Far East Freeway
FAI/LIC-70-0.00/0.00
Alternative Evaluation Report

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1.0 Introduction

1.1 Executive Summary

The section of IR 70 that this Alternative Evaluation Report covers begins at the eastern termini of the FRA-70-22.85 and FRA-70-22.61 projects (the Fairfield County Line) and extends to the east roughly to the two existing structures over Palmer Road. This section of IR 70 was analyzed as part of the 2014 Feasibility Study, and to further develop the recommended alternative in the 2014 study, a second Feasibility Study was completed by American Structurepoint. This second study was approved in March, 2023 and analyzed several different options for the improvement of IR 70 including the following:

- Widening IR 70 to the inside versus the outside
- The construction of a diamond interchange versus a diverging diamond interchange at Taylor Road
- Taylor Road passing over IR 70 or under IR 70
- Variations to the taper for the eastbound CD road back into IR 70
- Number of lanes for the westbound CD road
- The creating of a CD road east or west of Taylor Road for westbound IR 70

These alternatives were variations of Alternatives B & C developed in the 2014 Feasibility Study. No changes to the existing horizontal or vertical alignment of IR 70 were proposed in the Feasibility Study. The design of preliminary horizontal and vertical alignments was completed for the IR 70 & SR 256 exit and entrance ramps, as well as the IR 70 and Taylor Road exit and entrance ramps, and for Taylor Road over and under IR 70. The recommendations carried to this Alternative Evaluation Report (AER) were as follows:

- Widen IR 70 to the outside and maintain three through lanes in both directions
- Construct a standard diamond interchange at Taylor Road
- Shift the horizontal alignment of Taylor Road to the east
- Construct Taylor Road over IR 70
- Taper the eastbound CD road into IR 70 west of the Taylor Road eastbound entrance ramp
- Construct a two-lane westbound CD road between SR 256 and Taylor Road
- Have WB traffic on IR 70 exit at Taylor Road and complete the through movement to access SR 256

The recommendations were based on a number of factors including: Right of Way impacts, construction cost, crash reduction, congestion reduction, maintenance of traffic effort, environmental impacts, and construction duration. **This Alternative Evaluation Report refines the horizontal and vertical alignments developed during the Feasibility Study, establishes more accurate retaining wall locations and costs, provides recommendations for the structure work required for the project, provides recommendations for the maintenance of traffic for IR 70, and includes preliminary drainage design.** Detailed information for the structure types and maintenance of traffic alternatives considered can be found in **Appendix D** and **Appendix E** of this document

1.2 Summary of Findings of Feasibility Study

The Feasibility Study evaluated thirteen "build" alternatives and a "no-build" alternative and rated them based on a number of factors including construction cost, environmental impacts, Right of Way impacts, maintenance of traffic effort, and its effectiveness of meeting the primary and secondary goals of the Purpose and Need Statement. These thirteen alternatives were not "complete" alternatives, but instead consisted of variations of the overall concept identified in the 2014 Feasibility Study. The goal was to look at each component of the proposed project individually to identify the best overall configuration, while minimizing the number of alternatives being analyzed. Below is a breakdown of the alternatives evaluated in the Feasibility Study, with the recommended alternative shown in bold.

IR 70 Widening alternatives:

- Alternative 1A: Complete widening of IR 70 to the outside of the existing pavement (2 WB lanes)
- Alternative 1B: Complete widening of IR 70 to the inside of the existing pavement
- **Alternative 1C: Complete widening of IR 70 to the outside of the existing pavement (3 WB lanes)**

Taylor Road interchange alternatives:

- Alternative 2A: Diamond interchange at Taylor Road along existing Taylor Road alignment (under IR 70)
- Alternative 2B: Diamond interchange at Taylor Road shifted to the east (under IR 70)
- **Alternative 2C: Diamond interchange at Taylor Road shifted to the east (over IR 70)**
- Alternative 2D: Diverging Diamond interchange at Taylor Road shifted to the east (over or under IR 70)

Eastbound IR 70 CD road alternatives:

- Alternative 3A: Dual-lane entrance for eastbound CD road along IR 70
- **Alternative 3B: Merging of eastbound CD road prior to Taylor Road entrance**

Westbound IR 70 CD road alternatives:

- **Alternative 4A: Dual-lane westbound CD road along IR 70**
- Alternative 4B: Single-lane westbound CD road along IR 70

Westbound Taylor Road exit alternatives:

- **Alternative 5A: Westbound CD lane uses Taylor Road exit ramp and goes through Taylor Road intersection**
- Alternative 5B: Westbound CD lane stays parallel to IR 70 and goes under or over Taylor Road

Of those thirteen alternatives, all were identified as both feasible for construction and met the goals of the Purpose and Need. However, recommended options were identified between Alternatives 1A through 1C, 2A through 2D, 3A and 3B, 4A and 4B, and 5A and 5B, and these recommended options are the basis of this AER.

Below is the Evaluation Matrix from the Feasibility Study and the recommended alternatives:

Alternative	Evaluation Matrix Criteria								
	ROW Impacts	Crash Reduction	Congestion Reduction	Construction Duration	Maintenance of Traffic Effort	Construction Cost	Environmental Impacts	Overall	Cost ($Million)
No Build									$0
IR 70 Widening Options									
Alternative 1A									$55.77 M
Alternative 1B									$67.71 M
Alternative 1C								REC.	$56.77 M
Proposed Taylor Road Interchange Options									
Alternative 2A									$40.74 M
Alternative 2B									$45.16 M
Alternative 2C								REC.	$30.36 M
Alternative 2D									$35.24 M
Eastbound IR 70 CD Road Options									
Alternative 3A									$9.81 M
Alternative 3B								REC.	$2.88 M
Westbound IR 70 CD Road Options									
Alternative 4A								REC.	$3.99 M
Alternative 4B									$3.77 M
Westbound Taylor Road Exit Ramp Options									
Alternative 5A								REC.	$4.10 M
Alternative 5B									$6.38 M

Excellent Very Good Good Fair Poor

The configuration as recommended in the Feasibility Study includes: outside widening on IR 70 with three through lanes in each direction (Alternative 1C); a standard diamond interchange at Taylor Road, with Taylor Road shifted to the east and passing over IR 70 (Alternative 2C); merging the eastbound CD road prior to the Taylor Road entrance ramp merging with IR 70 (Alternative 3B); a dual-lane westbound CD road along IR 70 (Alternative 4A); and westbound traffic on IR 70 exiting at SR 256 being required to exit at Taylor Road and make the through movement to access the westbound CD road (Alternative 5A). A detailed analysis of these alternatives can be found in the Feasibility Study, which was approved by ODOT District 5 on March 9th, 2023.

2.0 Purpose and Need Summary

2.1 Purpose and Need Statement

The Purpose and Need Statement for this study was established in the 2006 FRA-70-16.17 Far East Freeway Study, which states the following:

The current designs of the interchanges on the Far East Freeway are inadequate for current traffic volumes. Traffic volumes are expected to increase by nearly 20 percent by the year 2030. Several locations with failing traffic conditions and high crash rates correspond to overcapacity mainline sections and weave areas at, and between, the interchanges. Solutions to these issues must:

- *Improve traffic flow and LOS by correcting operational deficiencies by improving capacity in interchange areas.*
- *Improve safety, by addressing problematic roadway geometric deficiencies and weave areas.*

The need to improve traffic operations and decrease crashes along this section of IR 70 is well documented; in the 2040 no-build condition IR 70 westbound would be a LOS F from Brice Road past Taylor Road (including LOS F on the westbound Brice Road exit ramp, westbound SR 256 entrance ramp, and westbound SR 256 exit ramp) in the AM peak. In the PM peak for the 2040 no-build condition IR 70 would be a LOS F from James Road to SR 256 (including LOS F on the SR 256 westbound and eastbound exit ramps, as well as the westbound entrance ramp from SR 256 onto IR 70). By 2030, traffic volumes along IR 70 are expected to increase throughout the corridor to over 190,000 vehicles per day, with over 1000 crashes per year anticipated. The social, economic, and environmental impacts from the congestion and traffic are high, and to offset these impacts ODOT has worked with project stakeholders and the public to identify goals for the improvements of the corridor. Prior to the 2023 Feasibility Study, the following goals were established for the Far East Freeway:

- Optimize traffic flow on IR 70 and IR 270 (improvements on IR 270 are not considered as part of this Feasibility Study).
- Improve access to and with the surrounding roadway network.
- Improve current roadway design (including geometrics and capacity).
- Support travel purposes, such as access to jobs, services, and location destinations, and coordinate with other modes of travel.
- Consider the impacts on the natural and cultural environment.
- Coordinate with local plans.
- Minimize disruption during construction.
- Balance benefits with infrastructure costs.

The alternatives presented in the 2023 Feasibility Study meet the goals of the Purpose and Need with varying levels of effectiveness. These alternatives are detailed below, along with recommendations on what should be evaluated during the AER.

3.0 Alternatives Considered and Dismissed

The project was broken into sections and each section analyzed individually to piece together a complete alternative in the 2023 Feasibility Study, that is refined in this AER to establish the Preferred Alternative. The alternatives studied in the Feasibility Study are briefly described below, and whether they were recommended for further study. More detailed descriptions and schematics of each alternative can be found in the Feasibility Study approved on March 9th, 2023.

3.1 Alternative 1A – Widening to the Outside on IR 70 (2 WB through lanes)

Alternative 1A included the widening of IR 70 in the eastbound and westbound direction to the outside of the existing pavement. In the eastbound direction, three through lanes would be present from the western terminus to east of the proposed Taylor Road interchange, where it would taper down to two lanes to match the existing pavement. An eastbound CD road would be developed west of the existing SR 256 interchange, and would continue past the proposed Taylor Road overpass, and taper back to IR 70 just west of the Taylor Road eastbound entrance ramp gore area. The existing structures over Blacklick Creek and SR 256 would require widening or replacement to accommodate the additional through lanes on IR 70 and the proposed eastbound and westbound CD roads. In the westbound direction, three through lanes would be present from the western terminus to the SR 256 interchange, but would be reduced to two through lanes east of SR 256. A westbound CD road would be developed east of the SR 256 interchange and would merge into IR 70 at the SR 256 overpass. Two options for the westbound CD road were analyzed for the Feasibility Study; the development of the CD road east of the proposed Taylor Road interchange (Alternative 5B), and having all westbound traffic exiting at SR 256 using the Taylor Road exit ramp and making the through movement at the signalized intersection at Taylor Road (Alternative 5A). The pavement replacement work on westbound IR 70 would continue approximately 7300' east of the proposed Taylor Road overpass where it would match the existing pavement widths. **Alternative 1A was dismissed from further consideration because the two through lanes in the westbound direction would result in a LOS F in the AM peak in the opening year.**

3.2 Alternative 1B - Widening to the Inside on IR 70

Alternative 1B included the widening of IR 70 in the eastbound and westbound direction to the inside of the existing pavement and the elimination of the grassed median along IR 70. In the eastbound direction, three through lanes would be present from the western terminus to east of the proposed Taylor Road interchange, where it would taper down to two lanes to match the existing pavement. An eastbound CD road would be developed west of the existing SR 256 interchange, and would continue past the proposed Taylor Road overpass, and taper back to IR 70 just west of the Taylor Road eastbound entrance ramp gore area. The existing structures over Blacklick Creek and SR 256 would require widening or replacement to accommodate the additional through lanes on IR 70 and the proposed eastbound and westbound CD roads. In the westbound direction, three through lanes would be present from the western terminus to approximately 9000' east of the proposed Taylor Road overpass, where would taper down to two lanes to match the existing pavement. A westbound CD road would be developed east of the SR 256 interchange and would merge into IR 70 at the SR 256 overpass. Two options for the westbound CD road were analyzed for the Feasibility Study; the development of the CD road east of the proposed Taylor Road interchange (Alternative 5B), and having all westbound traffic exiting at SR 256 using the

Taylor Road exit ramp and making the through movement at the signalized intersection at Taylor Road (Alternative 5A). The pavement replacement work on westbound IR 70 would continue approximately 7300' east of the proposed Taylor Road overpass where it would match the existing pavement widths. **Alternative 1B was dismissed from further consideration for several reasons including: higher construction cost, the elimination of the turnarounds for emergency services, additional MOT effort/cost, and any future lane additions requiring reconstruction of the interchange ramps at both SR 256 and Taylor Road.**

3.3 Alternative 2A – Diamond Interchange at Taylor Road along existing alignment (under IR 70)

Alternative 2A included the construction of a standard diamond interchange at Taylor Road and IR 70. The existing eastbound exit ramp from IR 70 eastbound to southbound Taylor Road would be removed and replaced allowing for exiting traffic to turn northbound or southbound on Taylor Road. In Alternative 2A, Taylor Road would follow the existing tangent horizontal alignment north and south of IR 70, and would have a vertical profile that passes underneath IR 70, requiring the construction of two bridges along eastbound and westbound IR 70. The proposed ramps would consist of a three-lane exit ramp onto Taylor Road from IR 70 eastbound, a single-lane entrance ramp onto IR 70 eastbound from Taylor Road, a two-lane exit ramp onto Taylor Road from IR 70 westbound, and a two-lane entrance onto the westbound CD road that can be used to access either the SR 256 exit ramp or IR 70 westbound. In the interchange area, Taylor Road would be reconstructed and would include two through lanes in the northbound and southbound directions, northbound and southbound left turn lanes, northbound and southbound right turn lanes, the realignment of Taylor Road SW, and the installation of four new traffic signals at the following intersections: SR 204, the IR 70 eastbound ramp intersection, the IR 70 westbound ramp intersection, and Taylor Road SW. **Alternative 2A was dismissed from further consideration for several reasons including: impacts to the Creekside Apartment units, groundwater concerns with passing under IR 70, increased MOT effort/duration because of the construction of the bridges along IR 70, higher construction cost, higher R/W acquisition costs, and reduction in access for the Creekside Apartment complex.**

3.4 Alternative 2B – Diamond Interchange at Taylor Road shifted to the east (under IR 70)

Alternative 2B included the construction of a standard diamond interchange at Taylor Road and IR 70. The existing eastbound exit ramp from IR 70 eastbound to southbound Taylor Road would be removed and replaced allowing for exiting traffic to turn northbound or southbound on Taylor Road. In Alternative 2B, the horizontal alignment of Taylor Road would be shifted 110' to the east through the use of reverse curves north and south of IR 70, and would have a vertical profile that passes underneath IR 70, requiring the construction of two bridges along eastbound and westbound IR 70. The proposed ramps would consist of a three-lane exit ramp onto Taylor Road from IR 70 eastbound, a single-lane entrance ramp onto IR 70 eastbound from Taylor Road, a two-lane exit ramp onto Taylor Road from IR 70 westbound, and a two-lane entrance onto the westbound CD road that can be used to access either the SR 256 exit ramp, or IR 70 westbound. In the interchange area, Taylor Road would be reconstructed and would include two through lanes in the northbound and southbound directions, northbound and southbound left turn lanes, northbound and southbound right turn lanes, the realignment of Taylor Road SW, and the installation of four new traffic signals at the following intersections: SR 204, the IR 70 eastbound ramp

intersection, the IR 70 westbound ramp intersection, and Taylor Road SW. **While the horizontal geometry and longitudinal work limits of Alternative 2B and 2C are identical, Alternative 2B was dismissed from further consideration for several reasons including: groundwater concerns with passing under IR 70, increased MOT effort/duration because of the construction of the bridges along IR 70, and higher construction cost than alternative 2C because of required retaining walls.**

3.5 Alternative 2D – Diverging Diamond Interchange at Taylor Road shifted to the east (over or under IR 70)

Alternative 2D included the construction of a diverging diamond interchange at Taylor Road and IR 70. The existing eastbound exit ramp from IR 70 eastbound to southbound Taylor Road would be removed and replaced with a "split" ramp allowing for exiting traffic to turn northbound or southbound on Taylor Road. In Alternative 2D, the horizontal alignment of Taylor Road would be shifted 110' to the east through the use of reverse curves north and south of IR 70, and would have a vertical profile that could pass either over or under IR 70, and would be similar to the profiles developed for Alternatives 2B and 2C. In the over option, two overpass bridges would be constructed along Taylor Road to accommodate the split traffic on Taylor Road northbound and southbound. In the under condition, two new structures would be required to carry IR 70 traffic over the realigned Taylor Road. In both conditions, the proposed ramps would consist of a split three-lane (two southbound, one northbound) exit ramp onto Taylor Road from IR 70 eastbound, a split two-lane entrance ramp onto IR 70 eastbound from Taylor Road, a split two-lane exit ramp onto Taylor Road from IR 70 westbound, and a split two-lane entrance onto the westbound CD road that can be used to access either the SR 256 exit ramp, or IR 70 westbound. In the interchange area, Taylor Road would be reconstructed and would include two through lanes in the northbound and southbound directions, northbound and southbound left turn lanes, northbound and southbound right turn lanes, the realignment of Taylor Road SW, and the installation of four new traffic signals at the following intersections: SR 204, the IR 70 eastbound ramp intersection, the IR 70 westbound ramp intersection, and Taylor Road SW. The phasing of the signals at the ramps would vary from the standard diamond however because of traffic being shifted to the opposite side in the interchange area. **While Alternative 2D does provide for a slightly better overall LOS than Alternatives 2B and 2C, it was dismissed from further consideration because the estimated construction cost was nearly $5 million higher than Alternative 2C.**

3.6 Alternative 3A - Dual-lane entrance for eastbound CD road along IR 70

The development of the eastbound CD road is identical for Alternatives 3A and 3B, and would consist of a three-lane exit ramp at SR 256 that utilizes a 50' taper immediately after the ramp gore to widen out to four total lanes. The two inside lanes would continue as the eastbound CD road for the SR 256 westbound exit ramp as well as the Taylor Road interchange. The two outside lanes would widen with a 50' taper to three lanes onto SR 256 eastbound and will be signalized at the intersection with SR 256. On the CD road over SR 256 the outside lane will be a single lane exit onto SR 256 westbound and will maintain roughly the same horizontal geometry as the existing ramp. The inside lane of the CD road will continue to the Taylor Road interchange, and the IR 70 eastbound entrance ramp from SR 256 would be an add lane running parallel to the CD road. Traffic on the CD road exiting onto Taylor Road would not be required to change lanes; the exit onto Taylor Road will utilize both lanes. However, traffic entering from SR 256 would need to complete the weave movement in order to continue on IR 70 eastbound. The total weave distance between the two ramps is 1050'. The CD road will tie into IR 70 as

an add lane approximately 500' west of the ramp gore for the IR 70 eastbound entrance ramp from Taylor Road. The single lane entrance ramp onto IR 70 from Taylor Road will tie into IR 70 as a second add lane running parallel to the CD road and will continue for approximately 1850' before it is merged into the CD road lane using a 600' taper. The CD road lane will continue an additional 2000' before it merges into IR 70 with a 600' taper. At this merge point the outside edge line for IR 70 will match the existing condition. **Alternative 3A was dismissed from further consideration for the following reasons: it requires an additional 2490' of pavement replacement compared to Alternative 3B, it requires the replacement of the eastbound IR 70 bridge over Palmer Road, increased Right of Way costs, potential for the creation of a bottleneck from merges on both the inside and outside of IR 70 eastbound, higher construction cost compared to Alternative 3B, and reduced distance between merges compared to Alternative 3A.**

3.7 Alternative 4B - Single-lane westbound CD road along IR 70

Alternative 4B included the construction of a single-lane westbound CD road along IR 70 between the SR 256 and Taylor Road interchanges. All traffic exiting IR 70 westbound for both Taylor Road and SR 256 would exit at Taylor Road. Traffic that is continuing onto SR 256 would make the through movement at the intersection of the ramp and Taylor Road. This entrance ramp from Taylor Road would be a two-lane ramp, but would merge down to a single 16' lane with a 720' taper approximately 425' west of the Taylor Road intersection. The single lane ramp would continue as a CD road between Taylor Road and the SR 256 exit ramp. A 50' taper would widen the CD lane back out to two lanes 650' east of the SR 256 exit ramp gore. Traffic exiting onto SR 256 would make the lane change, and traffic continuing onto IR 70 would continue on the CD road. The westbound CD road would tie into IR 70 as an add lane 565' east of the gore area for the SR 256 entrance ramp onto IR 70. The construction of the CD lane merge onto IR 70 over SR 256 would require the widening or replacement of the existing IR 70 westbound bridge over SR 256. The structure work would be required regardless of whether IR 70 is widened to the inside or outside. **While Alternative 4B does have a lower construction cost than Alternative 4A, it was dismissed from further consideration for the following reasons: Alternative 4B would merge the two lane entrance ramp down to a single lane for only a distance of 1850' (roughly 22 seconds at 55 mph) before it would immediately open back up to two lanes at the SR 256 exit ramp, reduced LOS compared to Alternative 4A, and the cost savings associated with Alternative 4B compared to 4A would be minor in relation to the overall project cost, with an estimated difference of $0.22 million.**

3.8 Alternative 5B - Westbound CD lane stays parallel to IR 70 and goes under or over Taylor Road

Alternative 5B included the development of the westbound CD road east of Taylor Road, with the westbound IR 70 exit ramp being a two lane exit ramp. The inside lane would serve as the CD road for SR 256 that passes either over or under Taylor Road depending on the selected alternative for the Taylor Road profile. The outside lane of the ramp would be a single lane exit ramp that widens to two lanes with a 50' taper approximately 100' west of the ramp gore. At the Taylor Road intersection, the exit ramp will feature a dedicated left turn lane for southbound Taylor Road traffic, and a through-right for northbound Taylor Road. Because of the CD lane passing over or under Taylor Road, the only through movements made at the intersection would be motorists who accidentally exited at Taylor Road instead of SR 256. The entrance ramp onto IR 70 westbound from Taylor Road would be a two-lane ramp that merges down to one with a 600' taper approximately 530' west of the Taylor Road

intersection. The single lane would then meet the CD road running parallel to IR 70 westbound. Traffic on the CD road exiting onto SR 256 and westbound IR 70 traffic entering from Taylor Road would need to complete the weaving movement between the two interchanges. The total weave length provided between the ramps was 1660'. If the profile for Taylor Road passed over IR 70, the span of the proposed bridge on Taylor Road would need to be increased by approximately 32' to accommodate for the CD road along IR 70 westbound. If the profile for Taylor Road passed under IR 70, the proposed IR 70 westbound structure would need to be approximately 32' wider to accommodate the CD road. **Alternative 5B was dismissed from further consideration because of the following reasons: development of the CD road east of Taylor Road requires all traffic exiting at SR 256 and entering IR 70 westbound from Taylor Road to complete the weave movement, increased construction cost from the required increase in bridge width/length for the Taylor Road crossing, and an increase in pavement replacement of 1480' along IR 70 westbound.**

3.9 No-Build Alternative

For comparison sake, a "no-build" alternative was included for evaluation. While the no-build alternative would free up available funds for ODOT to use on other pressing issues, the Far East Freeway ranks near the very top in both congestion and crash rate. Severe backups occur daily along IR 70 and SR 256, and over 800 crashes occur along the Far East Freeway annually; with this number expected to exceed 1000 annual crashes if no improvements are made. Improvements along the entire Far East Freeway corridor are critical for public safety, continued growth on the east side of Columbus, and to eliminate major traffic issues which have plagued the area for years.

While the no-build alternative does not meet the goals of the Purpose and Need, the NEPA process requires that the no-build option to be analyzed during the AER.

3.1 Alternatives Recommended from Feasibility Study

3.10 Alternative 1C – Widening to the Outside on IR 70 (3 WB through lanes)

Alternative 1C includes the widening of IR 70 in the eastbound and westbound direction to the outside of the existing pavement. In the eastbound direction, three through lanes are present from the western terminus to east of the proposed Taylor Road interchange, where it tapers down to two lanes to match the existing pavement. An eastbound CD road develops west of the existing SR 256 interchange, and continues past the proposed Taylor Road overpass, and tapers back to IR 70 just west of the Taylor Road eastbound entrance ramp gore area. The existing structures over Blacklick Creek and SR 256 require widening or replacement to accommodate the additional through lanes on IR 70 and the proposed eastbound and westbound CD roads. In the westbound direction, three through lanes are present from the western terminus to approximately 2375' east of Taylor Road and transitions to two via a 100' taper. A westbound CD road develops east of the SR 256 interchange and merges into IR 70 at the SR 256 overpass. Two options for the westbound CD road were analyzed for the Feasibility Study; the development of the CD road east of the proposed Taylor Road interchange (Alternative 5B), and having all westbound traffic exiting at SR 256 using the Taylor Road exit ramp and making the through movement at the signalized intersection at Taylor Road (Alternative 5A). The pavement replacement work on eastbound IR 70 continues approximately 7300' east of the proposed Taylor Road overpass where it matches the existing pavement

widths. **Alternative 1C was recommended for further study during the AER because of the following: improved LOS in the westbound direction compared to Alternative 1A, lower construction cost than Alternative 1B, can be widened in the future to four through lanes without impacting the interchange ramps, and it maintains the grassed median and emergency services turnaround locations.**

3.11 Alternative 2C – Diamond Interchange at Taylor Road shifted to the east (over IR 70)

Alternative 2C includes the construction of a standard diamond interchange at Taylor Road and IR 70. The existing eastbound exit ramp from IR 70 eastbound to southbound Taylor Road will be removed and replaced allowing for exiting traffic to turn northbound or southbound on Taylor Road. In Alternative 2C, the horizontal alignment of Taylor Road is shifted 110' to the east through the use of reverse curves north and south of IR 70, and has a vertical profile that passes over IR 70, requiring the construction of a single structure over IR 70. The proposed ramps consist of a two-lane exit ramp that transitions to three onto Taylor Road from IR 70 eastbound, a single-lane entrance ramp onto IR 70 eastbound from Taylor Road, a two-lane exit ramp onto Taylor Road from IR 70 westbound, and a two-lane entrance onto the westbound CD road that can be used to access either the SR 256 exit ramp, or IR 70 westbound. In the interchange area, Taylor Road will be reconstructed and includes two through lanes in the northbound and southbound directions, northbound and southbound left turn lanes, northbound and southbound right turn lanes, the realignment of Taylor Road SW, and the installation of four new traffic signals at the following intersections: SR 204, the IR 70 eastbound ramp intersection, the IR 70 westbound ramp intersection, and Taylor Road SW. **While the horizontal geometry and longitudinal work limits of Alternative 2B and 2C are identical, Alternative 2C was recommended for further study for several reasons including: lowest overall construction cost compared to 2A, 2B, and 2D, lowest overall MOT effort/duration, only slightly lower LOS compared to 2D (but only an increase in delay of 3.7 seconds during the peak hour), and the lowest Right of Way acquisition cost.**

3.12 Alternative 3B – Merging of eastbound CD road prior to Taylor Road entrance

Alternative 3B includes a three-lane exit ramp along IR 70 eastbound at SR 256 that utilizes a 50' taper immediately after the ramp gore to widen out to four total lanes. The two inside lanes continue as a CD road for the SR 256 westbound exit ramp as well as the Taylor Road interchange. The two outside lanes widen with a 50' taper to three lanes onto SR 256 eastbound and are signalized at the intersection with SR 256. On the CD road over SR 256, the outside lane is a single lane exit onto SR 256 westbound and maintains the same horizontal geometry as the existing ramp. The construction of the CD road over SR 256 requires the widening or replacement of the existing structure on eastbound IR 70 over SR 256. The structure work is required regardless of whether IR 70 is widened to the inside or outside. The inside lane of the CD road continues to the Taylor Road interchange, and the IR 70 eastbound entrance ramp from SR 256 is an add lane running parallel to the CD road. Traffic on the CD road exiting onto Taylor Road is not required to change lanes; the exit onto Taylor Road utilizes both lanes. However, traffic entering from SR 256 needs to complete the weave movement in order to continue on IR 70 eastbound. The total weave distance between the two ramps is 1050'. The CD road continues for 600' beyond the Taylor Road exit ramp gore where it merges into IR 70 with a 1250' taper that ends 70' west of the gore area

for the Taylor Road entrance ramp onto eastbound IR 70. The single lane entrance ramp onto IR 70 from Taylor Road ties into IR 70 using a 1250' taper. At this merge point the outside edge line for IR 70 matches the existing condition. **Alternative 3B was recommended for further study for the following reasons: Alternative 3B shortens the work limits on eastbound IR 70 by 2490', it prevents the need for the replacement/widening of the Palmer Road bridge, lower construction cost, lower Right of Way cost, improved distance between merge points along IR 70, and it eliminates the potential for a bottleneck with lanes being reduced on the inside and outside on IR 70.**

3.13 Alternative 4A - Dual-lane westbound CD road along IR 70

Alternative 4A includes the development of a two-lane westbound CD road between the SR 256 and Taylor Road interchanges. The IR 70 westbound/CD road entrance ramp from Taylor Road is a two-lane ramp, with the inside lane continuing to IR 70, and the outside lane as the single-lane SR 256 exit ramp. Turning traffic from Taylor Road onto the outside ramp lane needs to complete the lane change to continue onto IR 70 westbound (the weaving distance is 2350'). Traffic exiting from IR 70 westbound at Taylor Road and completing the through movement to continue to SR 256 are in the correct (outside) lane and do not need to complete any weaving. The SR 256 exit ramp is a single lane exit that widens to two lanes 360' east of the SR 256 intersection. The ramp consists of a dedicated right turn lane for SR 256 westbound and a through-left lane for SR 256 eastbound. The westbound CD road ties into IR 70 as an add lane 565' east of the gore area for the SR 256 entrance ramp onto IR 70 westbound. The construction of the CD lane merge onto IR 70 over SR 256 requires the widening or replacement of the existing IR 70 westbound bridge over SR 256. The structure work is required regardless of whether IR 70 is widened to the inside or outside. **Alternative 4A was recommended for further study because of the following: lower accident rate and increased traffic flow for the two-lane CD road, minimal increase in project construction cost (0.26%), and the minimization of lane changes along the entrance ramp and CD road compared to Alternative 4B.**

3.14 Alternative 5A - Westbound CD lane uses Taylor Road exit ramp and goes through Taylor Road intersection

Alternative 5A develops the westbound CD road west of Taylor Road, and all traffic exiting IR 70 westbound for both Taylor Road and SR 256 exits at Taylor Road. The exit ramp is a single lane exit ramp that widens to two lanes 450' east of the Taylor Road intersection. The right lane is a through-right (the right turn for northbound Taylor Road and the through for SR 256 traffic), and the left is a dedicated left turn lane for southbound Taylor Road. The IR 70 westbound entrance ramp from Taylor Road is a two-lane ramp, with the inside lane continuing to IR 70 as a CD road, and the outside lane as the single-lane SR 256 exit ramp. Turning traffic from Taylor Road onto the outside ramp lane completes the weave movement to continue onto IR 70 westbound (the weaving distance is 2350'). Traffic exiting from IR 70 westbound at Taylor Road and completing the through movement to continue to SR 256 are in the correct (outside) lane and do not need to complete any weaving. The SR 256 exit ramp is a single lane exit that widens to two lanes 360' east of the SR 256 intersection. The ramp consists of a dedicated right turn lane for SR 256 westbound and a through-left lane for SR 256 eastbound. The through movement is only used for motorists who incorrectly exit at SR 256 but wish to continue onto IR 70 westbound. **Alternative 5A was recommended for further study because of the following: lower construction cost, reduced weaving on the CD road compared to Alternative 5B, low traffic volumes needing to complete the through**

movement at the Taylor Road & IR 70 westbound ramp intersection, and reduction in the length/width of the Taylor Road bridge (or bridges if Taylor Road passes under IR 70) compared to Alternative 5B.

4.0 Key Issues

4.1 Traffic Analysis

At the time of the submission of this AER certified traffic was not available, so no updates to the traffic analysis have been made compared to what was shown in the Feasibility Study. For reference, traffic analysis information for the recommended alternatives is detailed below:

A capacity analysis was performed for the proposed Taylor Road interchange for a standard diamond configuration (Alternative 2C). Additionally, a weaving analysis was performed for the eastbound and westbound collector-distributor (CD) roads between the SR 256 interchange and the proposed Taylor Road interchange. These capacity analyses were performed using the 2040 AM and PM ODOT Certified Traffic Volumes that were provided as part of the Feasibility Study Report (FRA-70-16.17, PID 76997). The proposed interchange configuration was used in the Highway Capacity Software (HCS2022) which utilizes the methodology outlined in the *Highway Capacity* Manual (HCM) to determine the anticipated operating conditions that would be experienced in 2040.

The standard parameter used to evaluate traffic operating conditions is referred to as Level of Service (LOS). There are six LOS (A through F) which relate to driving conditions. LOS for signalized intersections is defined in terms of control delay per vehicle, which is a direct correlation to driver discomfort, frustration, fuel consumption, and lost travel time. LOS for weaving segments on CD roadways is defined by the computed density of the segment. This is used to characterize the total flow in the weaving segment and how the computed conditions relate to the capacity of the CD roadway. As the computed density of the CD roadway increases, weaving conditions become less safe as gaps to perform lane changes become smaller and fewer in number. **Table 4.1** provides the LOS criteria as defined in the HCM.

Table 4.1: LOS Thresholds

LOS	Signalized Intersection Control Delay per Vehicle (seconds)	Weaving on CD Roadways Density Range (veh/mi/ln)
A	≤ 10	≤ 12
B	> 10 and ≤ 20	> 12 and ≤ 24
C	> 20 and ≤ 35	> 24 and ≤ 32
D	> 35 and ≤ 55	> 32 and ≤ 36
E	> 55 and ≤ 80	> 36
F	> 80	Demand Exceeds Capacity

Operating conditions are generally considered to be acceptable if found to operate at LOS D or better for the overall intersection, with no approach operating worse than LOS E. The capacity analysis results for the Taylor Road diamond interchange can be found in **Table 4.2** for the Certified Traffic Volumes for the 2040 AM and PM

peak hours. The full capacity analysis output is provided in **Appendix G** of the Feasibility Study completed by ASI, dated March 3rd, 2023.

Table 4.2: Capacity Analysis for the Diamond Interchange at Taylor Road

Intersection	Approach		Diamond Interchange			
			2040 AM		2040 PM	
			LOS	Delay (sec)	LOS	Delay (sec)
Taylor Road & Eastbound Ramps	EB	L	C	21.7	D	38.5
		R				
	NB	T	C	20.3	C	29.0
		R				
	SB	L	A	7.7	B	10.9
		T				
	Overall		**B**	**17.1**	**C**	**27.4**
Taylor Road & Westbound Ramps	WB	L	C	25.7	C	32.2
		T/R				
	NB	L	A	10.0	B	13.2
		T				
	SB	T	B	15.4	C	28.2
		R				
	Overall		**B**	**16.5**	**C**	**21.2**

As shown in the table above, for the diamond interchange operates at a LOS C or better for both the AM and PM peak hour analysis periods. There are no overall or approach LOS or delays that fall below the acceptable thresholds discussed prior.

The westbound CD Road between SR 256 and Taylor Road is anticipated to have 10,120 ADT, 1,040 vehicles in the AM peak hour, and 1,020 vehicles in the PM peak hour according to the 2040 Certified Traffic Volumes. The CD Road was analyzed as 2 lane roadway which produces vehicle densities to 10.3 and 10.1 vehicles/mile/lane and a LOS A for 2040. The results of the capacity analysis are shown below in **Table 4.3**.

Table 4.3: Capacity Analysis for Westbound CD Road

Analysis Period	Roadway Configuration	LOS	Density
2040 PM	2 Lane	A	10.3
2040 PM		A	10.1

The results of the weaving analysis for the eastbound CD road between the SR 256 interchange and the proposed Taylor Road interchange can be found in **Table 4.4.** The weaving flow rate and the maximum weaving length were also calculated for the eastbound CD road. The weaving flow rate is a measure of passenger cars per hour and a

flow rate that exceeds 2,400 passenger cars per hour is considered failing for a 2 lane segment. The segment length of weave area cannot exceed the Maximum Weaving Length (L_{MAX}) calculated by HCS. If either of these measures fail, then further modeling via TransModeler is to be used as a supplemental analysis, however for this analysis both of these measures are acceptable for utilizing HCS. The full weaving analysis for the eastbound CD road can be found in **Appendix G** of the Feasibility Study completed by ASI and dated March 3rd, 2023.

Table 4.4: Weaving Analysis for Eastbound CD Road

Analysis Period	LOS	Density (vec/mi/n)	Weaving Flow Rate (pc/h)	Maximum Weaving Length (ft)	Segment Length (ft)
2040 AM	A	10.2	832	12,918	1,350
2040 PM	C	30.7	2,191	12,770	1,350

As shown in **Table 4.4**, the CD road operates acceptably for both the AM and PM peak hours in regards to providing adequate roadway to safely perform weaving maneuvers between the two interchanges.

4.2 Roadway Geometrics

IR 70 Eastbound and Westbound

The overall ramp and lane configurations established in the Feasibility Study have not been changed as part of this AER, but revisions to both the horizontal and vertical geometry of the ramps have been made. These changes are a result of the field survey being complete (Lidar/3DEP data was used in the Feasibility Study), and additional refinements made in order to minimize environmental and adjacent property impacts. Below is a summary of what geometric changes were made from the Feasibility Study to the AER:

- The eastbound IR 70 exit ramp at SR 256 was pushed 3.5' south to separate the ramp/CD bridge over Blacklick creek from the IR 70 eastbound bridge. Separating the structures minimized the profile adjustments required along IR 70 eastbound as well as provided more flexibility for the profile for the exit ramp/CD road. This also had the benefit of minimizing impacts to the Blacklick Trail.
- The shift to the south of the IR 70 eastbound exit ramp at SR 256 lengthened the taper for the CD road, which required modification to the spirals and horizontal curves for the SR 256 northbound exit ramp. The horizontal geometry and superelevation of the exit ramp still meets all design requirements.
- The taper and horizontal curves of the IR 70 westbound entrance ramps were modified to reduce the amount of widening required on the Blacklick Creek overpass on IR 70 westbound
- Minor revisions to the shoulder width and exit curve for the westbound IR 70 exit ramp at SR 256 were made. The shoulder width was reduced from 10.0' to 6.0' at the ramp gore.
- The exit curve for the eastbound IR 70 exit ramp at Taylor Road had the degree of curvature increased, and a spiral added to the horizontal alignment. This was done to reduce the impacts to the Violet Township parcel, with reduction of the work limits reduced by nearly 20' in some areas. The intersection angle of the ramp at the Taylor Road intersection was unchanged.

- **The intersection angle for the Taylor Road entrance ramp to IR 70 eastbound was reduced from 90° to 70° and all horizontal curves along the ramp were changed.** The ramp alignment was changed to eliminate the need for a retaining wall on the south side of the ramp, and to eliminate Right of Way impacts to the single family homes adjacent to the ramp in the Haaf Farms subdivision. The changes to the ramp baseline pushed the ramp closer to IR 70 as much as 83'. The new ramp alignment meets all design criteria for degree of curvature and superelevation.
- **The intersection angle for the Taylor Road entrance ramp to IR 70 westbound was reduced from 85° to 70° and all horizontal curves along the ramp were changed.** The ramp alignment was changed to reduce the length and height of the retaining wall required on the north side of the ramp, minimize/eliminate impacts to the creek on the north side of the ramp, and reduce the overall construction cost of the project. The changes to the ramp baseline push the ramp closer to IR 70 as much as 124'. The new ramp alignment meets all design criteria for degree of curvature and superelevation.
- **The IR 70 westbound exit ramp at Taylor Road was modified to utilize a single horizontal curve at the exit, and had the intersection angle with Taylor Road reduced from 83° to 70°.** The changes to the alignment allow for a tangent approach at the intersection which improves stopping sight distance, and improves the efficiency of traffic making the through movement onto the westbound ramp/CD road. The changes to the ramp will require additional Right of Way, but the impacted parcel was shown as a Total Take at the Feasibility Study.
- The profiles for all impacted ramps were updated. All vertical alignments meet the required stopping sight distance and K values. All vertical profiles are shown on the plan and profile sheets, found in **Appendix B.**
- Two profiles were developed for the Taylor Road overpass; one for the steel bridge design and one for concrete. Additionally, the tie-ins for the Taylor Road profile were modified because of the difference between the field survey and the aerial data used for the Feasibility Study. Both profiles are shown on the plan and profile sheets found in **Appendix B.**
- The profile for IR 70 was raised approximately 1000' west and east of the SR 256 bridge to meet the vertical clearance requirements for SR 256. Two profiles were developed for the raising of the profile; the steel bridge alternative requires the profile to be raised approximately 6", and the concrete bridge alternatives requires the profile to be raised 10". The 10" increase alternative is shown on the plans because it meets the vertical clearance for both bridge options considered.

Below is updated geometric information for IR 70, Taylor Road, and all ramps:

IR 70 is classified as a Principal Arterial Interstate with a design speed of 70 mph. 12' travel lanes, with 10' paved shoulders on the inside and outside are required per Figure 301-4 in the ODOT L&D, Volume 1. **The existing horizontal alignment of IR 70 is being maintained throughout the project limits.** The existing centerline of IR 70 has two horizontal curves within the project limits, the first has a Dc of 1°28'00" and the second has a Dc of 1°00'00", which meet the criteria for the 70 mph design speed (maximum allowable Dc is 2°45'00" per Figure 202-2 in the ODOT L&D, Volume 1). It should be noted that the maximum existing superelevation rate of IR 70 is 0.0617 which exceeds the maximum 0.06 currently shown in the L&D for an urban interstate. **A Design Exception is NOT required for exceeding the maximum superelevation rate,** and using variable thickness milling and

pavement overlays to reduce the proposed superelevation rate down to 0.06 is not recommended, as it would complicate construction and require variable thickness intermediate courses throughout to get the existing and proposed aggregate base layers to align. The existing vertical profile of IR 70 has three crest and two sag vertical curves in succession, and the K Value and stopping sight distance criteria are met for all five vertical curves. **The existing profile of IR 70 will be maintained with one exception; in the area of the SR 256 overpass the profile will be raised 10" using pavement overlays to achieve the required vertical clearance for the proposed structure.** No profile adjustments at the Blacklick Creek, Palmer Road, or Taylor Road bridges will be required. All pavement shifts and lane tapers shown meet the criteria for the 70 mph design speed. If Taylor Road passes over IR 70, a minimum of 16.5' vertical clearance will be required for the proposed bridge. **No Design Exceptions are anticipated for the work on IR 70.**

Taylor Road

The extension of Taylor Road over IR 70 will be classified as an Urban Minor Arterial with a design speed of 45 mph per the IMS. The proposed alternative as shown utilizes 12' lanes, but lane widths could be reduced to 11' per Figure 301-4 in the ODOT L&D, Volume 1 to reduce construction costs. Type 2 Combination Curb and Gutter is shown on both sides of the roadway, and 6" concrete median separates the northbound and southbound lanes along the majority of the work limits. A 10' asphalt shared use path with a 5' tree lawn is shown on the east side of Taylor Road to add pedestrian access from the residential areas south of IR 70 to the commercial area north of IR 70.

The shifted horizontal alignment of Taylor Road features reverse curves at the north and south ends of the project with a Dc of 5°30'00" to avoid the need for superelevation (maximum allowable Dc of 5°40'00" per Figure 202-3 in the L&D, Volume 1). The reverse curves at the north and south ends of the project push the tangent section crossing over or under IR 70 to the east 110' to avoid impacts to the apartments mentioned above. Turn lane lengths were generated based off Figures 401-9 and 401-10 in the ODOT L&D, Volume 1, and all horizontal shifts and tapers meet the design criteria for 45 mph.

The design criteria for the vertical profile of Taylor Road requires a minimum stopping sight distance of 360', and K values of 61 for crest vertical curves and 79 for sag vertical curves. The proposed profile utilizes a 450' crest vertical curve over IR 70 (SSD = 380.8', K = 67.2), with approach grades of +4.10% and -3.20%. The crest vertical curve is then followed by a 450' sag vertical curve (SSD = 377.2', K = 82.7) with approach grades of -3.20% and +2.20%. Generally, grades under 5.00% are desirable for overpass and underpass approaches, so the vertical geometry is acceptable. Revisions to the profile generated for the Feasibility Study were completed during the AER phase because the field survey is complete and superstructure depths were determined from the structure type study. 16.5' vertical clearance is required from the bottom of the superstructure to the pavement surface on IR 70. **No Design Exceptions are anticipated for the work on Taylor Road.**

Taylor Road and SR 256 Interchange Ramps

The existing horizontal and vertical geometry of the SR 256 ramps will be kept largely the same with a few exceptions. Listed below are the modifications being proposed for the ramp horizontal geometry:

- For the eastbound exit onto SR 256 eastbound (Ramp E), the ramp is being pushed south to accommodate the construction of the CD road running along IR 70. At the ramp gore, the baseline of the ramp is approximately 45.5' south of its current location. Beyond the ramp gore the ramp widens on the north side from two to three lanes to avoid impacts to the Cracker Barrel property. This inside widening places the edge of paved shoulder in roughly the same location as the existing condition. The horizontal curvature of Ramp E is being improved; the existing ramp has a curve radius of 229', and the proposed ramp has a curve radius of 260'. Even with the increased radius, the ramp does not meet the minimum radius required for the 35 mph design speed, and **a design exception for Degree of Curve will be required.**
- The eastbound exit onto SR 256 westbound (Ramp D) will require a decrease in the radius of the curve coming off the ramp gore from 249' to 229'. This is necessary because the construction of the CD road on the south side of IR 70 and the required barrier separation pushes the ramp baseline to the south approximately 24' at the ramp gore. The proposed horizontal curvature exceeds the minimum 150' radius required for a loop ramp, therefore **no design exceptions are required for Ramp D.**
- Ramps B (westbound exit ramp onto SR 256) and C (eastbound IR 70 entrance ramp from SR 256) will match the existing horizontal and vertical geometry at the intersection points at SR 256 and throughout the majority of the ramp. The construction of the CD roads on the north and south sides of IR 70 will push the ramp baselines at the gore areas to the north and south. The degree of curvature for the westbound and eastbound ramps will be 1°30'00" and 3°00'00", respectively, which exceeds the requirements for the ramp design criteria shown on Figure 503-1 in the ODOT L&D, Volume 1.
- Ramp A (westbound IR 70 entrance ramp from SR 256) will have the most significant changes to the roadway geometry of any of the ramps at the SR 256 interchange. The intersection skew angle between SR 256 and Ramp A will be improved to 80°00'00", and the radius of the horizontal curve coming off of SR 256 increased to 440.74' (Dc of 13°00'00"). The existing ramp merges from two lanes to one immediately west of the SR 256 intersection. The proposed Ramp A will carry two lanes for 1970' beyond the merge point with IR 70 (the ramp hits IR 70 as two add lanes) before merging down to one with a 600' merge taper. The improvements to the Ramp A geometry pushes the pavement to the northwest as much as 57' along the Target parking lot, and retaining walls will be required to prevent impacts to the parking lot. **No design exceptions will be required for the modifications to Ramp A.**
- Proposed profiles for Ramps A through E can be found on the 1" = 20' scale plan and profile sheets in **Appendix B.**

At the Taylor Road interchange, the existing eastbound exit ramp to southbound Taylor Road will be removed in its entirety, and new eastbound and westbound entrance and exit ramps will be constructed. These ramps will be named Ramps G, H, I and J. Listed below are details for the horizontal geometry for each of those ramps:

- Ramp G (eastbound IR 70 exit ramp) will exit the eastbound CD road via a horizontal curve with a Dc of 0°40'00", which exceeds the criteria for 70 mph. The exit curve will be followed with a 200' spiral and curve with a Dc of 4°00'00", good for 60 mph. A 359' tangent section follows the compound curve and intersections the centerline of Taylor Road at an 85° angle.
- Ramp H (westbound IR 70 entrance ramp) intersects Taylor Road at a 70° angle, and has a 110' tangent section before its first horizontal curve. The ramp curves to the left with a horizontal curve with a Dc of

3°00’00”, good for 71 mph. A 425’ tangent section separates the first curve from a second horizontal curve to the right with a Dc of 3°00’00” which meets the design criteria for 70 mph. The ramp runs parallel to IR 70 as the westbound CD road between the two interchanges.

- Ramp I (westbound IR 70 exit ramp) will exit IR 70 westbound via a horizontal curve with a Dc of 2°00’00”, which exceeds the criteria for 70 mph. The exit curve is followed by an 849’ tangent section and intersects Taylor Road at a 70° angle.
- Ramp J (eastbound IR 70 entrance ramp) intersects Taylor Road at a 70° angle, and has a 74’ tangent section before its first horizontal curve. The ramp curves to the left with a horizontal curve with a Dc of 12°00’00”, good for 40 mph. A 178’ tangent section separates the first curve from a second horizontal curve to the right with a Dc of 4°30’00” which meets the design criteria for 59 mph. The ramp then merges into IR 70 eastbound with a 1260’ merge taper.
- All proposed ramp geometry exceeds the minimum requirements in Table 503-1 in the ODOT L&D, Vol. 1.
- Proposed profiles for Ramps G through J for the over and under condition for Taylor Road can be found on the 1” = 20’ scale plan and profile sheets found in **Appendix B**.
- **No design exceptions are required for the horizontal or vertical geometry for the proposed Taylor Road interchange.**

4.3 Drainage Design

The existing conditions of IR 70 include six lanes with paved shoulders, median and roadside ditches, culverts, and minimal closed storm sewer used to outlet water from the ditches. The existing conditions of Taylor Road include two sections: one north and one south of IR 70. The section to the north of I-70 is two lanes with graded shoulders and a culvert. The section to the south of IR 70 is two lanes with a concrete median followed by a left turn lane. The southern portion of Taylor Road has curbs and existing inlets. Currently only eastbound IR 70 can exit onto Taylor Road and there is no entrance ramp to I-70 from Taylor Road. The majority of storm runoff drains to Blacklick Creek through the tributaries within the project area.

IR 70 will be widened to the outside with the addition of collector roads between SR 256 and Taylor Road. Taylor Road will be extended over IR 70 with the new construction of a bridge and re-grading of the existing road. The proposed stormwater management system includes closed storm sewer systems, curb inlets, concrete barrier inlets, median and roadside ditches, extension or replacement of existing culverts, and two detention basins. There are 30 runs of proposed storm sewer that outlet at several locations that ultimately drain to Blacklick Creek.

The existing ditch on the north side of IR 70 may be converted to a constructed wetland to meet Post-Construction BMP requirements

The project will require water 32.18 acres of quality and quantity treatment. Two proposed detention basins will provide the required water quality and quantity treatment for the project. One will be in the infield of the entrance ramp from SR 256 to eastbound IR 70 and one will be in the infield of the exit ramp to Taylor Road from eastbound IR 70. The detention basins will treat a total of 40.67 acres, 34.73 acres of that is from permanent ODOT Right of Way.

4.4 Driveway Replacement and Relocation

The alternative developed in this AER report has no driveway impacts along SR 256, but will require the reconstruction of two driveways along SR 204, and eleven along Taylor Road. For SR 204, the driveway on the south side of the roadway at Sta. 39+50 will be replaced in-kind, with only the construction of the apron anticipated. The existing driveway on the north side at Sta. 44+75 will be relocated 110' east and made perpendicular to the roadway. The existing drive location would be within the limits of the proposed right and left turn lanes which would make accessing the driveway difficult for eastbound traffic on SR 204. The relocated driveway will match the existing driveway width and pavement buildup.

Along Taylor Road, the following driveways will have their aprons reconstructed, but no other changes made to the driveway alignment or location:

- Sta. 14+17, west side
- Sta. 25+20, west side
- Sta. 52+79, east side
- Sta. 54+84, west side
- Sta. 54+88, east side
- Sta. 57+49, west side

The remaining driveways along Taylor Road will require additional public input and/or design considerations during the detailed design phase. The Haaf Farm Drive access point is currently a right-in only because Taylor Road ends 450' north of the access point. **The AER includes the plan to keep this access point as a right-in only.** Coordination with the HOA and residents of Haaf Farms will be completed to obtain input on this arrangement or other potential options including: full access, right-in right-out, and keeping the current right-in only condition. For the existing northern drive for the Violet Township/Wigwam property at Sta. 29+65, west side, no driveway reconstruction is planned in the AER. The driveway location is at the minimum 600' outside of the interchange area, but is located within the Limited Access Right of Way. Further coordination with Violet Township is anticipated for input on this access arrangement and any potential options.

The northern drive to the Violet Township/Wigwam Event Center

North of the Taylor Road interchange, a proposed retaining wall is shown on the west side of realigned Taylor Road from Sta. 45+38 to Sta. 47+57 to maintain the Tributary Lane access for the Creekside Apartments. As shown, the existing section of Taylor Road pavement between Tributary Lane and Clear Path Drive will remain, so residents at the east end of the Creekside Apartments will use the existing section of Taylor Road to Clear Path Drive to access Taylor Road SW. Elimination of this access point would require all residents to exit the complex at Banks Edge Way, which is unsignalized. During peak hours, finding adequate gaps to make the left turn from Banks Edge Way onto Taylor Road SW can be difficult. Maintaining the eastern Tributary Lane access will prevent additional traffic on Banks Edge Way, and will minimize impacts to emergency services response times. No pavement work will be required on Tributary Lane because of the proposed retaining wall.

The existing concrete apron at Sta. 53+55, west side is shown in the AER report as being shifted north to Sta. 54+34 to push the driveway beyond the limits of the right turn lane for the Taylor Road SW intersection.

The final driveway that will require additional input during the detailed design is a potential driveway along the east side of Taylor Road, north of the interchange, for the existing properties currently owned by Carroll Brown (parcel #012-027450-01.000, 012-027450-000, and 010.017448-00.000). The current appraised value of the three properties from the Licking County Auditor is $286,500. The proposed driveway would require the purchase of additional Right of Way from the adjacent property (parcel #012-027366-00.00), the extension of the proposed culvert for the tributary creek, and **has an estimated construction cost of $522,000**. ASI has developed a proposed alignment, profile, and grading limits for the proposed driveway to determine the construction cost listed above. **No proposed driveway is shown in the AER plan since further coordination on this driveway will need to be done during further development of this plan**.

4.5 Structure (Bridge) Impacts/Design

Construction of the project will require modification or replacement of the two mainline bridges on IR 70 over Blacklick Creek, a new structure for the eastbound CD road over Blacklick Creek, the modification or replacement of the two mainline bridges on IR 70 over SR 256, a new structure for the eastbound CD road over SR 256, a new structure on Taylor Road over IR 70, and the replacement of the existing structure over the tributary creek on Taylor Road, north of IR 70. Additionally, the project limits currently shown do not extend to Palmer Road, but Structure Type Studies for the widening or replacement of the two mainline bridges on IR 70 over Palmer Road have been completed due to their close proximity to the project. Detailed analysis, life cycle costs, and recommendations for all the bridges listed above can be found in the Structure Type Studies, found in **Appendix D** of this document**.** A summary of the recommendations is below:

IR 70 bridges over Blacklick Creek:

- For the three structures over on IR 70 over Blacklick Creek, full replacement of the existing structures is recommended, with the new structures being three-span, with continuous reinforced concrete slab on cap and column piers and integral abutments.

IR 70 bridges over SR 256:

- For the three structures on IR 70 over SR 256, full replacement of the existing structures is recommended, with the new structures being two-span, W30 composite rolled steel beam superstructure on cap and column piers and semi-integral abutments behind MSE walls.

IR 70 bridges over Palmer Road

- For the two structures on IR 70 over Palmer Road, full replacement of the existing structures is recommended, with the new structures being single span, 42” web composite welded steel plate girder superstructure on semi-integral abutments behind MSE walls.

Taylor Road bridge over IR 70

- For the new bridge on Taylor Road over IR 70, the recommended structure is a two span composite pre-stressed wide-flange beam superstructure on semi-integral abutments behind MSE walls.

Taylor Road bridge of Tributary Creek

- For the new structure on the realigned Taylor Road, the proposed structure will be a 20’ span x 10’ rise reinforced concrete box culvert, with a total length of 300’. This length assumes no access drive for the parcel east of Taylor Road.

Complete replacement of the SR 256 overpass bridges is recommended

4.6 Retaining Walls

The locations, heights, and lengths of the proposed retaining walls have been revised compared to what was detailed in the Feasibility Study. These changes are the result of the refinements in the horizontal and vertical geometry of the proposed ramps at Taylor Road, elimination of the wall on the south side of the eastbound IR 70 entrance ramp from Taylor Road (due to the high wall cost compared to the low Right of Way acquisition cost for the Haaf Farms HOA-owned parcel), the completion of the field survey, and refinements to the proposed grading for the recommended alternative. Below is a summary of the recommended retaining walls and the construction costs associated with each:

Assumptions:

- The area of wall is calculated based on the exposed height of wall. Unit costs used for estimates account for the buried portion of the wall and foundation costs.
- Unit cost of Mechanically Stabilized Earth Retaining Wall (MSE) is $95/SF.
- Unit cost of Cast-in-place Retaining Wall is $180/SF.

Proposed Retaining Walls:

Wall 1 - Retaining Wall along North side of IR 70 & Ramp H:

Wall 1 starts at station 92+50, on the north side of IR 70 westbound and continues along the north side of Ramp H and ends at station 108+50. The wall will be located outside the sleeper slab, 26' left of the baseline of Ramp H. The wall is required to retain the fill required to build up the pavement for Ramp H to reduce impacts to the apartment complex at the northwest corner of the proposed interchange and to preserve the existing channel of the Tributary to Blacklick Creek. Due to the proximity to the channel the first 700' of wall from station 92+50 to 99+50 will be cast in place founded on piles. The piles will extend to rock or 15' below the channel thalweg. From station 99+50 to 108+50 where the wall is further from the channel, the wall type will be MSE.

Wall 2 - Retaining Wall along Ramp H:

Wall 2 starts at station 103+50, at the gore located between Ramp H and IR 70 westbound. The wall will be along the south side of Ramp H and ends at station 108+00. This wall retains the fill that is required to build up the pavement for Ramp H so that 2:1 grading does not extend into IR 70. The wall type is MSE and the wall will be located outside the sleeper slab, 19' right of the baseline of Ramp H.

Wall 3 - Retaining Wall along Taylor Road:

Wall 3 starts at station 45+50 and ends at station 47+50. It will retain the fill required for the proposed alignment of Taylor Road. The wall type is MSE and the wall will be located along the existing portion of Taylor Road that will remain for access to the apartment complex.

No Wall – Taylor Road and Ramp J:

Due to modifications made to the Ramp J alignment since the Feasibility Study, a wall is no longer recommended in this location. The location, when graded out with no wall, is no longer affecting the residential properties.

The wall was considered along the east side of Taylor Road, starting at station 31+50 and ending at station 36+00. This wall also continued along the south side of Ramp J, starting at station 111+00 and ending at station 114+50. The proposed grading encroaches on a property owned by Haaf Farms Homeowners Association (Parcel #0360596300). A portion of this parcel is already required to be taken for the proposed Taylor Road and Ramp J construction, and the additional Right of Way required for grading (vs. wall option) is minimal. In addition, the auditor has the property valued as $1,610 for the entire 9.47 acre parcel. There would also be a small amount of temporary Right of Way required from a property owned by Leslie K. & Tillman A. Bauknight (Parcel #360569500) due to the grading at the end of the wall along Ramp J. According to the Fairfield County Auditor's value of the two effected parcels, the approximate Right of Way cost would be $525, whereas the cost of the proposed retaining wall would be approximately $350,000. Therefore, constructing a wall at this location is not recommended.

Table 1 presents the estimated costs for each of the walls as well as the station limits. The total wall cost is approximately $4.17 million.

Table 1. Retaining wall locations and cost

Wall Location	Type	Begin Sta.	End Sta.	Length (ft)	Min. Wall Height (ft)	Max. Wall Height (ft.)	Area (sf)	$/SF	Total Cost
Wall 1 - IR70 & Ramp H Left	CIP	92+50	99+50	700	0.5	18.1	9334	$180	$1,680,120
	MSE	99+50	108+50	900	0.5	33.1	18565	$95	$1,763,675
Wall 2 - IR70 & Ramp H Right	MSE	103+50	108+00	450	0.5	23.0	5619	$95	$533,805
Wall 3 - Taylor Road Left	MSE	45+50	47+50	200	1.0	7.5	1111	$95	$105,545
Total Cost of Walls									$4,083,145

4.7 Maintenance of Traffic

Three maintenance of traffic alternatives for IR 70 are being considered, and detailed descriptions, typical sections, and estimated construction costs can be found in the MOTAA document, which is **Appendix E** of this AER report. Two of the three MOT alternatives meet the minimum criteria detailed in the MOTAA report. The part-width does not, and this construction alternative requires reduced lane widths and barrier offsets as well as the overbuilding of the SR 256 westbound bridge to accommodate a second mainline lane. The ability to leverage the new Taylor Road interchange is important to the overall maintenance of traffic approach for each studied MOT alternatives, and the first year of construction should be dedicated to its construction. Once this interchange is open to traffic, even if partially to accept diverted traffic, the mainline and local improvements can commence. At this point, the three alternatives are varied and can be compared. The first mainline MOT phase for each of the three alternatives is the widening of IR 70 eastbound to the outside and includes the improvement of Ramps E, D, and C. The single lane contraflow and full crossover alternatives are identical in this phase. However, the part-width alternative adds the westbound outside improvements, including Ramp A improvements, and therefore, increases the amount of required work beyond what is required in the other two alternatives for the same phase.

As noted above, the construction of the Taylor Road interchange in the initial year can yield roadway access and congestion relief benefits. Construction efficiencies/increased production rates can be realized by reducing the interaction between the contractor and maintained traffic. These efficiencies are minimized with the part-width alternative and are anticipated to increase as the MOT approach changes from single lane contraflow to full crossover alternatives. This is maximized with the full crossover alternative as the SR 256 westbound bridge and several thousand feet of roadway can be built without maintaining a single IR 70 westbound vehicle. The construction durations are estimates only and assume work to be completed during accepted construction seasons. As a side note, the Palmer Road westbound bridge can also be constructed without traffic if eventually included in a revised project scope.

With respect to MOT related construction costs. The preliminary cost comparison reveals that the part-width alternative has the greatest impact with preliminary measurable costs at $2 million. This amount is not much more than the single lane contraflow alternative ($1.9 million) but is significantly higher than the full crossover option ($1.4 million). The extra costs combined with the limitations of the part-width alternative do not make this the alternative a first choice for this improvement. Preliminary construction costs are tabulated in the Cost Comparison Form in the MOTAA document. Anticipated MOT related construction costs for the Palmer Road bridges are not included at this time because they fall outside the limits of the work on IR 70.

The single lane contra-flow and full crossover both meet the criteria, have a similar project duration, and would provide ample space for the contractor to perform their work, it is recommended to utilize the full crossover alternative to save approximately a half million dollars towards the project costs.

4.8 Right of Way Impacts

Right of Way acquisition costs will be a major cost driver for the project. The use of retaining walls to limit Right of Way impacts to the creek on the north side of IR 70 west of Taylor Road and to maintain drive access for the Creekside Apartments is assumed. **The realignment of the westbound and eastbound entrance ramps to IR 70 from Taylor Road for the AER reduced the estimated Right of Way take areas by 2.22 acres.** Below is a table with estimated Right of Way take areas and costs:

Alternative	Proposed R/W Areas					
	Prop LA R/W	Prop R/W	Temp R/W	Total	Estimated R/W Cost 2022 Dollars	Total Take Parcel
Alternative1C	1.44 Acres		0.99 Acres	2.43 Acres	$53,128	
Alternative 2C	9.15 Acres	1.66 Acres	0.51 Acres	11.32 Acres	$549,503	1
Alternative 3B	2.58 Acres			2.58 Acres	$90,216	
Alternative 4A	0.79 Acres		0.13 Acres	0.92 Acres	$171,600	
Alternative 5A	2.61 Acres			2.61 Acres	$217,152	1
Preferred Alternative	16.57 Acres	1.66 Acres	1.63 Acres	19.86 Acres	$1,081,599	2
Costs are based off of Auditor's appraised values plus an additional 30%, and were assumed as the following: HOA property in southeast corner of Taylor Road interchange valued at $10,000 per acre, Blacklick Woods Metro Park land valued at $62,400 per acre, Creekside at Taylor Square Apartments land valued at $214,500 per acre, Violet Township property valued at $31,200 per acre, residential property valued at $83,200 per acre, and the value of the Total Take Parcel is $304,200. All values are in 2023 dollars.						

The majority of the Right of Way take areas required for the project are within the proposed Taylor Road interchange area, and the required areas are largely based on the ramp geometry. The outside widening does

result in the need to acquire Temporary or Limited Access Right of Way from Blacklick Woods Metro Park, which is a designated 6(f) property.

Shifting the alignment of Taylor Road to the east minimizes impacts to the apartment property, but the construction of the IR 70 westbound exit ramp onto Taylor Road will require a total take of the single family home at 13920 Taylor Road NW (APN 0360078900). Limited Access Right of Way takes will be required from the HOA owned property on the east side of Taylor Road (APN 0360596300) and possibly one of the single family home parcels in the Haaf Farms subdivision. In the southwest quadrant, Limited Access Right of Way will be required from the Violet Township Parcel (APN 0360073400) for the construction of the eastbound exit ramp to Taylor Road.

Shifting Taylor Road to the east will minimize impacts to the Creekside at Taylor Square Apartments

4.9 Environmental Analysis

As stated in the Feasibility Study, the following environmental studies, documents, and agency coordination are available in the EnviroNet project file. Additional documents and agency coordination pertaining to the project are also available in the project file. Environmental studies will be re-assessed once a Preferred Alternative is determined and additional studies and coordination may commence at this time.

• A Mobile Source Air Toxic (MSAT) Qualitative Analysis was approved by the Ohio Environmental Protection Agency (OEPA) on January 20, 2015. The OEPA determined this project meets the criteria to be categorized as "Low MSAT effect' project.

• A Noise Analysis Report titled *Far East Freeway/I-70 Brice Road to Palmer Road (FRA-70-16.17)*, completed in December 2014, is available in the project file on EnviroNet.

• A Regulated Materials Review (RMR), formerly referred to as an Environmental Site Assessment (ESA) Screening, was completed for the project in 2012. A Phase I ESA was recommended for eight (8) sites. In 2014, a Phase I ESA

for two (2) sites was completed. A Phase I ESA was conducted for the project by URS and ODOT-Office of Environmental Services recommended no further ESA or special material management for this project (July 29, 2014).

• A Section 106 Request for Review (2013), a Phase I Archaeology report (2014), and a Phase I History/Architecture report (2012) were completed for the project. In 2014, ODOT-OES issued an Inter-Office Communication determined that "no history/architecture properties listed in or determined eligible in the National Register of Historic Places were identified within the area of potential effects".

• A Level 2 Ecological Survey Report was completed in 2014 for the project. The Jurisdictional Determination for the streams and wetlands was received on February 27, 2015.

Permanent and temporary impacts to Blacklick Woods Metro Park (designated 6(f)) are likely, but exact impact areas will be determined during the detailed design phase when the structure types are determined. The Blacklick Trail crossing under IR 70 adjacent to Blacklick Creek will require closure when the mainline IR 70 bridges are reconstructed. **A coordination meeting between Metro Parks and ASI was held on May 15th, 2023 to start the coordination of the potential temporary trail closures during construction and permanent modifications to the trail.** A signed detour route for the trail will be investigated and developed as the plan further progresses. Areas of cattails on the north side of IR 70 between SR 256 and Taylor Road have been identified, and a wetland determination will need to be made. The environmental impacts of the project will be studied in greater detail as the plan is further developed, when the construction limits are finalized.

Temporary impacts to the Blacklick Trail running under IR 70 are likely during construction

4.10 Construction Cost

Revised construction cost estimates for the 5 alternatives detailed in this report are listed below (detailed construction cost estimates for each alternative can be found in **Appendix C** and are based on 2023 dollars). **ODOT Estimator was used to generate all construction costs with the following exceptions: proposed structure costs are carried from the structure type studies, retaining wall costs as detailed in Section 4.6, and Right of Way costs as detailed in Section 4.8. Costs in 2023 dollars.**

Roadway Recommended Alternative

- Alternatives 1C, 2C, 3B, 4A, and 5A: **Construction Cost = $67.97 M**

IR 70 over Blacklick Creek Bridge Alternatives

- Three span continuous rolled steel beam: **Construction Cost = $7.63 M**
- Three span continuous reinforced conc. slab (recommended): **Construction Cost = $6.94 M**

IR 70 over SR 256 Bridge Alternatives

- Two span continuous rolled steel beam (recommended): **Construction Cost = $9.51 M**
- Four span continuous rolled steel beam: **Construction Cost = $7.34 M**

Taylor Road over IR 70 Bridge Alternatives

- Two span composite prestressed wide-flange (recommended) **Construction Cost = $7.63 M**
- Two span plate girder **Construction Cost = $7.18 M**

Taylor Road over Tributary Creek Bridge Alternatives

- 20’ x 10’ reinforced concrete box culvert (recommended) **Construction Cost = $2.34 M**
- Three span prestressed I-girder **Construction Cost = $10.46 M**

Retaining Wall Recommended Alternatives

- Wall 1 (IR 70 & Ramp H Left Side): **Construction Cost = $3.49 M**
- Wall 2 (IR 70 & Ramp H Right Side): **Construction Cost = $0.56 M**
- Wall 3 (Taylor Road Left Side): **Construction Cost = $0.11 M**

The Recommended Alternative has a total estimated construction cost of $98.55 M. Construction cost does not include the replacement of the Palmer Road bridges, which would add an estimated $5.60 million to the project cost. The construction costs listed above include a 20% design contingency and an 18.00% inflation contingency. The cost shown does NOT include Right of Way or construction inspection.

4.11 Public Involvement

The scope of the project and the number of properties that will be impacted by the construction will require public involvement, and a Public Involvement Plan has been developed and approved by ODOT. To date, the following public/stakeholder involvement has been completed:

- ASI staff met with Metro Parks to discuss the impacts to the Blacklick Trail on May 15th, 2023. Metro Parks had no immediate concerns with the impacts to the trail from the widening and/or reconstruction of the bridges, but is requesting that a signed detour route for the trail be provided during construction. A summary of what was discussed during the meeting was sent to District 5 on June 5th, 2023.
- A stakeholder meeting was held at the Wigwam Event Center on May 24th, 2023 and was attended by ASI staff, District 5 staff, and project stakeholders. No negative feedback was generated during the stakeholder meeting, and no revisions to the alternative shown in the AER report resulted from the meeting.

Two additional stakeholder meetings are anticipated; one in the fall of 2023, and the other in late spring/early summer of 2024. Exact dates for these meetings have not been determined. A public meeting is anticipated for the project as well, which will be held after the ODOT review of the AER document is complete. This public meeting is anticipated in early 2024, and is currently slated to be in-person, with a live streaming component likely. The exact date, time and location of the public meeting will be determined, but the Wigwam Event Center is recommended because of the capacity and close proximity to the project area.

5.0 Comparison of Alternatives

5.1 Alternative Evaluation Matrix

Because the overall configuration of the proposed improvements was definitively determined during the Feasibility Study, an updated Alternative Evaluation Matrix for the widening of IR 70, CD road configurations, and Taylor Road interchange is not included in this AER. For reference, the Evaluation Matrix from the Feasibility Study is shown below:

Alternative	Evaluation Matrix								
	Criteria								
	ROW Impacts	Crash Reduction	Congestion Reduction	Construction Duration	Maintenance of Traffic Effort	Construction Cost	Environmental Impacts	Overall	Cost ($Million)
No Build									$0
IR 70 Widening Options									
Alternative 1A									$55.77 M
Alternative 1B									$67.71 M
Alternative 1C								REC.	$56.77 M
Proposed Taylor Road Interchange Options									
Alternative 2A									$40.74 M
Alternative 2B									$45.16 M
Alternative 2C								REC.	$30.36 M
Alternative 2D									$35.24 M
Eastbound IR 70 CD Road Options									
Alternative 3A									$9.81 M
Alternative 3B								REC.	$2.88 M
Westbound IR 70 CD Road Options									
Alternative 4A								REC.	$3.99 M
Alternative 4B									$3.77 M
Westbound Taylor Road Exit Ramp Options									
Alternative 5A								REC.	$4.10 M
Alternative 5B									$6.38 M

Excellent Very Good Good Fair Poor

The revisions to the horizontal and vertical geometry of the ramps were expected because of the availability of the field survey and do not have any negative impacts to the recommended alternatives. The revisions to the ramp alignments reduced construction cost, project footprint, and environmental impacts, but do not require the other alternatives analyzed in the Feasibility Study to be revisited. **No changes to turn lane lengths, lane configuration, or interchange layout were made, so no updates to the traffic analysis of the recommended alternative should be made until certified traffic is available (expected August 2023).** As such, the configuration (Alternatives 1C, 2C, 3B, 4A, and 5A) established in the Feasibility Study is recommended.

5.2 Comparison of Structure Types

Structure Type Studies were completed for the IR 70 bridges over Blacklick Creek, the IR 70 bridges over SR 256, the IR 70 bridges over Palmer Road, the new Taylor Road bridge over IR 70, and the new bridge on realigned Taylor Road over the tributary creek. The Structure Type Studies can be found in **Appendix D** of this document. Below is a summary of the recommendations for each structure:

IR 70 over Blacklick Creek

Three alternatives for the IR 70 bridges over Blacklick Creek were considered; full replacement of the existing bridges with a three-span arrangement with continuous rolled steel beams (Alternative A), full replacement of the existing bridges with a three-span arrangement with a continuous concrete slab superstructure (Alternative B), or widening of the existing three-span bridges (Alternative C).

The proposed three-span arrangement (49'-0", 65'-0", 49'-0) locates the proposed piers just beyond the existing piers and provides balanced end spans. This avoids interference with existing footings and pile foundations, while also lengthening the end span sufficiently to better accommodate the Blacklick Trail shared use path. Spill through slope grading at 2:1 max. will be utilized on both sides of the path, providing an improved channel section through the bridges, as well as eliminating the conditions contributing to the severe erosion at the NW end of the existing path retaining wall. The new substructure locations will also better align with the shifting channel alignment which is migrating west. The existing bridge low chord is matched through slight reduction is superstructure depth, to account for widening IR 70 westbound approximately 20 feet to the north. The current minimum vertical clearance over the Blacklick Trail of 9'-0" will be matched, with the controlling location being the new north fascia beam. Steel costs were balanced with superstructure depth to determine the most efficient beam sections and framing plans. W27 composite rolled steel beams are utilized for all the bridges, with ten beam lines proposed for the Left Bridge and eight beam lines for both the Right Bridge and CD Road Bridge. All bridges will be square with no skew. Considering the bridge low chord is greater than 10 feet above the Blacklick Creek Ordinary High Water Mark (OHWM), a weathering steel coating system will be utilized for the proposed steel superstructures. Fascia beams and beam ends will be painted as specified in Section 308.2.2.1.d.1 of the 2020 BDM.

The advantages associated with Alternative A include:

- No conflicts with existing foundations
- Satisfies "no rise" condition and meets all ODOT hydraulic design criteria

The disadvantages associated with Alternative A include:

- Higher initial and lifecycle cost
- Less vertical clearance provided over Blacklick Creek Trail

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $3,048,119 / $5,119,400
Right Bridge = $2,386,548 / $3,897,600
CD Road Bridge = $2,192,210 / $3,703,300

Total = $7,626,877 / $12,720,300

Alternative B, the proposed three-span arrangement (45'-0", 56'-3", 45'-0"), locates the R.A. as necessary to accommodate the Blacklick Trail shared use path. With this location established, a standard span configuration from Std. Dwg. CS-1-08 was selected to properly span the main channel, and provide the required waterway opening area. This configuration will require partial removal of the existing Pier 2 footing and possibly the removal of multiple piles to construct the proposed pier, though all other existing substructures are avoided. The preferred MOT scheme recommends construction of the Left and Right Bridges offline, each during a separate phase, allowing for full removal of the existing bridge, and substructures, prior to construction of the new bridges. The proposed slab thickness is 26 ½", resulting in a 1.29' reduction in superstructure depth as compared to the existing superstructure depth of approximately 3.5'. This will increase the minimum vertical clearance over the Blacklick Trail shared use path to the preferred minimum of 10'-0".

Proposed substructures will consist of integral stub abutments, per Std. Dwg. CPA-1-08, and cap and column piers. Similar to Alternative A, capped pile piers will be further evaluated once the scour analysis has been completed. To facilitate pier construction and support of the slab formwork it is anticipated that a Temporary Access Fill (TAF) will be required in Blacklick Creek.

The advantages associated with Alternative B include:

- Lower initial and lifecycle cost
- Increases vertical clearance over Blacklick Trail
- Satisfies "no rise" condition and meets all ODOT hydraulic design criteria
- Slab type structure can more easily accommodate superelevation transition across CD Road Bridge

The disadvantages associated with Alternative B include:

- Pier 2 construction requires partial removal of existing Pier 2 footing, and possibly multiple piles

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,855,028 / $4,172,100
Right Bridge = $2,140,210 / $3,071,600
CD Road Bridge = $1,945,872 / $2,877,300

Total = $6,941,110 / $10,121,000

It was determined that Alternative C was not feasible based on the following:

- Creates a rise in the effective FEMA 1% AEP base flood elevations
- The Blacklick Trail shared use path cannot be accommodated at the northern limits of the Left Bridge without significant impacts to Blacklick Creek

Given this alternative is not capable of satisfying all project design criteria it was eliminated from consideration.

IR 70 over SR 256

Two alternatives for the IR 70 bridges over SR 256 were considered; full replacement of the existing bridges with a two-span arrangement with continuous rolled steel beams (Alternative A), and widening of the existing four-span bridges with continuous rolled steel beams (Alternative B).

In Alternative A, the proposed two-span bridge span lengths were set by maintaining the existing SR 256 median pier location, bridge skew, and placing MSE walls outside the required 19'-0" clear zone on each side of SR 256. By matching the median pier location partial removal of the existing spread footing foundation will be required to construct the proposed pier, though all other existing substructures are avoided. This span arrangement reduces deck area compared to Alternative B, while still providing a large enough bridge opening to eliminate tunnel like conditions for motorists, and to accommodate future widening and/or pedestrian facilities. Steel costs were balanced with superstructure depth to determine the most efficient beam sections and framing plans. W30 composite rolled steel beams are utilized for all the bridges, with nine beam lines proposed for the Left Bridge, eight beam lines for the Right Bridge, and six beam lines for the CD Road Bridge. On both the Left Bridge and CD Road Bridge the deck, and exterior beam, will be flared to accommodate ramp tapers. Considering the vertical clearance is < 20' over SR 256, and the high IR 70 traffic volumes, a painted coating system will be utilized for the proposed steel superstructures per Section 308.2.2.1.d.1 of the 2020 BDM.

Proposed substructures will consist of semi-integral stub abutments and a cap and column center pier. To facilitate construction of the center pier it is anticipated that the inside lanes of SR 256 will require closure, with temporary shoring needed to minimize the excavation footprint.

The advantages associated with Alternative A include:

- Consistent expected service life for all structural components
- Consistent design loading for all bridge components
- New abutments will be placed outside the SR 256 splash zone
- Future widening of SR 256 can be accommodated
- Future addition of pedestrian facilities can be accommodated
- Fewer utility impacts
- Less impacts to SR 256 traffic during construction

The disadvantages associated with Alternative A include:

- Higher initial and lifecycle cost
- Temporary wire walls likely required at phase construction joints

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $3,813,153 / $6,108,000
Right Bridge = $3,298,931 / $5,258,000
CD Road Bridge = $2,395,170 / $3,849,700

Total = $9,507,254 / $15,216,500

In Alternative B, the proposed four-span superstructure replacement for the widened mainline bridges will utilize W33 composite rolled steel beams, approximately matching existing superstructure weight. Framing plans will match current beam line locations within the existing bridge limits to avoid changing the load configuration to salvaged substructures. The Left Bridge requires four additional beam lines, two on both sides, to accommodate the required IR 70 widening (nine beams total). The Right Bridge requires only one additional beam line on the north side (seven beams total). The CD Road Bridge will require all new structural components, comprised of a five beam line layout utilizing W27 composite rolled steel beams. Similar to Alternative A, the deck and exterior beam will be flared on the Left Bridge and CD Road Bridge and a painted coating system will be utilized for the proposed steel superstructures.

The existing substructures will be rehabilitated and widened as necessary to accommodate the proposed IR 70 roadway section. The Left Bridge requires widening to both sides and the Right Bridge widening only to the north. Portions of existing substructure beyond the proposed mainline bridge to the south will be removed to accommodate the new CD Road bridge. Proposed substructure work will include: the addition of a single column on each side of the existing piers for the Left Bridge and on the north side only for the Right Bridge, removal and reconstruction of portions of the existing pier caps to connect into the new pier caps, patching existing pier columns and composite fiber wrapping (FRP), conversion of existing abutments to semi-integral, removing and rebuilding wingwalls, dowelling in semi-integral diaphragm guides at the abutments, and capping all substructure beam seats to accommodate the raise in profile grade. To facilitate construction of the widened piers, it is anticipated that the inside and outside lanes of SR 256 will require closure, with temporary shoring needed to minimize the excavation footprint at each pier. Considering the current traffic congestion in the area, this will likely result in an unacceptable level of service. To avoid multiple lane closures in each direction, a staggered pier construction approach would likely be required, in which the outside piers are constructed after the center pier is complete.

All bearings will be replaced with expansion elastomeric bearings. By removing the fixed bearing condition at Pier 2, and the addition of semi-integral diaphragm guides at the abutments, all ODOT seismic guidelines will be satisfied, and no additional retrofit work required.

The advantages associated with Alternative B include:

- Lower initial and lifecycle cost

The disadvantages associated with Alternative B include:

- Differing expected service lives for structural components
- Salvaged substructures not designed for current HL-93 loading
- Increased future maintenance costs for columns located within SR 256 splash zone
- Future widening of SR 256 not feasible
- Future addition of pedestrian facilities not feasible
- Will require relocation of existing gas line
- Increased impacts to SR 256 traffic to facilitate pier construction

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,902,822 / $5,800,500
Right Bridge = $2,535,932 / $4,950,100
CD Road Bridge = $1,898,128 / $3,645,000

Total = $7,336,882 / $14,395,600

IR 70 over Palmer Road

Two alternatives for the IR 70 bridges over Palmer Road were considered; full replacement of the existing bridges with a single-span arrangement with 42" web composite steel plate girder superstructure (Alternative A), and widening of the existing four-span bridges with continuous rolled steel beams (Alternative B).

For the full replacement alternative (Alternative A), the Left and Right Bridges will be twin structures. The proposed single span arrangement places the abutments behind MSE walls located outside the required 17'-0" clear zone on each side of Palmer Rd. In this configuration all existing substructures are avoided. A reduction in skew to 30 degrees was evaluated, though this was ultimately determined to be uneconomical given a 30' increase in span length, and subsequent costs associated with a deeper superstructure and extended Palmer Rd. reconstruction limits. The proposed span arrangement reduces deck area compared to Alternative B, while still providing a large enough bridge opening to eliminate tunnel like conditions for motorists, and to accommodate future widening and/or pedestrian facilities. Steel costs were balanced with superstructure depth to determine the most efficient girder design and framing plans. Nine, 42" web composite welded steel plate girders are utilized for both the Left and Right Bridge. Considering the vertical clearance is < 20' over Palmer Rd., and the high IR 70 traffic volumes, a painted coating system will be utilized for the proposed steel superstructures per Section 308.2.2.1.d.1 of the 2020 BDM.

Proposed substructures will consist of semi-integral stub abutments behind MSE walls. Given their location beyond the clear zone limits, the MSE walls can be constructed using open cuts and there are no constructability issues anticipated.

The advantages associated with Alternative A include:

- Lower lifecycle cost
- Consistent expected service life for all structural components
- Consistent design loading for all bridge components
- Less impacts to Palmer Rd. traffic during construction
- Substructures removed from the Palmer Rd. splash zone
- Future widening of Palmer Rd. can be accommodated
- Future addition of pedestrian facilities can be accommodated
- Future lengthening of Palmer Rd. left turn lane to Georgian Dr. can be accommodated

The disadvantages associated with Alternative A include:

- Higher initial construction cost

- Increased Palmer Rd. reconstruction limits

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,774,095 / $3,960,200
Right Bridge = $2,774,095 / $3,960,200

Total = $5,598,190 / $8,467,200

For Alternative B, the proposed three-span superstructures will utilize W36 composite rolled steel beams, approximately matching existing superstructure weight. Framing plans will match current beam line locations within the existing bridge limits to avoid changing the load configuration to salvaged substructures. Two additional beam lines will be added to accommodate the required IR 70 widening, for a total of seven beam lines, on both the Left and Right Bridges. Similar to Alternative A, a painted coating system will be utilized for the proposed steel superstructures.

The existing substructures will be rehabilitated and widened as necessary to accommodate the proposed IR 70 roadway section. For both the Right and Left Bridges this requires widening to the inside only. It is recommended to add a pier cap to the existing free standing columns, providing added safety in the case of vehicular collision, as well as tying in new pier columns. Proposed substructure work will include: the addition of two columns and full length pier cap at both Pier 1 & 2, removal of the top 4’ of existing pier columns to facilitate construction of proposed pier cap, patching existing pier columns, conversion of existing abutments to semi-integral, removing and rebuilding wingwalls, and dowelling in semi-integral diaphragm guides at the abutments. To facilitate widened pier construction, it is anticipated that temporary shoring will be needed to minimize the excavation footprint and avoid the need for Palmer Rd. lane closures.

All bearings will be replaced with expansion elastomeric bearings. By removing the fixed bearing condition at Pier 2, and the addition of semi-integral diaphragm guides at the abutments, all ODOT seismic guidelines will be satisfied, and no additional retrofit work required.

The advantages associated with Alternative B include:

- Lower initial construction cost
- Shorter Palmer Rd. reconstruction limits

The disadvantages associated with Alternative B include:

- Higher lifecycle cost
- Differing expected service lives for structural components
- Salvaged substructures not designed for current HL-93 loading
- Increased Palmer Rd. traffic impacts during construction
- Increased future maintenance costs for columns located within Palmer Rd. splash zone
- Future widening of Palmer Rd. cannot be accommodated
- Future addition of pedestrian facilities cannot be accommodated
- Future lengthening of Palmer Rd. left turn lane to Georgian Dr. cannot be accommodated

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,401,553 / $4,166,200
Right Bridge = $2,319,105 / $3,977,200

Total = $4,720,658 / $8,933,200

Taylor Road over IR 70

Two alternatives for the Taylor Road bridge over IR 70 were considered; a two span composite prestressed wide-flange beam superstructure on semi-integral abutments behind MSE walls (Alternative A), and a two span plate girder superstructure on semi-integral abutments behind MSE walls (Alternative B).

Alternative A consists of a two span (126' – 110') composite prestressed wide-flange beam superstructure on semi-integral abutments behind MSE walls. The superstructure is comprised of eleven (11) WF72-49 beams.

The advantages associated with Alternative A include:

- Lower lifecycle cost (-10%)

The disadvantages associated with Alternative A include:

- Higher initial construction cost (+6%)
- Increased Taylor Road profile and associated approach roadway fills

Estimated preliminary structure and earthwork initial cost / life cycle cost = $7,630,872* / $10,747,600

*Includes additional earthwork costs relative to Alternative B

Alternative B is a two span (126' – 110') plate girder superstructure on semi-integral abutments behind MSE walls and a cap and column center pier. The superstructure is comprised of ten (10) painted steel plate girders with 58" web depth.

The advantages associated with Alternative B include:

- Lower initial construction cost (-6%)
- Fewer beam lines
- Reduced superstructure depth yields a lower proposed Taylor Road profile and reduced approach roadway fills

The disadvantages associated with Alternative B include:

- Higher lifecycle cost (+10%)

Estimated preliminary structure initial cost / life cycle cost = $7,180,217 / $11,922,800

Taylor Road over Tributary Creek

Three alternatives for the Taylor Road bridge over Tributary Creek were considered; full replacement of the existing culvert with a 20’ span x 10’ rise reinforced concrete box culvert (Alternative A), full replacement of the existing culvert with a three-span prestressed I-girder structure on semi-intergral abutments and hammerhead type piers (Alternative B), and the extension of the existing culvert an additional 243’ east under the proposed alignment of Taylor Road (Alternative C).

Alternative A is replacing the existing 60’ long, 20’ x 10’ box culvert with a longer 20’ x 10’ box culvert under the proposed alignment of Taylor Road. The culvert is anticipated to consist of 60 – 5’ long normal precast sections resulting in a total length of 300’-0” with cast in place wingwalls and headwalls on spread footings. The outlet of the proposed culvert will be located at the same location as the existing culvert outlet. The inlet of the proposed culvert will be placed 300’ linearly upstream to match the existing channel resulting in a skew of approximately 28.4° with respect to the proposed centerline of Taylor Road. The existing box culvert including the wingwalls and the spread footing foundations will be removed to avoid a potential conflict with the proposed foundations. The invert of the proposed culvert will be depressed 1’ to allow it to fill in to a natural bottom, similar to the existing culvert. The proposed culvert is oversize per L & D Volume 2 Section 1002.3.1 as It provides 5.40’ of freeboard above the 1% AEP storm.

The advantages associated with Alternative A include:

- Box culverts typically have low maintenance costs
- Numerous precast manufacturers can produce the non-skewed design sections
- Faster construction compared to a bridge alternative
- The cost of this option is significantly lower than Alternative B

The disadvantages associated with Alternative A include:

- There will be close to 40’ of type 1 structural fill over the culvert.
- The structure will require reconfiguration of the existing channel alignment. Over 300’ of disturbance to the existing channel will require an individual permit instead of a nationwide permit.
- Future replacement of the culvert would require the full closure of Taylor Road

Estimated preliminary structure initial cost = **$2,341,000.**

Alternative B is a three span (104’-0”, 124’-0”, 84’-0”), prestressed I-girder structure on semi-integral abutments and hammerhead type piers. The deck width will vary from approximately 85.5’ to 128.1’ due to the variable width raised median across the bridge. The proposed superstructure will utilize 13 beam lines of AASHTO wide flange type beams with variable spacing and overhangs. Due to the 50’ difference between the proposed profile grade and the thalweg of the channel, there will be adequate freeboard from both the 4% and 1% AEP storm events. The proposed approach slabs will be 30’-0” long.

The proposed stub abutments were placed based on 2H:1V grading from elevation 905 to avoid impacts the existing channel. The placement of the forward abutment will cut off an existing channel meander. However, based on field observations and survey data, the channel meander has already naturally begun to be cut off. To avoid cutting off the meander, an additional 100' span would need to be added to the bridge. The proposed hammerhead piers will be very tall due to the 50' difference in elevation between the proposed profile grade and thalweg of the channel. The piers were placed outside of the existing channel. Based on historic borings, it is anticipated that the piers and abutments will be founded on either spread foundations or friction type piles.

The advantages associated with Alternative B include:

- Abutment construction is not near the waterway, so dewatering or temporary shoring would not be needed
- The stream flow line alignment would remain the same
- This option will require a realignment of the channel upstream of the bridge, but will only require a nationwide permit instead of an individual permit

The disadvantages associated with Alternative B include:

- This option is significantly more expensive than Alternative A.
- Relatively large structure for a small stream due to the difference in profile grade elevation compared to the stream thalweg elevation
- Placement of the forward abutment will cut off an existing channel meander
- Life-cycle costs of this option would be significantly more than the culvert option

Estimated preliminary structure initial cost = **$10,458,000.**

Alternative C is extending the existing box culvert an additional 243' upstream under the proposed alignment of Taylor Road. This would require 47-5' long precast sections and one cast in place skewed end section to connect the proposed culvert to the existing culvert. The skewed end section will be required to ensure the upstream end of the culvert is aligned with the existing channel. The skewed end section could cause future maintenance issues due to the bend in the culvert. There could be settlement issues between the existing and proposed culvert sections which could cause long term erosion and scour issues. Additionally, the existing culvert was only designed for 7' to 10' of fill and will not be structurally sufficient to support the 40'+ of new fill making this option not viable. The advantage to this alternative would be less excavation and cost to remove the existing culvert as well as lower cost to build the proposed culvert as it will be shorter than Alternative A. However, the cost savings over Alternative A is expected to be minimal. Due to future maintenance concerns, Alternative C was eliminated from consideration and a cost estimate was not calculated.

The recommended structure type is Alternative A: Culvert Replacement. Alternative A is the lowest cost alternative and meets the hydraulic requirements for the storm events analyzed. Alternative B meets hydraulic requirements, however the cost is several times higher than Alternative A. Additionally, Alternative A will have a shorter construction duration than Alternative B.

5.3 Comparison of Retaining Wall Recommendations

Listed below are the justifications for each retaining wall:

- Wall 1 (north side of IR 70 and Ramp H) is necessary to prevent impacts to the tributary creek and the Creekside Apartments. Without a retaining wall in this location four apartment buildings would be impacted by the proposed grading, and nearly 900' of the tributary creek would need to be realigned. This wall does have an estimated construction cost of $3.49 million, which likely exceeds the value of the four apartment buildings that would be impacted by the grading without a wall. However, the environmental impacts of 900' of creek relocation would not clear the environmental process making the wall necessary. At the west end of the wall, the first 700' are recommended to be cast-in-place because of the close proximity to the tributary creek, as MSE walls near water are generally to be avoided. The remaining 900' of Wall 1 is recommended to be MSE because it is the most cost-efficient fill-type wall.
- Wall 2 (between IR 70 and Ramp H) is necessary because there is insufficient distance between Ramp H and mainline IR 70 to maintain a 2:1 slope. Grading steeper than 2:1 is not permitted, and achieving a 2:1 slope would require reduction in the paved shoulder width along IR 70 which would require a design exception. The wall type is recommended to be MSE because it would be the most cost-efficient design.
- Wall 3 (west side of realigned Taylor Road) is necessary to maintain access for Tributary Lane to Taylor Road. Closure of Tributary Lane would require all residents of the Creekside Apartments to travel west and exit at the Banks Edge Way and Taylor Road SW, which is unsignalized, and can be difficult to exit from during peak hours. This is also nearly 0.5 mile from the easternmost apartment building, which would add travel time for residents living at the east end of the apartment complex. It would also result in additional traffic on Tributary Lane, as all traffic would be required to travel to Banks Edge Way. The recommended wall type is MSE because it is the most cost-efficient.
- Wall 4 (south side of Ramp J) was shown on the Feasibility Study, but was eliminated from the AER. The realignment of Ramp J eliminated impacts to the single family homes within Haaf Farms using safety grading and would require Right of Way being purchased only from the HOA-owned parcel. The appraised value of the entire 9.47 acre HOA parcel is listed at $1,610, and the estimated retaining wall cost for Wall 4 is $350,000. The additional embankment cost required for the safety grading is estimated to be $5,000-$10,000, well below the cost of the retaining wall.

5.4 Comparison of Maintenance of Traffic Schemes

The maintenance of traffic alternative analysis looked at three options for maintain traffic on IR 70: part-width construction, single-lane contra flow, and full crossovers. Detailed analysis, typical sections, and other information can be found in the MOTAA document, which is **Appendix E** of this AER. Listed below are the advantages and disadvantages for each alternative:

Part-Width Construction

Advantages:

- No crossover temporary pavement required

Disadvantages:

- SR 256 bridge requires 1-foot barrier clearances and 10.5’ lanes to maintain two westbound lanes in Phase 1 that maximizes the available bridge width for follow-on phases
- SR 256 bridge requires overbuilding to maintain two westbound lanes in Phase 3
- Bridge overbuilding affects vertical clearance to SR 256 below and requires complementary mainline roadway widening near bridge
- Phase 1 requires the improvements to ramps along both sides of the mainline (a very heavy workload for the contractor during the first construction phase)
- Anticipate overbuilding of both eastbound and westbound Palmer Road bridges. Extra deck width, either inside or outside, is required to maintain part width method if these bridges are included in the final design

Single Lane Contraflow

Advantages:

- Temporary pavement only required for single lane crossovers
- No overbuilding of bridges or roadway required, including Palmer Road bridges
- Planned work in phase 1 is less than the first phase of part-width – reduced construction workload for contractor

Disadvantages:

- Narrow width of Palmer Road bridges requires several MOT phases to complete while maintaining a minimum of one traffic lane. Additional crossovers specific to Palmer Road might be required. Bridges require 1-foot barrier clearances and 10.5’ lanes

Full crossover

Advantages:

- Crossover is only used for one MOT phase
- Westbound IR 70 can be improved with minimal need to maintain traffic
- Westbound Blacklick Creek bridge can be improved while maintaining a single lane of traffic

Disadvantages:

- Defers westbound improvements until the very last phase of construction
- Anticipate two single lane crossovers to accommodate Palmer Road westbound bridge construction
- Palmer Road westbound bridge requires 1-foot barrier clearances and 10.5’ lanes to maintain one lane of contraflow while eastbound bridge is widened to accommodate a full crossover section

As stated in **Section 4.7,** the part-width construction alternative does not meet the minimum criteria listed in the MOTAA document, and requires bridge overbuilding and mainline widening. It also comes with the highest measureable cost of nearly $2 million. Because of these factors, **part-width construction should not be considered to maintain traffic along IR 70**. The single-lane contra flow and full crossover alternatives both meet the criteria of the MOTAA and do not require any bridge overbuilding. Both also have a similar construction duration and provide ample space for the contractor to perform the required work. **But because the full crossover is estimated to cost $500,000 less than the one-lane contra flow, the full lane crossover is the recommended method of maintaining traffic on IR 70.**

6.0 Conclusion

6.1 Summary of Recommended Alternatives

The recommendations for this Alternative Evaluation Report (AER) are as follows:

Roadway:

- Widen IR 70 to the outside, construct three through lanes in the eastbound and westbound directions
- Construct a standard diamond interchange at Taylor Road
- Shift the horizontal alignment of Taylor Road to the east
- Construct Taylor Road over IR 70
- Taper the eastbound CD road into IR 70 west of the Taylor Road eastbound entrance ramp
- Construct a two-lane westbound CD road between SR 256 and Taylor Road
- Have westbound traffic on IR 70 exit at Taylor Road and complete the through movement
- **Utilize the revised horizontal and vertical geometry developed for this AER in lieu of the geometry shown on the 2023 Feasibility Study**

Bridge:

- Complete replacement of the two existing structures on IR 70 over Blacklick Creek with three three-span continuous reinforced concrete slab on cap and column piers and integral abutments bridges
- Complete replacement of the two existing structures on IR 70 over SR 256 with three two-span W30 composite rolled steel beam superstructure on cap and column piers and semi-integral abutment bridges behind MSE walls
- Complete replacement of the two existing structures on IR 70 over Palmer Road with two single-span 42" web composite welded steel plate girder superstructure on semi-integral abutment bridges behind MSE walls
- A two-span composite prestressed wide-flange beam superstructure on semi-integral abutment bridge behind MSE walls is recommended for the new structure on Taylor Road over IR 70
- A 20' span x 10' rise reinforced concrete box culvert for the tributary creek at Taylor Road is recommended

Retaining Walls:

- A 700' cast-in-place on piles wall is recommended on the north side of IR 70 westbound and Ramp H
- A 900' MSE wall is recommended on the north side of IR 70 westbound and Ramp H (continuous with the cast-in-place wall listed above)
- A 450' MSE wall is recommended between IR 70 westbound and Ramp H starting at the ramp gore
- A 200' MSE wall is recommended on the west side of Taylor Road north of IR 70

Maintenance of Traffic:

- Construct new Taylor Road interchange during first phase of construction
- Utilize full crossovers during both phases of construction to maintain two-way, two-lane traffic on IR 70

Further refinements of these alternatives are likely during the detailed design of the project, but major changes to the recommendations above are not anticipated.

7.0 Next Steps

7.1 Completion of Public Involvement/NEPA Requirements

Before the recommendations of this AER can be considered the Preferred Alternative, additional public involvement must be completed to satisfy the NEPA requirements for the project. The first stakeholder meeting was held May 24th, 2023, a second is anticipated in Fall 2023, and the third is anticipated in late Spring/early Summer 2024. A public meeting will be held in early 2024 after the ODOT review of this AER is complete. Public input in regards to driveway locations, retaining walls, pedestrian facilities, etc. will be obtained as part of this public engagement.

7.2 Determination of the Preferred Alternative

The goal of this AER is to identify the Preferred Alternative that will be carried on to the detailed design. The geometric layout created for the Feasibility Study has been refined in an effort to lower the project footprint, reduce environmental impacts, and lower the estimated construction cost. Structure type studies for all mainline IR 70 bridges, the new Taylor Road bridge over IR 70, and the structure over the tributary of Blacklick Creek have been completed and recommendations made for the proposed structure types. Additionally, a full MOTAA has been completed and a recommendation made for the maintenance of traffic for IR 70. Recommendations for wall locations and types are included in this document. Upon completion of the additional public involvement mentioned in **Section 7.1,** and a review of this document by District 5, a determination of the Preferred Alternative is anticipated in early 2024, with detailed design commencing shortly after.

Appendix A – Project Area Map

Appendix B – Preliminary Engineering Plans

Appendix C – Construction Cost Estimates

Appendix D – Structure Type Studies & Hydraulic Reports

Appendix E – Maintenance of Traffic Alternative Analysis (MOTAA)

Appendix F – Preliminary Drainage Calculations

Appendix A – Project Area Map

FEASIBILITY STUDY
PROJECT AREA

0 12.5 25 50

DESIGNED: AJO
REVIEWED: BER 12/09/22
PROJECT #: 96808
SHEET: P.001 | TOTAL: P.001

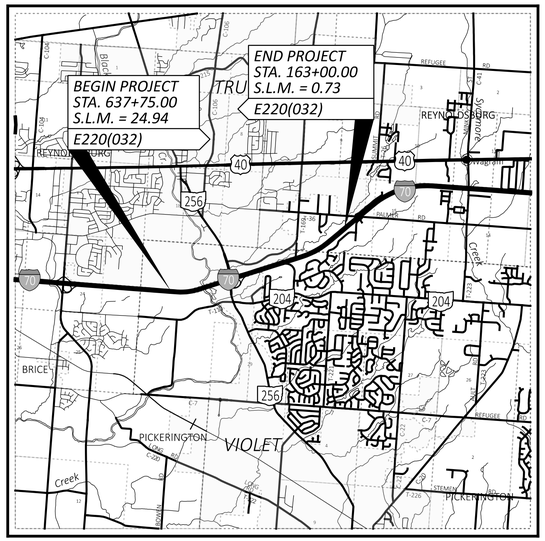
FAR-070-0.00

Appendix B – Preliminary Engineering Plans

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

FAI/LIC IR 70 0.00/0.00

FAIRFIELD / LICKING COUNTY



LOCATION MAP

LATITUDE: 39°56'08" LONGITUDE: 82°46'59"

PORTION TO BE IMPROVED
INTERSTATE HIGHWAY
FEDERAL ROUTES
STATE ROUTES
COUNTY & TOWNSHIP ROADS
OTHER ROADS

DESIGN DESIGNATION

	IR 70	CD ROAD EB/WB	SR 256	TAYLOR RD	SR 204
CURRENT ADT (2030)	56,680	19,370	53,910	18,460	19,000
DESIGN YEAR ADT (2050)	76,150	26,770	65,060	24,650	26,150
DESIGN HOURLY VOLUME (2050)	5,290	2,410	5,860	2,930	2,350
DIRECTIONAL DISTRIBUTION	50%	60%	55%	53%	51%
TRUCKS (24 HOUR B&C)	12%	4%	4%	3%	3%
DESIGN SPEED	70	60	45	45	45
LEGAL SPEED	65	55	40	45	45
DESIGN FUNCTIONAL CLASSIFICATION:	URBAN INTERSTATE	URBAN INTERSTATE	URBAN ARTERIAL	URBAN ARTERIAL	URBAN ARTERIAL
NHS PROJECT	YES				

DESIGN EXCEPTIONS

NONE

ADA DESIGN WAIVERS

NONE

UNDERGROUND UTILITIES
Contact Two Working Days Before You Dig
OHIO811.org Before You Dig
OHIO811, 8-1-1, or 1-800-362-2764
(Non members must be called directly)

PLAN PREPARED BY:

AMERICAN STRUCTUREPOINT INC.
2550 CORPORATE EXCHANGE DR, STE 300
COLUMBUS, OH 43231
TEL 614.901.2235 FAX 614.901.2236
www.structurepoint.com

INDEX OF SHEETS:

SEE SHEET P.002

STANDARD CONSTRUCTION DRAWINGS					*SUPPLEMENTAL SPECIFICATIONS*	*SPECIAL PROVISIONS*

FEDERAL PROJECT NUMBER

E220(032)

RAILROAD INVOLVEMENT

NONE

PROJECT DESCRIPTION

PROJECT CONSISTS OF THE IMPROVEMENT OF 3.15 MILES OF I.R. 70 INCLUDING AN ADDITIONAL THROUGH LANE IN THE EASTBOUND AND WESTBOUND DIRECTION, THE CONSTRUCTION OF A TWO-LANE COLLECTOR-DISTRIBUTOR ROAD IN THE EASTBOUND AND WESTBOUND DIRECTION, AND A NEW INTERCHANGE AT TAYLOR ROAD. PROJECT INCLUDES BRIDGE RECONSTRUCTION, RETAINING WALLS, LIGHTING, TRAFFIC SIGNAL INSTALLATION, DRAINAGE, AND TRAFFIC CONTROL.

EARTH DISTURBED AREAS

PROJECT EARTH DISTURBED AREA:	*ACRES*
ESTIMATED CONTRACTOR EARTH DISTURBED AREA:	*ACRES*
NOTICE OF INTENT EARTH DISTURBED AREA:	*ACRES*

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

2023 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS, CHANGES LISTED IN THE PROPOSAL, AND THE SUPPLEMENTAL SPECIFICATION 800 VERSION INDICATED ON THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

Jason L. Sturgeon, P.E
District 05 Deputy Director

Jack Marchbanks, PhD
Director, Department of Transportation

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

ENGINEER'S SEAL	*ENGINEER'S SEAL*
ROADWAY	*BRIDGE*
ENGINEER'S SEAL	*ENGINEER'S SEAL*
RETAINING WALLS	*SIGNALS*

TITLE SHEET

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.001 TOTAL 740

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TITLE

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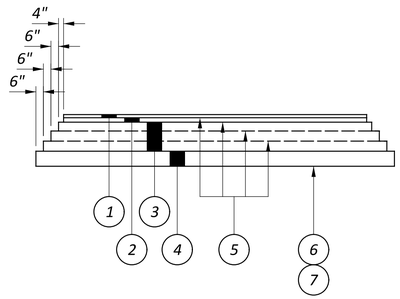
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
AJO

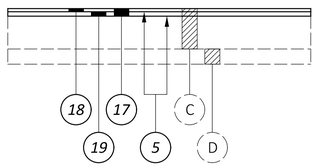
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.002 TOTAL 740



PROPOSED PAVEMENT - IR 70 (P1)



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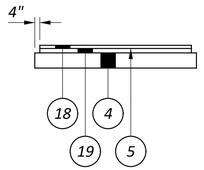
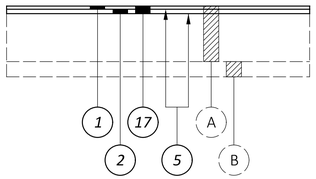
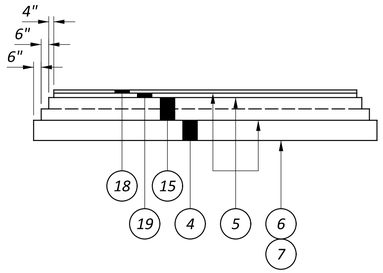


PROPOSED PAVEMENT - SHARED USE PATH (P9)



PROPOSED PAVEMENT - IR 70 (P2)



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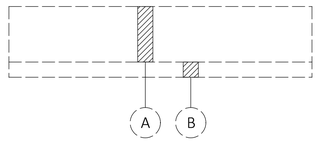
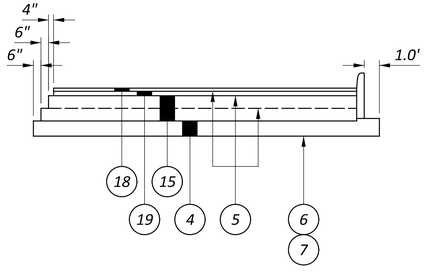
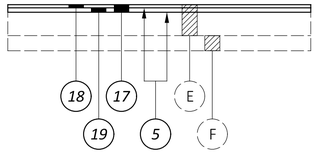


EXISTING PAVEMENT - IR 70 (E1)



PROPOSED PAVEMENT - SR 256 / TAYLOR RD (P3)



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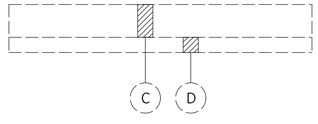

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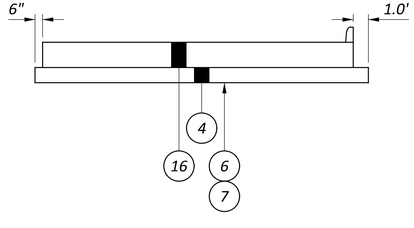
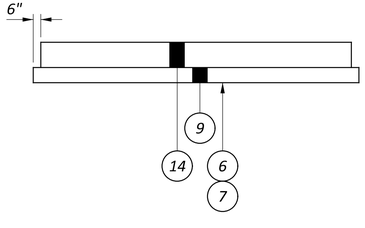
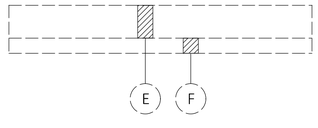


PROPOSED PAVEMENT - RAMPS / TAYLOR RD (P4)



PROPOSED PAVEMENT - BLACKLICK TRAIL (P10)



EXISTING PAVEMENT - SR 204 (E3)

PROPOSED LEGEND

1. ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A (446)
2. ITEM 442 - 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, 12.5MM, TYPE A (446)
3. ITEM 301 - 11 1/2" ASPHALT CONCRETE BASE, PG64-22 (PLACED IN LIFTS OF 4", 4", 3.5")
4. ITEM 304 - 6" AGGREGATE BASE
5. ITEM 407 - NON-TRACKING TACK COAT (0.05 GAL/SY)
6. ITEM 204 - SUBGRADE COMPACTION
7. ITEM 204 - PROOF ROLLING
8. ITEM 609 - 6" CONCRETE TRAFFIC ISLAND
9. ITEM 304 - 4" AGGREGATE BASE
10. ITEM 622 - CONCRETE BARRIER, SINGLE SLOPE, TYPE D
11. ITEM 622 - CONCRETE BARRIER, SINGLE SLOPE, TYPE C
12. ITEM 659 - SEEDING AND MULCHING
13. ITEM 411 - 8" STABILIZED CRUSHED AGGREGATE
14. ITEM 452 - 6" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P
15. ITEM 301 - 10" ASPHALT CONCRETE BASE, PG64-22 (PLACED IN 2 - 5" LIFTS)
16. ITEM 452 - 10" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P
17. ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE (T = X" MIN., X" MAX)
18. ITEM 441 - 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22
19. ITEM 441 - 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
20. ITEM 609 - CURB, TYPE 6
21. ITEM 609 - CURB, TYPE 2-A
22. ITEM 609 - COMBINATION CURB AND GUTTER, TYPE 2
25. ITEM 611 - SLOTTED DRAIN, TYPE 2, 15"
26. ITEM 608 - 4" CONCRETE WALK

EXISTING LEGEND

- A 22"± ASPHALT CONCRETE
- B 6"± AGGREGATE
- C 13"± ASPHALT CONCRETE
- D 6"± AGGREGATE
- E 12"± ASPHALT CONCRETE
- F 8"± AGGREGATE

TYPICAL SECTIONS LEGEND

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER AJO

REVIEWER KAM 06/18/23

PROJECT ID 96808

SHEET P.003 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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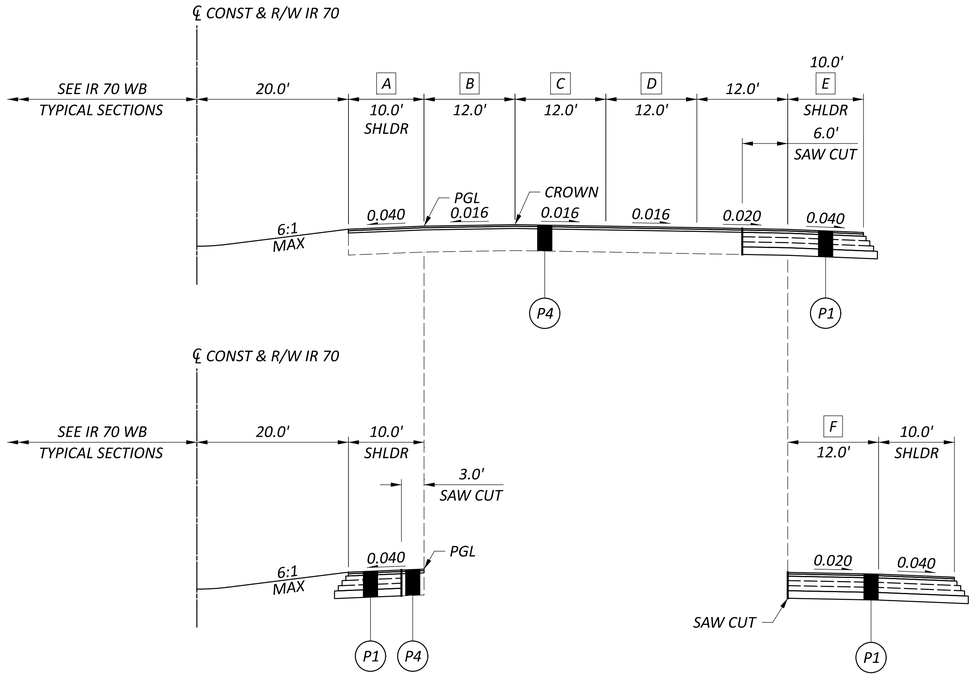


STA. 5+50.00 TO STA. 22+00.00

STA. 15+00.00 TO STA. 22+00.00

NORMAL SECTION - IR 70 EB

STA. 641+05.19 TO STA. 22+00.00

A VARIES FROM 9.6' AT STA. 641+05.19 TO 10.0' AT STA. 0+67.75

B VARIES FROM 12.1' AT STA. 641+05.19 TO 12.0' STA. 0+67.75

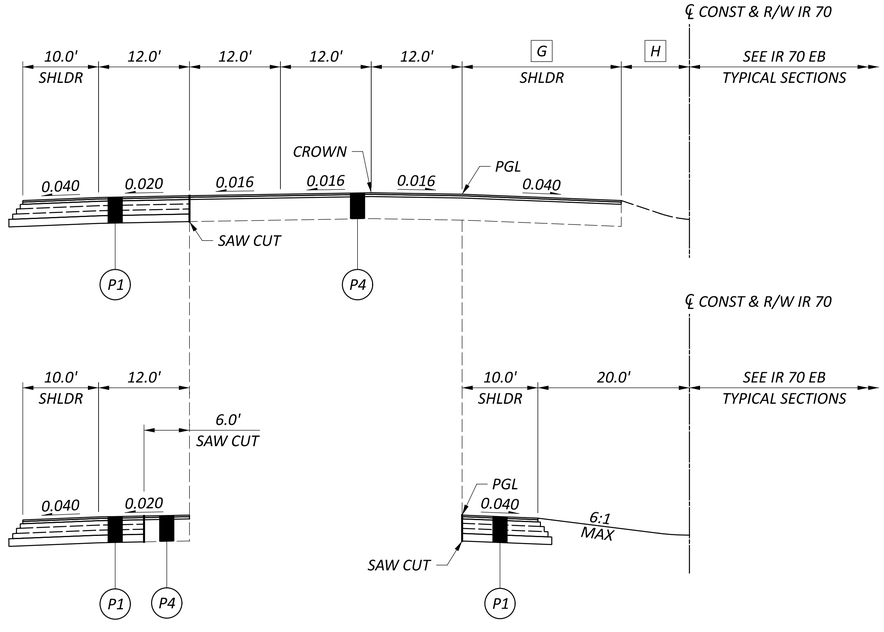
C VARIES FROM 12.2' AT STA. 641+05.19 TO 12.0' STA. 0+67.75

D VARIES FROM 11.3' AT STA. 641+05.19 TO 12.0' STA. 0+67.75

E VARIES FROM 12.0' AT STA. 641+05.19 TO 10.0' AT STA. 0+67.75

F VARIES FROM 0.0' AT STA. 15+00.00 TO 12.0' AT STA. 16+00.00

STA. 641+07.44 BACK = STA. 0+00.00 AHEAD



STA. 638+78.89 TO 22+00.00

STA. 3+17.21 TO STA. 22+00.00

NORMAL SECTION - IR 70 WB

STA. 637+75.00 TO STA. 22+00.00

STA. 641+07.44 BACK = STA. 0+00.00 AHEAD

G 19.0' FROM STA. 637+75.00 TO 3+17.21
VARIES FROM 19.0' AT STA. 3+17.21 TO 10.0' STA. 4+19.59
10.0' FROM STA. 4+19.59 TO STA. 22+00.00

H 11.0' FROM STA. 637+75.00 TO 3+17.21
VARIES FROM 11.0' AT STA. 3+17.21 TO 20.0' STA. 4+19.59
20.0' FROM STA. 4+19.59 TO STA. 22+00.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER AJO

REVIEWER KAM 06/18/23

PROJECT ID 96808

SHEET P.004 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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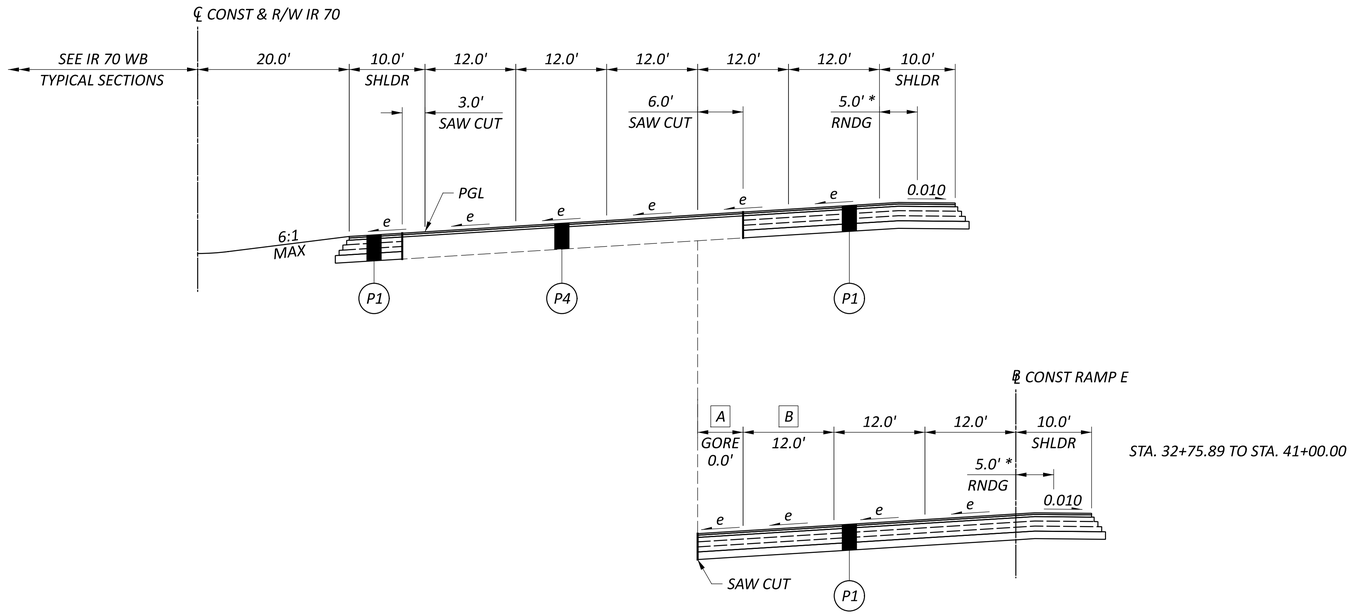
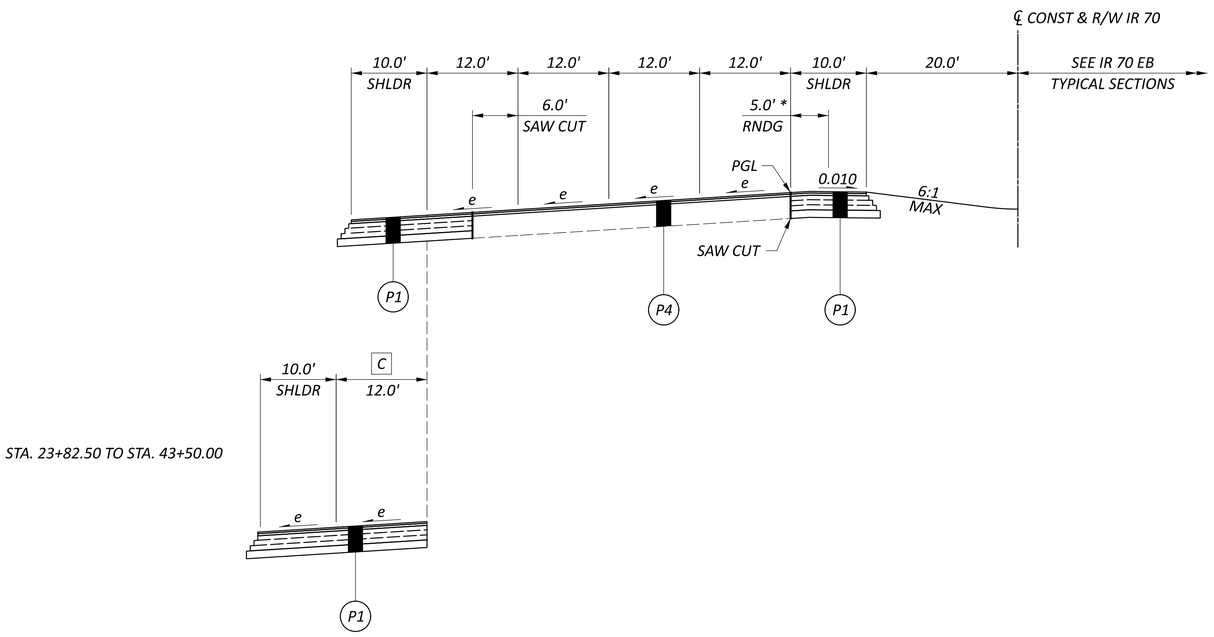


STA. 32+75.89 TO STA. 41+00.00

SUPERELEVATED SECTION - IR 70 EB

STA. 22+00.00 TO STA. 41+00.00



STA. 23+82.50 TO STA. 43+50.00

SUPERELEVATED SECTION - IR 70 WB

STA. 22+00.00 TO STA. 43+92.51

* WHEN e ≥ 6.0%
e = SUPERELEVATION RATE

A VARIES FROM 0.0' AT STA. 38+05.76 TO 16.3' AT STA. 41+00.00

B VARIES FROM 0.0' AT STA. 32+75.89 TO 12.0' AT STA. 38+05.76

C VARIES FROM 0.0' AT STA. 23+82.50 TO 12.0' AT STA. 29+82.50

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

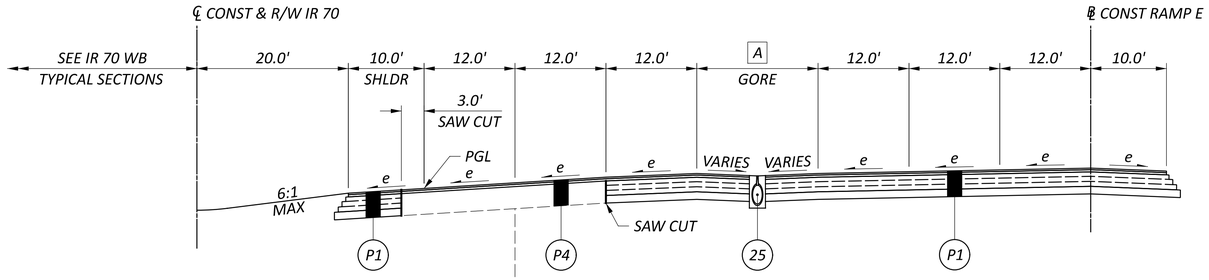
DESIGNER AJO

REVIEWER KAM 06/18/23

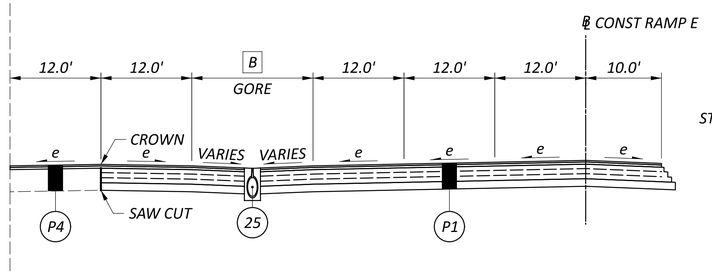
PROJECT ID 96808

SHEET P.005 TOTAL 740

e = SUPERELEVATION RATE

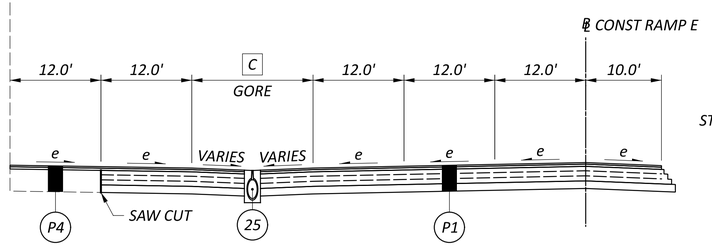


A VARIES FROM 16.3' AT STA. 41+00.00 TO 20.0' AT STA. 41+84.38



B VARIES FROM 20.0' AT STA. 41+84.38 TO 22.0' AT STA. 42+46.16

STA. 41+84.38 TO STA. 42+46.16



C VARIES FROM 20.0' AT STA. 42+46.16 TO 24.0' AT STA. 43+92.60

STA. 42+46.16 TO STA. 43+92.60

FAI-070-0084 R
APPROACH SLAB = STA. 43+92.60 TO STA. 44+17.60
STRUCTURE = STA. 44+17.60 TO STA. 45+82.60
APPROACH SLAB = STA. 45+82.60 TO STA. 46+07.60

SUPERELEVATED SECTION - IR 70 EB

STA. 41+00.00 TO STA. 43+92.60

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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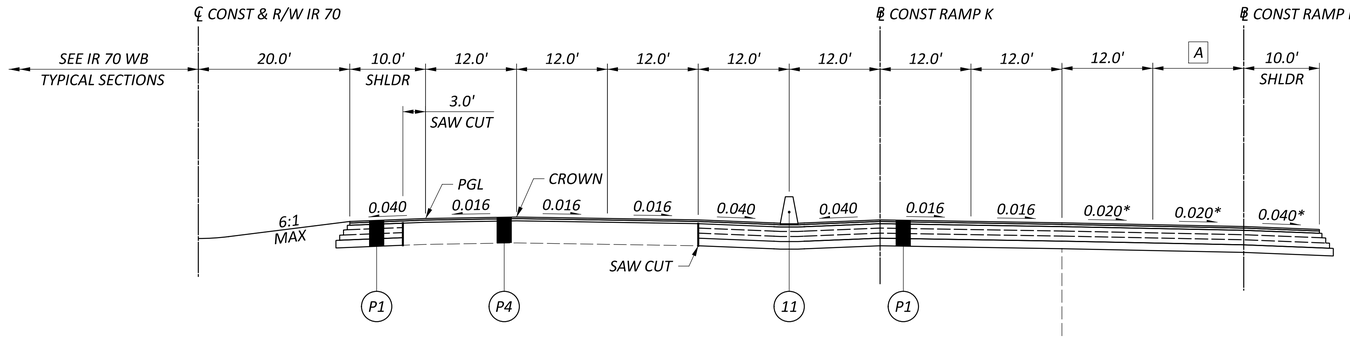
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
AJO

REVIEWER
KAM 06/18/23

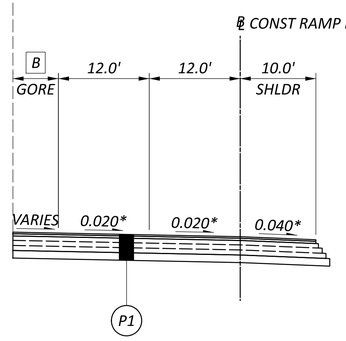
PROJECT ID
96808

SHEET P.006 TOTAL 740



NORMAL SECTION - IR 70 EB

STA. 46+07.60 TO STA. 55+81.03



STA. 49+75.00 TO STA. 55+81.03

A VARIES FROM 0.0' AT STA. 46+00.00 TO 12.0' AT STA. 47+00.00
12.0' FROM STA. 47+00.00 TO STA. 49+75.00

* SEE SUPERELEVATION TABLES FOR RAMP RATES

B VARIES FROM 0.0' AT STA. 49+75.00 TO 24.0' AT STA. 55+81.03

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

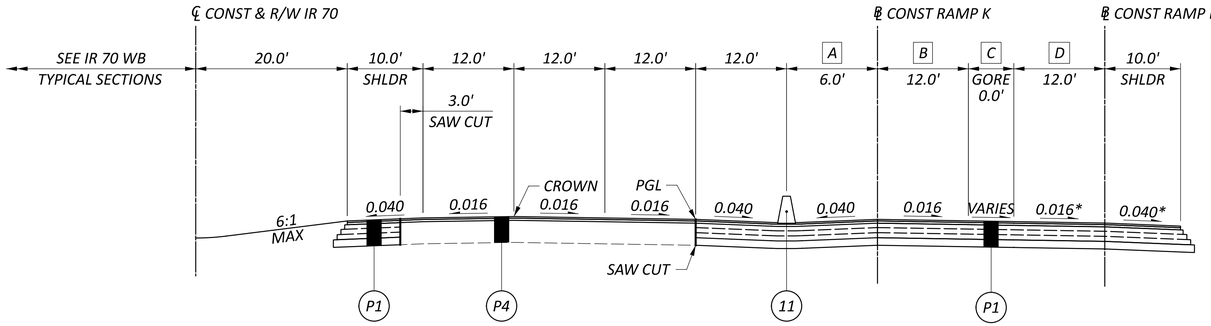
DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.007 TOTAL 740

* SEE SUPERELEVATION TABLES FOR RAMP RATES
** ℄ CONST RAMP D BEGINS AT STA. 59+94.80

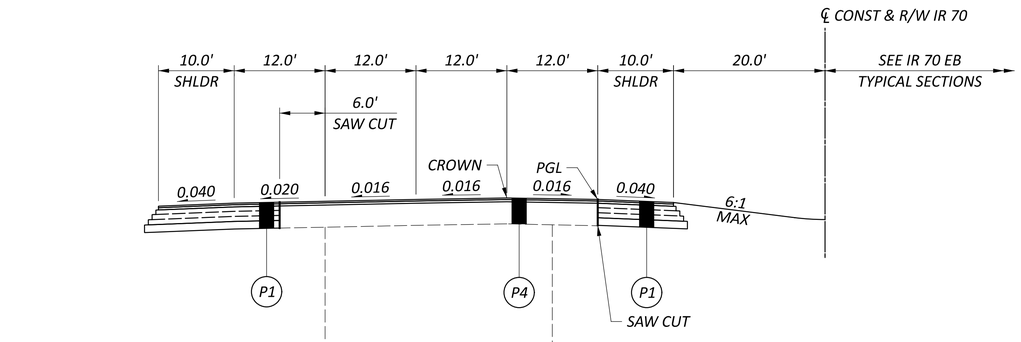


FAI-070-0119 R
APPROACH SLAB = STA. 62+64.12 TO STA. 62+89.12
STRUCTURE = STA. 62+89.12 TO STA. 64+33.16
APPROACH SLAB = STA. 64+33.16 TO STA. 64+58.16

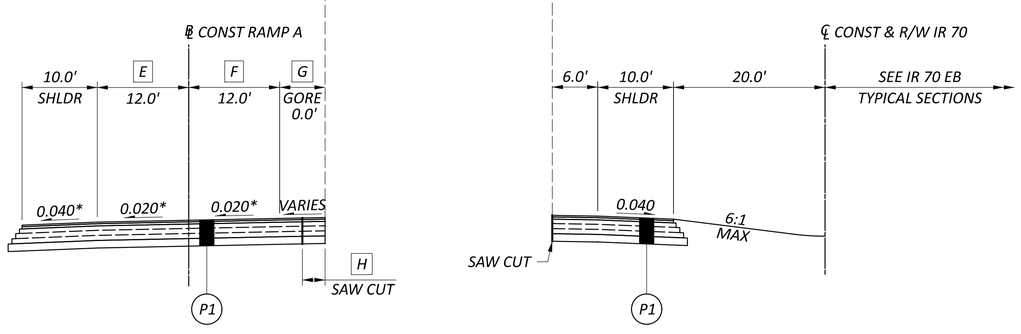
NORMAL SECTION - IR 70 EB

STA. 55+81.03 TO STA. 66+81.07

- A VARIES FROM 12.0' AT STA. 55+81.03 TO 6.0' AT STA. 59+41.03
- B VARIES FROM 12.0' AT STA. 63+76.44 TO 16.0' AT STA. 66+81.07
- C VARIES FROM 0.0' AT STA. 62+27.73 TO 16.0' AT STA. 66+81.07
- D VARIES FROM 12.0' AT STA. 63+76.44 TO 16.0' AT STA. 66+81.07



FAI-070-0084 L
APPROACH SLAB = STA. 43+92.51 TO STA. 44+17.51
STRUCTURE = STA. 44+17.51 TO STA. 45+82.51
APPROACH SLAB = STA. 45+82.51 TO STA. 46+07.51



STA. 48+82.50 TO STA. 57+24.86

STA. 54+00.00 TO STA. 57+24.86

NORMAL SECTION - IR 70 WB

STA. 43+50.00 TO STA. 57+24.86

- E VARIES FROM 12.0' AT STA. 55+32.79 TO 13.4' AT STA. 57+24.86
- F VARIES FROM 12.0' AT STA. 55+32.79 TO 13.4' AT STA. 57+24.86
- G VARIES FROM 0.0' AT STA. 48+82.50 TO 24.0' AT STA. 57+24.86
- H 6.0' FROM STA. 48+82.50 TO STA. 49+82.50
  0.0' FROM STA. 49+82.50 TO STA. 57+24.86

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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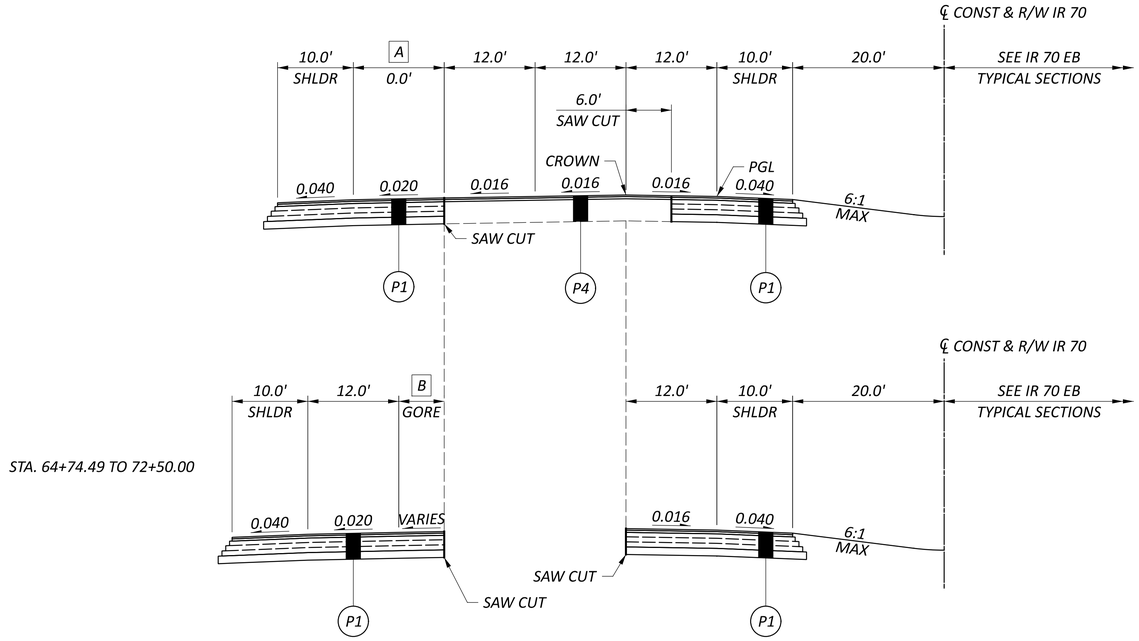
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.
DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.008 TOTAL 740



NORMAL SECTION - IR 70 WB

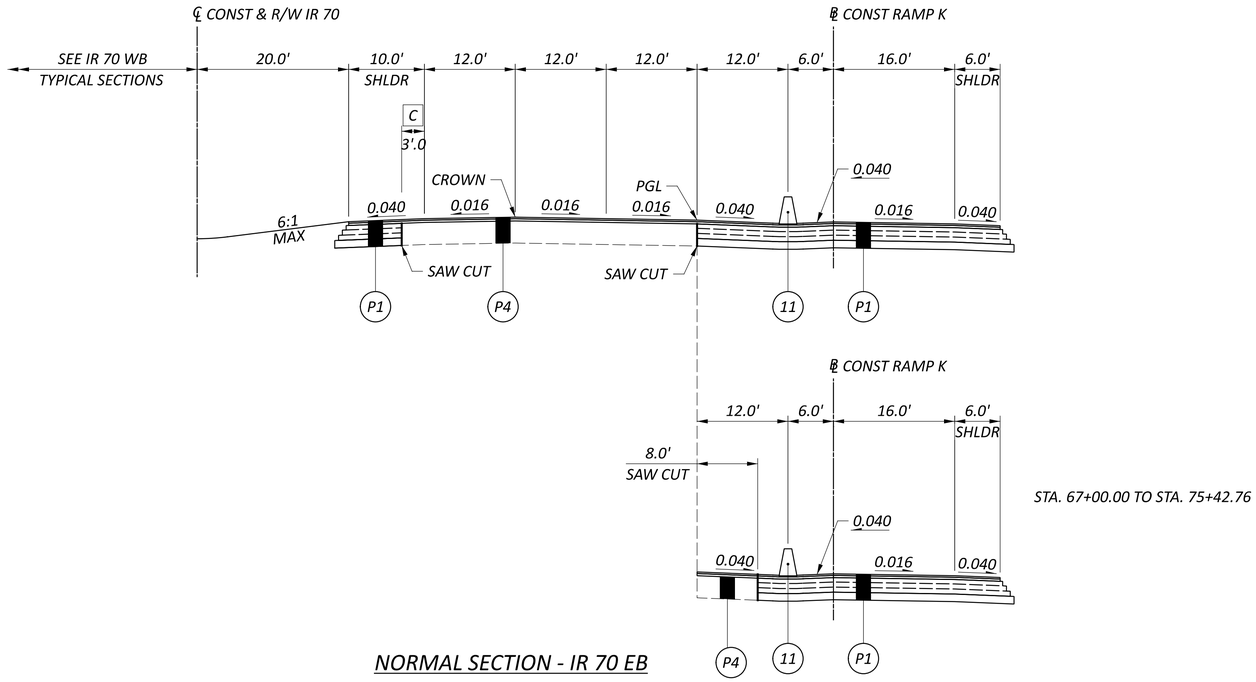
STA. 57+24.86 TO STA. 72+50.00

A VARIES FROM 0.0' AT STA. 58+00.00 TO 9.6' AT STA. 62+80.44

FAI-070-0119 L
APPROACH SLAB = STA. 62+72.79 TO STA. 62+97.79
STRUCTURE = STA. 62+97.79 TO STA. 64+41.83
APPROACH SLAB = STA. 64+41.83 TO STA. 64+66.83

B VARIES FROM 0.0' AT STA. 64+00.00 TO 17.0' AT STA. 72+50.00

STA. 57+50.00 TO STA. 72+50.00



NORMAL SECTION - IR 70 EB

STA. 66+81.07 TO STA. 75+42.76

C VARIES FROM 3.0' AT STA. 71+00.00 TO 7.0' AT STA. 75+00.00

STA. 67+00.00 TO STA. 75+42.76

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.009 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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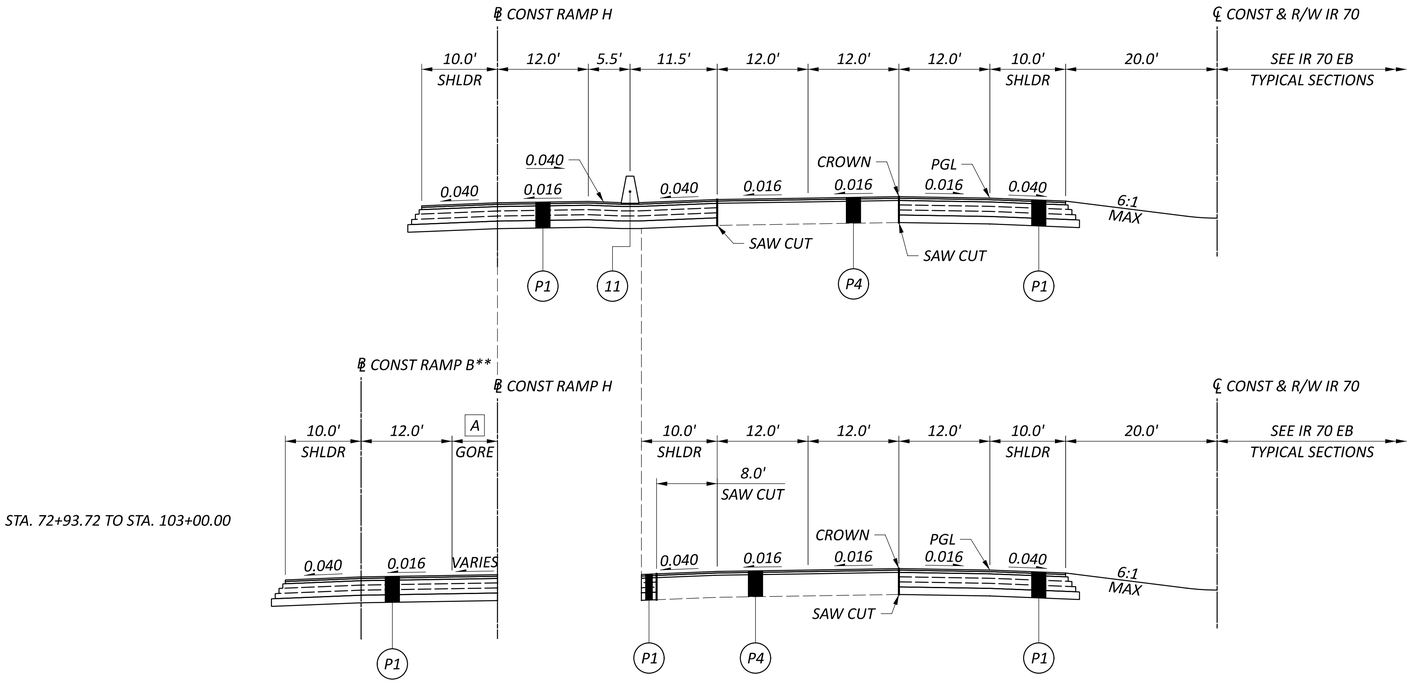


* SEE SUPERELEVATION TABLES FOR RAMP RATES
** ℄ CONST RAMP B ENDS AT STA. 77+22.13

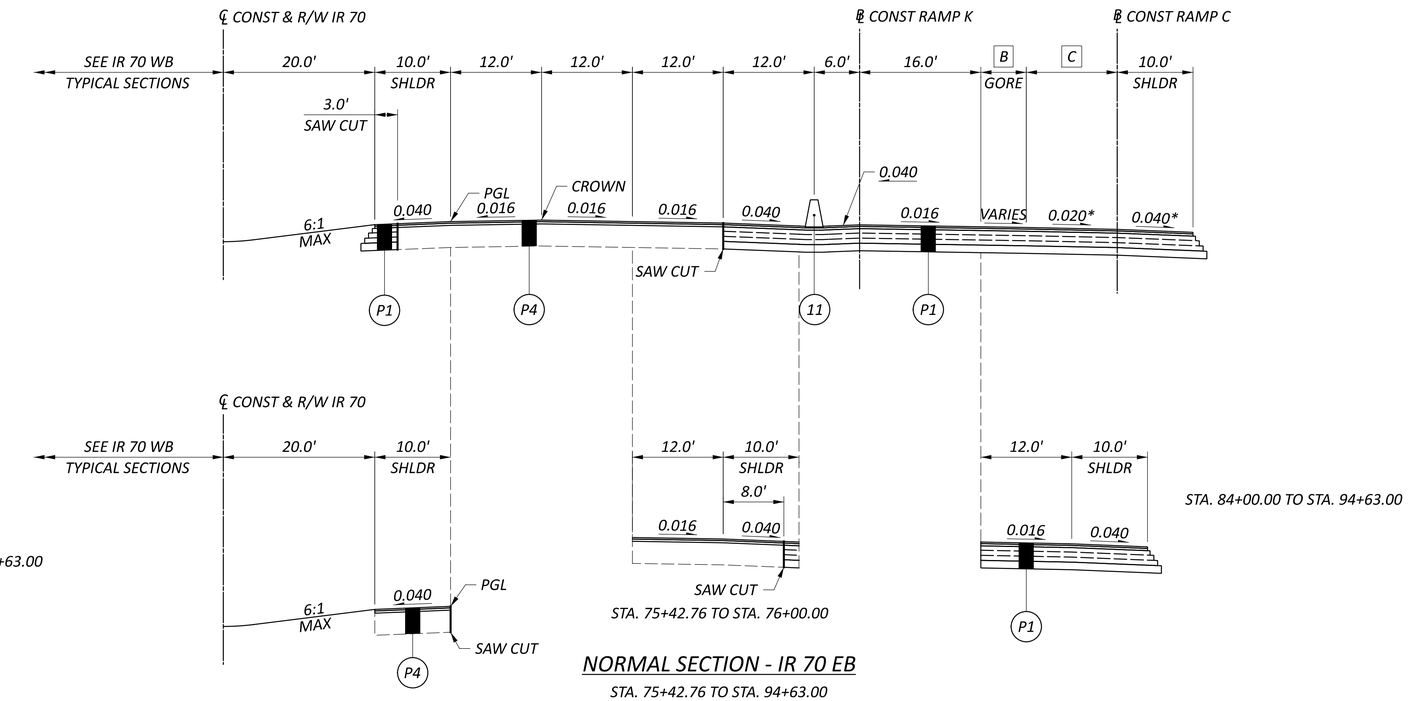
A VARIES FROM 20.0' AT STA. 72+93.72 TO 0.0' AT STA. 77+22.13
0.0' FROM STA. 77+22.13 TO STA. 103+00.00

STA. 72+93.72 TO STA. 103+00.00

STA. 81+00.00 TO STA. 103+00.00

NORMAL SECTION - IR 70 WB

STA. 72+50.00 TO STA. 103+00.00



B VARIES FROM 23.0' AT STA. 75+42.76 TO 0.0' AT STA. 84+00.00

C VARIES FROM 16.0' AT STA. 75+42.76 TO 12.0' AT STA. 84+00.00

NORMAL SECTION - IR 70 EB

STA. 75+42.76 TO STA. 94+63.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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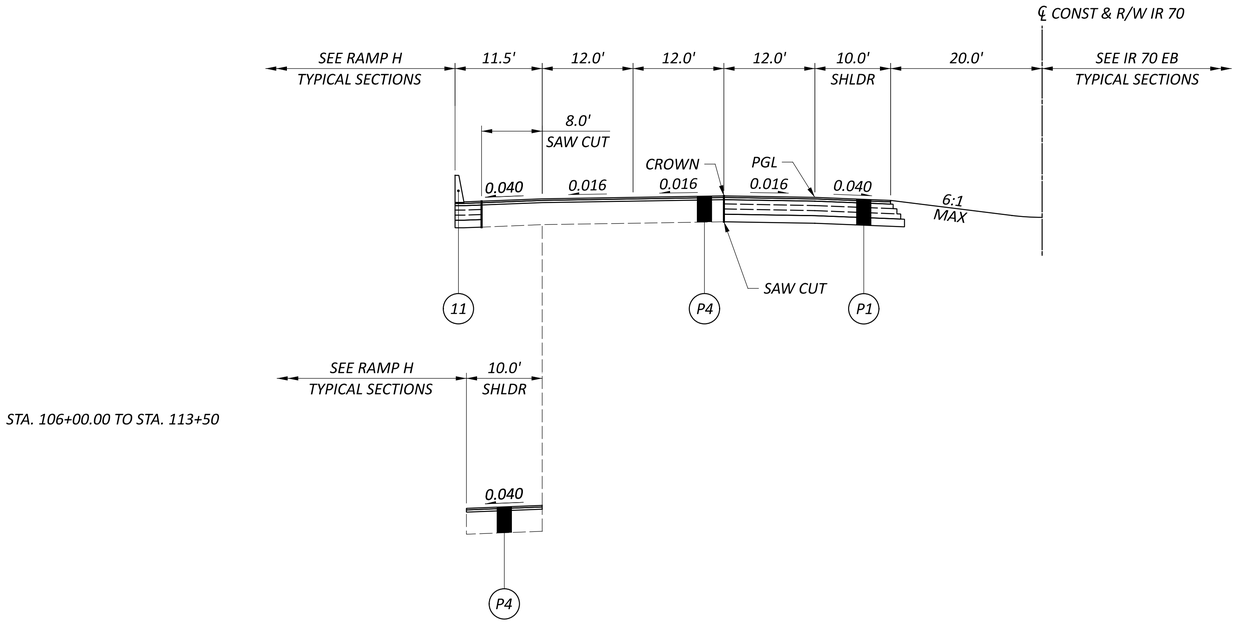
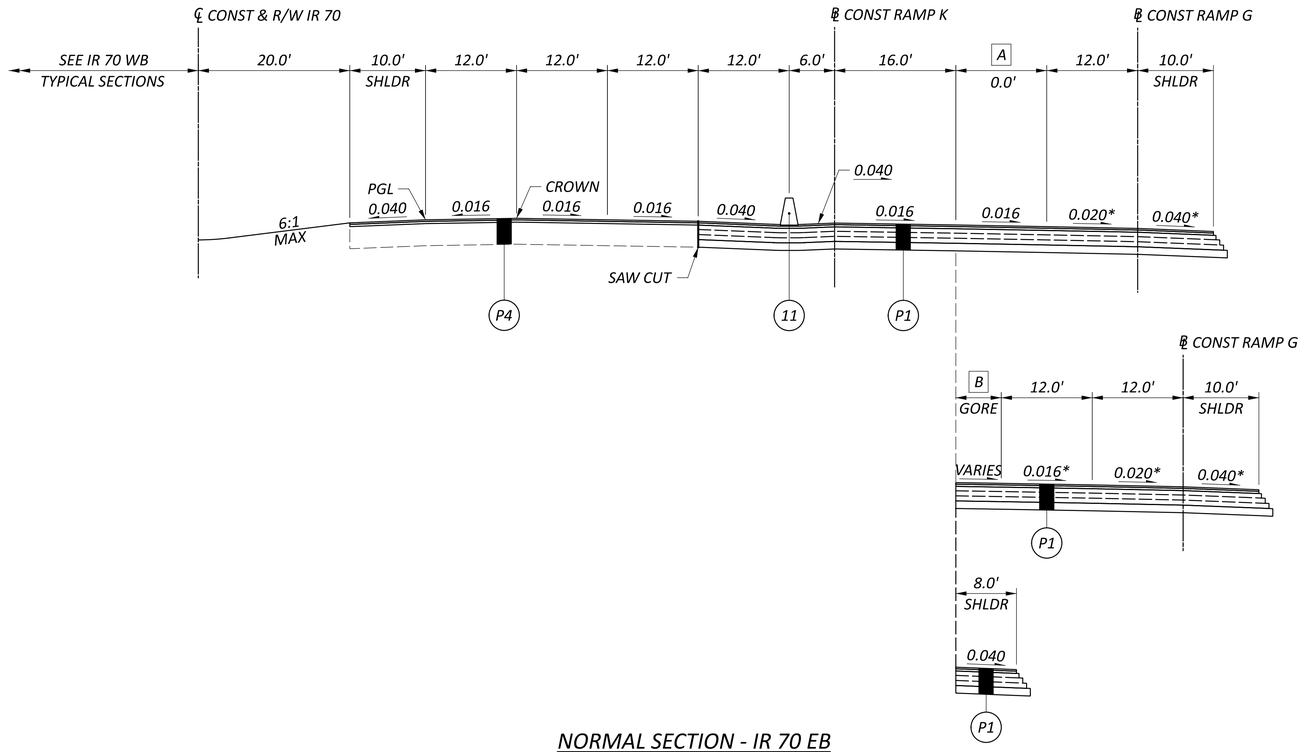
DESIGN AGENCY: STRUCTUREPOINT
DESIGNER: AJO
REVIEWER: KAM 06/18/23
PROJECT ID: 96808
SHEET: P.010 TOTAL: 740



STA. 106+00.00 TO STA. 113+50

NORMAL SECTION - IR 70 WB

STA. 103+00.00 TO STA. 113+50.00



STA. 99+19.84 TO STA. 102+07.25

STA. 102+07.25 TO STA. 102+50.00

NORMAL SECTION - IR 70 EB

STA. 94+63.00 TO STA. 102+50.00

* SEE SUPERELEVATION TABLES FOR RAMP RATES

A VARIES FROM 0.0' AT STA. 94+65.20 TO 12.0' AT STA. 99+19.84

B VARIES FROM 0.0' AT STA. 99+19.84 TO 20.0' AT STA. 102+07.25

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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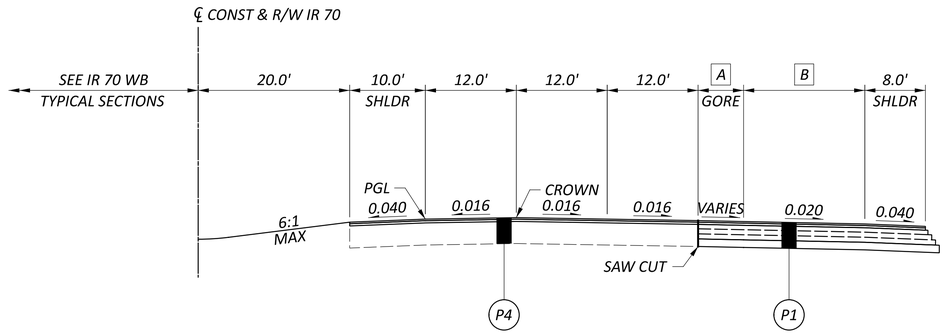
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.011 TOTAL 740



NORMAL SECTION - IR 70 EB

STA. 102+50.00 TO STA. 113+50.00

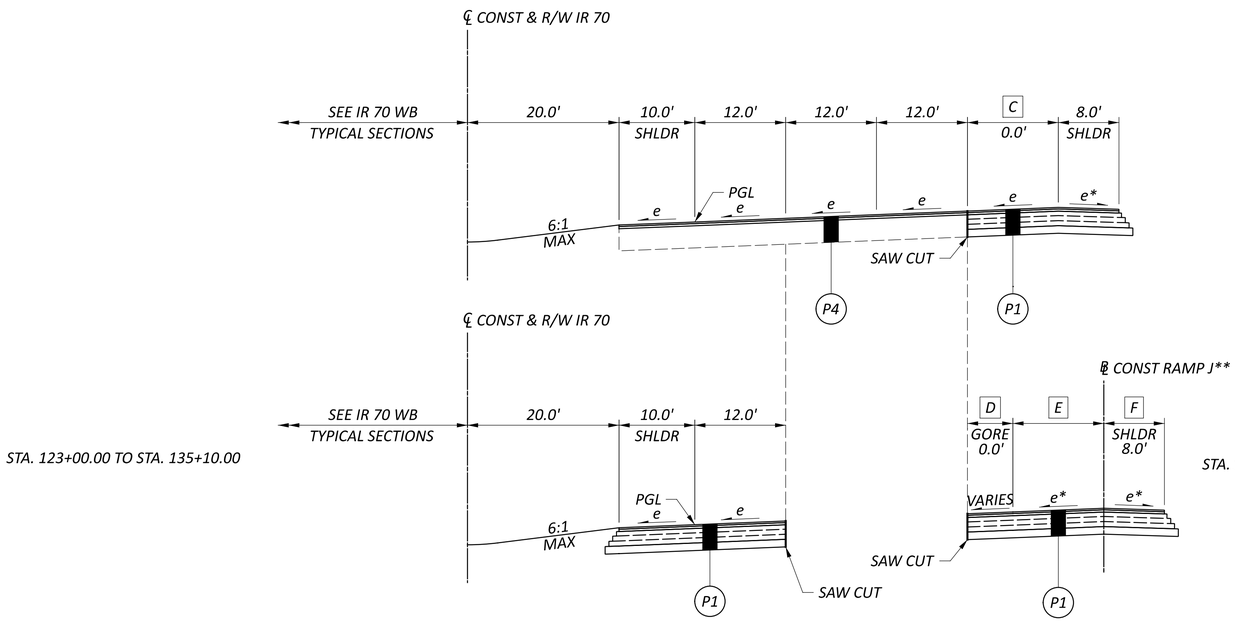
e = SUPERELEVATION RATE

* SEE SUPERELEVATION TABLES FOR RAMP RATES

** ℄ CONST RAMP J ENDS AT STA. 122+40.08

A VARIES FROM 18.0' AT STA. 102+50.00 TO 0.0' AT STA. 111+50.00

B 16.0' FROM STA. 102+50.00 TO STA. 111+50.00
VARIES FROM 16.0' AT STA. 111+50.00 TO 12.0' AT STA. 113+50.00



STA. 123+00.00 TO STA. 135+10.00

STA. 120+45.78 TO 135+10.00

SUPERELEVATED SECTION - IR 70 EB

STA. 113+50.00 TO STA. 135+10.00

C VARIES FROM 12.0' AT STA. 113+50.00 TO 0.0' AT STA. 119+50.00

D VARIES FROM 23.0' AT STA. 120+45.78 TO 0.0' AT STA. 127+09.84

E VARIES FROM 16.0' AT STA. 120+45.78 TO 0.0' AT STA. 135+10.00

F VARIES FROM 6.0' AT STA. 121+92.37 TO 8.0' AT STA. 122+60.95
VARIES FROM 8.0' AT STA. 134+10.50 TO 10.0' AT STA. 135+10.00

NOTES:

1. *FOR PAVEMENT LEGEND, SEE SHEET P.003*
2. *GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN*
3. *SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN*

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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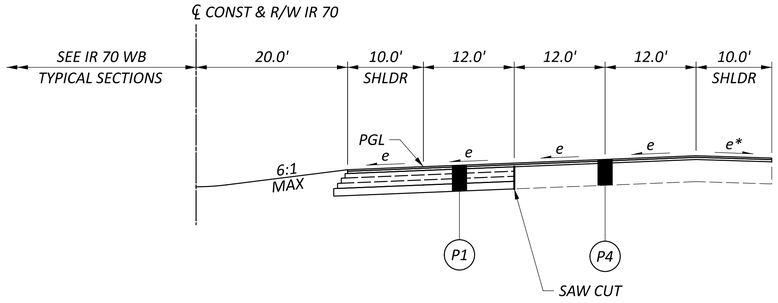
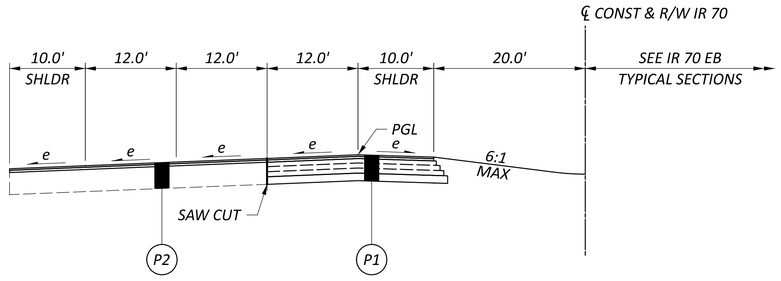
DESIGN AGENCY
STRUCTUREPOINT
DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.012 TOTAL 740

e = SUPERELEVATION RATE



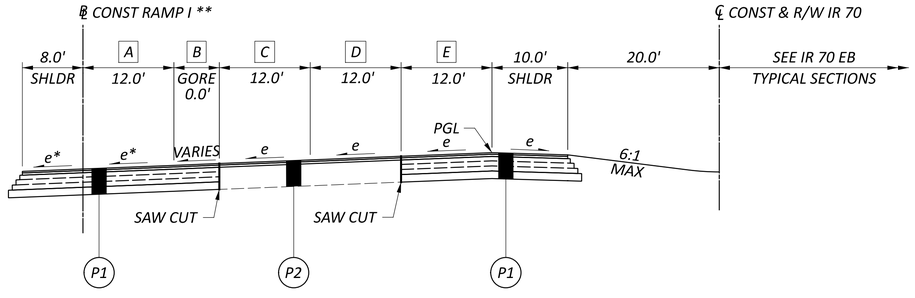
SUPERELEVATED SECTION - IR 70 EB

STA. 135+10.00 TO STA. 139+75.00



SUPERELEVATED SECTION - IR 70 WB

STA. 113+50.00 TO STA. 124+85.56



NORMAL SECTION - IR 70 WB

STA. 124+85.56 TO STA. 137+00.00

A VARIES FROM 16.0' AT STA. 124+85.56 TO 12.0' AT STA. 130+53.71
VARIES FROM 12.0' AT STA. 136+00.00 TO 0.0' AT STA. 137+00.00

B VARIES FROM 23.0' AT STA. 124+85.56 TO 0.0' AT STA. 128+74.90

C VARIES FROM 12.0' AT STA. 136+00.00 TO 12.7' AT STA. 137+00.00

D VARIES FROM 12.0' AT STA. 136+00.00 TO 10.8' AT STA. 137+00.00

E VARIES FROM 12.0' AT STA. 136+00.00 TO 0.0' AT STA. 137+00.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.013 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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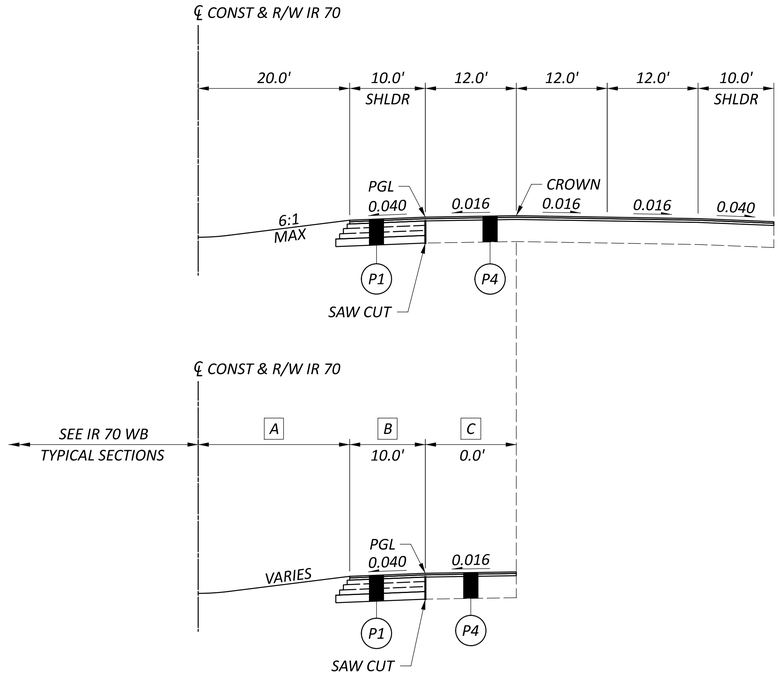

NORMAL SECTION - IR 70 EB

STA. 139+75.00 TO STA. 163+00.00

STA. 155+50.00 TO STA. 163+00.00

* SEE SUPERELEVATION TABLES FOR RAMP RATES
** ℄ CONST RAMP I ENDS AT STA. 136+00.00

A VARIES FROM 20.0' AT STA. 155+50.00 TO 38.0' AT STA. 163+00.00

B VARIES FROM 10.0' AT STA. 161+50.00 TO 4.0' AT STA. 163+00.00

C VARIES FROM 12.0' AT STA. 155+50.00 TO 0.0' AT STA. 161+50.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.014 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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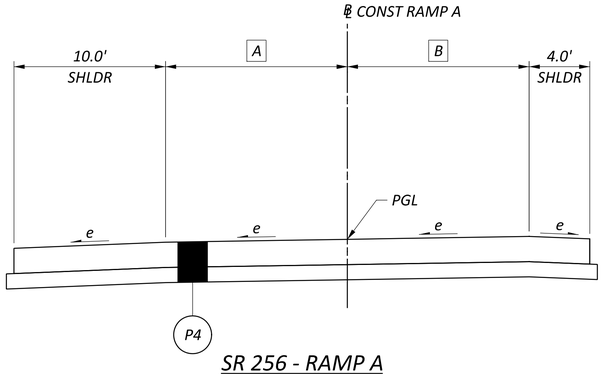
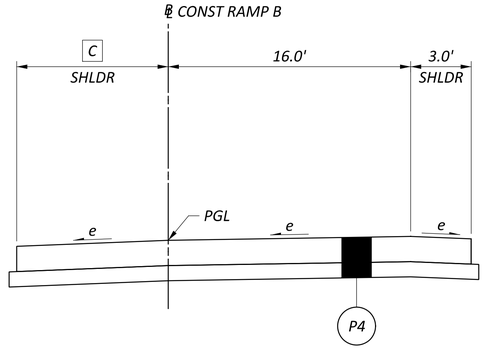


SR 256 - RAMP A

STA. 57+23.33 TO STA. 64+37.62



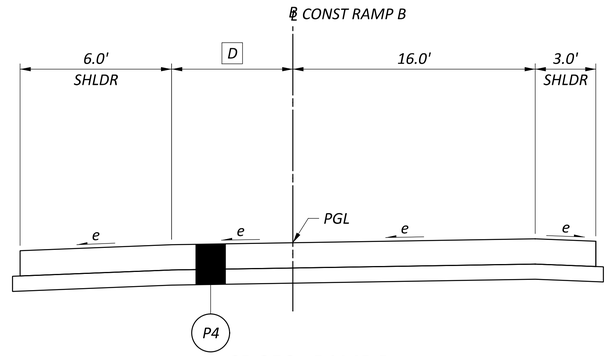
SR 256 - RAMP B

STA. 68+25.00 TO STA. 72+94.95

A VARIES 14.85' AT STA. 57+23.33 TO 15.0' AT STA. 57+32.92
15.0' FROM STA. 57+32.92 TO STA. 59+98.62
VARIES 15.0' FROM STA. 59+98.63 TO 12.0' AT STA. 61+27.39
12.0' FROM STA. 61+27.39 TO STA. 64+37.62

B 12.0' FROM STA. 57+23.33 TO STA. 61+27.39
VARIES FROM 12.0' AT STA. 61+27.39 TO 17.5' AT STA. 61+99.46
17.5' FROM STA. 61+99.46 TO STA. 64+37.62

C VARIES FROM 6.0' RT AT STA. 71+94.95 TO 10.0' AT STA. 72+94.95



SR 256 - RAMP B

STA. 64+51.08 TO STA. 68+25.00

D VARIES 8.0' AT STA. 67+75.00 TO 0.0' AT STA. 68+25.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER AJO

REVIEWER KAM 06/18/23

PROJECT ID 96808

SHEET P.015 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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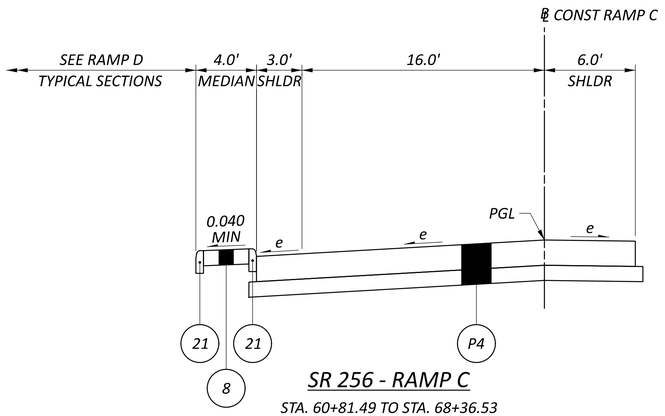
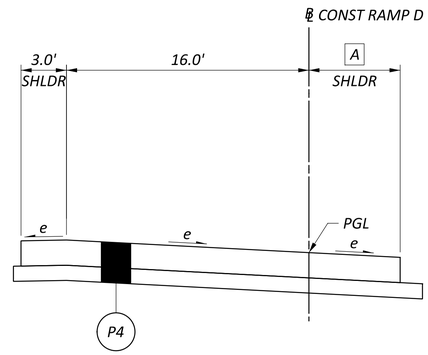


SR 256 - RAMP C

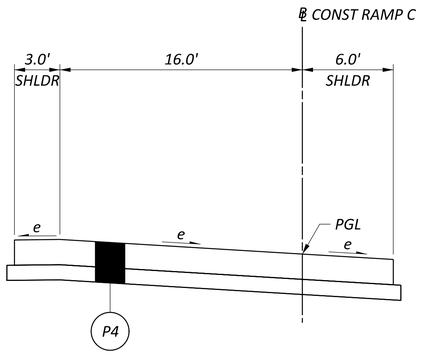
STA. 60+81.49 TO STA. 68+36.53



SR 256 - RAMP D

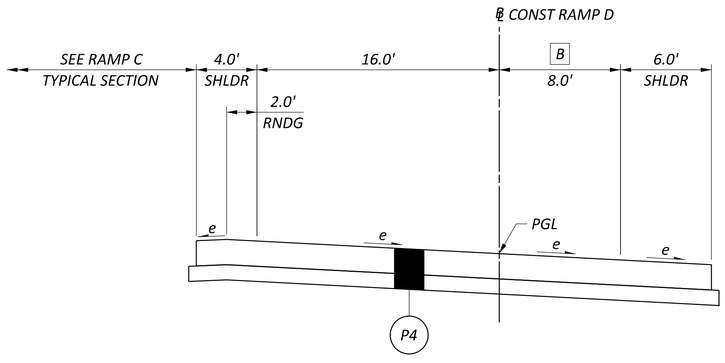
STA. 66+85.33 TO STA. 72+50.00

A 10.0' FROM STA. 66+85.00 TO STA. 67+39.10
VARIES 10.0' AT STA. 67+39.10 TO 6.0' AT STA. 68+39.10
6.0' FROM STA. 68+39.10 TO STA. 72+50.00



SR 256 - RAMP C

STA. 68+36.53 TO 75+45.07



SR 256 - RAMP D

STA. 72+50.00 TO STA. 79+57.26

B VARIES FROM 0.0' AT STA. 72+50.00 TO 8.0' AT STA. 73+00.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.016 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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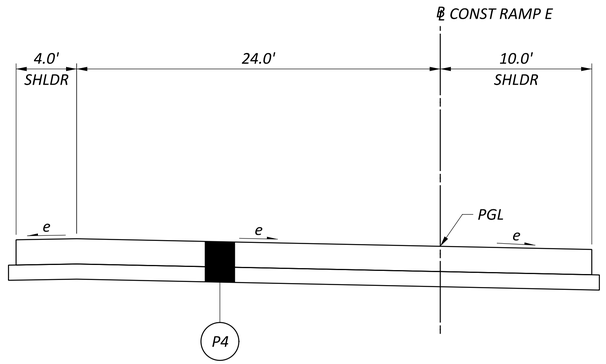
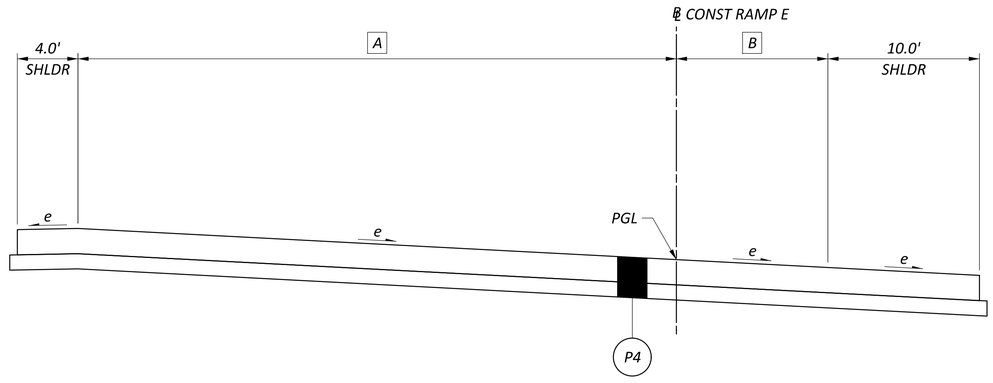


SR 256 - RAMP E

STA. 55+99.13 TO STA. 57+00.00



SR 256 - RAMP E

STA. 57+00.00 TO STA. 64+16.49

A *VARIES 24.0' AT STA. 57+00.00 TO 36.0' AT STA. 57+50.00*
36.0' FROM STA. 57+50.00 TO STA. 64+16.49

B *0.0' FROM STA. 57+00.00 TO STA. 58+66.38*
VARIES 0.0' AT STA. 58+00.00 TO 13.5' AT STA. 60+66.38
13.5' FROM STA. 60+66.38 TO STA. 62+32.27
VARIES FROM 13.5' AT STA. 62+32.27 TO 0.0' AT STA. 64+16.49

NOTES:

1. *FOR PAVEMENT LEGEND, SEE SHEET P.003*
2. *GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN*
3. *SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN*

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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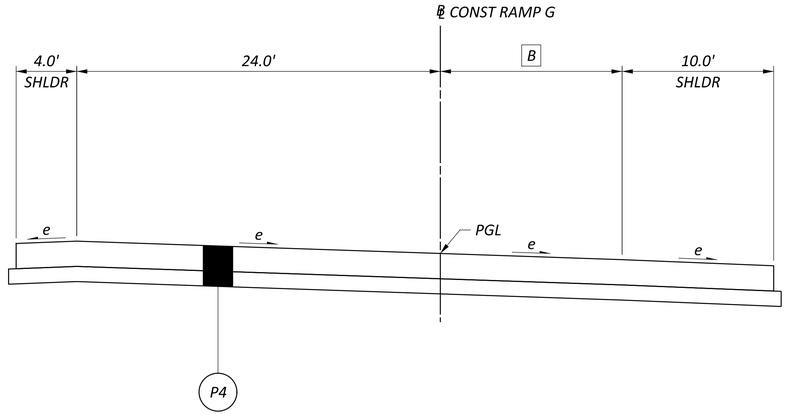
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

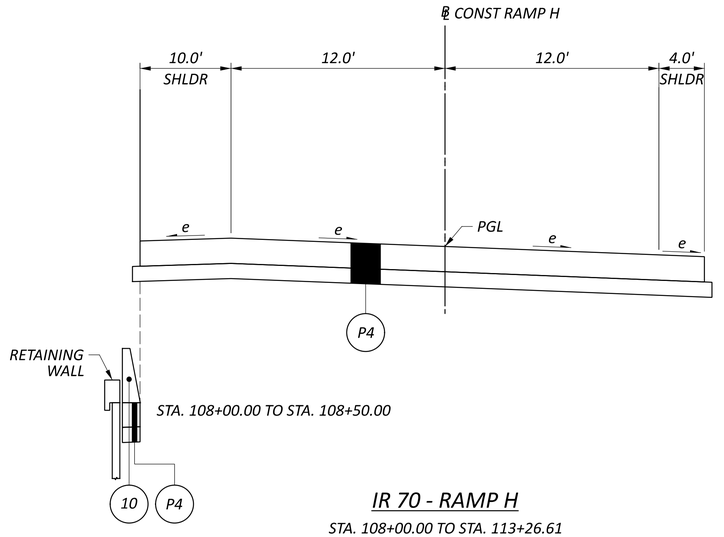
PROJECT ID
96808

SHEET P.017 TOTAL 740



TAYLOR ROAD - RAMP G

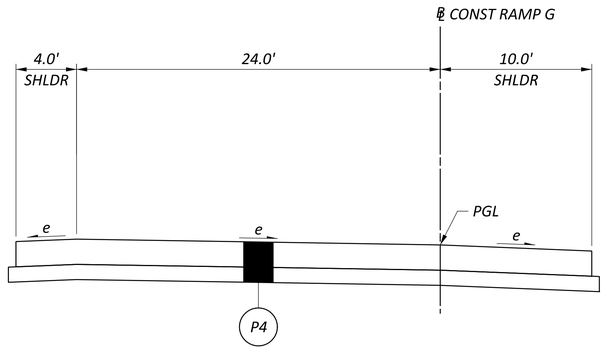
STA. 107+00.00 TO STA. 111+45.15



IR 70 - RAMP H

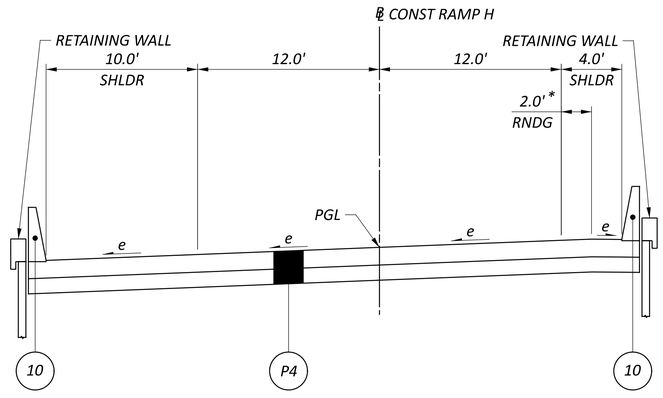
STA. 108+00.00 TO STA. 113+26.61

B VARIES FROM 0.0' AT STA. 107+00.00 TO 12.0' AT STA. 107+50.00



TAYLOR ROAD - RAMP G

STA. 102+11.30 TO STA. 107+00.00



TAYLOR ROAD - RAMP H

STA. 103+00.00 TO STA. 108+00.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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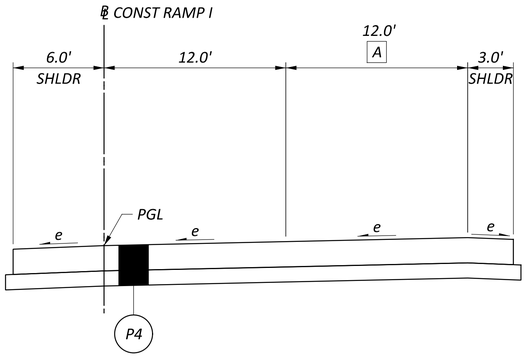
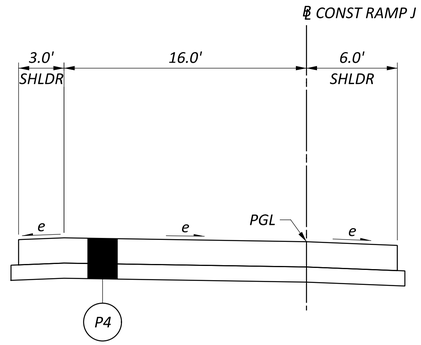
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	AJO
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.018
TOTAL	740



TAYLOR ROAD - RAMP I

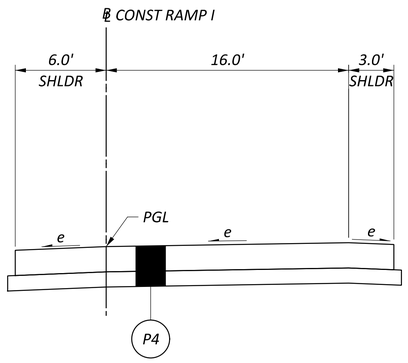
STA. 114+45.28 TO STA. 119+50.00



TAYLOR ROAD - RAMP J

STA. 110+54.90 TO STA. 120+44.38

A VARIES FROM 12.0' AT STA. 119+00.00 TO 0.0' AT STA. 119+50.00



TAYLOR ROAD - RAMP I

STA. 119+50.00 TO STA. 125+02.59

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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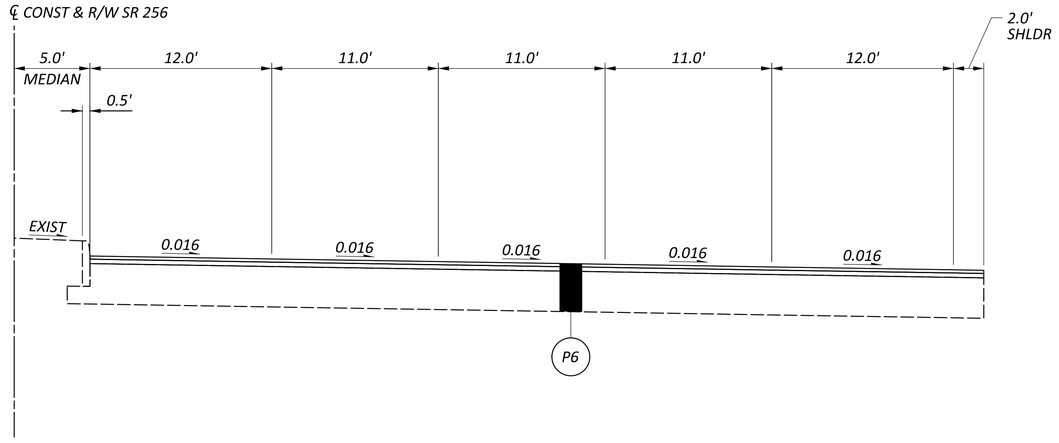
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

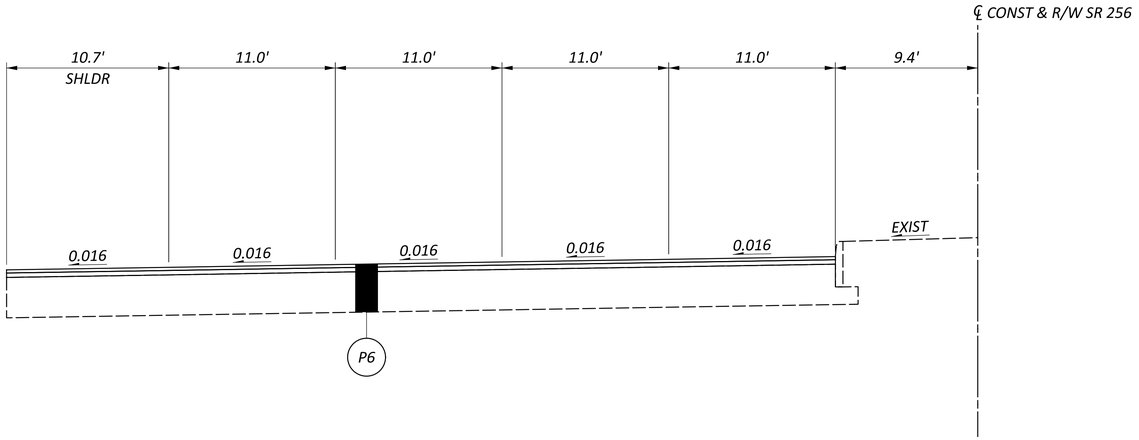
PROJECT ID
96808

SHEET P.019 | TOTAL 740



NORMAL SECTION - SR 256

STA. 29+76.13 TO STA. 30+95.00



NORMAL SECTION - SR 256

STA. 29+76.13 TO STA. 30+95.00

NOTES:

1. *FOR PAVEMENT LEGEND, SEE SHEET P.003*
2. *GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN*
3. *SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN*

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.020 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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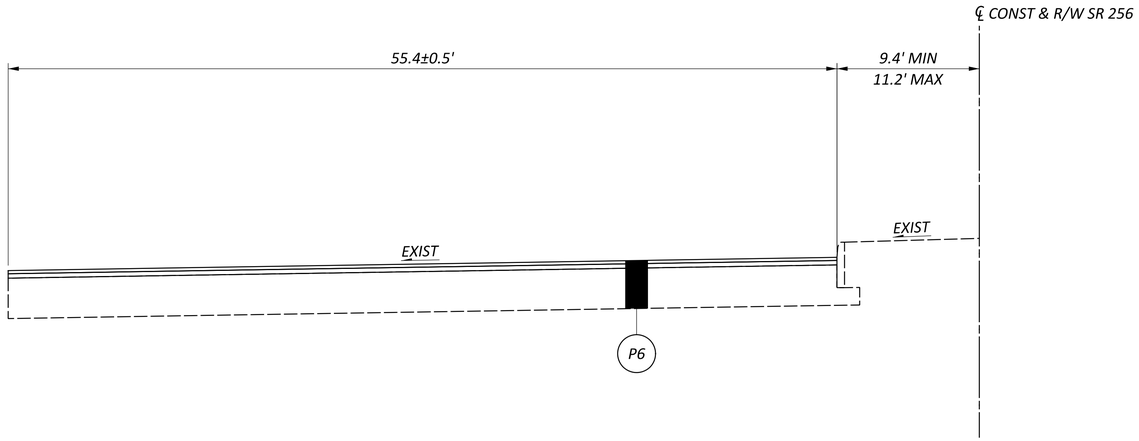
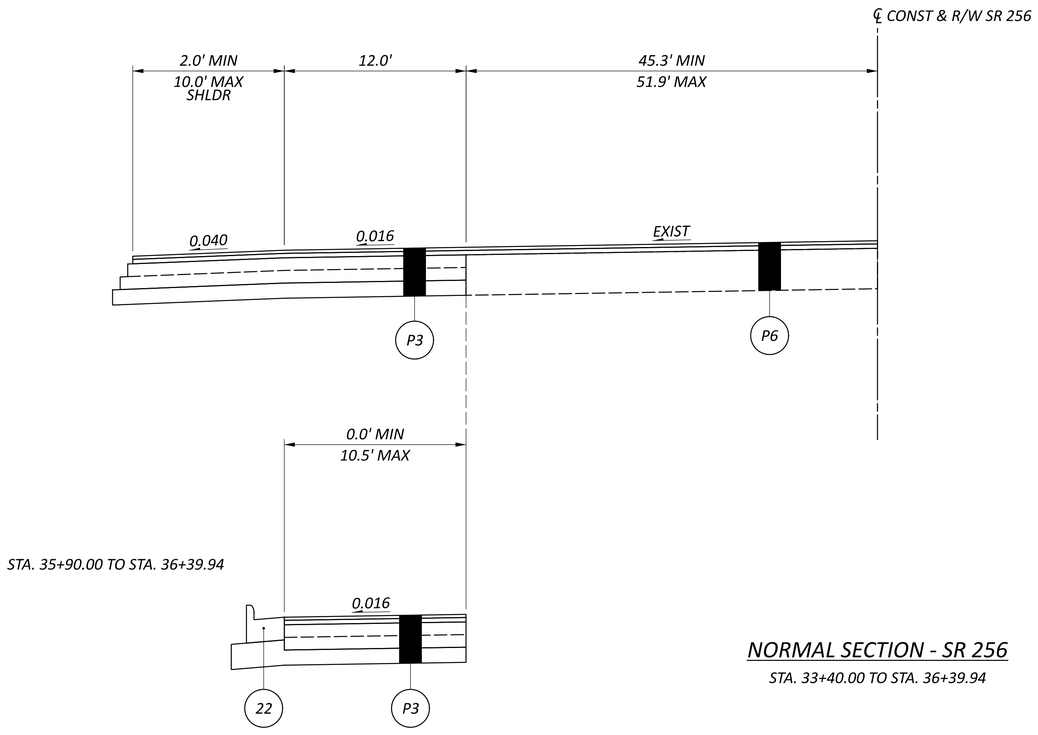


NORMAL SECTION - SR 256

STA. 30+95.00 TO STA. 33+40.00



NORMAL SECTION - SR 256

STA. 33+40.00 TO STA. 36+39.94

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.021 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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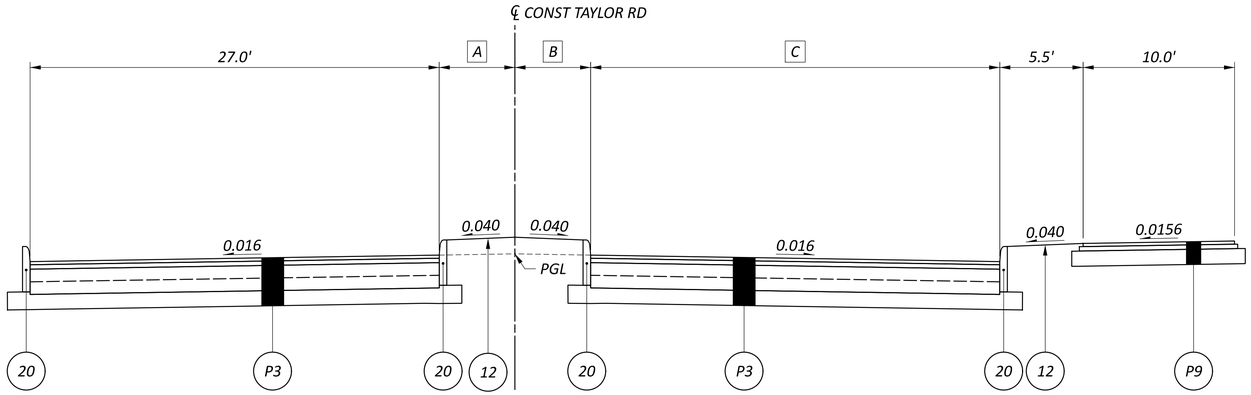


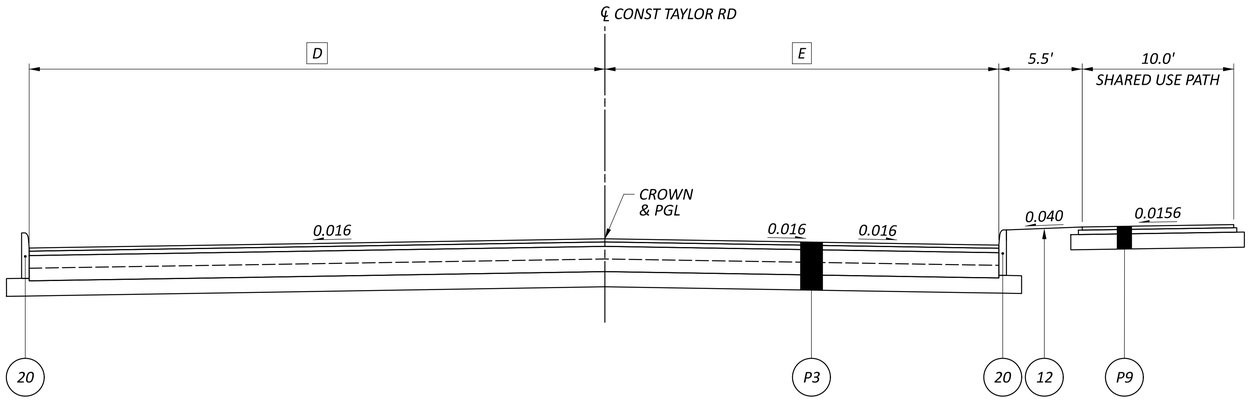
NORMAL SECTION - TAYLOR RD

STA. 25+50.00 TO STA. 35+19.95

A 5.0' FROM STA. 25+50.00 TO STA. 32+74.23
VARIES FROM 5.0' AT STA. 32+74.23 TO 12.1' AT STA. 35+19.95

B 5.0' FROM STA. 25+50.00 TO STA. 32+74.23
VARIES FROM 5.0' AT STA. 32+74.23 TO 12.1' AT STA. 35+19.95

C 27.0' FROM STA. 25+50.00 TO STA. 29+50.00
VARIES FROM 27.0' AT STA. 29+50.00 TO 39.0' AT STA. 30+00.00
39.0' FROM STA. 30+00.00 TO STA. 39+19.95



NORMAL SECTION - TAYLOR RD

STA. 17+18.00 TO STA. 25+50.00

D 38.0' FROM STA. 17+18.00 TO STA. 20+47.50
VARIES FROM 38.0' AT STA. 20+47.50 TO 44.0' STA. 22+50.00
VARIES FROM 44.0' AT STA. 22+50.00 TO 32.0' AT STA. 23+00.00
32.0' FROM STA. 23+00.00 TO STA. 25+50.00

E 26.0' FROM STA. 17+18.00 TO STA. 20+47.50
VARIES FROM 26.0' AT STA. 20+47.50 TO 32.0' STA. 22+50.00
32.0' FROM STA. 22+50.00 TO STA. 25+50.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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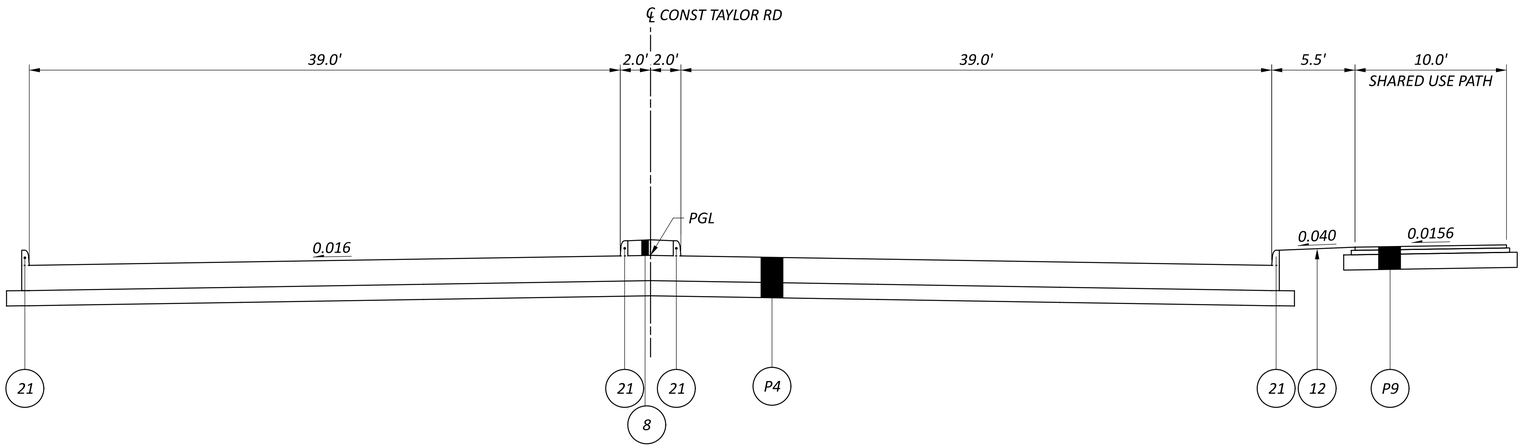
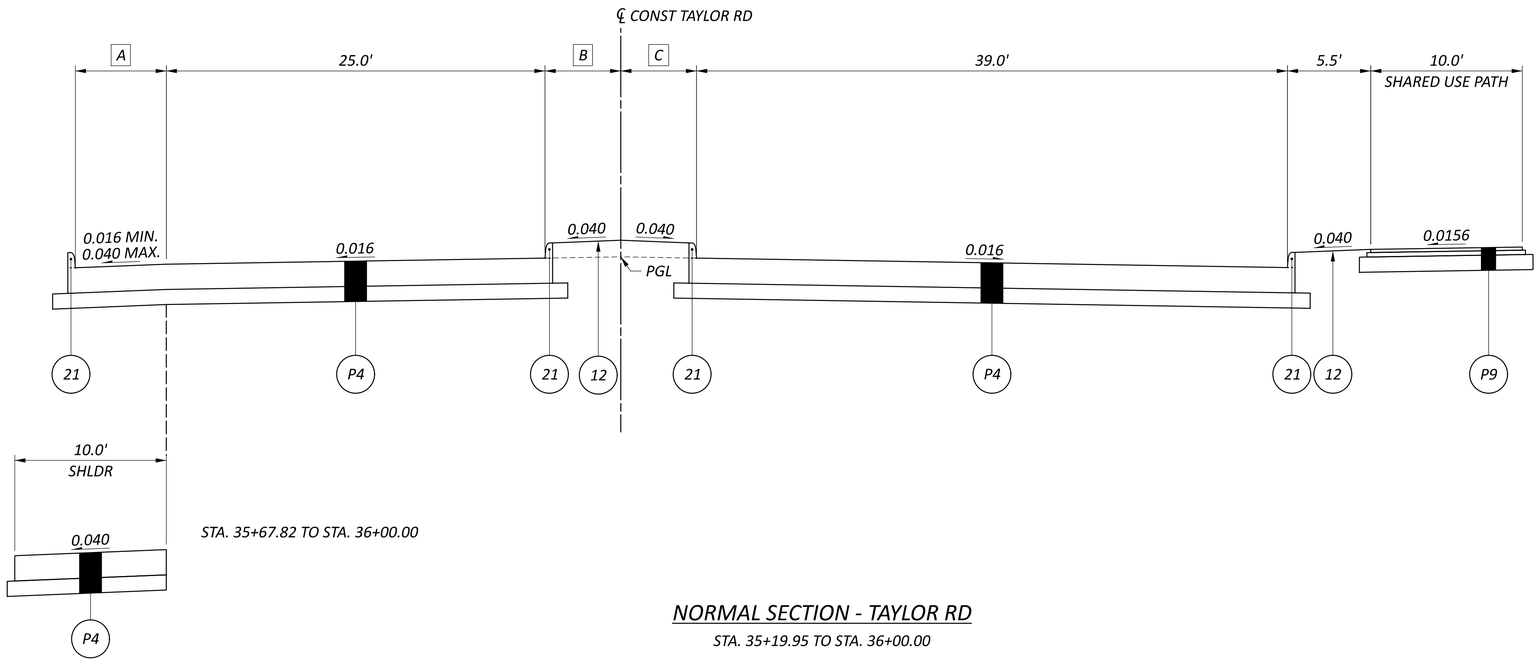
DESIGN AGENCY
STRUCTUREPOINT INC.
DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.022 TOTAL 740



NORMAL SECTION - TAYLOR RD

STA. 36+84.79 TO STA. 39+55.87

PROPOSED BRIDGE
APPROACH SLAB = STA. 39+58.02 TO STA. 39+88.02
STRUCTURE = STA. 39+88.02 TO STA. 42+26.16
APPROACH SLAB = STA. 42+26.16 TO STA. 42+56.16



STA. 35+67.82 TO STA. 36+00.00

NORMAL SECTION - TAYLOR RD

STA. 35+19.95 TO STA. 36+00.00

A VARIES FROM 2.0' AT STA. 35+19.95 TO 10.0' AT STA. 35+67.82

B VARIES FROM 12.1' AT STA. 35+19.95 TO 14.0' AT STA. 36+00.00

C VARIES FROM 12.1' AT STA. 35+19.95 TO 14.0' AT STA. 36+00.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.023 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/20/2023 TIME: 12:08:58 PM USER: aoldaker
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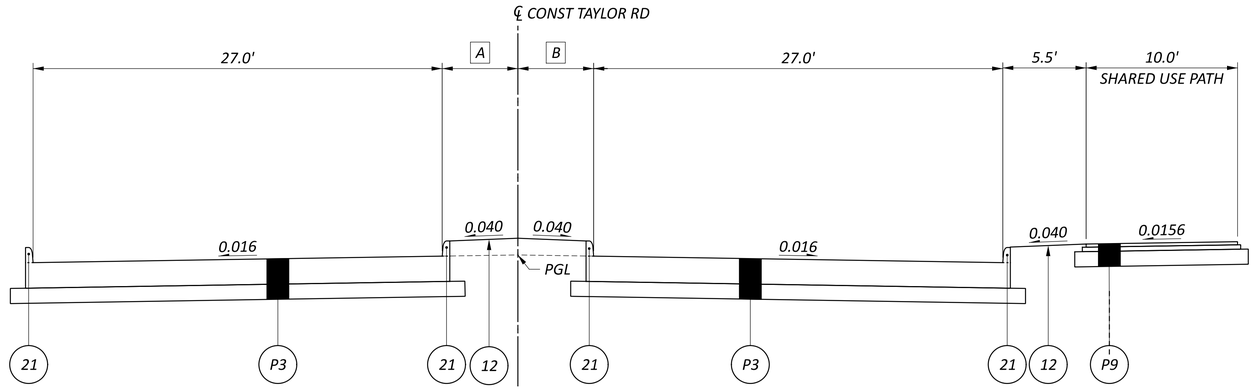
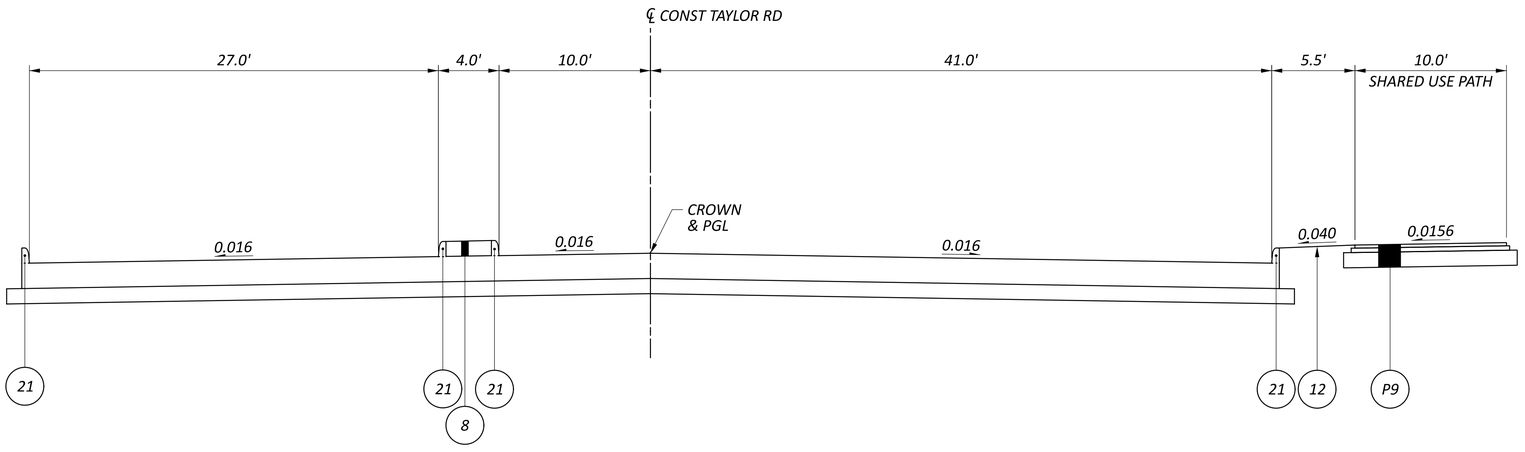


A VARIES FROM 14.0' AT STA. 43+50.00 TO 10.0' AT STA. 44+99.44

B VARIES FROM 14.0' AT STA. 43+50.00 TO 10.0' AT STA. 44+99.44

NORMAL SECTION - TAYLOR RD

STA. 43+50.00 TO STA. 44+99.44



NORMAL SECTION - TAYLOR RD

STA. 42+40.88 TO STA. 42+50.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER AJO

REVIEWER KAM 06/18/23

PROJECT ID 96808

SHEET P.024 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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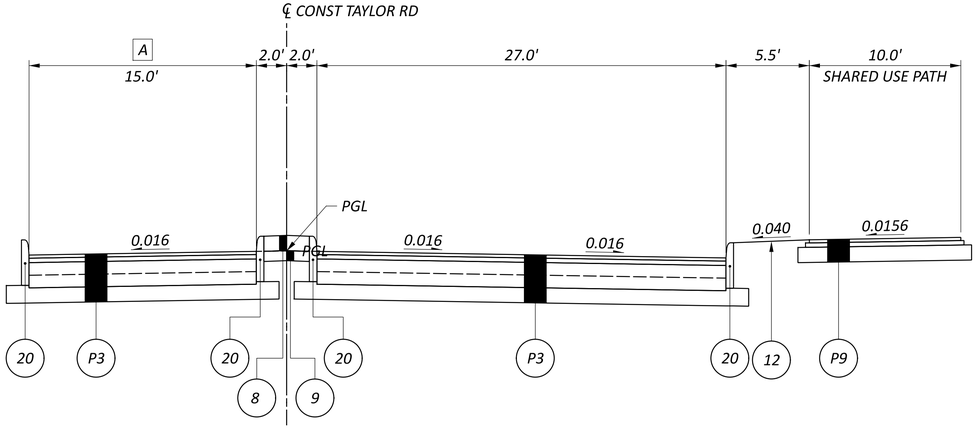
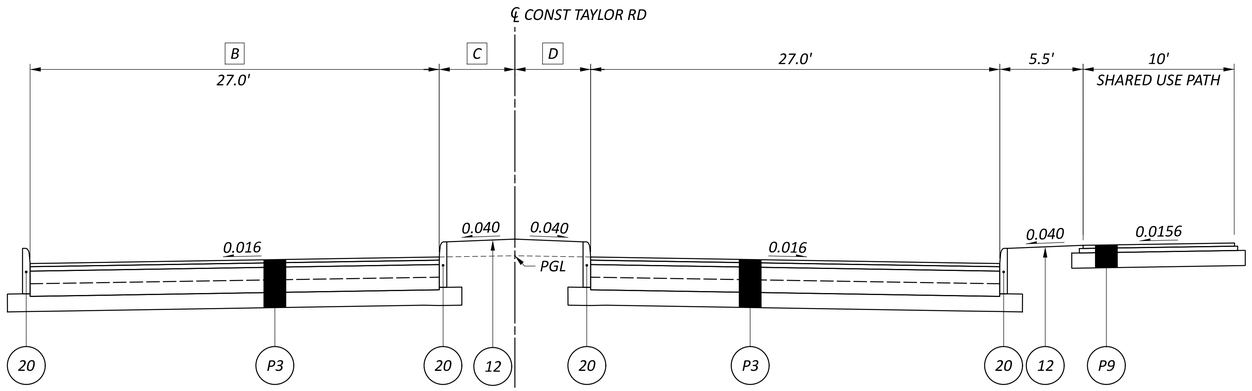


NORMAL SECTION - TAYLOR RD

STA. 47+41.00 TO STA. 50+20.00

A VARIES FROM 22.3' AT STA. 47+41.00 TO 15.0' AT STA. 47+70.00



NORMAL SECTION - TAYLOR RD

STA. 44+99.44 TO STA. 47+41.00

B VARIES FROM 27.0' AT STA. 47+20.00 TO 22.3' AT STA. 47+41.00

C VARIES FROM 10.0' AT STA. 44+99.44 TO 2.0' AT STA. 47+41.00

D VARIES FROM 10.0' AT STA. 44+99.44 TO 2.0' AT STA. 47+41.00

NOTES:

1. *FOR PAVEMENT LEGEND, SEE SHEET P.003*
2. *GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN*
3. *SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN*

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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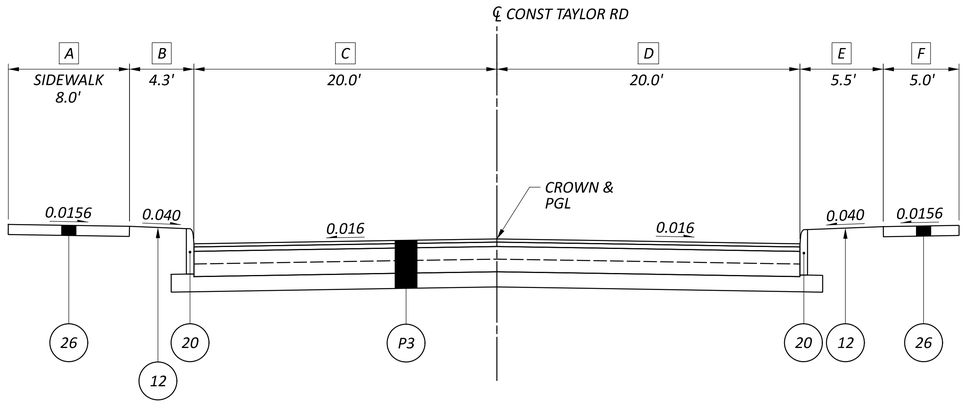
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

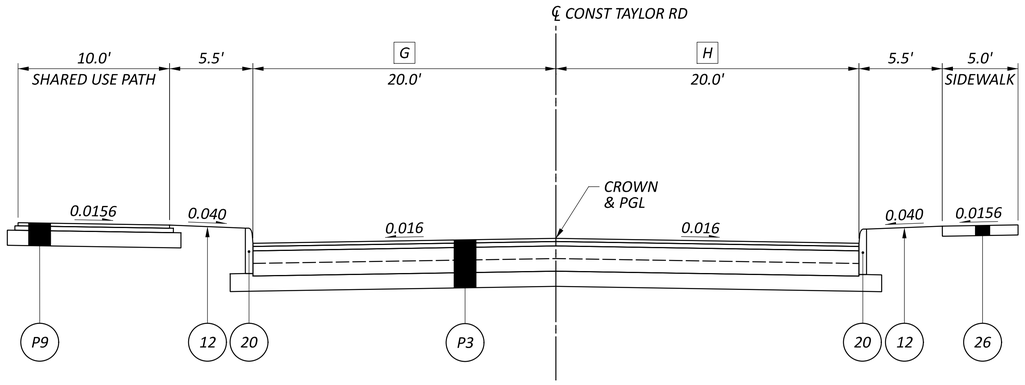
SHEET P.025 TOTAL 740



NORMAL SECTION - TAYLOR RD

STA. 56+86.99 TO STA. 58+00.00

- A VARIES FROM 8.0' AT STA. 57+80.00 TO 7.9' AT STA. 58+00.00
- B VARIES FROM 4.3' AT STA. 57+80.00 TO 4.6' AT STA. 58+00.00
- C VARIES FROM 20.0' AT STA. 57+80.00 TO 19.4' AT STA. 58+00.00
- D VARIES FROM 20.0' AT STA. 57+80.00 TO 19.6' AT STA. 58+00.00
- E VARIES FROM 5.5' AT STA. 57+80.00 TO 4.6' AT STA. 58+00.00
- F VARIES FROM 5.0' AT STA. 57+80.00 TO 4.9' AT STA. 58+00.00



NORMAL SECTION - TAYLOR RD

STA. 52+04.75 TO STA. 55+51.23

- G VARIES FROM 30.2' AT STA. 52+04.75 TO 32.0' AT STA. 53+63.00
  VARIES FROM 32.0' AT STA. 53+63.00 TO 20.0' AT STA. 54+13.00
- H VARIES FROM 29.7' AT STA. 52+04.75 TO 20.0' AT STA. 55+01.38

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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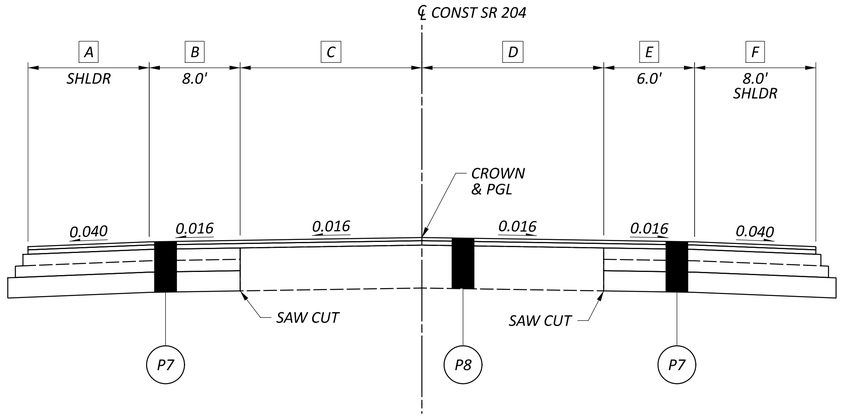
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.026 TOTAL 740



NORMAL SECTION - SR 204

STA. 36+57.80 TO STA. 39+30.13

A *VARIES FROM 1.1' AT STA. 36+57.80 TO 8.0' AT STA. 38+29.44*

B *VARIES FROM 5.3' AT STA. 36+57.80 TO 6.0' AT STA. 37+20.58*

C *VARIES FROM 5.6' AT STA. 36+57.80 TO 6.0' AT STA. 37+20.58*
VARIES FROM 6.0' AT STA. 37+20.58 TO 11.7' AT STA. 39+30.13

D *VARIES FROM 5.3' AT STA. 36+57.80 TO 6.0' STA. 37+20.58*
VARIES FROM 6.0' AT STA. 37+20.58 TO 11.2' AT STA. 39+30.13

E *VARIES FROM 5.3' AT STA. 36+57.80 TO 6.0' AT STA. 37+20.58*

F *VARIES FROM 0.8' AT STA. 36+57.80 TO 8.0' AT STA. 36+93.95*

NOTES:

1. *FOR PAVEMENT LEGEND, SEE SHEET P.003*
2. *GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN*
3. *SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN*

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.027 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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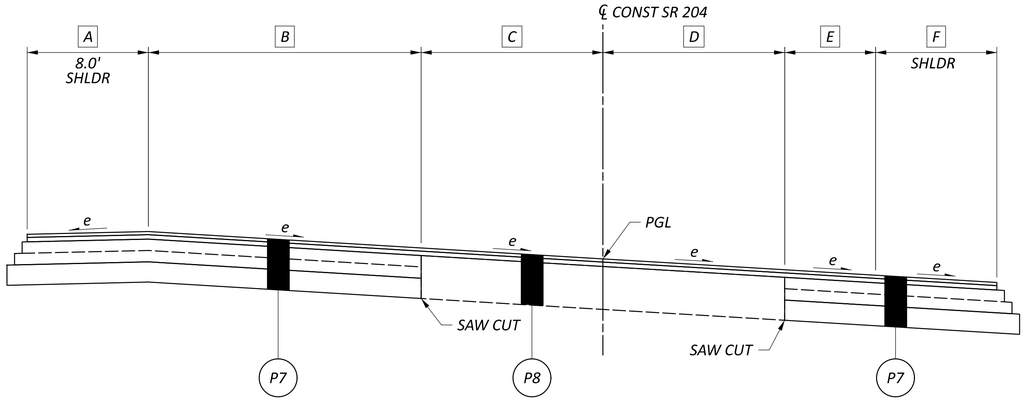


SUPERELEVATION SECTION - SR 204

STA. 39+30.13 TO STA. 47+83.03

A — 8.0' FROM STA. 39+30.13 TO STA. 47+64.57

B — 6.0' FROM STA. 39+30.13 TO STA. 41+27.88
18.0' FROM STA. 43+29.86 TO STA. 45+05.17
VARIES FROM 18.0' AT STA. 45+05.17 TO 6.0' AT STA. 45+55.15
6.0' FROM STA. 45+55.15 TO STA. 46+50.00
0.0' FROM STA. 46+50.00 TO STA. 47+83.00

C — VARIES FROM 11.7' AT STA. 39+30.13 TO 12.0' AT STA. 39+50.82
12.0' FROM STA. 39+50.82 TO STA. 45+55.48
VARIES FROM 12.0' AT STA. 45+55.48 TO 9.2' AT STA. 46+24.91
VARIES FROM 15.9' AT STA. 46+24.91 TO 11.9' AT STA. 47+83.00

E — VARIES FROM 11.2' AT STA. 39+30.13 TO 12.0' AT STA. 39+50.75
12.0' FROM STA. 39+50.75 TO STA. 45+55.26
VARIES FROM 12.0' AT STA. 45+55.26 TO 9.9' AT STA. 46+24.91
VARIES FROM 15.9' AT STA. 46+24.91 TO 11.9' AT 47+83.00

E — 6.0' FROM STA. 39+30.13 TO STA. 46+24.82
0.0' FROM 46+24.82 TO STA. 47+83.00

F — 8.0' FROM STA. 39+30.13 TO STA. 45+55.48
VARIES FROM 8.0' AT STA. 45+55.48 TO 3.8' AT STA. 47+83.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/20/2023 TIME: 12:09:45 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GY419.dgn

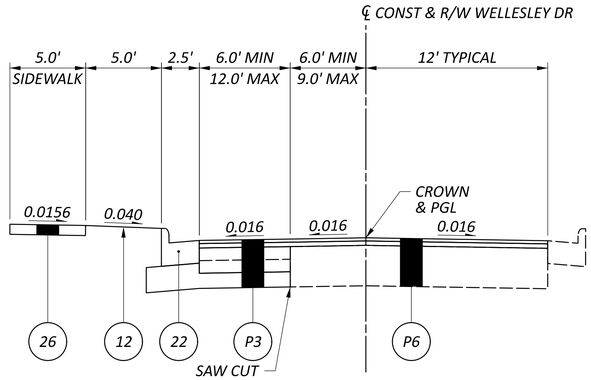
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

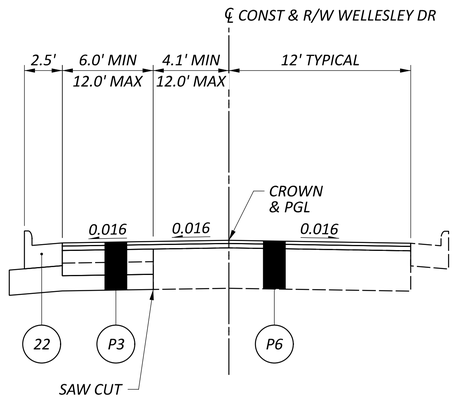
PROJECT ID
96808

SHEET P.028 | TOTAL 740



NORMAL SECTION - WELLESLEY RD

STA. 13+33.24 TO STA. 13+96.00



NORMAL SECTION - WELLESLEY RD

STA. 13+96.00 TO STA. 15+52.87

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

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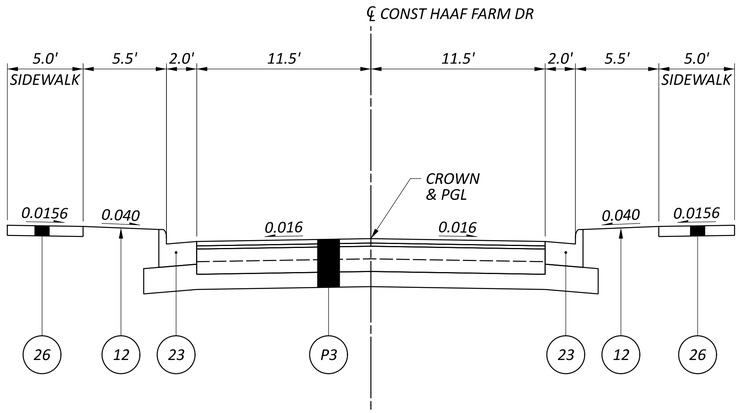
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.029 | TOTAL 740



NORMAL SECTION - HAAF FARM DR

STA. 0+78.18 TO STA. 1+28.76

NOTES:

1. *FOR PAVEMENT LEGEND, SEE SHEET P.003*
2. *GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN*
3. *SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN*

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/20/2023 TIME: 12:10:04 PM USER: aoldaker
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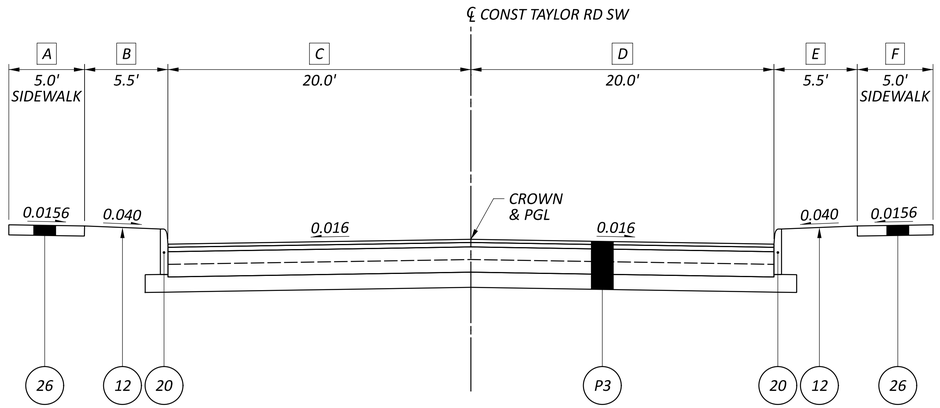
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.030 TOTAL 740



NORMAL SECTION - TAYLOR RD SW

STA. 11+96.70 TO STA. 14+49.46

- A VARIES FROM 3.9' AT STA. 11+96.70 TO 5.0' AT STA. 12+64.20
- B VARIES FROM 6.5' AT STA. 11+96.70 TO 5.5' AT STA. 12+64.20
- C VARIES FROM 17.8' AT STA. 11+96.70 TO 20.0' AT STA. 12+64.20
- D VARIES FROM 16.8' AT STA. 11+96.70 TO 20.0' AT STA. 12+64.20
- E VARIES FROM 5.7' AT STA. 11+96.70 TO 5.5' AT STA. 12+64.20
- F VARIES FROM 3.9' AT STA. 11+96.70 TO 5.0' AT STA. 12+64.20

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 8/20/2023 TIME: 12:10:14 PM USER: aoldaker
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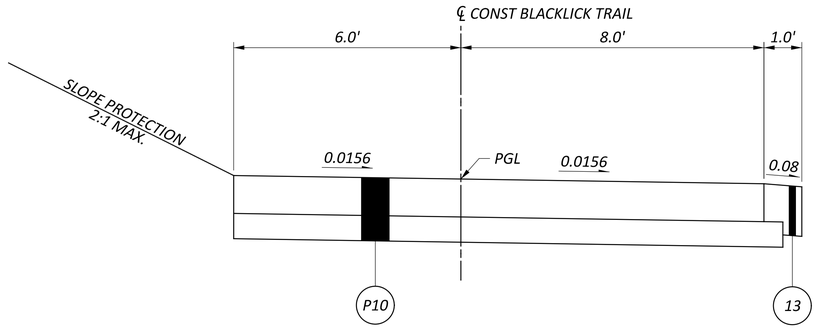
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

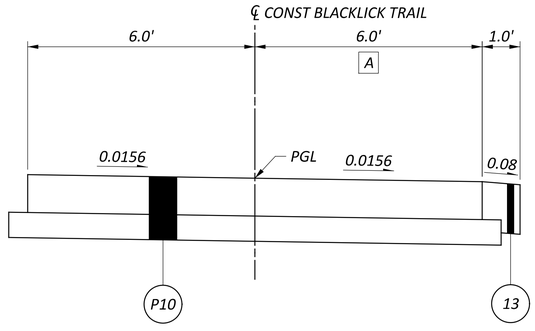
PROJECT ID
96808

SHEET P.031 TOTAL 740



NORMAL SECTION - BLACKLICK TRAIL

STA. 2+16.26 TO STA. 4+55.59



NORMAL SECTION - BLACKLICK TRAIL

STA. 1+25.00 TO STA. 2+16.26

STA. 4+55.59 TO STA. 5+50.00

A VARIES FROM 6.0' AT STA. 2+05.00 TO 8.0' AT STA. 2+15.00
VARIES FROM 8.0' AT STA. 4+60.00 TO 7.3' AT STA. 4+70.00
7.0' FROM STA. 4+70.00 TO STA. 5+50.00

NOTES:

1. FOR PAVEMENT LEGEND, SEE SHEET P.003
2. GRADING DETAILS TO BE PROVIDED IN STAGE 1 DESIGN
3. SUPERELEVATION TABLES TO BE PROVIDED IN STAGE 1 DESIGN

PROPOSED TYPICAL SECTIONS

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
AJO

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.032 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: Blacklick Trail PAPERSIZE: 34x22 (in.) DATE: 6/20/2023 TIME: 12:10:28 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GY700.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

BEGIN PROJECT
STA. 637+75.00
S.L.M. = 24.94

E220(032)

STA. 641+07.44 BK =
STA. 0+00.00 AH

SAW CUT

IR 70 WB
FRA-70-22.85
PID 98232

℄ CONST & R/W IR 70

S85°38'17"E

IR 70 EB
FRA-70-22.61
PID 95639

SAW CUT

MATCH LINE STA. 4+50.00 (SEE SHEET P.034)

FRANKLIN COUNTY
FAIRFIELD COUNTY

Ex LA-R/W

634 635 636 637 638 639 640 641 1 2 3 4

6.0' 48.0' 10.0' 19.0' 10.0' 48.0' 10.0' 48.0' 10.0' 10.0'

EX 12" STM.

M.N.S.
I.P.S.
I.P.F.

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 633+00.00 TO STA. 4+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.033 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/20/2023 TIME: 12:21:30 PM USER: aoldaker
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MODEL: CLP_I070 - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:44:14 PM USER: aoldaker
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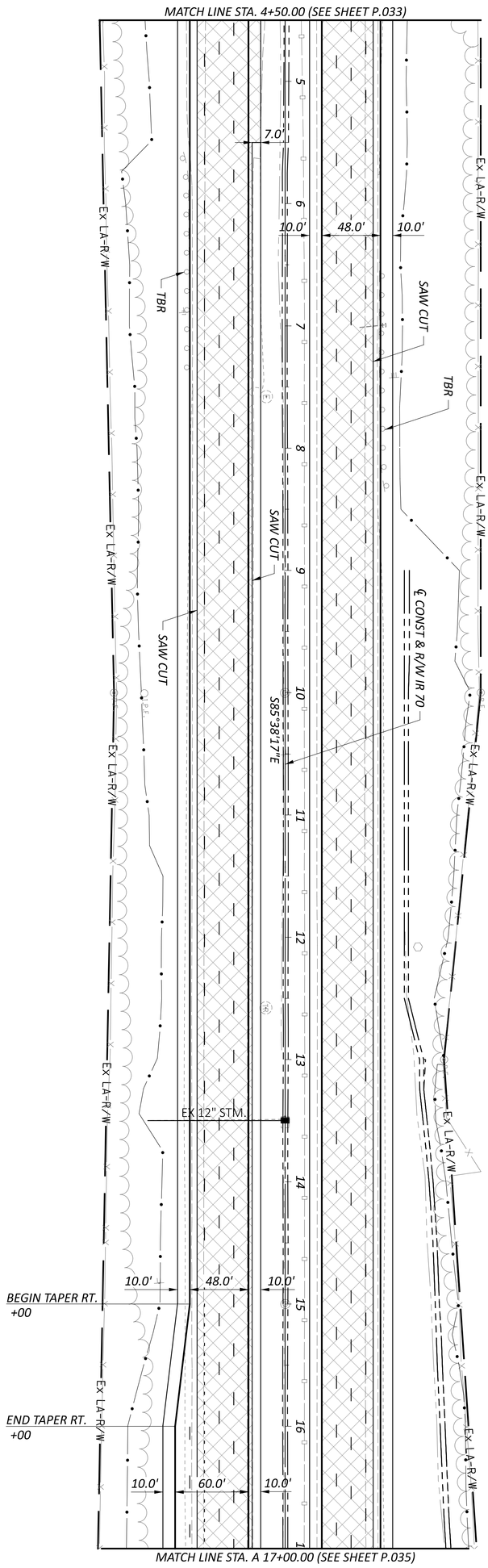
LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS



PLAN SHEET - IR 70
STA. 4+50.00 TO STA. 17+00.00

HORIZONTAL SCALE IN FEET
0 50
25 100

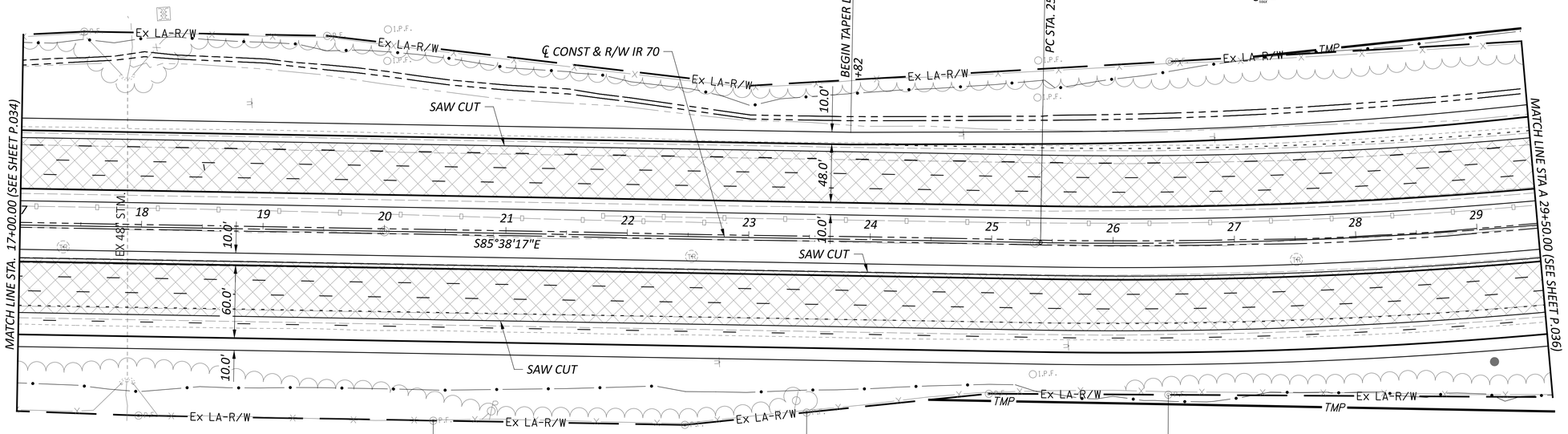
SHEET	TOTAL
P.034	740

PROJECT ID: 96808
REVIEWER: KAM 06/18/23
DESIGNER: BER
DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 32+93.91
Δ = 21°52'12" LT
Dc = 01°28'08"
R = 3,900.61'
T = 753.61'
L = 1,488.88'
E = 72.13'
e_{max} =



HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 17+00.00 TO STA. 29+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:44:28 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP103.dgn

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

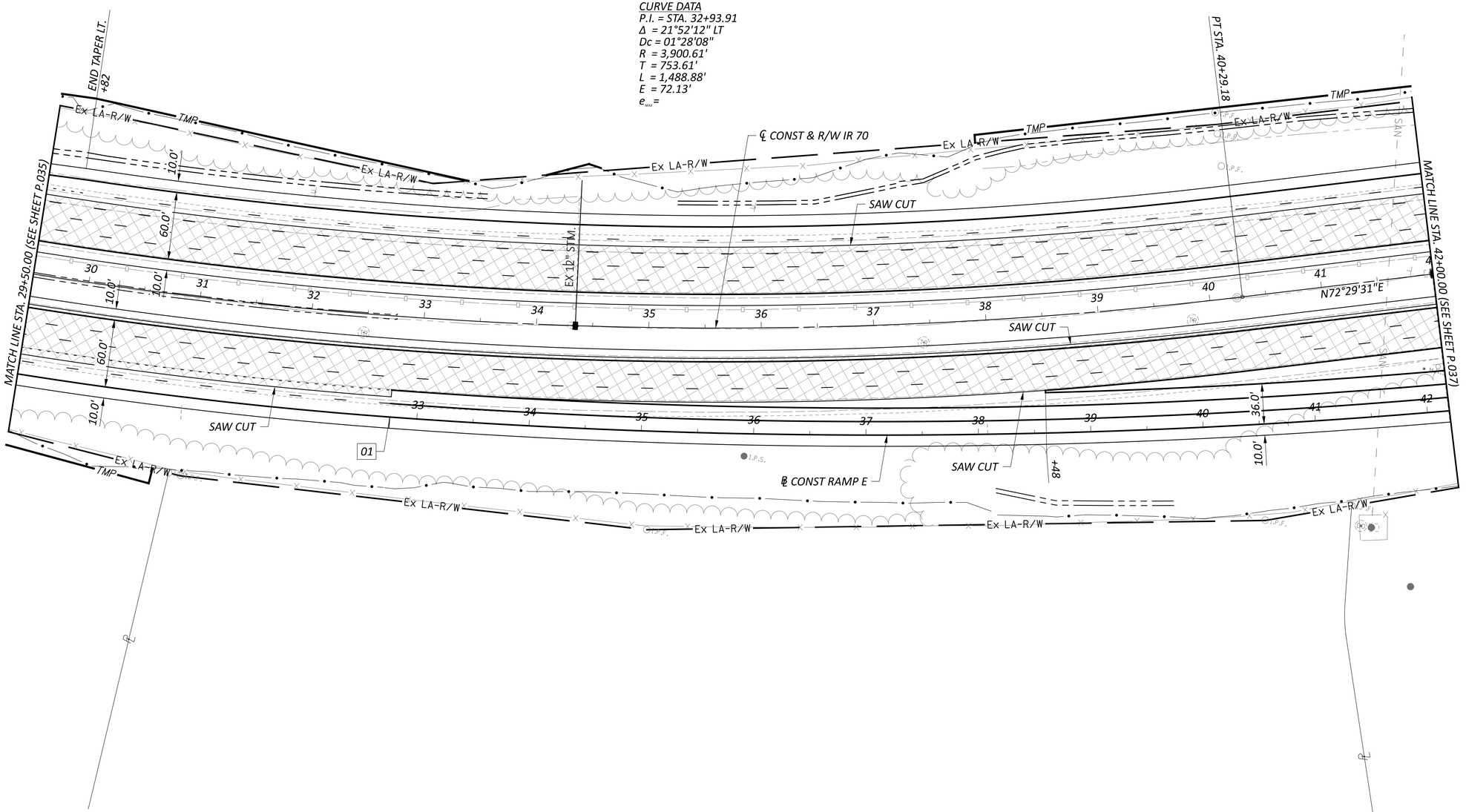
PROJECT ID
96808

SHEET P.035 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 32+93.91
Δ = 21°52'12" LT
Dc = 01°28'08"
R = 3,900.61'
T = 753.61'
L = 1,488.88'
E = 72.13'
e_{max} =



01 STA. 32+75.89, ℄ CONST RAMP E, PC =
STA. 32+75.89, 90.00' RT, ℄ CONST & R/W IR 70

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 29+50.00 TO STA. 42+00.00

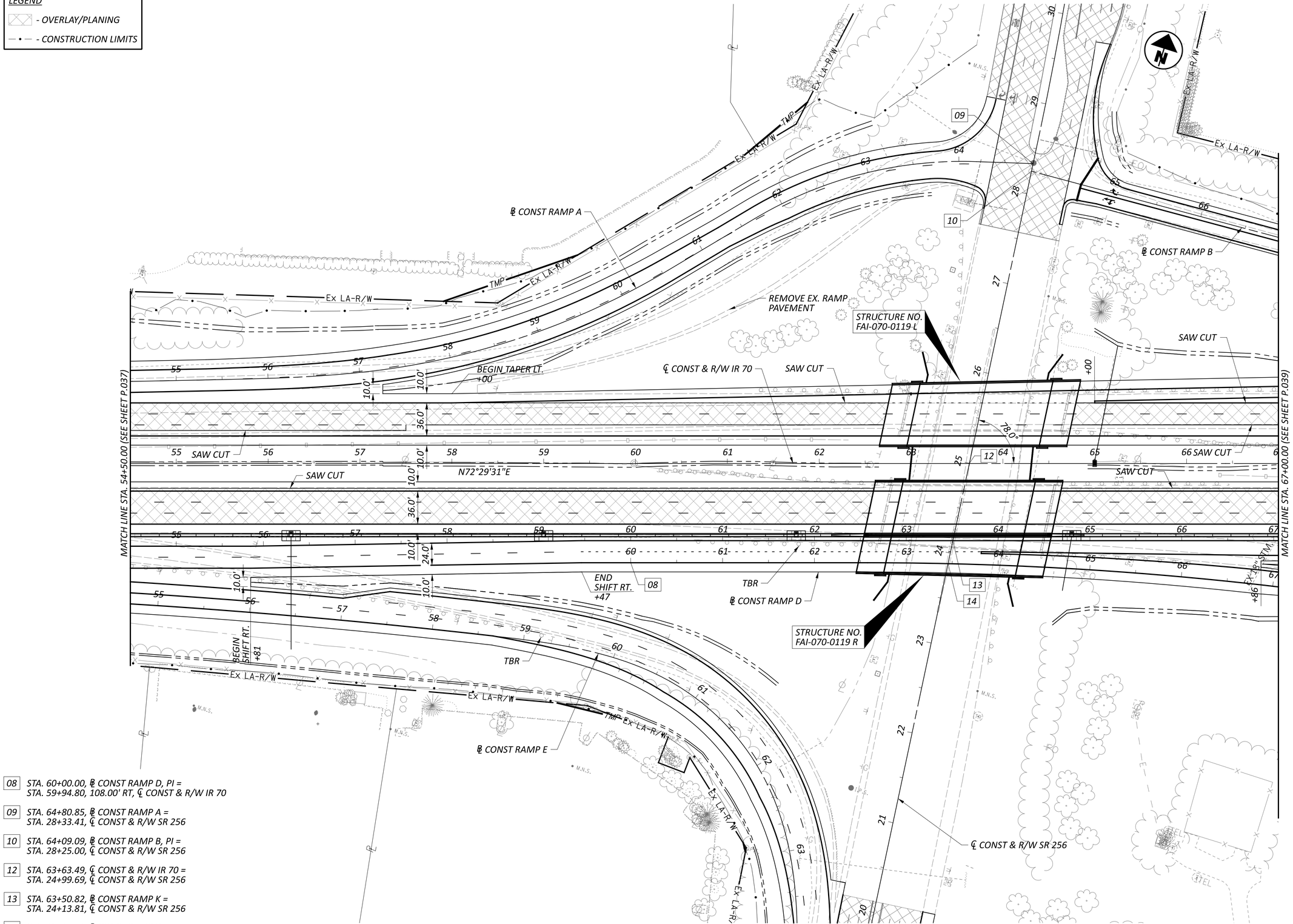
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.036 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:44:45 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP104.dgn

LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS
BLACKLICK CREEK
BLACKLICK TRAIL
℄ CONST BLACKLICK TRAIL
STRUCTURE NO. FAI-70-0084 L
℄ CONST & R/W IR 70
℄ CONST RAMP A
℄ CONST RAMP E
℄ CONST RAMP K
STRUCTURE NO. FAI-70-0084 R
Ex LA-R/W
TMP
TBR
SAW CUT
EX 12" STM.
N72°29'31"E
MATCH LINE STA. 42+00.00 (SEE SHEET P.036)
MATCH LINE STA. A 54+50.00 (SEE SHEETP.038)
02 STA. 44+00.84, ℄ CONST RAMP K, PI = STA. 44+00.84, 90.00' RT, ℄ CONST & R/W IR 70
03 STA. 2+27.93, ℄ CONST BLACKLICK TRAIL = STA. 44+41.51, ℄ CONST & R/W IR 70
04 STA. 2+63.93, ℄ CONST BLACKLICK TRAIL = STA. 44+41.51, ℄ CONST RAMP K
05 STA. 3+53.93, ℄ CONST BLACKLICK TRAIL = STA. 44+61.21, ℄ CONST RAMP E
06 STA. 47+19.70, ℄ CONST RAMP E, PI = STA. 47+19.70, 12.00' RT, ℄ CONST RAMP E
07 STA. 48+82.50, ℄ CONST RAMP A, PI = STA. 48+82.50, 78.00' LT, ℄ CONST & R/W IR 70
HORIZONTAL SCALE IN FEET
0 25 50 100
PLAN SHEET - IR 70
STA. 42+00.00 TO STA. 54+50.00
FAI/LIC IR 70 0.00/0.00
MODEL: CLP_I070 - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:45:01 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP105.dgn
DESIGN AGENCY
STRUCTUREPOINT LLC
DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.037
TOTAL 740



HORIZONTAL SCALE IN FEET
0 25 50 100

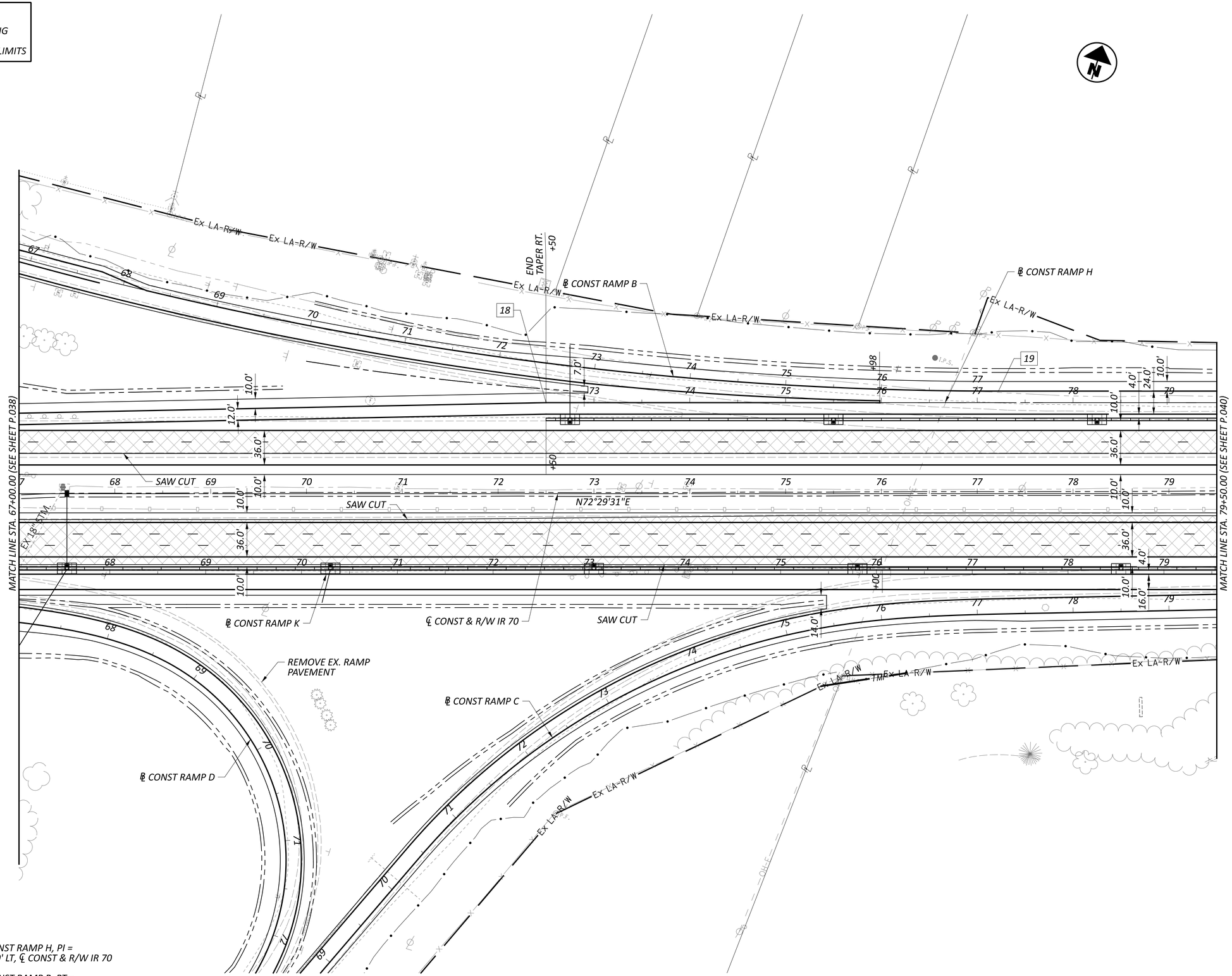
PLAN SHEET - IR 70
STA. 54+50.00TO STA. 67+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 6 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:45:16 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP106.dgn

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.038
TOTAL	740



18 STA. 72+50.00, ℄ CONST RAMP H, PI =
STA. 72+50.00, 95.00' LT, ℄ CONST & R/W IR 70

19 STA. 77+22.13, ℄ CONST RAMP B, PT =
STA. 77+22.13, 107.00' LT, ℄ CONST & R/W IR 70

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 7 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:45:32 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP107.dgn

PLAN SHEET - IR 70
STA. 67+00.00 TO STA. 79+50.00

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

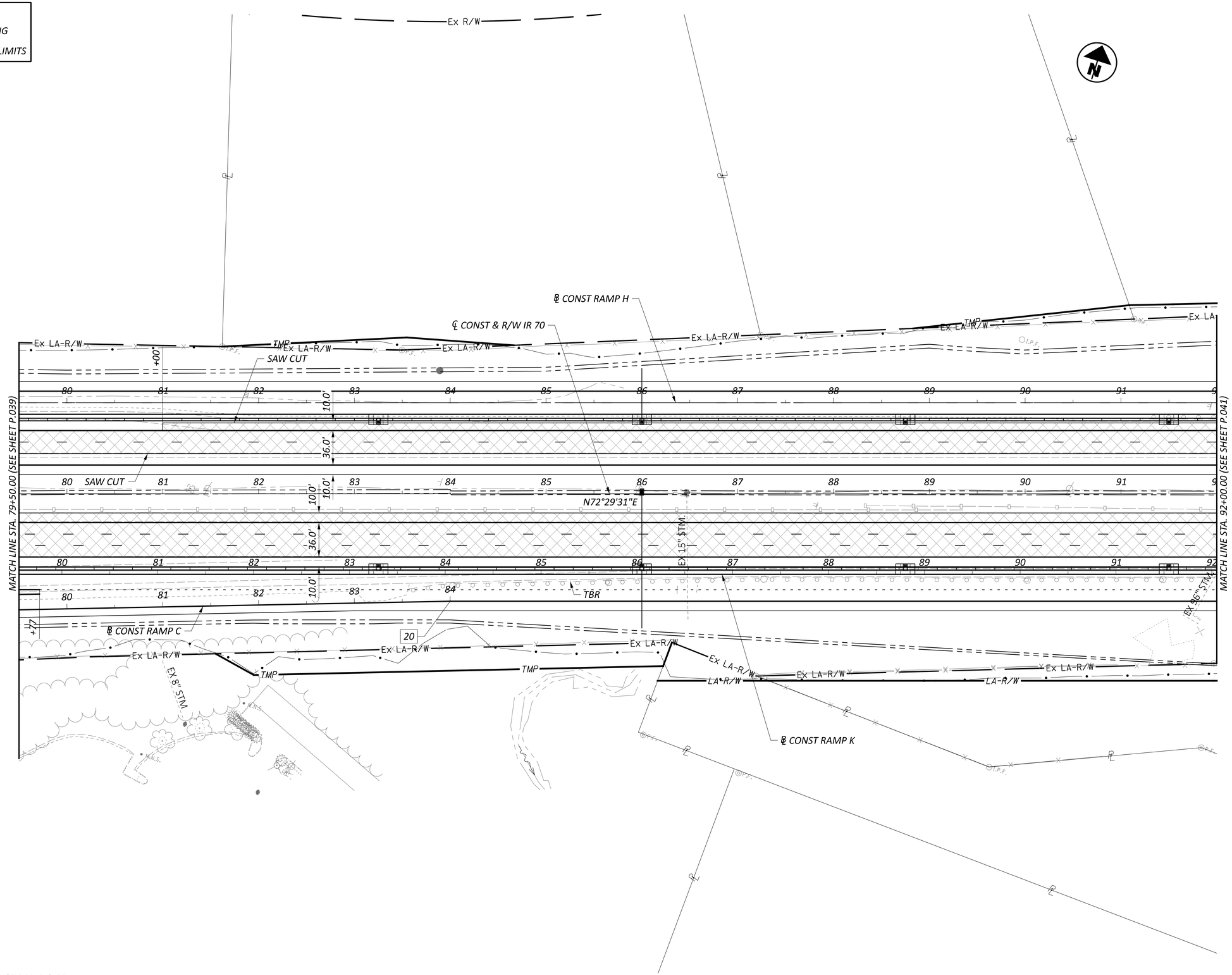
DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.039
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 8 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:45:47 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP108.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



20 STA. 84+00.00, ℄ CONST RAMP C, PI =
STA. 84+00.00, 112.00' RT, ℄ CONST & R/W IR 70

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA.79+50.00 TO STA. 92+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.040
TOTAL	740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

HORIZONTAL SCALE IN FEET
0 25 50 100

EX 12" STM.
TMP
R/W
BEGIN WALL STA. 92+50.00, ℄ CONST RAMP H
SAW CUT
℄ CONST IR 70
℄ CONST RAMP H
BEGIN WALL STA. 103+50.00, ℄ CONST RAMP H
Ex LA-R/W
11.2'
10.0'
24.0'
4.0'
36.0'
EX 15" STM.
EX 48" STM.
EX 96" STM.
TBR
N72°29'31"E
MATCH LINE STA. 92+00.00 (SEE SHEET P.040)
MATCH LINE STA. 104+50.00 (SEE SHEET P.042)
16.0'
8.0'
EX 42" STM.
EX 36" STM.
+61
+12
+50
21
22
LA-R/W
℄ CONST RAMP K
℄ CONST RAMP G
BEGIN TAPER LT.
P.I.
℄

21 STA. 94+70.40, ℄ CONST RAMP G, PC = STA. 94+65.20, 112.00' RT, ℄ CONST & R/W IR 70

22 STA. 102+55.20, ℄ CONST RAMP K, PI = STA. 102+50.00, 84.00' RT, ℄ CONST & R/W IR 70

PLAN SHEET - IR 70
STA. 92+00.00 TO STA. 104+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.041 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 9 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:46:02 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP109.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 126+83.38
Δ = 22°19'17" LT
Dc = 01°00'00"
R = 5,729.42'
T = 1,130.37'
L = 2,232.07'
E = 110.44'
e_{max} =

END WALL
STA. 108+50.00, ℄ CONST RAMP H

END WALL
STA. 108+00.00, ℄ CONST RAMP H

℄ CONST RAMP H

℄ CONST RAMP I

℄ CONST RAMP G

℄ CONST RAMP J

℄ CONST & R/W IR 70

℄ CONST TAYLOR RD

EX DRIVE

STRUCTURE NO.
---TBD---

LA-R/W

Ex LA-R/W

Ex R/W

EX 15" STM.

TBR

SAW CUT

N72°29'31"E

N03°39'46"E

68.8°

PC STA. 115+53.01

MATCH LINE STA. 104+50.00 (SEE SHEET P.041)

MATCH LINE STA. 117+00.00 (SEE SHEET P.043)

24 STA. 114+03.78, ℄ CONST RAMP I, PI = STA. 43+20.00, ℄ CONST TAYLOR RD

25 STA. 113+68.11, ℄ CONST RAMP H, PI = STA. 43+07.23, ℄ CONST TAYLOR RD

26 STA. 41+15.09, ℄ CONST TAYLOR RD = STA. 112+93.76, ℄ CONST & R/W IR 70

27 STA. 111+84.30, ℄ CONST RAMP G, PI = STA. 36+30.00, ℄ CONST TAYLOR RD

28 STA. 110+13.40, ℄ CONST RAMP J, PI = STA. 36+25.00, ℄ CONST TAYLOR RD

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 104+50.00 TO STA. 117+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 10 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:46:17 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\v401-Engineering_StructurePoint\Roadway\Sheets\96808_GP110.dgn

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.042 TOTAL 740

MODEL: CLP_I070 - Plan 11 PAPERSIZE: 34x22 (in.) DATE: 8/28/2023 TIME: 11:05:46 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP111.dgn

LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*

HORIZONTAL SCALE IN FEET
0 25 50 100

CURVE DATA
P.I. = STA. 126+83.38
Δ = 22°19'17" LT
Dc = 01°00'00"
R = 5,729.42'
T = 1,130.37'
L = 2,232.07'
E = 110.44'
e_{sw} = 0.042

LICKING COUNTY
FAIRFIELD COUNTY

EX DRIVE

LA-R/W

℄ CONST RAMP T

Ex LA-R/W

SAW CUT

MATCH LINE STA. 117+00.00 (SEE SHEET P.042)

MATCH LINE STA. 129+50.00 (SEE SHEET P.044)

10.0'
36.0'
22.0'
9.9'

EX 18" STM

TBR

℄ CONST RAMP J

END TAPER RT. +50

BEGIN TAPER RT. +86

℄ CONST & R/W IR 70

32 STA. 122+60.00, ℄ CONST RAMP J, PI =
STA. 122+60.00, 91.00' RT, ℄ CONST & R/W IR 70

PLAN SHEET - IR 70
STA. 117+00.00 TO STA. 129+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

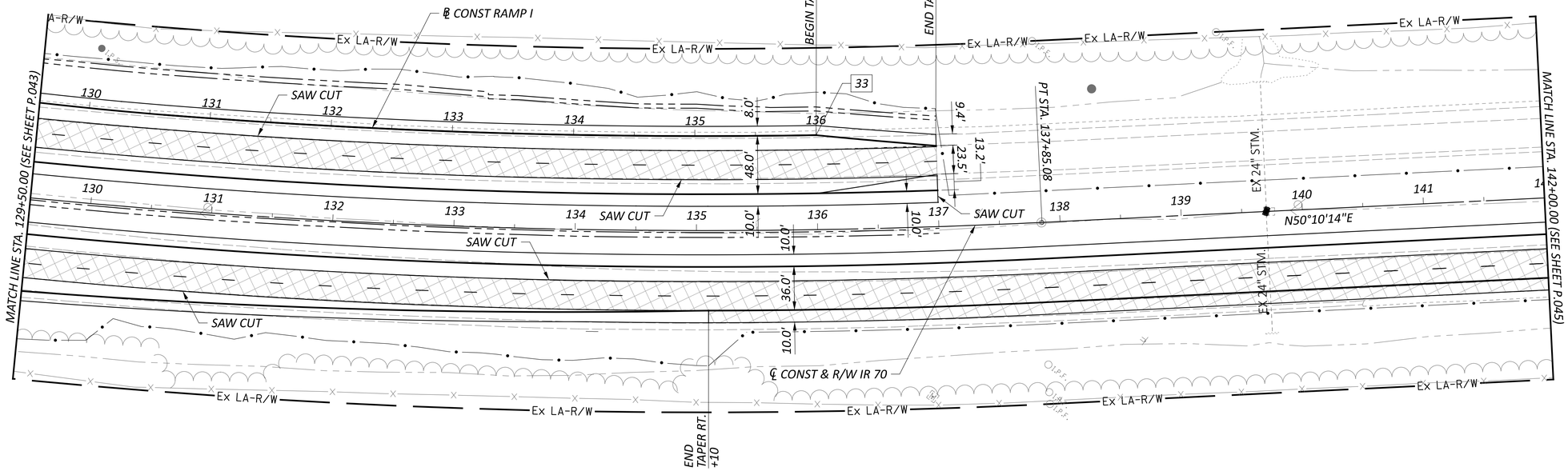
PROJECT ID
96808

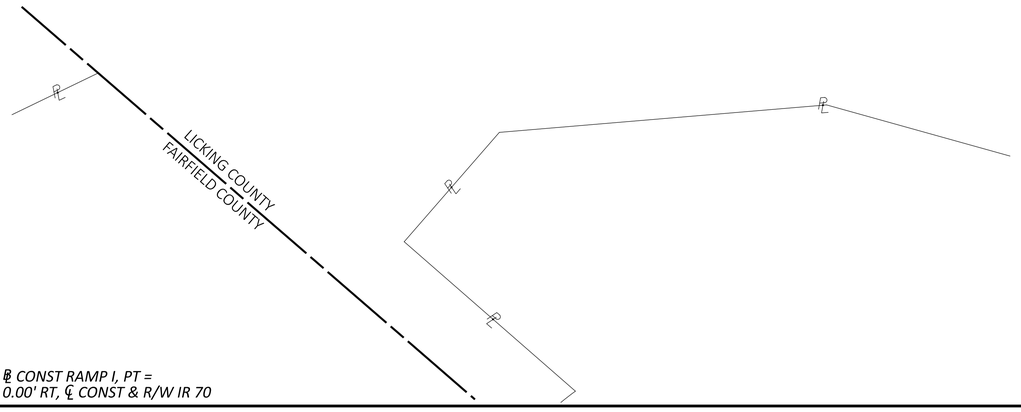
SHEET P.043 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 126+83.38
Δ = 22°19'17" LT
Dc = 01°00'00"
R = 5,729.42'
T = 1,130.37'
L = 2,232.07'
E = 110.44'
e_{max} = 0.08





33 STA. 136+00.00, ℄ CONST RAMP I, PT =
STA. 136+00.00, 0.00' RT, ℄ CONST & R/W IR 70

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 129+50.00 TO STA. 142+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 12 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:46:47 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP112.dgn

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

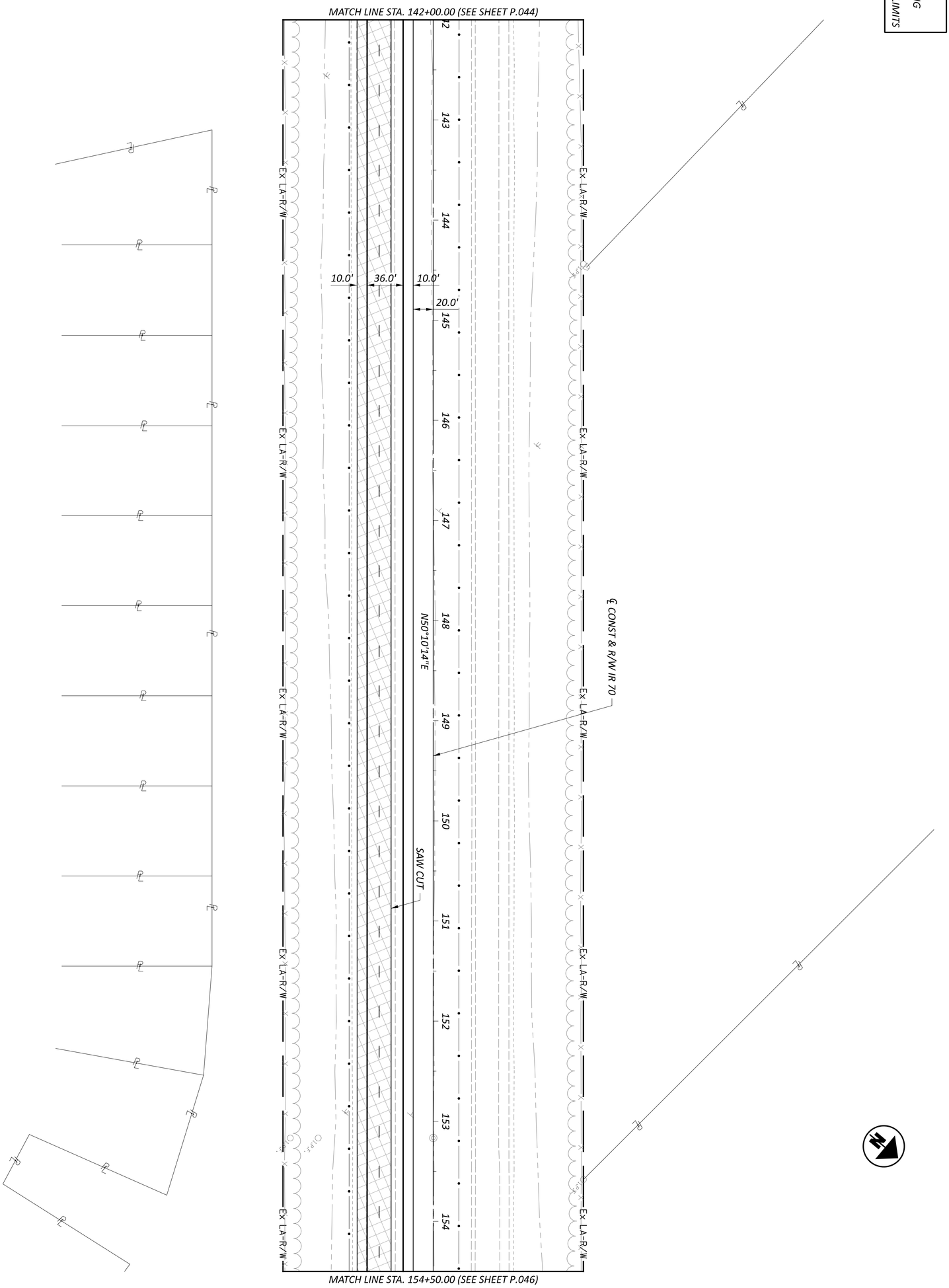
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.044 TOTAL 740

MODEL: CLP_I070 - Plan 13 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:47:01 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP113.dgn



PLAN SHEET - IR 70
STA. 142+00.00 TO STA. 154+50.00

HORIZONTAL SCALE IN FEET
0 50
25 100

SHEET	TOTAL
P.045	740

PROJECT ID: 96808
REVIEWER: KAM 06/18/23
DESIGNER: BER
DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 154+50.00 TO STA. 167+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 14 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:47:17 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP114.dgn

MATCH LINE STA. 154+50.00 (SEE SHEET P.045)

MATCH LINE STA. 1+67.00 (SEE SHEET P.047)

℄ CONST & R/W IR 70

℄ R/W PALMER RD

℄ CONST GEORGIAN DR SW

PALMER RD

FRENCH LAKE DR

GEORGIAN DR SW

STRUCTURE NO. LIC-70-0074 L

STRUCTURE NO. LIC-70-0074 R

BEGIN TAPER RT. +50

END TAPER RT. +00

BEGIN TAPER RT. +50

END PROJECT STA. 163+00.00 S.L.M. = 0.73

E220(032)

EX 15" STM.

EX 30" STM.

EX 36" STM.

EX 15" STM.

EX 15" STM.

EX 30" STM.

N50°10'14"E

43.7°

10.0'

36.0'

10.0'

Ex R/W

Ex LA-R/W

SAN

OHE

34 STA. 19+88.66, ℄ R/W PALMER RD = STA. 165+10.33, ℄ CONST & R/W IR 70

35 STA. 103+45.00, ℄ CONST GEORGIAN DR SW, PI= STA. 22+45.49, ℄ R/W PALMER RD

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

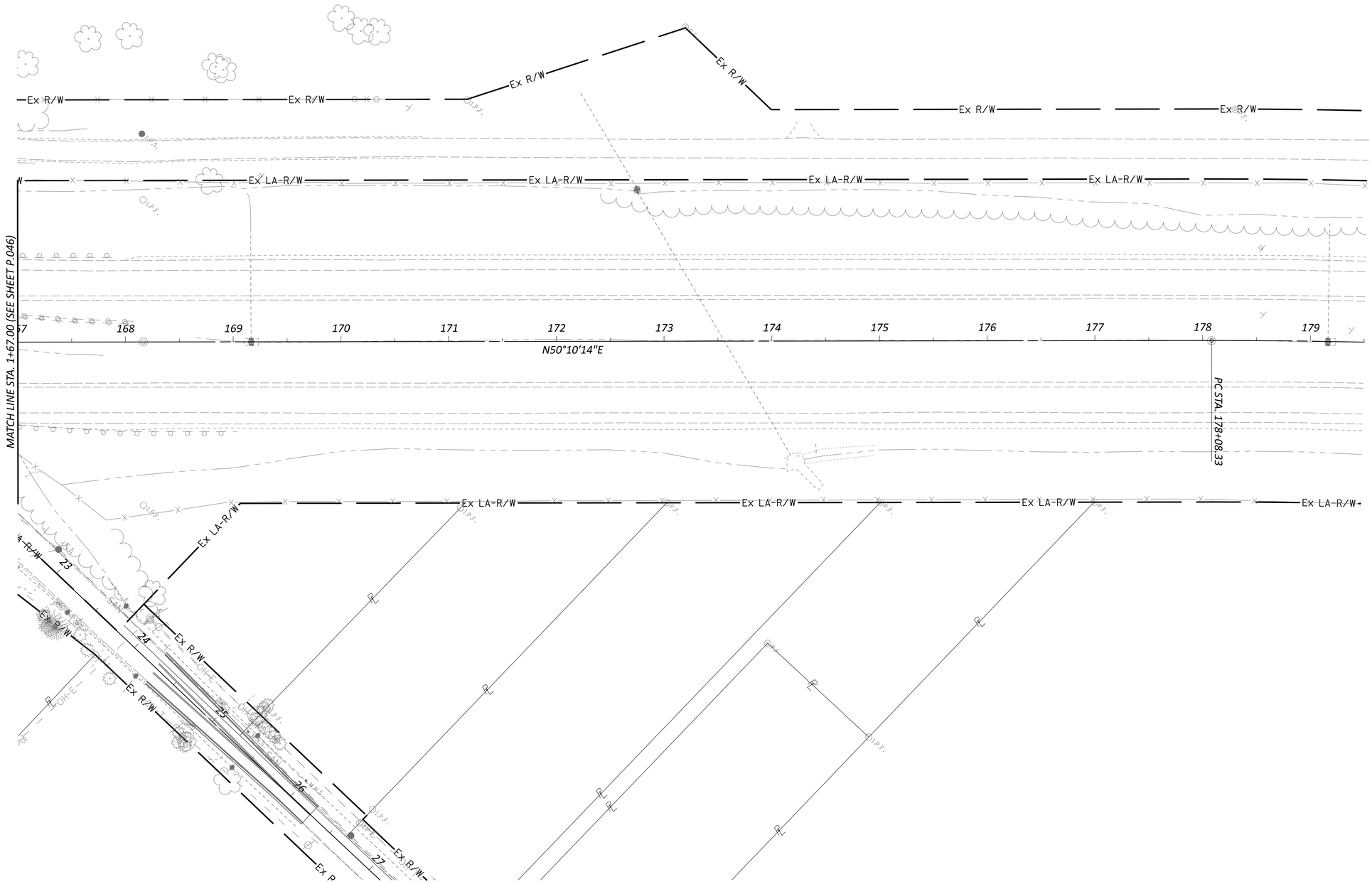
PROJECT ID
96808

SHEET P.046 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 201+17.90
Δ = 43°54'30" RT
Dc = 01°00'00"
R = 5,729.58'
T = 2,309.57'
L = 4,390.83'
E = 447.98'



HORIZONTAL SCALE IN FEET
0 25 50 100

PLAN SHEET - IR 70
STA. 167+00.00 TO STA. 172+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.047 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - Plan 15 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:47:32 PM USER: aoldaker
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MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:25:57 PM USER: aoldaker
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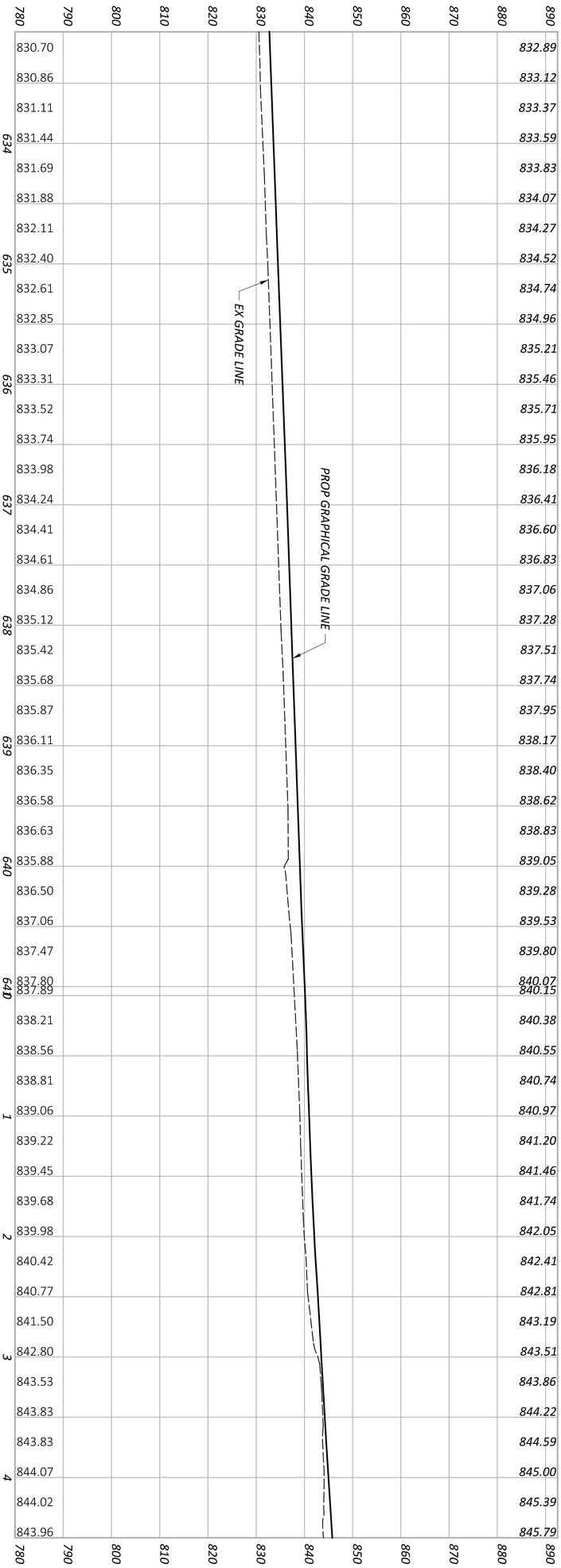
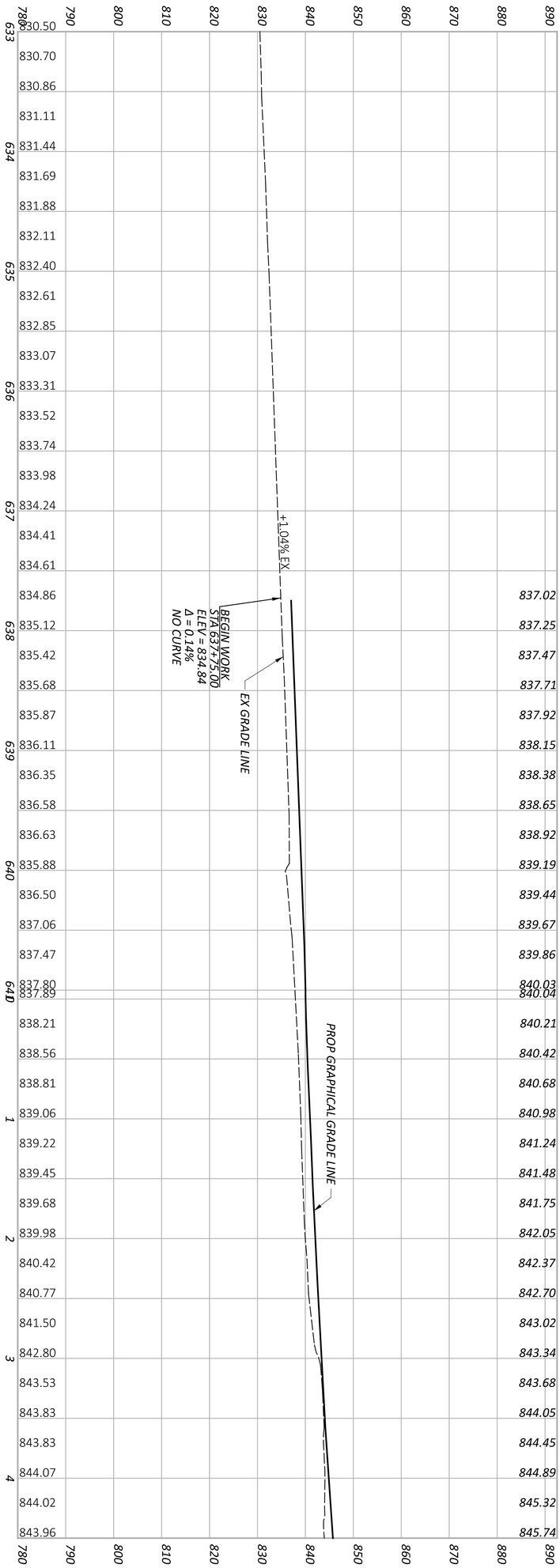


IR 70 EB



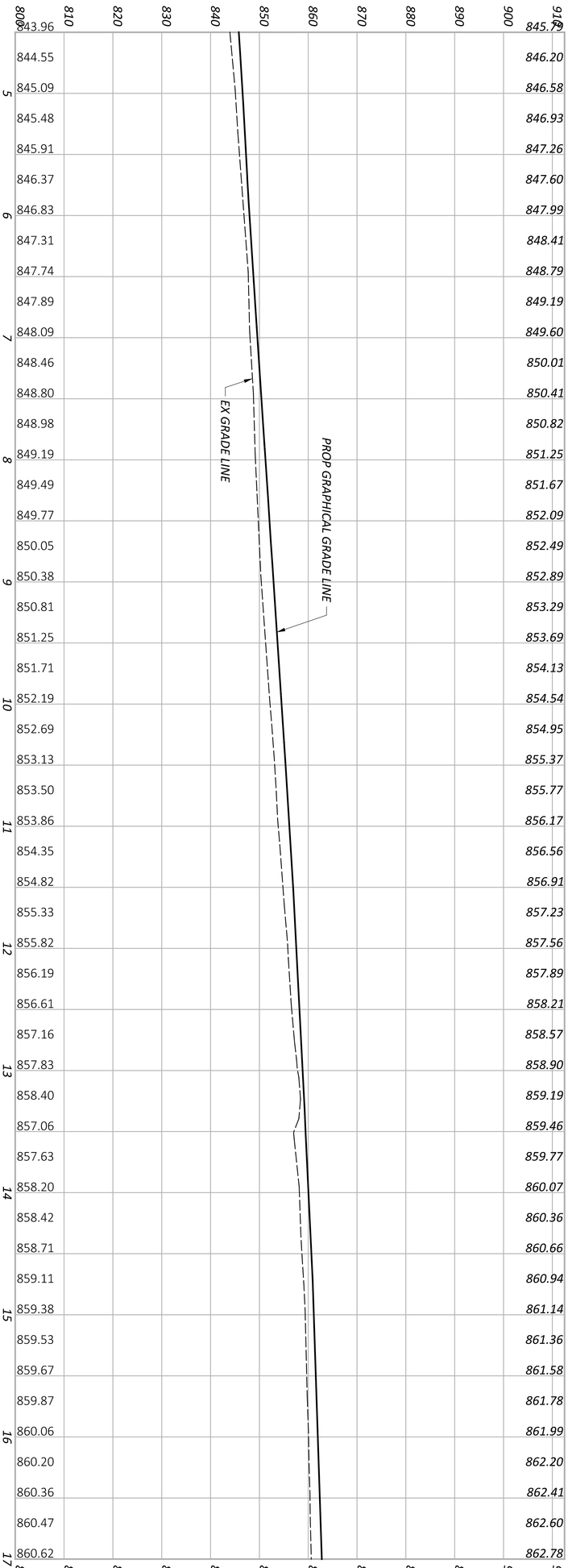
IR 70 WB

SHEET	TOTAL
P.048	740

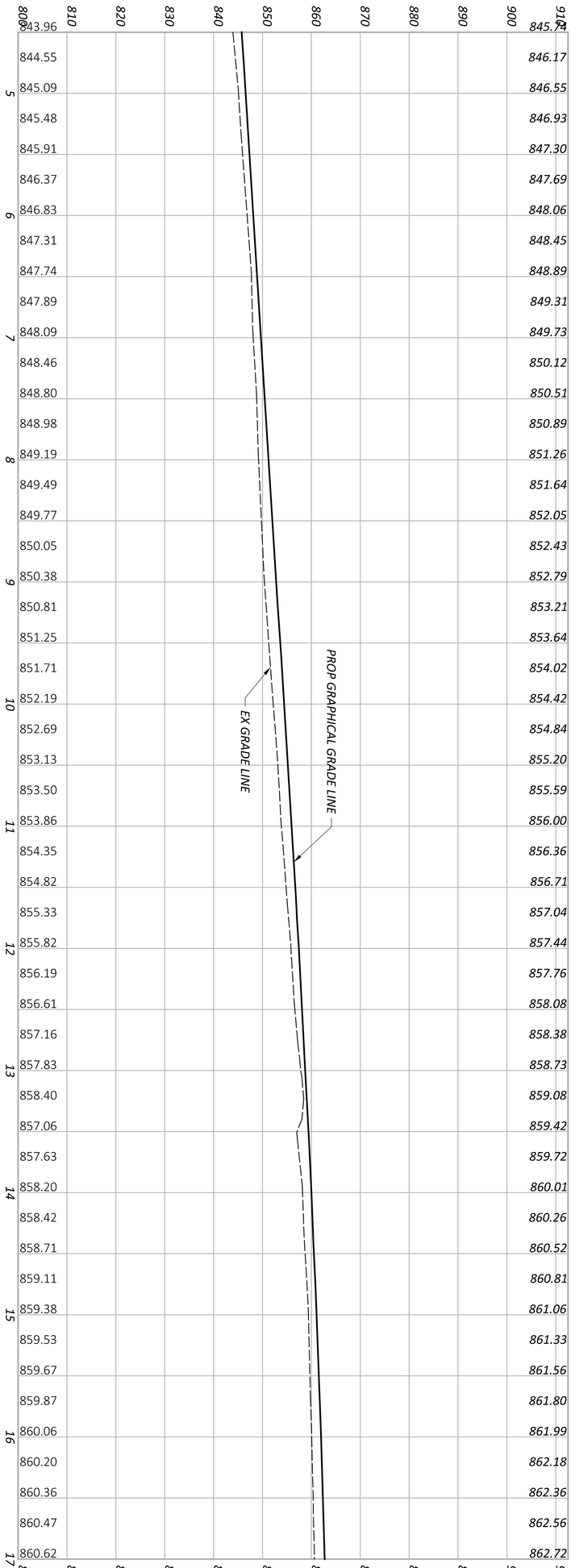
PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 633+00.00 TO STA. 4+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:26:06 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF102.dgn



IR 70 EB



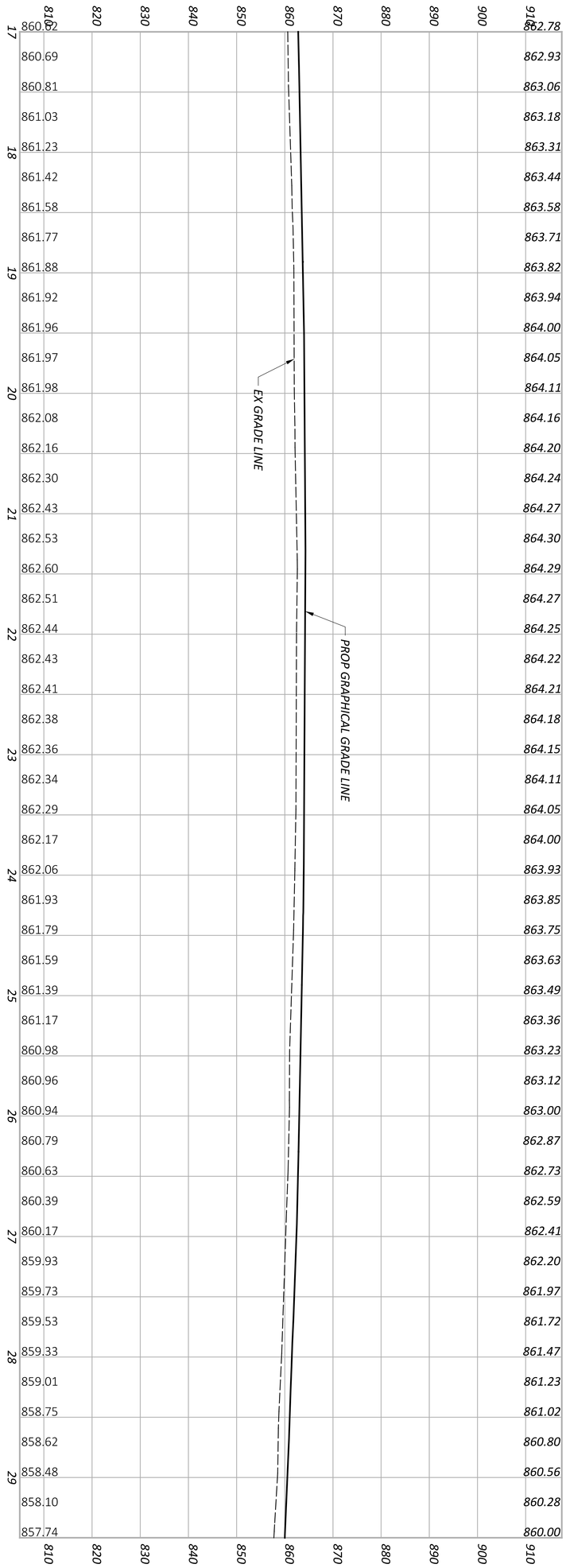
IR 70 WB

SHEET	TOTAL
P.049	740

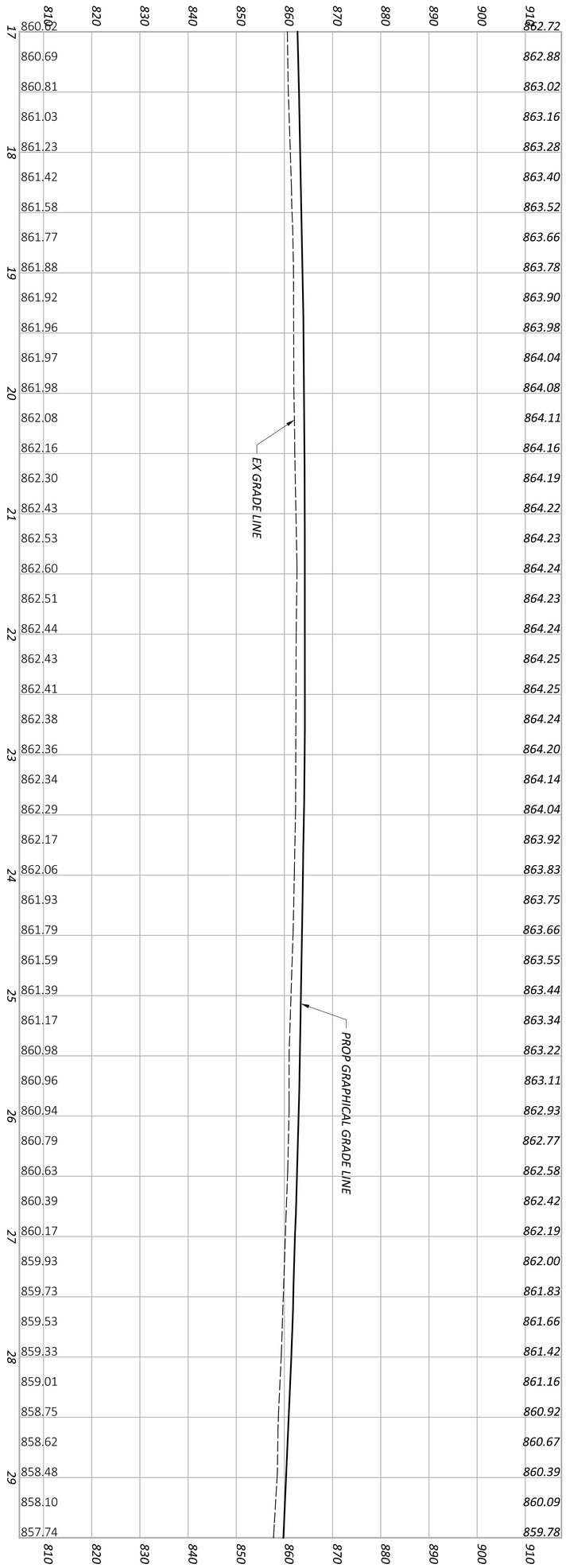
PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 4+50.00 TO STA. 17+00.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:26:15 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF103.dgn



IR 70 EB



IR 70 WB

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P 050 TOTAL 740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 17+00.00 TO STA. 29+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:26:24 PM USER: aoldaker
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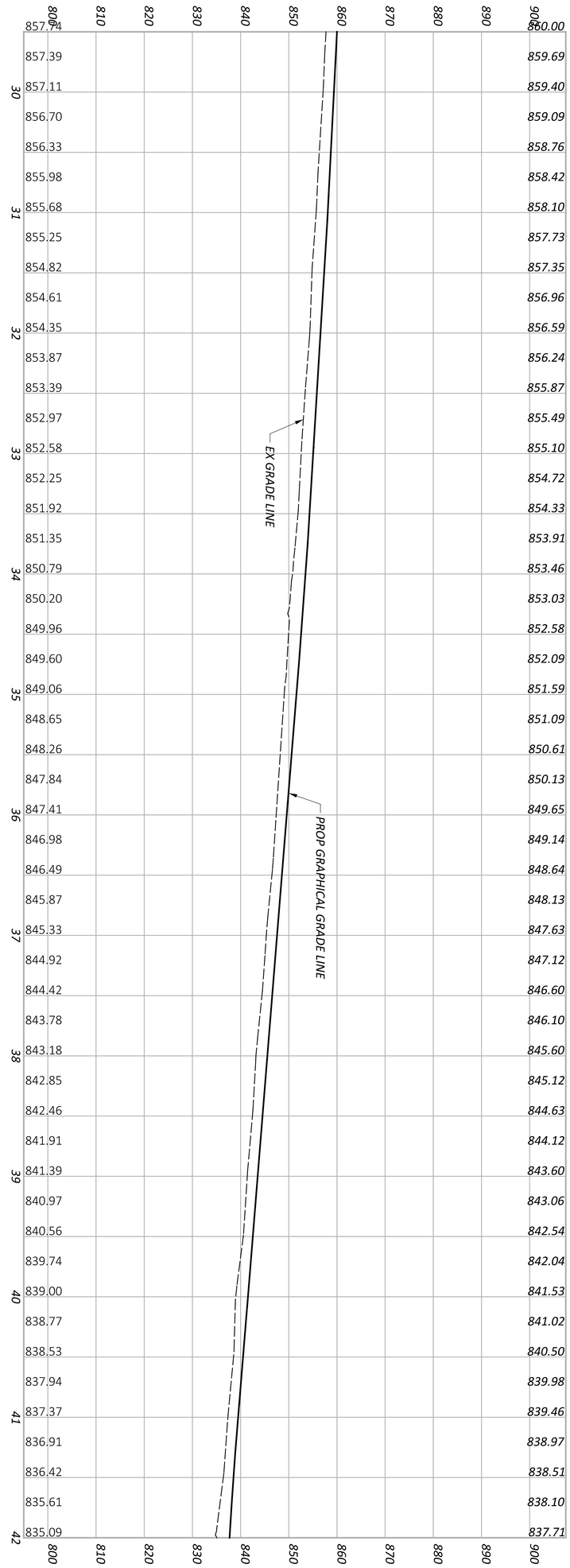
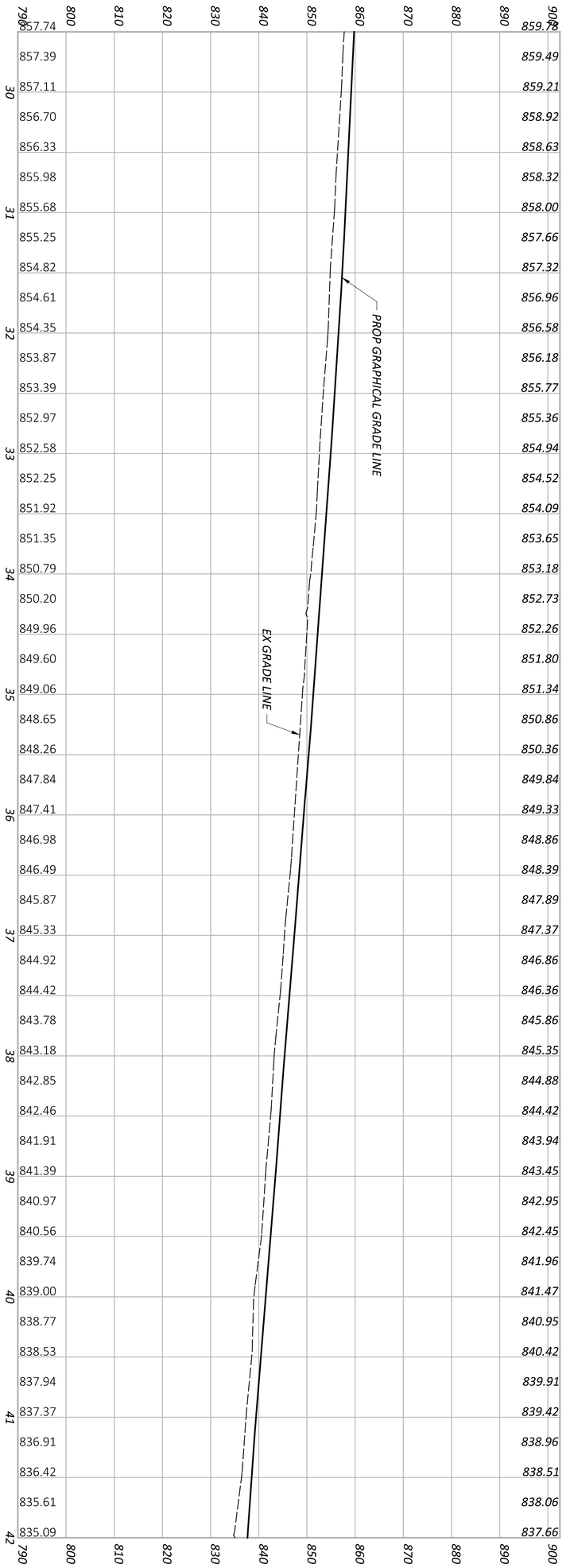


IR 70 EB



IR 70 WB

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.051 / TOTAL 740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 29+50.00 TO STA. 42+00.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:26:33 PM USER: aoldaker
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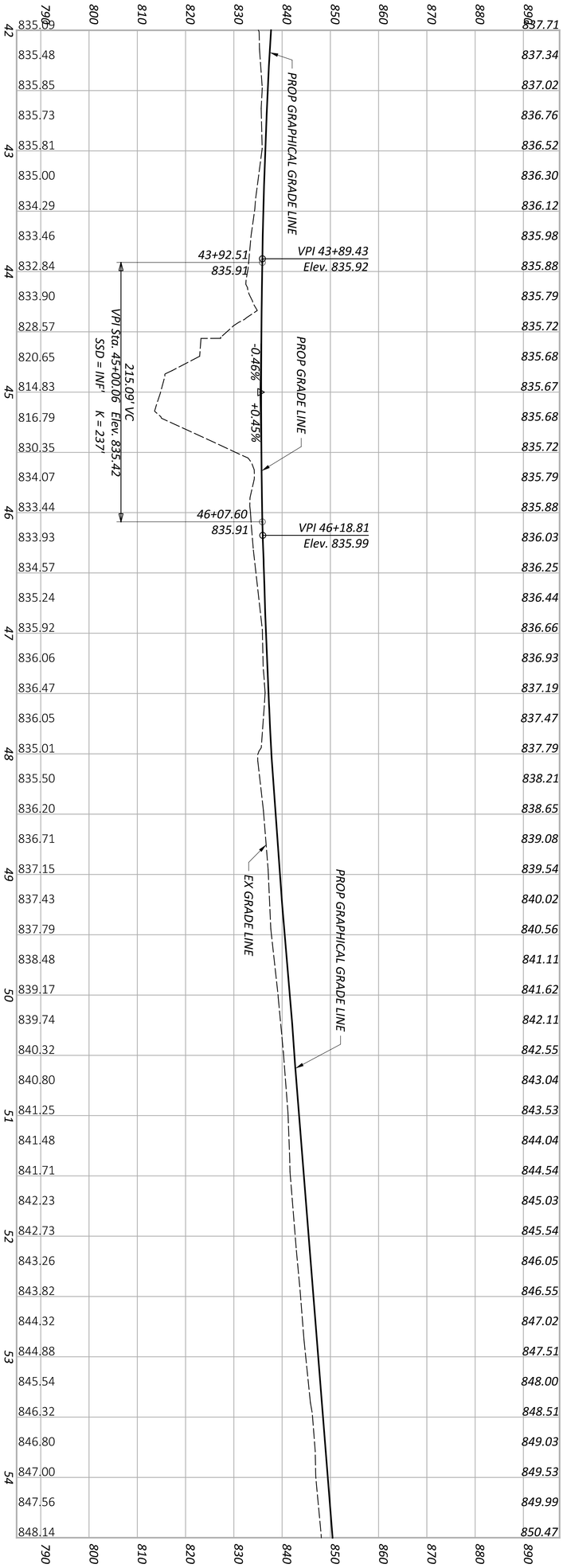
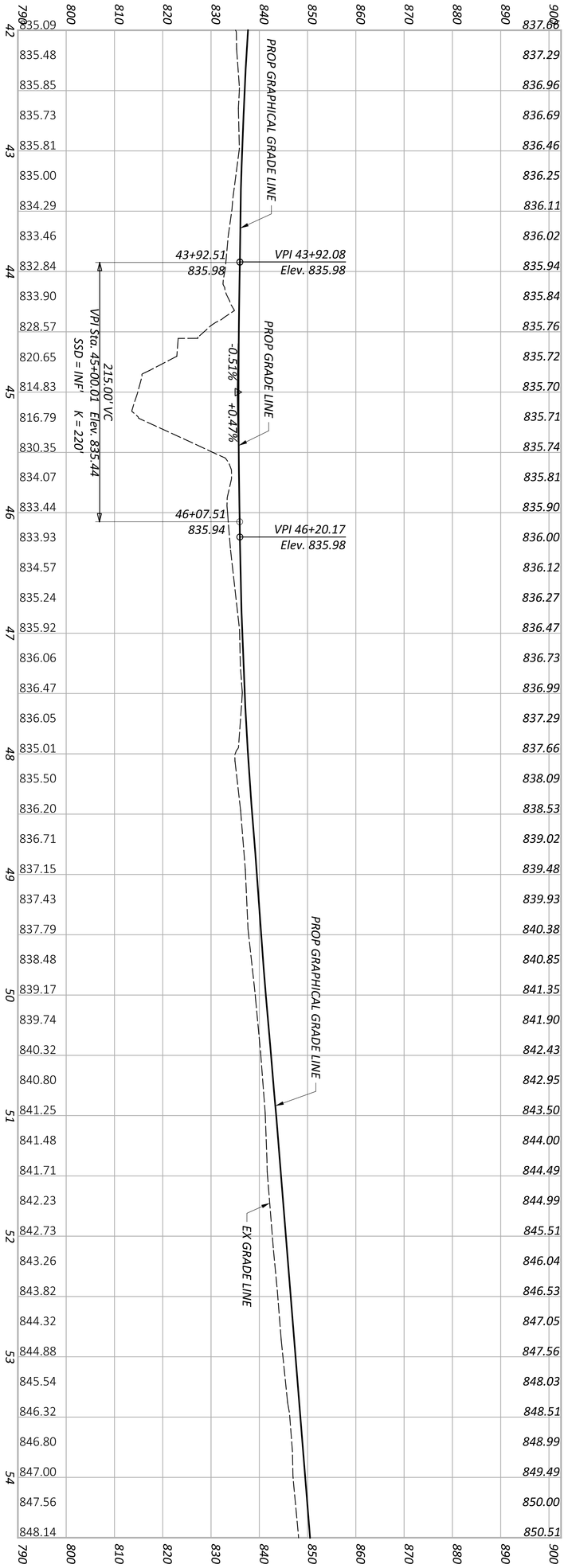


IR 70 EB



IR 70 WB

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.052	740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 42+00.00 TO STA. 54+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:26:42 PM USER: aoldaker
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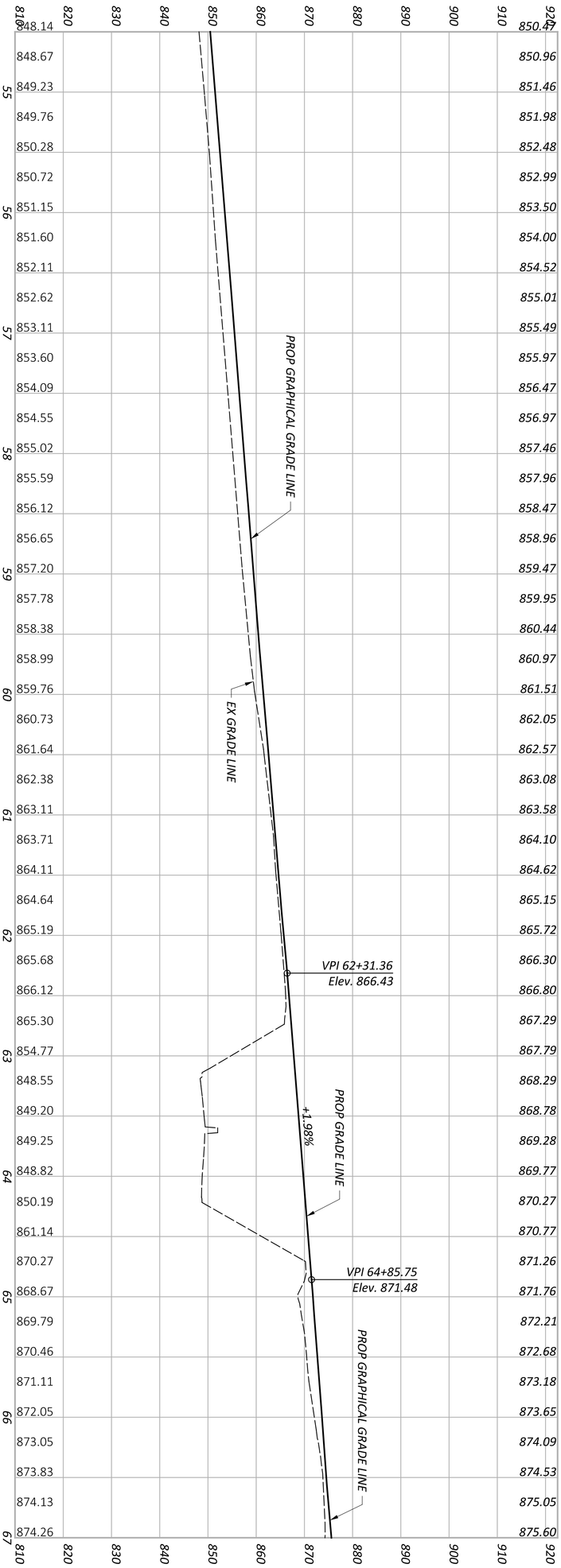
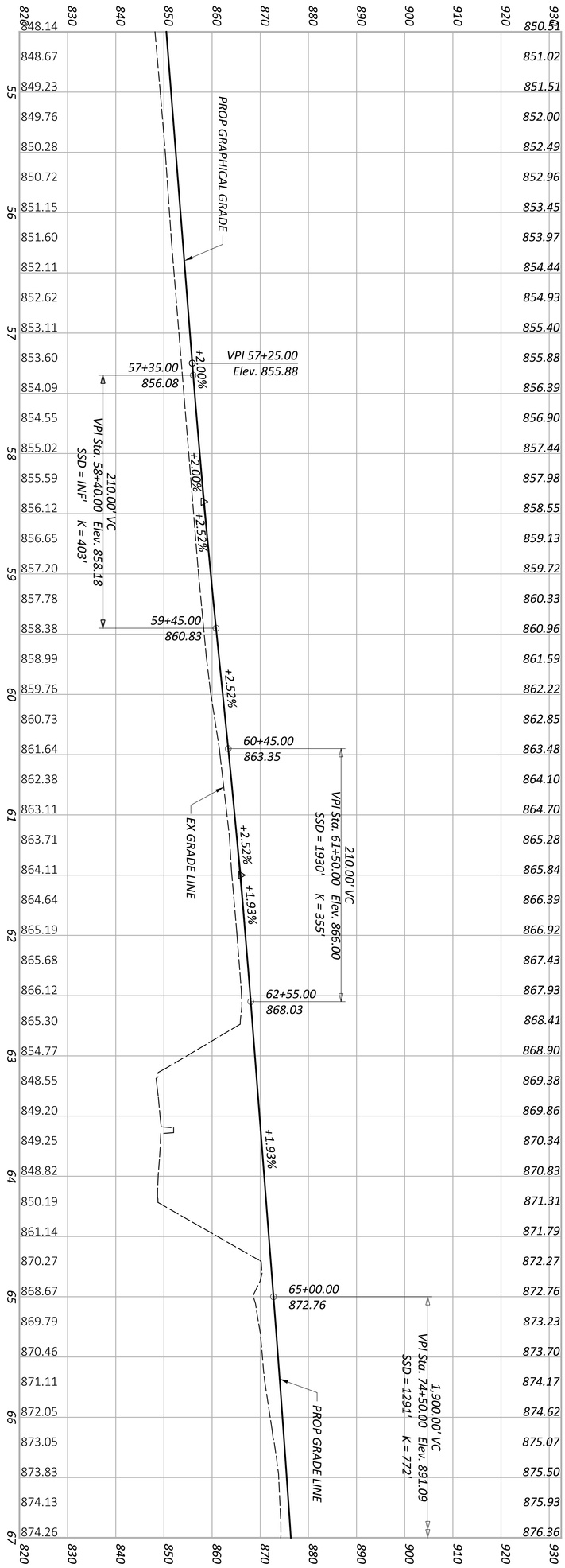


IR 70 EB



IR 70 WB

SHEET	TOTAL
P.053	740

PROJECT ID	REVIEWER	DESIGNER
96808	KAM 06/18/23	BER

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 54+50.00TO STA. 67+00.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:26:51 PM USER: aoldaker
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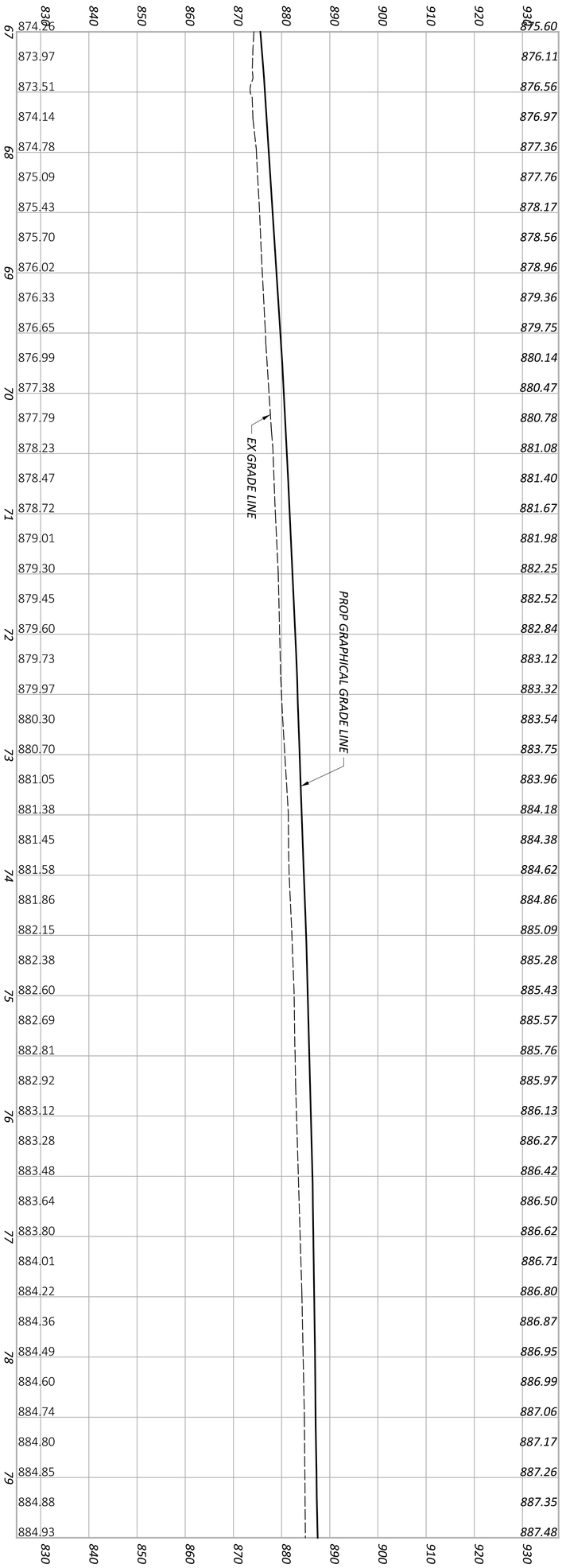
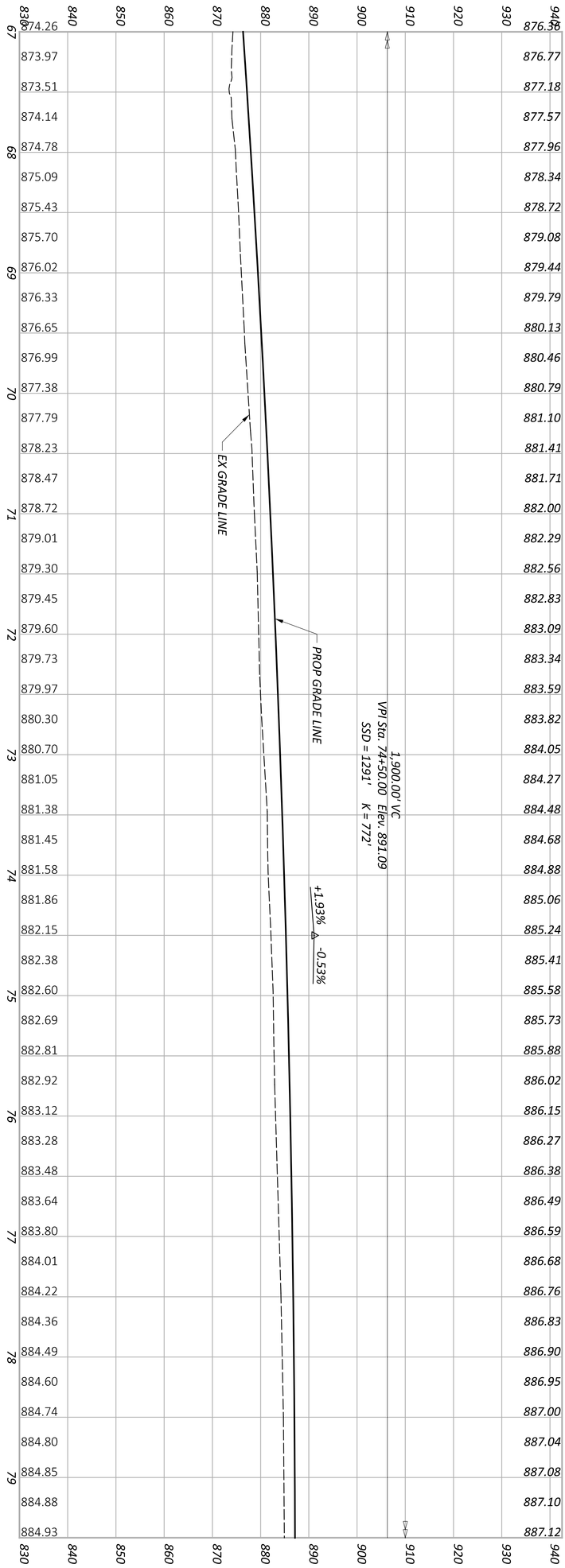


IR 70 EB



IR 70 WB

SHEET	TOTAL
P 054	740

PROJECT ID: 96808

REVIEWER: KAM 06/18/23

DESIGNER: BER

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 67+00.00 TO STA. 79+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:00 PM USER: aoldaker
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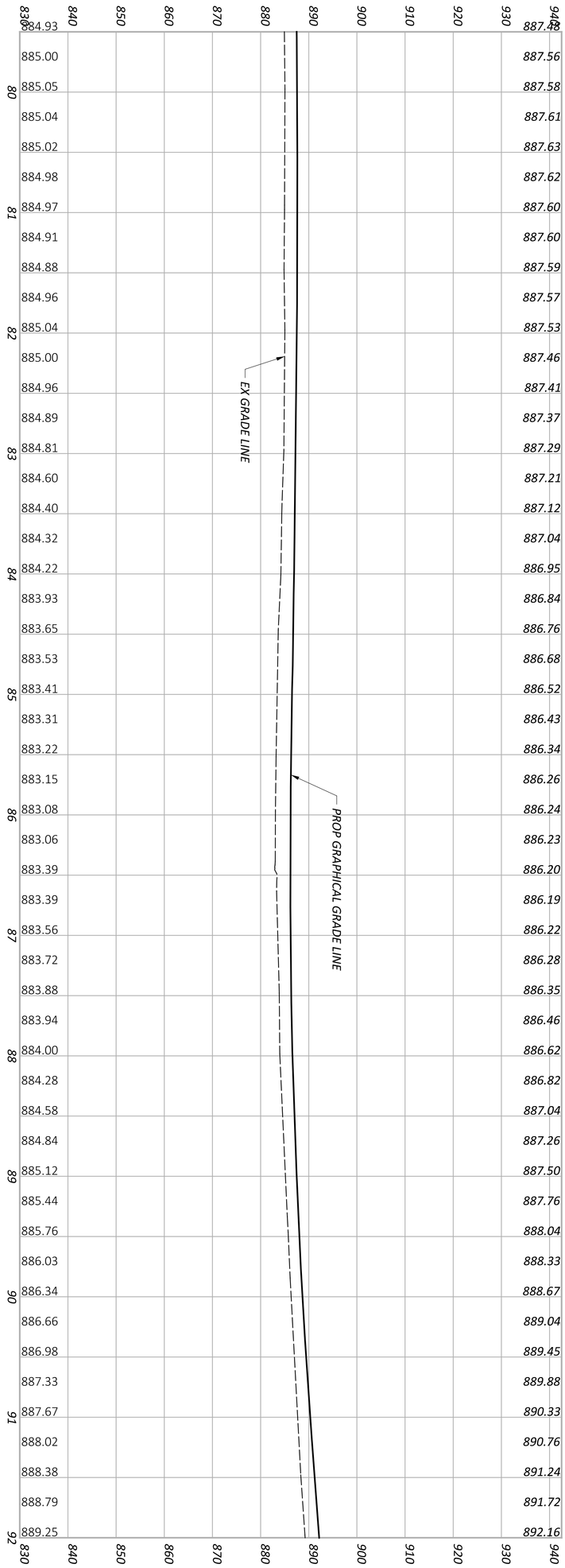
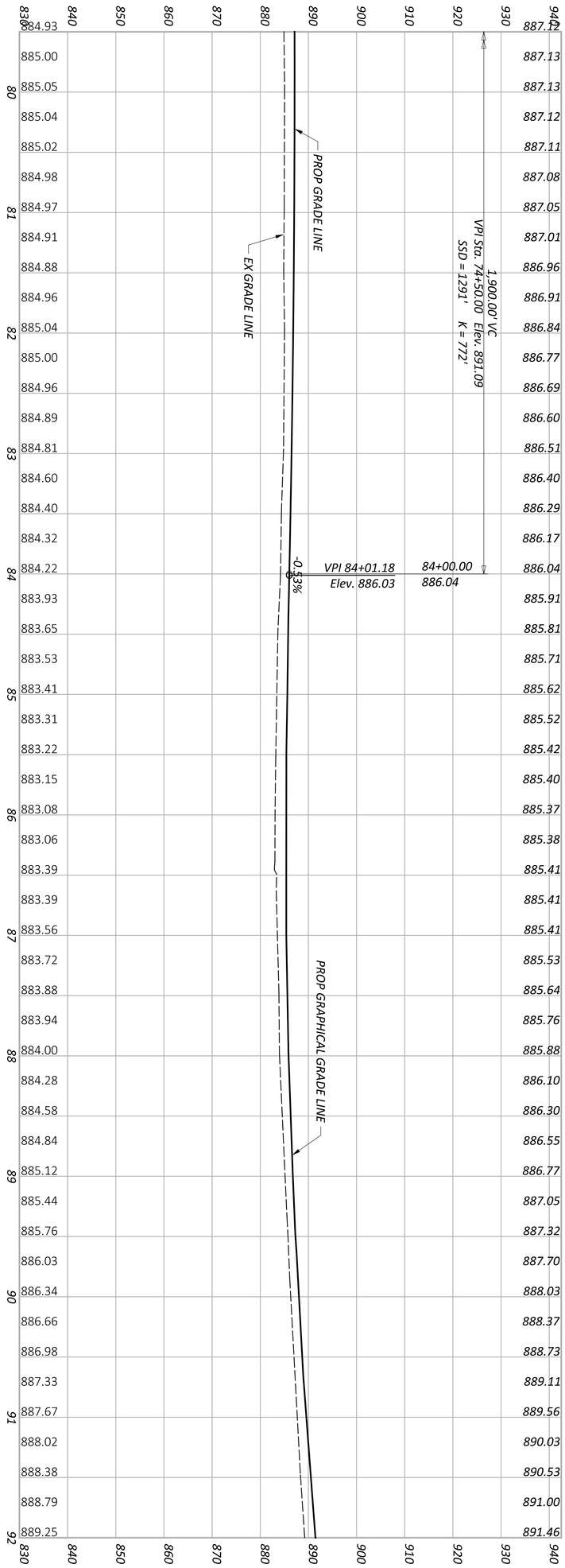


IR 70 EB



IR 70 WB

DESIGNER	REVIEWER	PROJECT ID	SHEET	TOTAL
BER	KAM 06/18/23	96808	P.055	740

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA.79+50.00 TO STA. 92+00.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:09 PM USER: aoldaker
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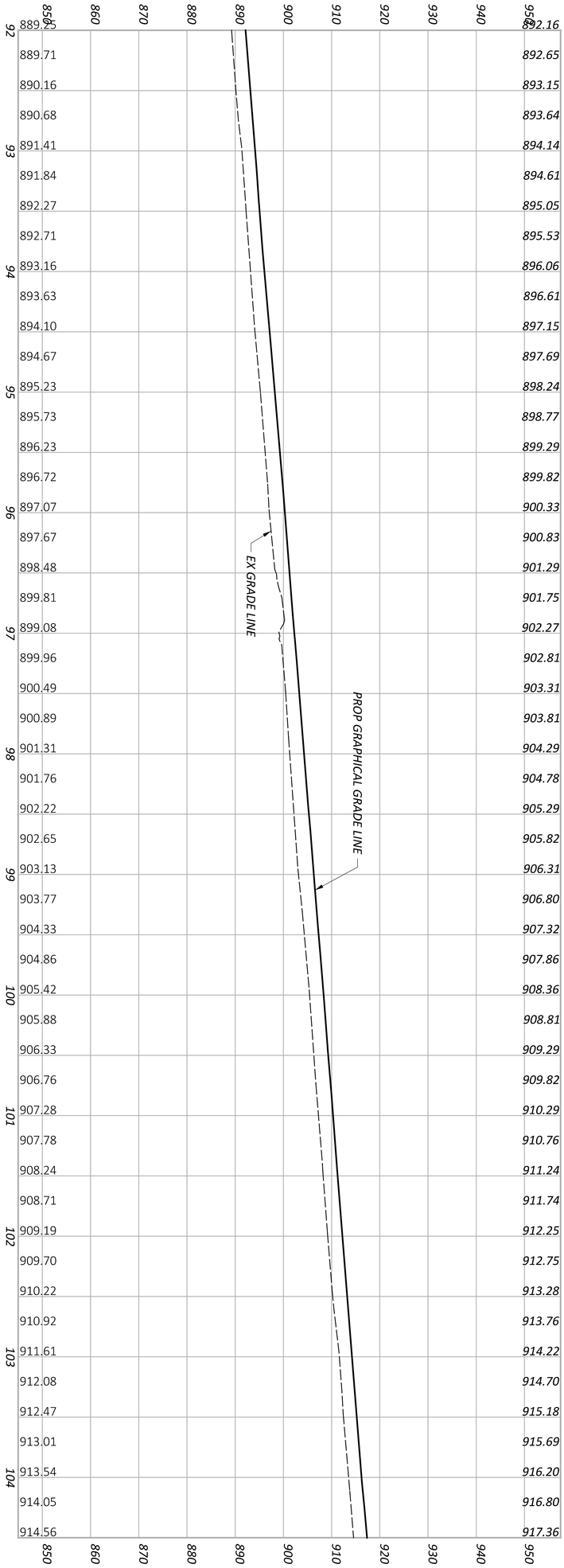
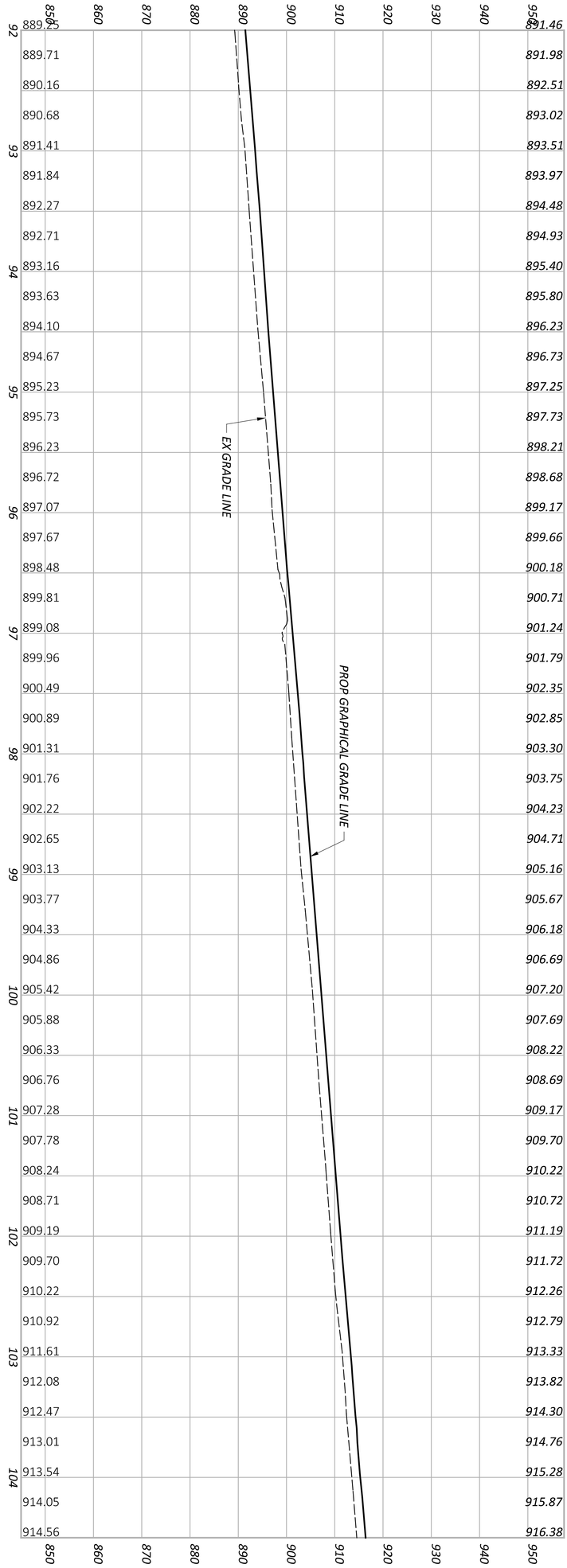


IR 70 EB



IR 70 WB

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P 056 | TOTAL 740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 92+00.00 TO STA. 104+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:18 PM USER: aoldaker
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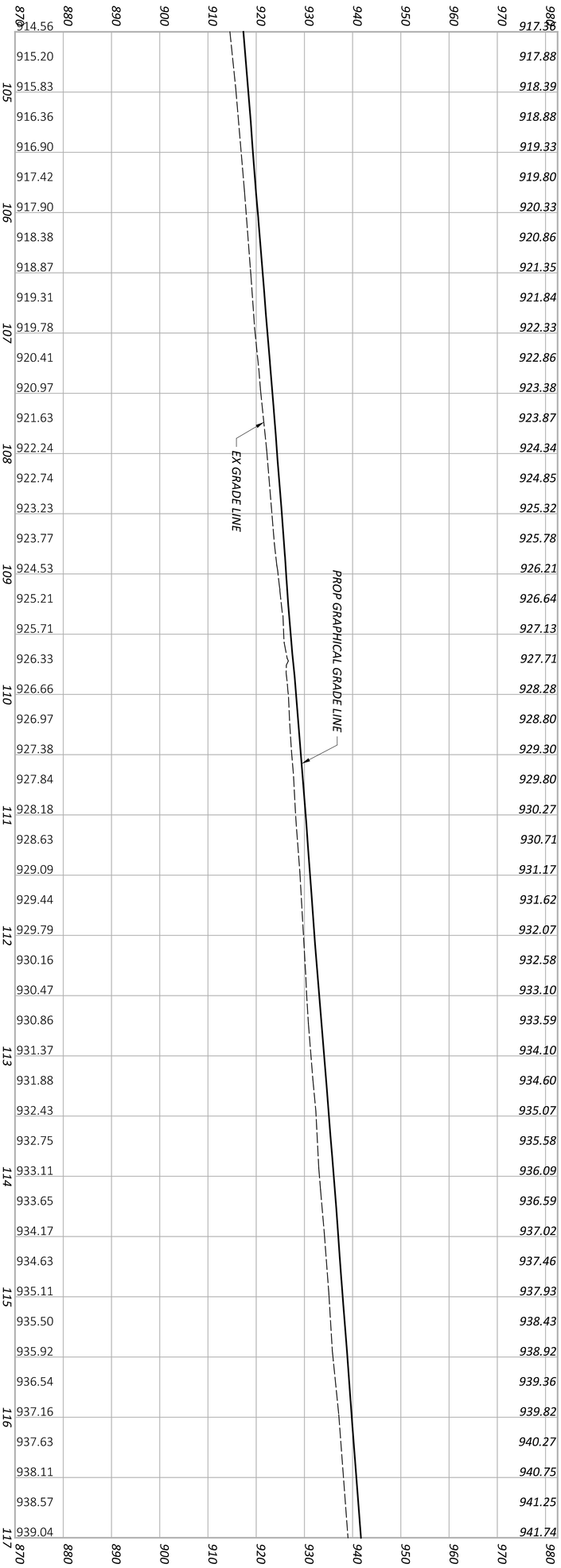
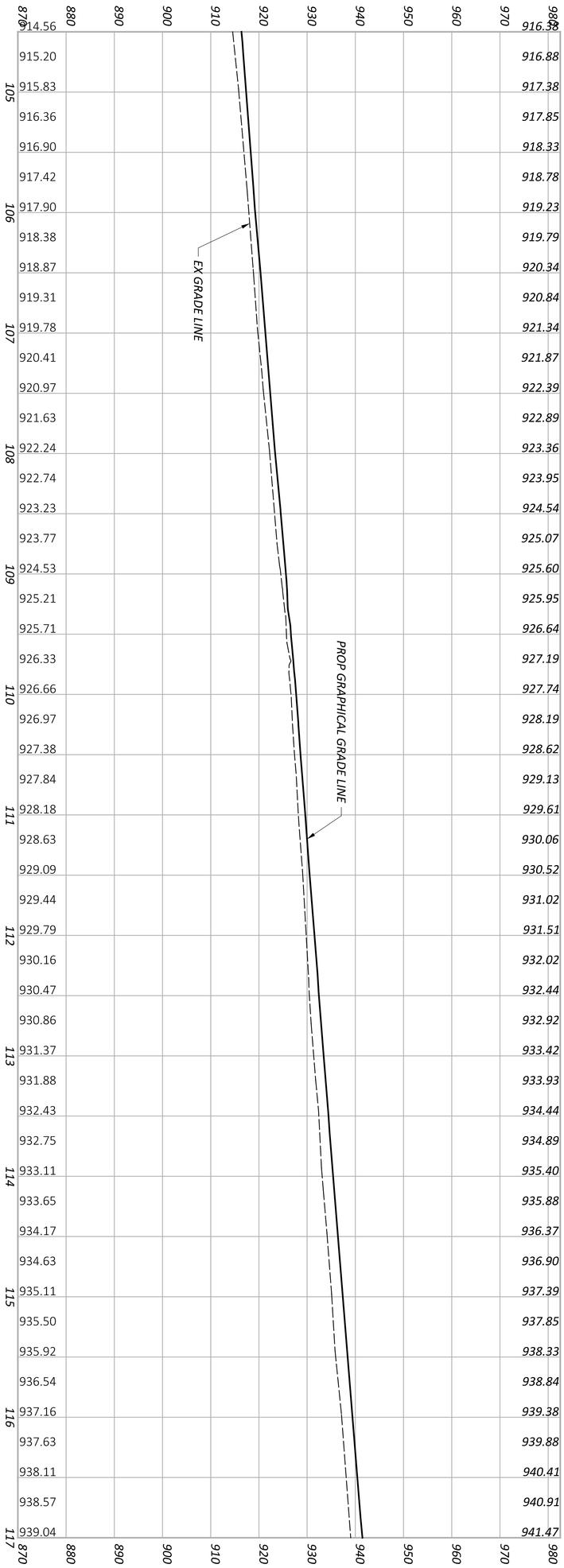


IR 70 EB



IR 70 WB

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P 057 / TOTAL 740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 104+50.00 TO STA. 117+00.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:27 PM USER: aoldaker
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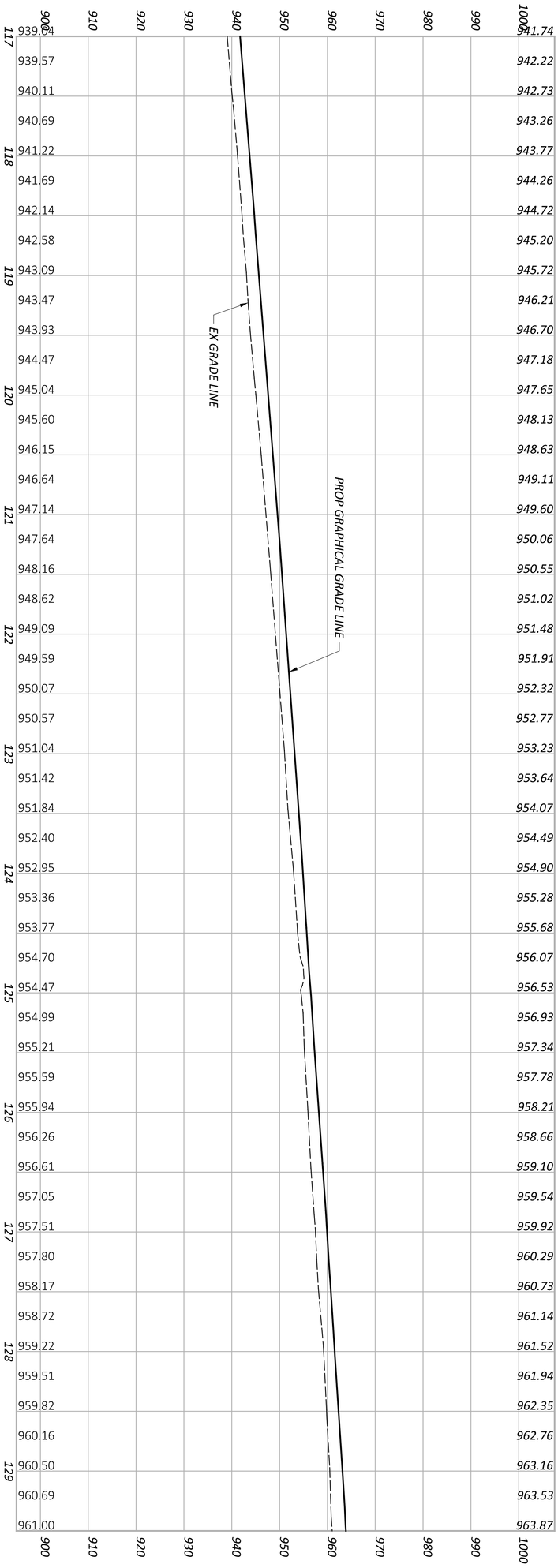
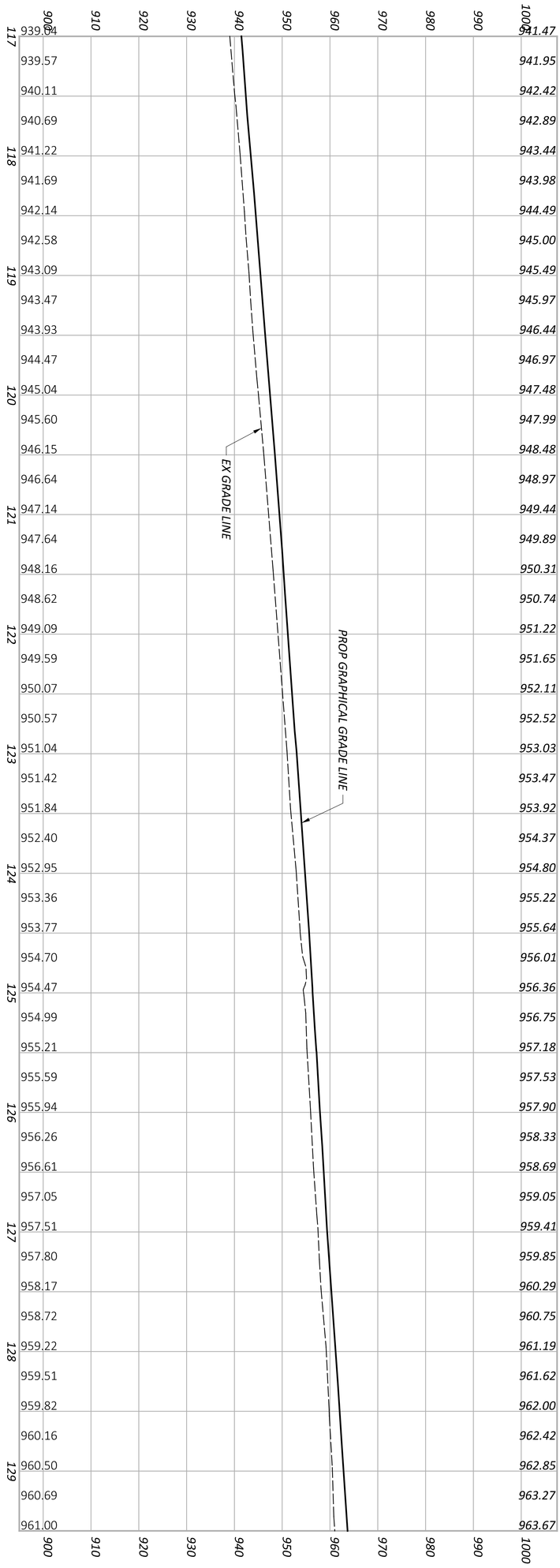


IR 70 EB



IR 70 WB

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.058	740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 117+00.00 TO STA. 129+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:35 PM USER: aoldaker
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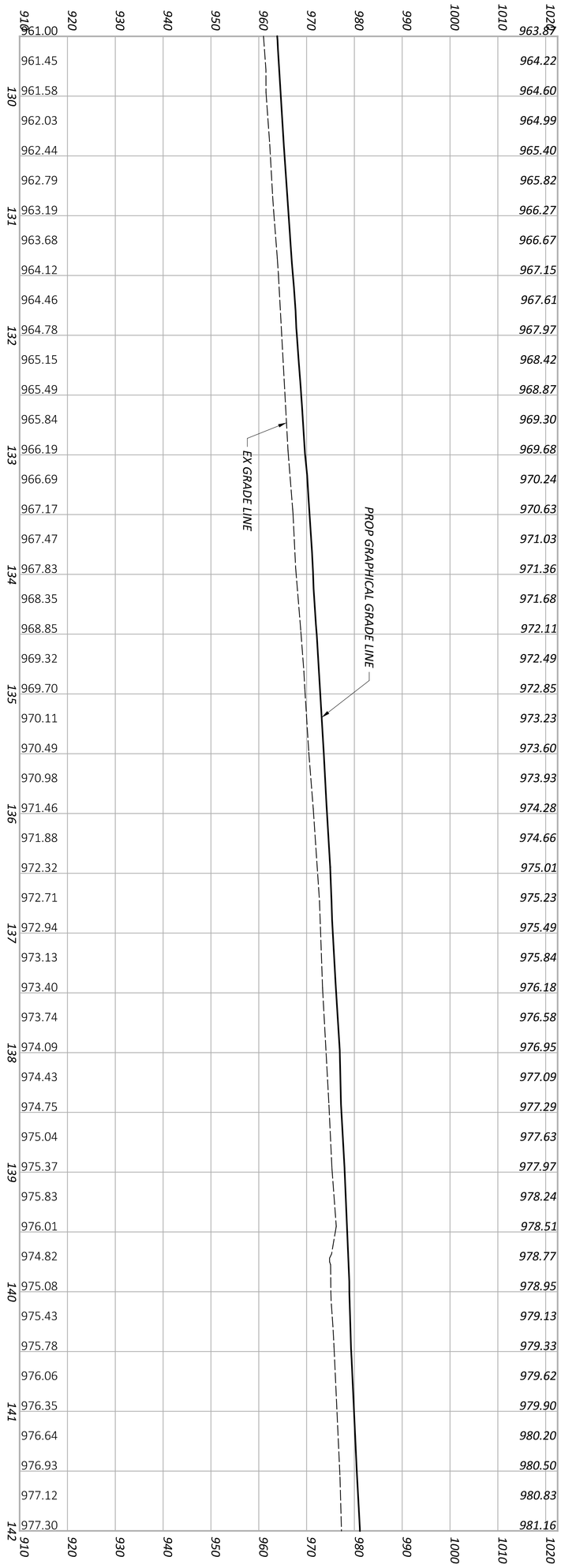
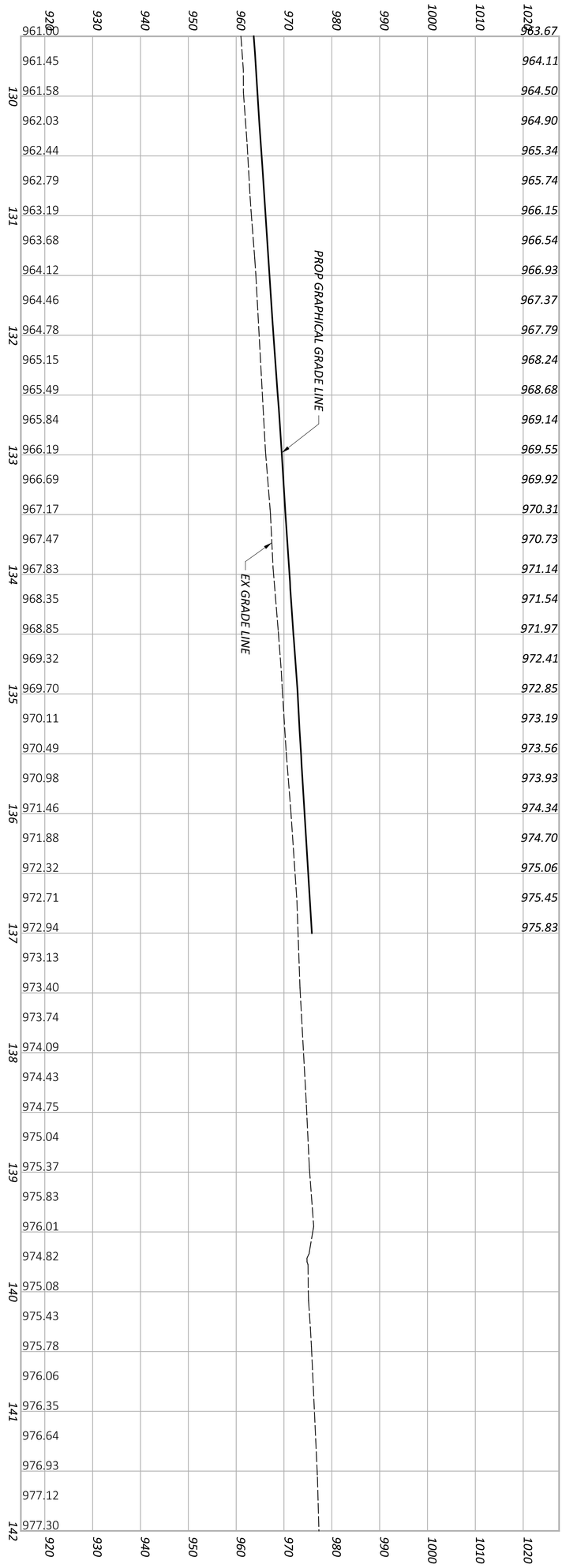


IR 70 EB



IR 70 WB

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.059 / TOTAL 740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 129+50.00 TO STA. 142+00.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:44 PM USER: aoldaker
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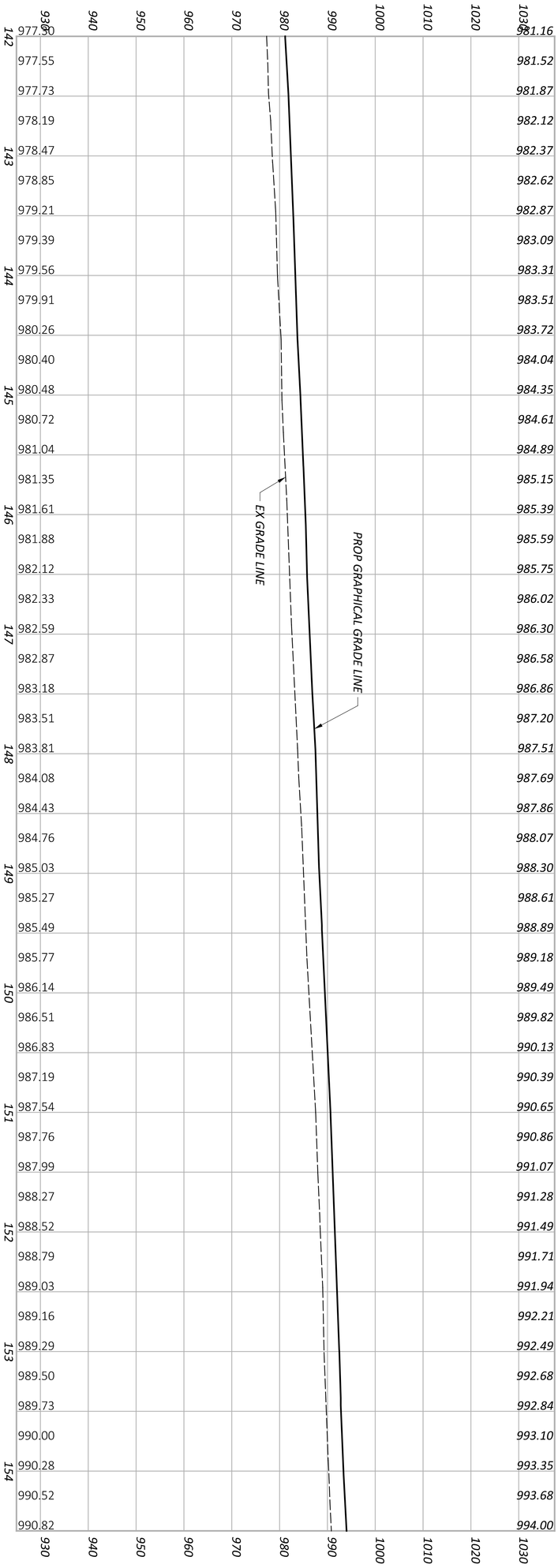
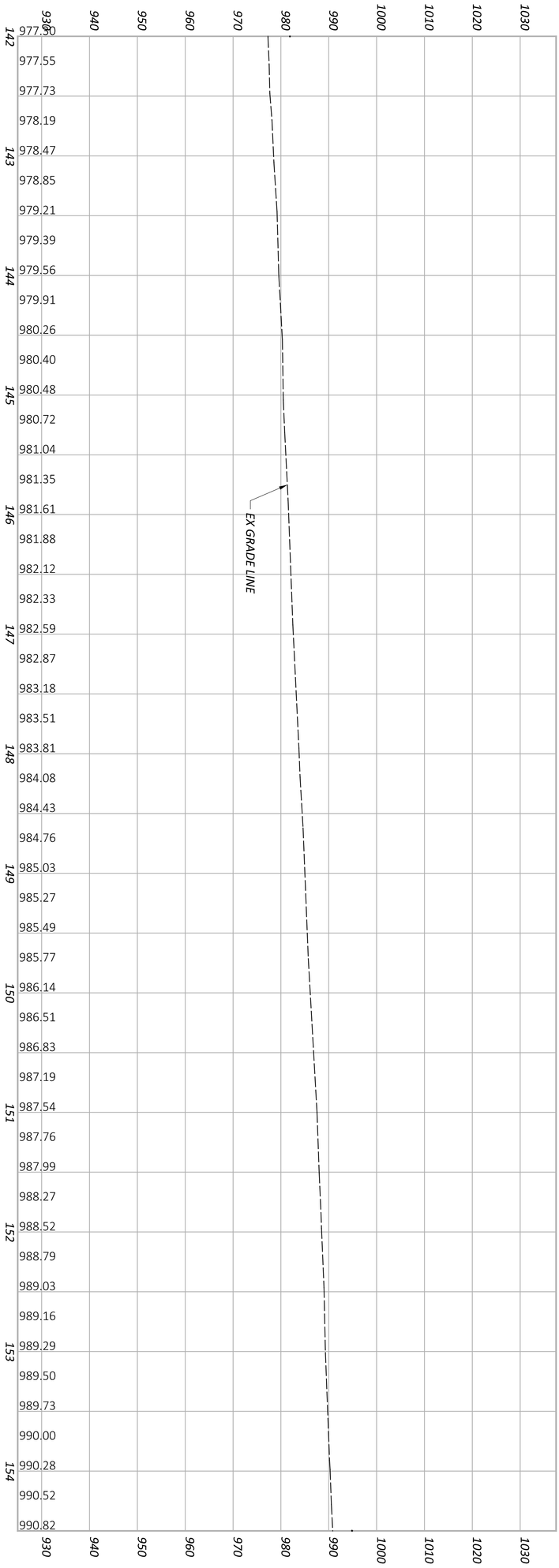


IR 70 EB



IR 70 WB

DESIGNER	REVIEWER	PROJECT ID	SHEET
BER	KAM 06/18/23	96808	P 060

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

TOTAL 740

PROFILE - IR 70
STA. 142+00.00 TO STA. 154+50.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:27:53 PM USER: aoldaker
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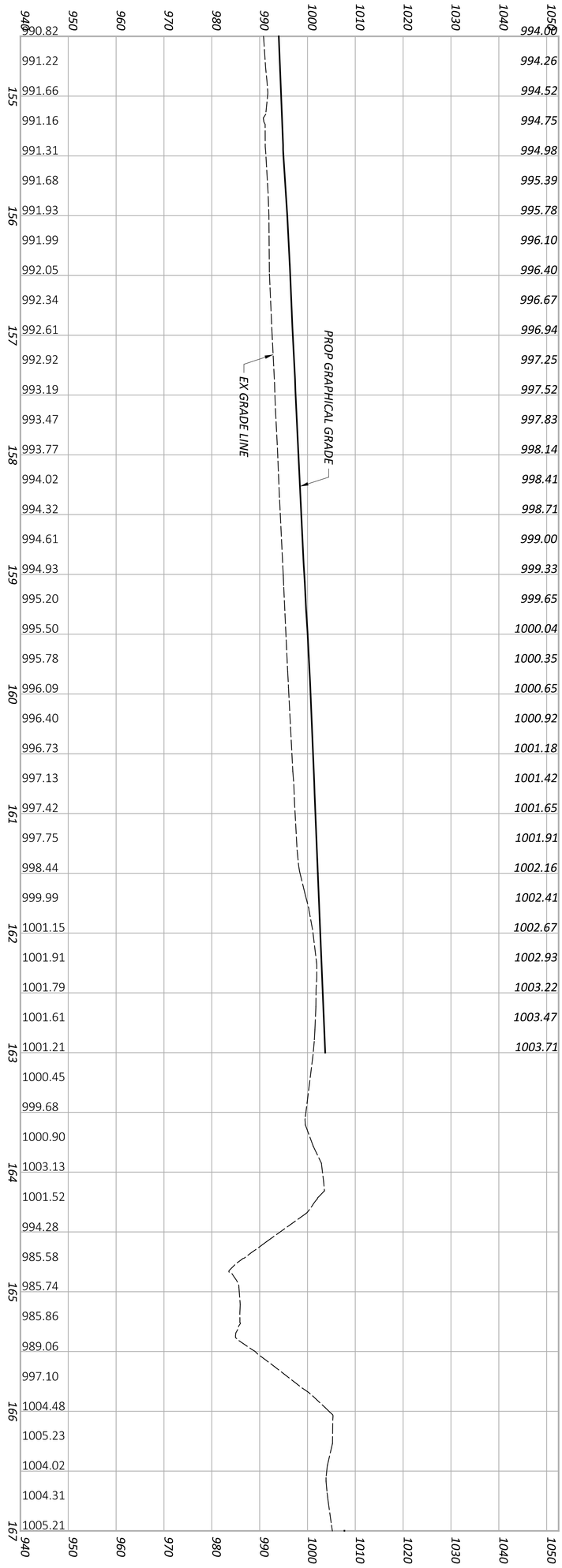
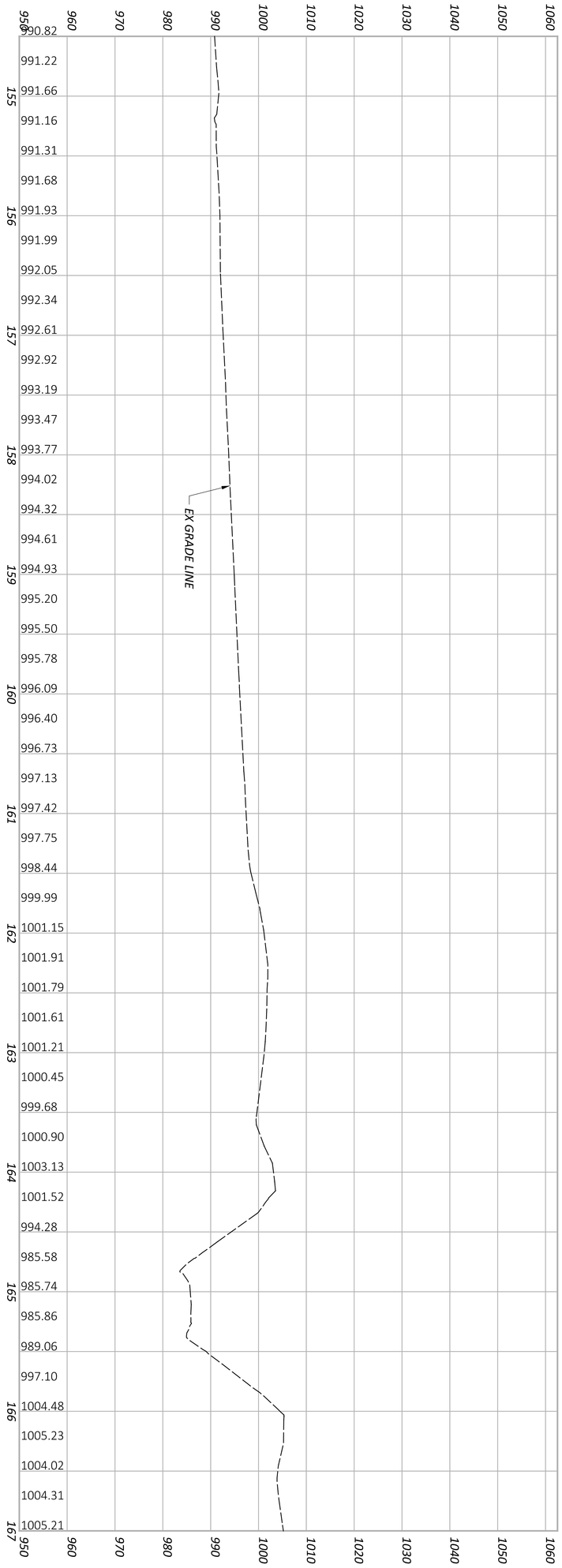


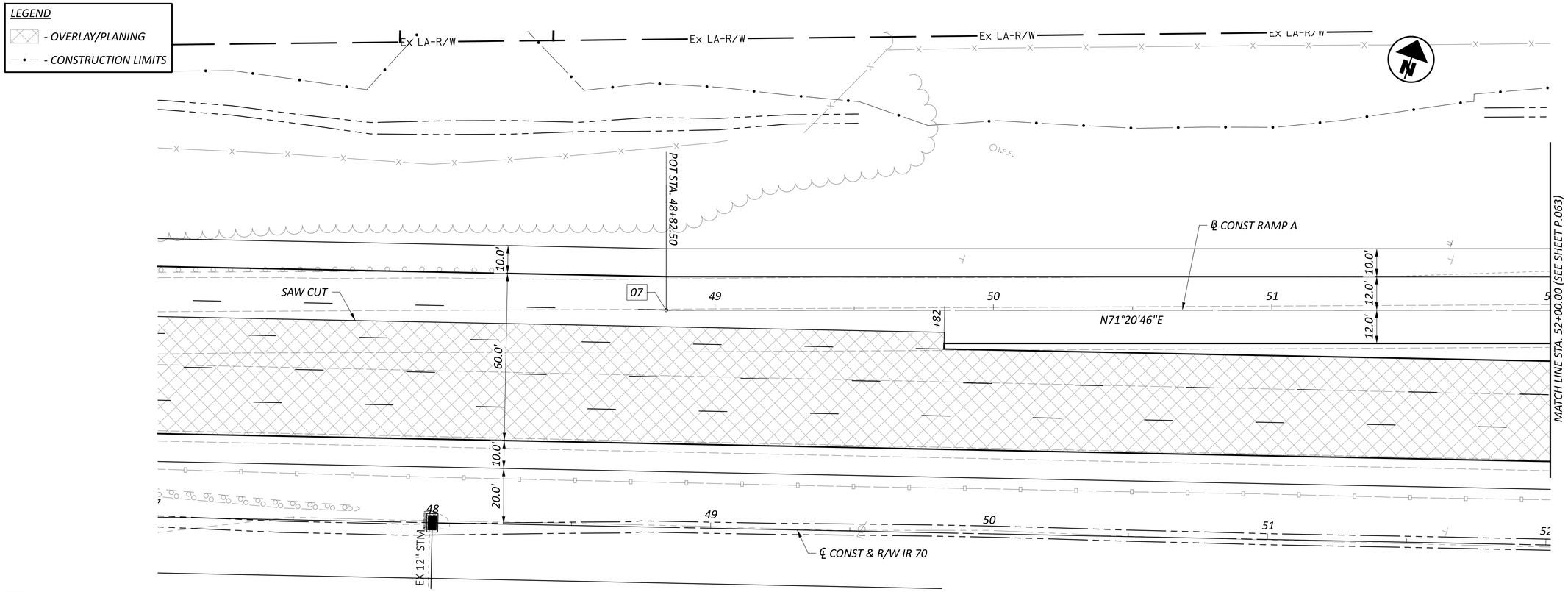
IR 70 EB



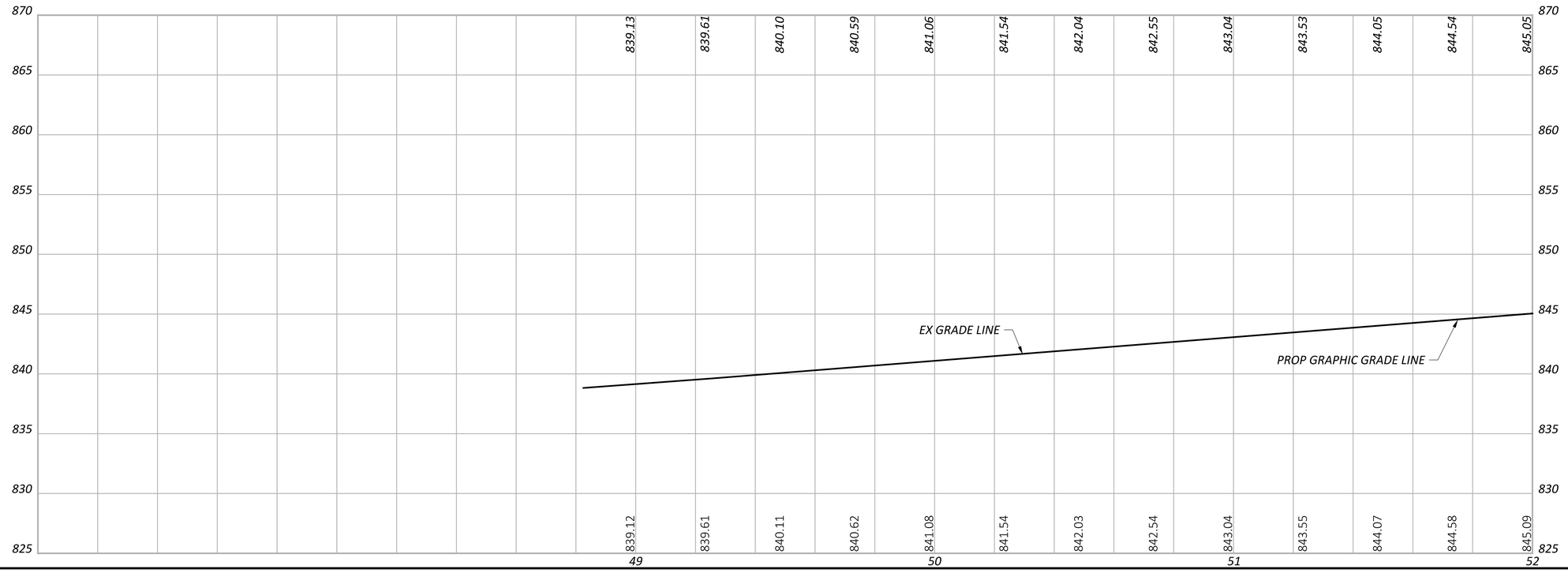
IR 70 WB

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.061 / TOTAL 740	96808	KAM 06/18/23	BER	AMERICAN STRUCTUREPOINT INC.

PROFILE - IR 70
STA. 154+50.00 TO STA. 167+00.00



07 STA. 48+82.50, ℄ CONST RAMP A, PI =
STA. 48+82.50, 78.00' LT, ℄ CONST & R/W IR 70



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP A
STA. 48+82.50 TO STA. 52+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.062 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070A - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:53:57 AM USER: aoldaker
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FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070A - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:44:53 PM USER: aoldaker
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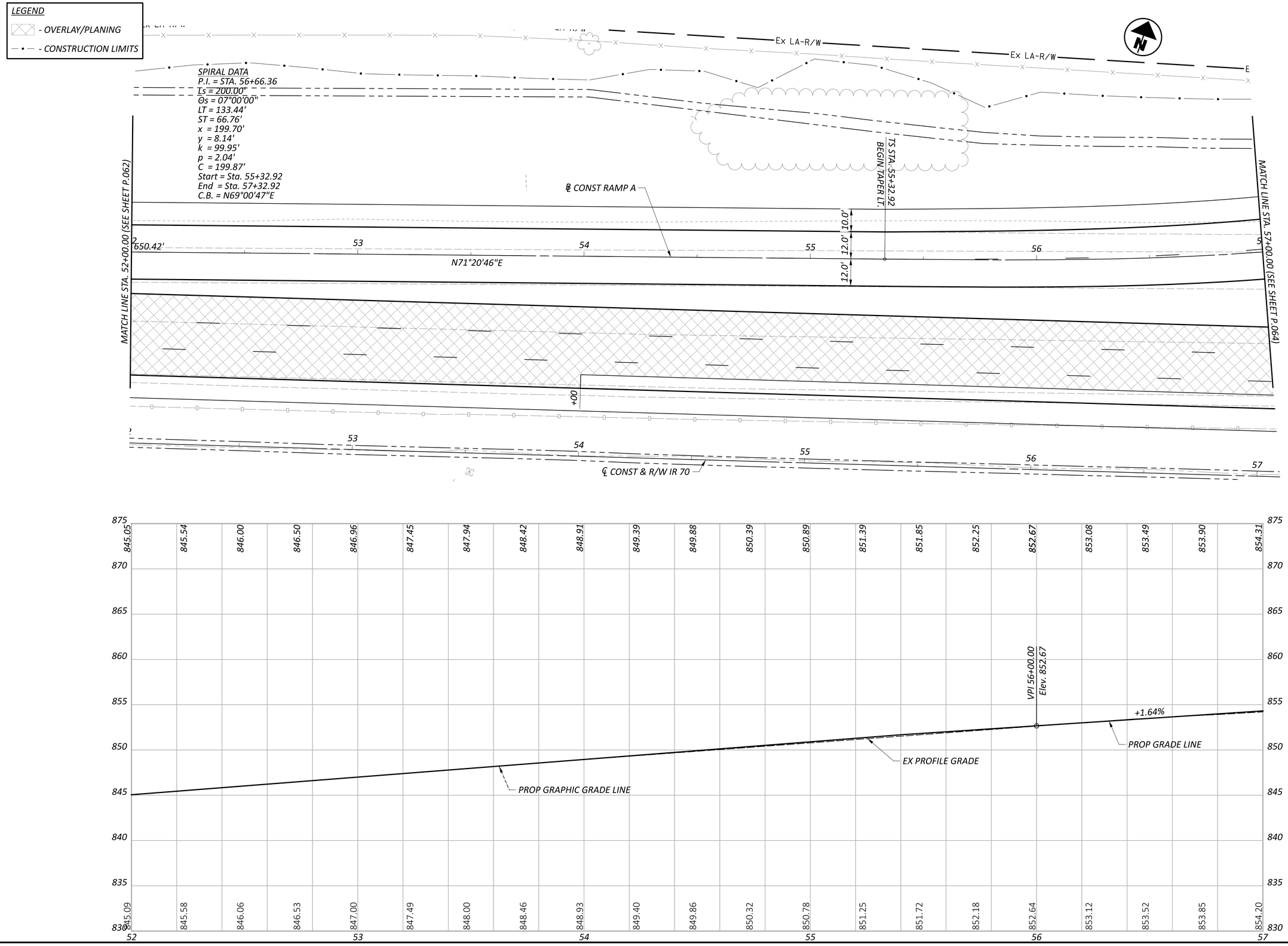
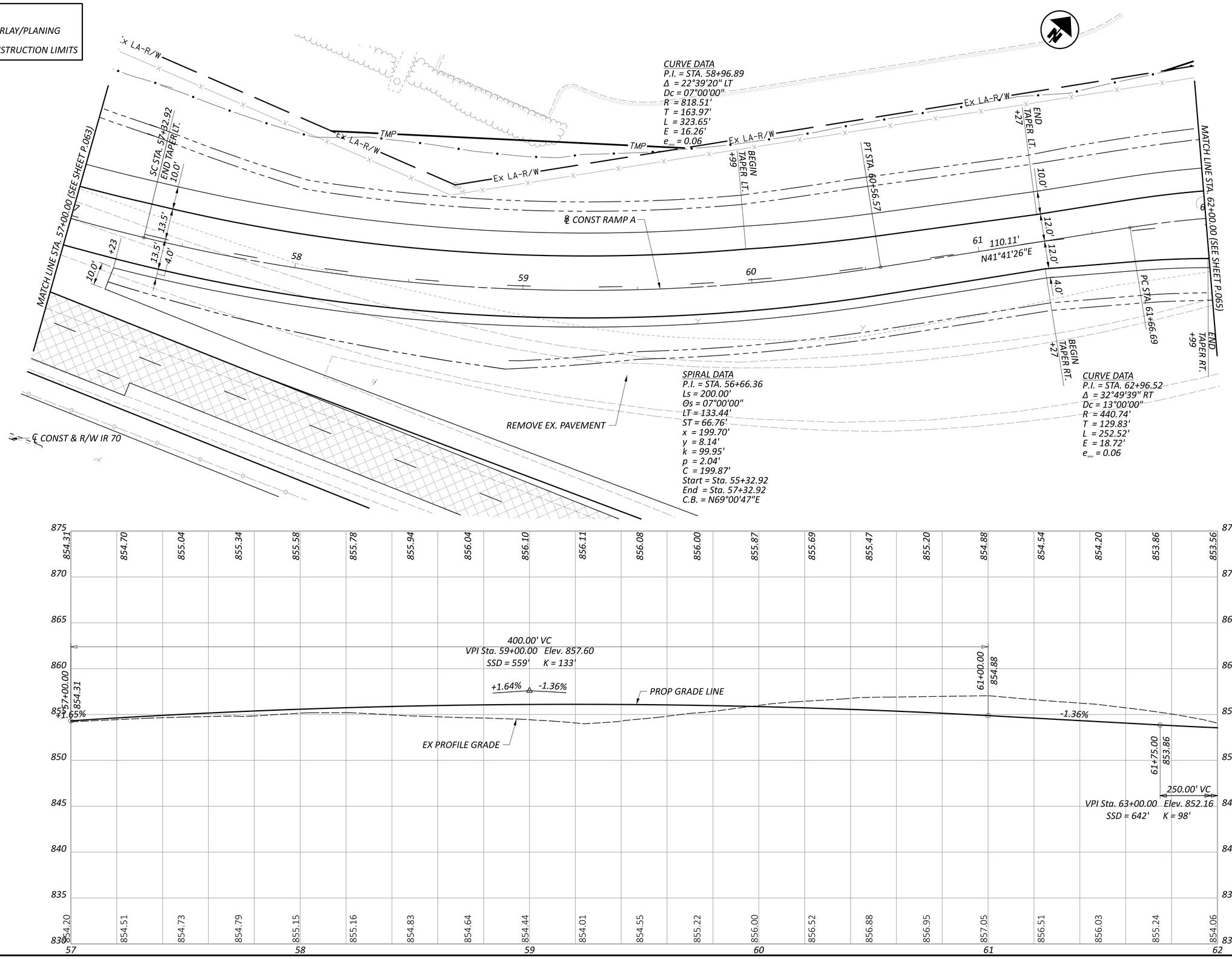


HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP A
STA. 52+00.00 TO STA. 57+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.063
TOTAL	740



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP A
STA. 57+00.00 TO STA. 62+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070A - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:45:05 PM USER: aoldaker
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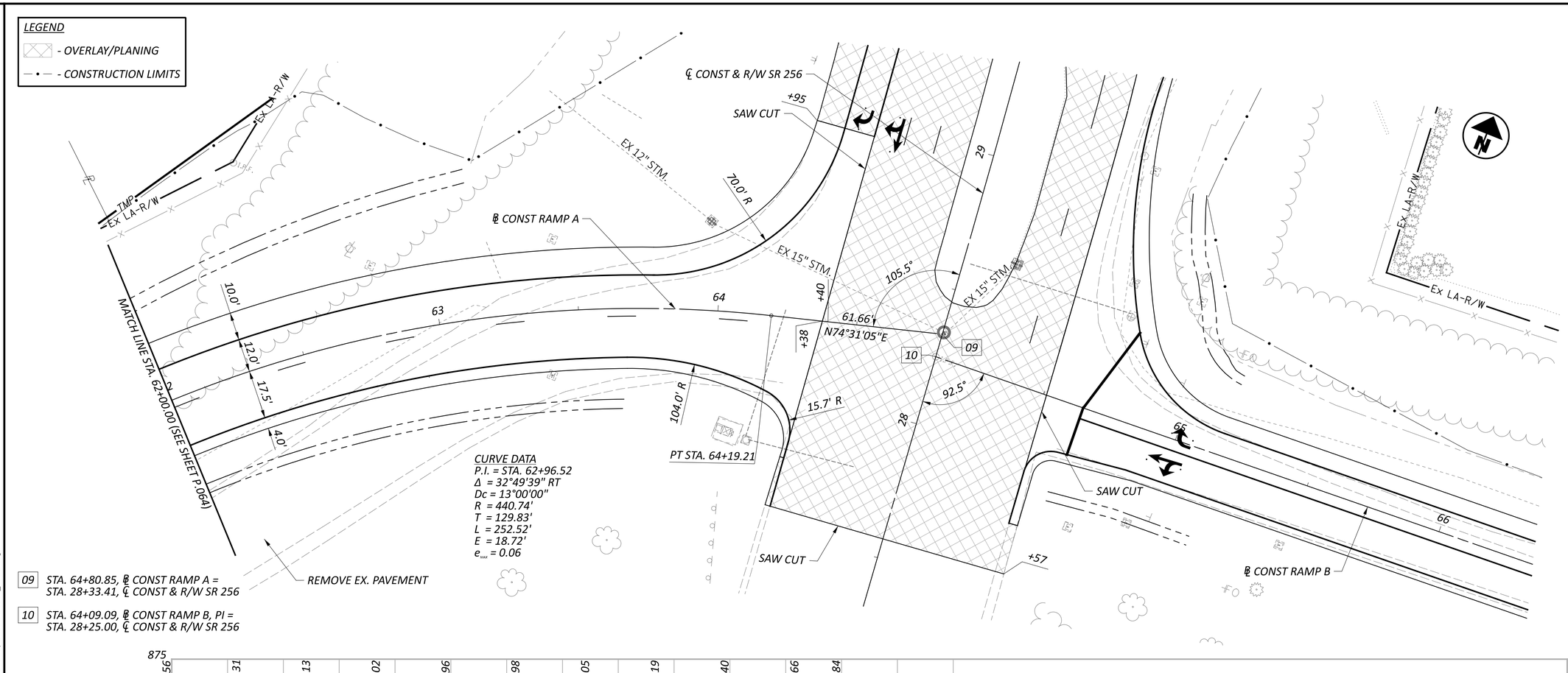
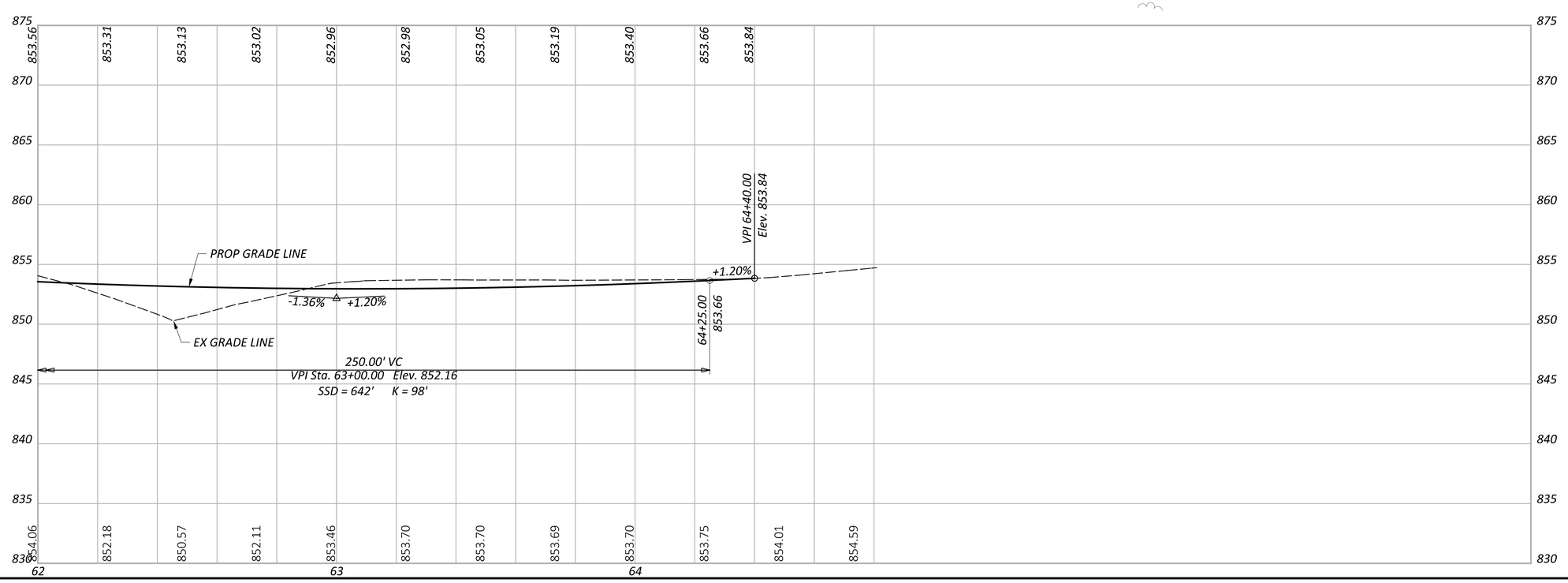
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.064 TOTAL 740





PLAN AND PROFILE - RAMP A
STA. 62+00.00 TO STA. 64+80.85

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.065
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070A - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:45:16 PM USER: aoldaker
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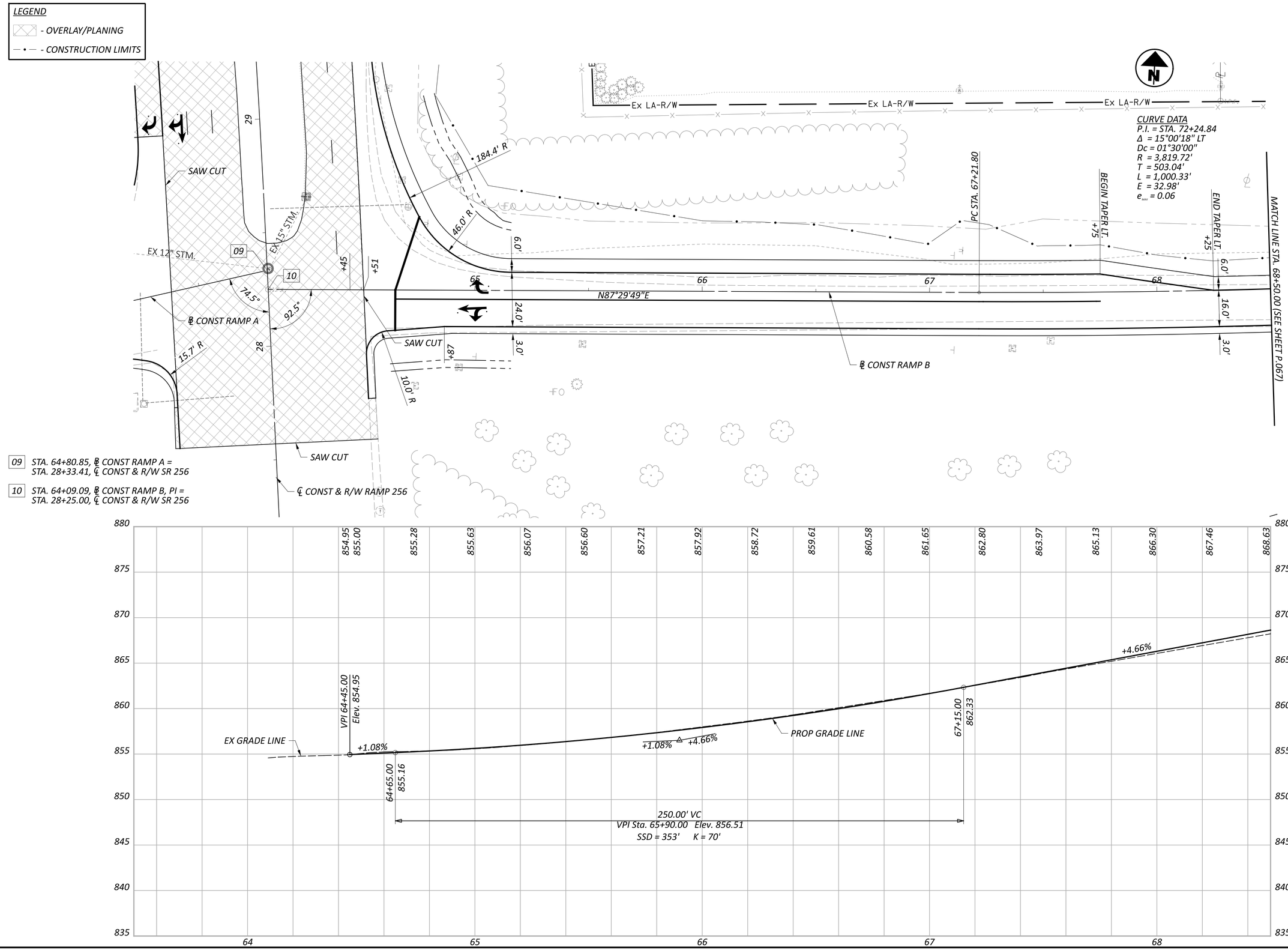


HORIZONTAL SCALE IN FEET
0 10 20 40

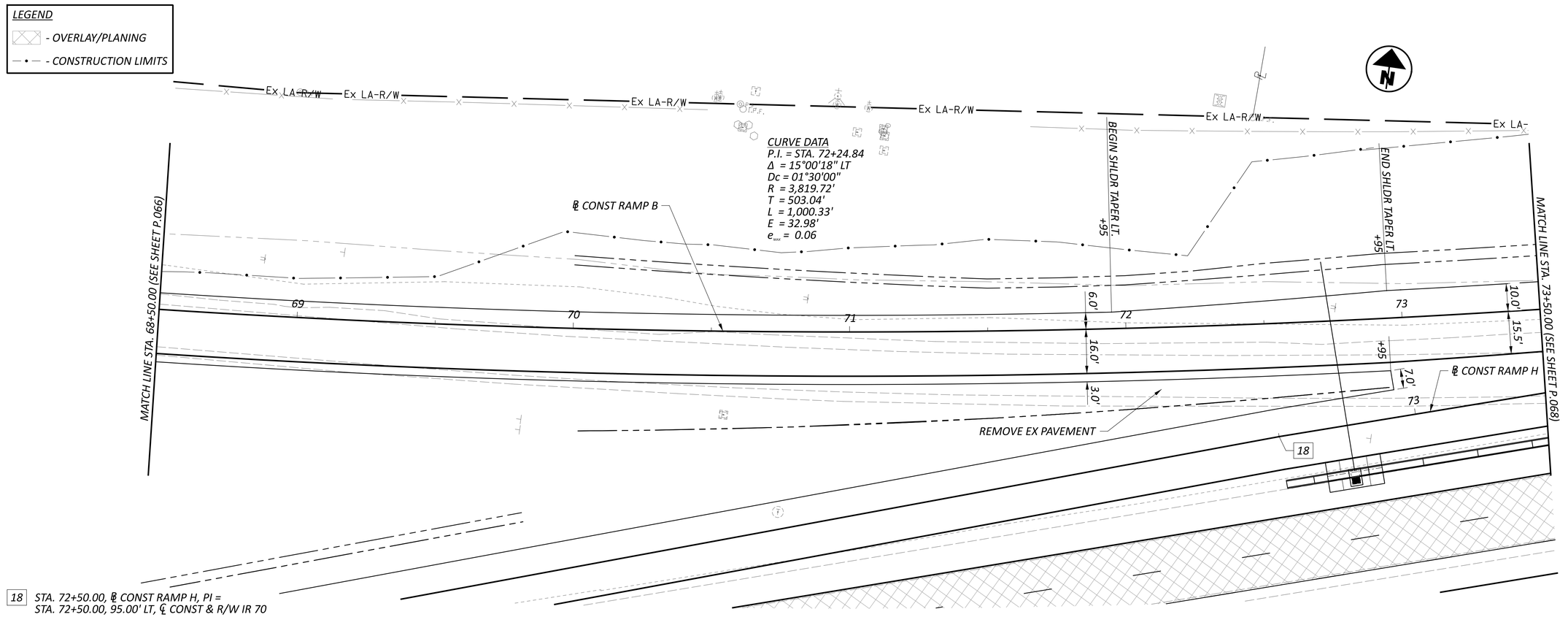
PLAN AND PROFILE - RAMP B
STA. 64+09.09 TO STA. 68+50.00

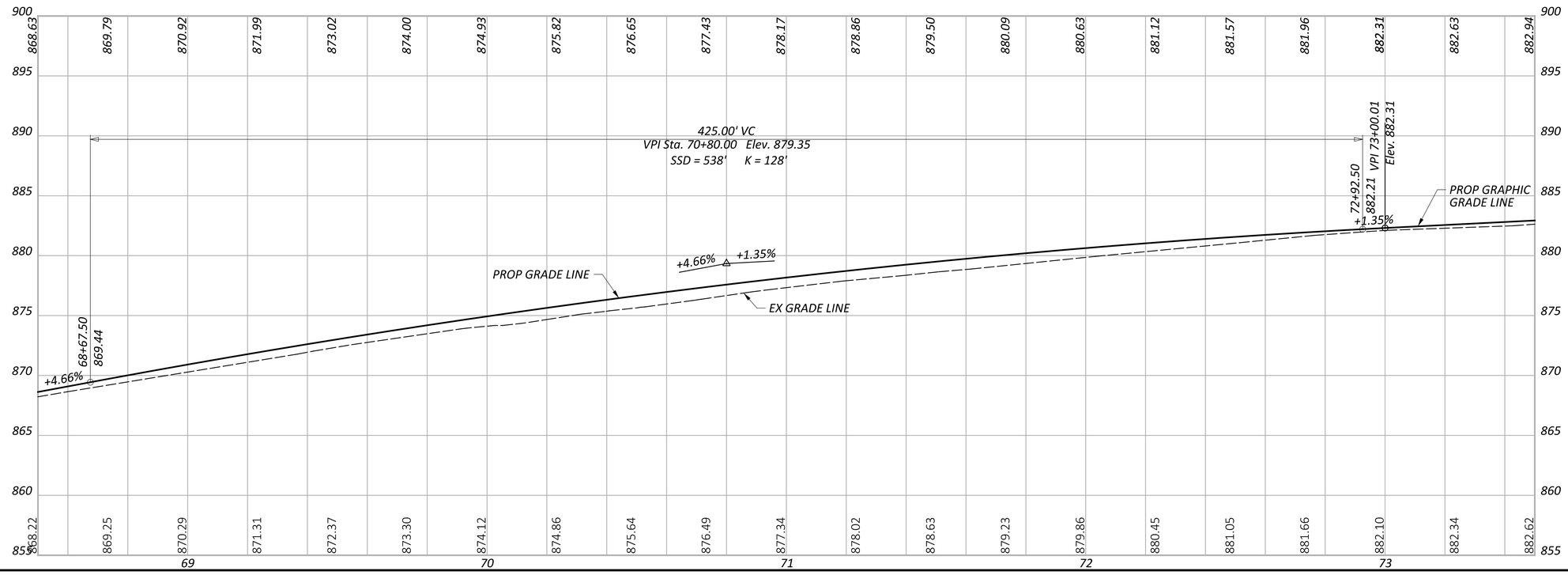
FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070B - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:45:29 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP221.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.066 TOTAL 740





HORIZONTAL SCALE IN FEET
0 10 20 40

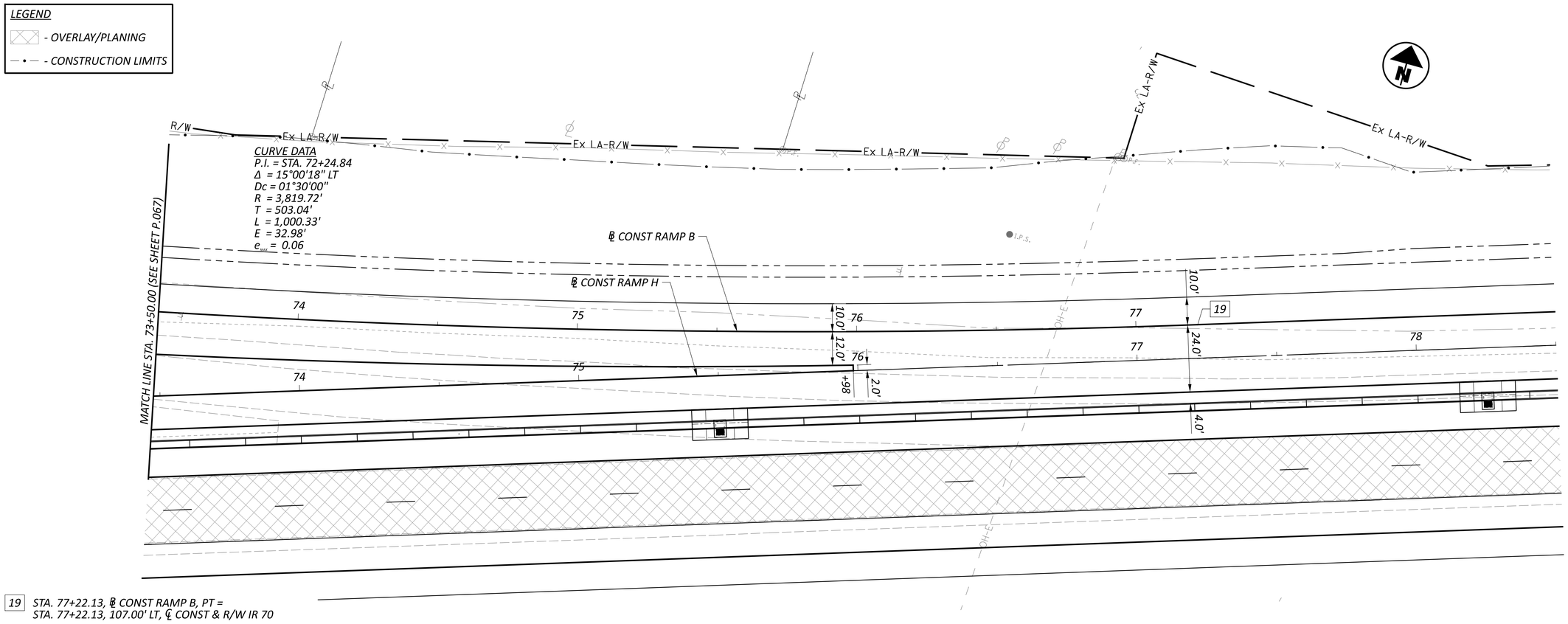
PLAN AND PROFILE - RAMP B
STA. 68+50.00 TO STA. 73+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070B - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:45:43 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP222.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.067
TOTAL	740



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP B
STA. 73+50.00 TO STA. 77+22.13

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.068
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070B - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:45:56 PM USER: aoldaker
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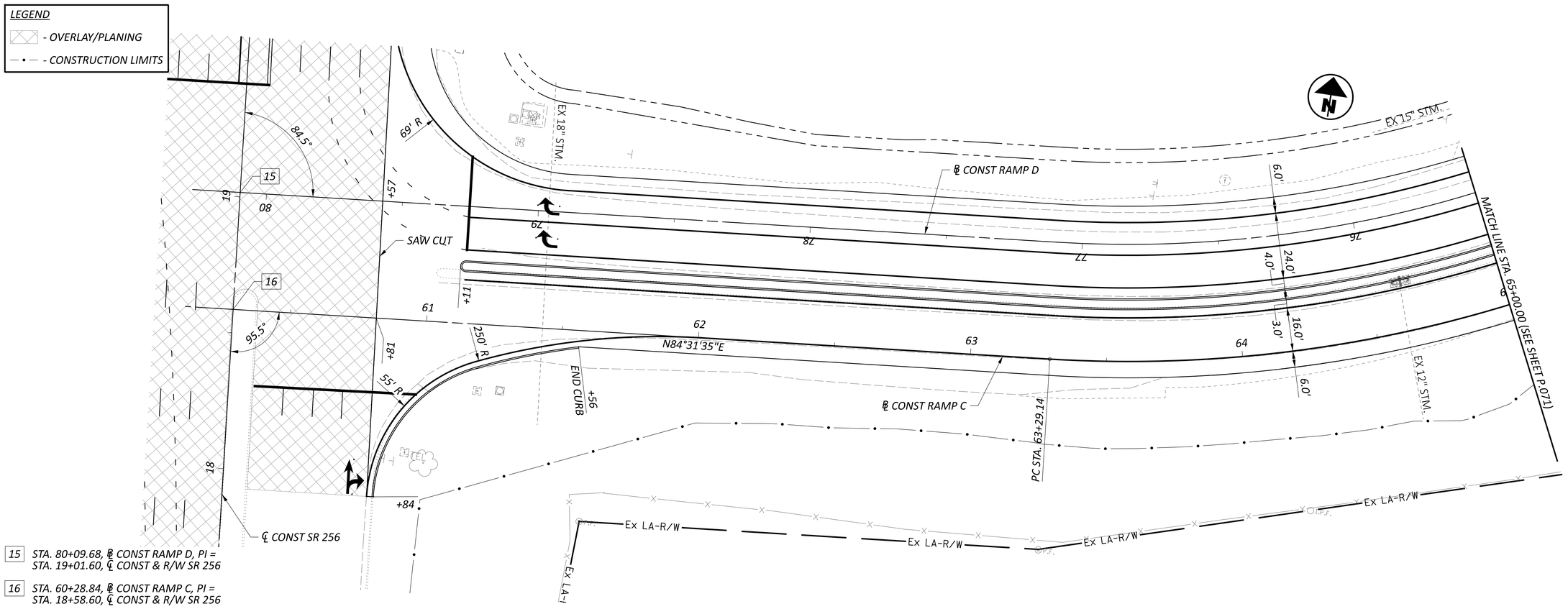

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP C
STA. 60+28.84 TO STA. 65+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070C - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:46:08 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP231.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.069
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070C - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:46:21 PM USER: aoldaker
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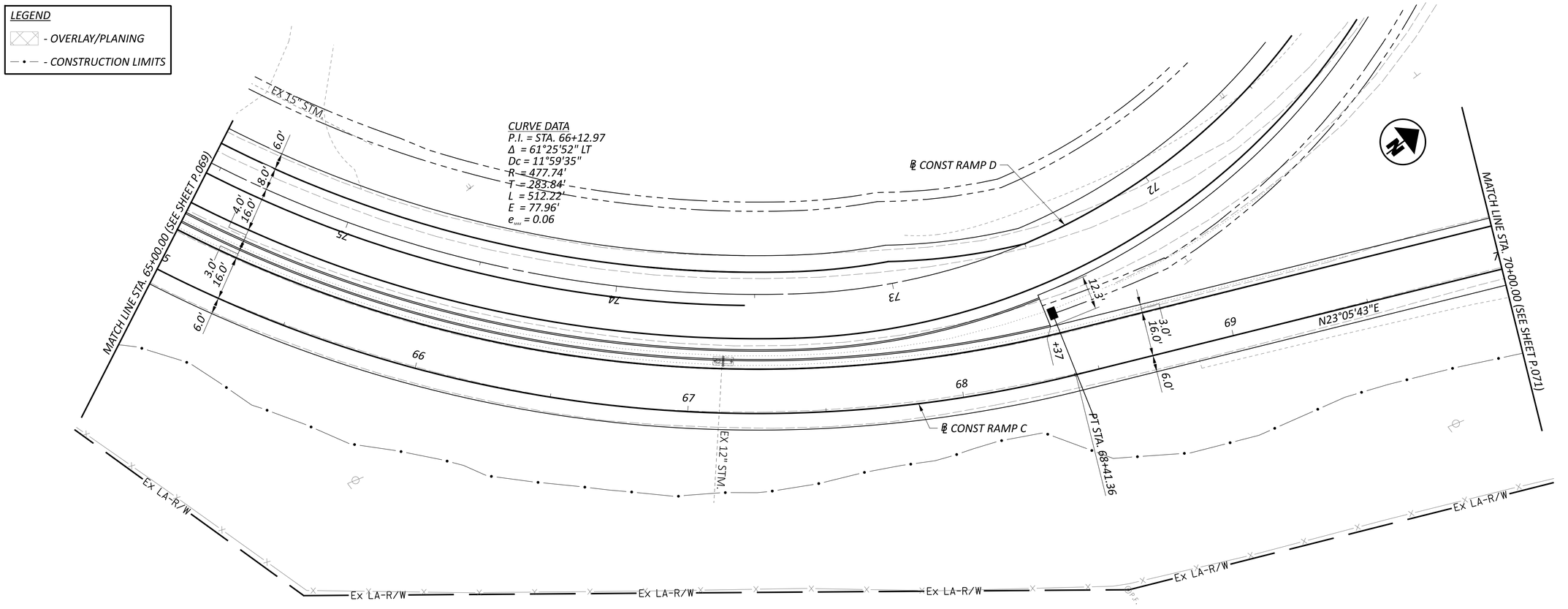

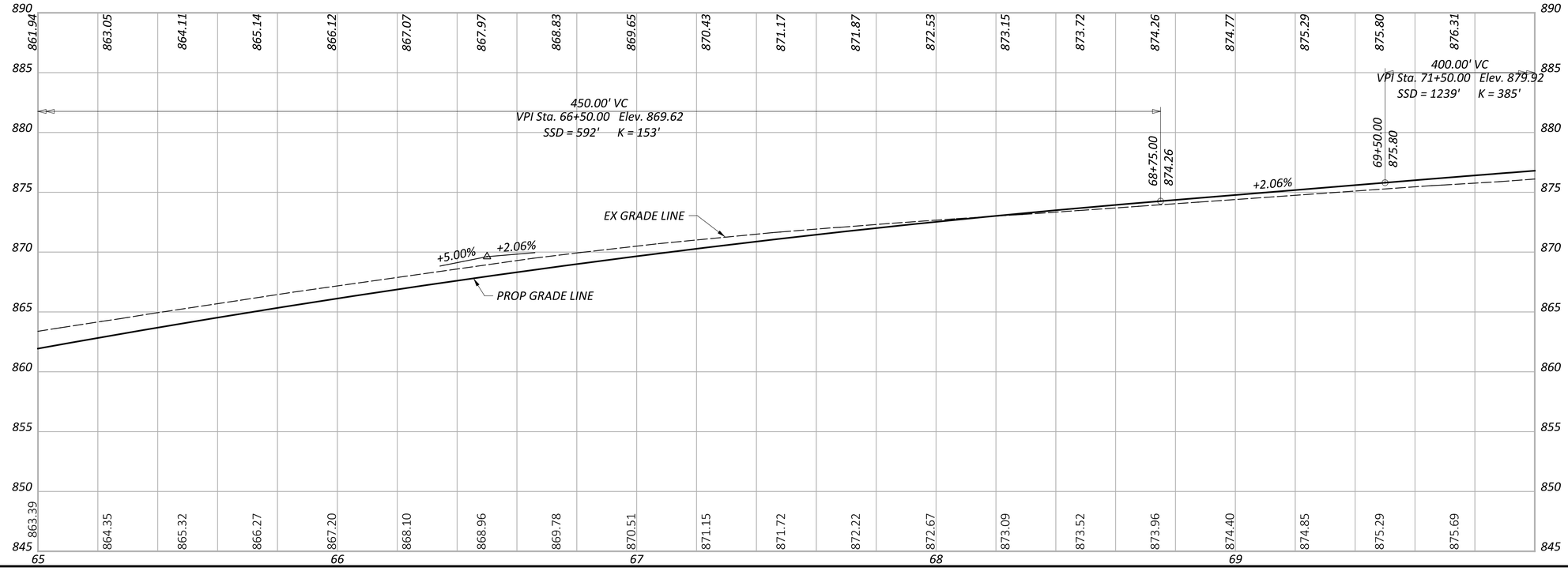

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP C
STA. 65+00.00 TO STA. 70+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.070
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070C - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:46:33 PM USER: aoldaker
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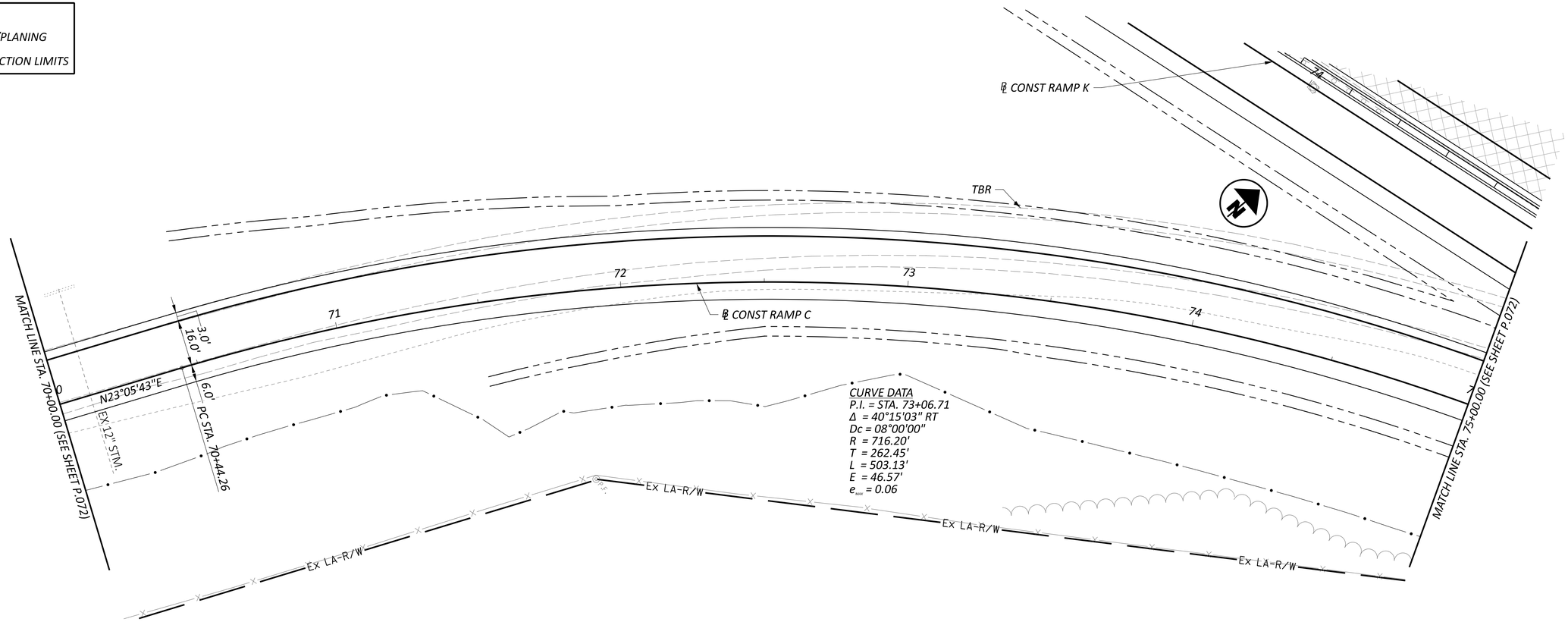
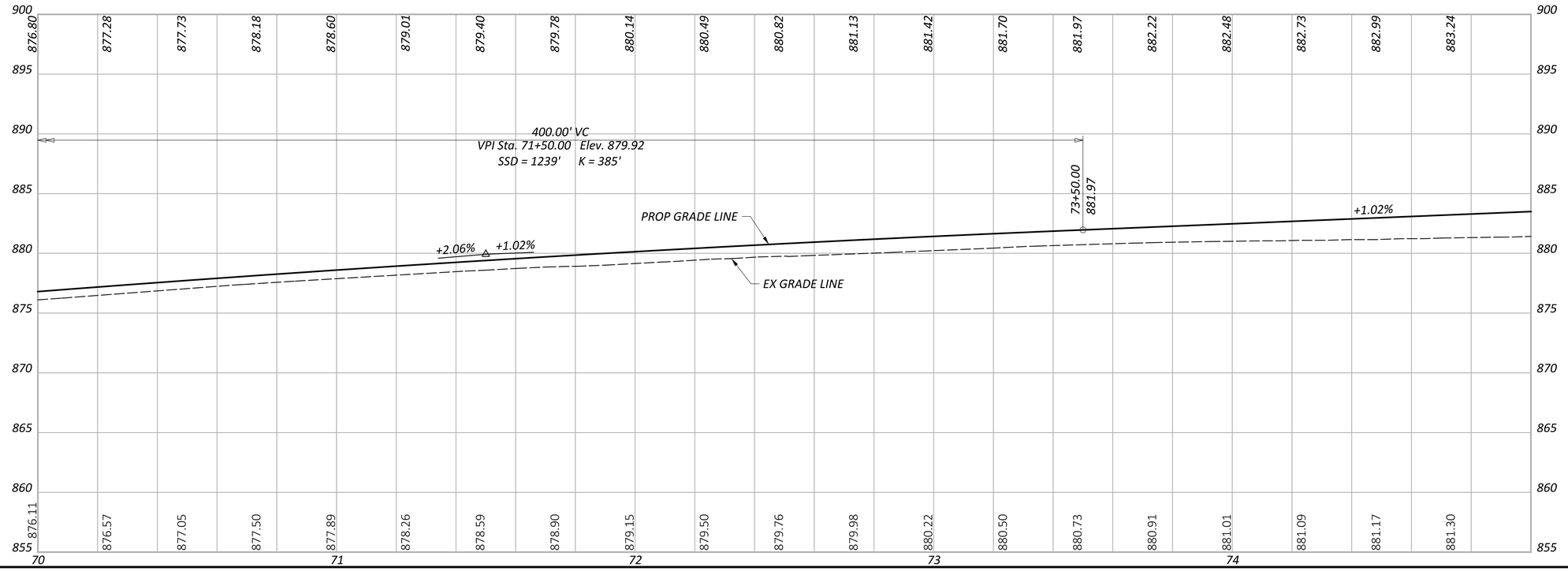
LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*



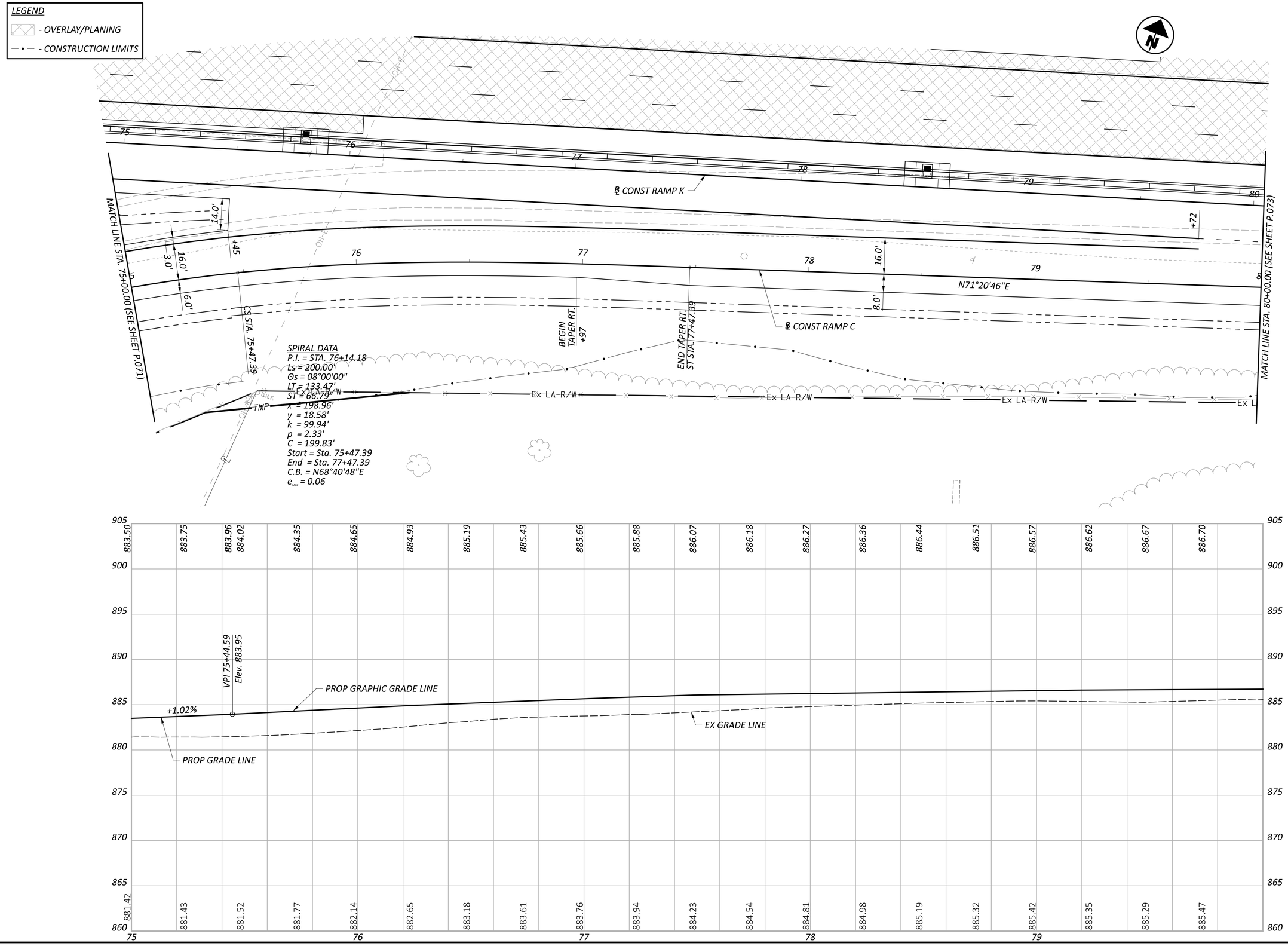


HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP C
STA. 70+00.00 TO STA. 75+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.071
TOTAL	740



PLAN AND PROFILE - RAMP C
STA. 75+00.00 TO STA. 80+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070C - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:46:45 PM USER: aoldaker
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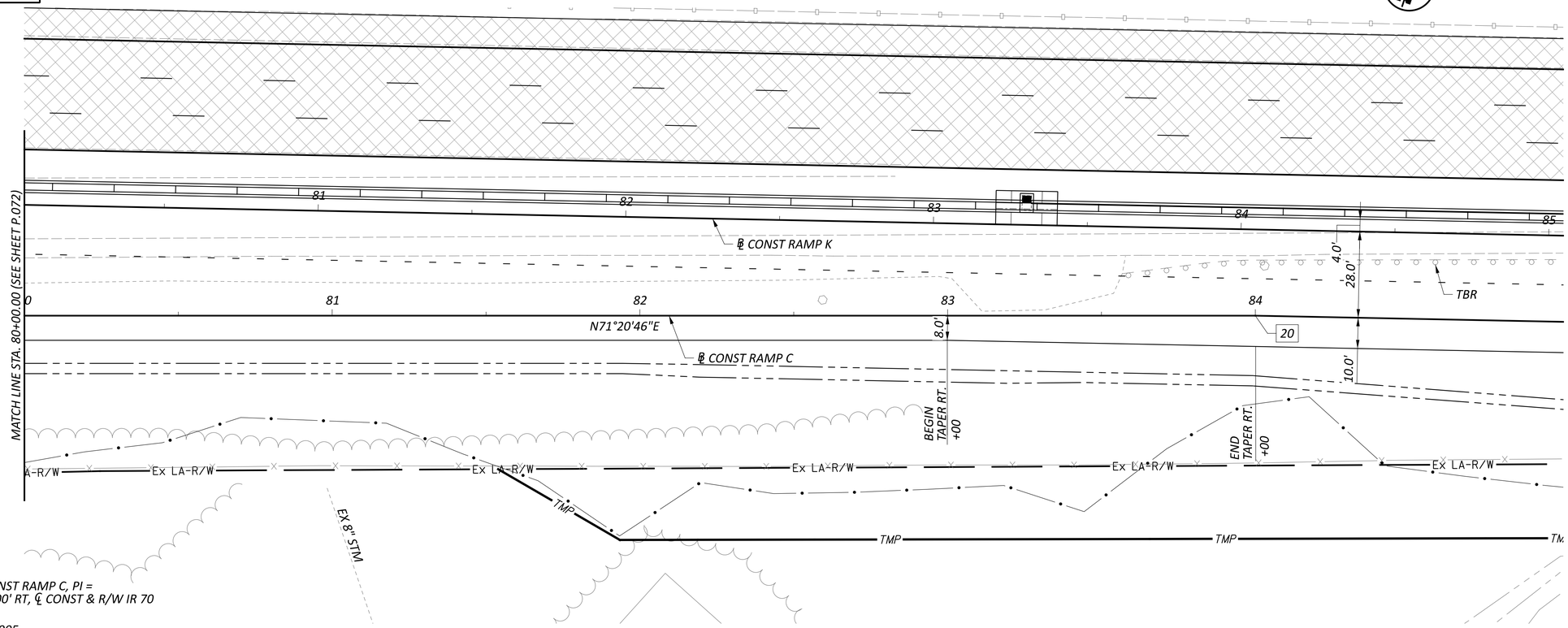
DESIGN AGENCY
WSP USA STRUCTUREPOINT INC.

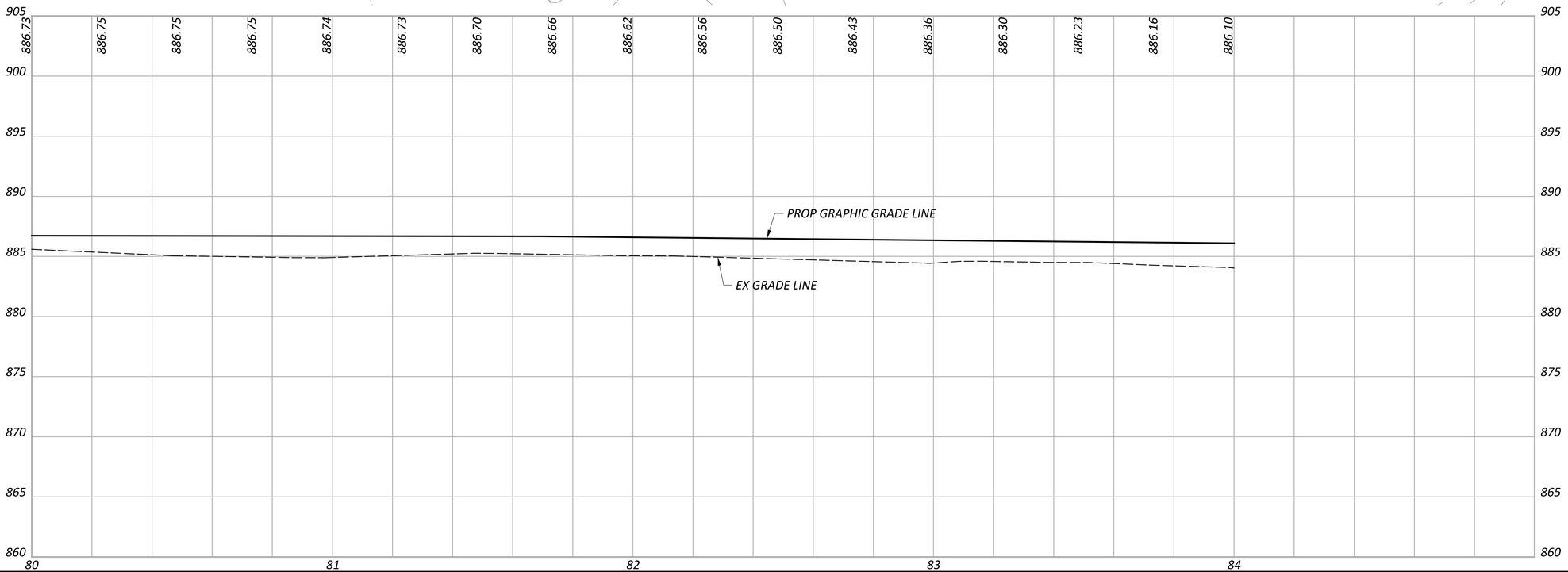
DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.072
TOTAL	740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



20 STA. 84+00.00, ℄ CONST RAMP C, PI =
STA. 84+00.00, 112.00' RT, ℄ CONST & R/W IR 70



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP C
STA. 80+00.00 TO STA. 84+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070C - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:46:58 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

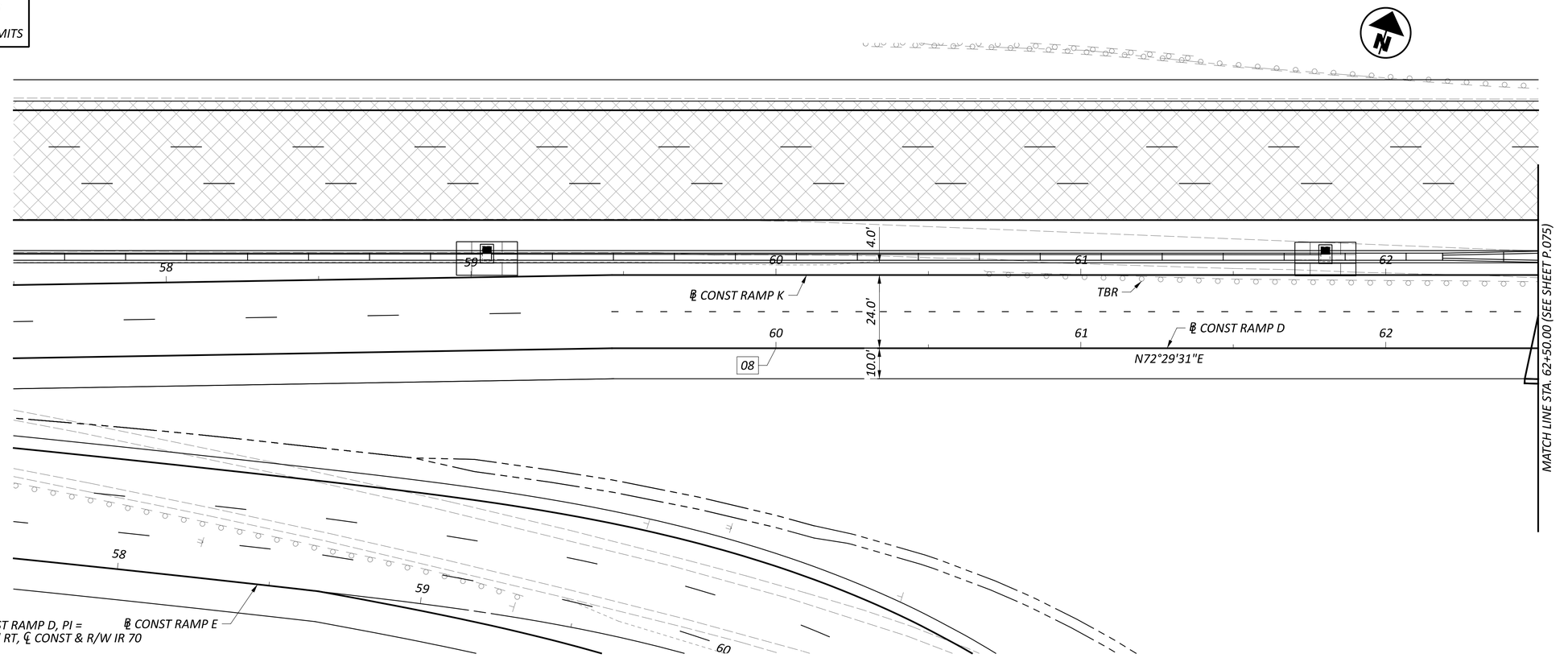
REVIEWER
KAM 06/18/23

PROJECT ID
96808

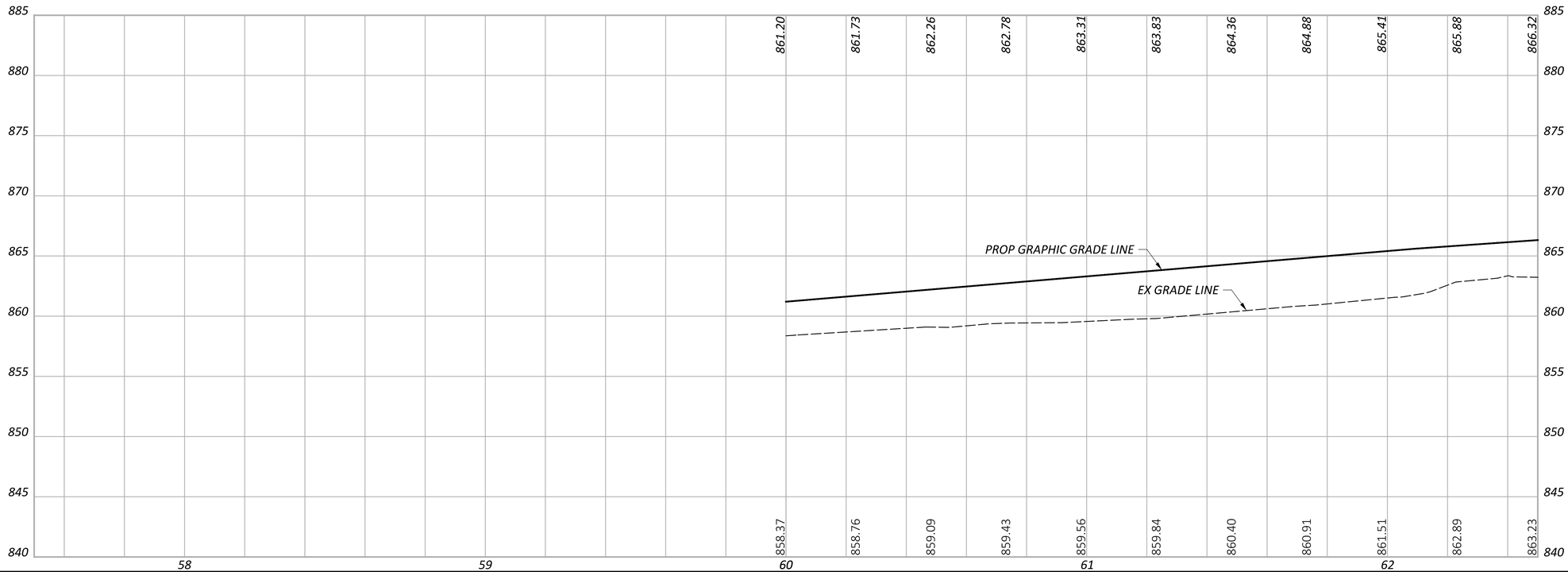
SHEET P.073 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



08 STA. 60+00.00, ℄ CONST RAMP D, PI = ℄ CONST RAMP E
STA. 59+94.80, 108.00' RT, ℄ CONST & R/W IR 70



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP D
STA. 60+00.00 TO STA. 62+50.00

DESIGN AGENCY
WSP USA STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.074
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070D - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:47:12 PM USER: aoldaker
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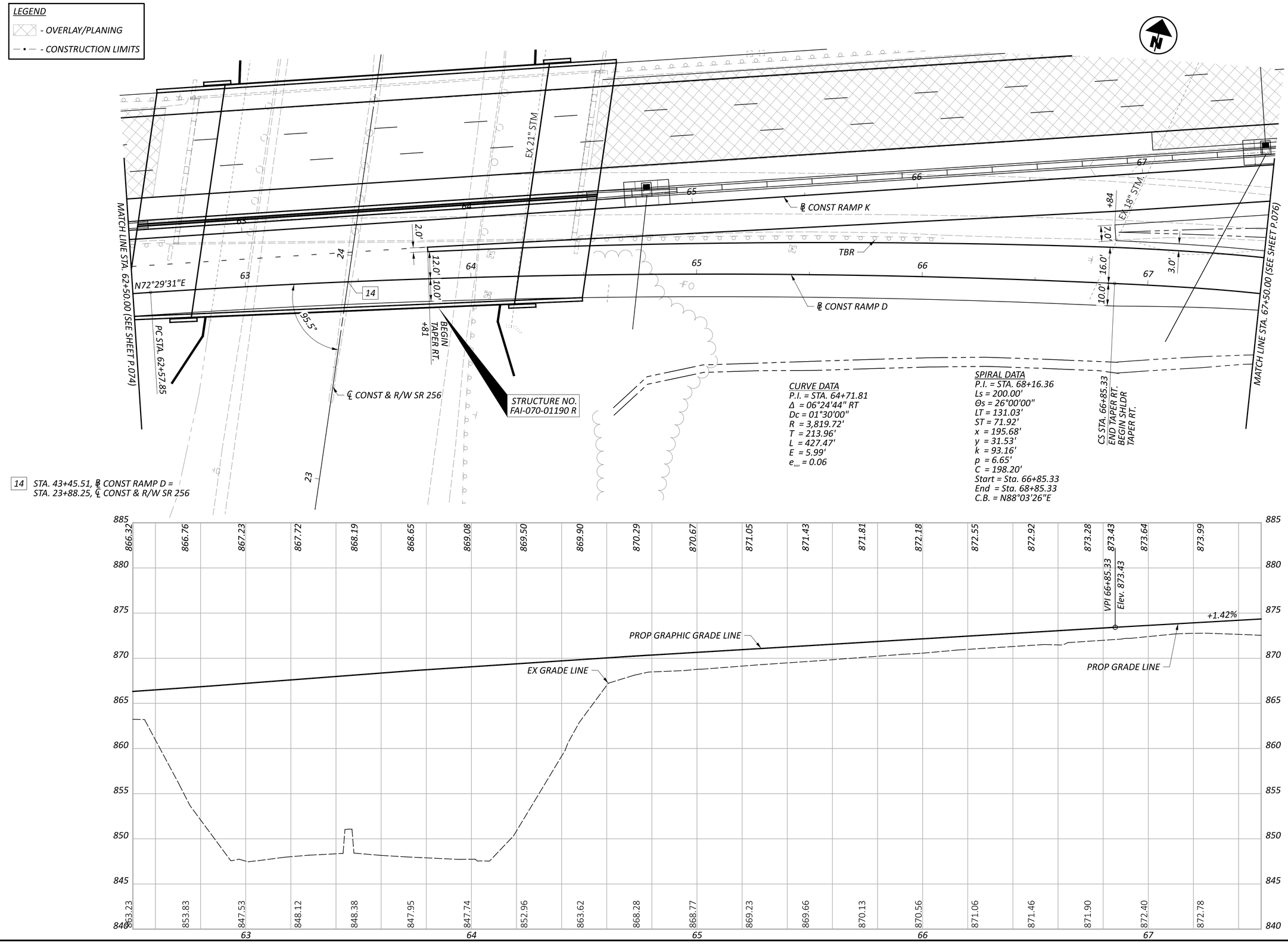

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP D
STA. 62+50.00 TO STA. 67+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.075
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R07OD - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:47:25 PM USER: aoldaker
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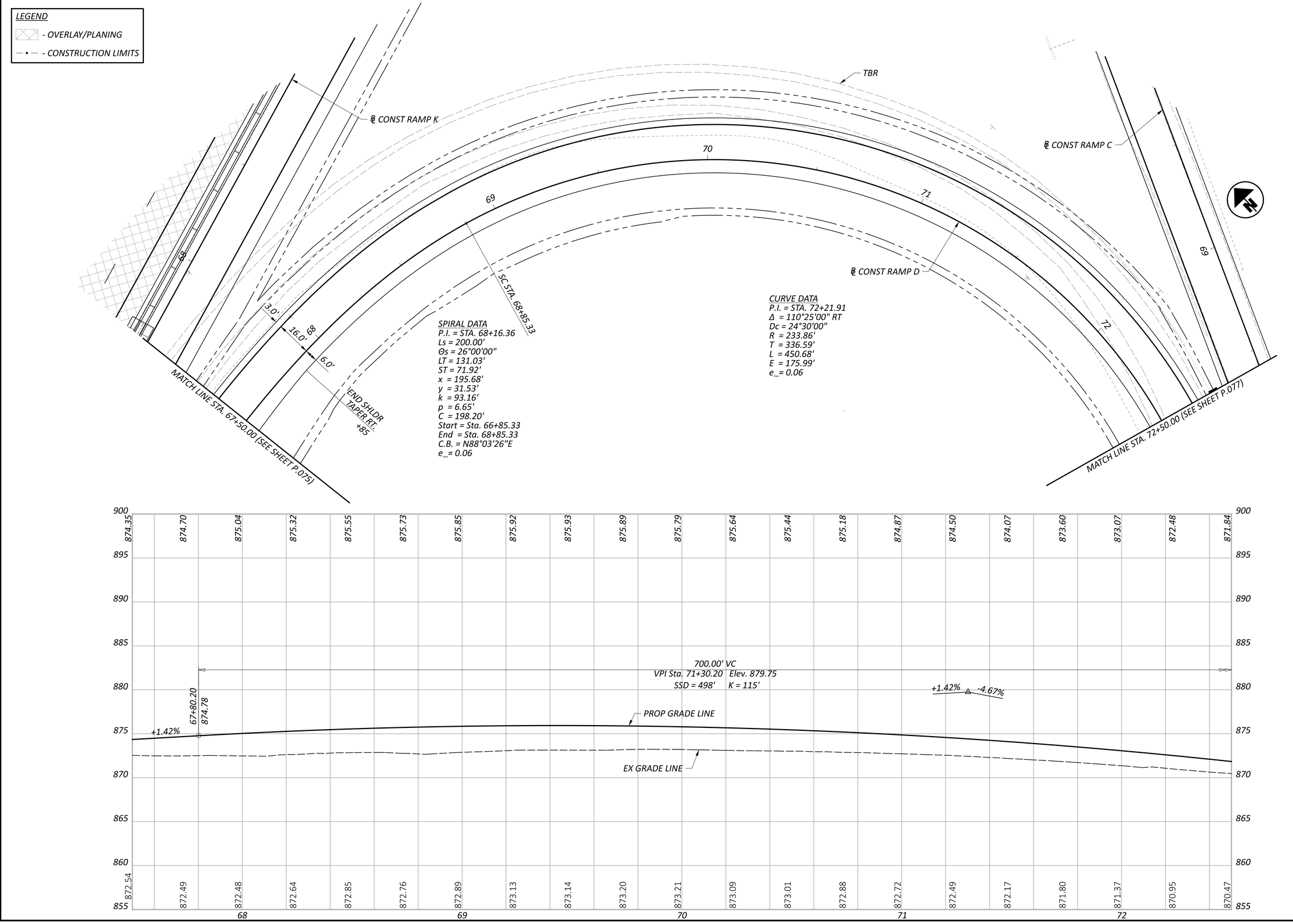

PLAN AND PROFILE - RAMP D
STA. 67+50.00 TO STA. 72+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070D - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:47:38 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP243.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.076
TOTAL	740

MODEL: BLP_R070D - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:47:51 PM USER: aoldaker
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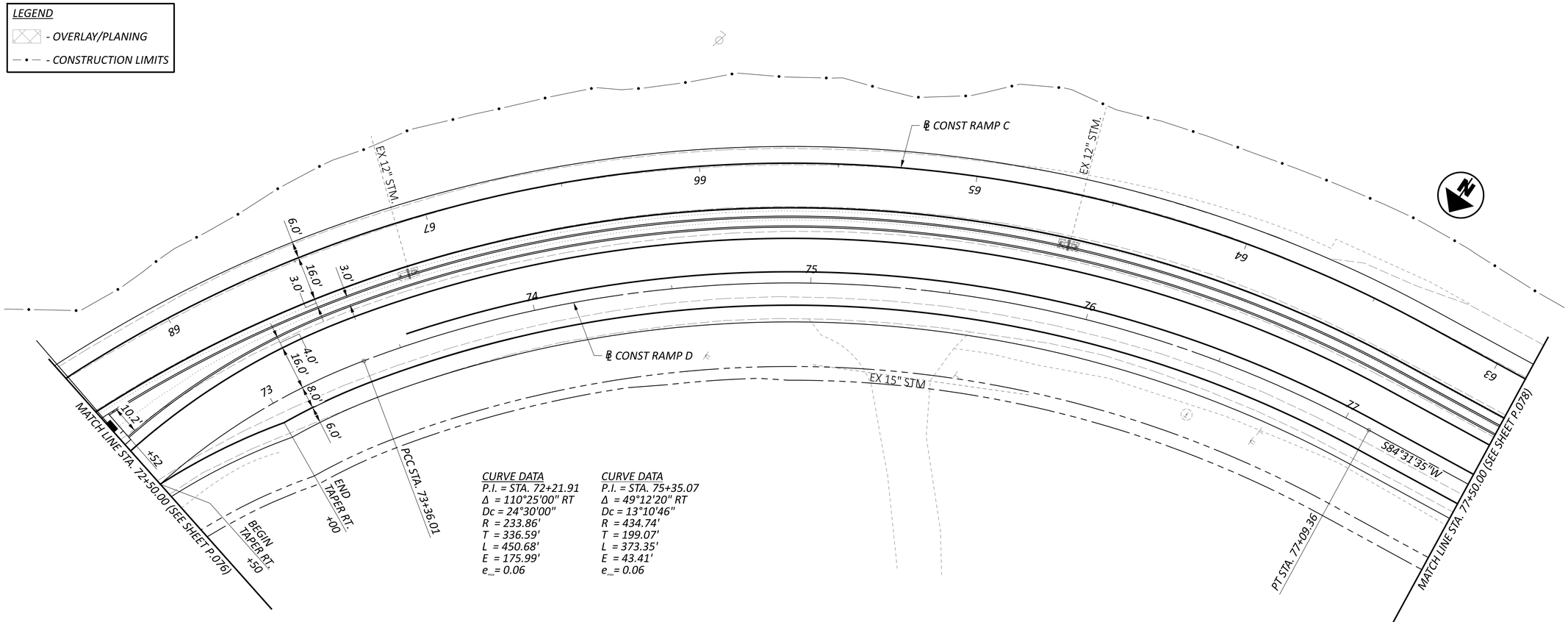
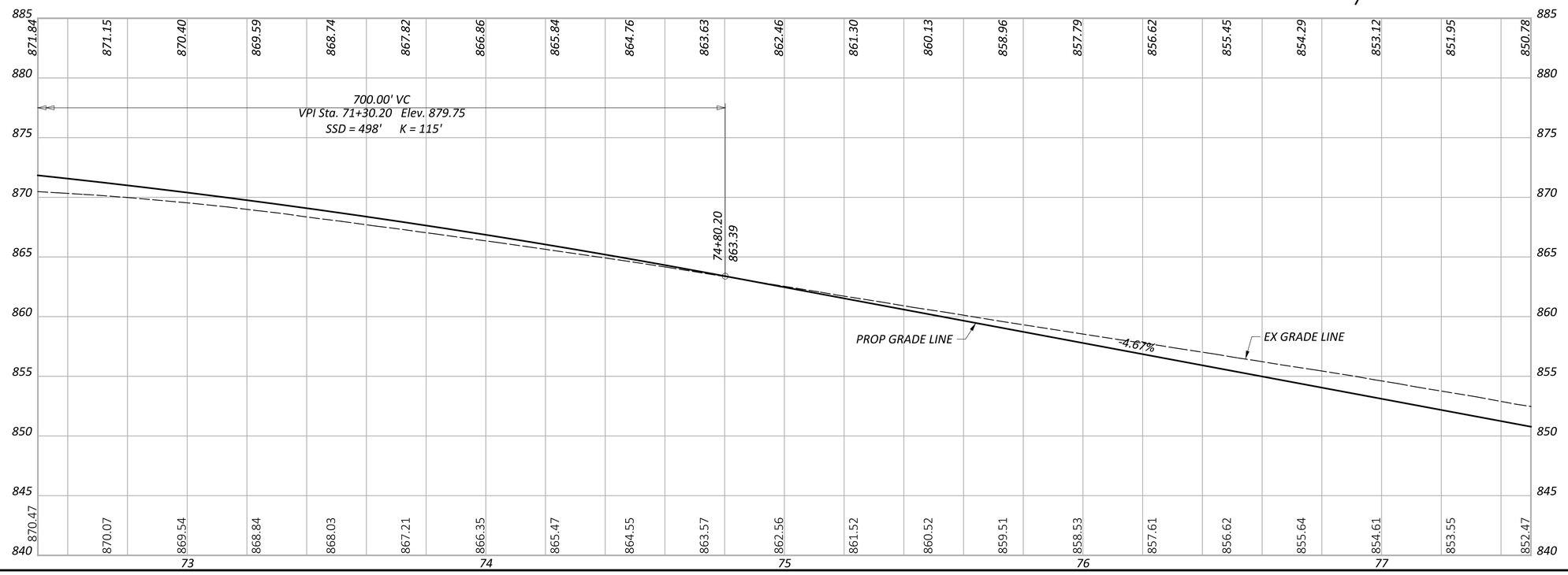




PLAN AND PROFILE - RAMP D
STA. 72+50.00 TO STA. 77+50.00

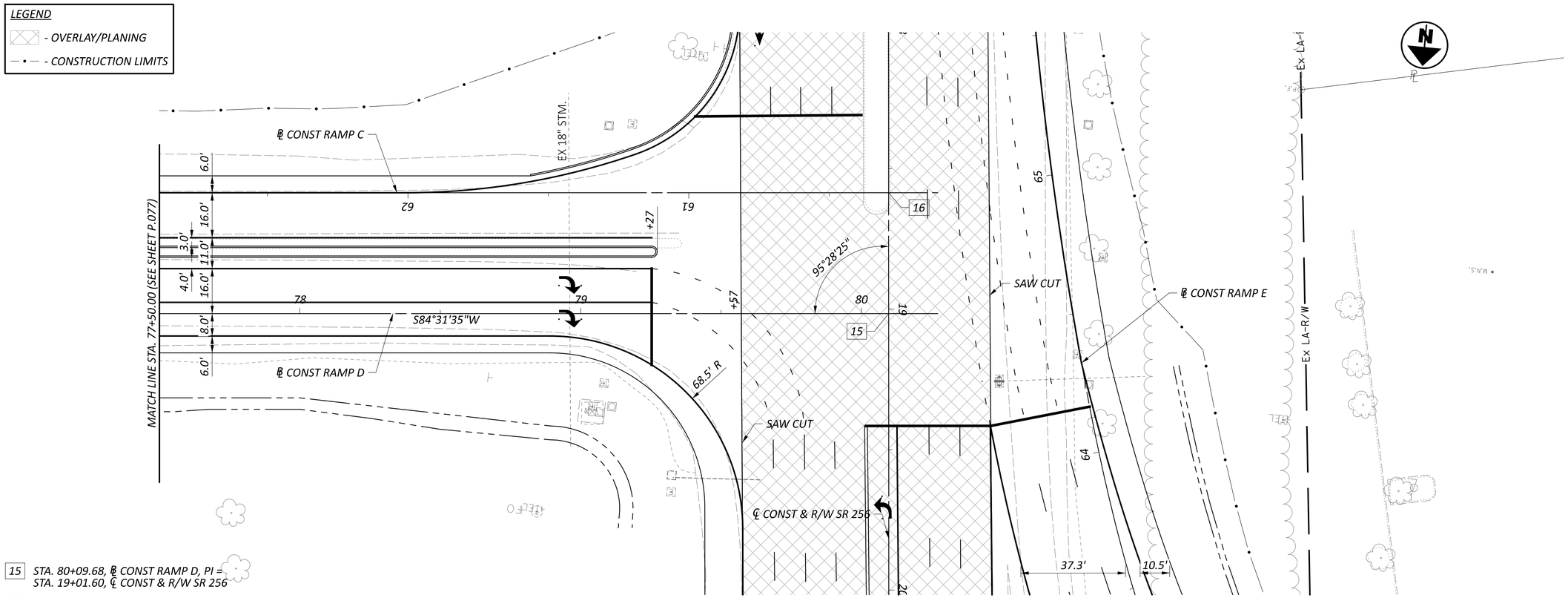
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

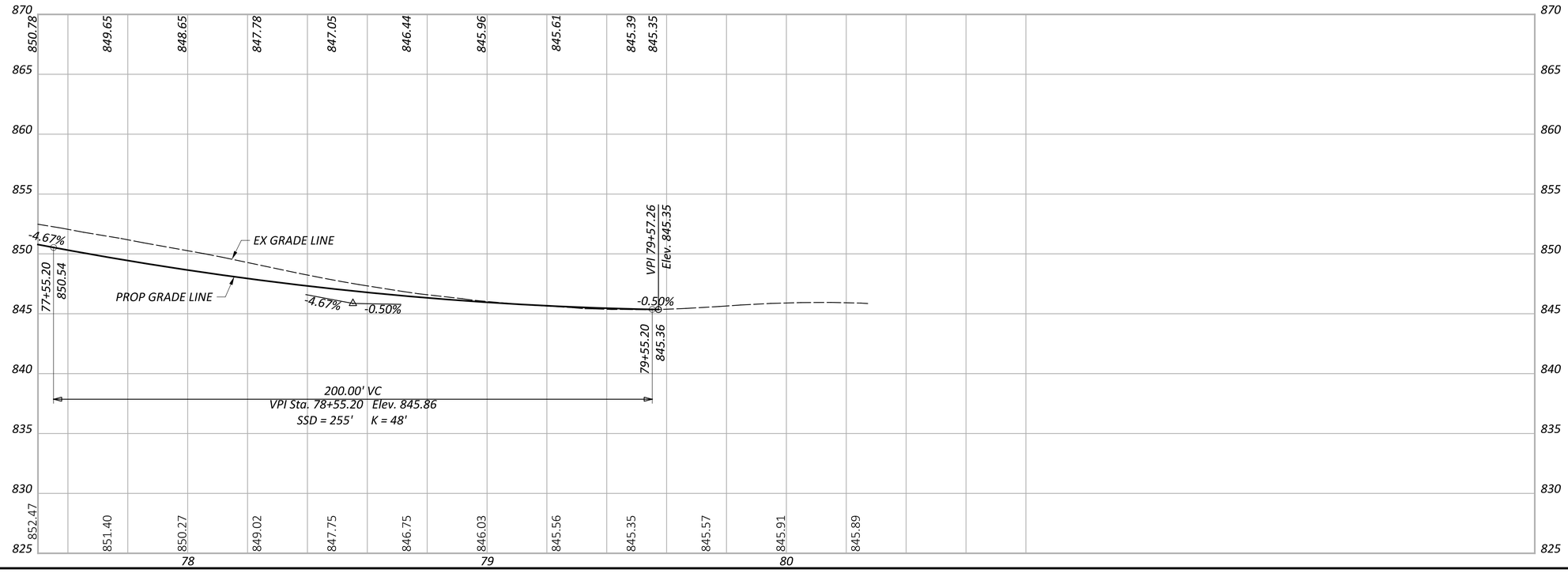
PROJECT ID
96808

SHEET P.077 TOTAL 740



15 STA. 80+09.68, ℄ CONST RAMP D, PI =
STA. 19+01.60, ℄ CONST & R/W SR 256

16 STA. 60+28.84, ℄ CONST RAMP C, PI =
STA. 18+58.60, ℄ CONST & R/W SR 256



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP D
STA. 77+50.00 TO STA. 80+27.15

DESIGN AGENCY
WSP/USA STRUCTUREPOINT INC.

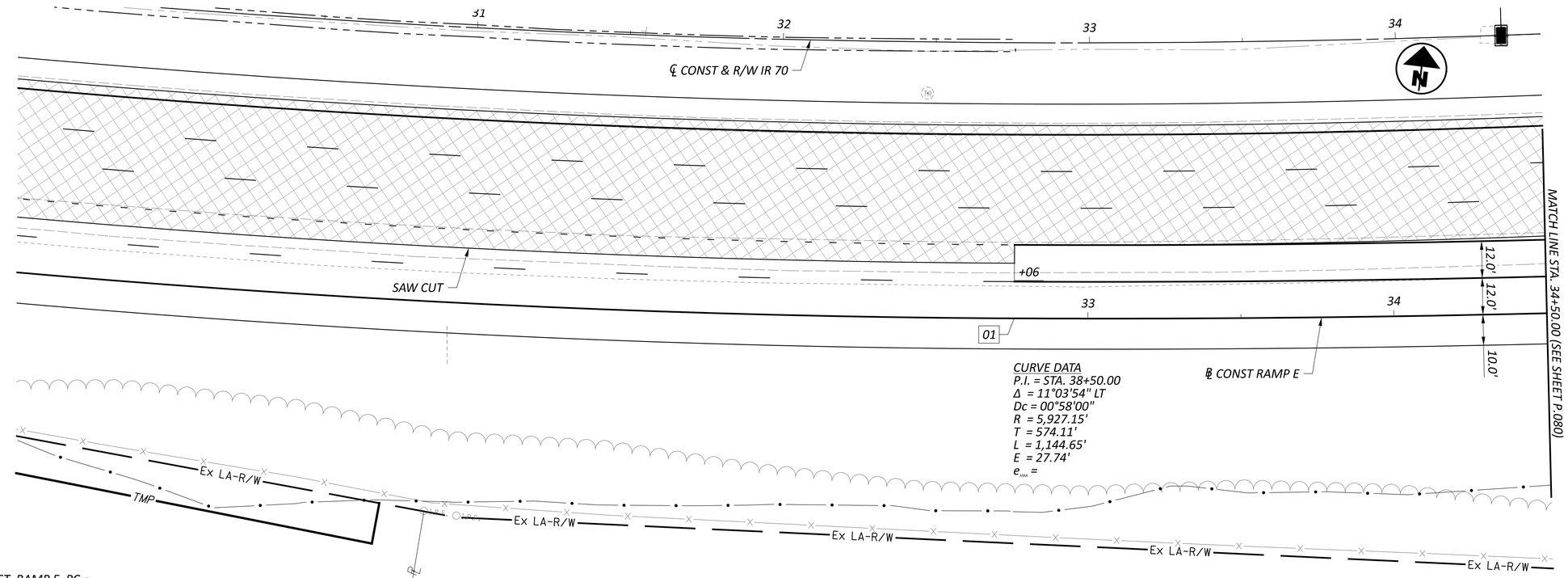
DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.078 TOTAL 740

FAI/LIC IR 70 0.00/0.00

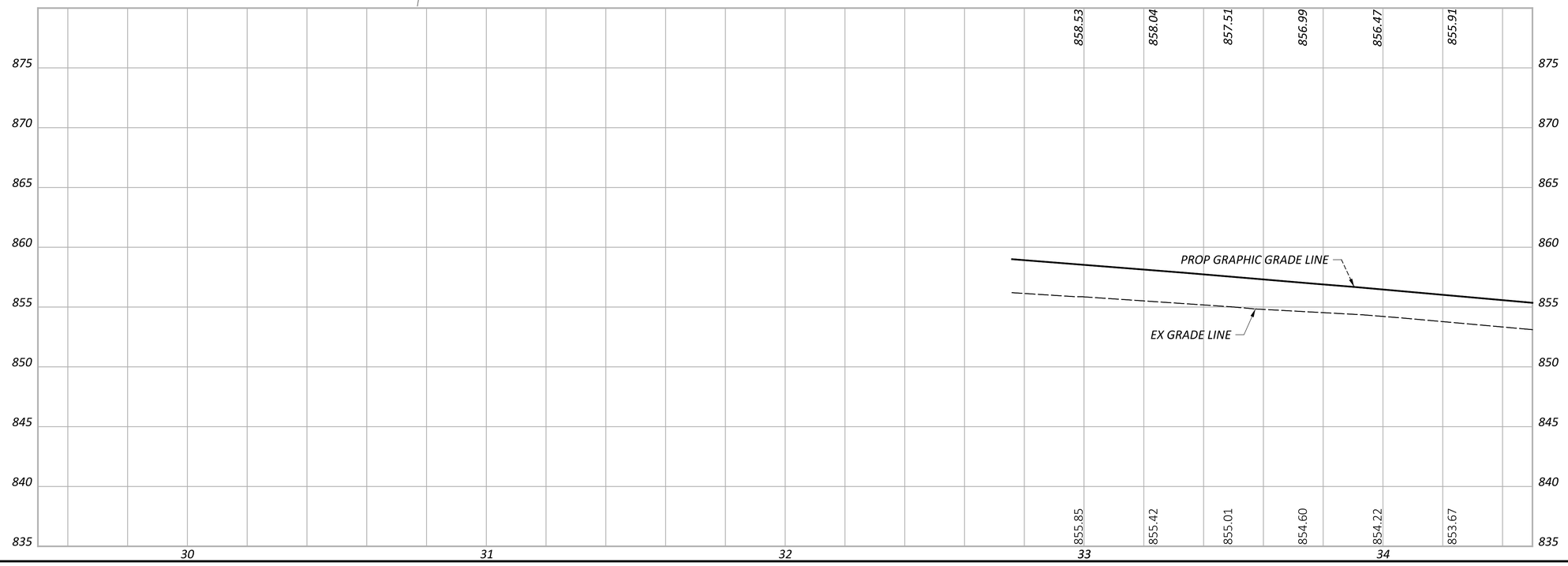
MODEL: BLP_R070D - Plan S PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:48:02 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP245.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



01 STA. 32+75.89, ℄ CONST RAMP E, PC =
STA. 32+75.89, 90.00' RT, ℄ CONST & R/W IR 70



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP E
STA. 32+75.89 TO STA. 34+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.079 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070E - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:48:19 PM USER: aoldaker
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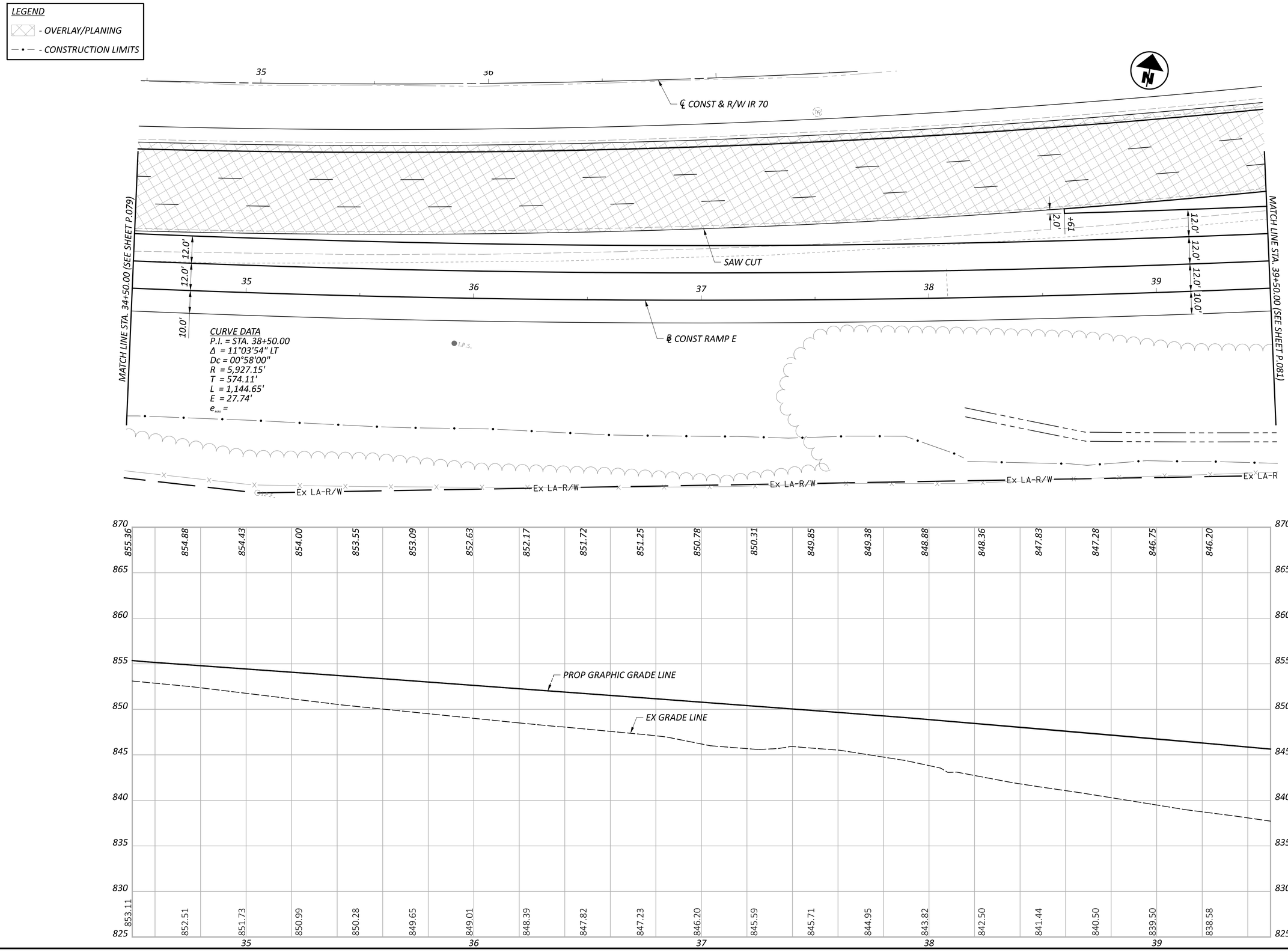

PLAN AND PROFILE - RAMP E
STA. 34+50.00 TO STA. 39+50.00

FAI/LIC IR 70 0.00/0.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.080 TOTAL 740

MODEL: BLP_R070E - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:48:32 PM USER: aoldaker
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LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

MATCH LINE STA. 39+50.00 (SEE SHEET P.080)

MATCH LINE STA. 44+50.00 (SEE SHEET P.082)

EX 12" STM.

℄ CONST RAMP E

℄ CONST RAMP K

TBR

24.0'

36.0'

10.0'

N72°29'31"E

PT STA. 44+20.54

STRUCTURE NO. FAI-070-0084 R

Ex LA-R/W

TMP

CURVE DATA
P.I. = STA. 38+50.00
Δ = 11°03'54" LT
Dc = 00°58'00"
R = 5,927.15'
T = 574.11'
L = 1,144.65'
E = 27.74'
e_{max} =

PROP GRAPHIC GRADE LINE

EX GRADE LINE

40	41	42	43	44
845.64	845.08	844.55	843.98	843.36
842.74	842.10	841.46	840.85	840.27
839.77	839.30	838.86	838.46	838.09
837.75	837.39	837.08	836.75	836.42
837.73	836.85	835.99	834.99	833.79
832.61	831.64	830.59	829.45	828.57
828.01	827.36	826.54	825.76	825.03
824.38	823.79	823.13	822.86	822.76

865 860 855 850 845 840 835 830 825 820

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP E
STA. 39+50.00 TO STA. 44+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER: BER
REVIEWER: KAM 06/18/23
PROJECT ID: 96808
SHEET: P.081 TOTAL: 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070E - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:11:56 AM USER: aoldaker
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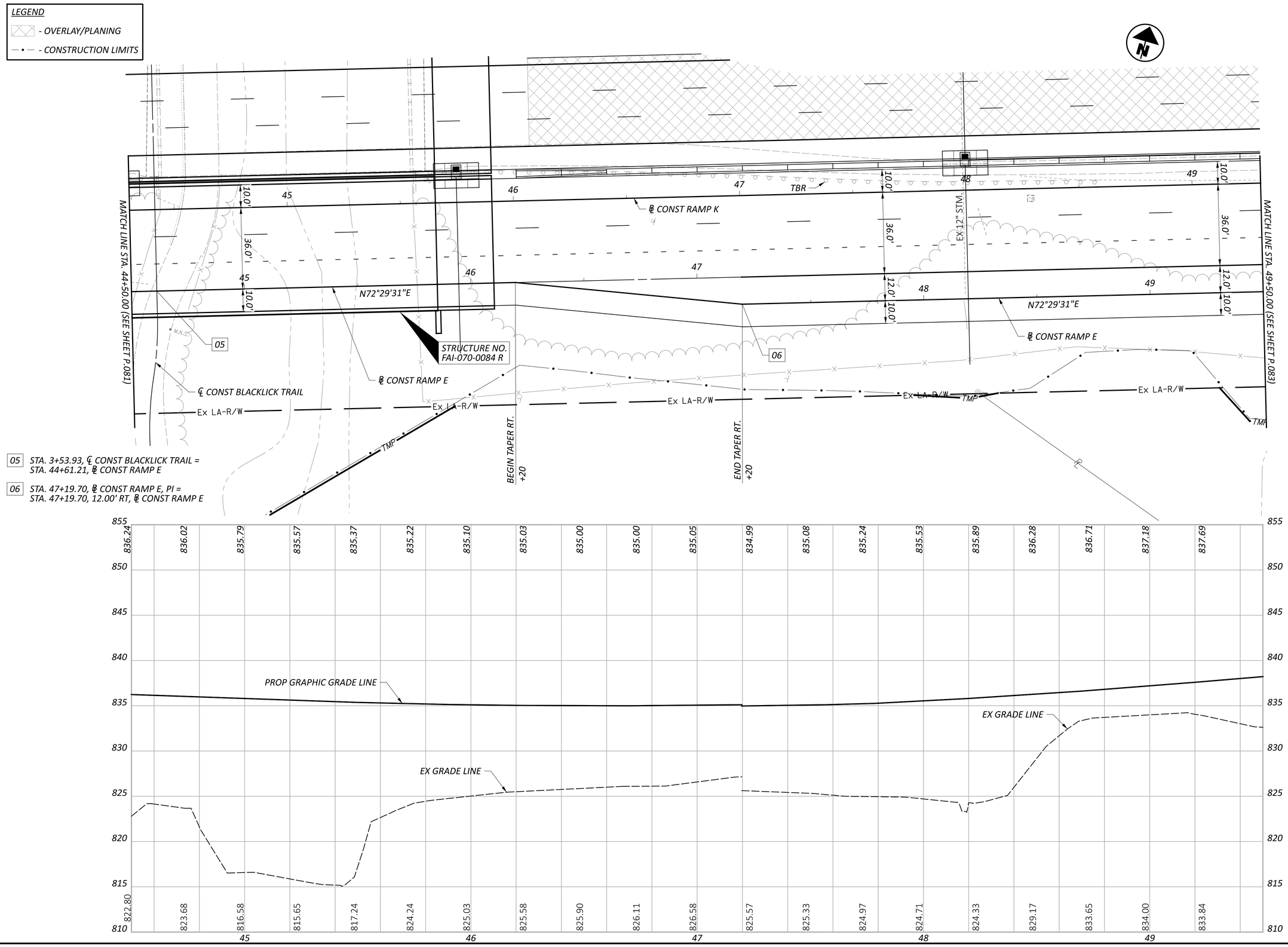


HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP E
STA. 44+50.00 TO STA. 49+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070E - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:12:23 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP254.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

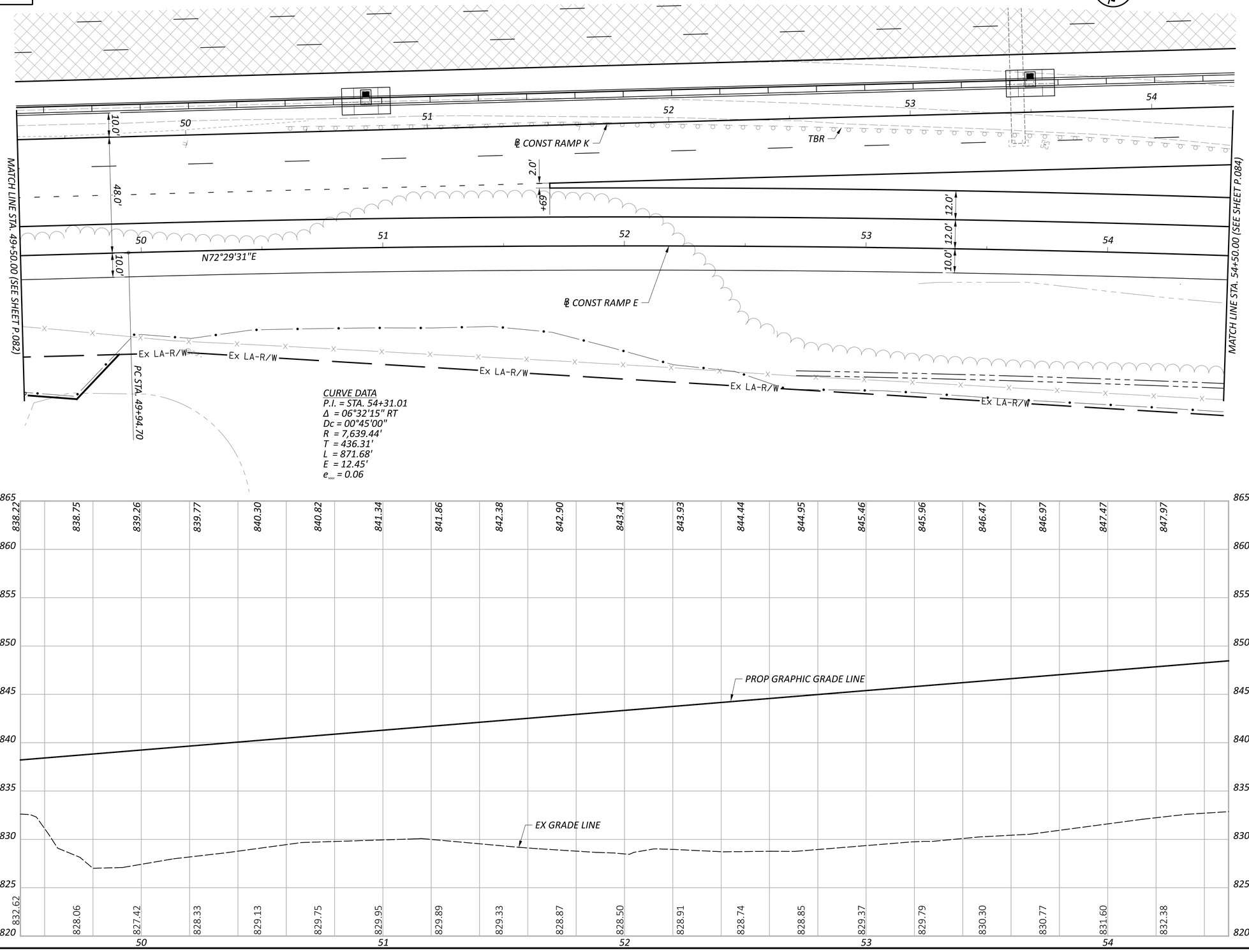
PROJECT ID
96808

SHEET P.082 TOTAL 740

MODEL: BLP_R070E - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:49:13 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP255.dgn

LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP E
STA. 49+50.00 TO STA. 54+50.00

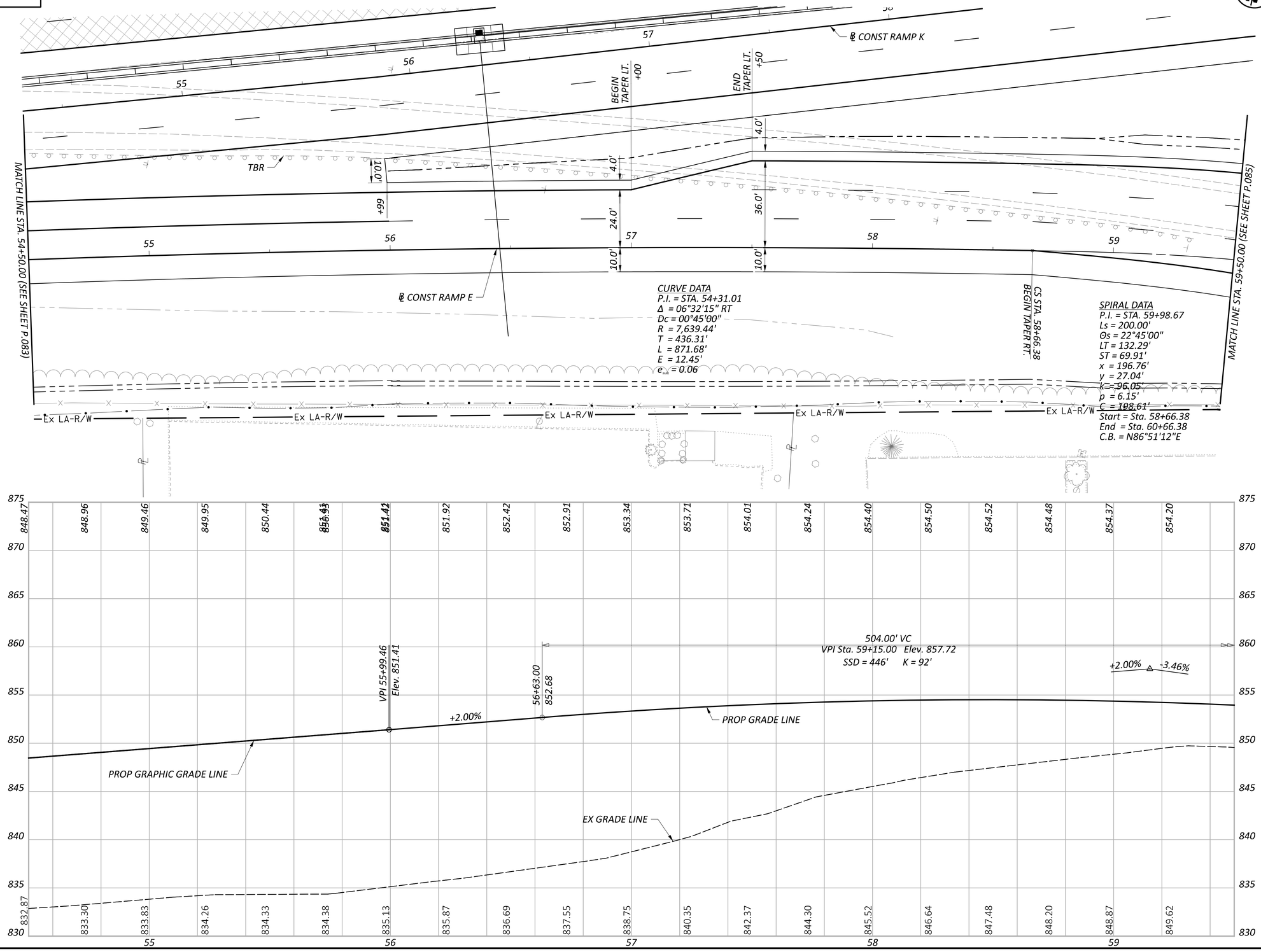
DESIGN AGENCY
WSP USA STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.083
TOTAL	740

MODEL: BLP_R070E - Plan 6 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:49:27 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP256.dgn

LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP E
STA. 54+50.00 TO STA. 59+50.00

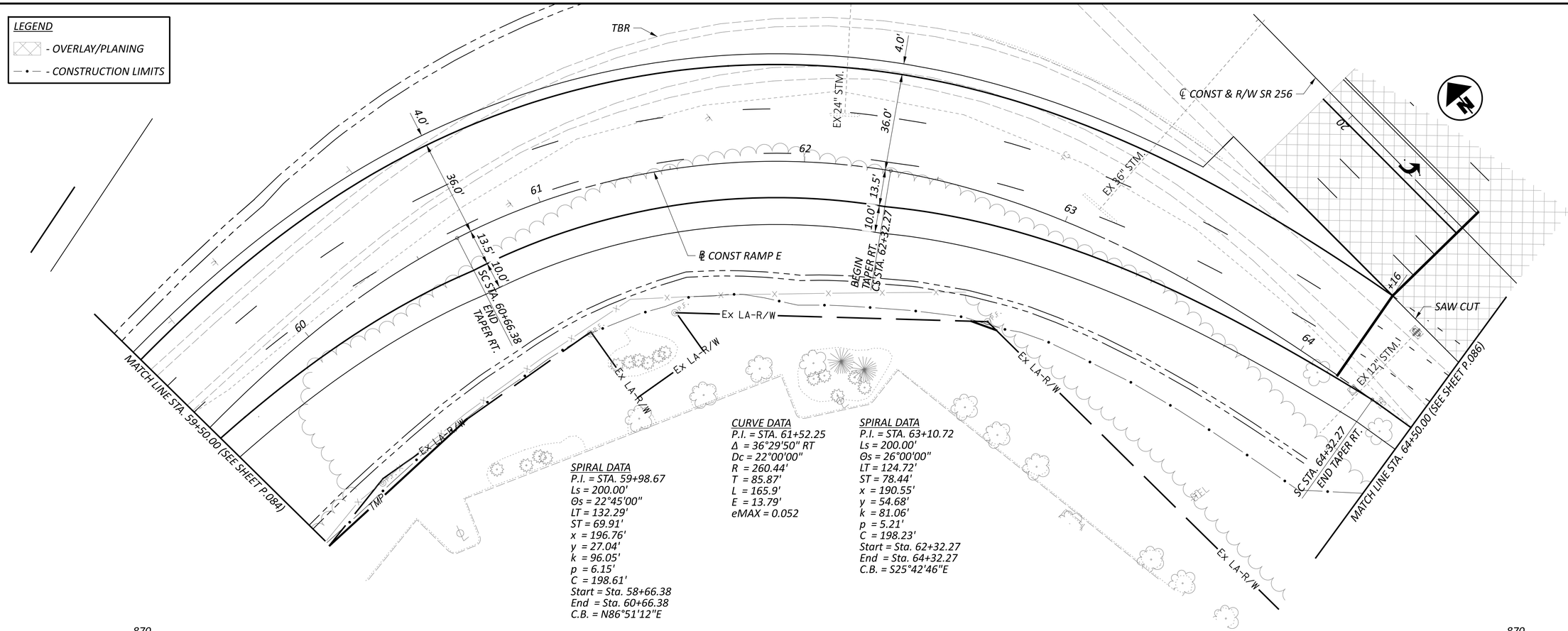
DESIGN AGENCY
STRUCTUREPOINT LLC

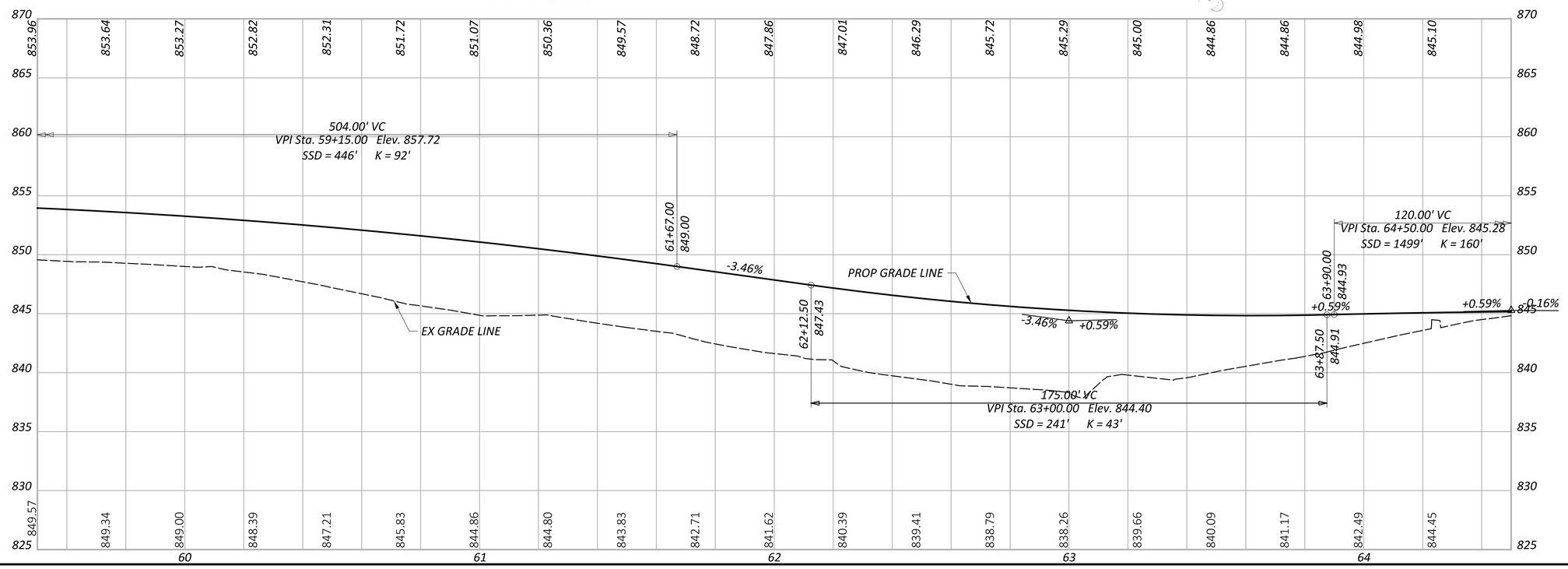
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.084 TOTAL 740





PLAN AND PROFILE - RAMP E
STA. 59+50.00 TO STA. 64+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

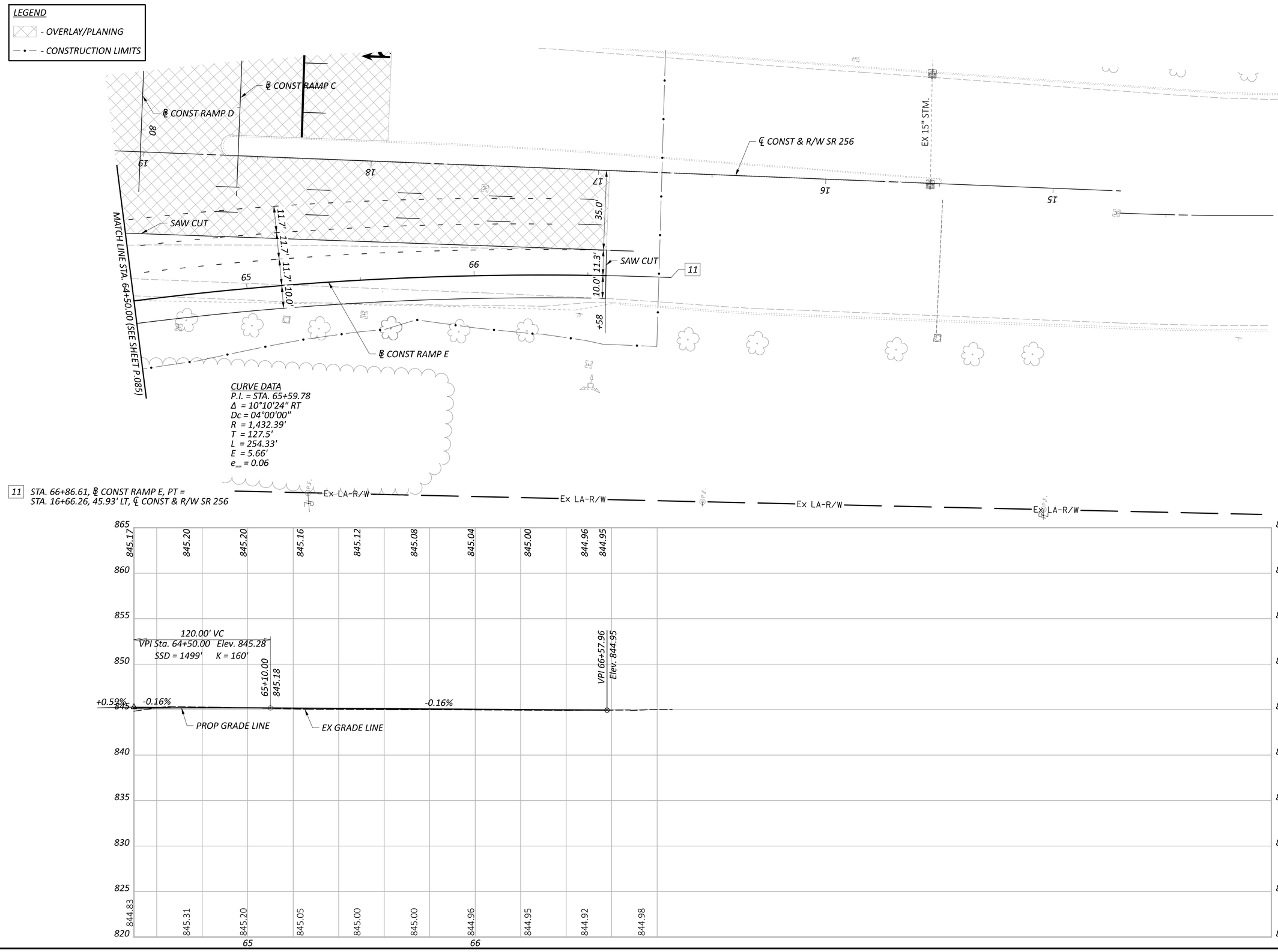
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.085 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070E - Plan 7 PAPERSIZE: 34x22 (in.) DATE: 8/28/2023 TIME: 11:22:25 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\v401-Engineering_StructurePoint\Roadway\Sheets\96808_GP257.dgn



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP E
STA. 64+50.00 TO STA. 66+86.61

FAI/LIC IR 70 0.00/0.00

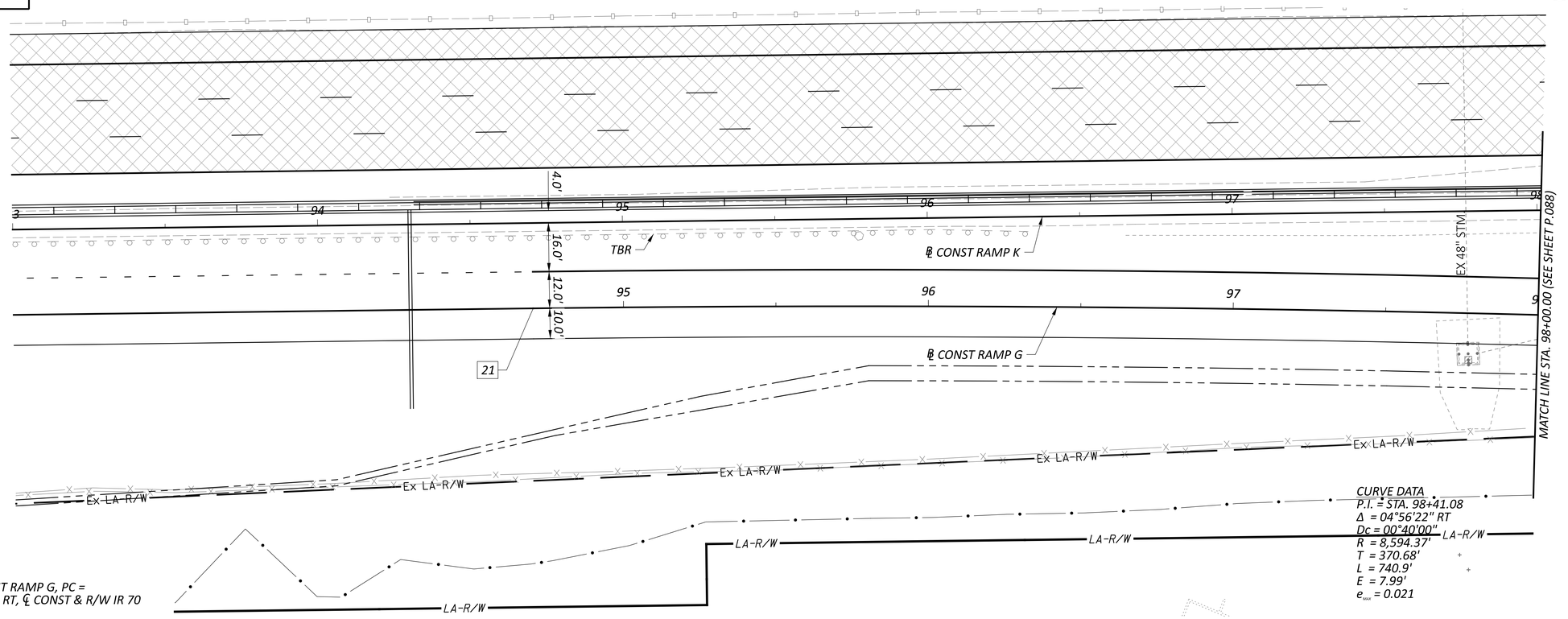
MODEL: BLP_R070E - Plan 8 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:49:55 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP258.dgn

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.086 TOTAL 740

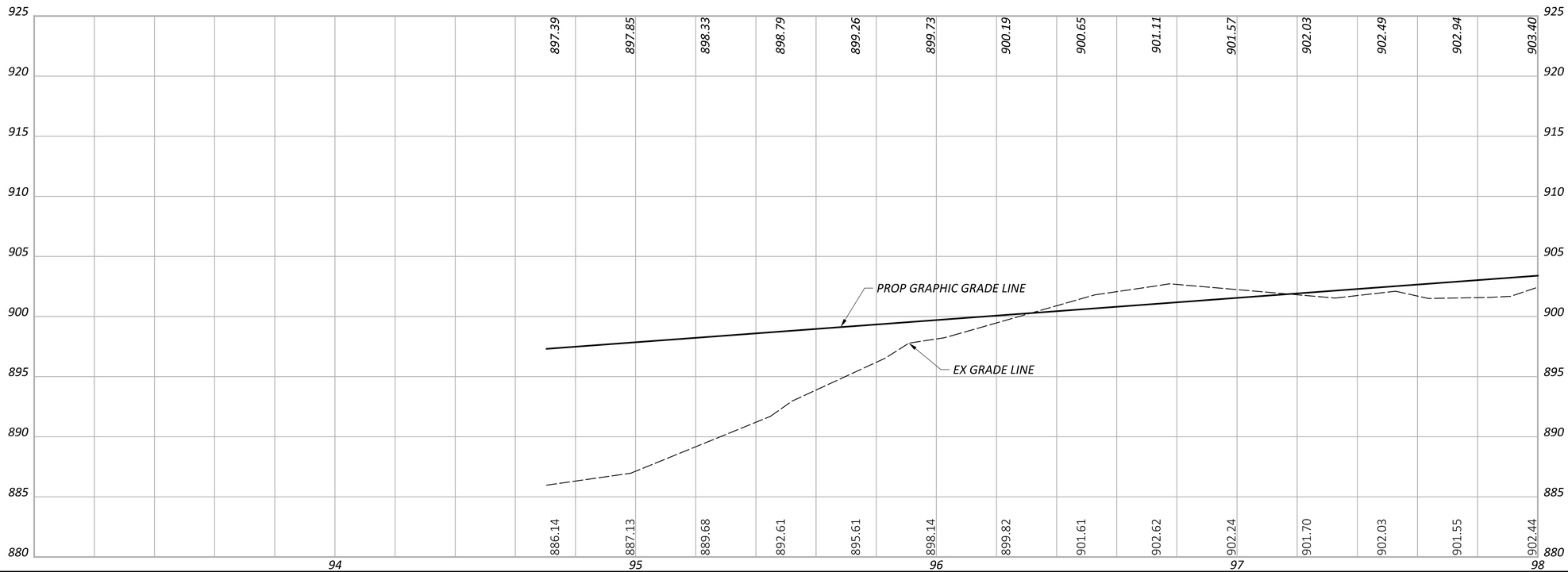
LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



21 STA. 94+70.40, ℄ CONST RAMP G, PC =
STA. 94+65.20, 112.00' RT, ℄ CONST & R/W IR 70

CURVE DATA
P.I. = STA. 98+41.08
Δ = 04°56'22" RT
Dc = 00°40'00"
R = 8,594.37'
T = 370.68'
L = 740.9'
E = 7.99'
e_{max} = 0.021



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP G (CONC)
STA. 94+70.40 TO STA. 98+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

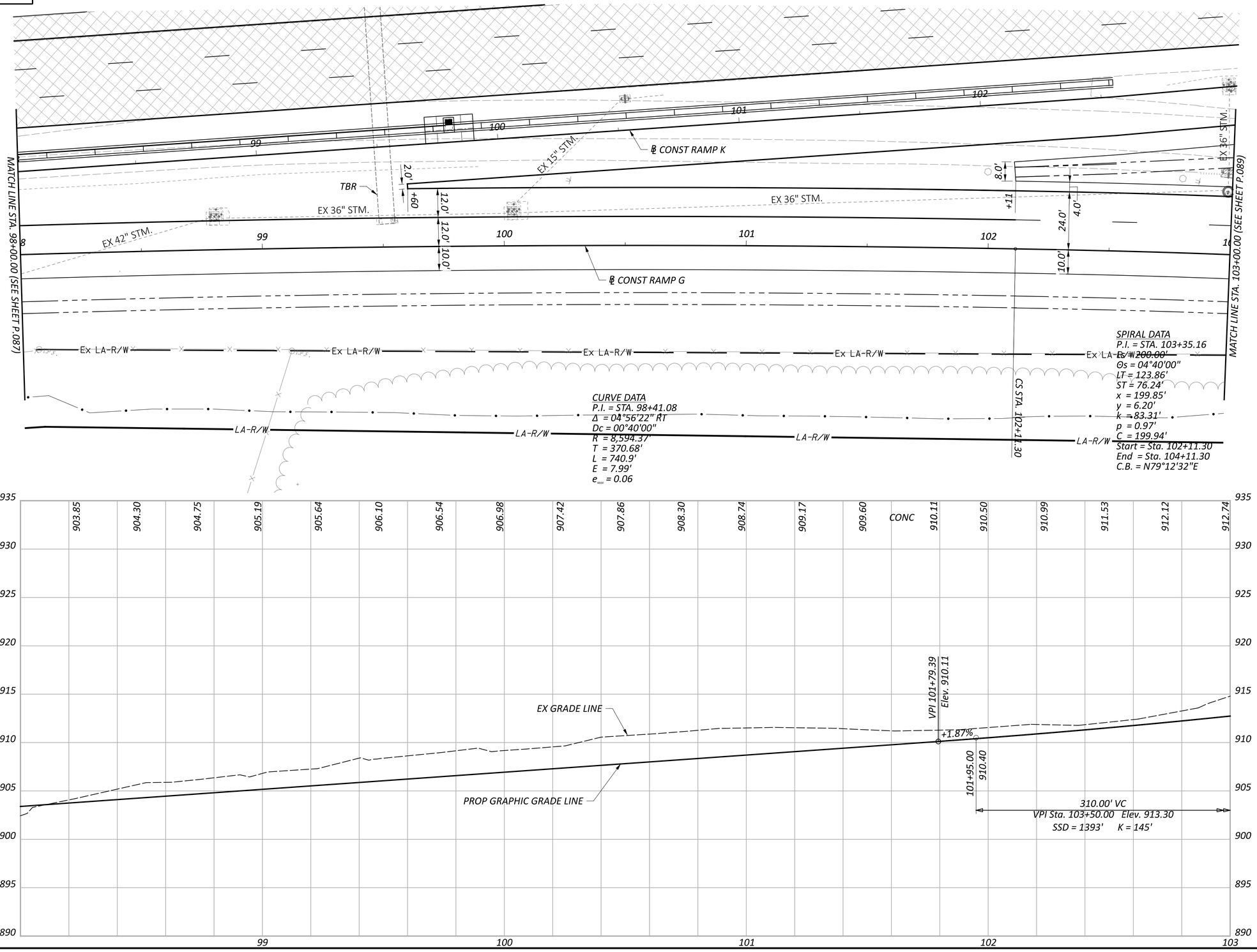
DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.087 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070G - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 11:14:02 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP261.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP G (CONC)
STA. 98+00.00 TO STA. 103+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R07DG - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:50:23 PM USER: aoldaker
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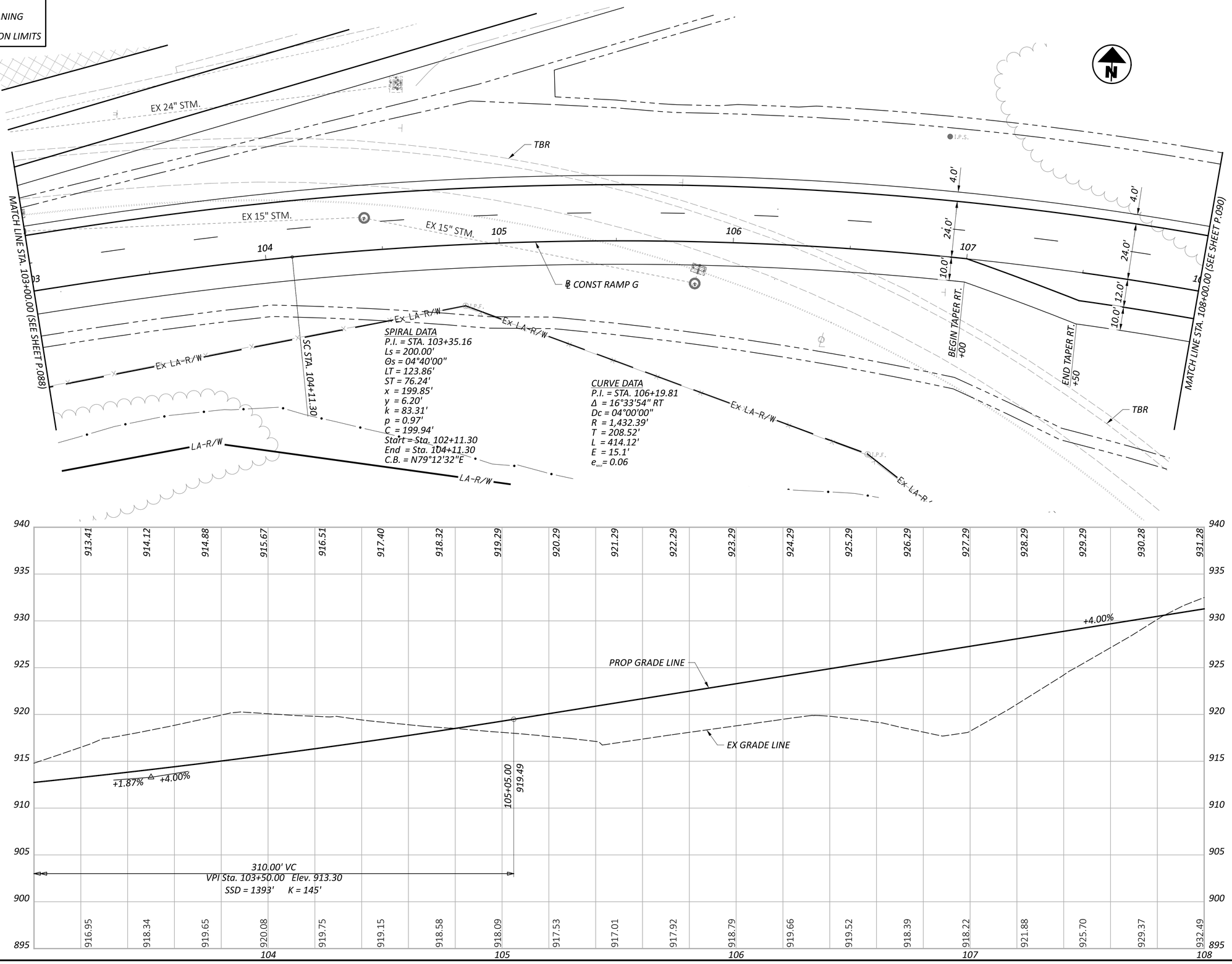
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.088
TOTAL	740

MODEL: BLP_R070G - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:50:35 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP263.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP G (CONC)
STA. 103+00.00 TO STA. 108+00.00

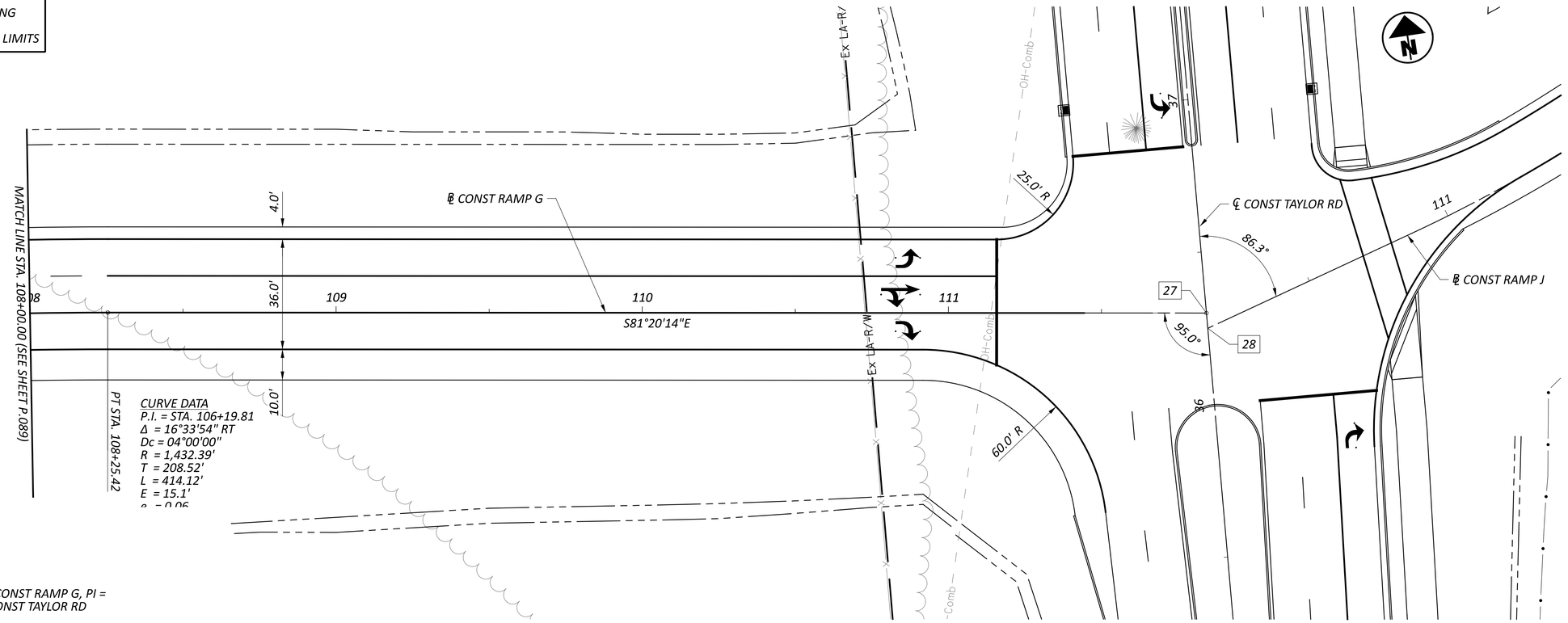
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.089
TOTAL	740

MODEL: BLP_R070G - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:50:48 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP264.dgn

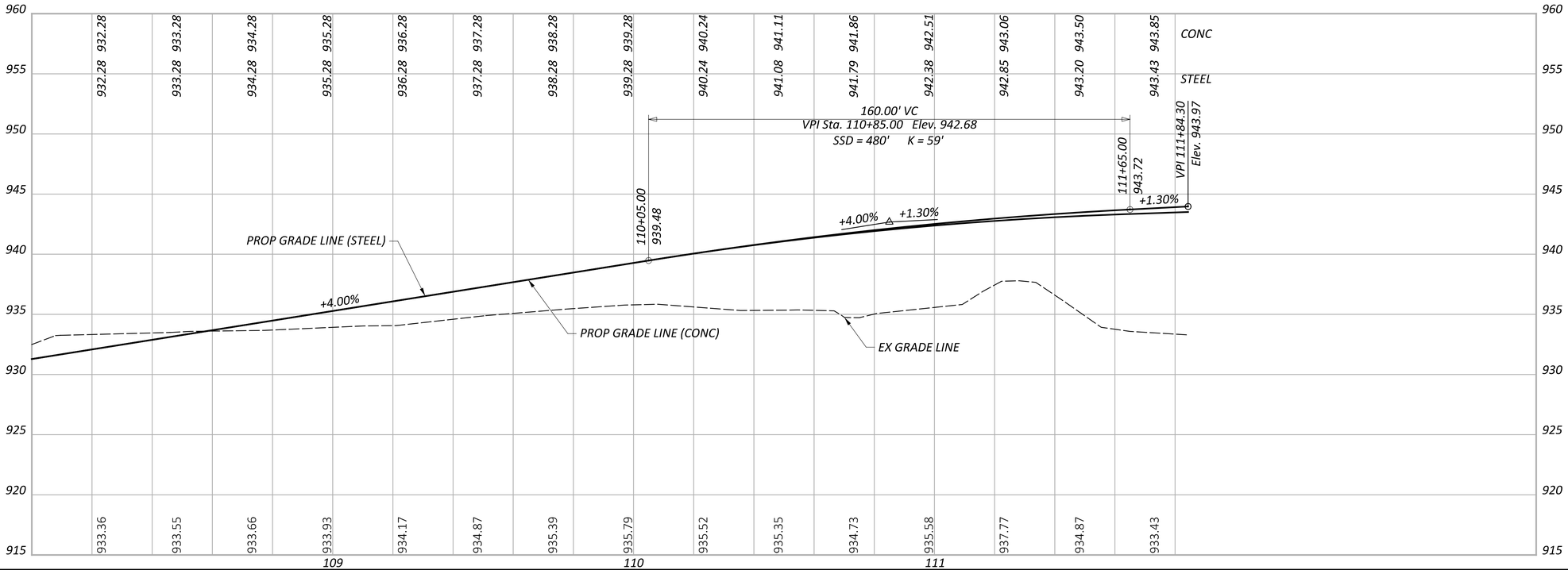
LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*



27 *STA. 111+84.30, ℄ CONST RAMP G, PI = STA. 36+30.00, ℄ CONST TAYLOR RD*

28 *STA. 110+13.40, ℄ CONST RAMP J, PI = STA. 36+25.00, ℄ CONST TAYLOR RD*



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP G (CONC)
STA. 108+00.00 TO STA. 111+84.30

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.090
TOTAL	740

PROFILE - RAMP G (STEEL)

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:57:16 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF201_S.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

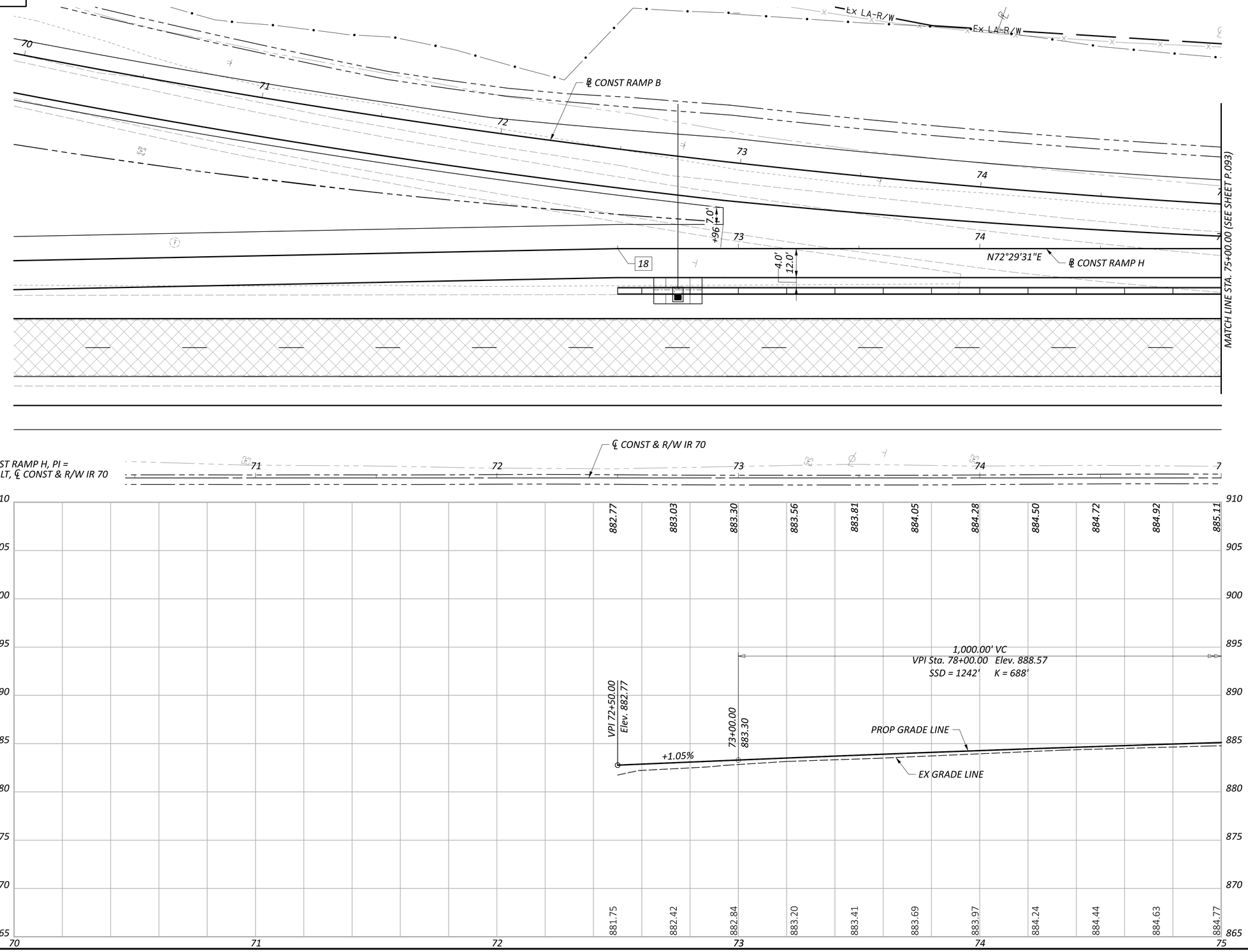
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.091 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



18 STA. 72+50.00, ℄ CONST RAMP H, PI =
STA. 72+50.00, 95.00' LT, ℄ CONST & R/W IR 70

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP H (CONC)
STA. 72+50.00 TO STA. 75+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.092 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:51:22 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP271.dgn

MODEL: BLP_R070H - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 10:04:50 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\d01-Engineering_StructurePoint\Roadway\Sheets\96808_GP272.dgn

LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*

HORIZONTAL SCALE IN FEET
0 10 20 40

Ex LA-R/W

℄ CONST RAMP B

℄ CONST RAMP H

℄ CONST & R/W IR 70

I.P.S.

OH-E

MATCH LINE STA. 75+00.00 (SEE SHEET P.092)

MATCH LINE STA. 80+00.00 (SEE SHEET P.094)

+98

2.0'

4.0'

12.0'

10.0'

N72°29'31"E

1,000.00' VC
VPI Sta. 78+00.00 Elev. 888.57
SSD = 1242' K = 688'

+1.05% -0.40%

PROP GRADE LINE

EX GRADE LINE

75 76 77 78 79 80

910 905 900 895 890 885 880 875 870 865

885.11 885.30 885.48 885.65 885.81 885.96 886.10 886.23 886.35 886.46 886.57 886.66 886.75 886.83 886.90 886.95 887.00 887.04 887.08 887.10 887.11

884.77 884.91 885.06 885.22 885.27 885.46 885.59 885.73 885.86 885.96 886.02 886.05 886.12 886.20 886.19 886.25 886.35 886.35 886.30 886.28 886.30

PLAN AND PROFILE - RAMP H (CONC)
STA. 75+00.00 TO STA. 80+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

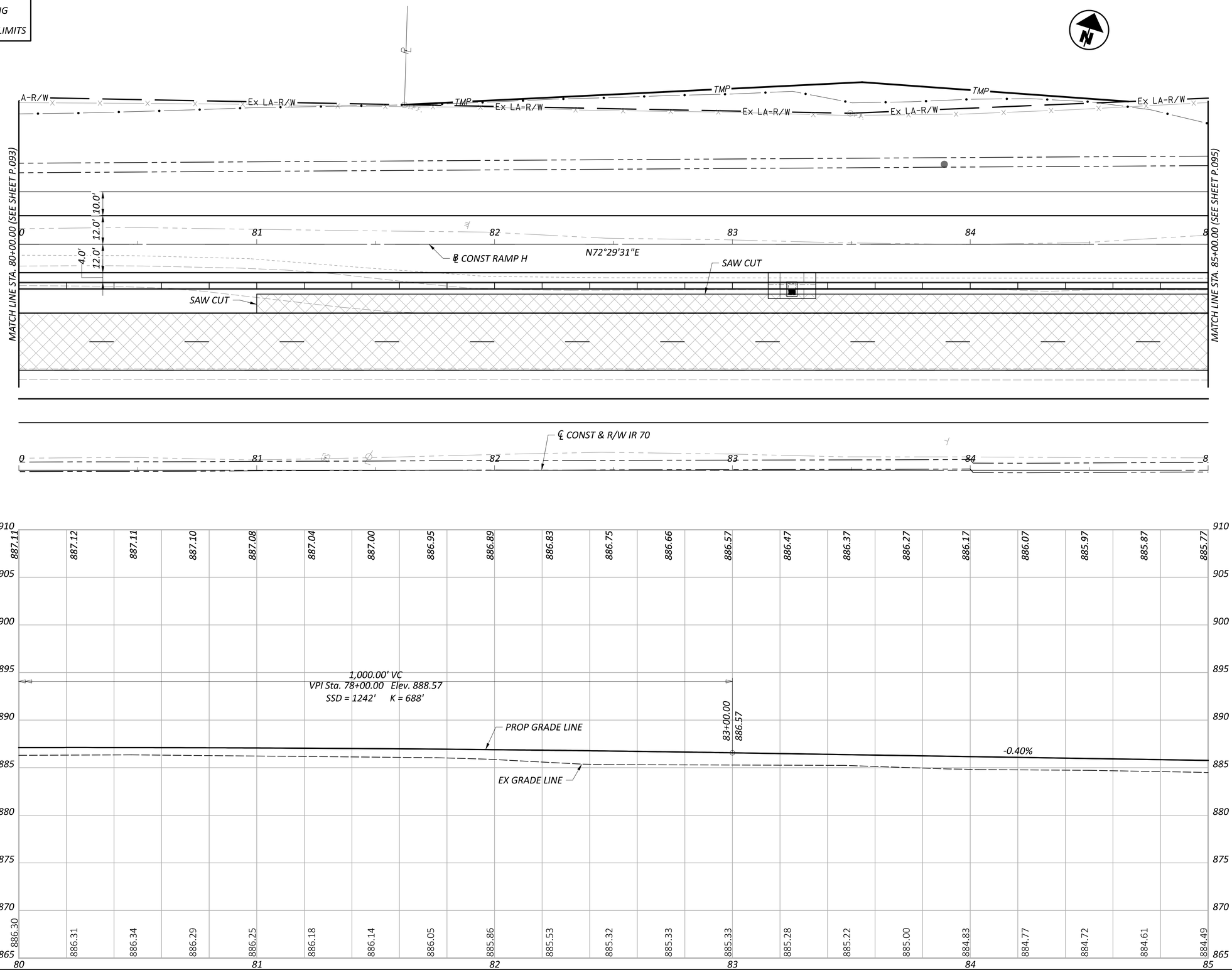
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.093 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP H (CONC)
STA. 80+00.00 TO STA. 85+00.00

DESIGN AGENCY
MIDWEST STRUCTUREPOINT INC

DESIGNER: BER
REVIEWER: KAM 06/18/23
PROJECT ID: 96808
SHEET: P.094 TOTAL: 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:51:48 PM USER: aoldaker
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FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:52:00 PM USER: aoldaker
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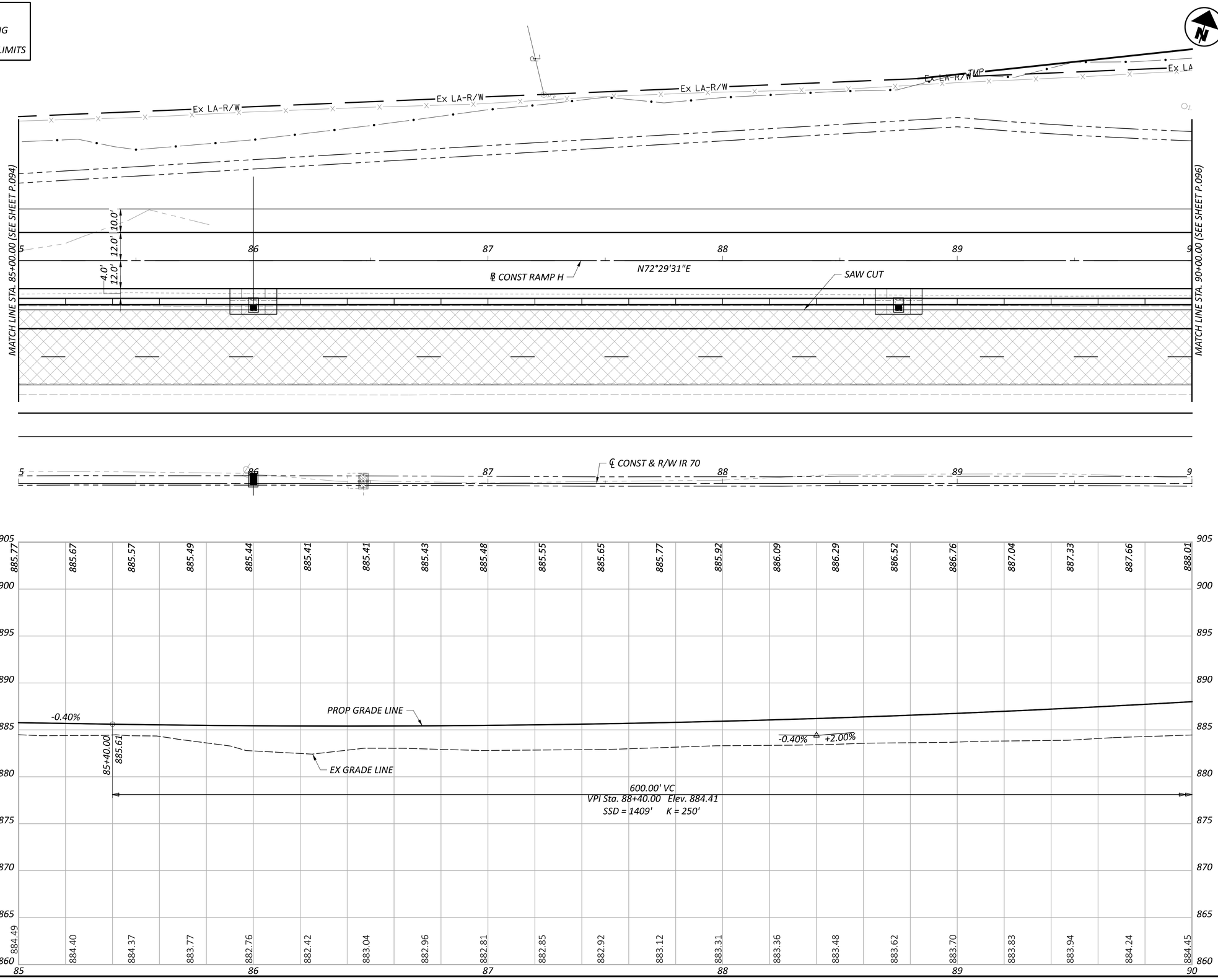
LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP H (CONC)
STA. 85+00.00 TO STA. 90+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.095
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 8/28/2023 TIME: 12:08:52 PM USER: sott
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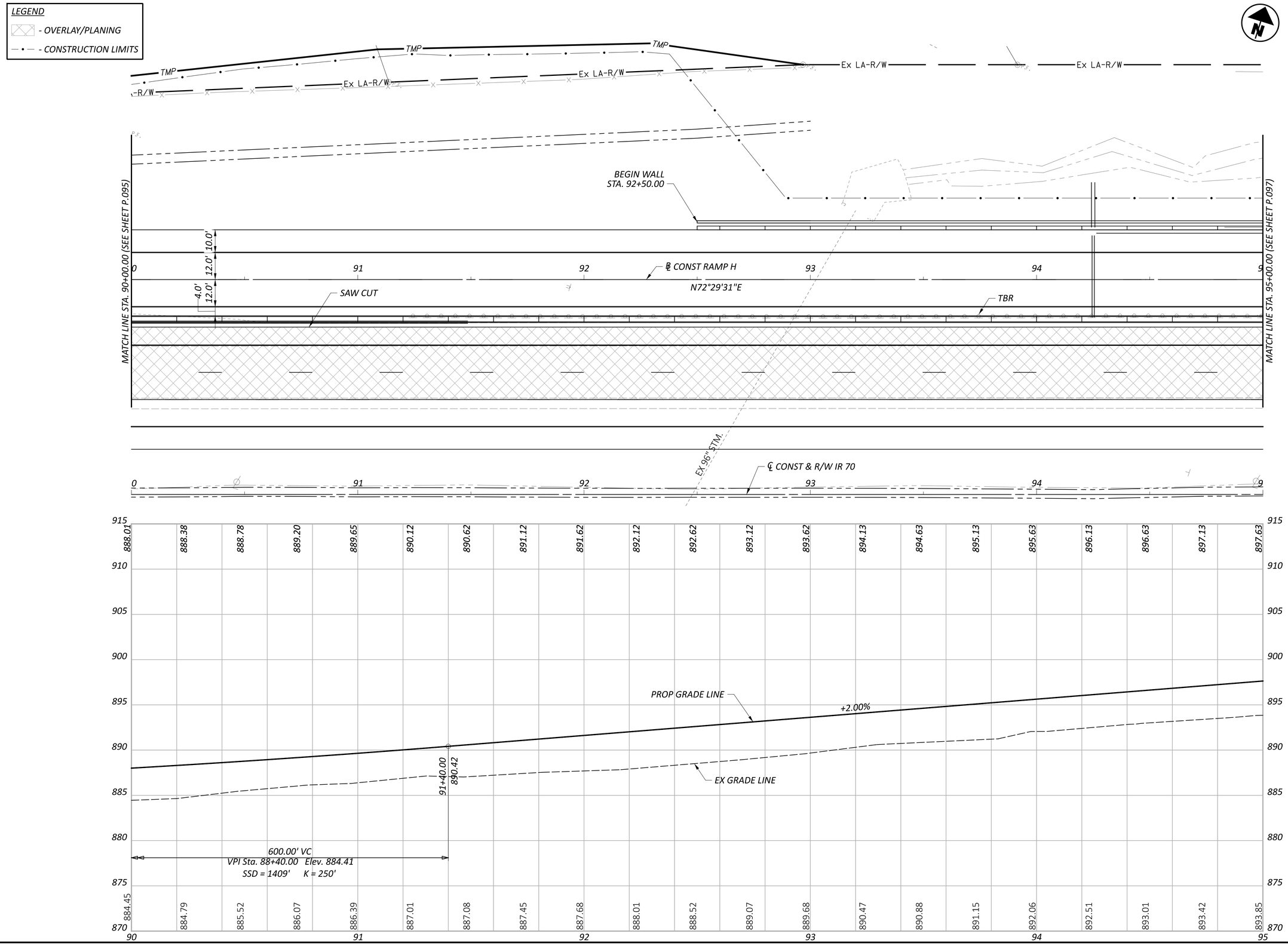


HORIZONTAL SCALE IN FEET
0 10 20 40

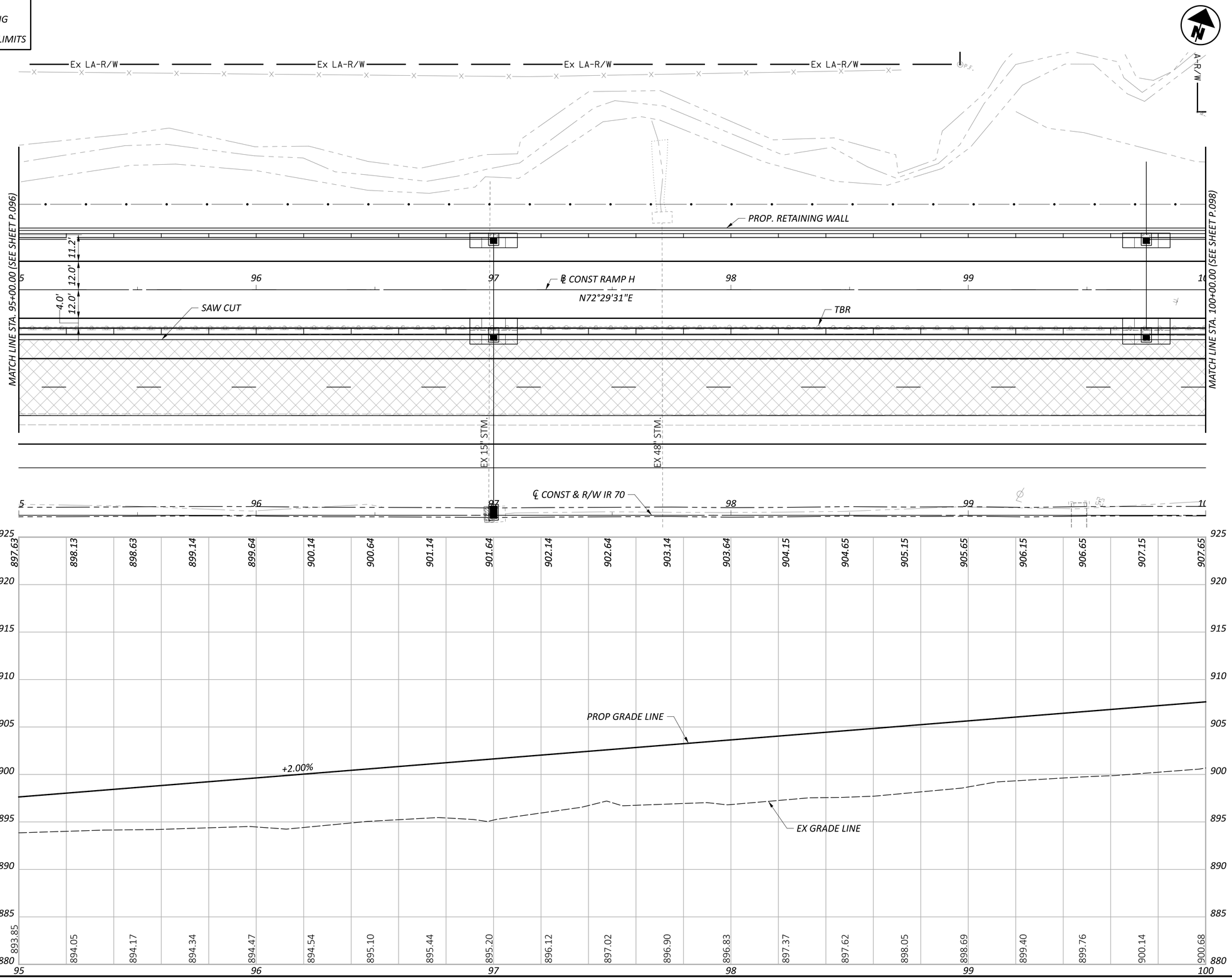
PLAN AND PROFILE - RAMP H (CONC)
STA. 90+00.00 TO STA. 95+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.096
TOTAL	740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP H (CONC)
STA. 95+00.00 TO STA. 100+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan 6 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:52:25 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP276.dgn

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.097 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R07OH - Plan 7 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:52:37 PM USER: aoldaker
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LEGEND

- *OVERLAY/PLANING*
- *CONSTRUCTION LIMITS*

CURVE DATA
P.I. = STA. 104+23.74
Δ = 07°24'50" LT
Dc = 03°00'00"
R = 1,909.86'
T = 123.74'
L = 247.13'
E = 4.00'
e_{max} = 0.06

HORIZONTAL SCALE IN FEET
0 10 20 40

Ex LA-R/W

BEGIN WALL STA. 103+50.00

PC STA. 103+00.00

MATCH LINE STA. 100+00.00 (SEE SHEET P.097)

MATCH LINE STA. 105+00.00 (SEE SHEET P.099)

11.2'
12.0'
4.0'
12.0'

℄ CONST RAMP H

N72°29'31"E

TBR

SAW CUT

℄ CONST & R/W IR 70

PROP GRADE LINE

+2.00% *+5.00%*

EX GRADE LINE

100+95.00
909.56

410.00' VC
VPI Sta. 103+00.00 Elev. 913.66
SSD = 654' K = 137'

100	101	102	103	104	105
907.65	908.15	908.65	909.15	909.66	910.19	910.77	911.39	912.06	912.78	913.54	914.35	915.20	916.10	917.04	918.03	919.07	920.15	921.27	922.45	923.66
900.68	901.55	902.14	902.72	903.65	904.16	904.60	904.65	905.03	905.35	905.94	906.41	906.87	907.16	907.36	907.51	907.86	907.65	907.02	906.29	905.36

940 935 930 925 920 915 910 905 900 895

PLAN AND PROFILE - RAMP H (CONC)
STA. 100+00.00 TO STA. 105+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.098 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan B PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:52:49 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP278.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 104+23.74
Δ = 07°24'50" LT
Dc = 03°00'00"
R = 1,909.86'
T = 123.74'
L = 247.13'
E = 4.00'
e_{max} = 0.06

PT STA. 105+47.13

Ex LA-R/W

℄ CONST RAMP H

LA-R/W

END WALL
STA. 108+50.00

11.2'
12.0'
4.0'
12.0'

N65°04'41"E

END WALL
STA. 108+00.00

MATCH LINE STA. 105+00.00 (SEE SHEET P.098)

MATCH LINE STA. 110+00.00 (SEE SHEET P.100)

CURVE DATA
P.I. = STA. 111+15.77
Δ = 08°35'05" RT
Dc = 03°00'00"
R = 1,909.86'
T = 143.35'
L = 286.15'
E = 5.37'
e_{max} = 0.06

PC STA. 109+72.43

EX 15" STM.

PROP GRADE LINE

+5.00%

EX GRADE LINE

VPI Sta. 103+00.00 Elev. 913.66
SSD = 654' K = 137'

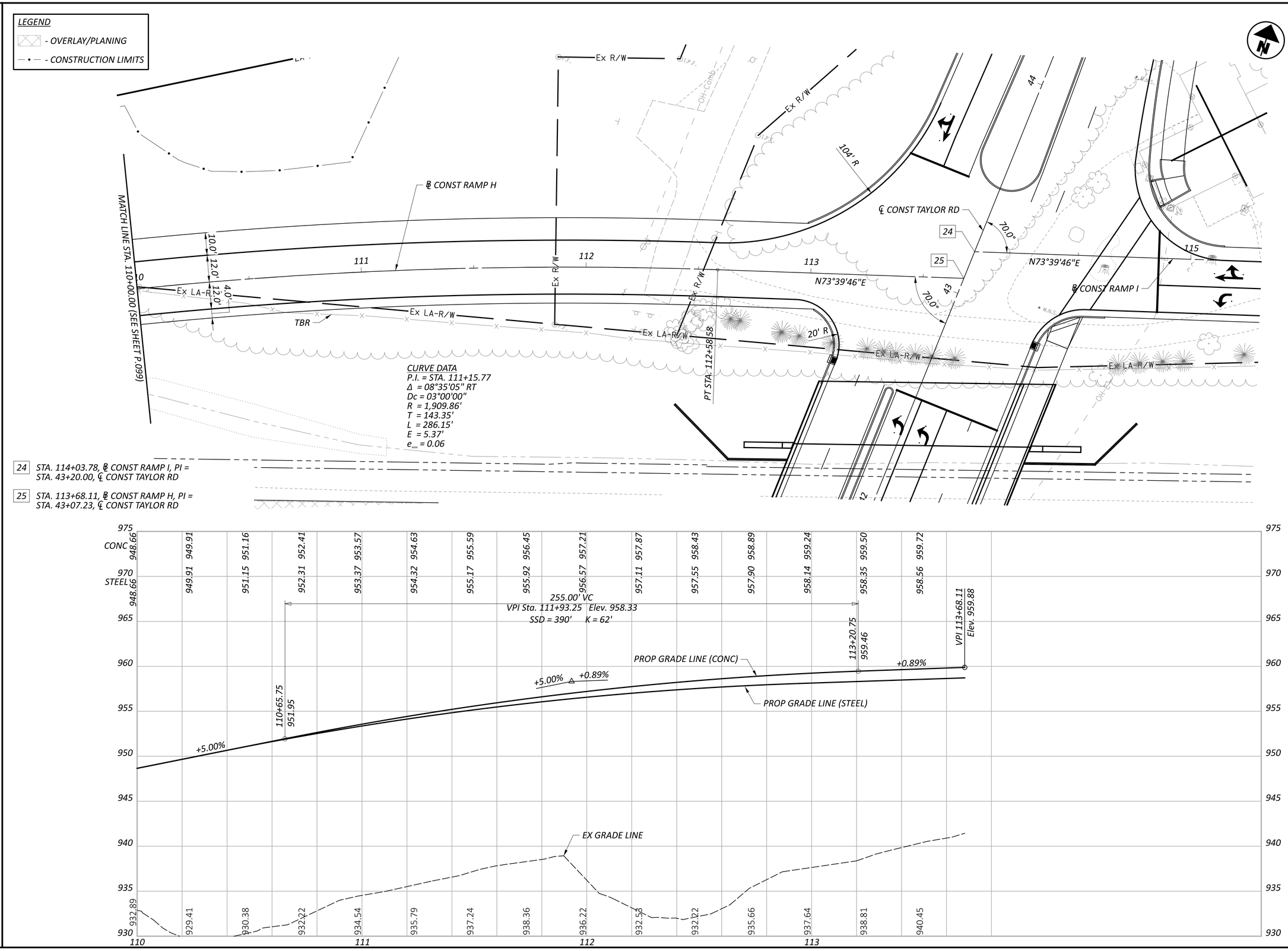
105+05.00
923.91
410.00'

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP H (CONC)
STA. 105+00.00 TO STA. 110+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.099
TOTAL	740



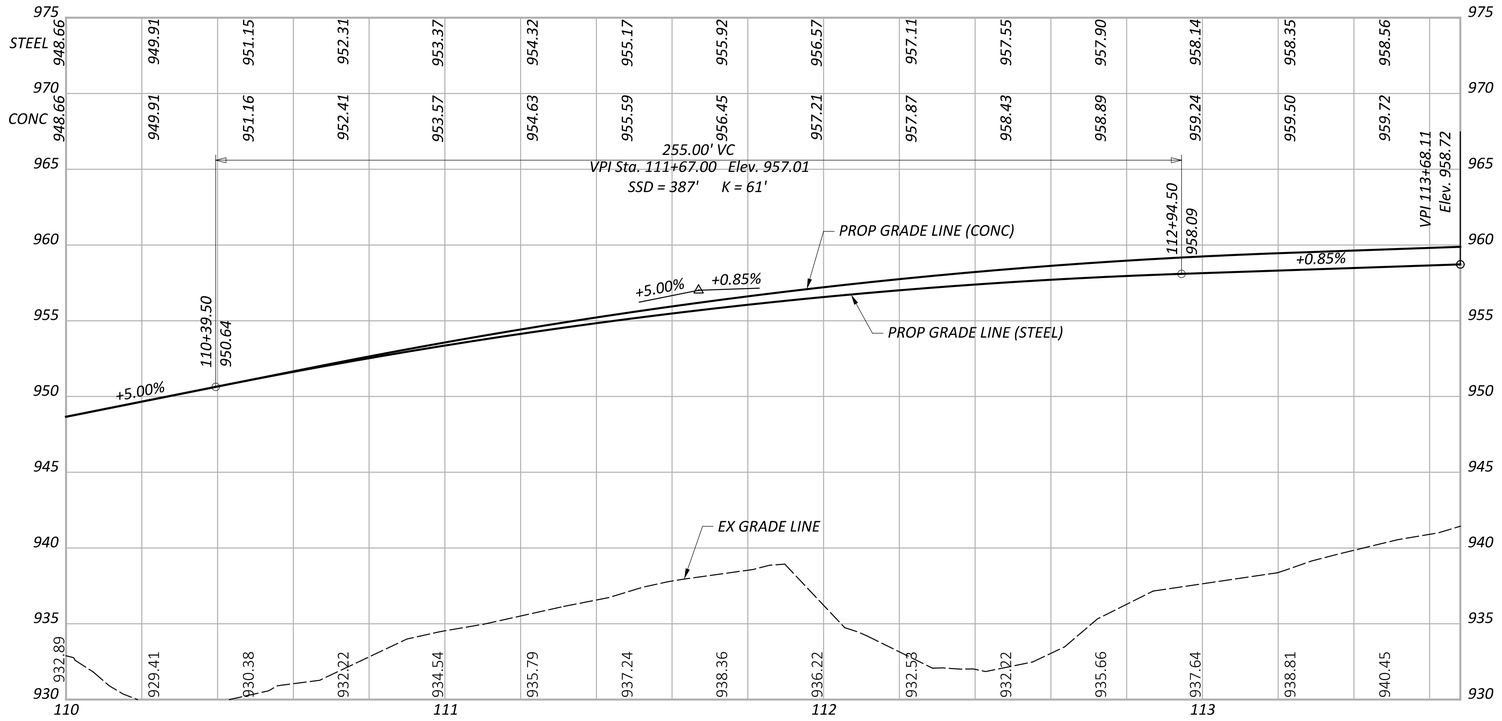
PLAN AND PROFILE - RAMP H (CONC)
STA. 110+00.00 TO STA. 113+68.11

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - Plan 9 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:53:01 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP279.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.100
TOTAL	740



PROFILE - RAMP H (STEEL)

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:53:18 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF203_S.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

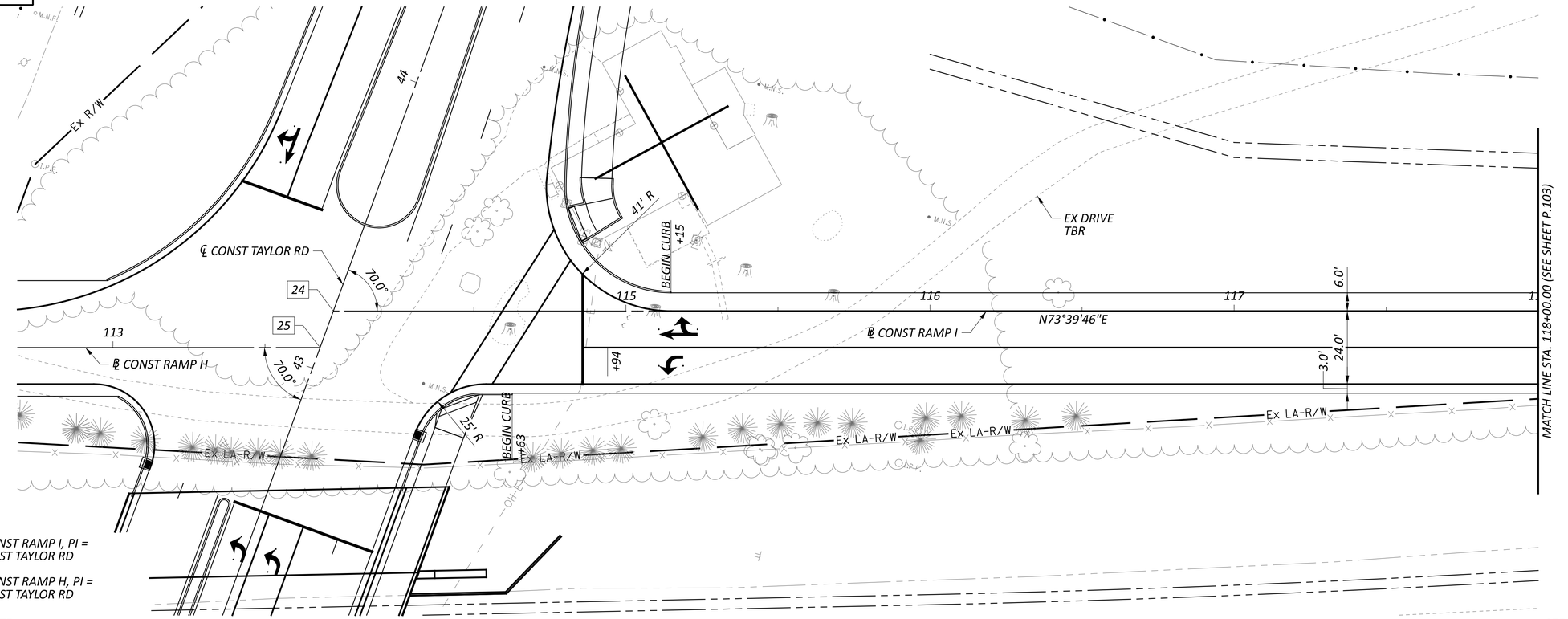
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.101 TOTAL 740

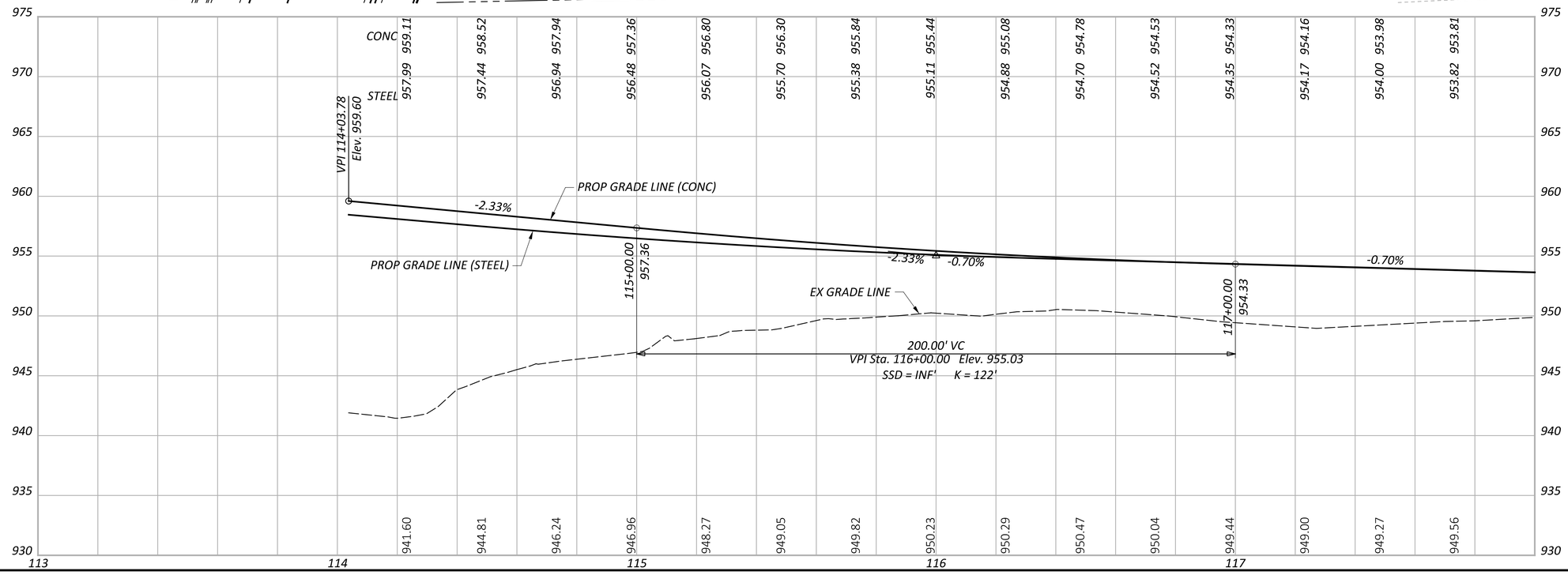
LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



24 STA. 114+03.78, ℄ CONST RAMP I, PI = STA. 43+20.00, ℄ CONST TAYLOR RD

25 STA. 113+68.11, ℄ CONST RAMP H, PI = STA. 43+07.23, ℄ CONST TAYLOR RD



FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070I - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:53:36 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP291.dgn

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP I (CONC)
STA. 114+03.78 TO STA. 118+00.00

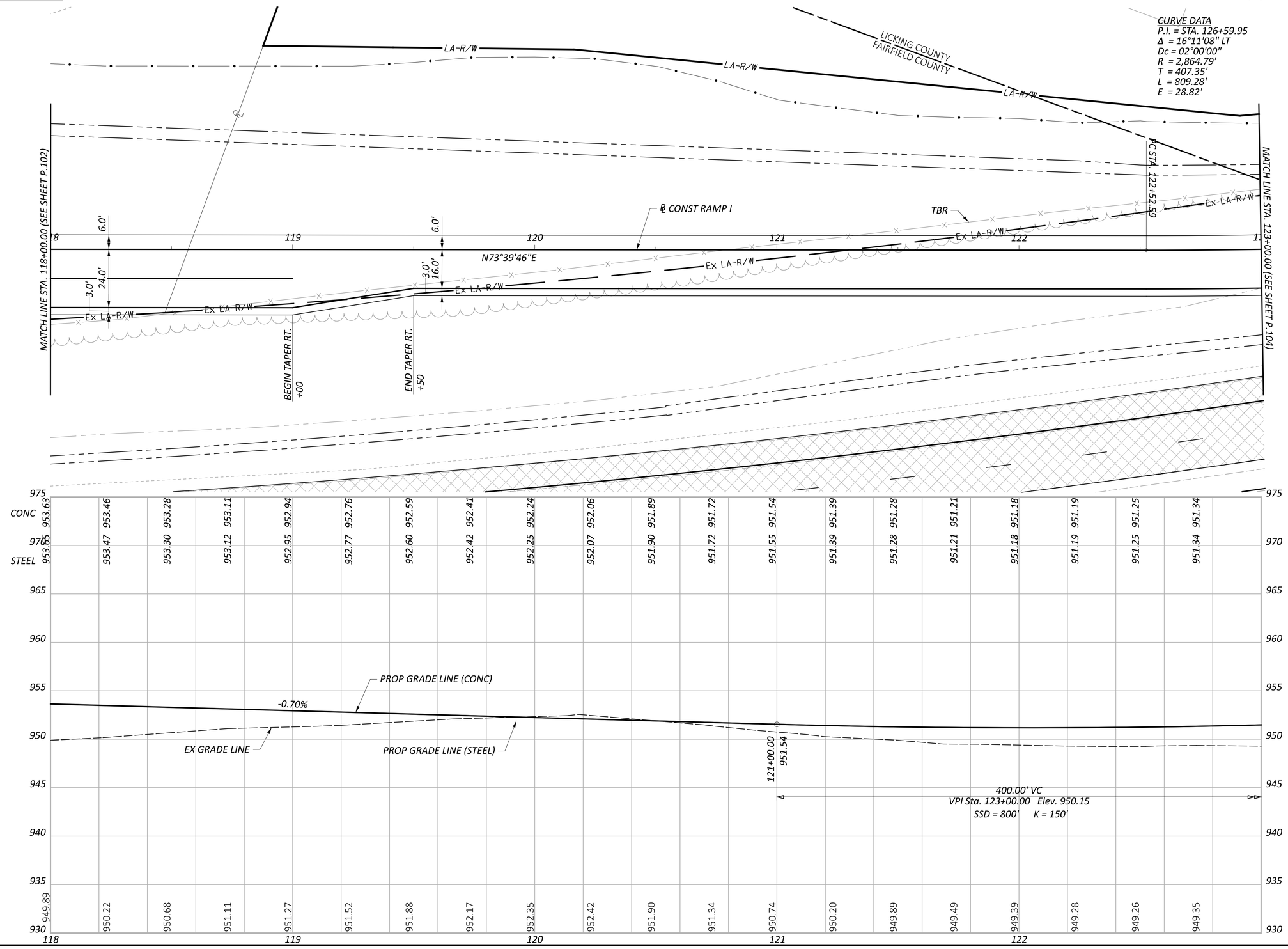
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.102 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070I - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:53:49 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP292.dgn

LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP I (CONC)
STA. 118+00.00 TO STA. 123+00.00

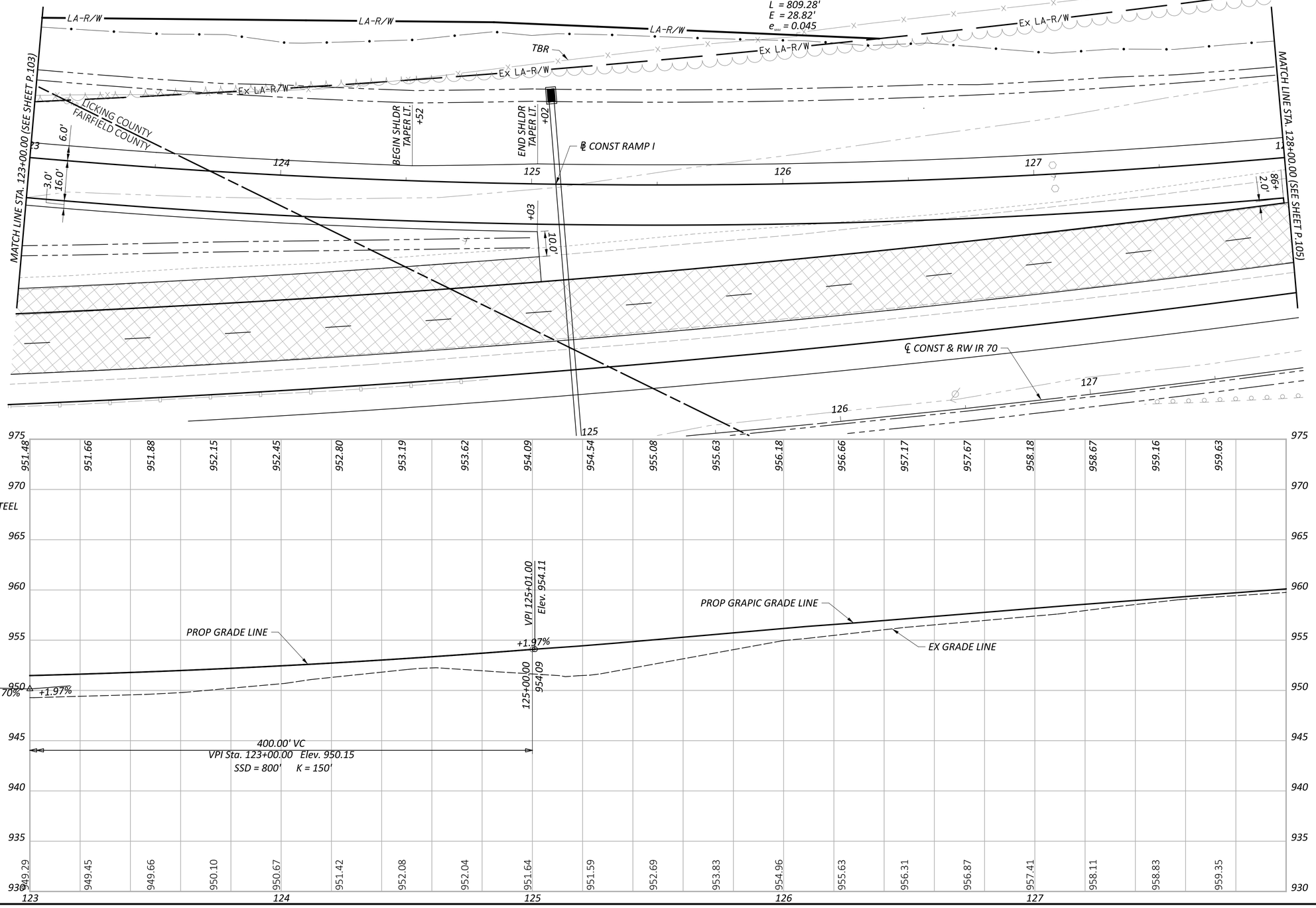
DESIGN AGENCY
WSP/E&S STRUCTUREPOINT INC.

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.103 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 126+59.95
Δ = 16°11'08" LT
Dc = 02°00'00"
R = 2,864.79'
T = 407.35'
L = 809.28'
E = 28.82'
e_{max} = 0.045



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP I (CONC)
STA. 123+00.00 TO STA. 128+00.00

DESIGN AGENCY
MEAD & HUNT / STRUCTUREPOINT INC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.104 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070I - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 11:23:40 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP293.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 126+59.95
Δ = 16°11'08" LT
Dc = 02°00'00"
R = 2,864.79'
T = 407.35'
L = 809.28'
E = 28.82'

CURVE DATA
P.I. = STA. 133+31.14
Δ = 05°27'20" LT
Dc = 01°00'50"
R = 5,651.42'
T = 269.27'
L = 538.12'
E = 6.41'

Ex LA-R/W

MATCH LINE STA. 128+00.00 (SEE SHEET P.104)

MATCH LINE STA. 133+00.00 (SEE SHEET P.106)

P.I.

PCC STA. 130+61.88

℄ CONST RAMP I

SAW CUT

8.0'
12.0'
24.0'
12.0'
10.0'
20.0'

℄ CONST & R/W IR 70

PROP GRAPHIC GRADE LINE

EX GRADE LINE

128	129	130	131	132
960.10	960.57	961.06	961.52	961.97
959.75	960.35	960.98	961.51	962.01

128	129	130	131	132
962.42	962.86	963.30	963.69	964.09
962.40	962.76	963.17	963.60	964.03

128	129	130	131	132
964.51	964.97	965.36	965.77	966.21
964.38	964.75	965.15	965.56	965.97

128	129	130	131	132
966.64	967.09	967.53	967.96	968.34
966.40	966.85	967.27	967.68	968.08

985 980 975 970 965 960 955 950 945 940

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP I (CONC)
STA. 128+00.00 TO STA. 133+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R07OI - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:54:12 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

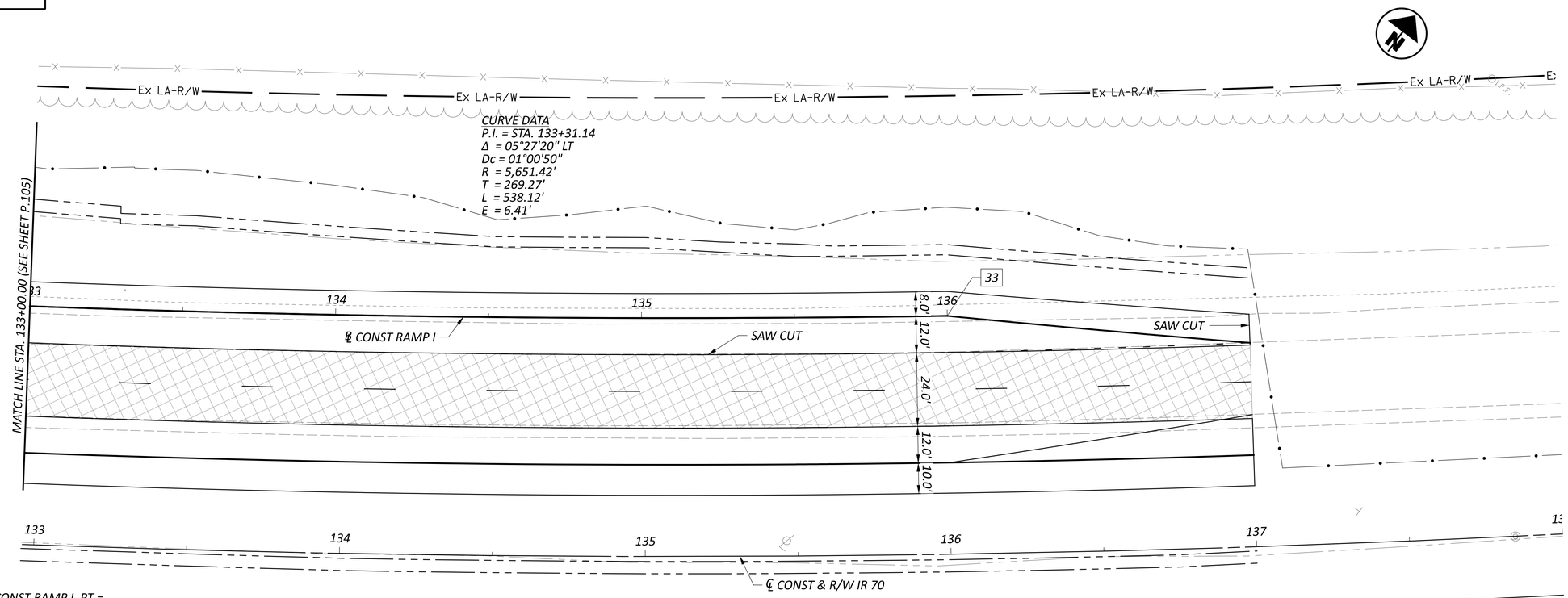
REVIEWER
KAM 06/18/23

PROJECT ID
96808

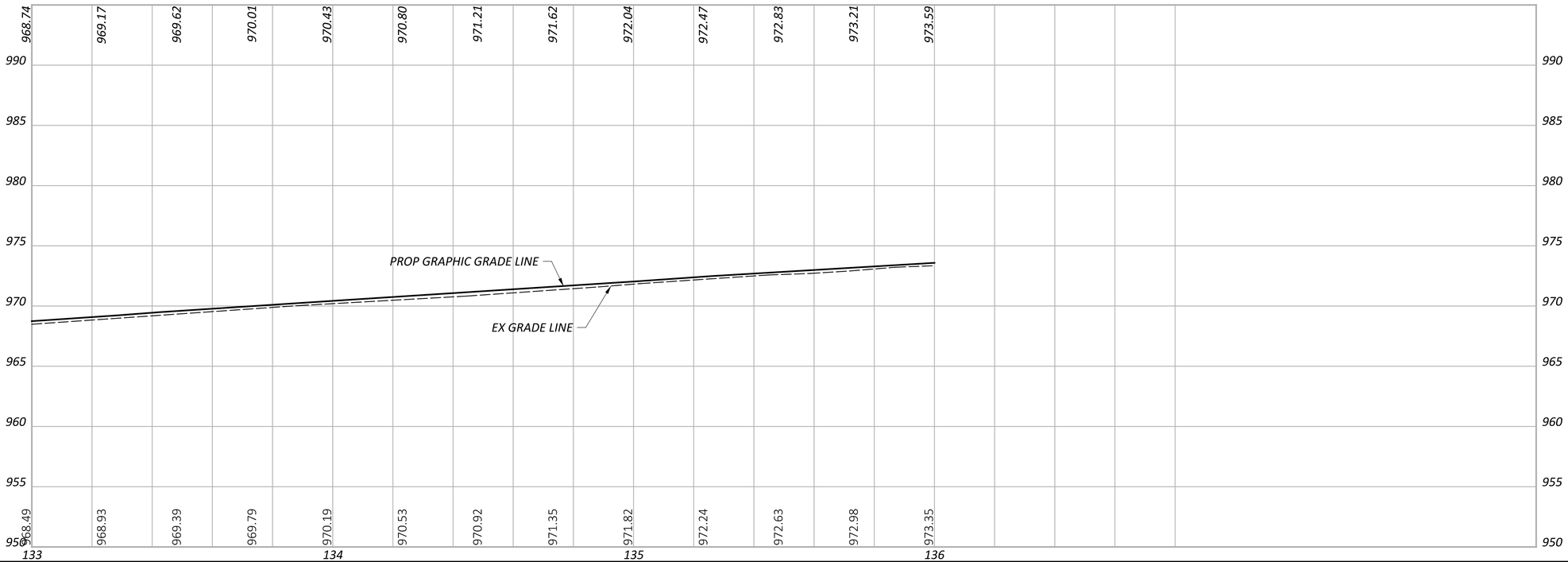
SHEET P.105 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



33 STA. 136+00.00, ℄ CONST RAMP I, PT =
STA. 136+00.00, 0.00' RT, ℄ CONST & R/W IR 70



HORIZONTAL SCALE IN FEET
0 10 20 40

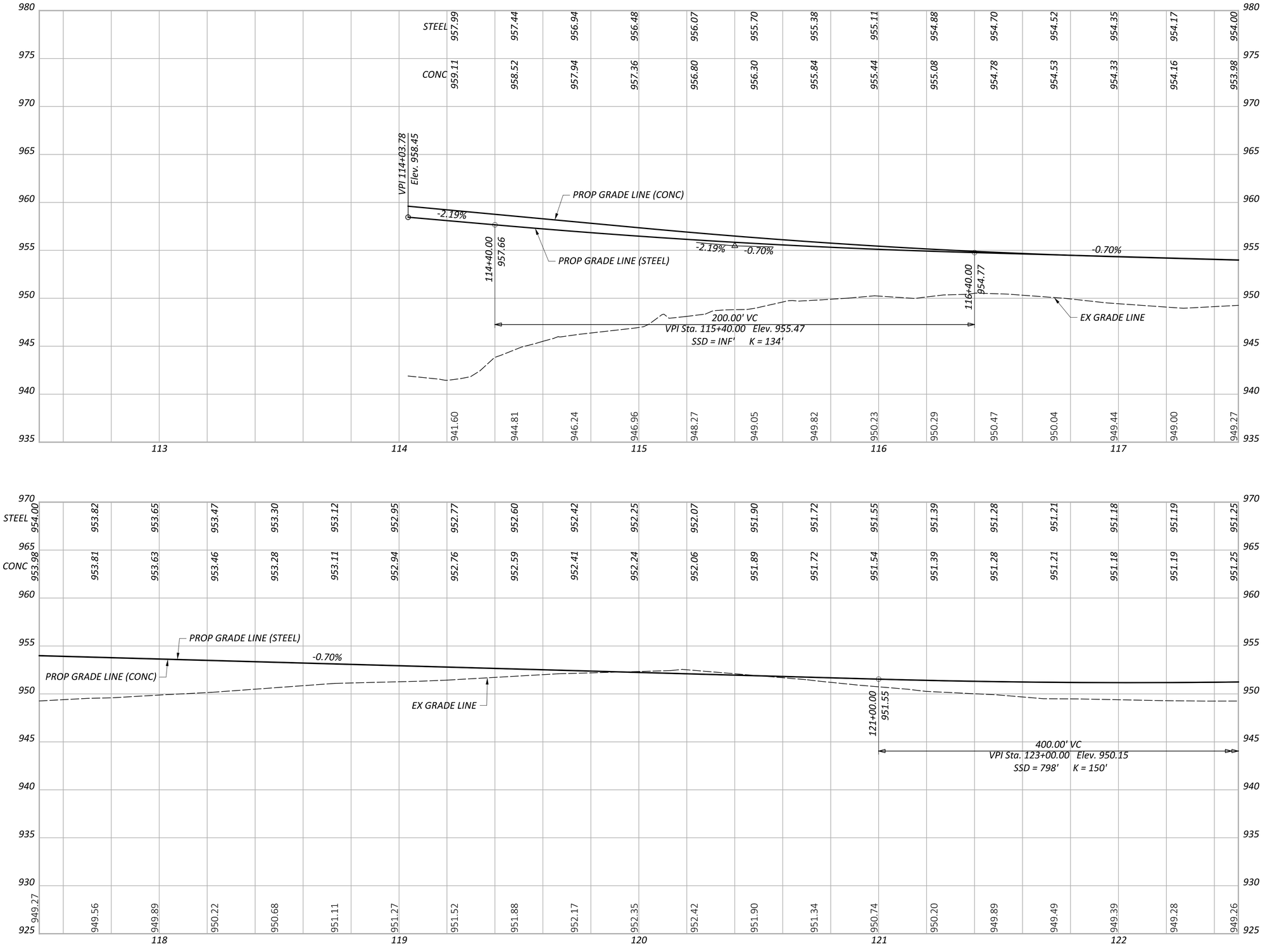
PLAN AND PROFILE - RAMP I (CONC)
STA. 133+00.00 TO STA. 136+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070I - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:54:24 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\i01-Engineering_StructurePoint\Roadway\Sheets\96808_GP295.dgn

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.106 TOTAL 740



PROFILE - RAMP I (STEEL)

FAI/LIC IR 70 0.00/0.00

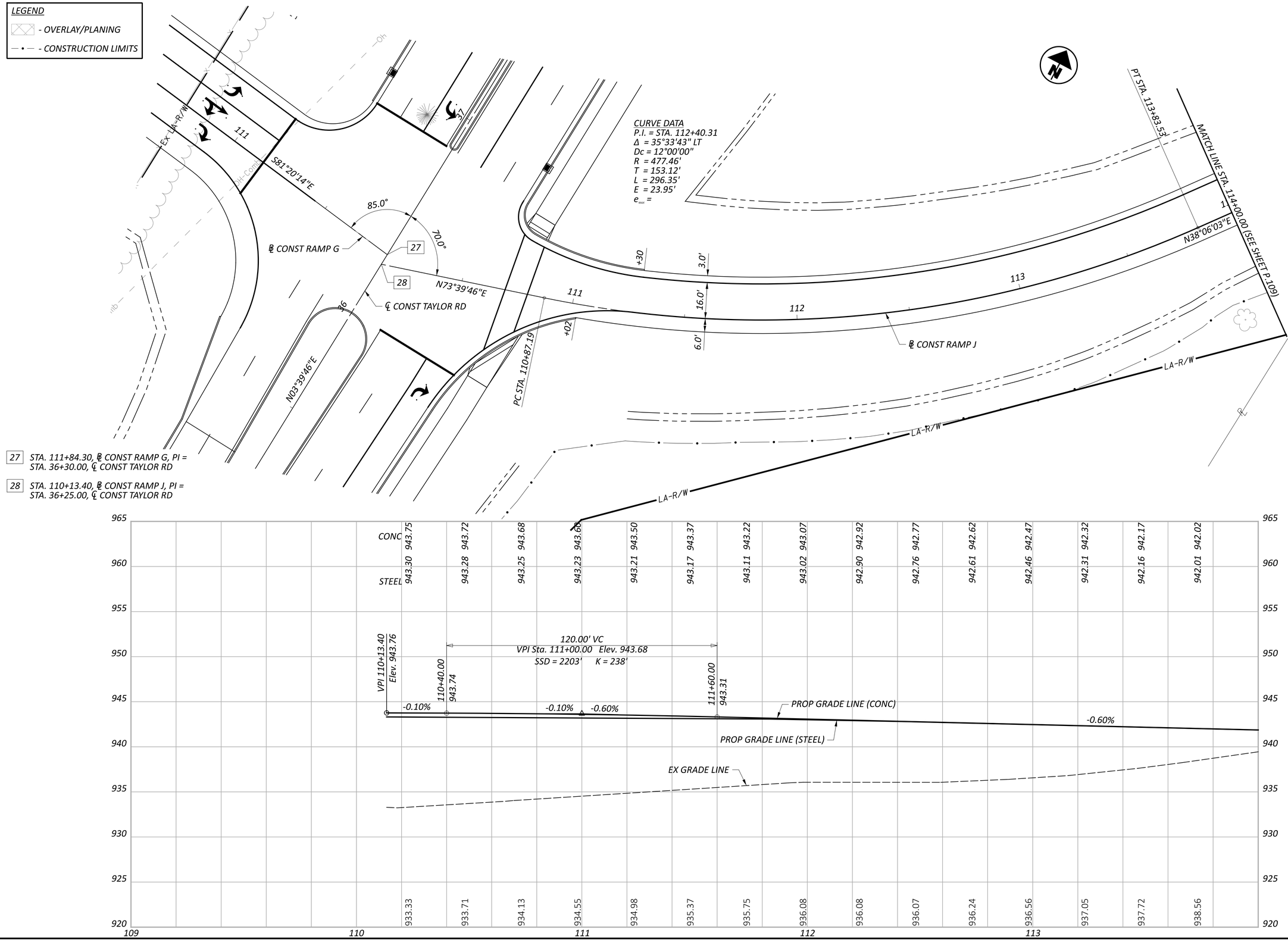
MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:54:39 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF205_S.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.107
TOTAL	740

PLAN AND PROFILE - RAMP J (CONC)
STA. 110+13.32 TO STA. 114+00.00

HORIZONTAL SCALE IN FEET
0 10 20 40



DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.108
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070 - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:54:58 PM USER: aoldaker
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FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R07DI - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:55:11 PM USER: aoldaker
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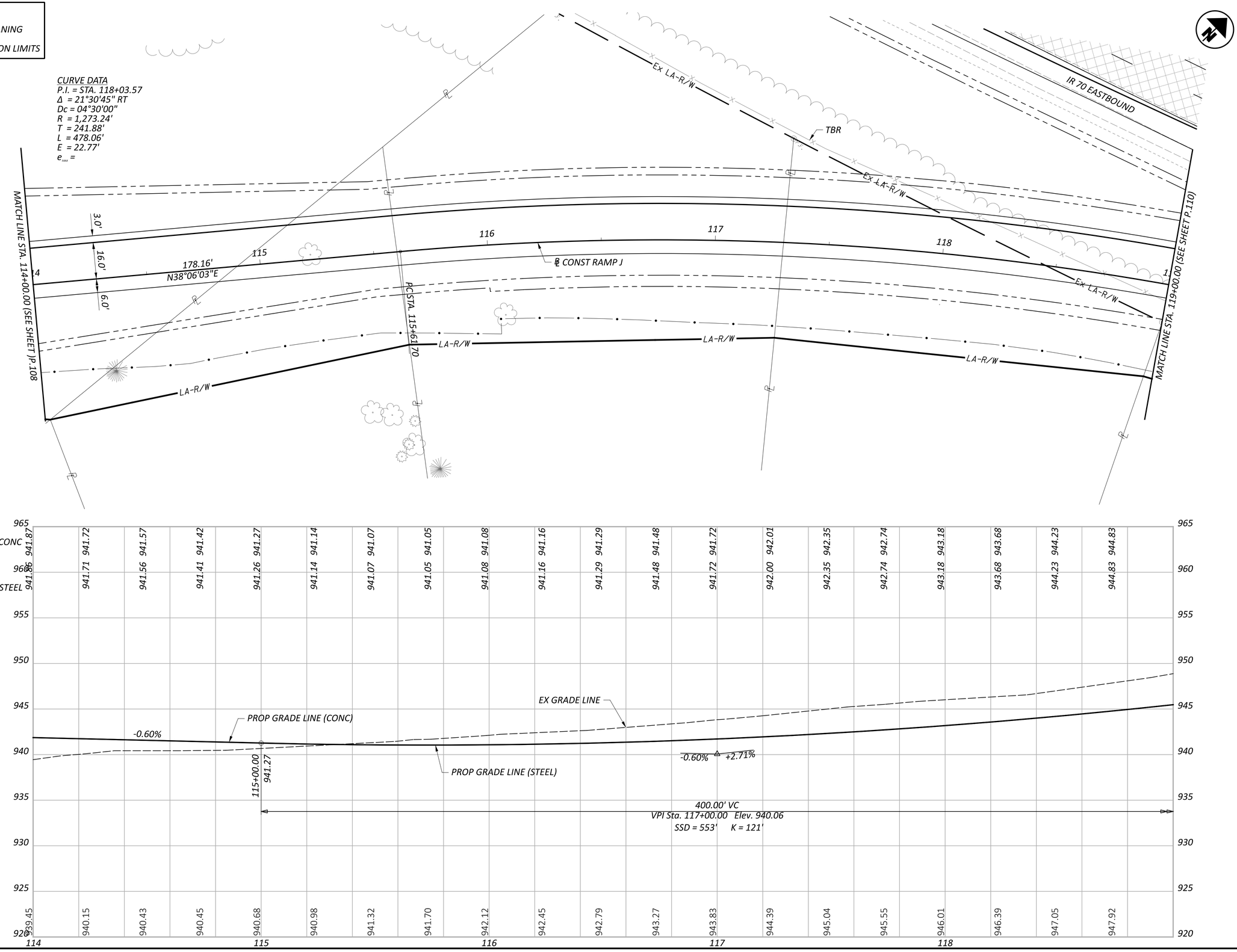
LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 118+03.57
Δ = 21°30'45" RT
Dc = 04°30'00"
R = 1,273.24'
T = 241.88'
L = 478.06'
E = 22.77'
e_{max} =

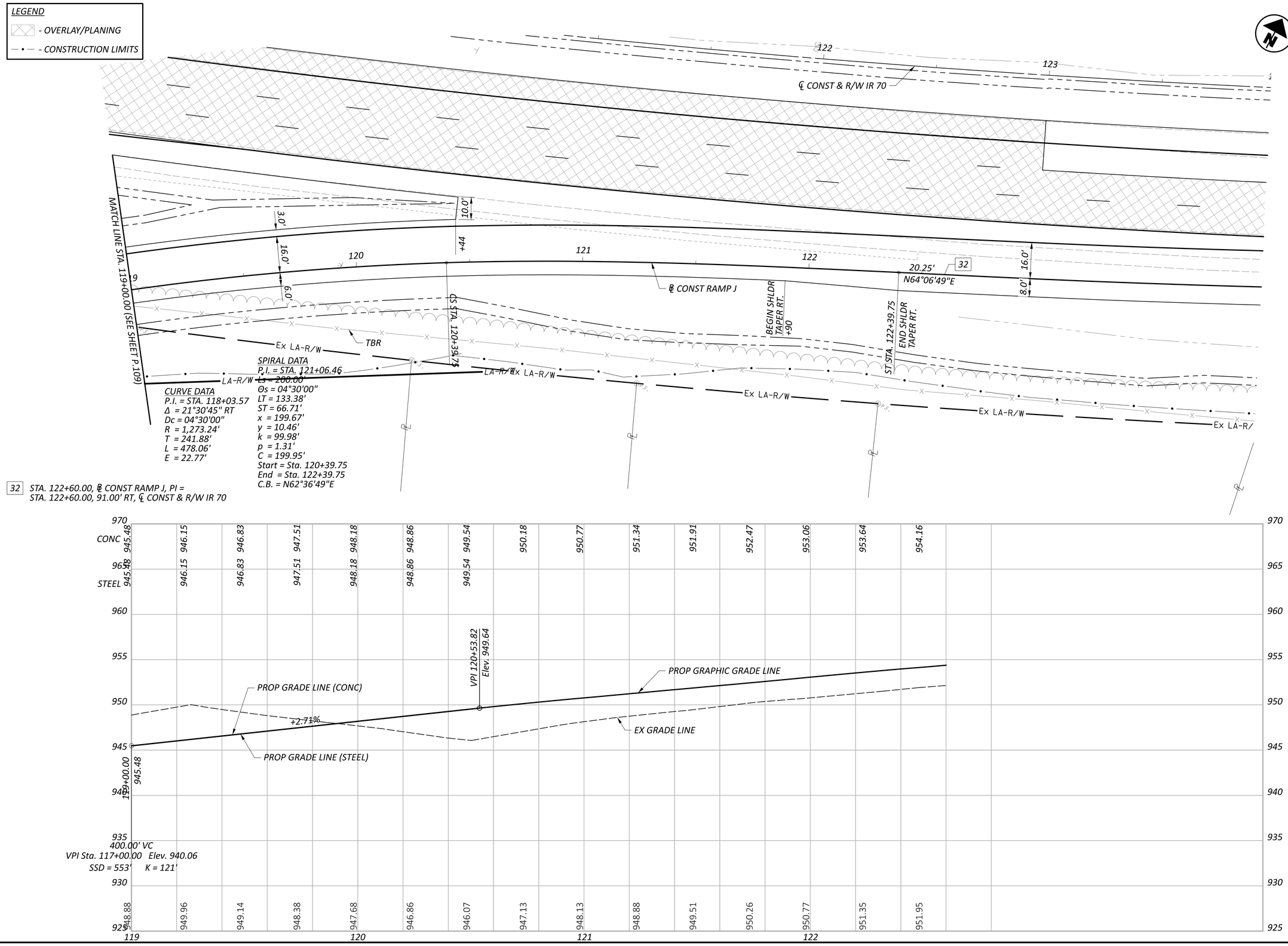


HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP J (CONC)
STA. 114+00.00 TO STA. 119+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.109
TOTAL	740



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP J (CONC)
STA. 119+00.00 TO STA. 122+60.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.110
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070J - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:55:24 PM USER: aoldaker
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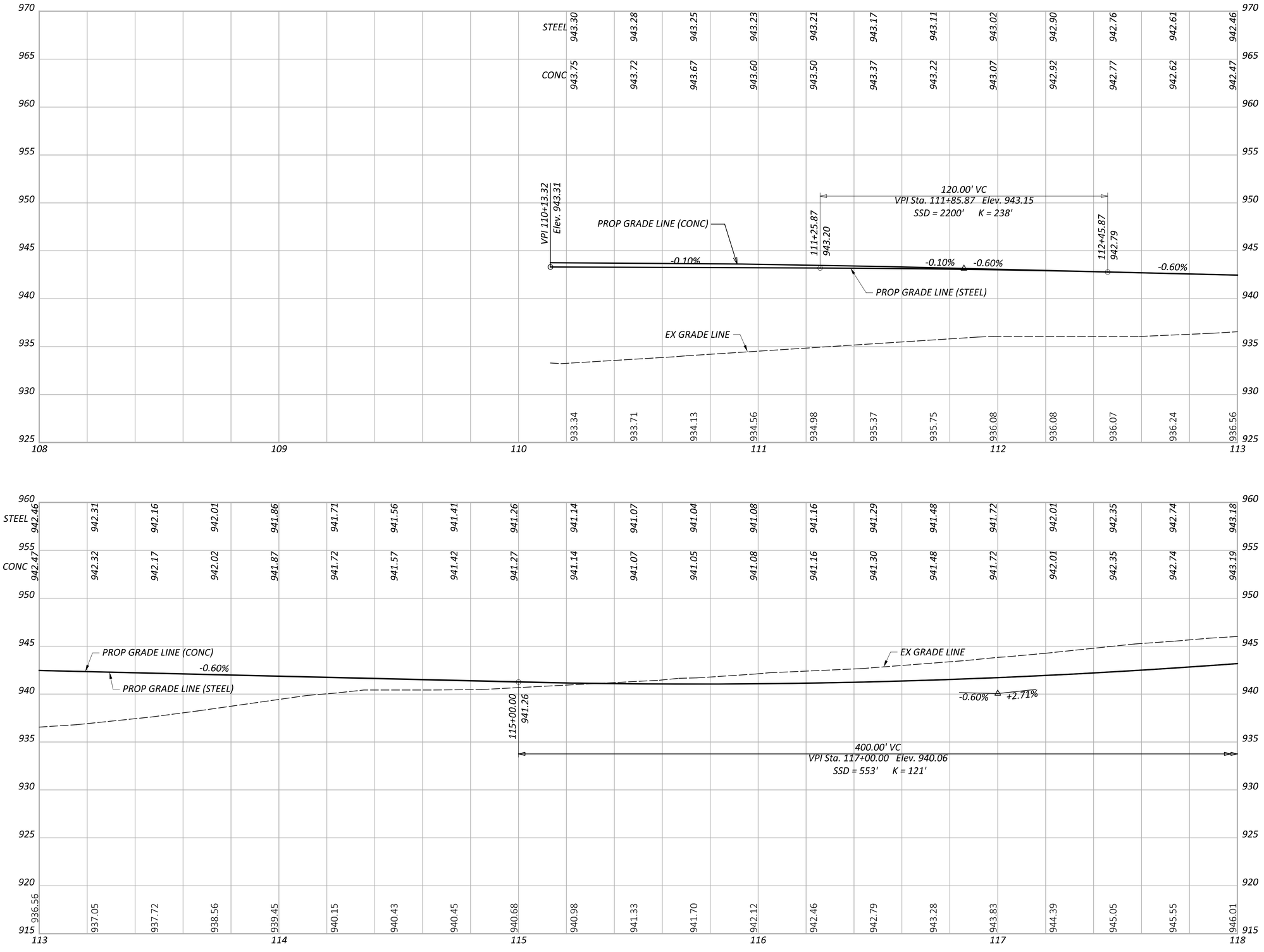

PROFILE - RAMP J (STEEL)

FAI/LIC IR 70 0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:55:38 PM USER: aoldaker
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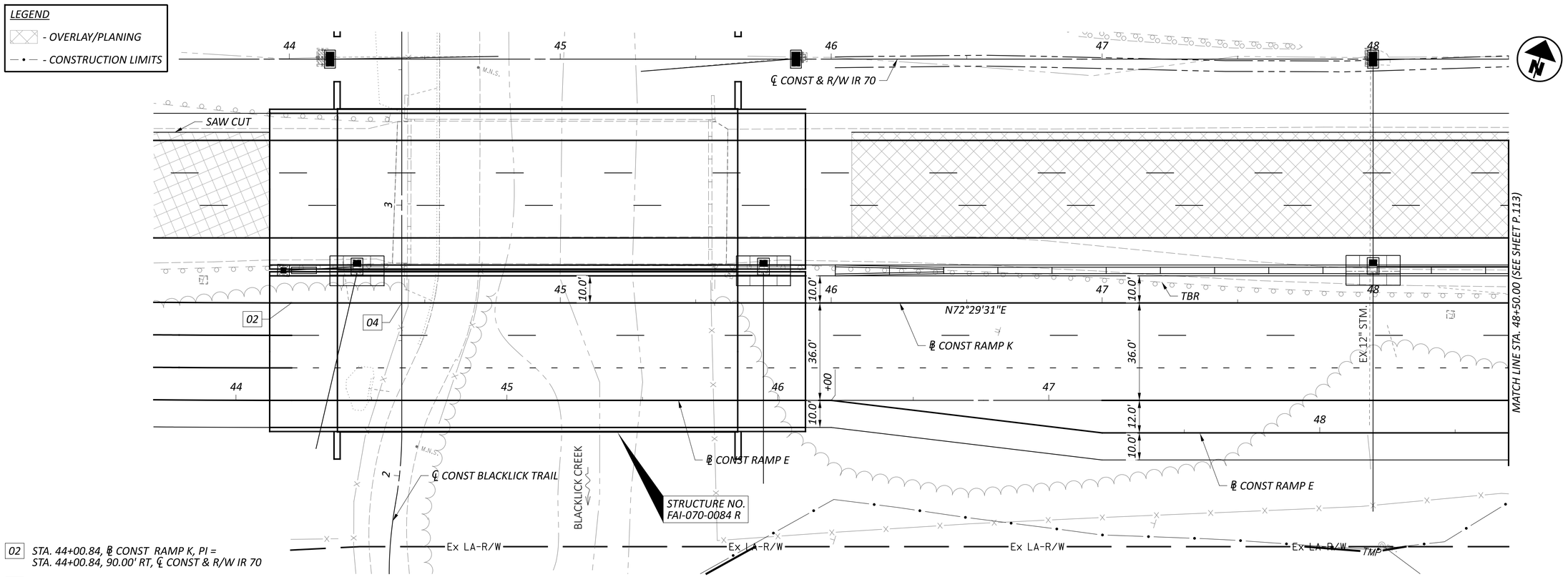
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

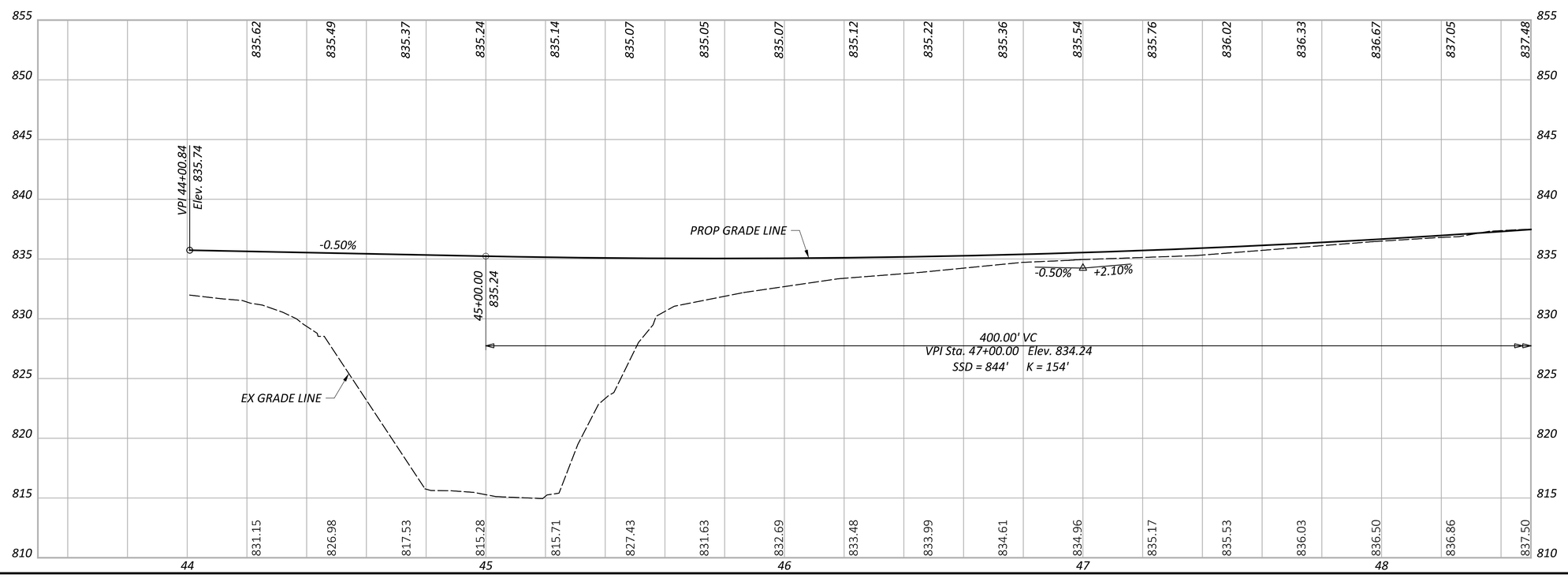
PROJECT ID
96808

SHEET P.111 TOTAL 740



02 STA. 44+00.84, ℄ CONST RAMP K, PI =
STA. 44+00.84, 90.00' RT, ℄ CONST & R/W IR 70

04 STA. 2+63.93, ℄ CONST BLACKLICK TRAIL =
STA. 44+41.51, ℄ CONST RAMP K



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 44+00.84 TO STA. 48+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.112 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R07OK - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:55:56 PM USER: aoldaker
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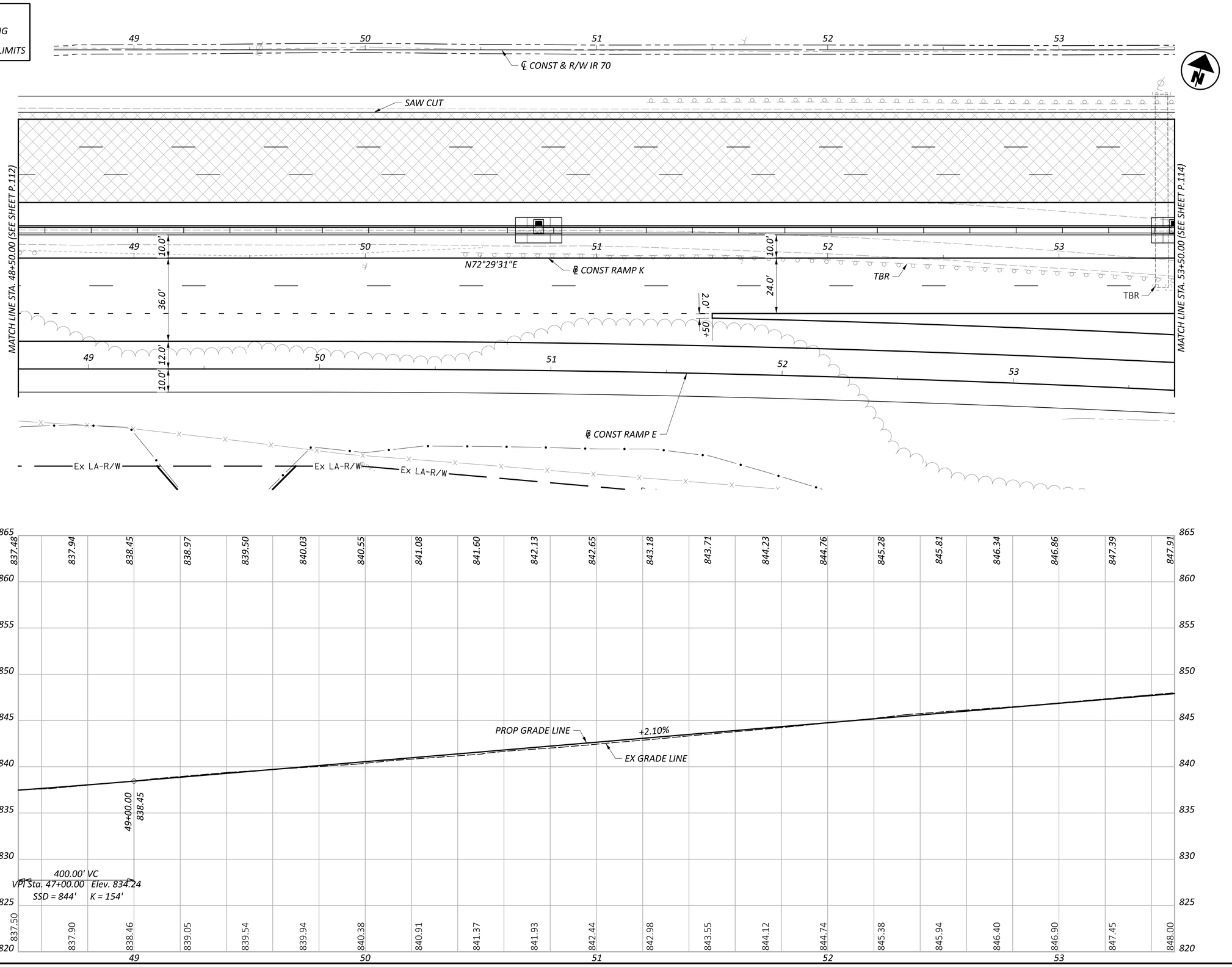

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 48+50.00 TO STA. 53+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:56:10 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.113
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 8:48:52 AM USER: aoldaker
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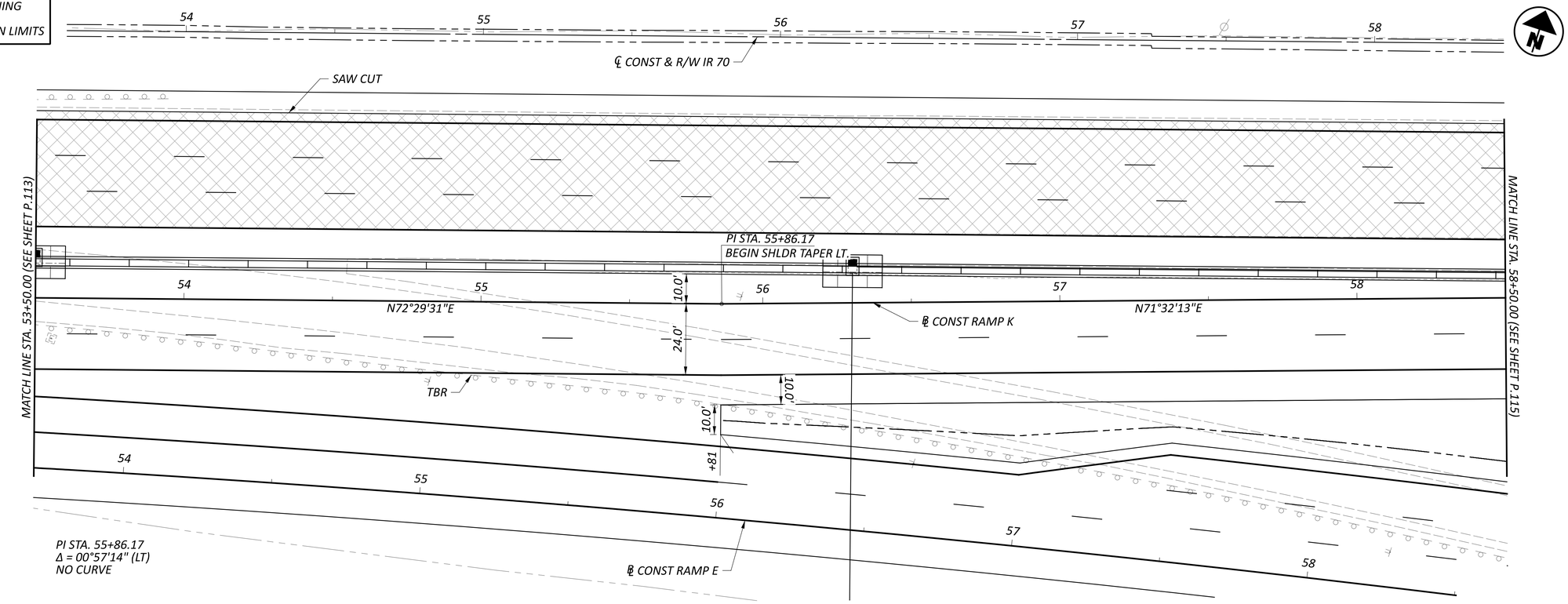
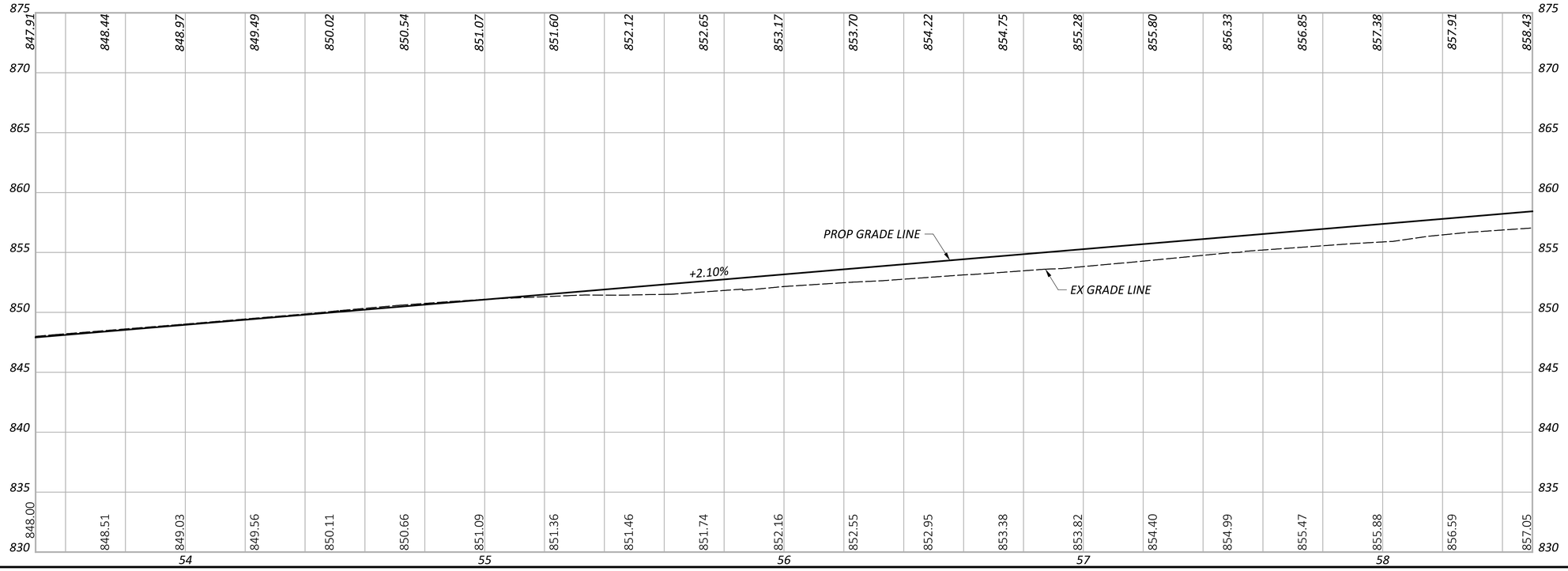
LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS





HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 53+50.00 TO STA. 57+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

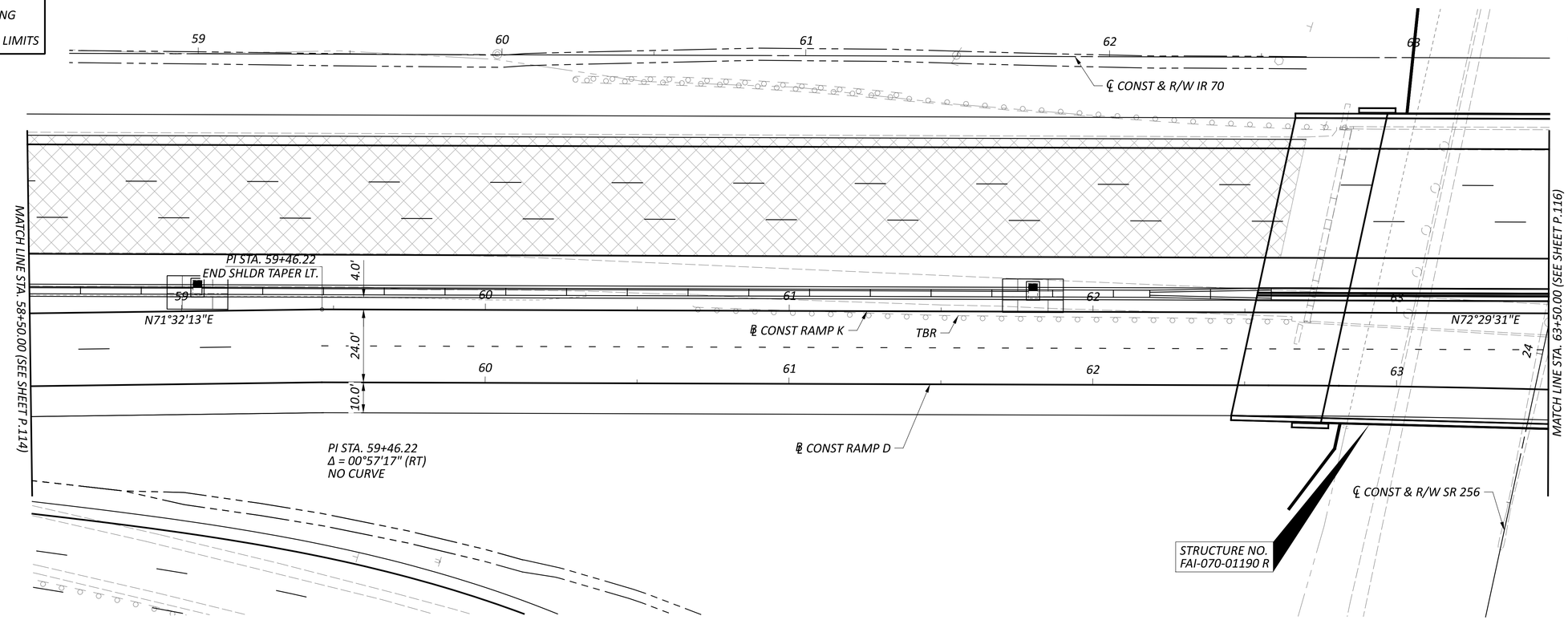
REVIEWER
KAM 06/18/23

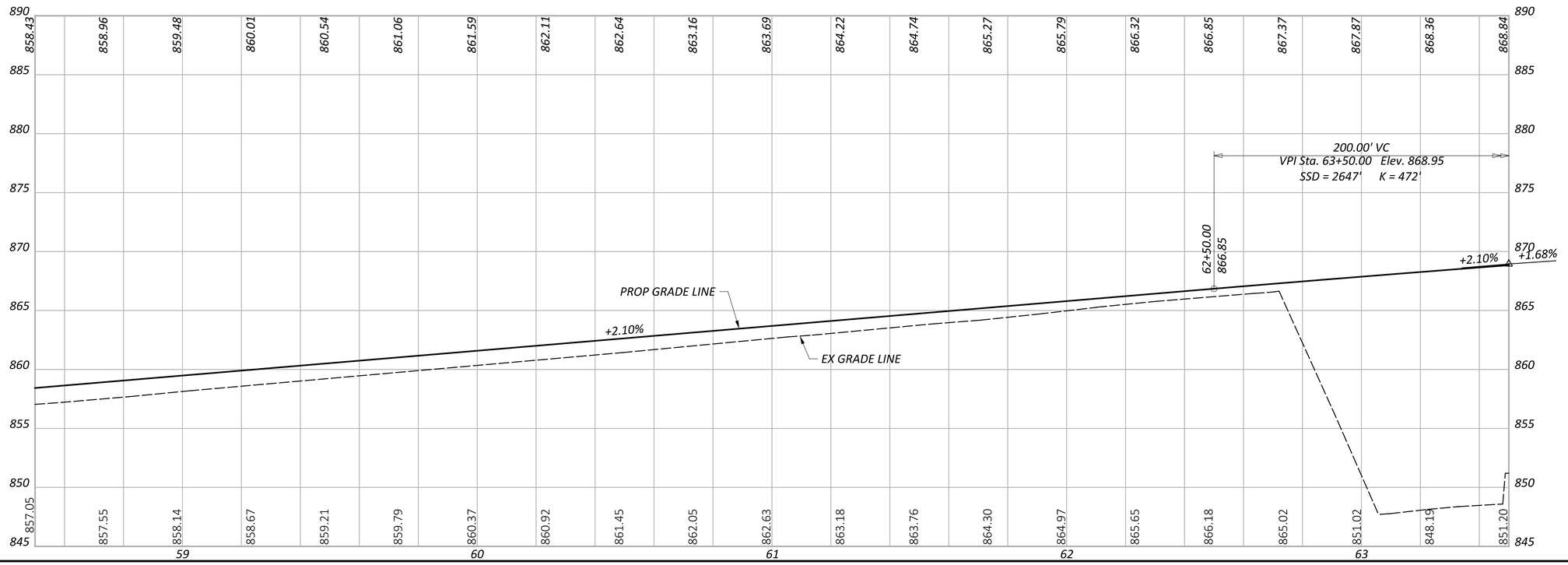
PROJECT ID
96808

SHEET P.114 TOTAL 740

MODEL: BLP_R070K - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 8:49:05 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP314.dgn

LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS



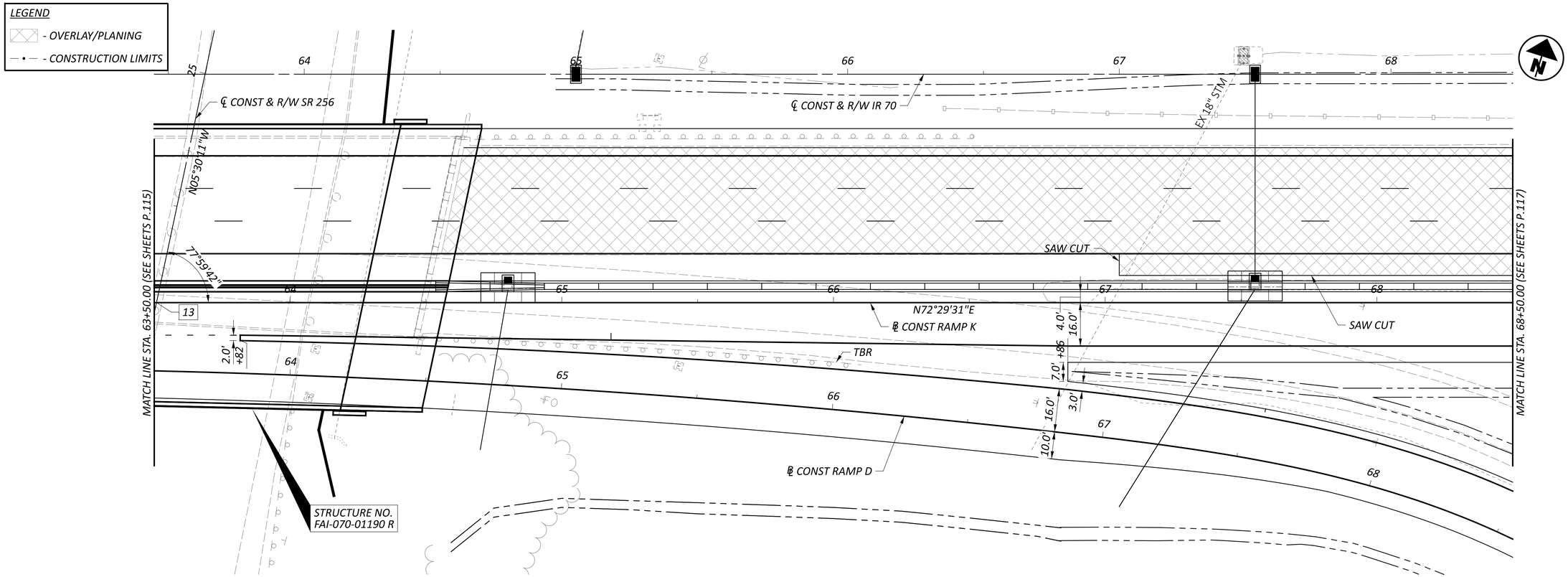


HORIZONTAL SCALE IN FEET
0 10 20 40

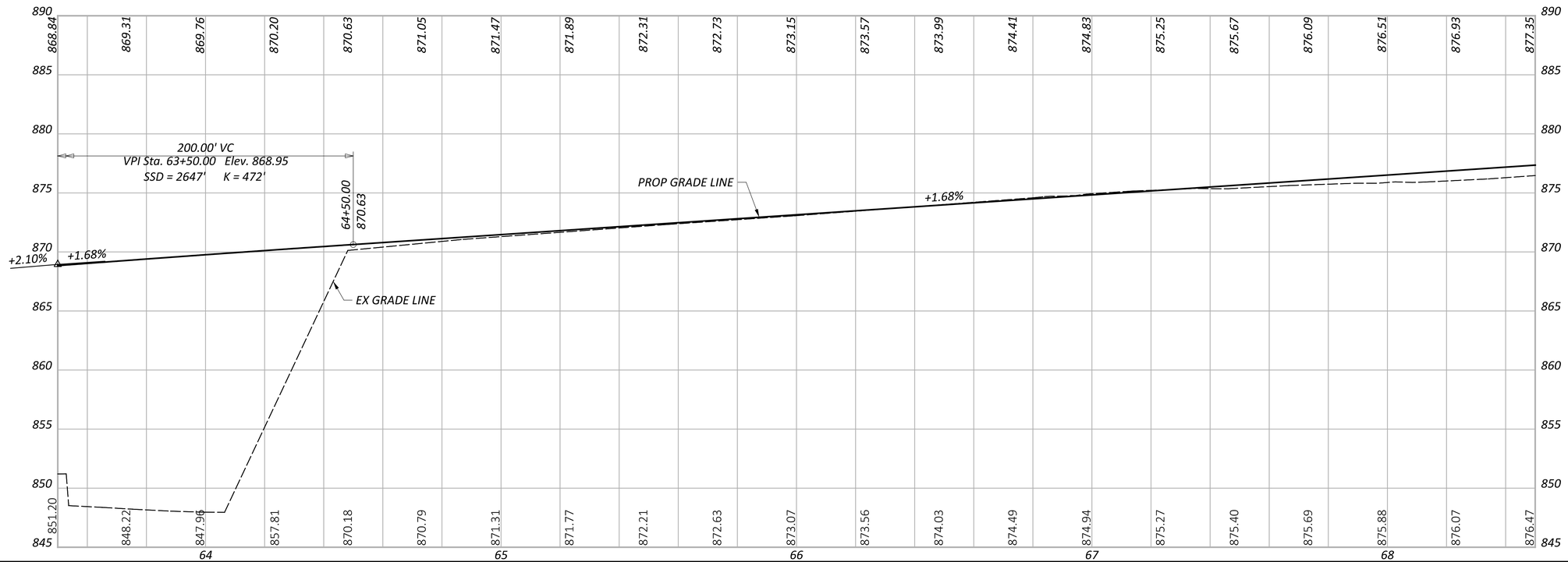
PLAN AND PROFILE - RAMP K
STA. 57+50.00 TO STA. 63+50.00

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.115
TOTAL	740



13 STA. 63+50.82, ℄ CONST RAMP K =
STA. 24+13.81, ℄ CONST & R/W SR 256



HORIZONTAL
SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 63+50.00 TO STA. 68+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:56:49 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP315.dgn

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

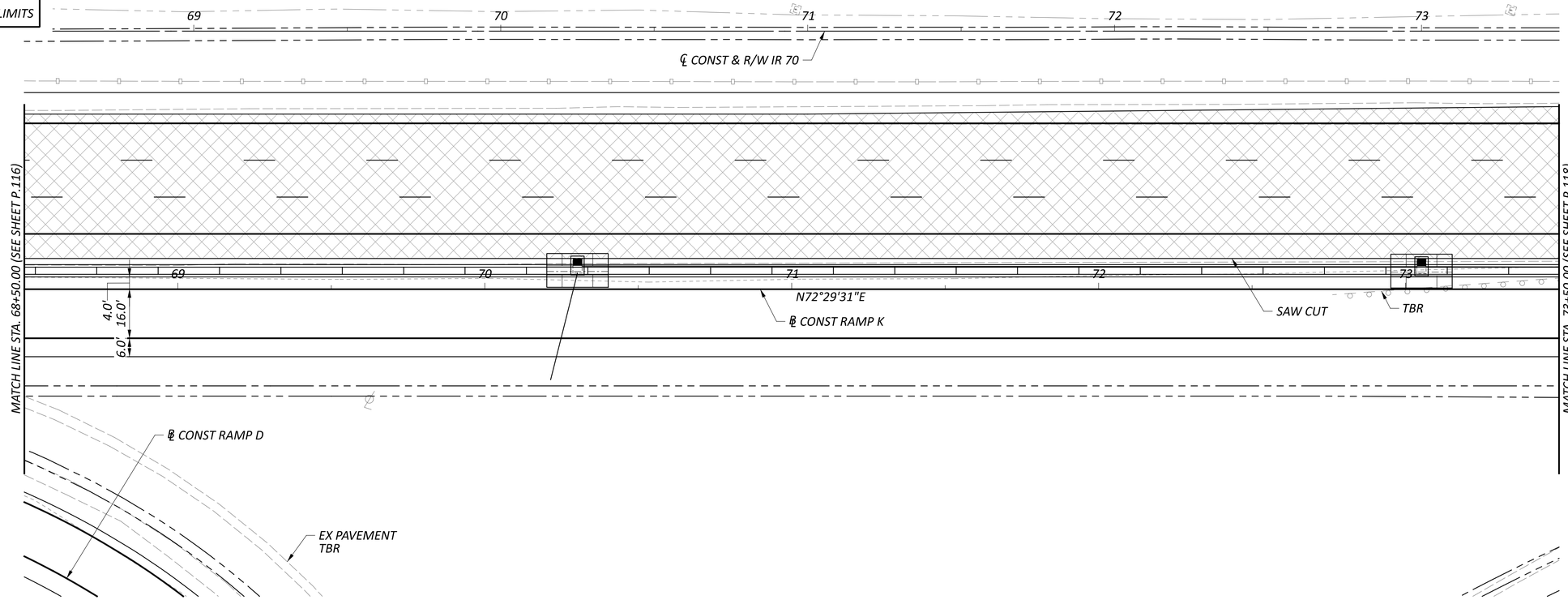
PROJECT ID
96808

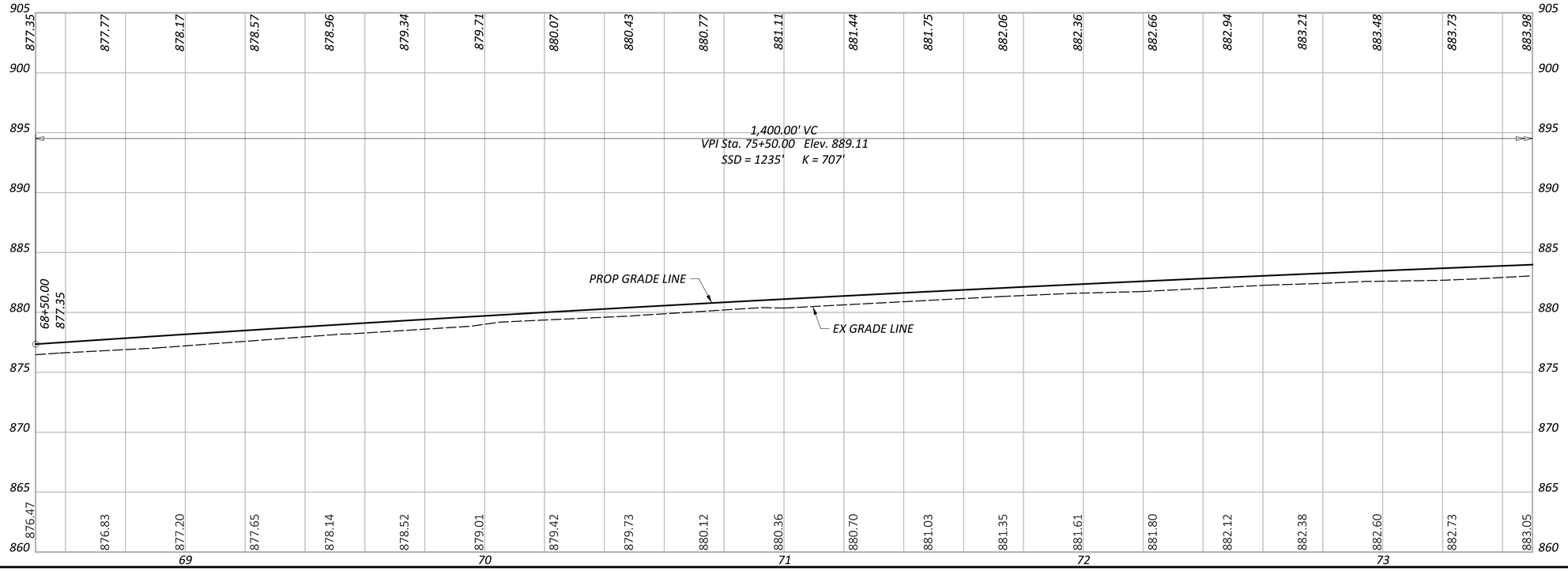
SHEET P.116 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 6 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:57:03 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP316.dgn

LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS





HORIZONTAL SCALE IN FEET
0 10 20 40

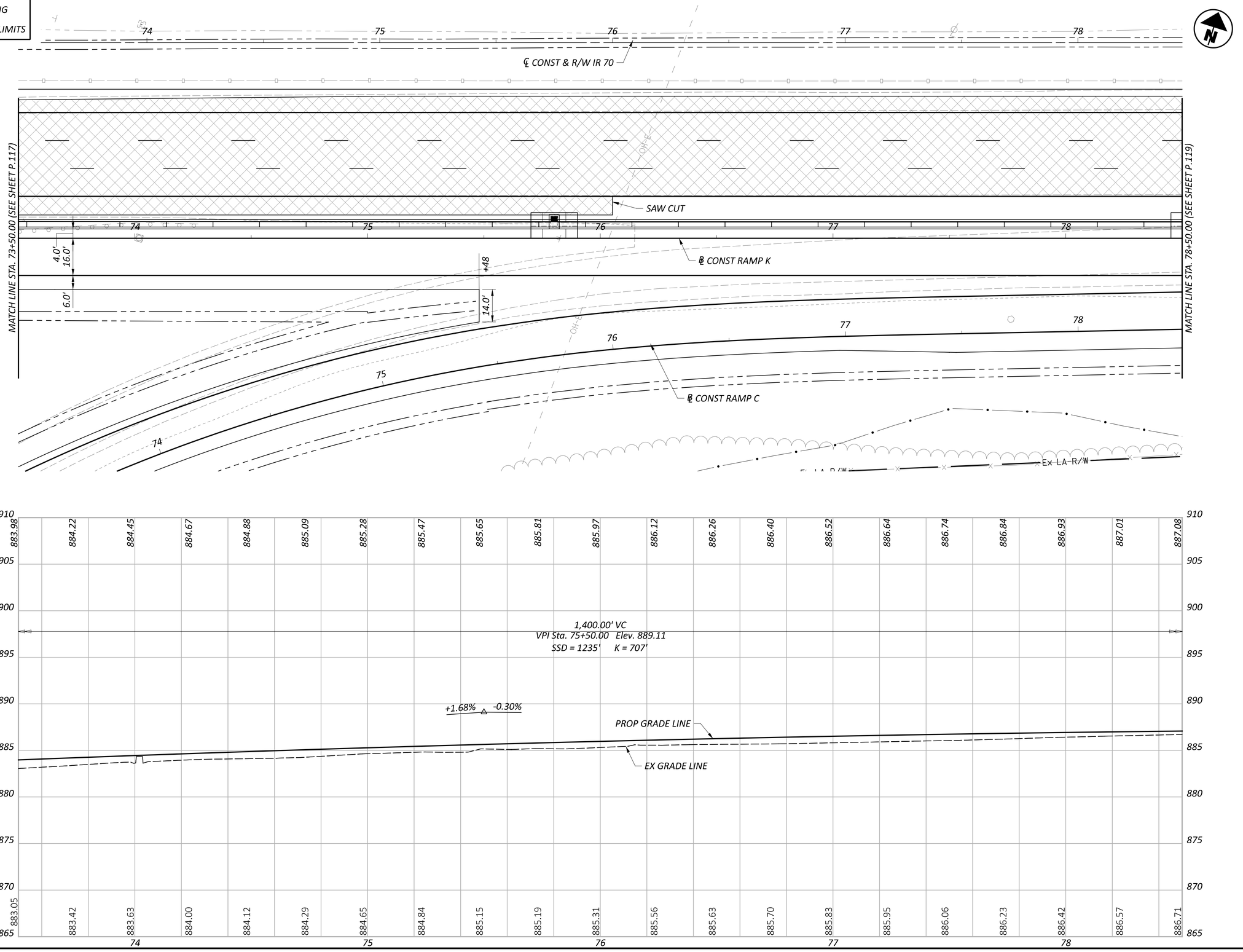
PLAN AND PROFILE - RAMP K
STA. 68+50.00 TO STA. 73+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.117
TOTAL	740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



HORIZONTAL SCALE IN FEET
0 10 20 40

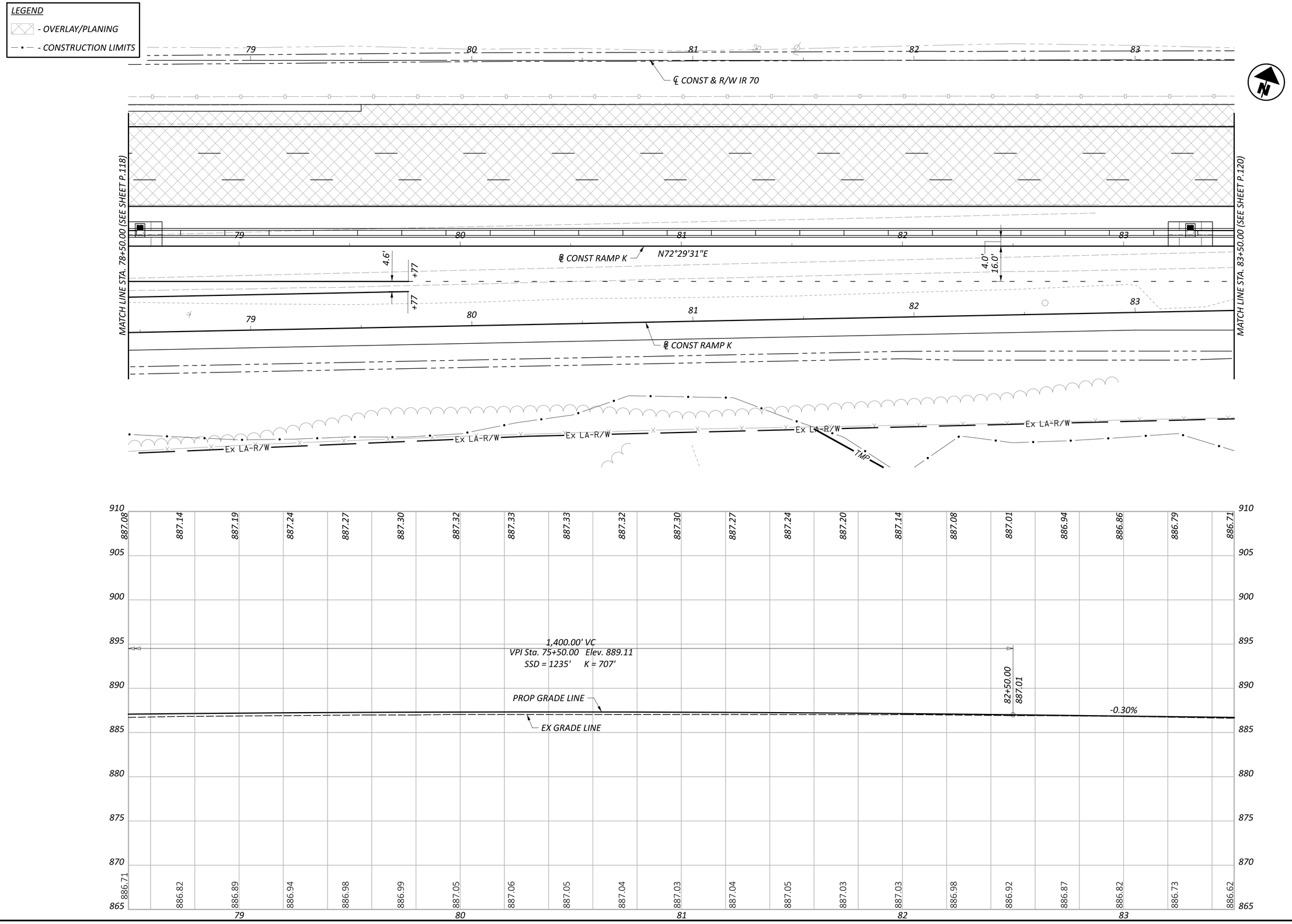
PLAN AND PROFILE - RAMP K
STA. 73+50.00 TO STA. 78+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.118
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 7 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:57:16 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP317.dgn



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 78+50.00 TO STA. 83+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

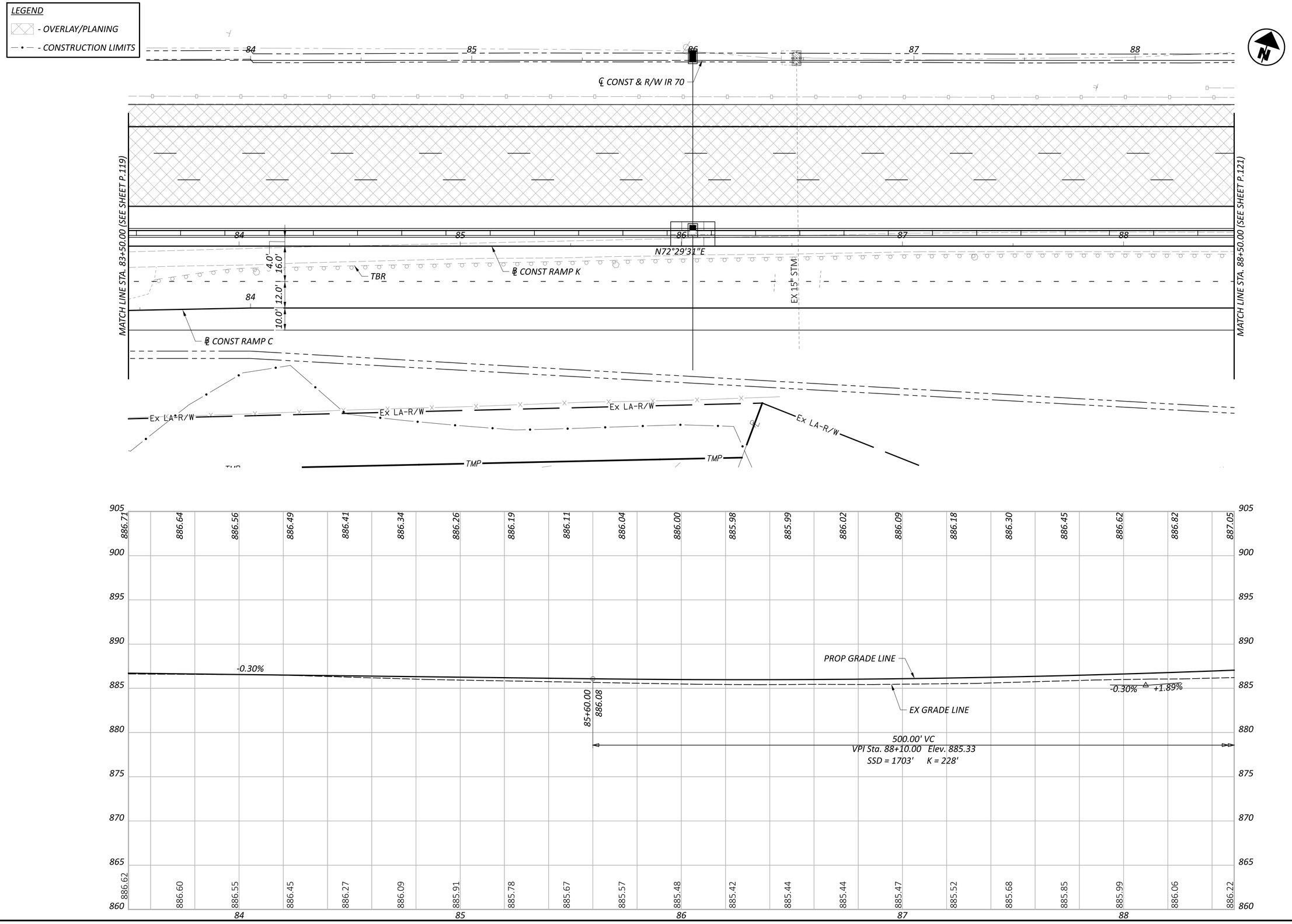
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.119 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 8 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:57:29 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP318.dgn



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 83+50.00 TO STA. 88+50.00

FAI/LIC IR 70 0.00/0.00

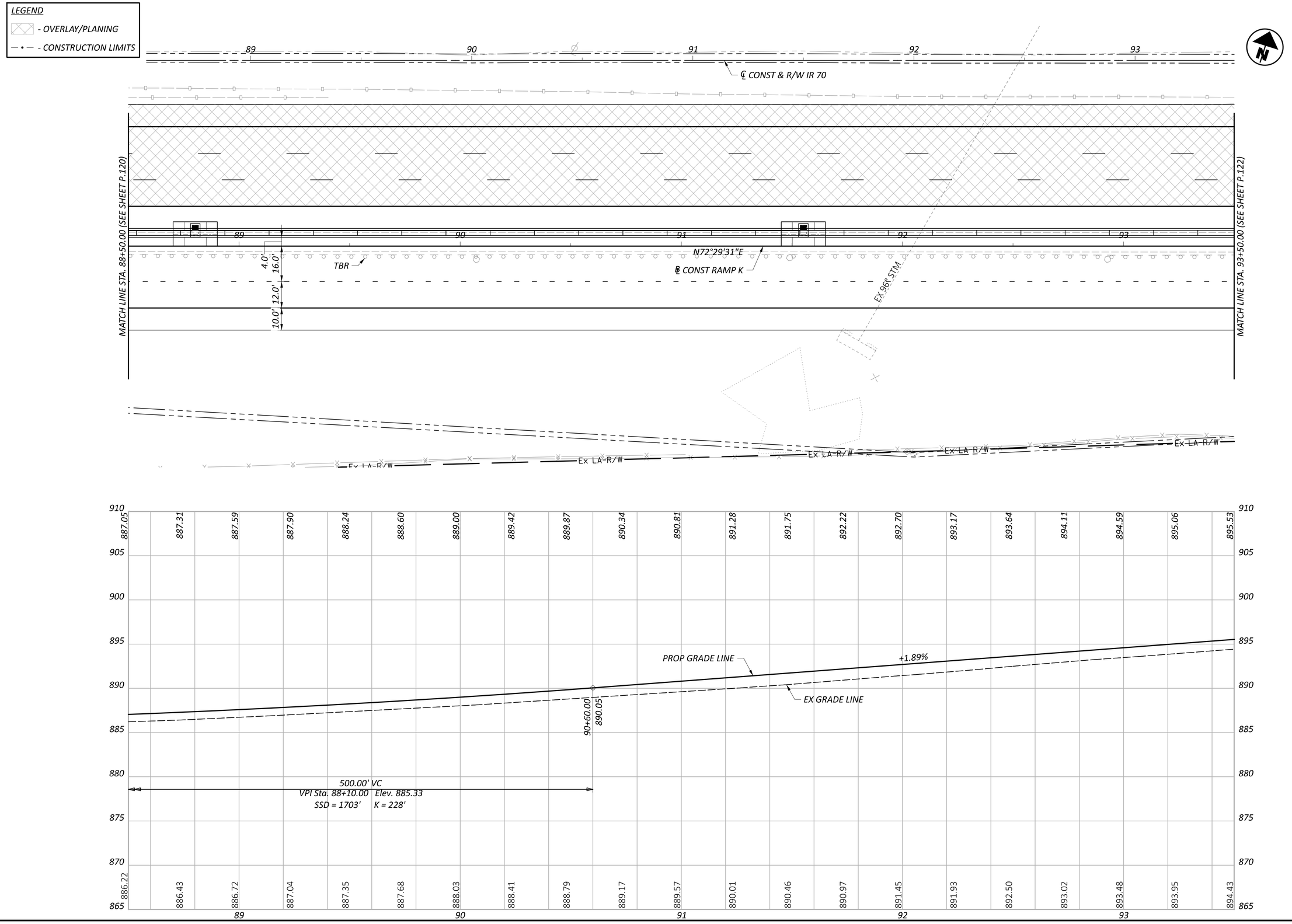
MODEL: BLP_R070K - Plan 9 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:57:41 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP319.dgn

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.120 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 10 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:57:54 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP320.dgn



HORIZONTAL SCALE IN FEET
0 10 20 40

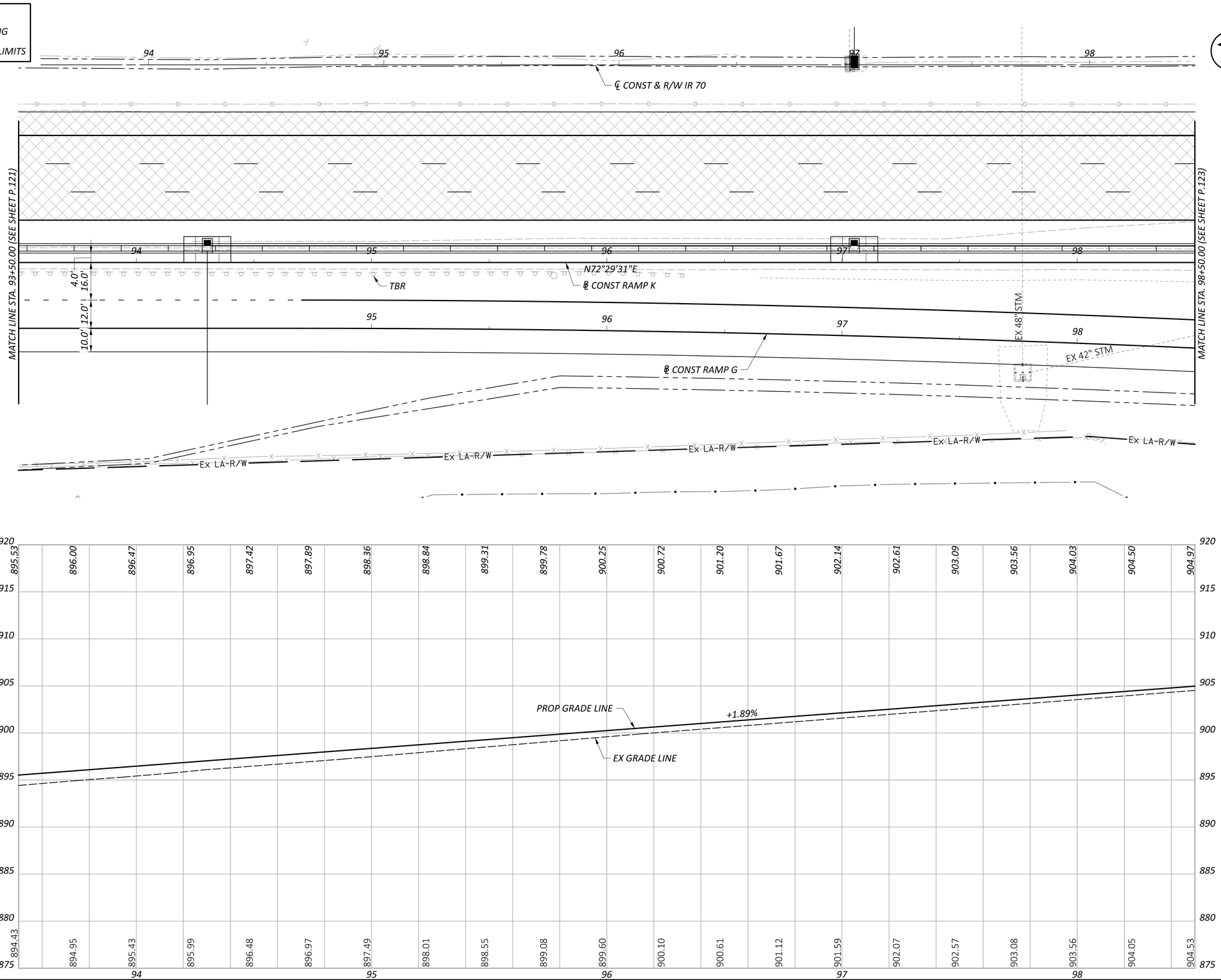
PLAN AND PROFILE - RAMP K
STA. 88+50.00 TO STA. 93+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.121
TOTAL	740

MODEL: BLP_R070K - Plan 11 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:58:07 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP321.dgn

LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS

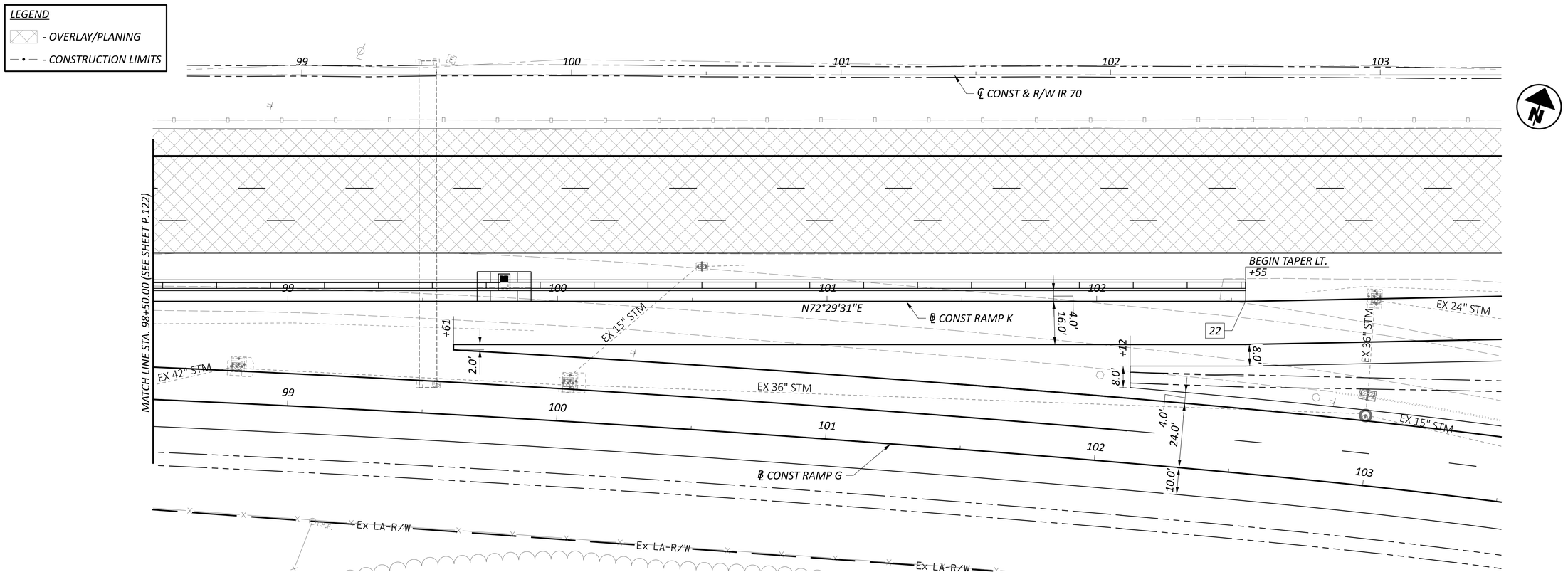


HORIZONTAL SCALE IN FEET
0 10 20 40

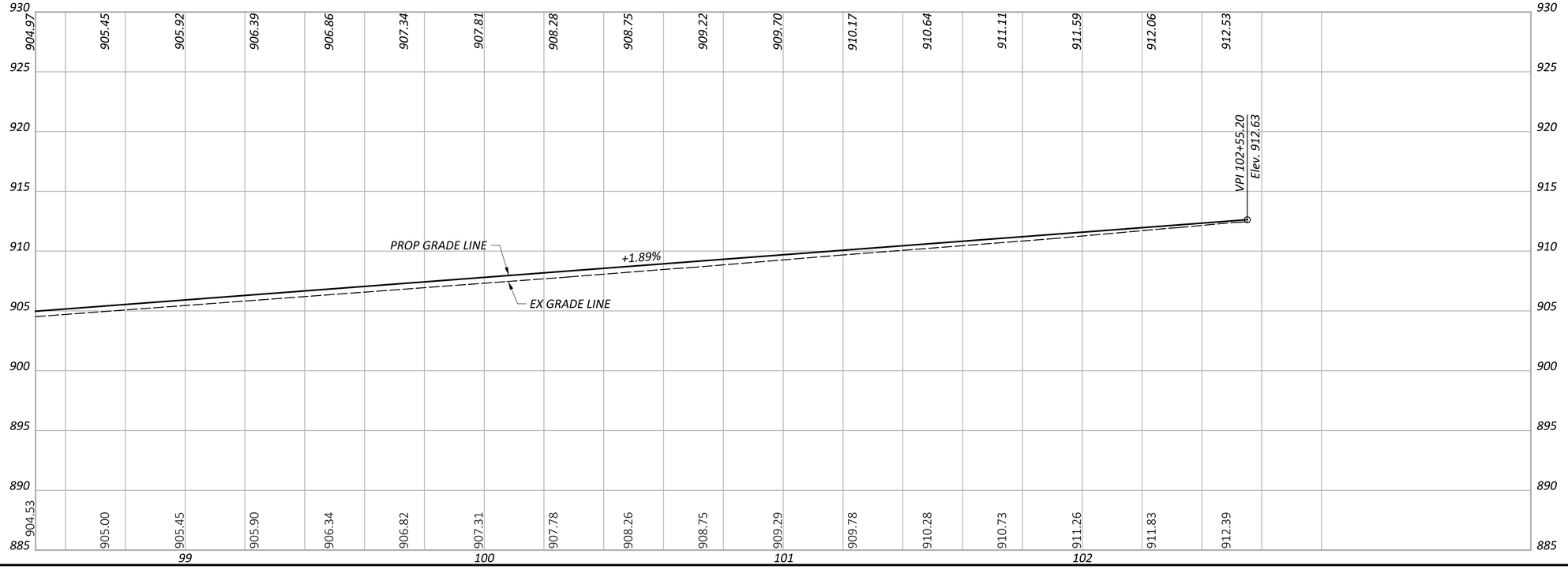
PLAN AND PROFILE - RAMP K
STA. 93+50.00 TO STA. 98+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER BER
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.122 TOTAL 740



22 STA. 102+55.20, ℄ CONST RAMP K, PI =
STA. 102+50.00, 84.00' RT, ℄ CONST & R/W IR 70



HORIZONTAL
SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - RAMP K
STA. 98+50.00 TO STA. 102+55.20

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.123 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - Plan 12 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 1:58:20 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP322.dgn

17 STA. 14+70.28, ℄ CONST & R/W SR 256, PT = STA. 14+70.28, 9.77' RT ℄ CONST & R/W SR 256

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 256
STA. 11+50.00 TO STA. 16+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.124 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5256 - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:24:01 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\d01-Engineering_StructurePoint\Roadway\Sheets\96808_GP401.dgn

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5256 - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:24:15 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\d01-Engineering_StructurePoint\Roadway\Sheets\96808_GP402.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 256
STA. 16+50.00 TO STA. 21+50.00

MATCH LINE STA. 16+50.00 (SEE SHEET P.124)

MATCH LINE STA. 21+50.00 (SEE SHEET P.127)

BEGIN WORK STA. 16+95.14

SUSPEND WORK STA. 20+11.81

℄ CONST & R/W SR 256

℄ CONST RAMP C

℄ CONST RAMP D

℄ CONST RAMP E

SAW CUT

EX 12" STM.

EX 24" STM.

EX 36" STM.

EX 18" STM.

Ex LA-R/W

N05°30'11"W

90°

55.0' R

68.5' R

21.4'

22.2'

12.9'

44.1'

88.6'

13.5'

+93 +66 +59 +02 +25

11 STA. 66+86.61, ℄ CONST RAMP E, PT = STA. 16+66.26, 45.93' LT, ℄ CONST & R/W SR 256

15 STA. 80+09.68, ℄ CONST RAMP D, PI = STA. 19+01.60, ℄ CONST & R/W SR 256

16 STA. 60+28.84, ℄ CONST RAMP C, PI = STA. 18+58.60, ℄ CONST & R/W SR 256

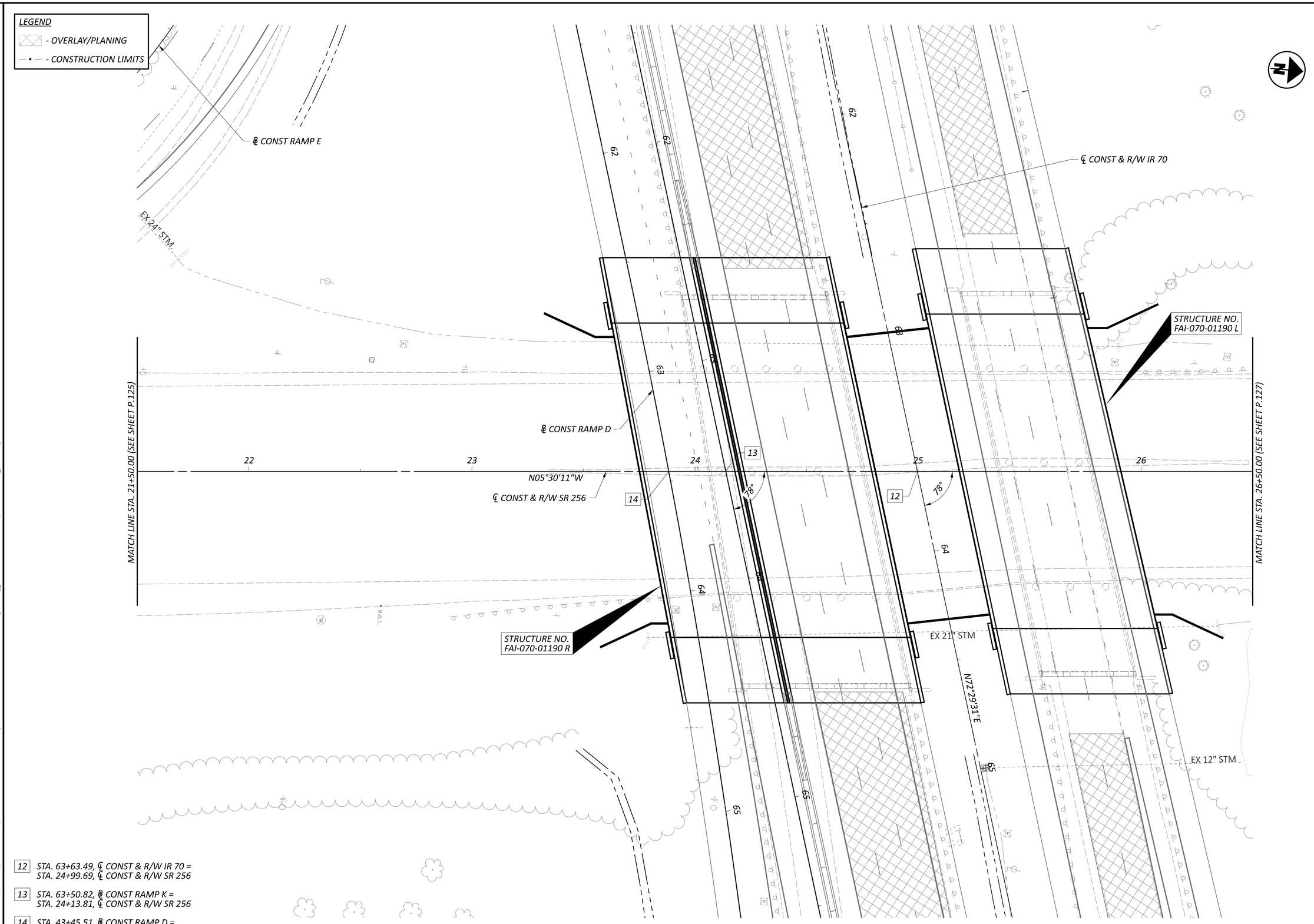
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER AJO

REVIEWER KAM 06/18/23

PROJECT ID 96808

SHEET P.125 TOTAL 740



12 STA. 63+63.49, ℄ CONST & R/W IR 70 =
STA. 24+99.69, ℄ CONST & R/W SR 256

13 STA. 63+50.82, ℄ CONST RAMP K =
STA. 24+13.81, ℄ CONST & R/W SR 256

14 STA. 43+45.51, ℄ CONST RAMP D =
STA. 23+88.25, ℄ CONST & R/W SR 256

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 256
STA. 21+50.00 TO STA. 26+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5256 - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:24:30 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP403.dgn

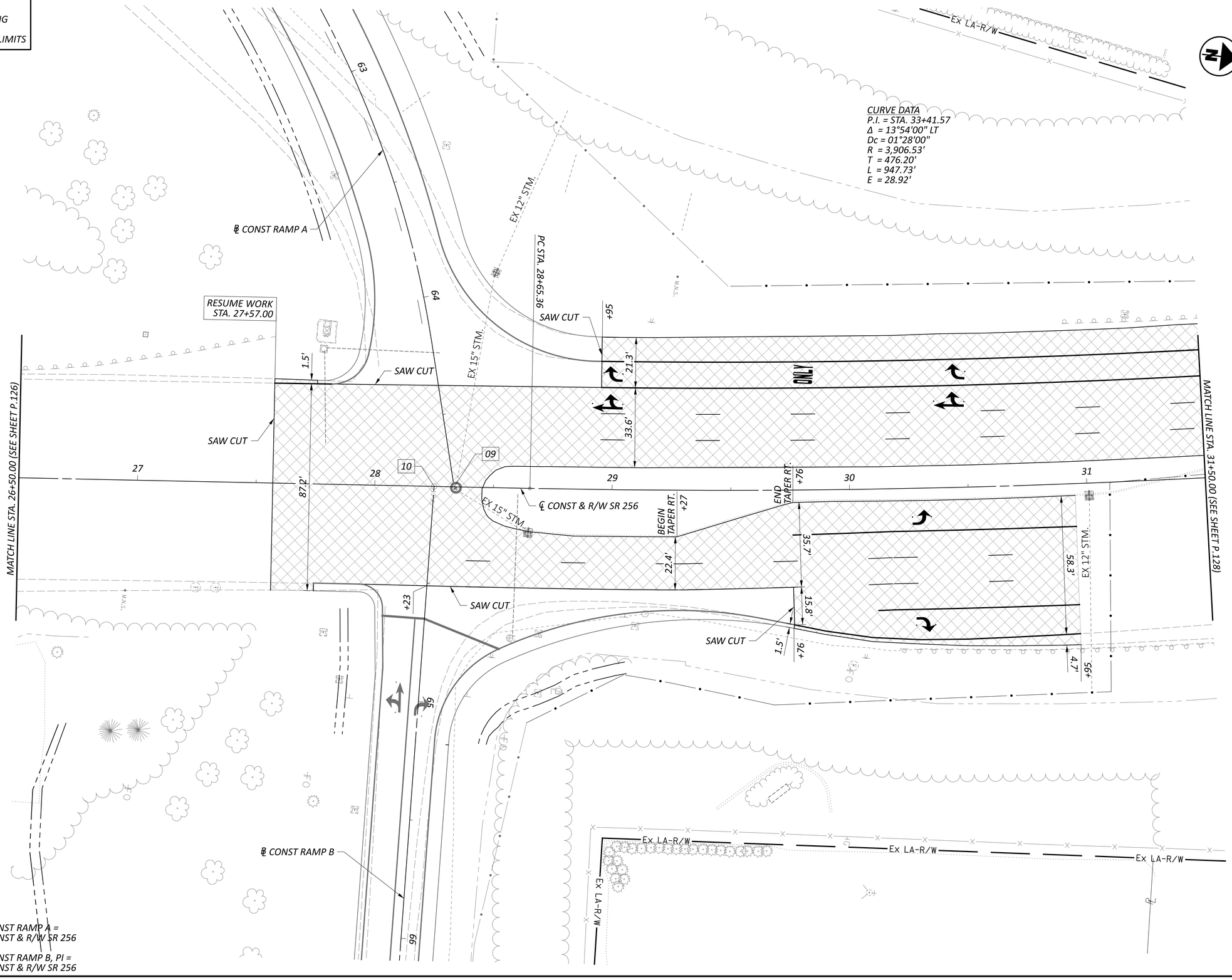
DESIGN AGENCY
STRUCTUREPOINT INC.
DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.126 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5256 - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:24:46 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP404.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS



09 STA. 64+80.85, ℄ CONST RAMP A =
STA. 28+33.41, ℄ CONST & R/W SR 256

10 STA. 64+09.09, ℄ CONST RAMP B, PI =
STA. 28+25.00, ℄ CONST & R/W SR 256

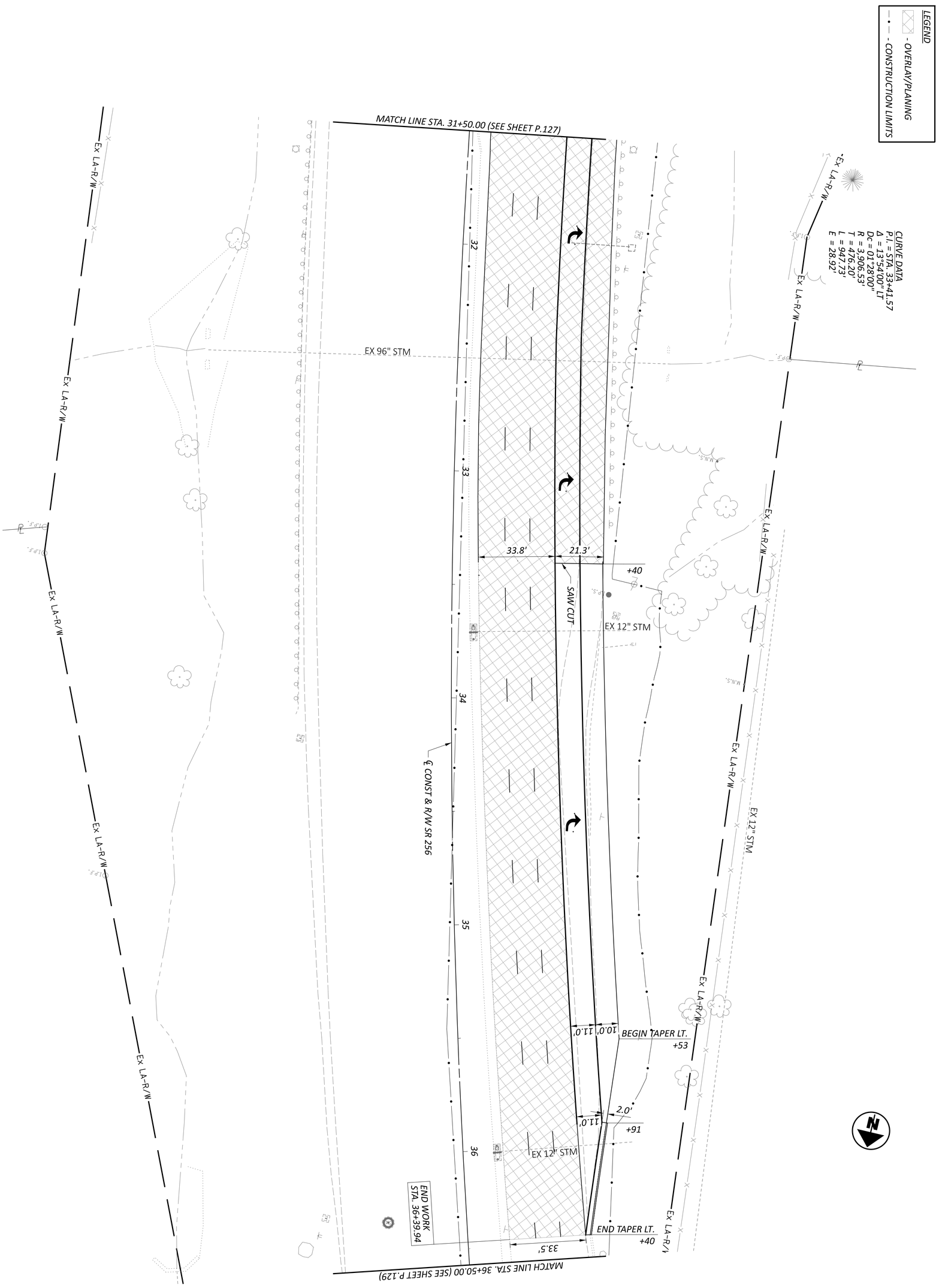
HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 256
STA. 26+50.00 TO STA. 31+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.127 TOTAL 740

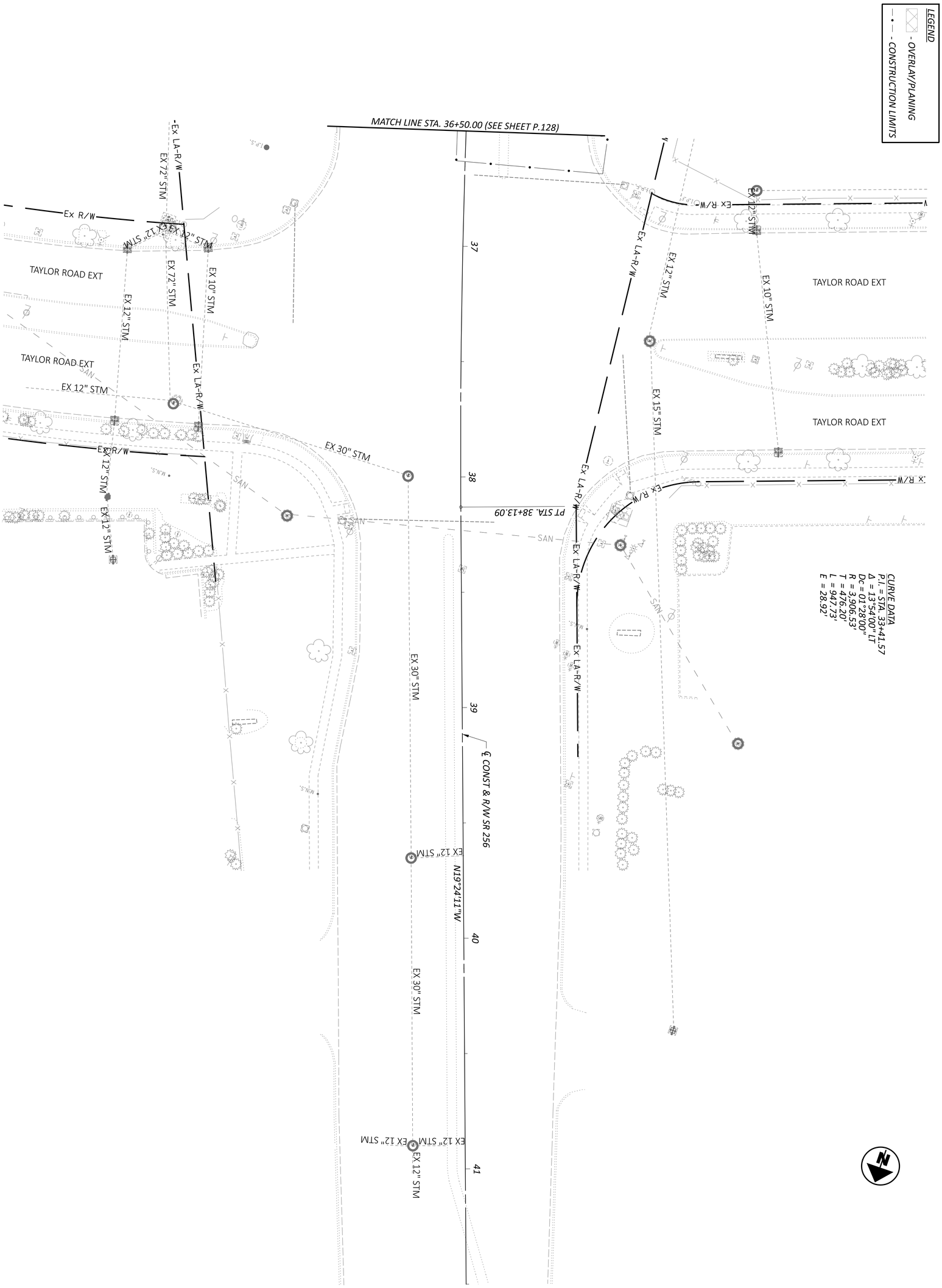
MODEL: CLP_S256 - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:25:01 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP405.dgn



SHEET P.128 TOTAL 740	PROJECT ID 96808	REVIEWER KAM 06/18/23	DESIGNER AJO	DESIGN AGENCY AMERICAN STRUCTUREPOINT INC.	PLAN SHEET - SR 256 STA. 31+50.00 TO STA. 36+50.00

HORIZONTAL SCALE IN FEET
0 20
10 40

MODEL: CLP_S256 - Plan 6 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:25:16 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP406.dgn



SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.129	740	96808	KAM 06/18/23	AJO	AMERICAN STRUCTUREPOINT INC.

PLAN SHEET - SR 256
STA. 36+50.00 TO STA. 41+50.00

HORIZONTAL SCALE IN FEET
0 20
10 40

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA - SR 204
P.I. = STA. 44+29.49
Δ = 43°45'47" RT
Dc = 06°00'00"
R = 954.93'
T = 383.52'
L = 729.38'
E = 74.14'
e_{max} = 0.054

CURVE DATA - WELLESLEY DR
P.I. = STA. 14+24.19
Δ = 28°45'22" LT
Dc = 15°00'00"
R = 381.97'
T = 97.92'
L = 191.71'
E = 12.35'
e_{max} = NC

CURVE DATA - NEEDHAM PL NW
P.I. = STA. 2+01.56
Δ = 08°28'17" LT
Dc = 18°00'00"
R = 318.31'
T = 23.57'
L = 47.06'
E = 0.87'

CURVE DATA - NEEDHAM PL NW
P.I. = STA. 3+11.64
Δ = 25°23'16" RT
Dc = 28°00'00"
R = 204.63'
T = 46.09'
L = 90.67'
E = 5.13'

30 STA. 42+47.15, ℄ CONST SR 204 =
STA. 16+26.48, ℄ CONST WELLESLEY DR =
STA. 16+26.48, ℄ CONST TAYLOR RD

31 STA. 1+00.00, ℄ NEEDHAM PL NW, PI =
STA. 14+33.69, ℄ CONST WELLESLEY DR

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD
STA. 14+00.00 TO STA. 19+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER FGW
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.130 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 11:27:40 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP412.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD
STA. 19+00.00 TO STA. 24+00.00

MATCH LINE STA. 19+00.00 (SEE SHEET P.130)

MATCH LINE STA. 24+00.00 (SEE SHEET P.132)

BEGIN TAPER +47

END TAPER BEGIN TAPER LT. +50

END TAPER LT. +00

℄ CONST TAYLOR RD

N04°00'02"E

LA-R/W

Ex LA-R/W

TBR

TMP

EX 21" STM

EX 18" STM

EX 12" STM

EX 12" STM

Ex LA-R/W

OH-Comb

36.0'

24.0'

6.0'

10.0'

7.5'

PL

20

21

22

23

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.131 TOTAL 740

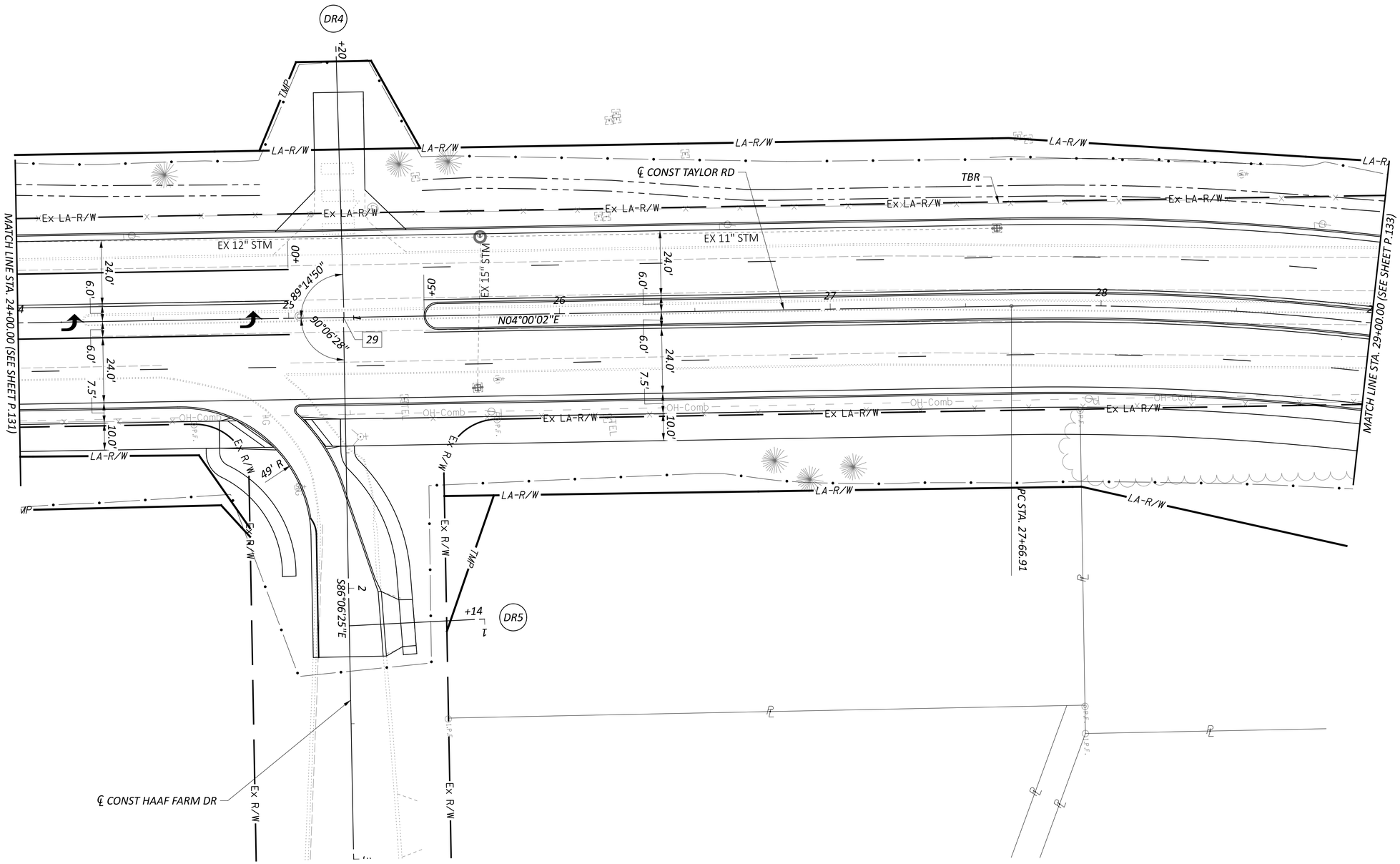
FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 11:31:31 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\d01-Engineering_StructurePoint\Roadway\Sheets\96808_GP413.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 28+90.31
Δ = 13°30'40" RT
Dc = 05°30'00"
R = 1,041.74'
T = 123.4'
L = 245.65'
E = 7.28'
e_{max} = NC



29 STA. 1+00.00, ℄ CONST HAAF FARM DR = STA. 25+20.22, ℄ CONST TAYLOR RD

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD
STA. 24+00.00 TO STA. 29+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER FGW
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.132 TOTAL 740

FAI/LIC IR 70 0.00/0.00

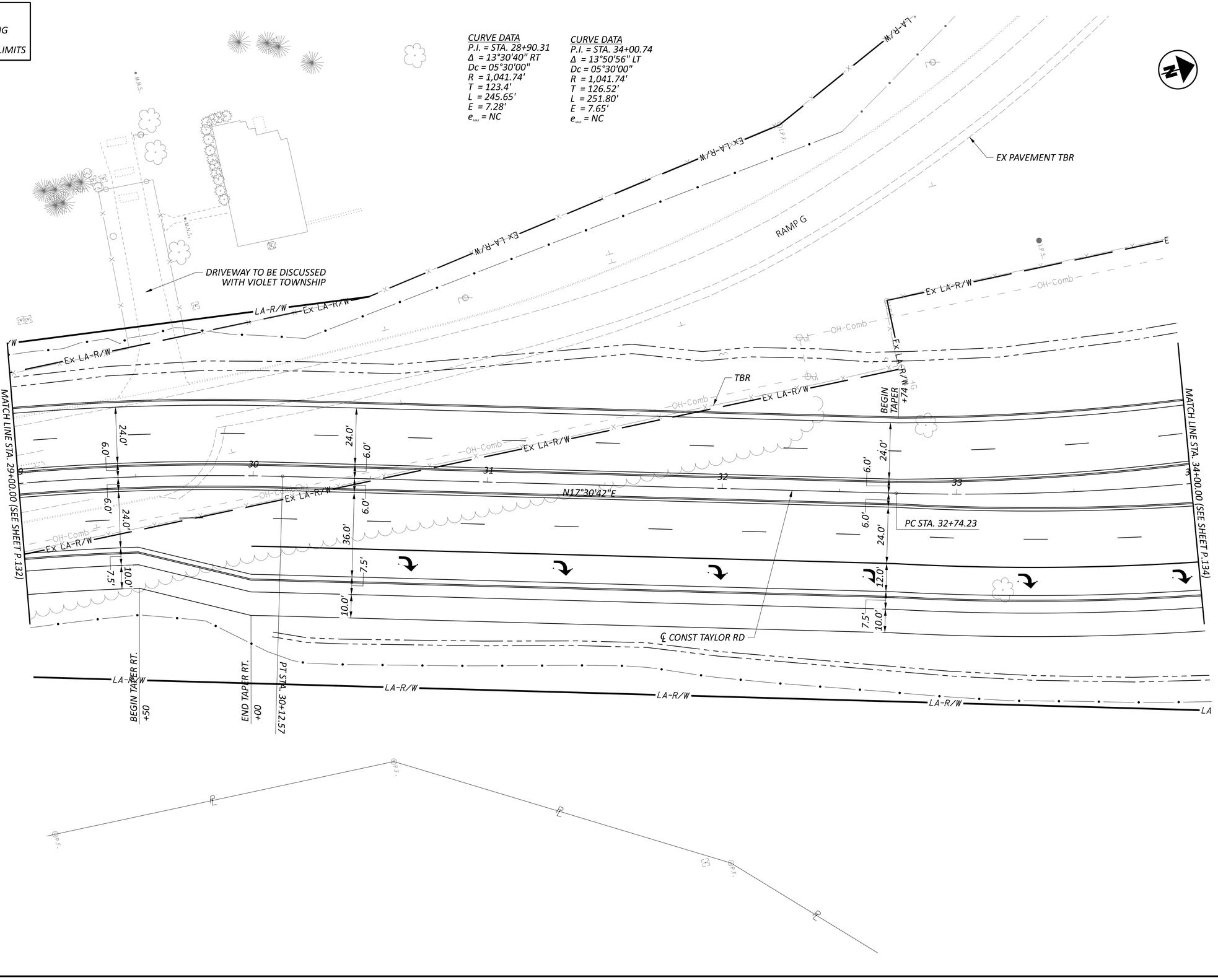
MODEL: CLP_TAYLOR - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 11:34:49 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\d01-Engineering_StructurePoint\Roadway\Sheets\96808_GP414.dgn

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 28+90.31
Δ = 13°30'40" RT
Dc = 05°30'00"
R = 1,041.74'
T = 123.4'
L = 245.65'
E = 7.28'
e_{max} = NC

CURVE DATA
P.I. = STA. 34+00.74
Δ = 13°50'56" LT
Dc = 05°30'00"
R = 1,041.74'
T = 126.52'
L = 251.80'
E = 7.65'
e_{max} = NC



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD
STA. 29+00.00 TO STA. 34+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - Plan 5 PAPERSIZE: 34x22 (in.) DATE: 8/28/2023 TIME: 12:26:20 PM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP415.dgn

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.133 TOTAL 740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 34+00.74
Δ = 13°50'56" LT
Dc = 05°30'00"
R = 1,041.74'
T = 126.52'
L = 251.80'
E = 7.65'
e_{max} = NC

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD
STA. 34+00.00 TO STA. 39+00.00

Ex LA-R/W
OH-Comb
BEGIN TAPER LT. 20+
PT STA. 35+26.02
END TAPER LT. +68
60.0' R
℄ CONST RAMP G
111
110
25.0' R
+85
MATCH LINE STA. 34+00.00 (SEE SHEET P.133)
MATCH LINE STA. 39+00.00 (SEE SHEET P.135)
24.0'
14.0'
14.0'
36.0'
7.5'
10.0'
00+ R
14.0' R
85°00'00"
70°00'00"
N03°39'46"E
℄ CONST TAYLOR RD
2.0'
36.0'
6.0'
3.0'
12.0' R
95.0' R
℄ CONST RAMP J
112
LA-R/W

27 STA. 111+84.30, ℄ CONST RAMP G, PI = STA. 36+30.00, ℄ CONST TAYLOR RD

28 STA. 110+13.40, ℄ CONST RAMP J, PI = STA. 36+25.00, ℄ CONST TAYLOR RD

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER FGW
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.134 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - Plan 6 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:30:02 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP416.dgn

MODEL: CLP_TAYLOR - Plan 7 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 10:47:54 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP417.dgn

26 STA. 41+15.09, ℄ CONST TAYLOR RD = STA. 112+93.76, ℄ CONST & R/W IR 70

25 STA. 113+68.11, ℄ CONST RAMP H, PI = STA. 43+07.23, ℄ CONST TAYLOR RD

24 STA. 114+03.78, ℄ CONST RAMP I, PI = STA. 43+20.00, ℄ CONST TAYLOR RD

LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS

MATCH LINE STA. 39+00.00 (SEE SHEET P.134)

10.0' 7.5' 36.0' 6.0' 36.0' 2.0'
3.0'
BEGIN TAPER RT. +39
END TAPER RT. +59
5.5'
Ex LA-R/W
℄ CONST TAYLOR RD
℄ CONST & R/W IR 70
40
+75
68°49'45"
44
26
+25
+50
42
10.0' 39.0' 9.0' 24.0'
6.0'
Ex R/W
20.0' R
70°00'00"
℄ CONST RAMP I
℄ CONST RAMP H
43
25
N03°39'46"E
24
25.0' R
104.0' R
14.0' R
41.0' R
15.0' 15.0'
TAYLOR ROAD
OH-Comb
111 112 113 114 115 116

MATCH LINE STA. 44+00.00 (SEE SHEET P.136)

N

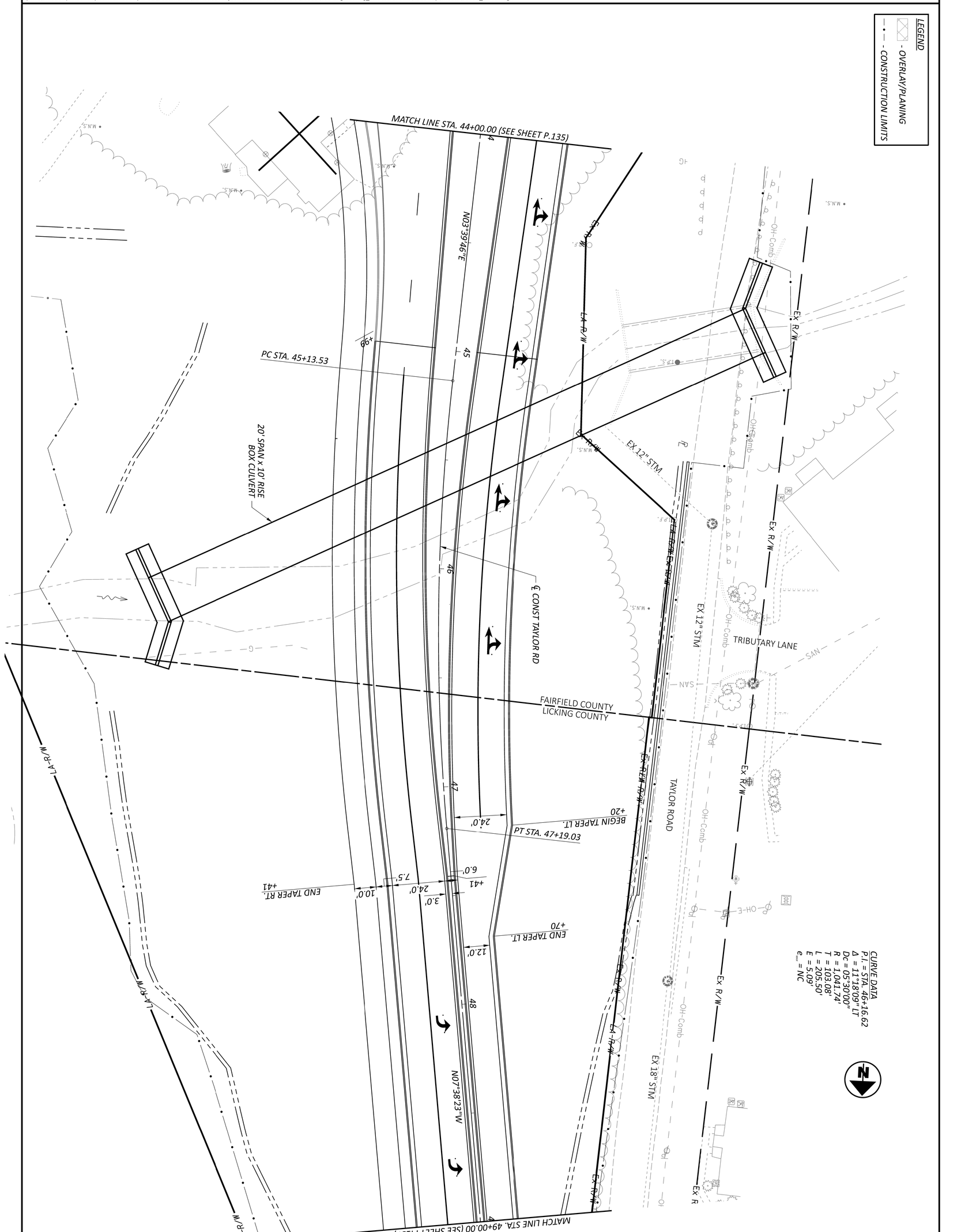
PLAN SHEET - TAYLOR ROAD
STA. 39+00.00 TO STA. 44+00.00

HORIZONTAL SCALE IN FEET
0 20
10 40

SHEET	TOTAL
P. 135	740

PROJECT ID: 96808
REVIEWER: KAM 06/18/23
DESIGNER: FGW
DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

MODEL: CLP_TAYLOR - Plan 8 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 10:51:25 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP418.dgn



PLAN SHEET - TAYLOR ROAD
STA. 44+00.00 TO STA. 49+00.00

HORIZONTAL SCALE IN FEET
0 20
10 40

SHEET	TOTAL
P.136	740

PROJECT ID: 96808
REVIEWER: KAM 06/18/23
DESIGNER: FGW
DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

MATCH LINE STA. 14+00.00 (SEE SHEET P.166)

TAYLOR RD SW

℄ CONST TAYLOR RD SW

R/W

5.0'

Ex R/W

CLEAR PATH DRIVE

EX 18" STM

TAYLOR RD

LA-R/W

200.0' R

60.0' R

PT STA. 15+19.00

N86°06'17"E

90°43'56"

23

51

℄ CONST TAYLOR RD

+64

+82

+20

PC STA. 50+31.92

MATCH LINE STA. 49+00.00 (SEE SHEET P.136)

N07°38'23"W

2.0'

3.0'

12.0'

6.0'

24.0'

7.5'

10.0'

50

9

CURVE DATA - TAYLOR RD SW
P.I. = STA. 13+90.69
Δ = 40°13'45" RT
Dc = 15°00'00"
R = 381.97'
T = 139.89'
L = 268.2'
E = 24.81'
e_{MAX} = NC

CURVE DATA - TAYLOR RD
P.I. = STA. 51+36.59
Δ = 11°28'30" RT
Dc = 05°30'00"
R = 1,041.74'
T = 104.67'
L = 208.64'
E = 5.25'
e_{MAX} = NC

EX 12" STM

EX PAVEMENT TBR

BEGIN TAPER LT. +63

OH-Comb

52

53

91°41'50"

N03°50'07"E

27.7'

7.5'

30.0'

10.0'

EX 18" STM

MATCH LINE STA. 54+00.00 (SEE SHEET P.138)

5.0'

PT STA. 52+40.56
BEGIN TAPER RT.

+79

TMP

DR6

23 STA. 15+74.78, ℄ CONST TAYLOR RD SW, PT = STA. 51+00.00, ℄ CONST TAYLOR RD

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD
STA. 49+00.00 TO STA. 54+00.00

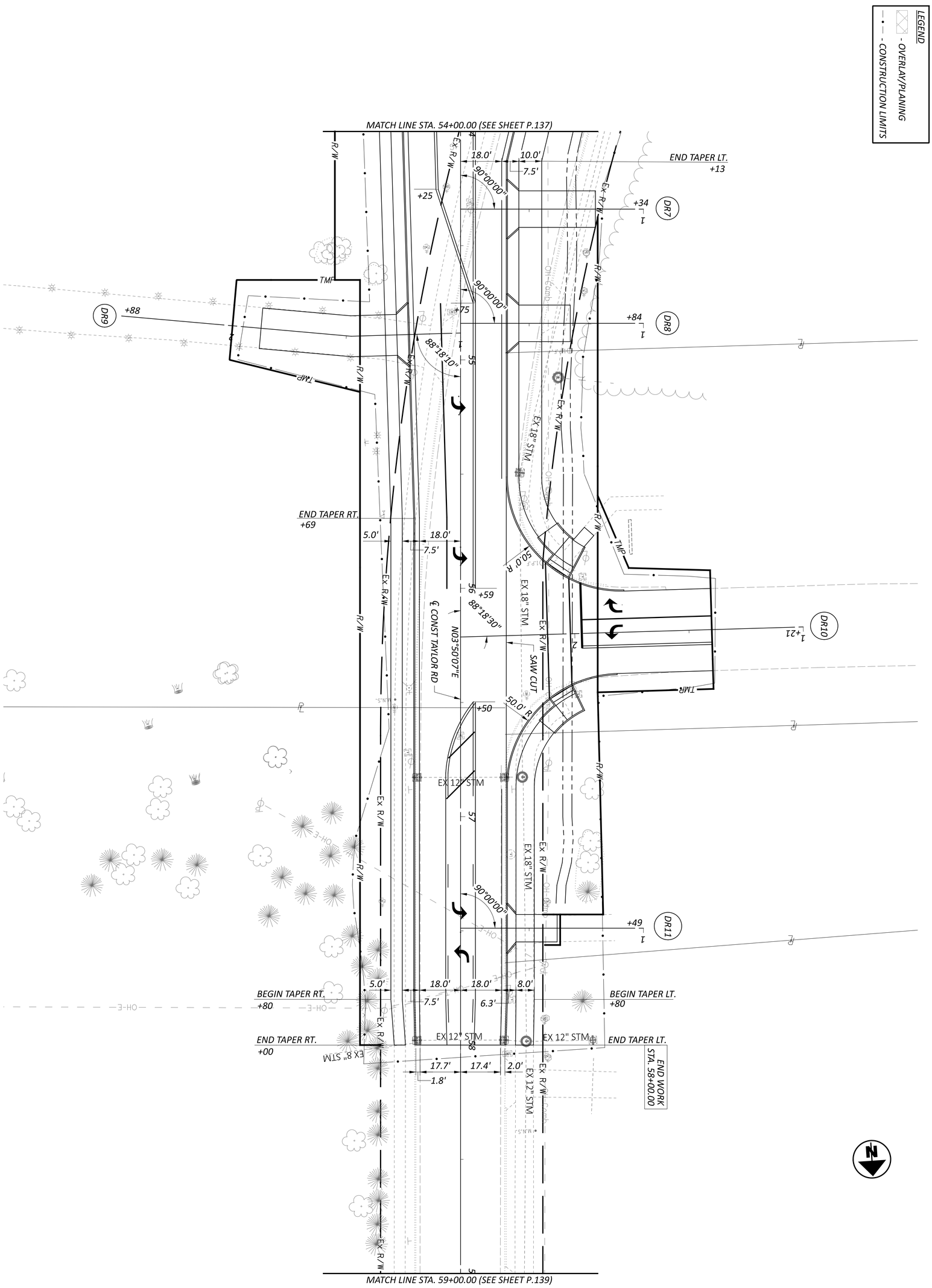
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER FGW
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.137 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - Plan 9 PAPERSIZE: 34x22 (in.) DATE: 8/29/2023 TIME: 10:54:14 AM USER: sott
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\

MODEL: CLP_TAYLOR - Plan 10 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:31:07 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP420.dgn



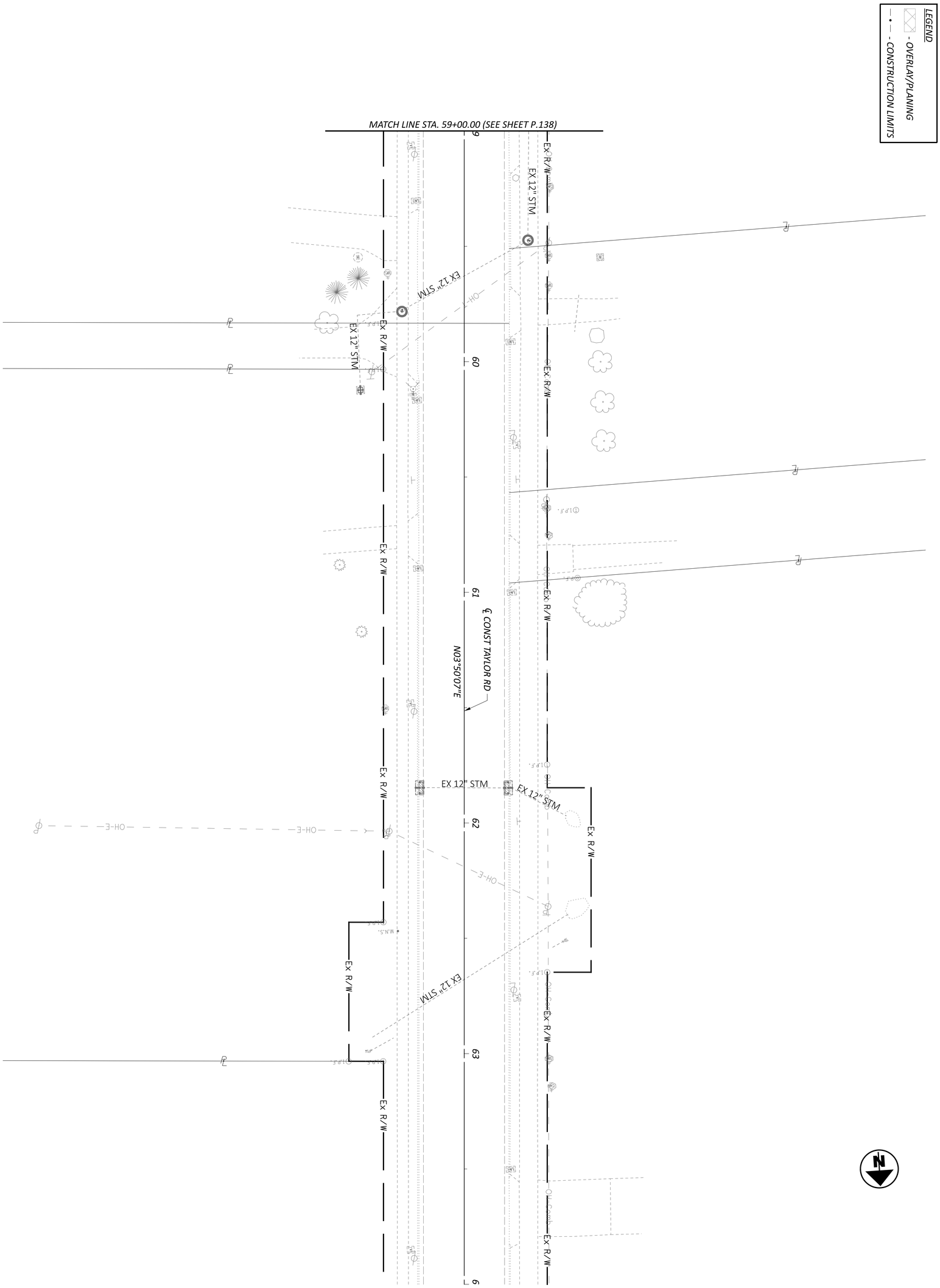
PLAN SHEET - TAYLOR ROAD
STA. 54+00.00 TO STA. 59+00.00

HORIZONTAL SCALE IN FEET
0 20
10 40

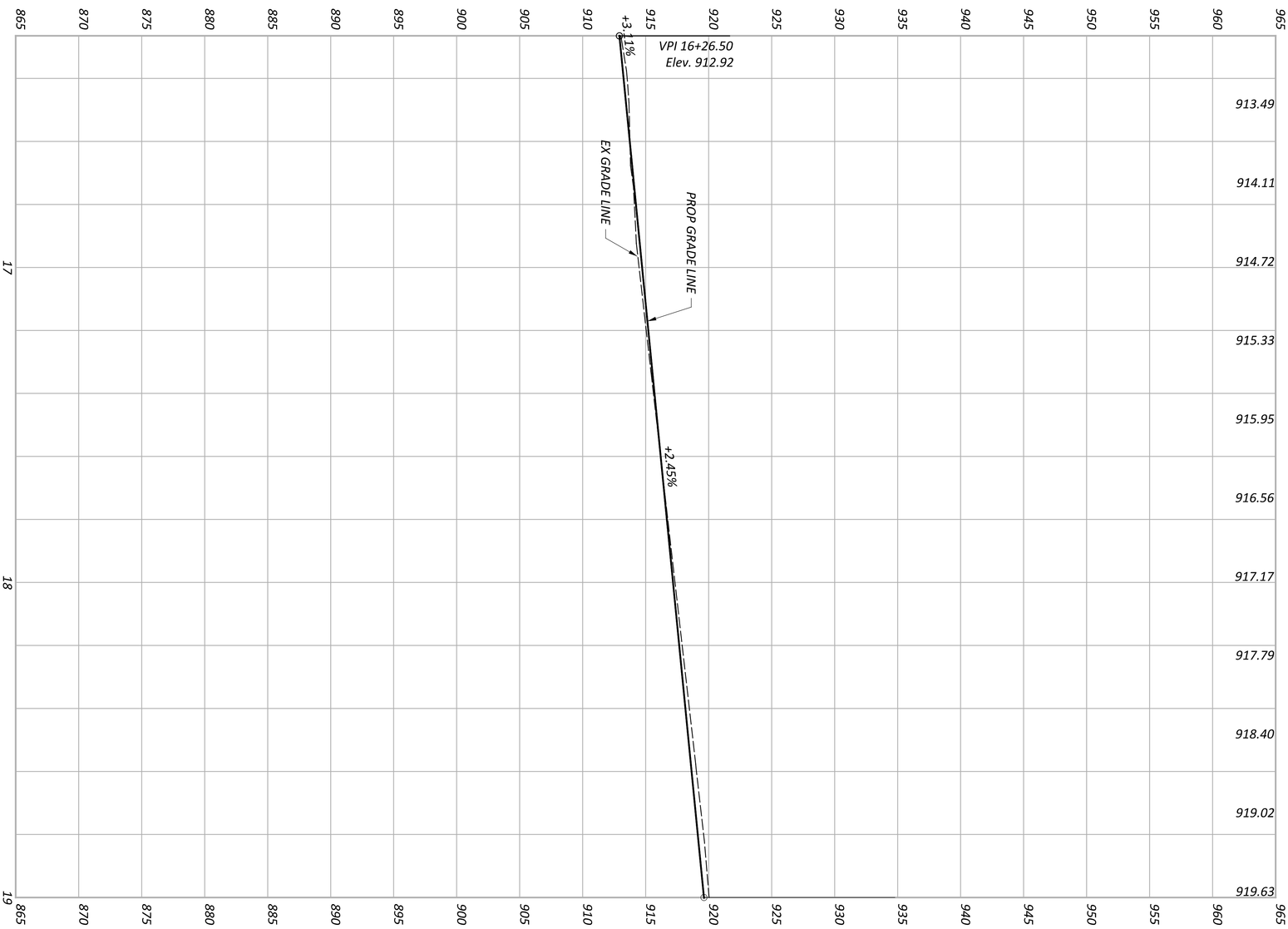
SHEET	TOTAL
P.138	740

PROJECT ID: 96808
REVIEWER: KAM 06/18/23
DESIGNER: FGW
DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

MODEL: CLP_TAYLOR - Plan 11 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:31:21 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP421.dgn


LEGEND
- OVERLAY/PLANING
- CONSTRUCTION LIMITS
MATCH LINE STA. 59+00.00 (SEE SHEET P.138)
59
60
61
62
63
64
℄ CONST TAYLOR RD
N03°50'07"E
EX 12" STM
EX 12" STM
EX 12" STM
EX 12" STM
EX 12" STM
Ex R/W
Ex R/W
Ex R/W

MODEL: PGL_CLP_TAYLOR - Profile 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:04:10 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF412.dgn



SHEET	TOTAL
P.140	740

PROJECT ID: 96808

REVIEWER: KAM 06/18/23

DESIGNER: FGW

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 14+00.00 TO STA. 19+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:04:22 PM USER: aoldaker
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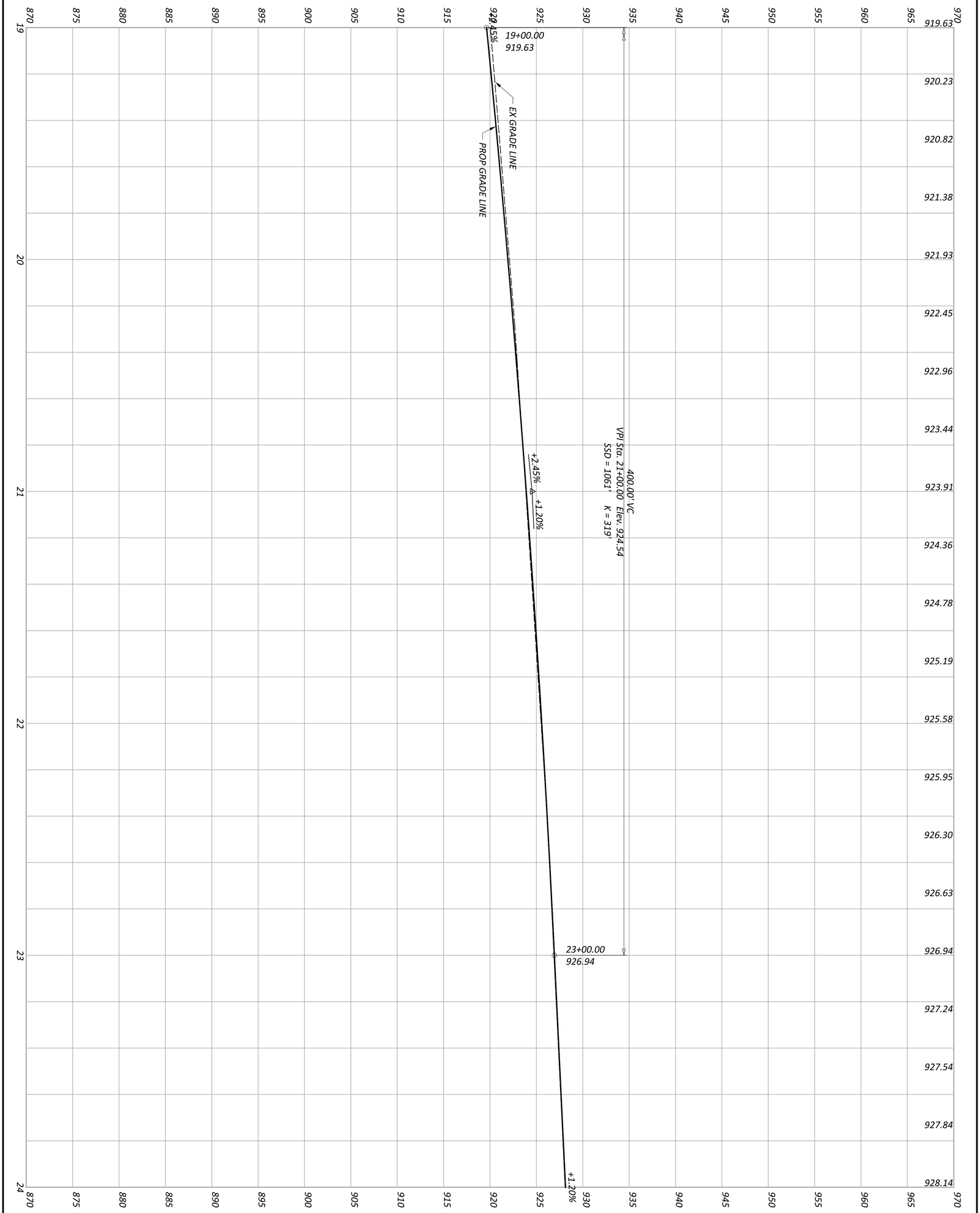

PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 19+00.00 TO STA. 24+00.00

SHEET	TOTAL
P.141	740

PROJECT ID: 96808

REVIEWER: KAM 06/18/23

DESIGNER: FGW

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD
STA. 24+00.00 TO STA. 29+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:04:31 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF414.dgn

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.142 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 5 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:04:41 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF415.dgn

PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 29+00.00 TO STA. 34+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.143 TOTAL 740

MODEL: PGL_CLP_TAYLOR - Profile 6 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:04:50 PM USER: aoldaker
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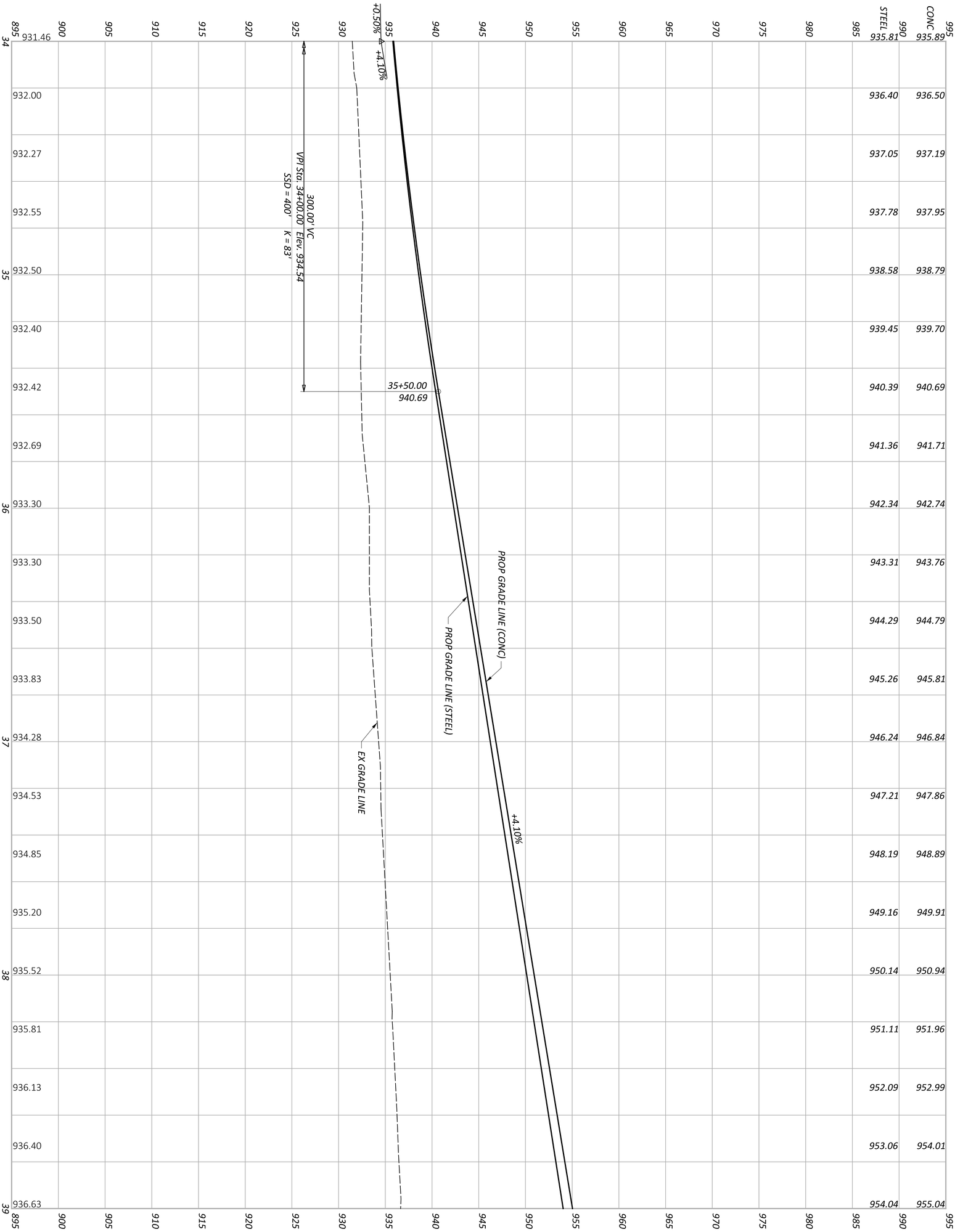

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.144	740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 34+00.00 TO STA. 39+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 7 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:05:00 PM USER: aoldaker
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PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 39+00.00 TO STA. 44+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.145 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 8 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:05:10 PM USER: aoldaker
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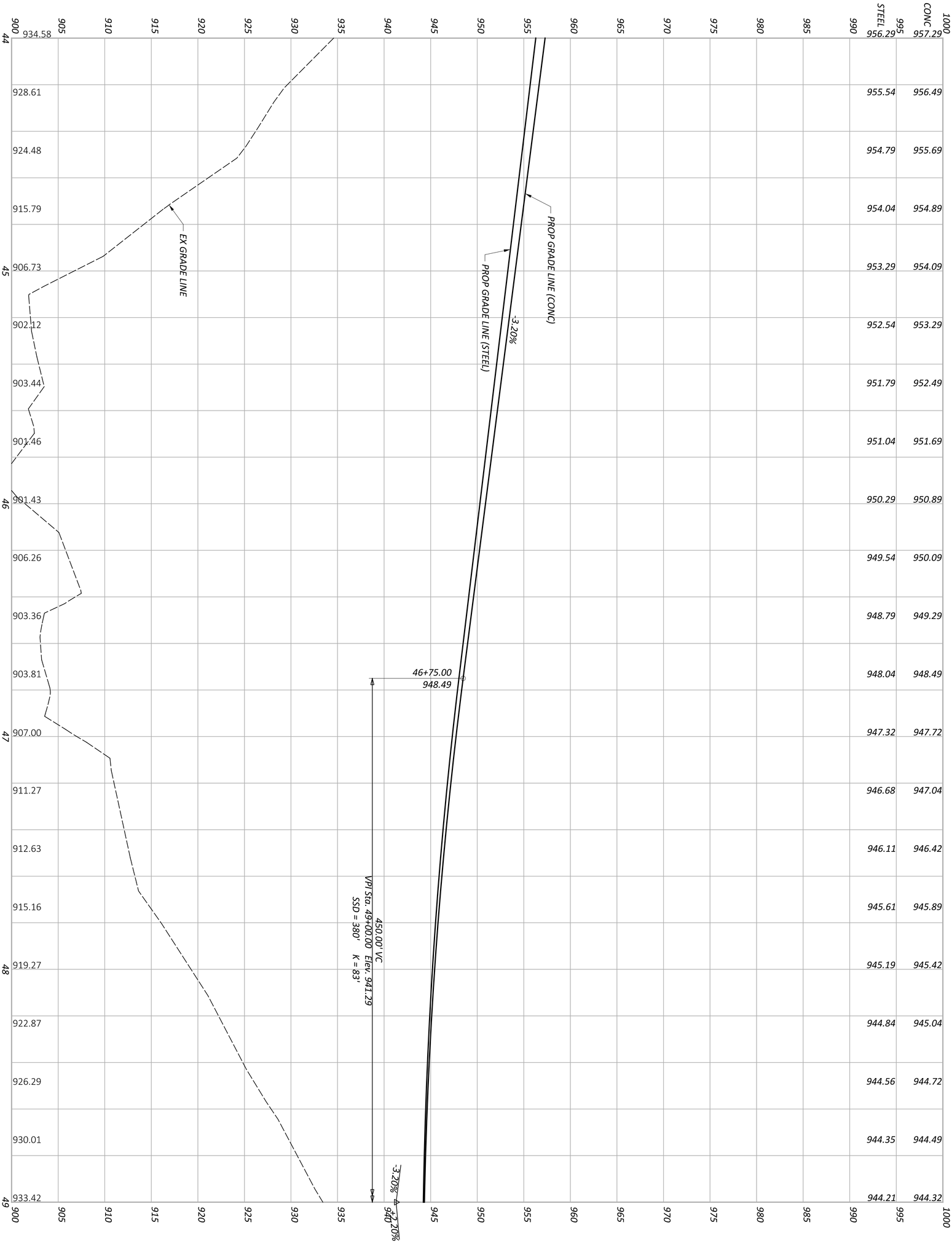


SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.146	740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 44+00.00 TO STA. 49+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 9 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:05:19 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF419.dgn

PROFILE SHEET - TAYLOR ROAD (CONC) STA. 49+00.00 TO STA. 54+00.00

DESIGN AGENCY
MIDWEST STRUCTUREPOINT INC

DESIGNER	FGW
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.147
TOTAL	740

952.29 952.81 953.30 953.74 954.13 954.48 954.79 955.05 955.26 955.46 955.65 955.84 956.04 956.23 956.42 956.62 956.81

200.00' VC
VPI Sta. 55+00.00 Elev. 954.49
SSD = 857' K = 140'

54+00.00
952.29
+2.20%
+2.20%
+0.78%
56+00.00
955.26
+0.78%
PROP GRADE LINE
VPI 58+00.00
Elev. 956.81
+ 0.53% EX
END WORK
STA 58+00.00
ELEV = 956.81
Δ = 0.25%
NO CURVE
EX GRADE LINE

1000 995 990 985 980 975 970 965 960 955 950 945 940 935 930 925 920 915 910 905 900

54 55 56 57 58 59

PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 54+00.00 TO STA. 59+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 10 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:05:28 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF420.dgn

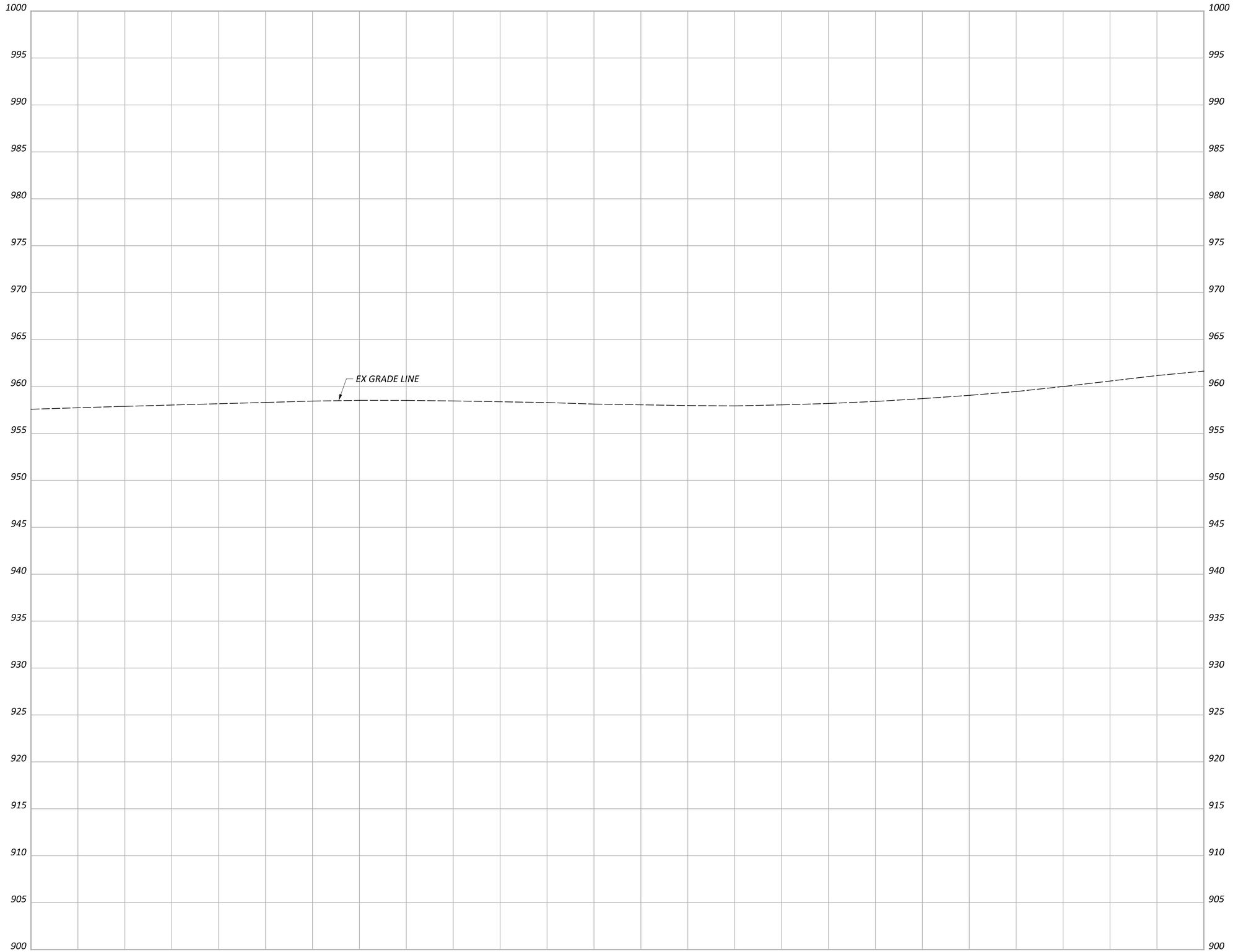
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.148 TOTAL 740



FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR - Profile 11 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:05:38 PM USER: aoldaker
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PROFILE SHEET - TAYLOR ROAD (CONC)
STA. 59+00.00 TO STA. 64+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.149 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR_S - Profile 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:06:55 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF421_S.dgn

PROFILE SHEET - TAYLOR ROAD (STEEL)
STA. 32+00.00 TO STA. 37+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.150 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR_S - Profile 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:07:04 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF422_S.dgn

PROFILE SHEET - TAYLOR ROAD (STEEL)
STA. 37+00.00 TO STA. 42+00.00

450.00' VC
VPI Sta. 41+50.00 Elev. 963.79
SSD = 375' K = 65'

+3.90% -3.00%

39+25.00
955.01

PROP GRADE LINE (CONC)

PROP GRADE LINE (STEEL)

+3.90%

EX GRADE LINE

STEEL 946.24 947.21 948.19 949.16 950.14 951.11 952.09 953.06 954.04 955.01 955.94 956.77 957.51 958.15 958.69 959.14 959.49 959.75 959.91 959.97 959.94

CONC 946.84 947.86 948.89 949.91 950.94 951.96 952.99 954.01 955.04 956.06 957.04 957.91 958.68 959.35 959.92 960.39 960.75 961.02 961.18 961.24 961.20

934.28 934.53 934.85 935.20 935.52 935.81 936.13 936.40 936.63 936.63 936.79 935.90 931.33 932.67 933.63 933.92 932.79 931.28 933.77 934.54 934.10

1010 1005 1000 995 990 985 980 975 970 965 960 955 950 945 940 935 930 925 920 915 910

37 38 39 40 41 42

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.151 TOTAL 740

MODEL: PGL_CLP_TAYLOR_S - Profile 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:07:13 PM USER: aoldaker
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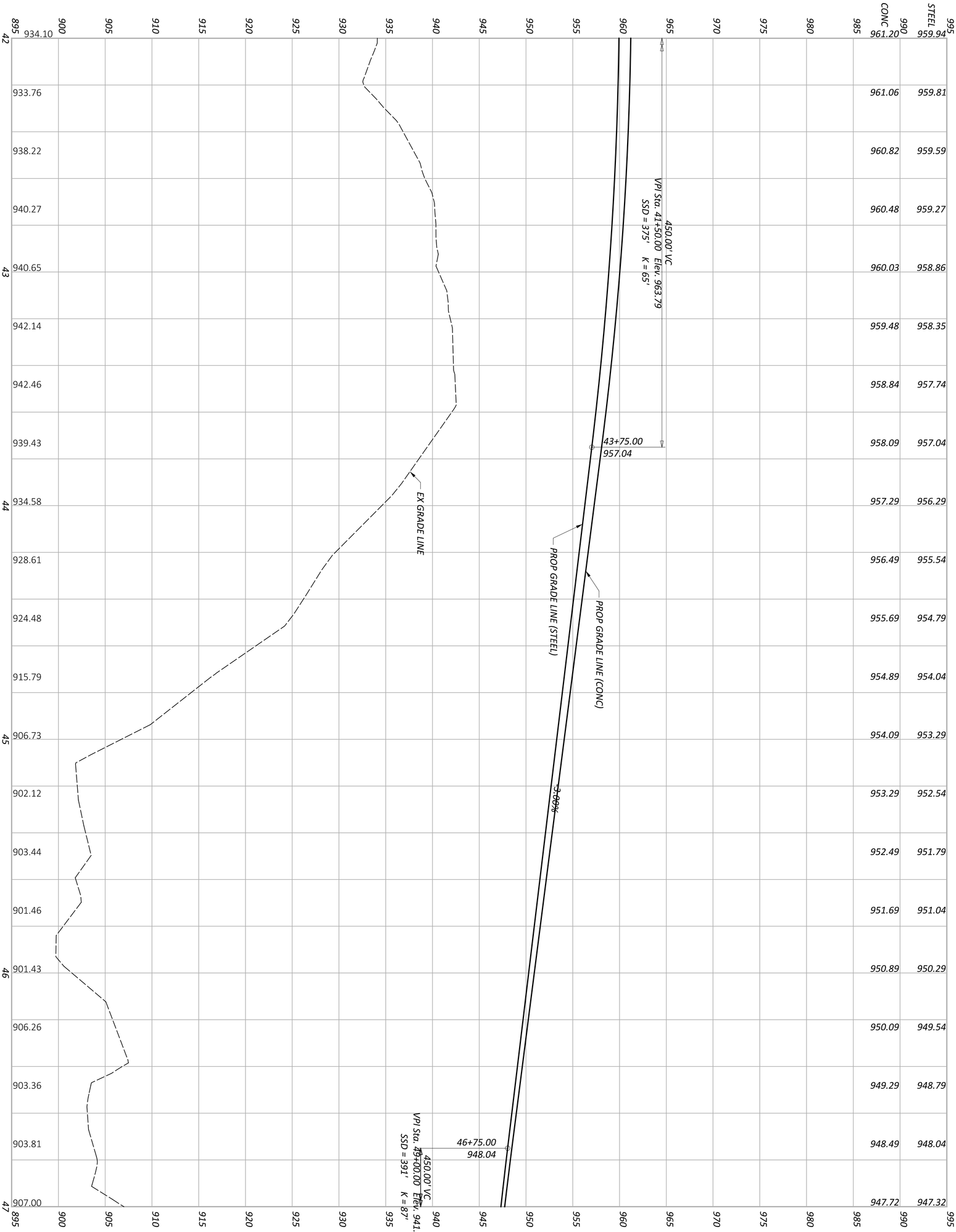

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.152	740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD (STEEL)
STA. 42+00.00 TO STA. 47+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: PGL_CLP_TAYLOR_S - Profile 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:07:27 PM USER: aoldaker
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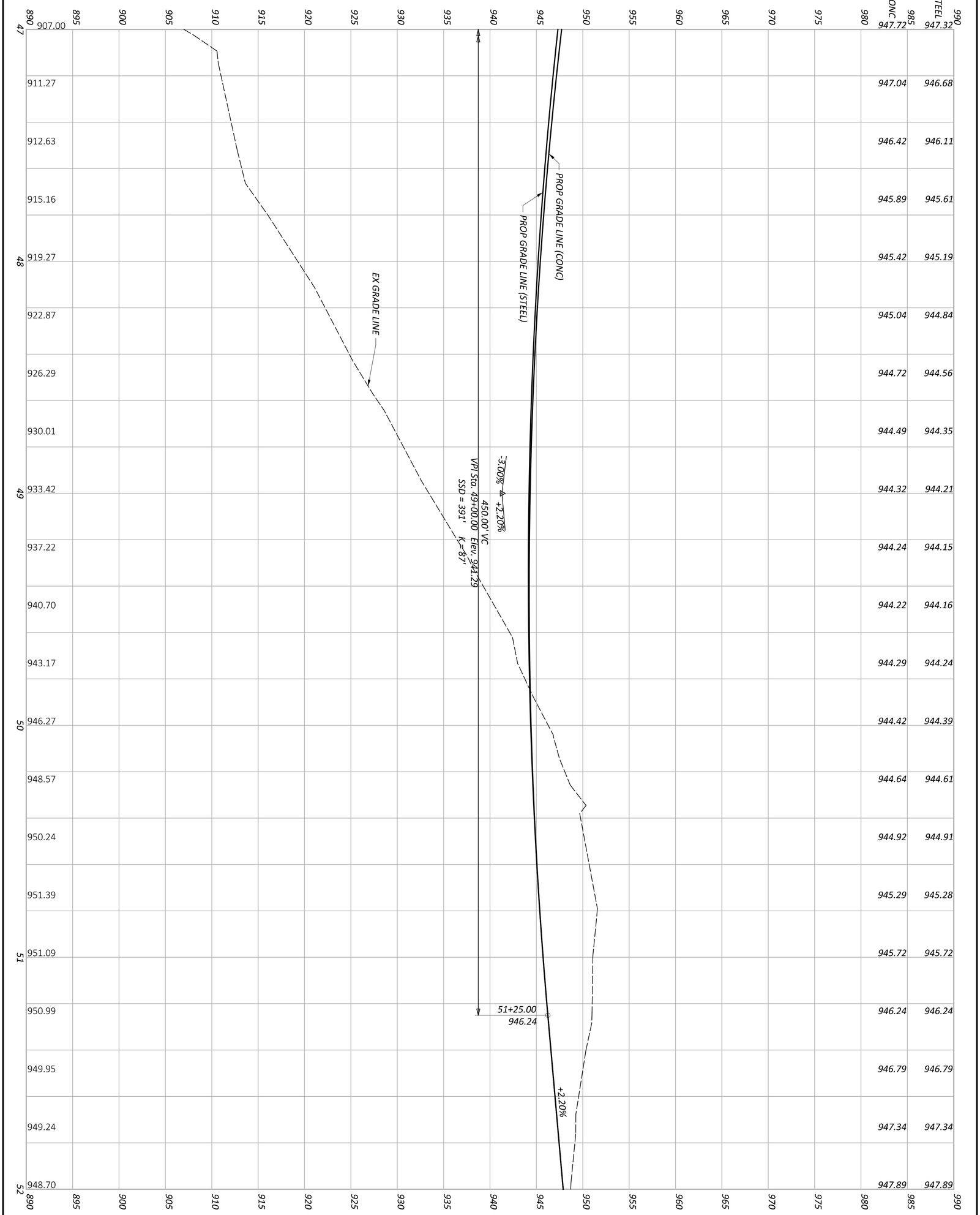


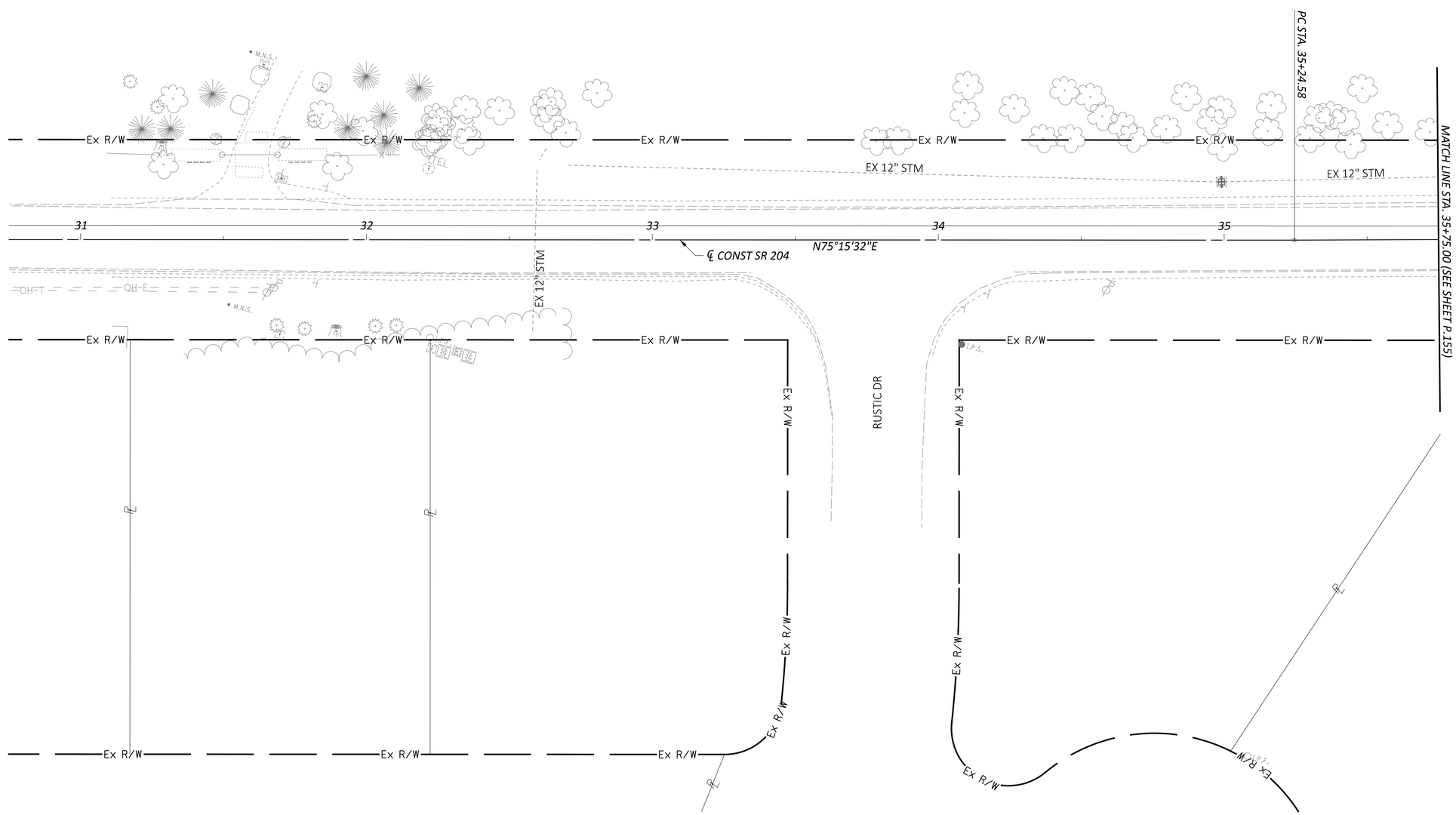
SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P. 153	740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD (STEEL)
STA. 47+00.00 TO STA. 52+00.00

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 37+12.90
Δ = 03°55'20" LT
Dc = 01°02'30"
R = 5,500.00'
T = 188.32'
L = 376.50'
E = 3.22'



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 204
STA. 30+75.00 TO STA. 35+75.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:32:39 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP430.dgn

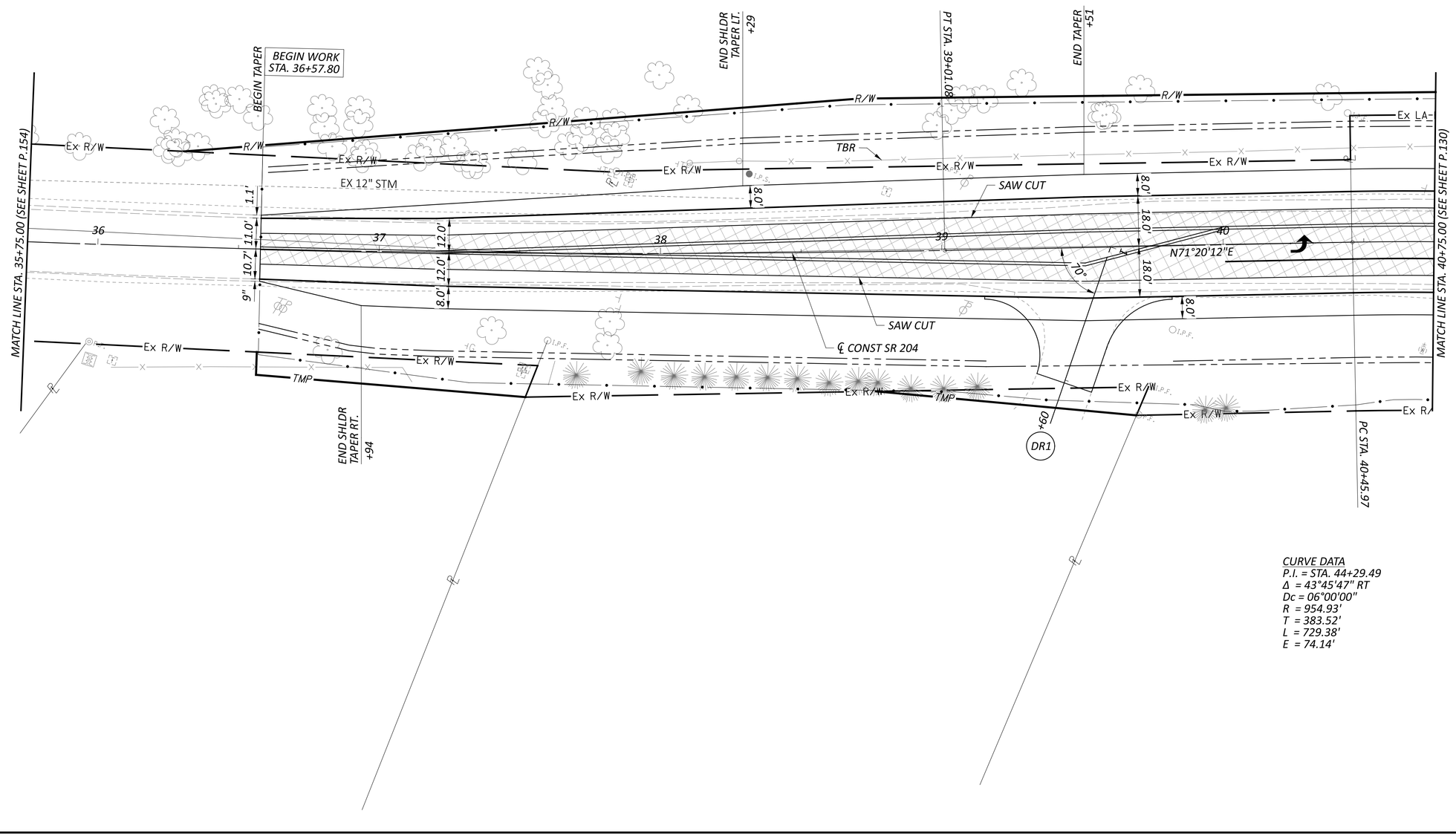
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	FGW
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.154
TOTAL	740

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 37+12.90
Δ = 03°55'20" LT
Dc = 01°02'30"
R = 5,500.00'
T = 188.32'
L = 376.50'
E = 3.22'



CURVE DATA
P.I. = STA. 44+29.49
Δ = 43°45'47" RT
Dc = 06°00'00"
R = 954.93'
T = 383.52'
L = 729.38'
E = 74.14'

HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 204
STA. 35+75.00 TO STA. 40+75.00

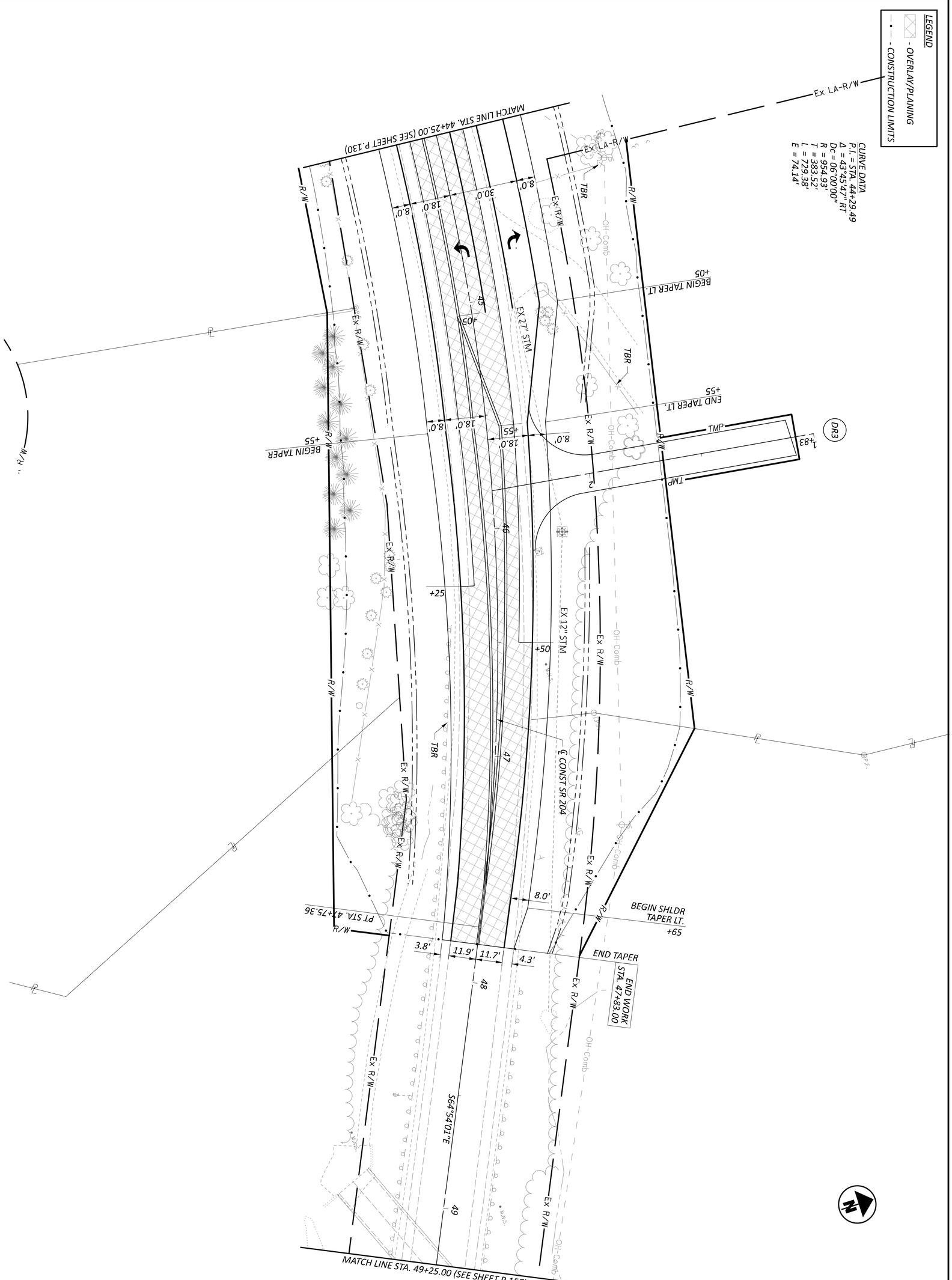
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	FGW
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.155
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_S204 - Plan 2 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:32:53 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP431.dgn

MODEL: CLP_S204 - Plan 3 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:33:07 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP433.dgn



DESIGNER	DESIGN AGENCY	PROJECT ID	REVIEWER	SHEET	TOTAL
FGW	AMERICAN STRUCTUREPOINT INC.	96808	KAM 06/18/23	P.156	740

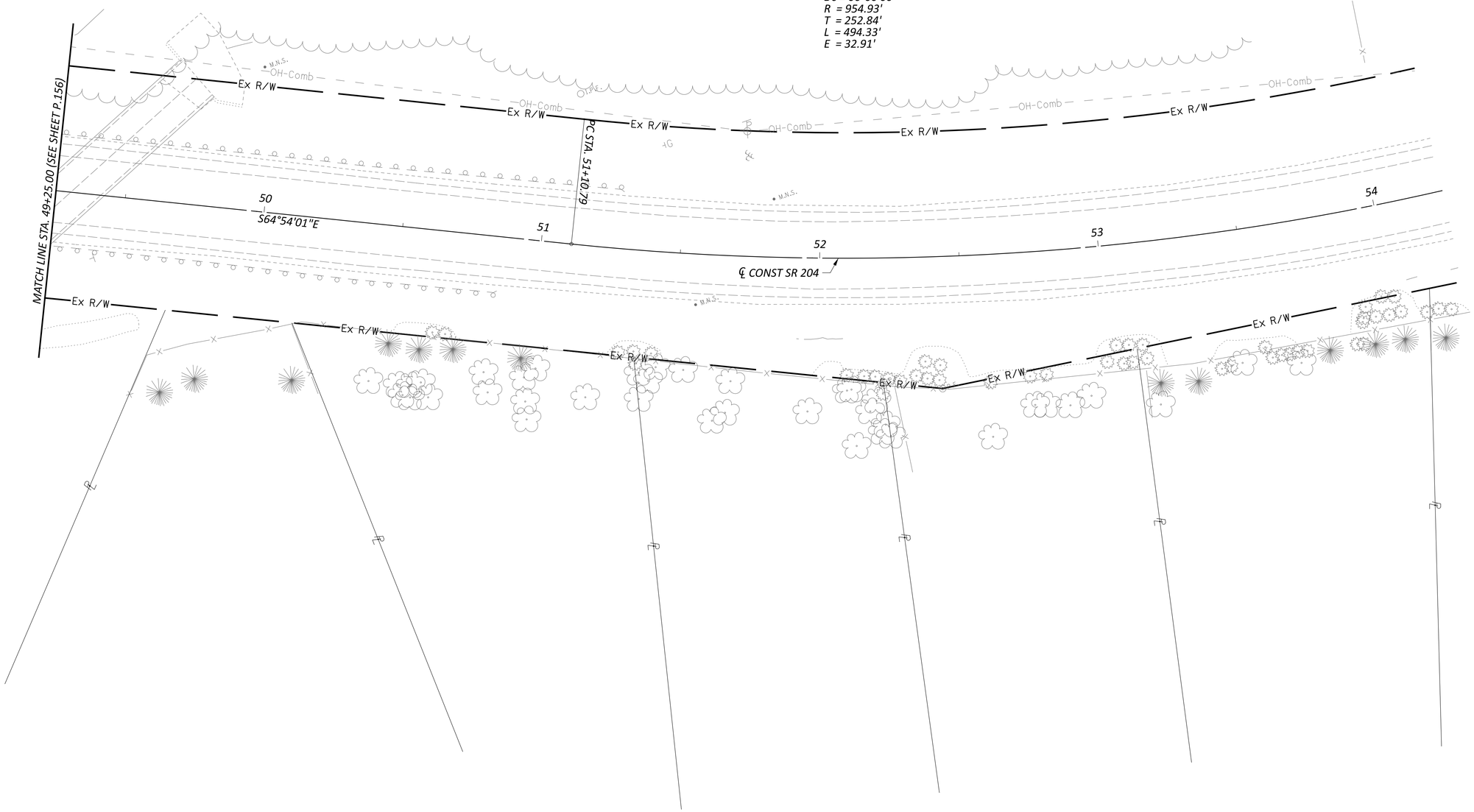
PLAN SHEET - SR 204
STA. 44+25.00 TO STA. 49+25.00

HORIZONTAL SCALE IN FEET
0 20
10 40

LEGEND

- OVERLAY/PLANING
- • - CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 53+63.63
Δ = 29°39'36" LT
Dc = 06°00'00"
R = 954.93'
T = 252.84'
L = 494.33'
E = 32.91'



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - SR 204
STA. 49+25.00 TO STA. 54+25.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
FGW

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.157 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - Plan 4 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:33:21 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP434.dgn

MODEL: CLP_S204 - Profile 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:09:58 PM USER: aoldaker
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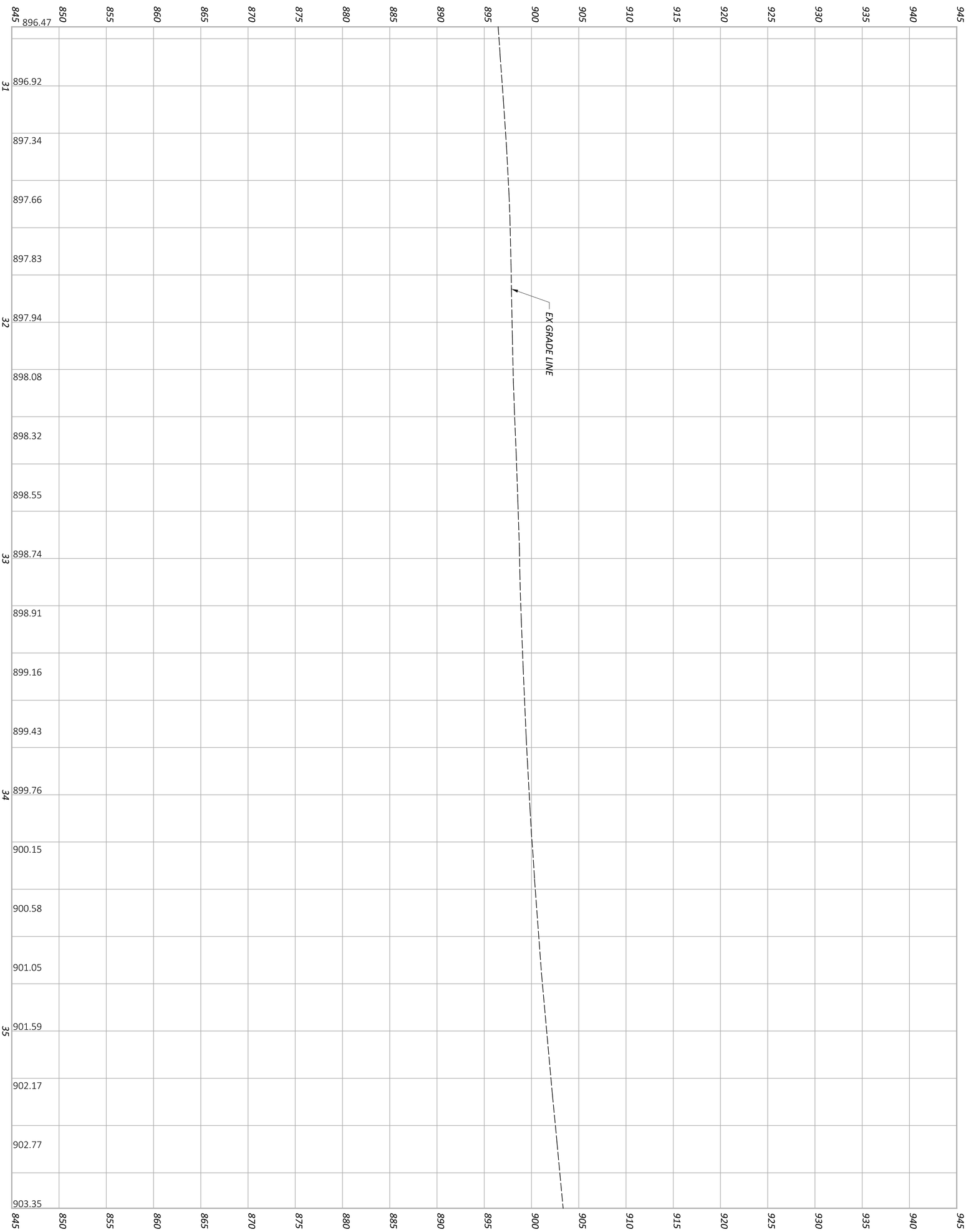
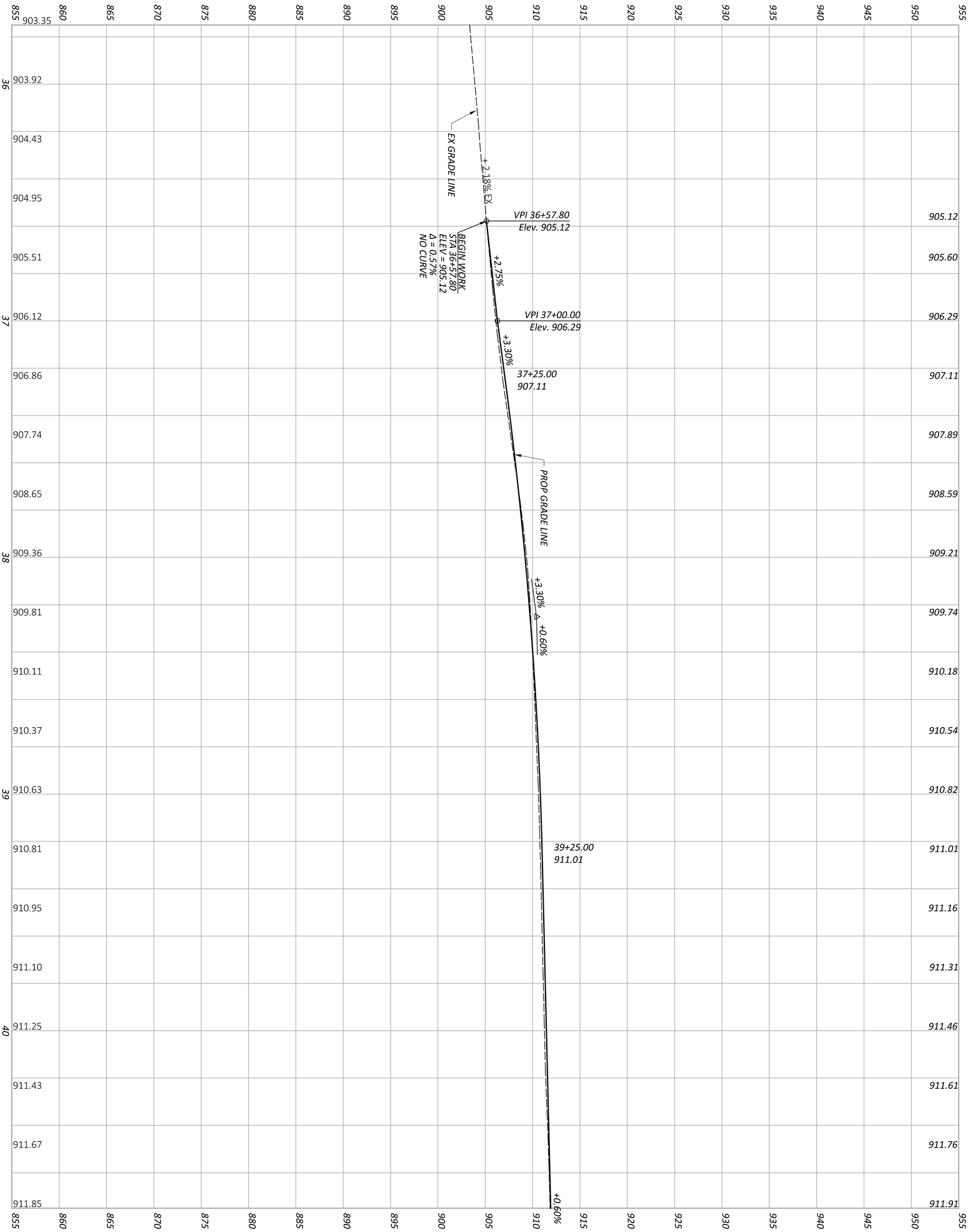


SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.158 / TOTAL 740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - SR 204
STA. 30+75.00 TO STA. 35+75.00

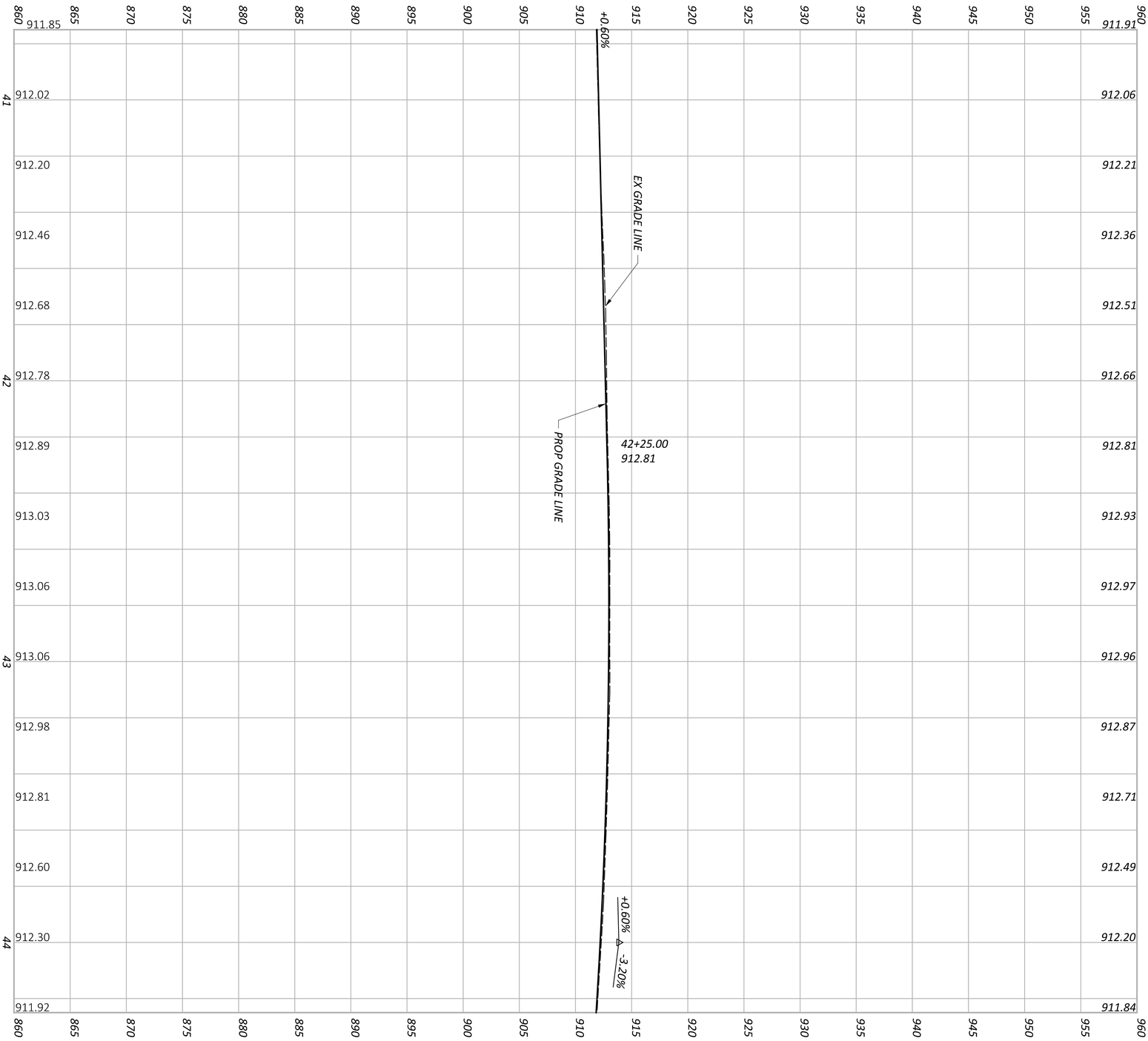
MODEL: CLP_S204 - Profile 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:10:14 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF431.dgn



SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.159 / TOTAL 740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - SR 204
STA. 35+75.00 TO STA. 40+75.00

MODEL: CLP_S204 - Profile 3 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:10:23 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF432.dgn



SHEET	TOTAL
P.160	740

PROJECT ID: 96808

REVIEWER: KAM 06/18/23

DESIGNER: FGW

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - SR 204
STA. 40+75.00 TO STA. 44+25.00

MODEL: CLP_S204 - Profile 4 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:10:32 PM USER: aoldaker
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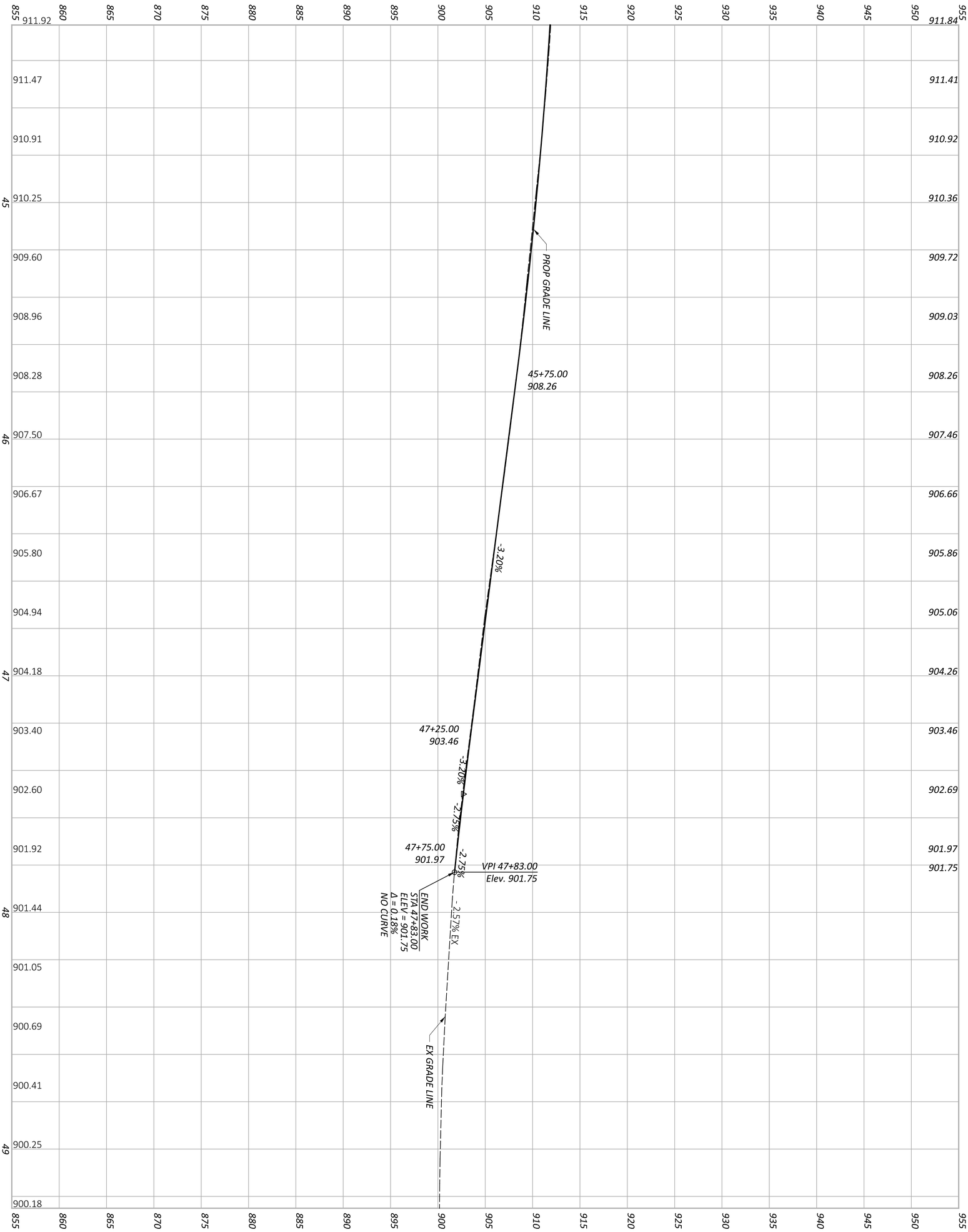

SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.161	96808	XXX MM-DD-YY	XXX	AMERICAN STRUCTUREPOINT INC.
TOTAL 740				

PROFILE SHEET - SR 204
STA. 44+25.00 TO STA. 49+25.00

FAR/LIC IR 70 0.00/0.00

MODEL: CLP_S204 - Profile 5 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:10:41 PM USER: aoldaker
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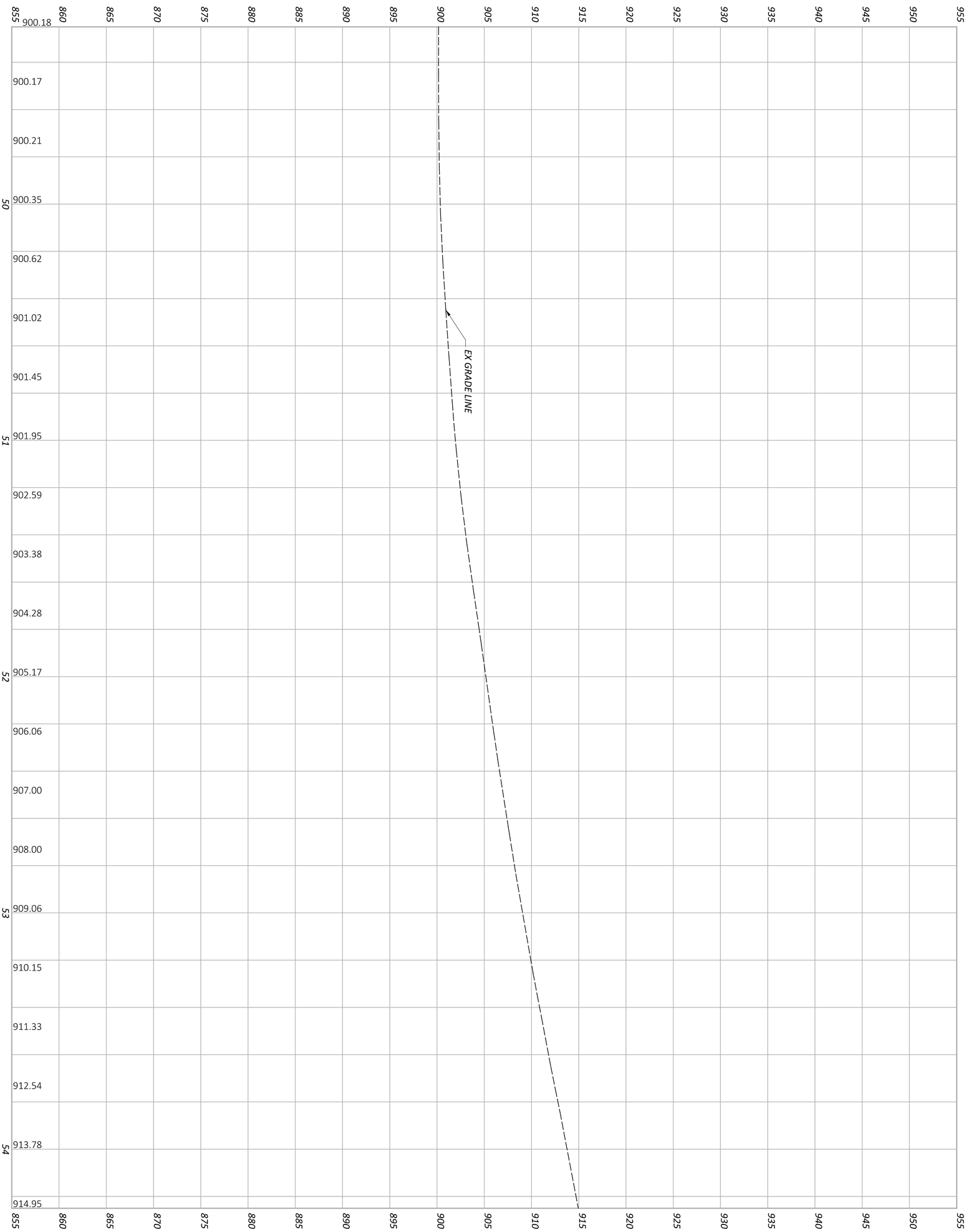
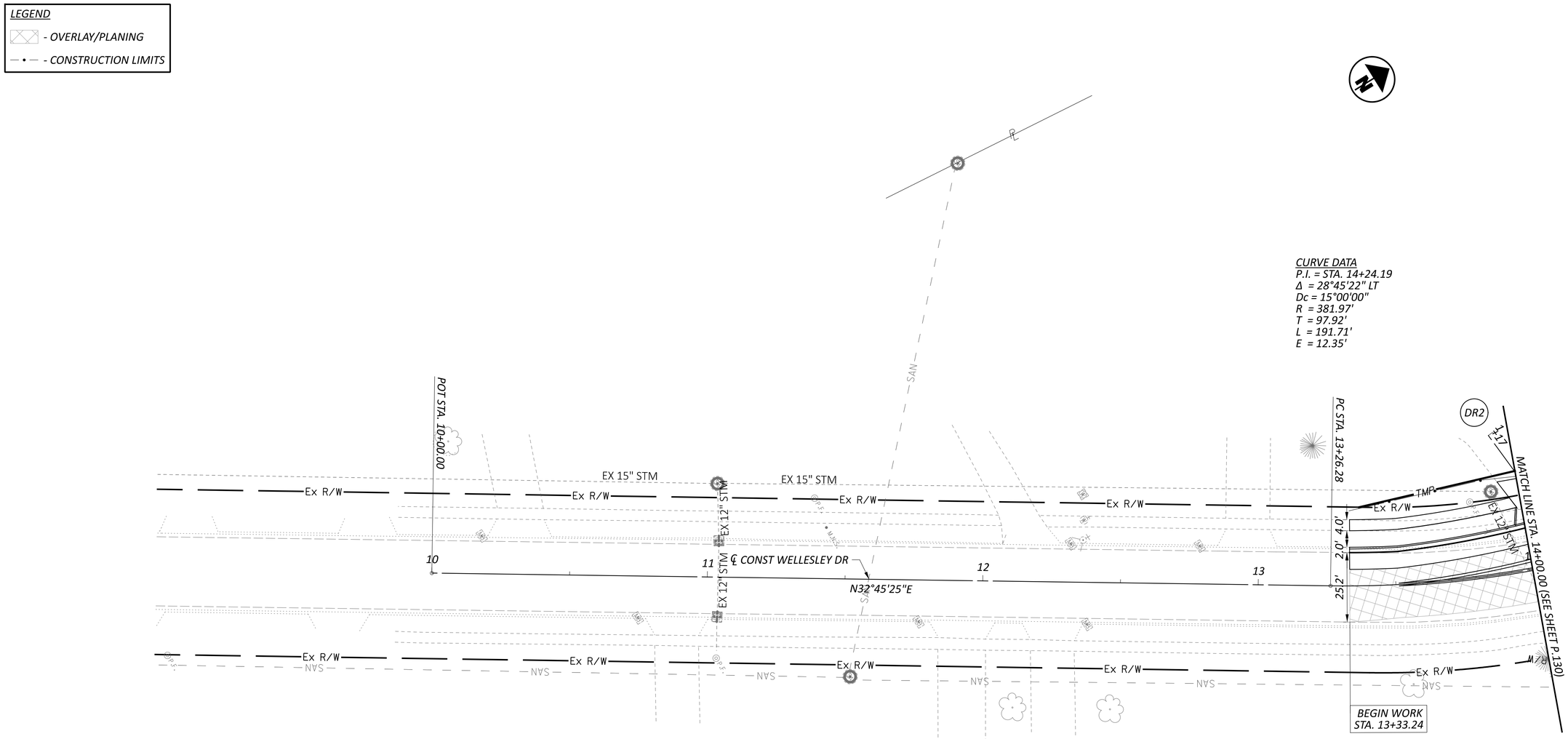


SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.162 / TOTAL 740	96808	XXX MM-DD-YY	XXX	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - SR 204
STA. 49+25.00 TO STA. 54+25.00



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - WELLESLEY DR
STA. 9+00.00 TO STA. 14+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_WELLESLEY - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:33:59 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP441.dgn

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	FGW
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.163
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: WELLESLEY - Profile 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:11:21 PM USER: aoldaker
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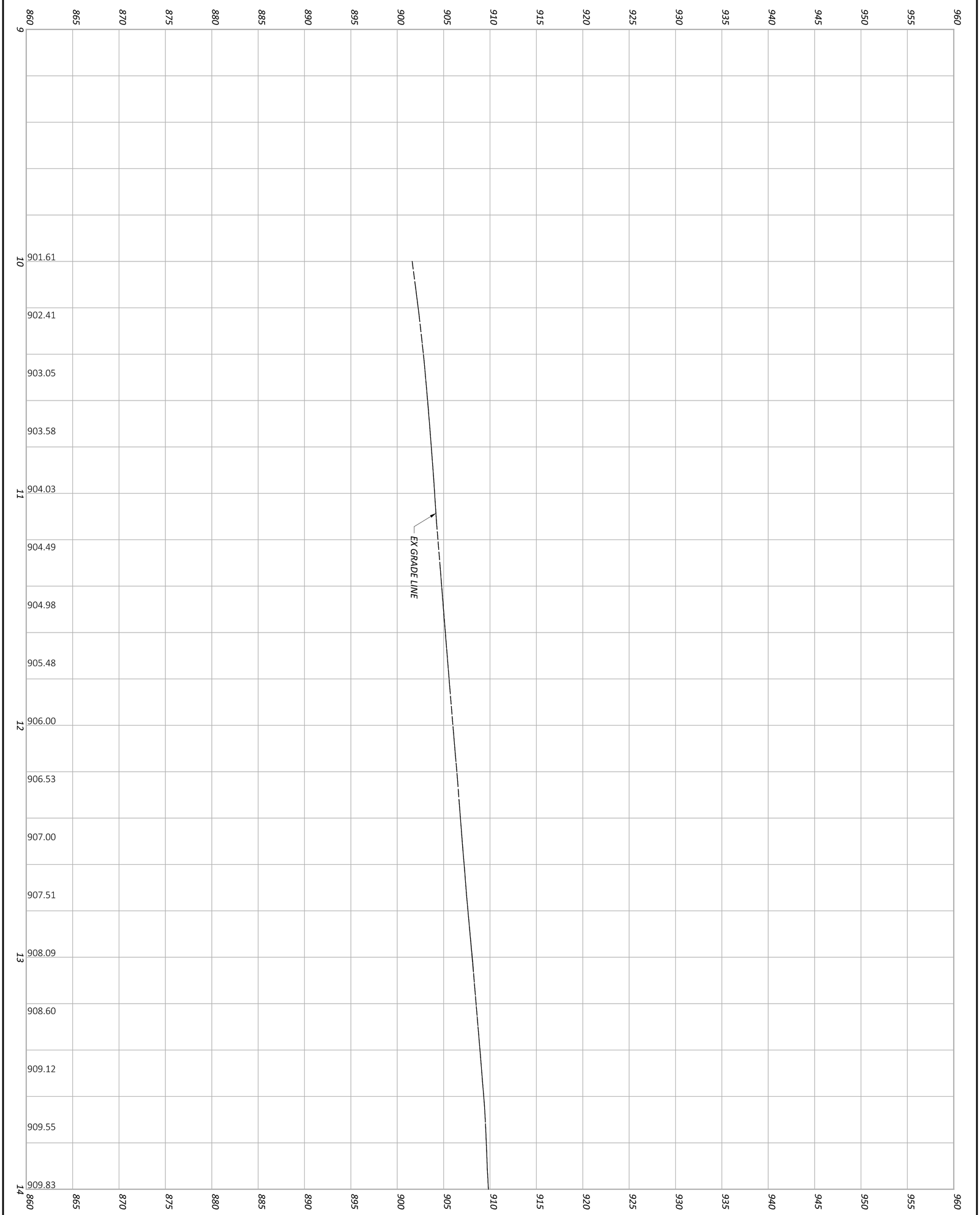

SHEET	TOTAL
P.164	740

PROJECT ID: 96808

REVIEWER: KAM 06/18/23

DESIGNER: FGW

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - WELLESLEY DR
STA. 9+00.00 TO STA. 14+00.00

MODEL: WELLESLEY - Profile 2 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:11:32 PM USER: aoldaker
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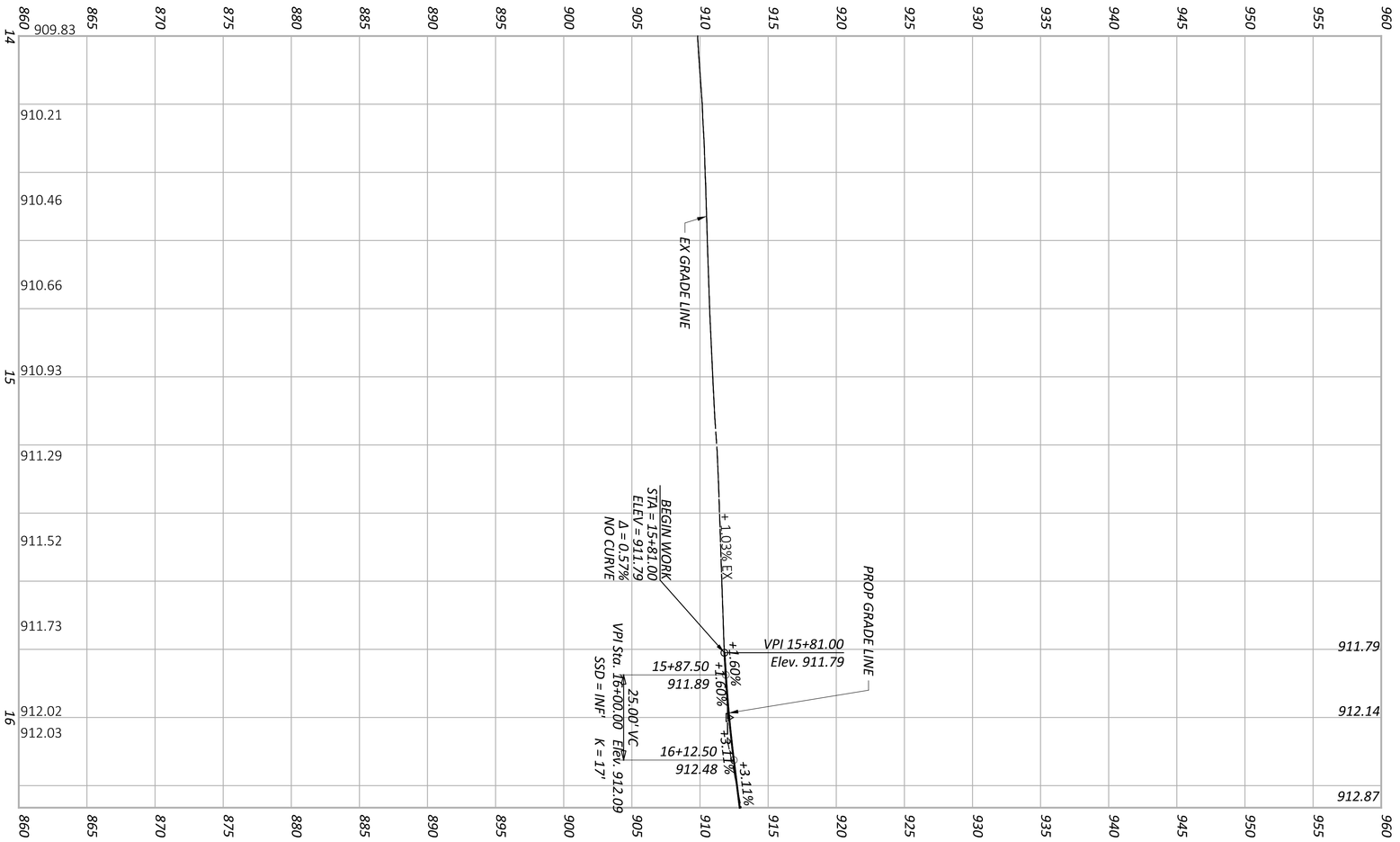


SHEET P.165 / TOTAL 740	PROJECT ID 96808	REVIEWER KAM 06/18/23	DESIGNER FGW	DESIGN AGENCY AMERICAN STRUCTUREPOINT INC.

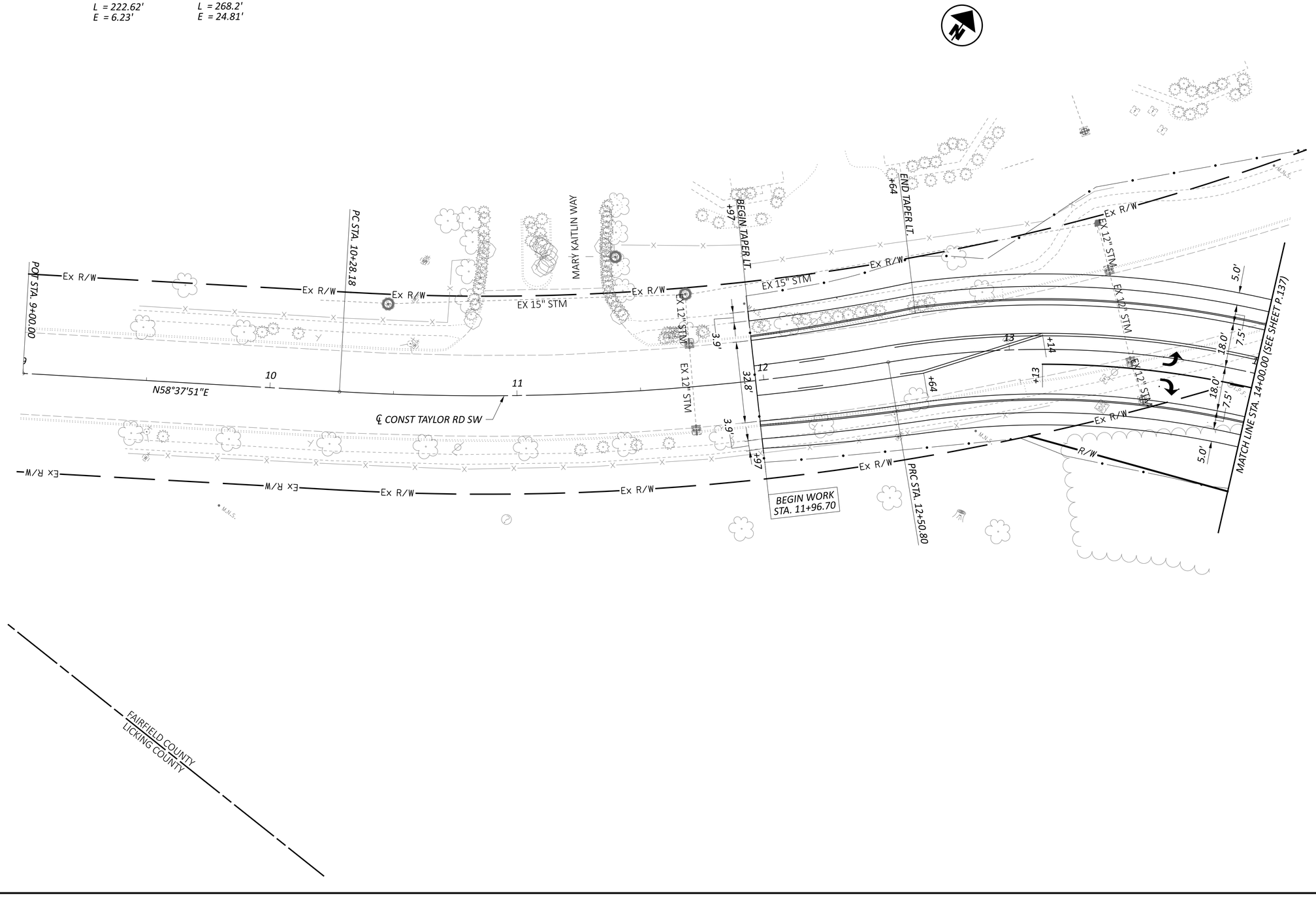
PROFILE SHEET - WELLESLEY DR
STA. 14+00.00 TO STA. 16+26.48

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 11+39.95
Δ = 12°45'19" LT
Dc = 05°43'46"
R = 1,000.00'
T = 111.77'
L = 222.62'
E = 6.23'

CURVE DATA
P.I. = STA. 13+90.69
Δ = 40°13'45" RT
Dc = 15°00'00"
R = 381.97'
T = 139.89'
L = 268.2'
E = 24.81'



HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN SHEET - TAYLOR ROAD SW
STA. 9+00.00 TO STA. 14+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLORSW - Plan 1 PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:34:39 AM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GP450.dgn

DESIGN AGENCY
STRUCTUREPOINT INC.

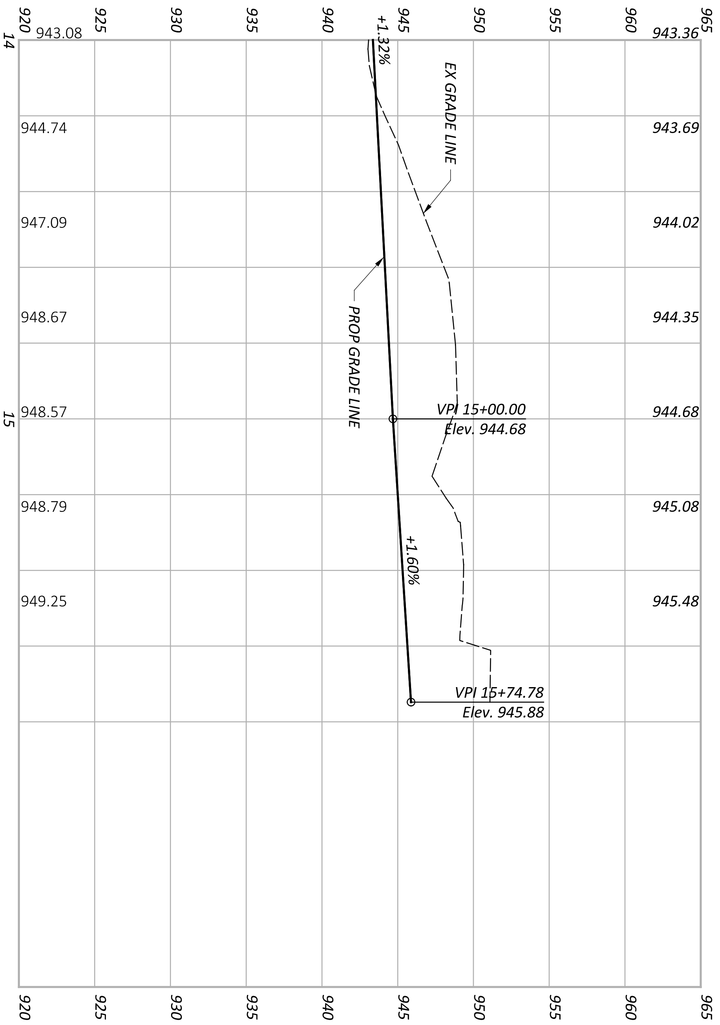
DESIGNER
FGW

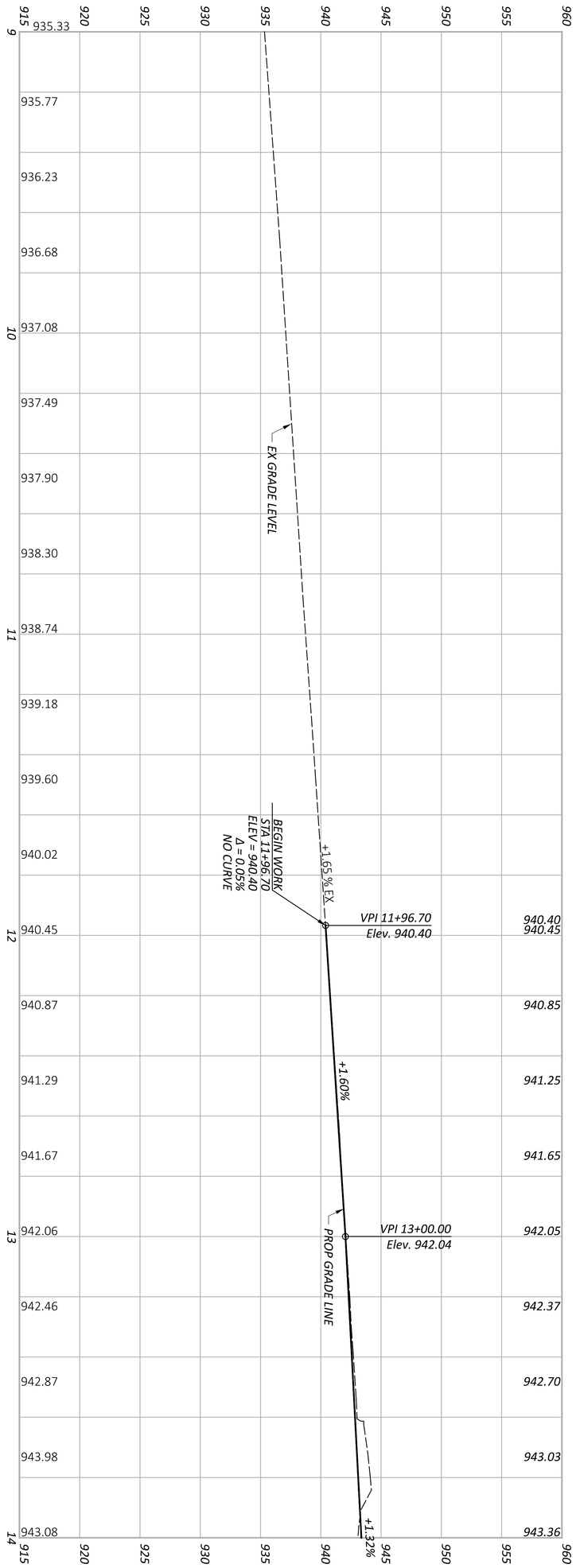
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.166 TOTAL 740

MODEL: PGL_CLP_Taylor Rd SW - Profile 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:12:06 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_GF450.dgn





SHEET	TOTAL
P.167	740

PROJECT ID: 96808

REVIEWER: KAM 06/18/23

DESIGNER: FGW

DESIGN AGENCY: AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - TAYLOR ROAD SW
STA. 9+00.00 TO STA. 15+74.78

MODEL: PGL_CLP_Haaf Farm Dr - Profile 1 PAPERSIZE: 34x22 (in.) DATE: 6/17/2023 TIME: 2:12:16 PM USER: aoldaker
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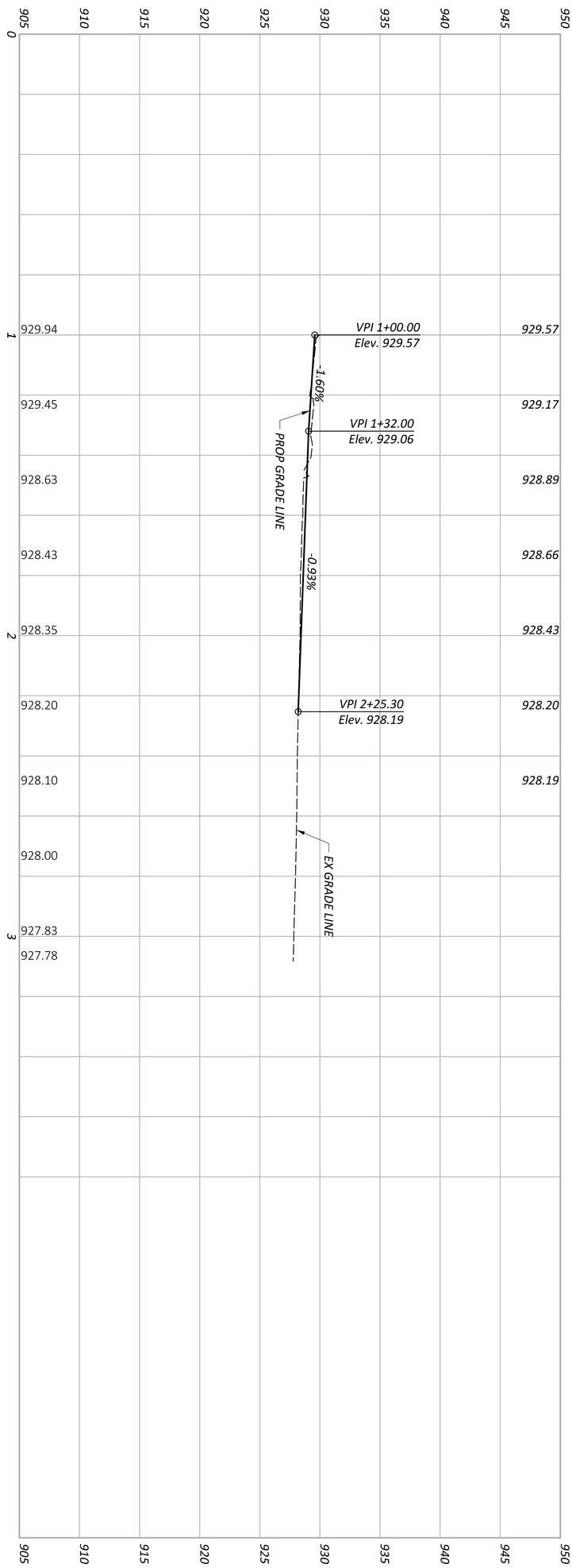


SHEET	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
P.168 / TOTAL 740	96808	KAM 06/18/23	FGW	AMERICAN STRUCTUREPOINT INC.

PROFILE SHEET - HAAF FARM DRIVE
STA. 0+00 TO STA. 5+00.00

LEGEND

- OVERLAY/PLANING
- CONSTRUCTION LIMITS

CURVE DATA
P.I. = STA. 1+68.89
Δ = 15°56'32" RT
Dc = 38°00'00"
R = 150.78'
T = 21.11'
L = 41.95'
E = 1.47'

CURVE DATA
P.I. = STA. 2+03.03
Δ = 10°04'51" LT
Dc = 38°00'00"
R = 150.78'
T = 13.30'
L = 26.53'
E = 0.59'

CURVE DATA
P.I. = STA. 4+89.01
Δ = 77°39'45" LT
Dc = 138°00'00"
R = 41.52'
T = 33.42'
L = 56.28'
E = 11.78'

CURVE DATA
P.I. = STA. 5+33.48
Δ = 24°16'05" RT
Dc = 57°00'00"
R = 100.52'
T = 21.61'
L = 42.58'
E = 2.3'

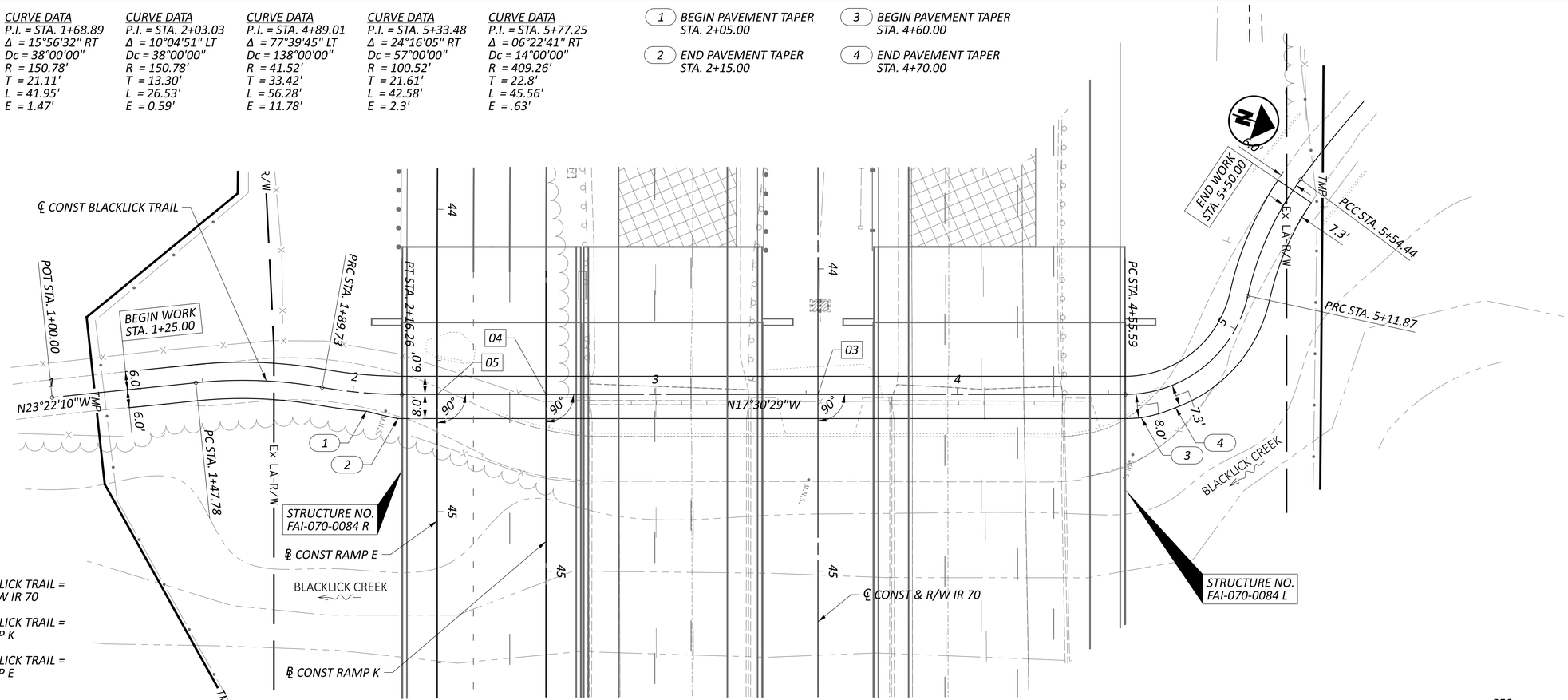
CURVE DATA
P.I. = STA. 5+77.25
Δ = 06°22'41" RT
Dc = 14°00'00"
R = 409.26'
T = 22.8'
L = 45.56'
E = .63'

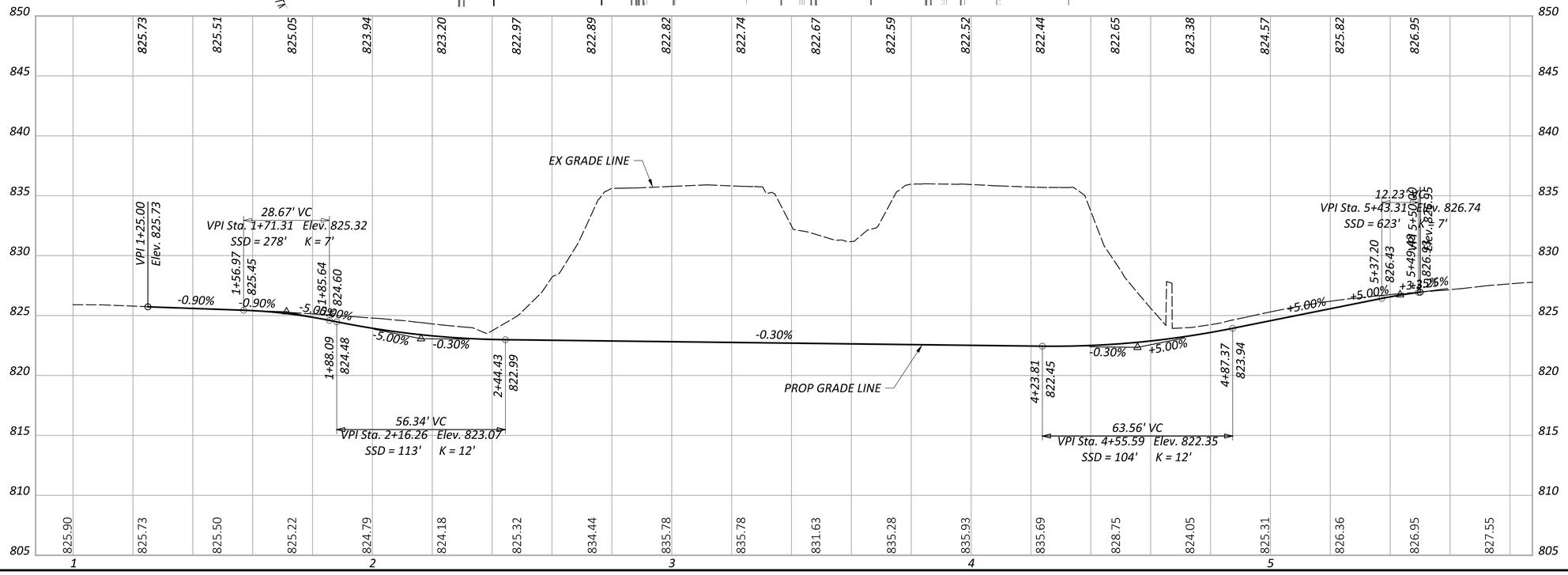
1 BEGIN PAVEMENT TAPER STA. 2+05.00

2 END PAVEMENT TAPER STA. 2+15.00

3 BEGIN PAVEMENT TAPER STA. 4+60.00

4 END PAVEMENT TAPER STA. 4+70.00





HORIZONTAL SCALE IN FEET
0 10 20 40

PLAN AND PROFILE - BLACKLICK TRAIL
STA. 1+00.00 TO STA. 6+00.00

FAI/LIC IR 70 0.00/0.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER AJO
REVIEWER KAM 06/18/23
PROJECT ID 96808
SHEET P.169 TOTAL 740

MODEL: CLP_BLACKLICK - Plan 1 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 9:35:33 AM USER: aoldaker
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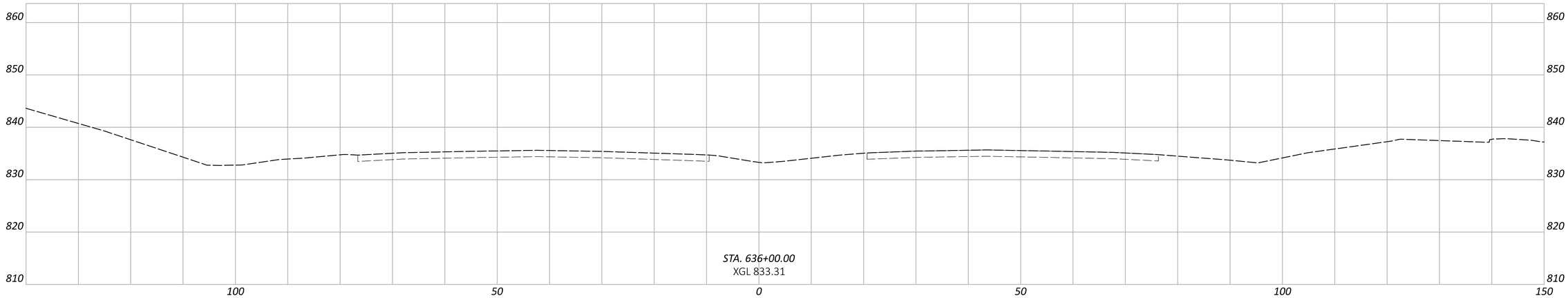

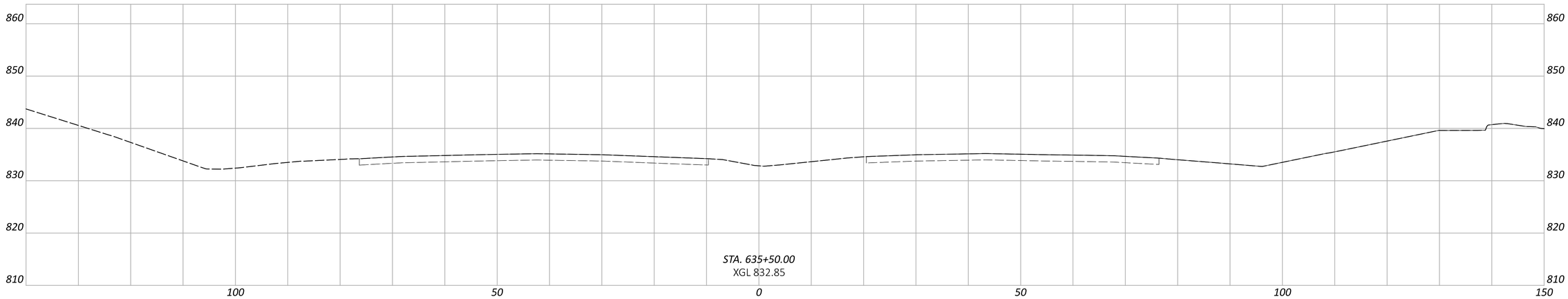

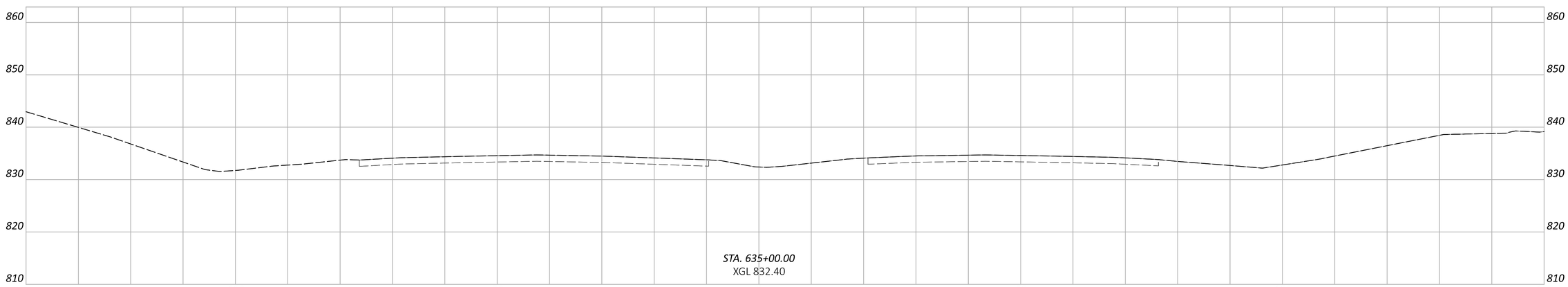

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - 635+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:12 PM USER: aoldaker
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CROSS SECTIONS - IR 70
STA. 635+00 TO STA. 636+00

Sheet Totals		
Seeding	Cut	Fill

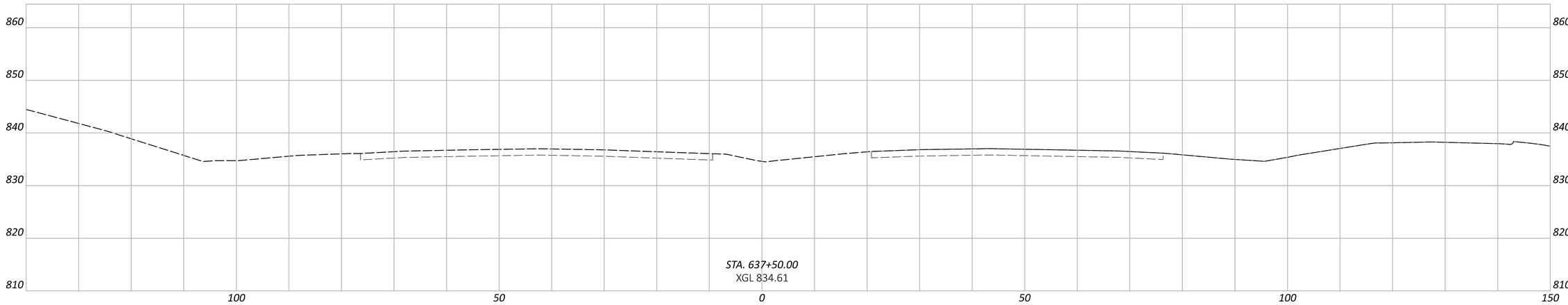
DESIGN AGENCY
STRUCTUREPOINT LLC

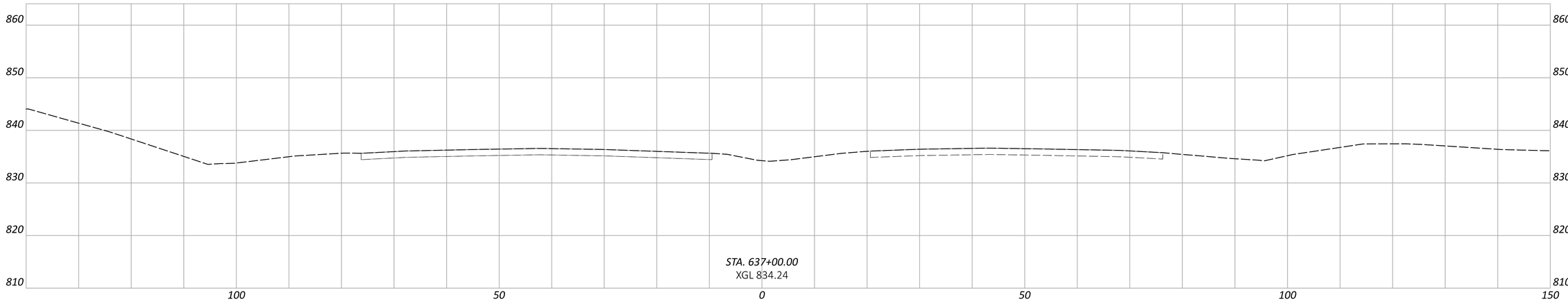
DESIGNER
BER

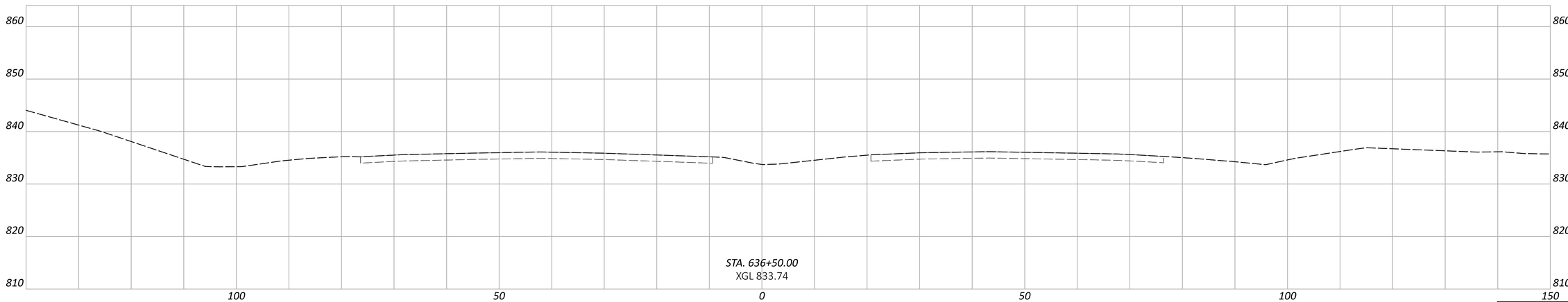
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.170 TOTAL 740







CROSS SECTIONS - IR 70
STA. 636+50 TO STA. 637+50

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.171 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - 636+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:27 PM USER: aoldaker
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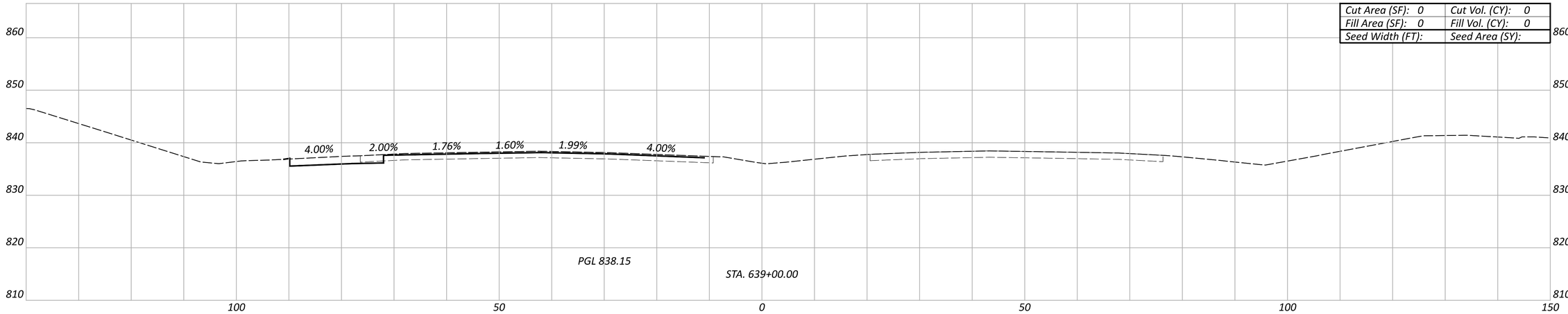

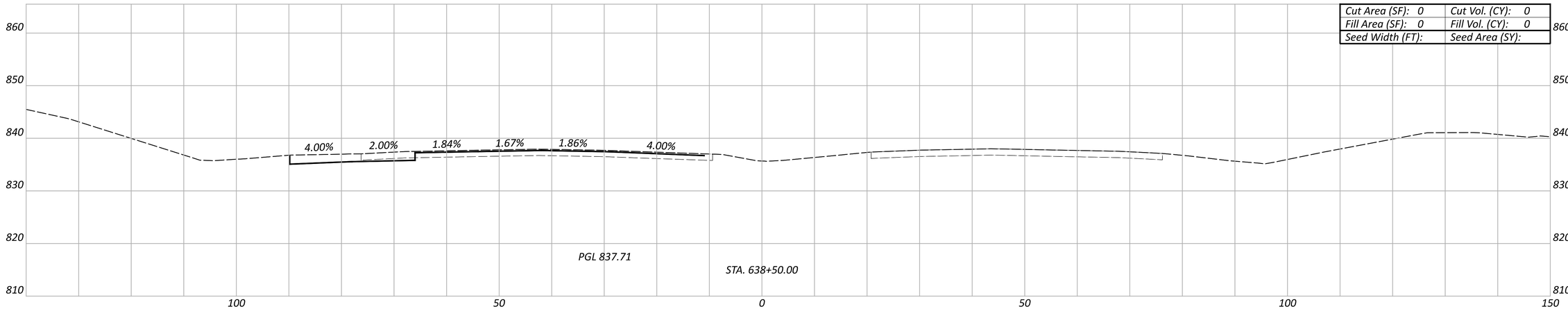

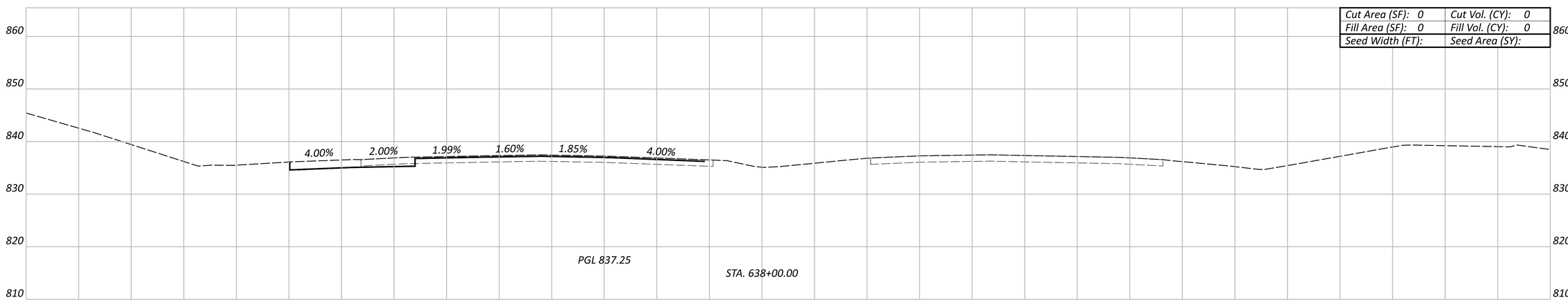

CROSS SECTIONS - IR 70
STA. 638+00 TO STA. 639+00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.172 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - 638+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:30 PM USER: aoldaker
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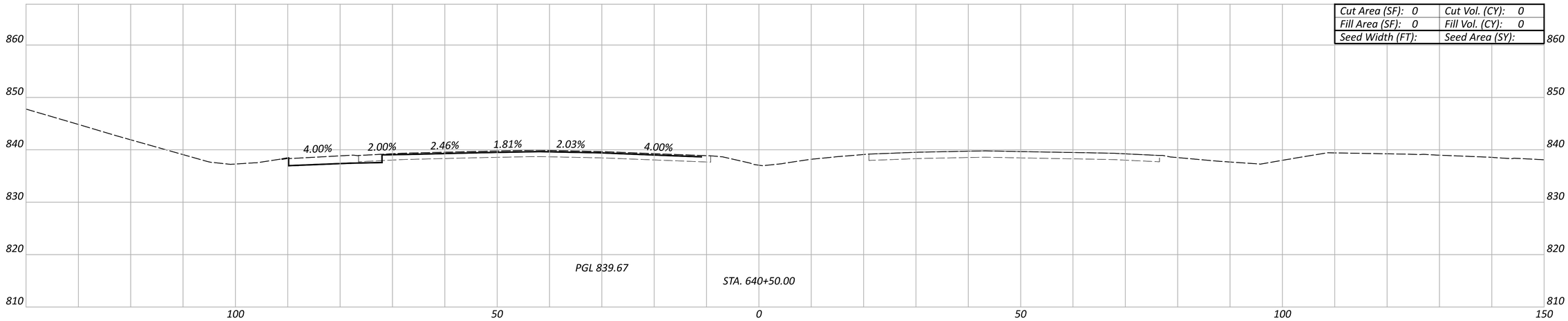

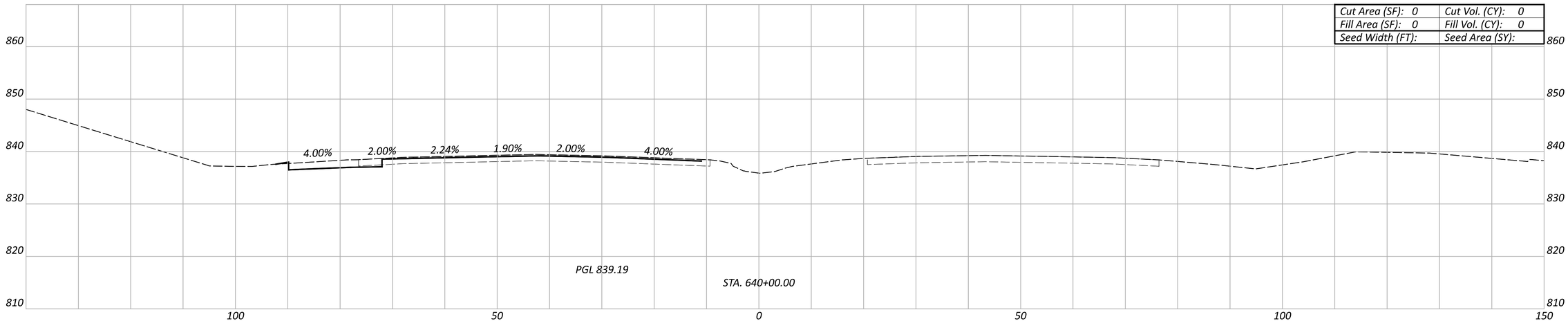

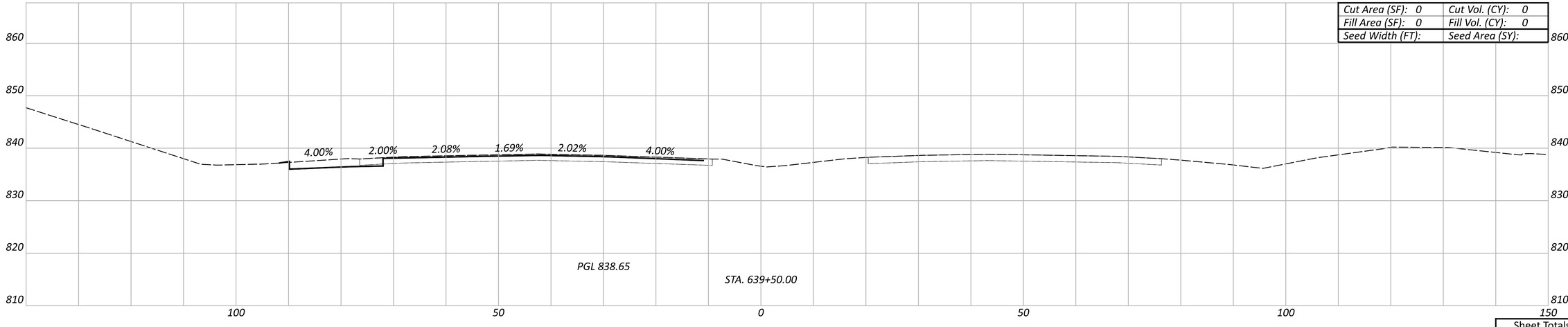

CROSS SECTIONS - IR 70
STA. 639+50 TO STA. 640+50

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.173 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - 639+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:34 PM USER: aoldaker
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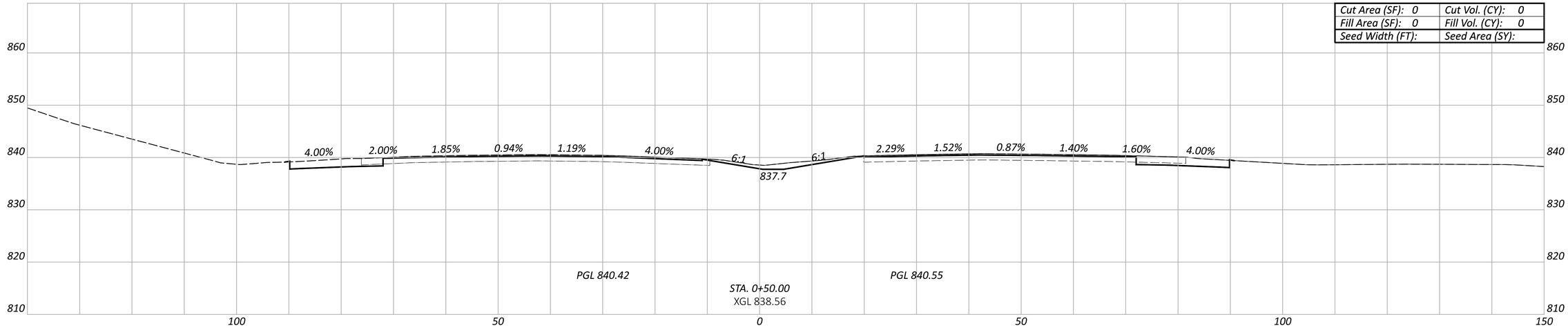

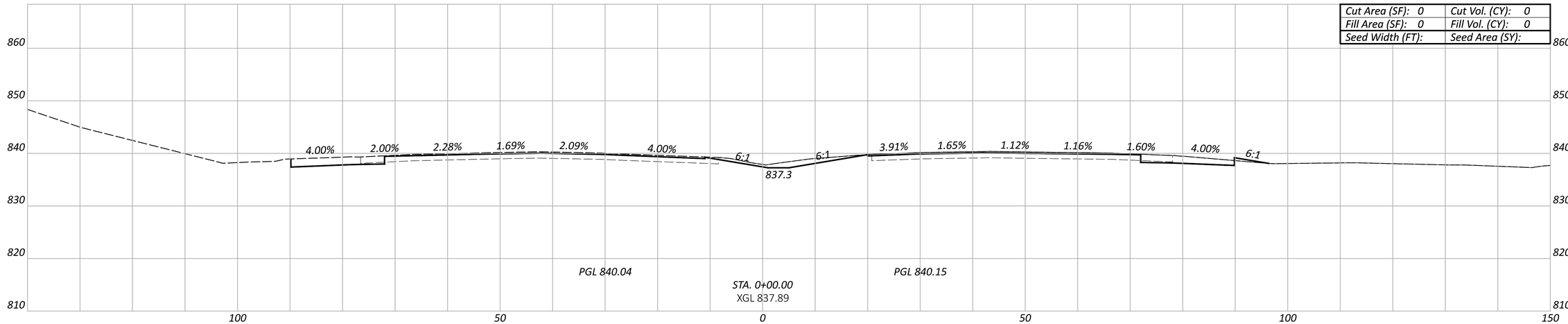

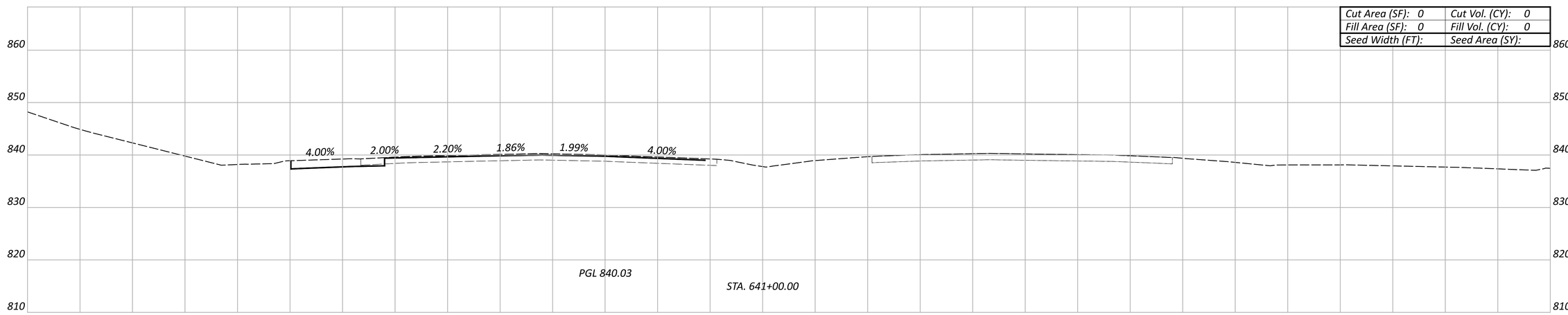

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - 641+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:37 PM USER: aoldaker
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CROSS SECTIONS - IR 70
STA. 641+00 TO STA. 0+50

Sheet Totals		
Seeding	Cut	Fill

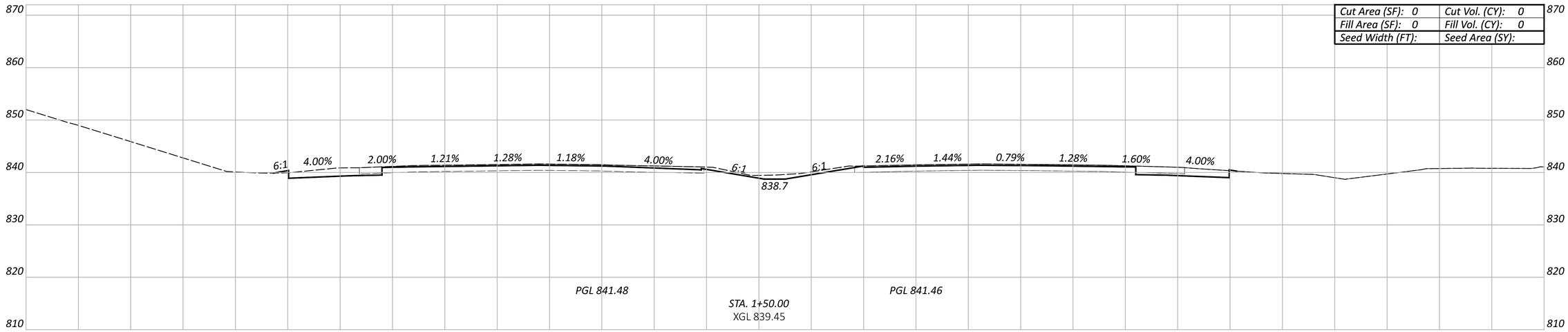
DESIGN AGENCY
STRUCTUREPOINT LLC

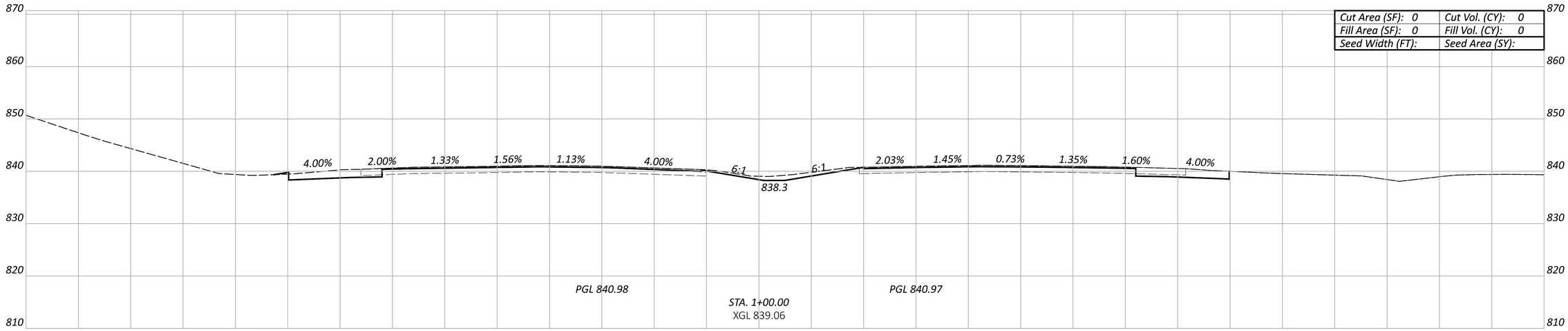
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.174 TOTAL 740





CROSS SECTIONS - IR 70
STA. 1+00 TO STA. 1+50

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.175 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 1+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:41 PM USER: aoldaker
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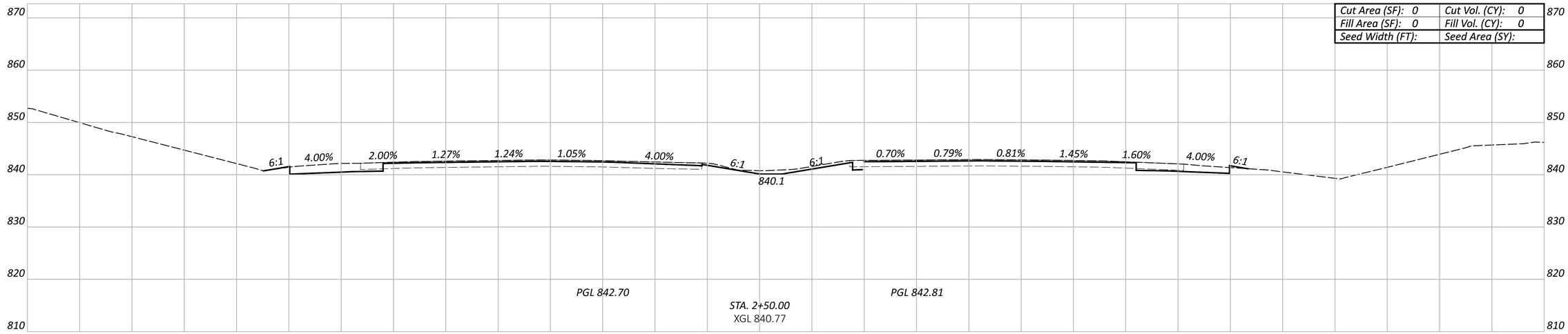

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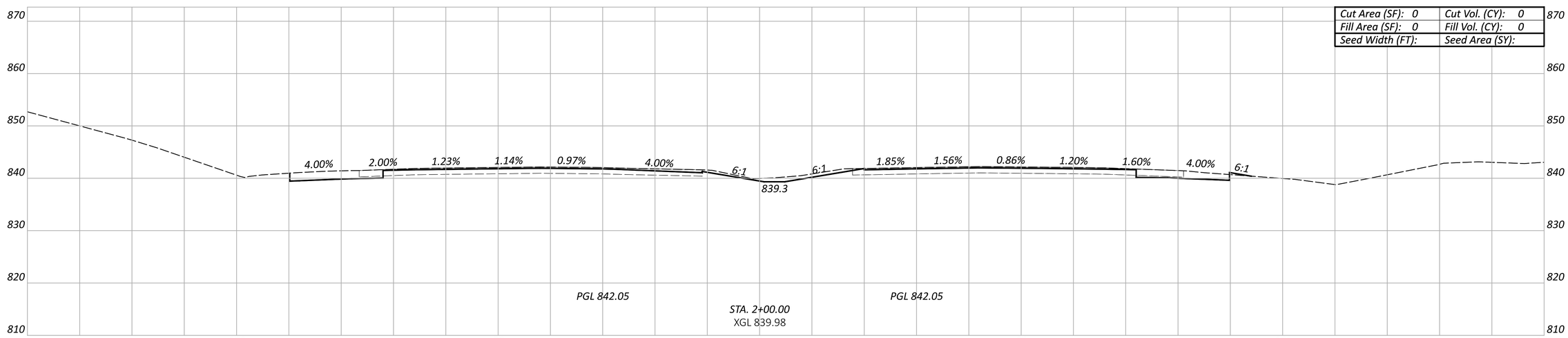
Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):



Cut Area (SF): 0	Cut Vol. (CY): 0
Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 2+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:44 PM USER: aoldaker
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CROSS SECTIONS - IR 70
STA. 2+00 TO STA. 2+50

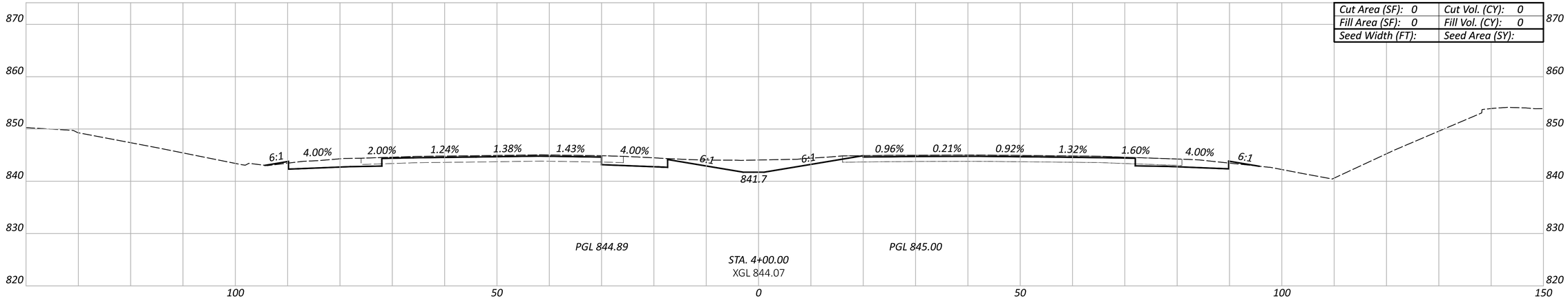
DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

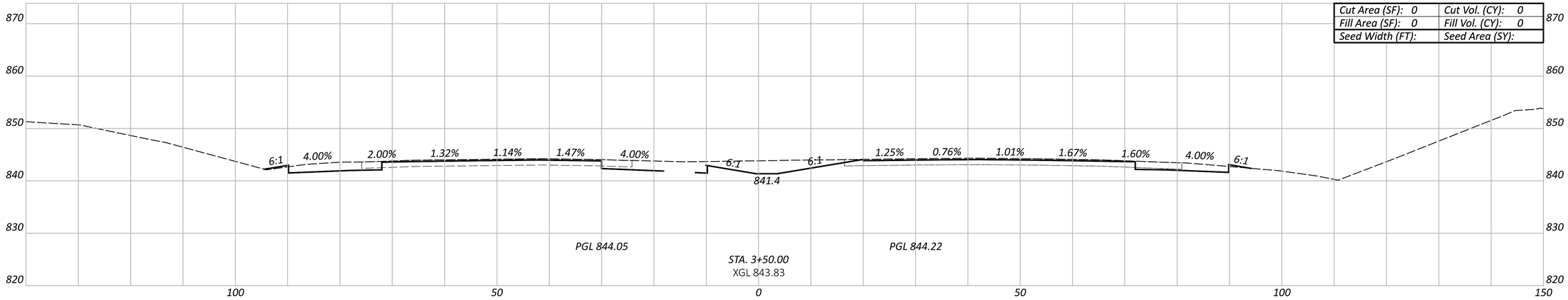
DESIGNER
BER

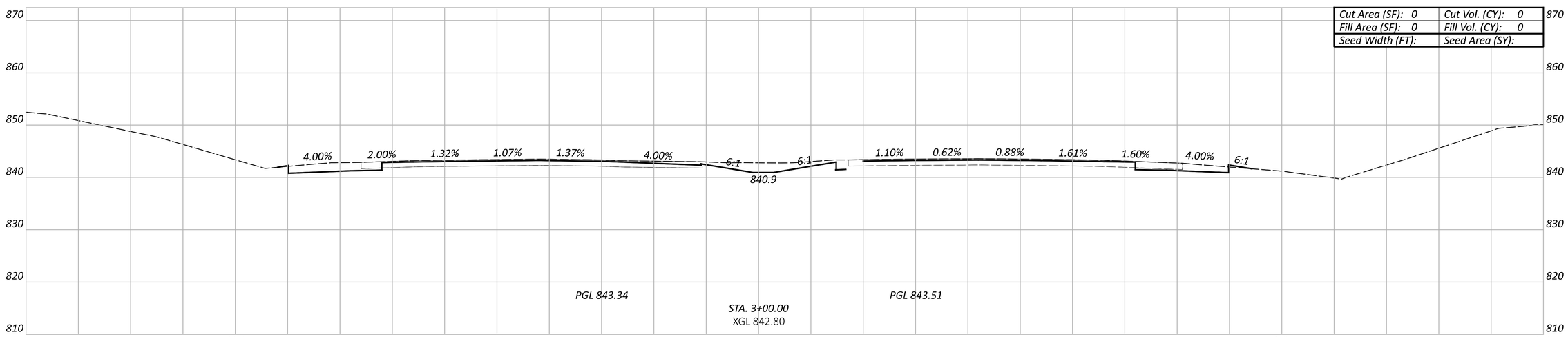
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.176 TOTAL 740







Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - IR 70
STA. 3+00 TO STA. 4+00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.177
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 3+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:48 PM USER: aoldaker
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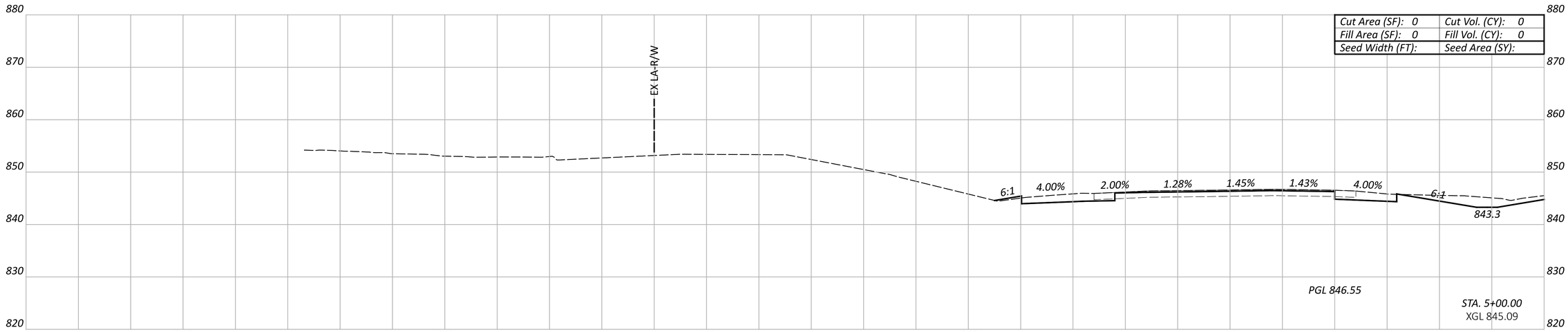

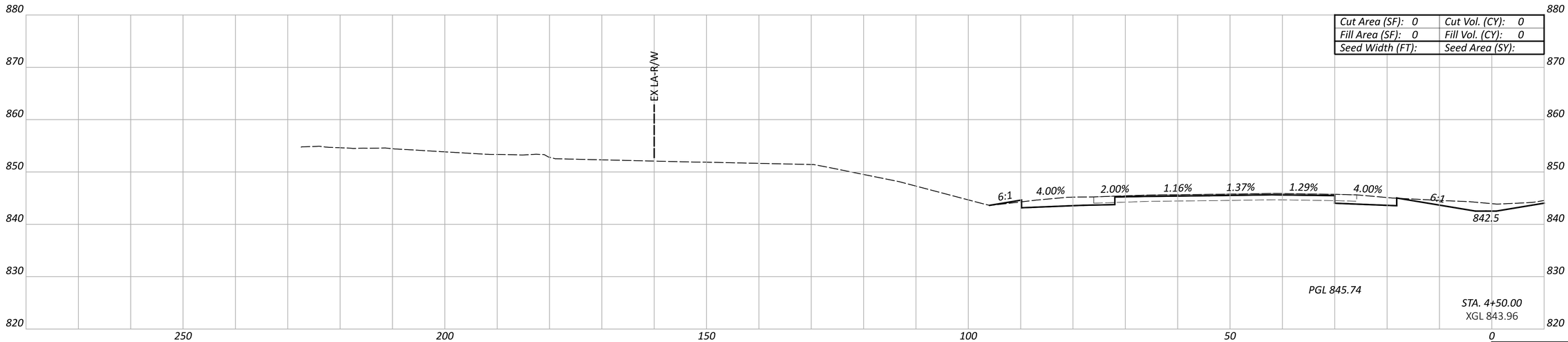

CROSS SECTIONS - IR 70 WB
STA. 4+50 TO STA. 5+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_WB - A 4+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:52 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

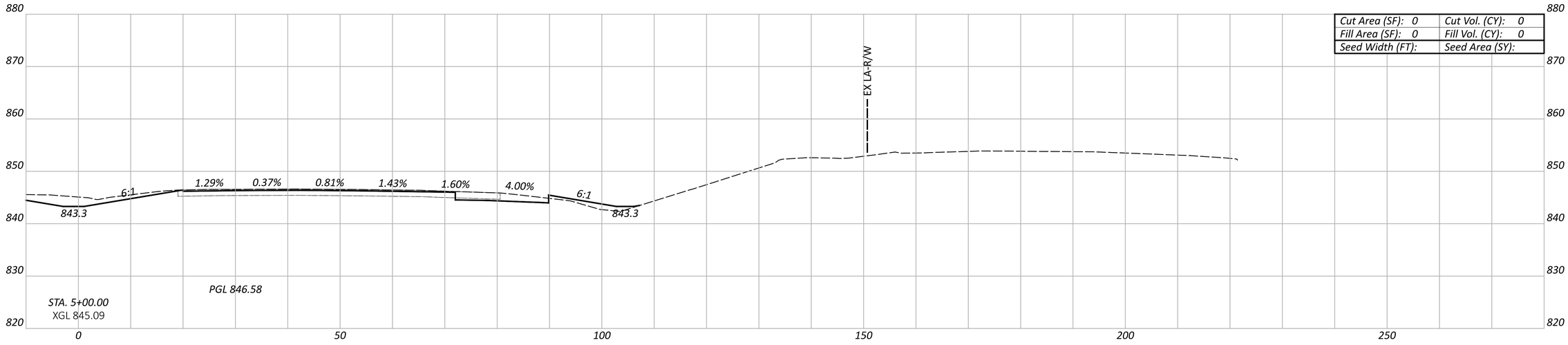
DESIGN AGENCY
STRUCTUREPOINT LLC

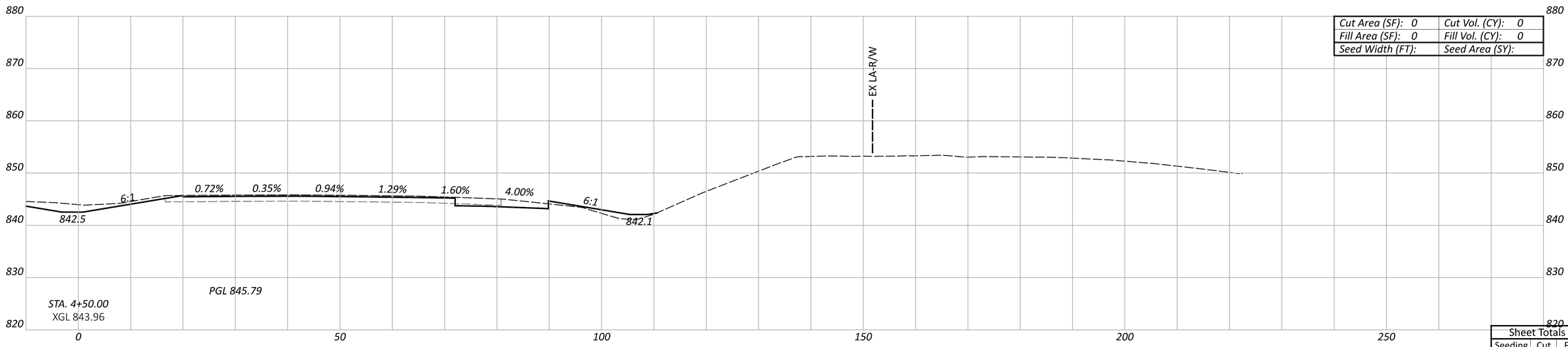
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.178 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 4+50 TO STA. 5+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_EB - A 4+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:12:56 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

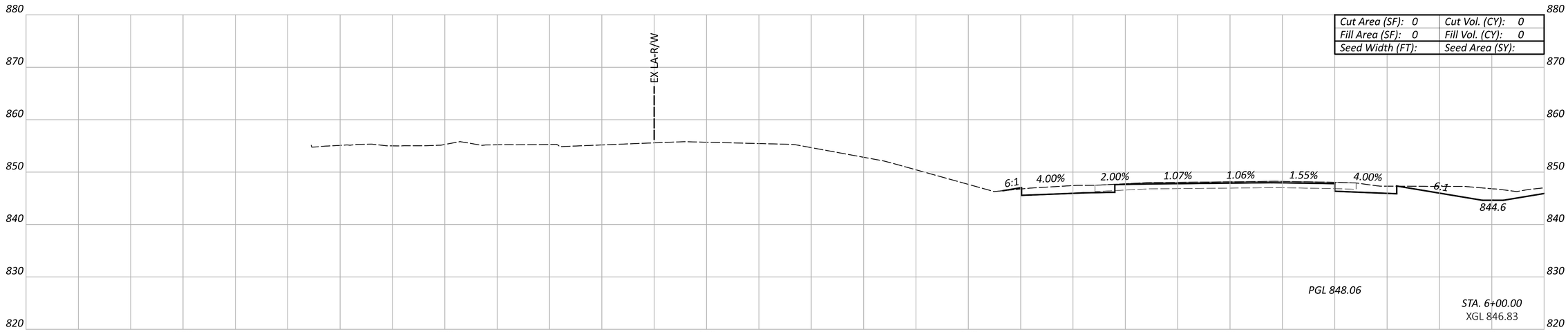
DESIGN AGENCY
STRUCTUREPOINT INC.

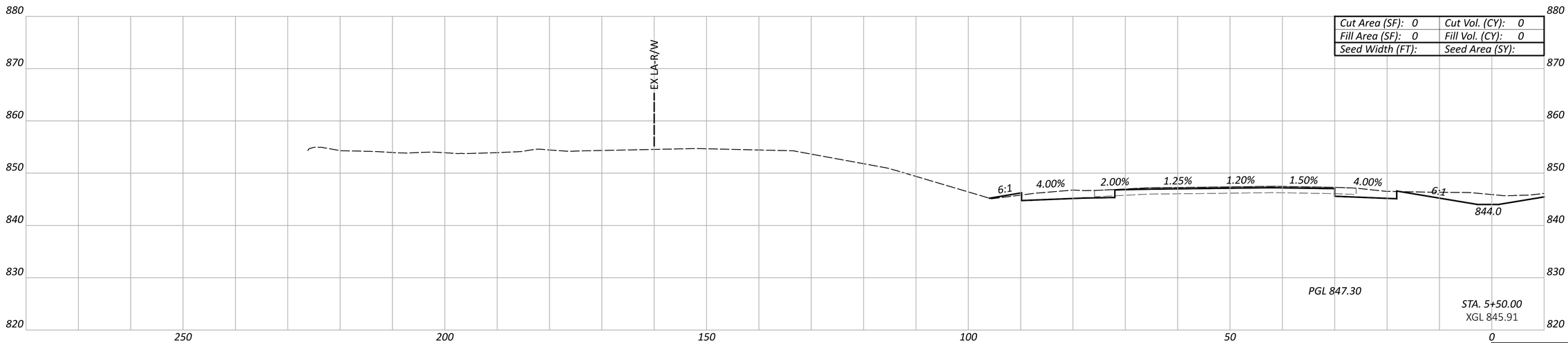
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.179 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 5+50 TO STA. 6+00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

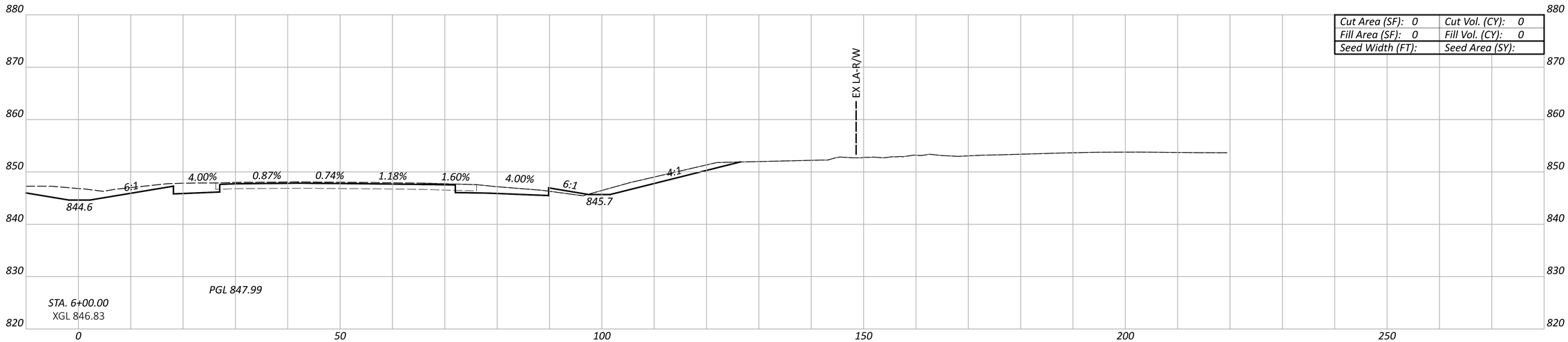
DESIGN AGENCY
STRUCTUREPOINT LLC

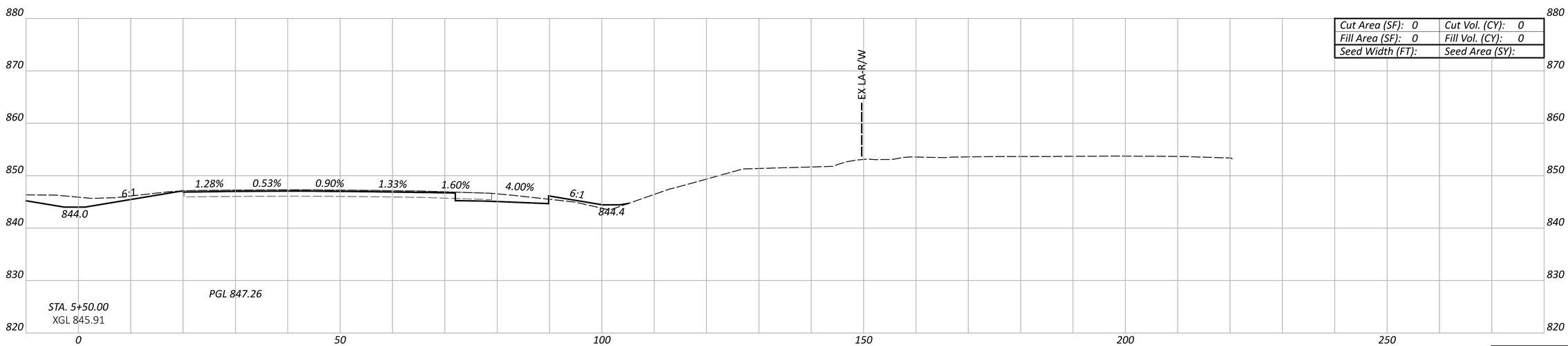
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.180 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 5+50 TO STA. 6+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_EB - A 5+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:13:02 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

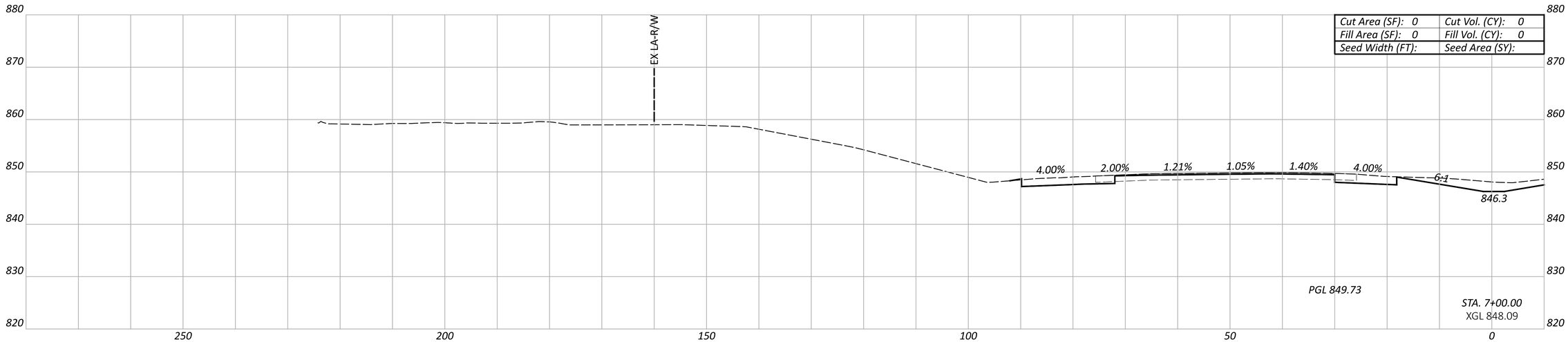
DESIGN AGENCY
STRUCTUREPOINT LLC

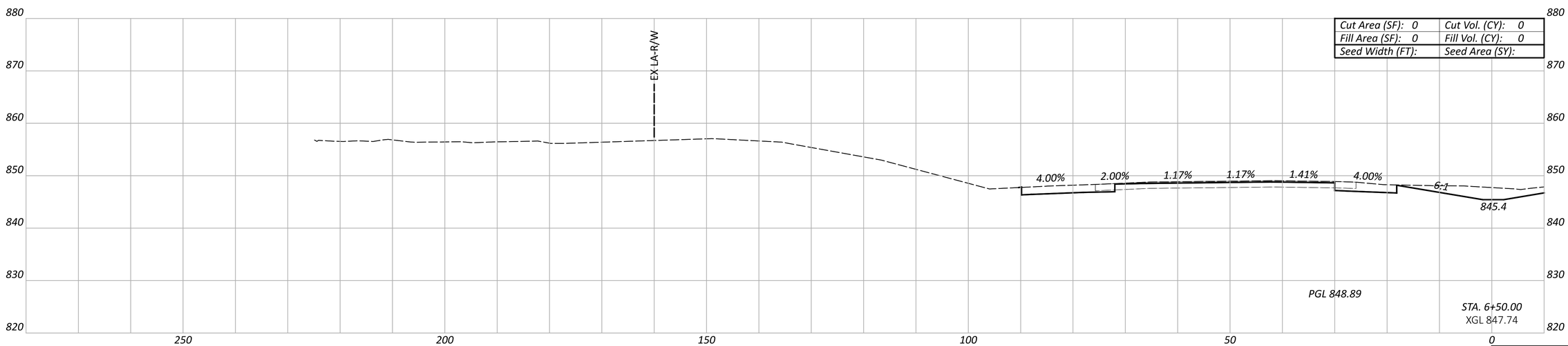
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.181 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 6+50 TO STA. 7+00

FAI/LIC IR 70 0.00/0.00

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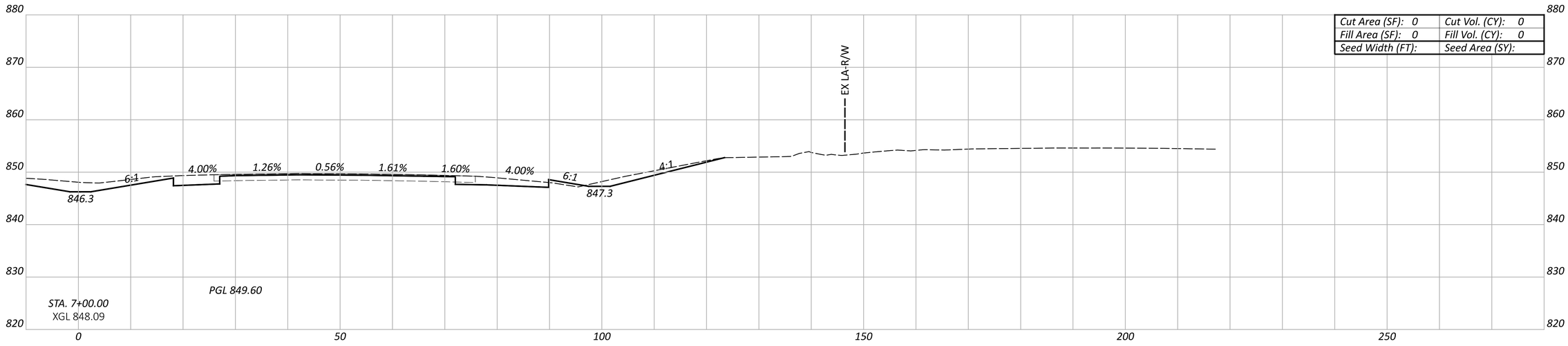
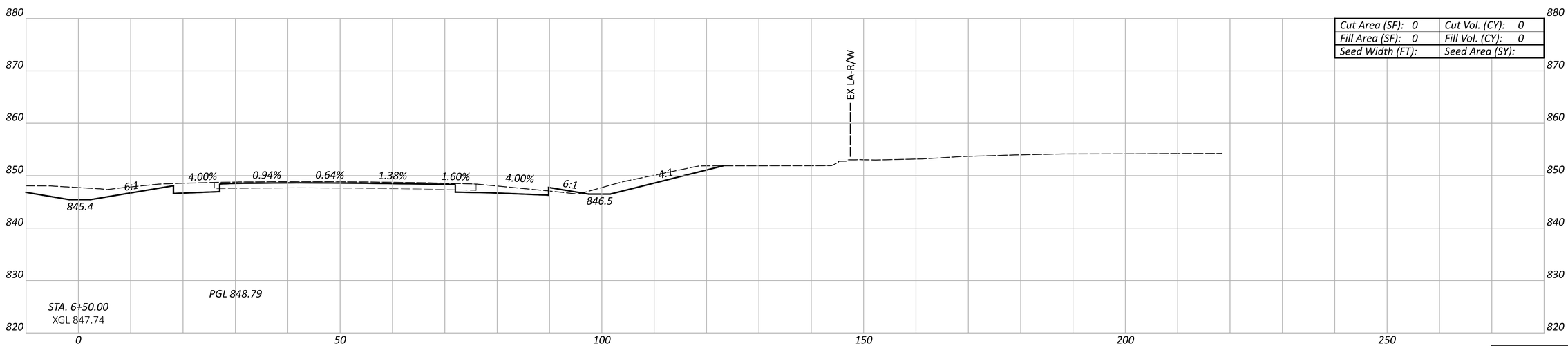
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.182
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 6+50 TO STA. 7+00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

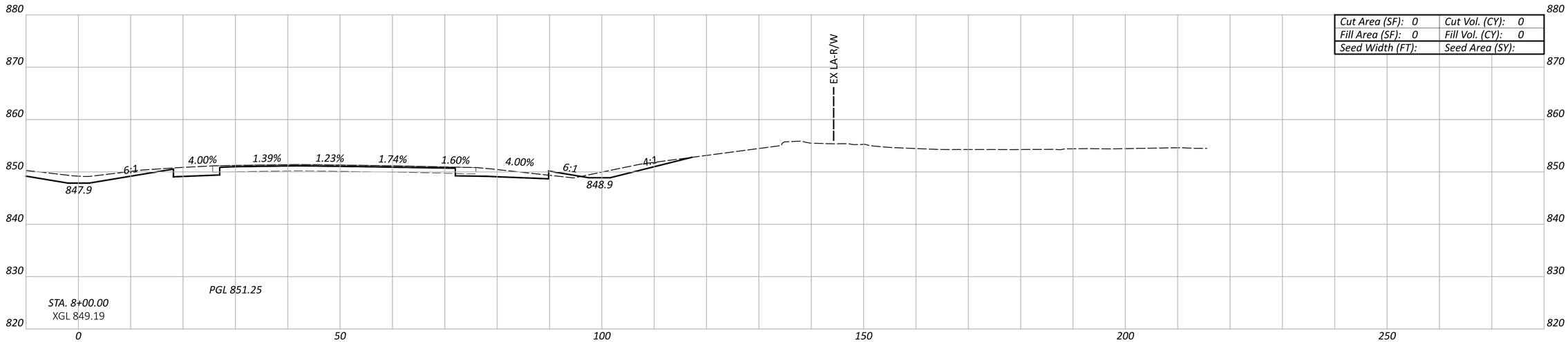
DESIGN AGENCY
STRUCTUREPOINT LLC

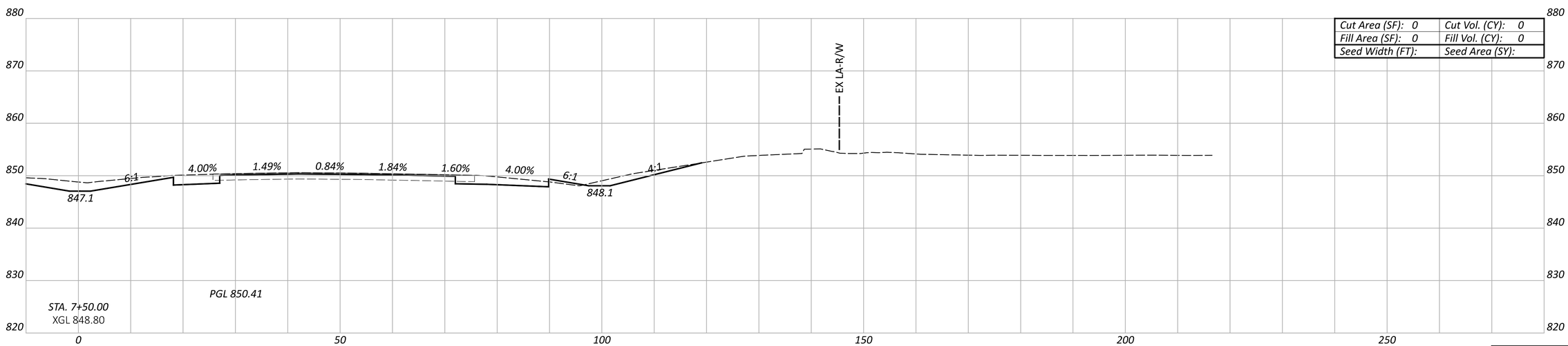
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.183 | TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 7+50 TO STA. 8+00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

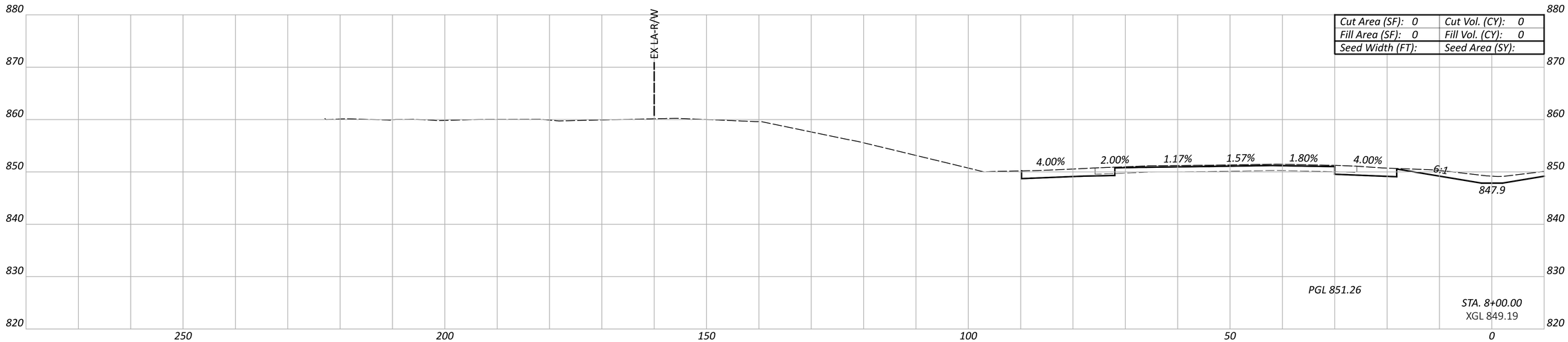
DESIGN AGENCY
STRUCTUREPOINT INC.

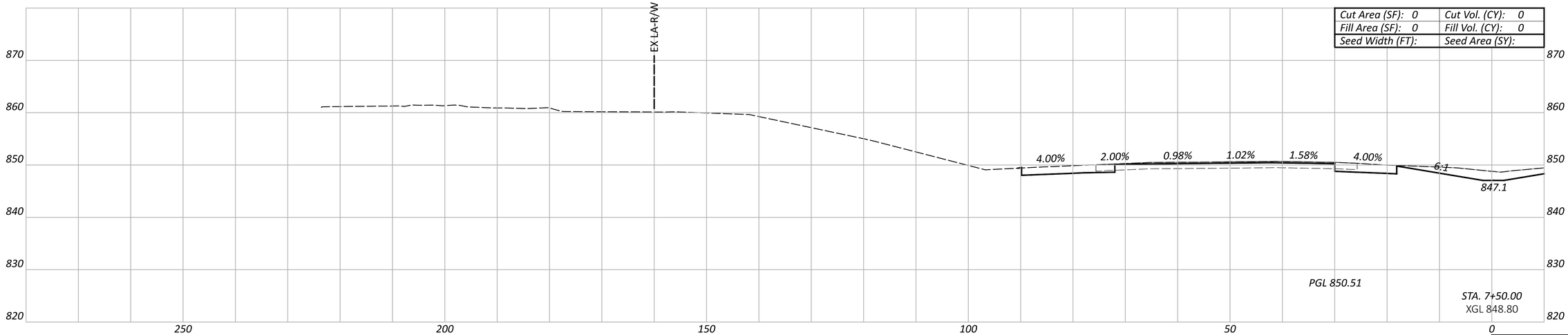
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.185 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 7+50 TO STA. 8+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_WB - A 7+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:13:15 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

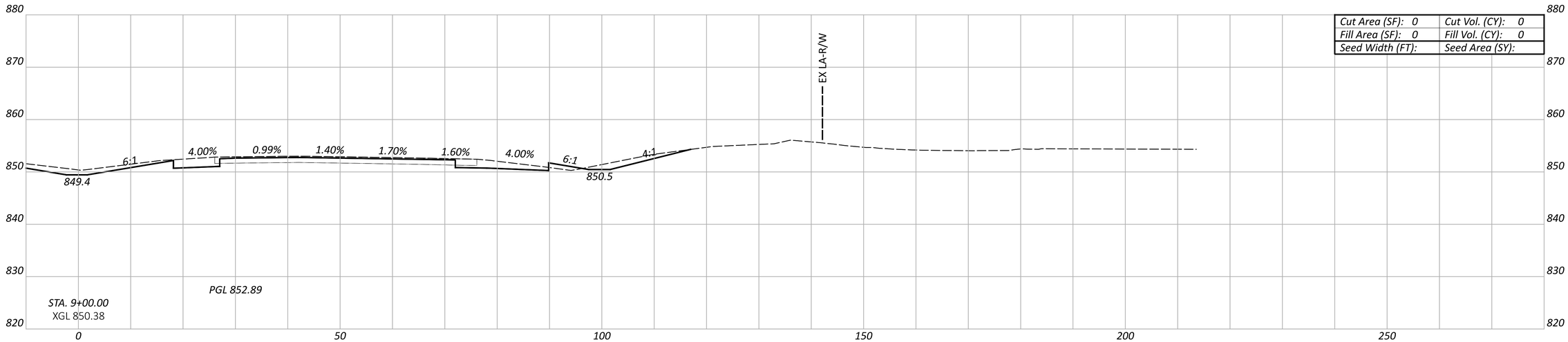
DESIGNER
BER

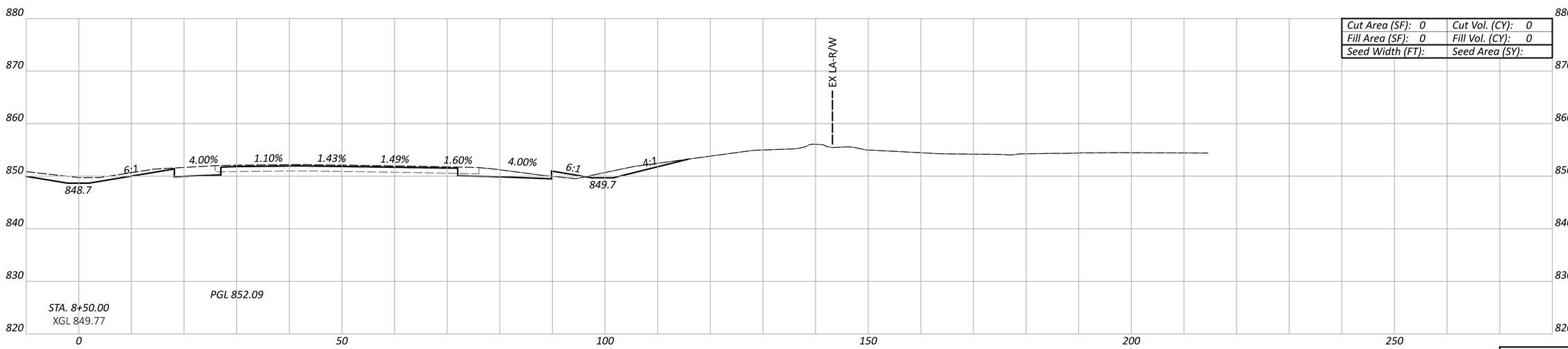
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.184 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 8+50 TO STA. 9+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_EB - A 8+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:13:19 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

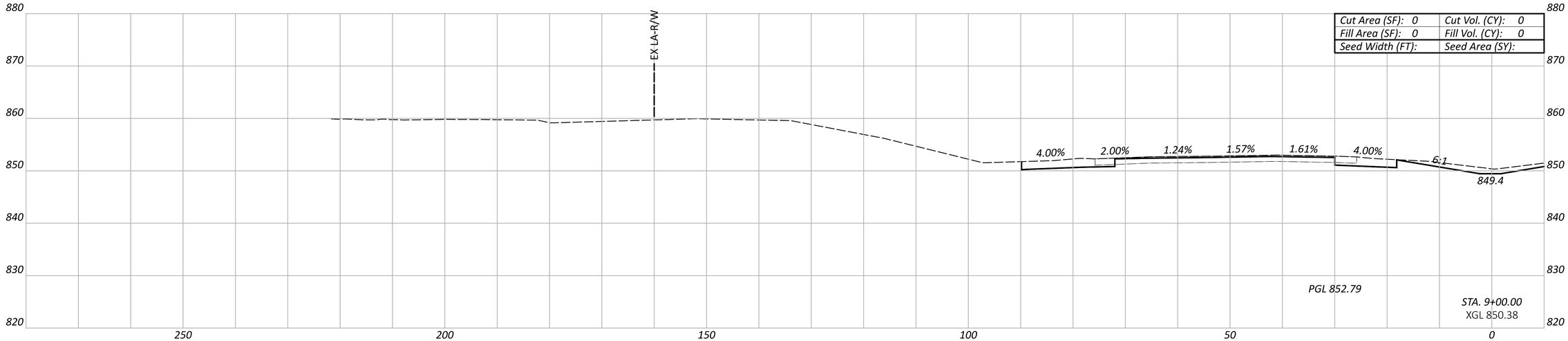
DESIGNER
BER

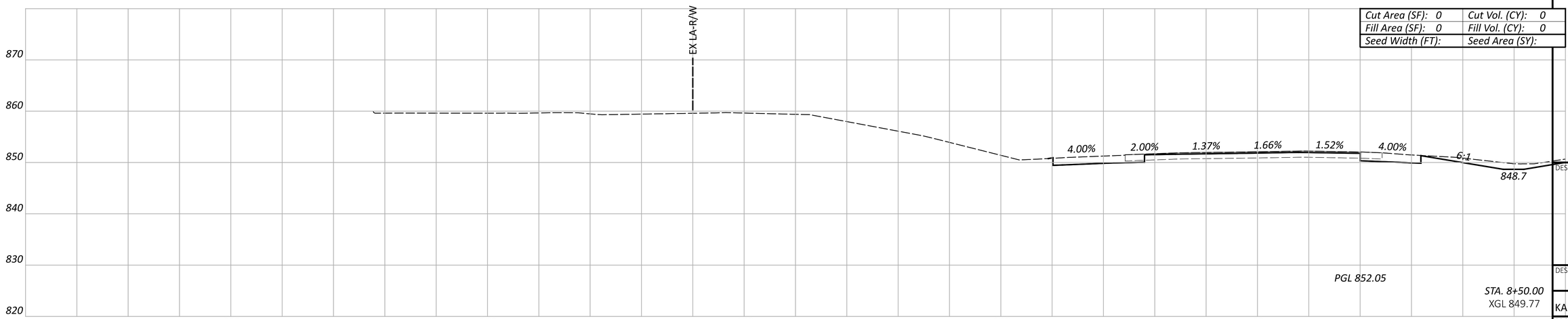
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.187	740





CROSS SECTIONS - IR 70 WB
STA. 8+50 TO STA. 9+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_WB - A 8+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:13:22 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_XS101.dgn

Sheet Totals		
Seeding	Cut	Fill

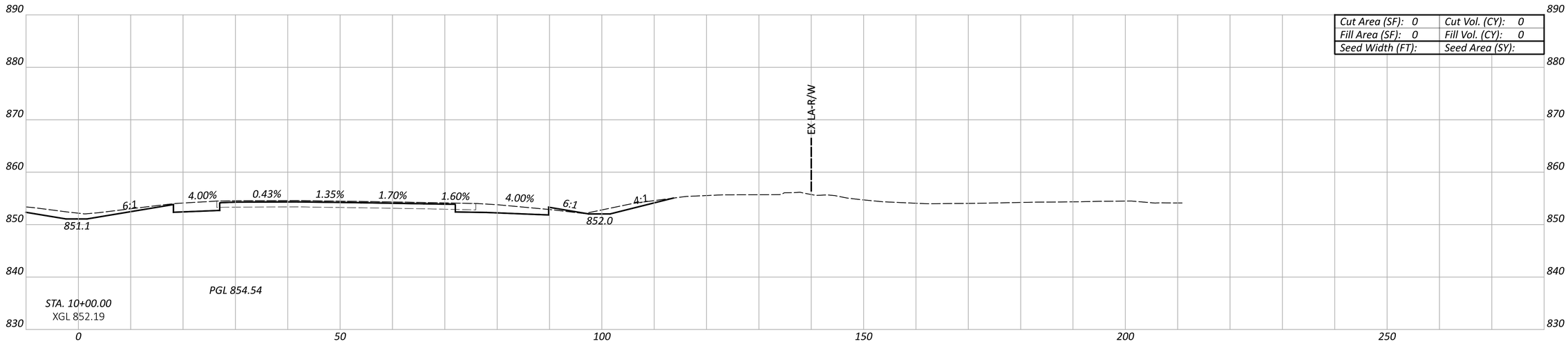
DESIGN AGENCY
WEHRLEY STRUCTUREPOINT INC.

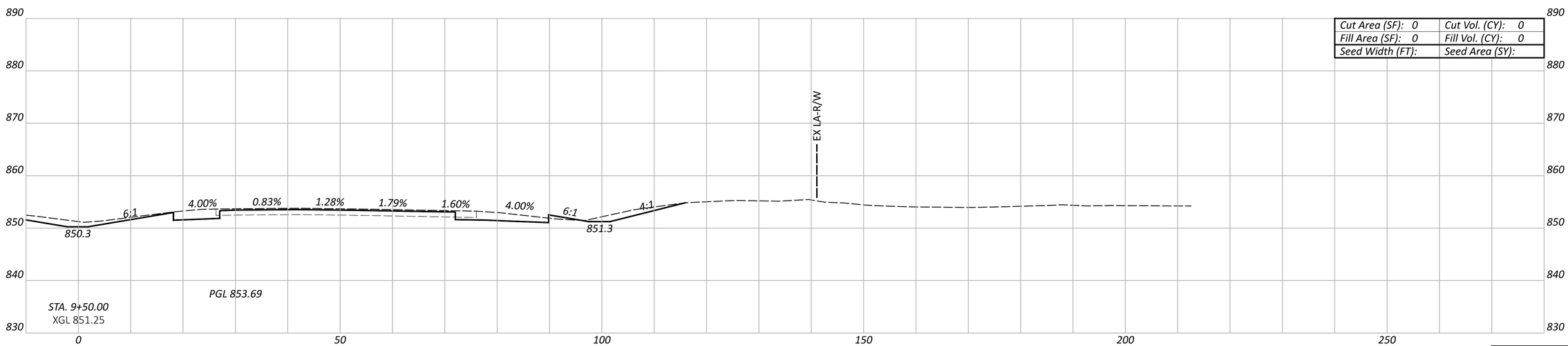
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.186 | TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 9+50 TO STA. 10+00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I70_EB - A 9+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:13:25 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_XS101.dgn

Sheet Totals		
Seeding	Cut	Fill

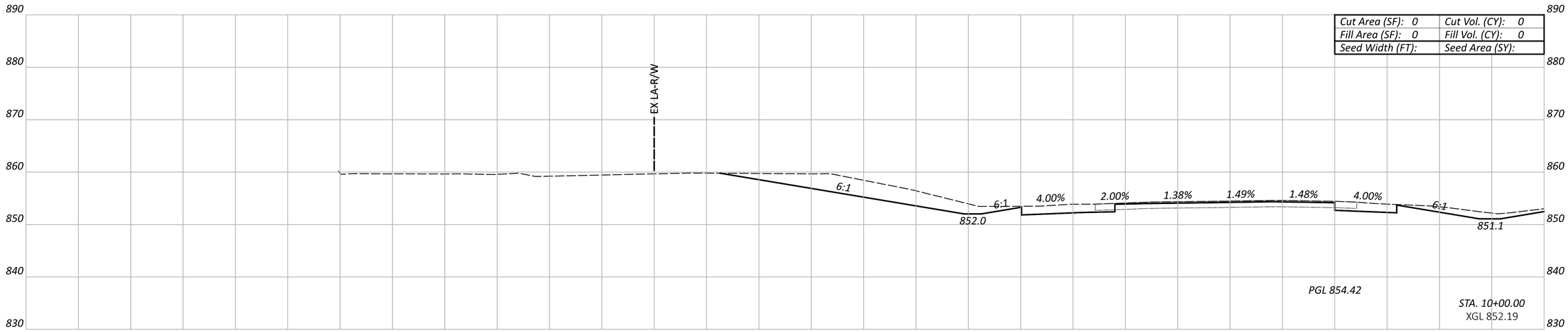
DESIGN AGENCY
STRUCTUREPOINT LLC

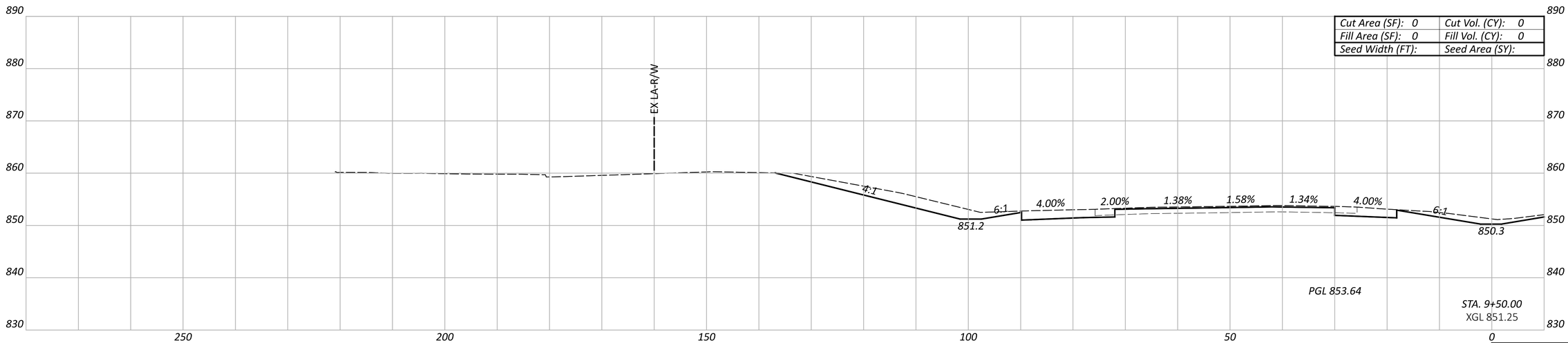
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.189 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 9+50 TO STA. 10+00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

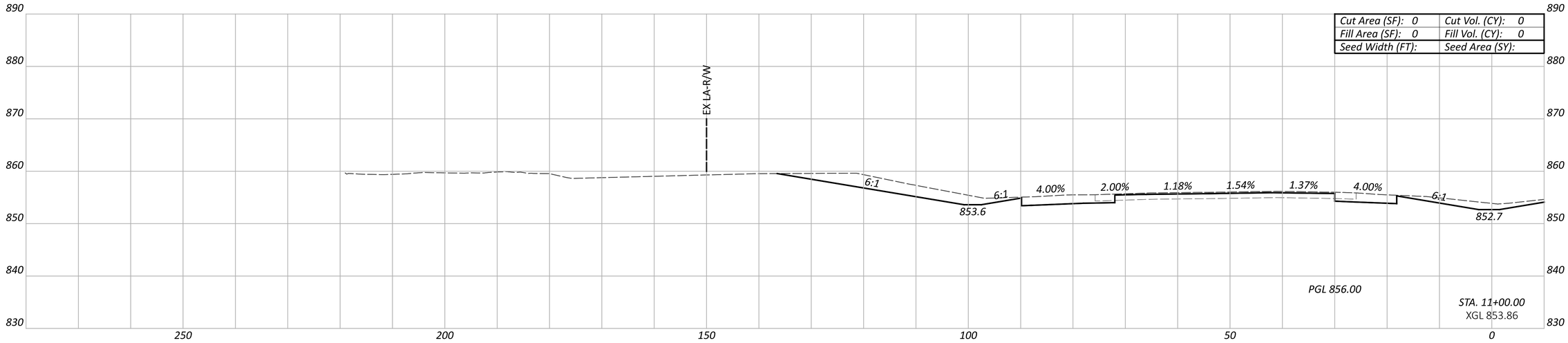
DESIGN AGENCY
STRUCTUREPOINT INC.

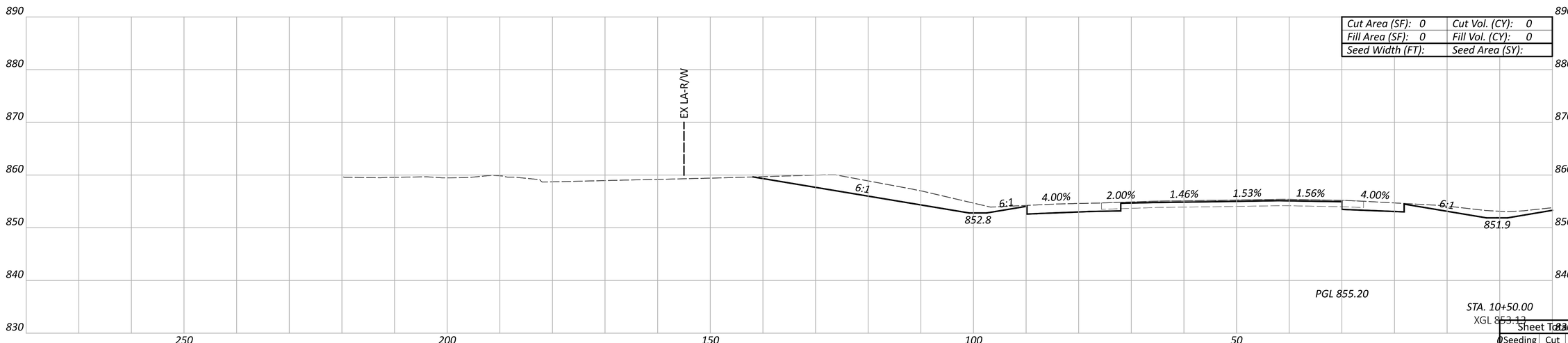
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.188 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 10+50.00 TO STA. 11+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill
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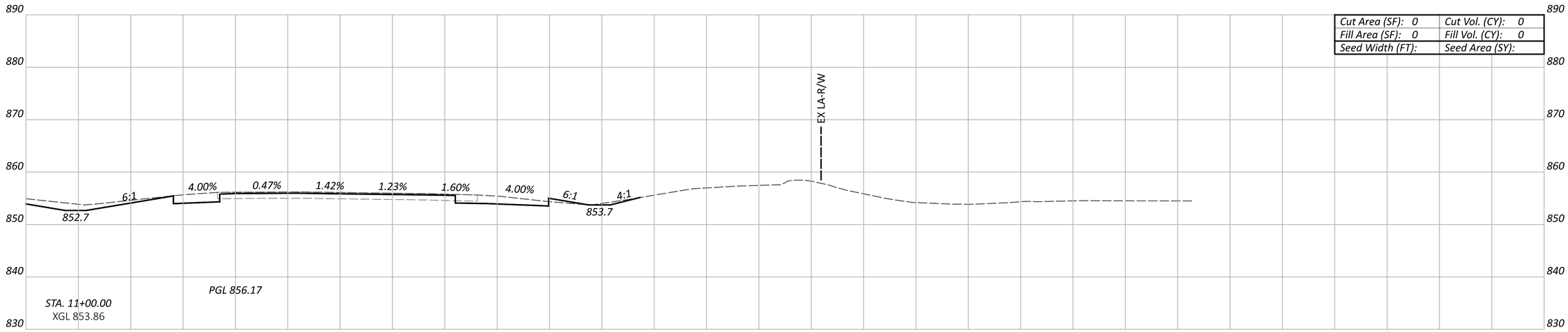
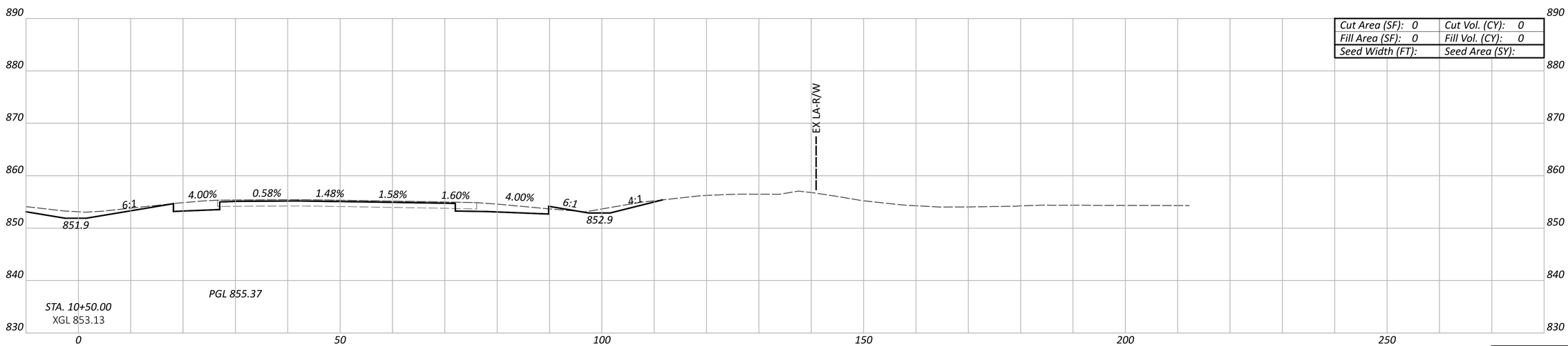
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.190
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 10+50.00 TO STA. 11+00.00

FAI/LIC IR 70 0.00/0.00

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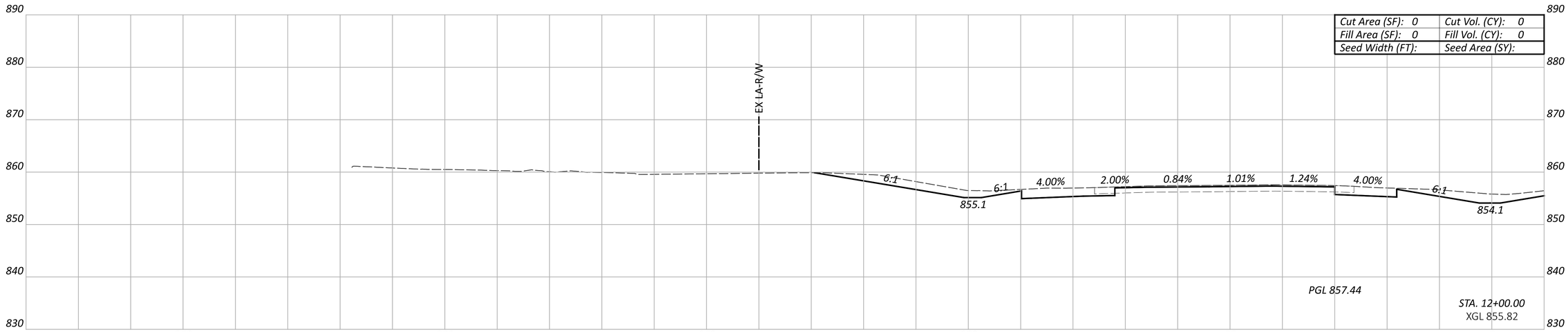
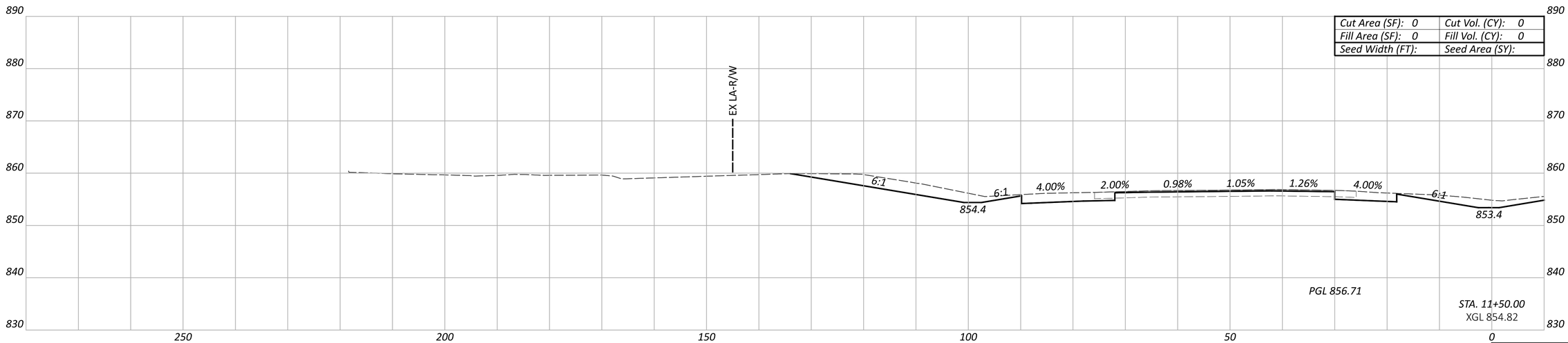
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.191
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 11+50.00 TO STA. 12+00.00

FAI/LIC IR 70 0.00/0.00

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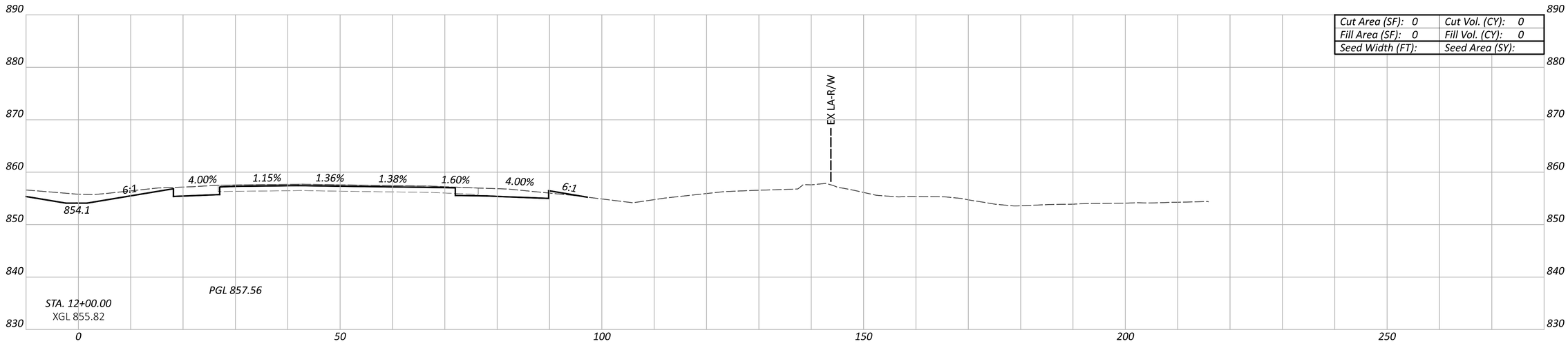
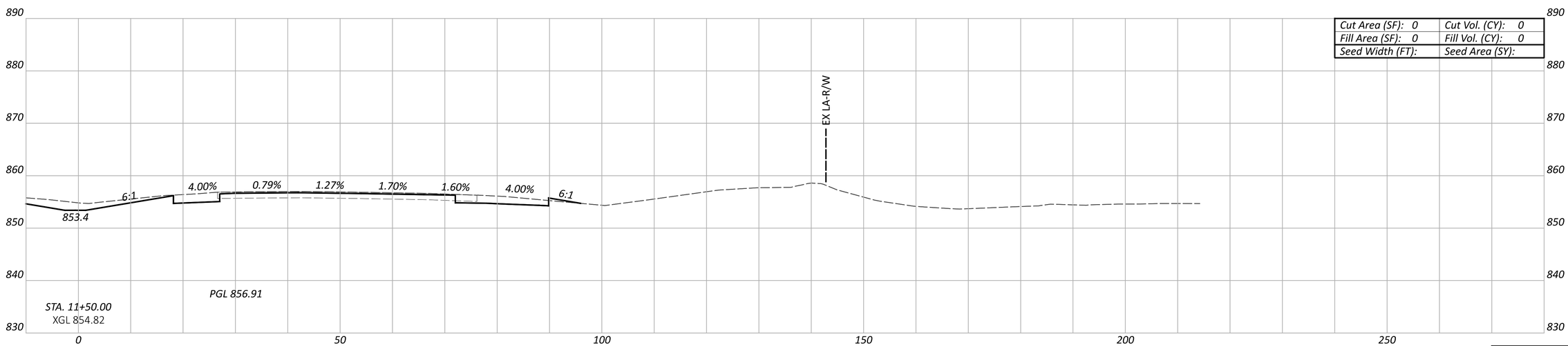
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
KIRFIDAY STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.192
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 11+50.00 TO STA. 12+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

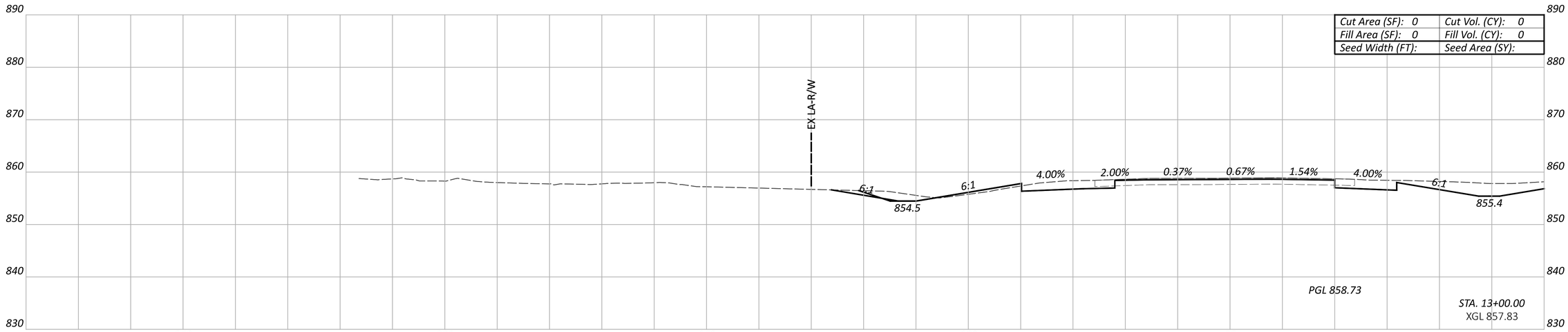
DESIGN AGENCY
STRUCTUREPOINT LLC

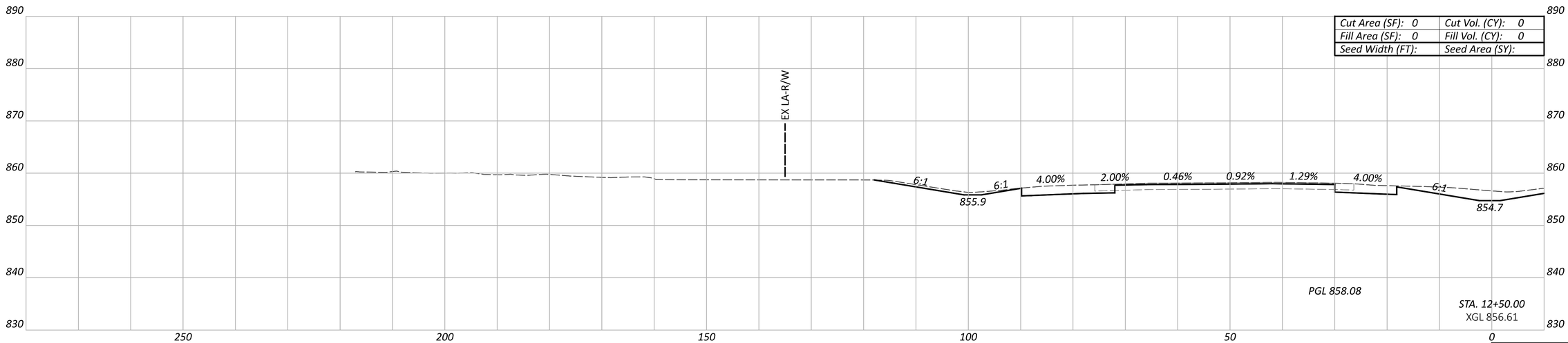
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.193 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 12+50.00 TO STA. 13+00.00

FAI/LIC IR 70 0.00/0.00

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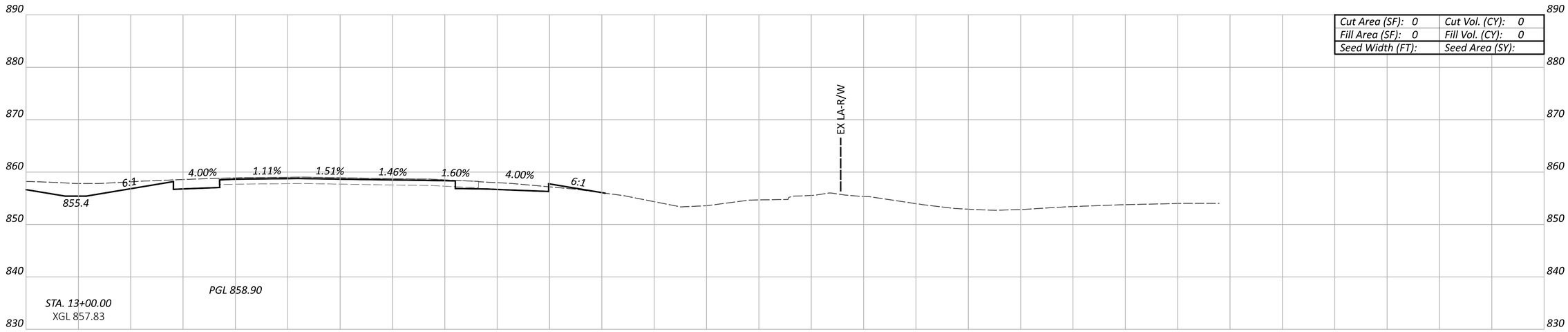
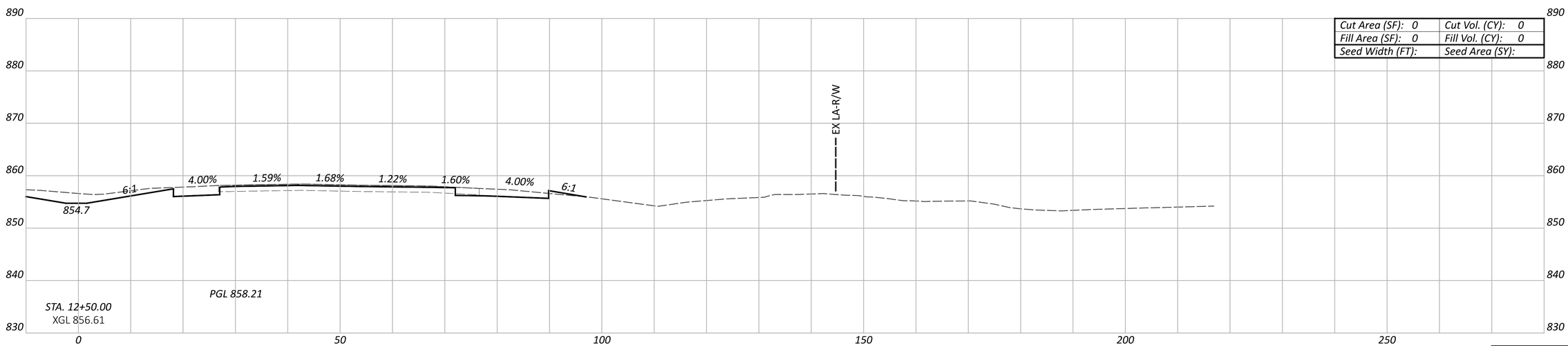
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.194	740

Sheet Totals

Seeding	Cut	Fill





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CROSS SECTIONS - IR 70 EB
STA. 12+50.00 TO STA. 13+00.00

Sheet Totals		
Seeding	Cut	Fill

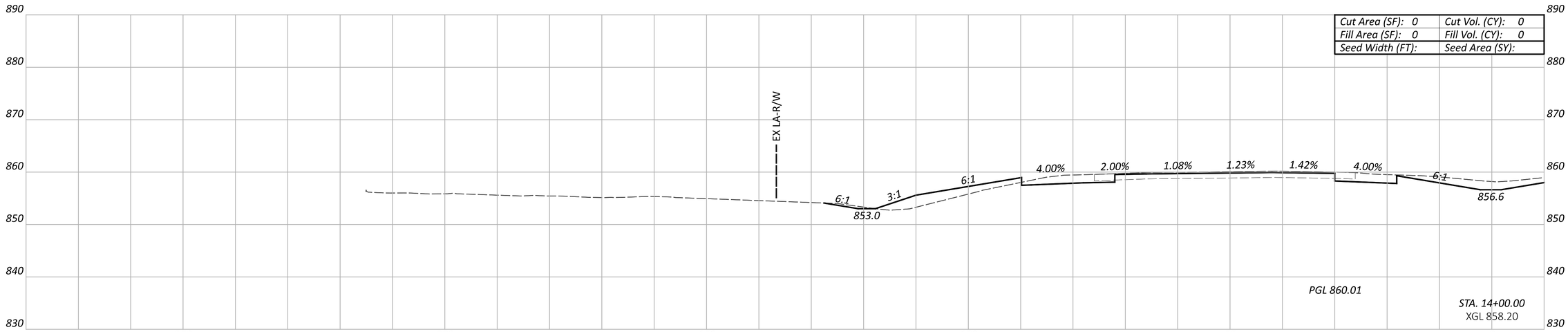
DESIGN AGENCY
STRUCTUREPOINT LLC

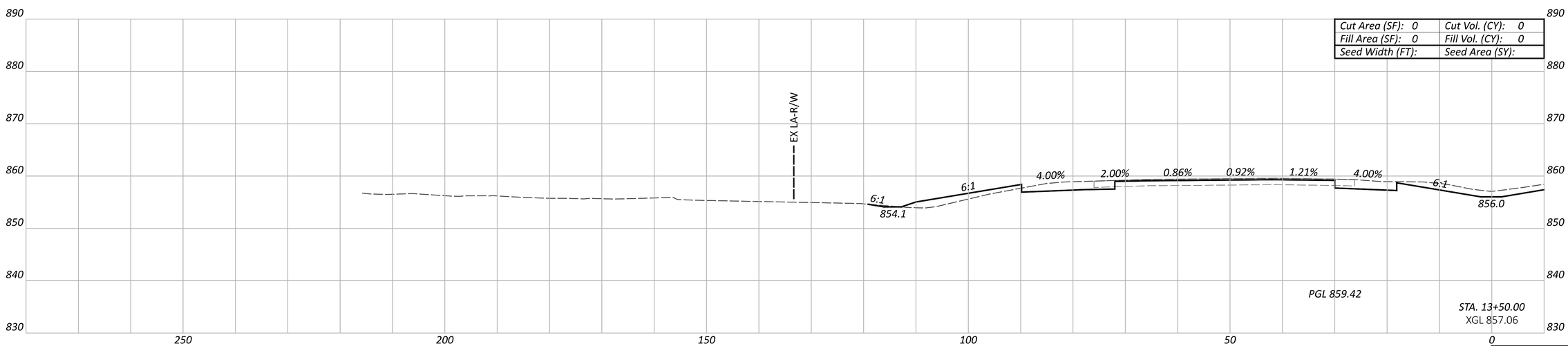
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.195 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 13+50.00 TO STA. 14+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 13+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:13:57 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT LLC

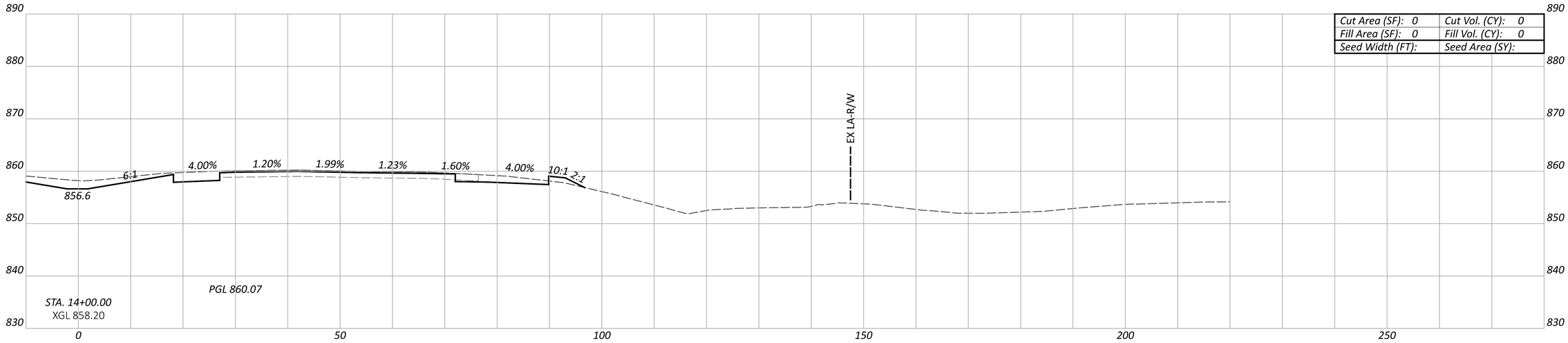
DESIGNER
BER

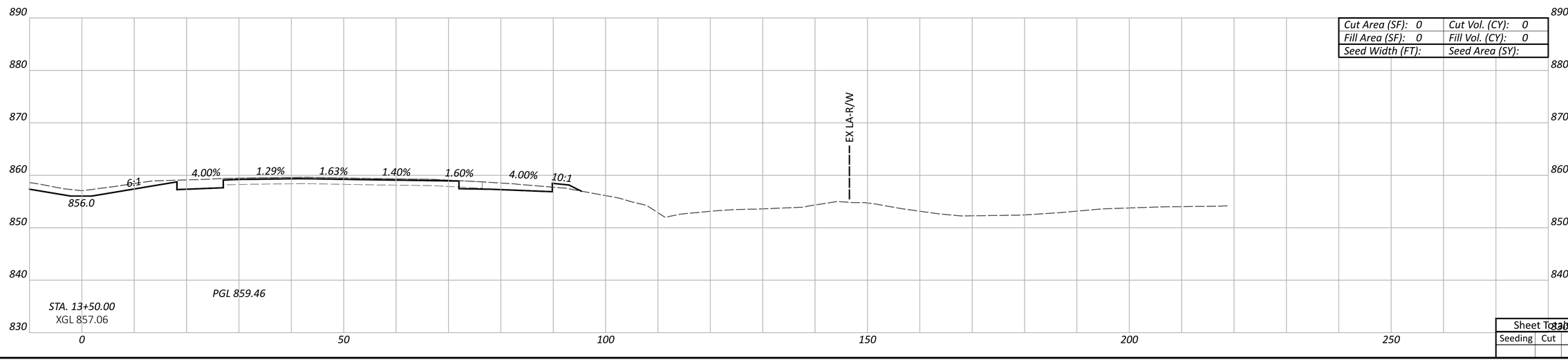
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.196	740





Sheet Totals

Seeding	Cut	Fill
	330	

CROSS SECTIONS - IR 70 EB
STA. 13+50.00 TO STA. 14+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 13+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:00 PM USER: aoldaker
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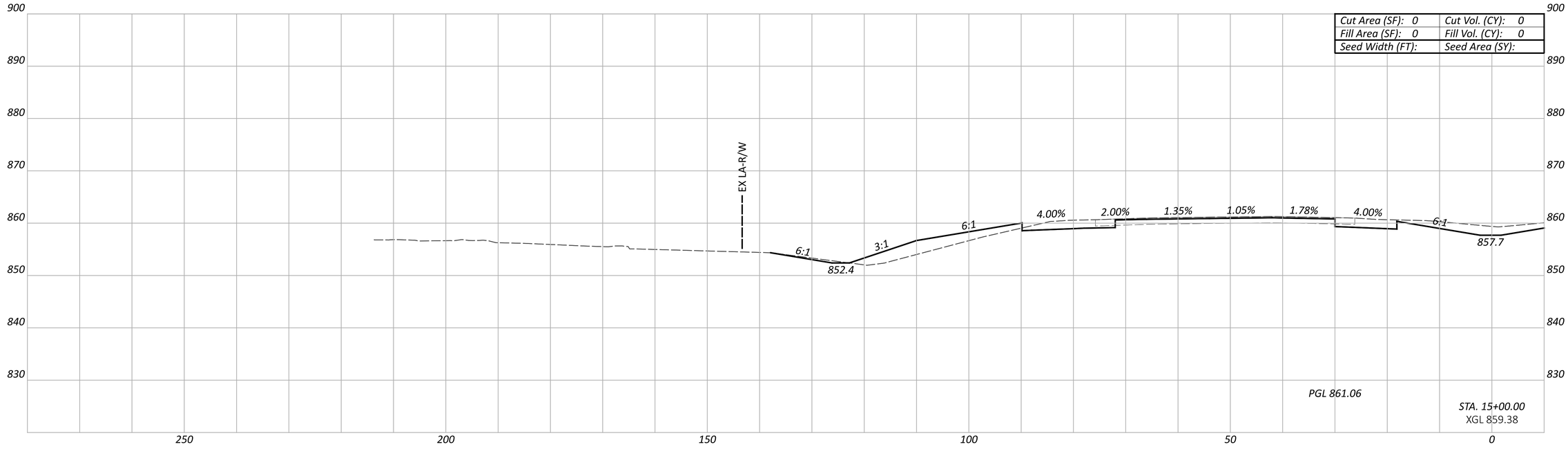
DESIGN AGENCY
STRUCTUREPOINT LLC

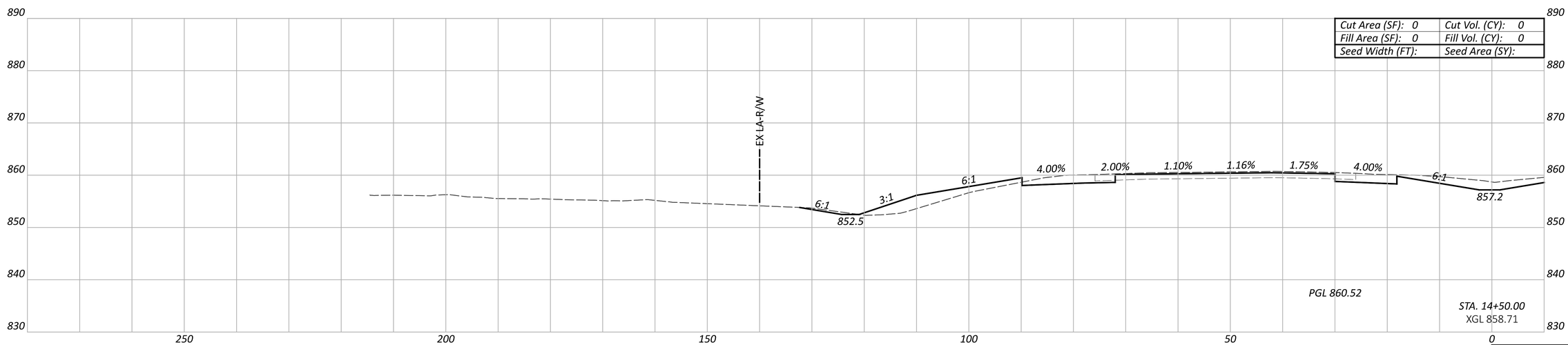
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.197 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 14+50.00 TO STA. 15+00.00

FAI/LIC IR 70 0.00/0.00

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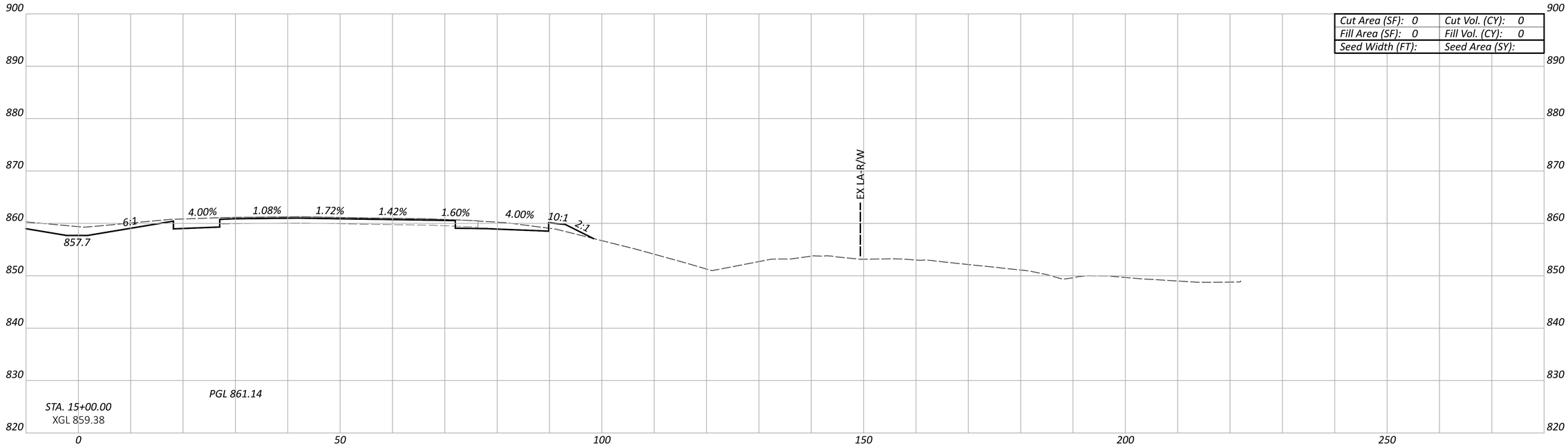
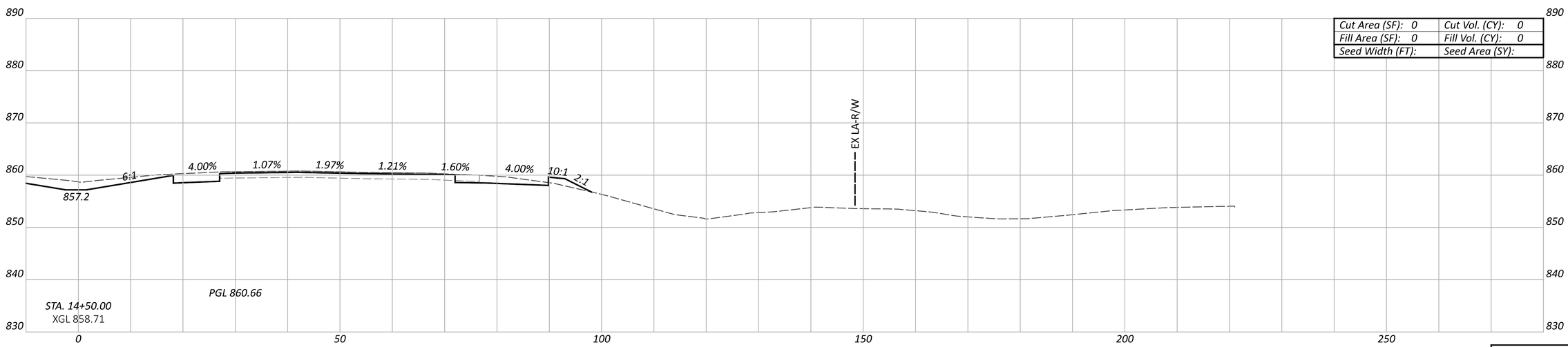
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.198	740

Sheet Totals		
Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 14+50.00 TO STA. 15+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 14+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:04 PM USER: aoldaker
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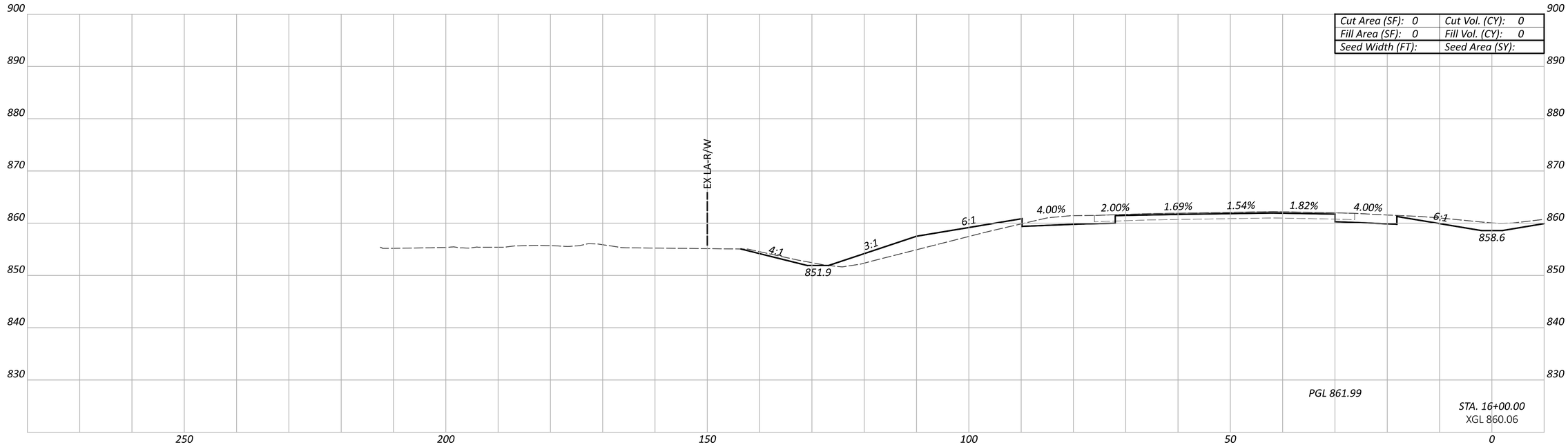
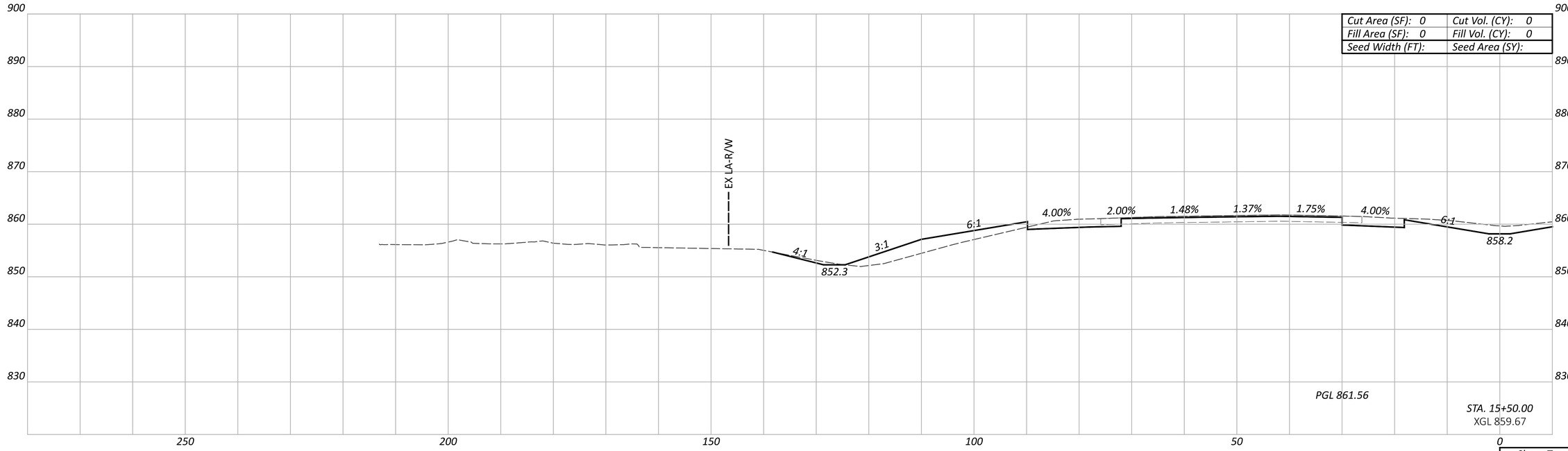
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.199
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 15+50.00 TO STA. 16+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 15+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:06 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

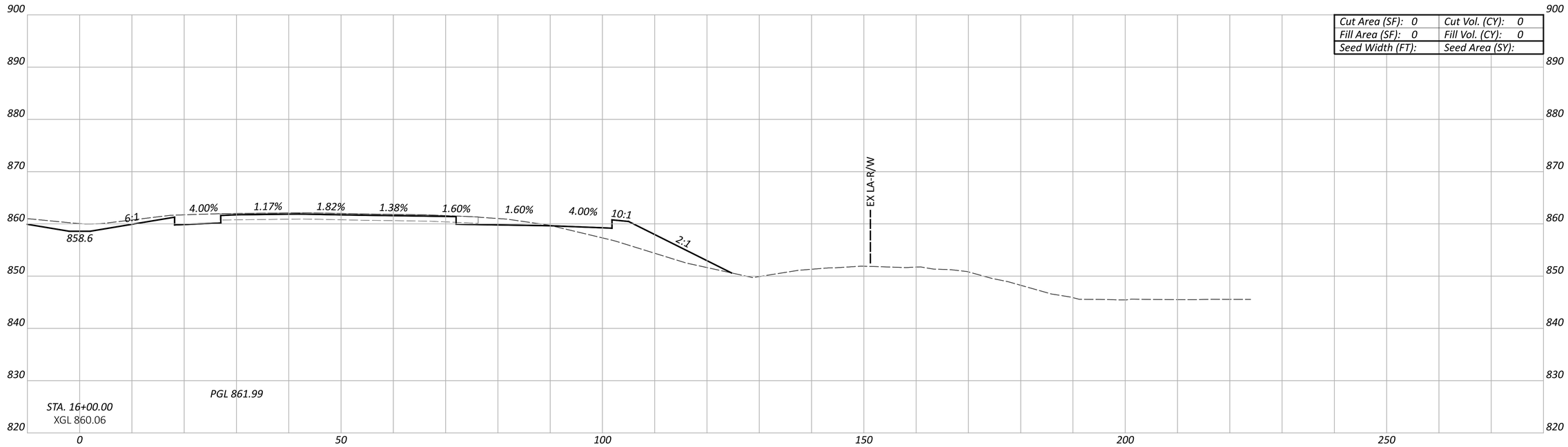
REVIEWER
KAM 06/18/23

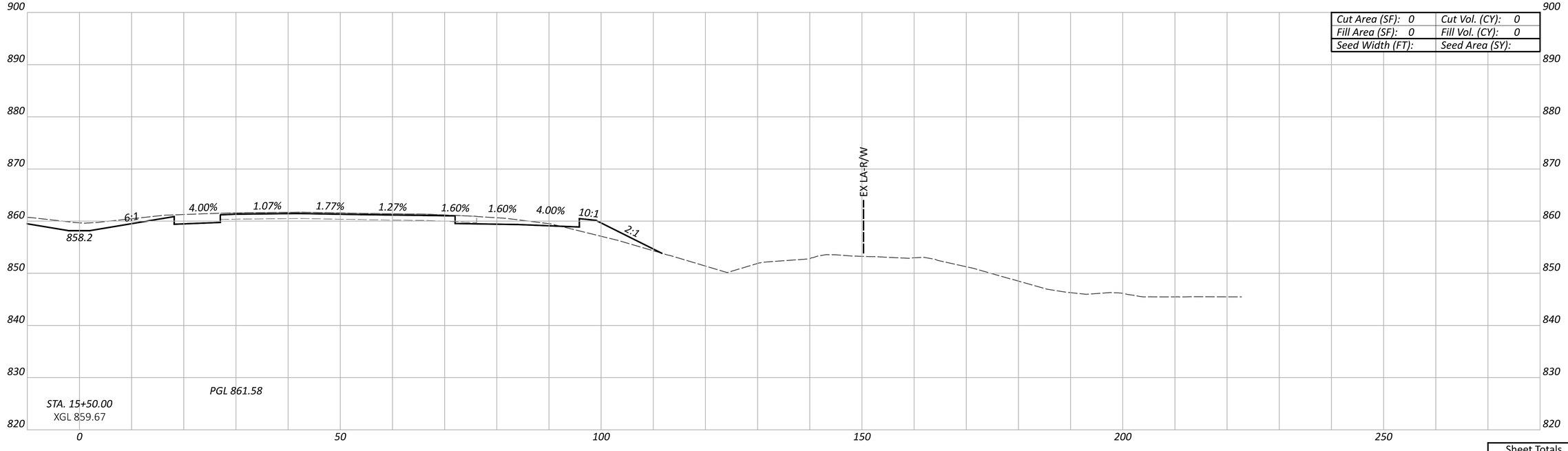
PROJECT ID
96808

Sheet Totals

Seeding	Cut	Fill

SHEET P.200 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 15+50.00 TO STA. 16+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.201 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 15+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:09 PM USER: aoldaker
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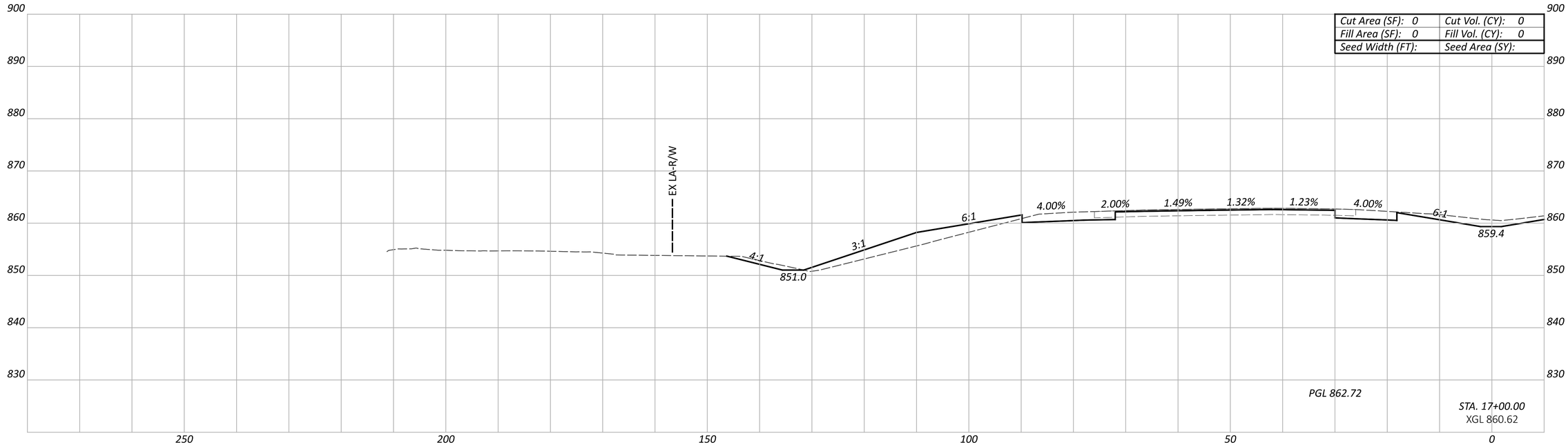

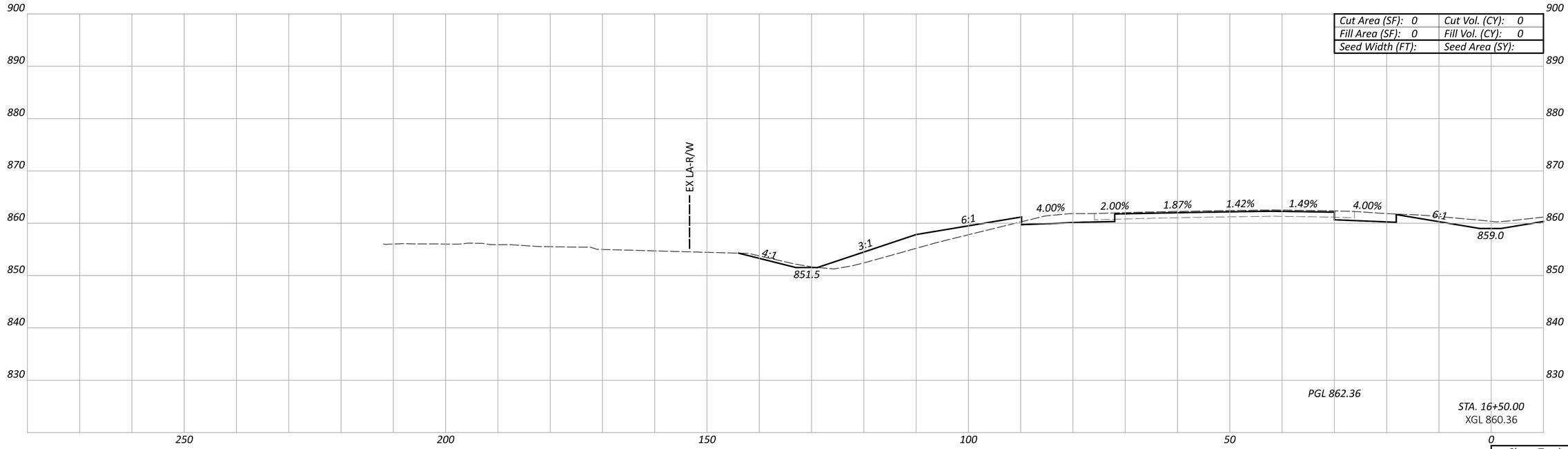

CROSS SECTIONS - IR 70 WB
STA. 16+50.00 TO STA. 17+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 16+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:11 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

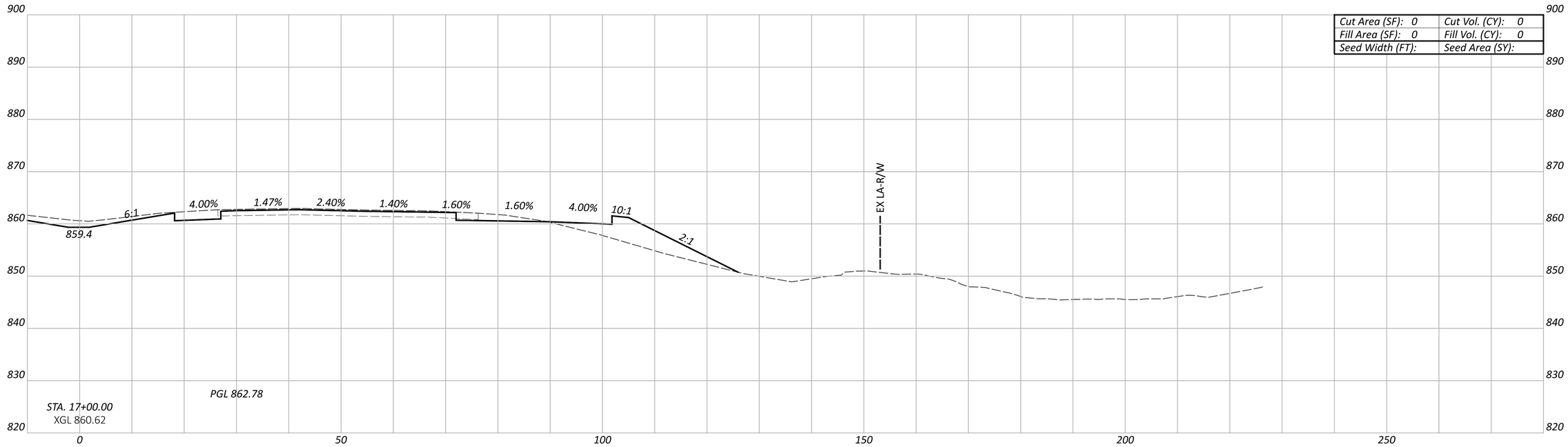
DESIGNER
BER

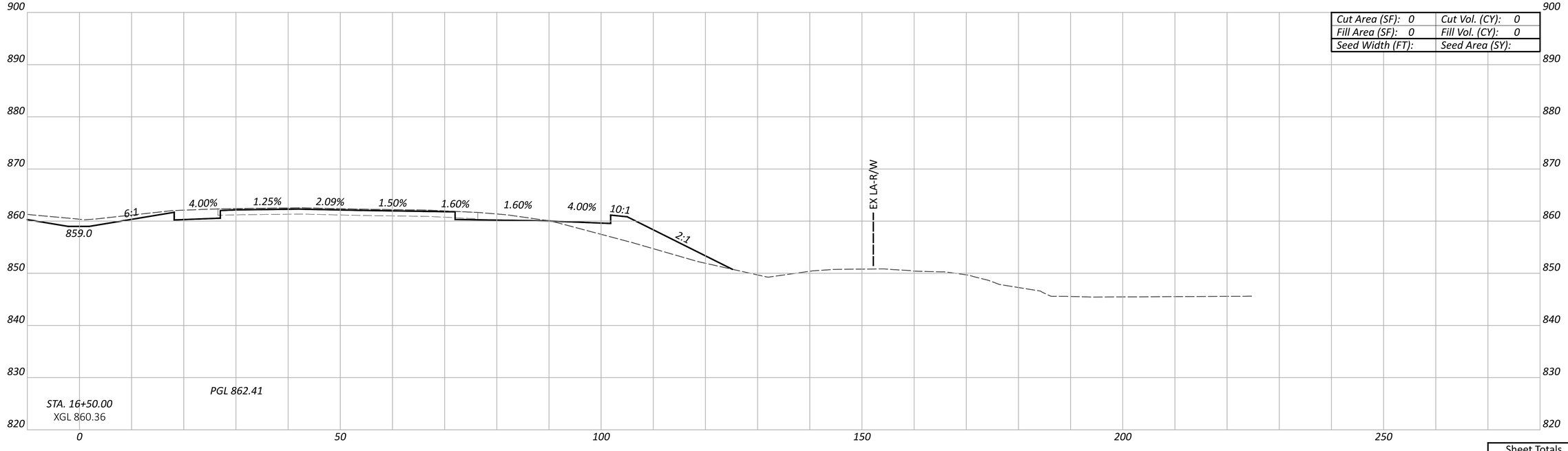
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.202 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 16+50.00 TO STA. 17+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 16+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:13 PM USER: aoldaker
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Sheet Totals

Seeding	Cut	Fill

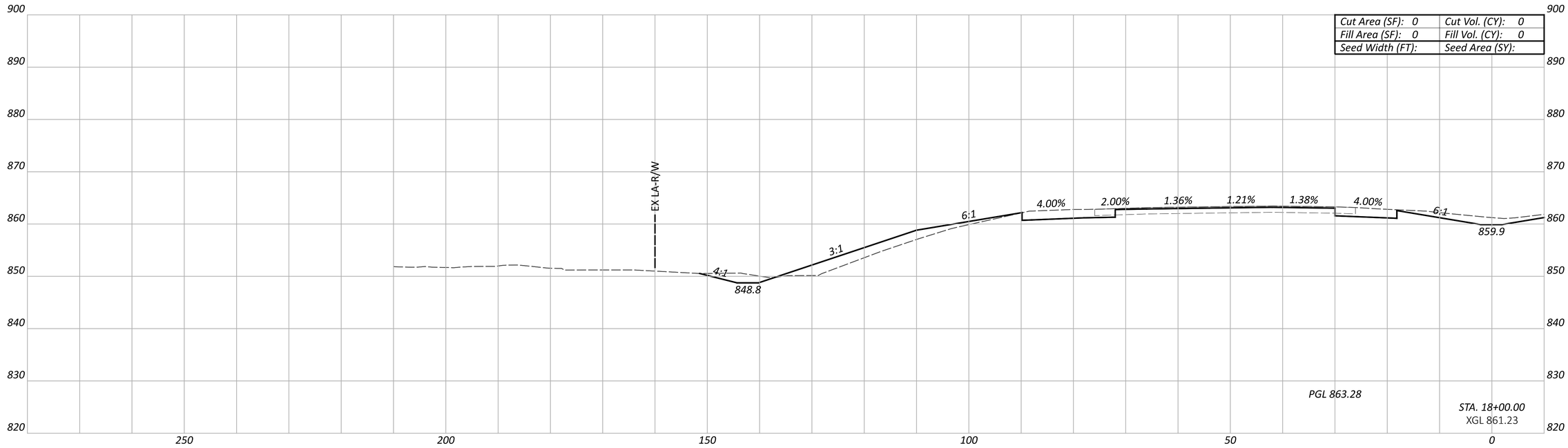
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

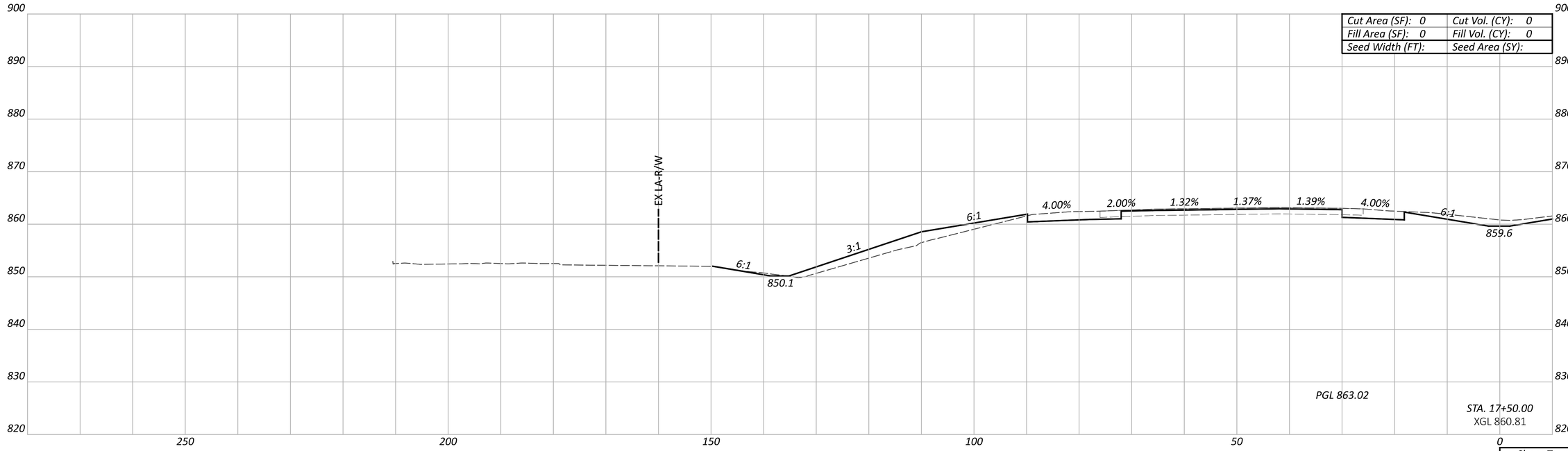
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.203 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 17+50.00 TO STA. 18+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

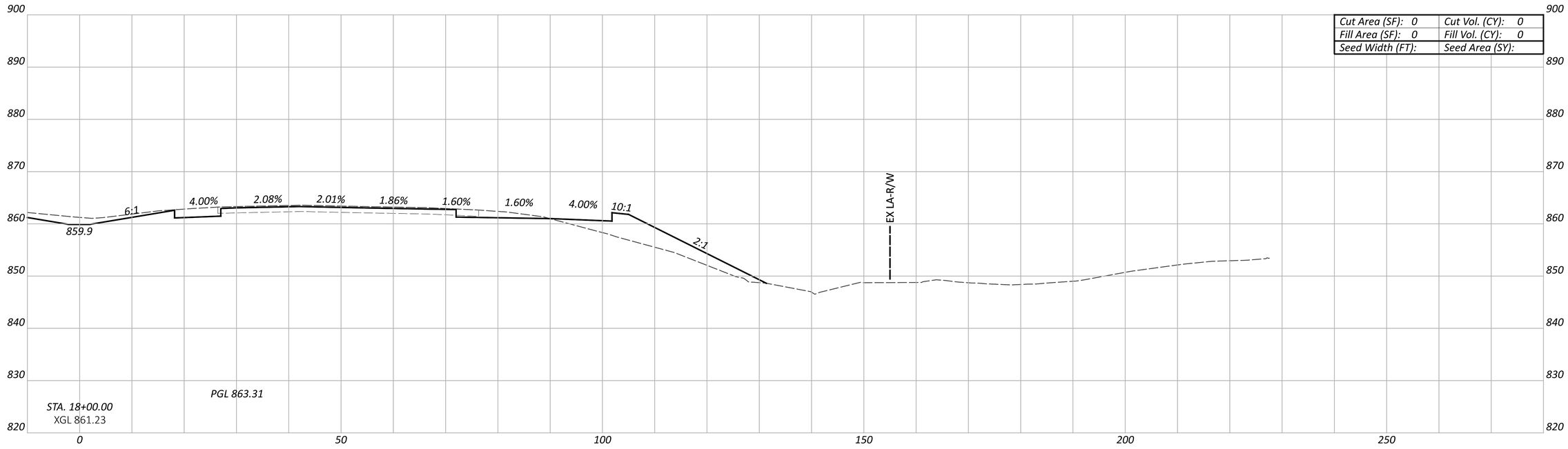
DESIGNER
BER

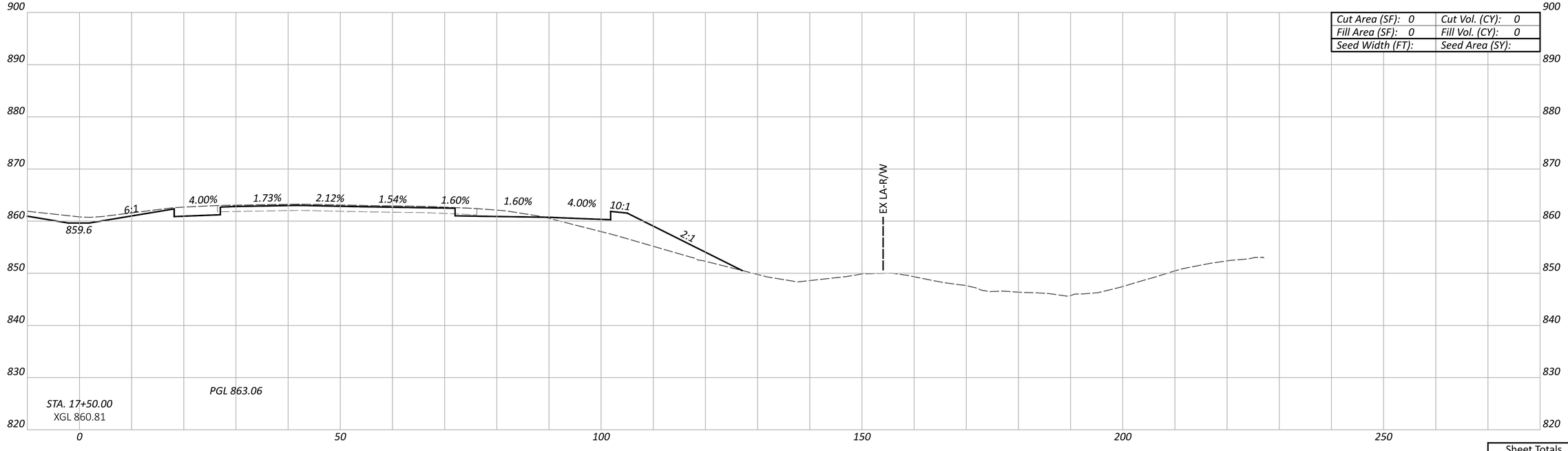
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.204 TOTAL 740





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STA. 17+50.00 TO STA. 18+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

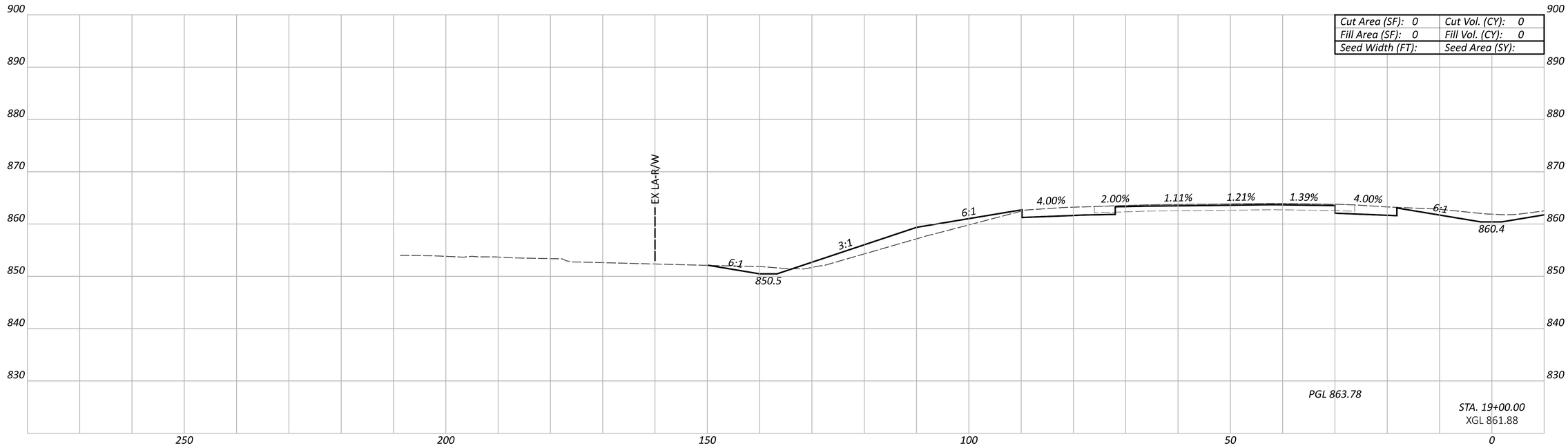
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

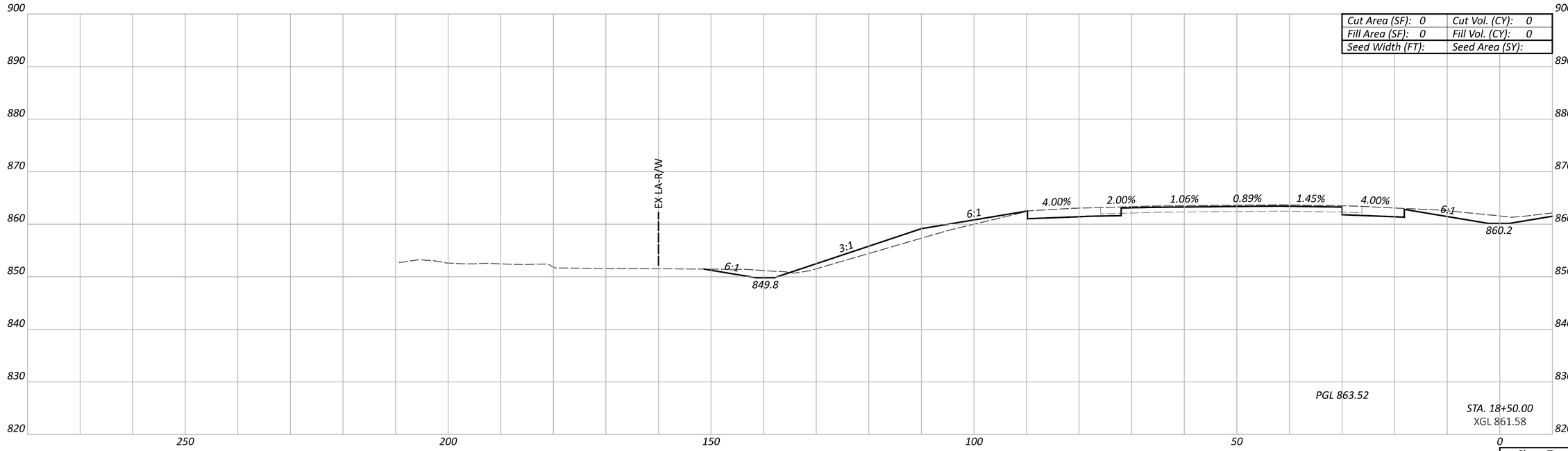
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.205 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 18+50.00 TO STA. 19+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

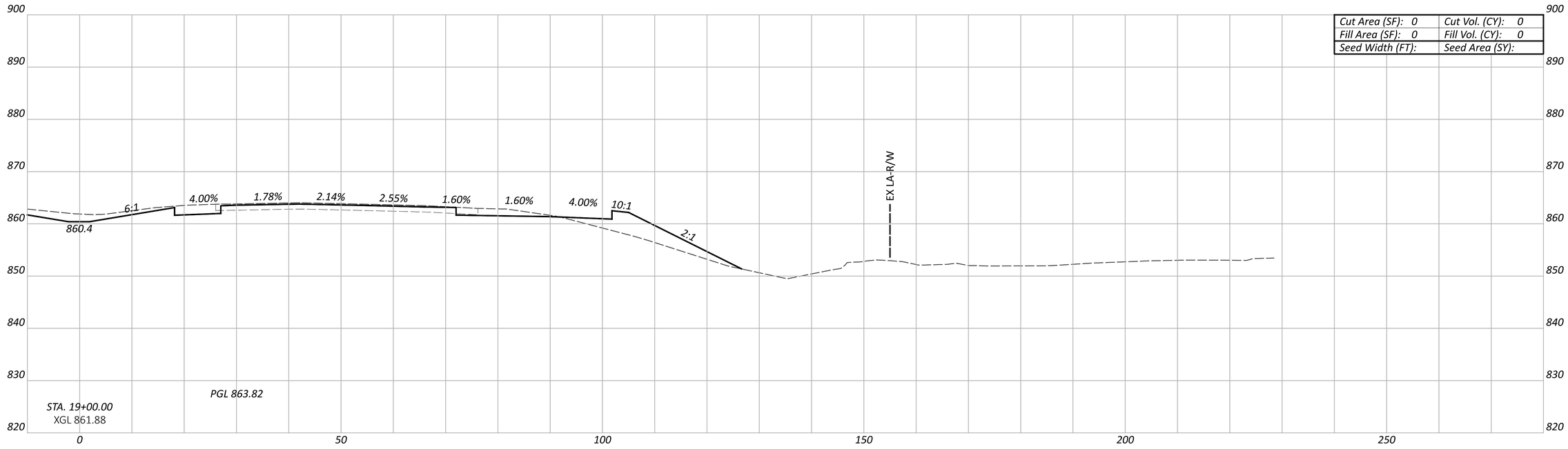
REVIEWER
KAM 06/18/23

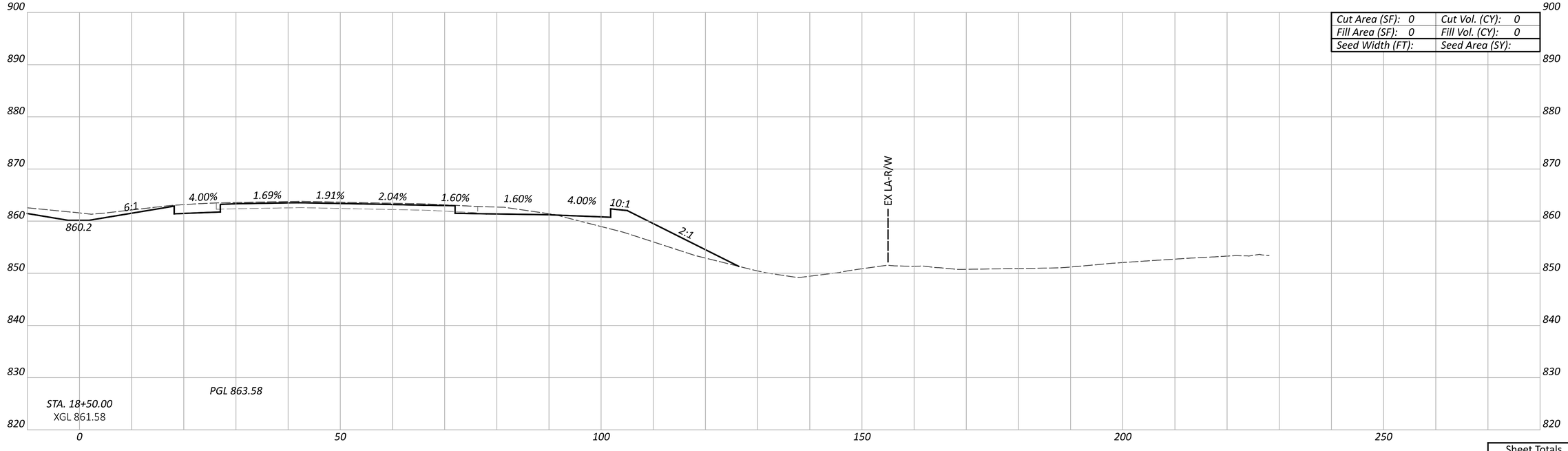
PROJECT ID
96808

Sheet Totals

Seeding	Cut	Fill

SHEET P.206 TOTAL 740





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STA. 18+50.00 TO STA. 19+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

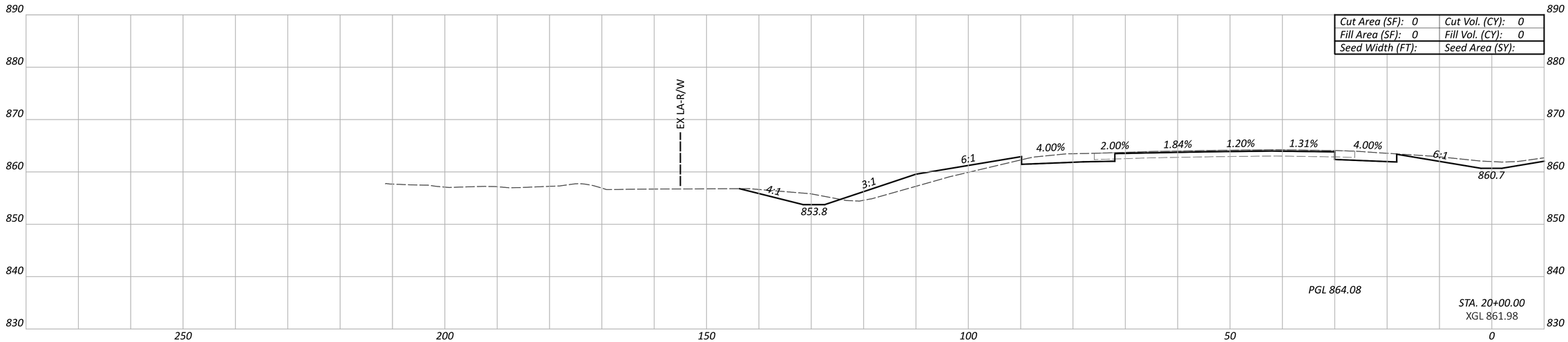
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

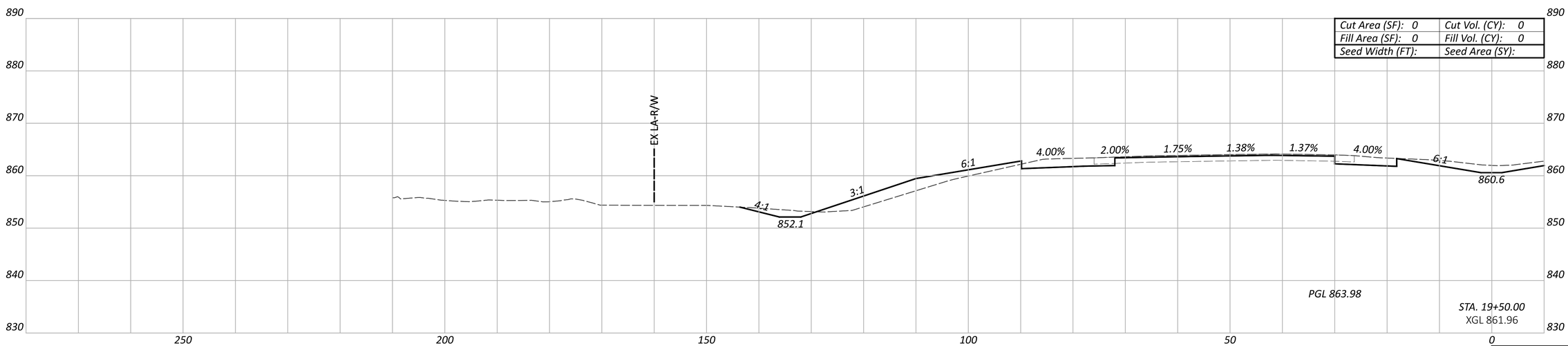
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.207 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 19+50.00 TO STA. 20+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

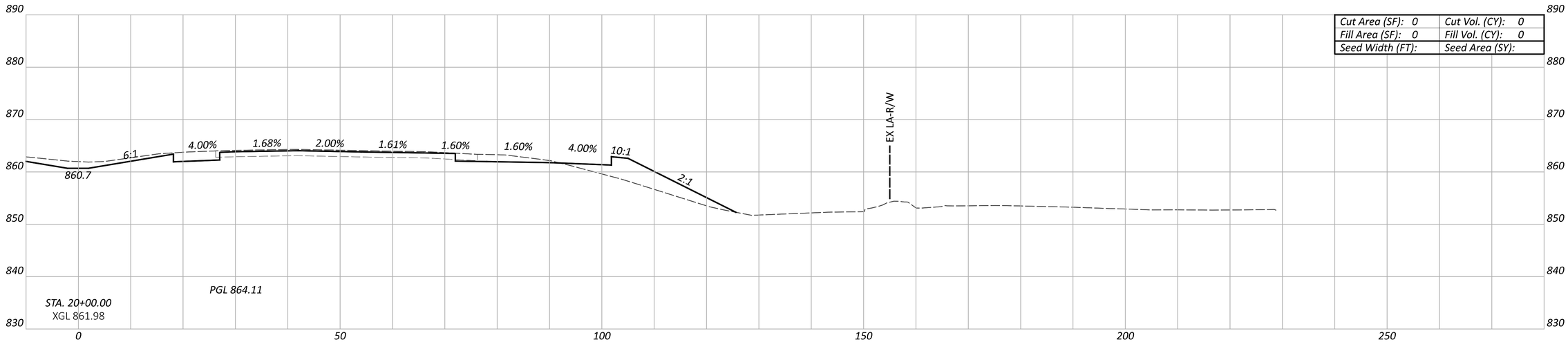
DESIGN AGENCY
STRUCTUREPOINT INC.

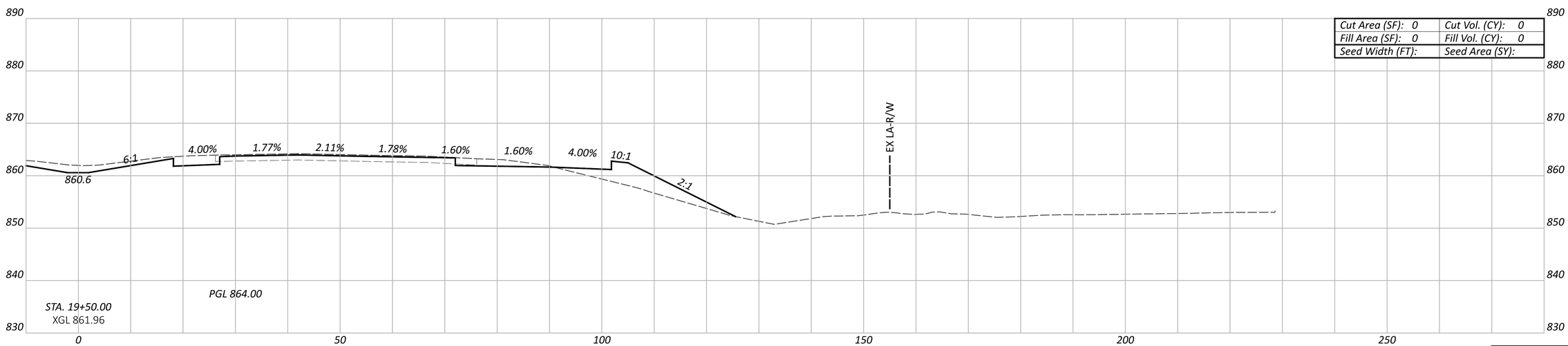
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.208 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 19+50.00 TO STA. 20+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

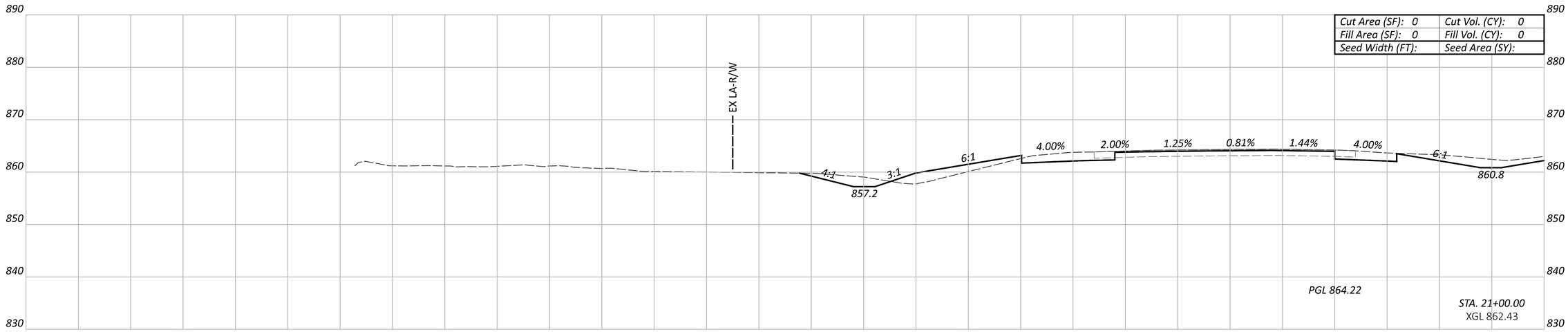
DESIGN AGENCY
STRUCTUREPOINT INC.

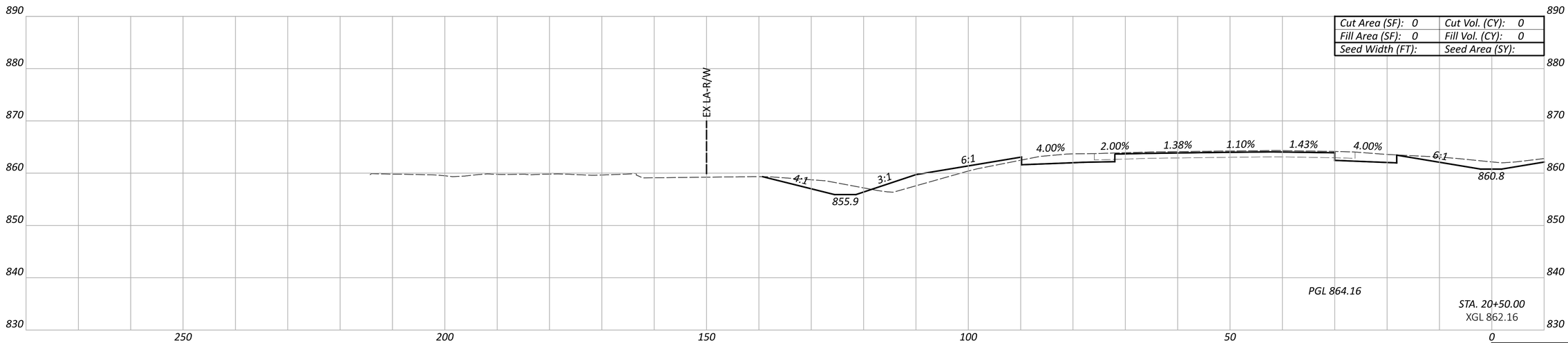
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.209 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 20+50.00 TO STA. 21+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

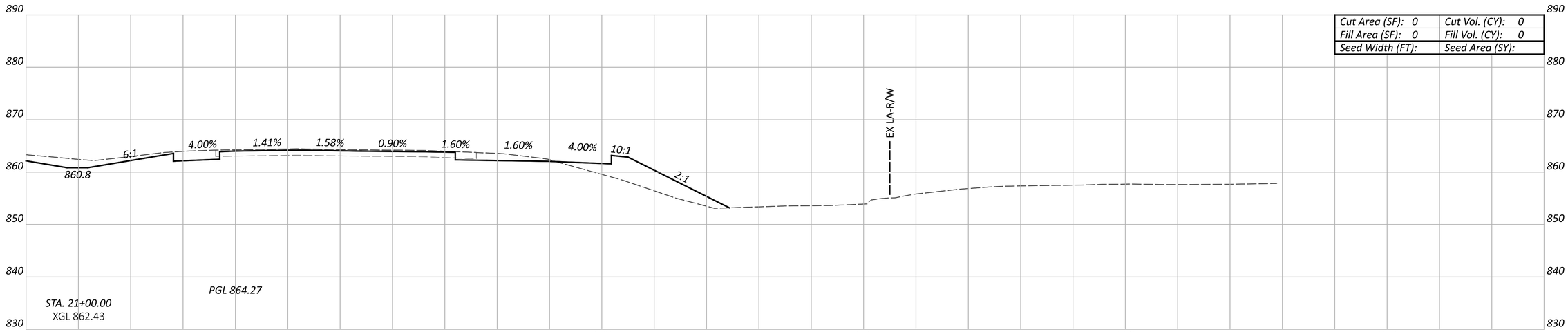
DESIGN AGENCY
STRUCTUREPOINT INC.

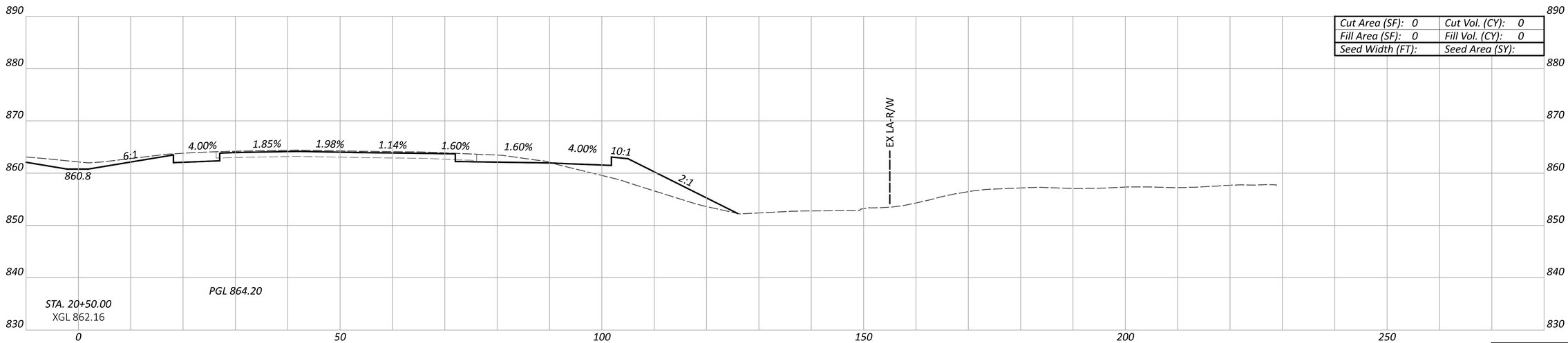
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.210 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 20+50.00 TO STA. 21+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

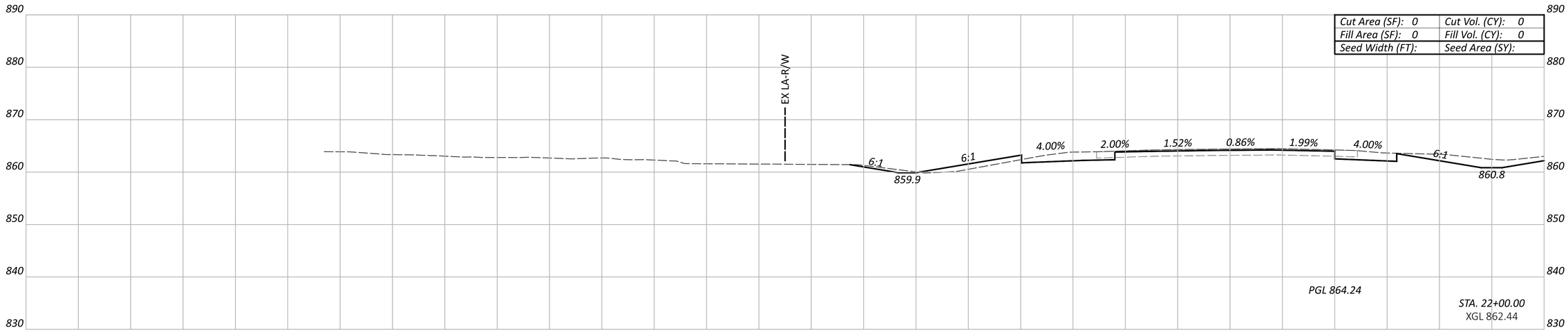
DESIGN AGENCY
STRUCTUREPOINT INC.

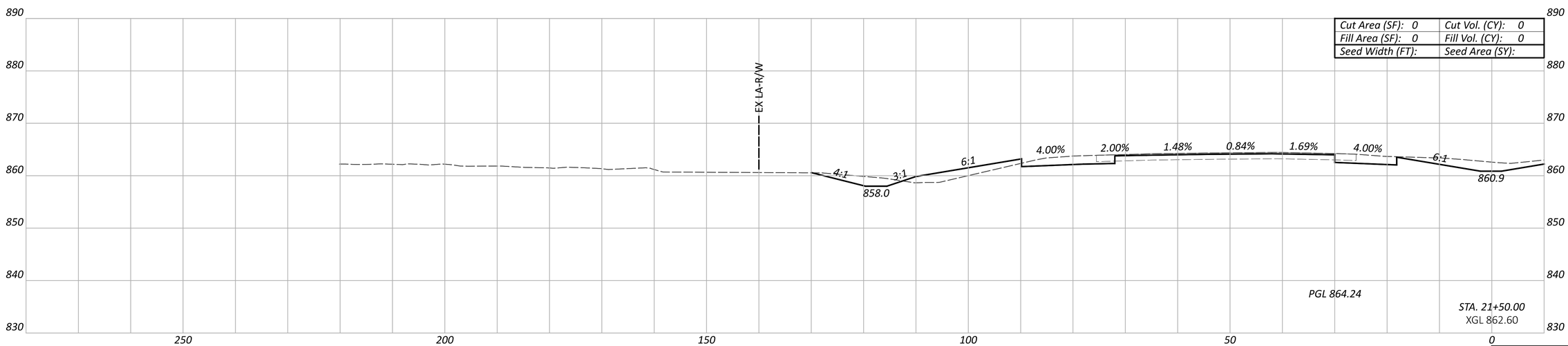
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.211 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 21+50.00 TO STA. 22+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

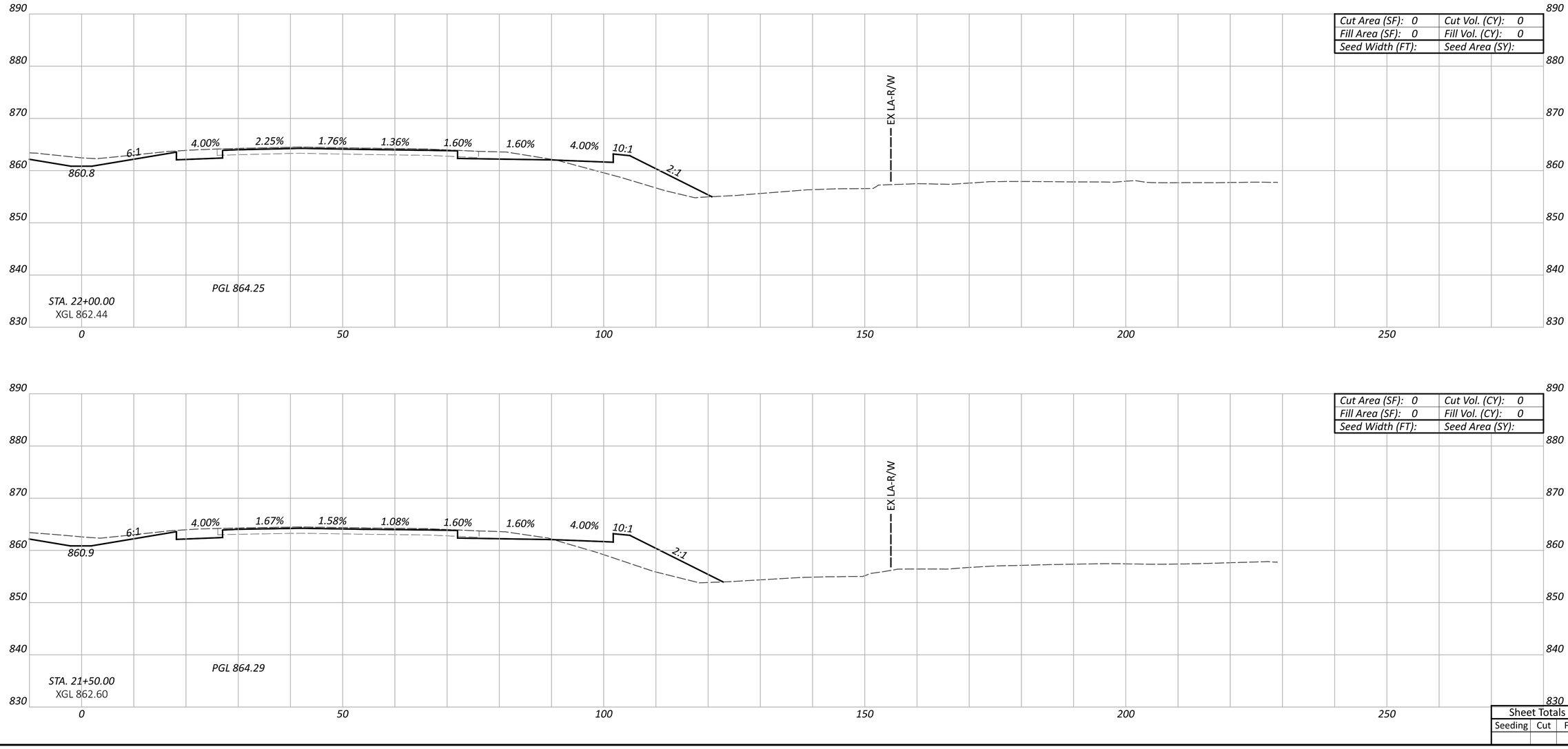
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.212	740



Sheet Totals

Seeding	Cut	Fill

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FAI/LIC IR 70 0.00/0.00

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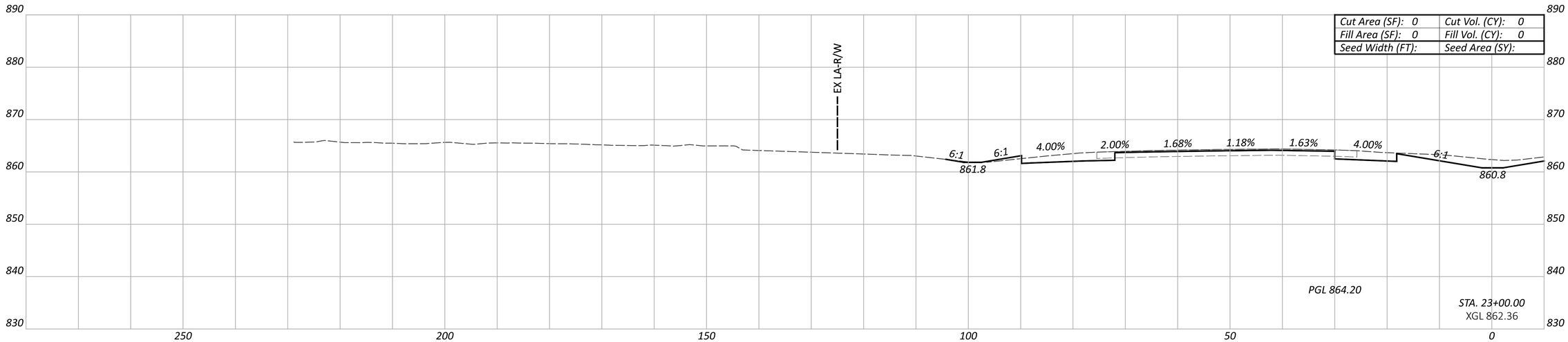
DESIGN AGENCY
STRUCTUREPOINT INC.

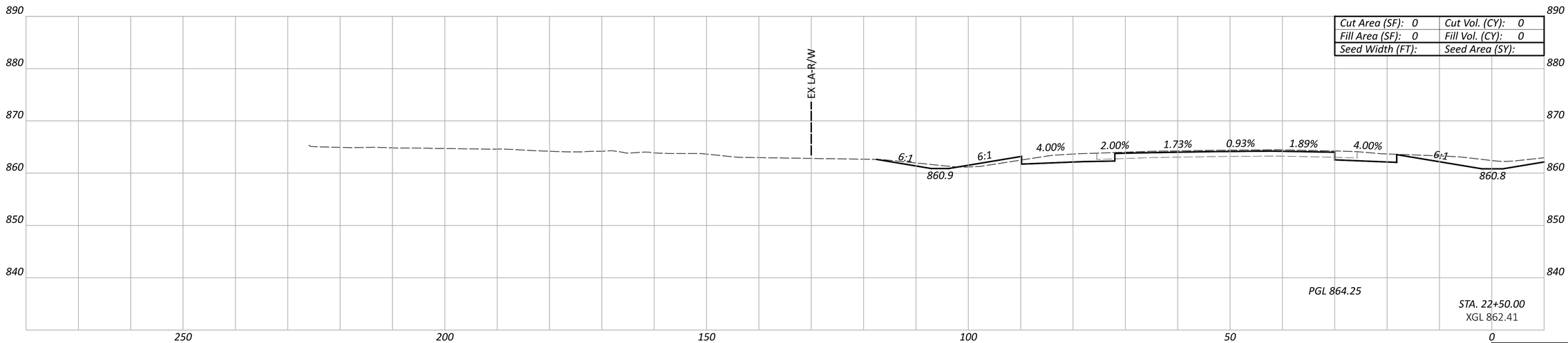
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.213 TOTAL 740





CROSS SECTIONS - IR 70 WB
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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

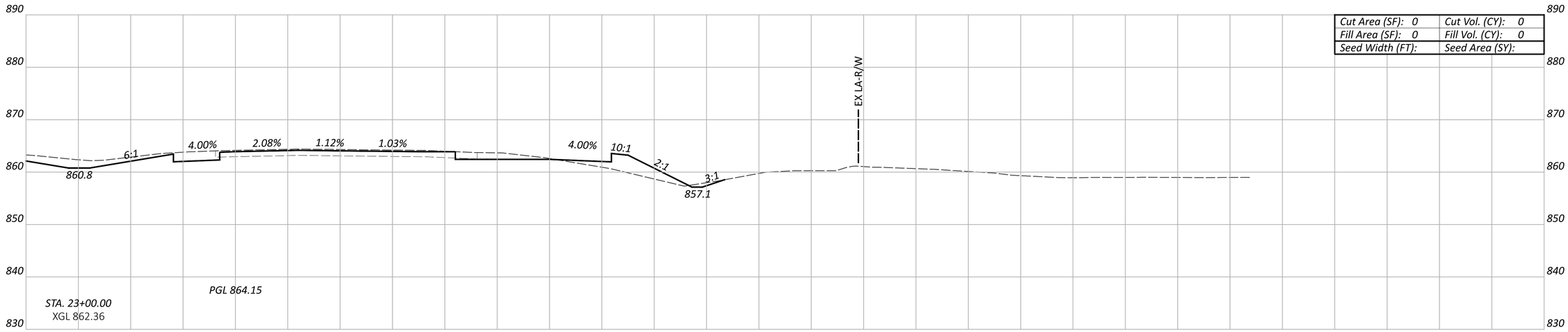
DESIGNER
BER

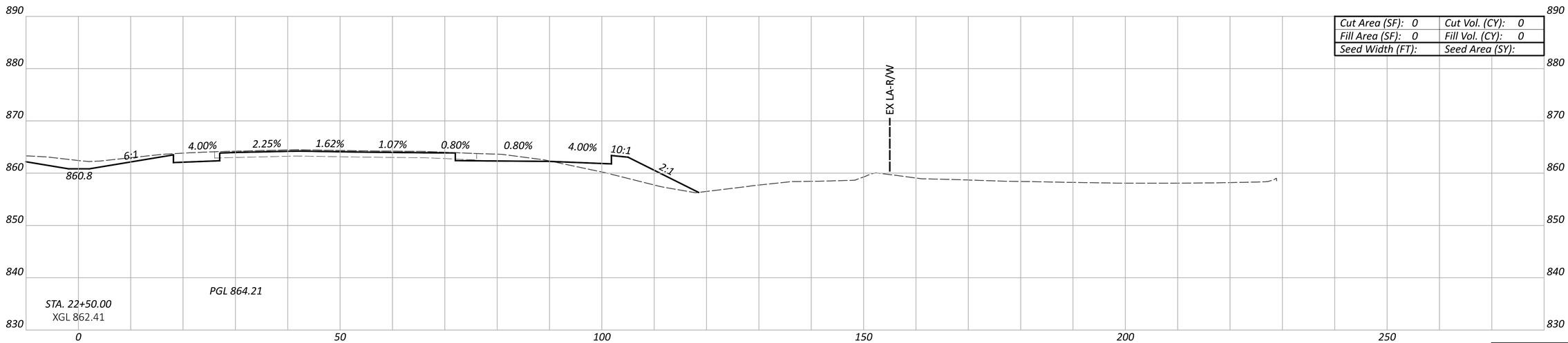
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.214	740





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FAI/LIC IR 70 0.00/0.00

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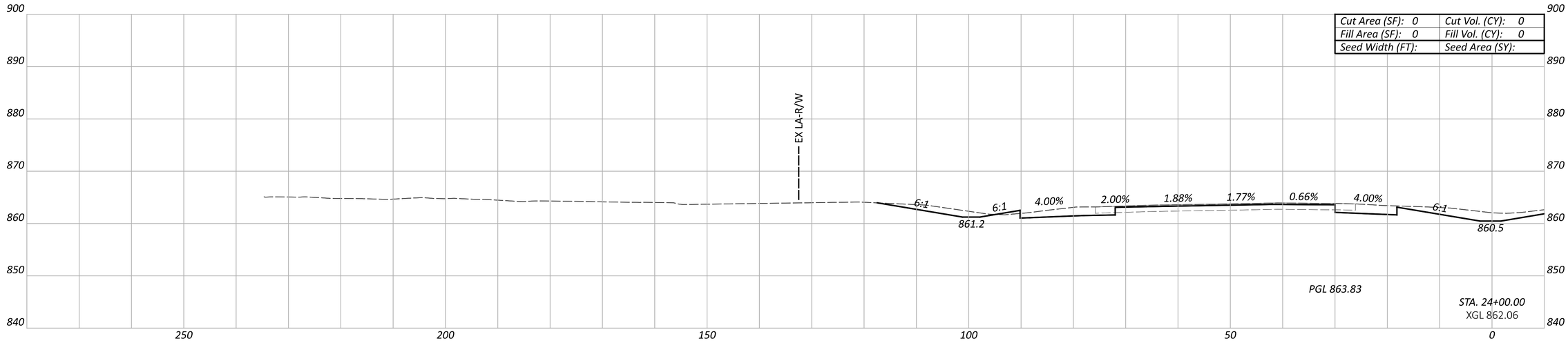
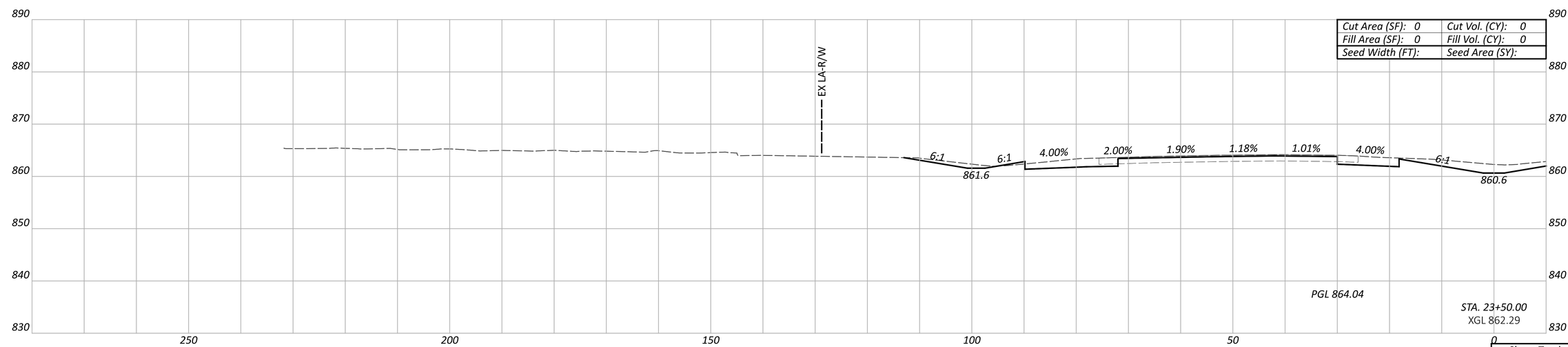
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	REVIEWER	PROJECT ID
BER	KAM 06/18/23	96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.215	740





CROSS SECTIONS - IR 70 WB
STA. 23+50.00 TO STA. 24+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAS STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.216 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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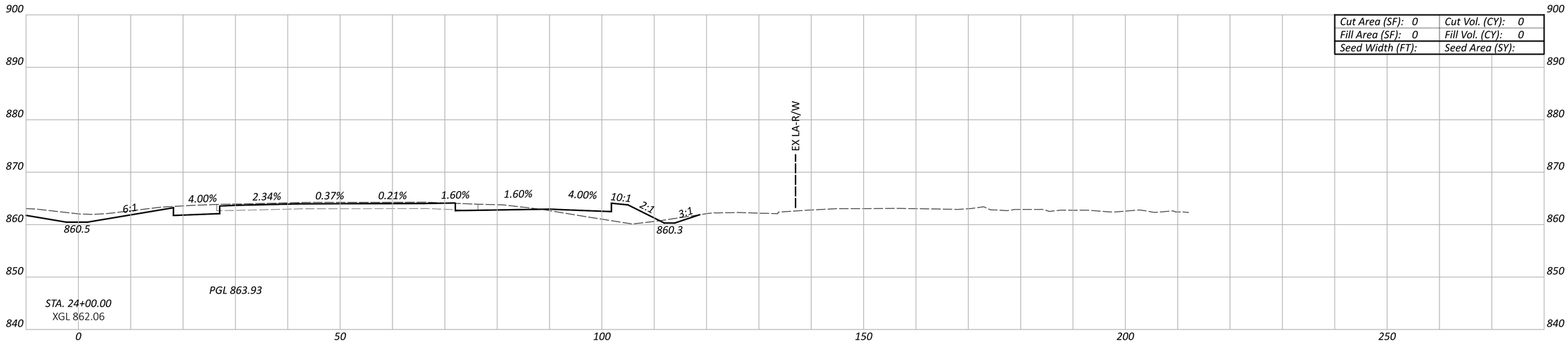

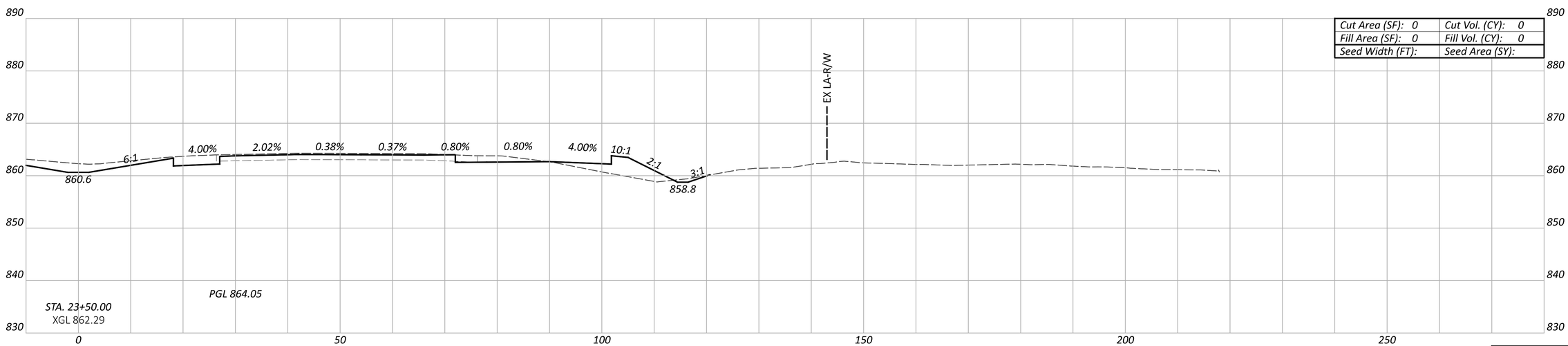

CROSS SECTIONS - IR 70 EB
STA. 23+50.00 TO STA. 24+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 23+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:46 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

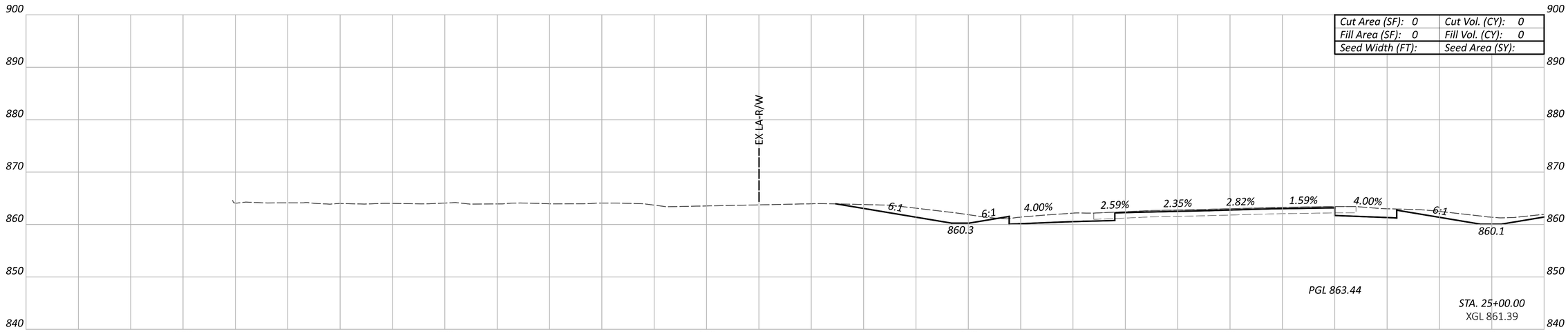
DESIGN AGENCY
STRUCTUREPOINT LLC

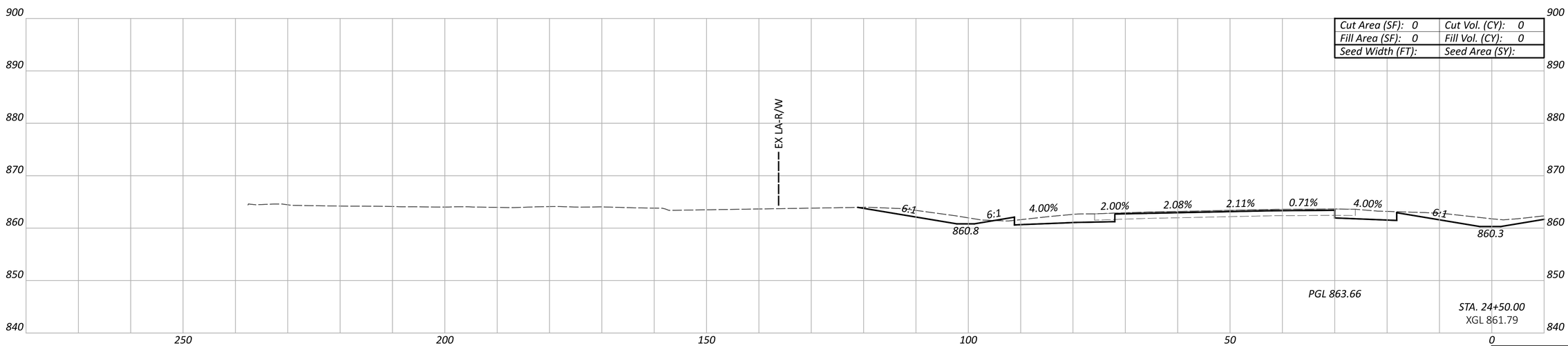
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.217 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 24+50.00 TO STA. 25+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 24+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:48 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT LLC

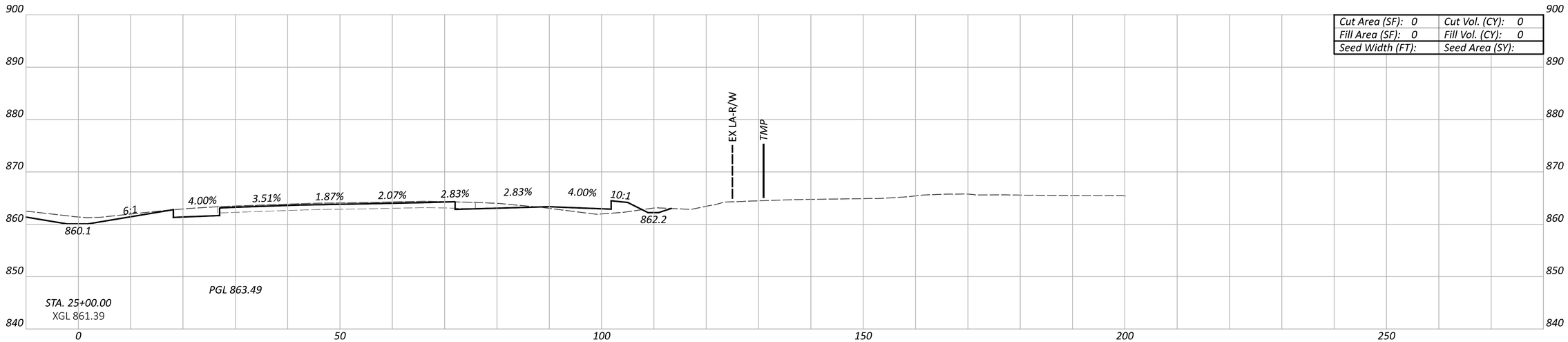
DESIGNER
BER

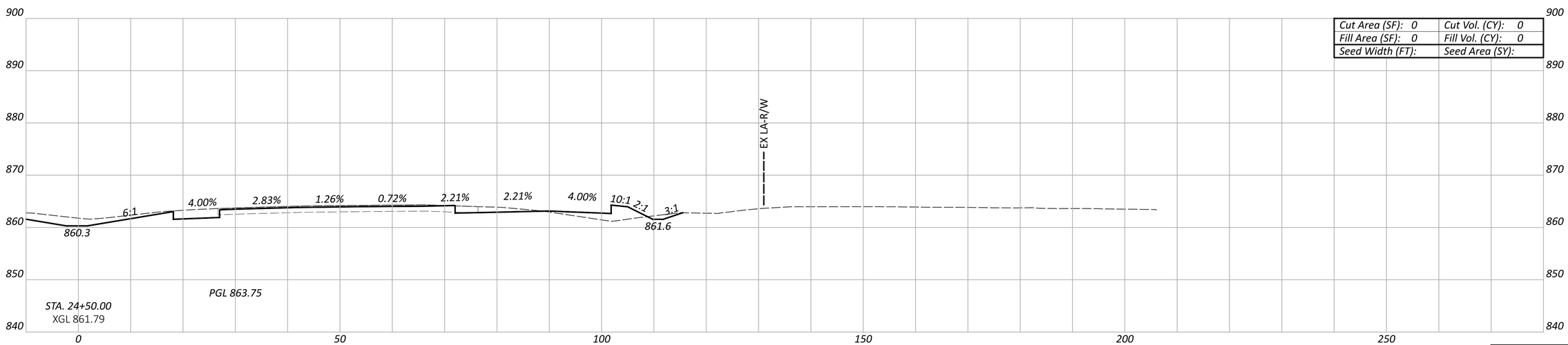
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.218	740





CROSS SECTIONS - IR 70 EB
STA. 24+50.00 TO STA. 25+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 24+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:51 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

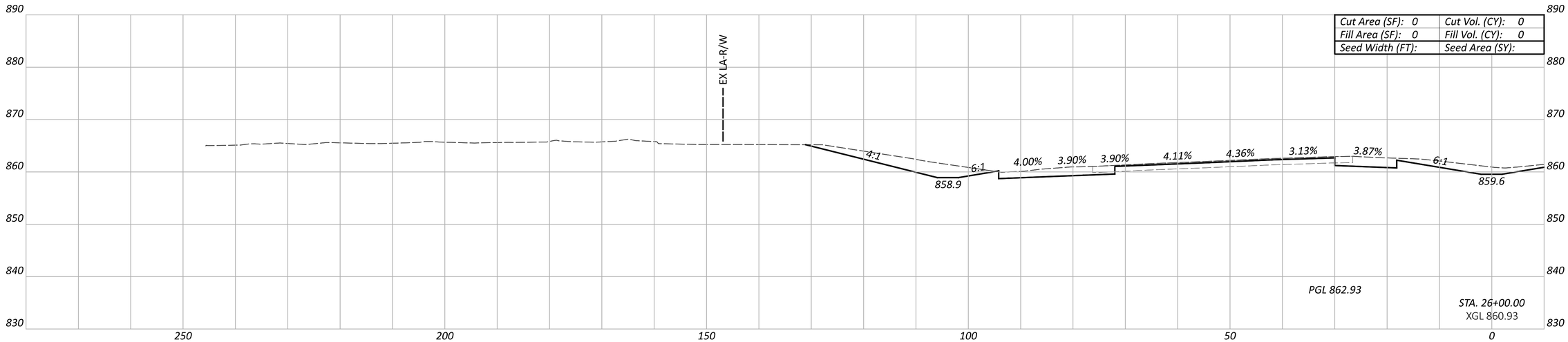
DESIGN AGENCY
STRUCTUREPOINT LLC

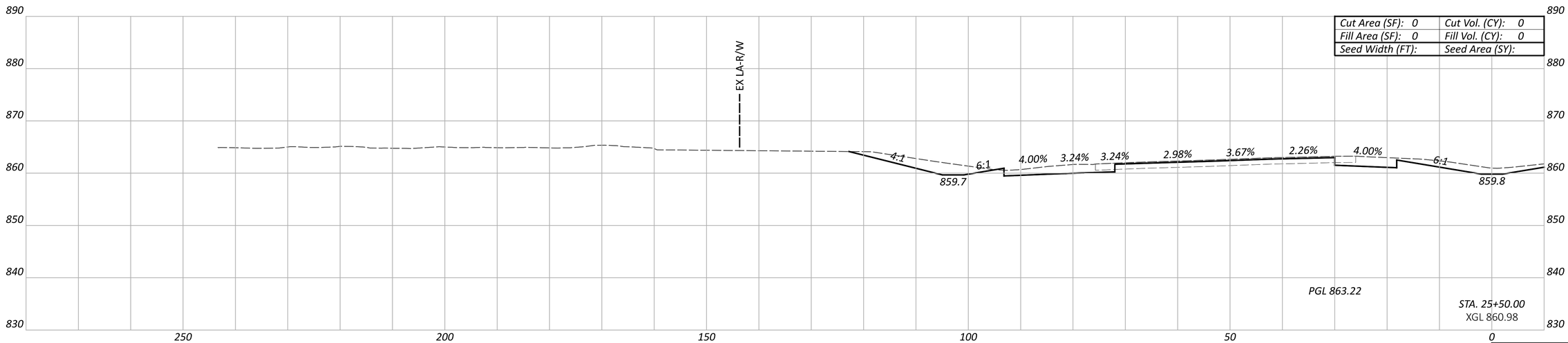
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.219 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 25+50.00 TO STA. 26+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.220
TOTAL	740

FAI/LIC IR 70 0.00/0.00

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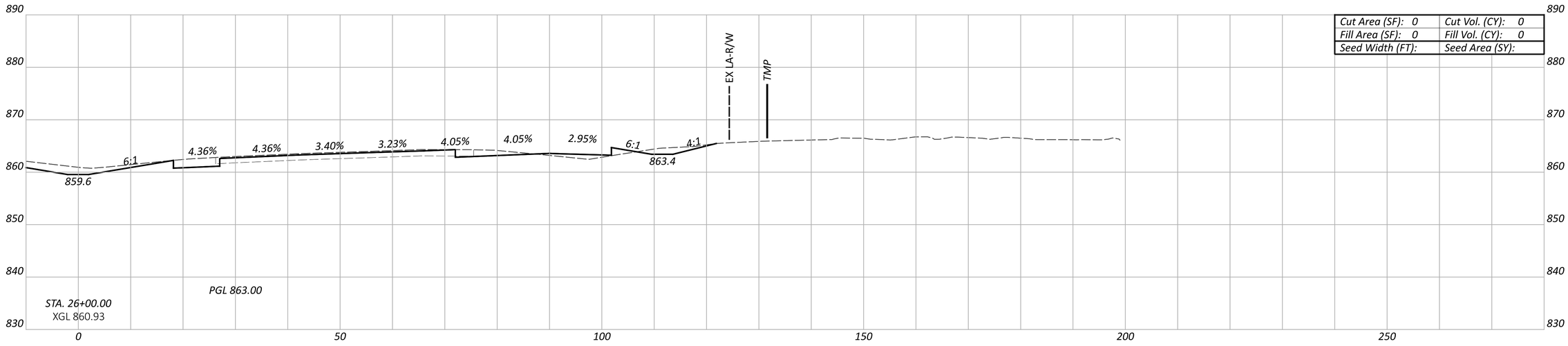

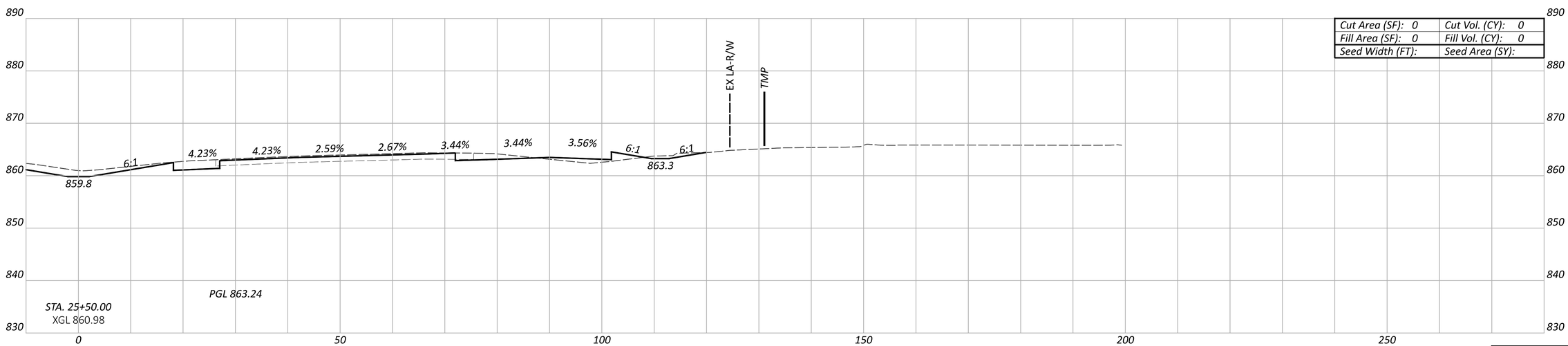

CROSS SECTIONS - IR 70 EB
STA. 25+50.00 TO STA. 26+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.221	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 25+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:14:56 PM USER: aoldaker
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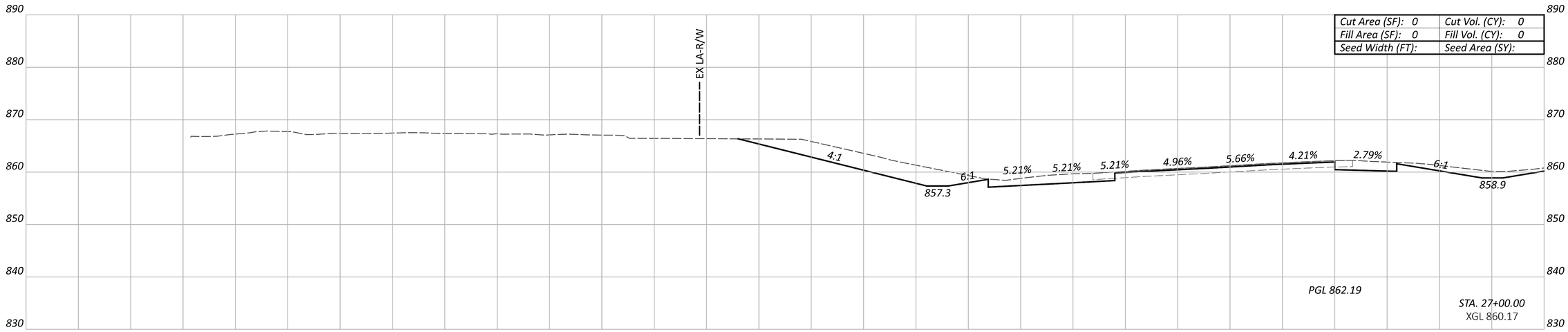

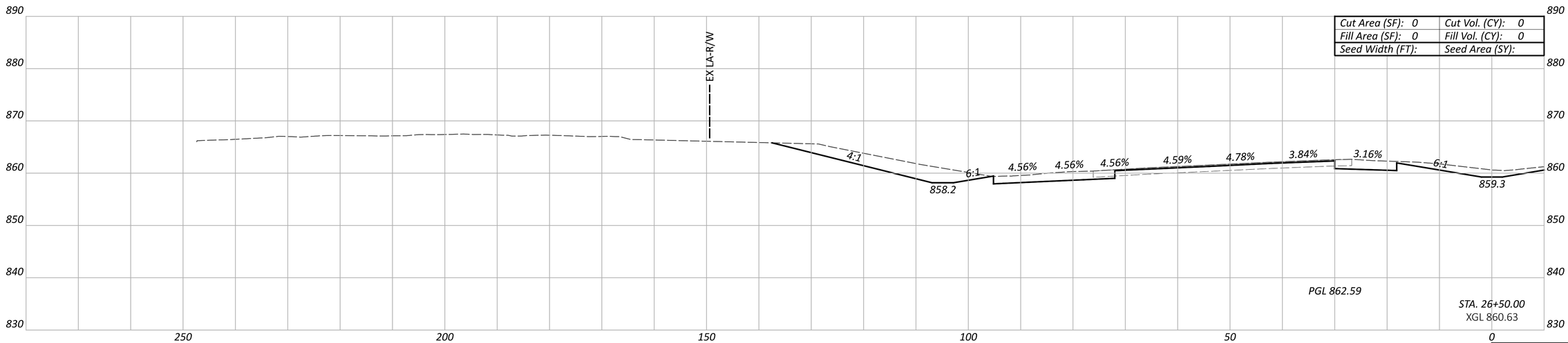

CROSS SECTIONS - IR 70 WB
STA. 26+50.00 TO STA. 27+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.222
TOTAL	740

Sheet Totals

Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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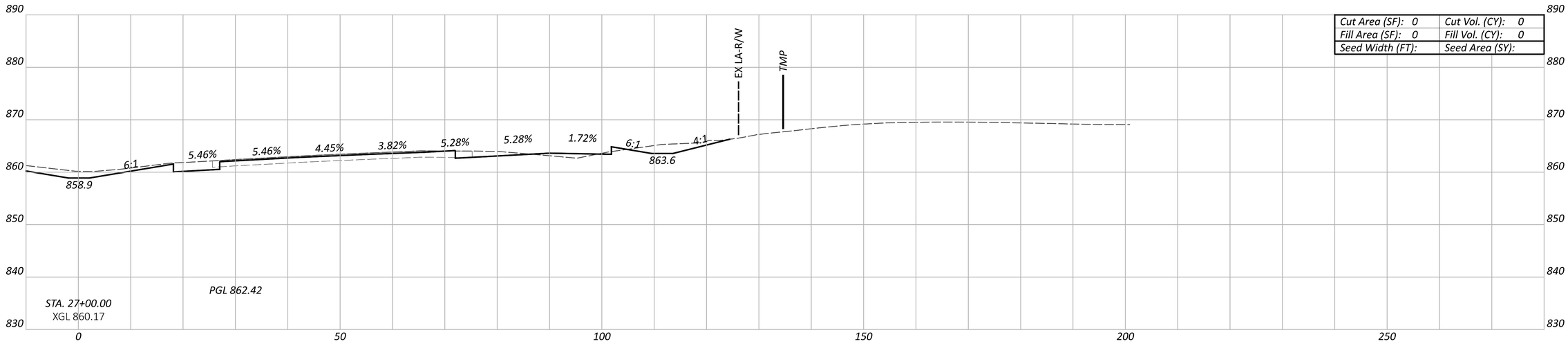

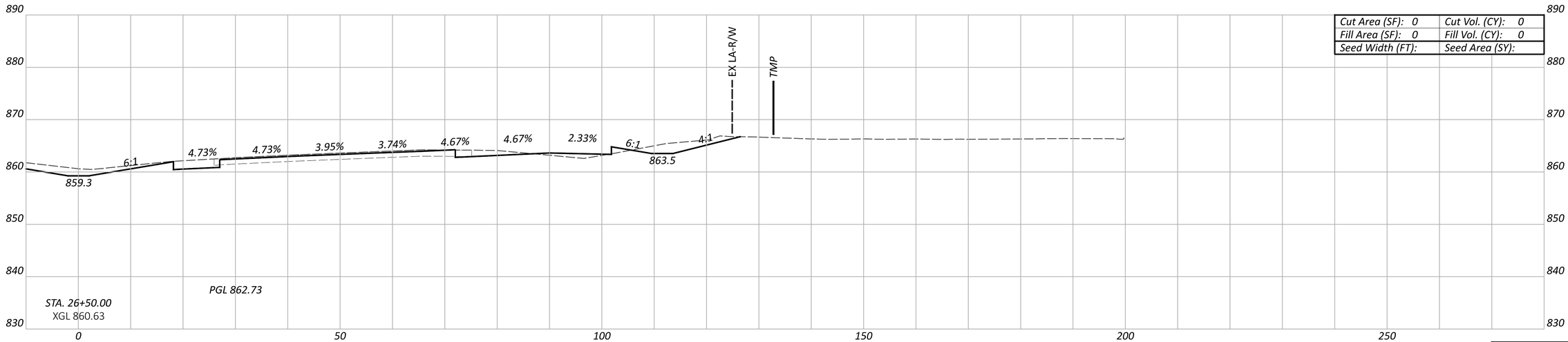

CROSS SECTIONS - IR 70 EB
STA. 26+50.00 TO STA. 27+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 26+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:01 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

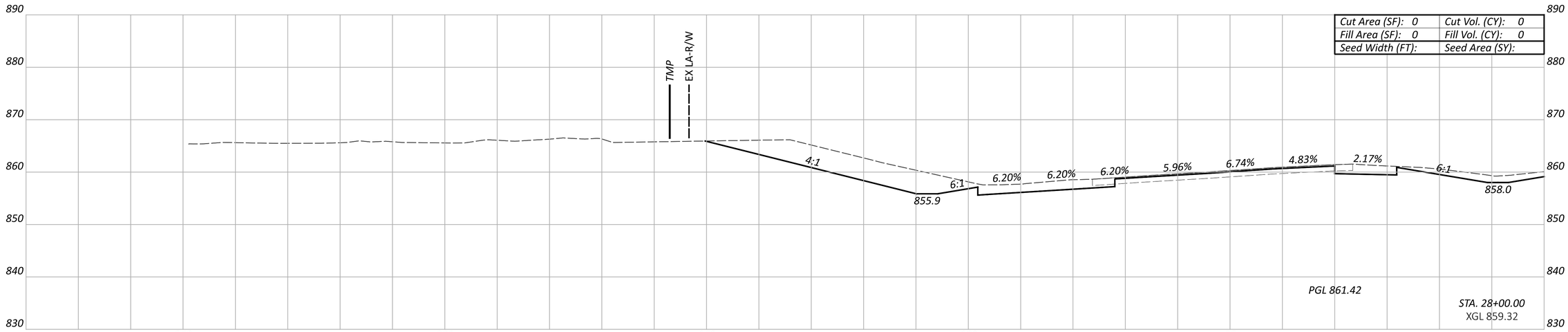
DESIGN AGENCY
STRUCTUREPOINT INC.

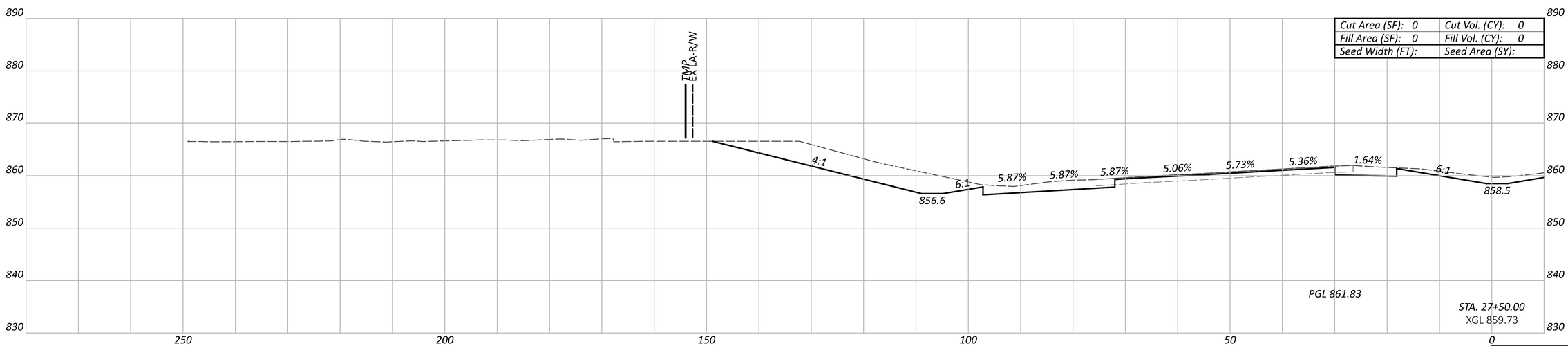
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.223 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 27+50.00 TO STA. 28+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 27+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:03 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

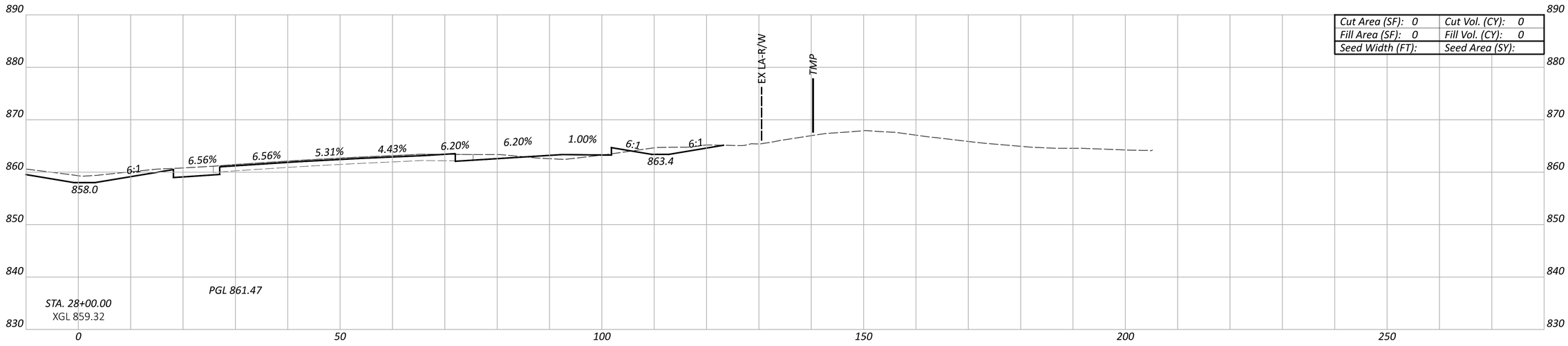
DESIGN AGENCY
STRUCTUREPOINT LLC

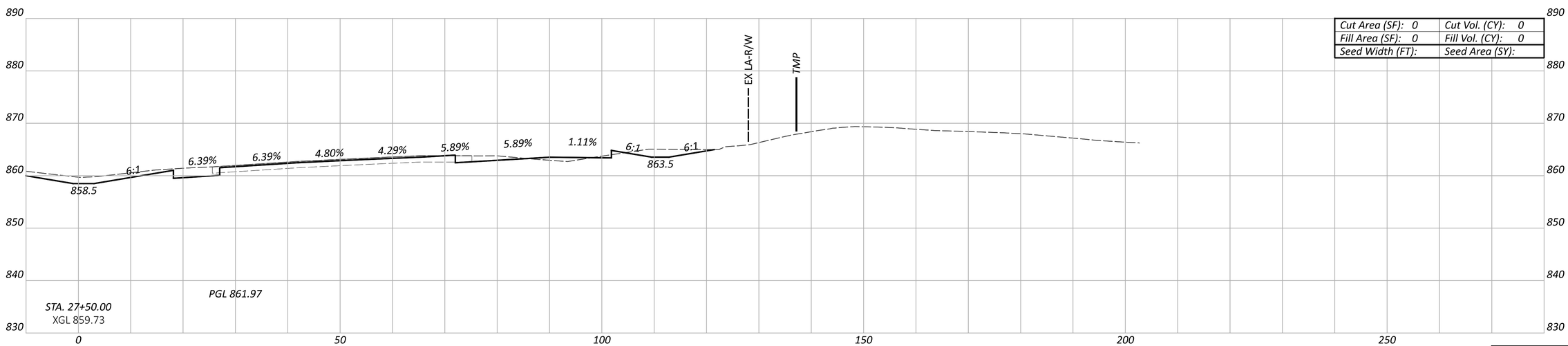
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.224 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 27+50.00 TO STA. 28+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.225 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 27+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:06 PM USER: aoldaker
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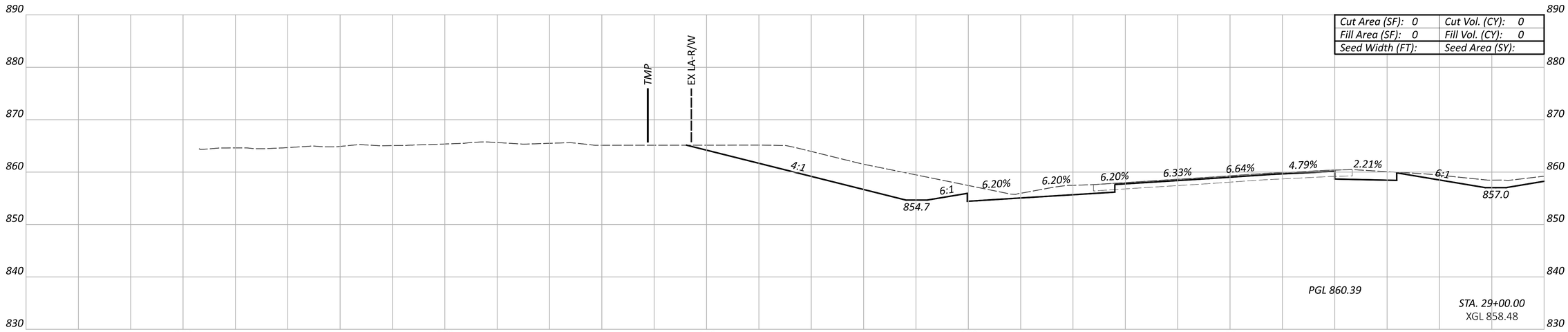

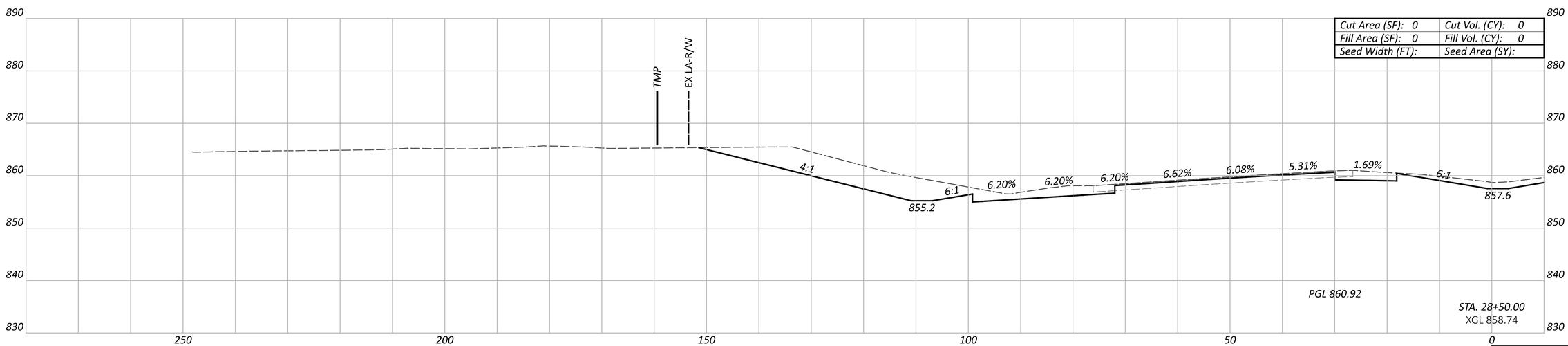

CROSS SECTIONS - IR 70 WB
STA. 28+50.00 TO STA. 29+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 28+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:08 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

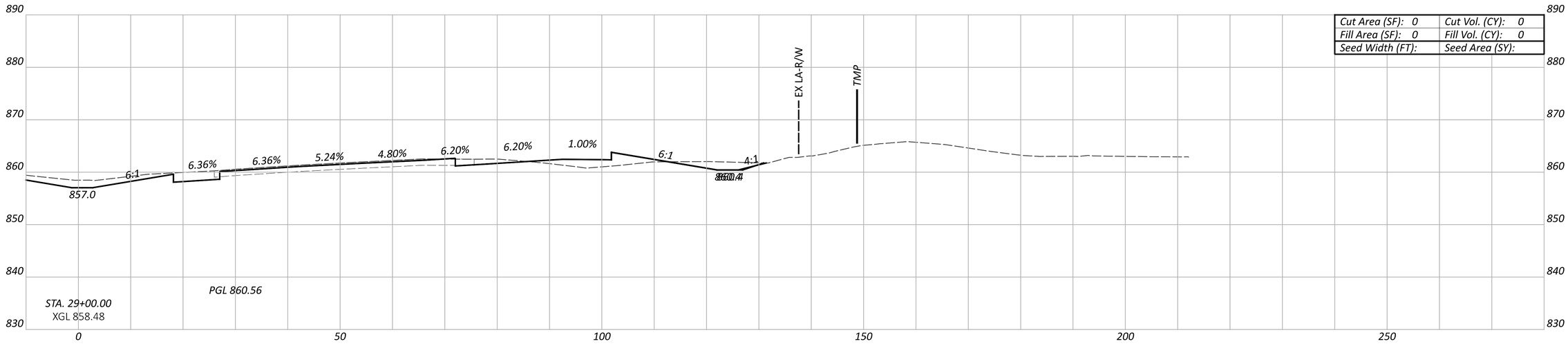
DESIGN AGENCY
STRUCTUREPOINT LLC

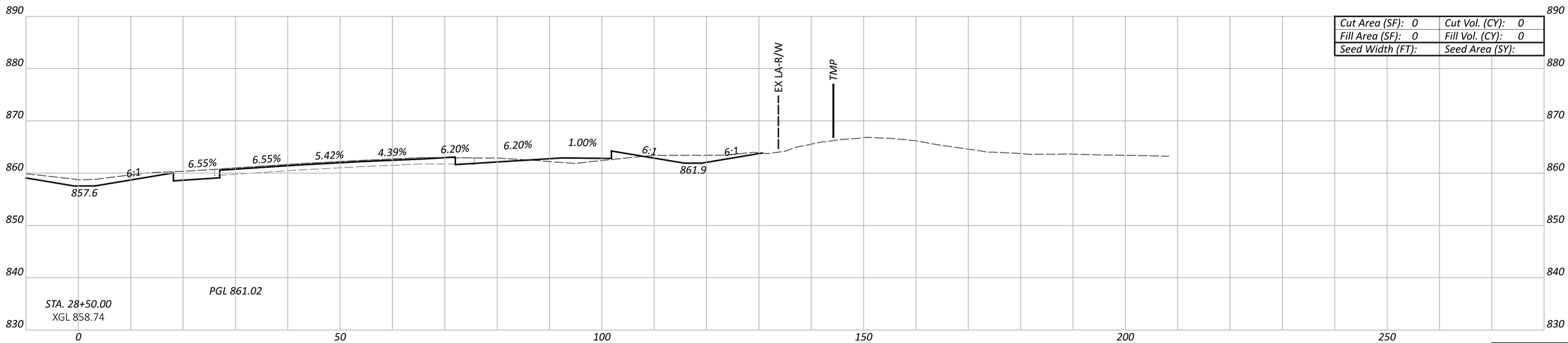
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.226 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 28+50.00 TO STA. 29+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 28+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:10 PM USER: aoldaker
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DESIGN AGENCY: STRUCTUREPOINT INC.

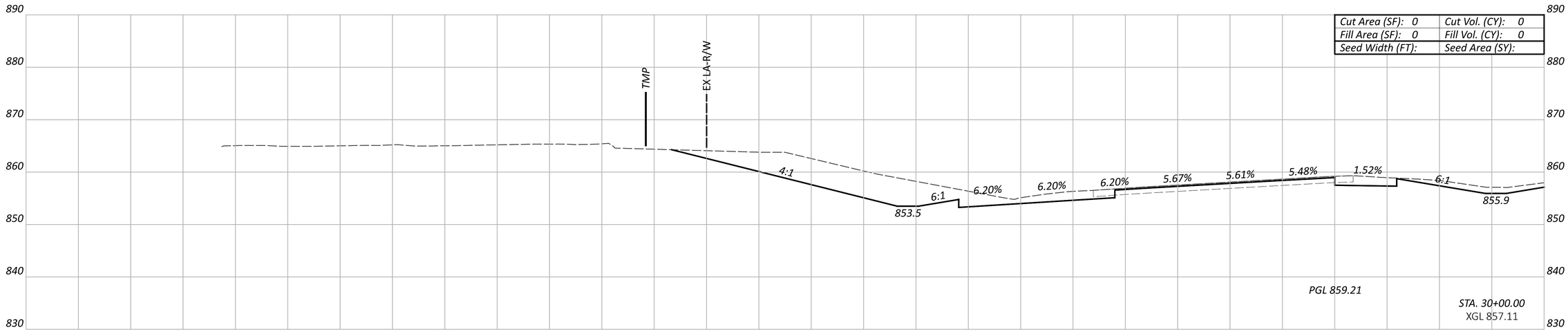
DESIGNER: BER

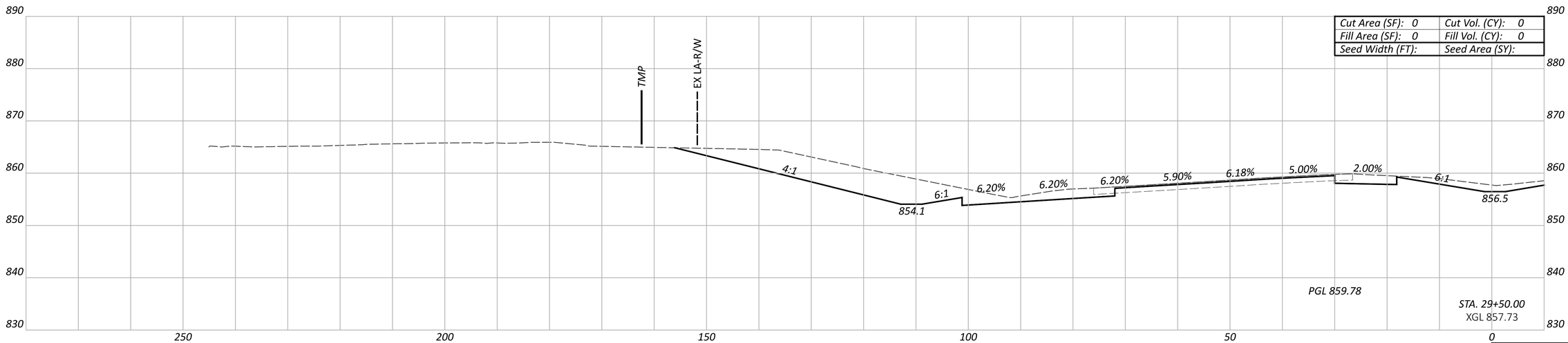
REVIEWER: KAM 06/18/23

PROJECT ID: 96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.227	740





CROSS SECTIONS - IR 70 WB
STA. 29+50.00 TO STA. 30+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 29+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:12 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

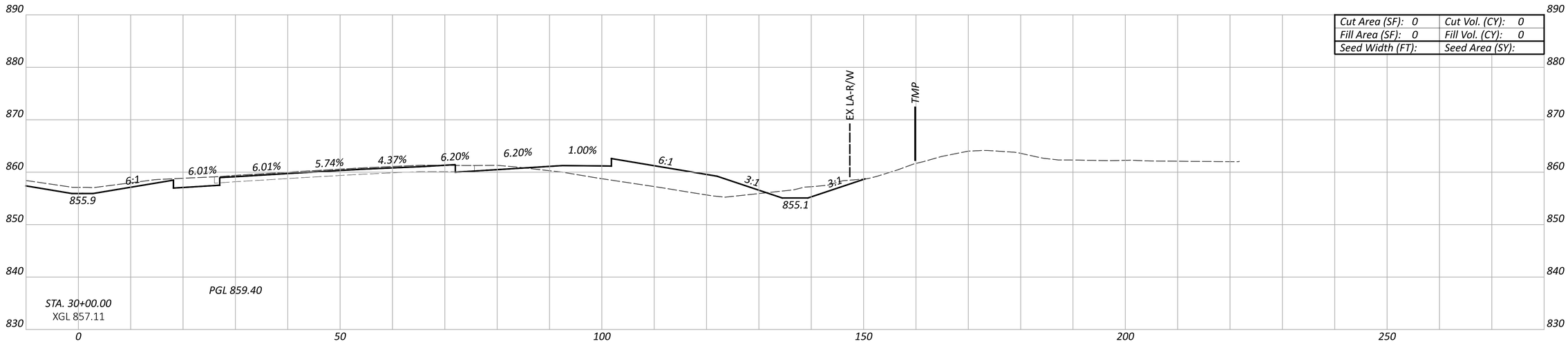
DESIGN AGENCY
STRUCTUREPOINT LLC

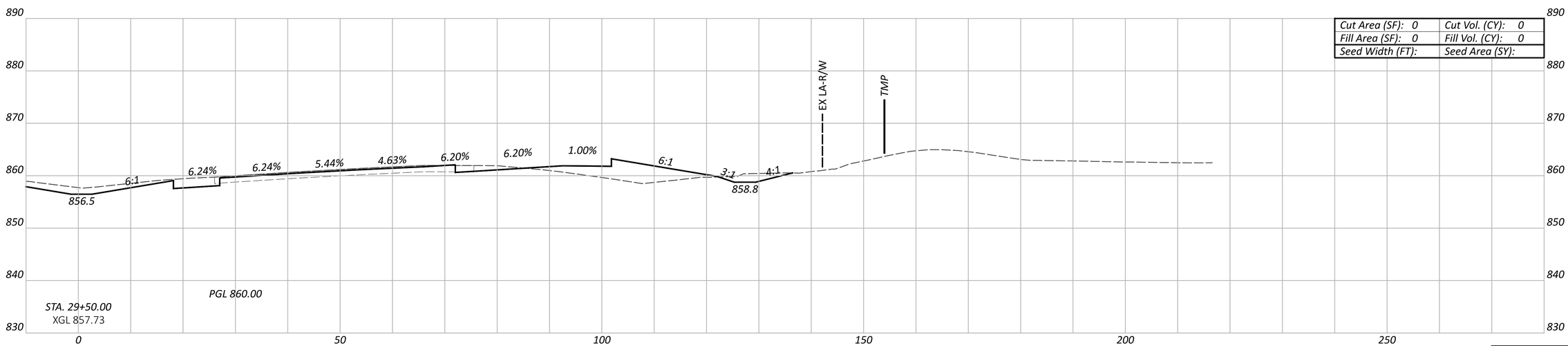
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.228 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 29+50.00 TO STA. 30+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 29+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:15 PM USER: aoldaker
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DESIGN AGENCY: STRUCTUREPOINT INC.

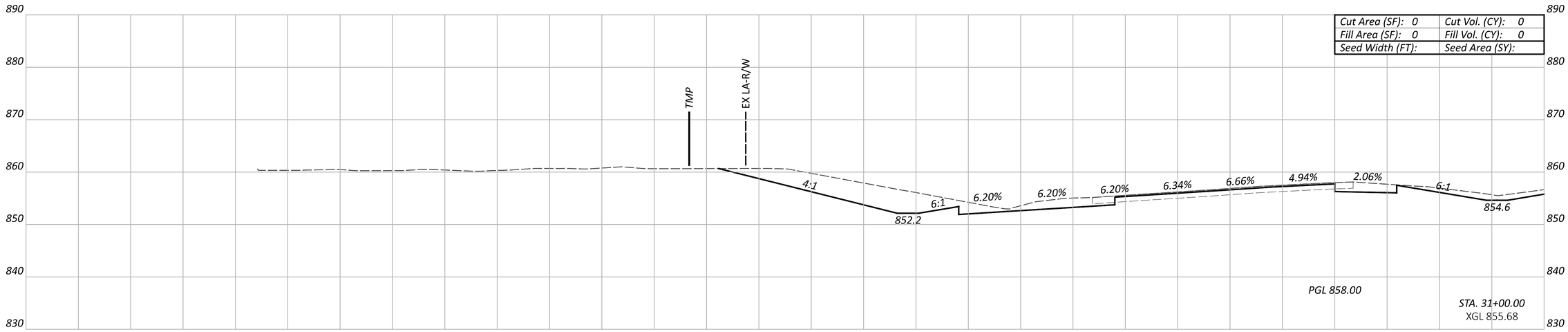
DESIGNER: BER

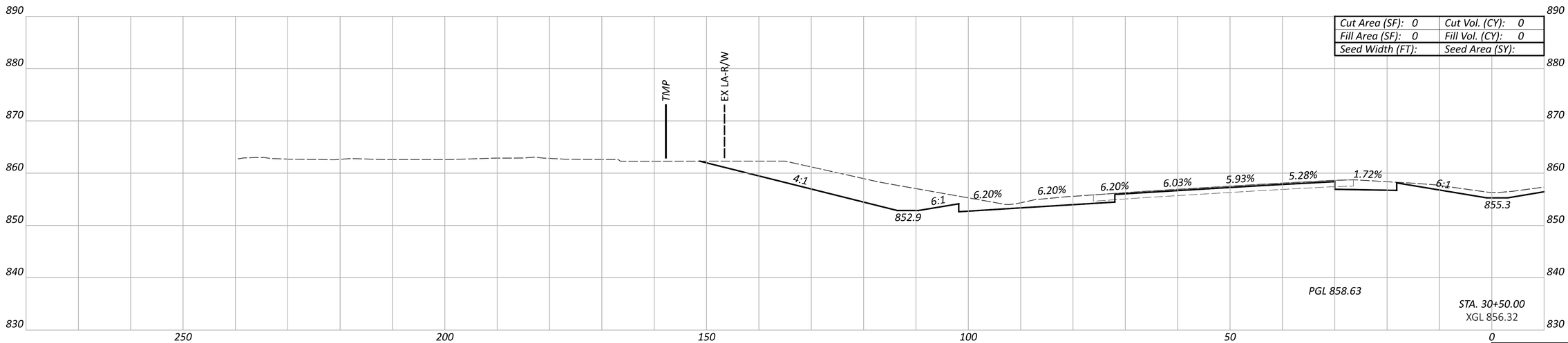
REVIEWER: KAM 06/18/23

PROJECT ID: 96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.229	740





CROSS SECTIONS - IR 70 WB
STA. 30+50.00 TO STA. 31+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 30+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:28 PM USER: aoldaker
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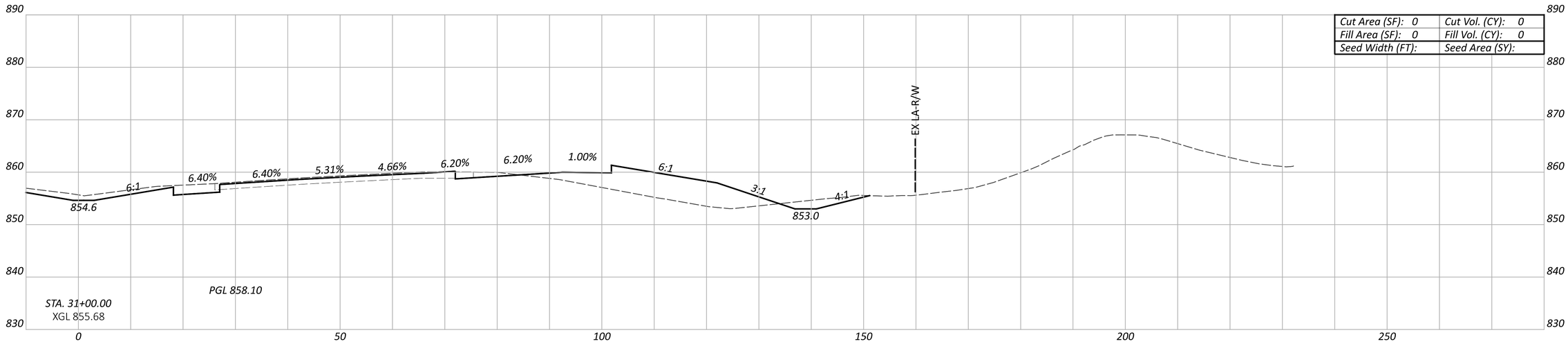
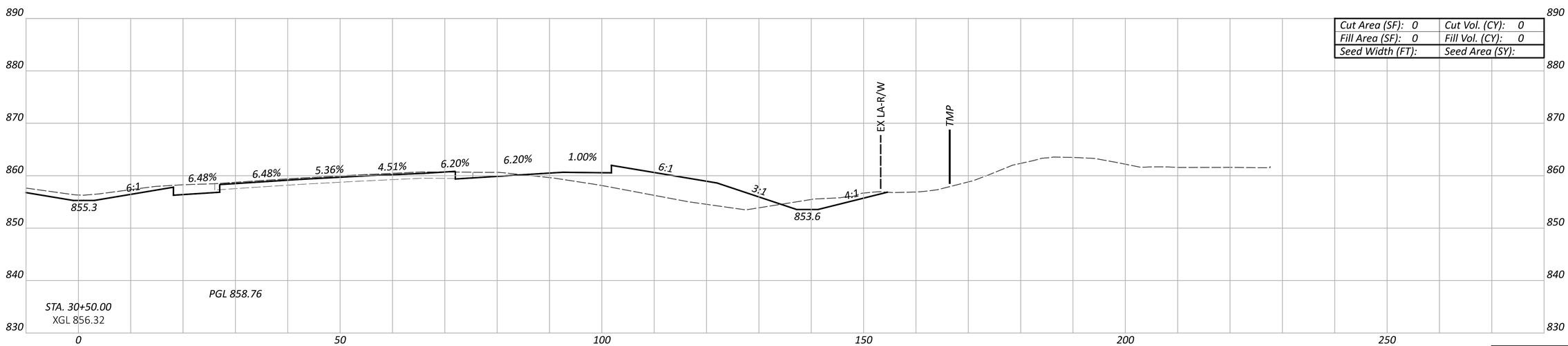
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.230
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 30+50.00 TO STA. 31+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.231 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 30+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:31 PM USER: aoldaker
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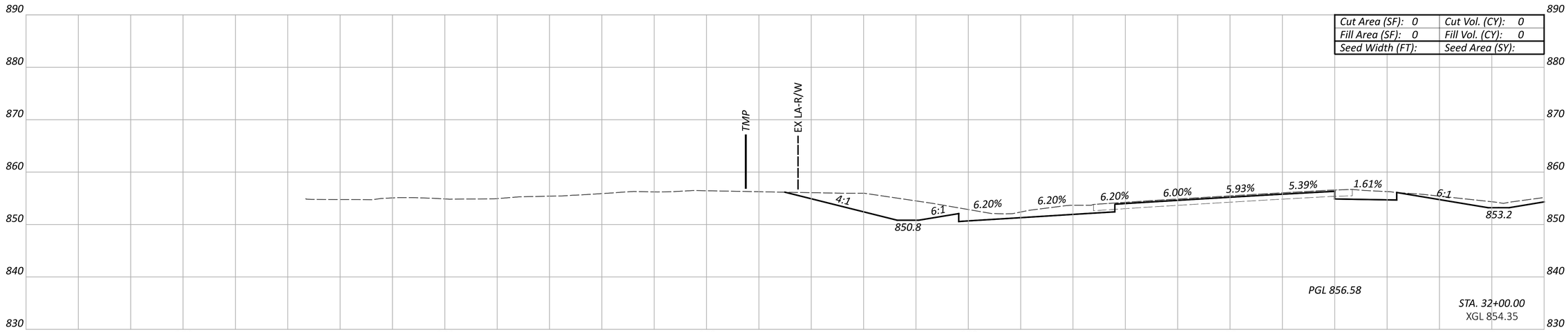

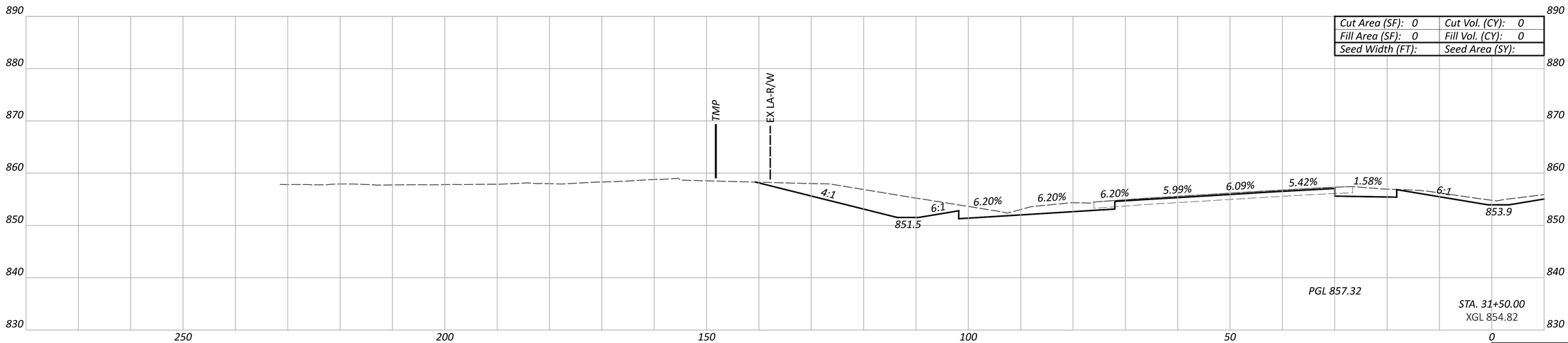

CROSS SECTIONS - IR 70 WB
STA. 31+50.00 TO STA. 32+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 31+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:34 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

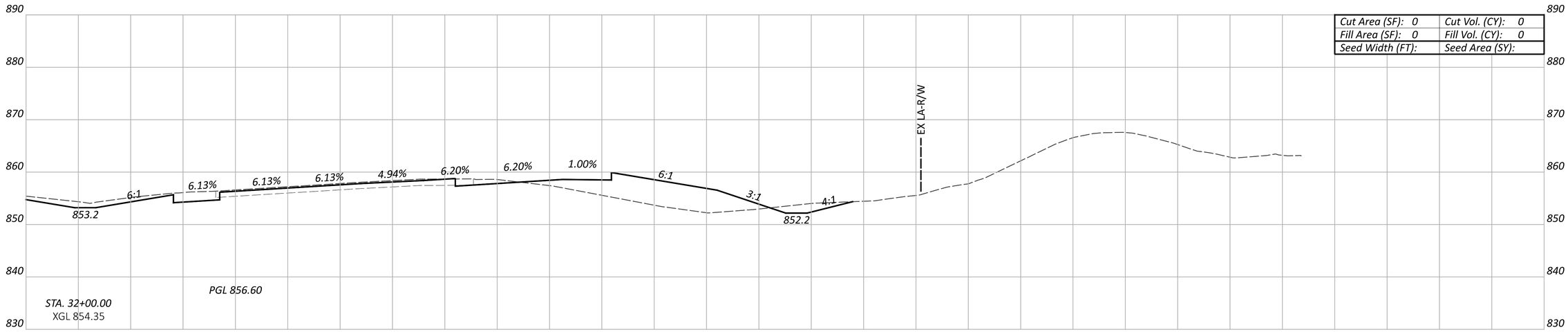
DESIGN AGENCY
STRUCTUREPOINT LLC

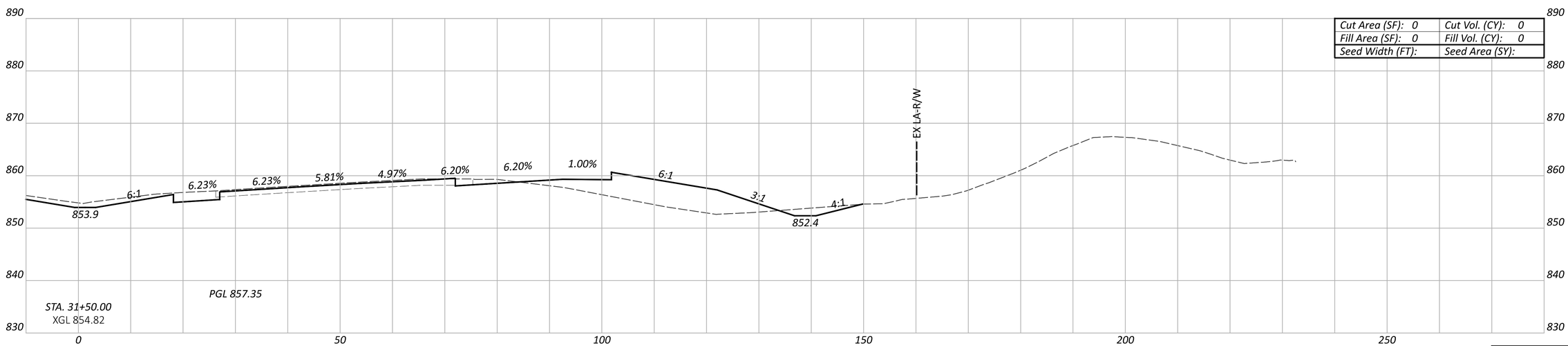
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.232 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 31+50.00 TO STA. 32+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.233 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 31+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:36 PM USER: aoldaker
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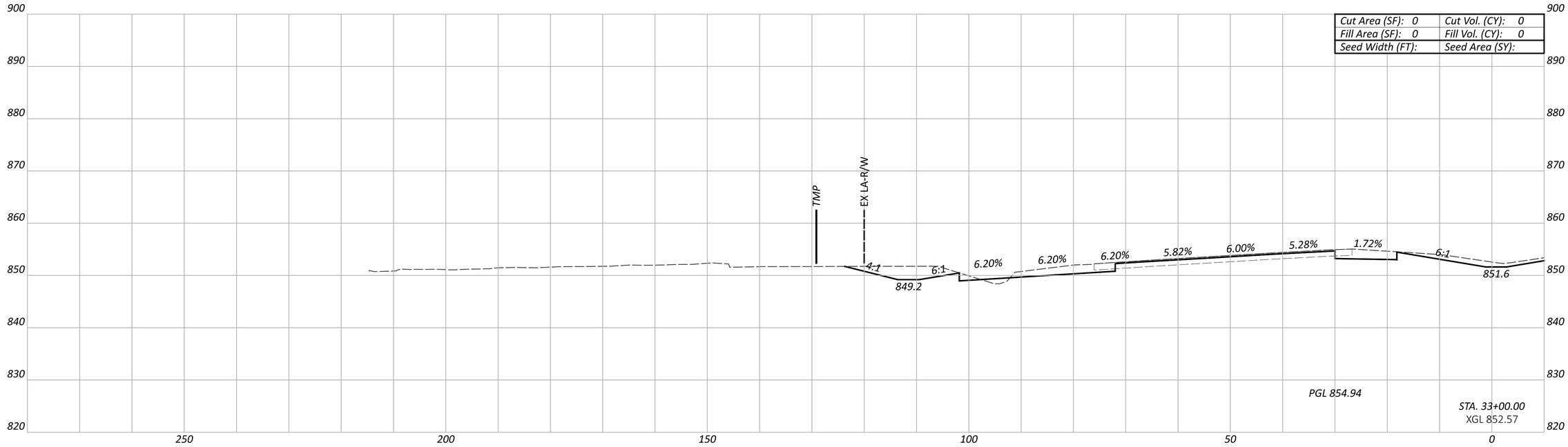
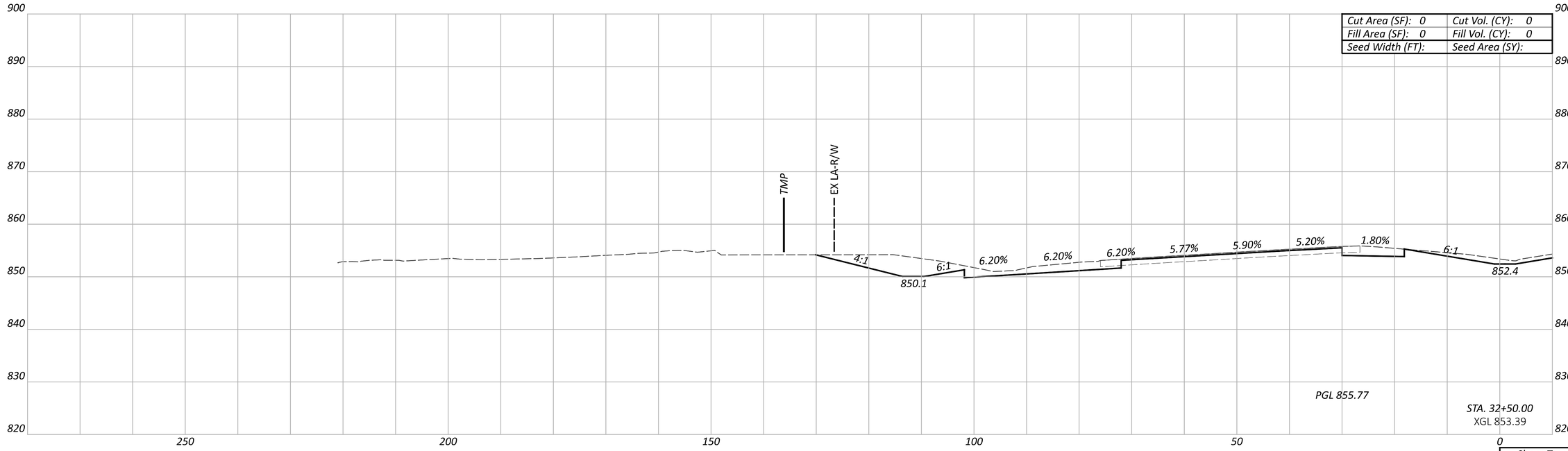




CROSS SECTIONS - IR 70 WB
STA. 32+50.00 TO STA. 33+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 32+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:38 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\d01-Engineering_StructurePoint\Roadway\Sheets\96808_XS103.dgn

Sheet Totals		
Seeding	Cut	Fill

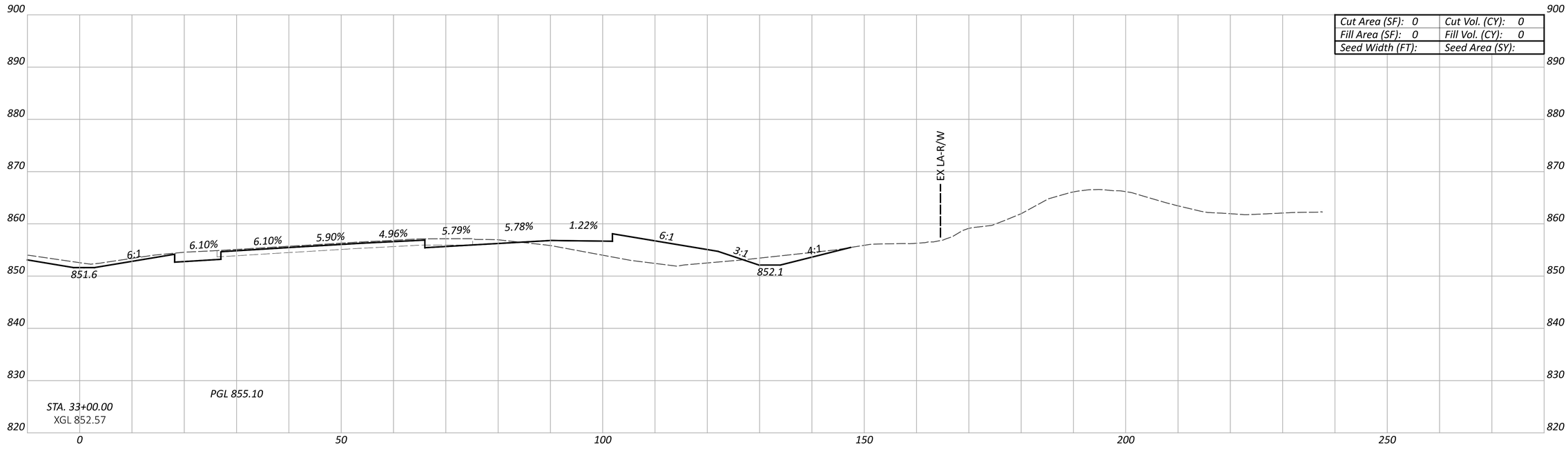
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.234 TOTAL 740



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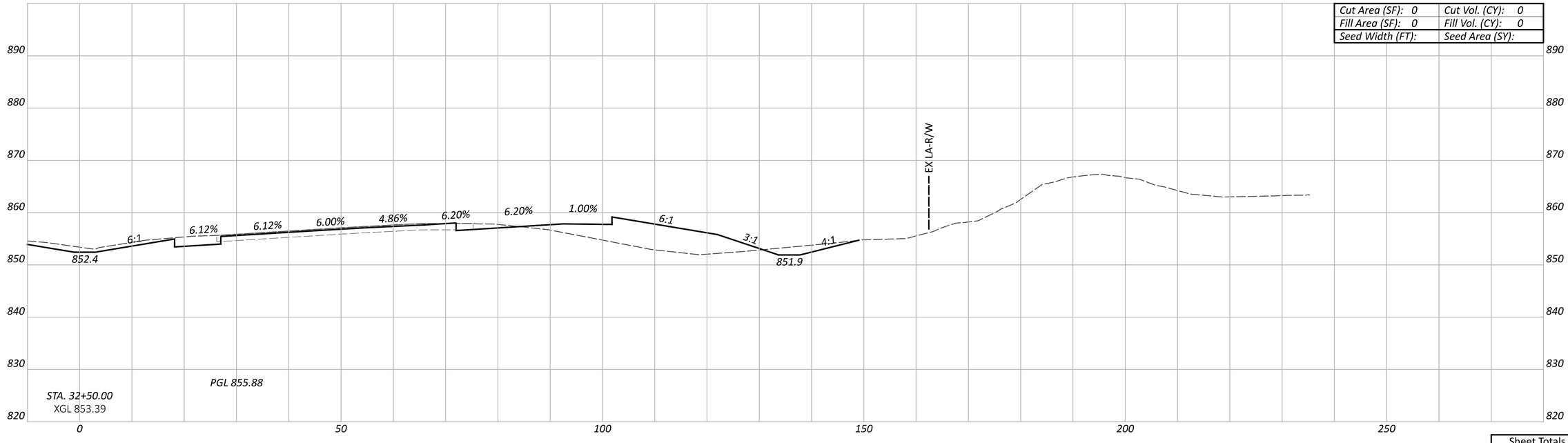
Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):



Cut Area (SF): 0	Cut Vol. (CY): 0
Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - IR 70 EB
STA. 32+50.00 TO STA. 33+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.235 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 32+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:41 PM USER: aoldaker
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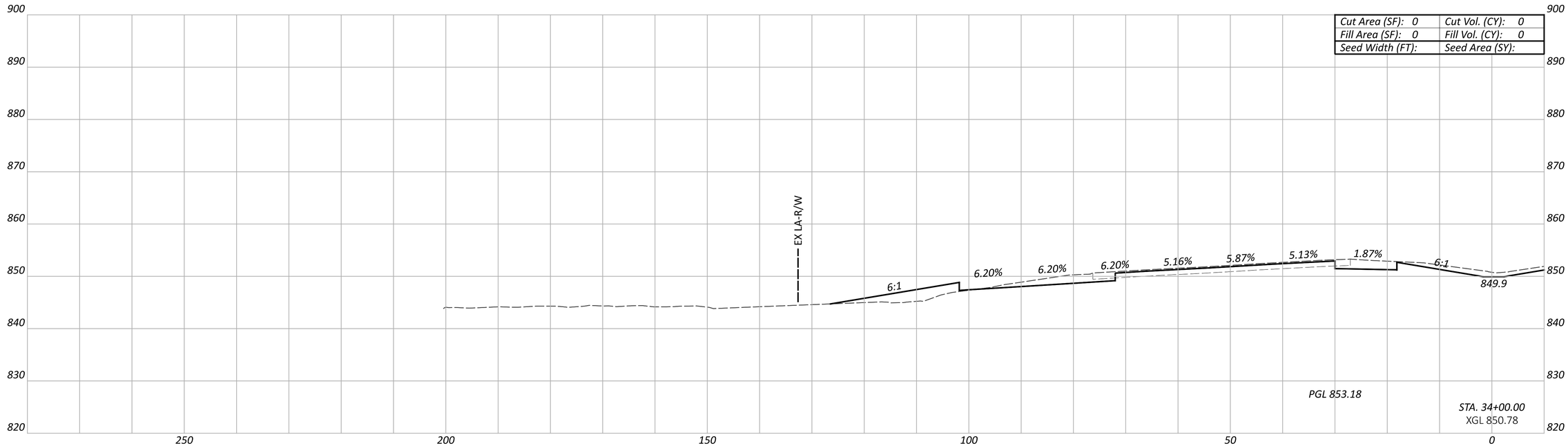

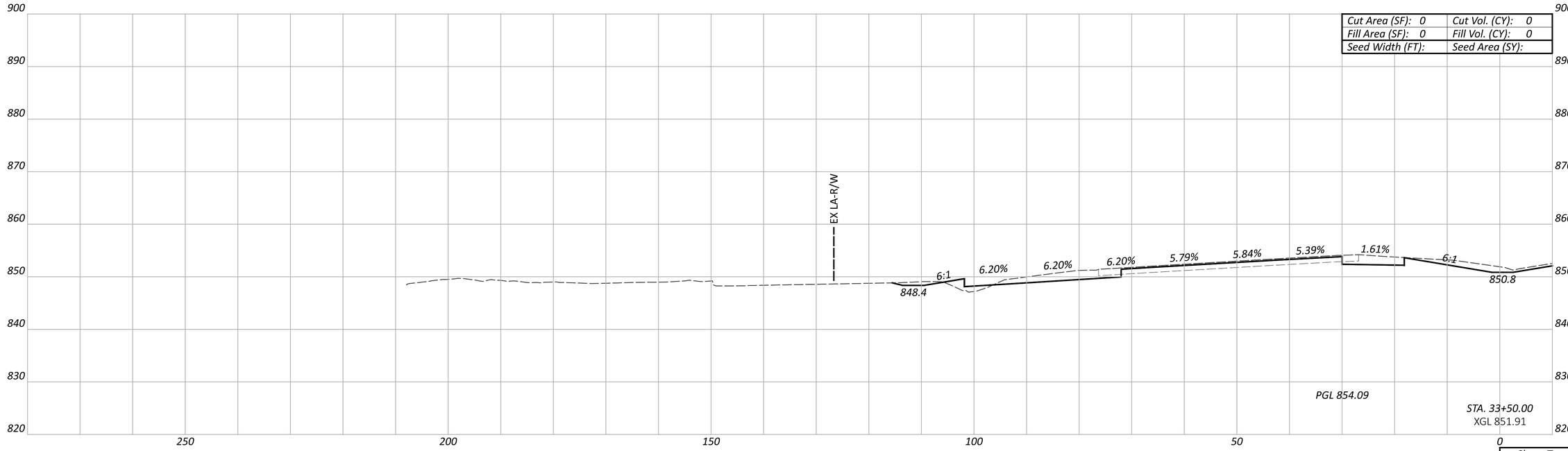

CROSS SECTIONS - IR 70 WB
STA. 33+50.00 TO STA. 34+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.236 TOTAL 740

Sheet Totals

Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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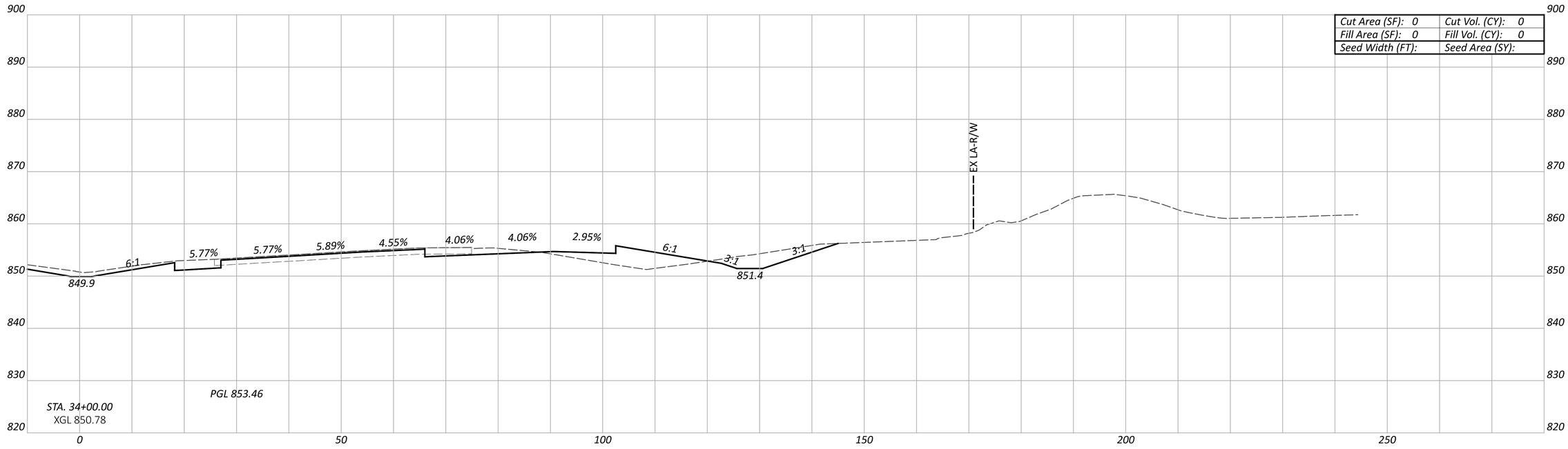

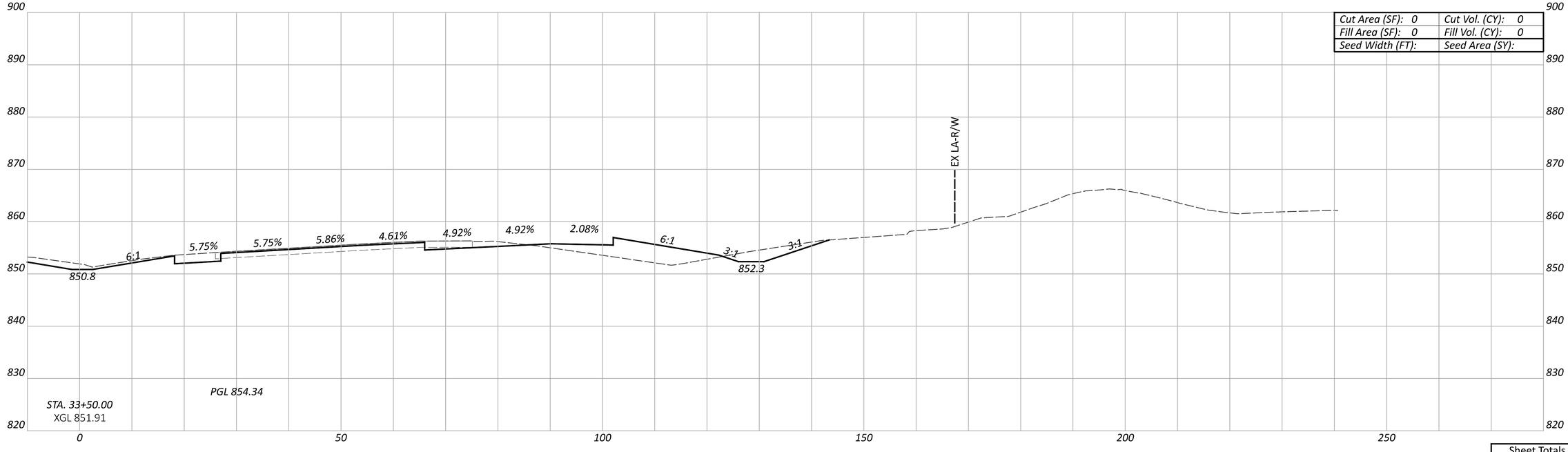

CROSS SECTIONS - IR 70 EB
STA. 33+50.00 TO STA. 34+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.237 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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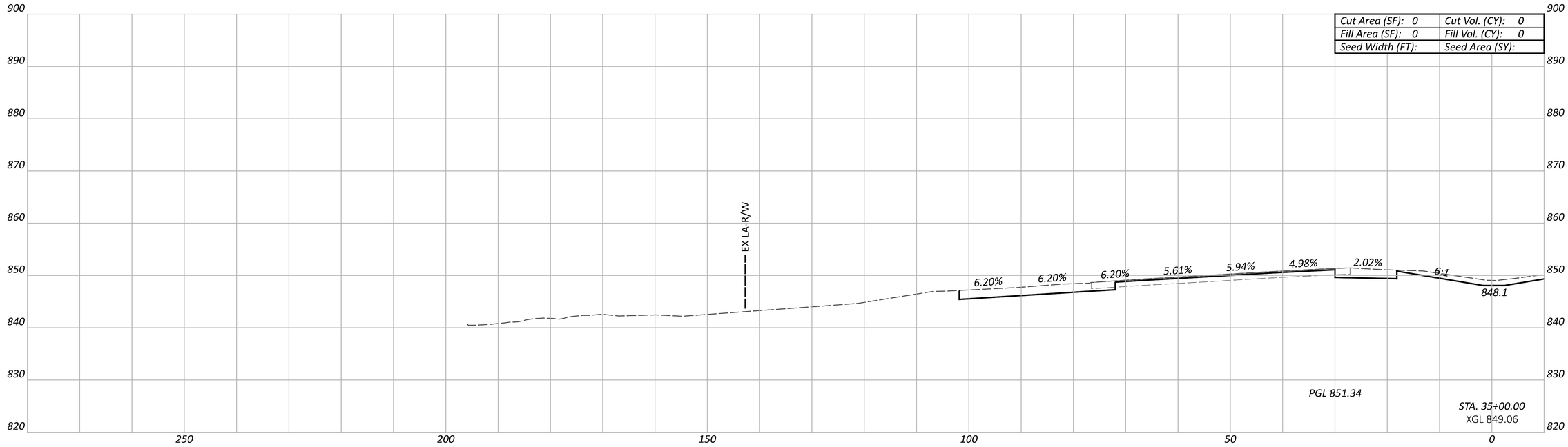

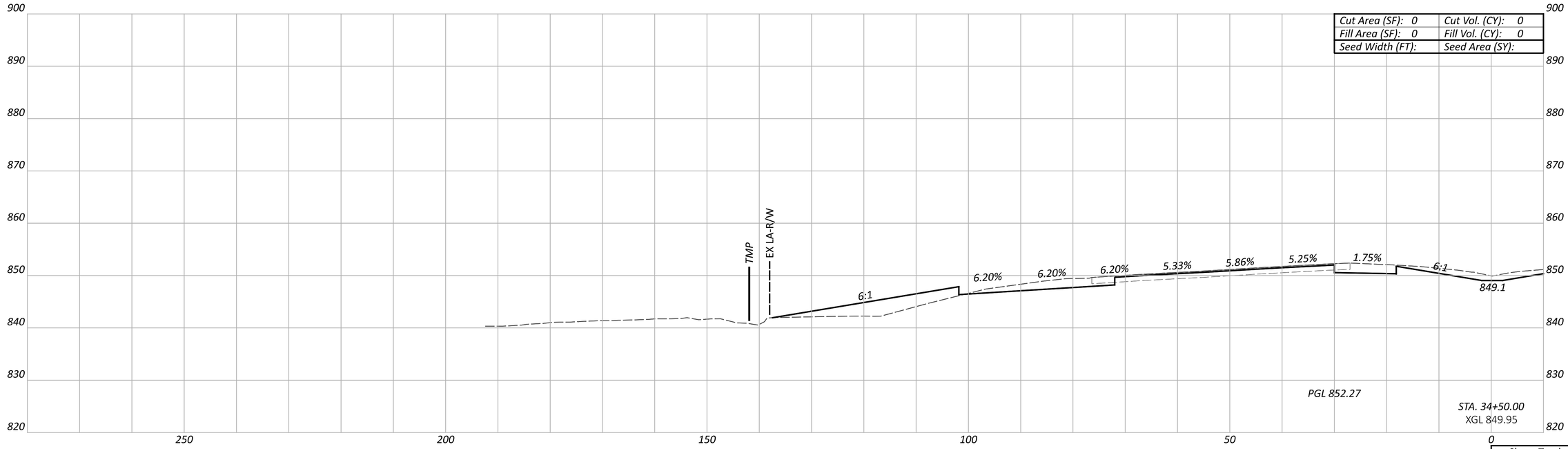

CROSS SECTIONS - IR 70 WB
STA. 34+50.00 TO STA. 35+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

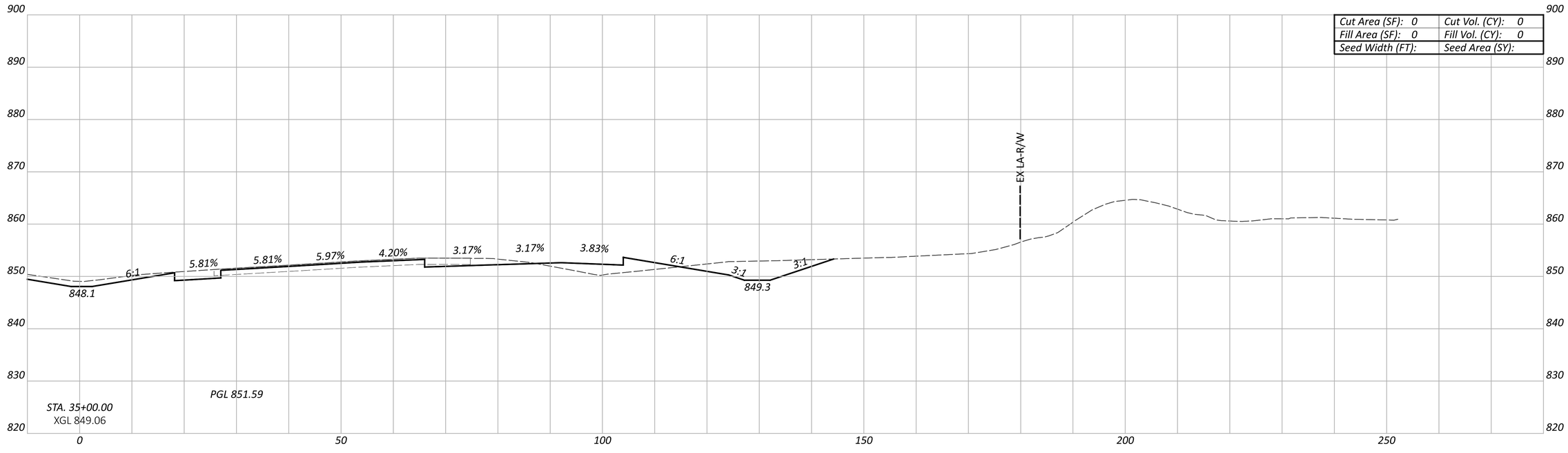
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

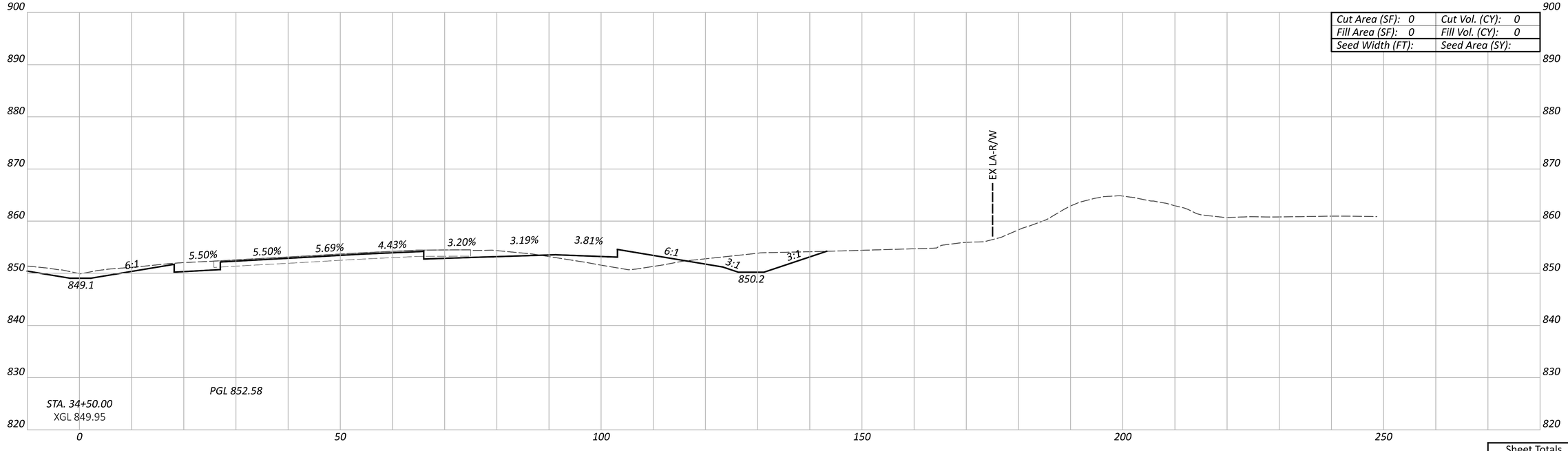
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.238 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 34+50.00 TO STA. 35+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.239 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 34+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:52 PM USER: aoldaker
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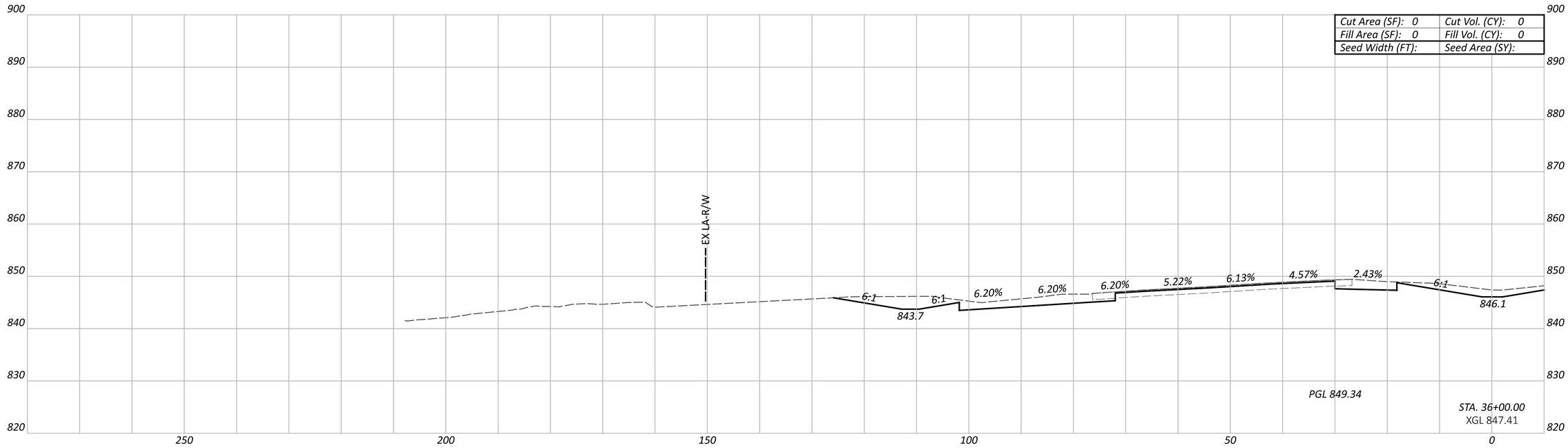

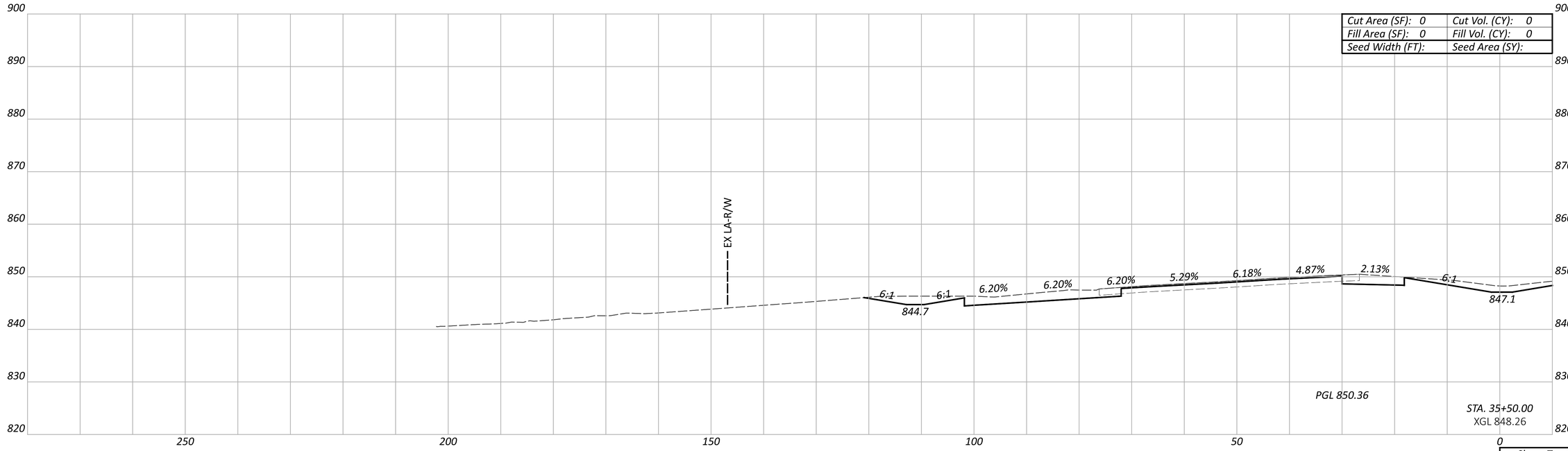

CROSS SECTIONS - IR 70 WB
STA. 35+50.00 TO STA. 36+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 35+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:15:55 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

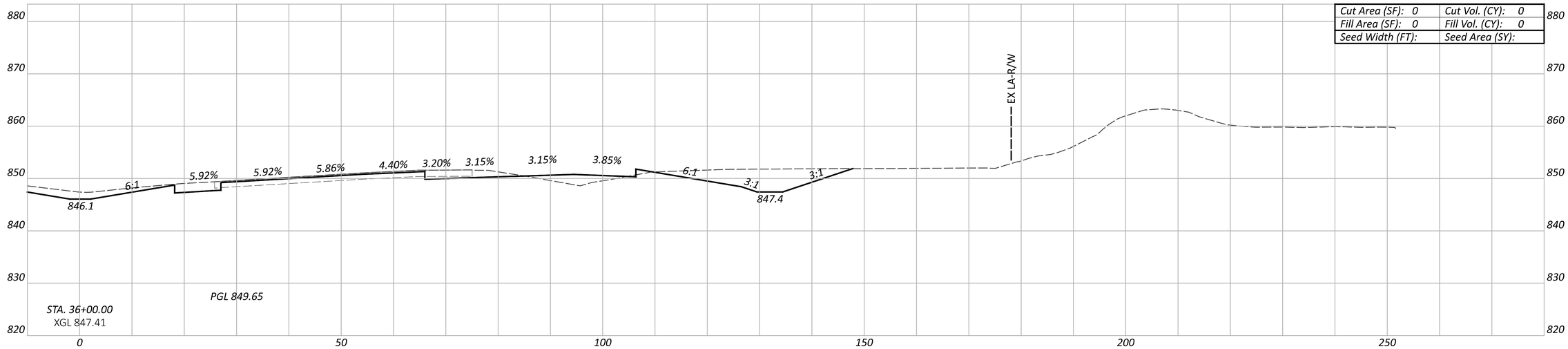
DESIGN AGENCY
STRUCTUREPOINT INC.

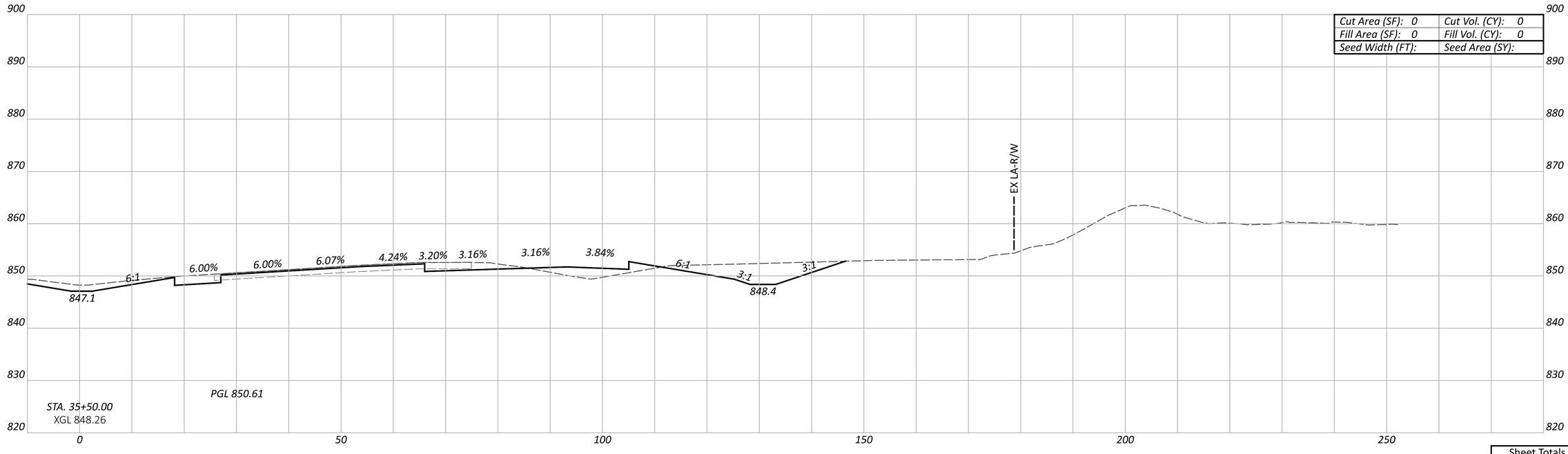
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.240 TOTAL 740





FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 EB
STA. 35+50.00 TO STA. 36+00.00

Sheet Totals		
Seeding	Cut	Fill

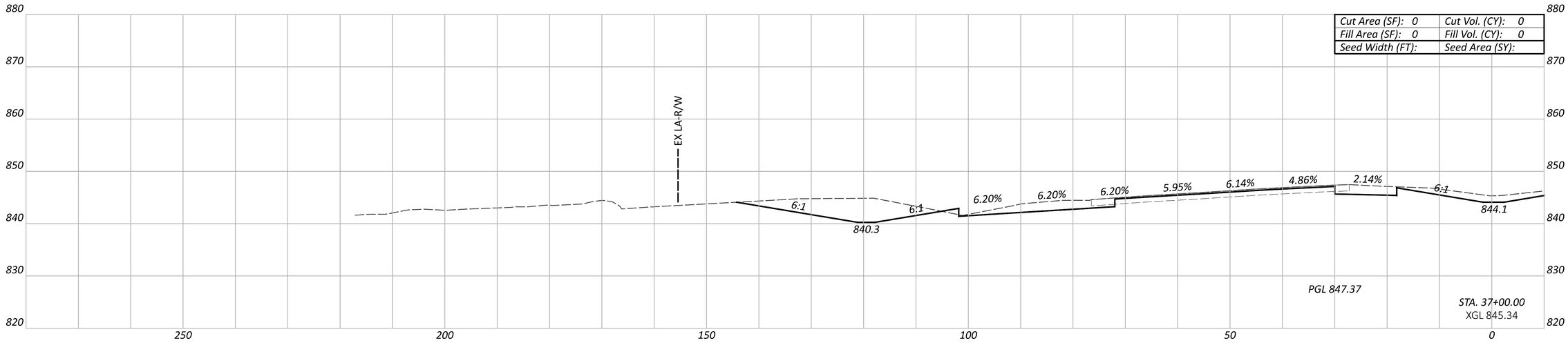
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

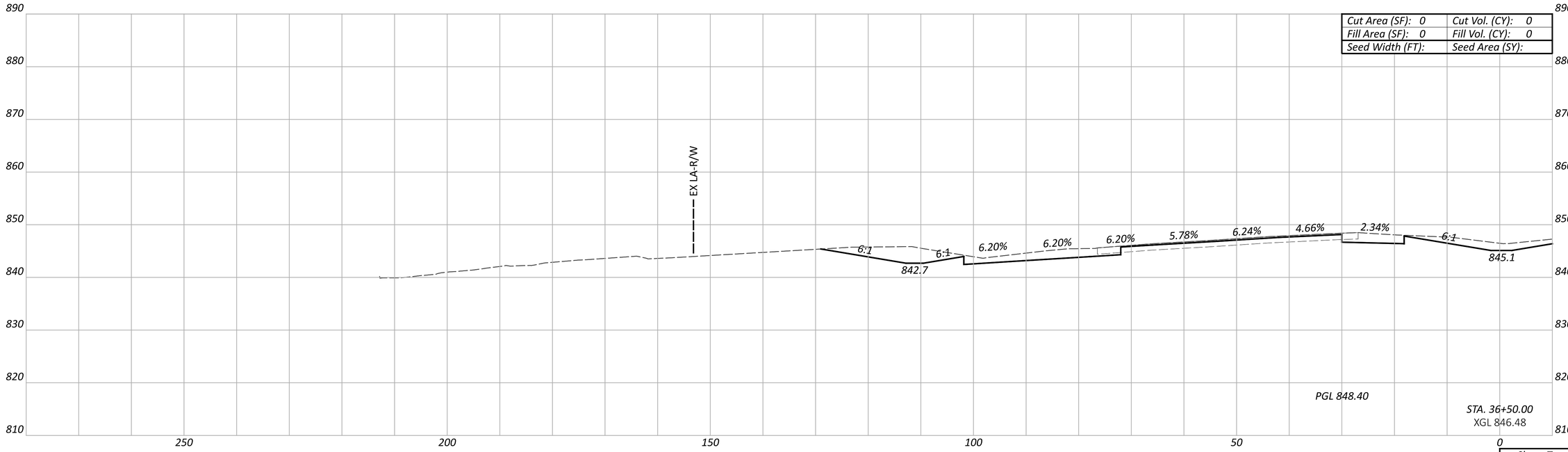
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.241 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 36+50.00 TO STA. 37+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 36+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:00 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

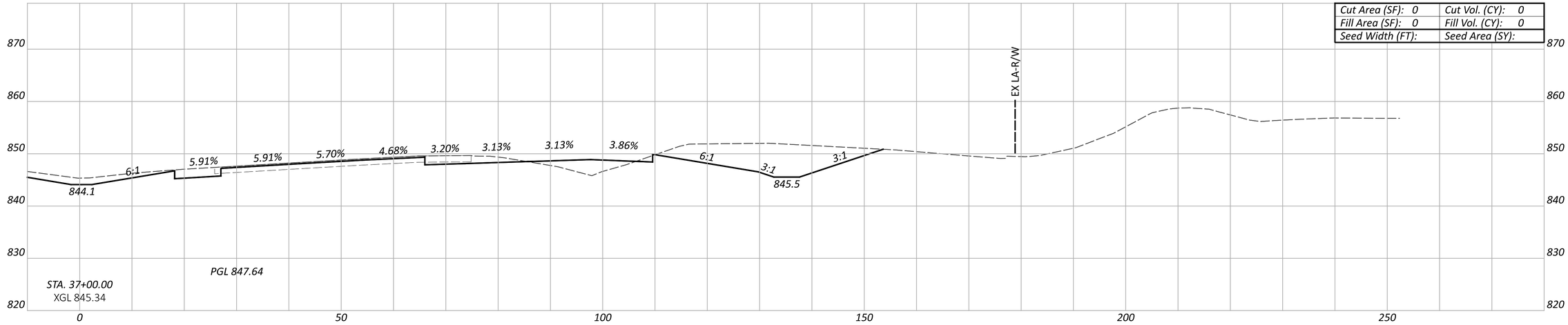
REVIEWER
KAM 06/18/23

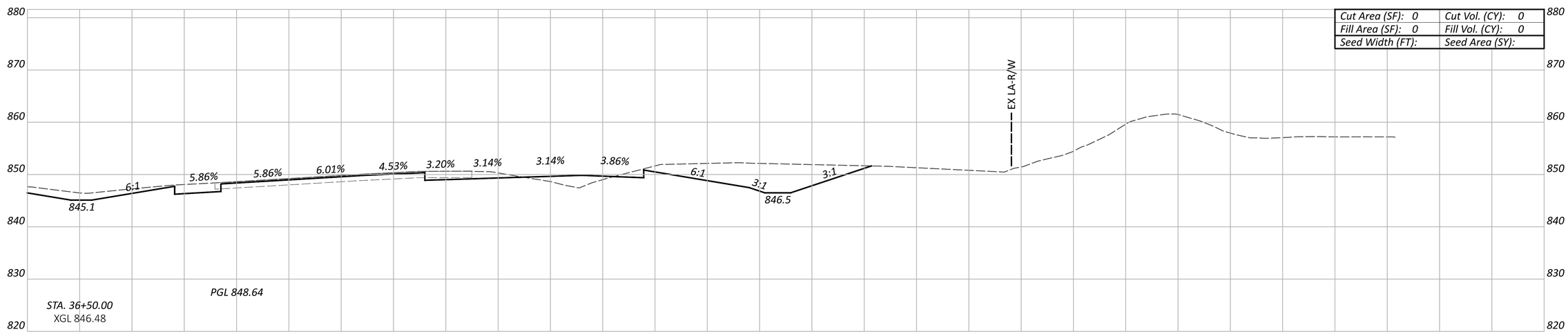
PROJECT ID
96808

SHEET P.242 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 EB
STA. 36+50.00 TO STA. 37+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.243 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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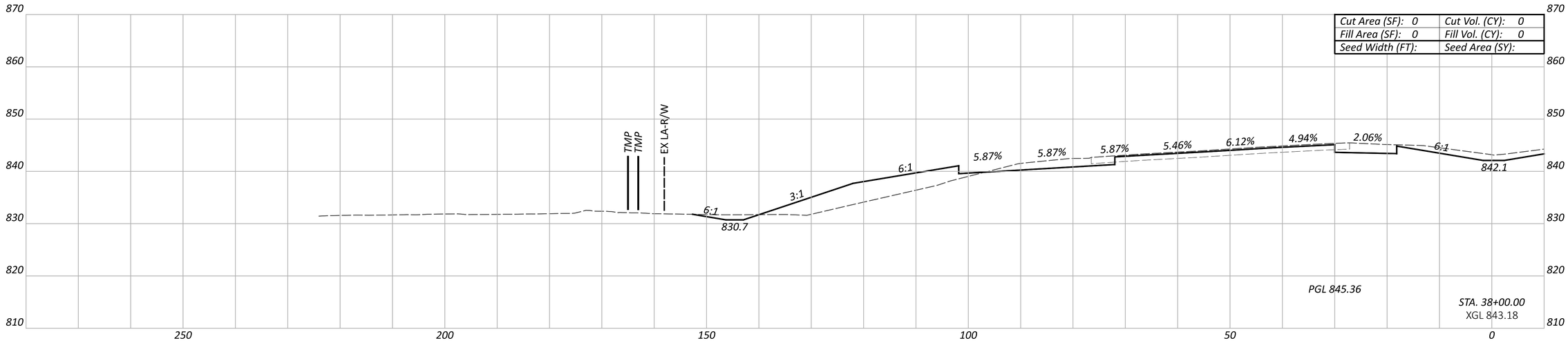

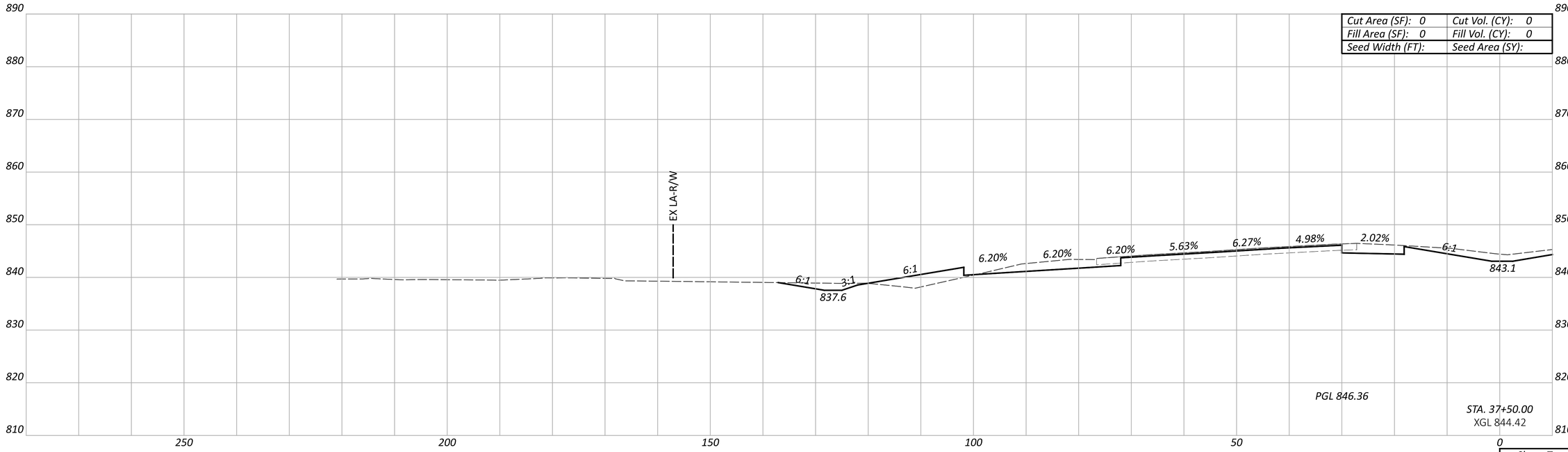

CROSS SECTIONS - IR 70 WB
STA. 37+50.00 TO STA. 38+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

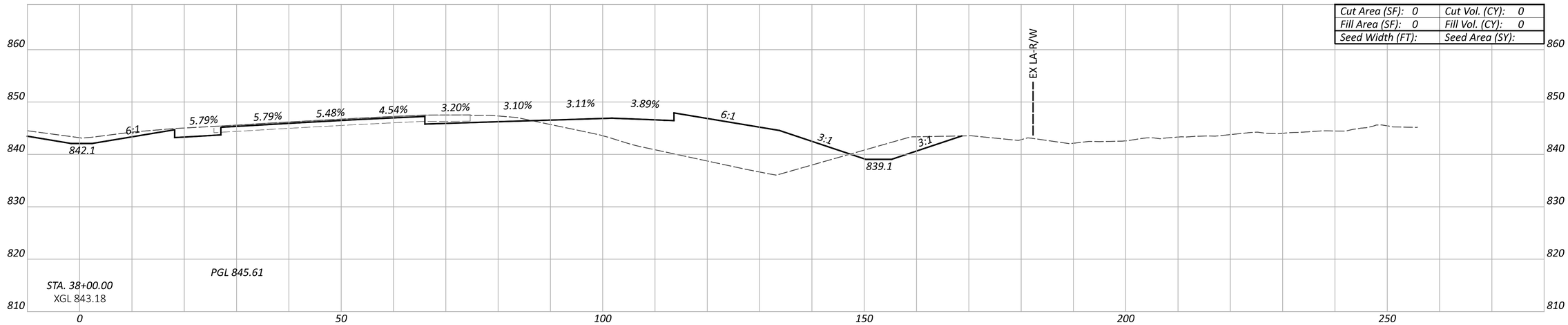
DESIGNER
BER

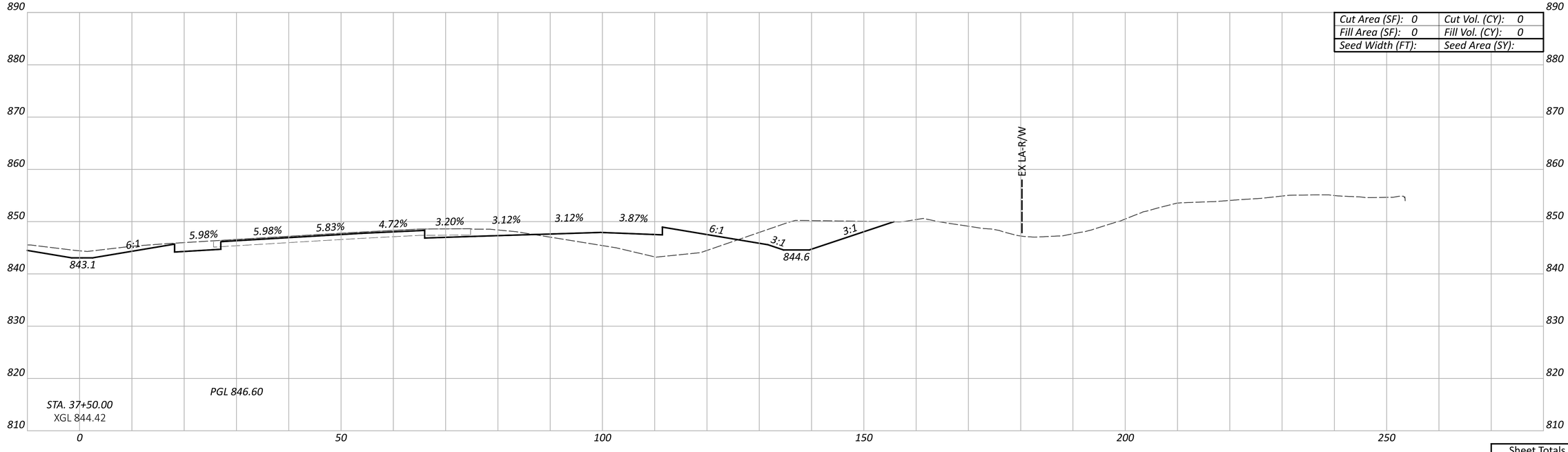
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.244 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 37+50.00 TO STA. 38+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.245 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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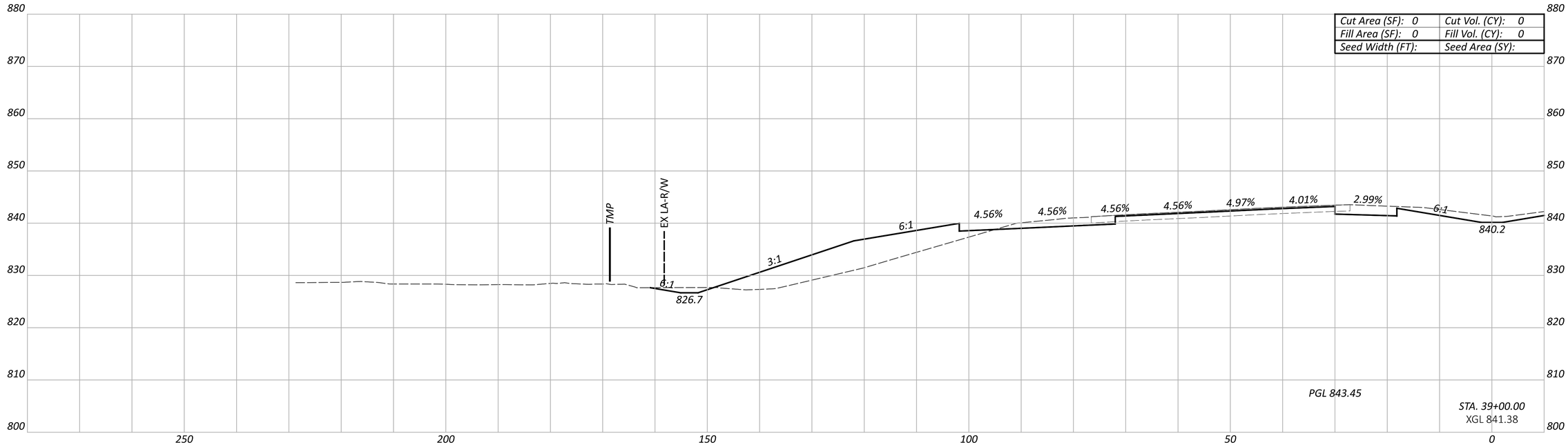

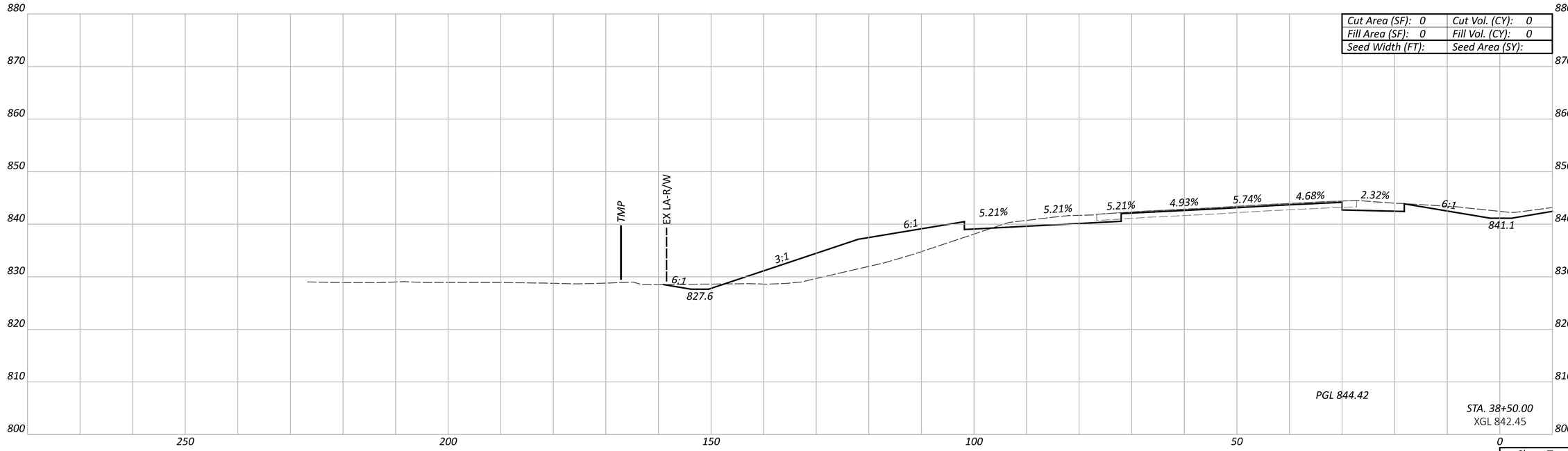

CROSS SECTIONS - IR 70 WB
STA. 38+50.00 TO STA. 39+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.246 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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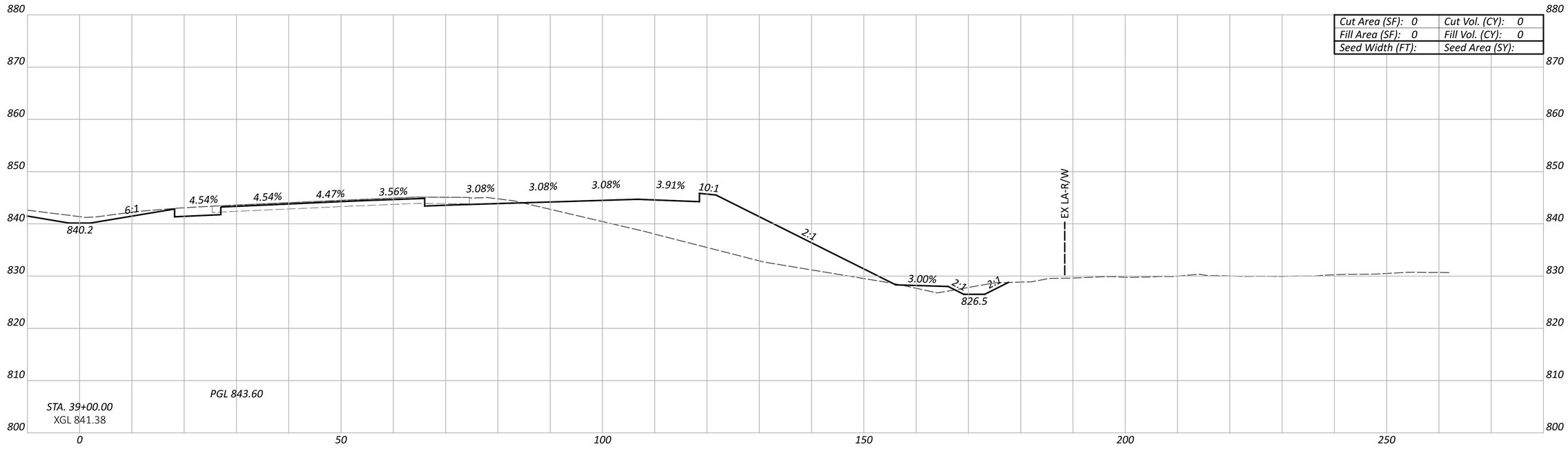

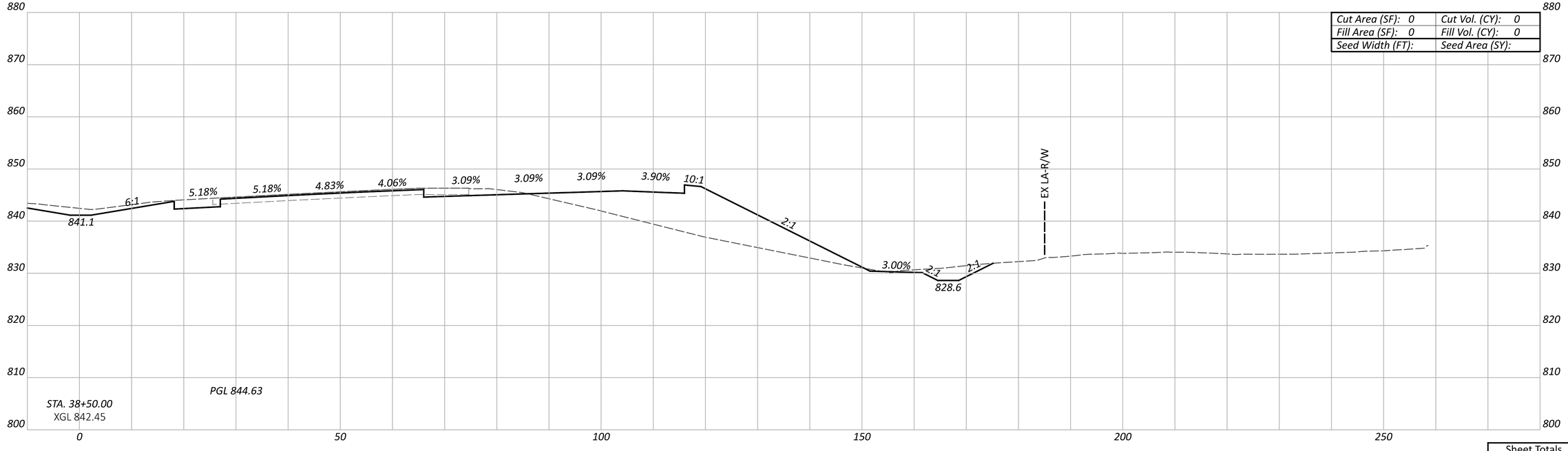

CROSS SECTIONS - IR 70 EB
STA. 38+50.00 TO STA. 39+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 38+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:14 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

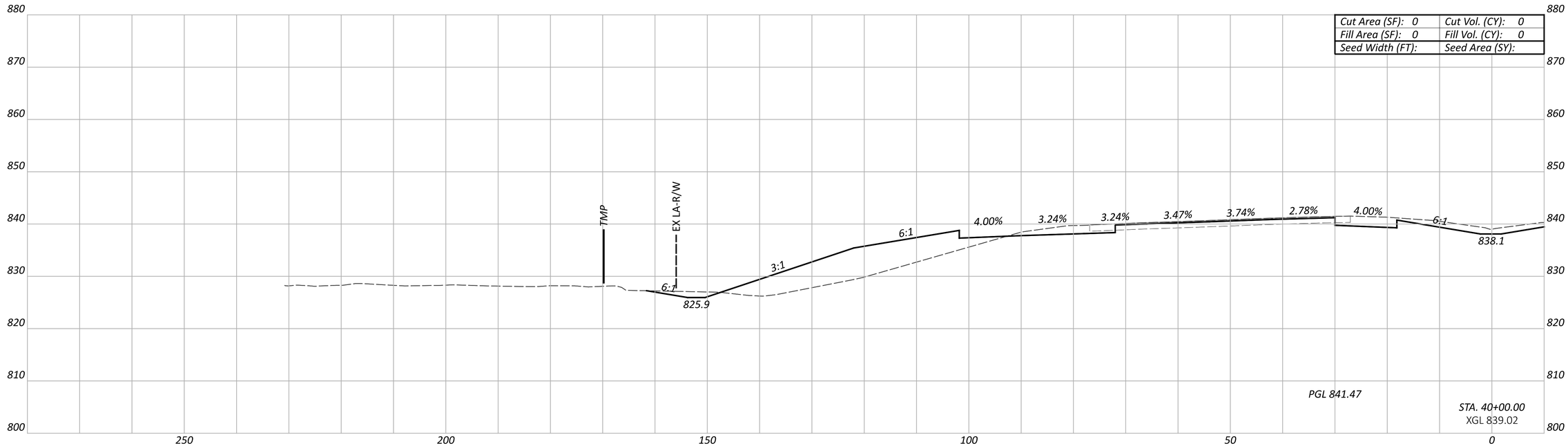
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

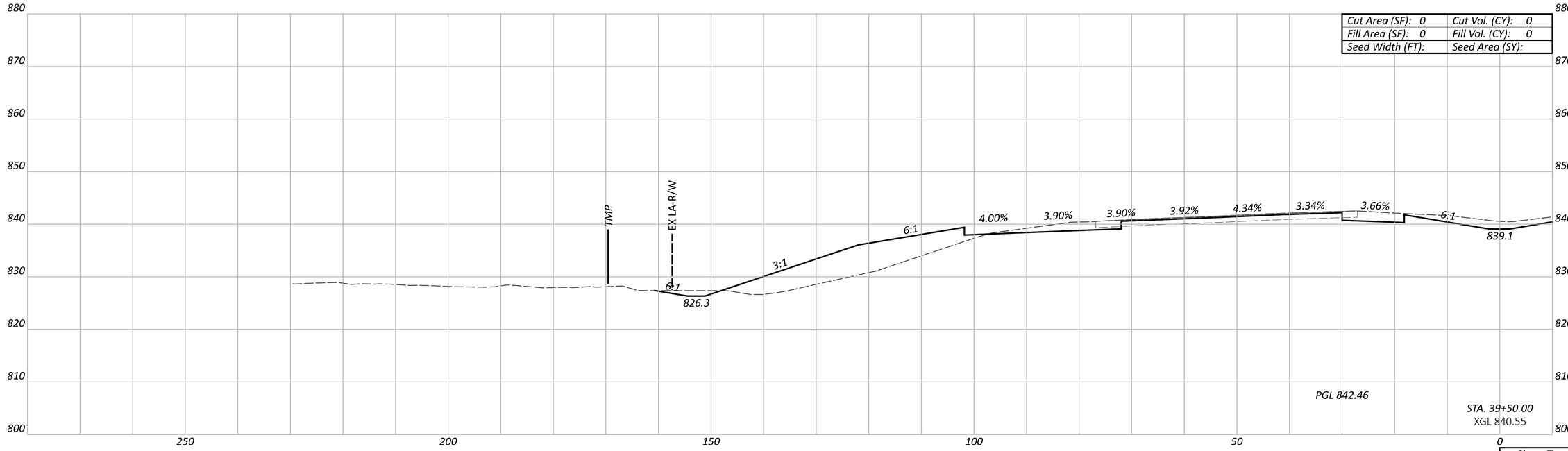
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.247 TOTAL 740





FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 39+50.00 TO STA. 40+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

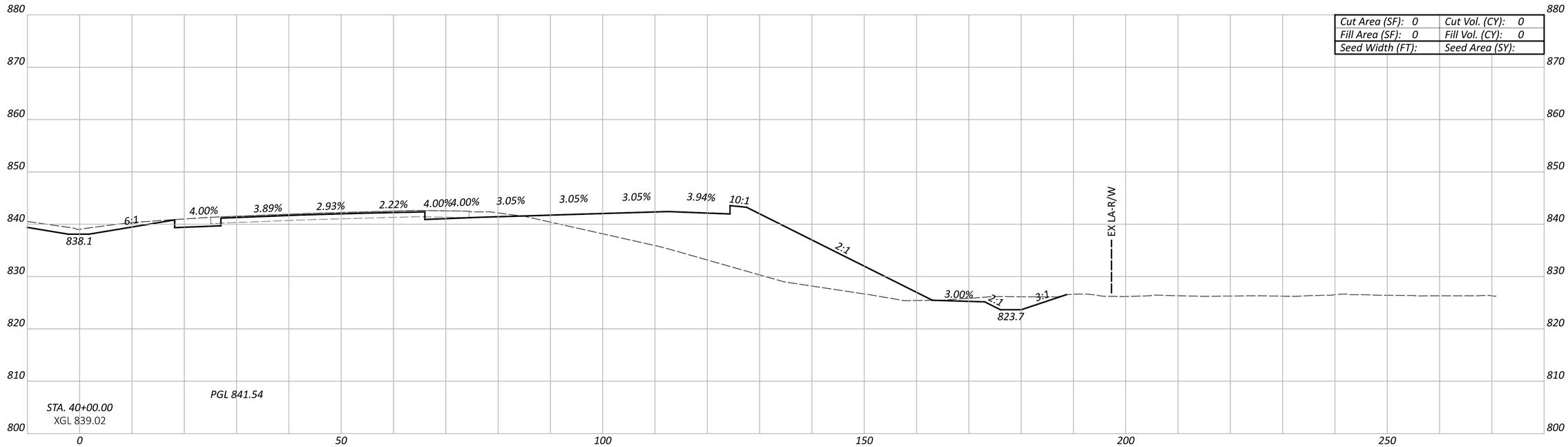
REVIEWER
KAM 06/18/23

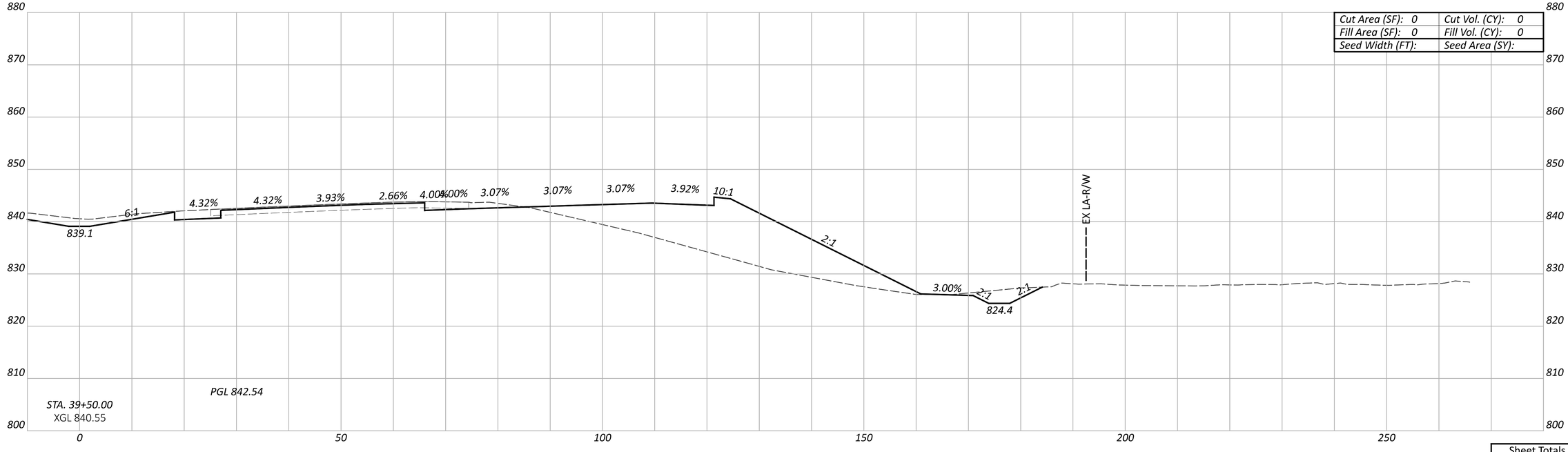
PROJECT ID
96808

Sheet Totals

Seeding	Cut	Fill

SHEET P.248 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 39+50.00 TO STA. 40+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 39+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:20 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

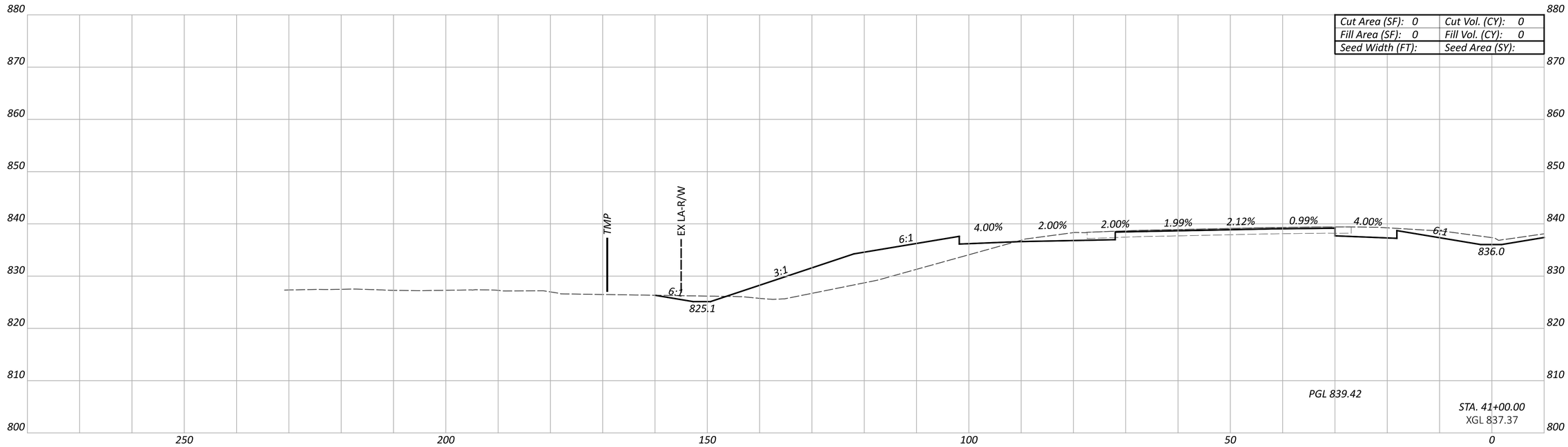
DESIGNER
BER

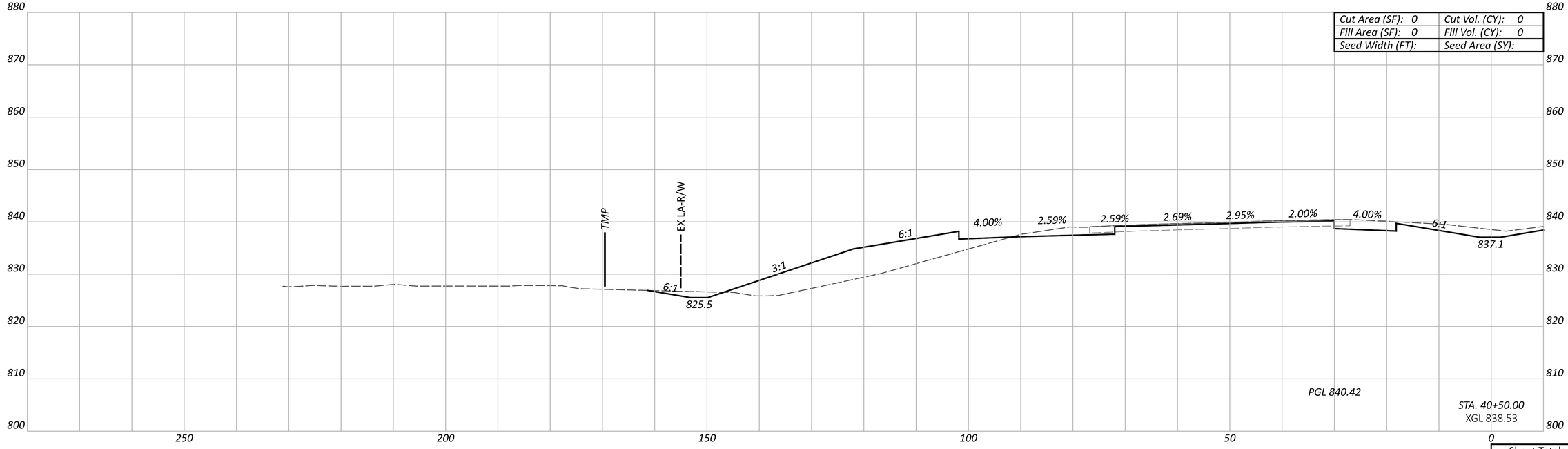
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.249 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 40+50.00 TO STA. 41+00.00

Sheet Totals

Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.250 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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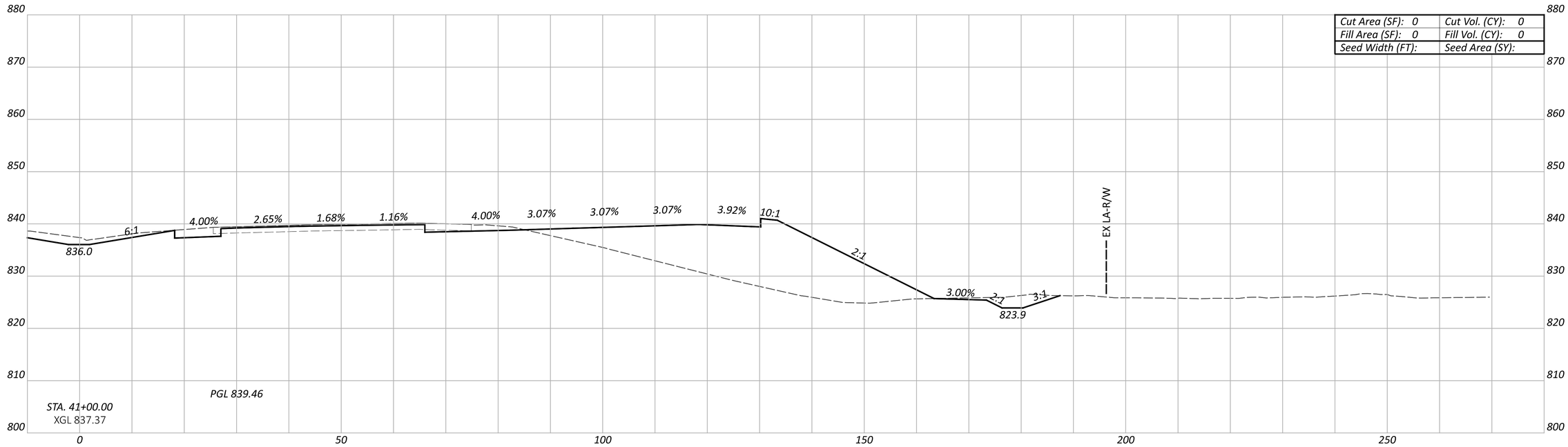

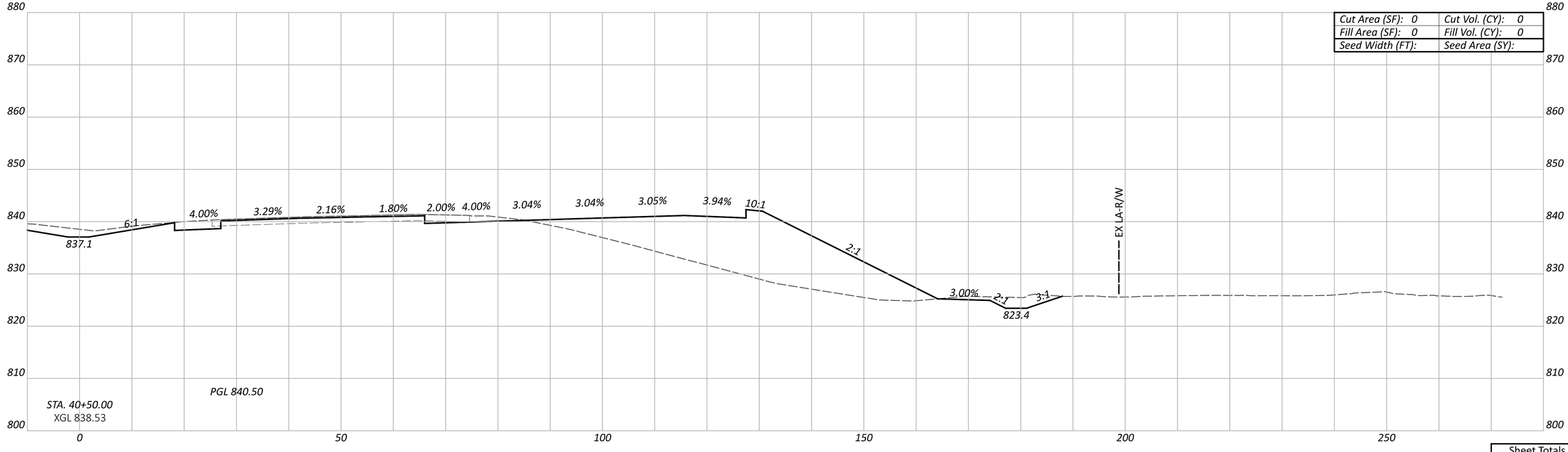

CROSS SECTIONS - IR 70 EB
STA. 40+50.00 TO STA. 41+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

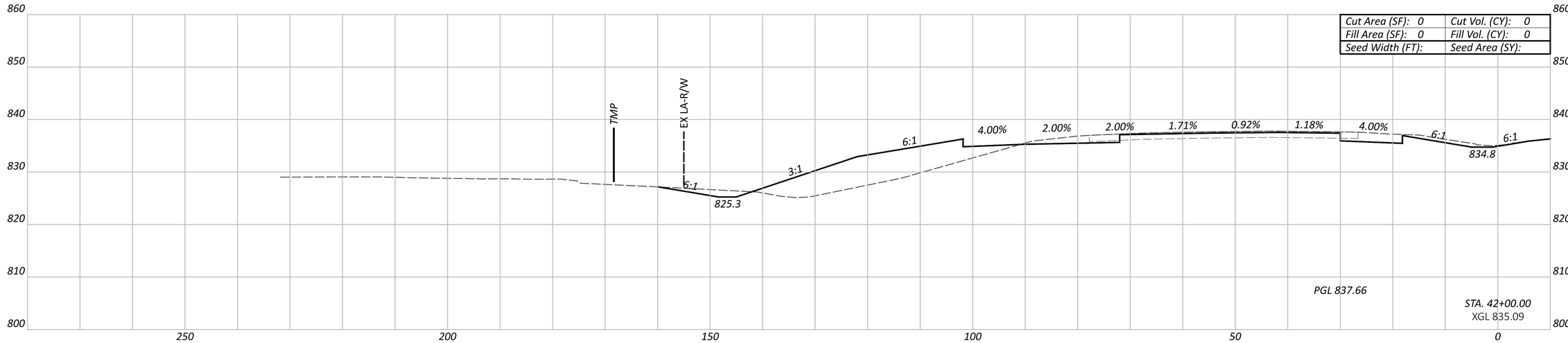
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

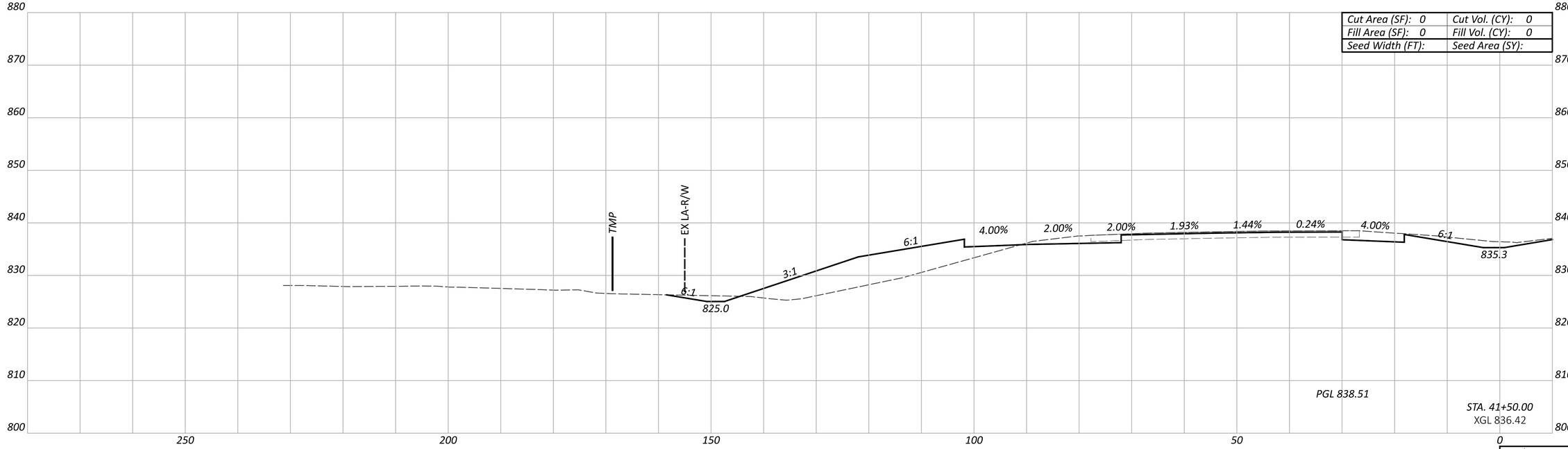
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.251 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 41+50.00 TO STA. 42+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.252 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 41+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:28 PM USER: aoldaker
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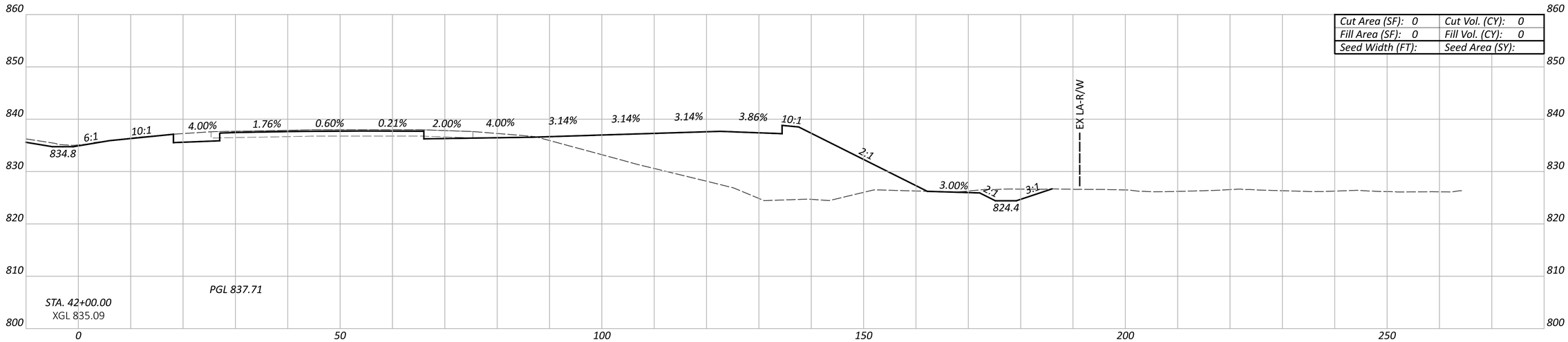

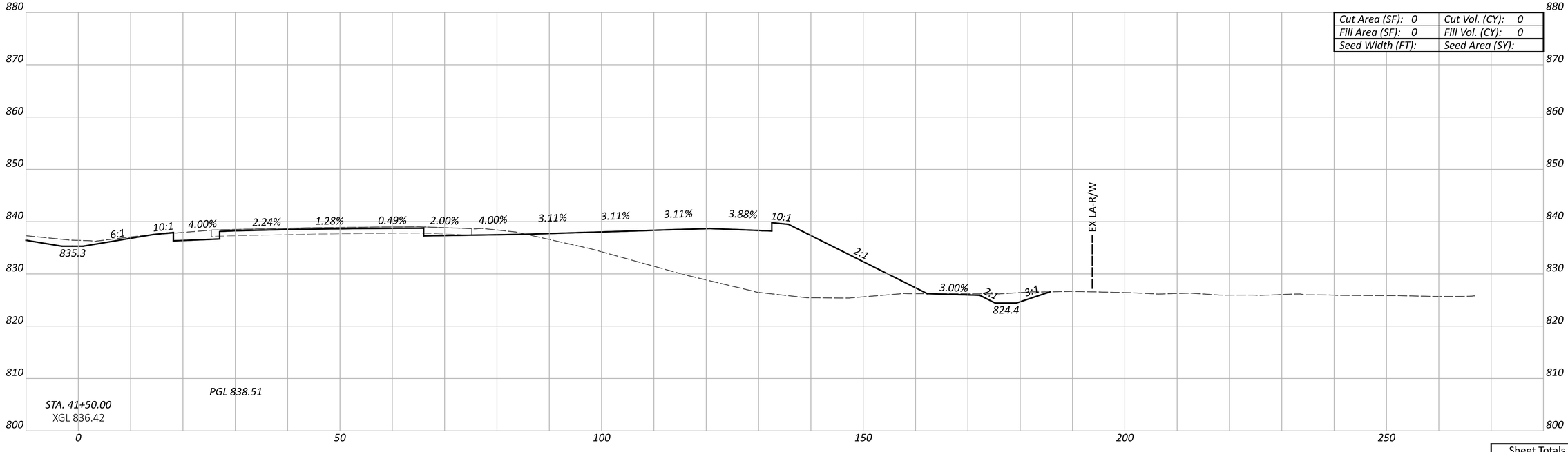

CROSS SECTIONS - IR 70 EB
STA. 41+50.00 TO STA. 42+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.253 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 41+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:30 PM USER: aoldaker
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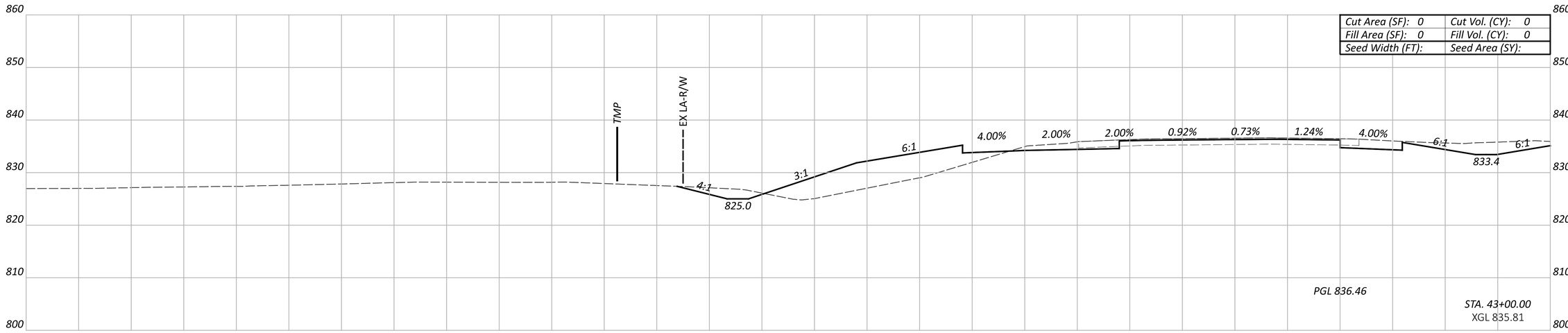

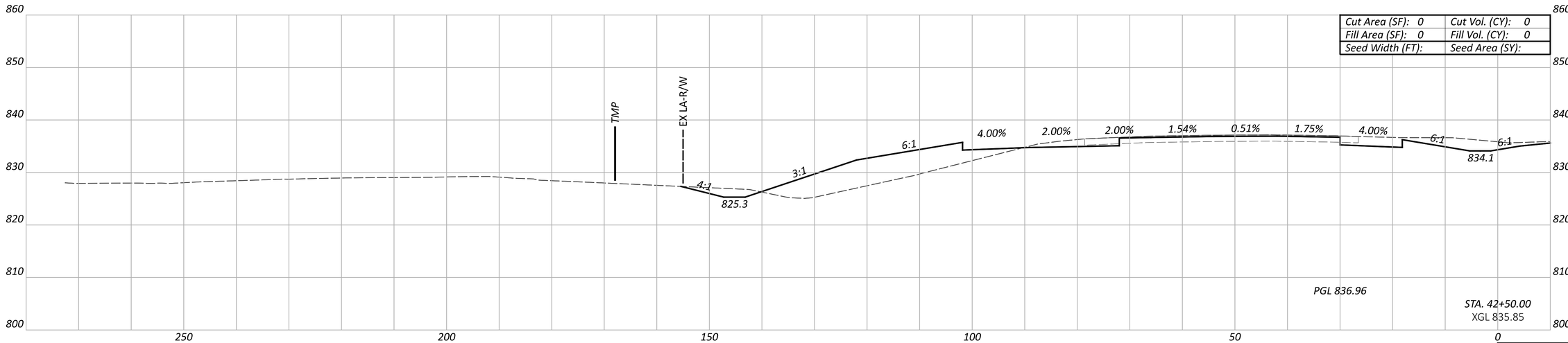

CROSS SECTIONS - IR 70 WB
STA. 42+50.00 TO STA. 43+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 42+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:33 PM USER: aoldaker
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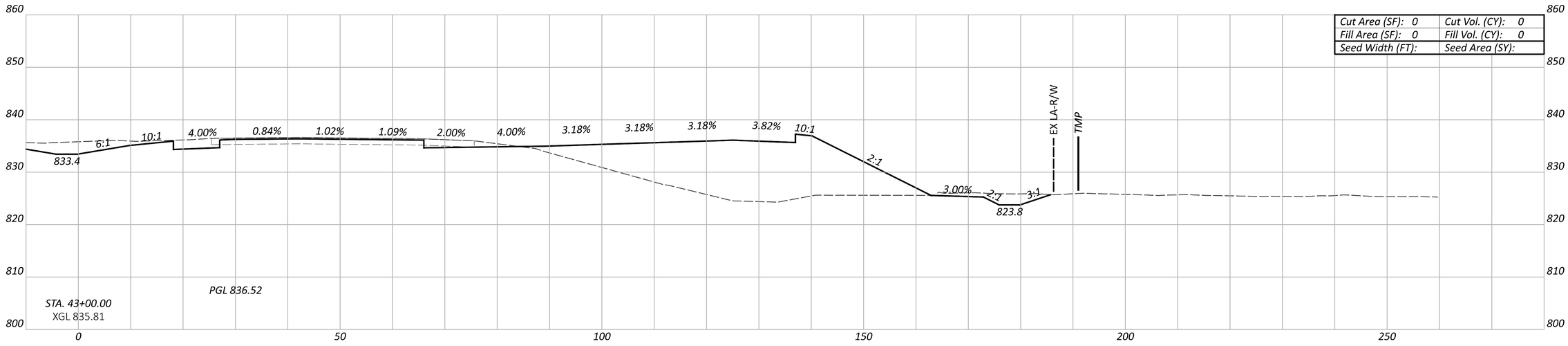
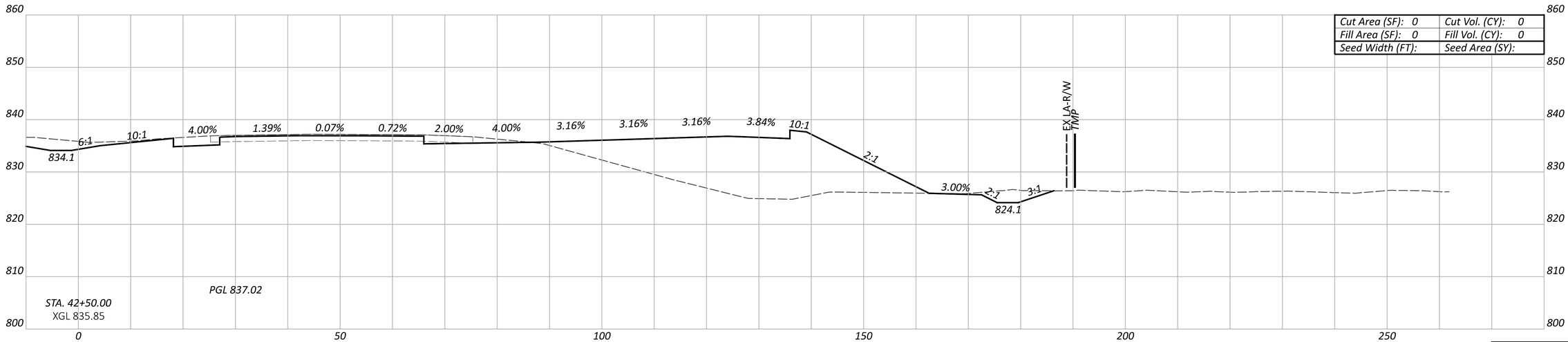
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.254
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 42+50.00 TO STA. 43+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.255 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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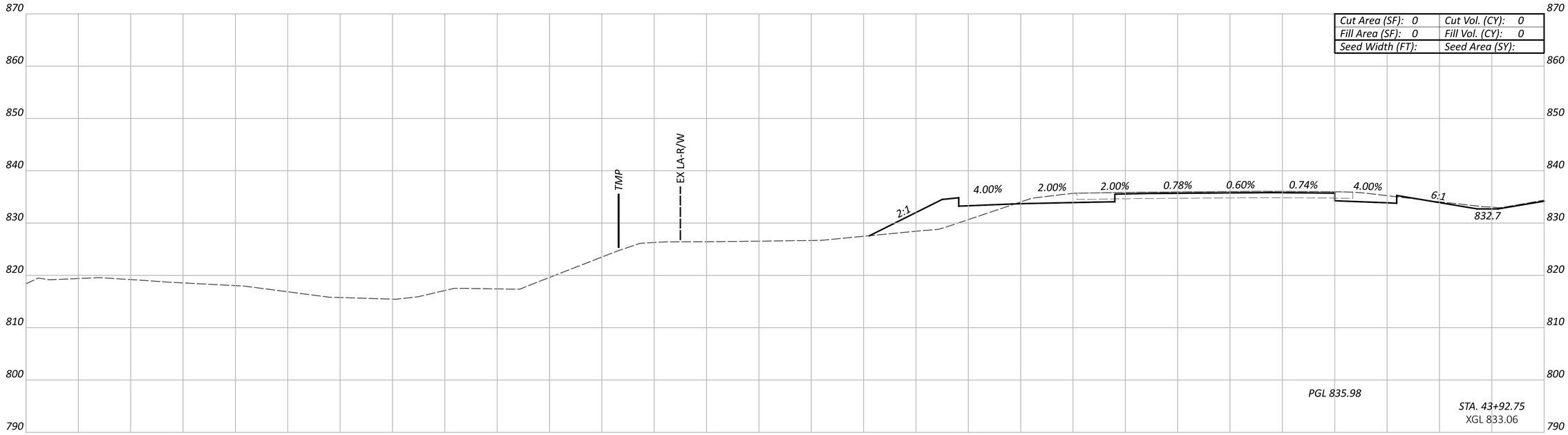

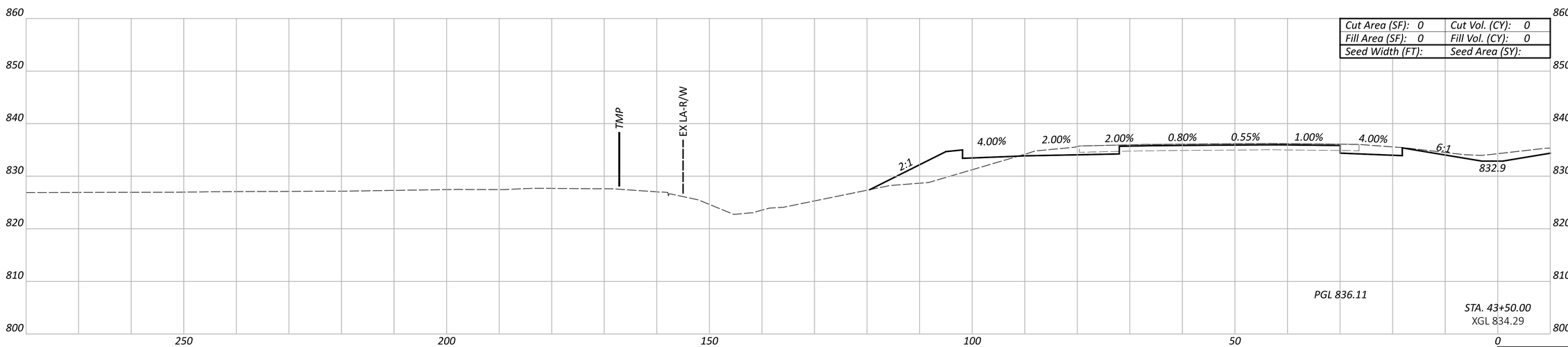

CROSS SECTIONS - IR 70 WB
STA. 43+50.00 TO STA. 43+92.75

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 43+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:39 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

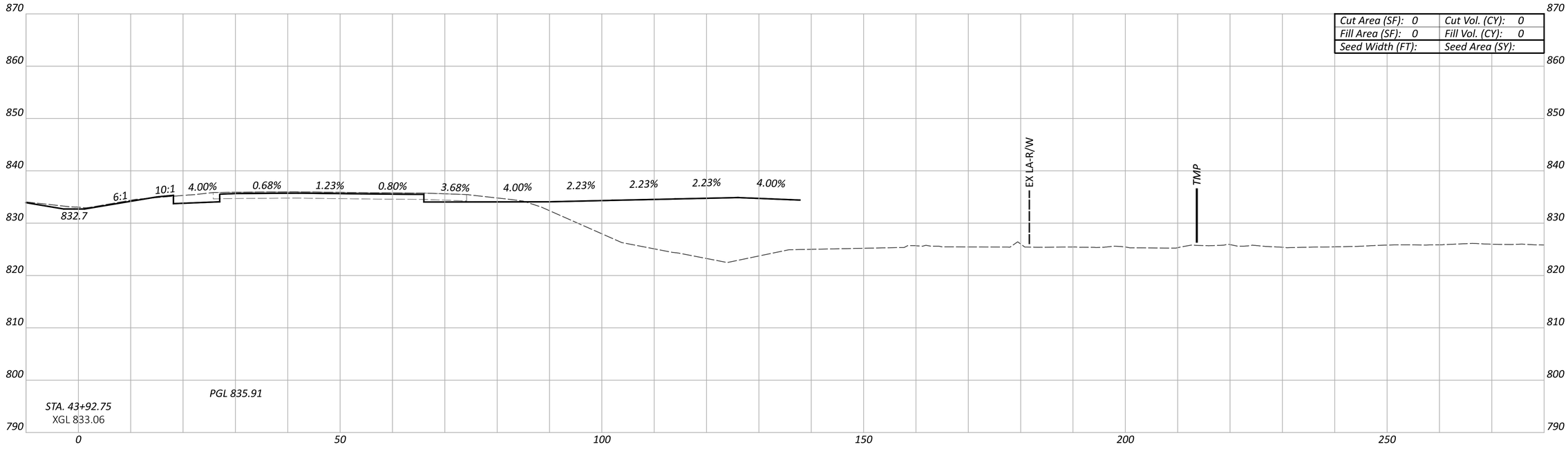
DESIGNER
BER

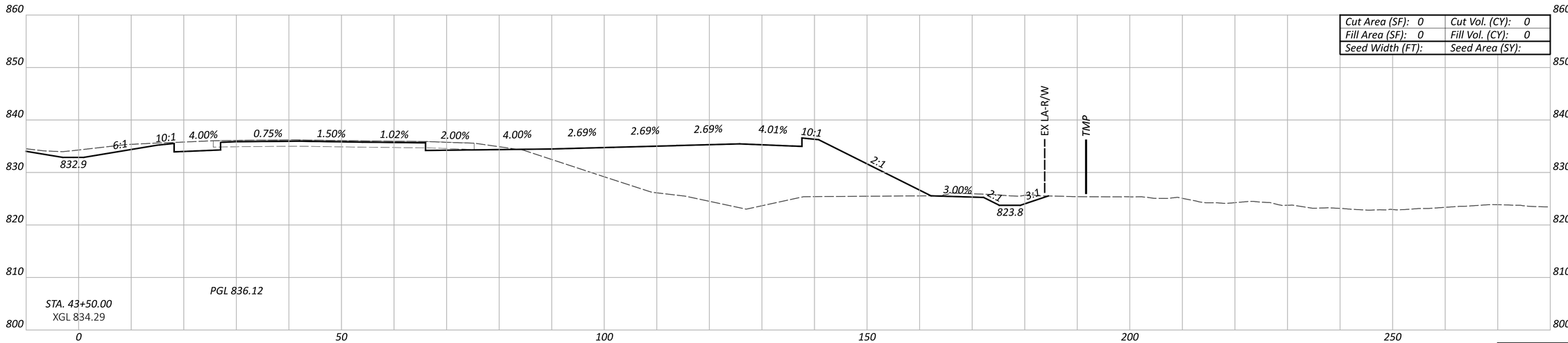
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.256	740





CROSS SECTIONS - IR 70 EB
STA. 43+50.00 TO STA. 43+92.75

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 43+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:42 PM USER: aoldaker
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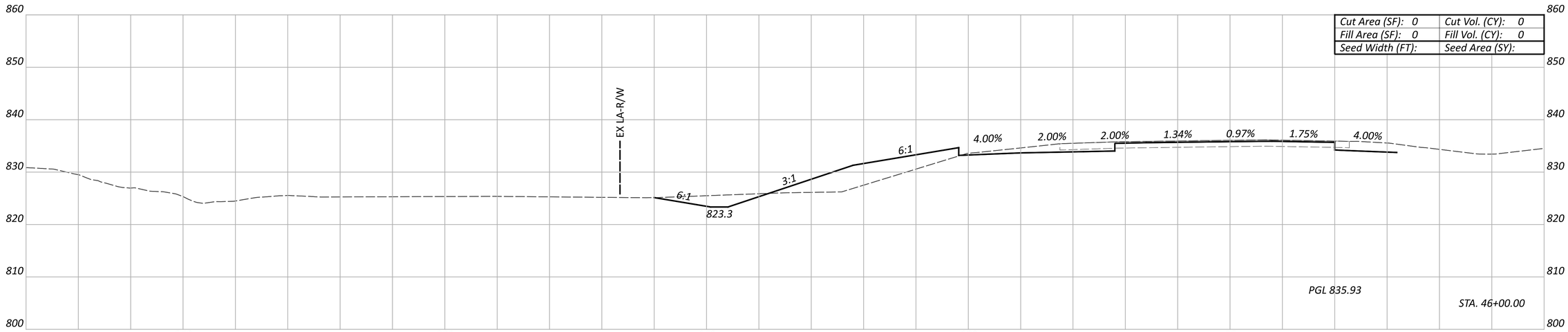
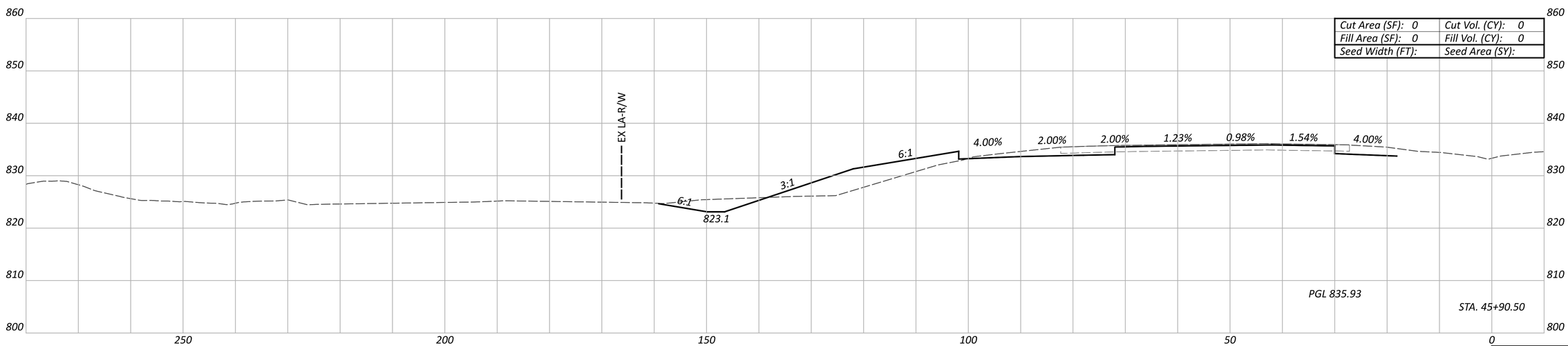
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.257
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 45+90.50 TO STA. 46+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 45+90.50 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:45 PM USER: aoldaker
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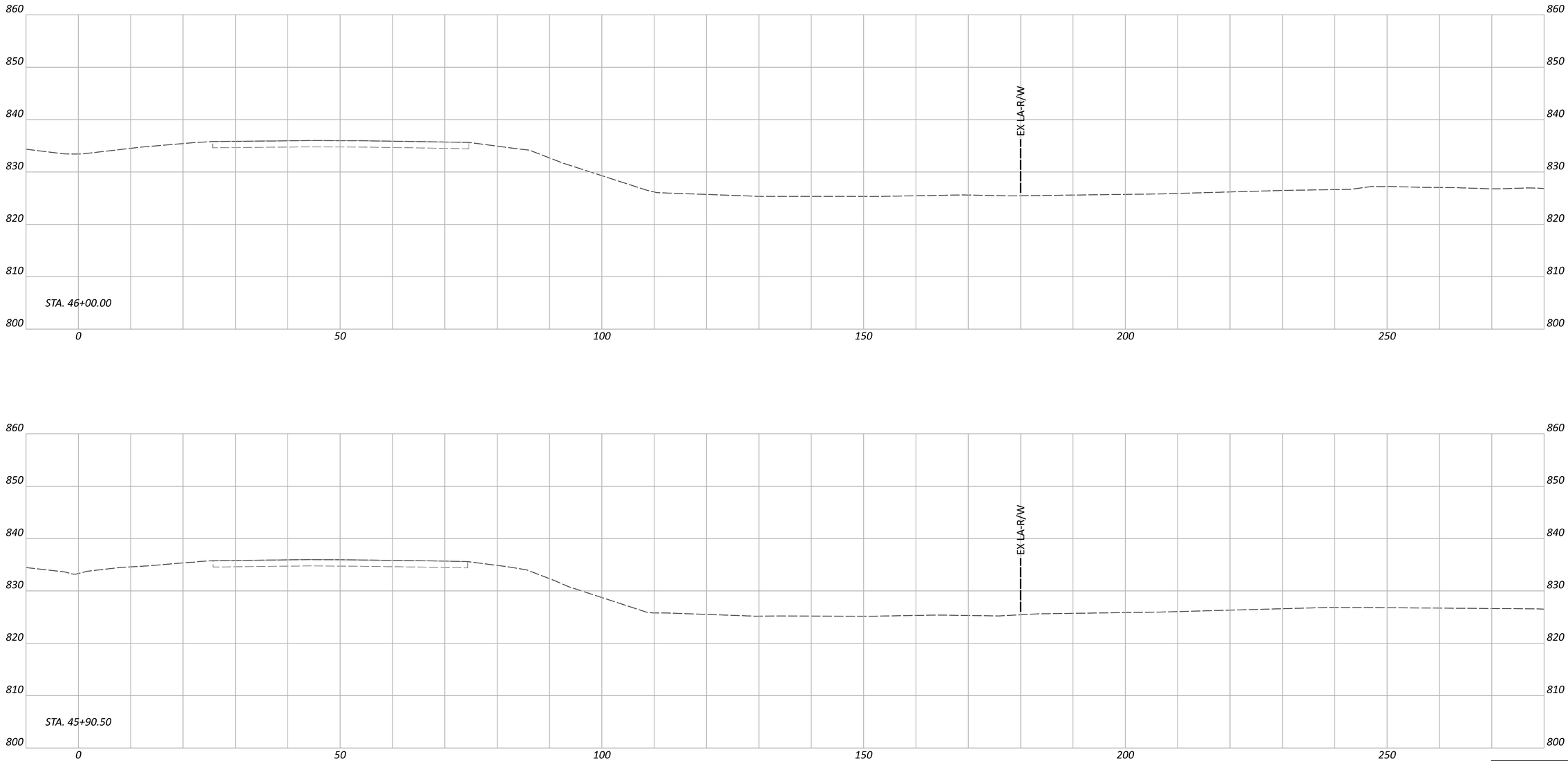
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.258	740

Sheet Totals

Seeding	Cut	Fill



CROSS SECTIONS - IR 70 EB
STA. 45+90.50 TO STA. 46+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

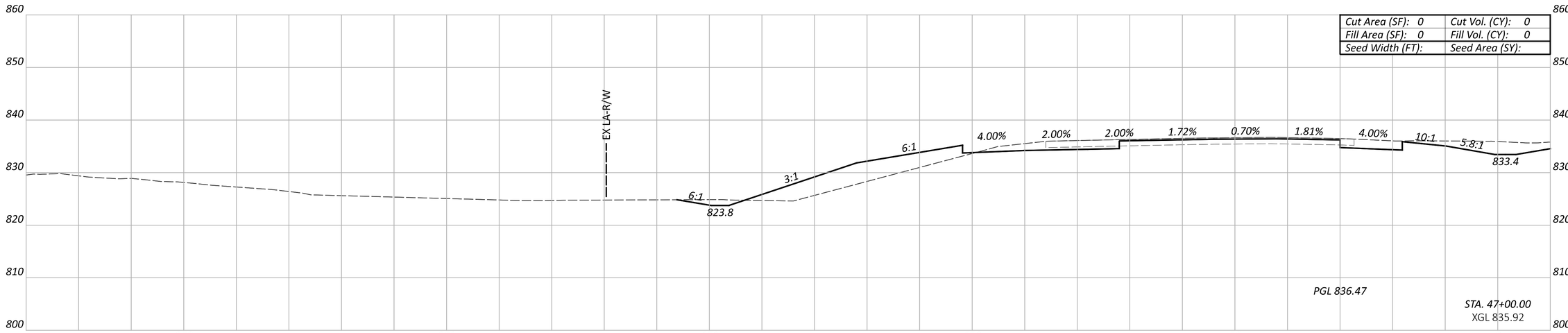
DESIGN AGENCY
STRUCTUREPOINT INC.

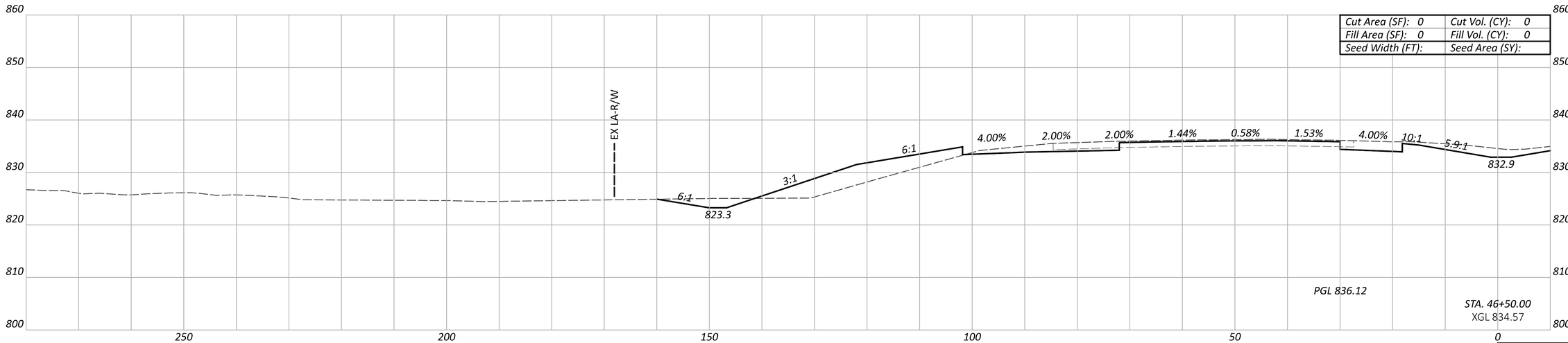
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.259 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 46+50.00 TO STA. 47+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 46+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:50 PM USER: aoldaker
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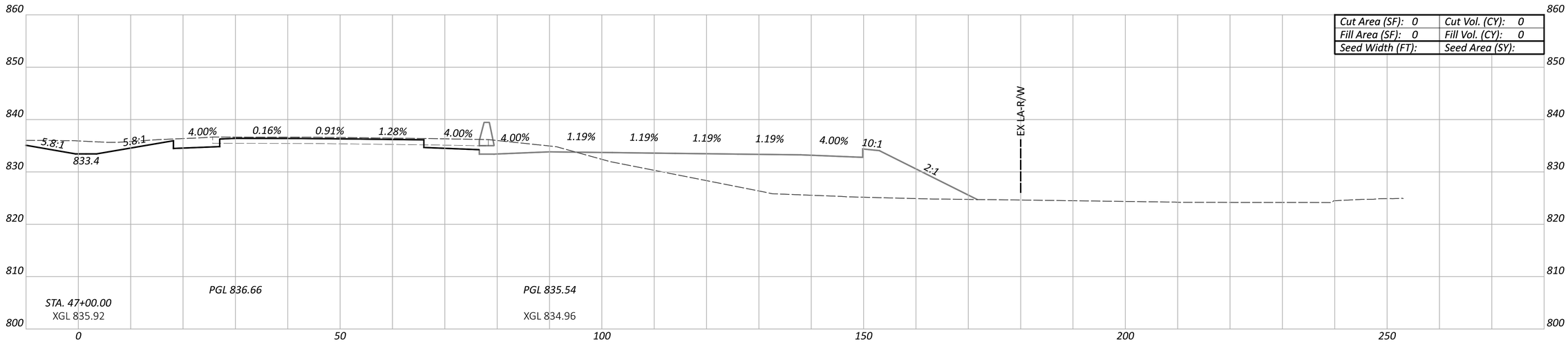
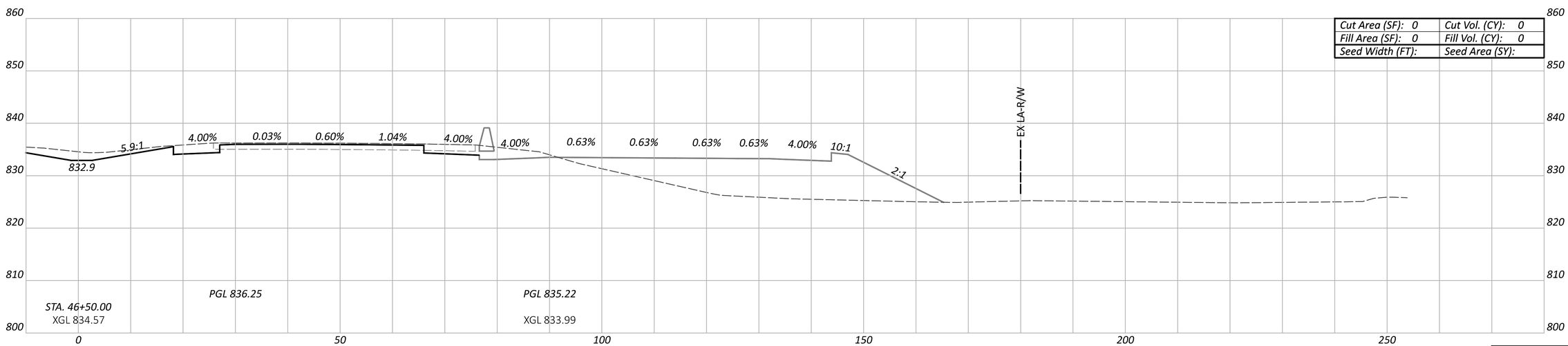
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.260
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 46+50.00 TO STA. 47+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.261 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 46+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:53 PM USER: aoldaker
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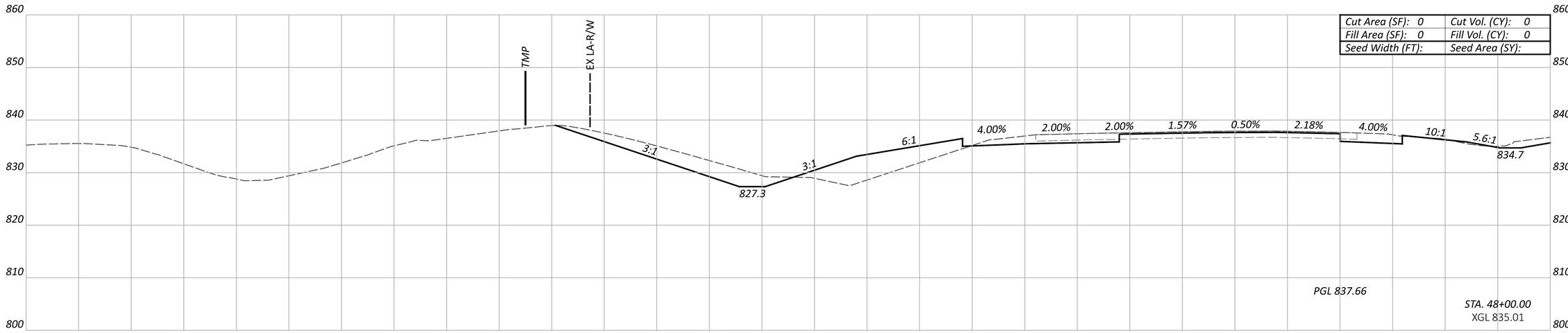

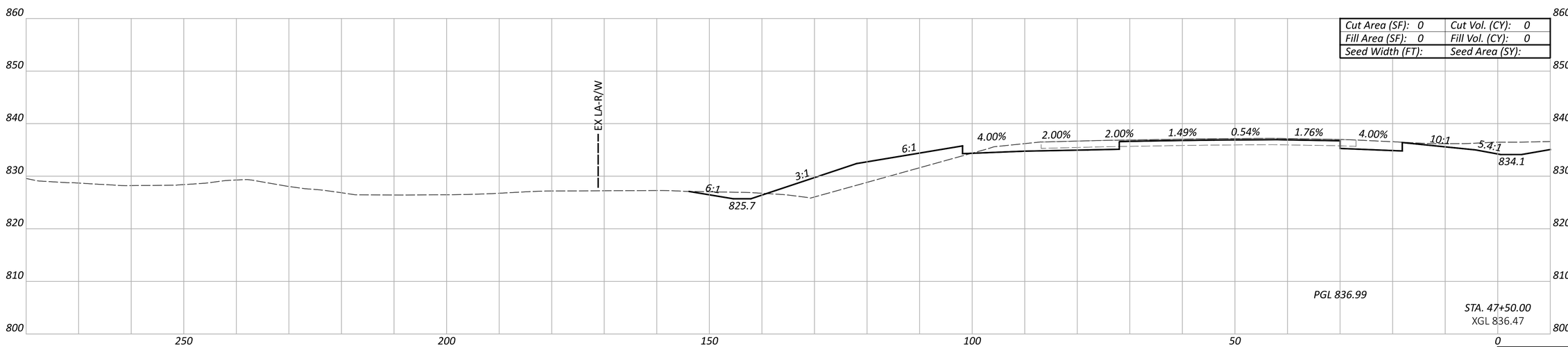

CROSS SECTIONS - IR 70 WB
STA. 47+50.00 TO STA. 48+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 47+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:56 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

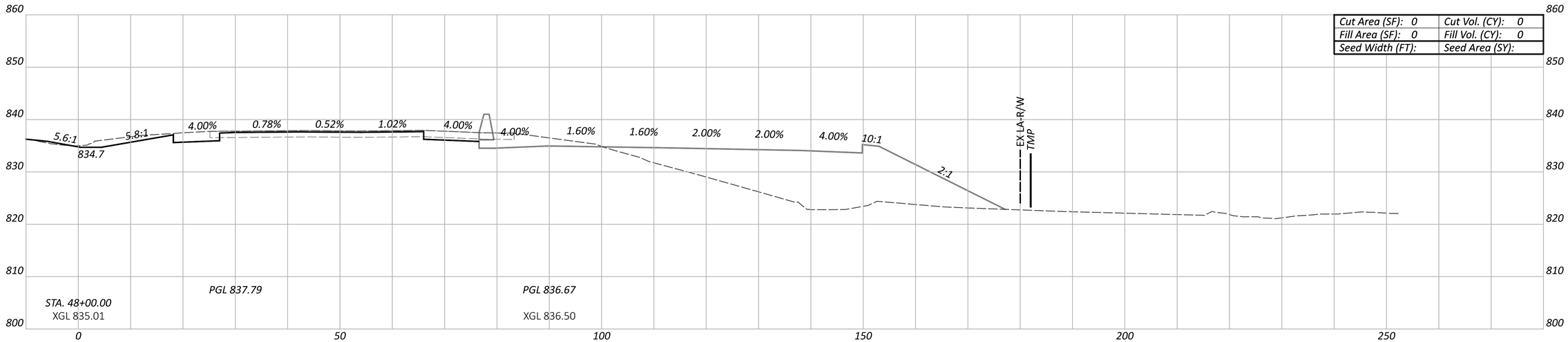
DESIGNER
BER

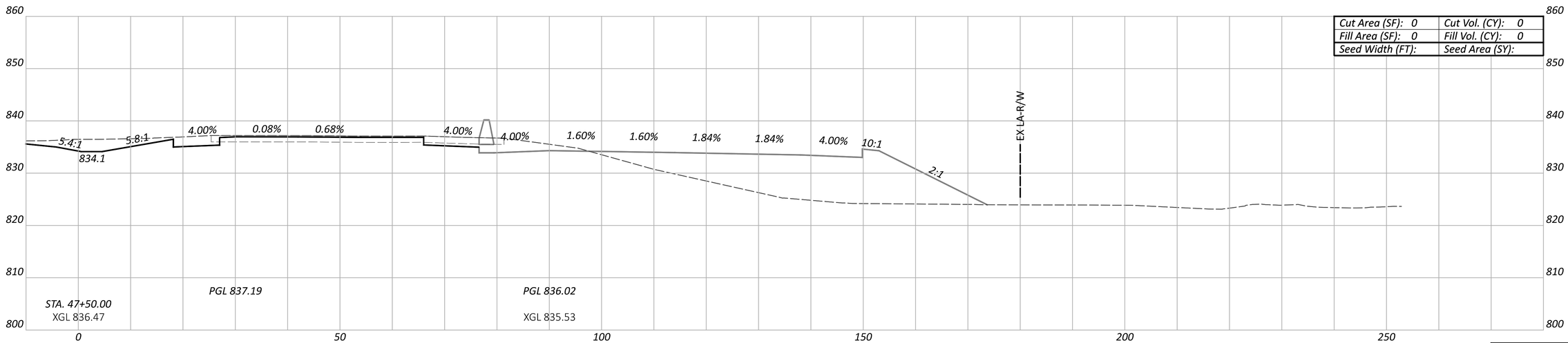
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.262	740





CROSS SECTIONS - IR 70 EB
STA. 47+50.00 TO STA. 48+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.263	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 47+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:16:59 PM USER: aoldaker
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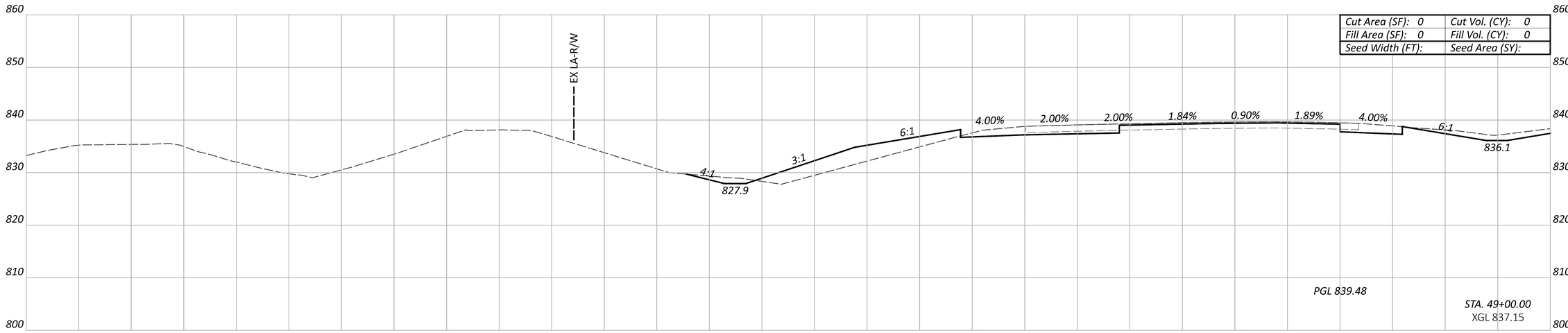

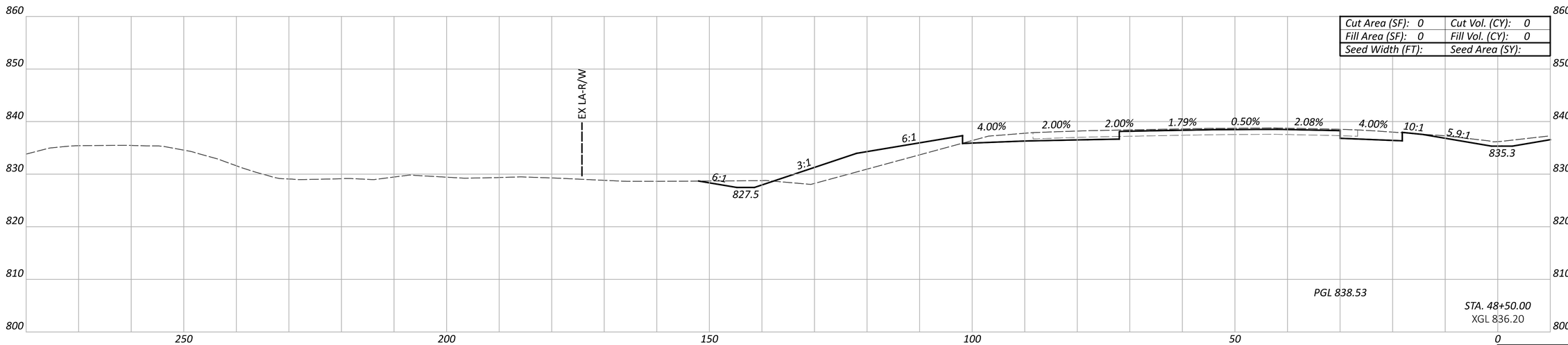

CROSS SECTIONS - IR 70 WB
STA. 48+50.00 TO STA. 49+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 48+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:17:01 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

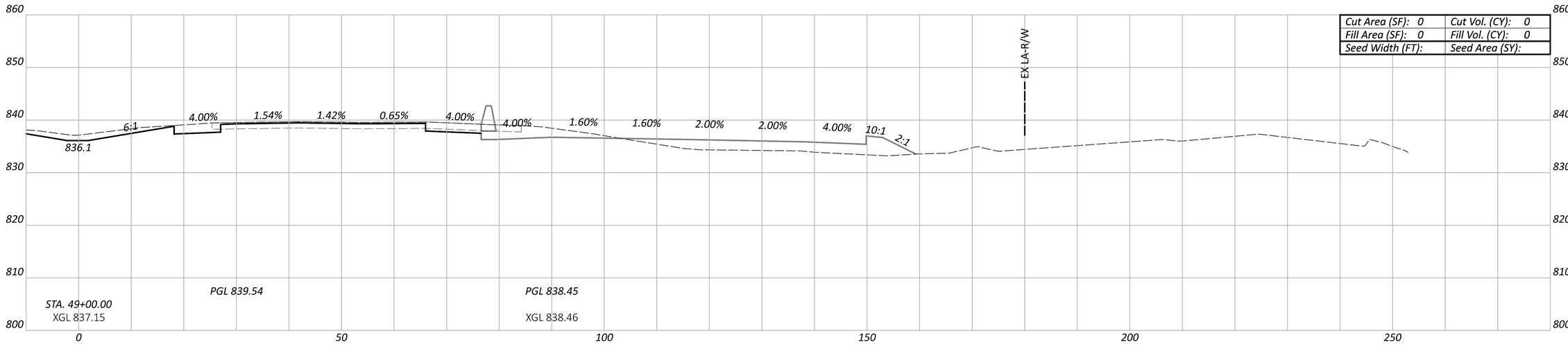
DESIGN AGENCY
STRUCTUREPOINT INC.

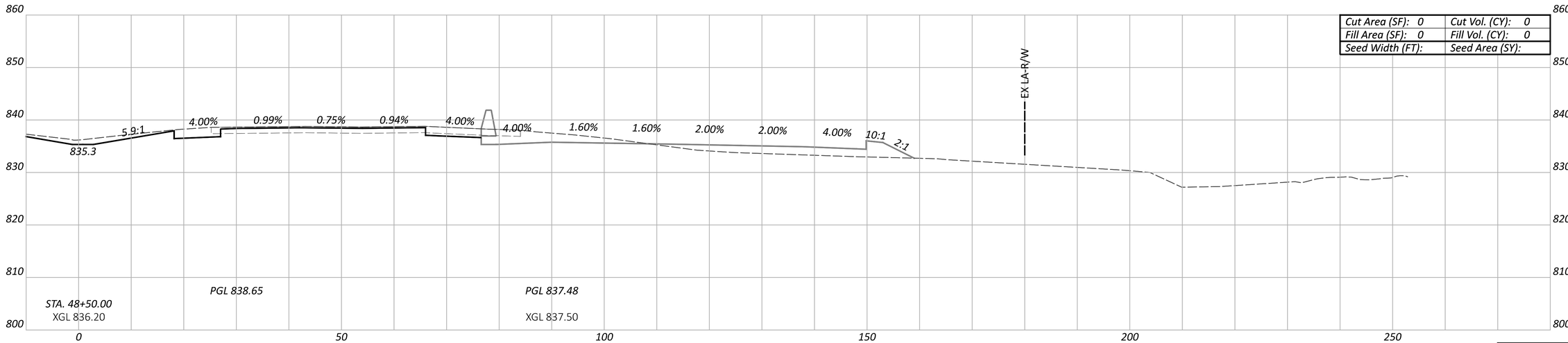
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.264 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 48+50.00 TO STA. 49+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 48+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:17:04 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

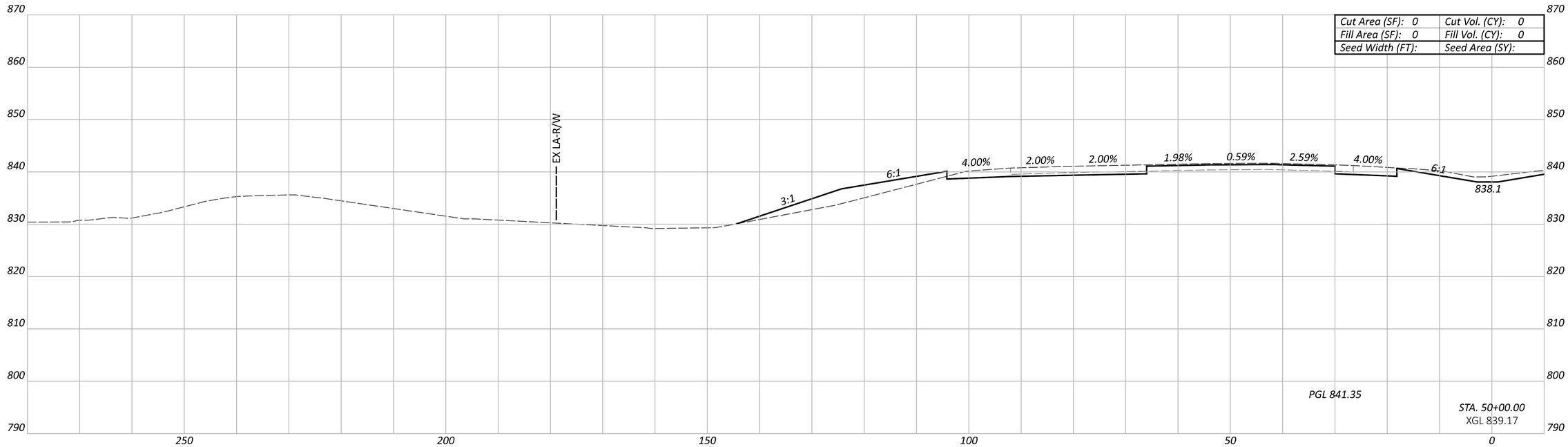
DESIGN AGENCY
STRUCTUREPOINT INC.

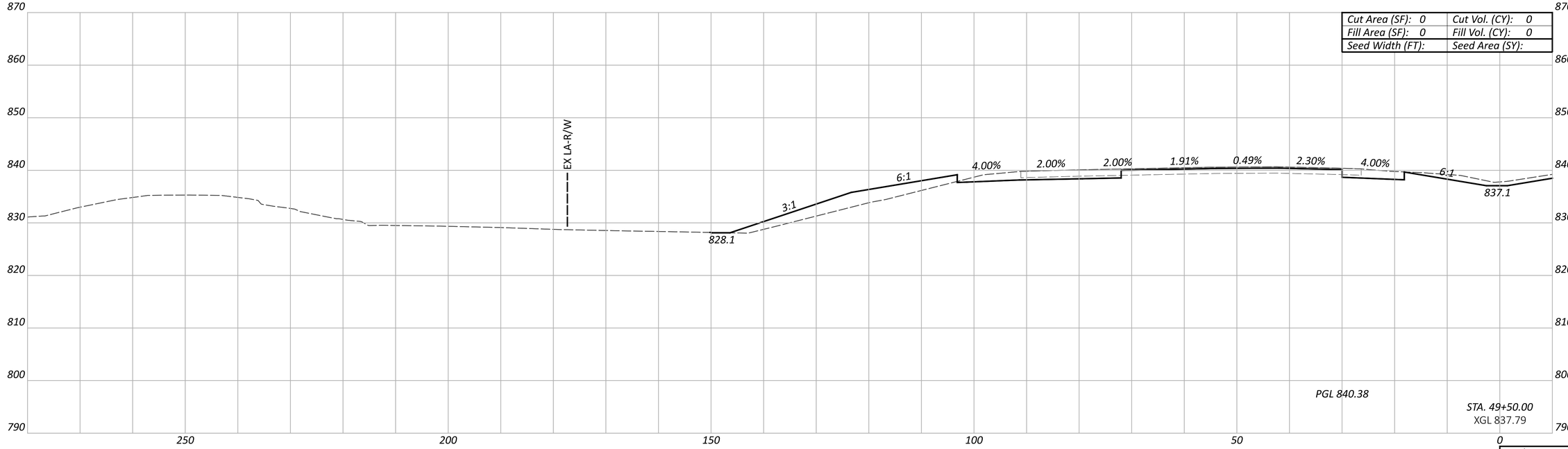
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.265 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 49+50.00 TO STA. 50+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 49+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:17:07 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

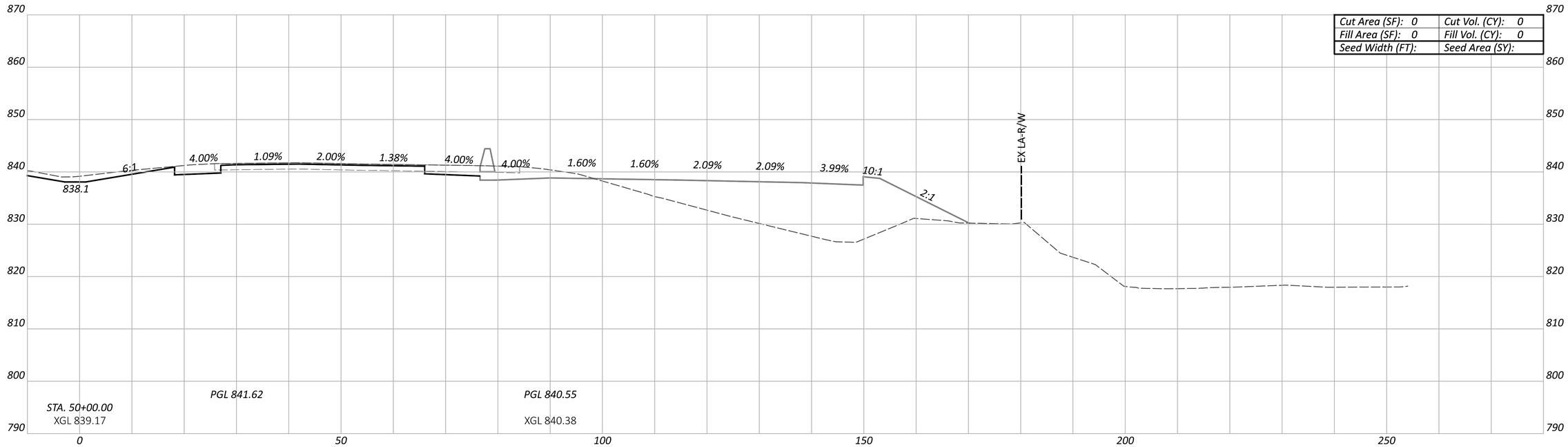
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

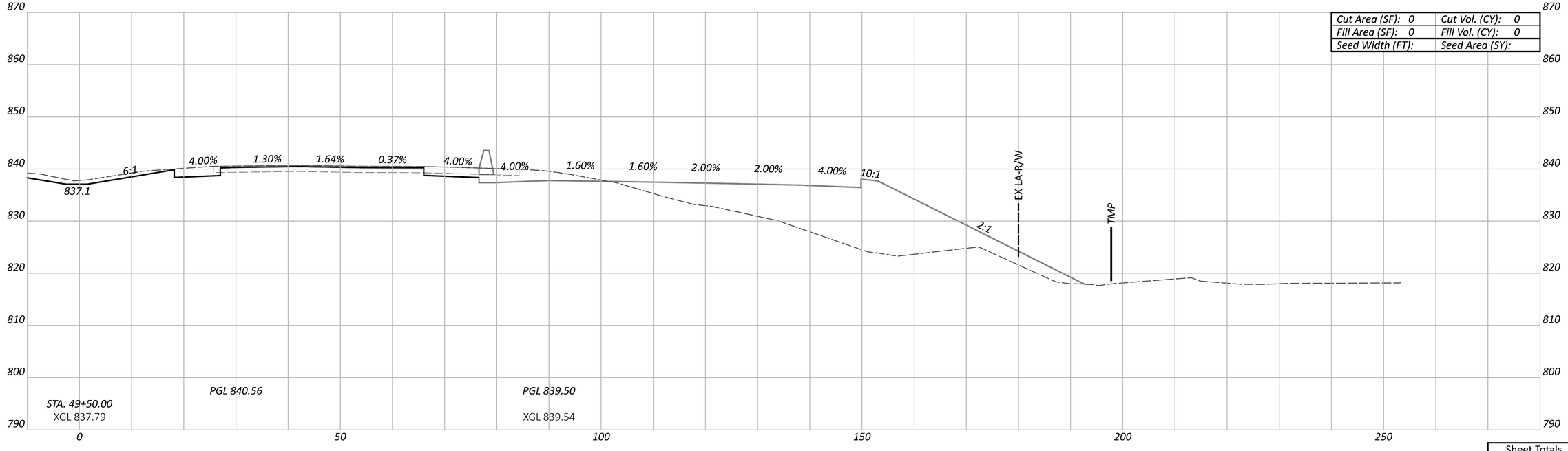
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.266 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 49+50.00 TO STA. 50+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.267
TOTAL	740

FAI/LIC IR 70 0.00/0.00

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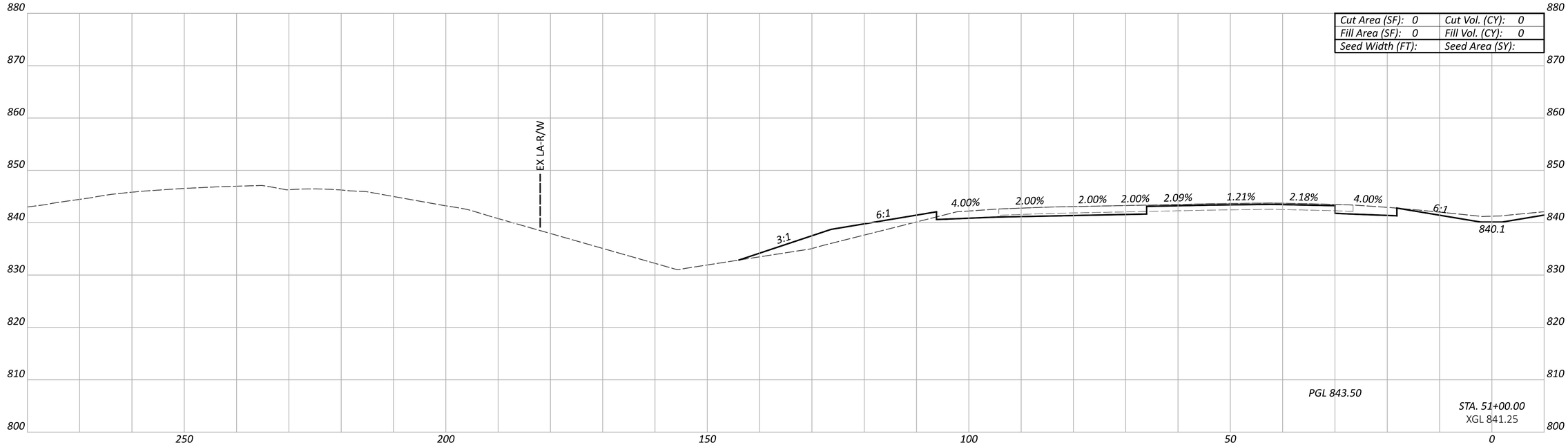

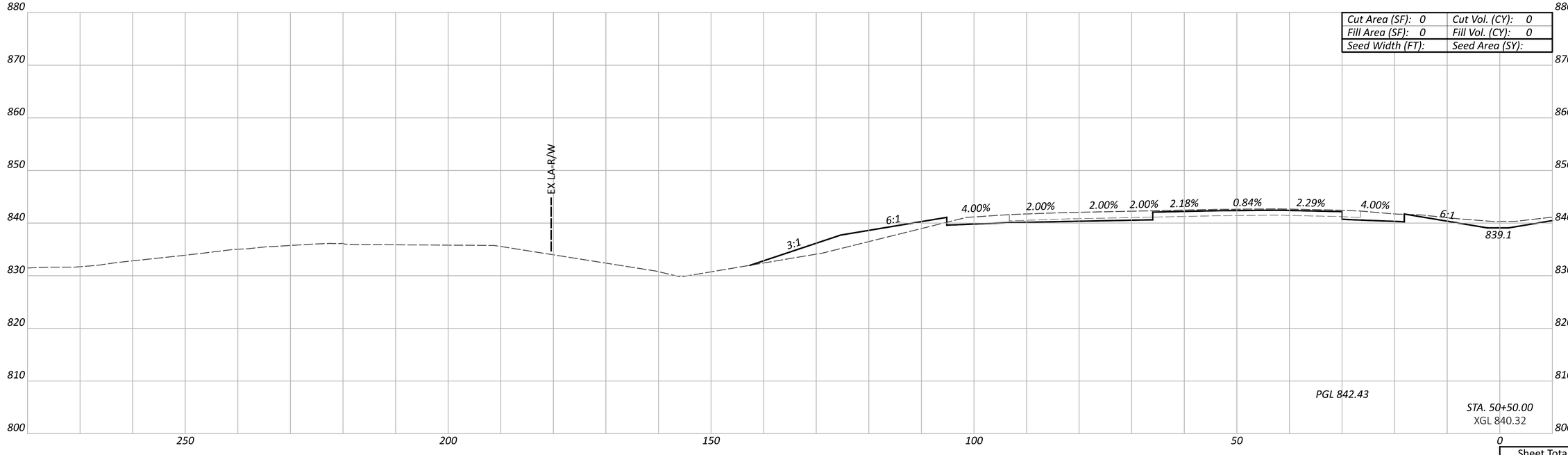

CROSS SECTIONS - IR 70 WB
STA. 50+50.00 TO STA. 51+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

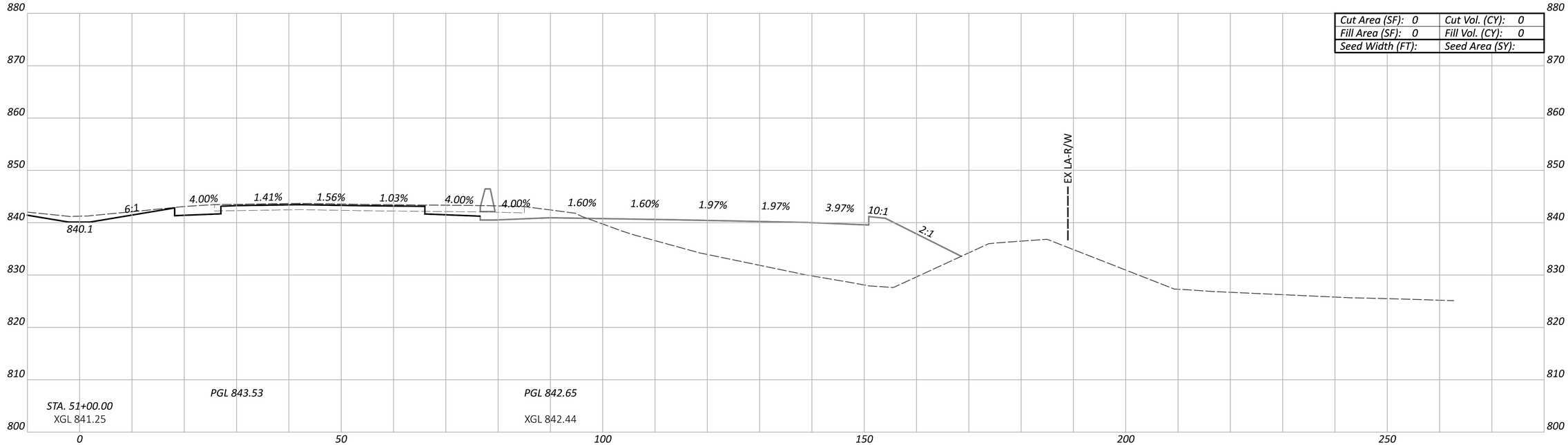
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

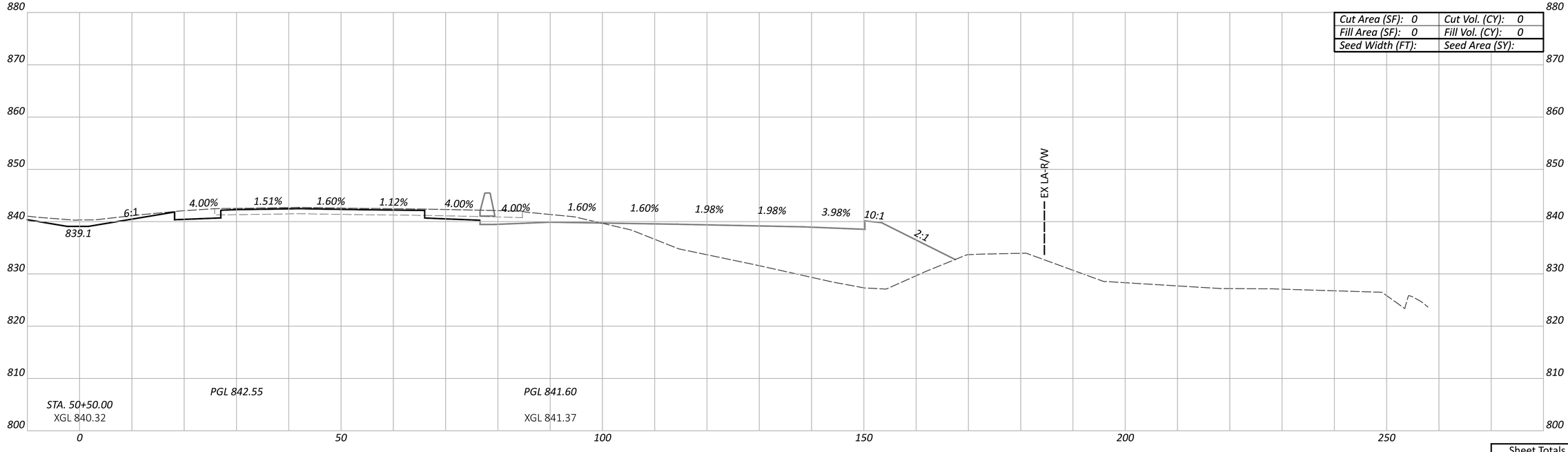
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.268 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

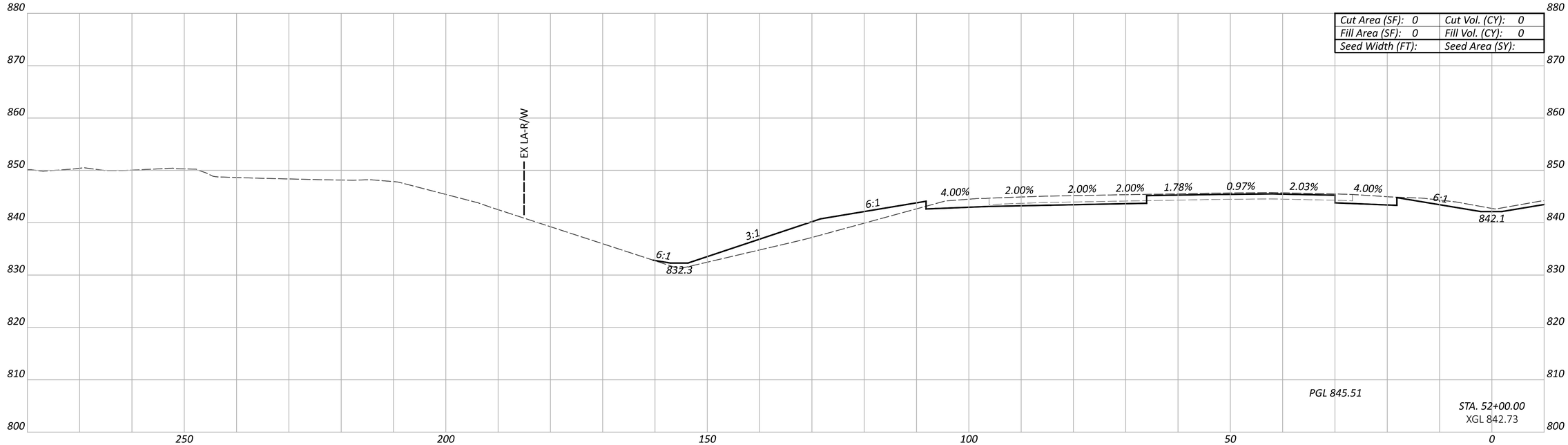
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

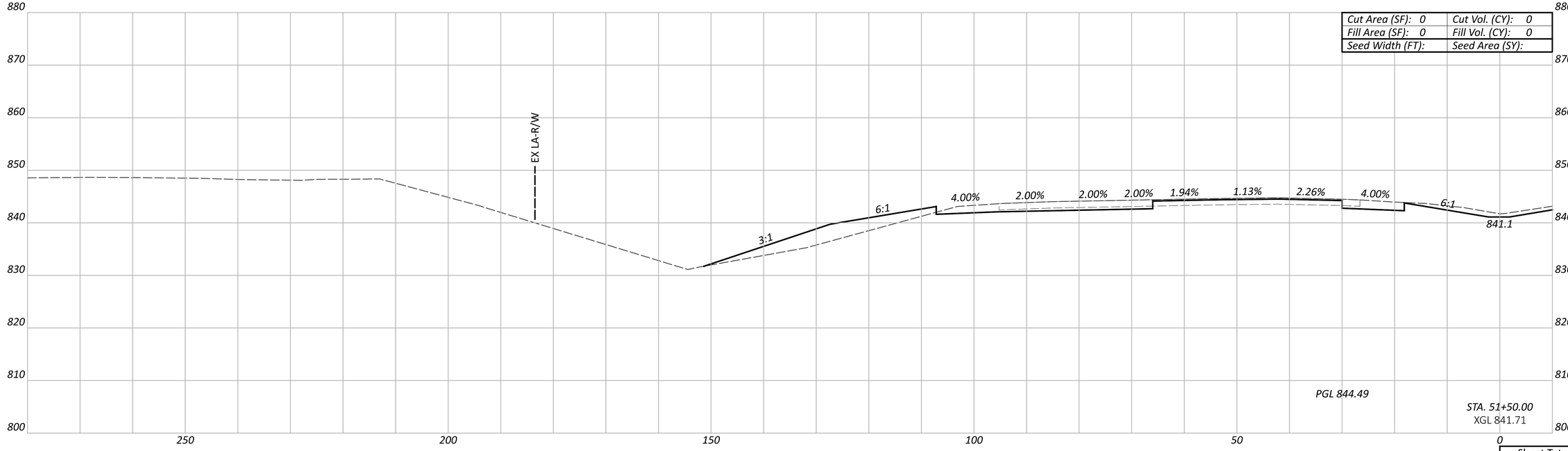
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.269 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

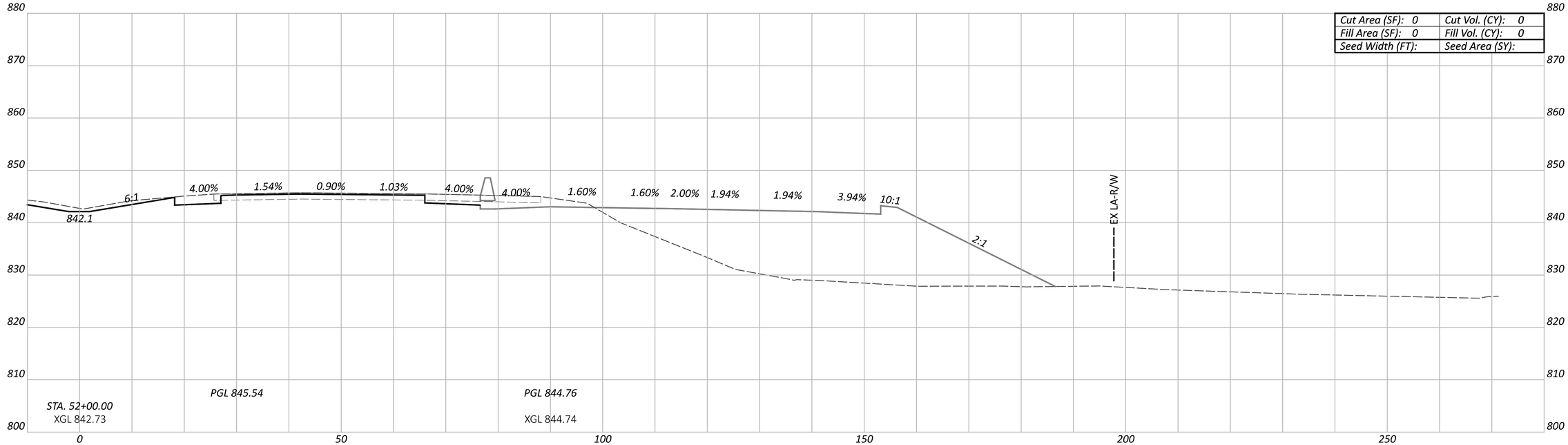
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

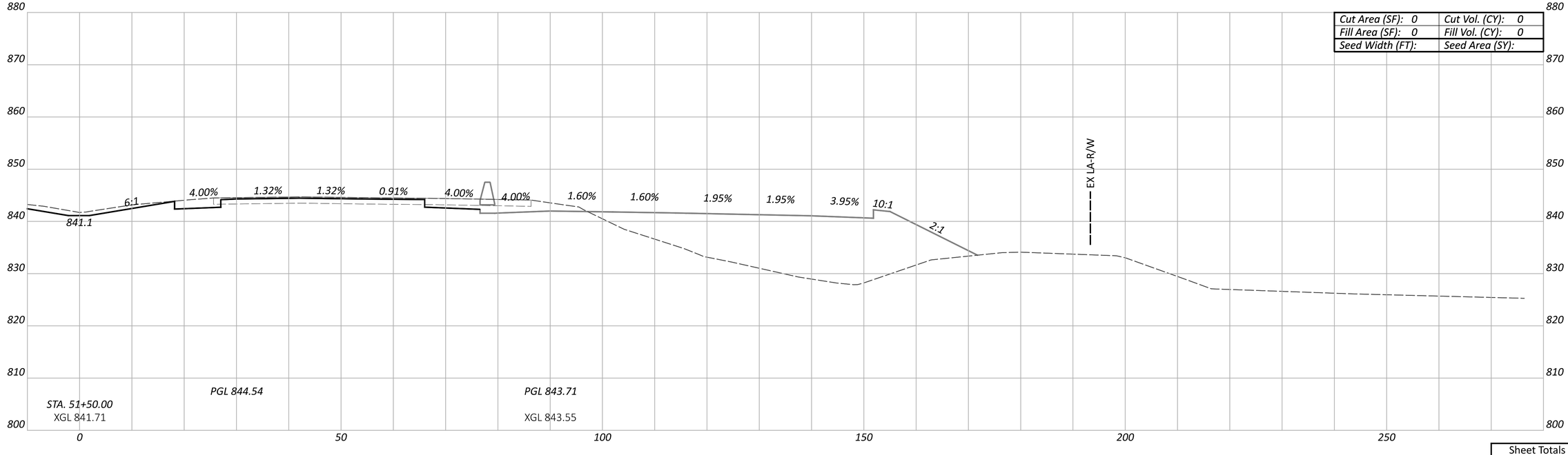
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.270	740





CROSS SECTIONS - IR 70 EB
STA. 51+50.00 TO STA. 52+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.271	740

FAI/LIC IR 70 0.00/0.00

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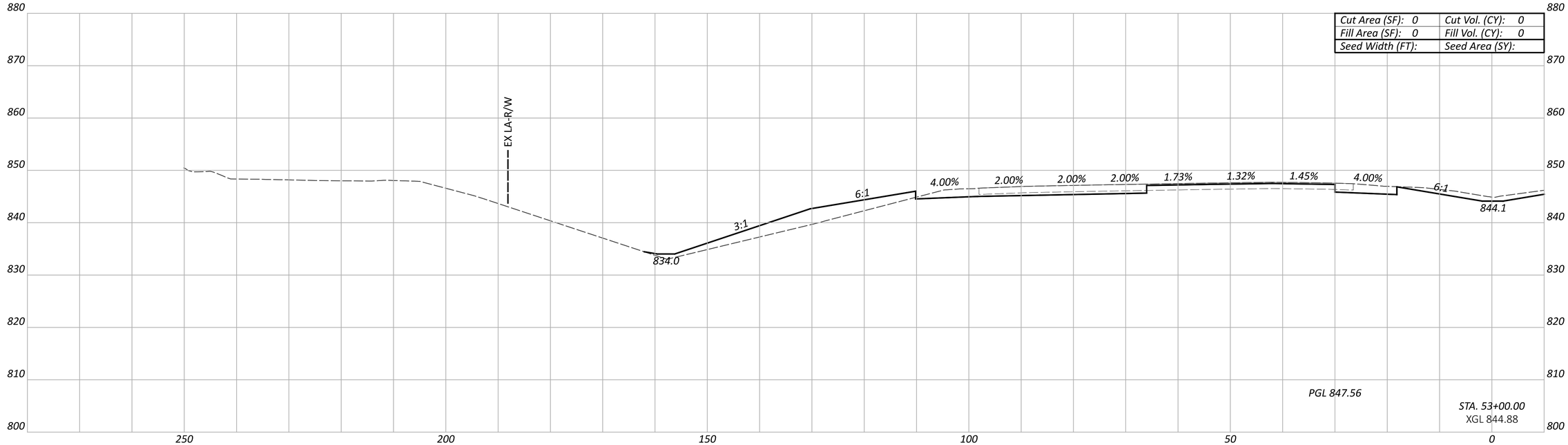

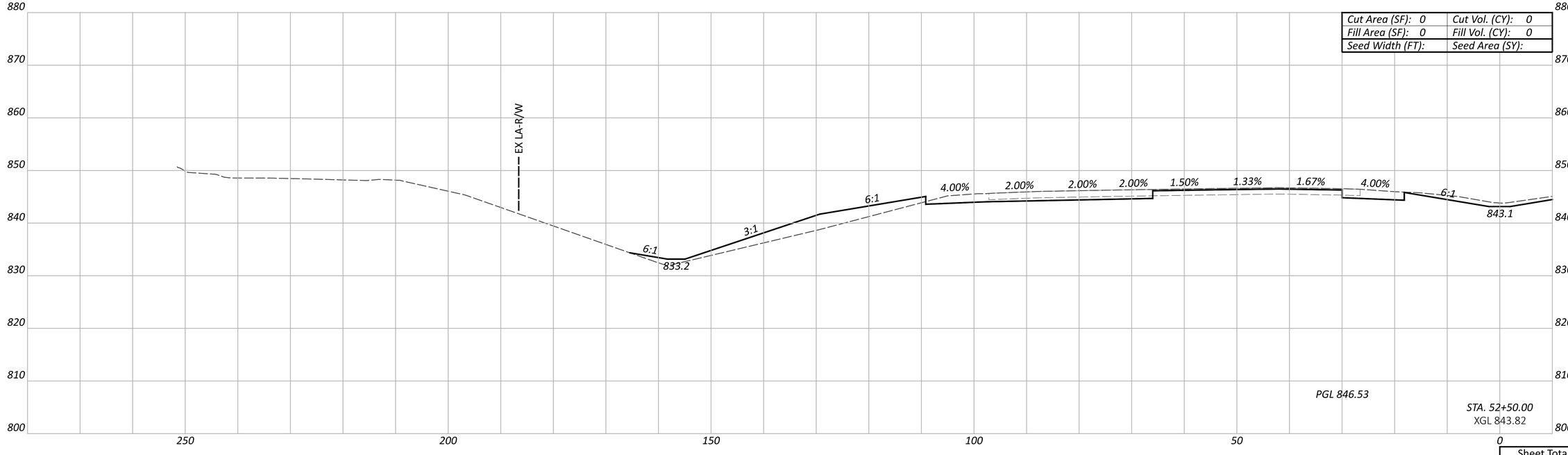

CROSS SECTIONS - IR 70 WB
STA. 52+50.00 TO STA. 53+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

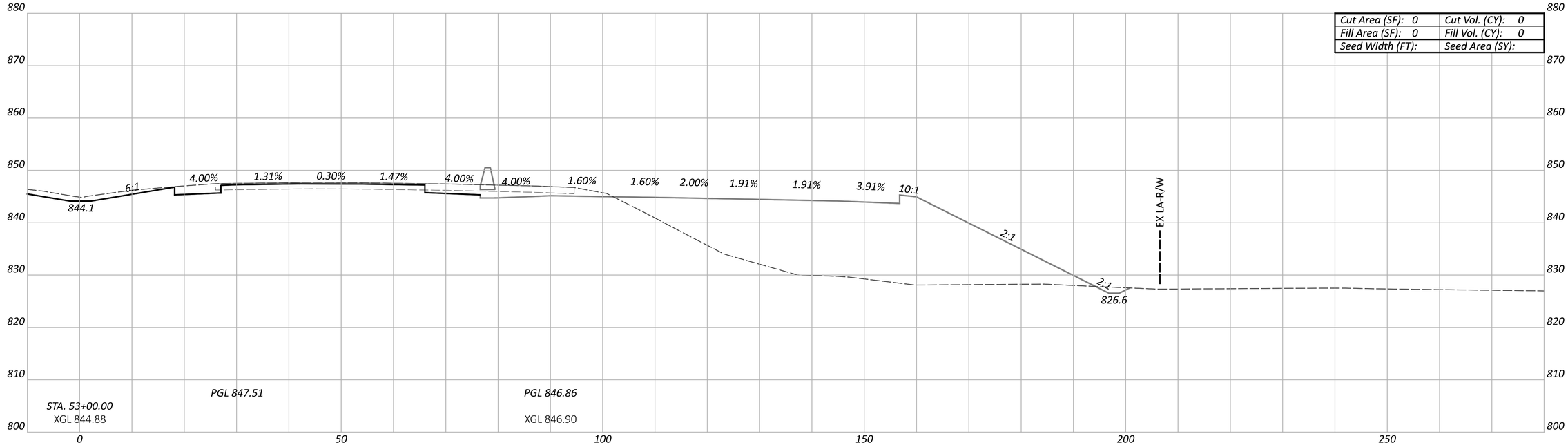
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

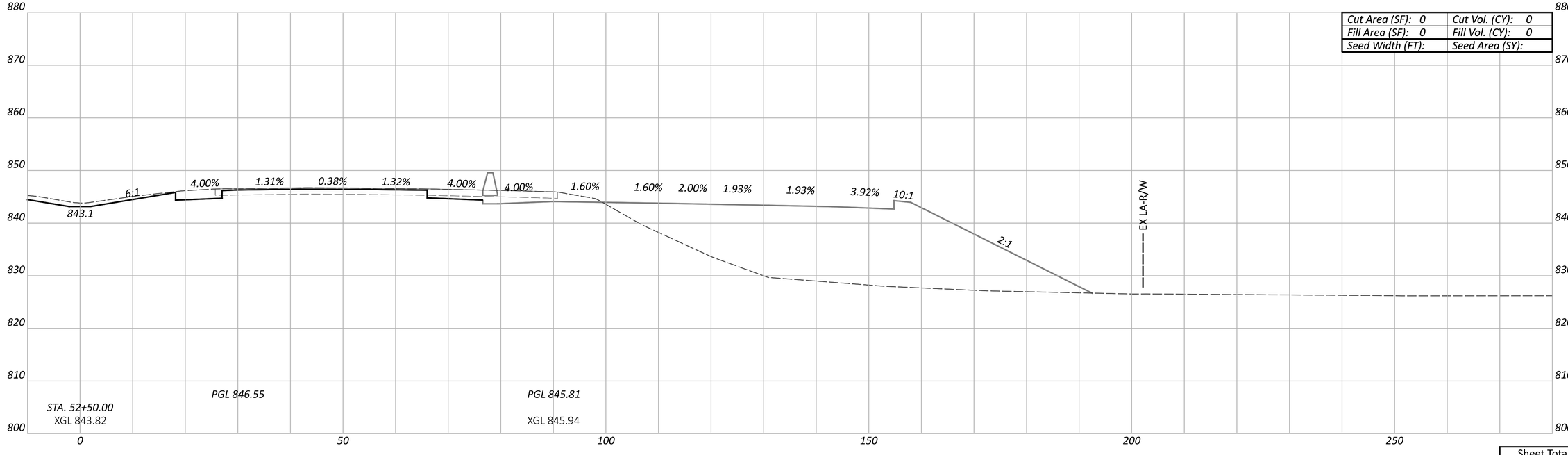
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.272 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 52+50.00 TO STA. 53+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.273 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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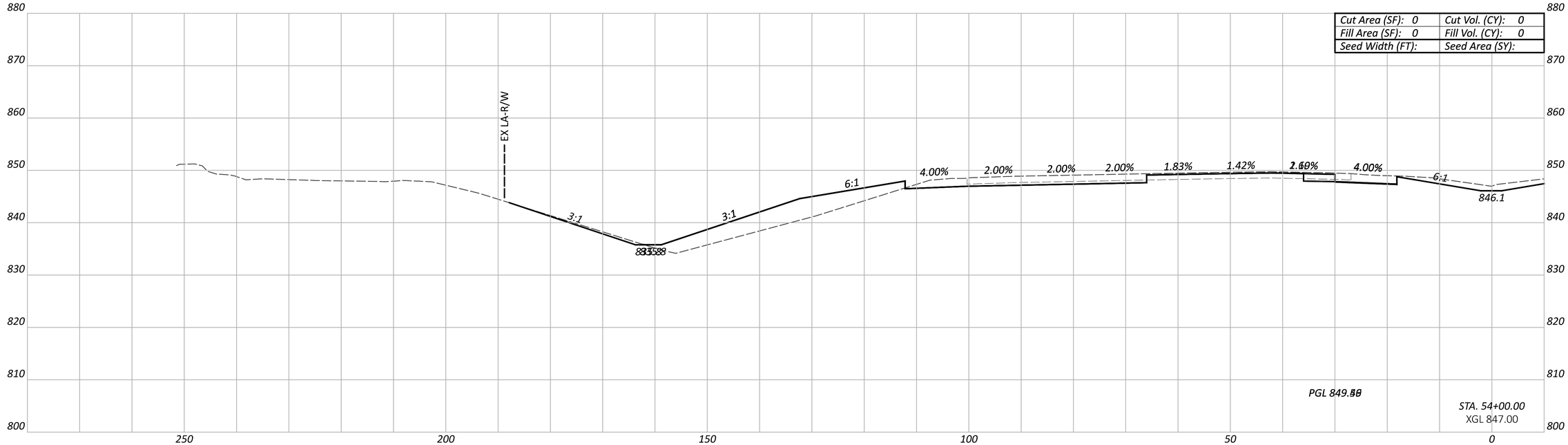

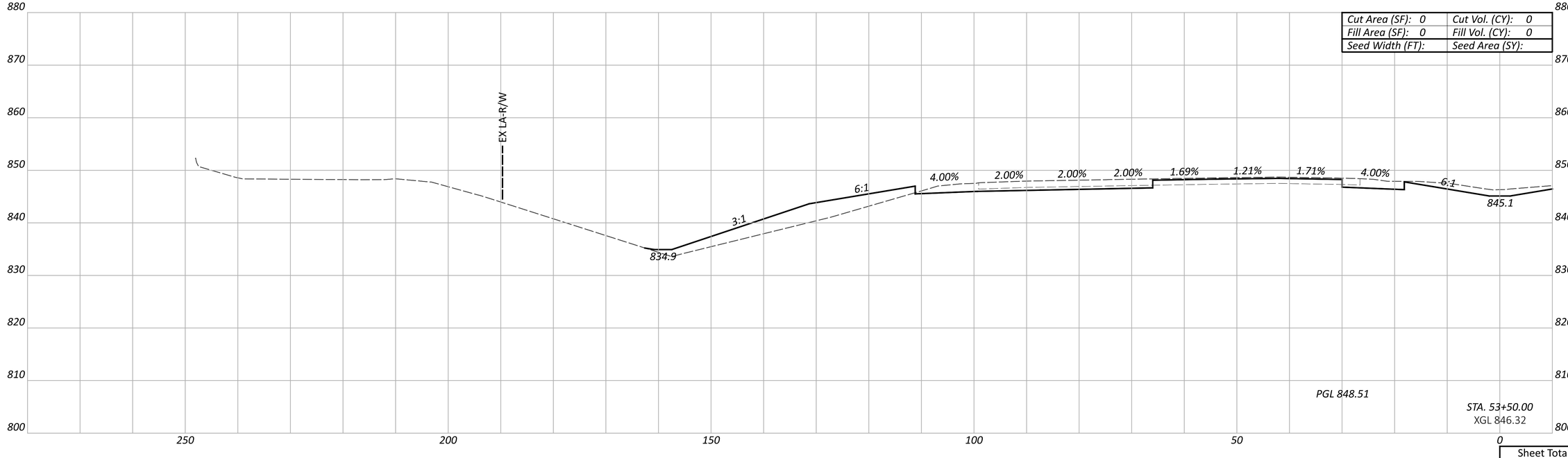

CROSS SECTIONS - IR 70 WB
STA. 53+50.00 TO STA. 54+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.274 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 53+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:17:47 PM USER: aoldaker
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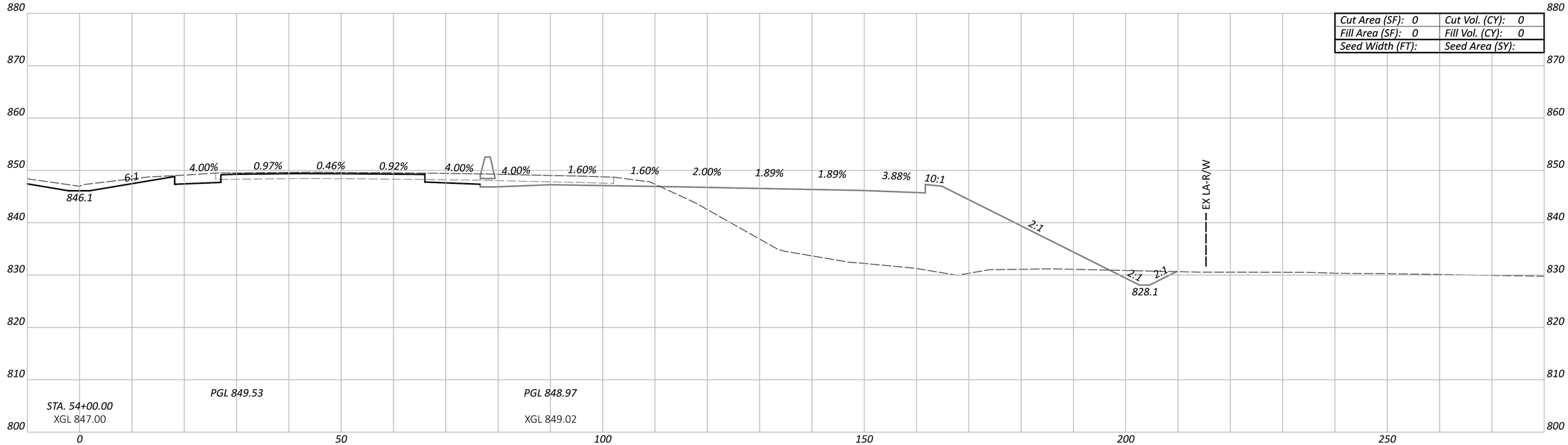

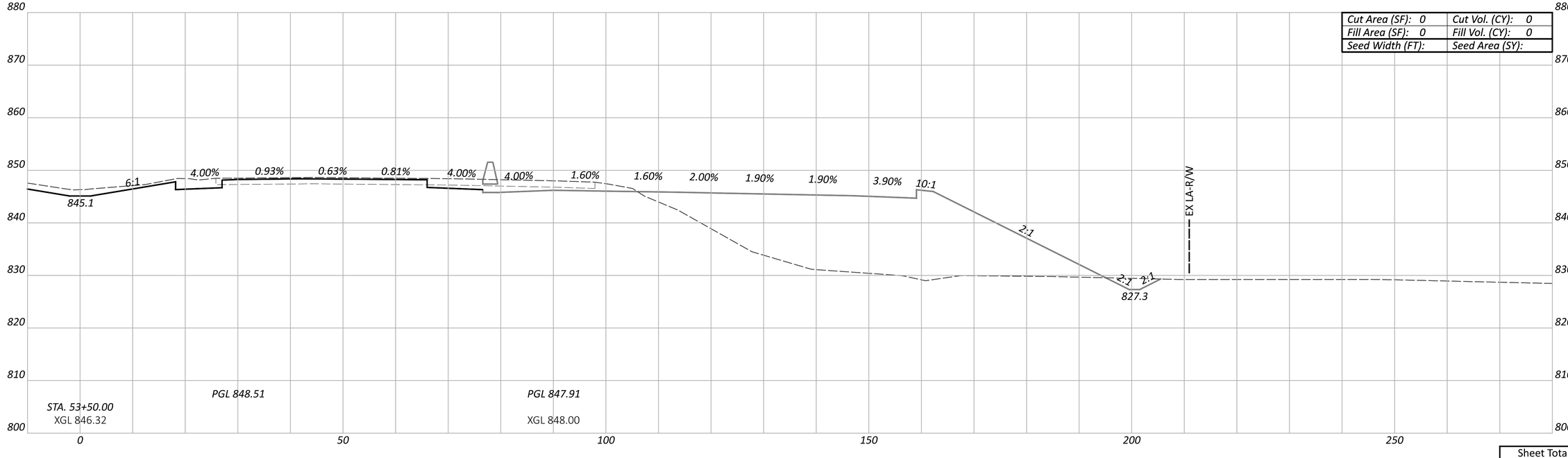

CROSS SECTIONS - IR 70 EB
STA. 53+50.00 TO STA. 54+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.275 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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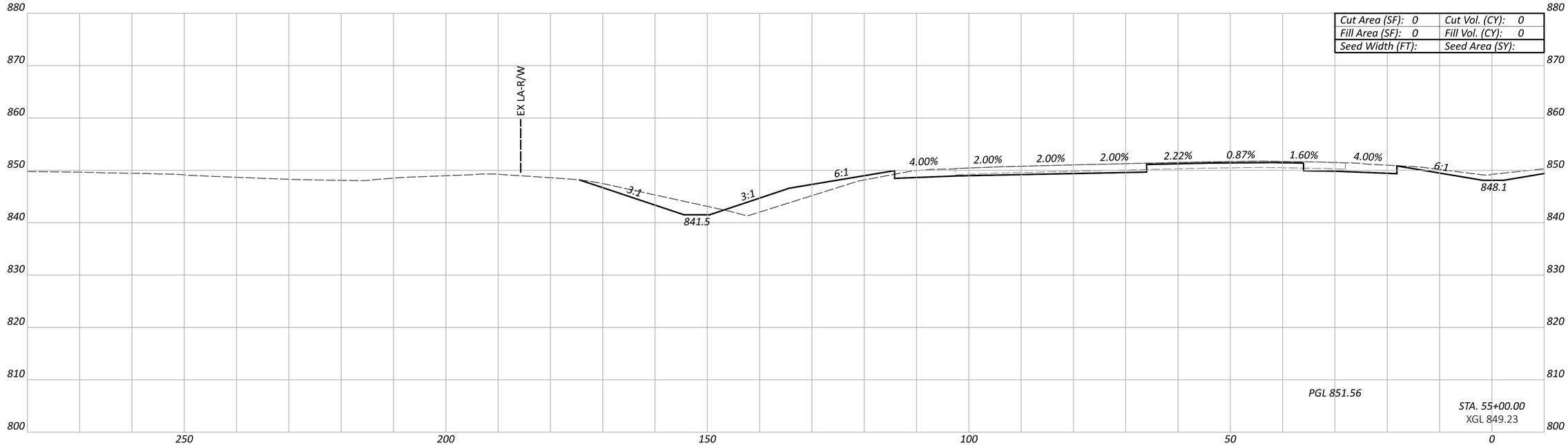

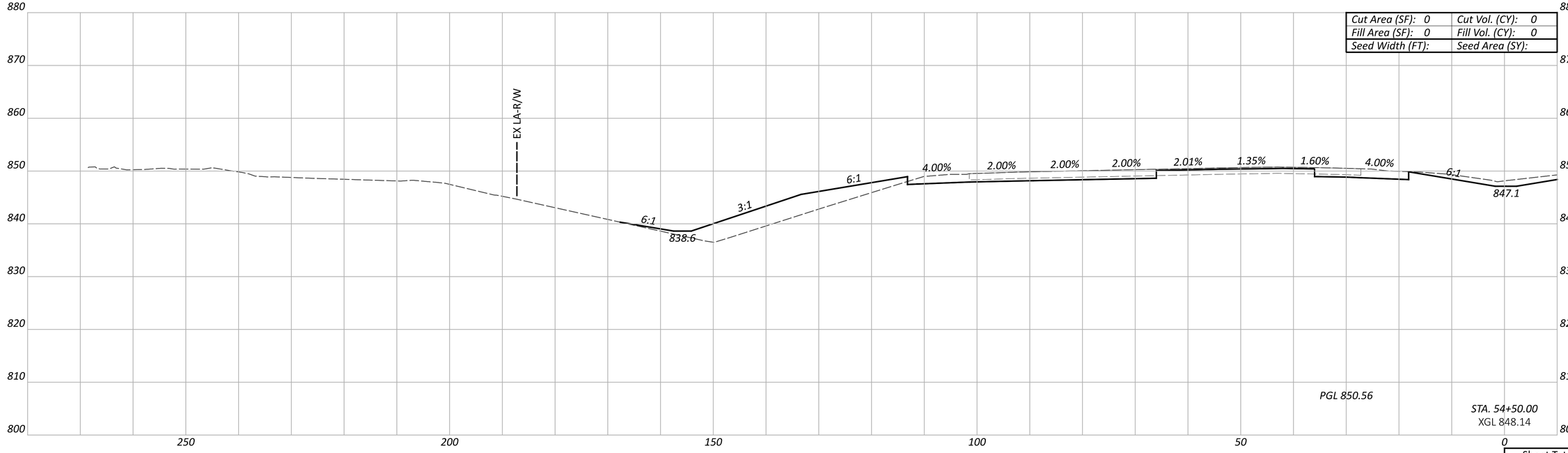

CROSS SECTIONS - IR 70 WB
STA. 54+50.00 TO STA. 55+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.276 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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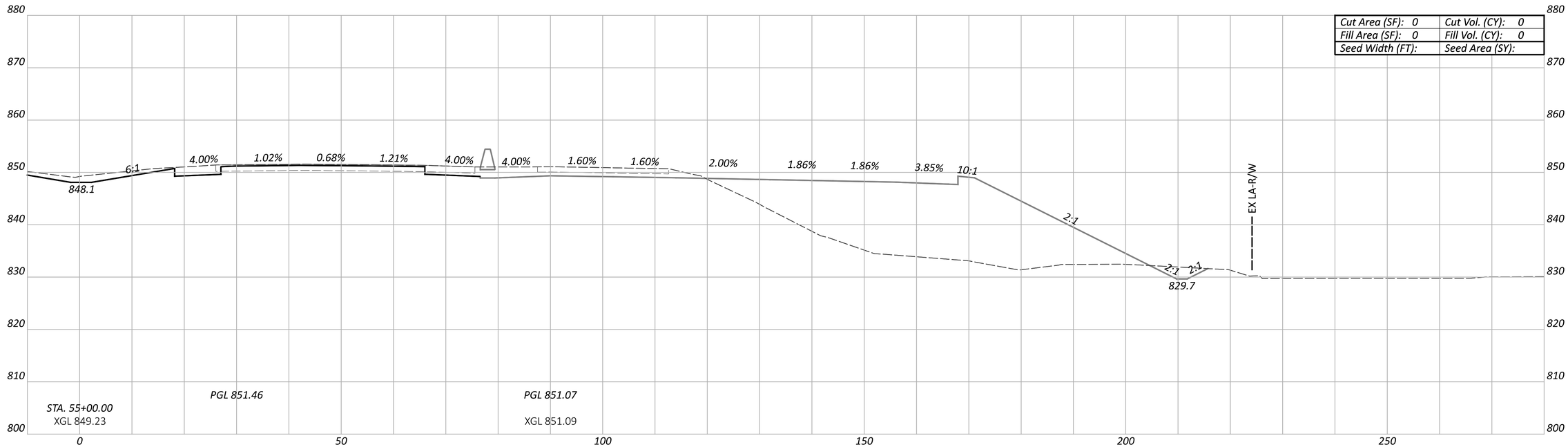

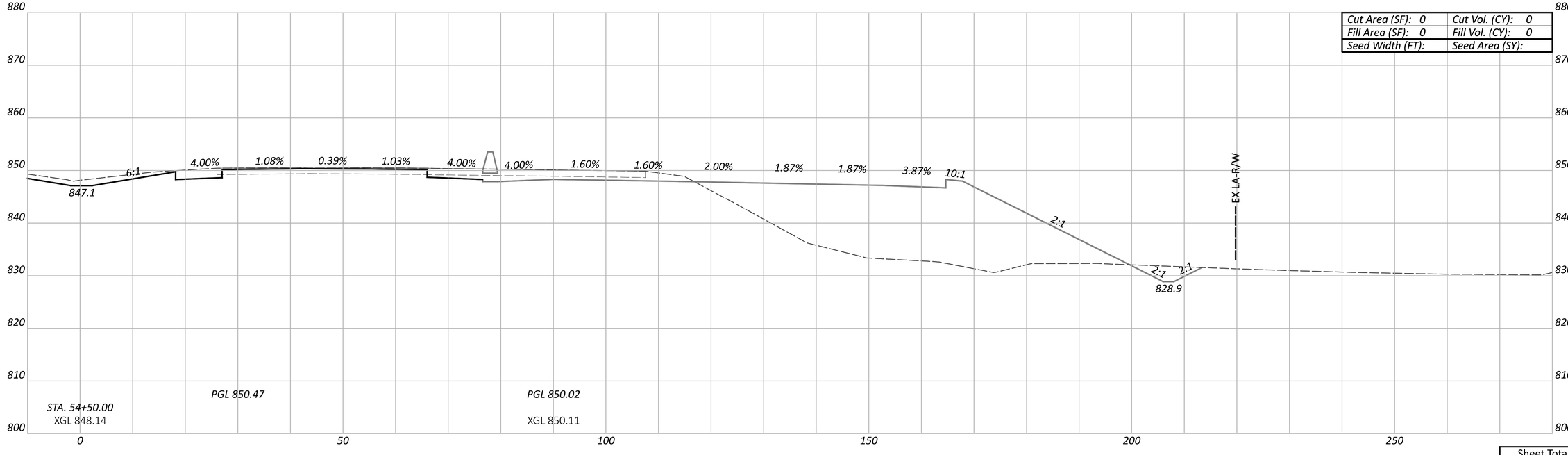

CROSS SECTIONS - IR 70 EB
STA. 54+50.00 TO STA. 55+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

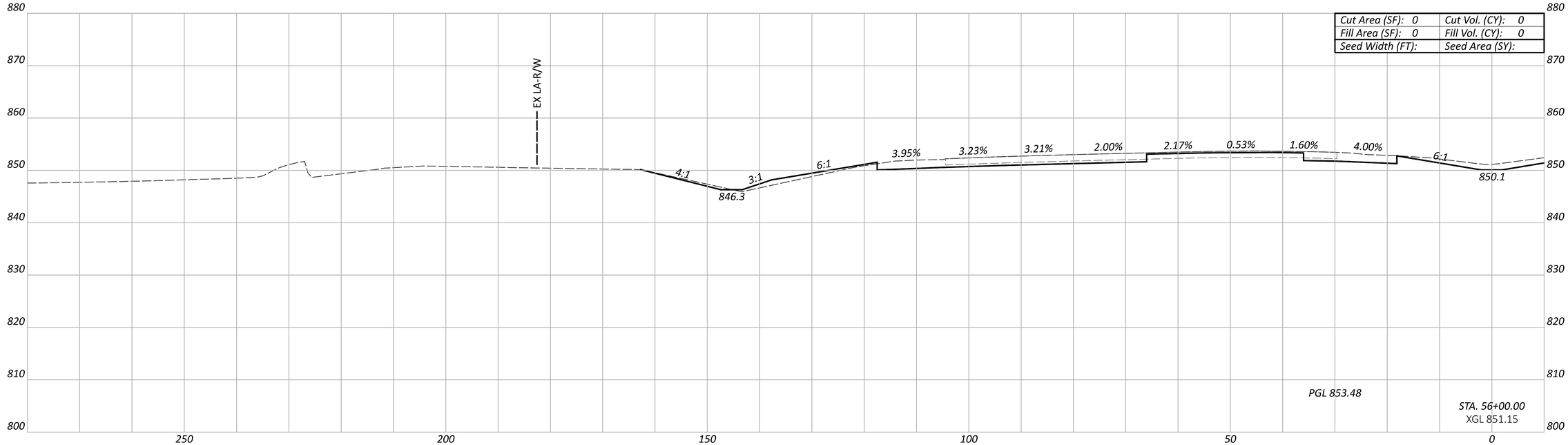
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

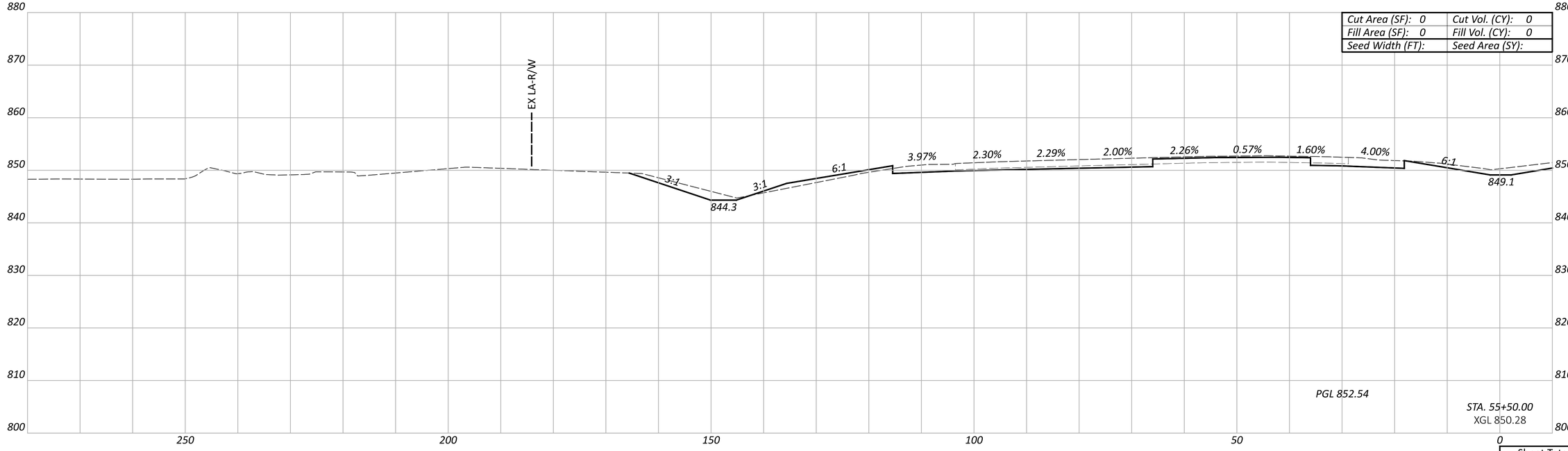
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.277 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 55+50.00 TO STA. 56+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.278 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 55+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:17:59 PM USER: aoldaker
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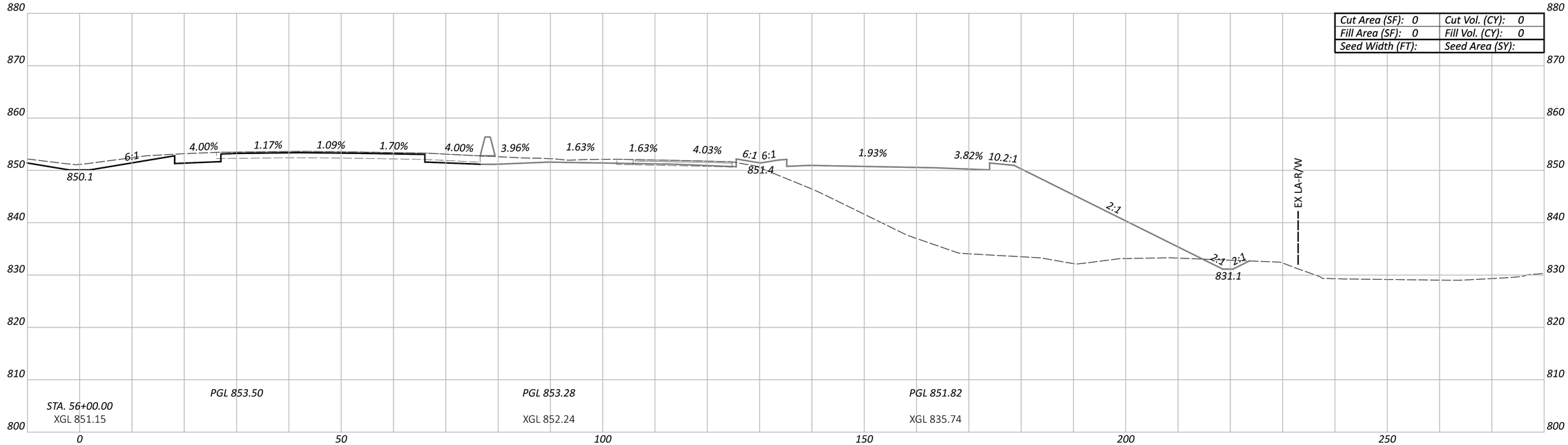

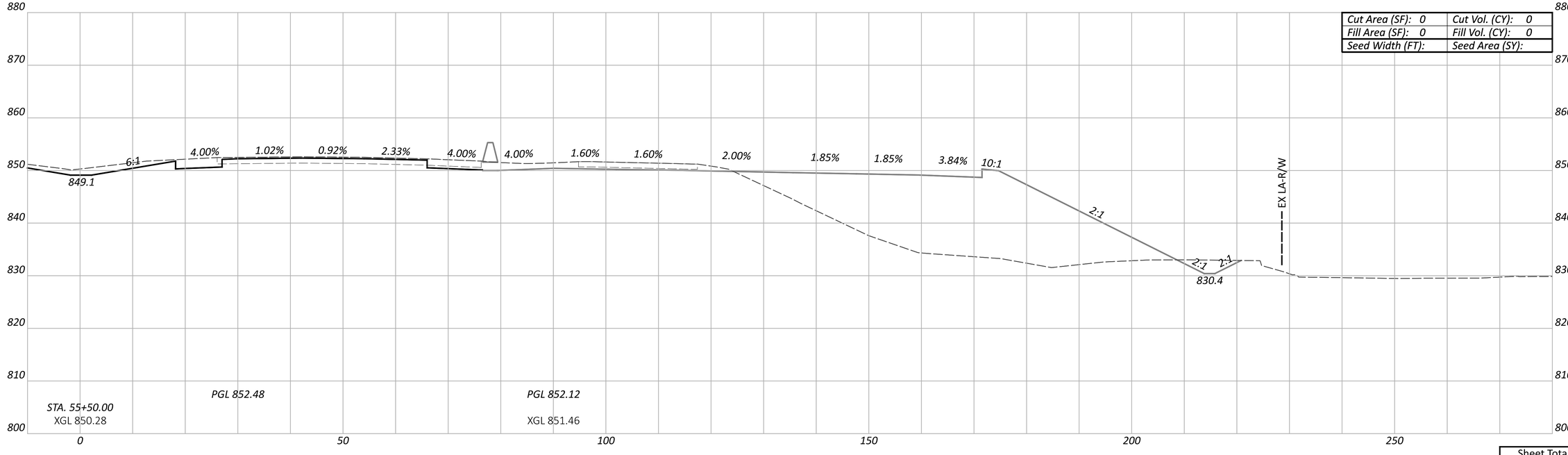

CROSS SECTIONS - IR 70 EB
STA. 55+50.00 TO STA. 56+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 55+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:02 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

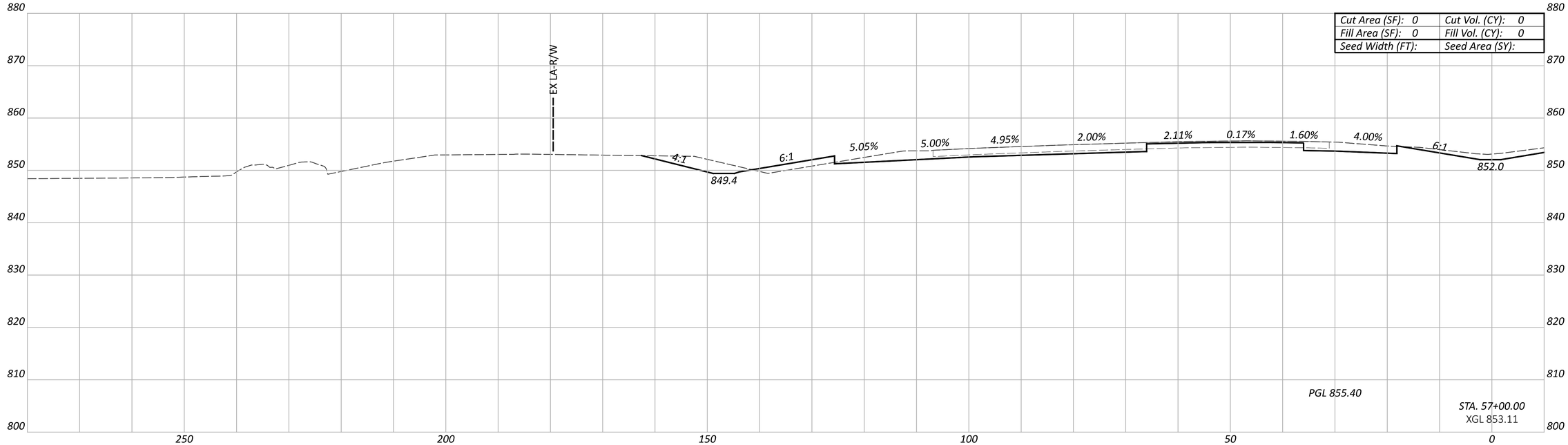
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

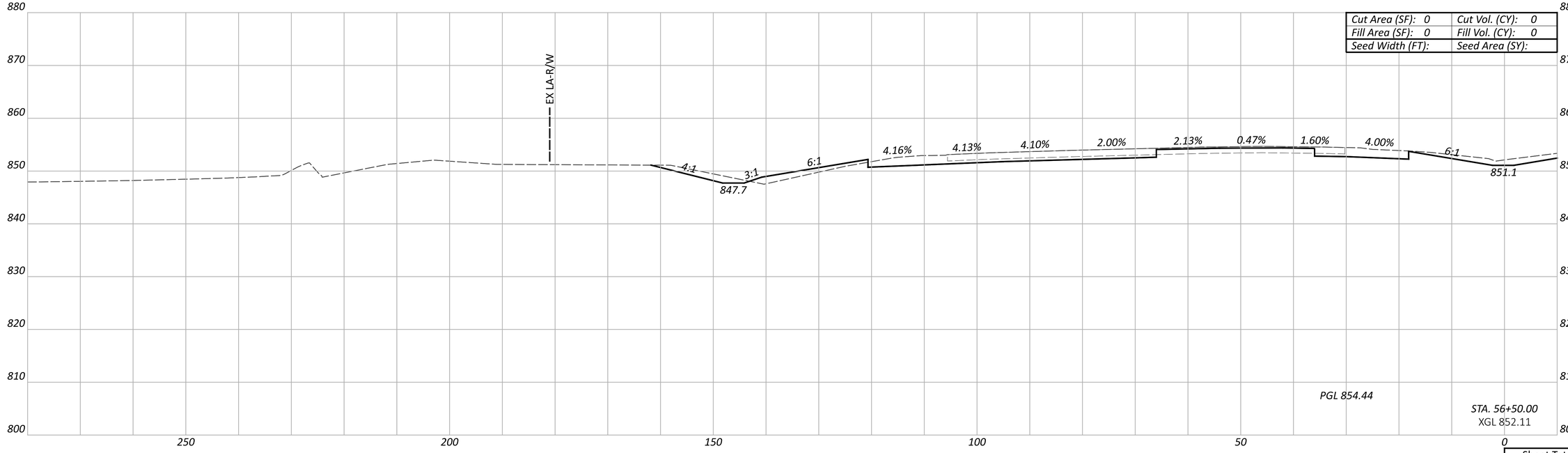
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.279 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 56+50.00 TO STA. 57+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

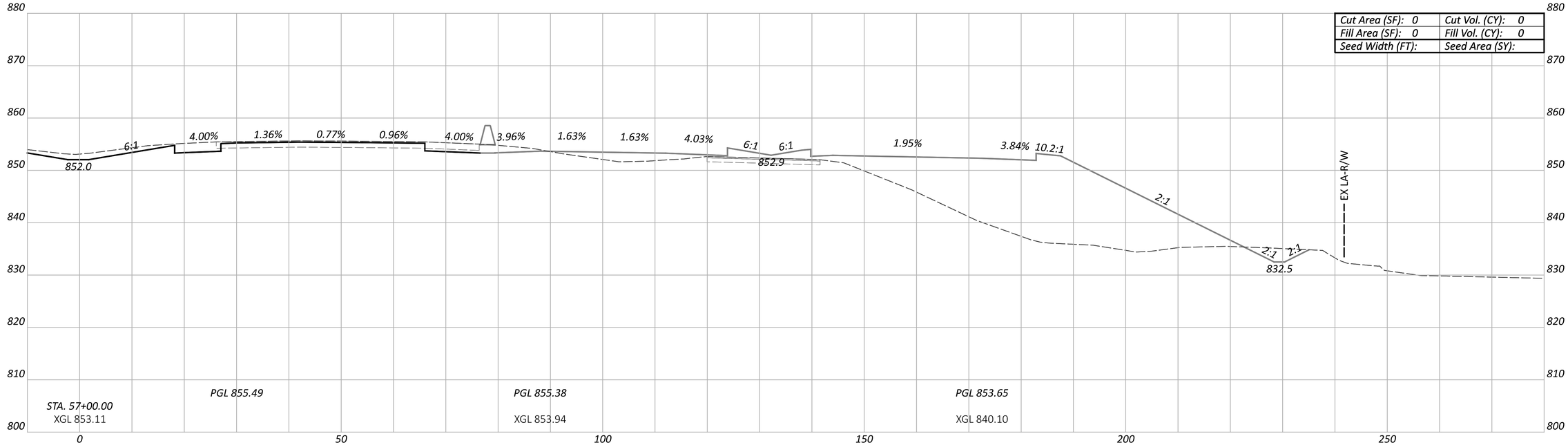
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

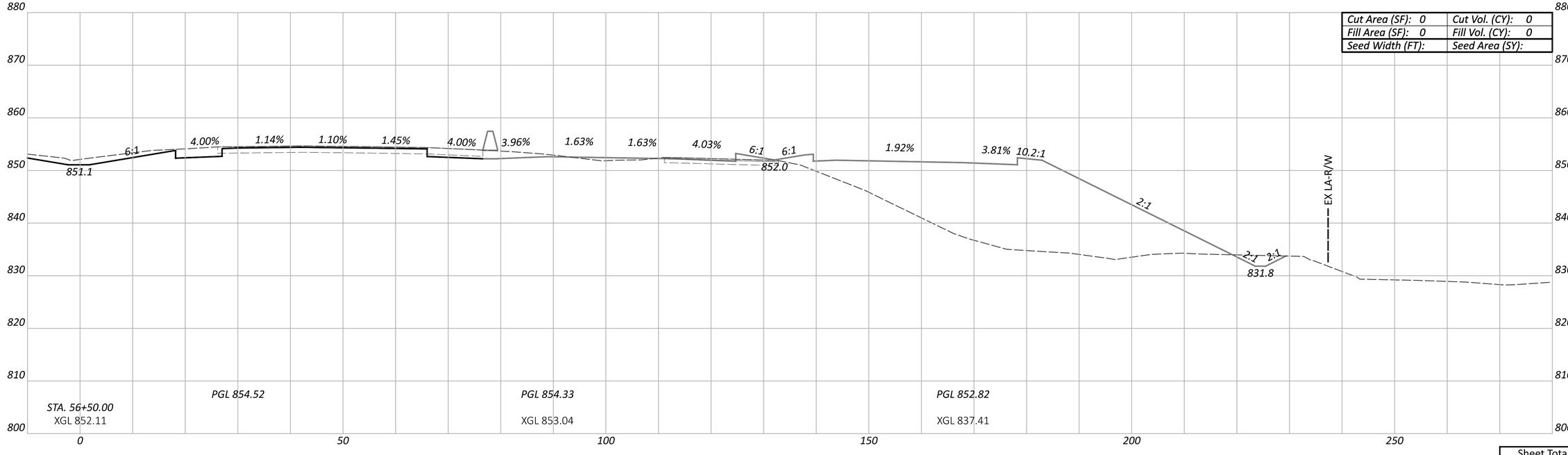
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.280 TOTAL 740





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CROSS SECTIONS - IR 70 EB
STA. 56+50.00 TO STA. 57+00.00

Sheet Totals

Seeding	Cut	Fill

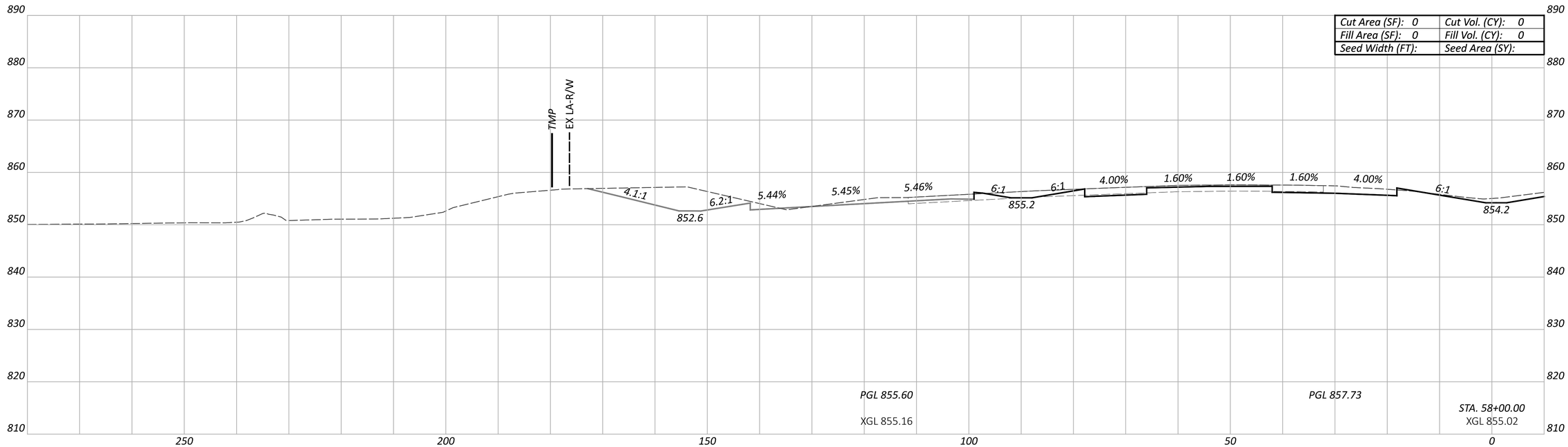
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

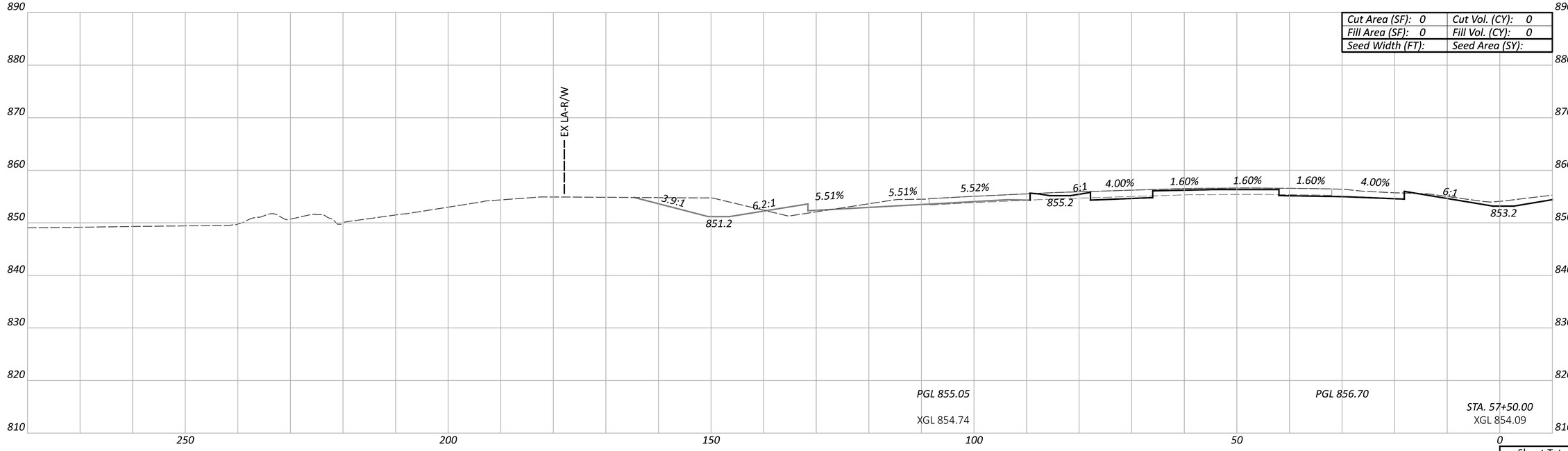
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.281 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 57+50.00 TO STA. 58+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

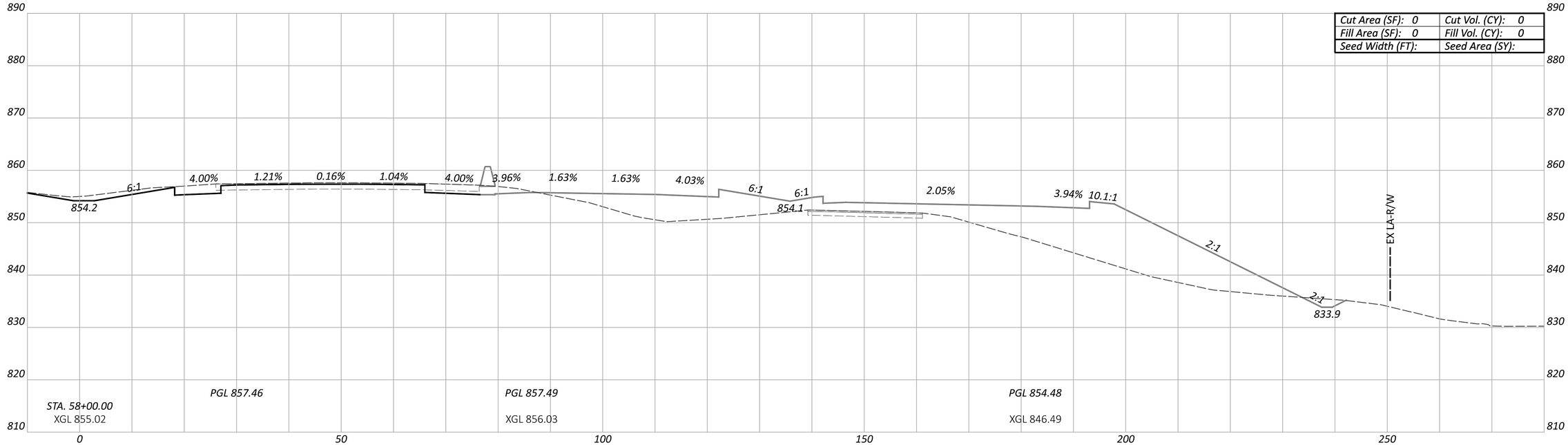
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

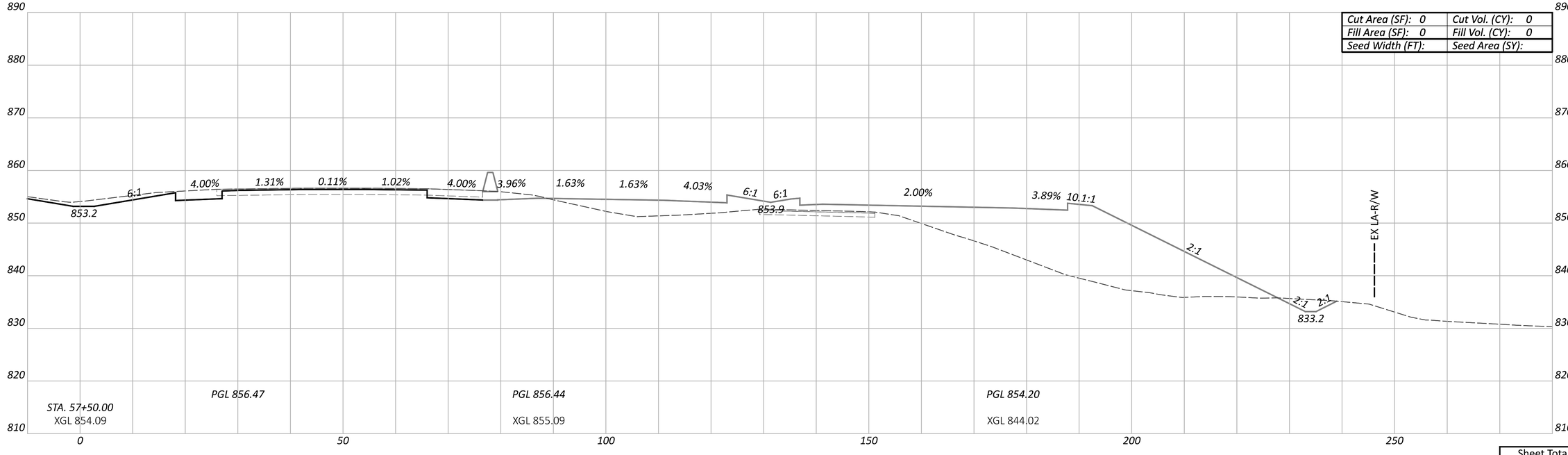
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.282	740





CROSS SECTIONS - IR 70 EB
STA. 57+50.00 TO STA. 58+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.283 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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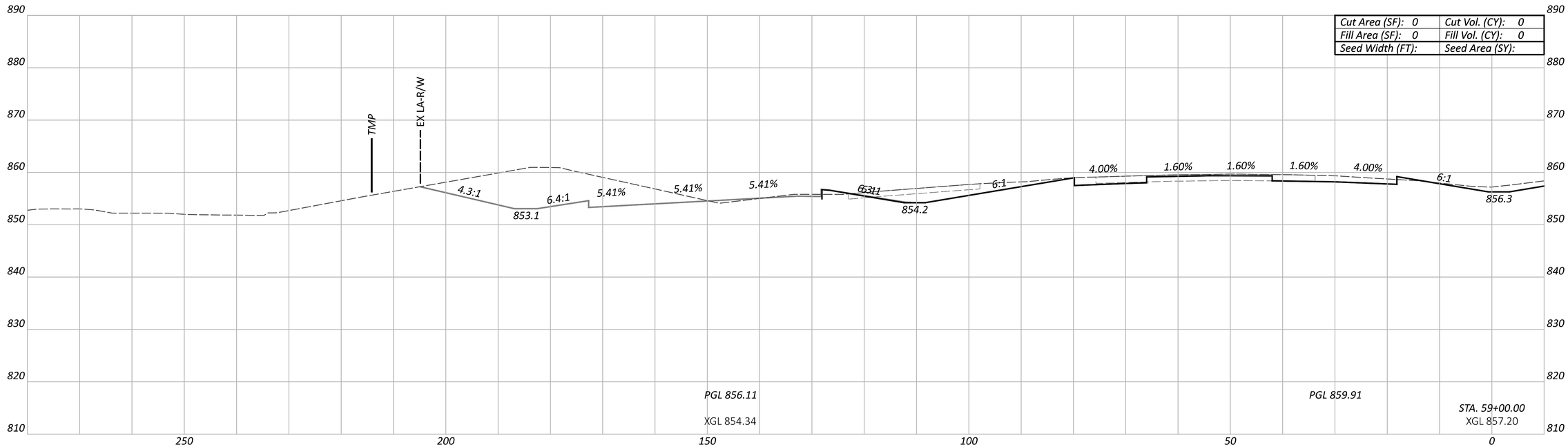

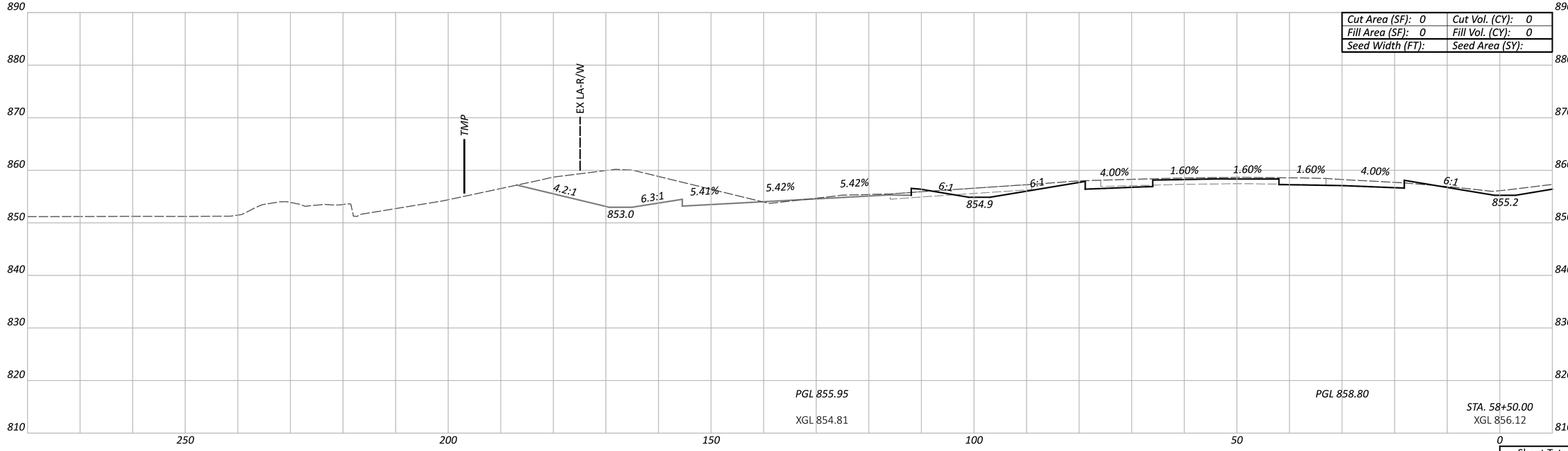

CROSS SECTIONS - IR 70 WB
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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

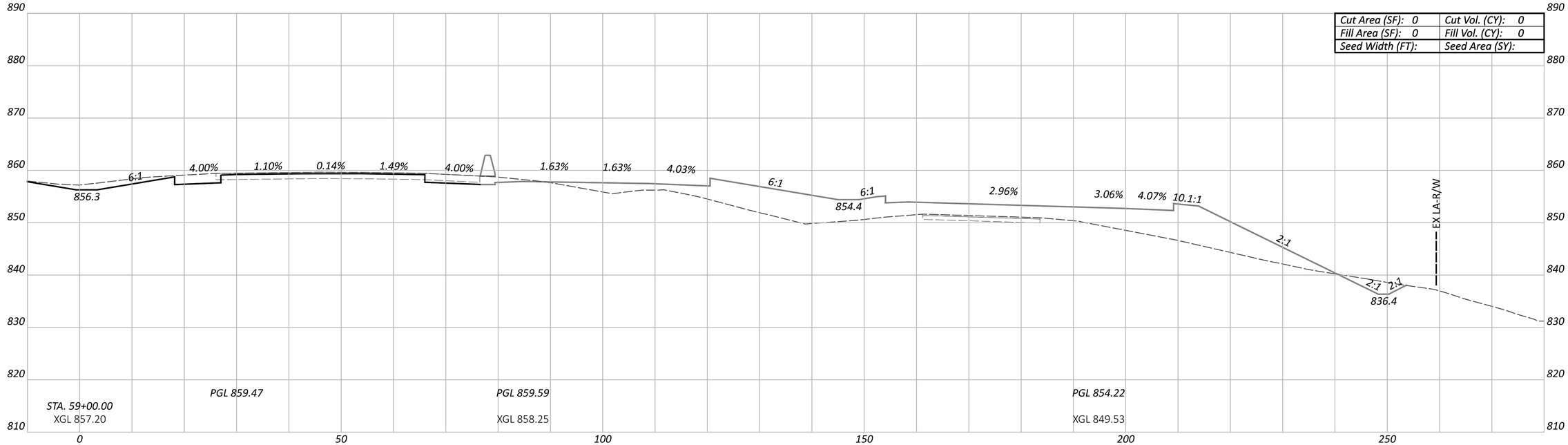
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

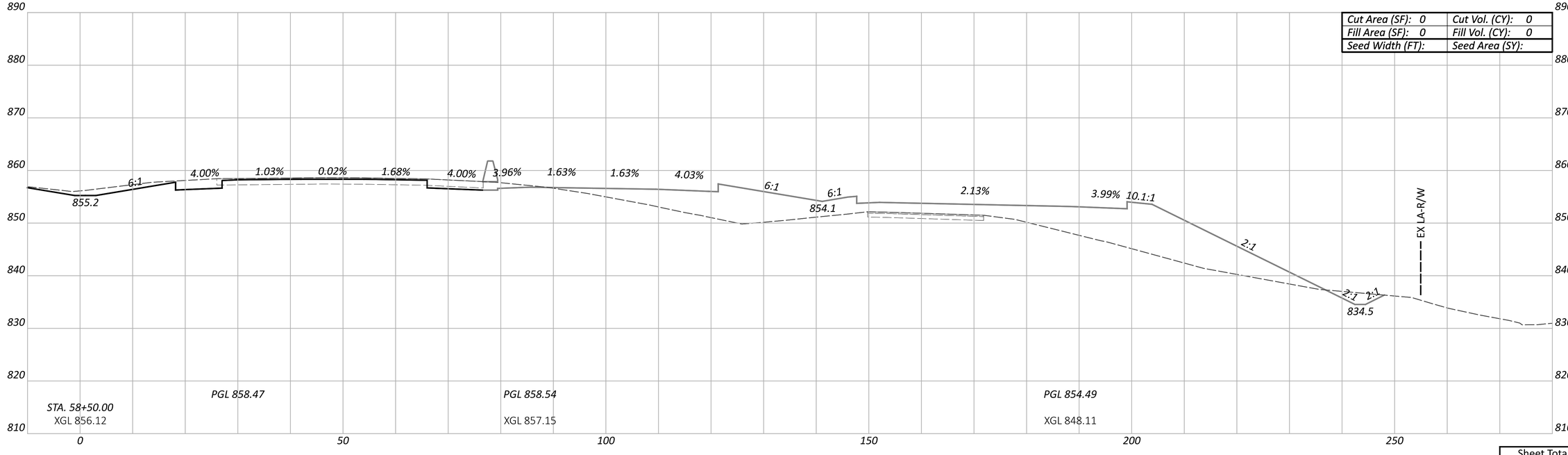
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.284 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 58+50.00 TO STA. 59+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.285 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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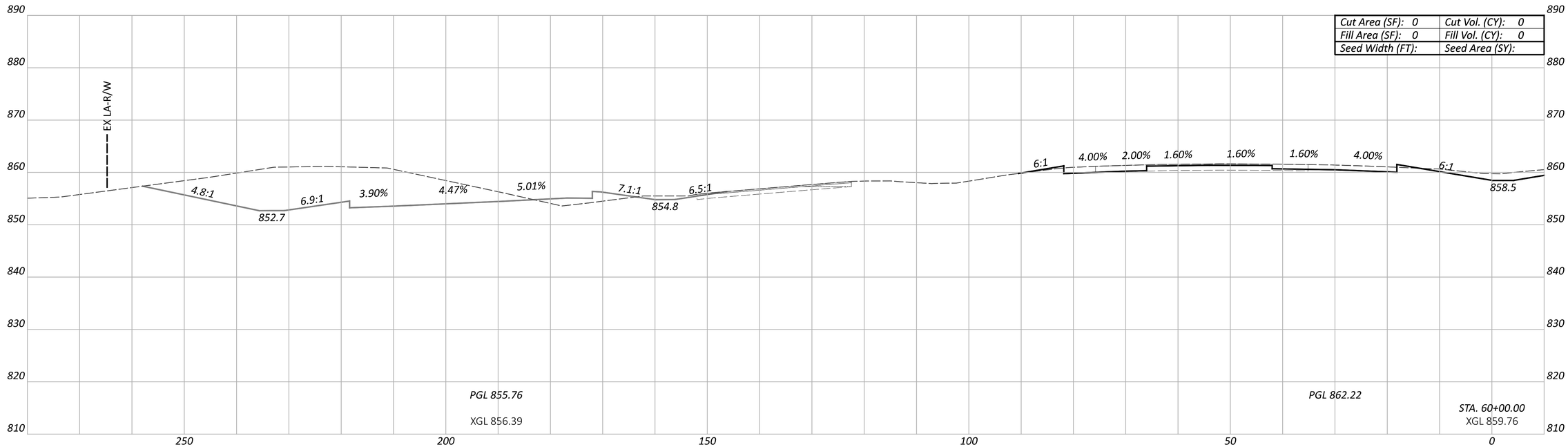

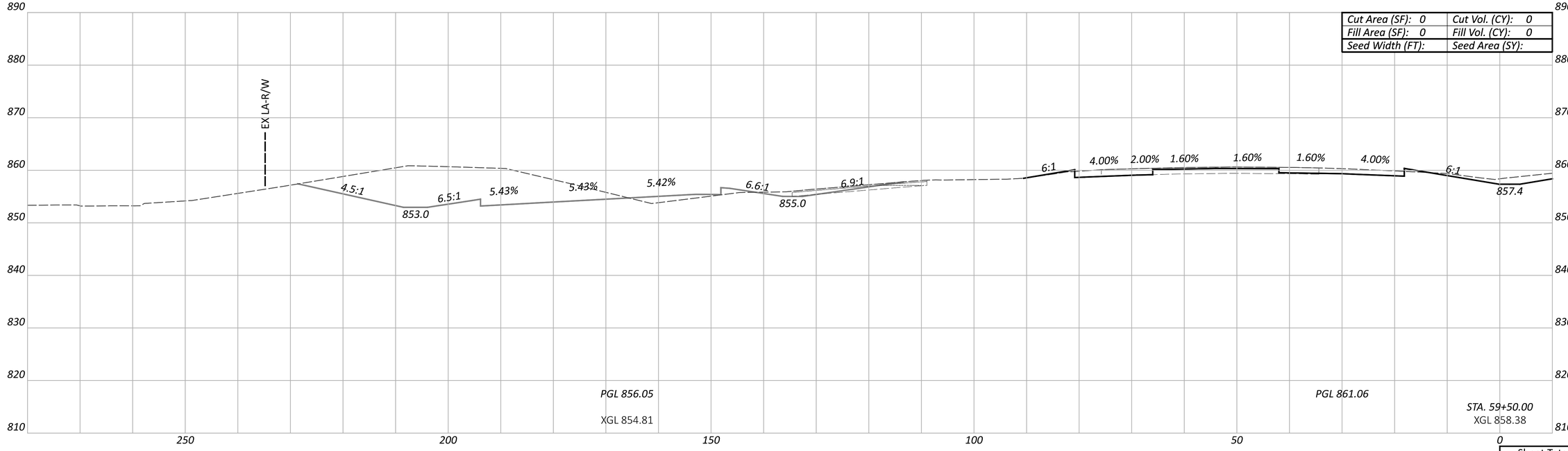

Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 WB
STA. 59+50.00 TO STA. 60+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.286	740

FAI/LIC IR 70 0.00/0.00

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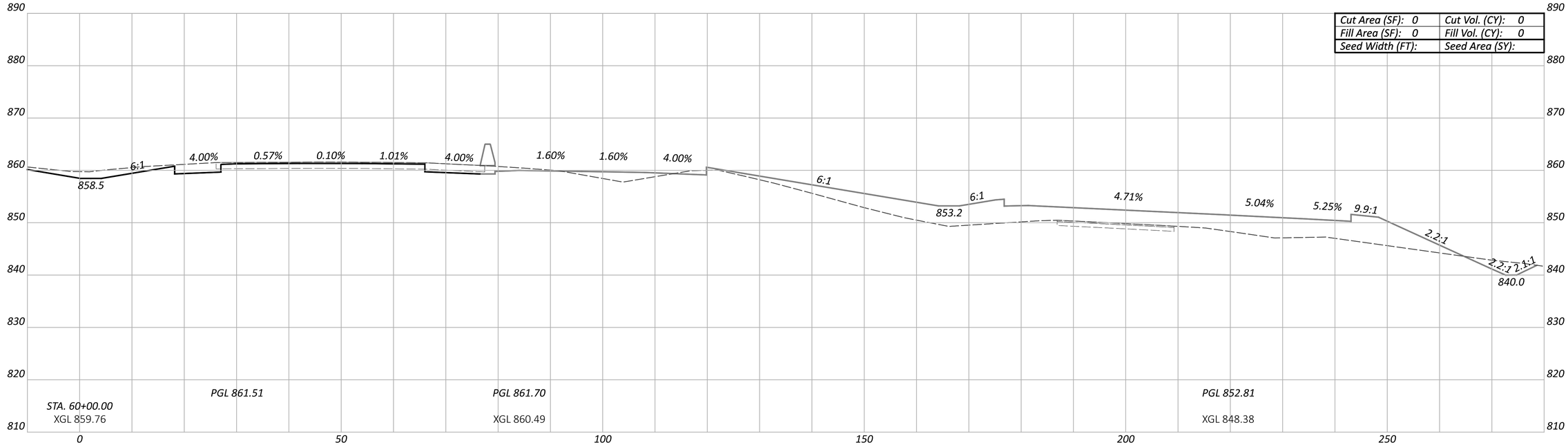

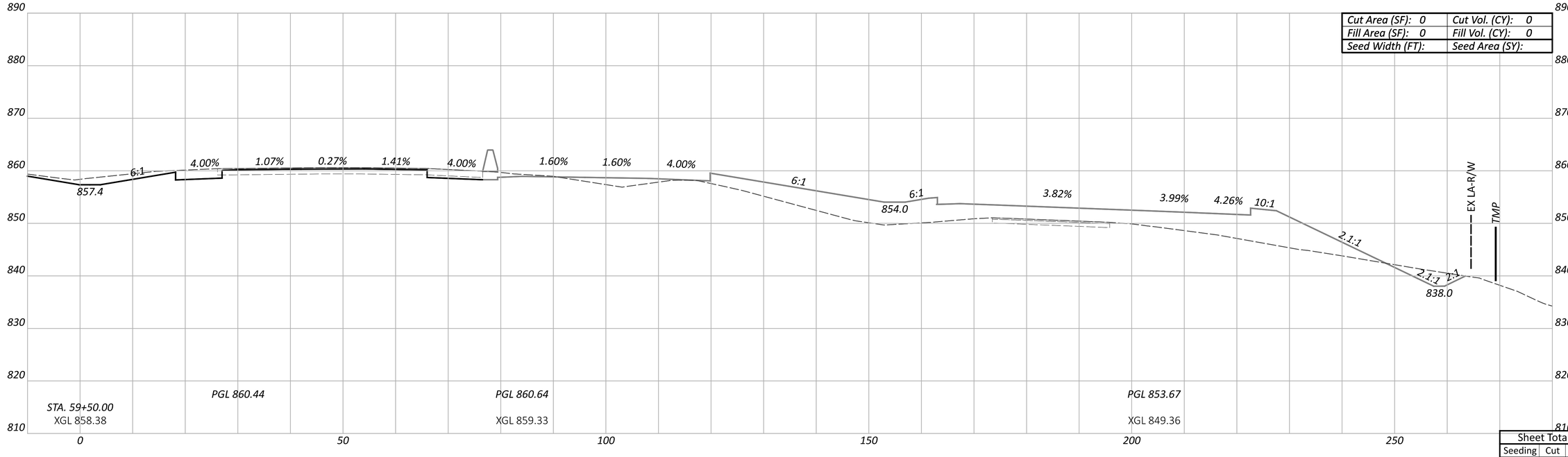

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 EB
STA. 59+50.00 TO STA. 60+00.00

Sheet Totals		
Seeding	Cut	Fill

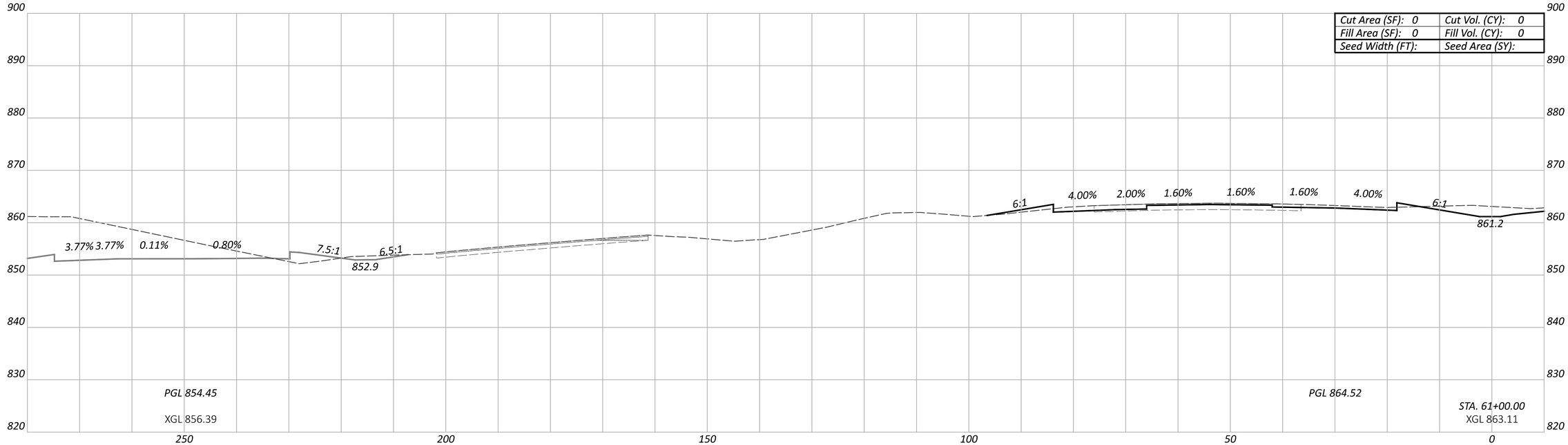
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

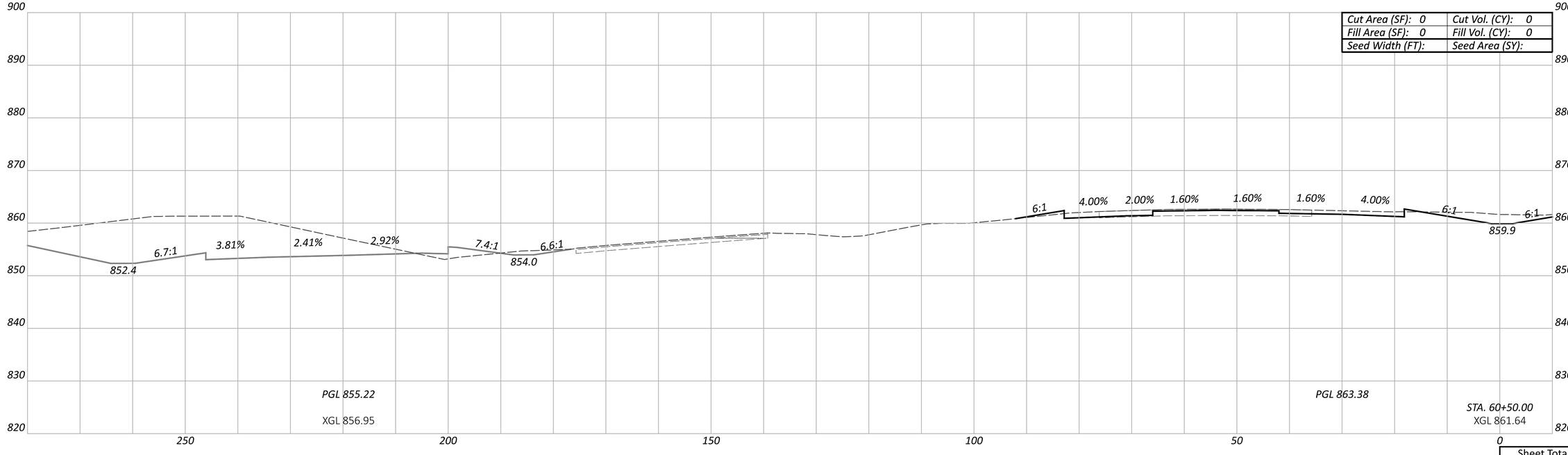
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.287 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 60+50.00 TO STA. 61+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

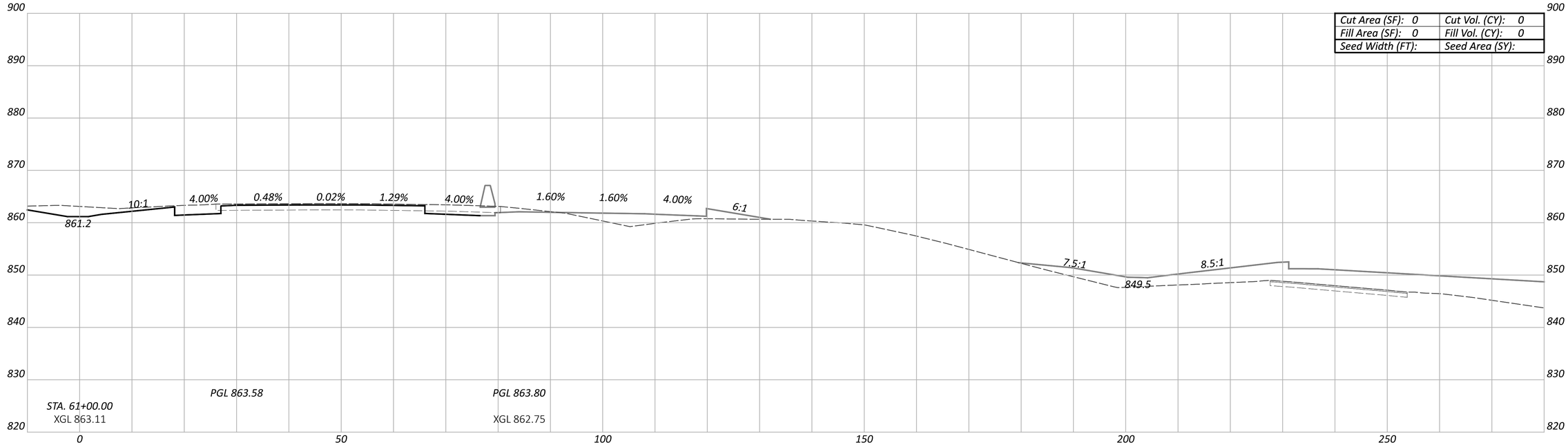
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

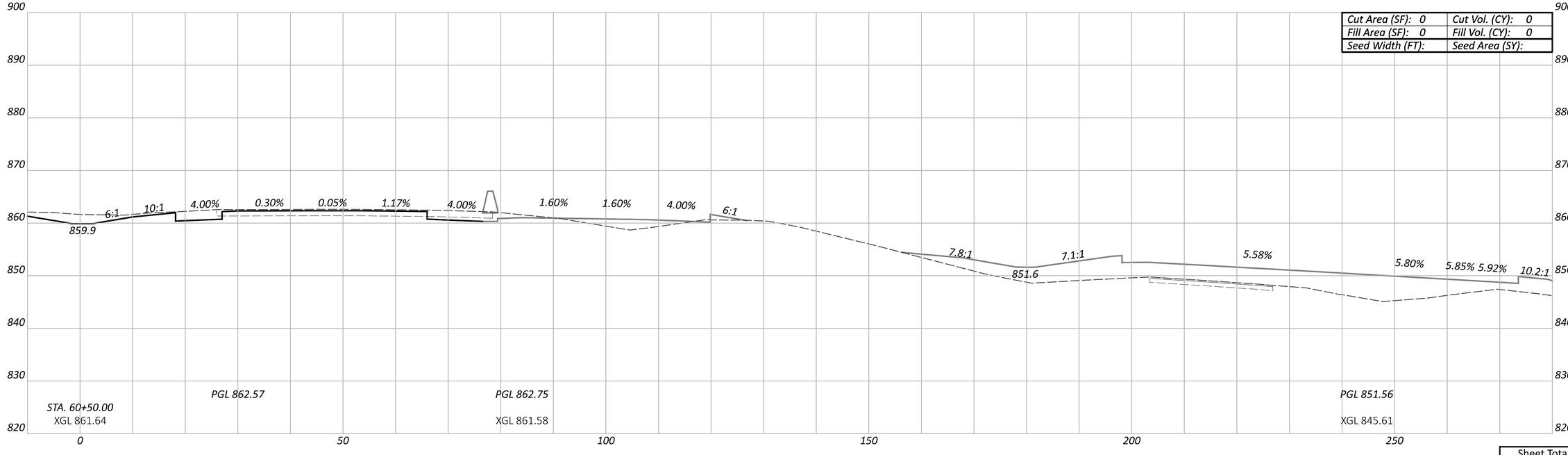
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.288 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 60+50.00 TO STA. 61+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

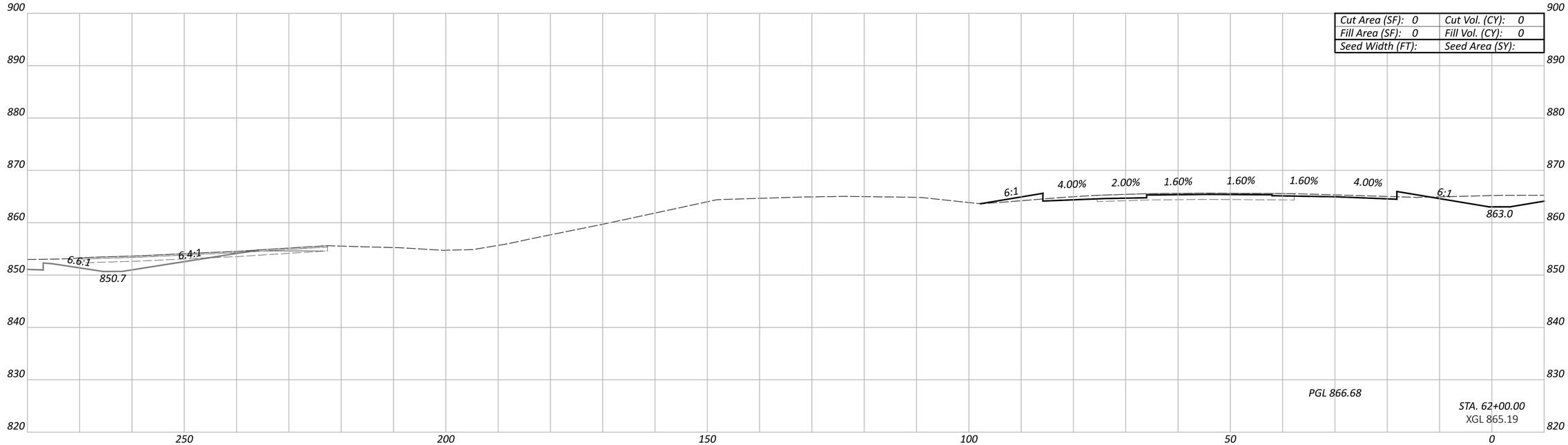
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

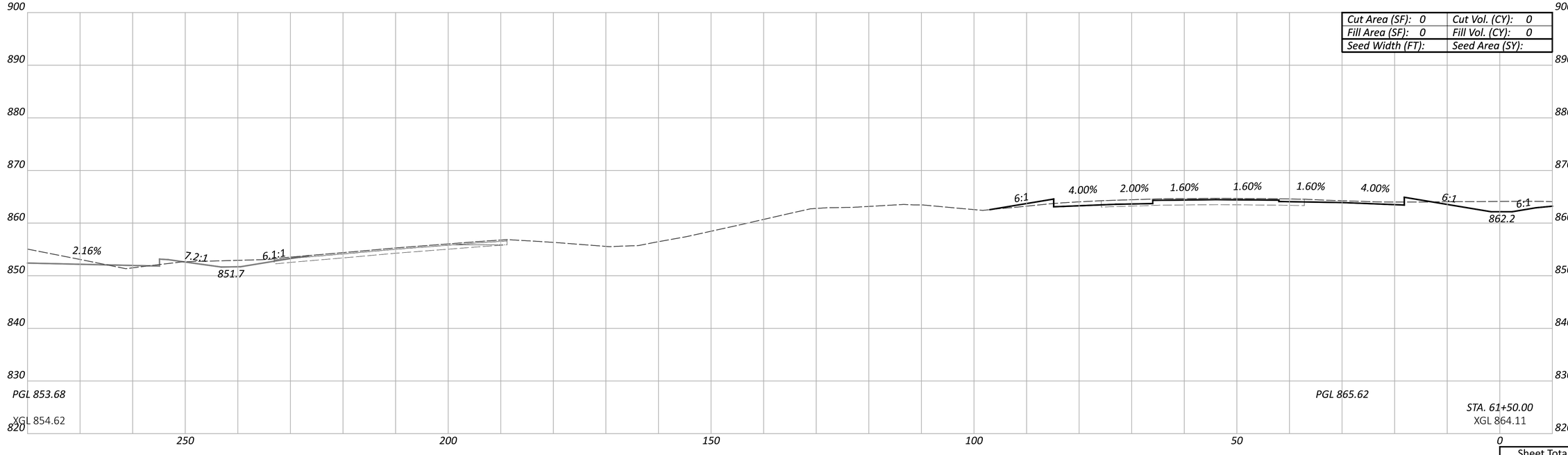
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.289 TOTAL 740





FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 61+50.00 TO STA. 62+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

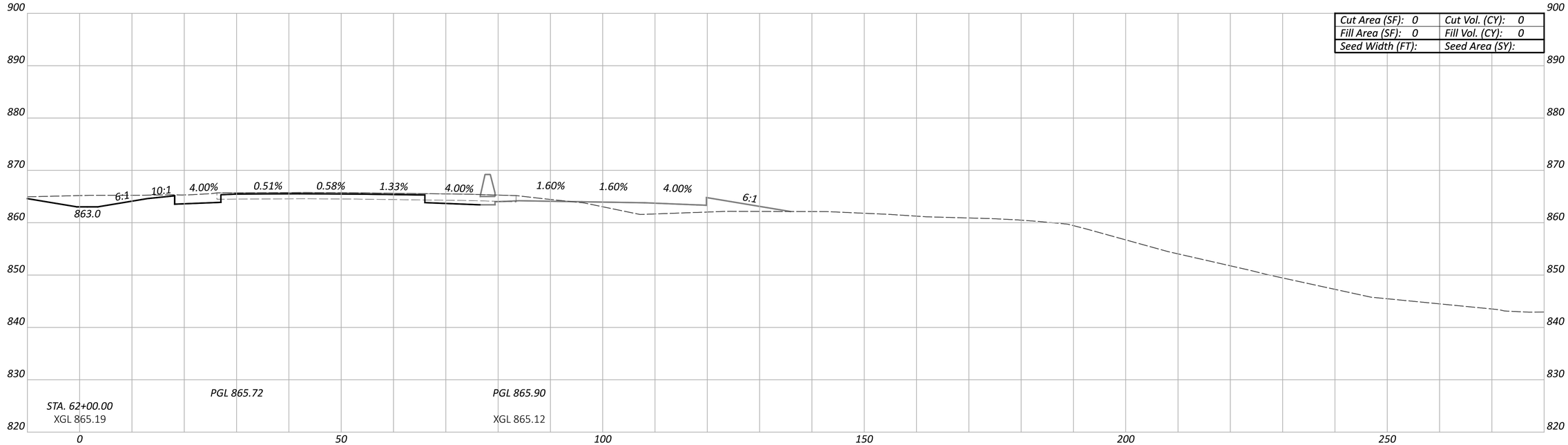
REVIEWER
KAM 06/18/23

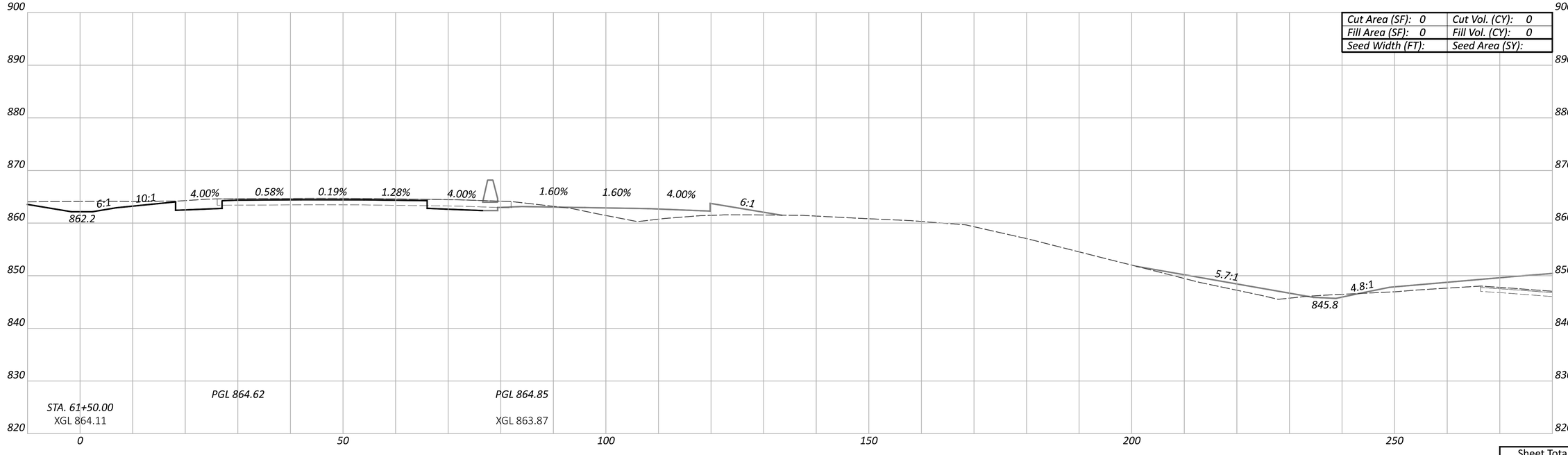
PROJECT ID
96808

SHEET P.290 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 61+50.00 TO STA. 62+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 61+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:38 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

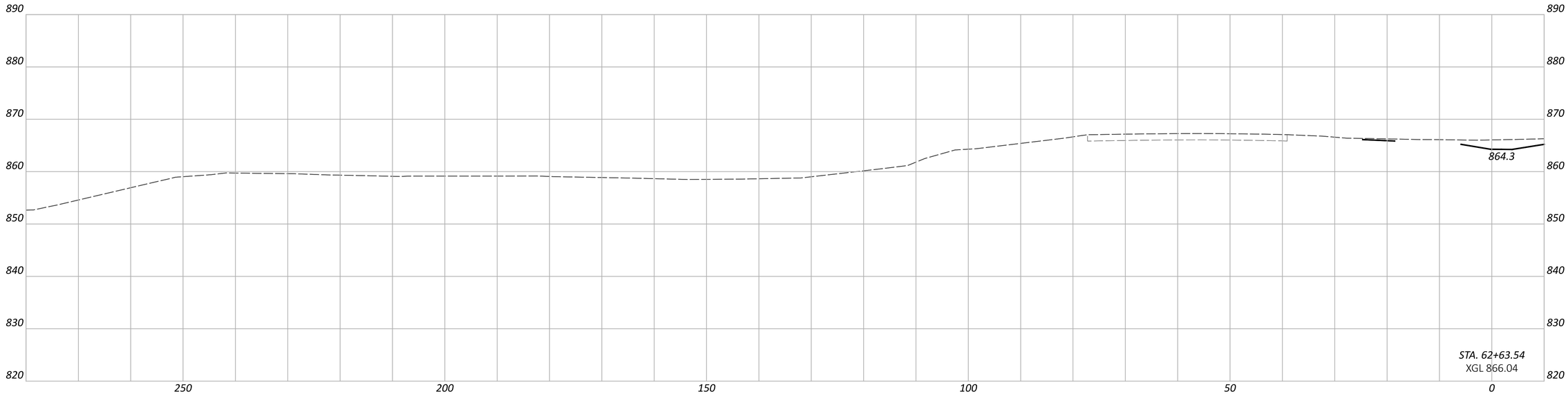
REVIEWER
KAM 06/18/23

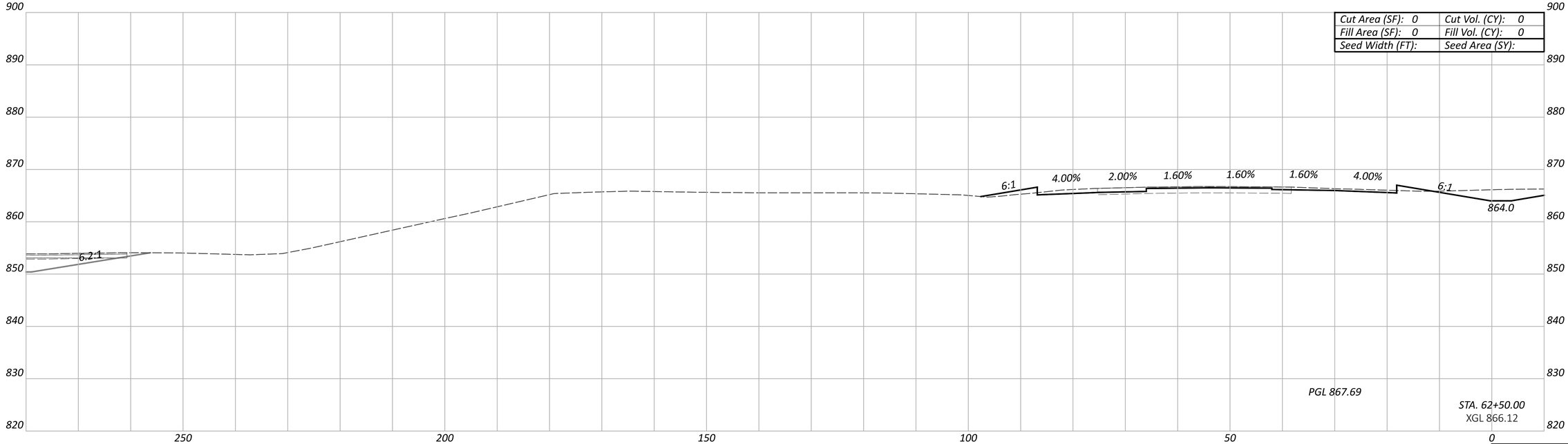
PROJECT ID
96808

SHEET P.291 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 WB
STA. 62+50.00 TO STA. 62+63.54

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.292 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 62+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:41 PM USER: aoldaker
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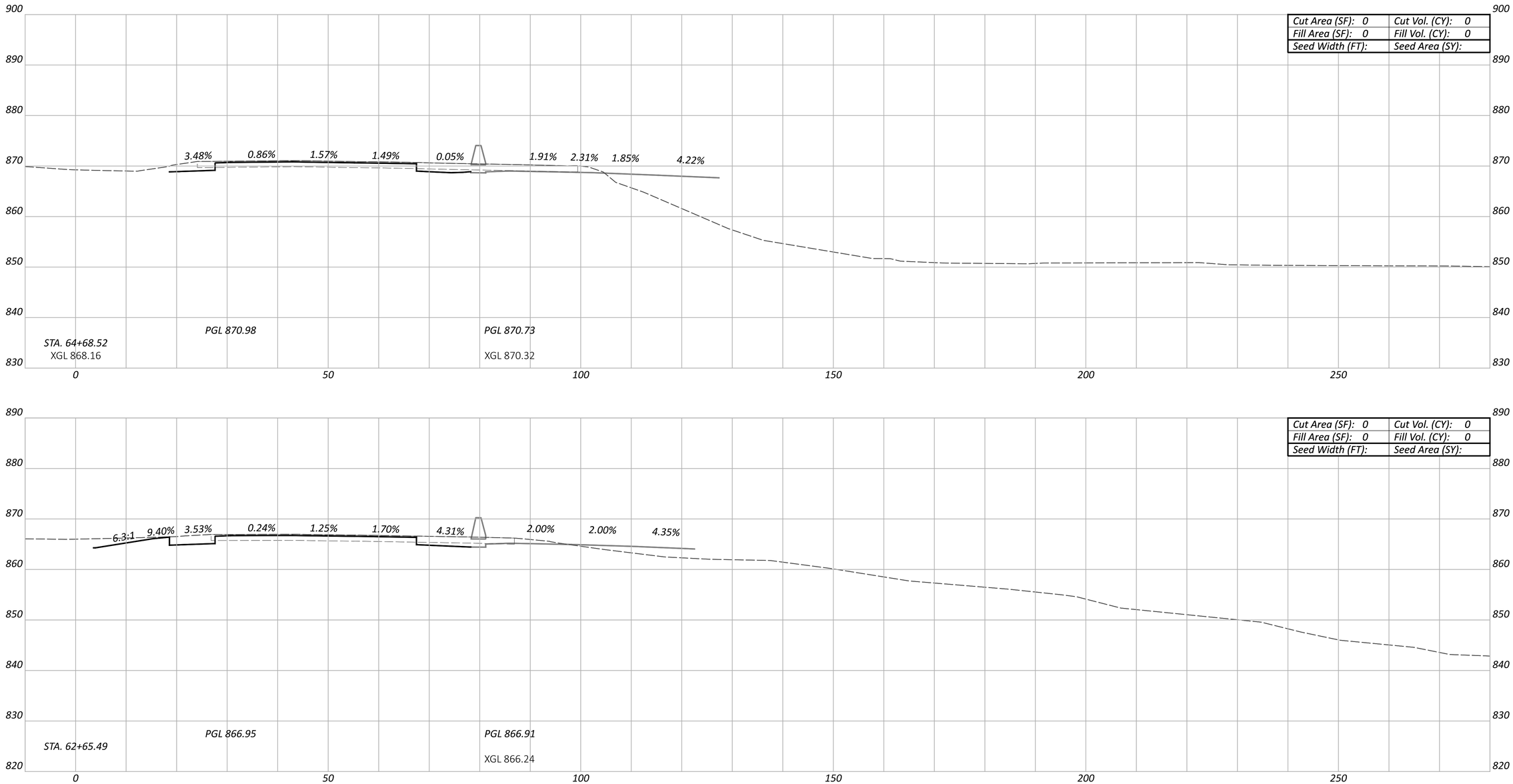

CROSS SECTIONS - IR 70 EB
STA. 62+65.49 TO STA. 64+68.52

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 62+65.49 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:44 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

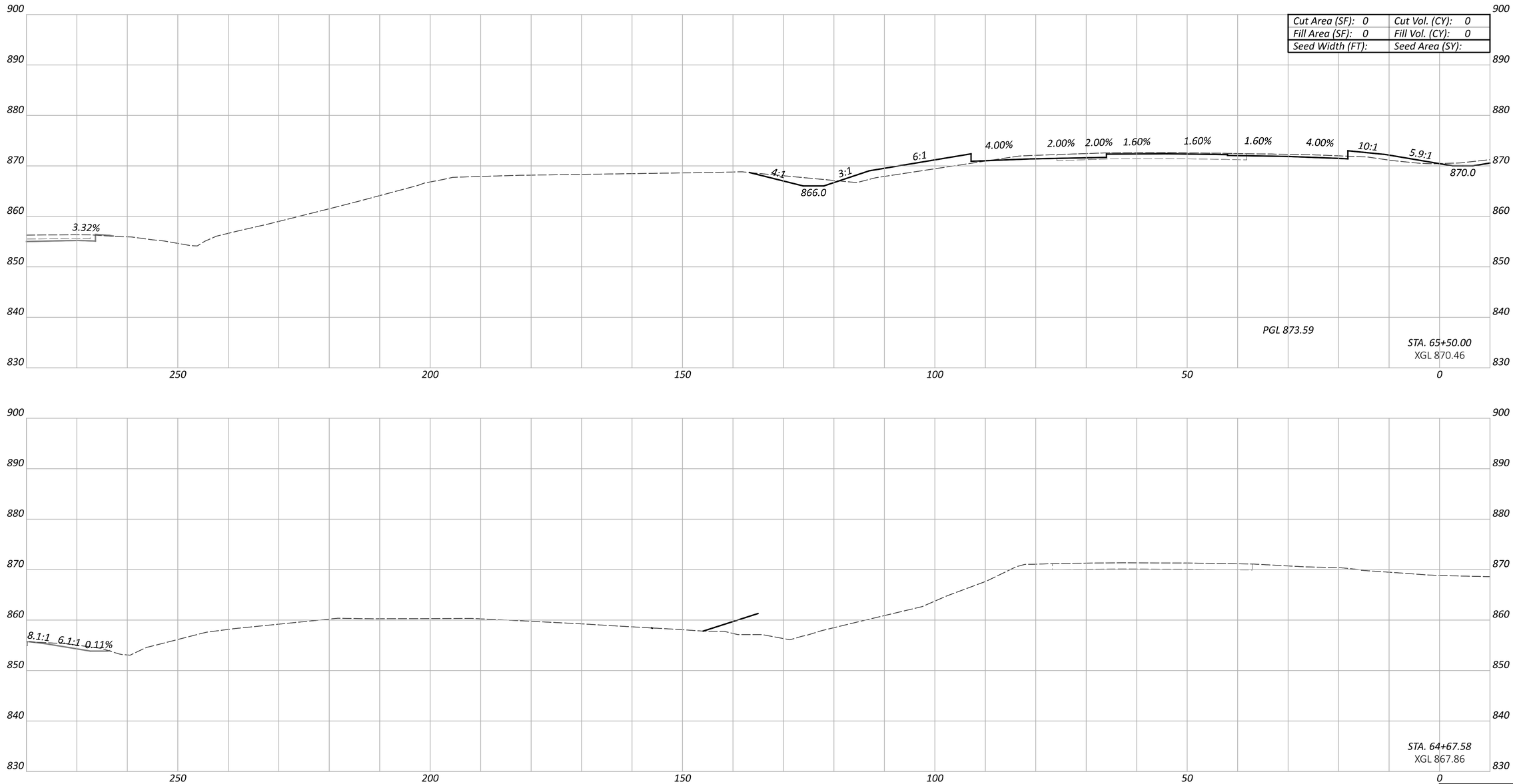
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.293 TOTAL 740



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CROSS SECTIONS - IR 70 WB
STA. 64+67.58 TO STA. 65+50.00

Sheet Totals		
Seeding	Cut	Fill

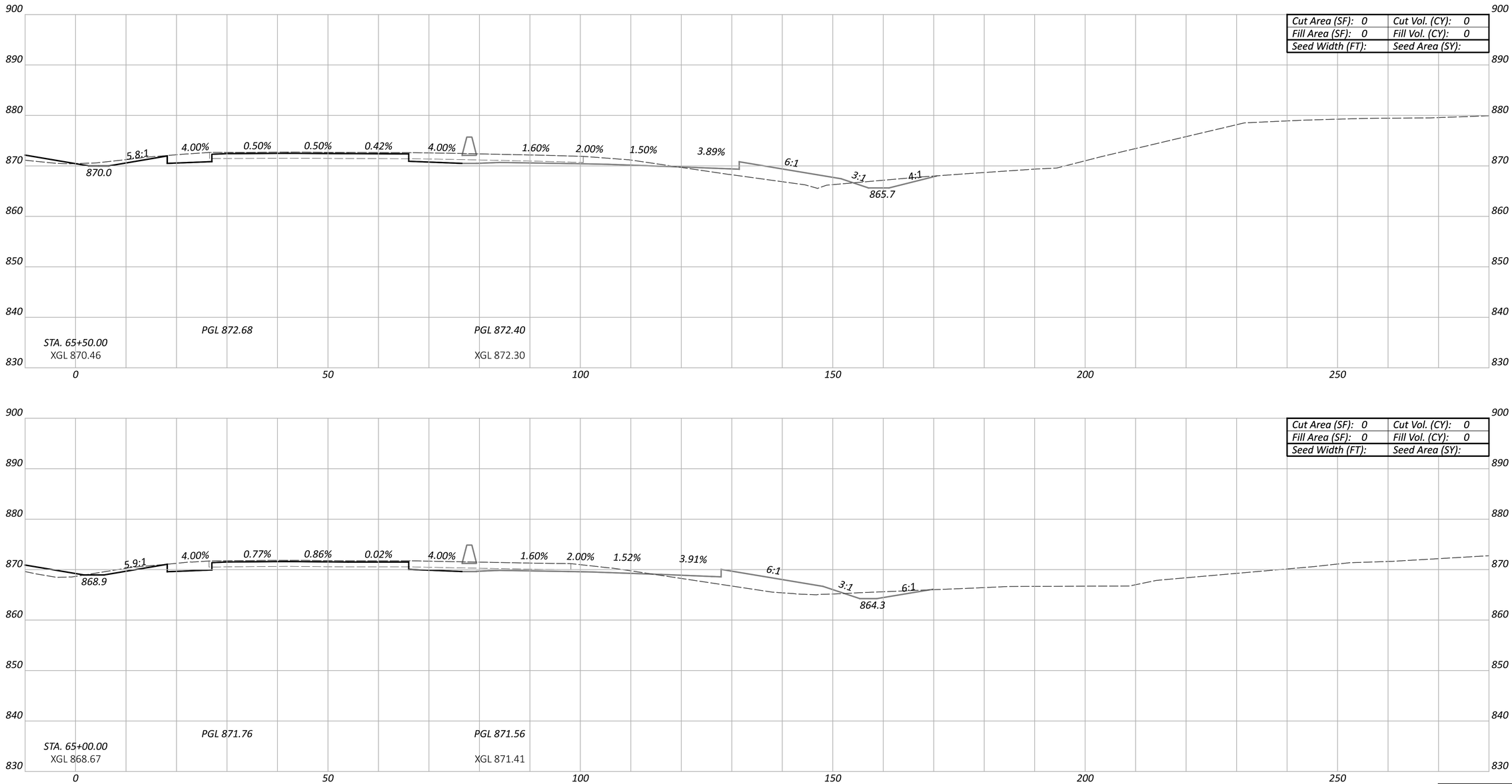
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.294 TOTAL 740



CROSS SECTIONS - IR 70 EB
STA. 65+00.00 TO STA. 65+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 65+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:51 PM USER: aoldaker
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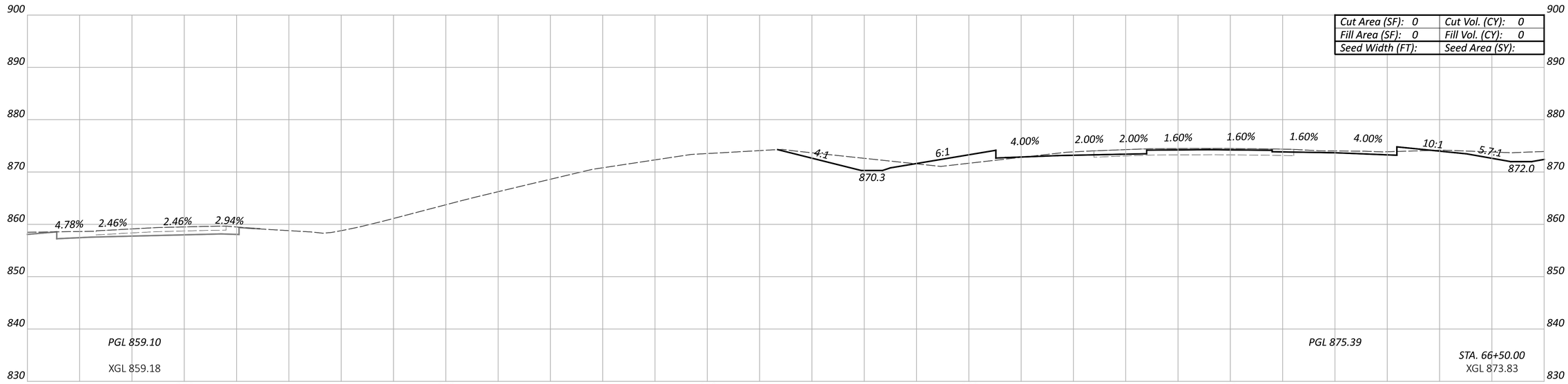
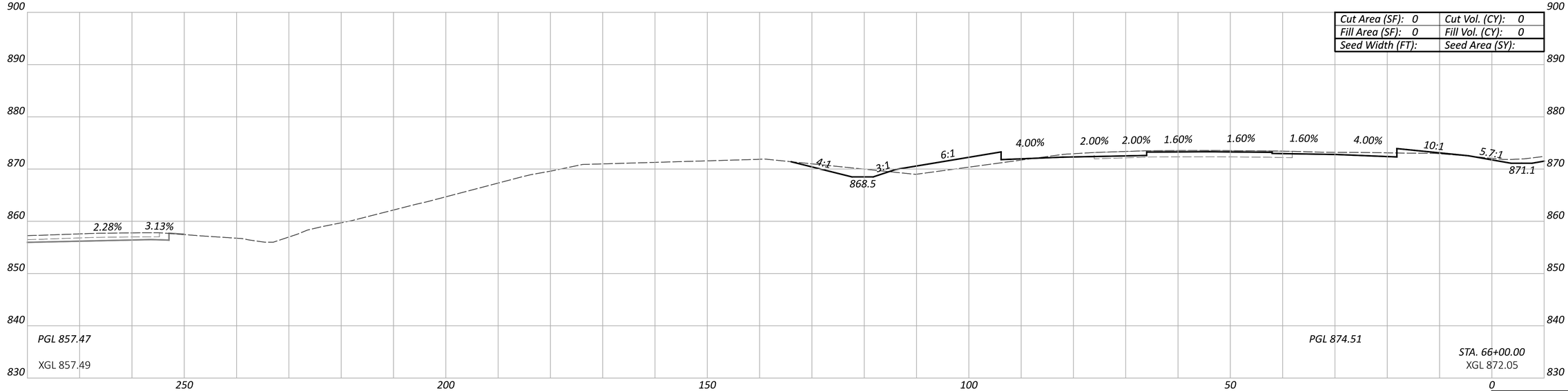
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.295
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 66+00.00 TO STA. 66+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 66+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:54 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

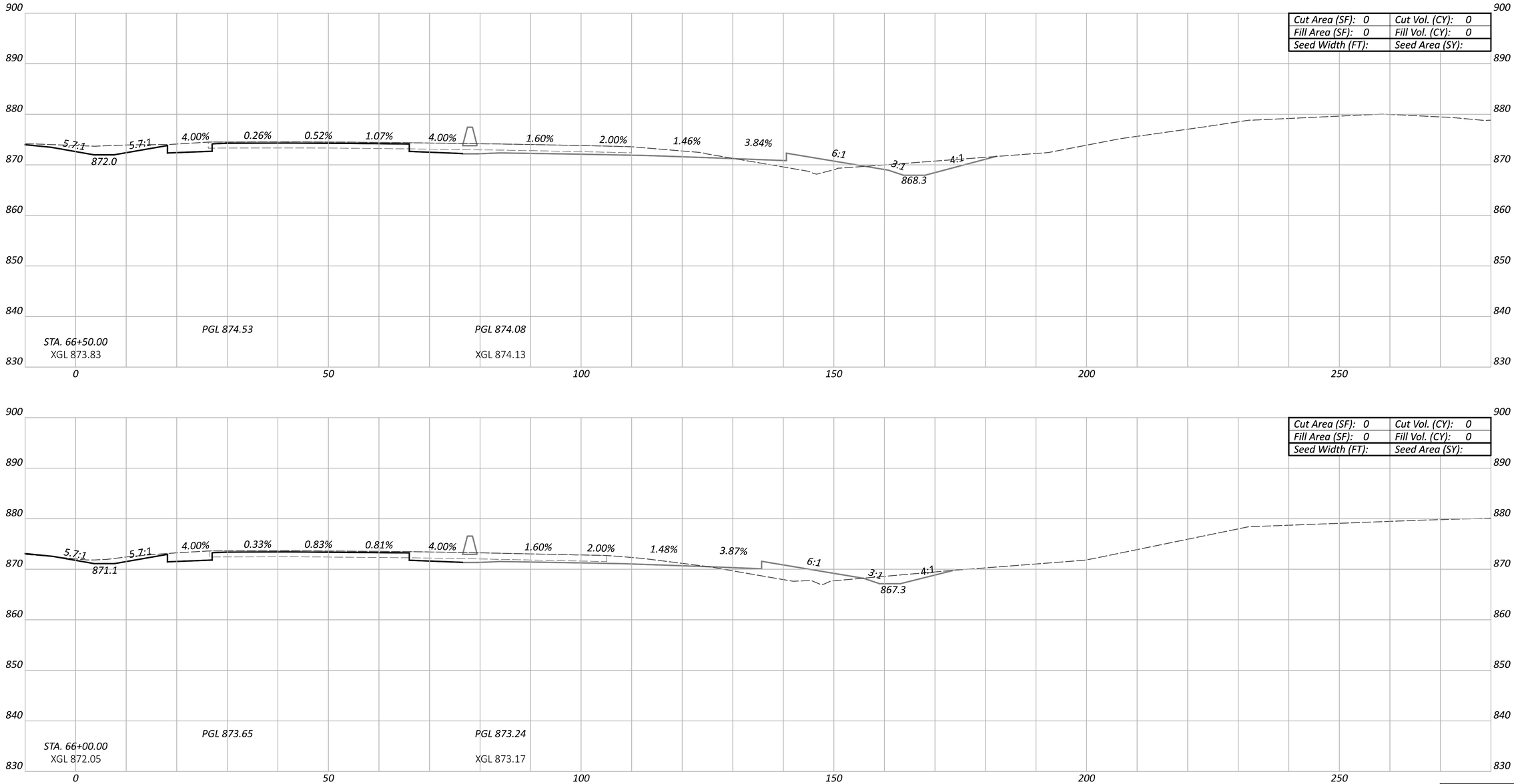
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.296	740



CROSS SECTIONS - IR 70 EB
STA. 66+00.00 TO STA. 66+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 66+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:18:57 PM USER: aoldaker
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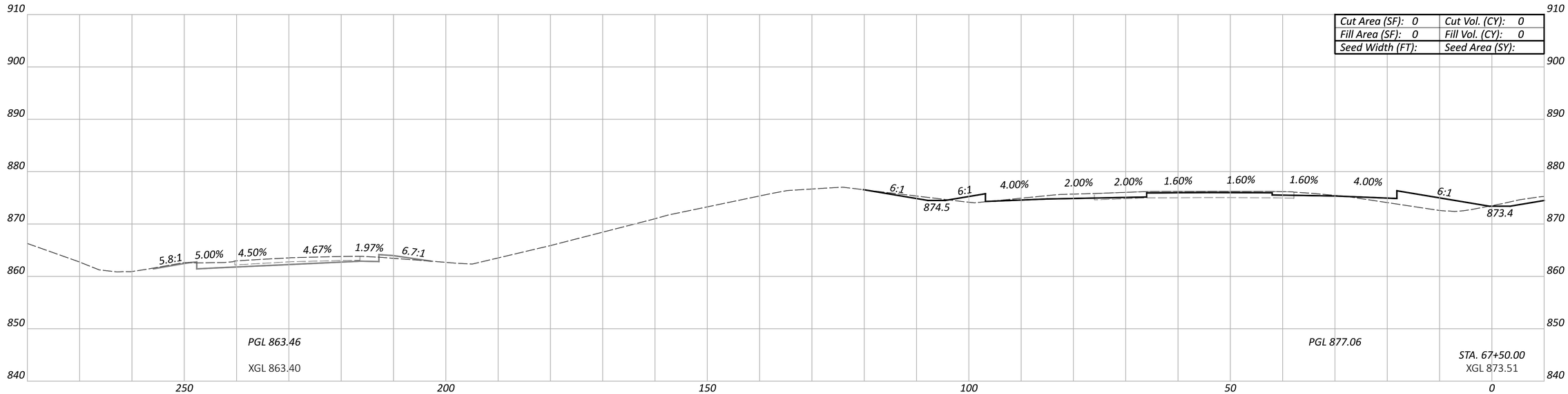
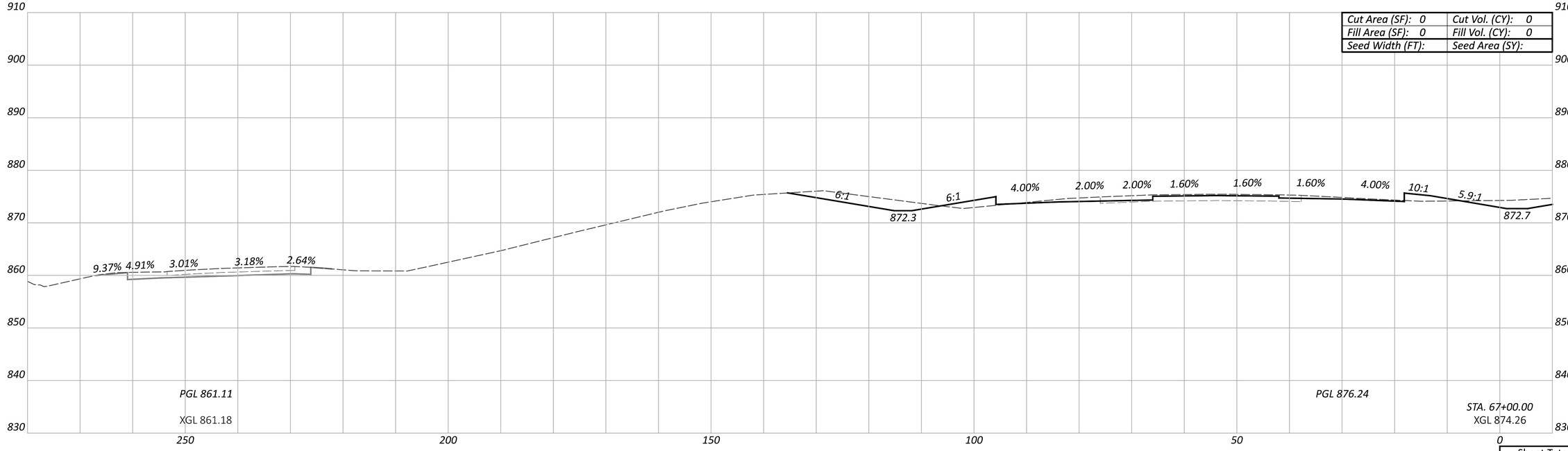
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.297
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 67+00.00 TO STA. 67+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 67+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:19:00 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

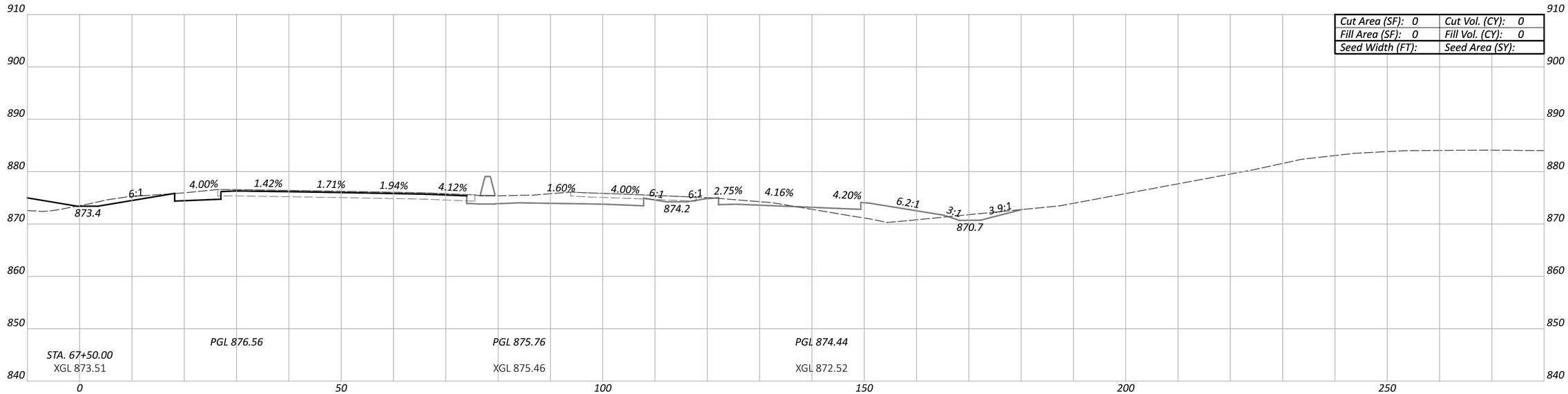
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

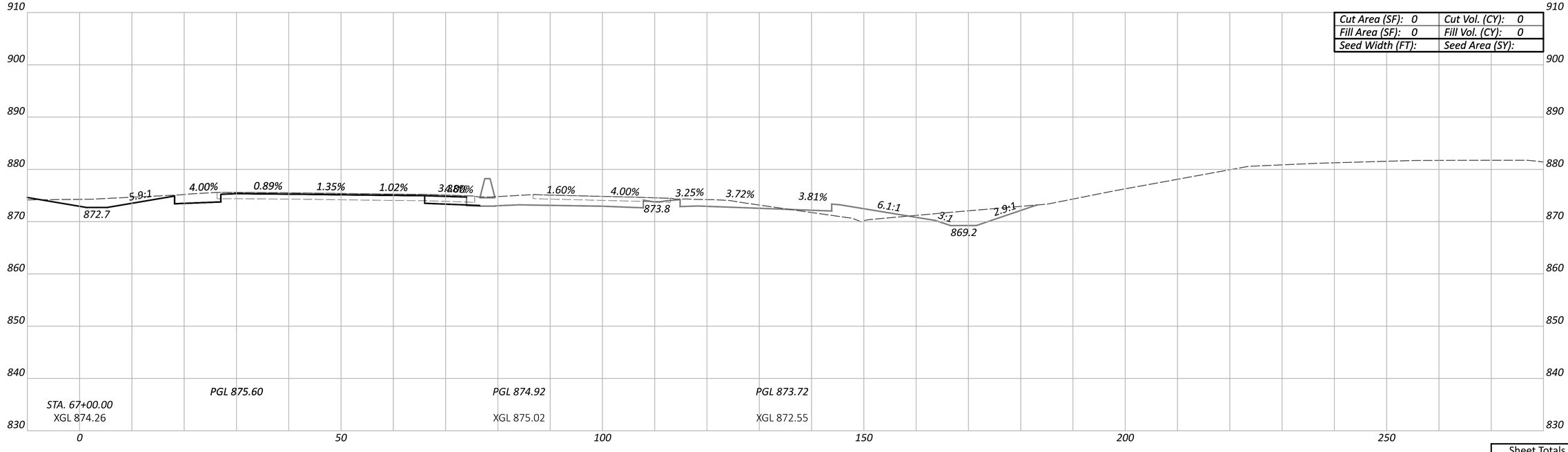
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.298 TOTAL 740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 EB
STA. 67+00.00 TO STA. 67+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.299	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 67+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:19:03 PM USER: aoldaker
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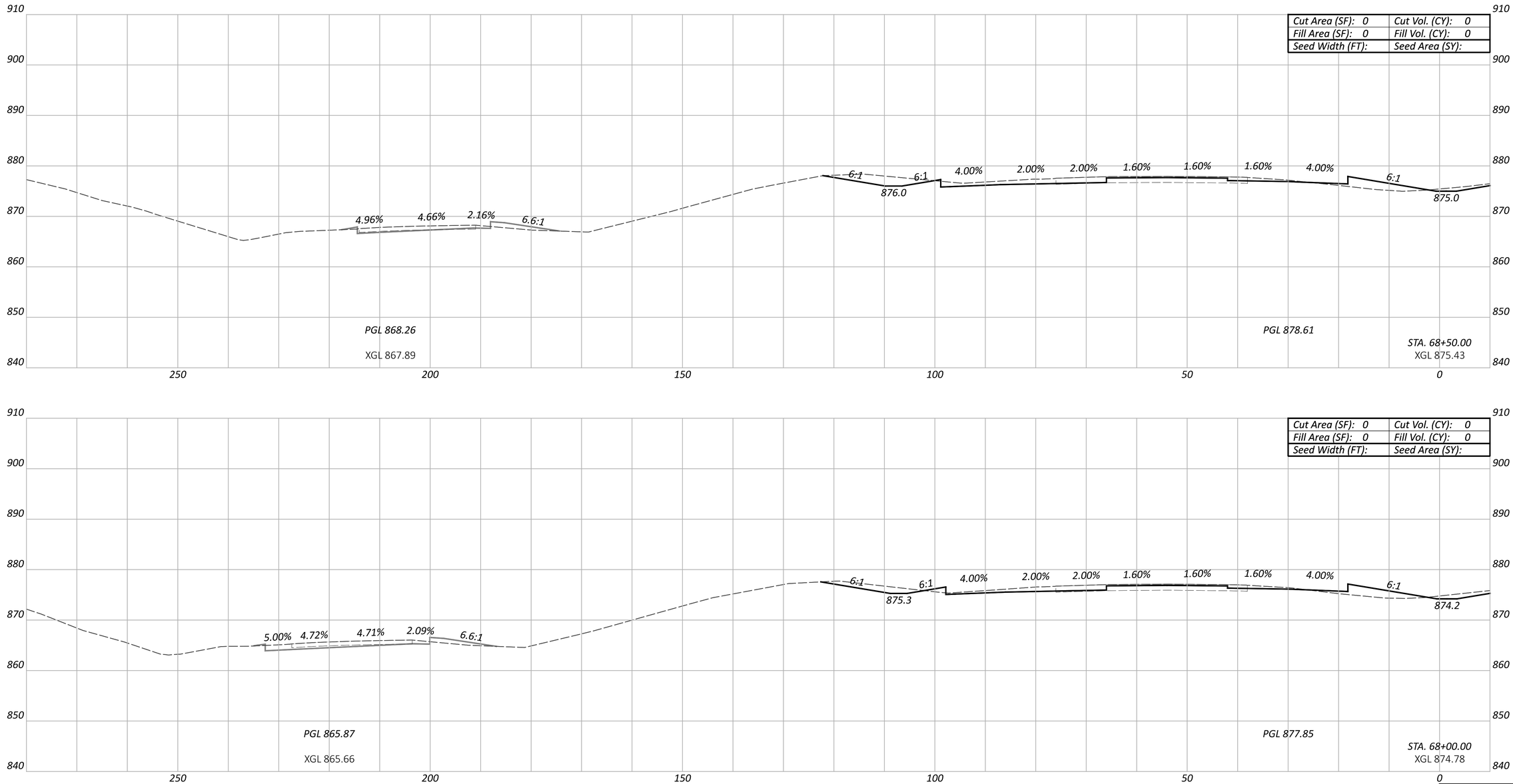

CROSS SECTIONS - IR 70 WB
STA. 68+00.00 TO STA. 68+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 68+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:19:07 PM USER: aoldaker
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Sheet Totals

Seeding	Cut	Fill

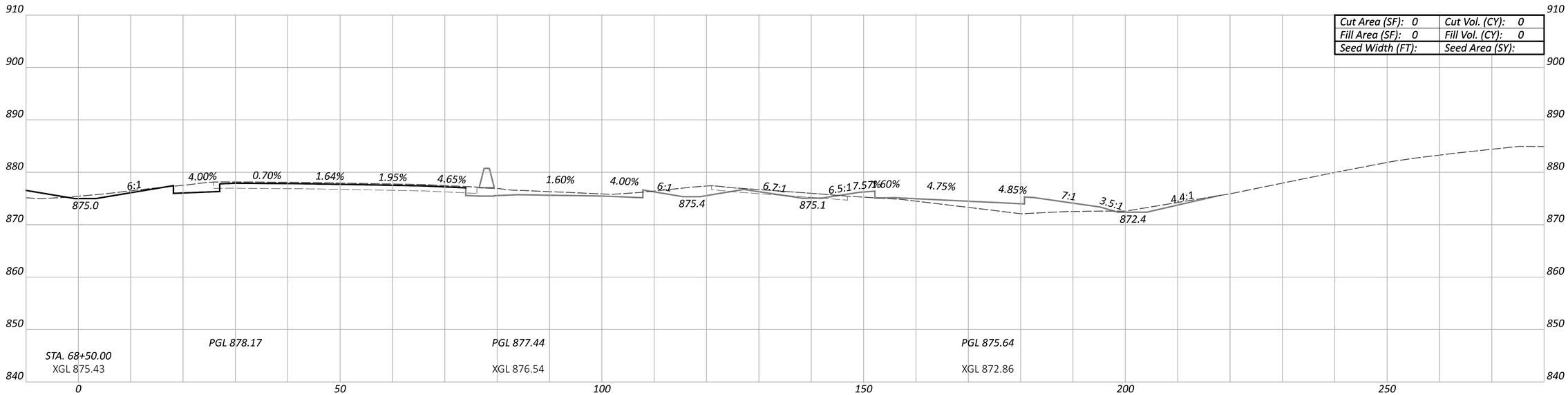
DESIGN AGENCY
STRUCTUREPOINT INC.

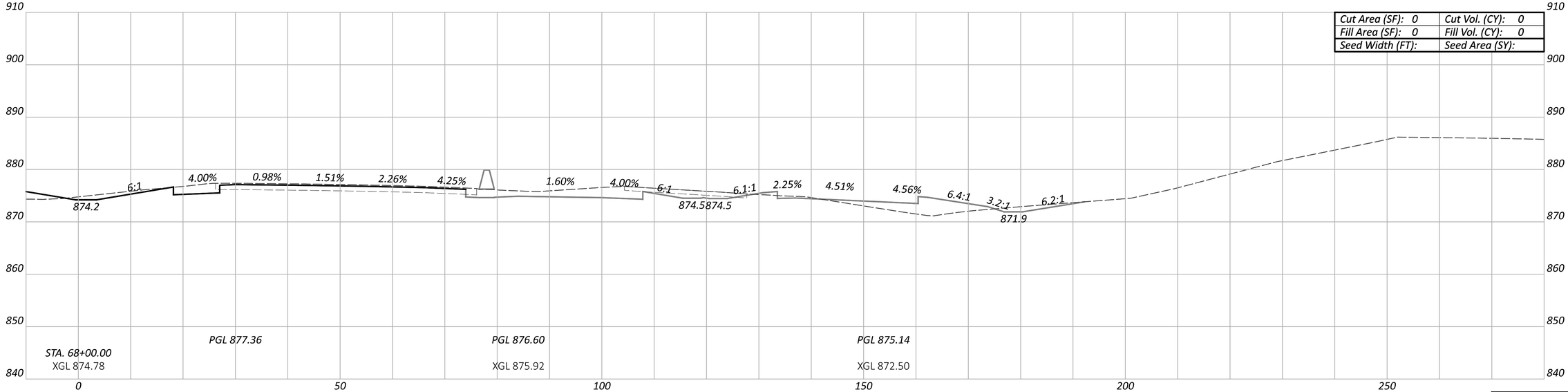
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.300 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

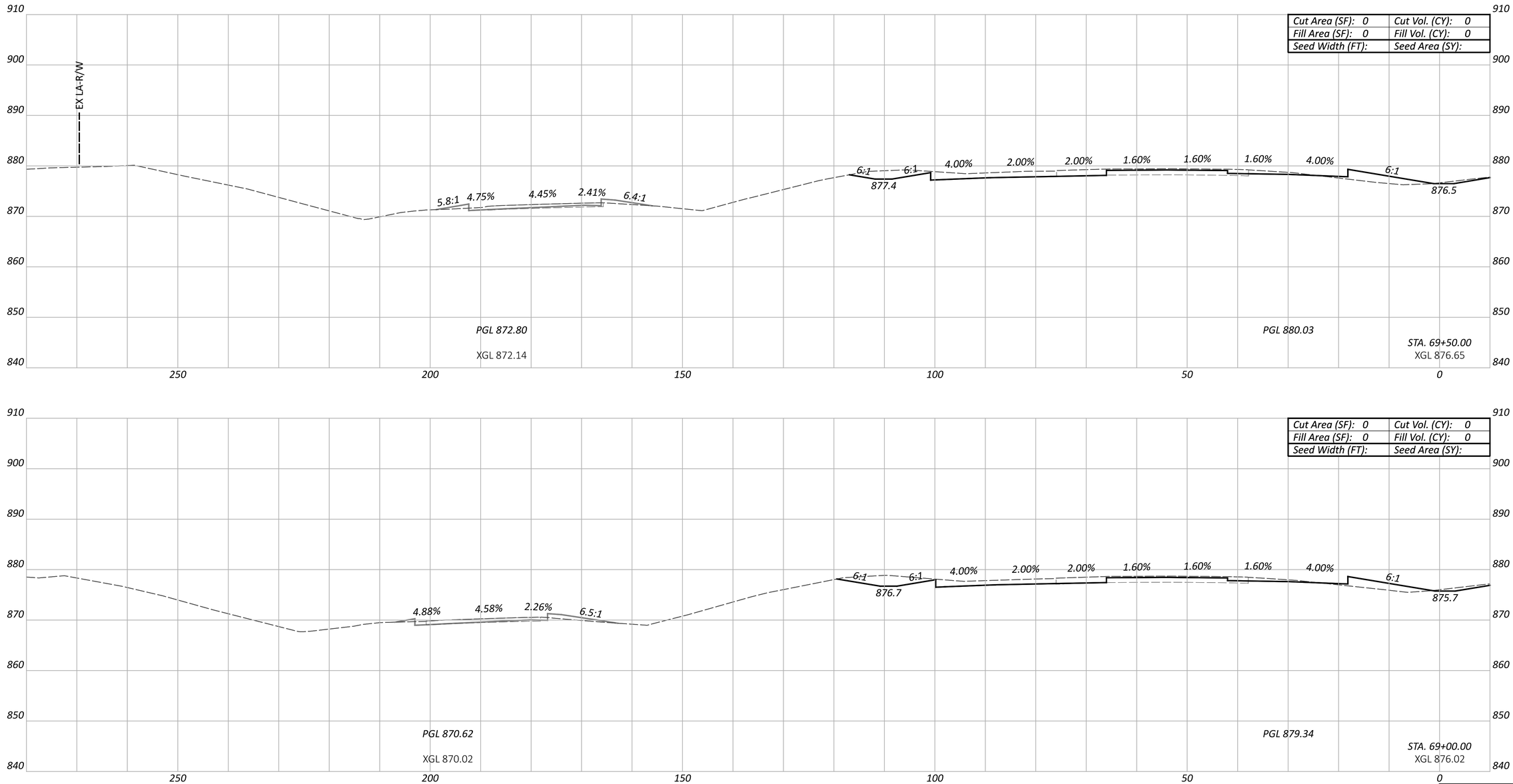
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.301 TOTAL 740



CROSS SECTIONS - IR 70 WB
STA. 69+00.00 TO STA. 69+50.00

FAI/LIC IR 70 0.00/0.00

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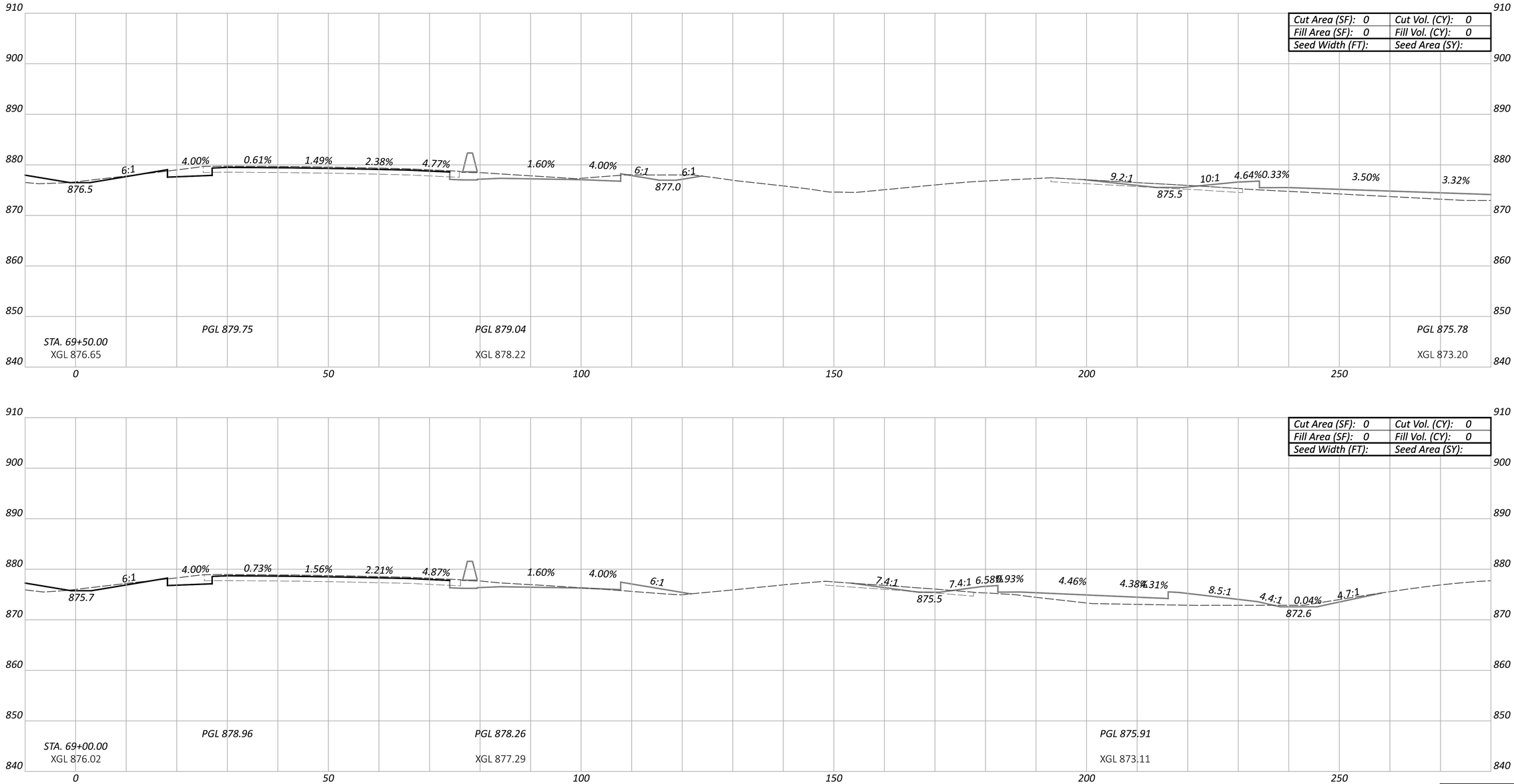
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.302
TOTAL	740



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Sheet Totals		
Seeding	Cut	Fill

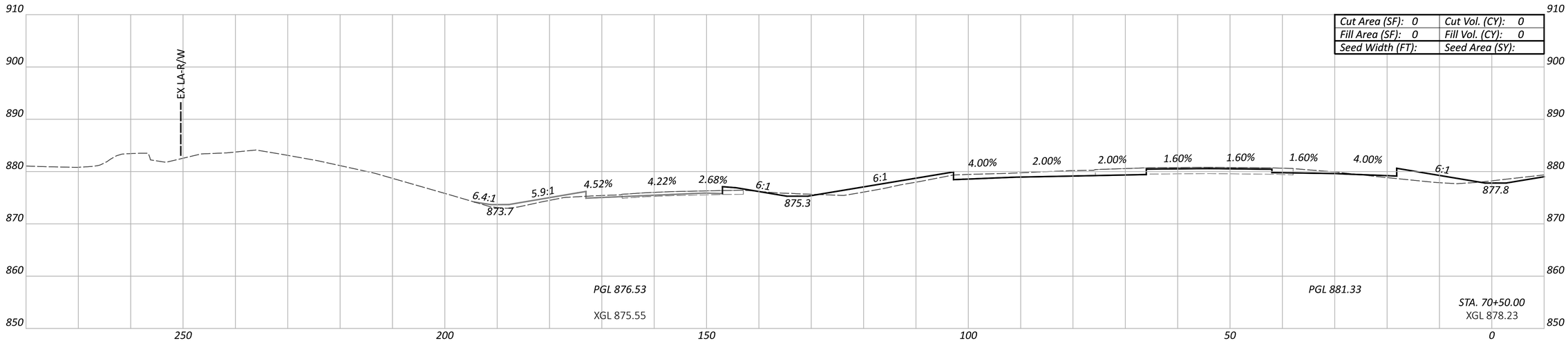
DESIGN AGENCY
STRUCTUREPOINT INC.

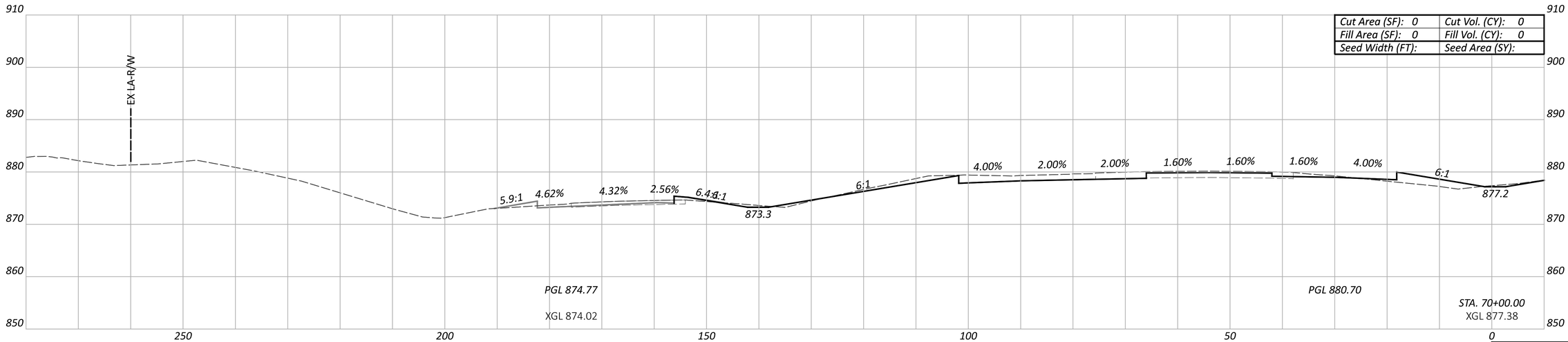
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.303 | TOTAL 740





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CROSS SECTIONS - IR 70 WB
STA. 70+00.00 TO STA. 70+50.00

Sheet Totals		
Seeding	Cut	Fill

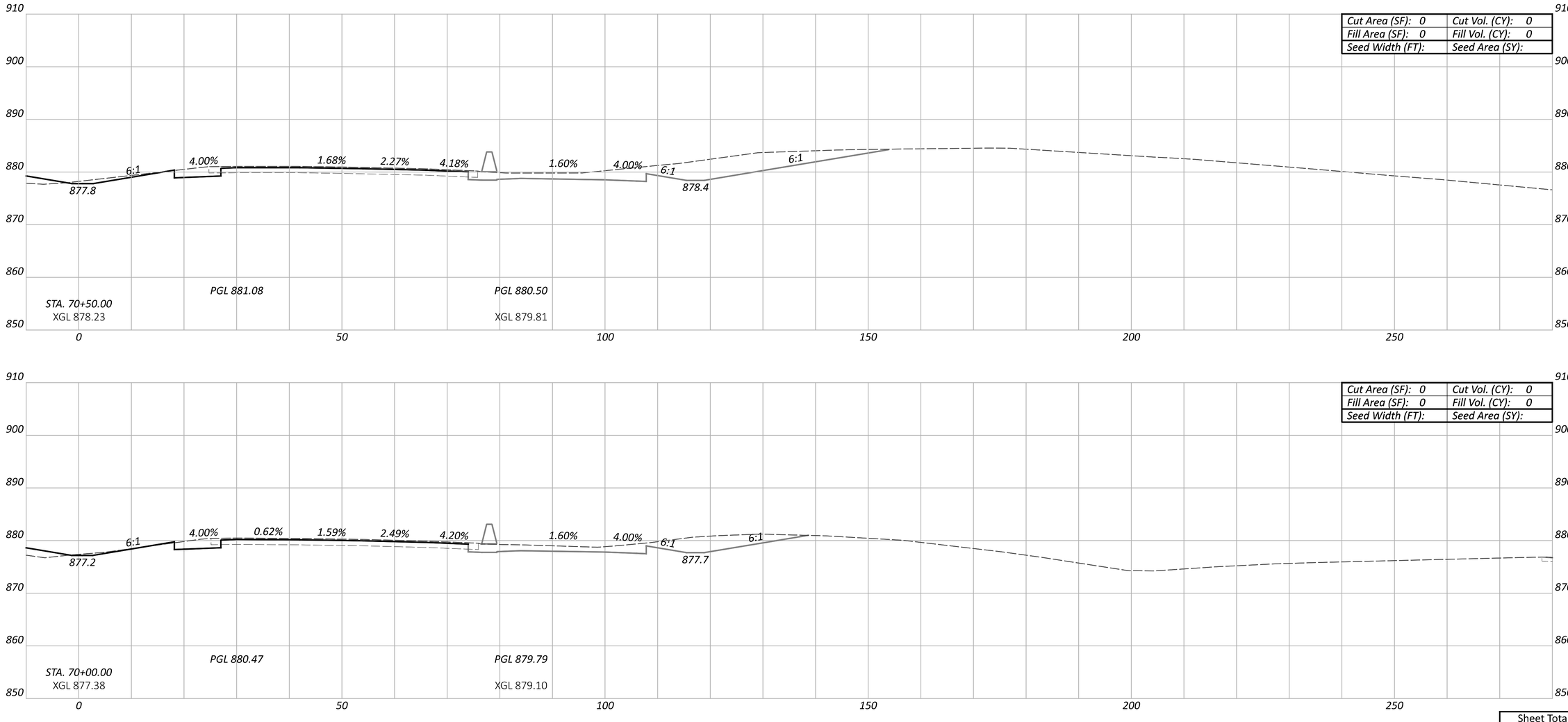
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.304 TOTAL 740



CROSS SECTIONS - IR 70 EB
STA. 70+00.00 TO STA. 70+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT LLC

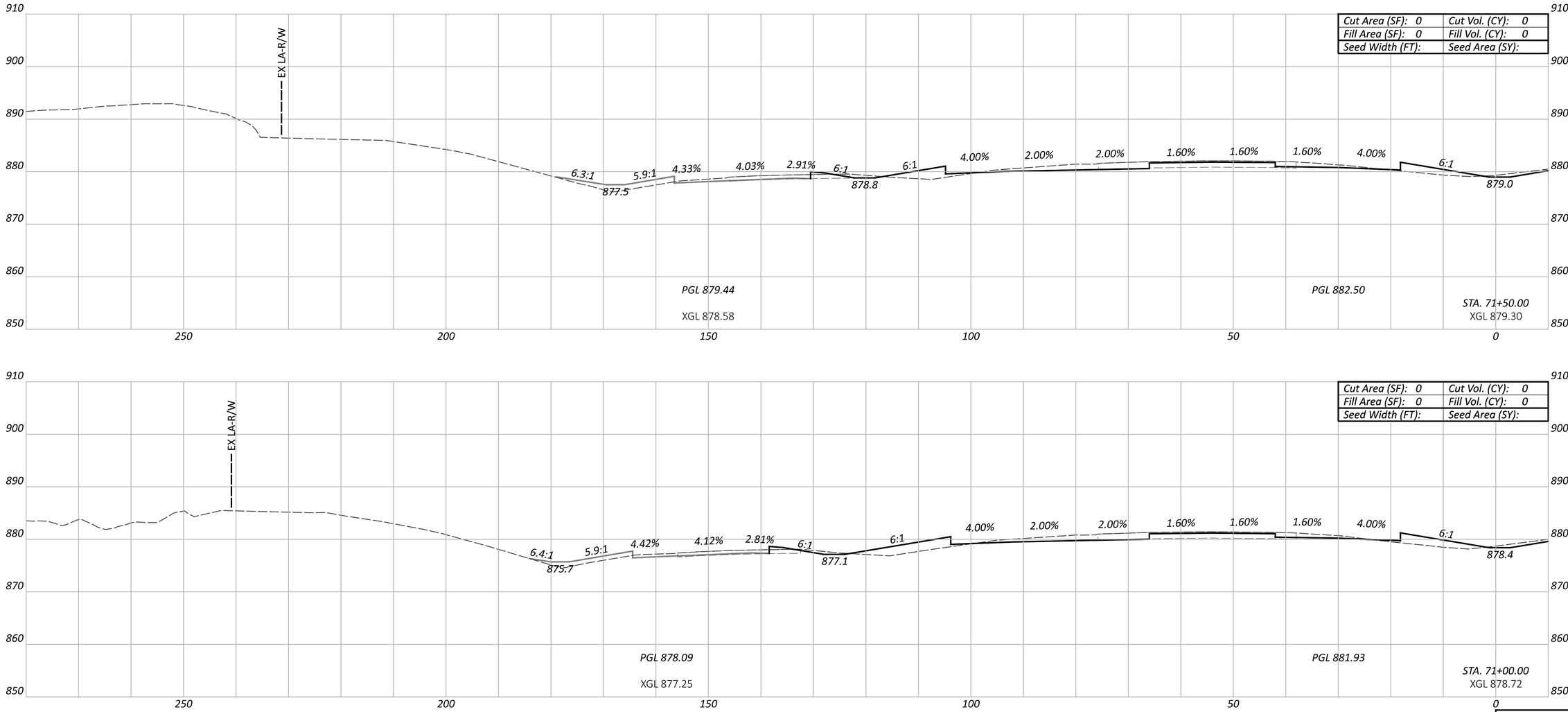
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.305	740



CROSS SECTIONS - IR 70 WB
STA. 71+00.00 TO STA. 71+50.00

FAI/LIC IR 70 0.00/0.00

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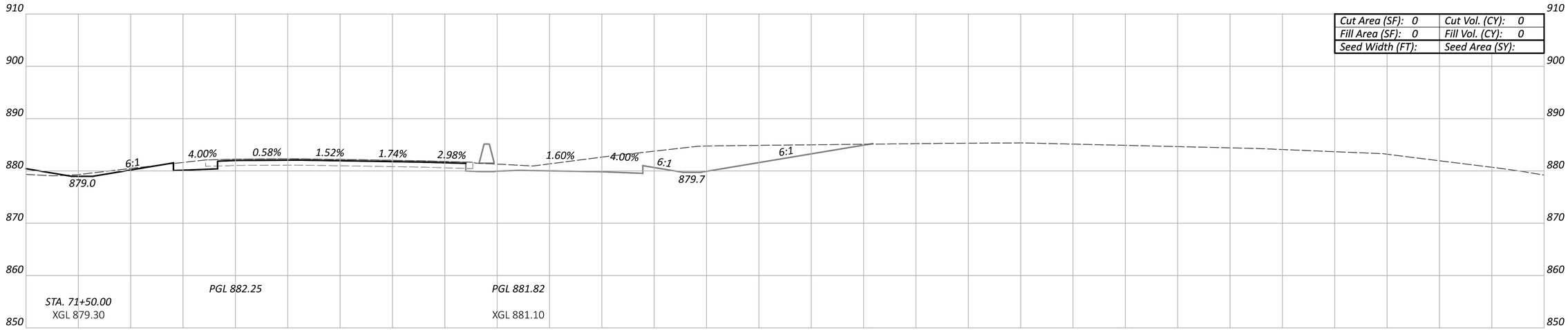
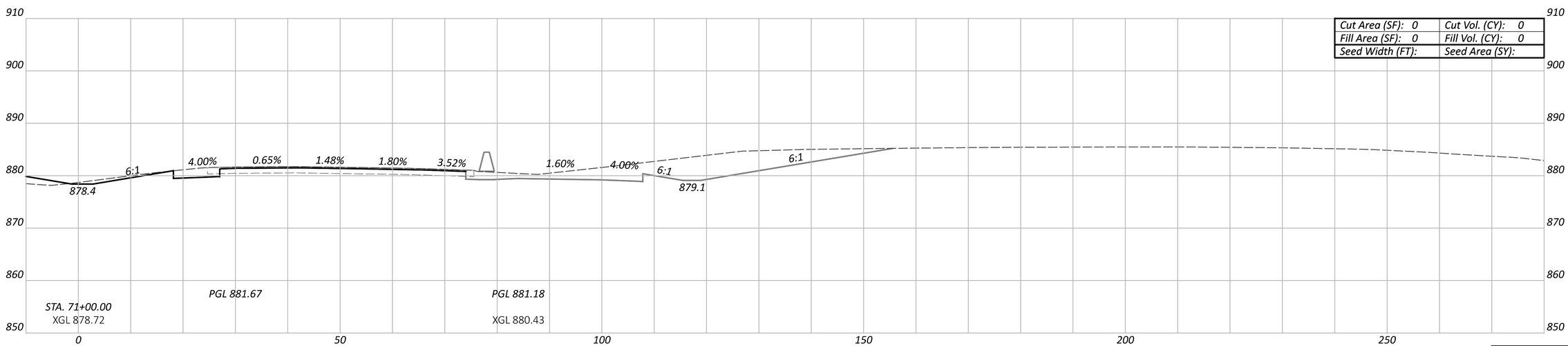
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.306
TOTAL	740





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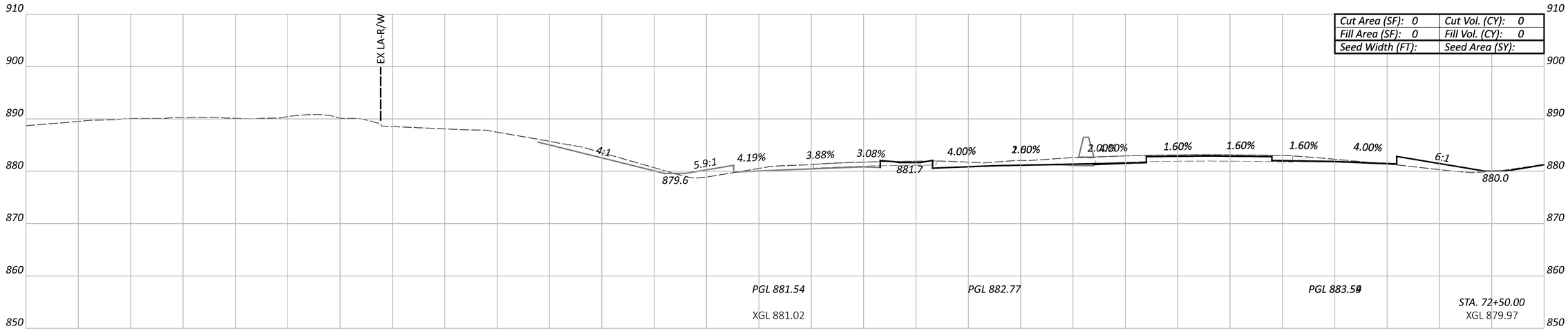
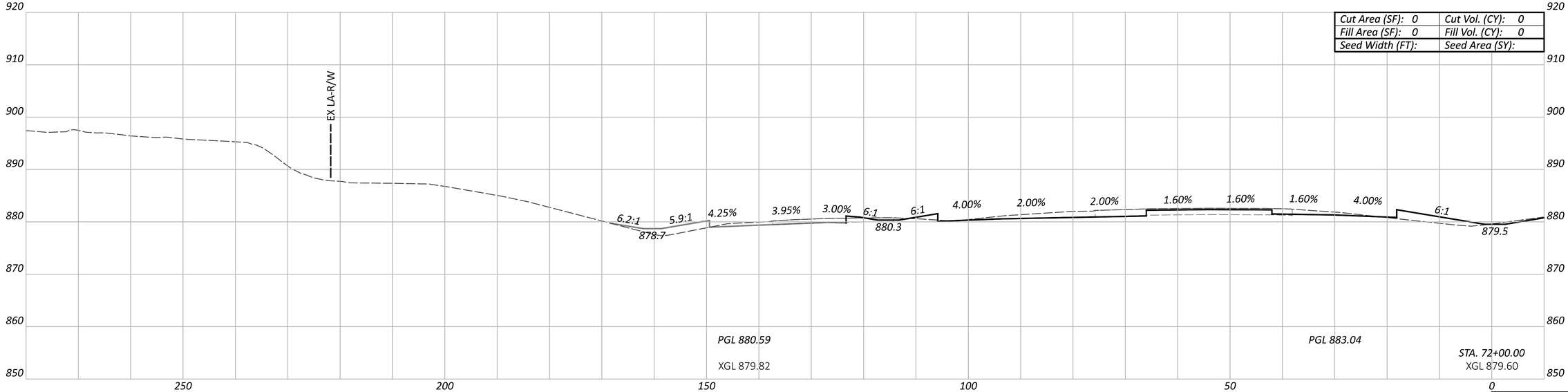
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.307
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 72+00.00 TO STA. 72+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

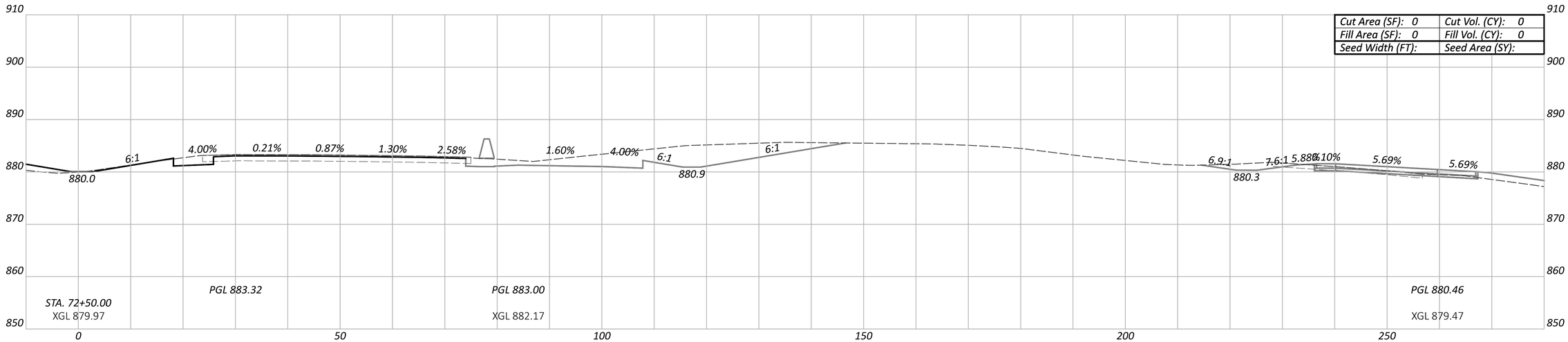
REVIEWER
KAM 06/18/23

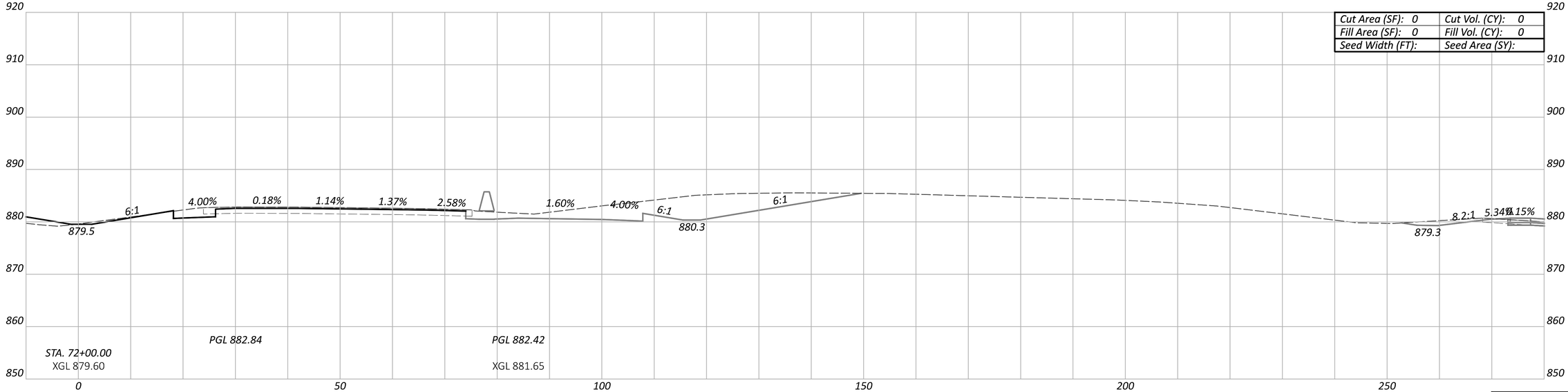
PROJECT ID
96808

SHEET P.308 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





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Sheet Totals		
Seeding	Cut	Fill

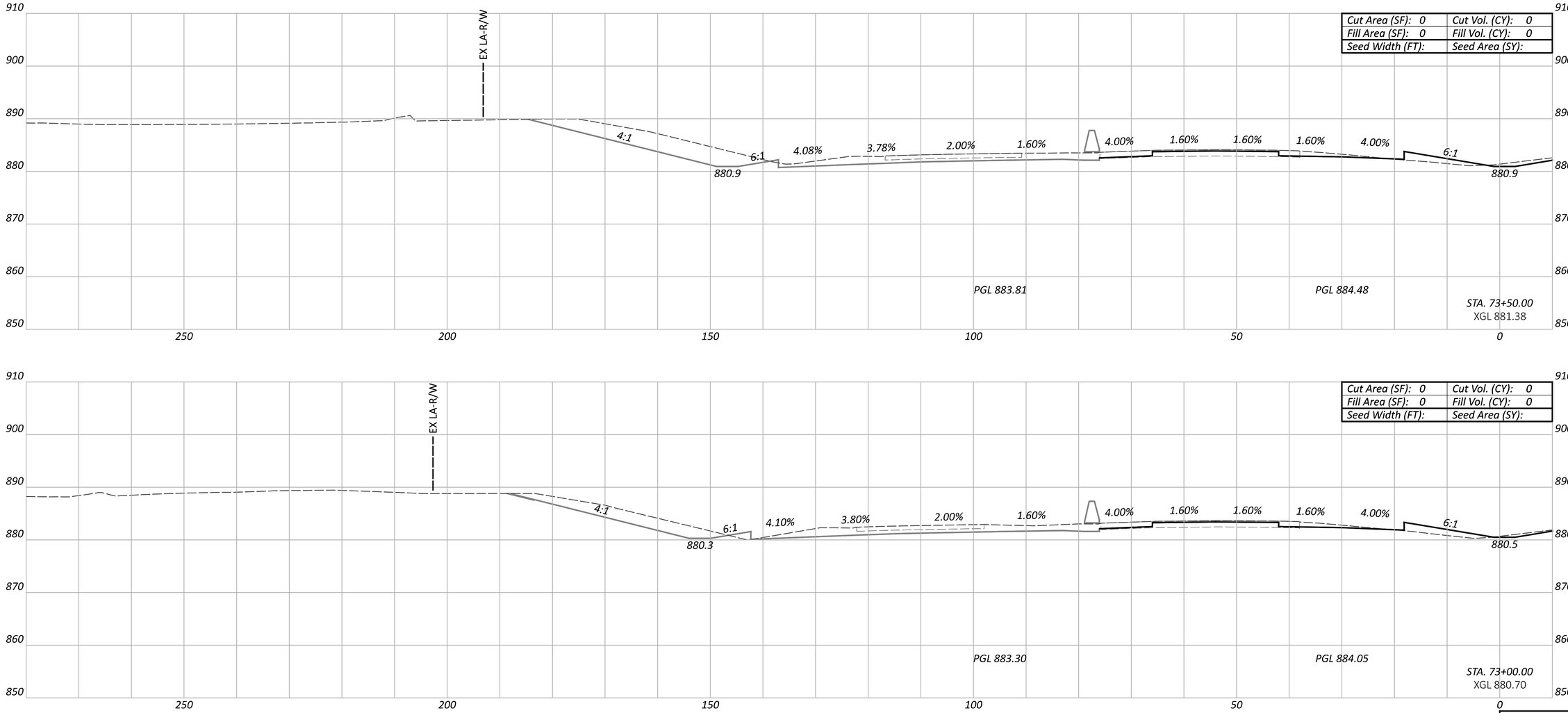
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.309 | TOTAL 740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 73+00.00 TO STA. 73+50.00

DESIGN AGENCY
STRUCTUREPOINT INC.

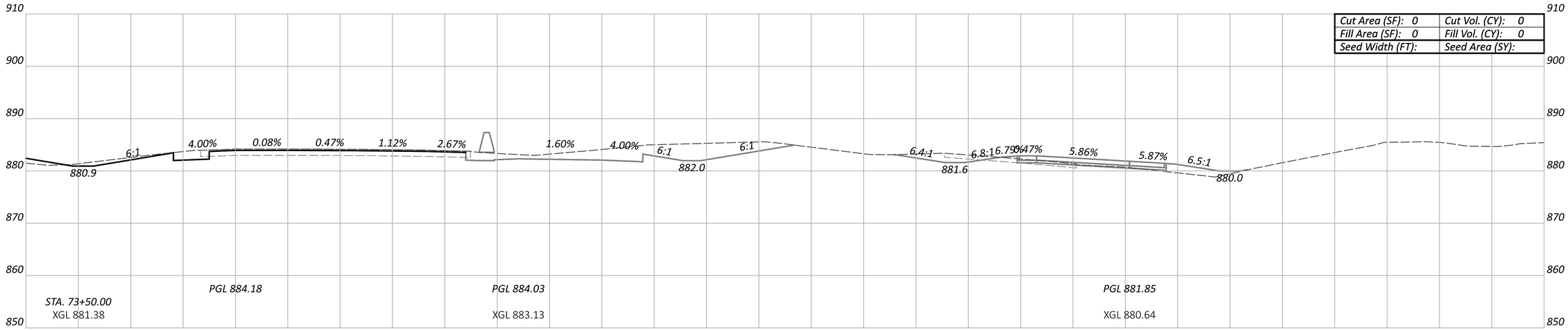
DESIGNER
BER

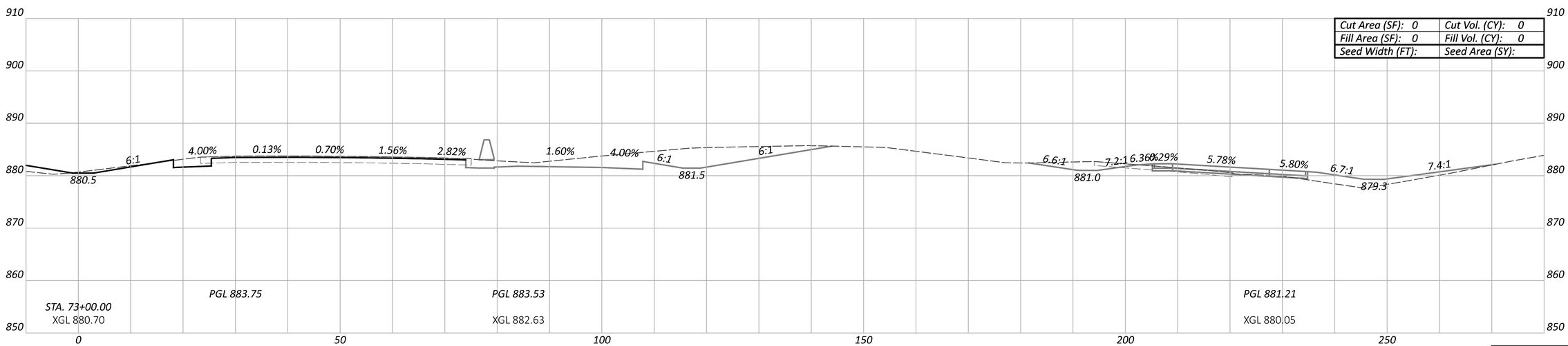
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.310	740





CROSS SECTIONS - IR 70 EB
STA. 73+00.00 TO STA. 73+50.00

FAI/LIC IR 70 0.00/0.00

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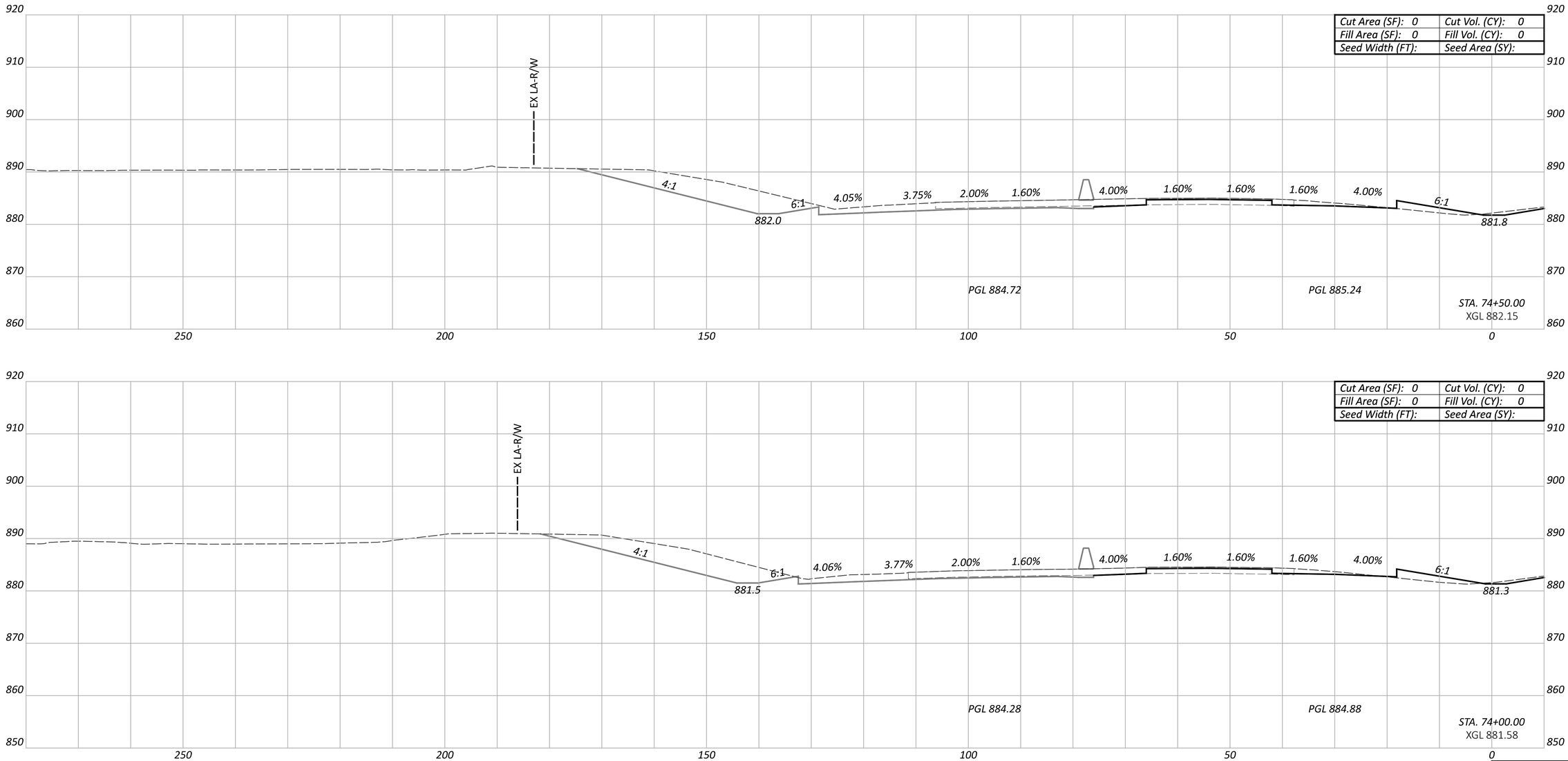
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.311	740

Sheet Totals

Seeding	Cut	Fill



CROSS SECTIONS - IR 70 WB
STA. 74+00.00 TO STA. 74+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

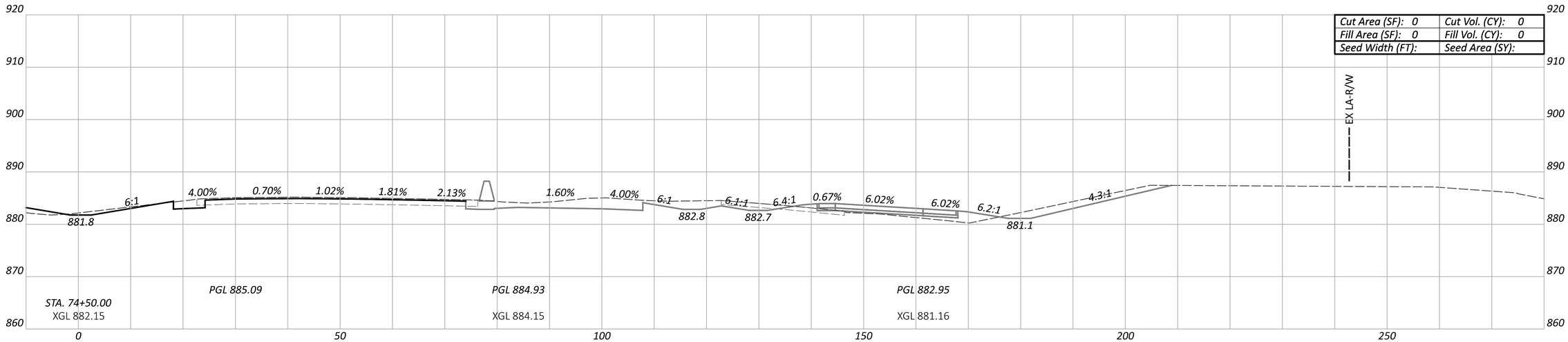
DESIGNER
BER

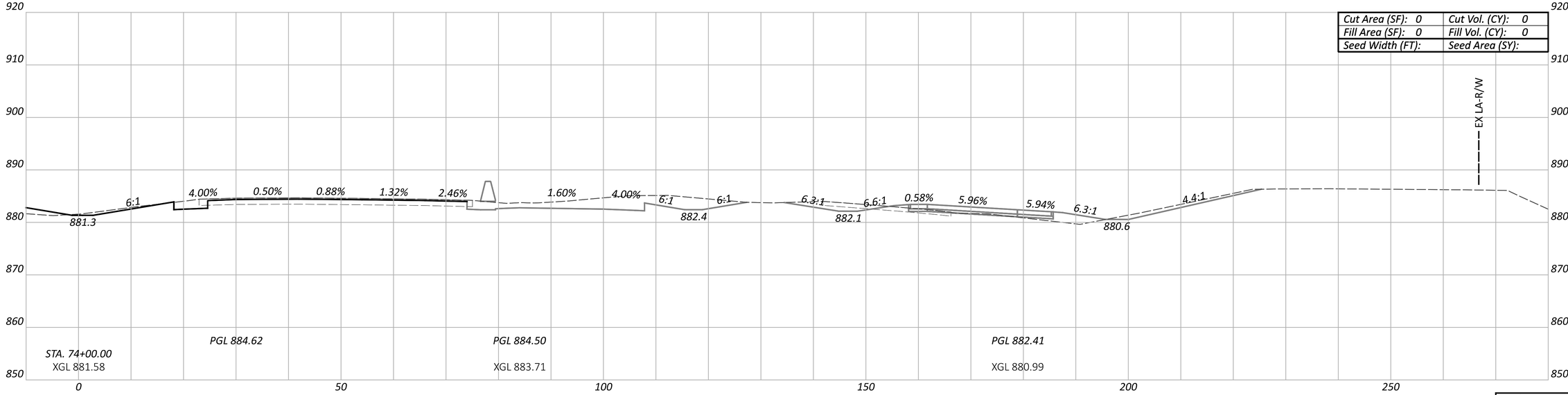
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.312	740





CROSS SECTIONS - IR 70 EB
STA. 74+00.00 TO STA. 74+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

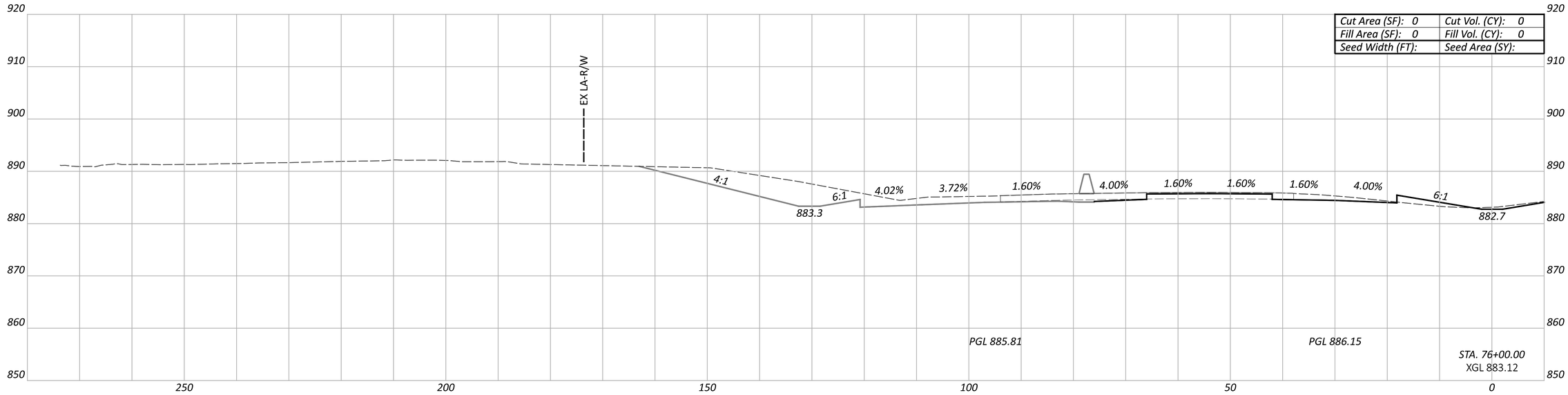
DESIGN AGENCY
STRUCTUREPOINT INC.

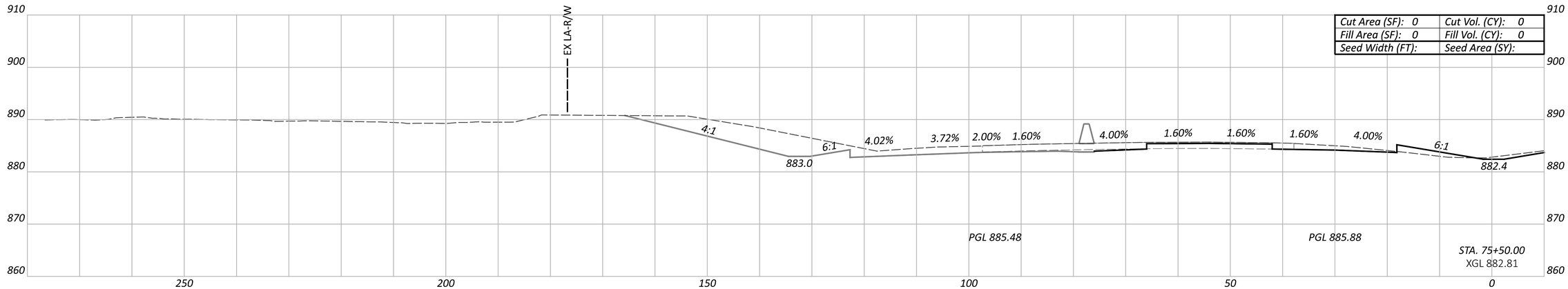
DESIGNER
BER

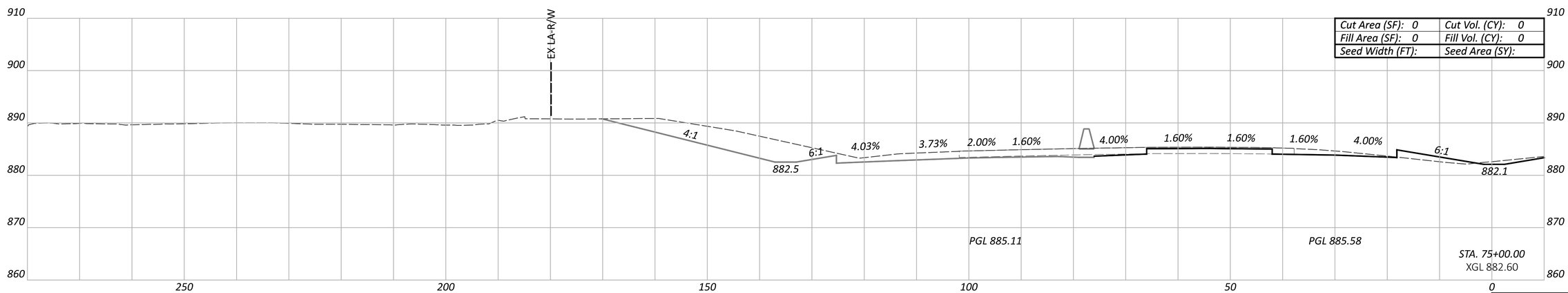
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.313 TOTAL 740







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CROSS SECTIONS - IR 70 WB
STA. 75+00.00 TO STA. 76+00.00

Sheet Totals		
Seeding	Cut	Fill

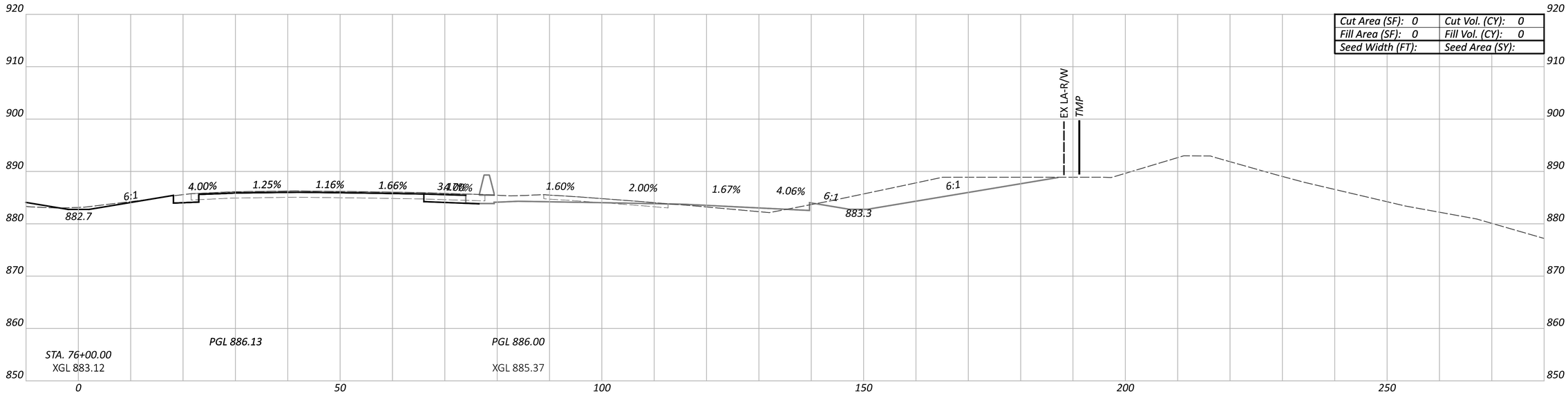
DESIGN AGENCY
STRUCTUREPOINT LLC

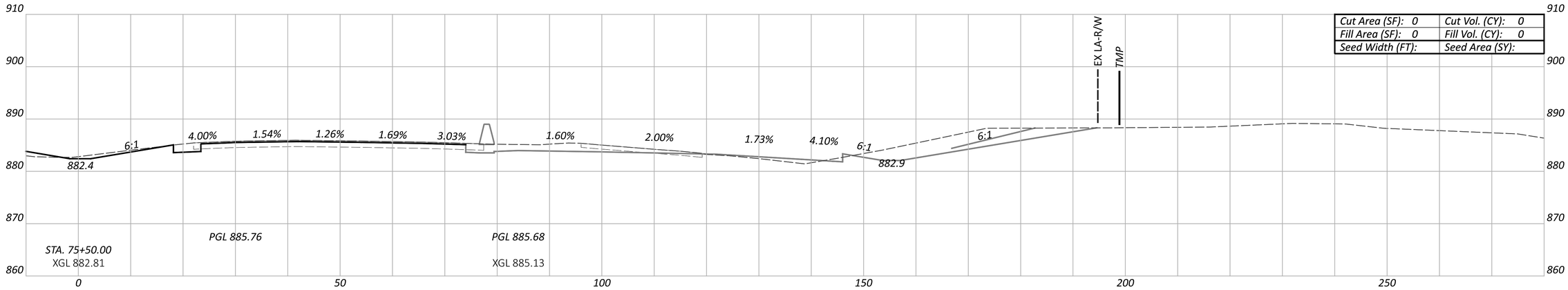
DESIGNER
BER

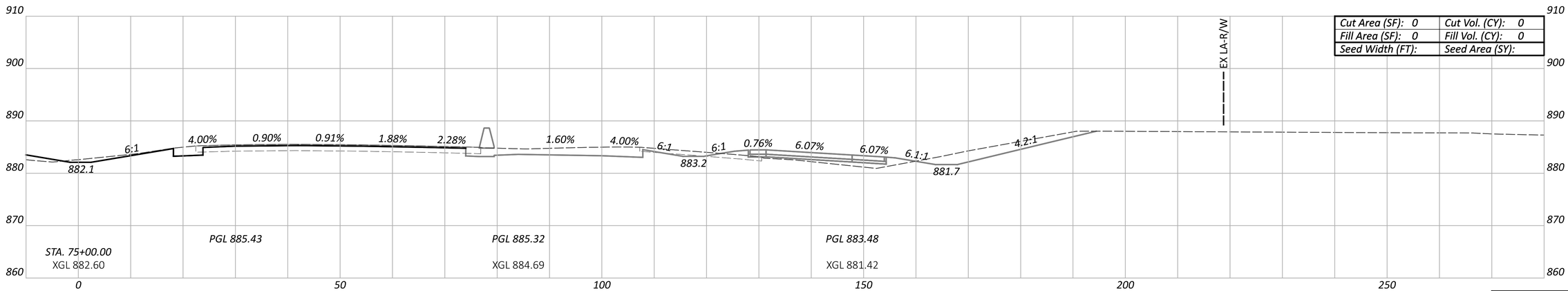
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.314 TOTAL 740







CROSS SECTIONS - IR 70 EB
STA. 75+00.00 TO STA. 76+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 75+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:20:03 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_XS105.dgn

Sheet Totals		
Seeding	Cut	Fill

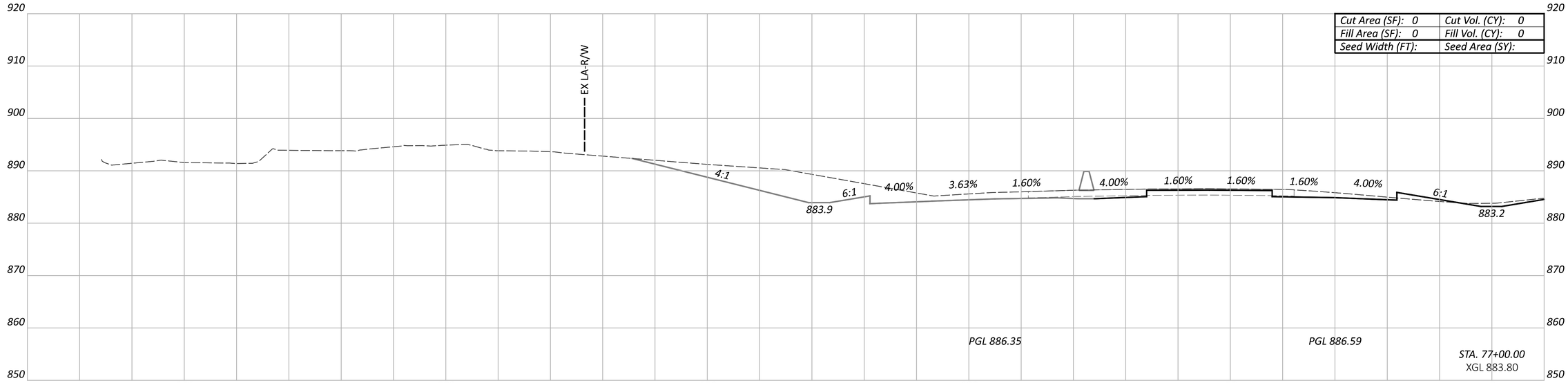
DESIGN AGENCY
STRUCTUREPOINT LLC

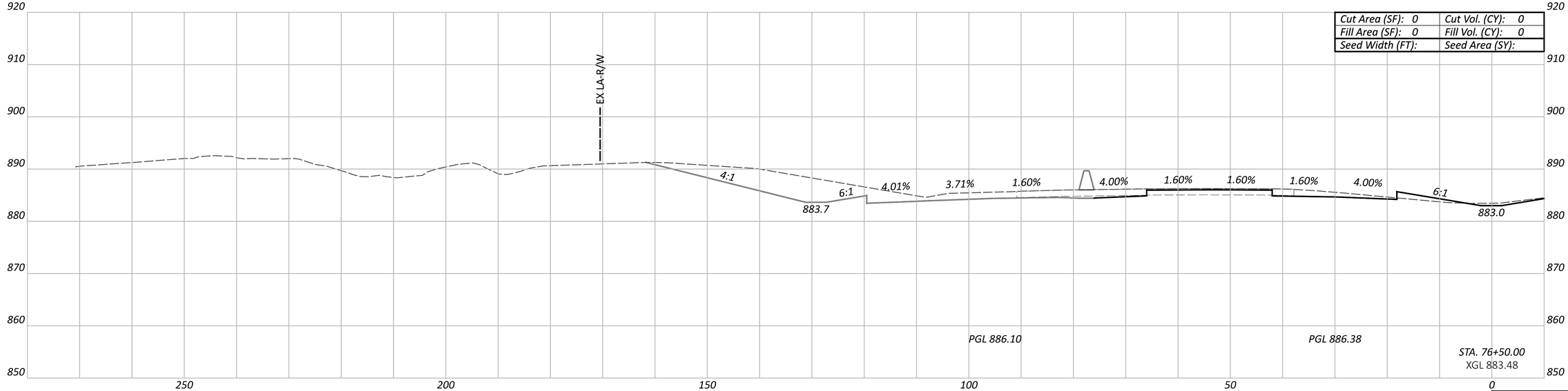
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.315 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 76+50.00 TO STA. 77+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 76+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:20:07 PM USER: aoldaker
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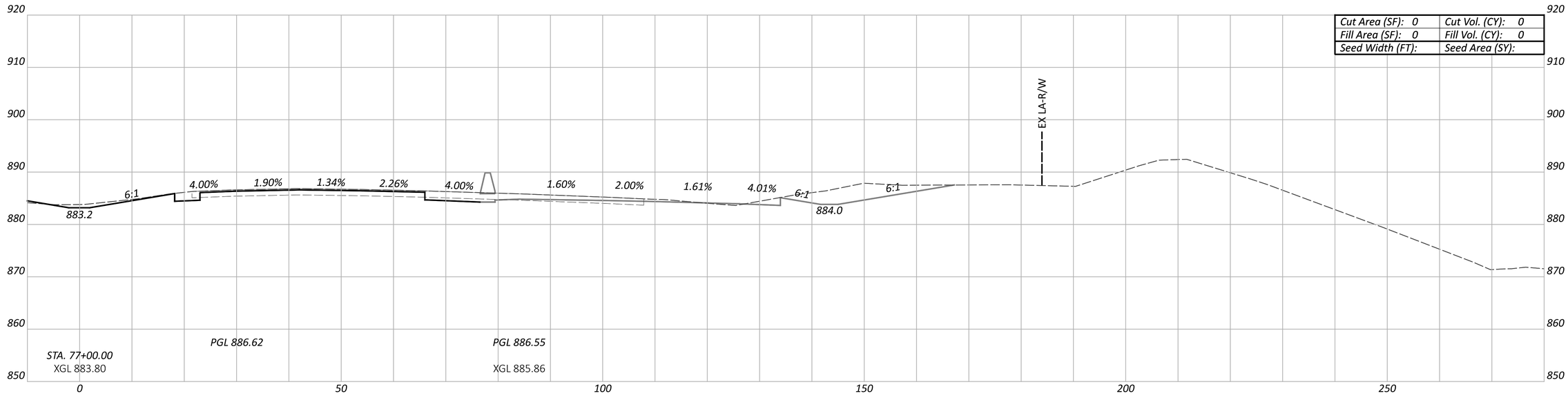
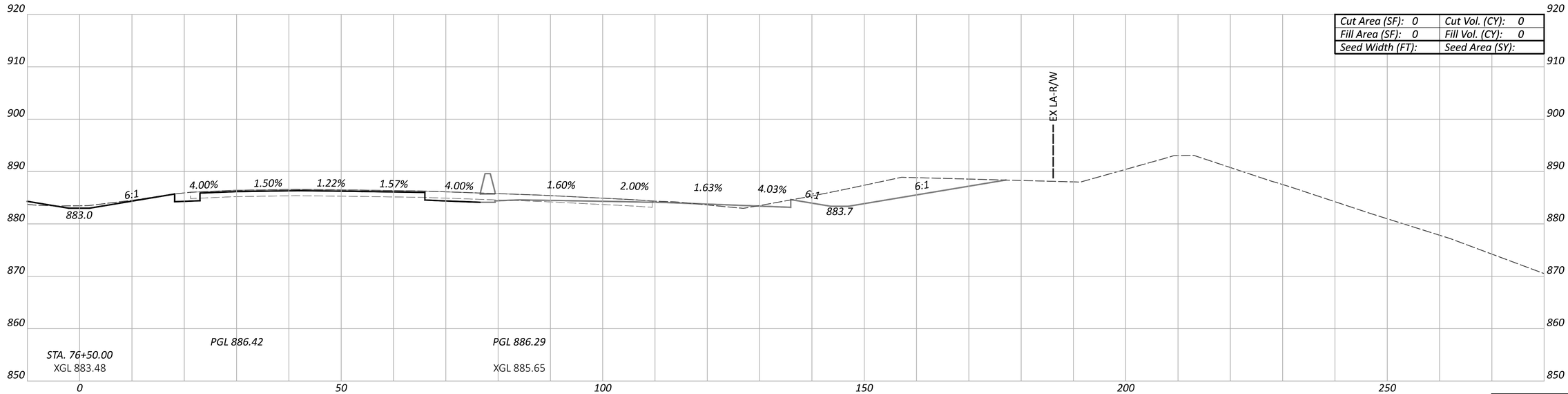
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	REVIEWER	PROJECT ID
BER	KAM 06/18/23	96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.316	740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 EB
STA. 76+50.00 TO STA. 77+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.317 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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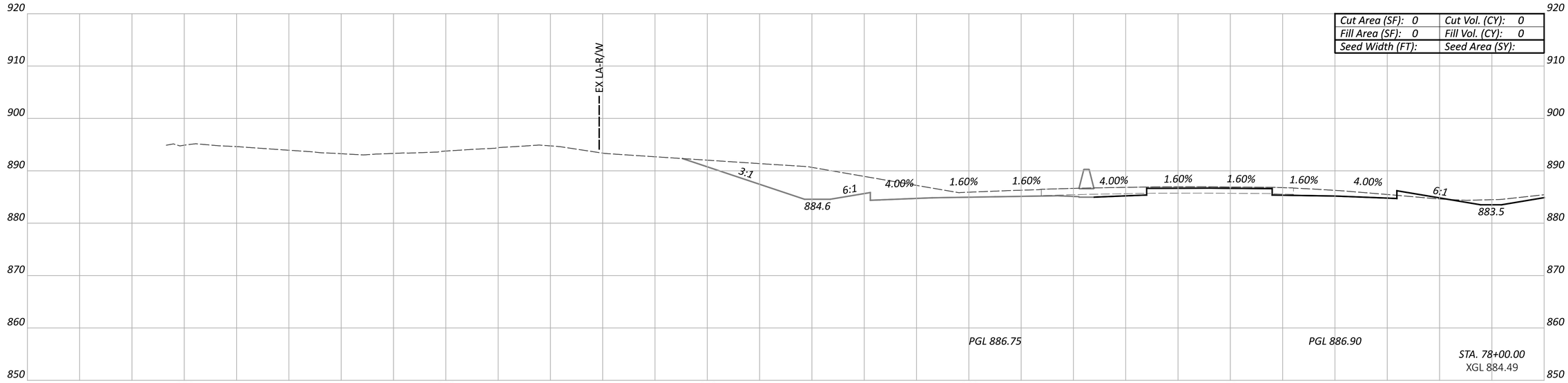

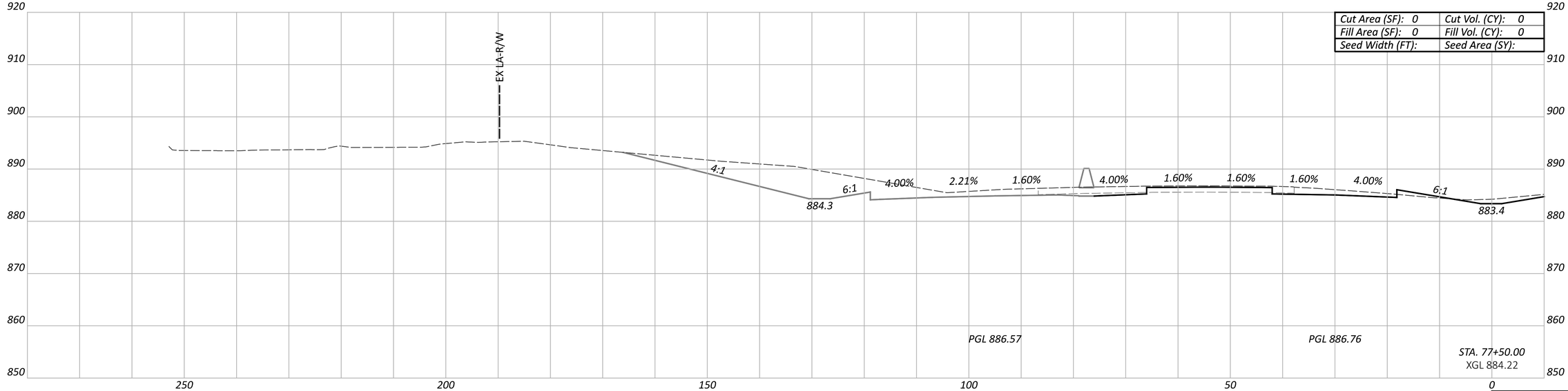

CROSS SECTIONS - IR 70 WB
STA. 77+50.00 TO STA. 78+00.00

FAI/LIC IR 70 0.00/0.00

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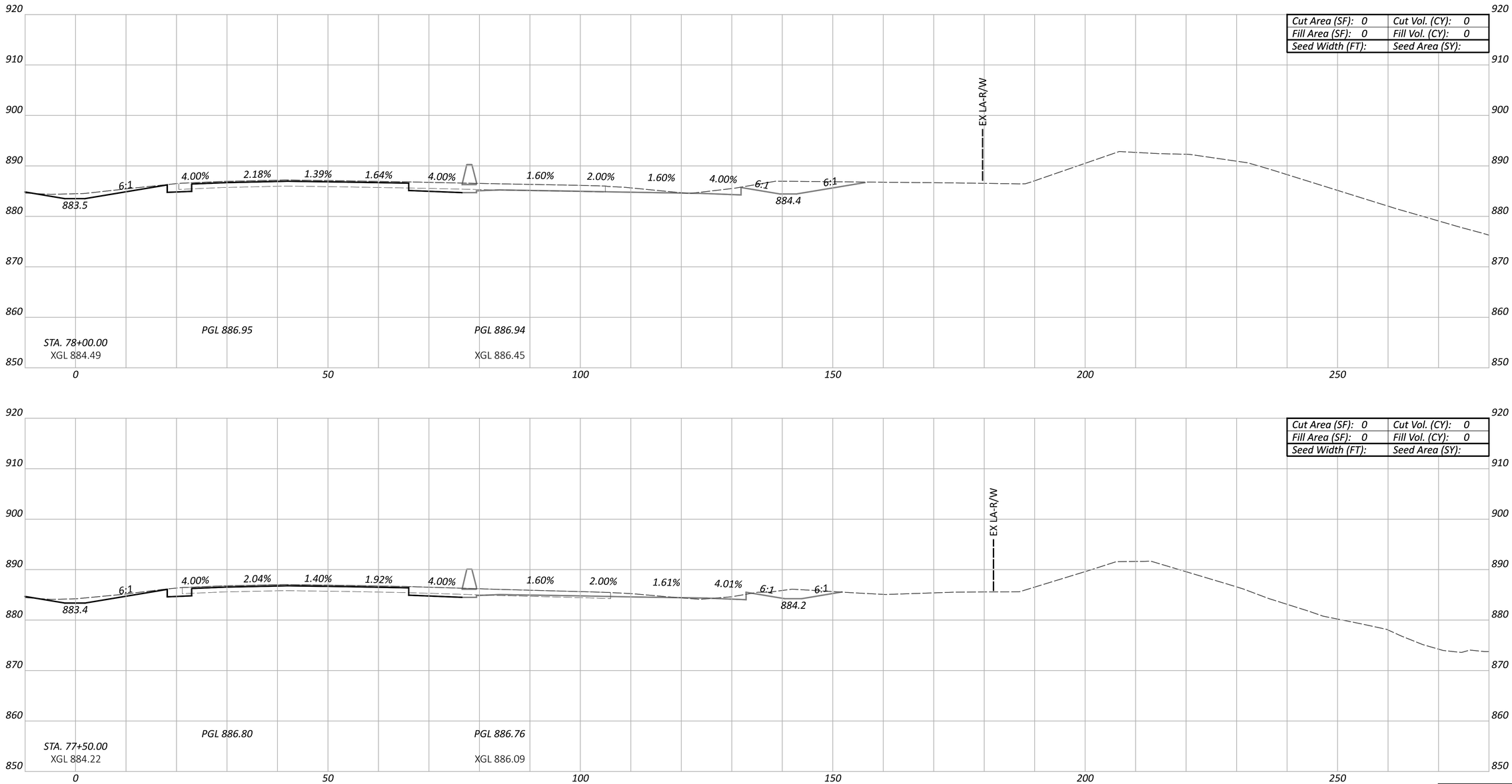
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.318
TOTAL	740



CROSS SECTIONS - IR 70 EB
STA. 77+50.00 TO STA. 78+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

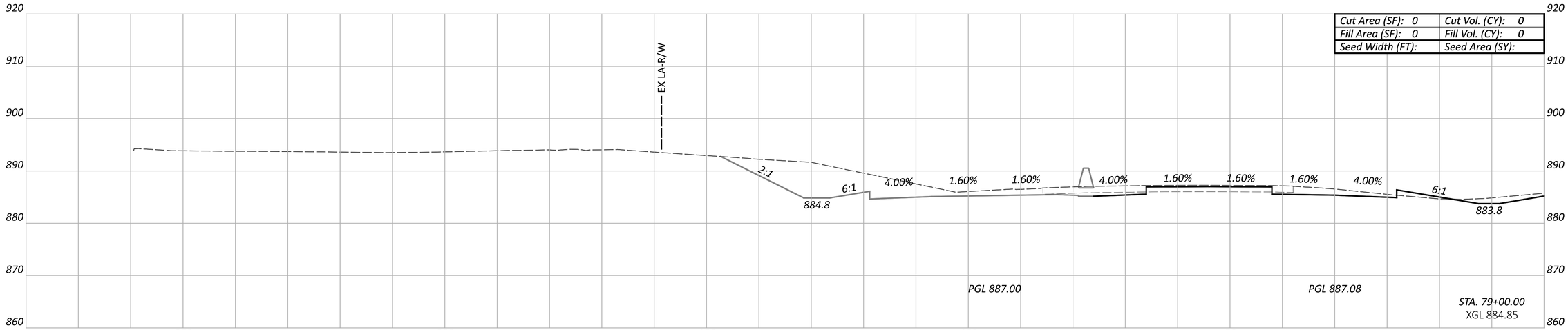
DESIGN AGENCY
STRUCTUREPOINT INC.

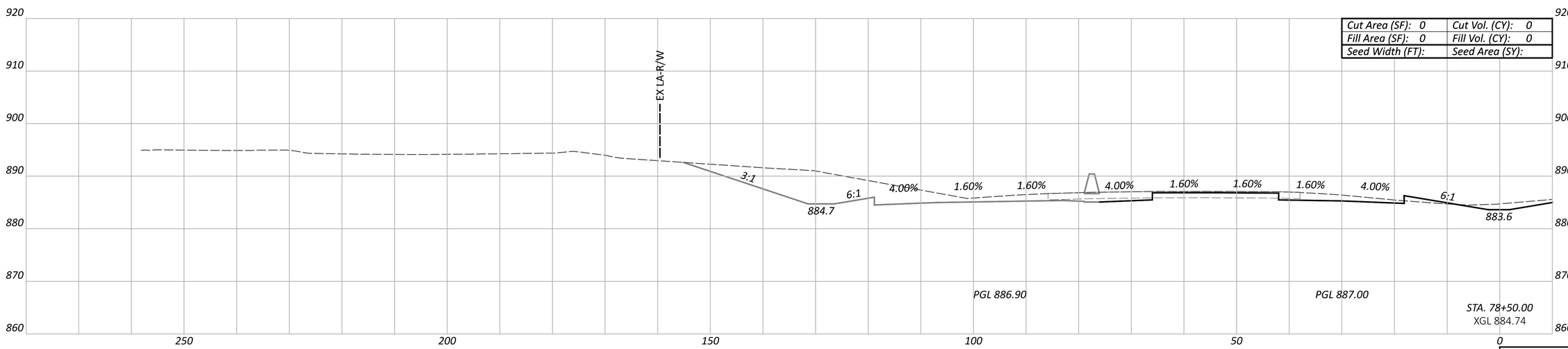
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.319 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 78+50.00 TO STA. 79+00.00

FAI/LIC IR 70 0.00/0.00

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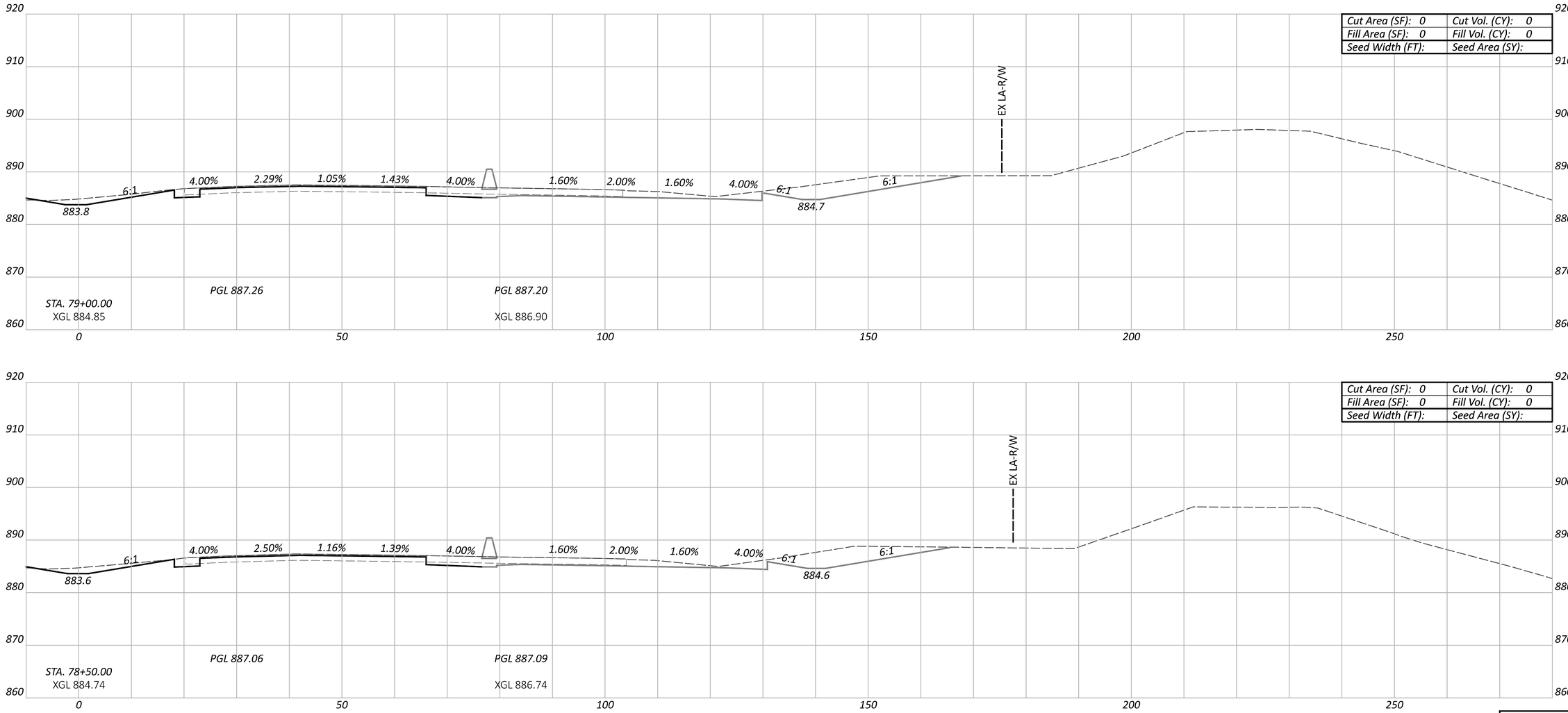
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.320
TOTAL	740

Sheet Totals

Seeding	Cut	Fill



CROSS SECTIONS - IR 70 EB
STA. 78+50.00 TO STA. 79+00.00

FAI/LIC IR 70 0.00/0.00

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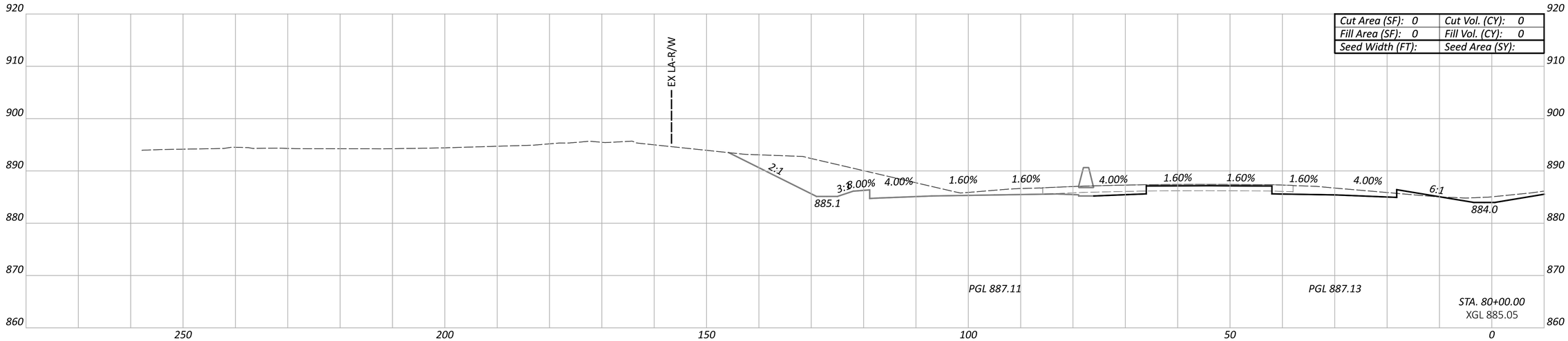
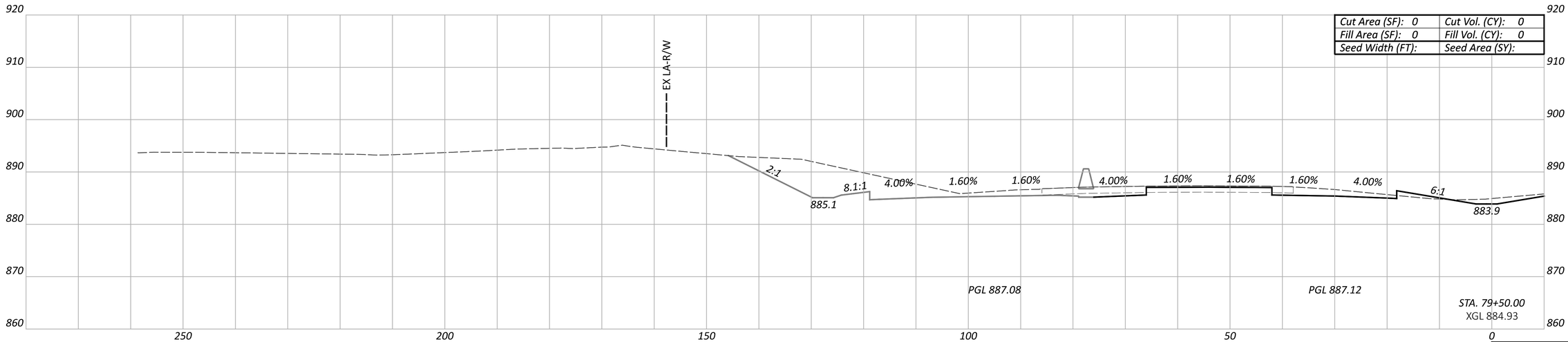
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.321
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 79+50.00 TO STA. 80+00.00

FAI/LIC IR 70 0.00/0.00

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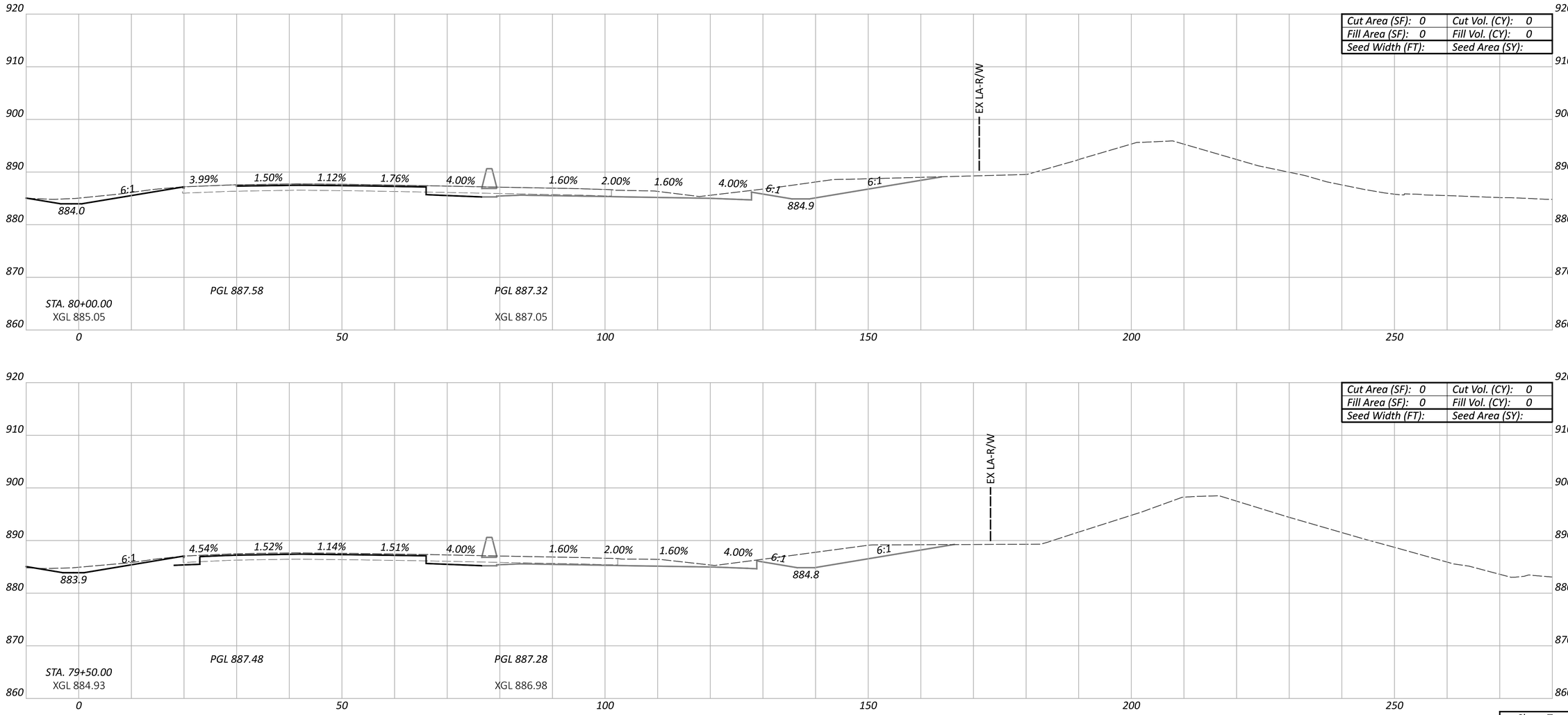
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.322
TOTAL	740



CROSS SECTIONS - IR 70 EB
STA. 79+50.00 TO STA. 80+00.00

FAI/LIC IR 70 0.00/0.00

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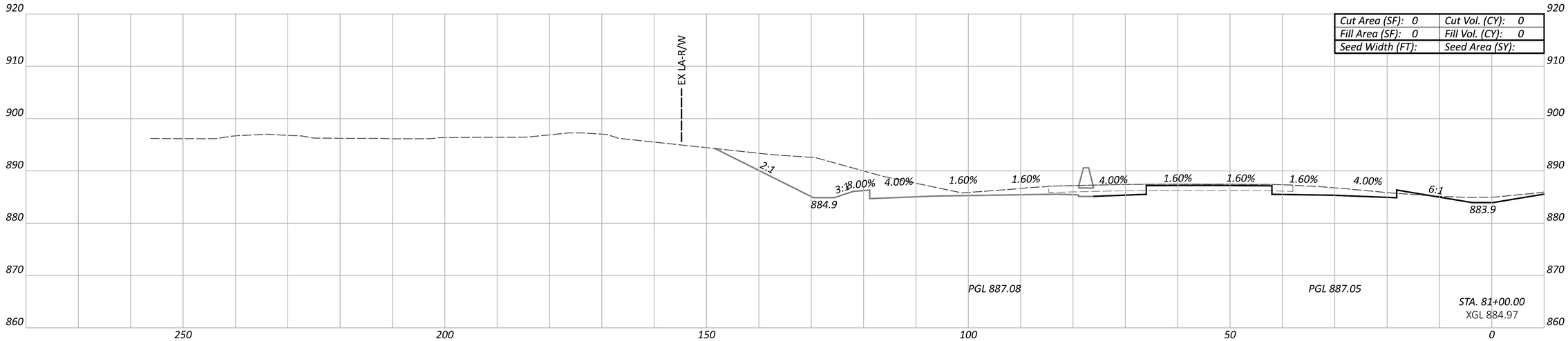
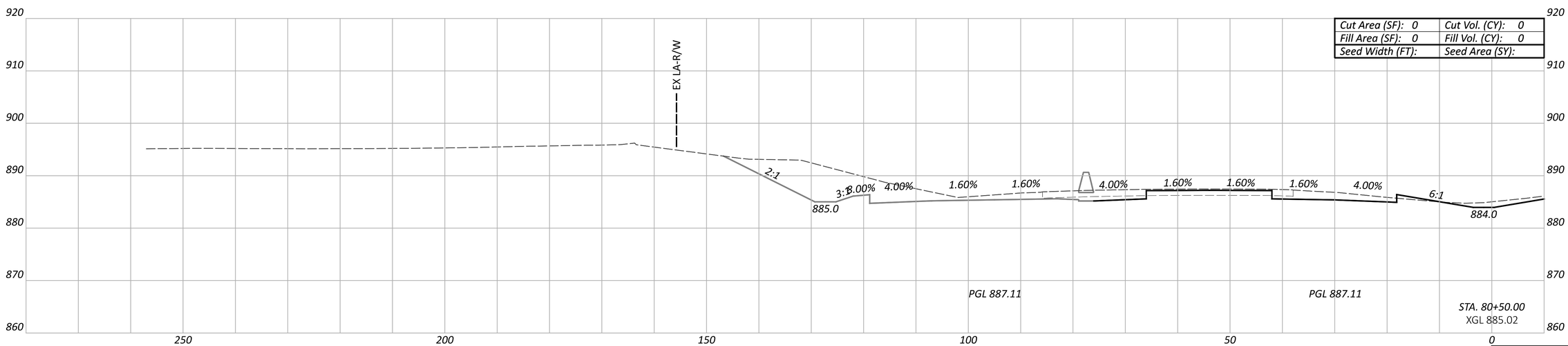
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.323
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 80+50.00 TO STA. 81+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT LLC

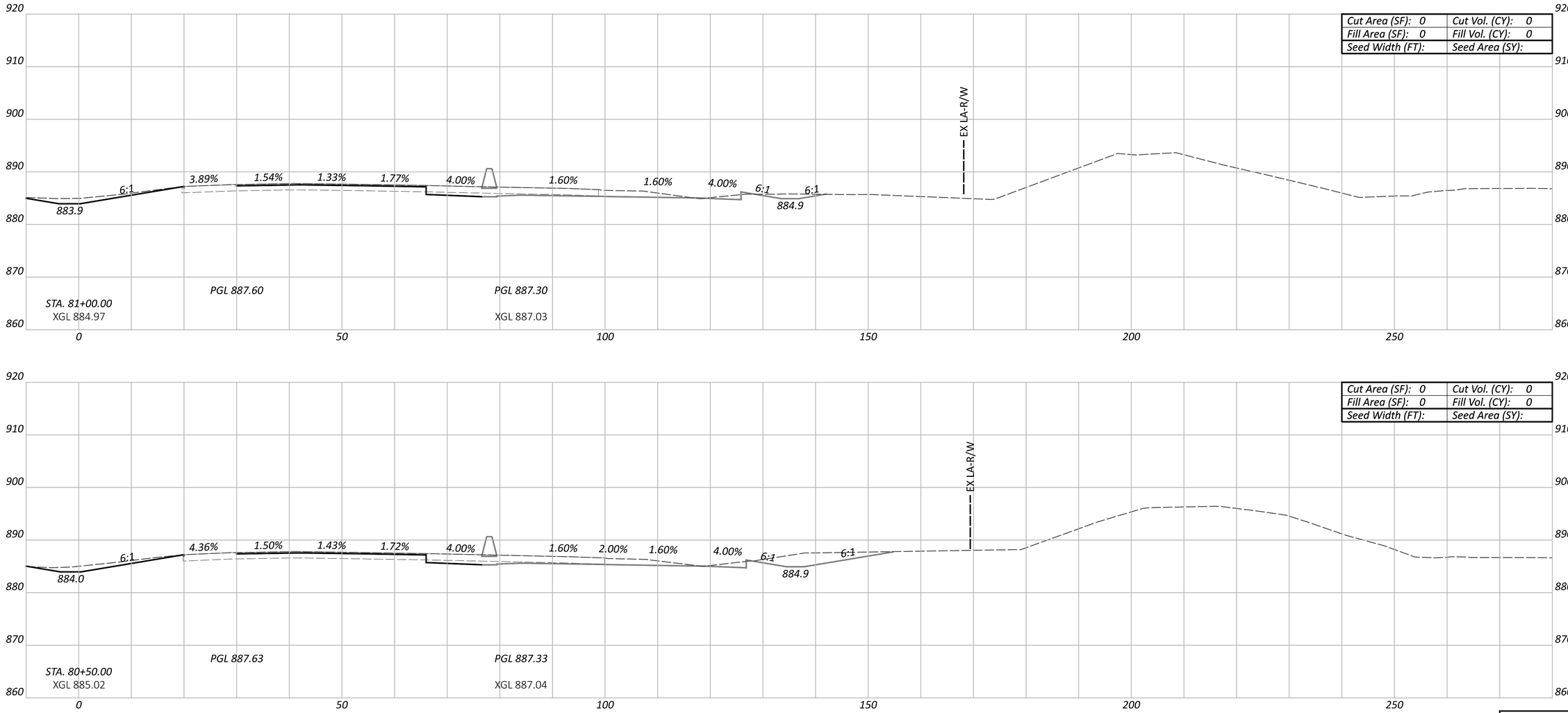
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.324	740



CROSS SECTIONS - IR 70 EB
STA. 80+50.00 TO STA. 81+00.00

FAI/LIC IR 70 0.00/0.00

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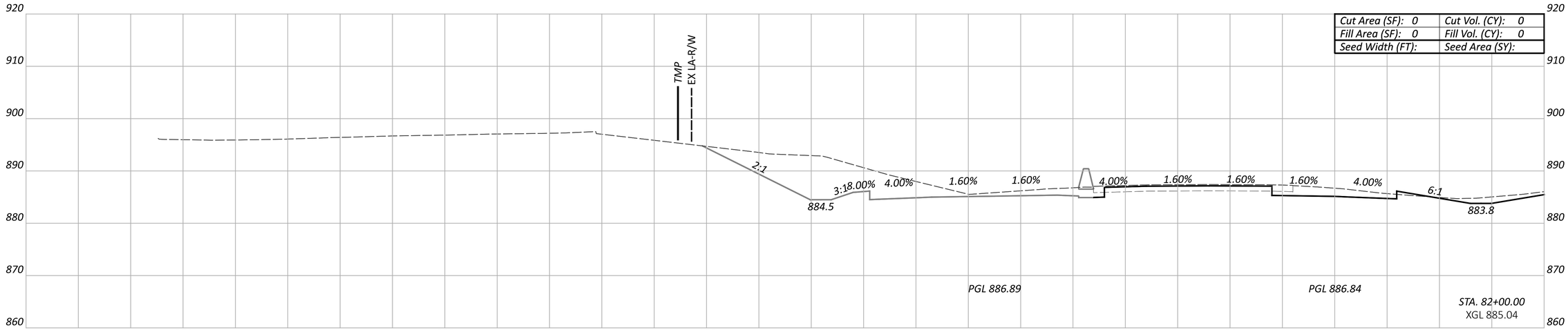
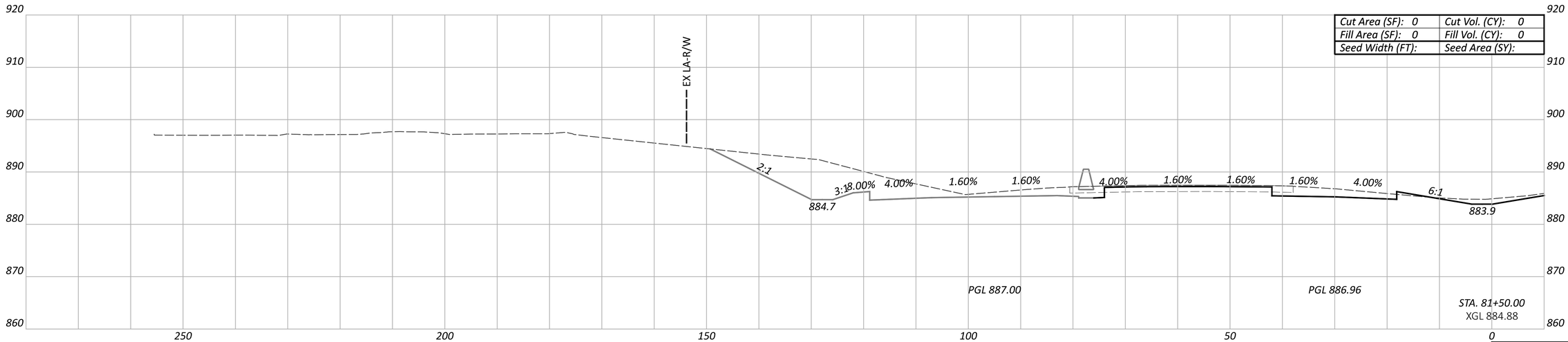
DESIGN AGENCY: STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.325
TOTAL	740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 WB
STA. 81+50.00 TO STA. 82+00.00

FAI/LIC IR 70 0.00/0.00

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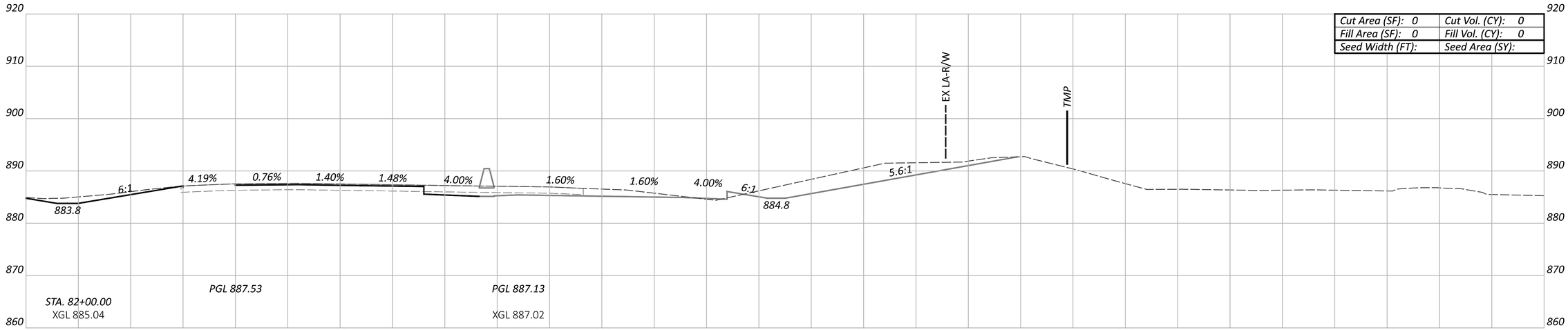
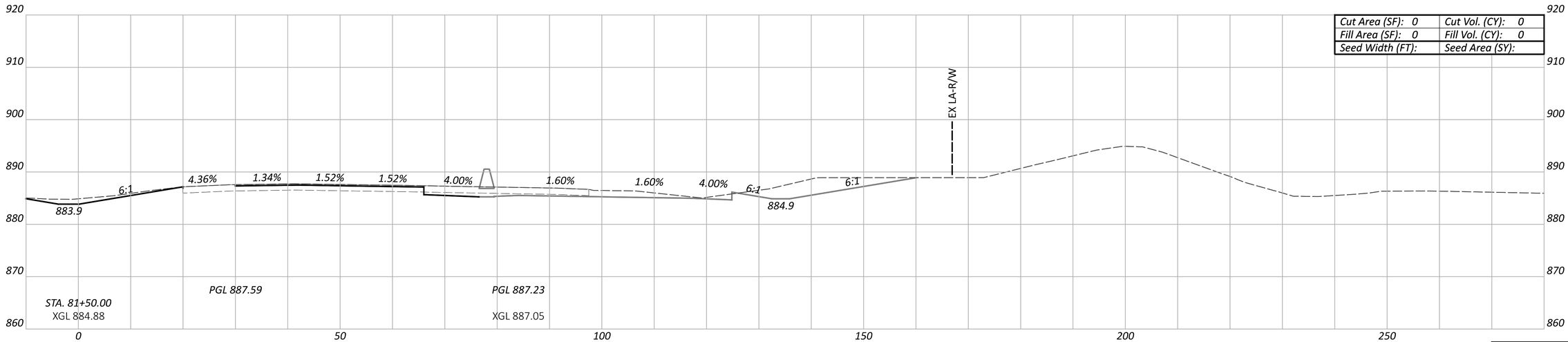
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.326
TOTAL	740





CROSS SECTIONS - IR 70 EB
STA. 81+50.00 TO STA. 82+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

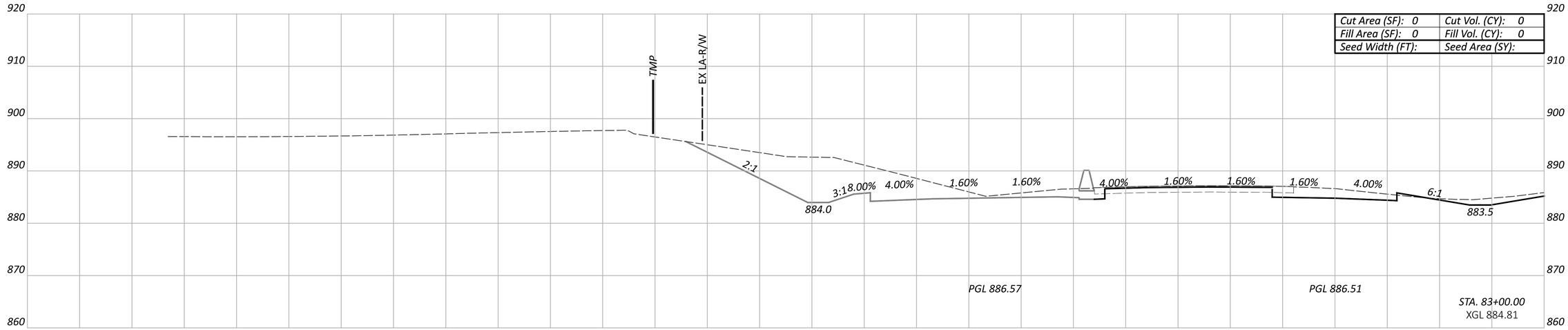
DESIGN AGENCY
STRUCTUREPOINT LLC

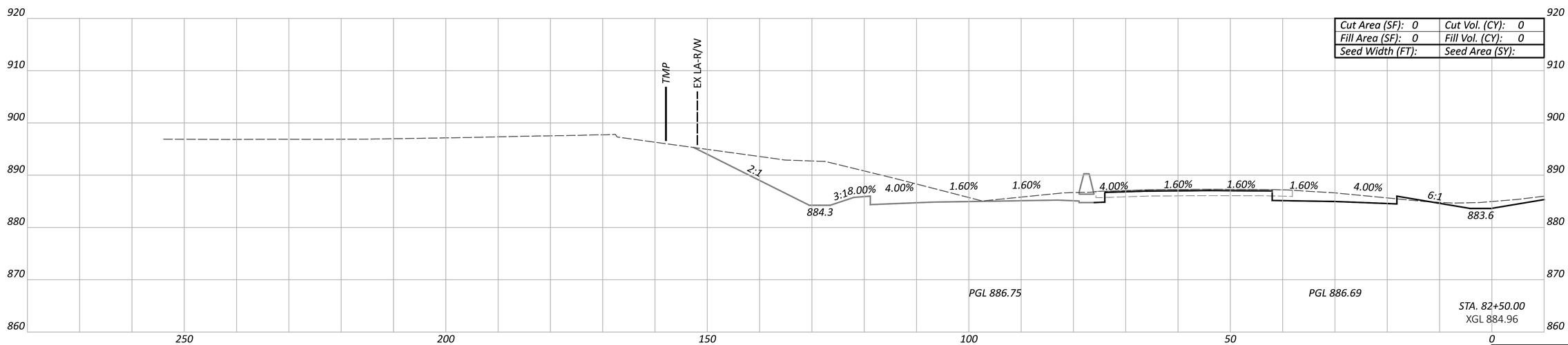
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.327 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 82+50.00 TO STA. 83+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

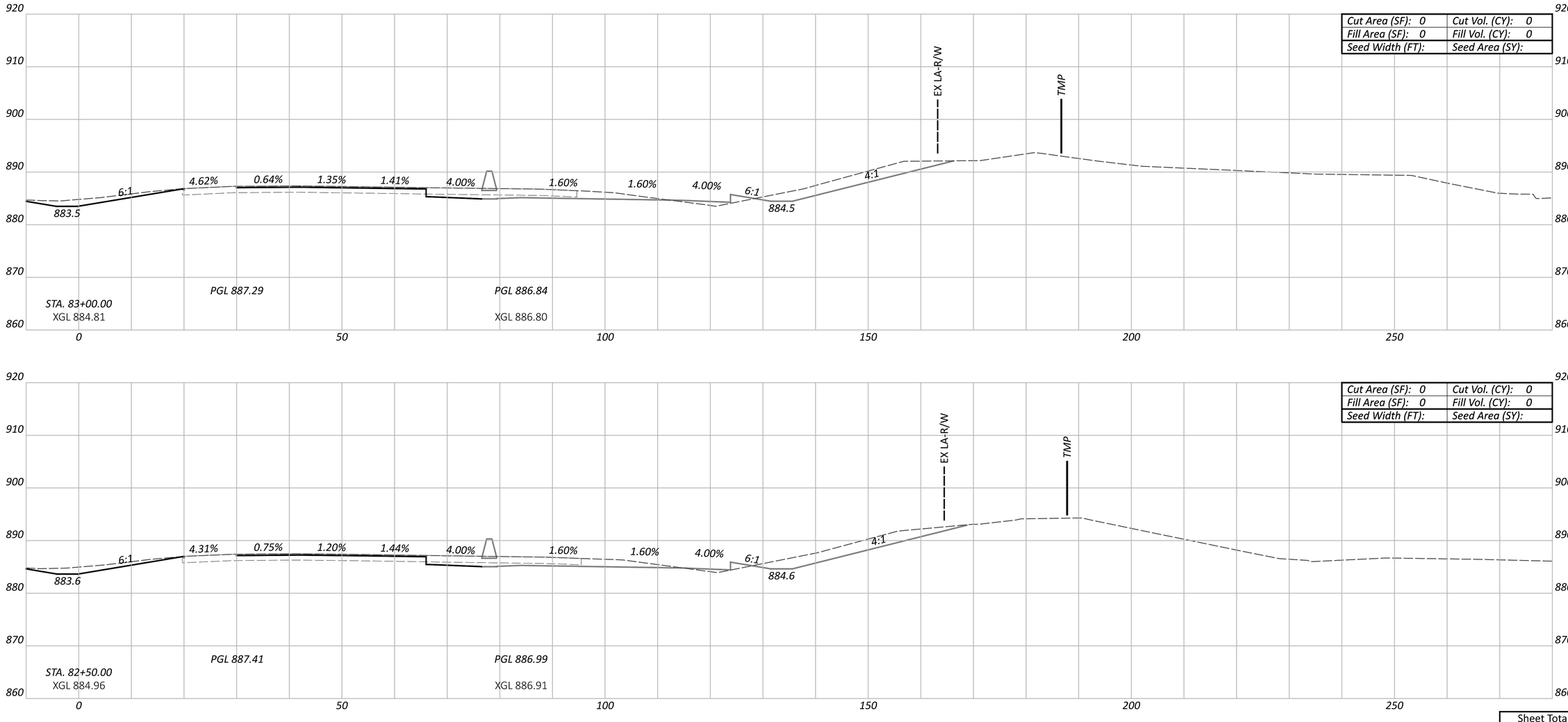
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.328	740



CROSS SECTIONS - IR 70 EB
STA. 82+50.00 TO STA. 83+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

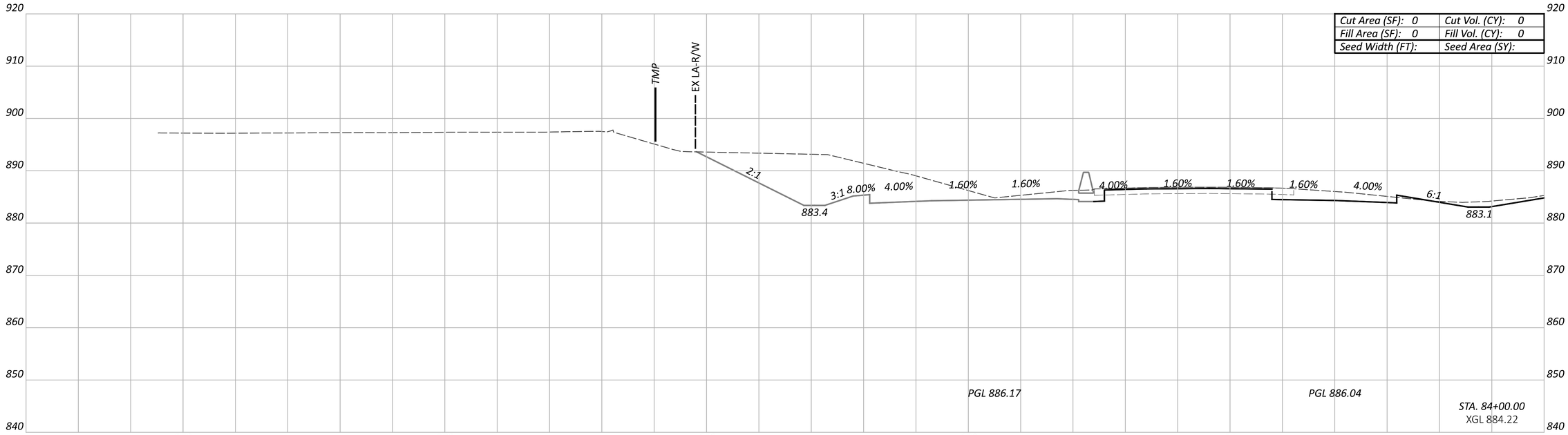
DESIGN AGENCY
STRUCTUREPOINT LLC

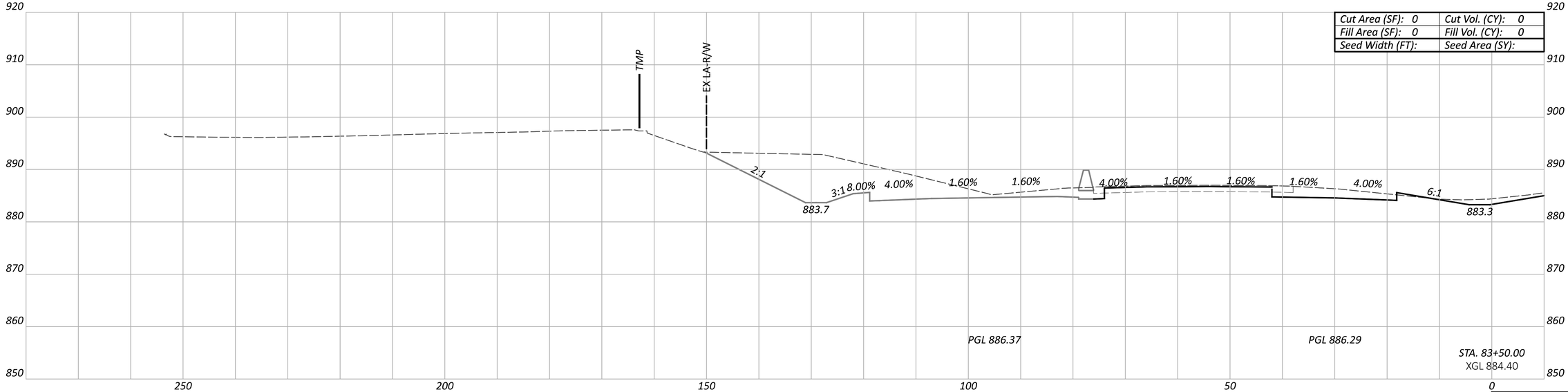
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.329 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 83+50.00 TO STA. 84+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.330
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 83+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:20:49 PM USER: aoldaker
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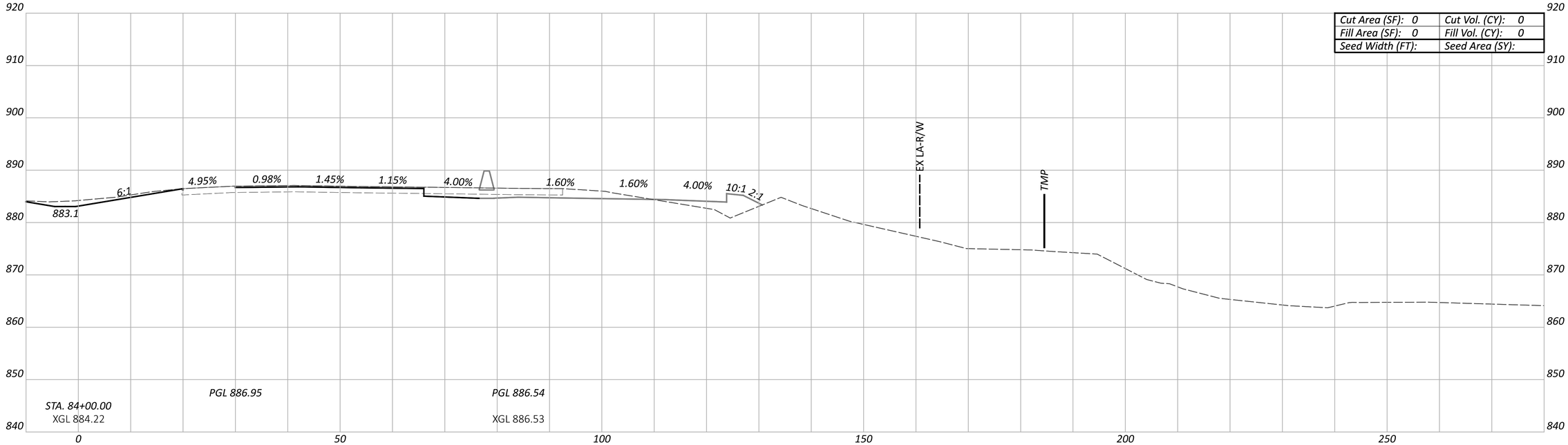

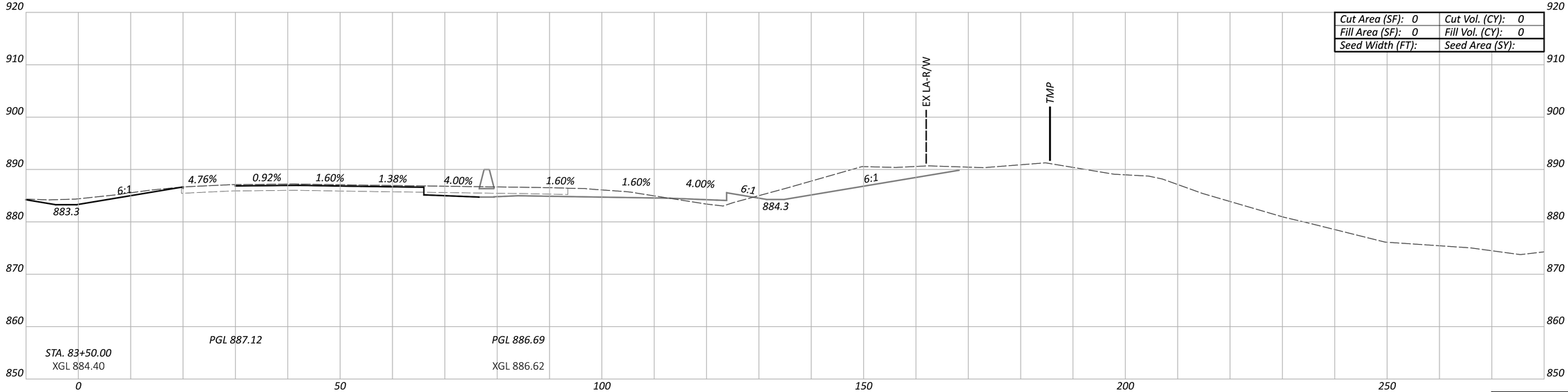

CROSS SECTIONS - IR 70 EB
STA. 83+50.00 TO STA. 84+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 83+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:20:52 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

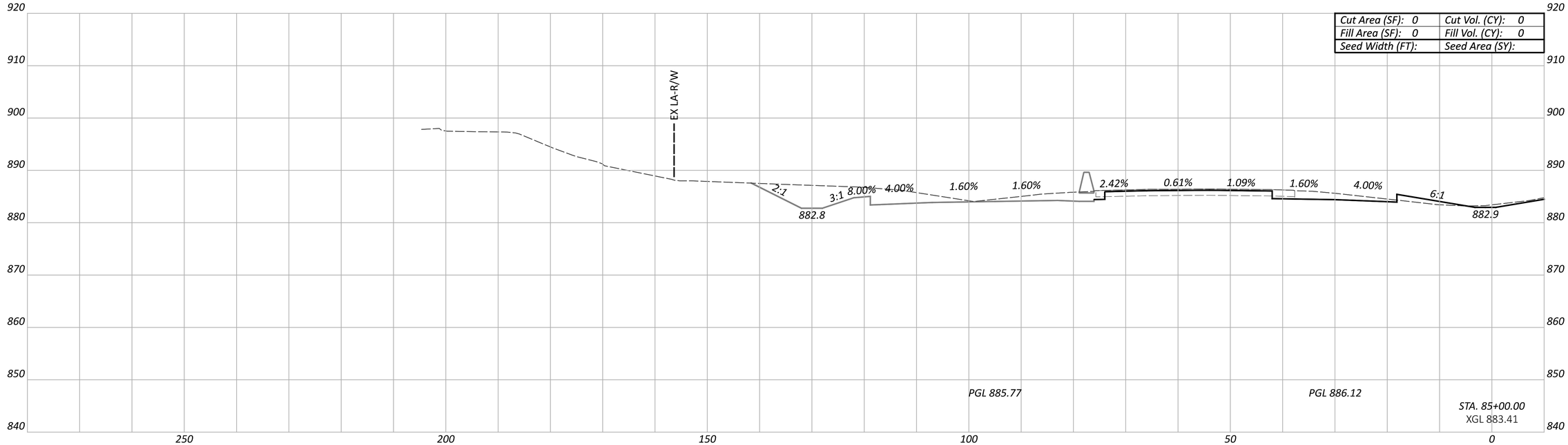
DESIGN AGENCY
STRUCTUREPOINT

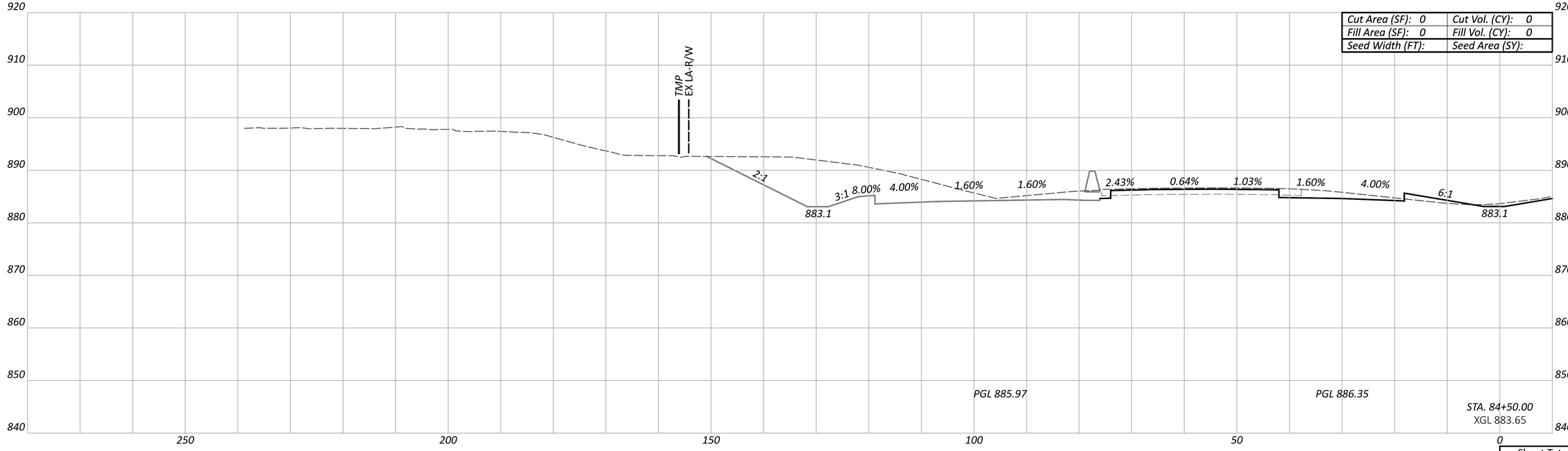
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.331 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 84+50.00 TO STA. 85+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.332 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 84+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:20:55 PM USER: aoldaker
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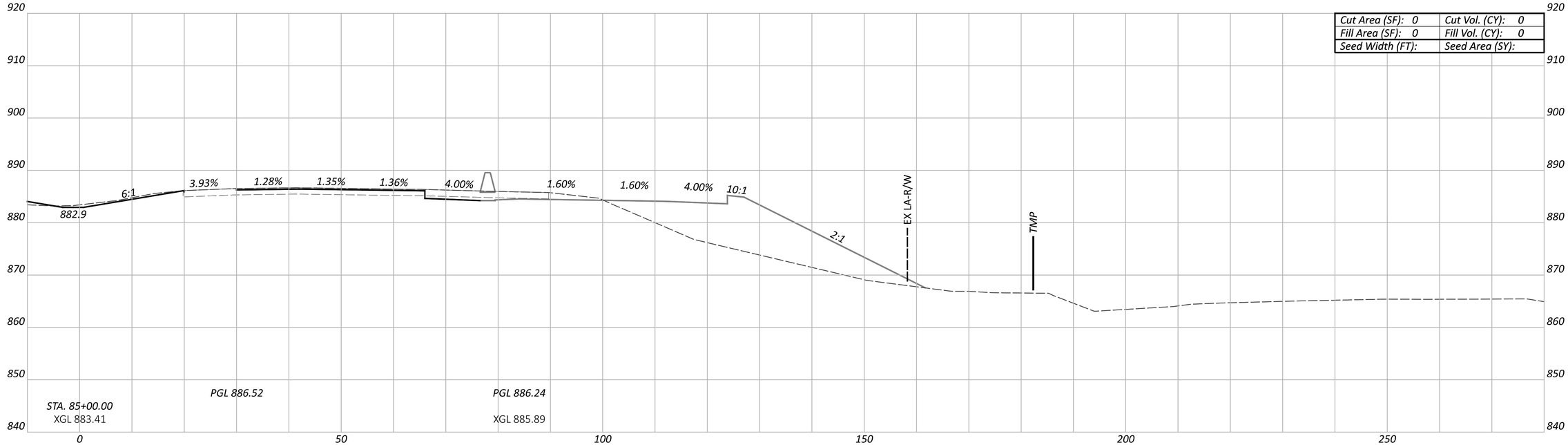

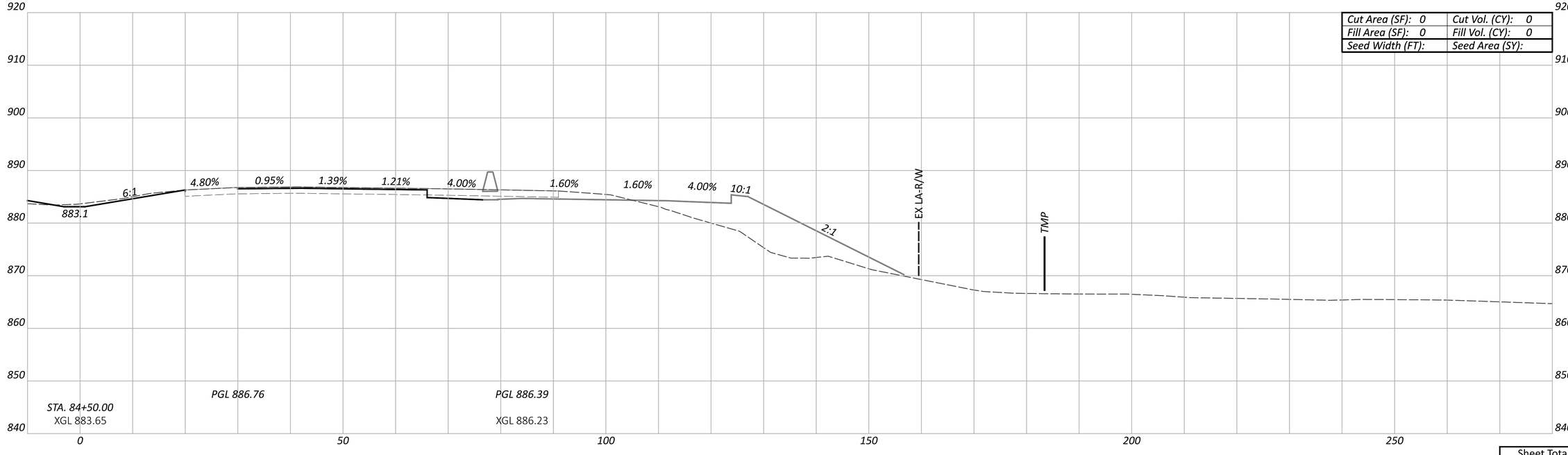

CROSS SECTIONS - IR 70 EB
STA. 84+50.00 TO STA. 85+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 84+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:20:58 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

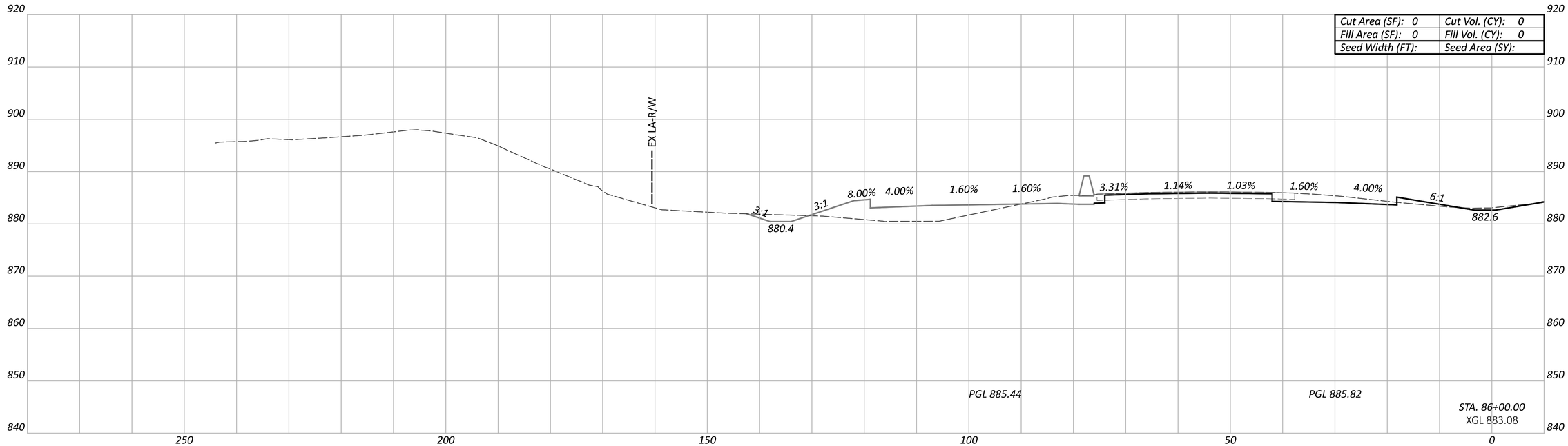
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

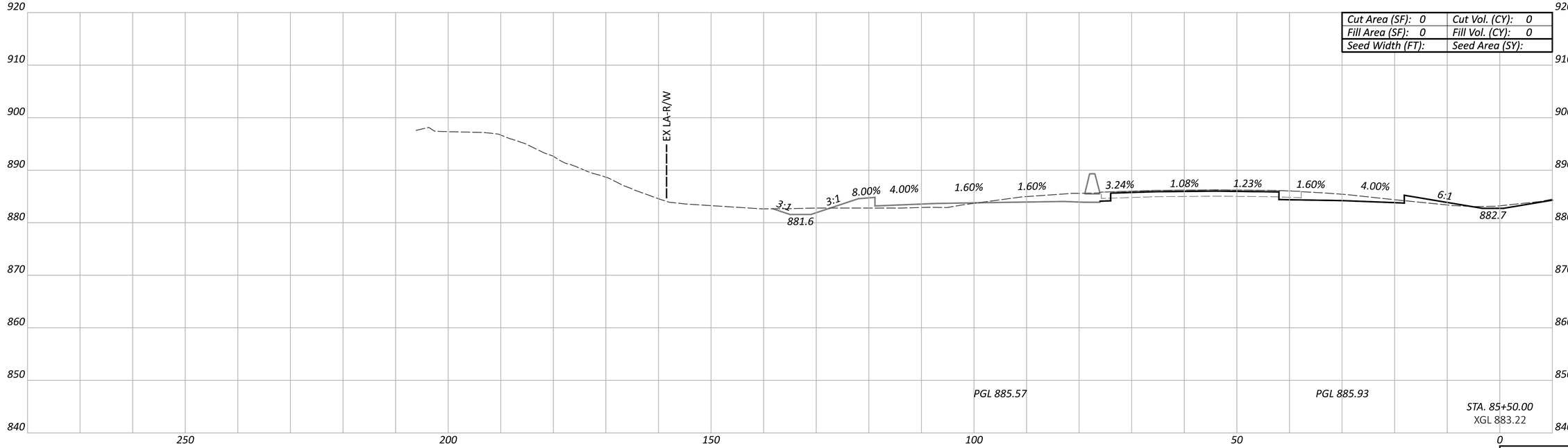
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.333 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 85+50.00 TO STA. 86+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.334 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 85+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:21:01 PM USER: aoldaker
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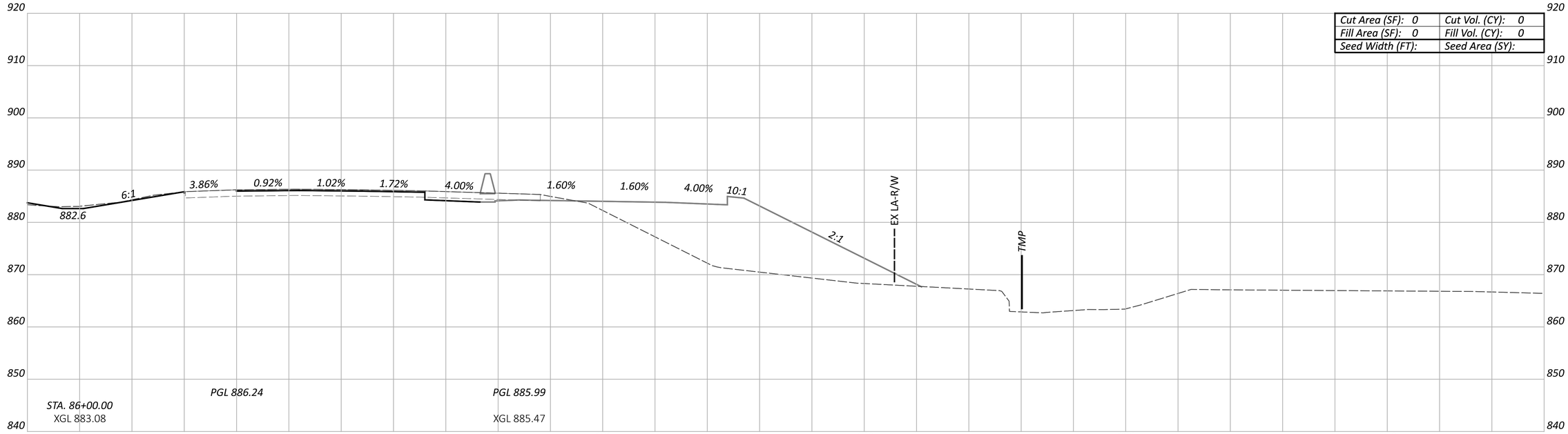

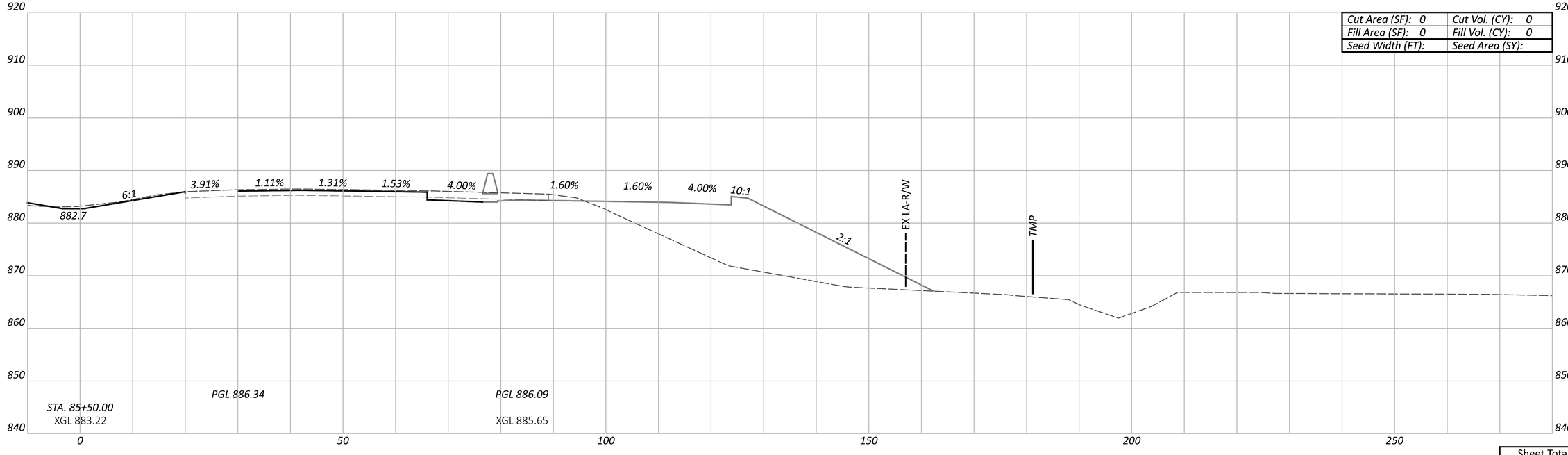

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STA. 85+50.00 TO STA. 86+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

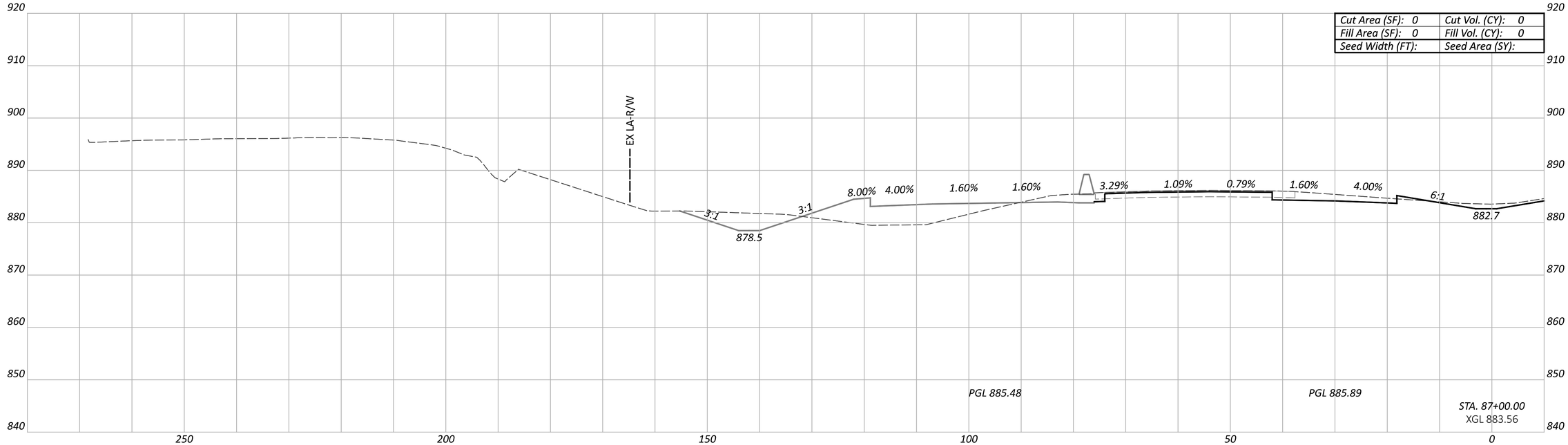
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

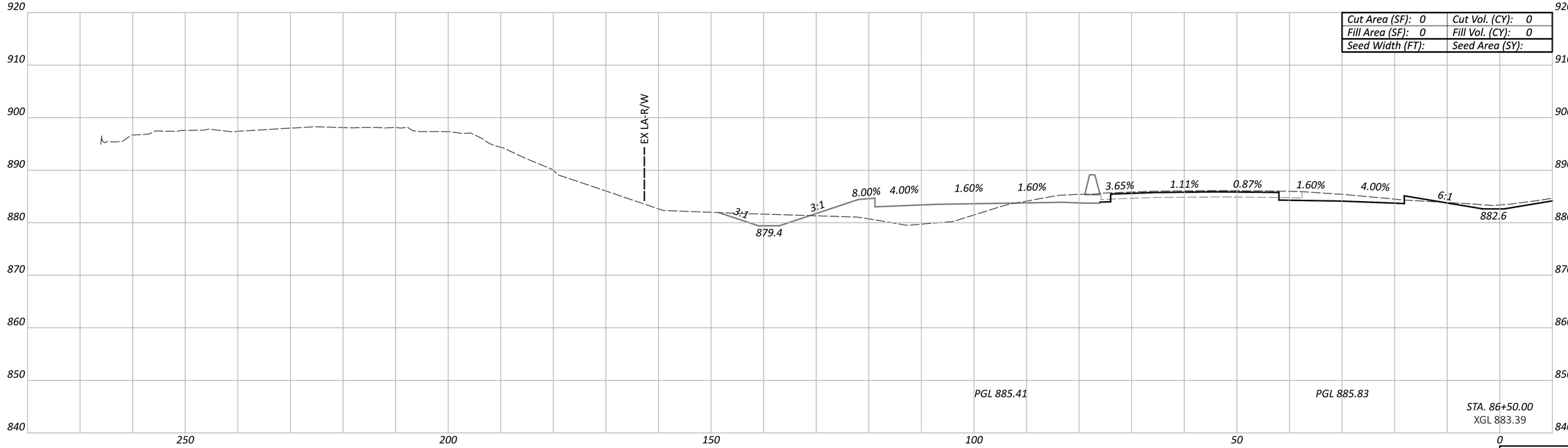
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.335 TOTAL 740





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STA. 86+50.00 TO STA. 87+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

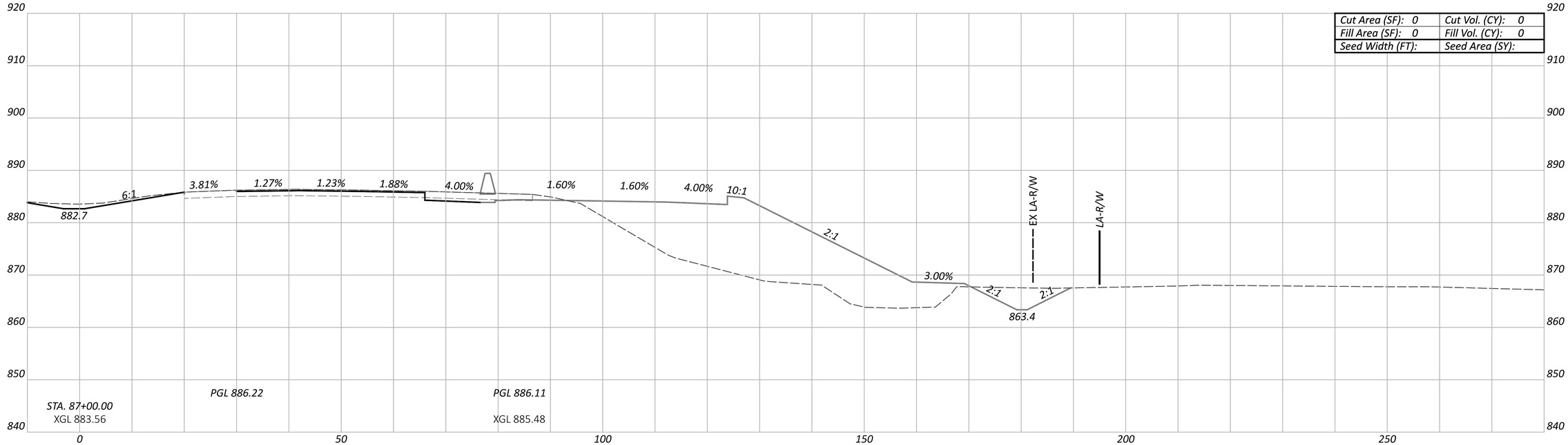
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

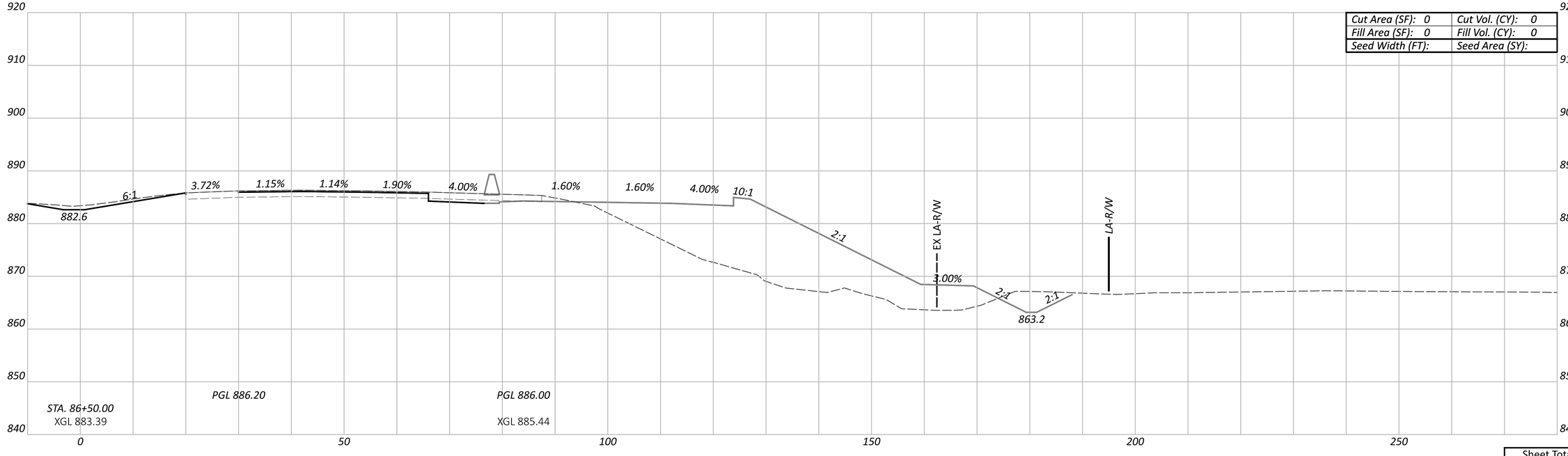
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.336 TOTAL 740





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STA. 86+50.00 TO STA. 87+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

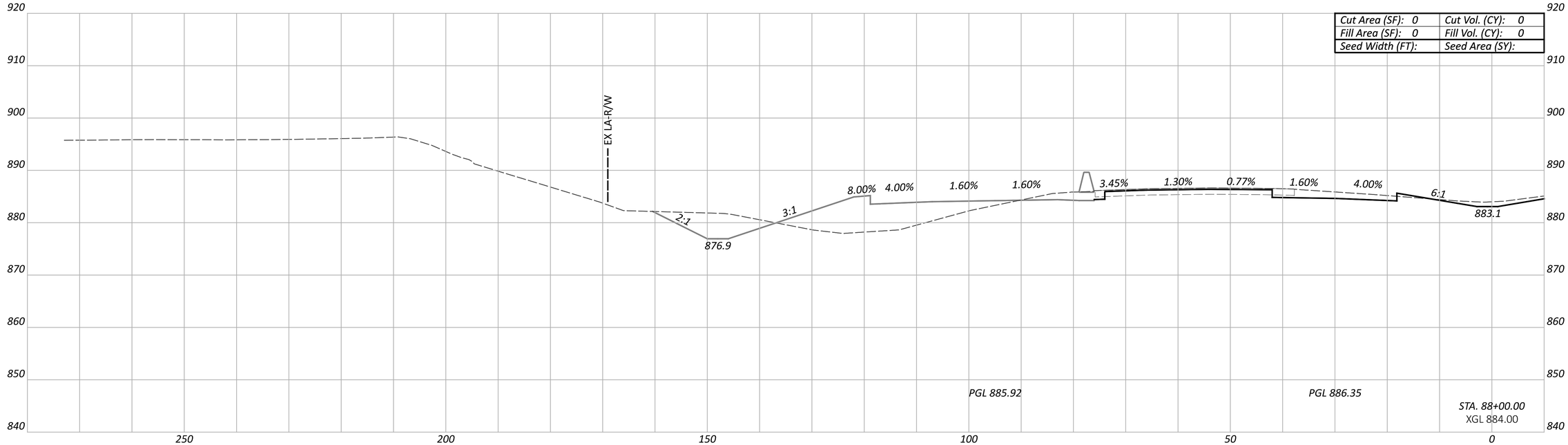
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

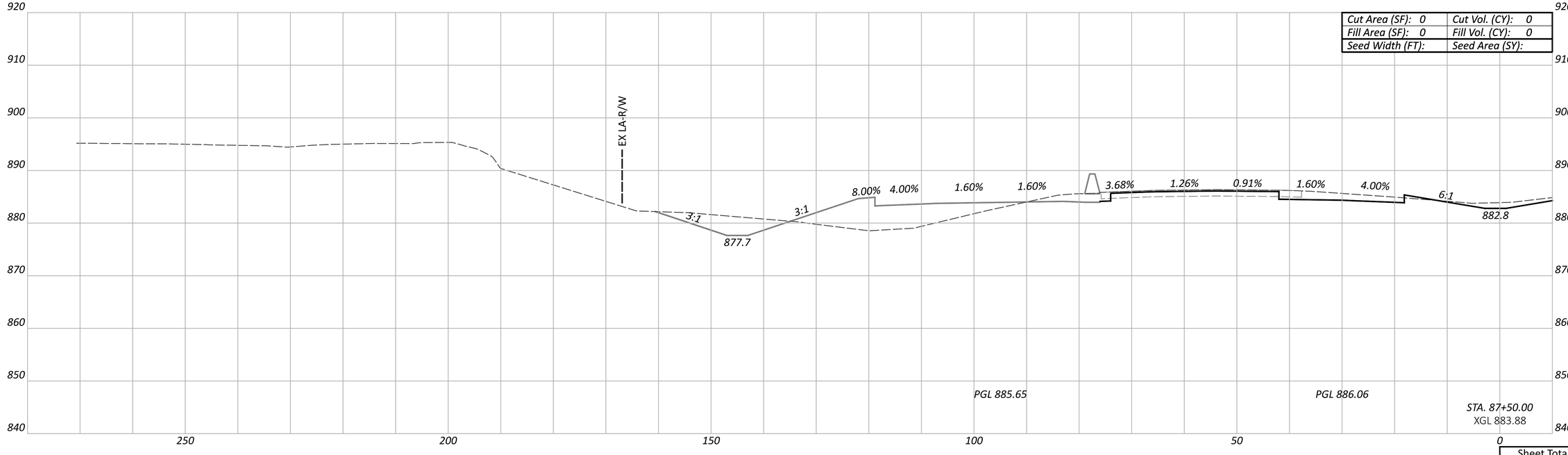
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.337 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 87+50.00 TO STA. 88+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

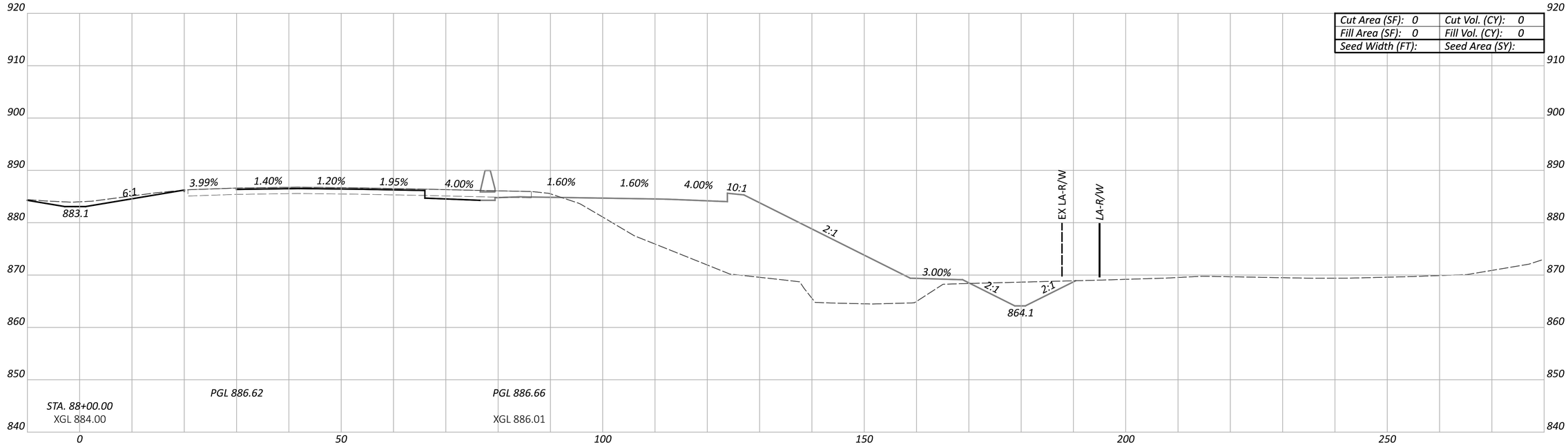
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

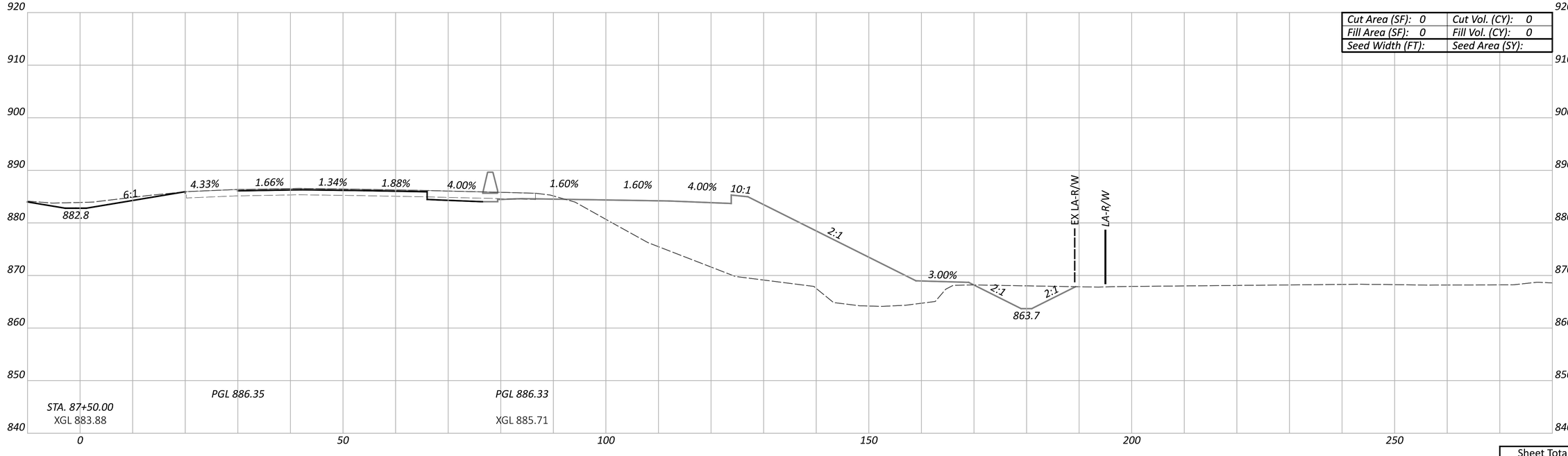
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.338	740





CROSS SECTIONS - IR 70 EB
STA. 87+50.00 TO STA. 88+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.339 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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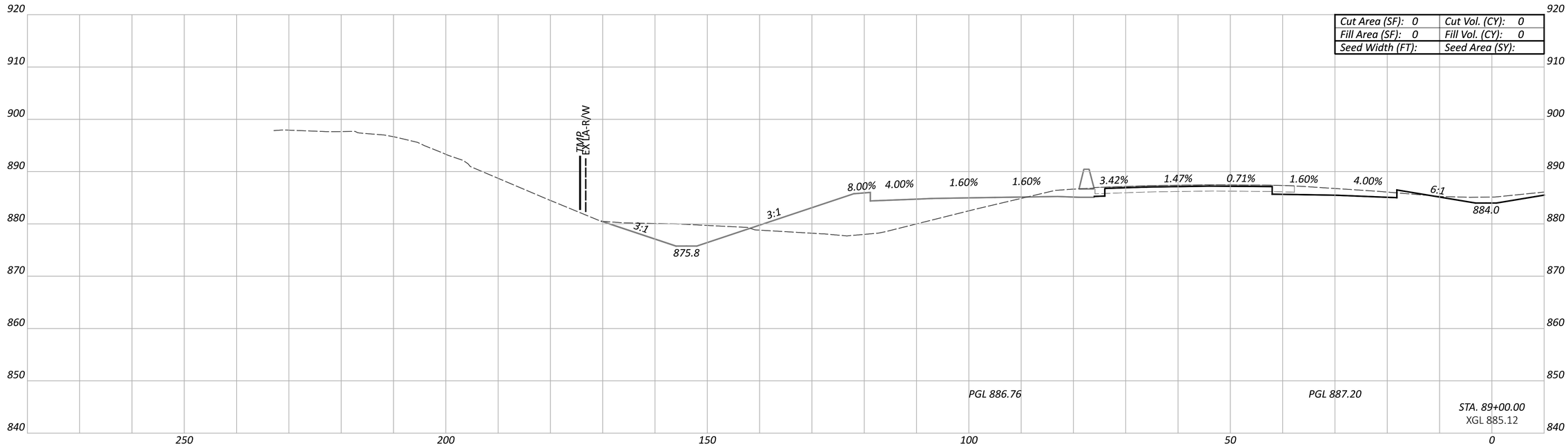

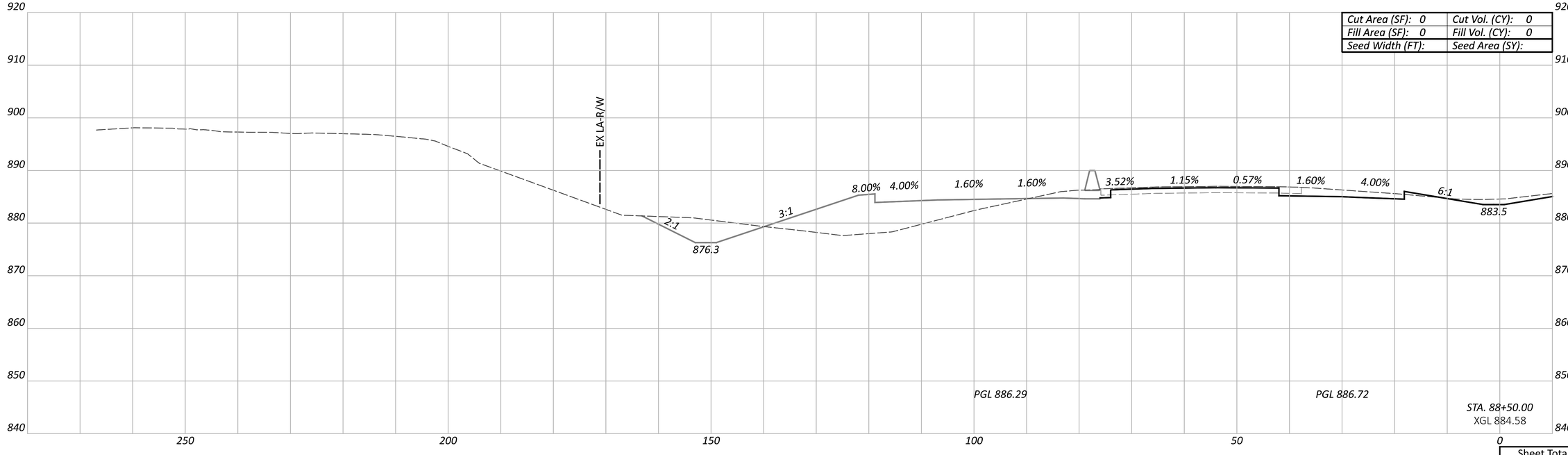

CROSS SECTIONS - IR 70 WB
STA. 88+50.00 TO STA. 89+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.340 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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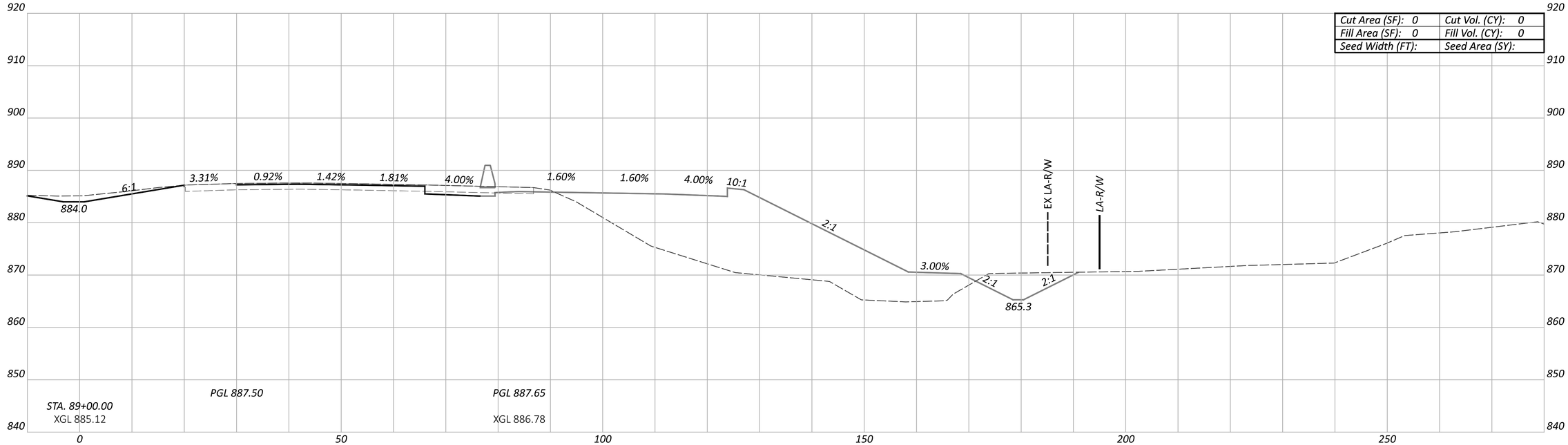

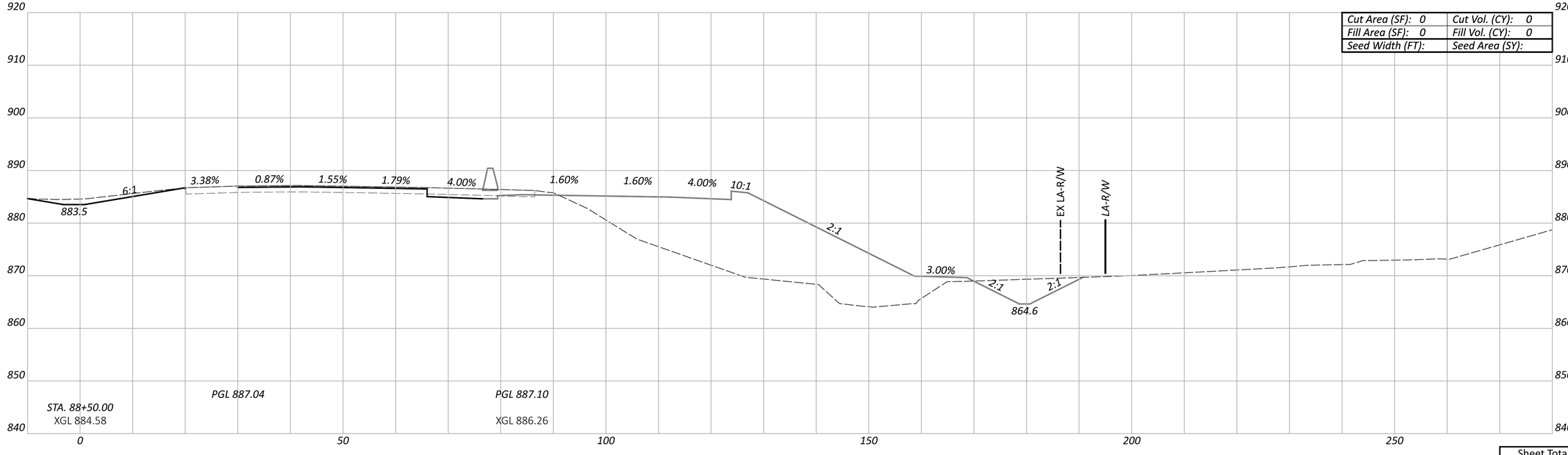

CROSS SECTIONS - IR 70 EB
STA. 88+50.00 TO STA. 89+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

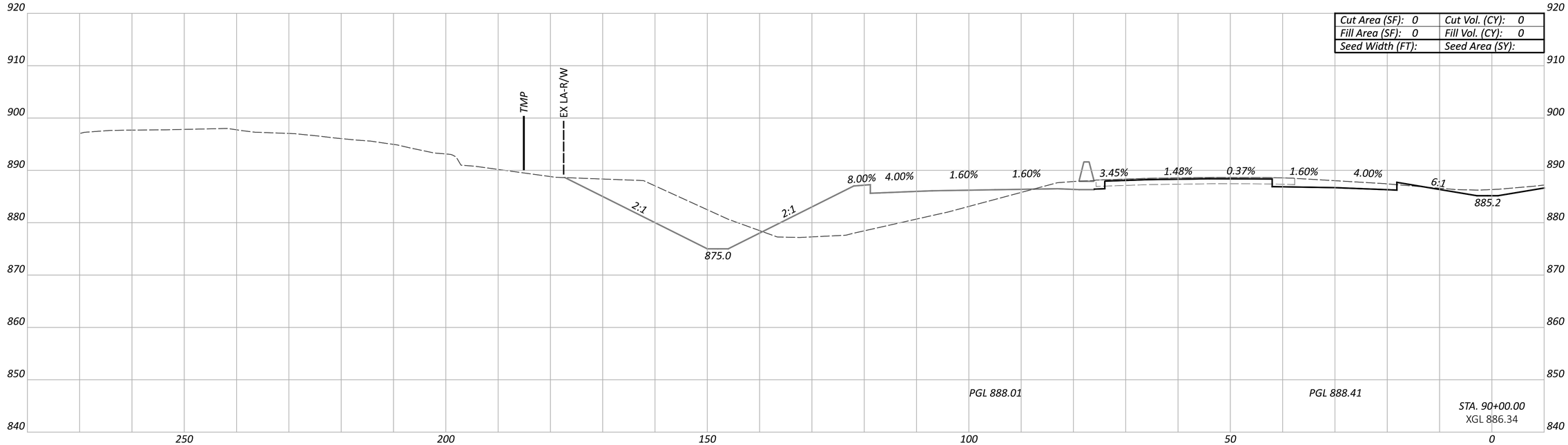
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

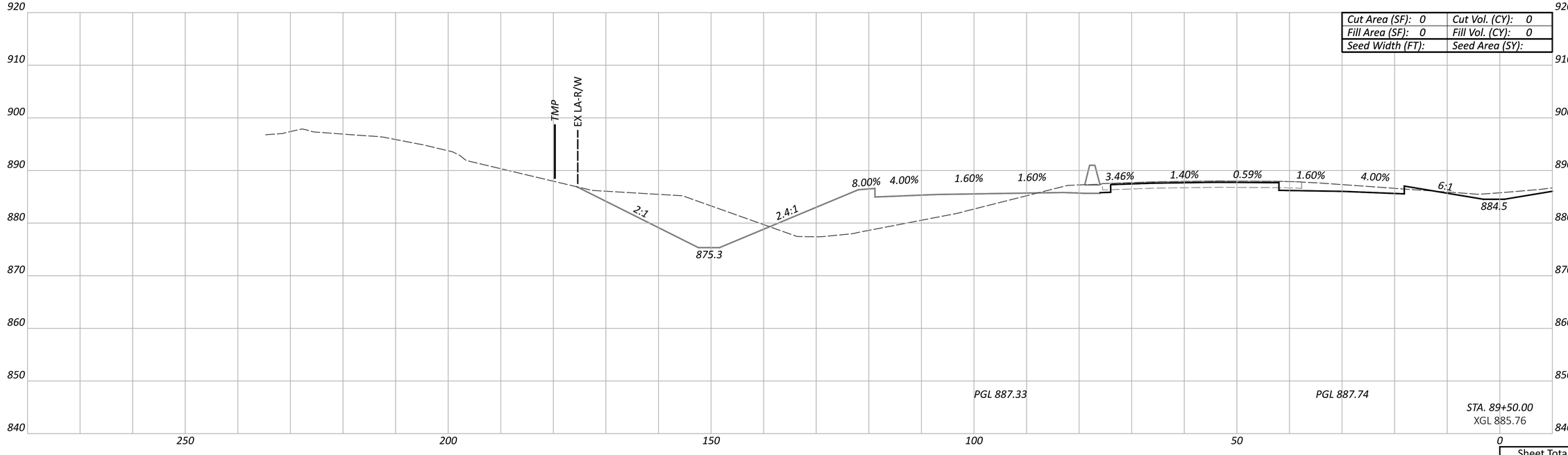
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.341 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 89+50.00 TO STA. 90+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.342 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 89+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:21:25 PM USER: aoldaker
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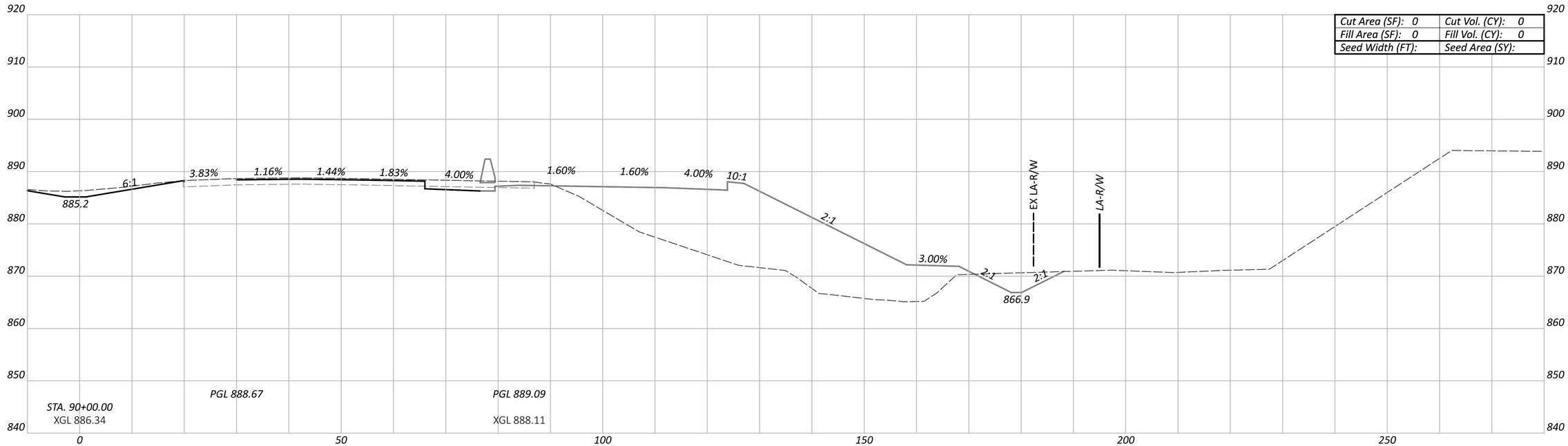

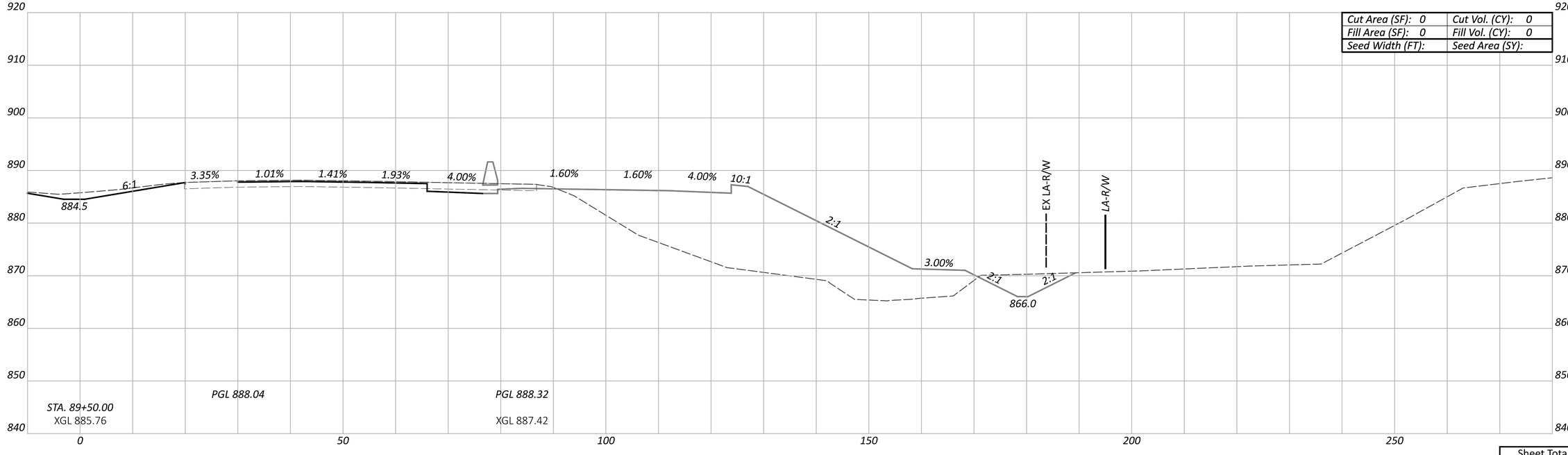

CROSS SECTIONS - IR 70 EB
STA. 89+50.00 TO STA. 90+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

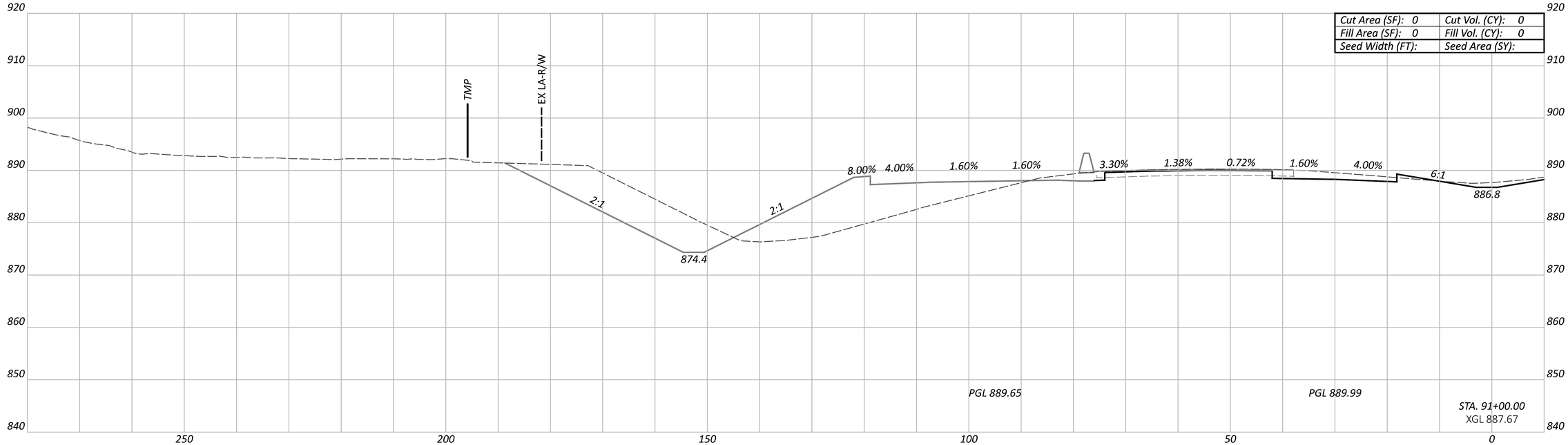
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

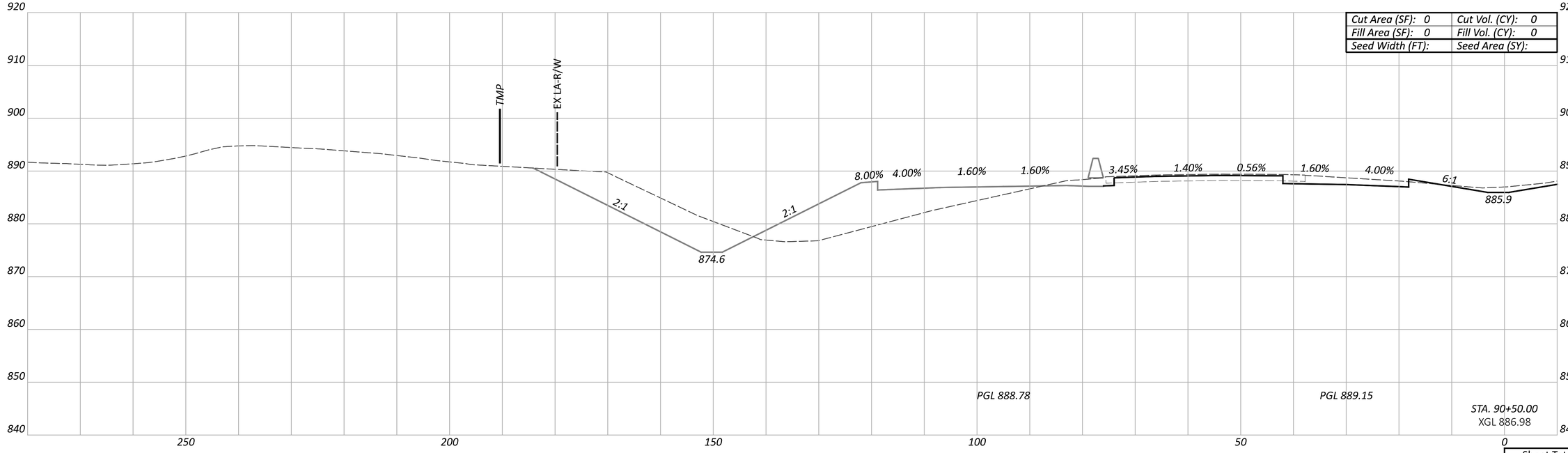
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.343 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 90+50.00 TO STA. 91+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

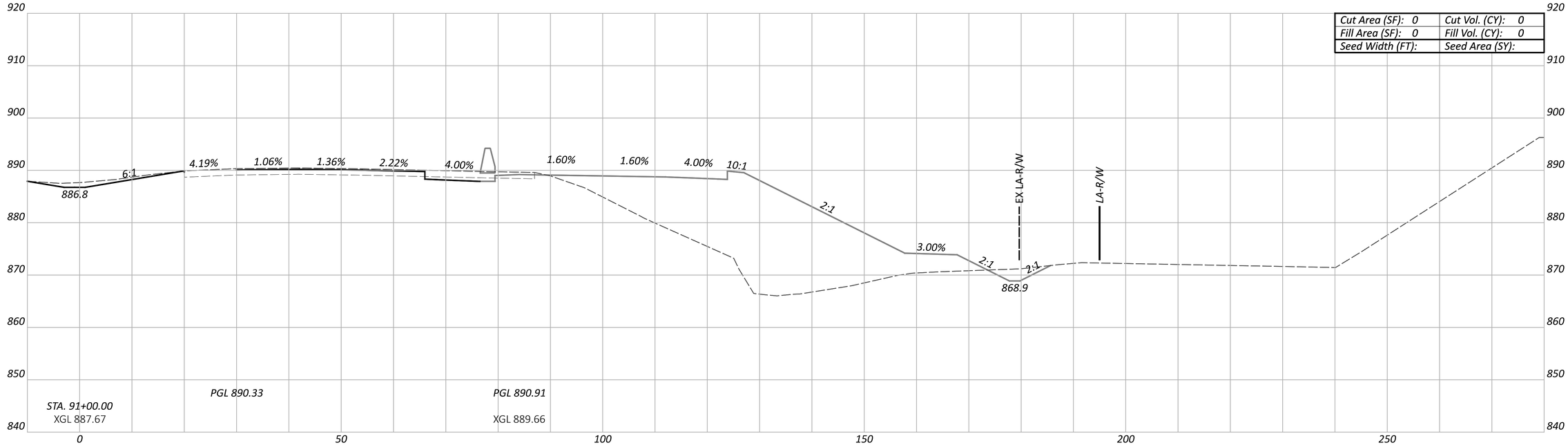
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

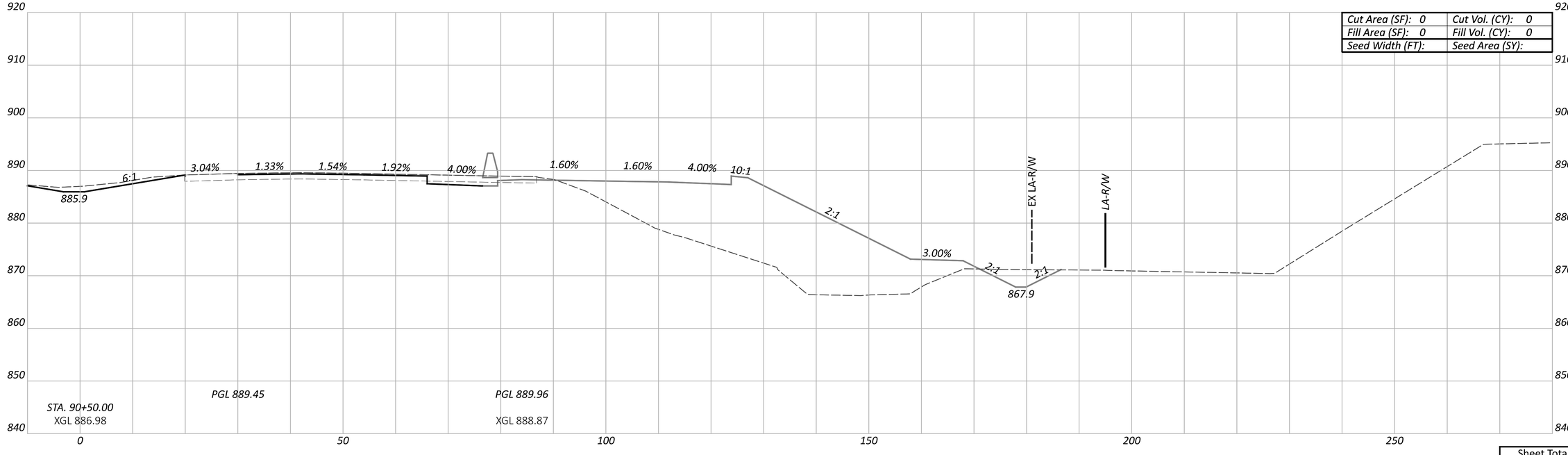
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.344	740





CROSS SECTIONS - IR 70 EB
STA. 90+50.00 TO STA. 91+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

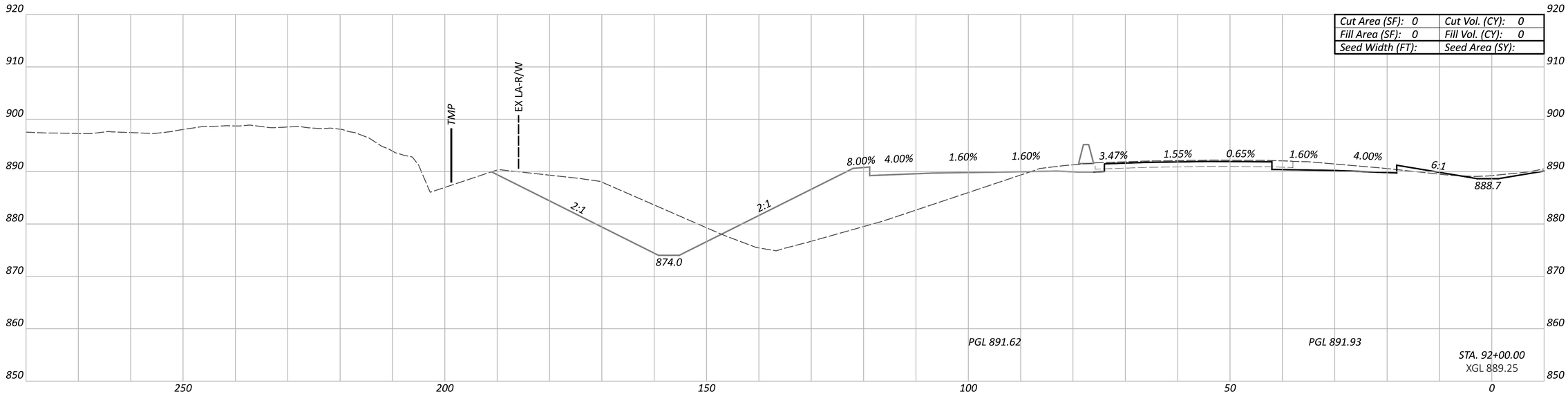
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

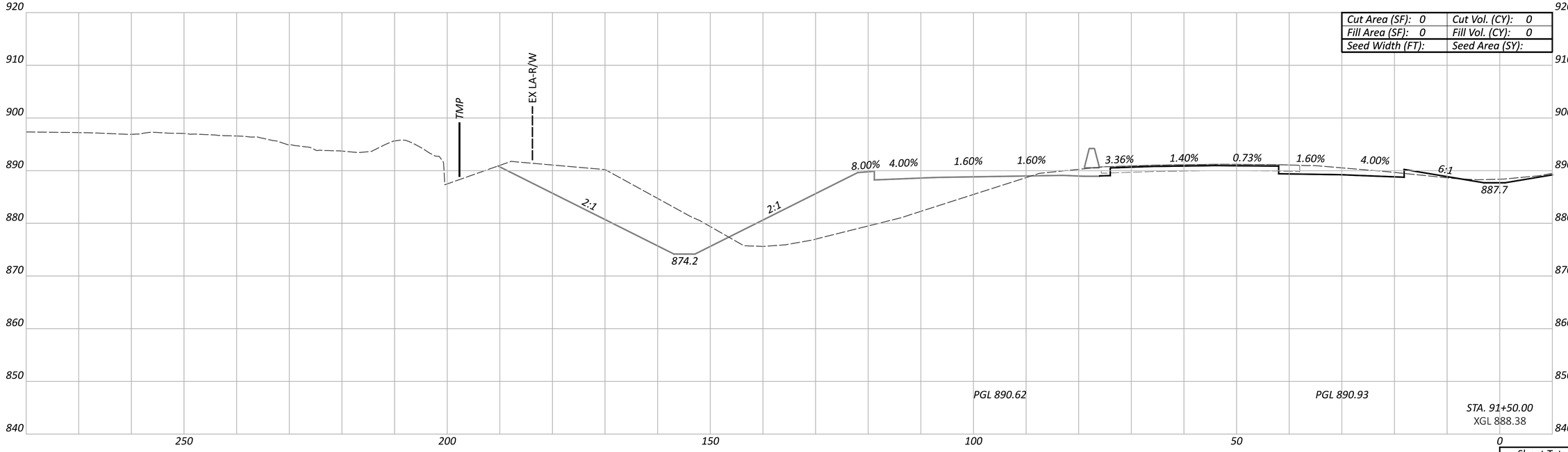
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.345 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 91+50.00 TO STA. 92+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

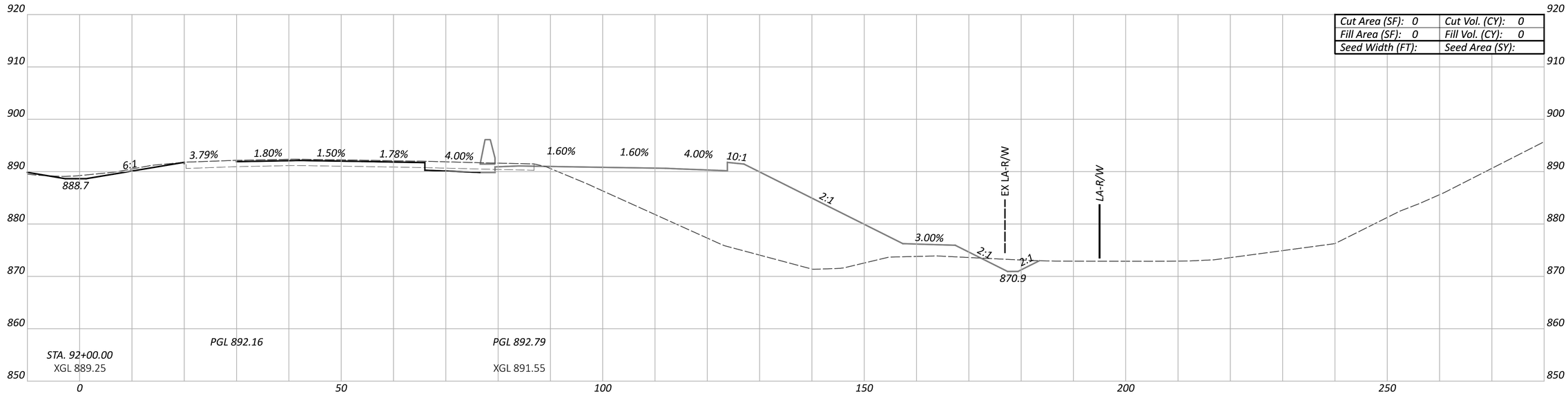
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

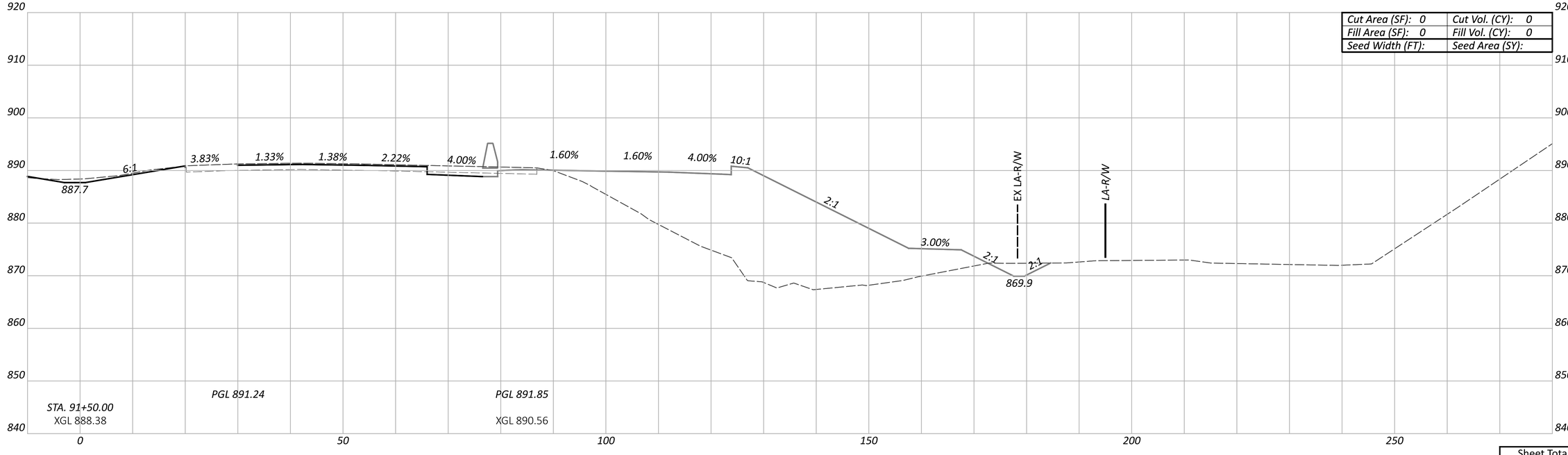
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.346 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 91+50.00 TO STA. 92+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 91+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:21:55 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

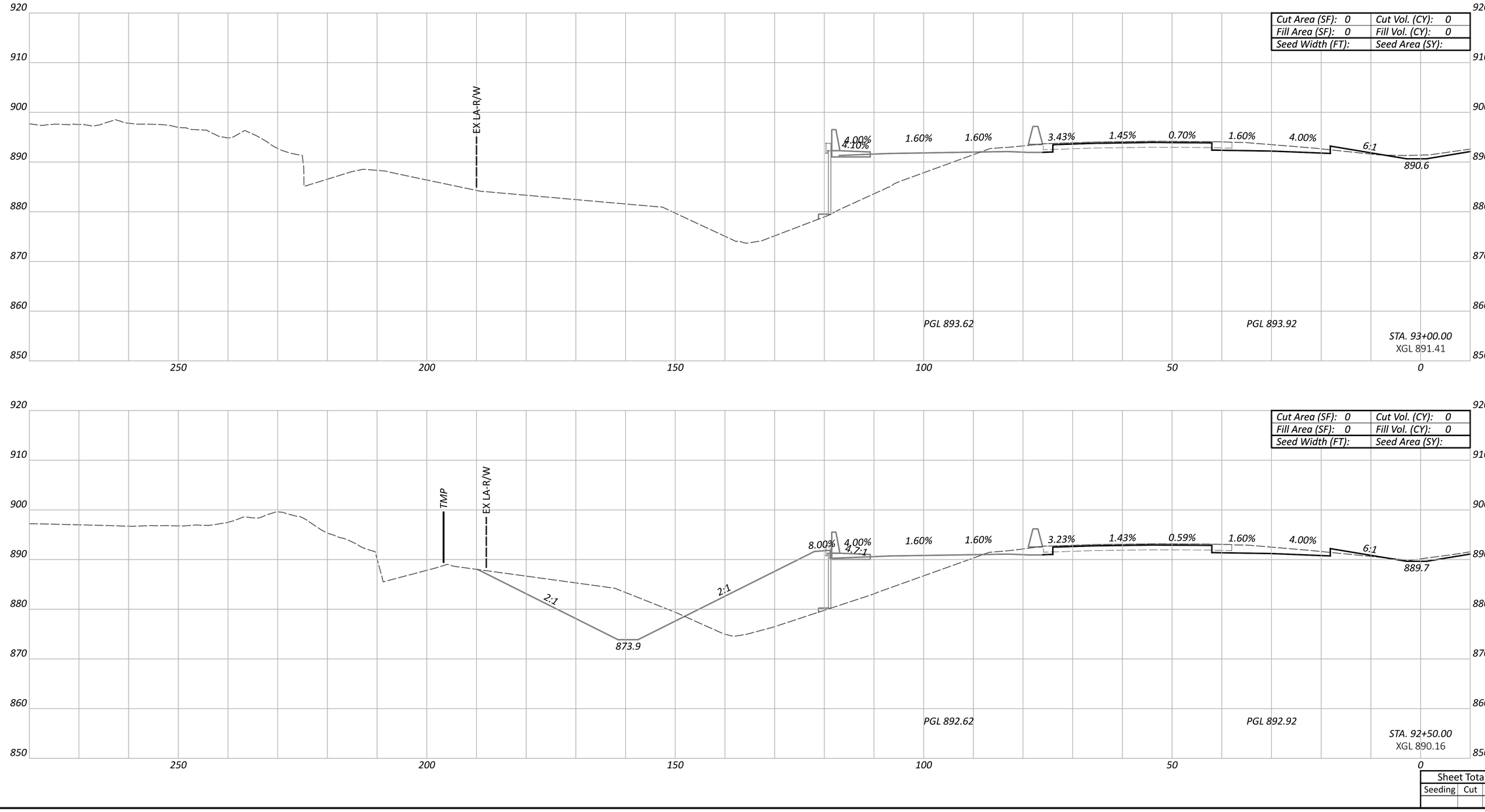
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.347 TOTAL 740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 92+50.00 TO STA. 93+00.00

Sheet Totals		
Seeding	Cut	Fill

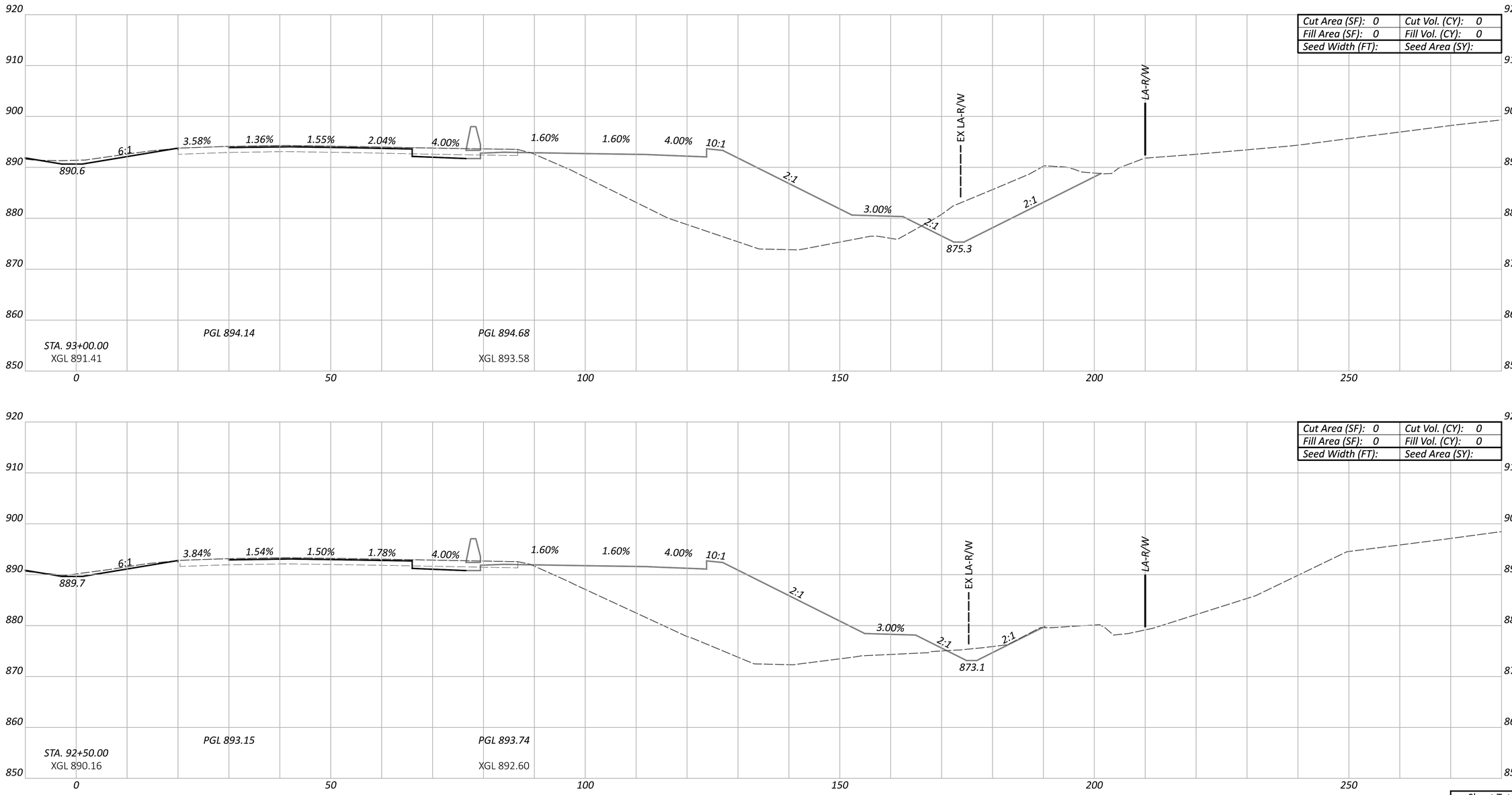
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.348 TOTAL 740



CROSS SECTIONS - IR 70 EB
STA. 92+50.00 TO STA. 93+00.00

FAI/LIC IR 70 0.00/0.00

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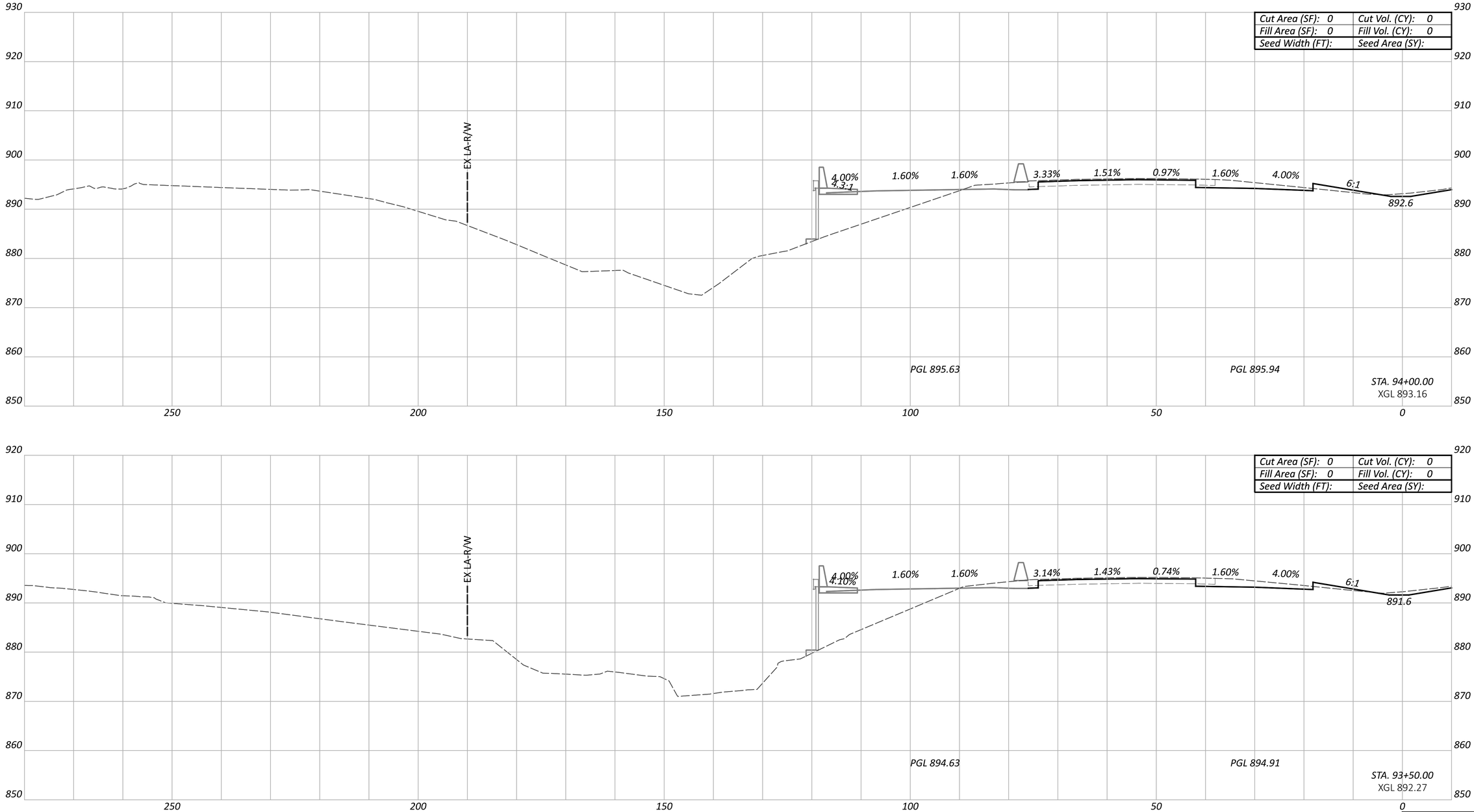
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.349
TOTAL	740



CROSS SECTIONS - IR 70 WB
STA. 93+50.00 TO STA. 94+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

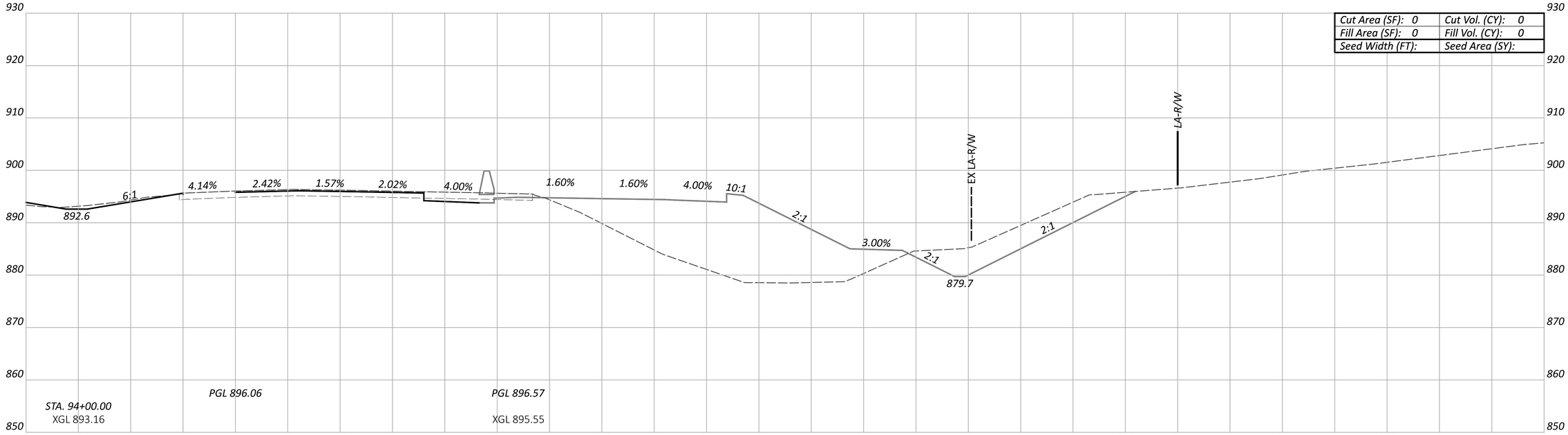
DESIGN AGENCY
STRUCTUREPOINT INC.

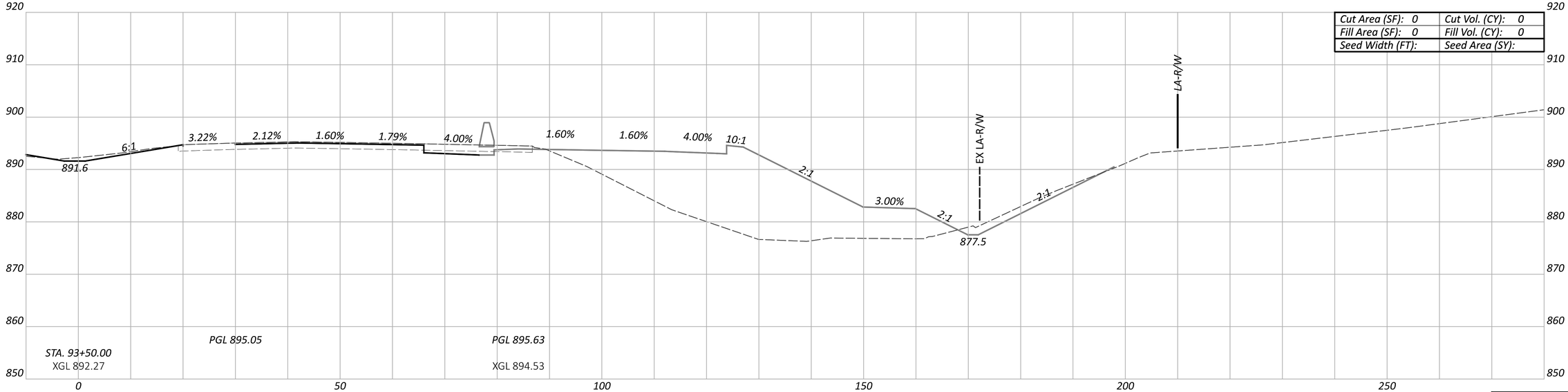
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.350 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 93+50.00 TO STA. 94+00.00

FAI/LIC IR 70 0.00/0.00

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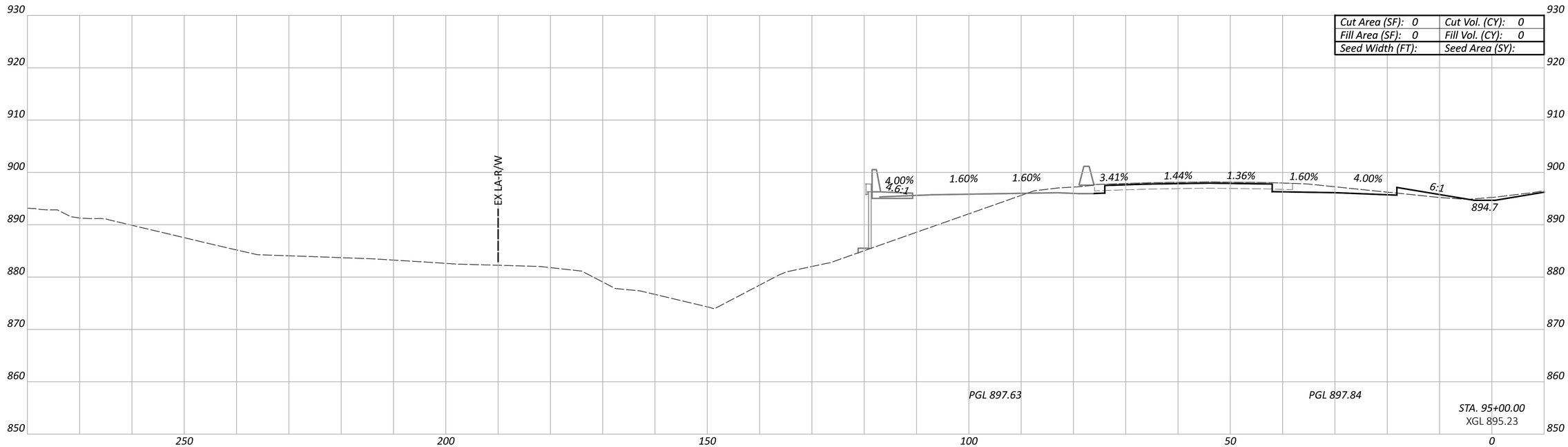
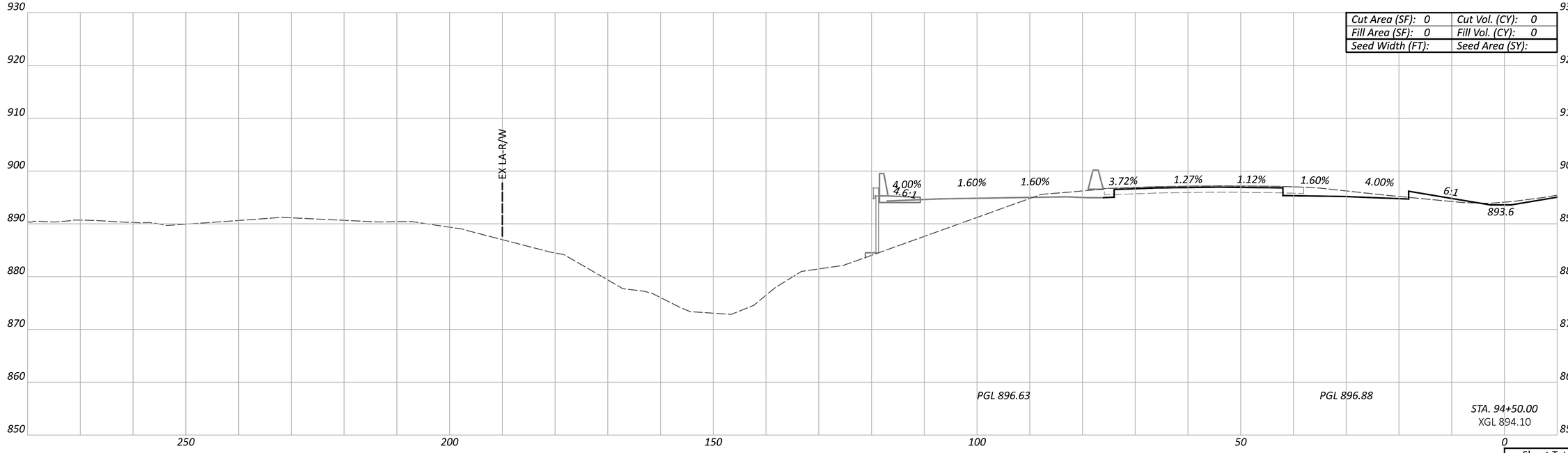
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.351
TOTAL	740





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CROSS SECTIONS - IR 70 WB
STA. 94+50.00 TO STA. 95+00.00

Sheet Totals		
Seeding	Cut	Fill

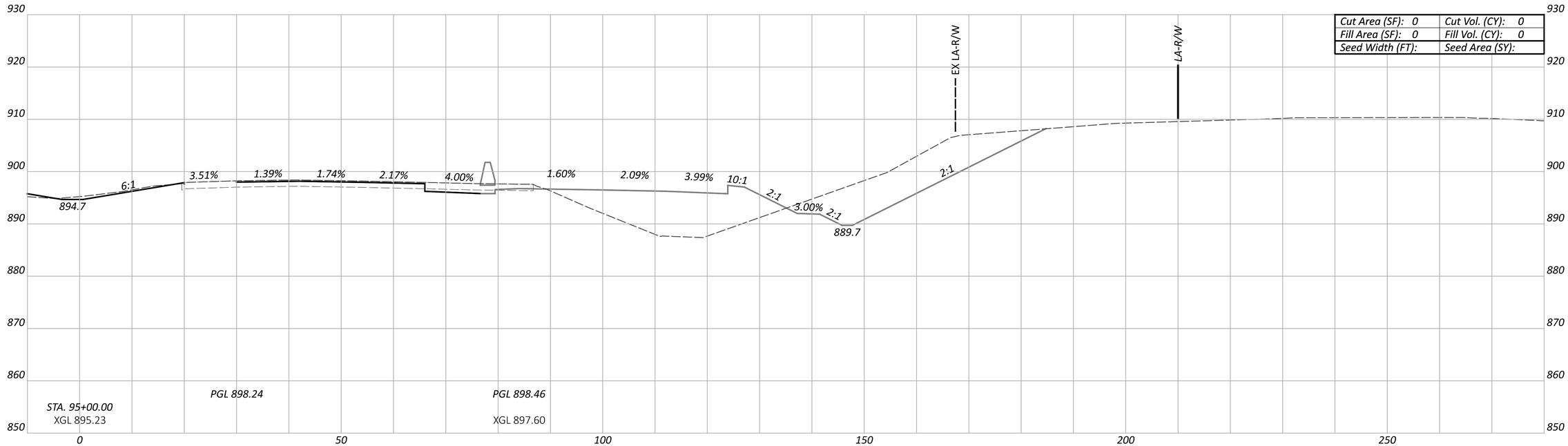
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

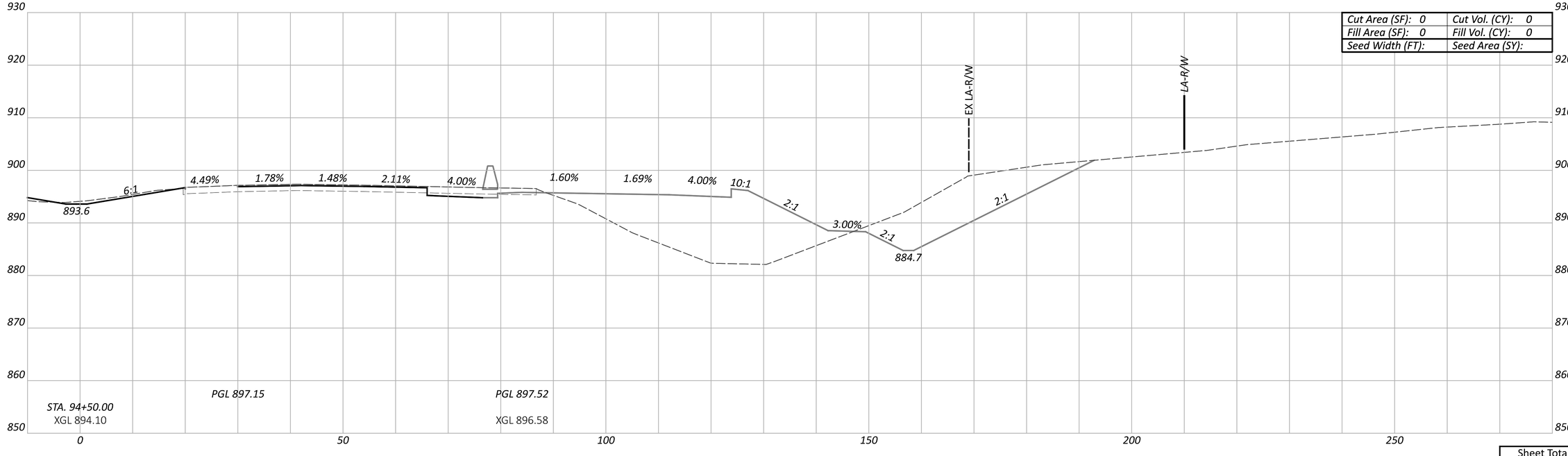
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.352 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 94+50.00 TO STA. 95+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.353 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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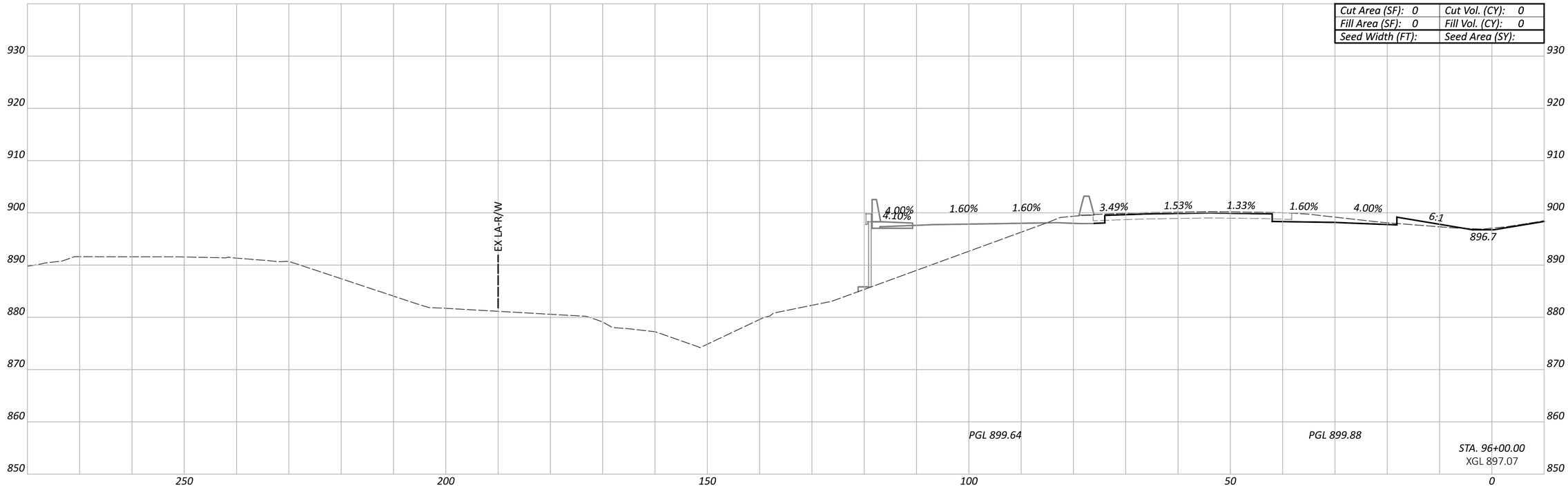

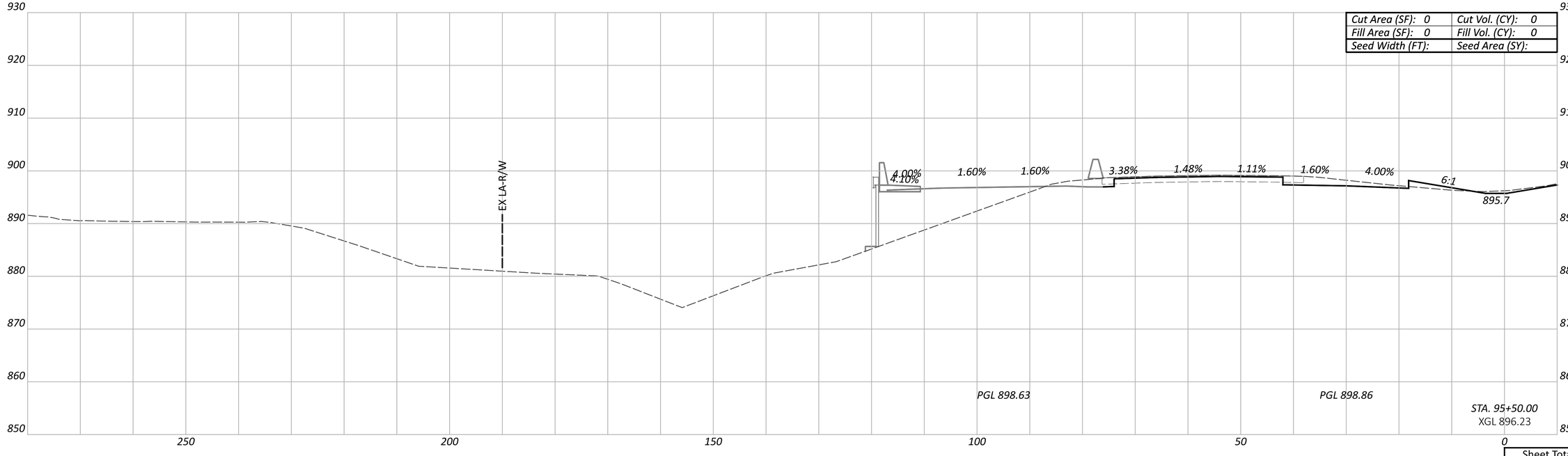

CROSS SECTIONS - IR 70 WB
STA. 95+50.00 TO STA. 96+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

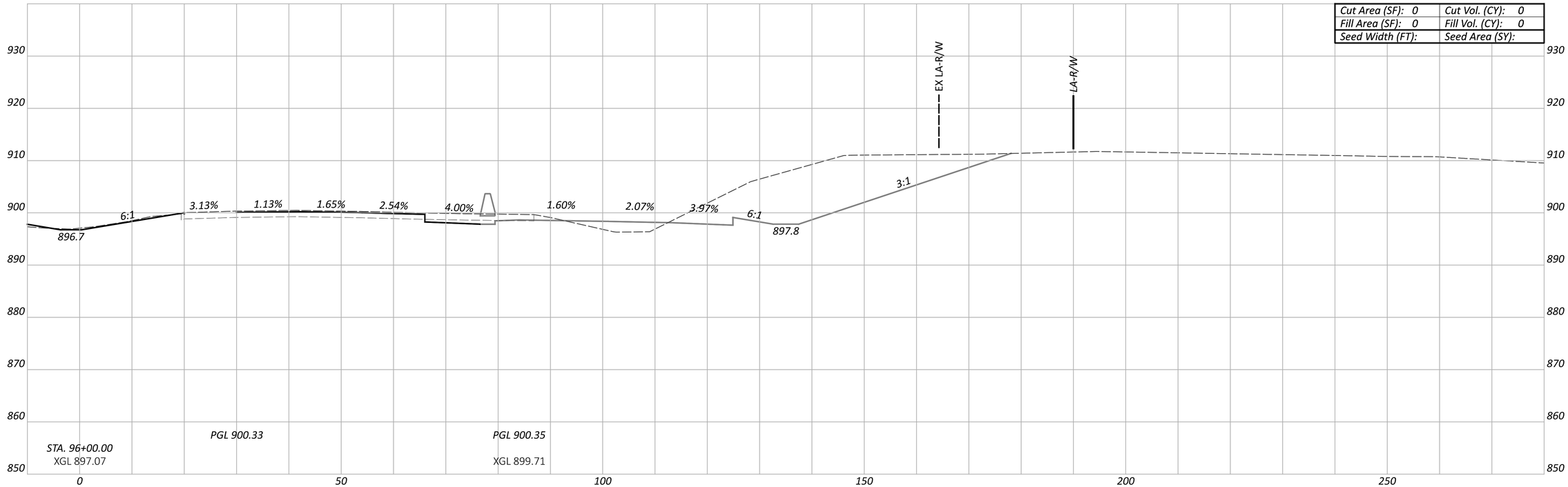
DESIGNER
BER

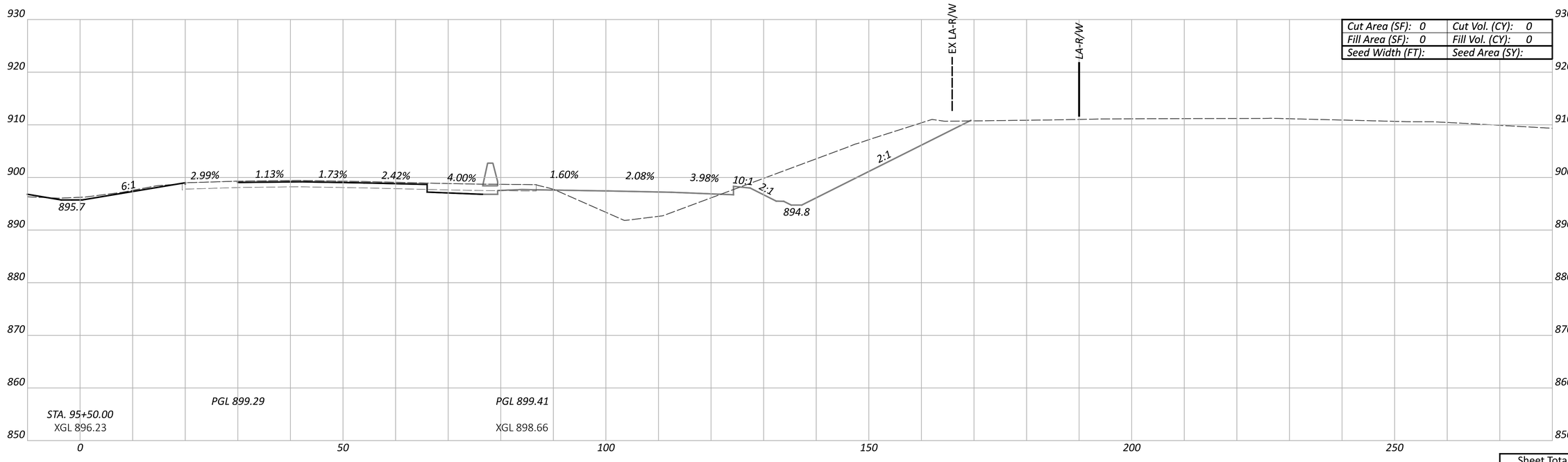
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.354	740





CROSS SECTIONS - IR 70 EB
STA. 95+50.00 TO STA. 96+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

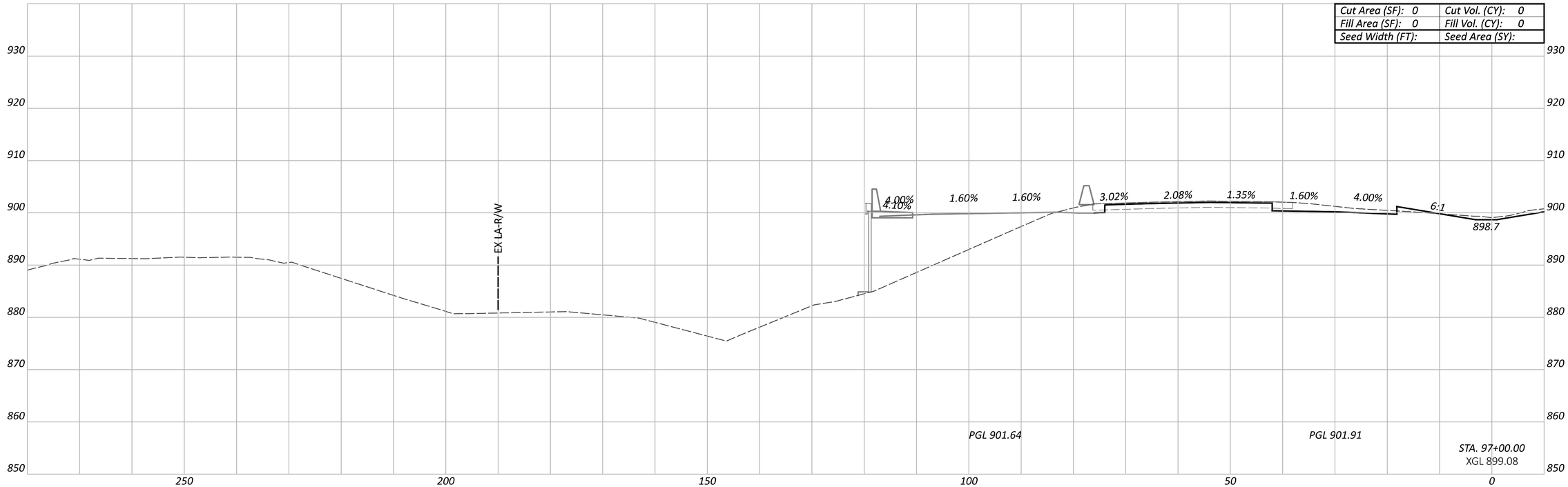
DESIGNER
BER

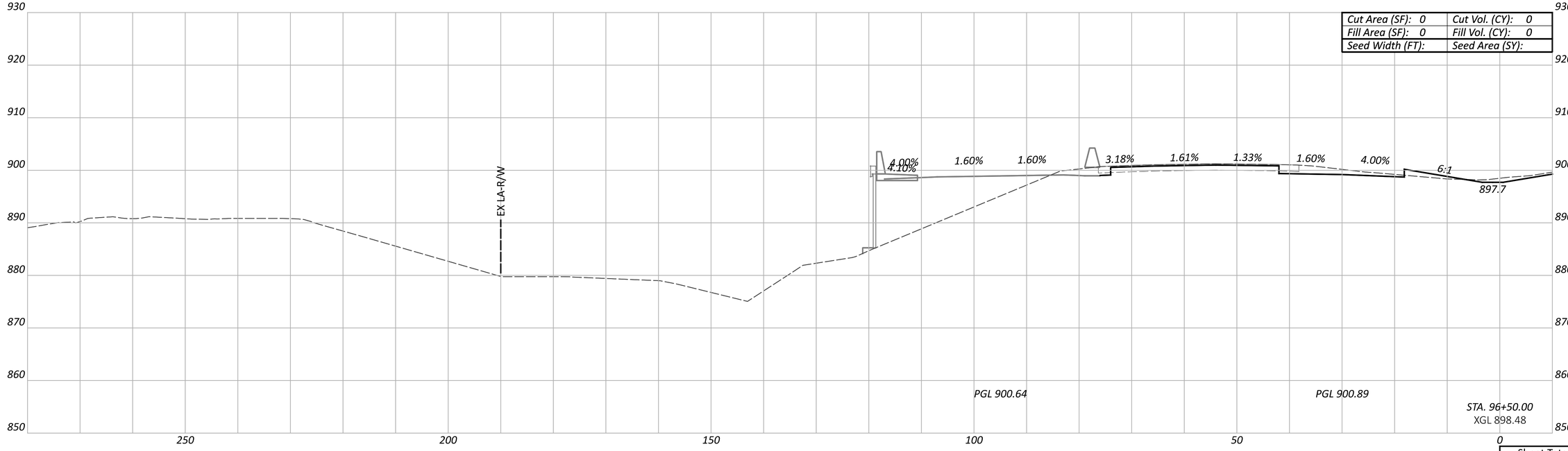
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.355 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 96+50.00 TO STA. 97+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

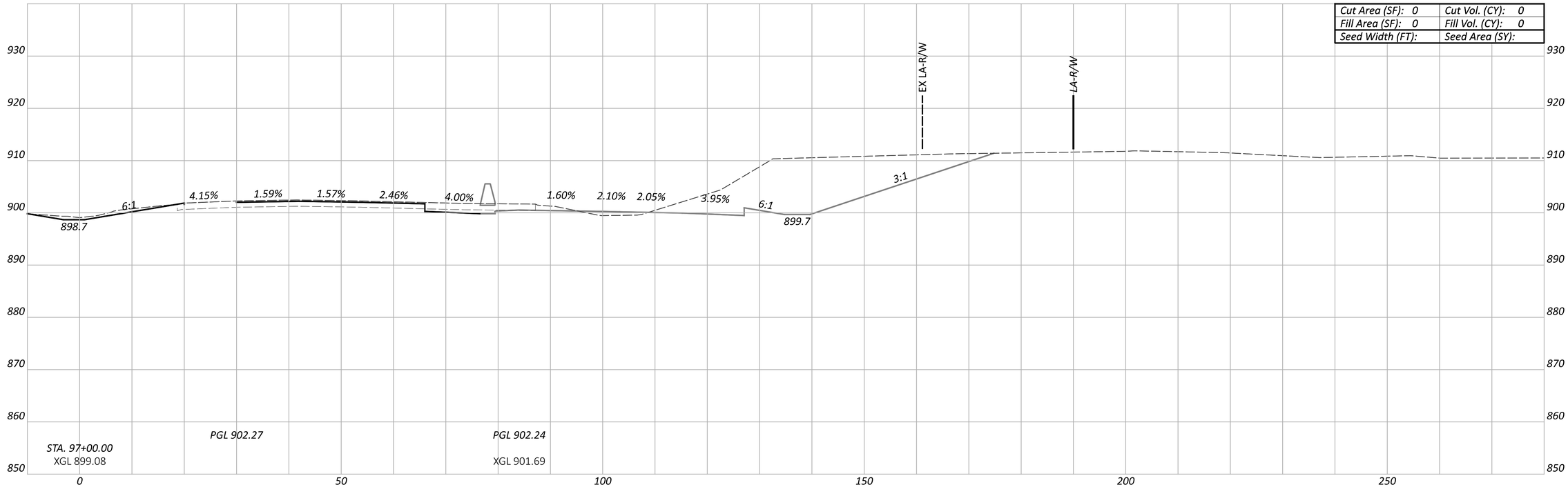
DESIGNER
BER

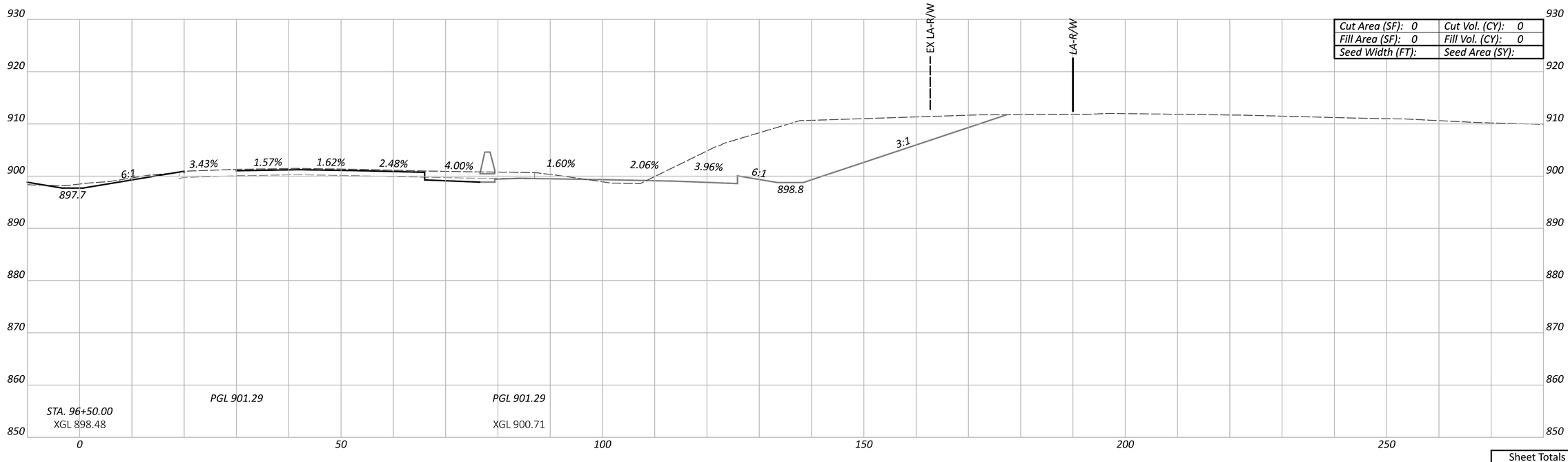
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.356	740





CROSS SECTIONS - IR 70 EB
STA. 96+50.00 TO STA. 97+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

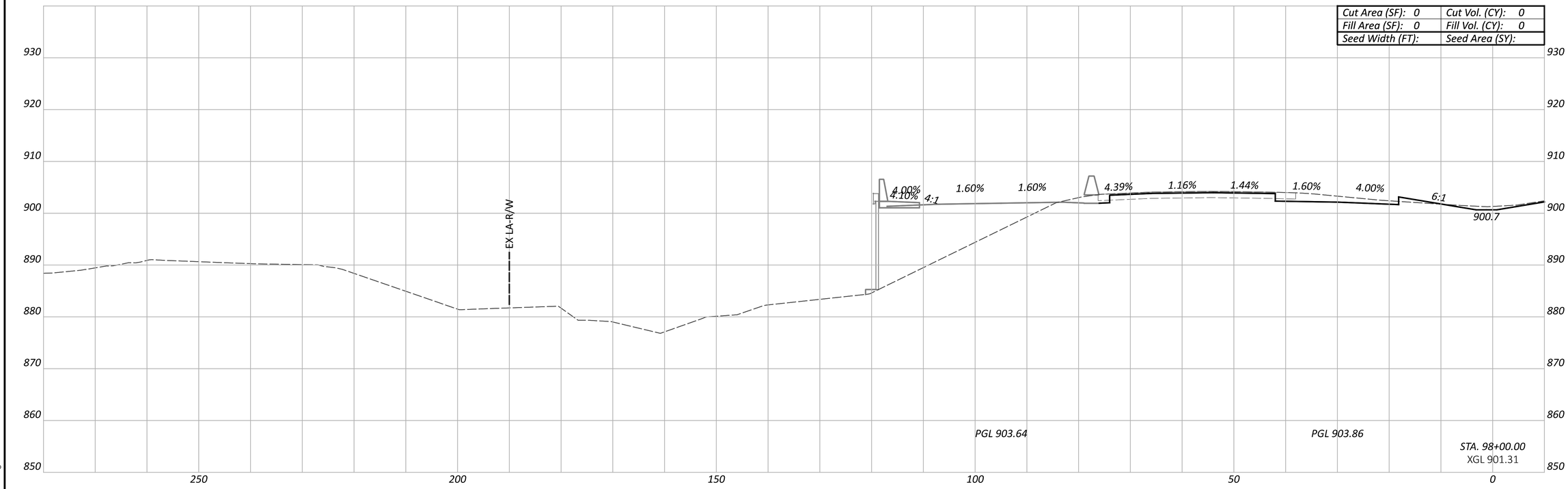
DESIGNER
BER

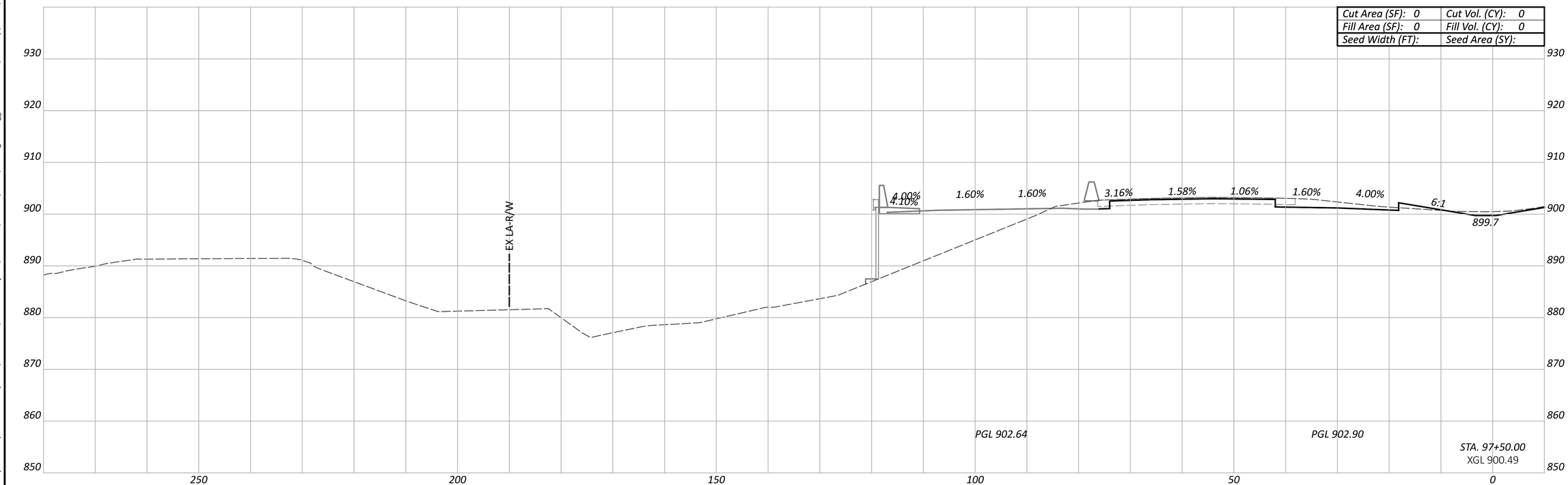
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.357 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 97+50.00 TO STA. 98+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT

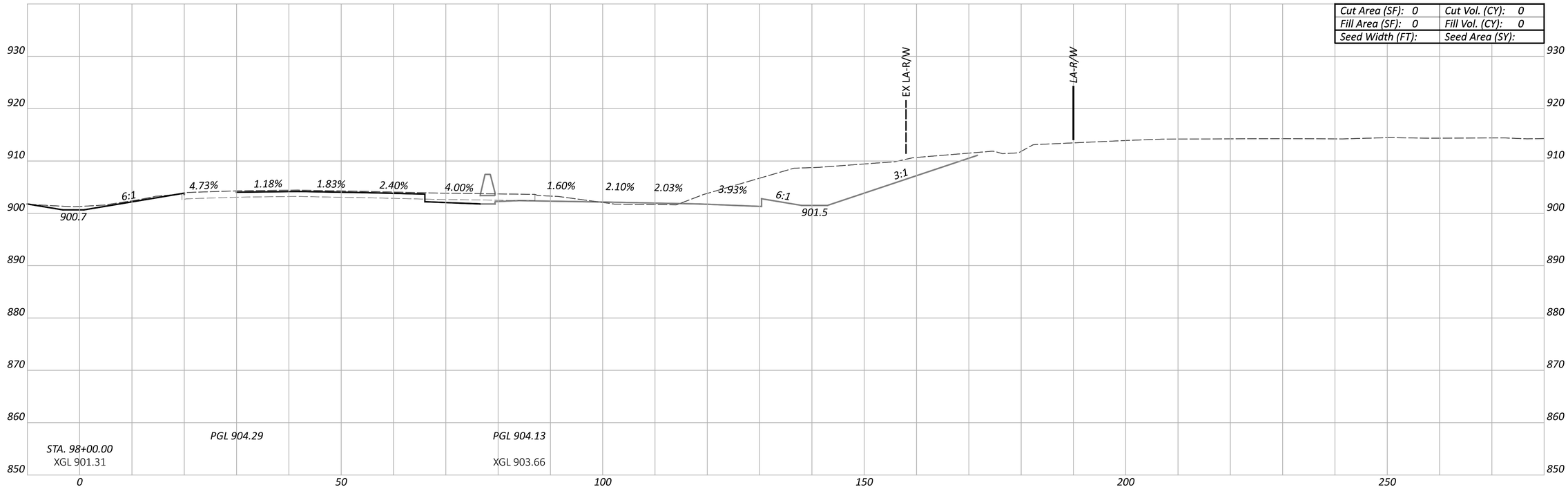
Sheet Totals		
Seeding	Cut	Fill

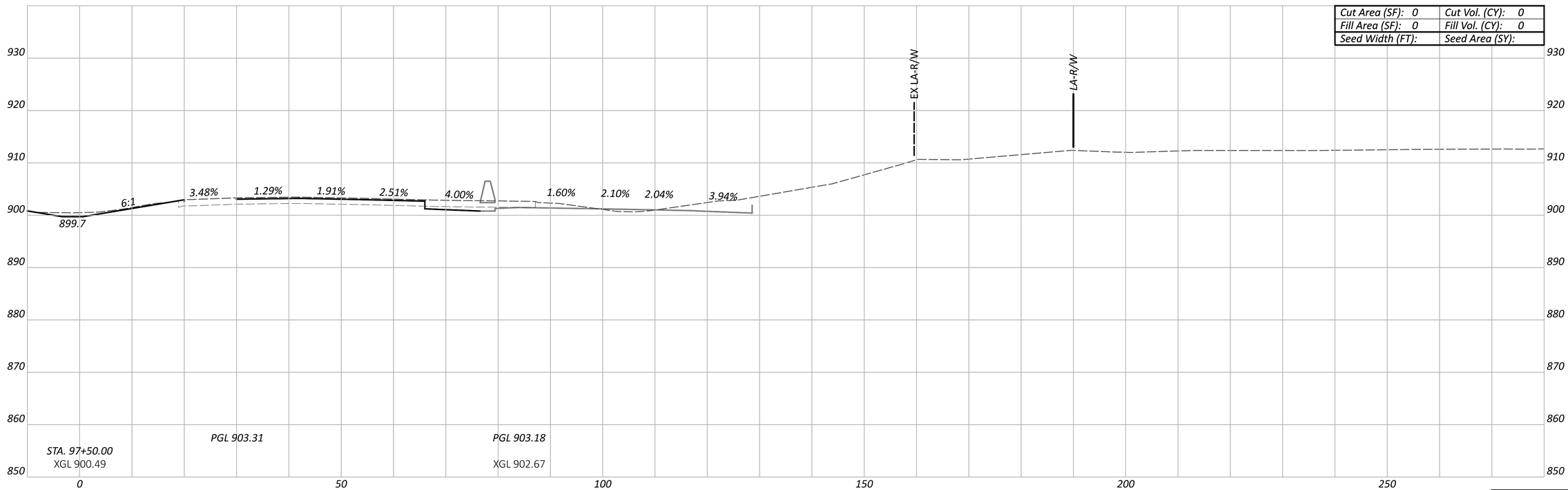
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.358 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 97+50.00 TO STA. 98+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

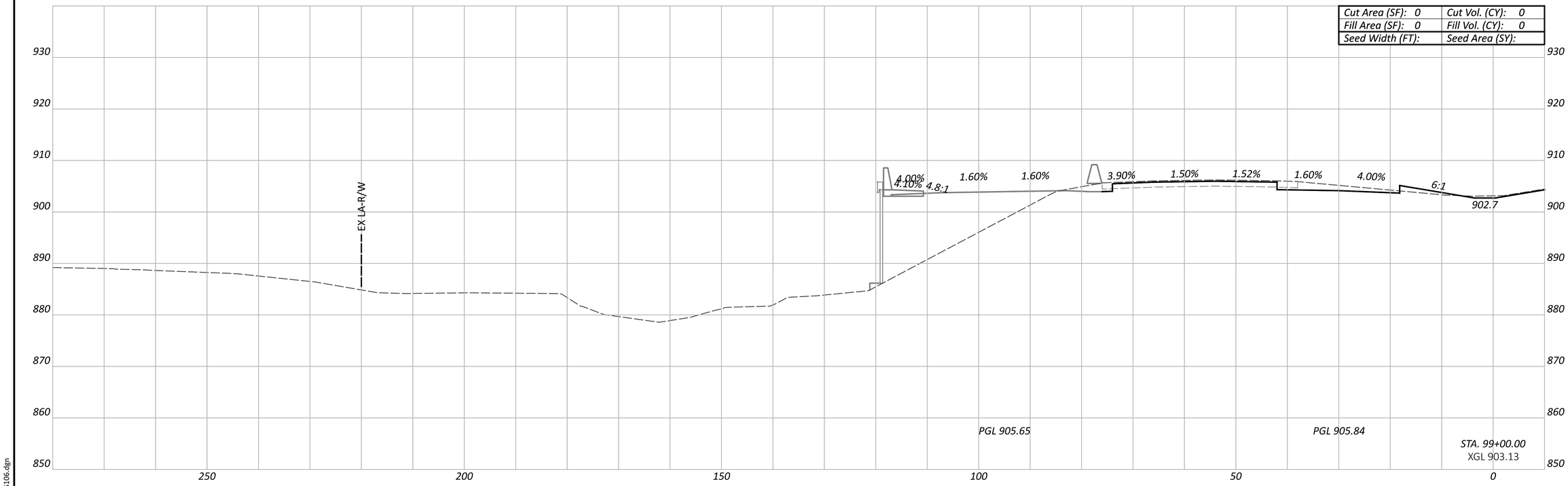
DESIGNER
BER

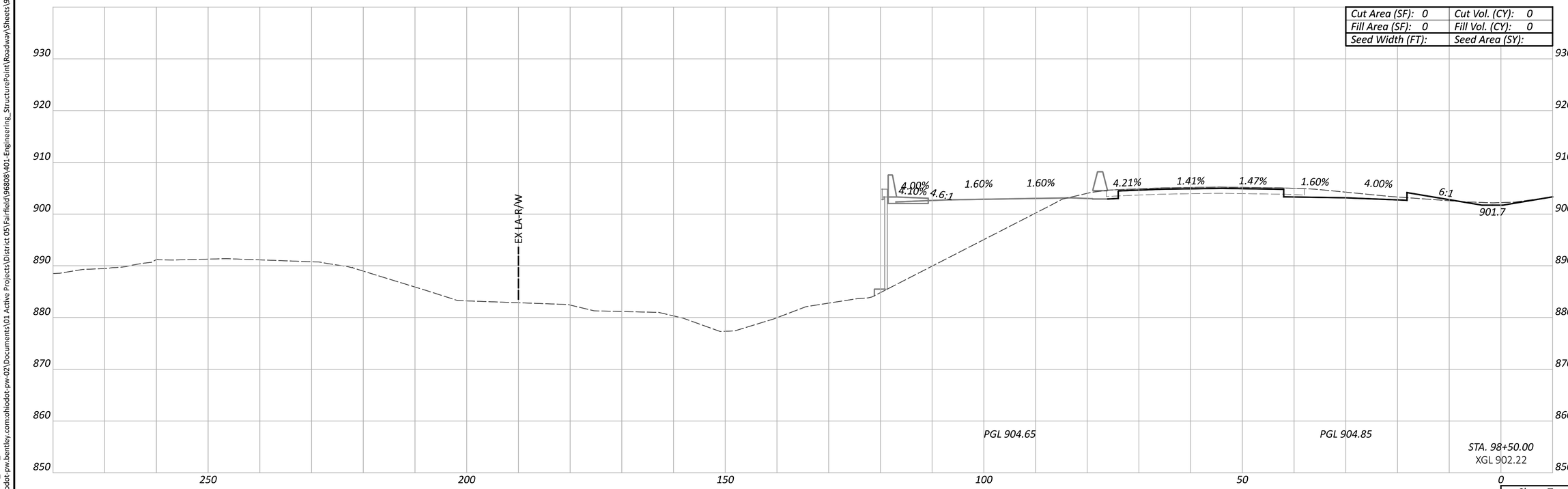
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.359 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 98+50.00 TO STA. 99+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

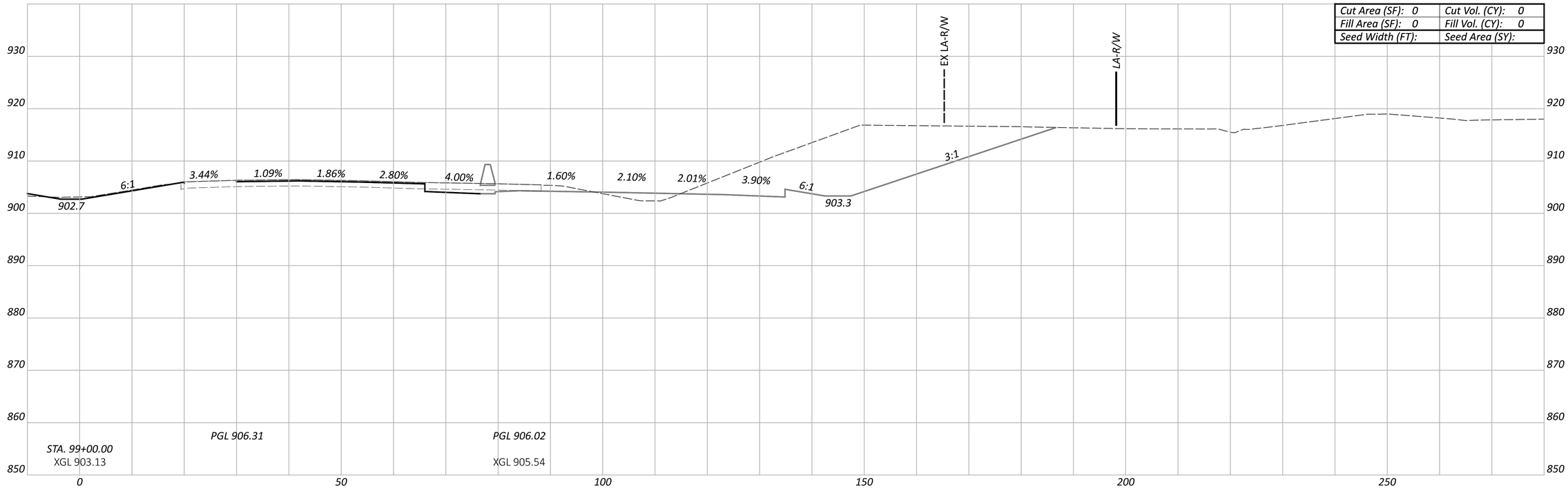
REVIEWER
KAM 06/18/23

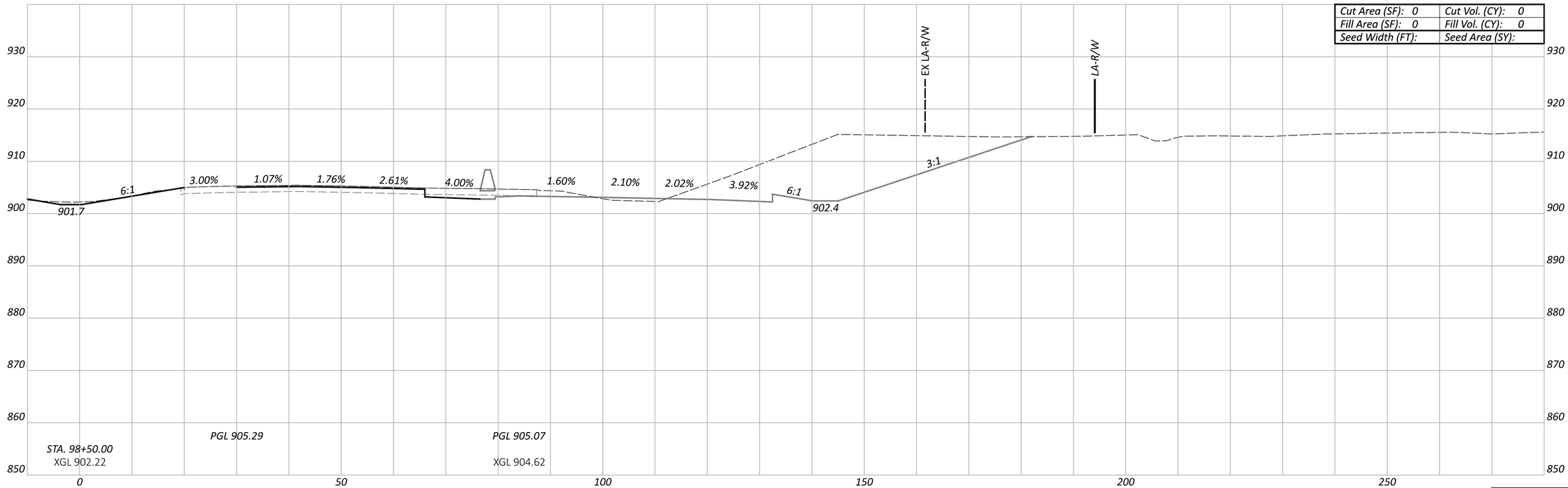
PROJECT ID
96808

SHEET P.360 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 98+50.00 TO STA. 99+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.361
TOTAL	740

FAI/LIC IR 70 0.00/0.00

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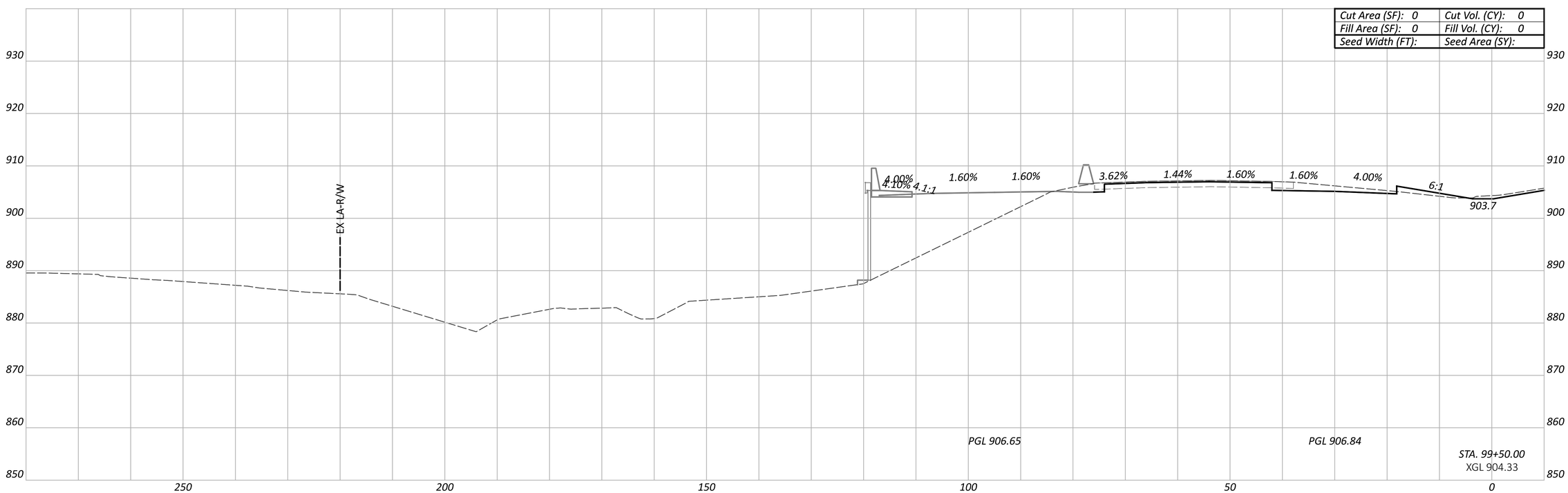

CROSS SECTIONS - IR 70 WB
STA. 99+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.362 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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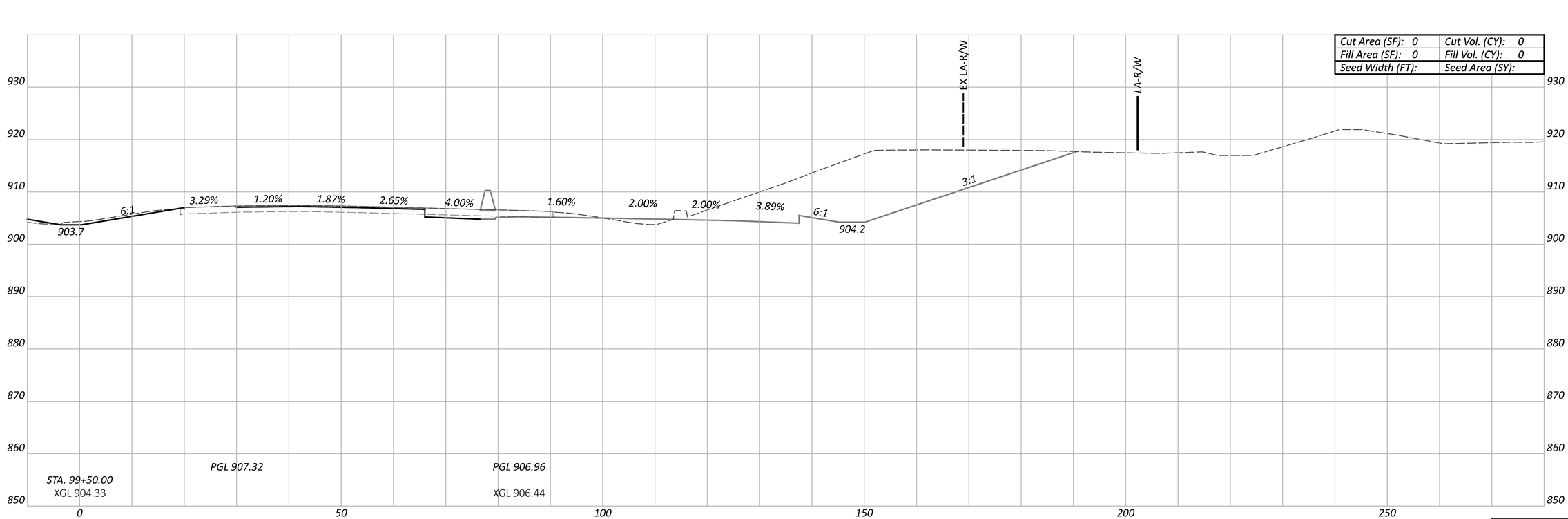

CROSS SECTIONS - IR 70 EB
STA. 99+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.363 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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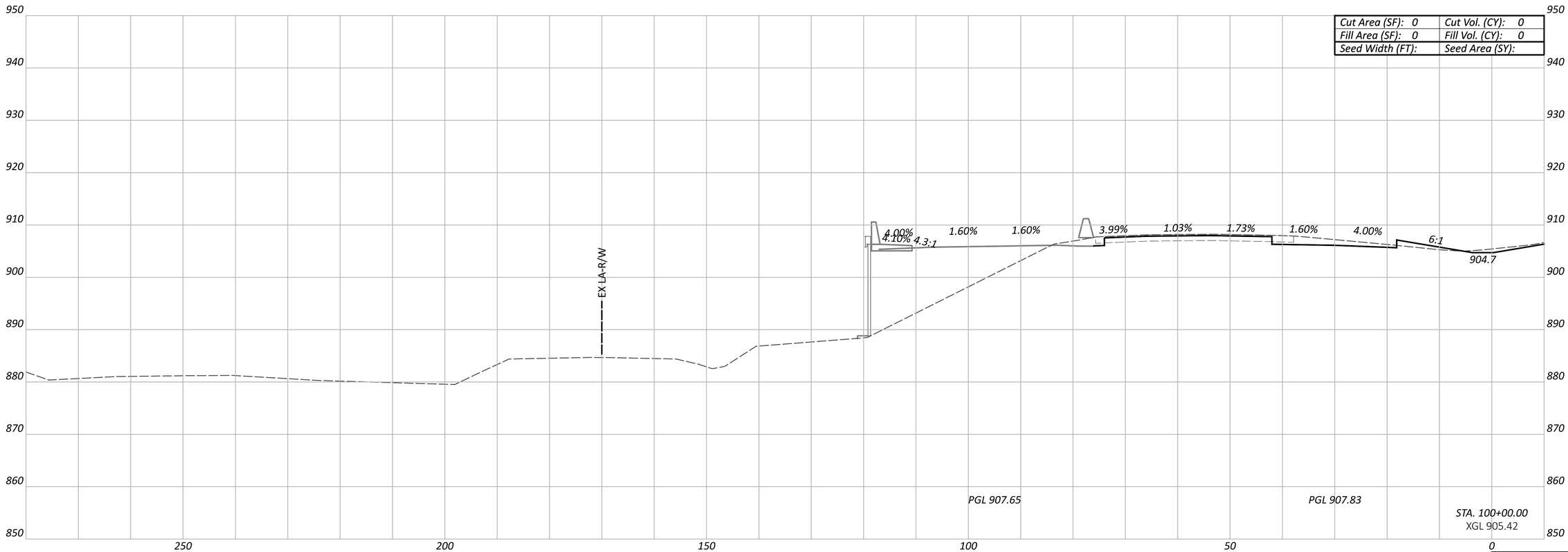

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - IR 70 WB
STA. 100+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.364 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 100+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:22:43 PM USER: aoldaker
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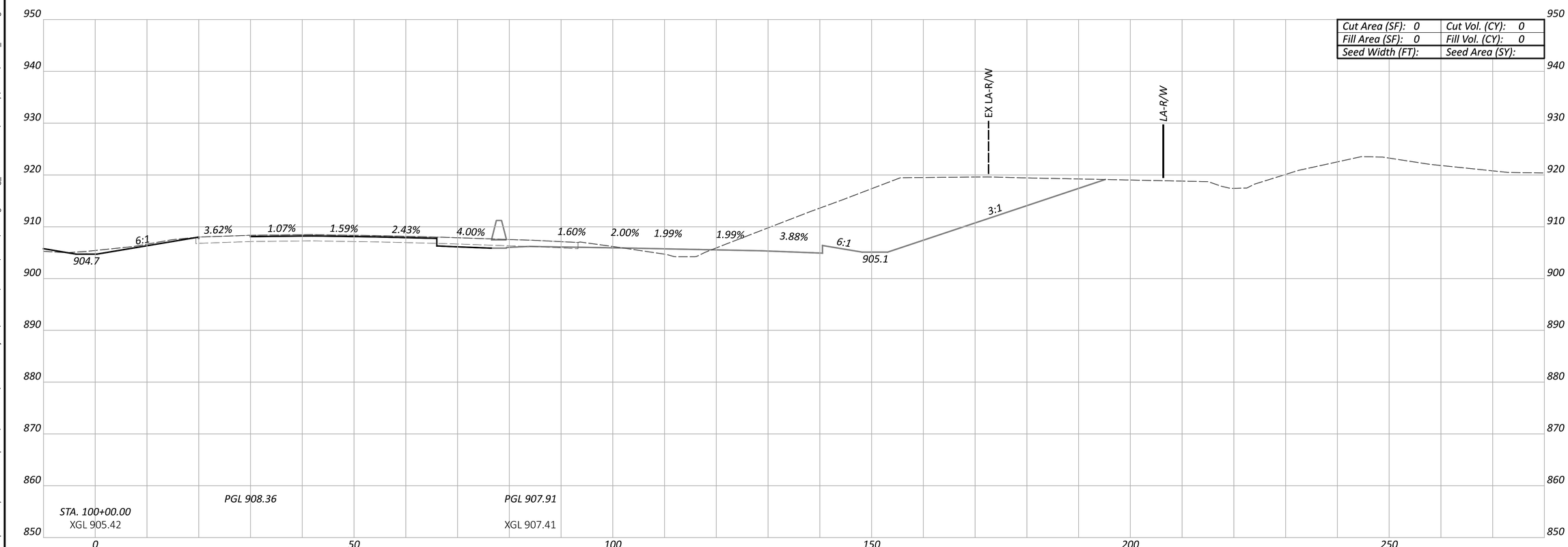


CROSS SECTIONS - IR 70 EB
STA. 100+00.00

Sheet Totals		
Seeding	Cut	Fill

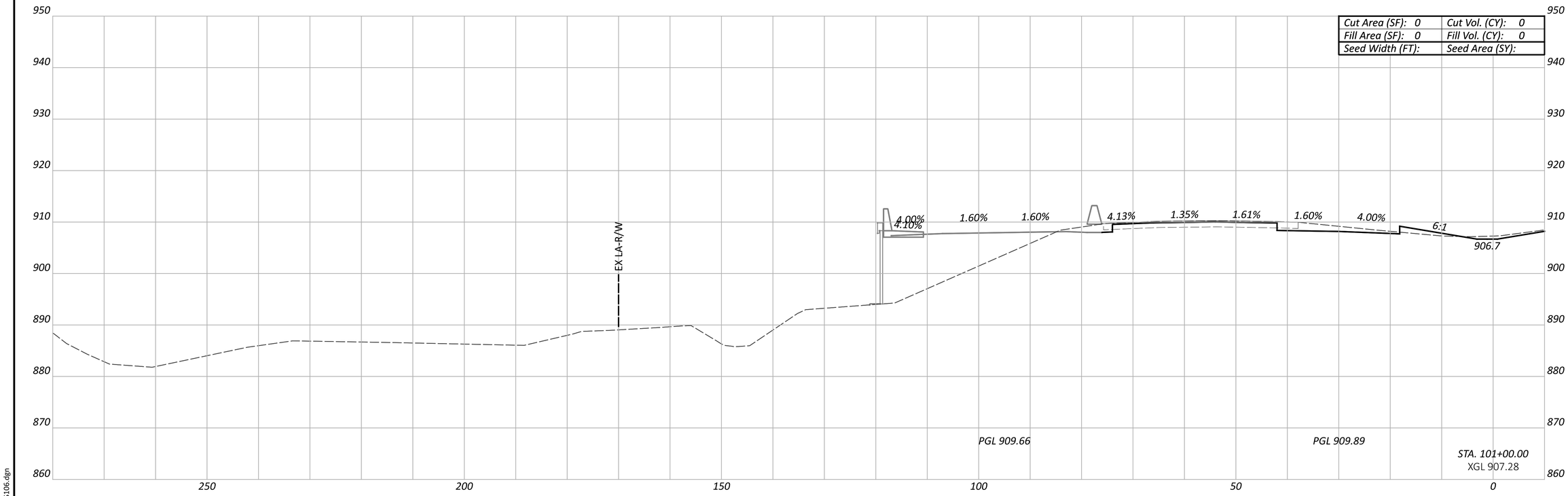
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

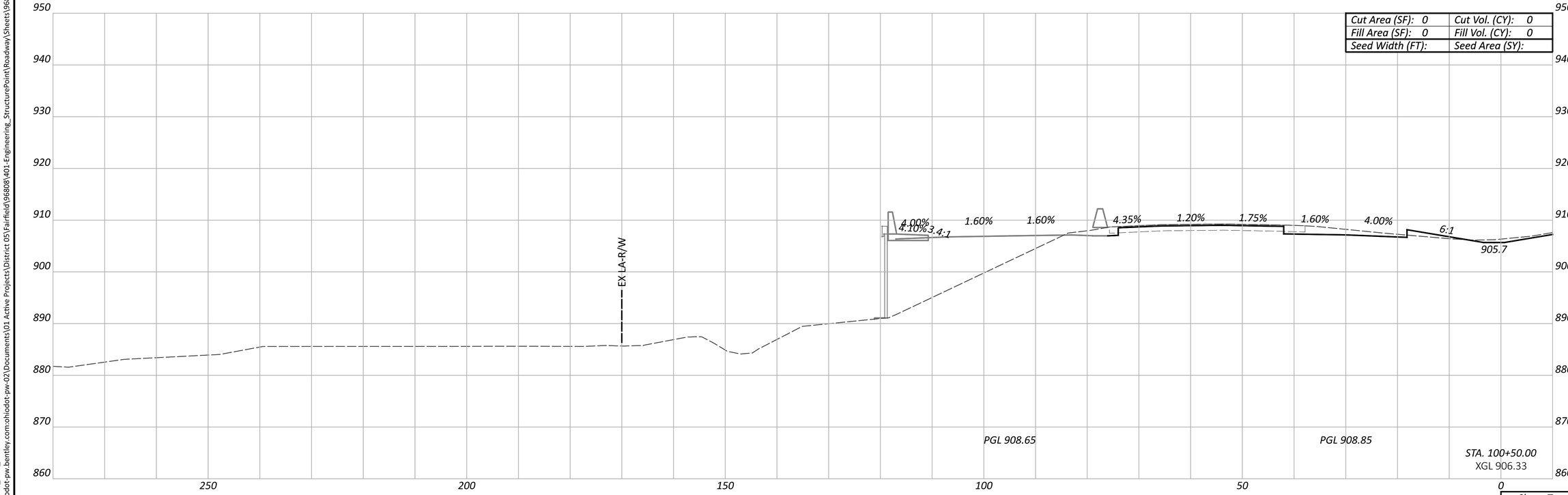
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.365 | TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 100+50.00 TO STA. 101+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT

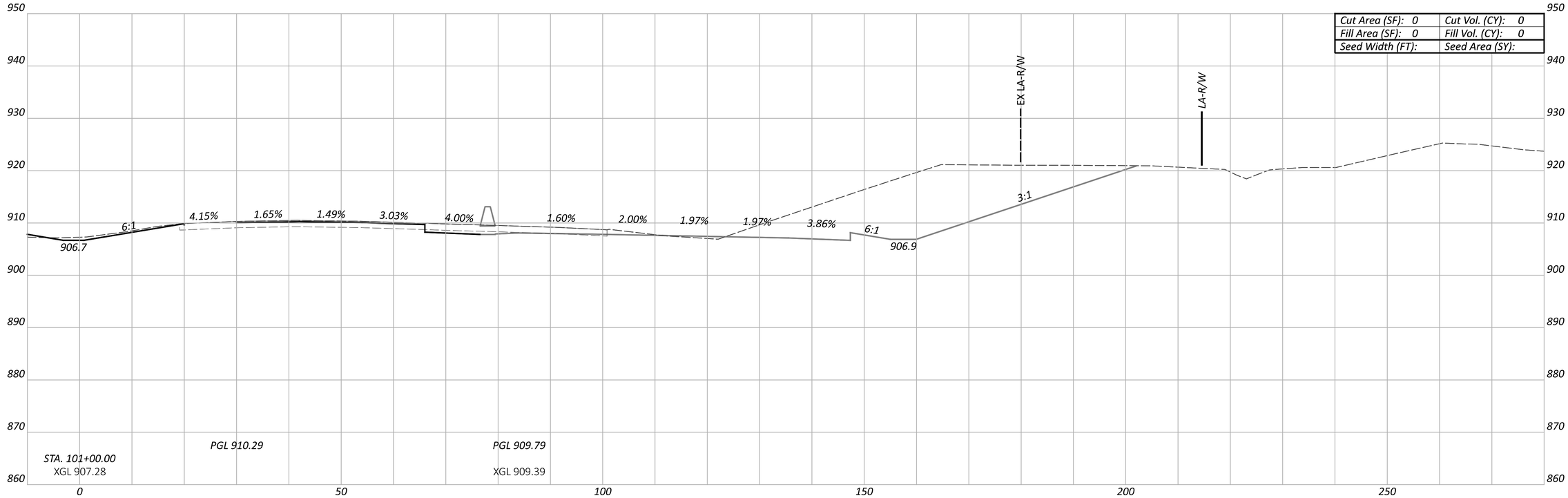
DESIGNER
BER

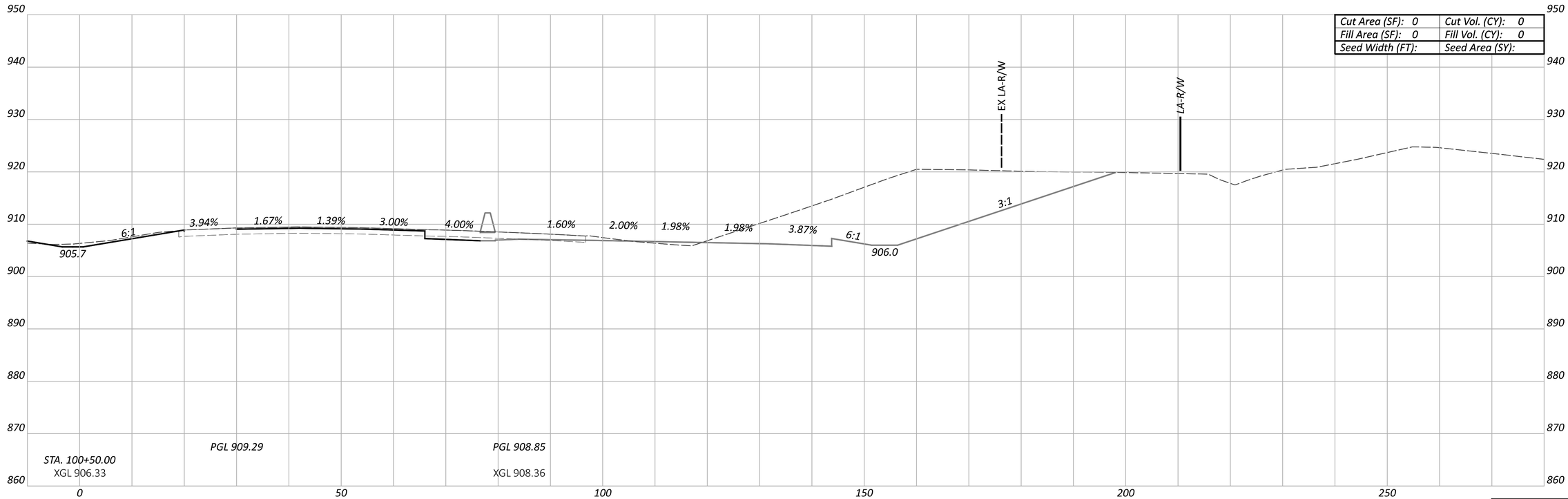
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.366 TOTAL 740





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STA. 100+50.00 TO STA. 101+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

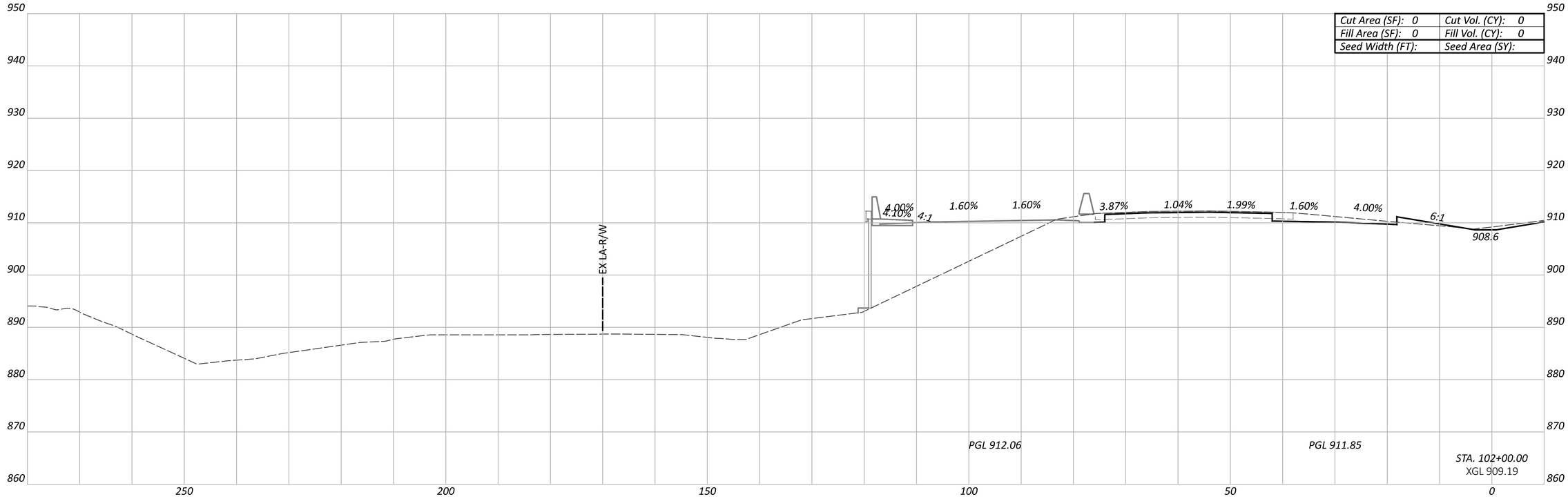
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

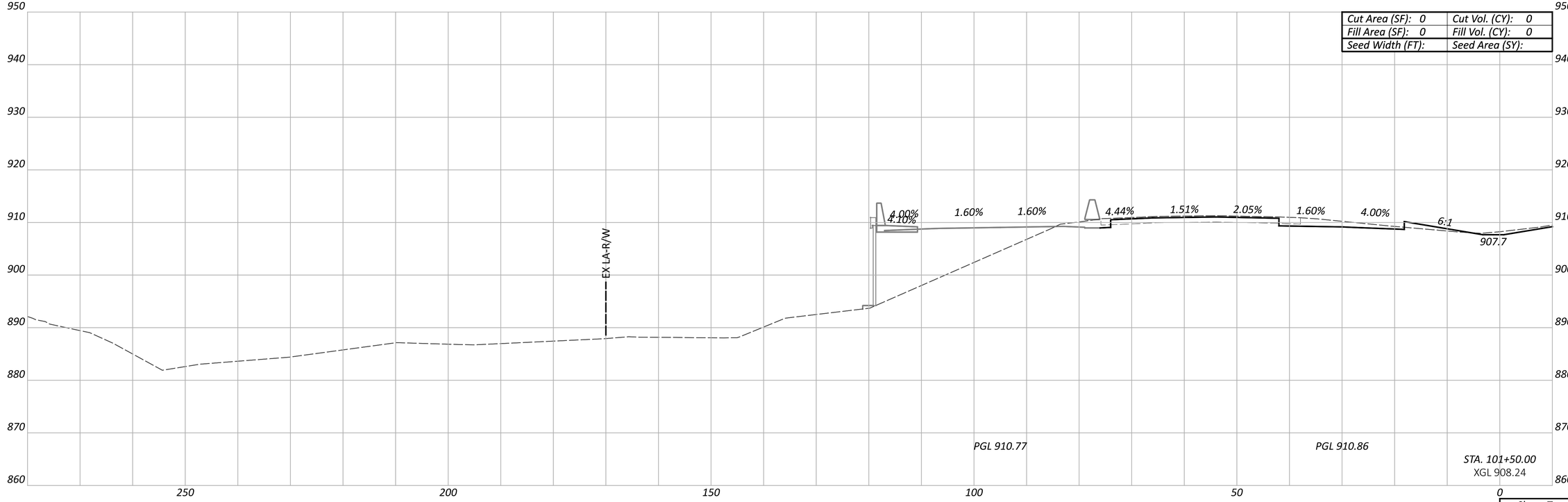
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.367 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

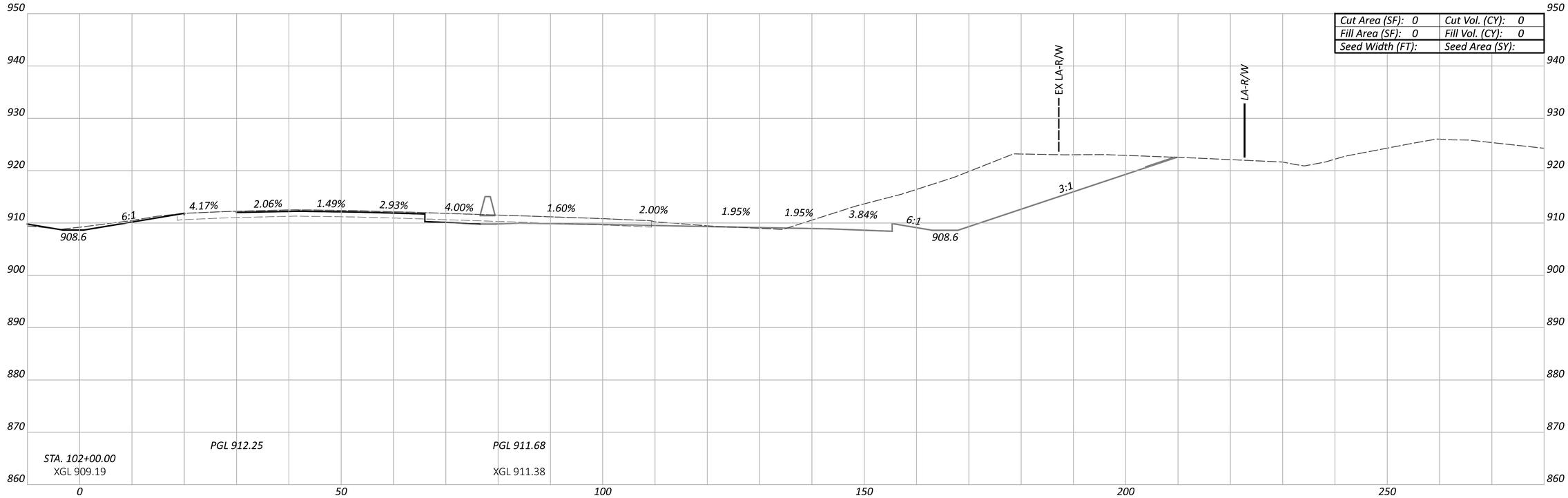
REVIEWER
KAM 06/18/23

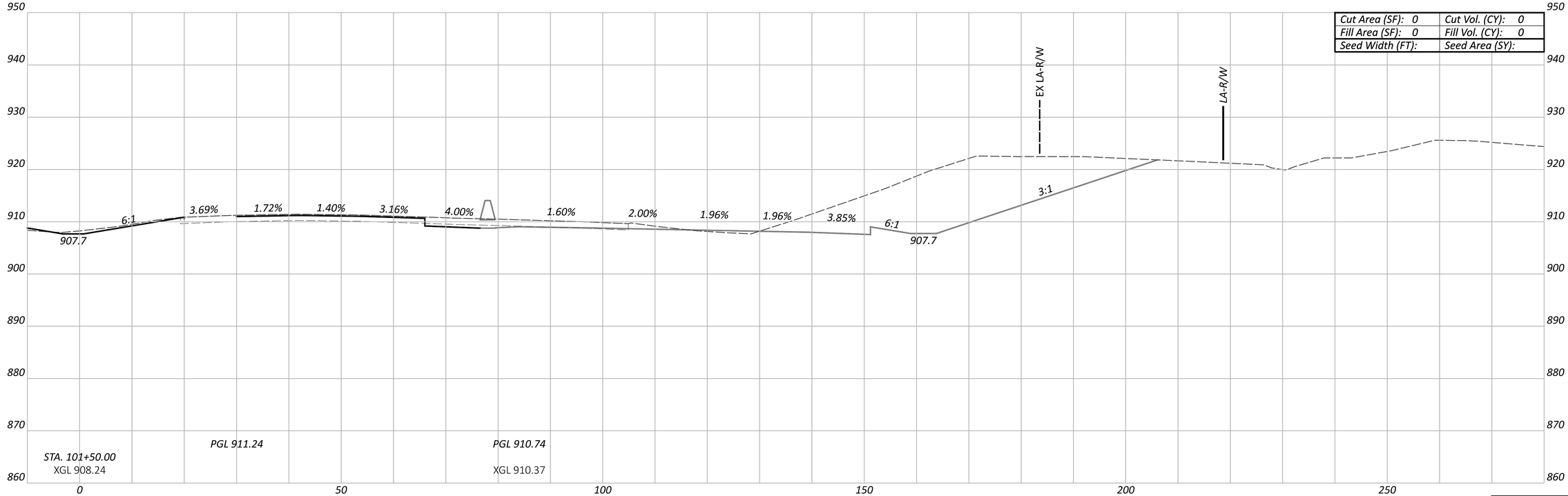
PROJECT ID
96808

SHEET P.368 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 101+50.00 TO STA. 102+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.369 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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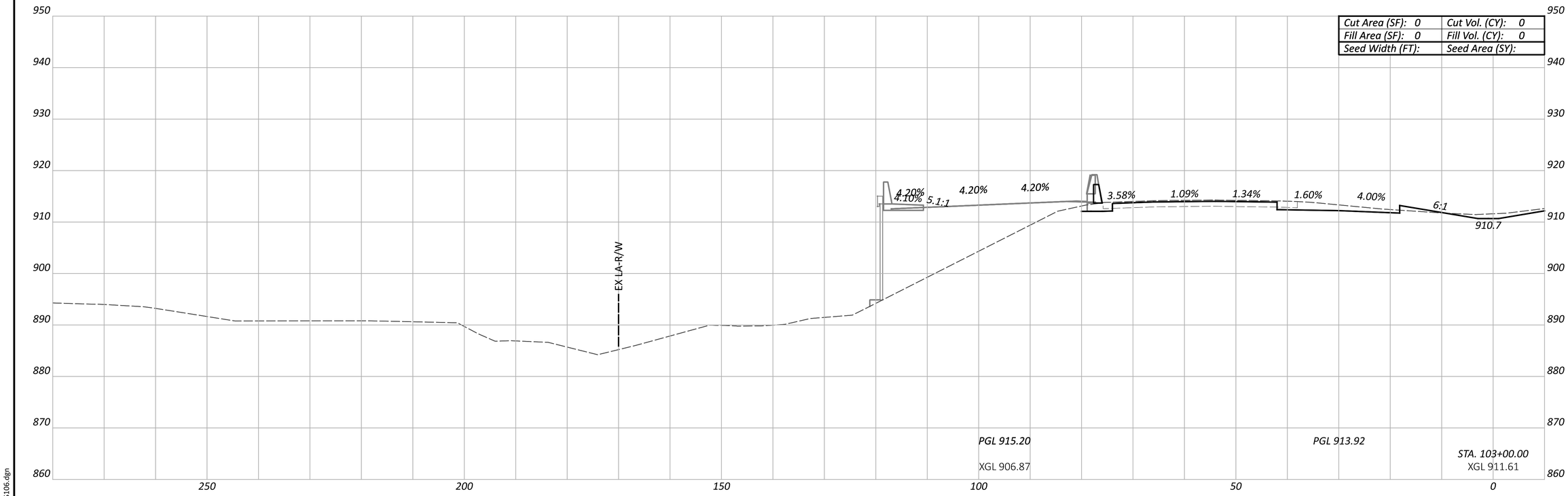

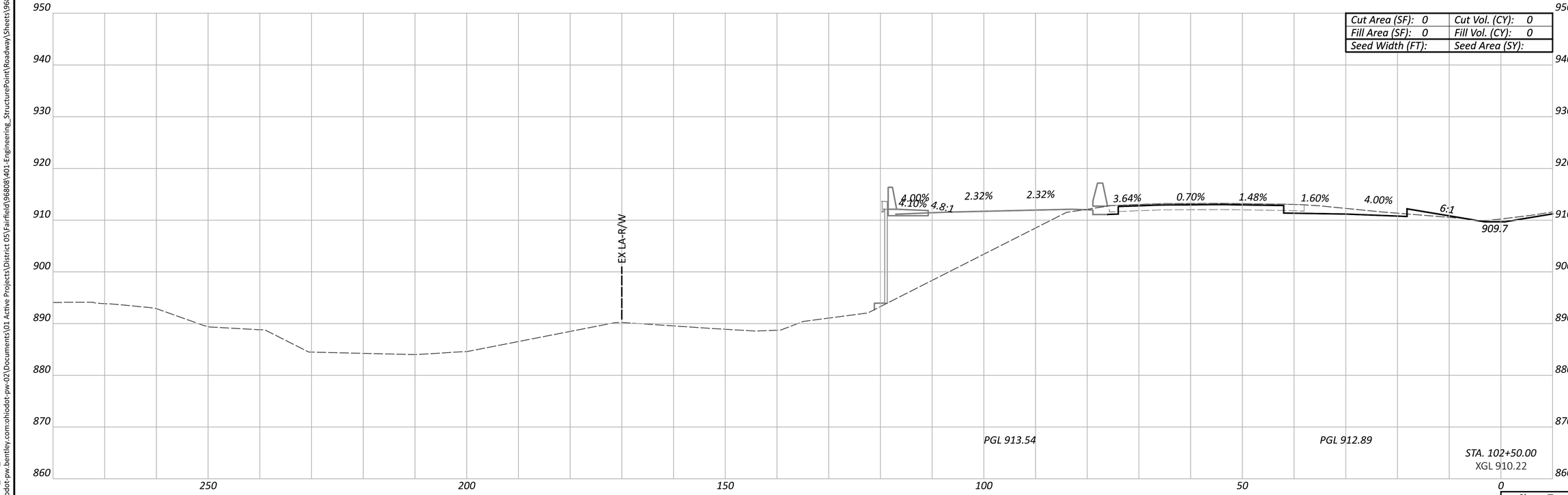

CROSS SECTIONS - IR 70 WB
STA. 102+50.00 TO STA. 103+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

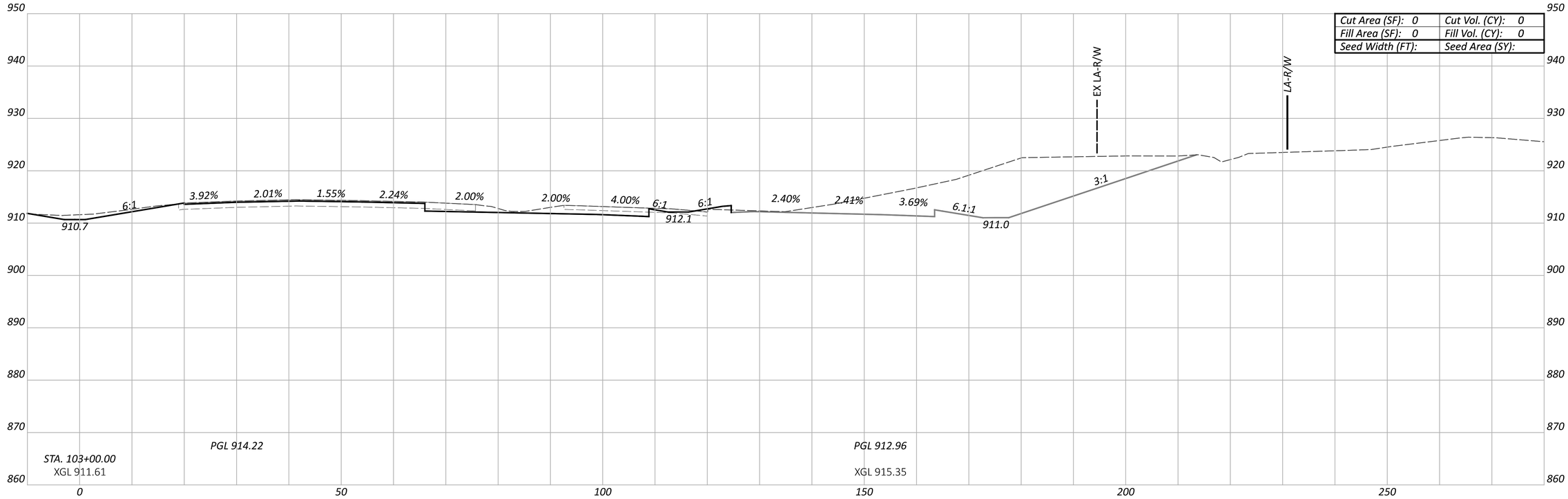
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

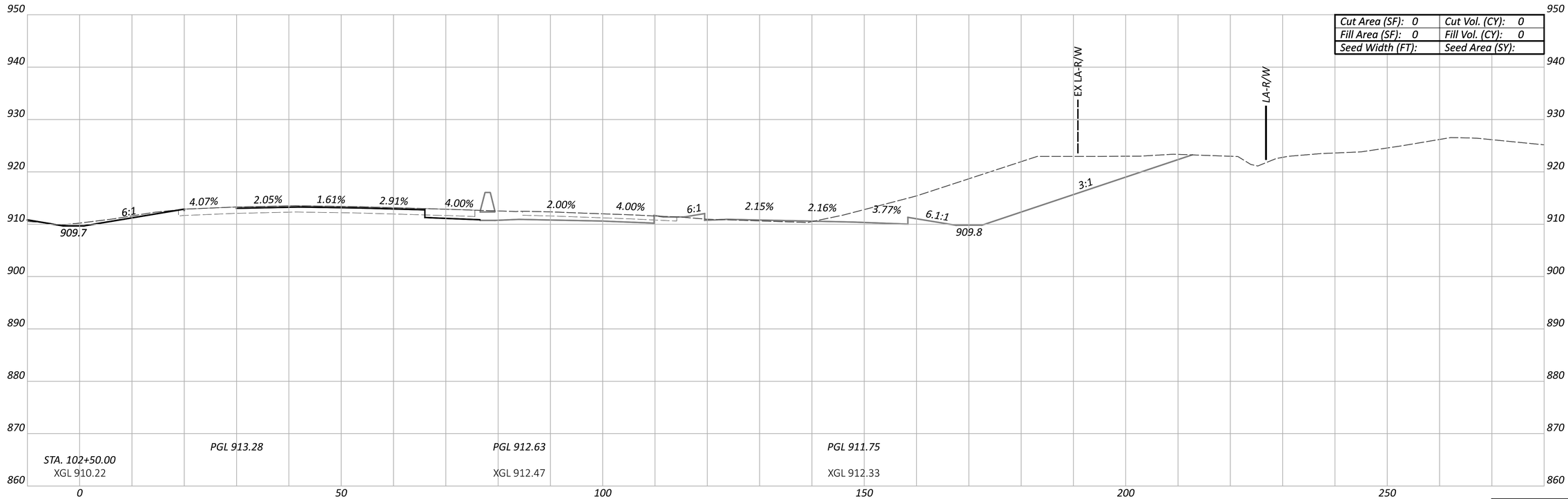
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.370 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 102+50.00 TO STA. 103+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

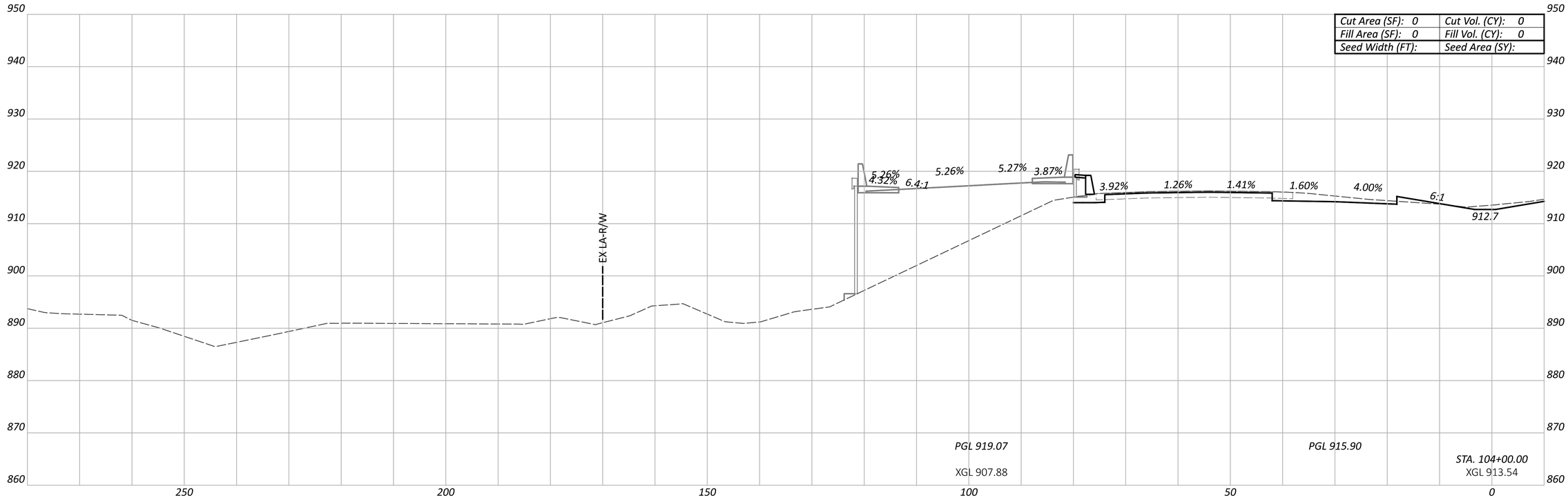
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

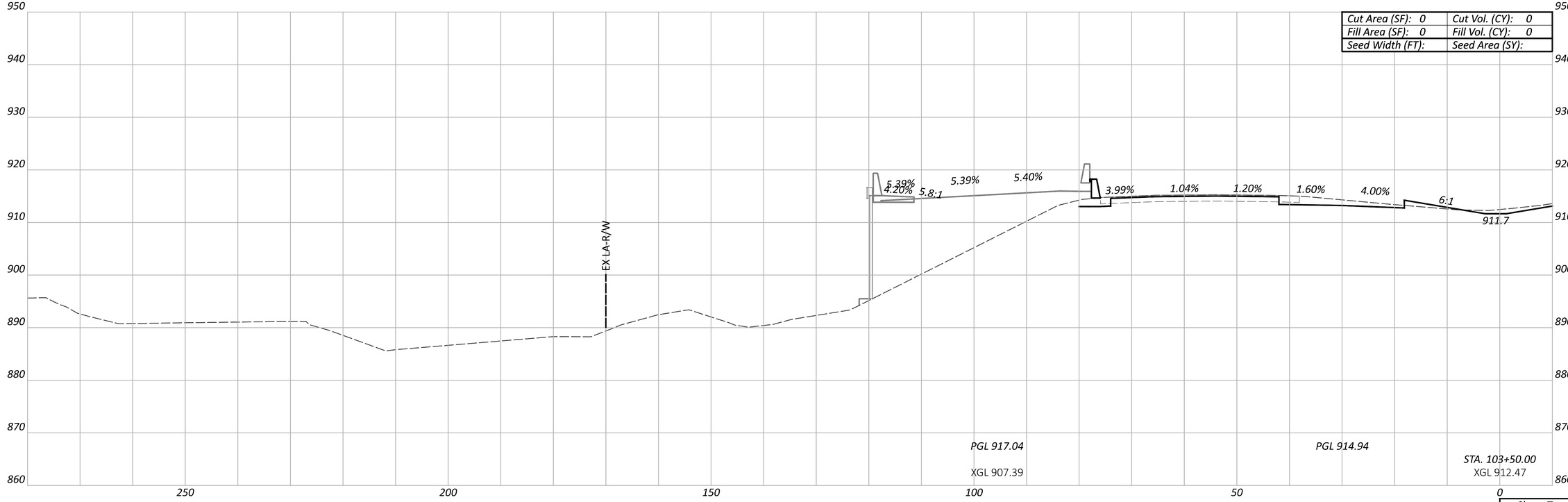
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.371 TOTAL 740





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CROSS SECTIONS - IR 70 WB
STA. 103+50.00 TO STA. 104+00.00

Sheet Totals		
Seeding	Cut	Fill

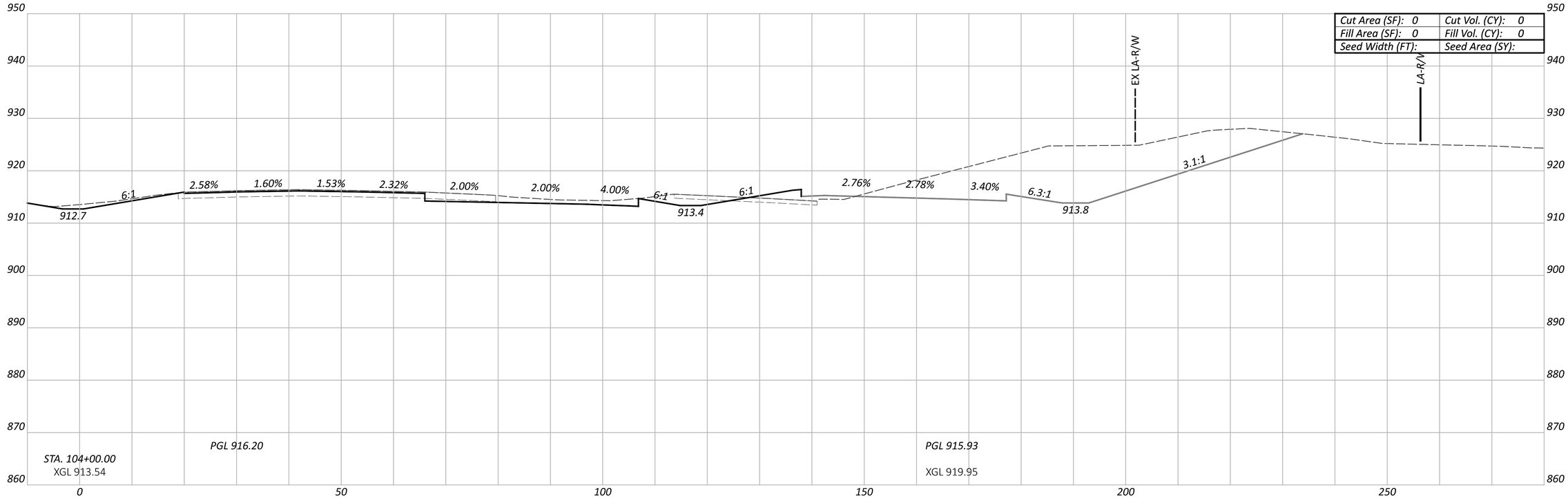
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

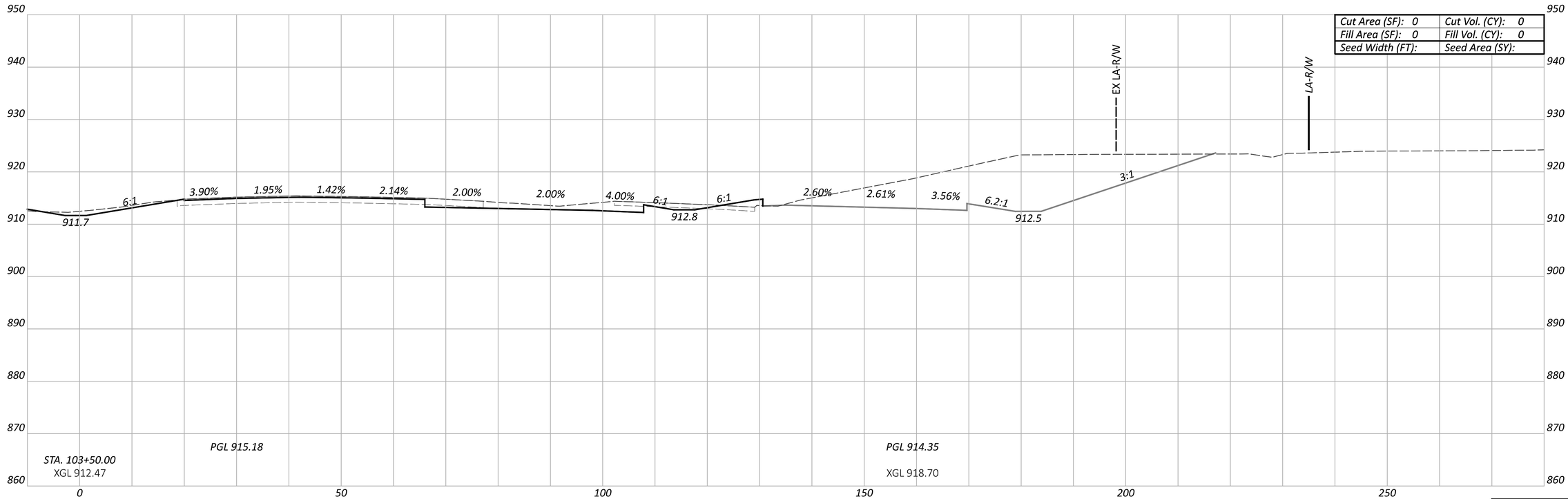
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.372 TOTAL 740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 EB
STA. 103+50.00 TO STA. 104+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.373 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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FAI/LIC IR 70 0.00/0.00

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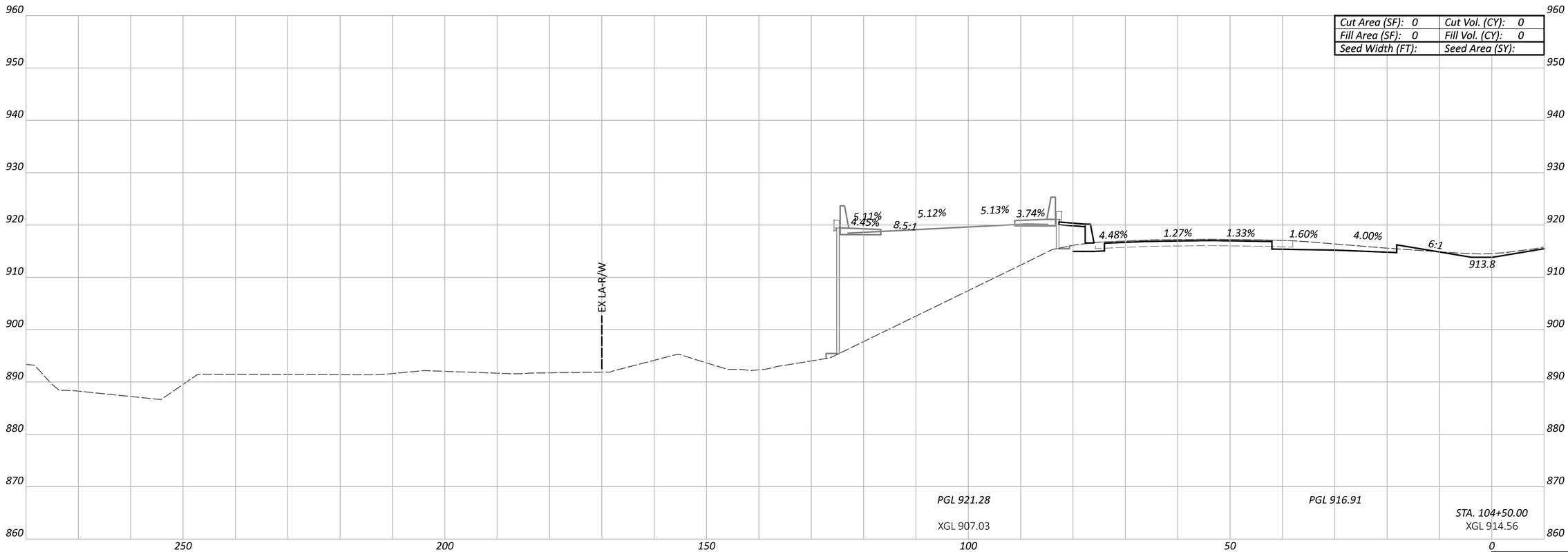

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - IR 70 WB
STA. 104+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.374 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 104+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:23:11 PM USER: aoldaker
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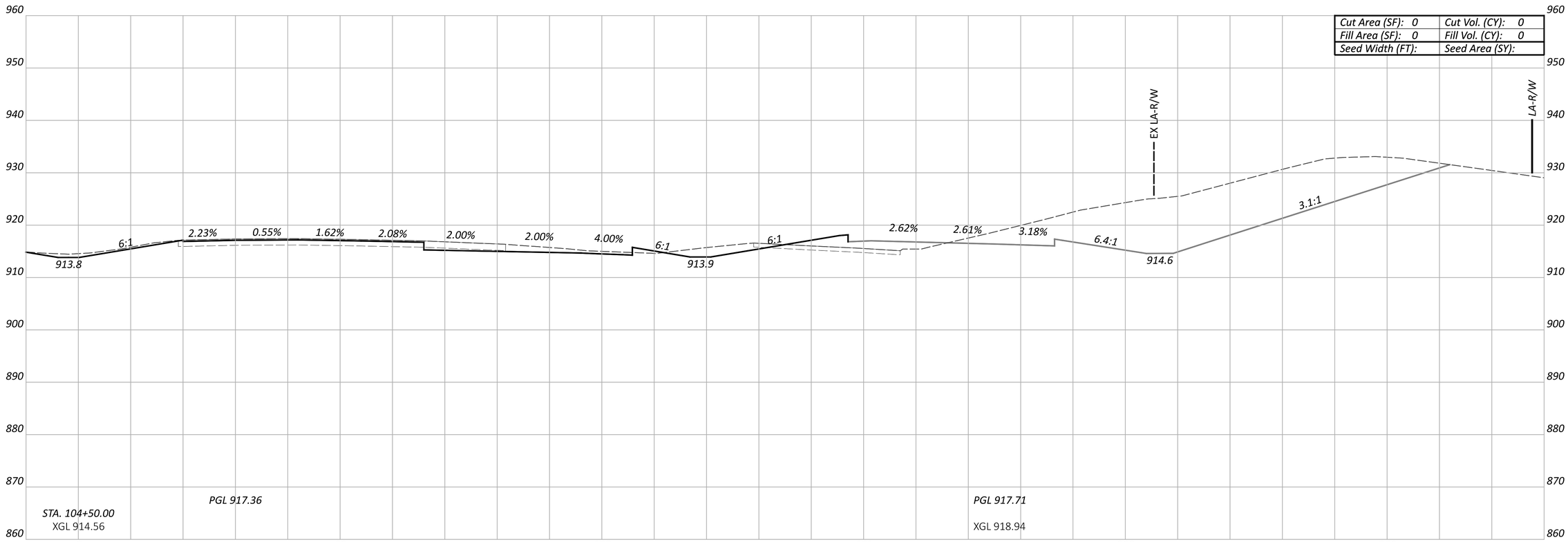
CROSS SECTIONS - IR 70 EB
STA. 104+50.00



Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.375
TOTAL	740

FAI/LIC IR 70 0.00/0.00

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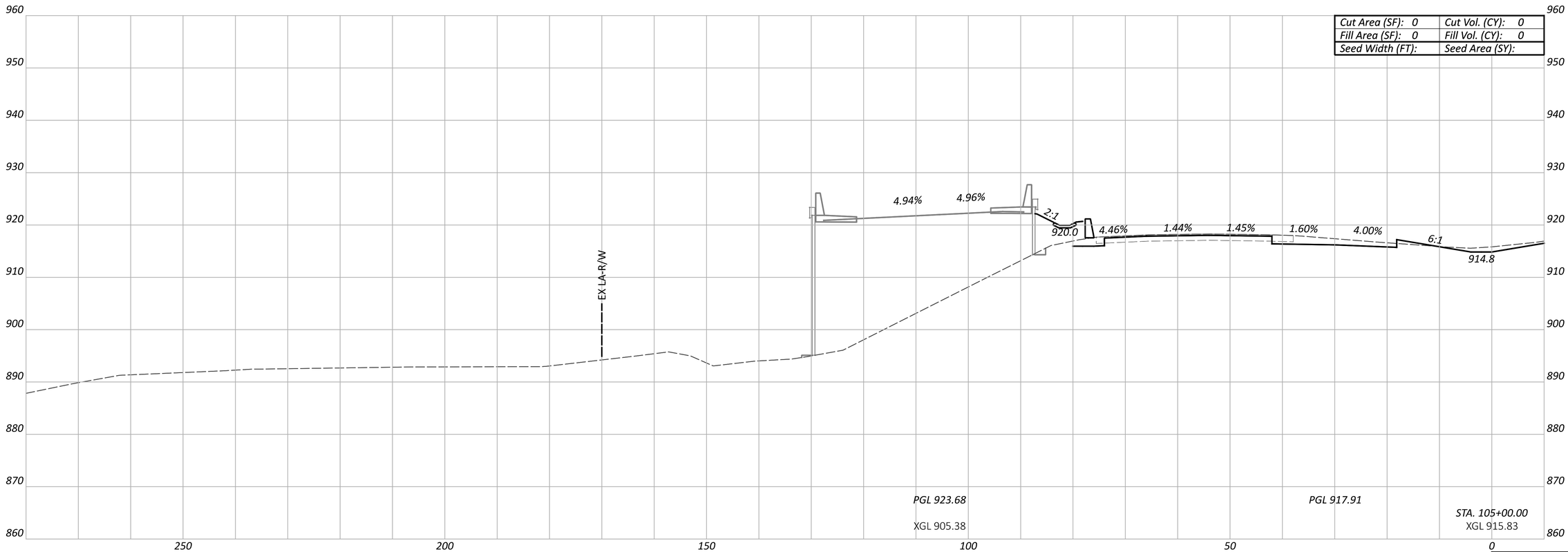

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - IR 70 WB
STA. 105+00.00

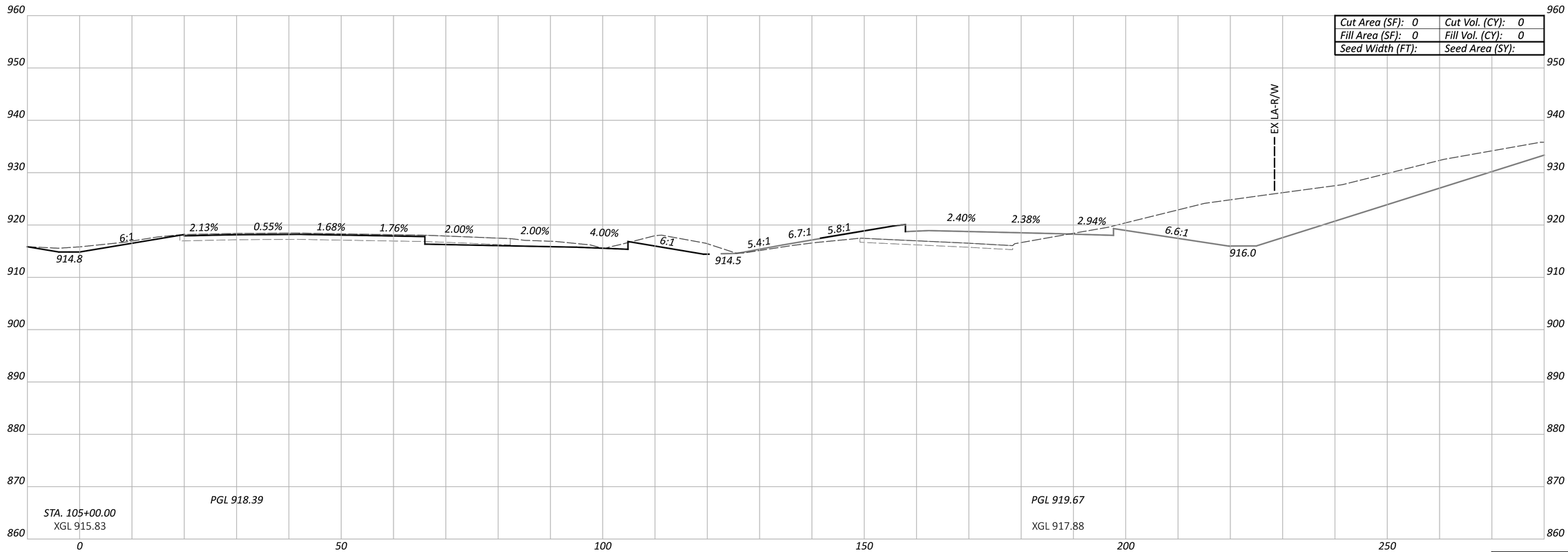
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.376 | TOTAL 740



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CROSS SECTIONS - IR 70 EB
STA. 105+00.00

FAI/LIC IR 70 0.00/0.00

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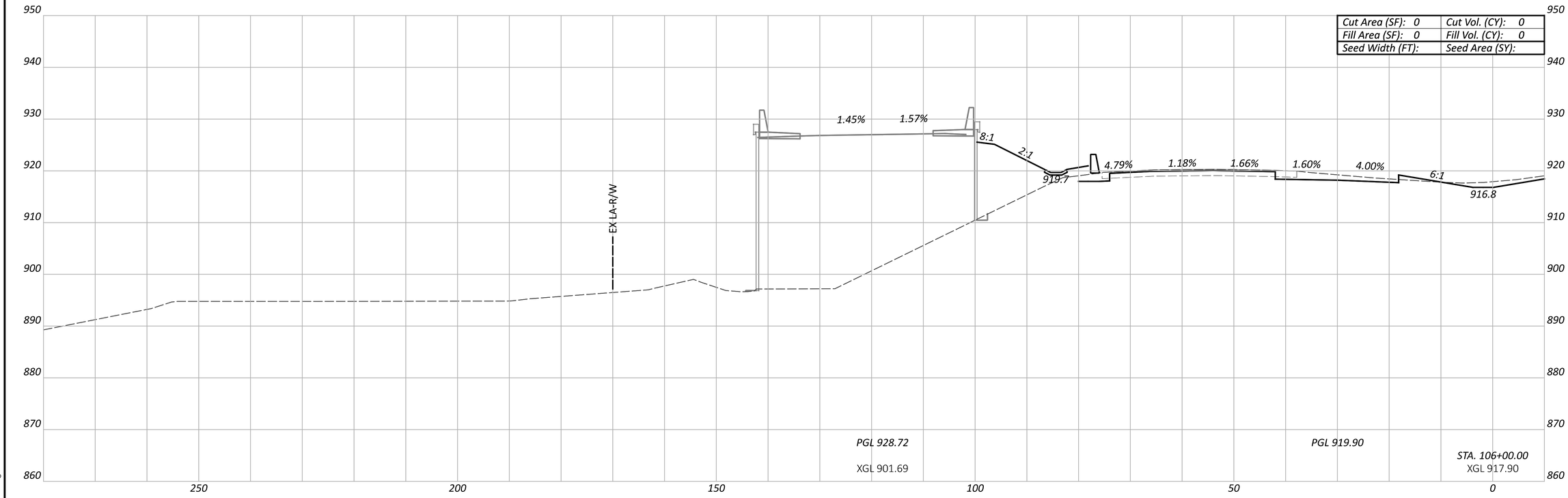
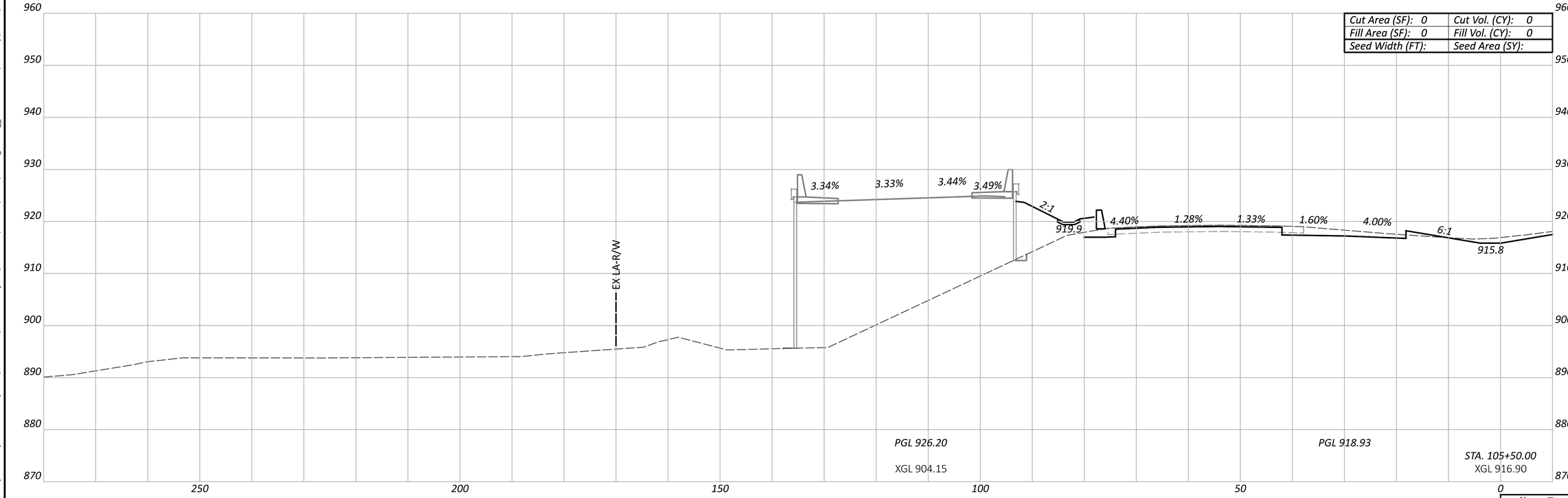
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.377
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 105+50.00 TO STA. 106+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

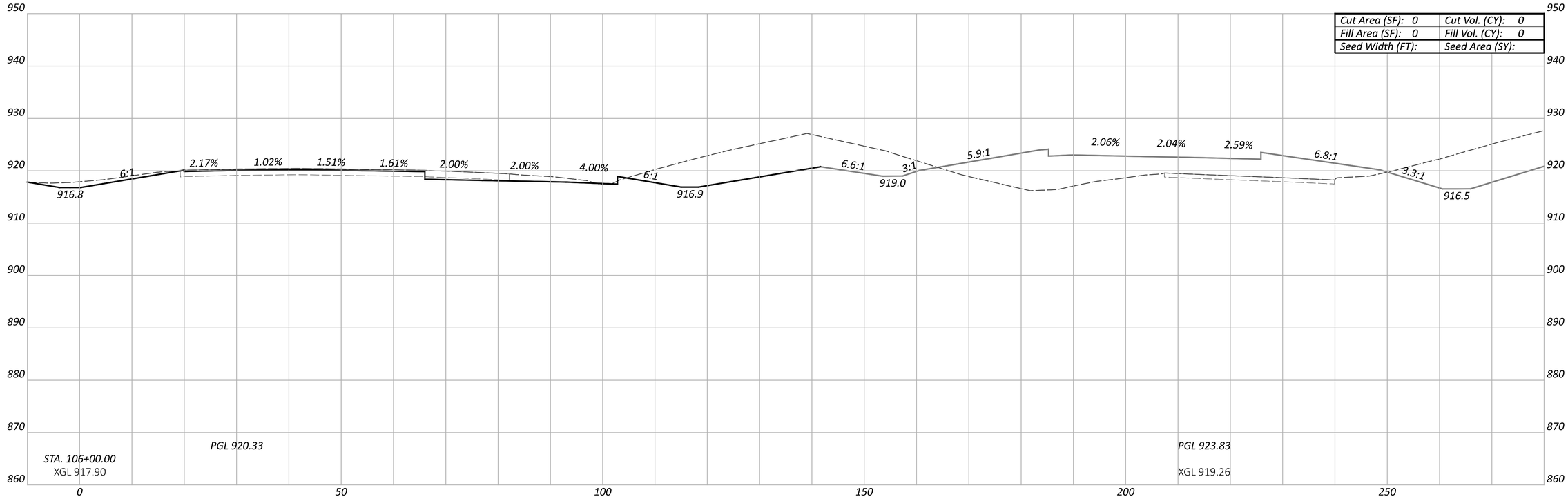
REVIEWER
KAM 06/18/23

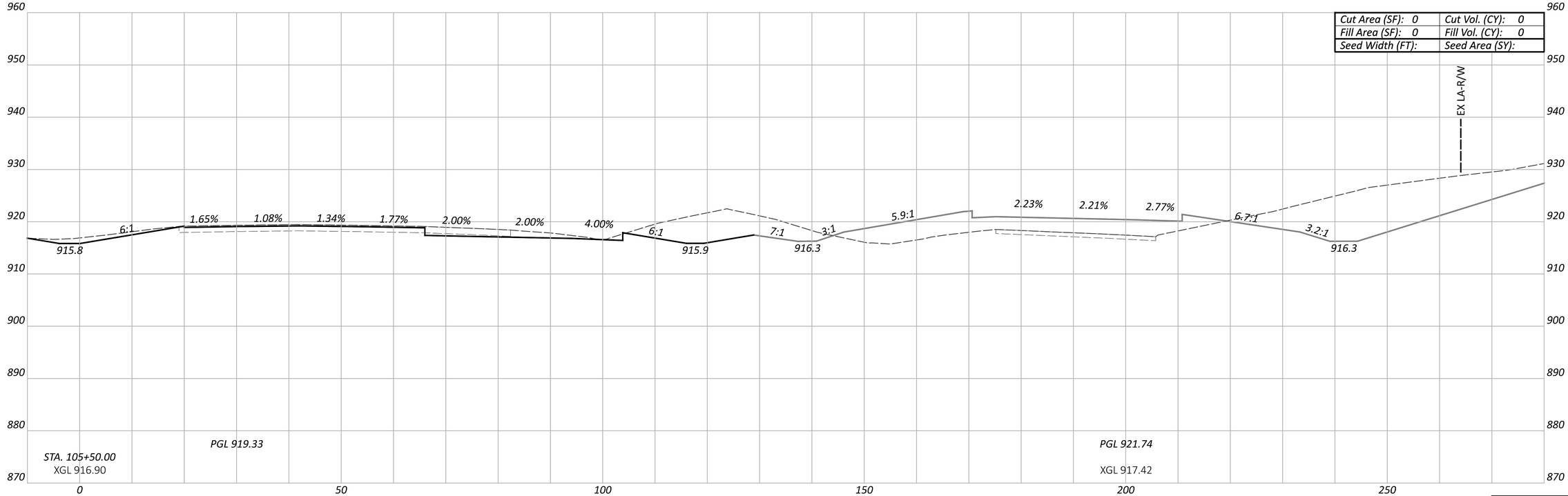
PROJECT ID
96808

SHEET P.378 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 105+50.00 TO STA. 106+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.379 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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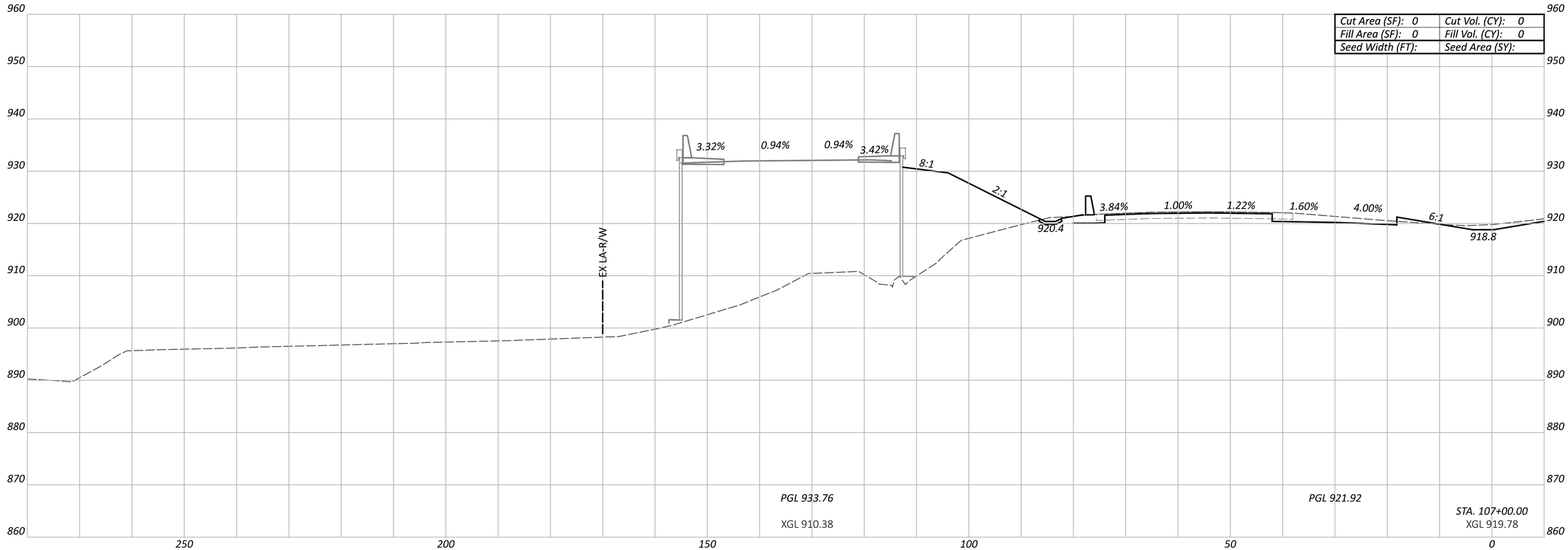

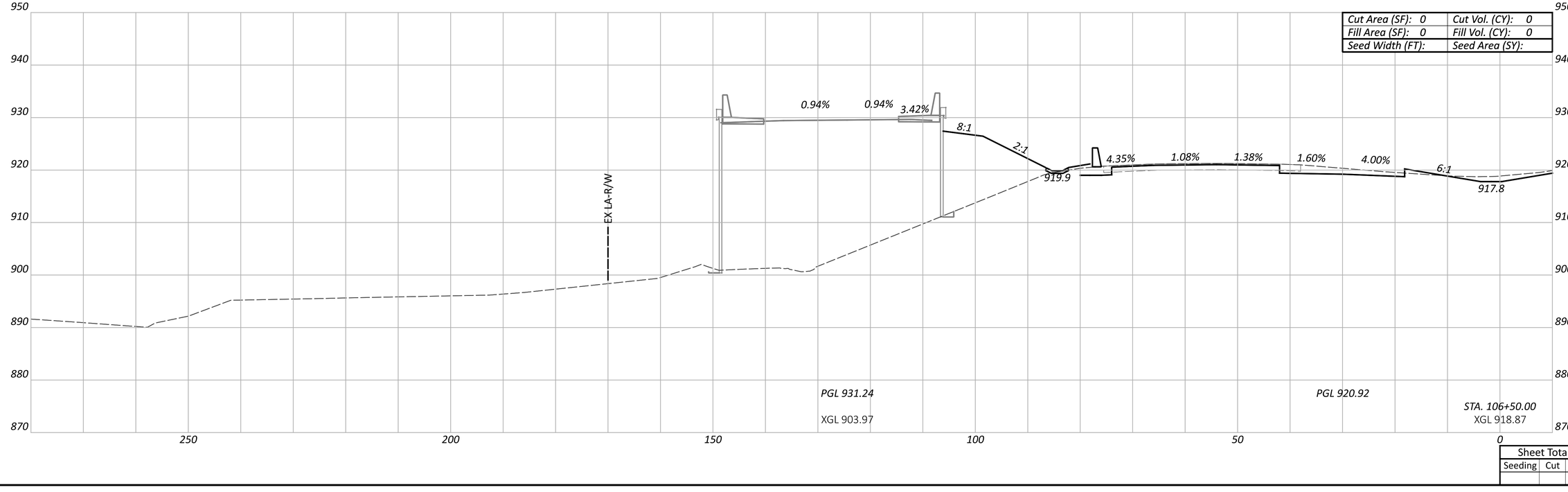

CROSS SECTIONS - IR 70 WB
STA. 106+50.00 TO STA. 107+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

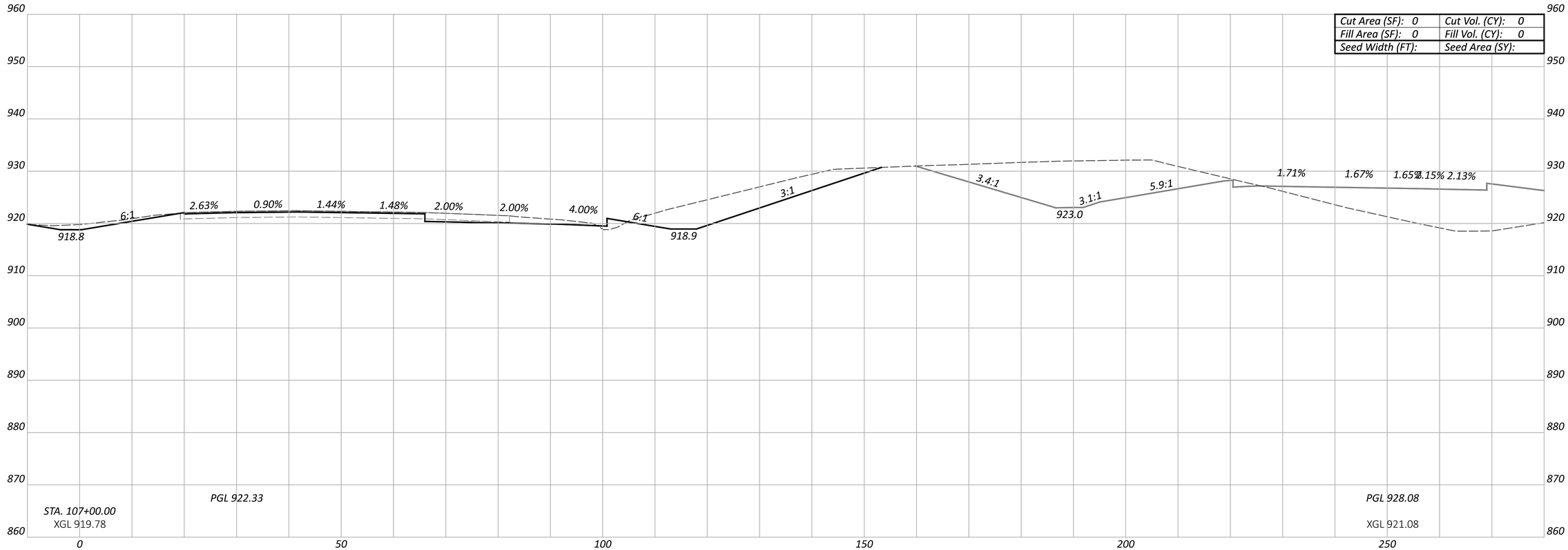
DESIGNER
BER

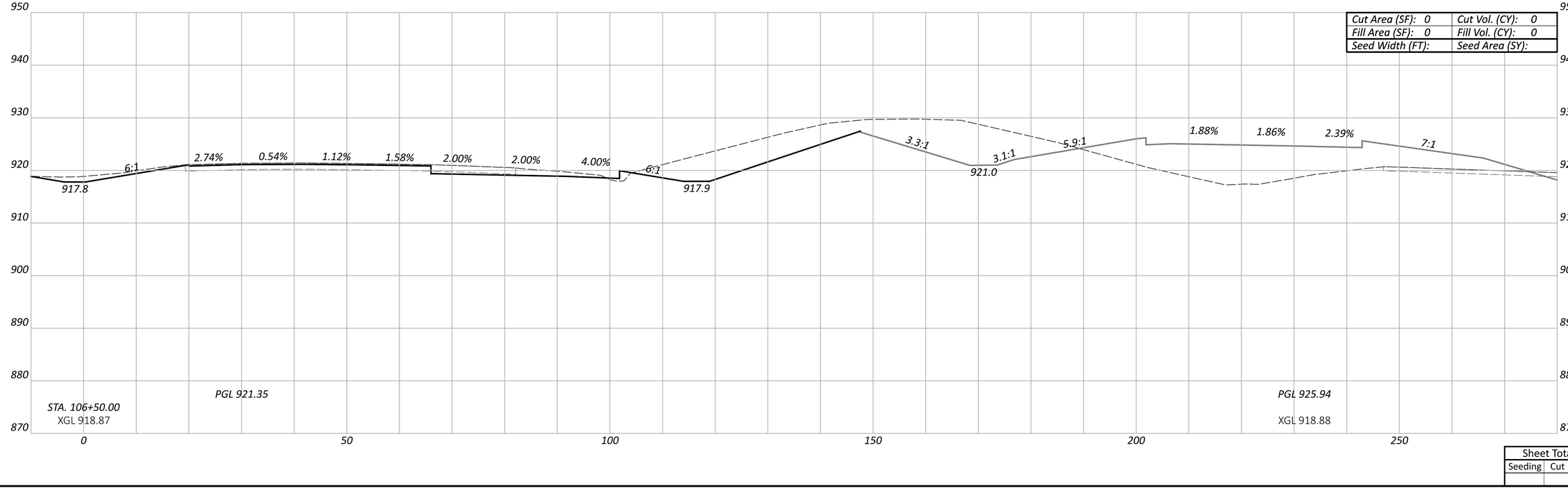
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.380	740





CROSS SECTIONS - IR 70 EB
STA. 106+50.00 TO STA. 107+00.00

FAI/LIC IR 70 0.00/0.00

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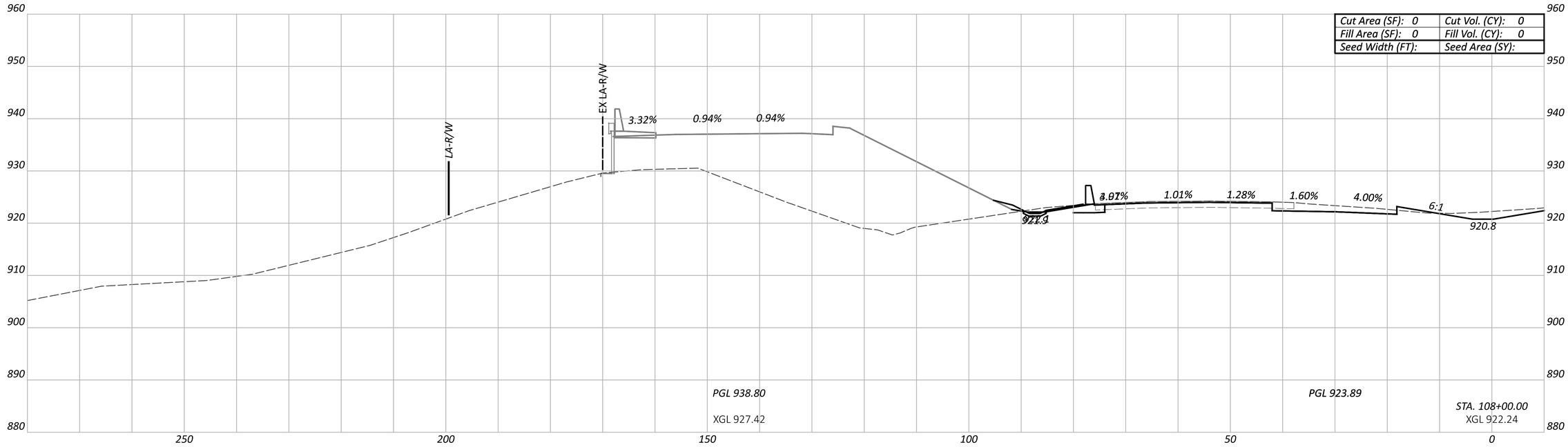
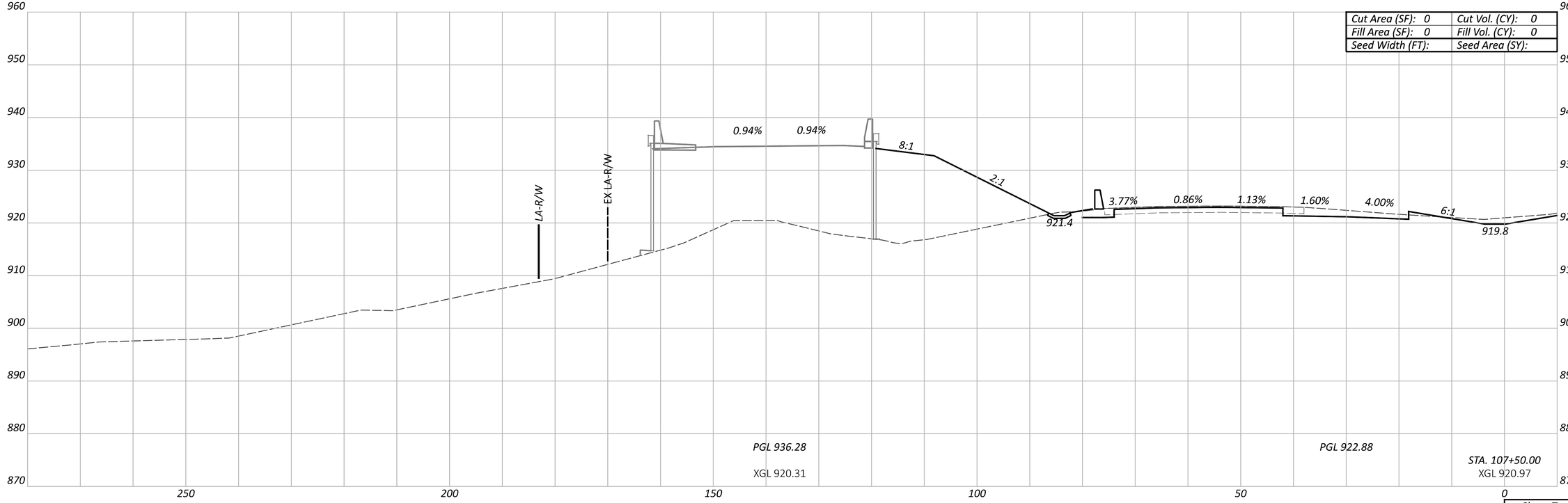
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.381
TOTAL	740





CROSS SECTIONS - IR 70 WB
STA. 107+50.00 TO STA. 108+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 107+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:23:31 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

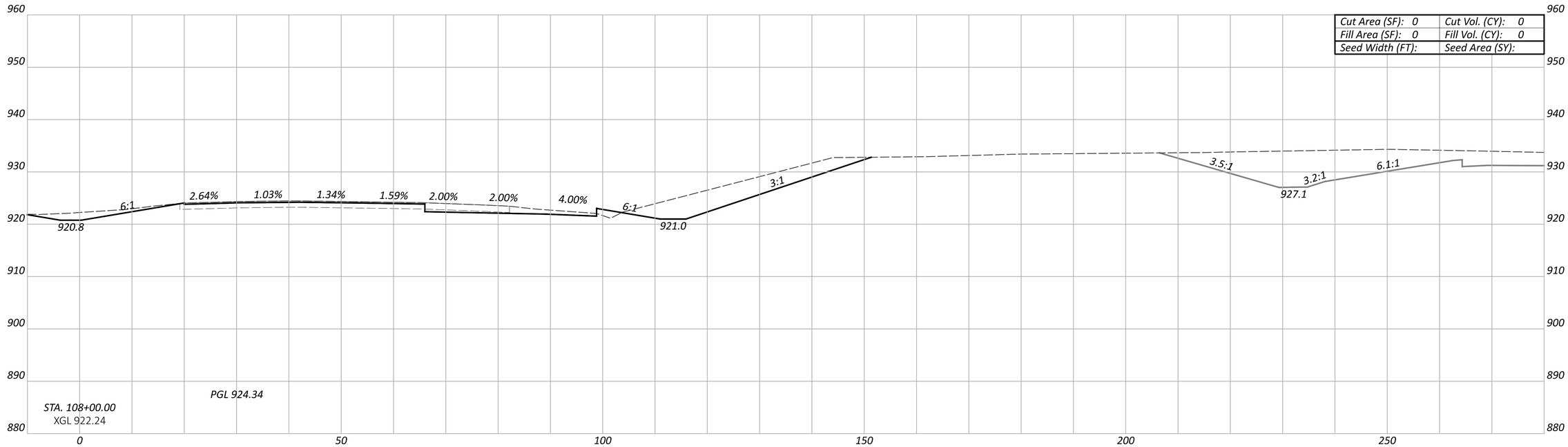
DESIGNER
BER

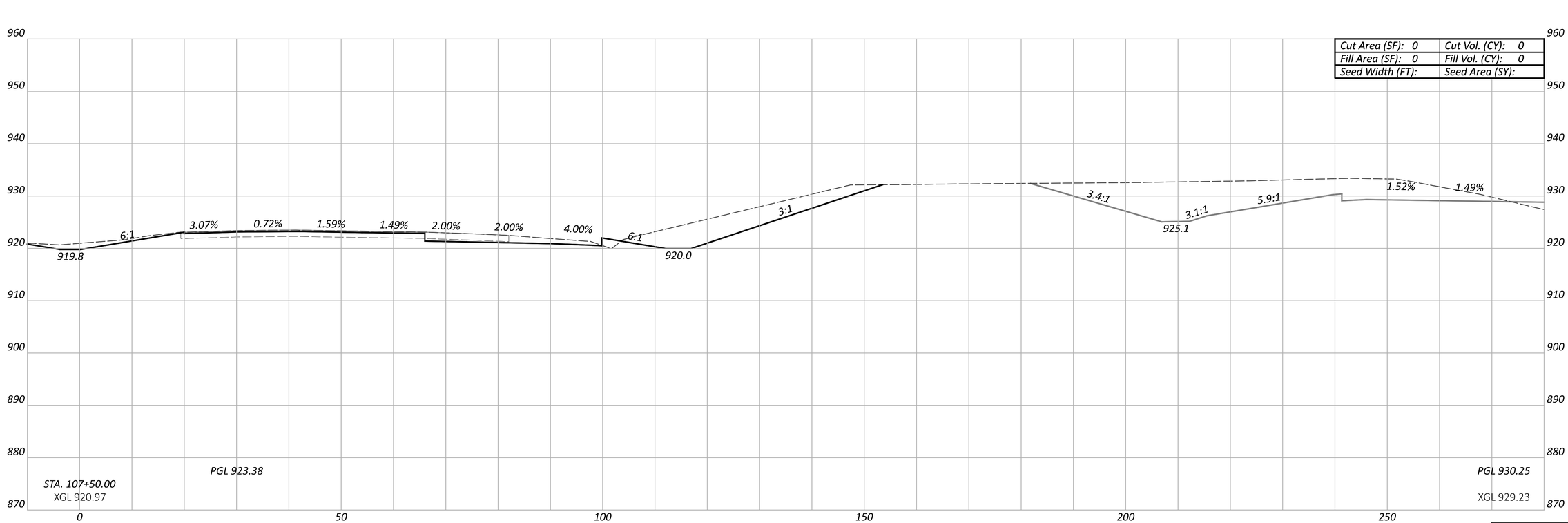
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.382 TOTAL 740





FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 EB
STA. 107+50.00 TO STA. 108+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

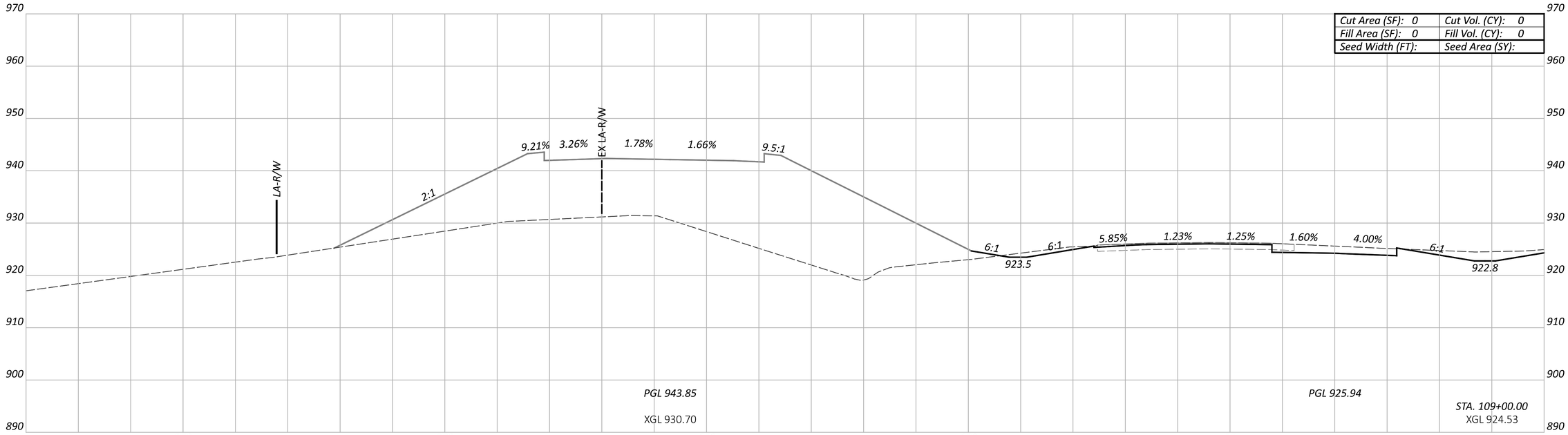
REVIEWER
KAM 06/18/23

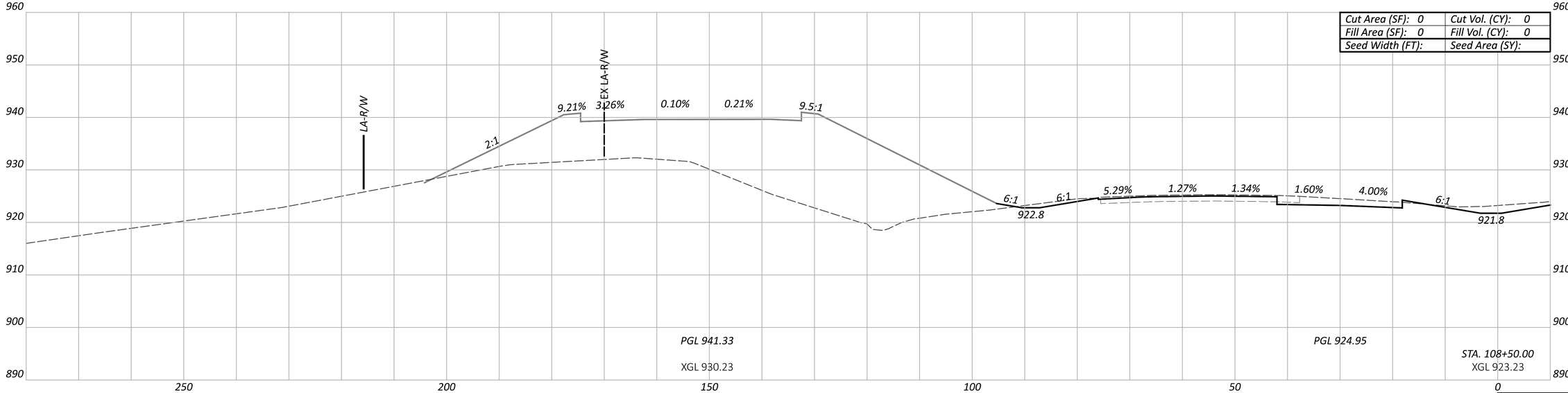
PROJECT ID
96808

SHEET P.383 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 WB
STA. 108+50.00 TO STA. 109+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

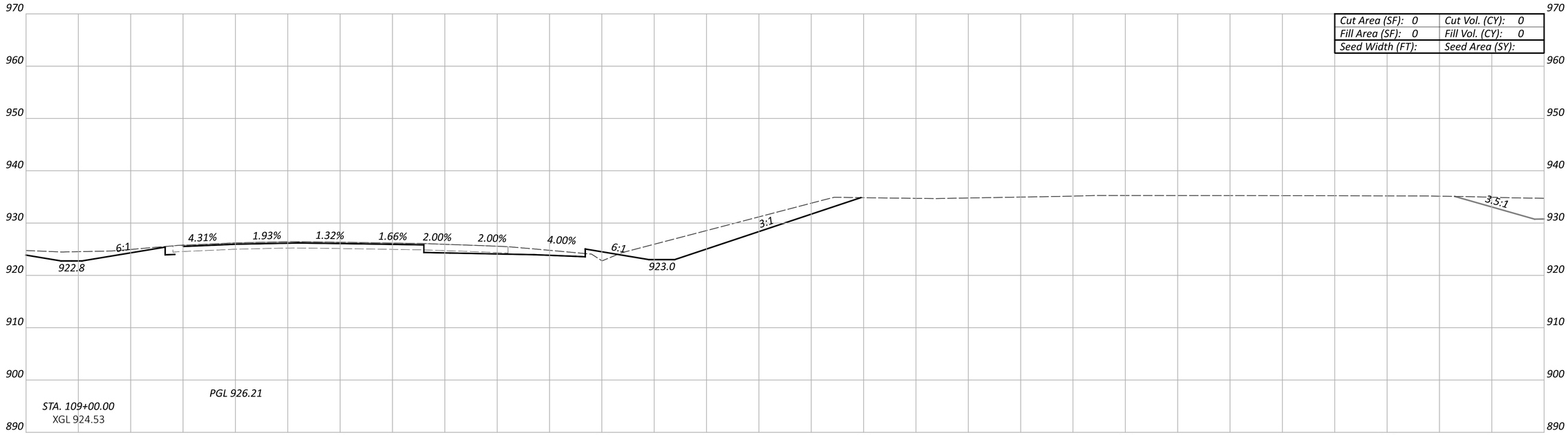
DESIGNER
BER

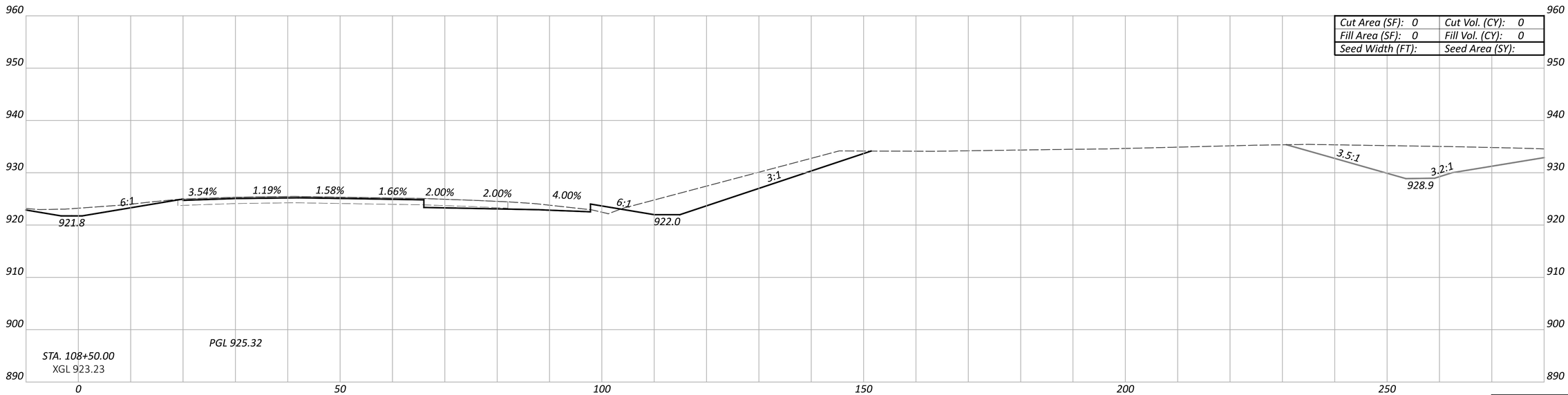
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.384 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 108+50.00 TO STA. 109+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

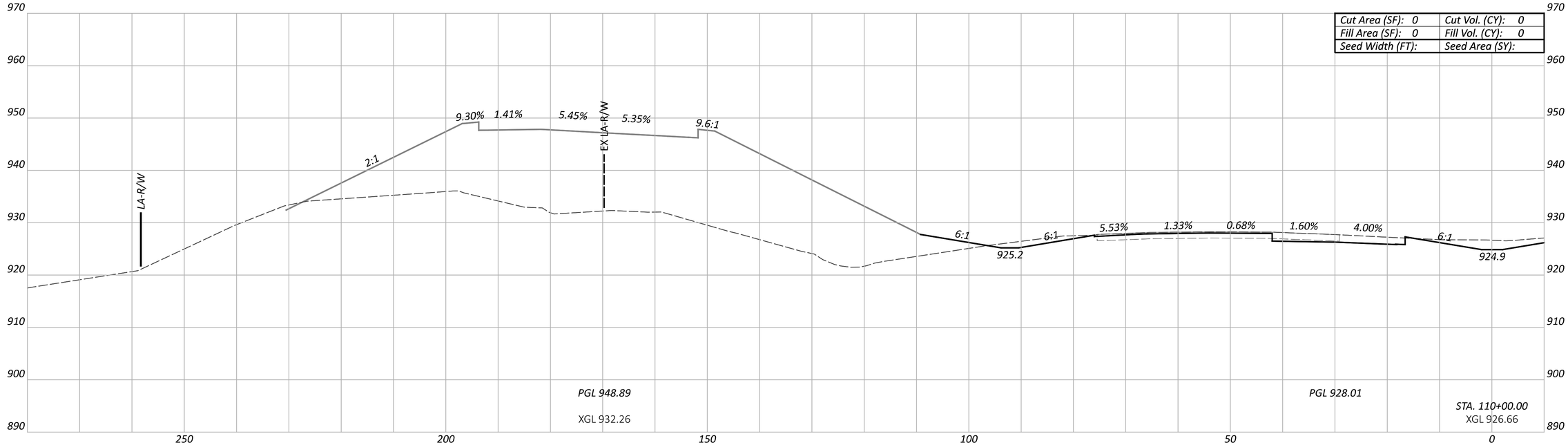
DESIGN AGENCY
STRUCTUREPOINT INC.

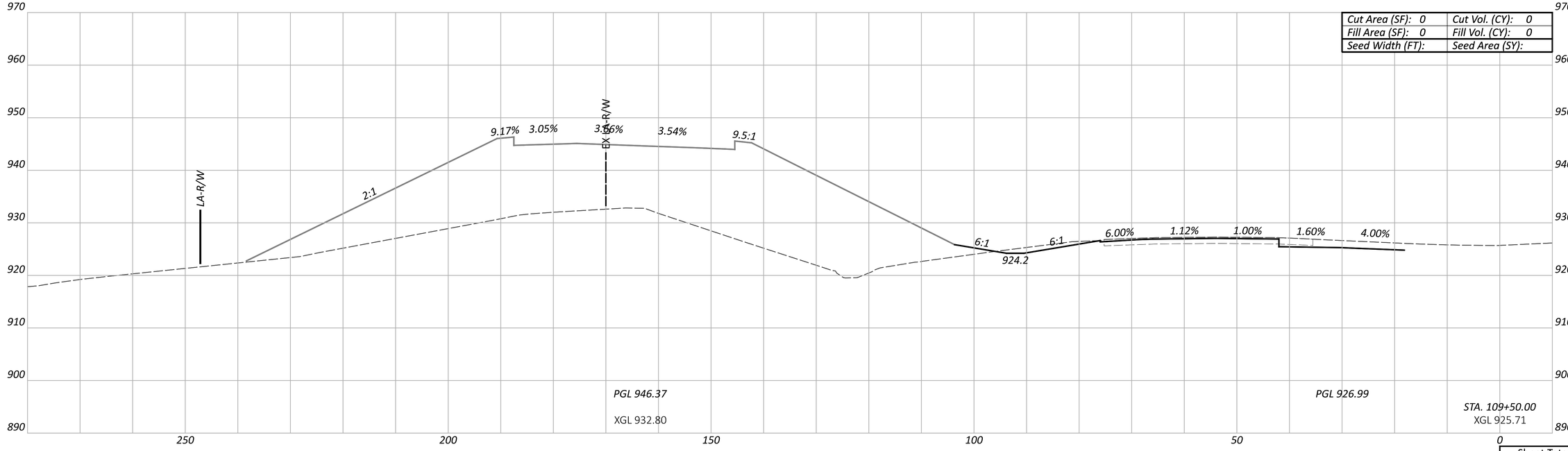
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.385 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 109+50.00 TO STA. 110+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

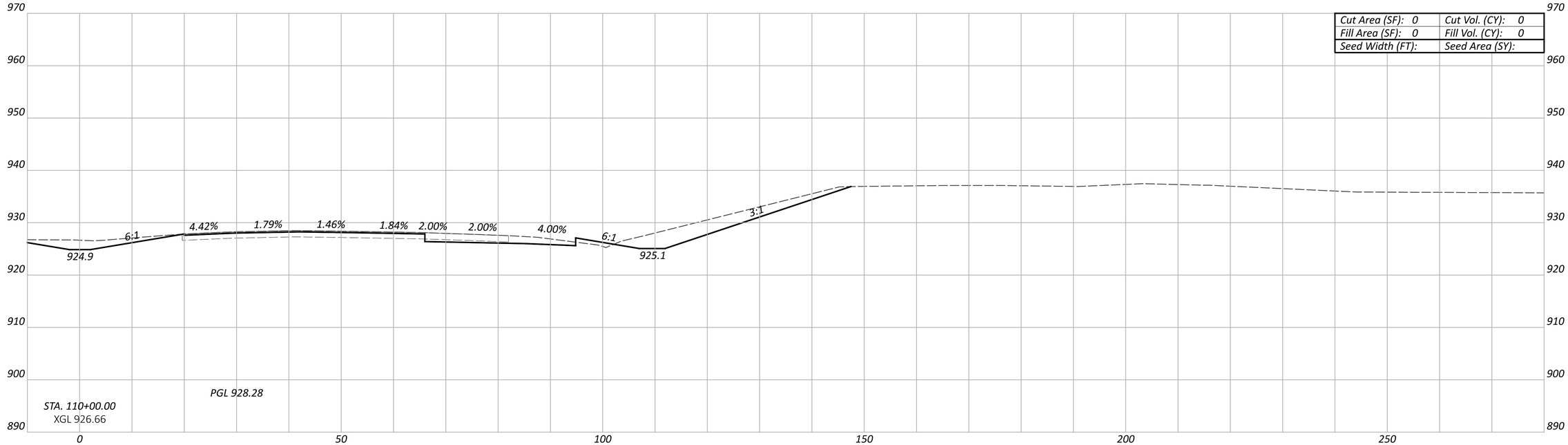
DESIGNER
BER

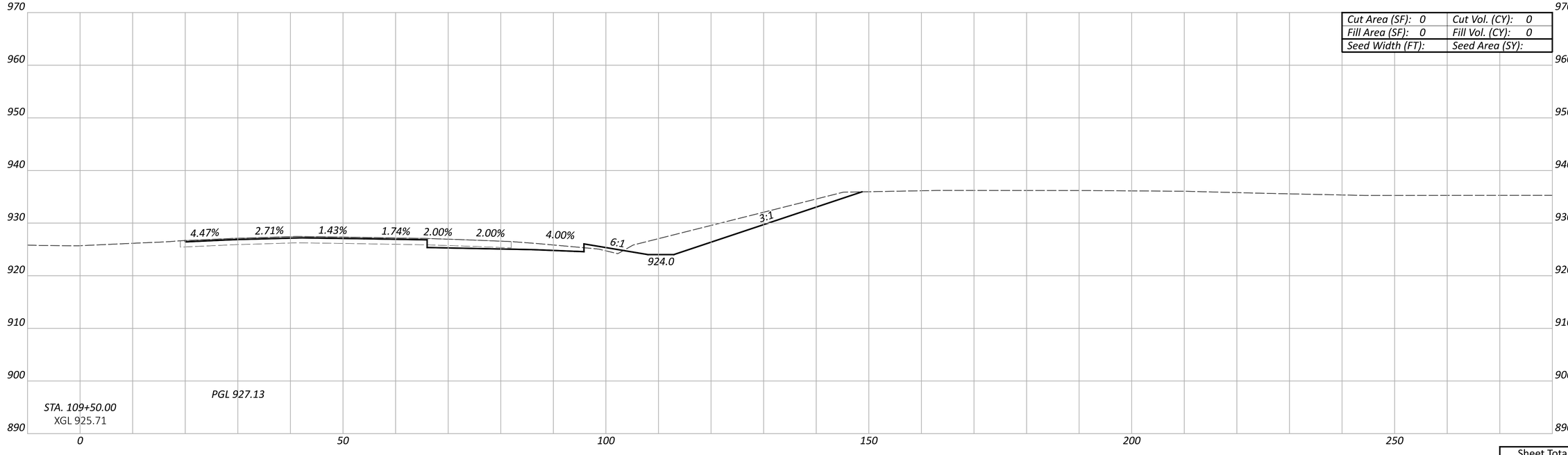
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.386	740





CROSS SECTIONS - IR 70 EB
STA. 109+50.00 TO STA. 110+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

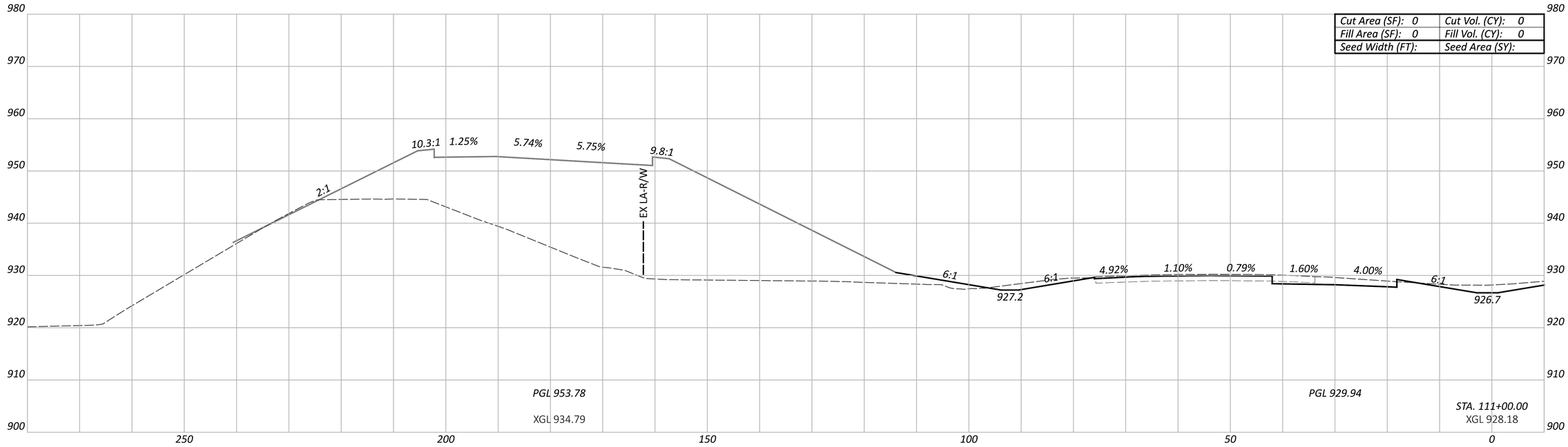
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

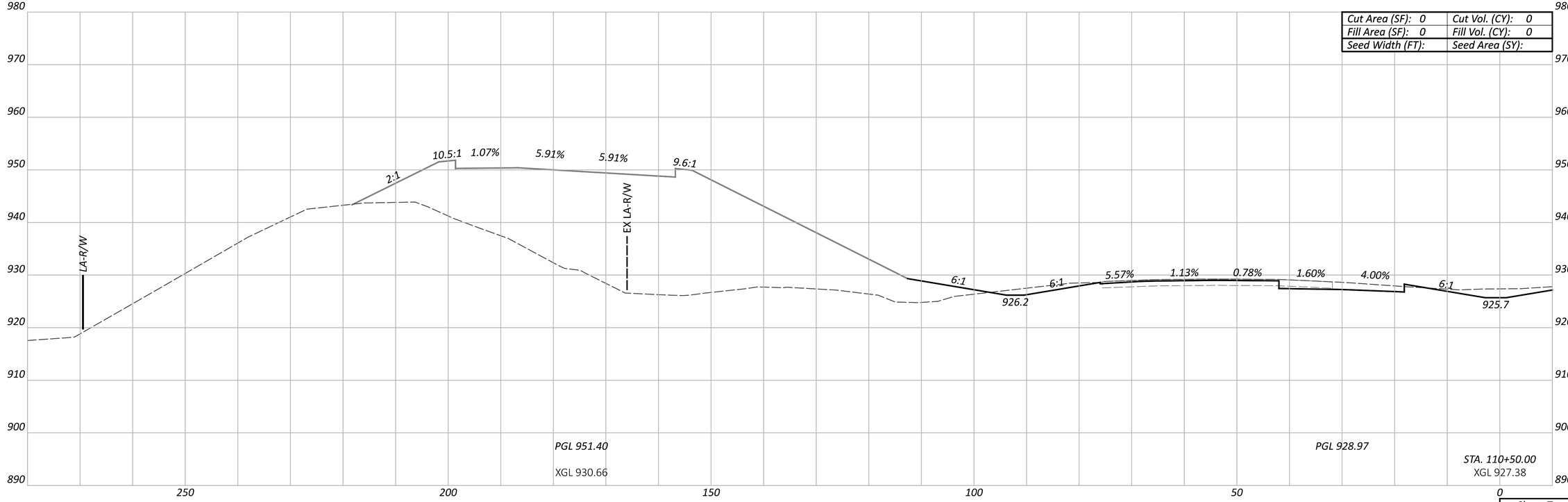
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.387 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 110+50.00 TO STA. 111+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

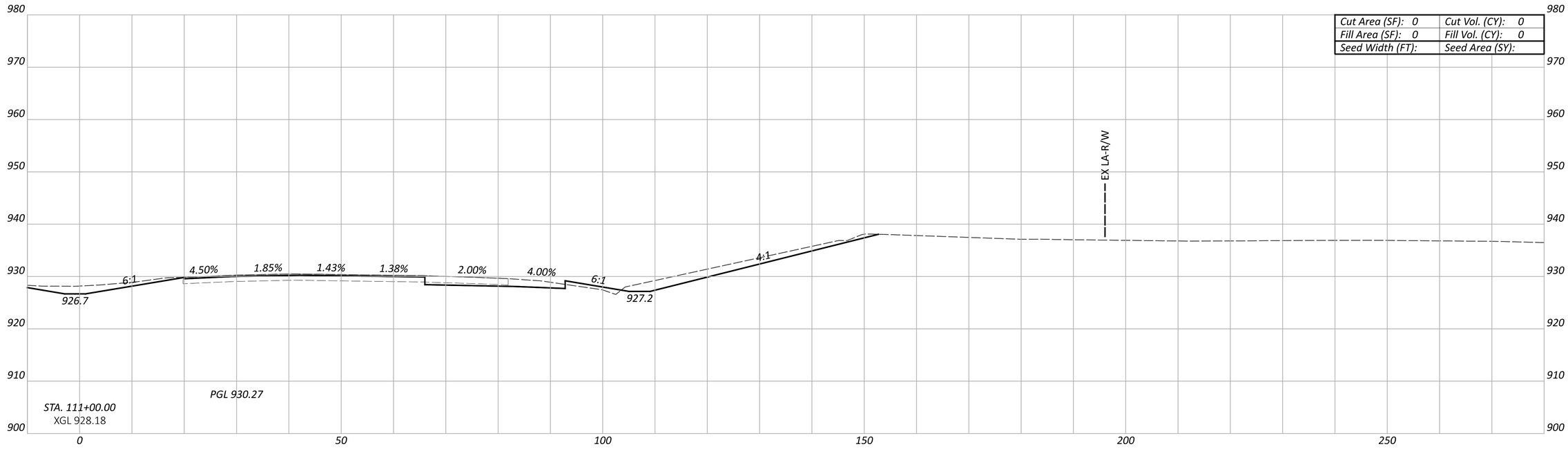
REVIEWER
KAM 06/18/23

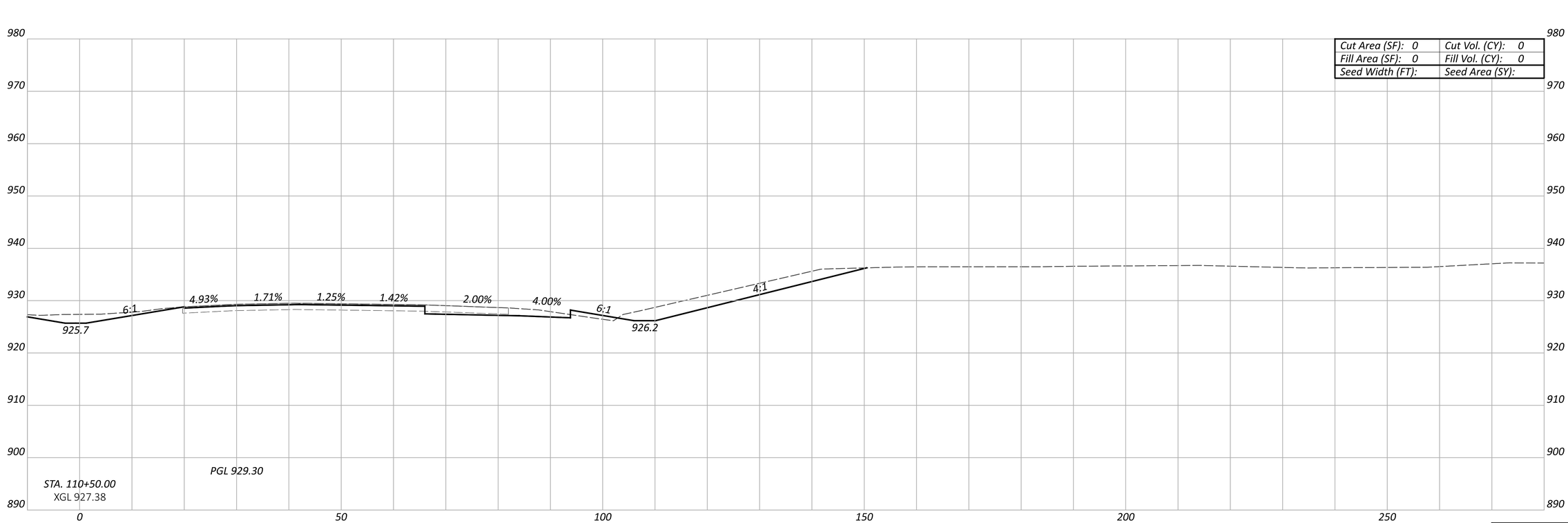
PROJECT ID
96808

SHEET P.388 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 110+50.00 TO STA. 111+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

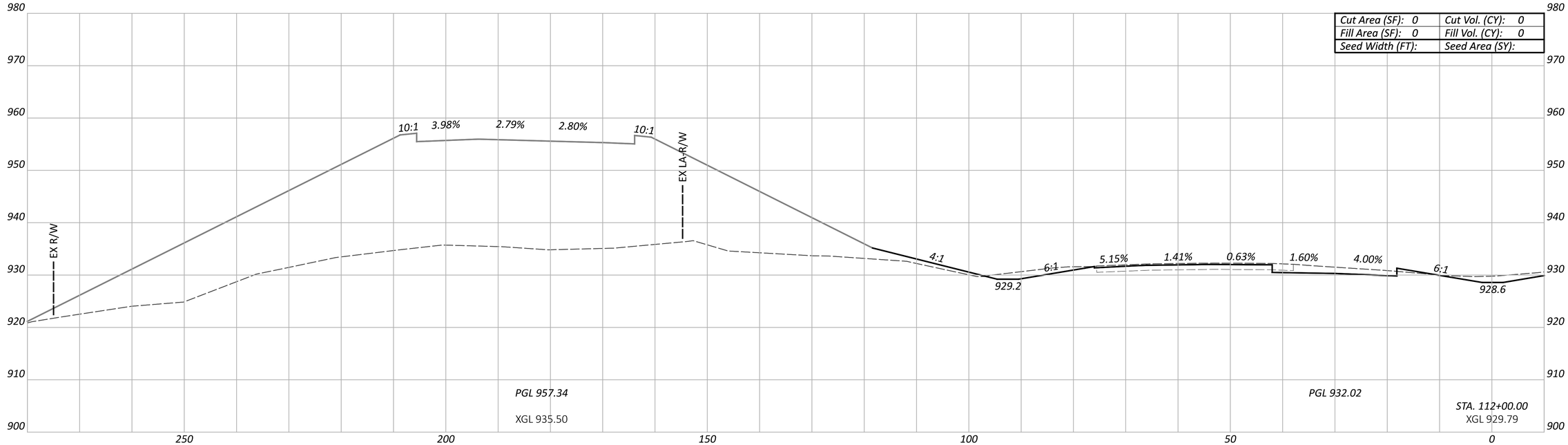
DESIGNER
BER

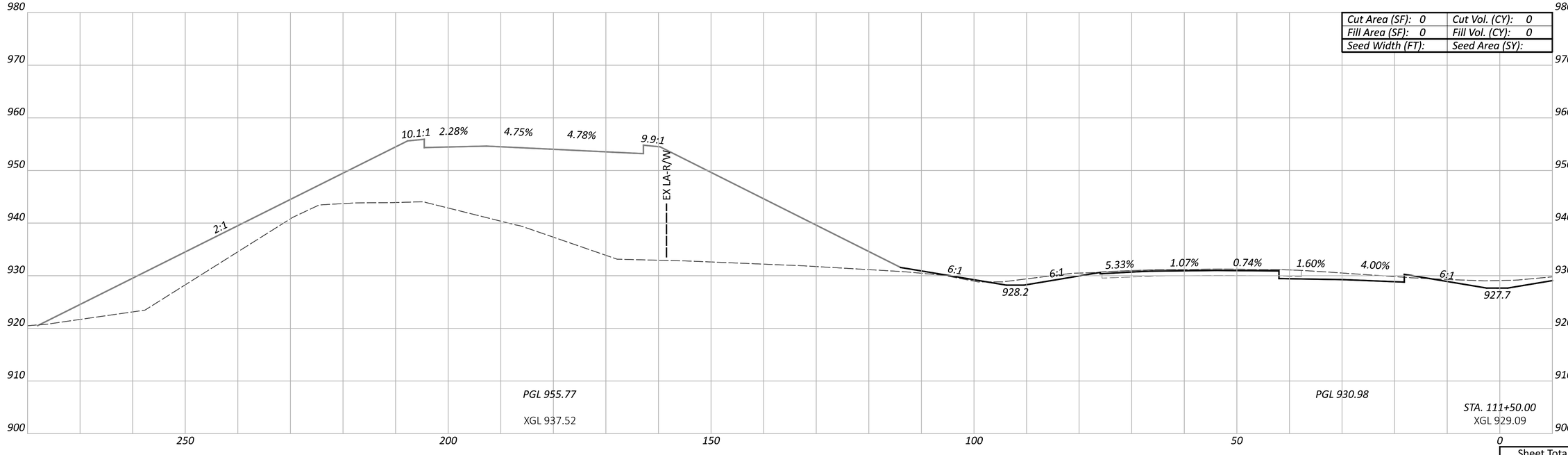
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.389 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 111+50.00 TO STA. 112+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

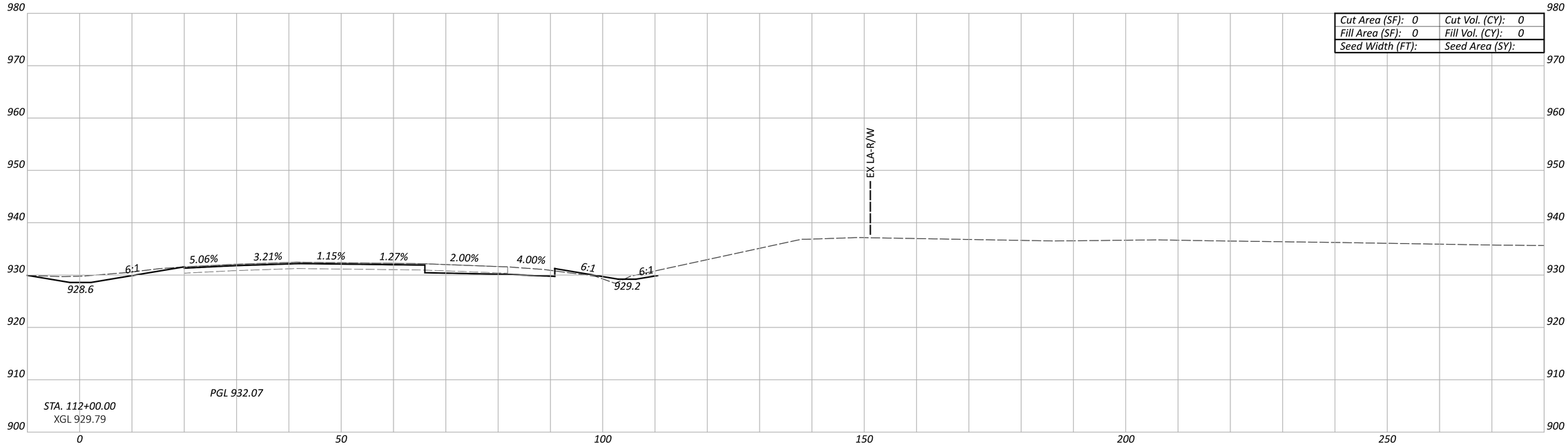
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

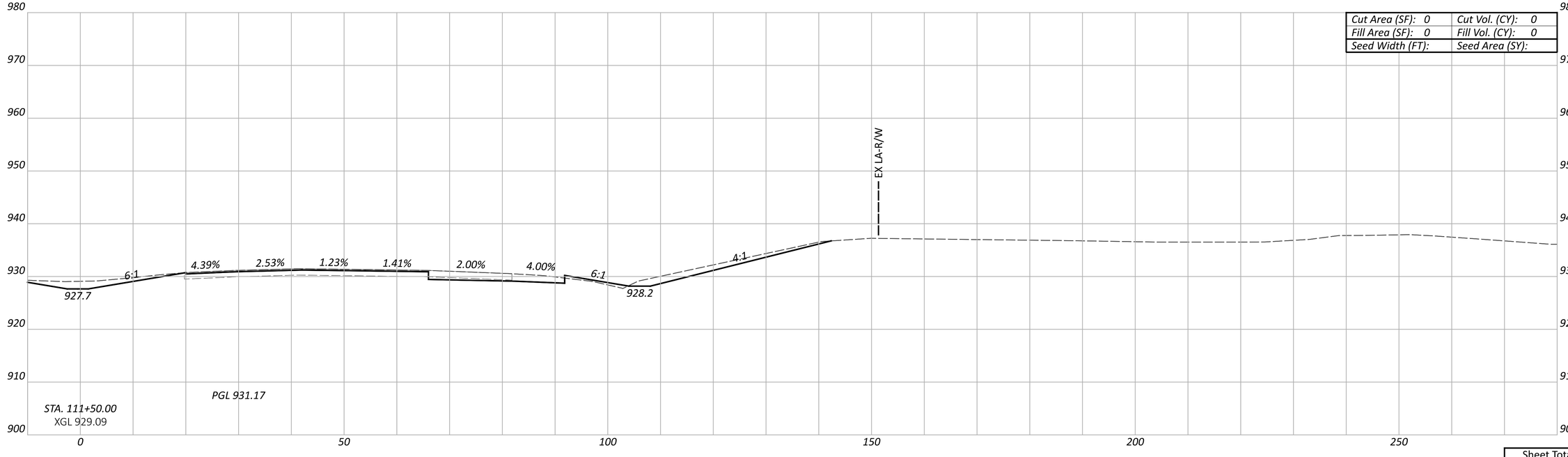
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.390 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 111+50.00 TO STA. 112+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

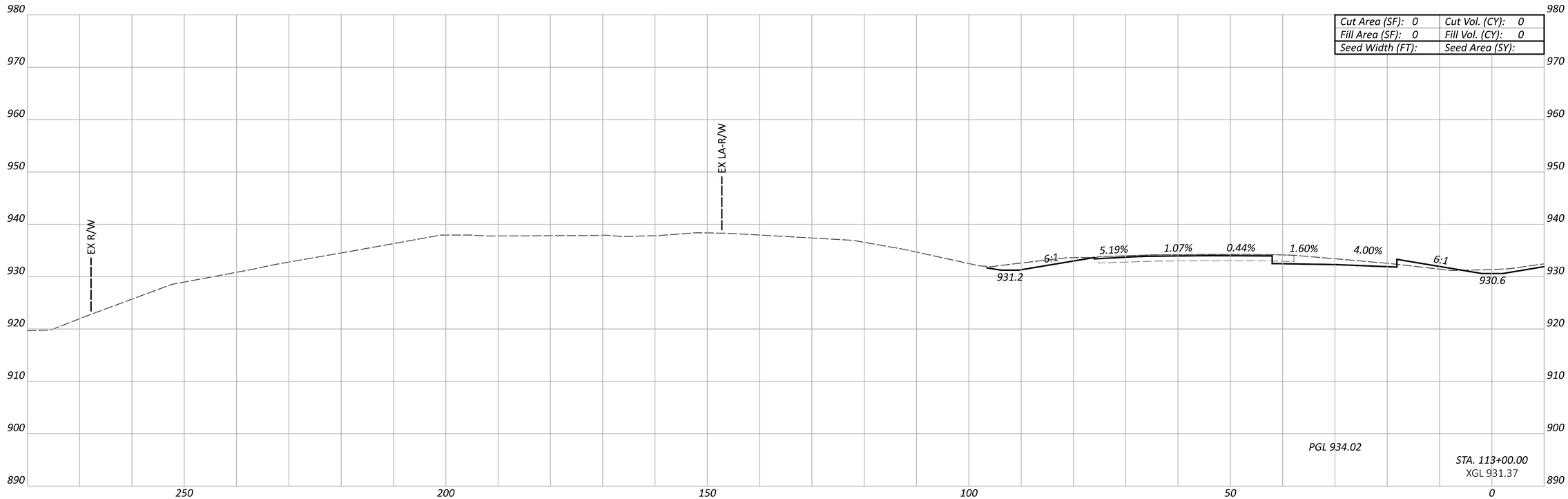
DESIGNER
BER

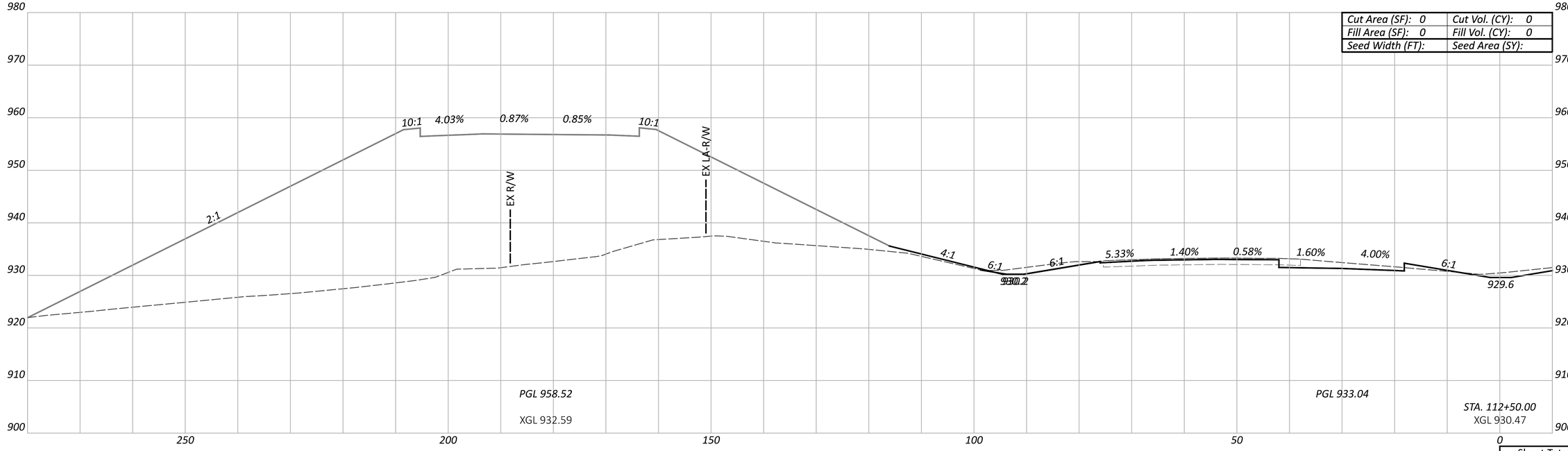
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.391 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 112+50.00 TO STA. 113+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

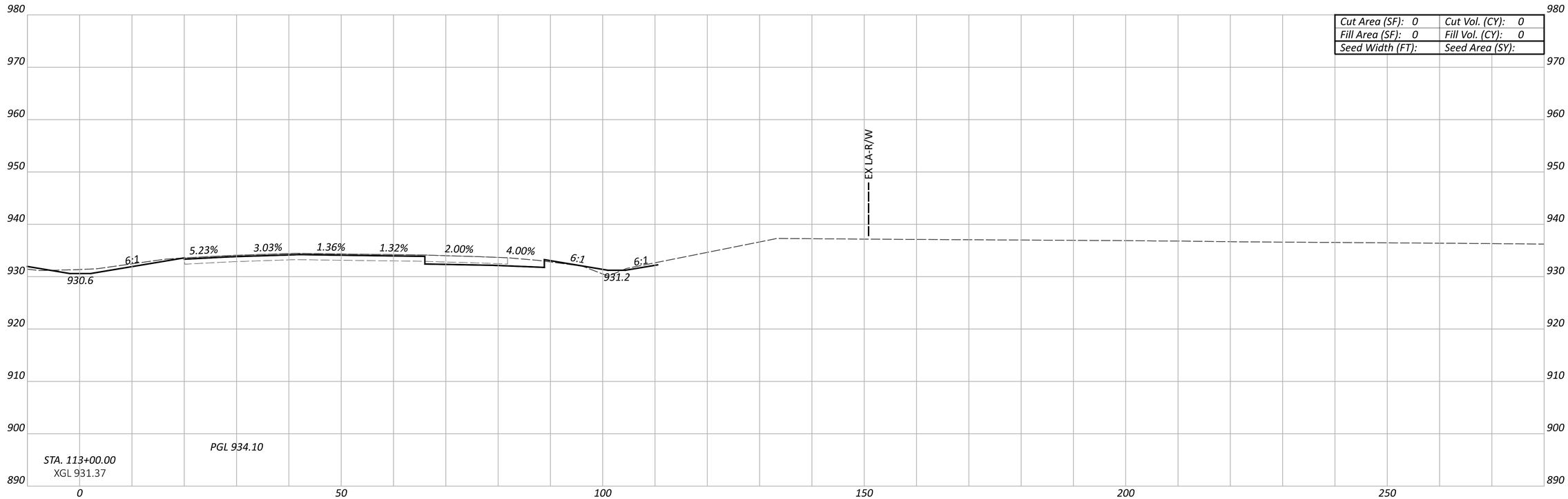
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

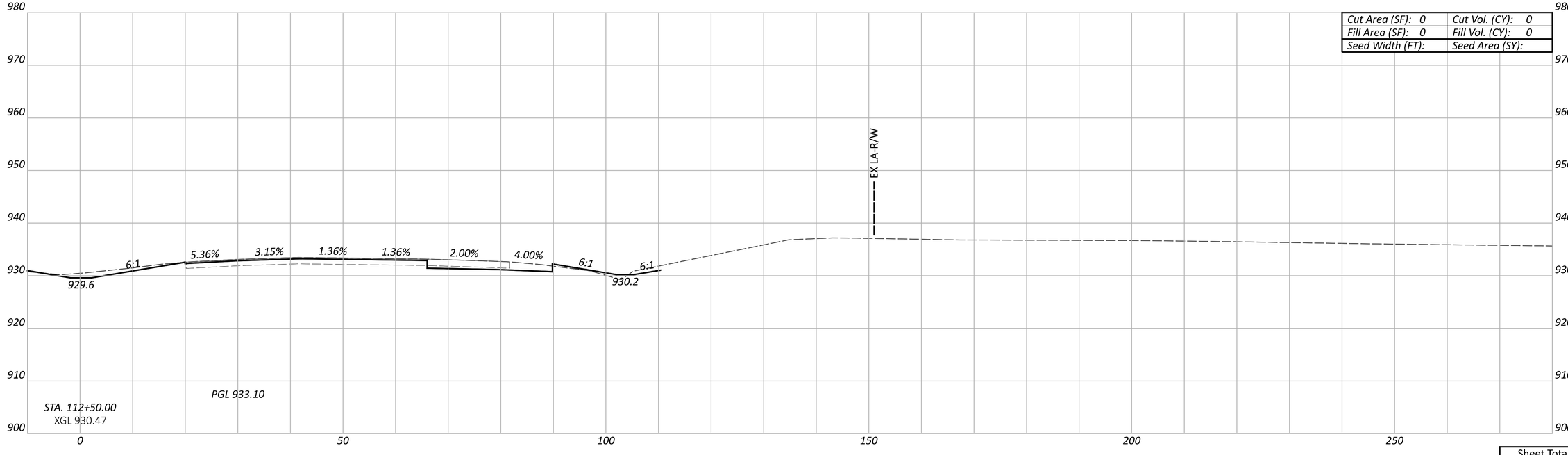
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.392 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 112+50.00 TO STA. 113+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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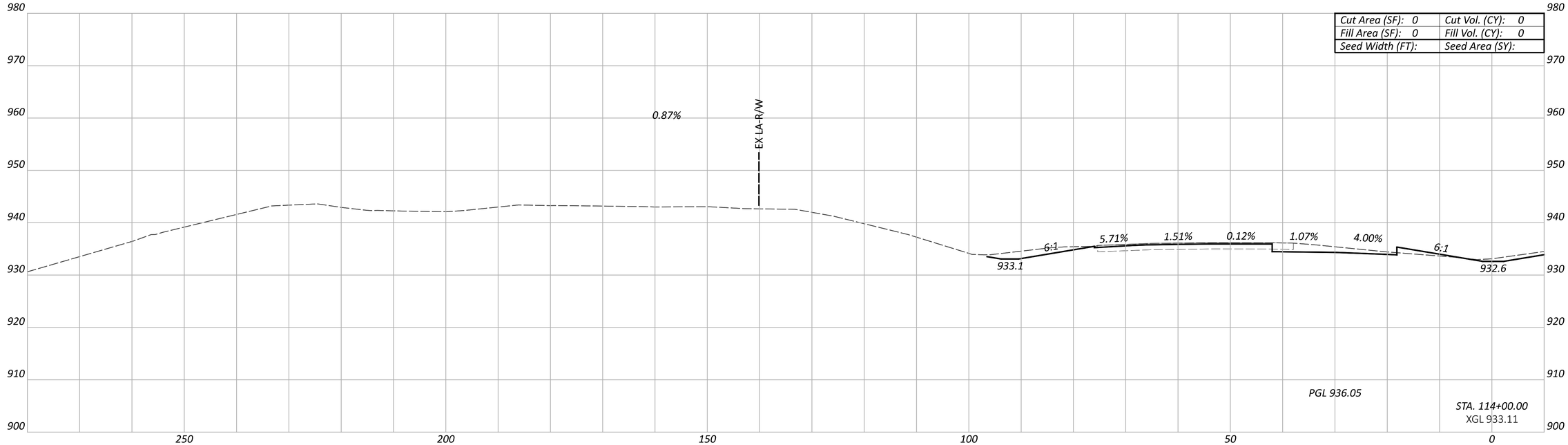
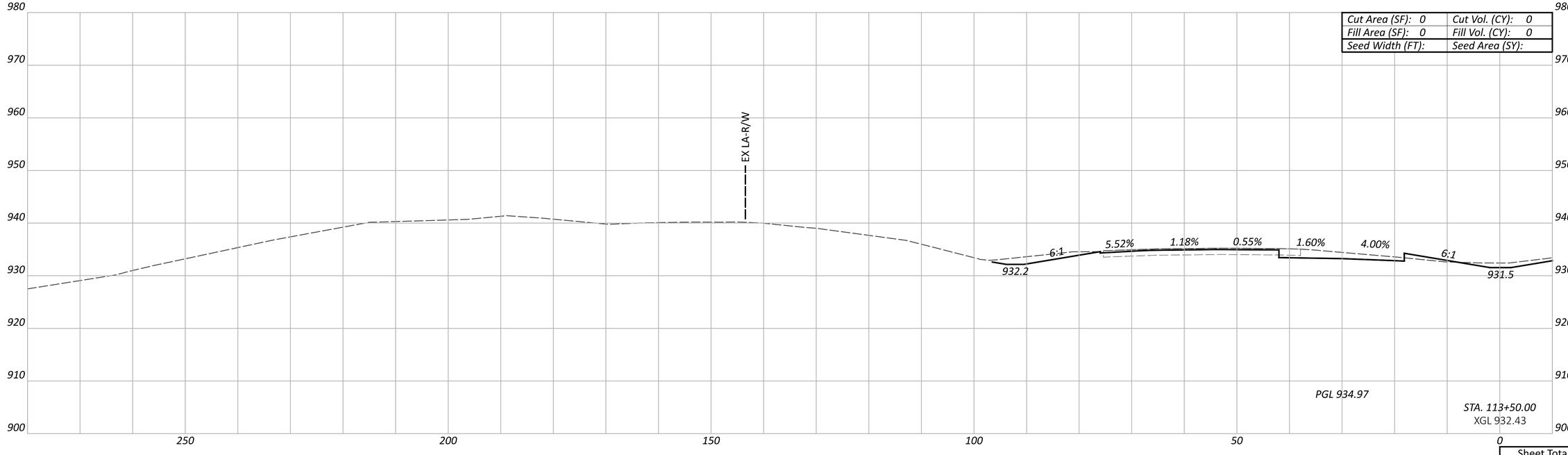
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.393 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 113+50.00 TO STA. 114+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_WB - A 113+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:24:28 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

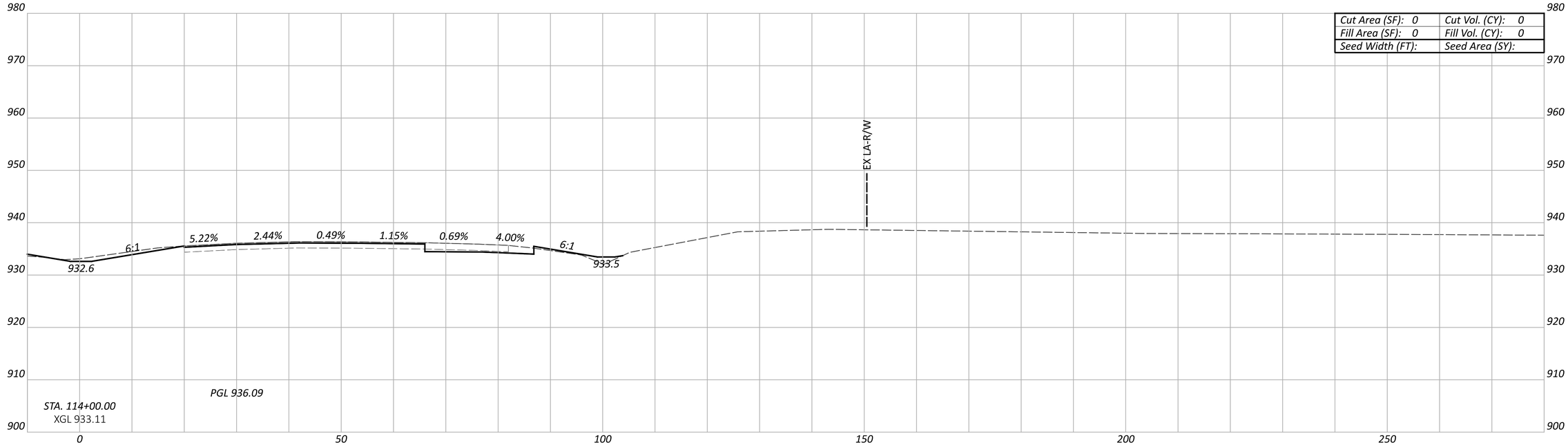
DESIGNER
BER

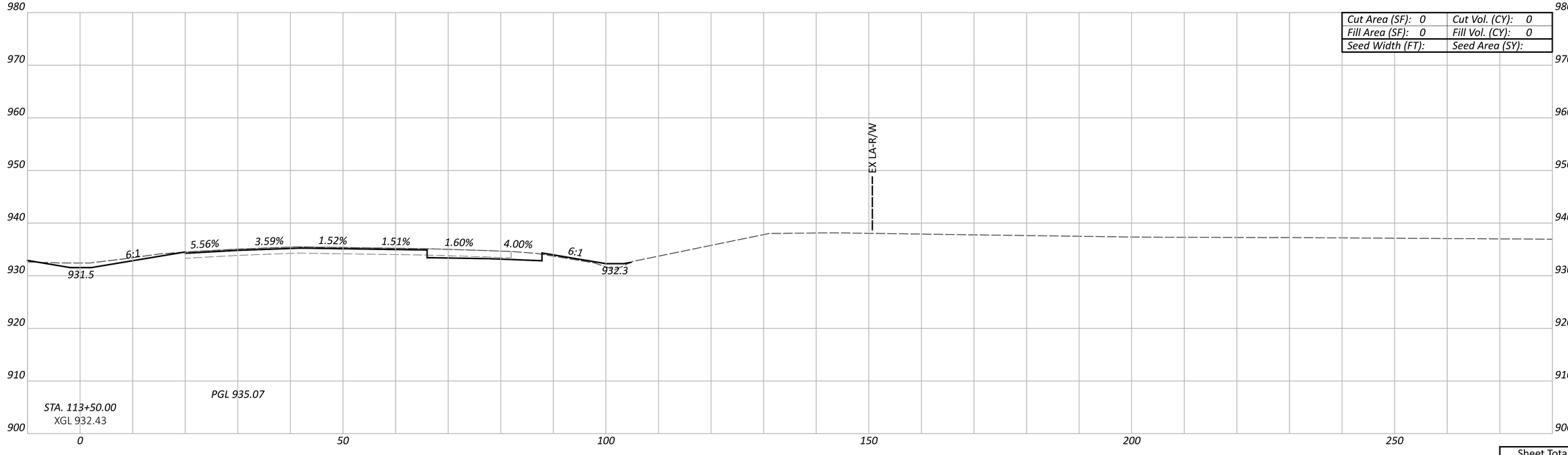
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.394 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 113+50.00 TO STA. 114+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070_EB - A 113+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:24:31 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

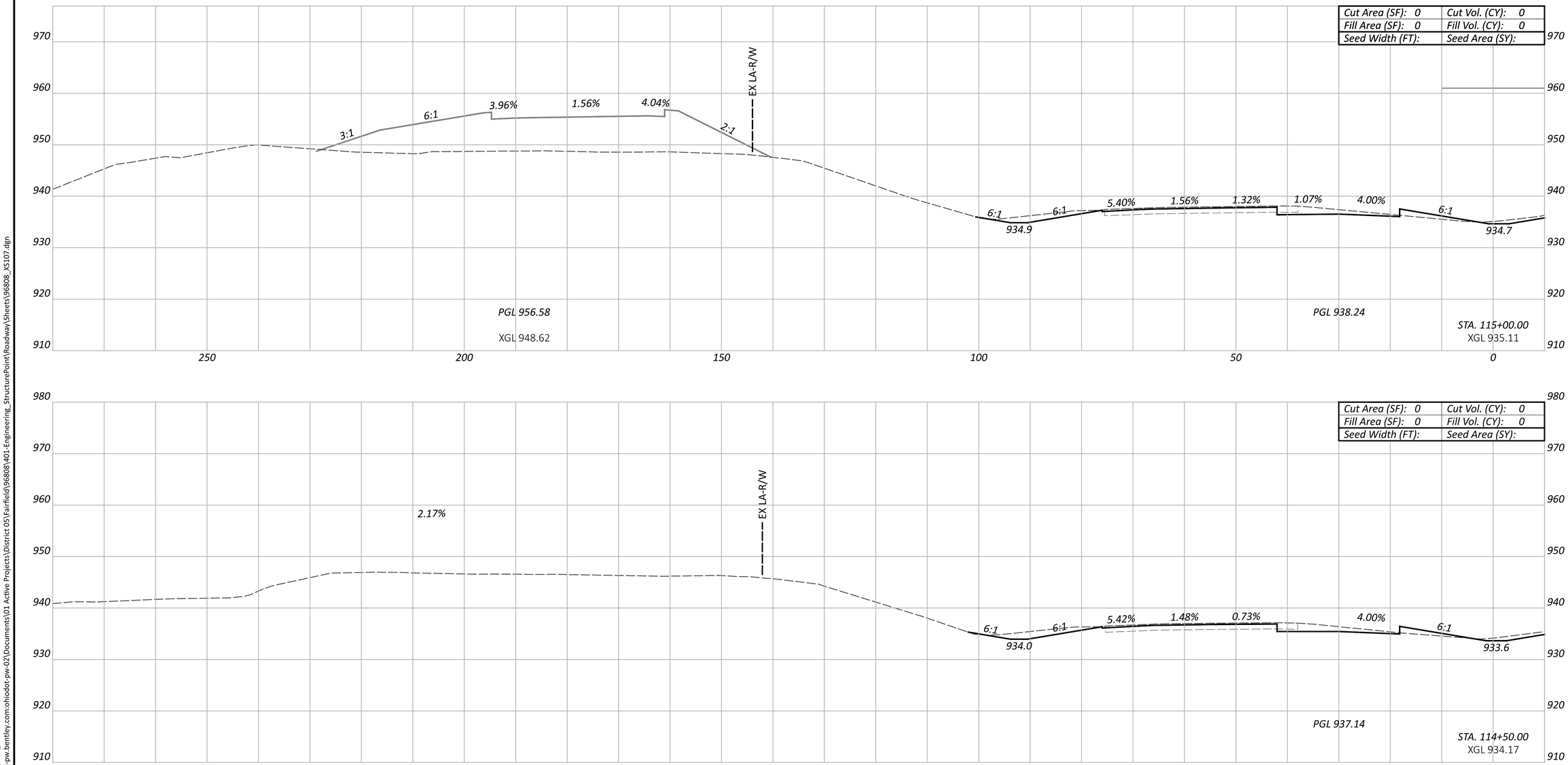
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.395 TOTAL 740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 114+50.00 TO STA. 115+00.00

Sheet Totals		
Seeding	Cut	Fill

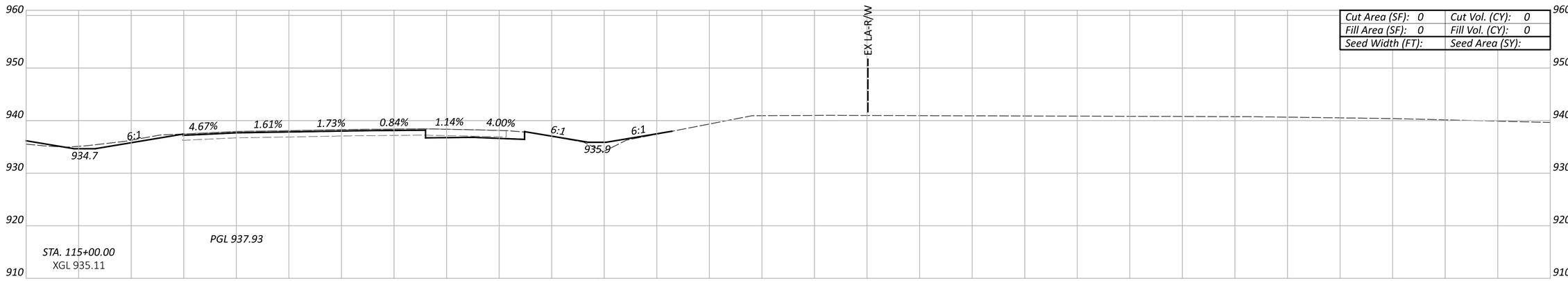
DESIGN AGENCY
MICHAEL BAKER INTERNATIONAL STRUCTUREPOINT INC.

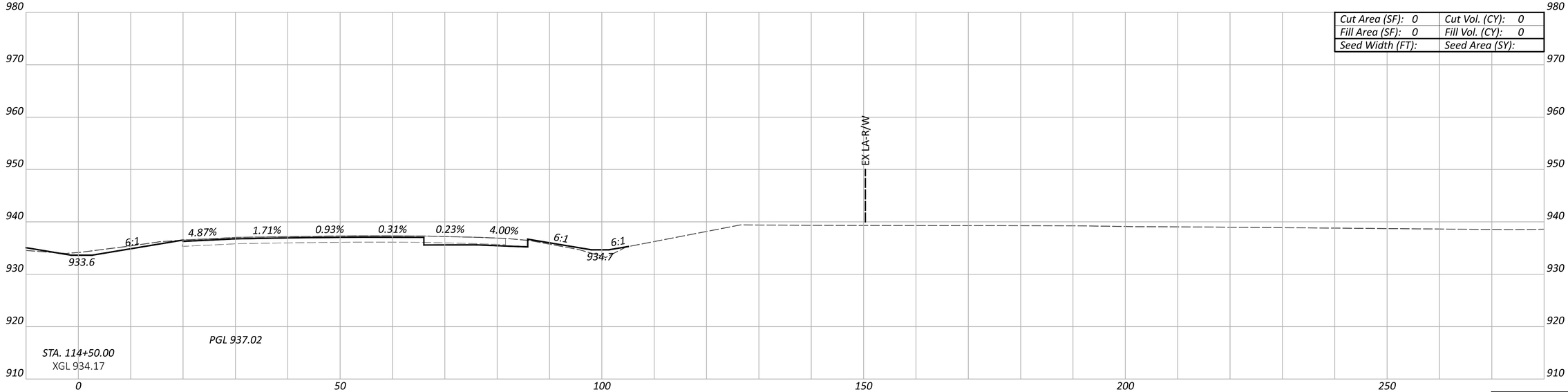
DESIGNER BER

REVIEWER KAM 06/18/23

PROJECT ID 96808

SHEET P.396 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 114+50.00 TO STA. 115+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

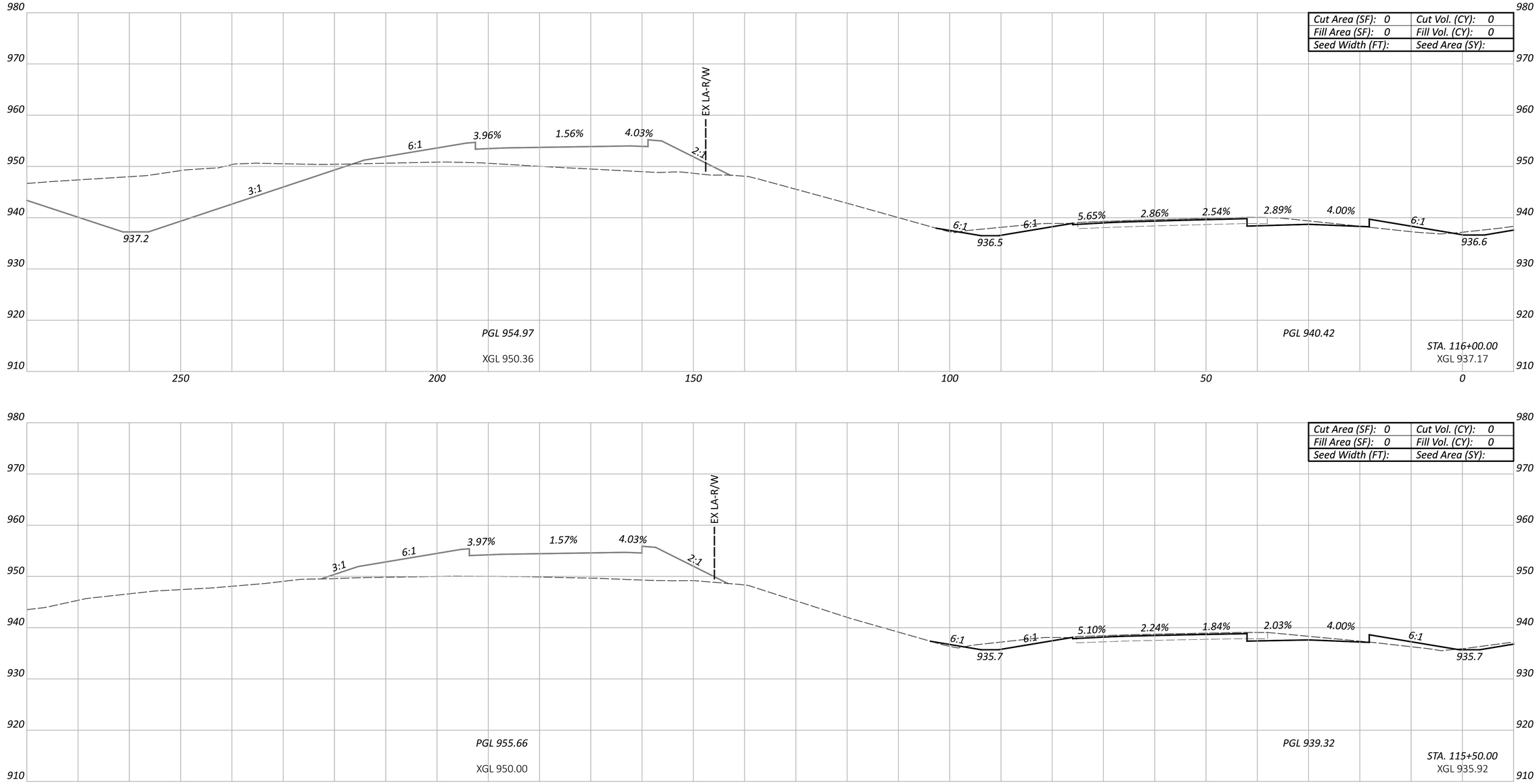
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.397 TOTAL 740



Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 115+50.00 TO STA. 116+00.00

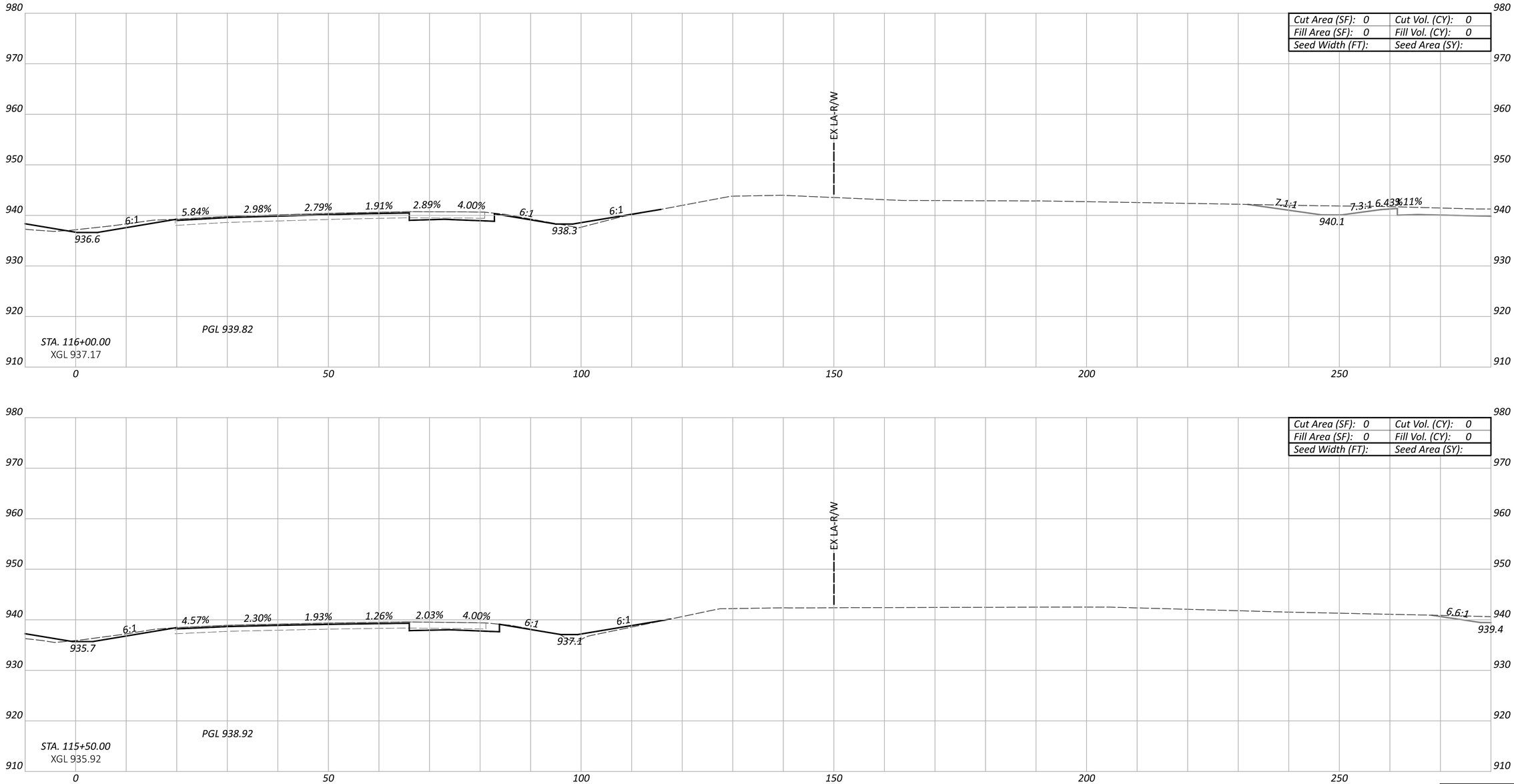
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.398 TOTAL 740



CROSS SECTIONS - IR 70 EB
STA. 115+50.00 TO STA. 116+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
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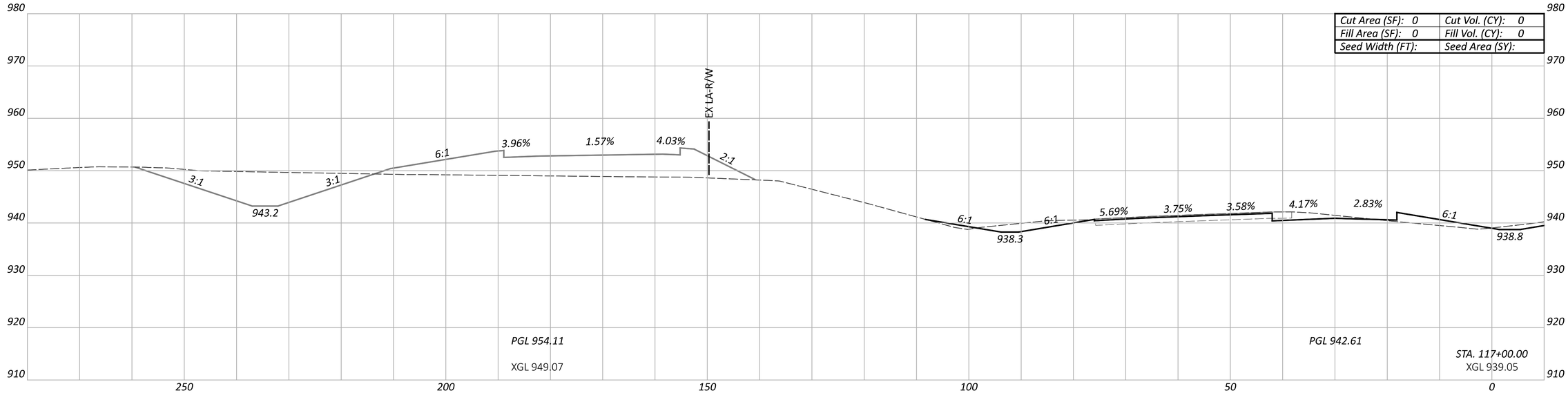
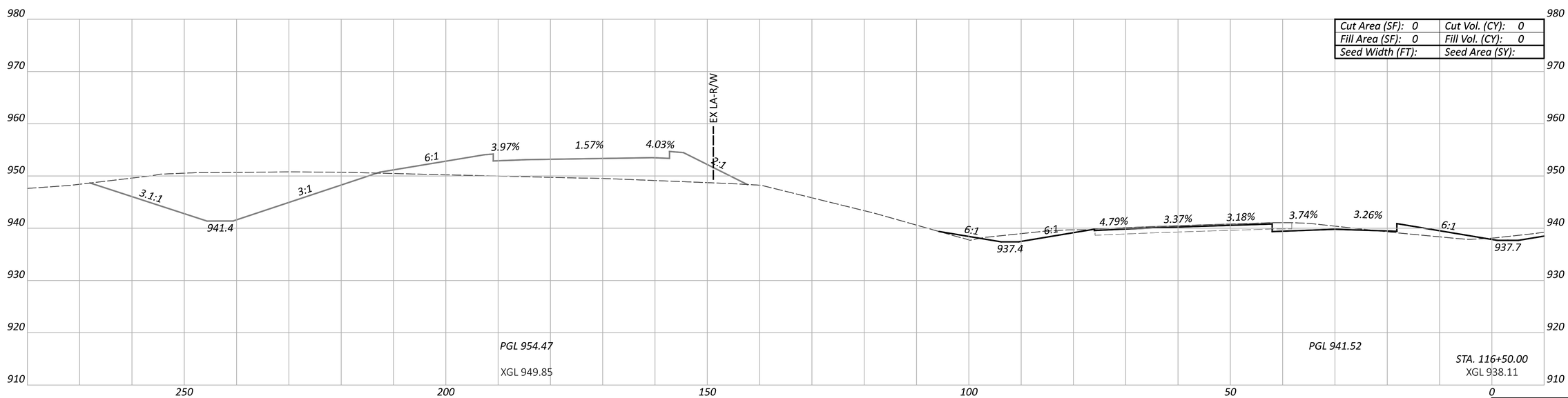
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.399 TOTAL 740





FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 WB
STA. 116+50.00 TO STA. 117+00.00

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

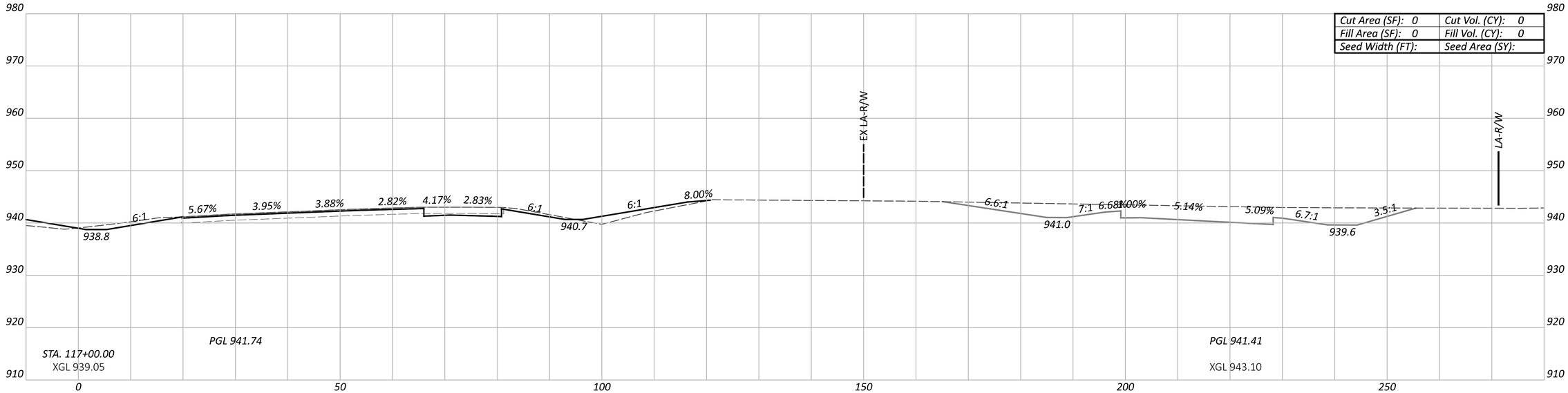
DESIGNER
BER

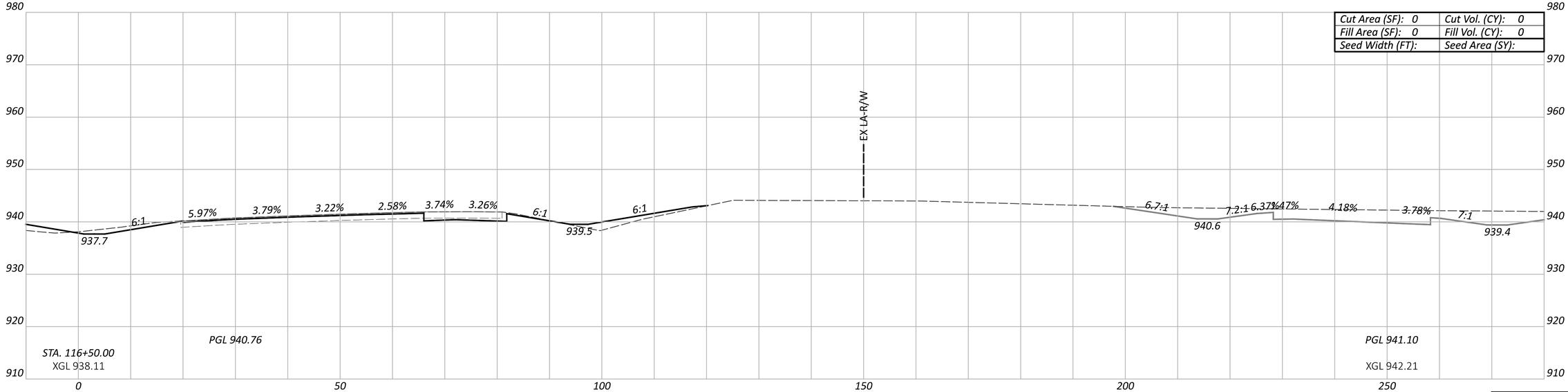
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.400 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 116+50.00 TO STA. 117+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.401 | TOTAL 740

Sheet Totals

Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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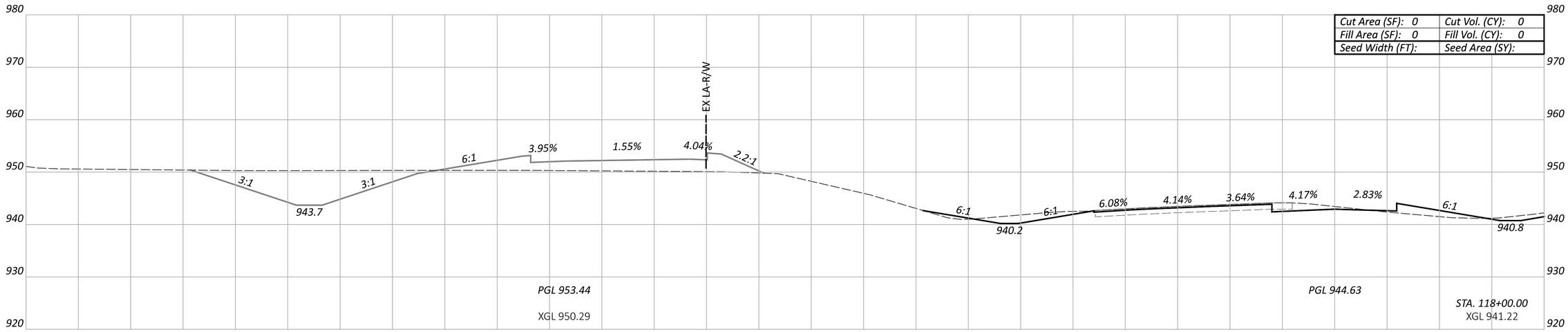

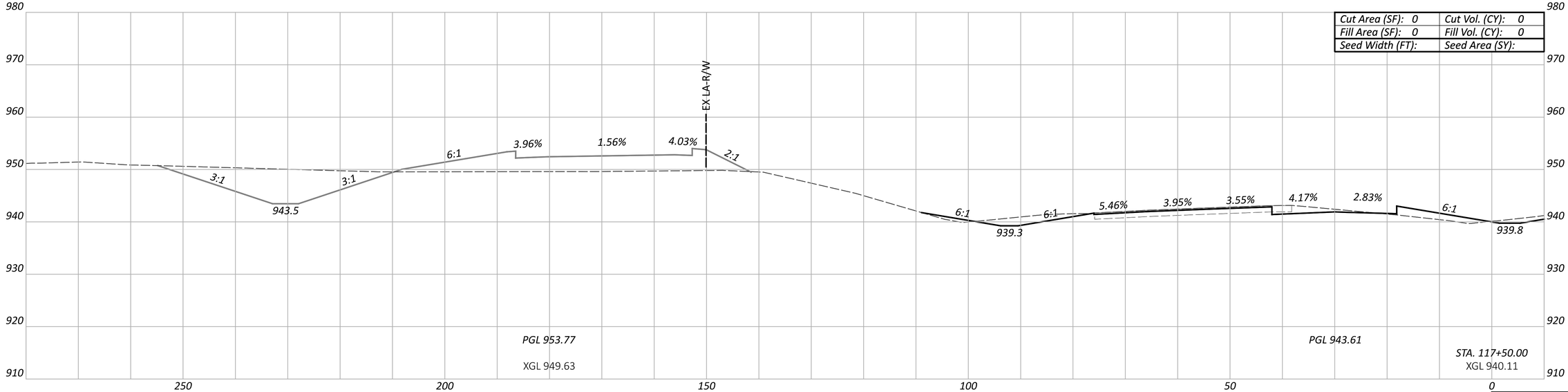

CROSS SECTIONS - IR 70 WB
STA. 117+50.00 TO STA. 118+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.402 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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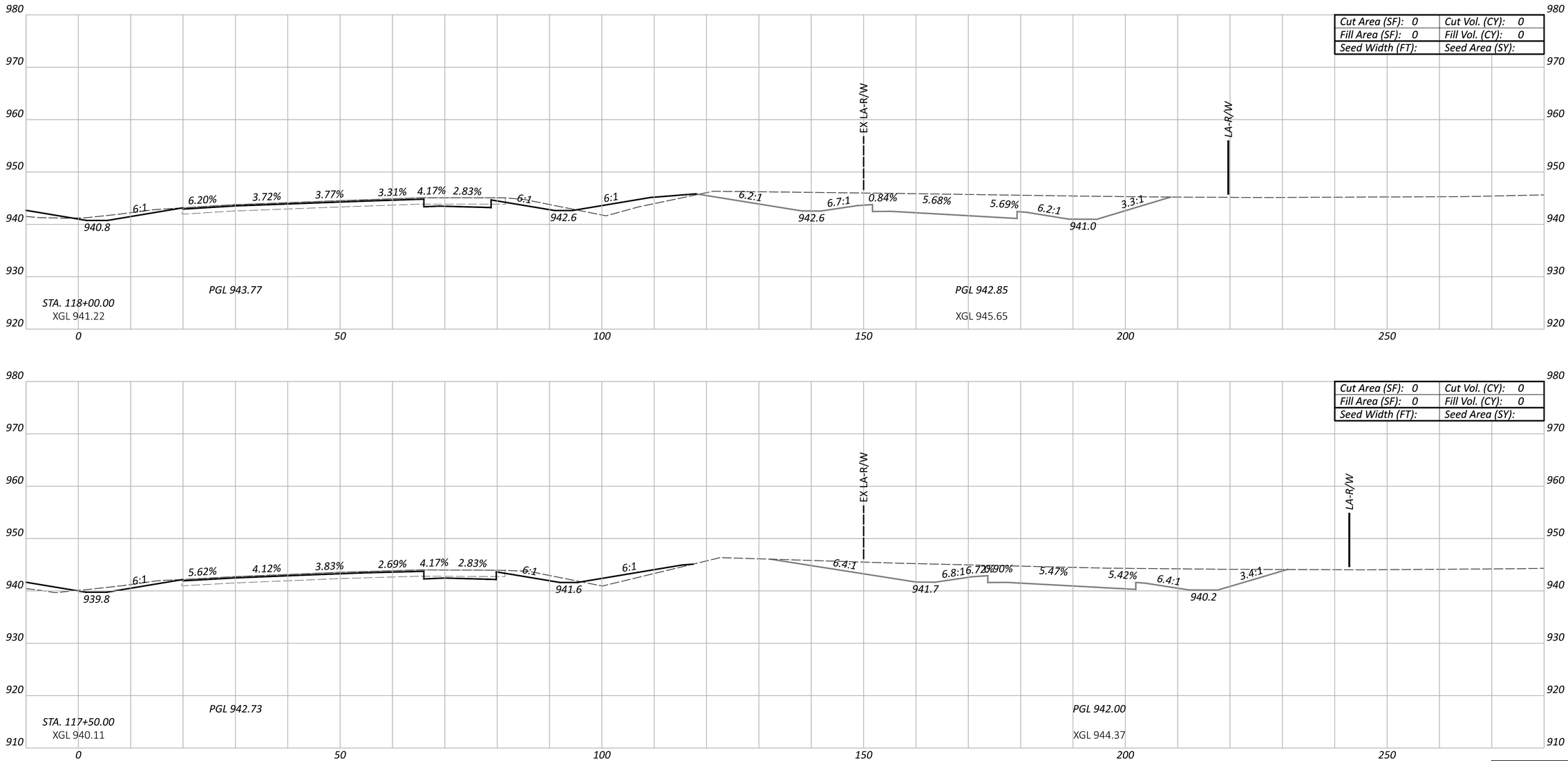

CROSS SECTIONS - IR 70 EB
STA. 117+50.00 TO STA. 118+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	
BER	
REVIEWER	
KAM 06/18/23	
PROJECT ID	
96808	
SHEET	TOTAL
P.403	740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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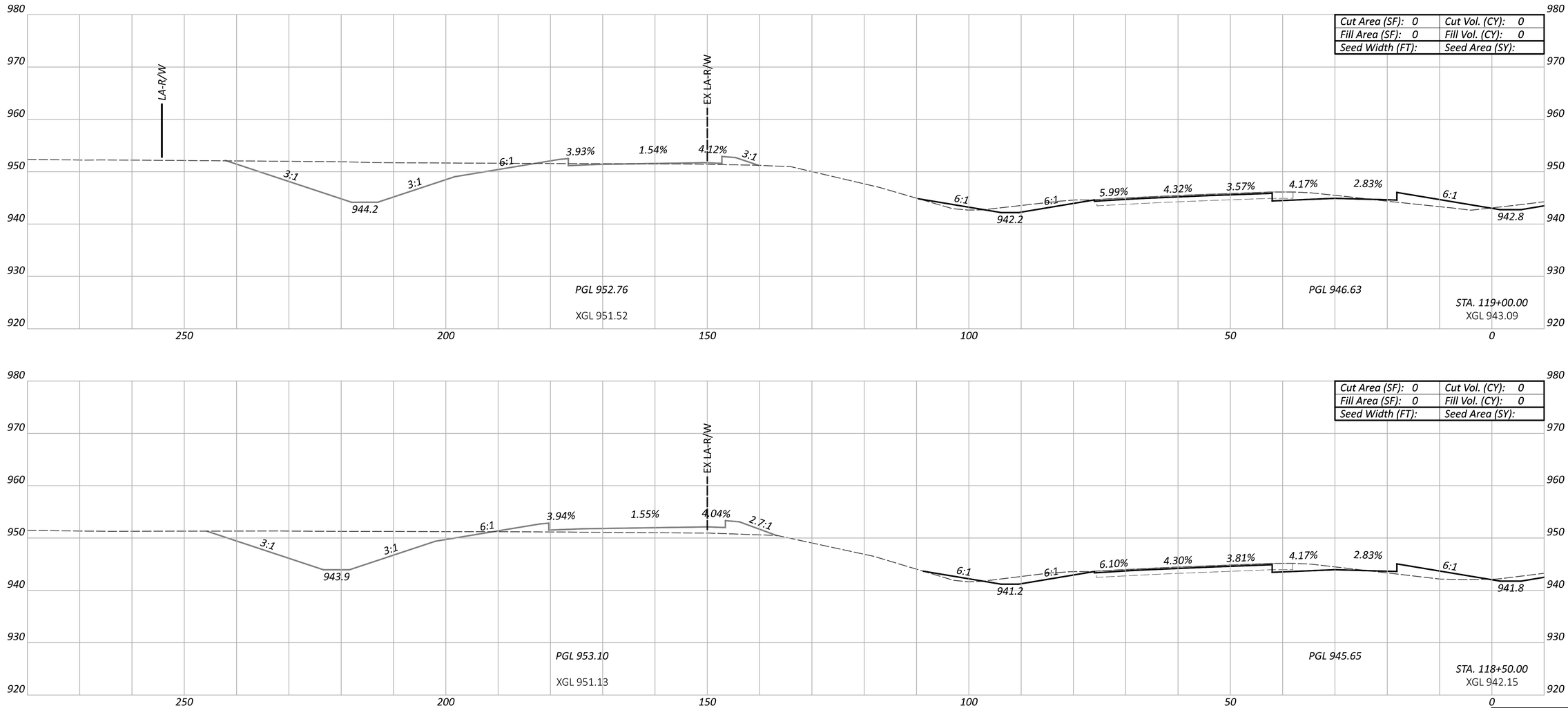

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CROSS SECTIONS - IR 70 WB
STA. 118+50.00 TO STA. 119+00.00

Sheet Totals		
Seeding	Cut	Fill

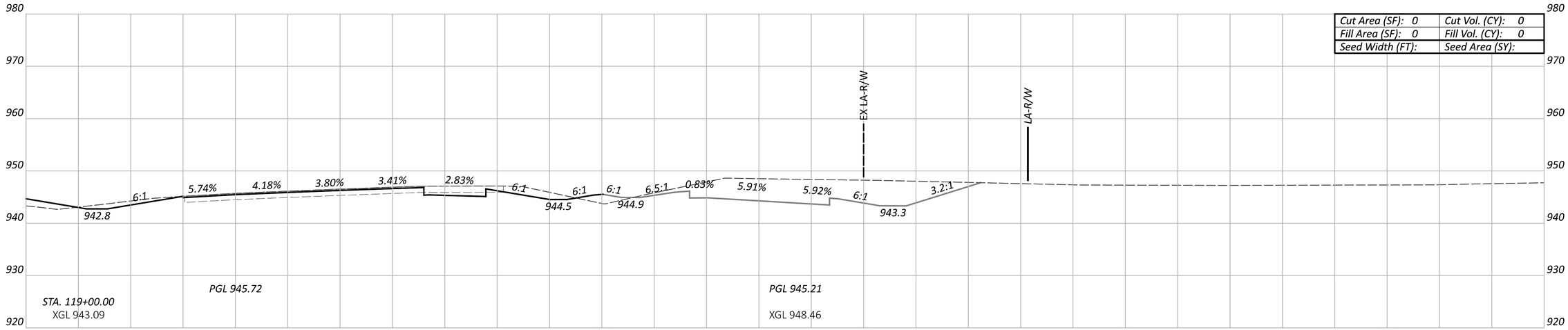
DESIGN AGENCY
STRUCTUREPOINT LLC

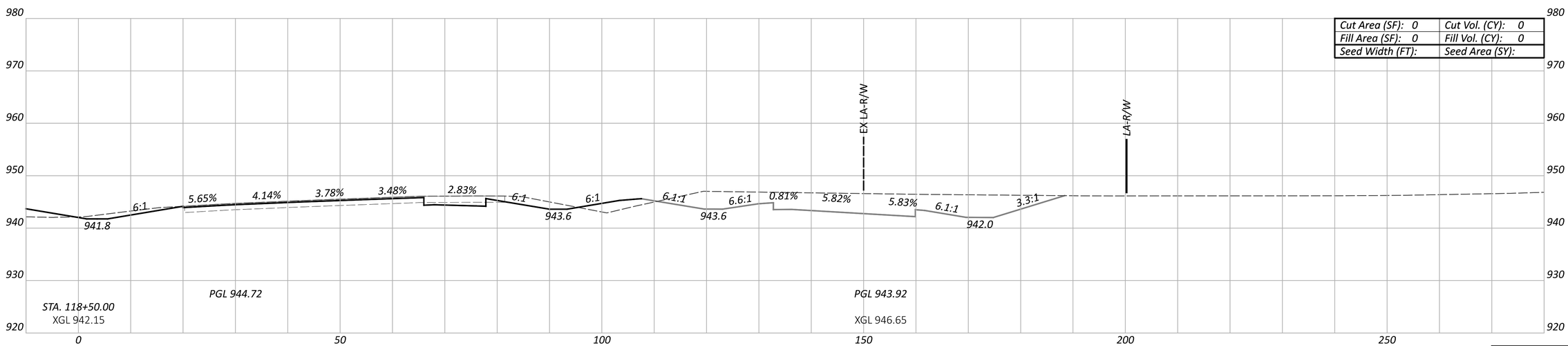
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.404 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 118+50.00 TO STA. 119+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.405 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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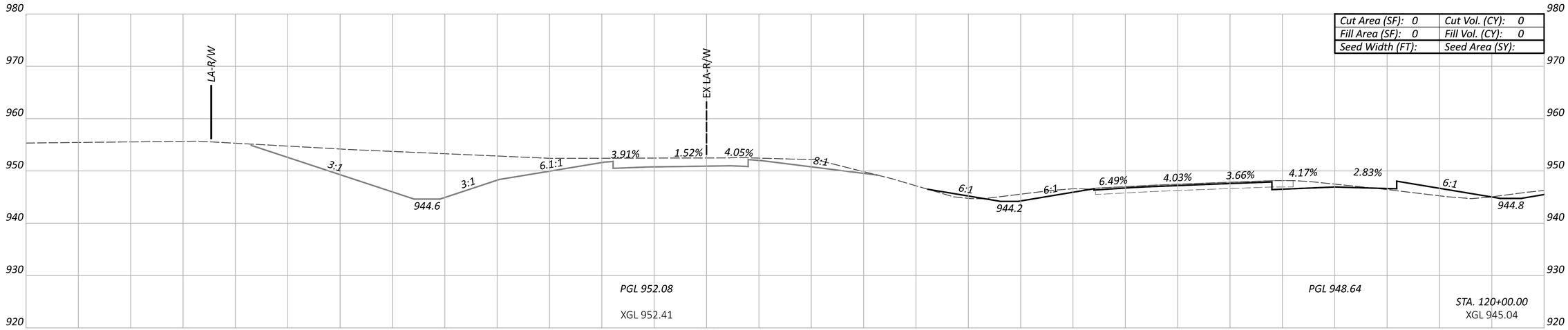

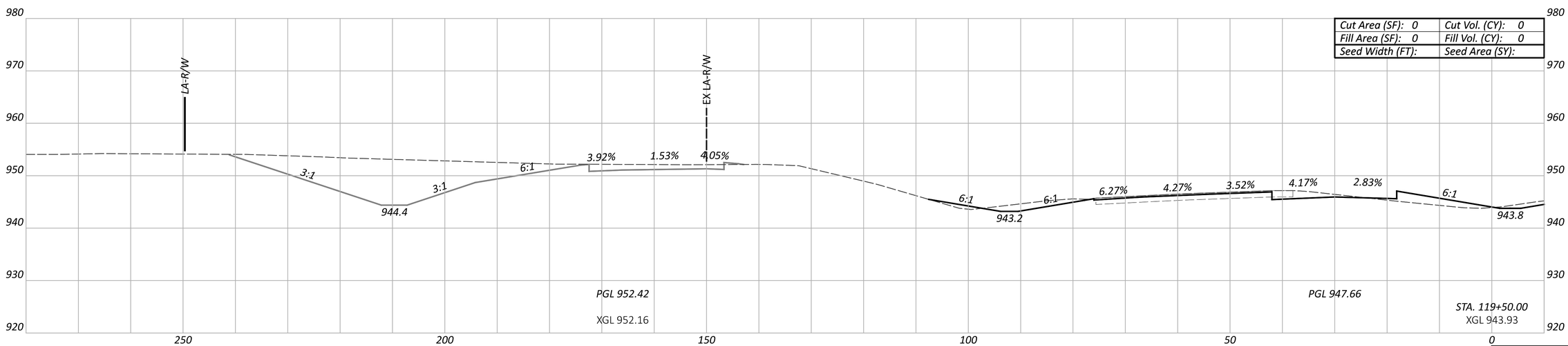

CROSS SECTIONS - IR 70 WB
STA. 119+50.00 TO STA. 120+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

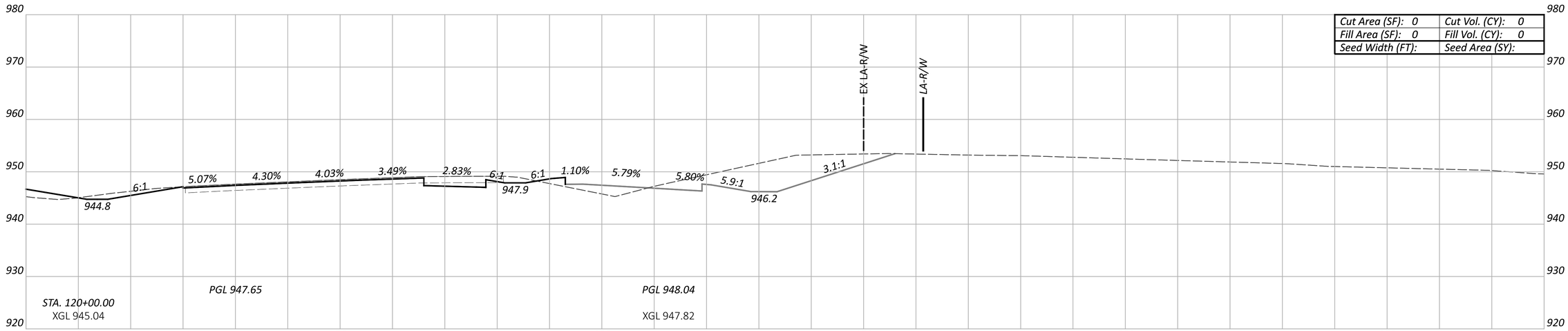
DESIGN AGENCY
STRUCTUREPOINT LLC

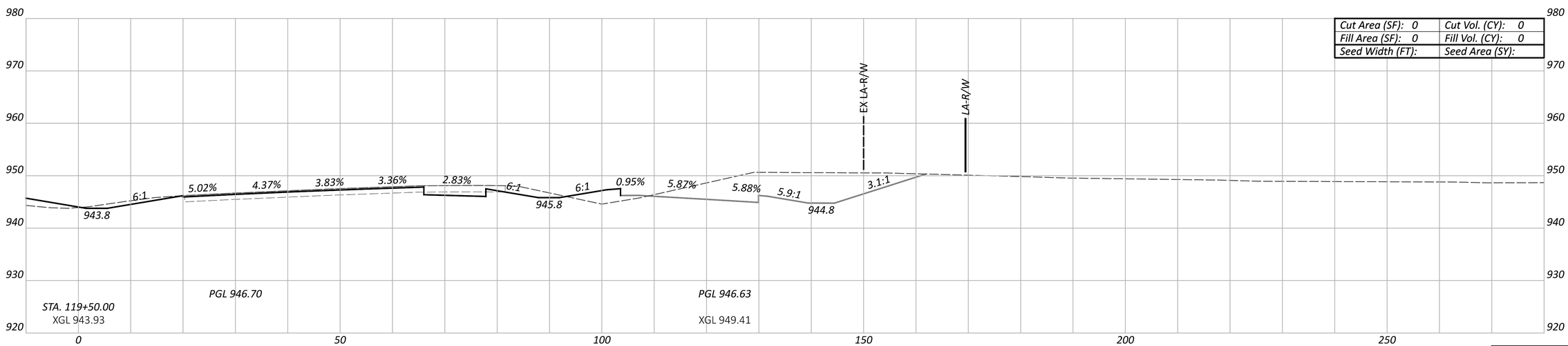
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.406 TOTAL 740





CROSS SECTIONS - IR 70 EB
STA. 119+50.00 TO STA. 120+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

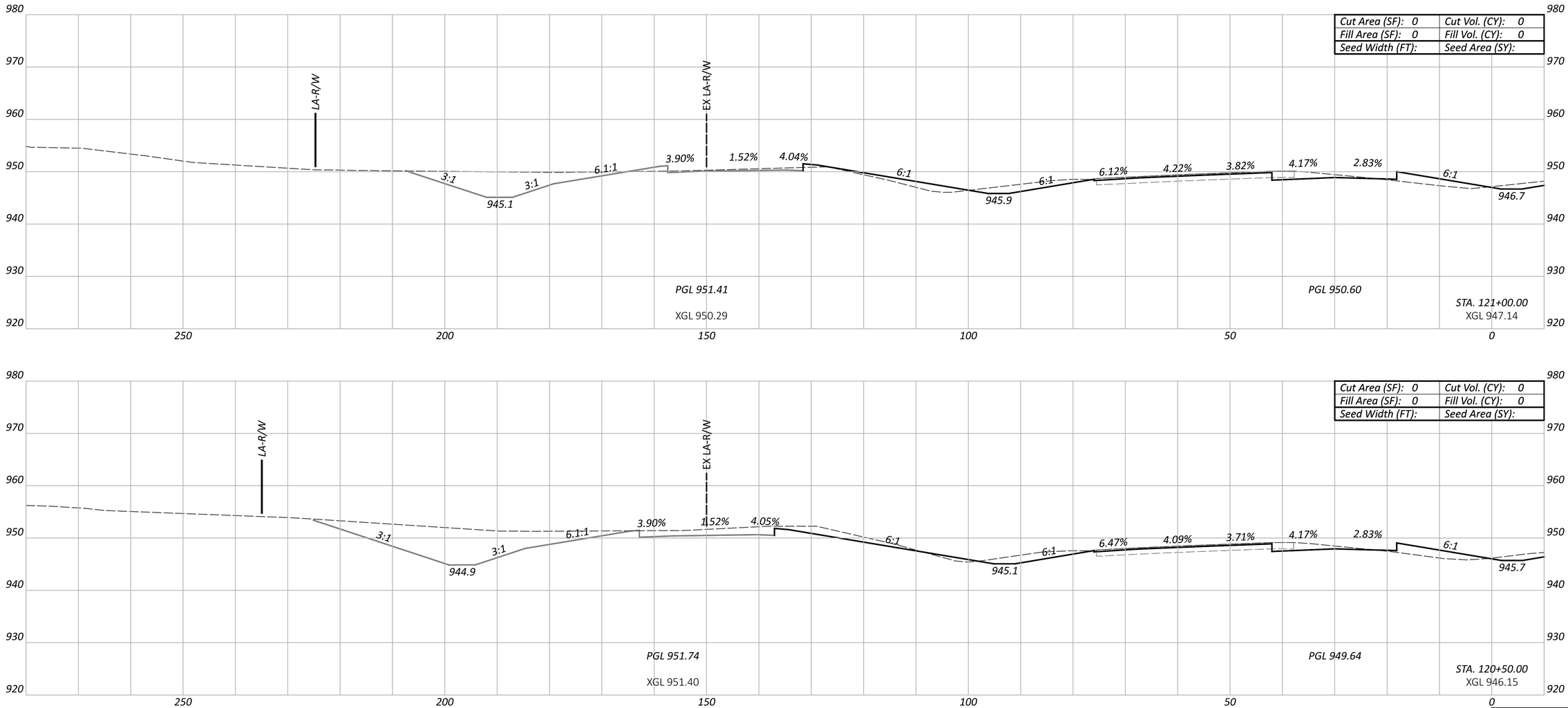
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.407 TOTAL 740



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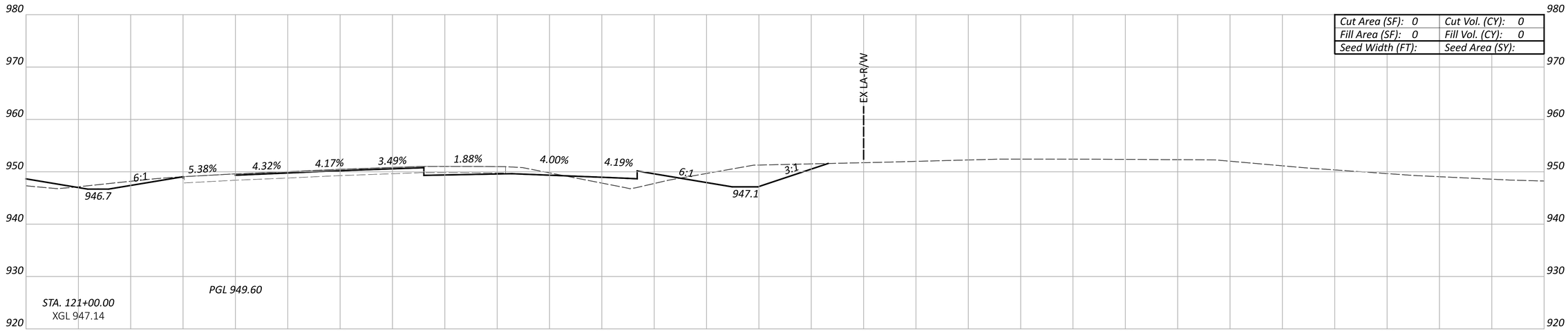
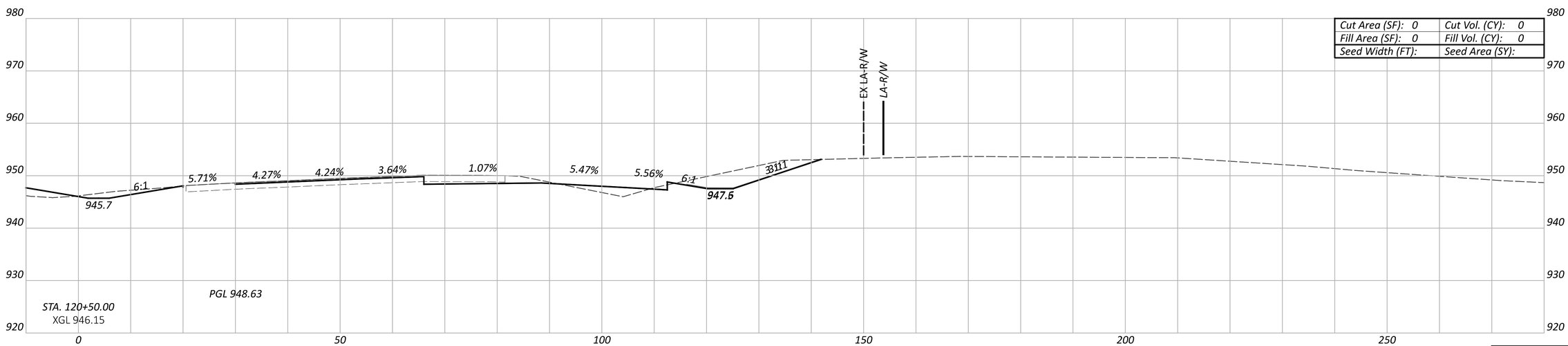
CROSS SECTIONS - IR 70 WB
STA. 120+50.00 TO STA. 121+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.408	740

Sheet Totals		
Seeding	Cut	Fill





CROSS SECTIONS - IR 70 EB
STA. 120+50.00 TO STA. 121+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.409 TOTAL 740

Sheet Totals

Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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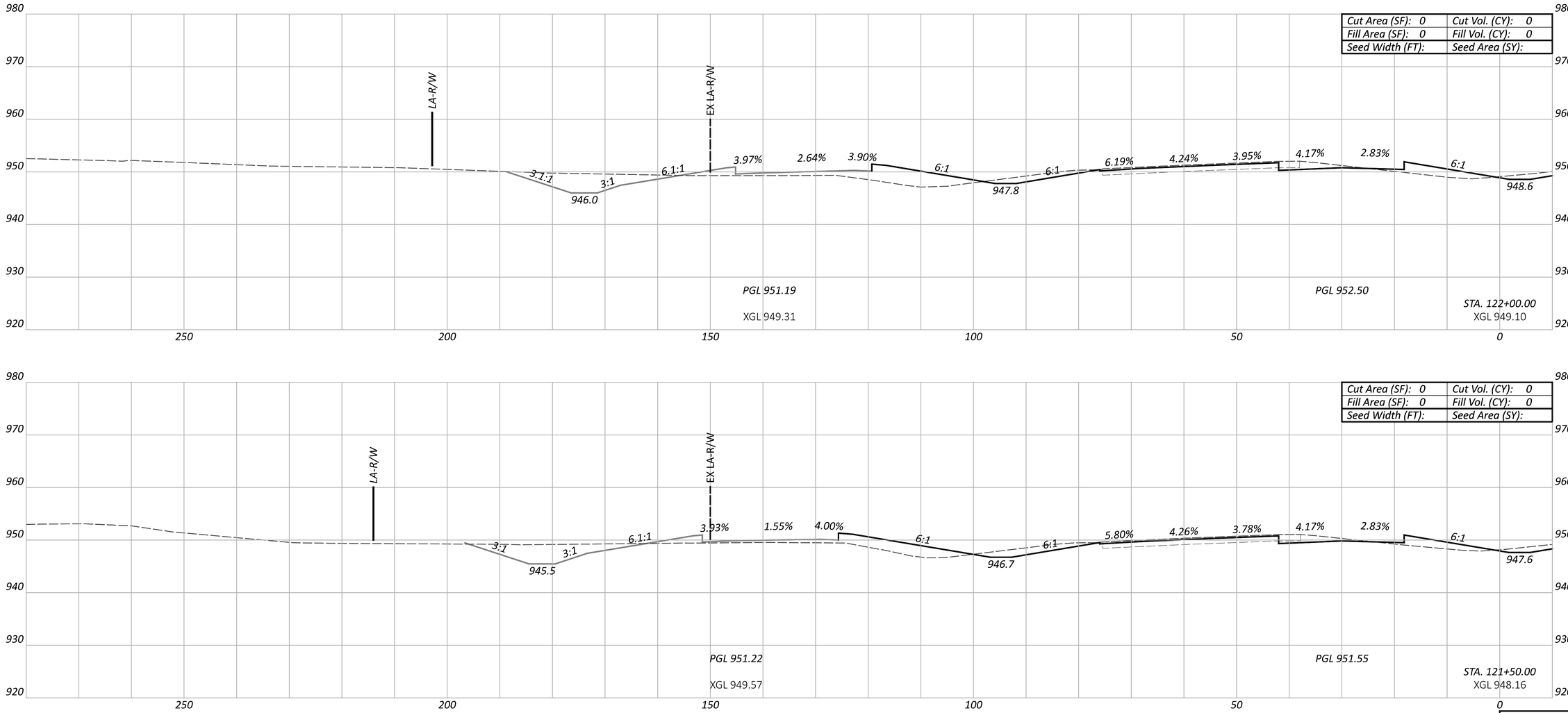

CROSS SECTIONS - IR 70 WB
STA. 121+50.00 TO STA. 122+00.00

FAI/LIC IR 70 0.00/0.00

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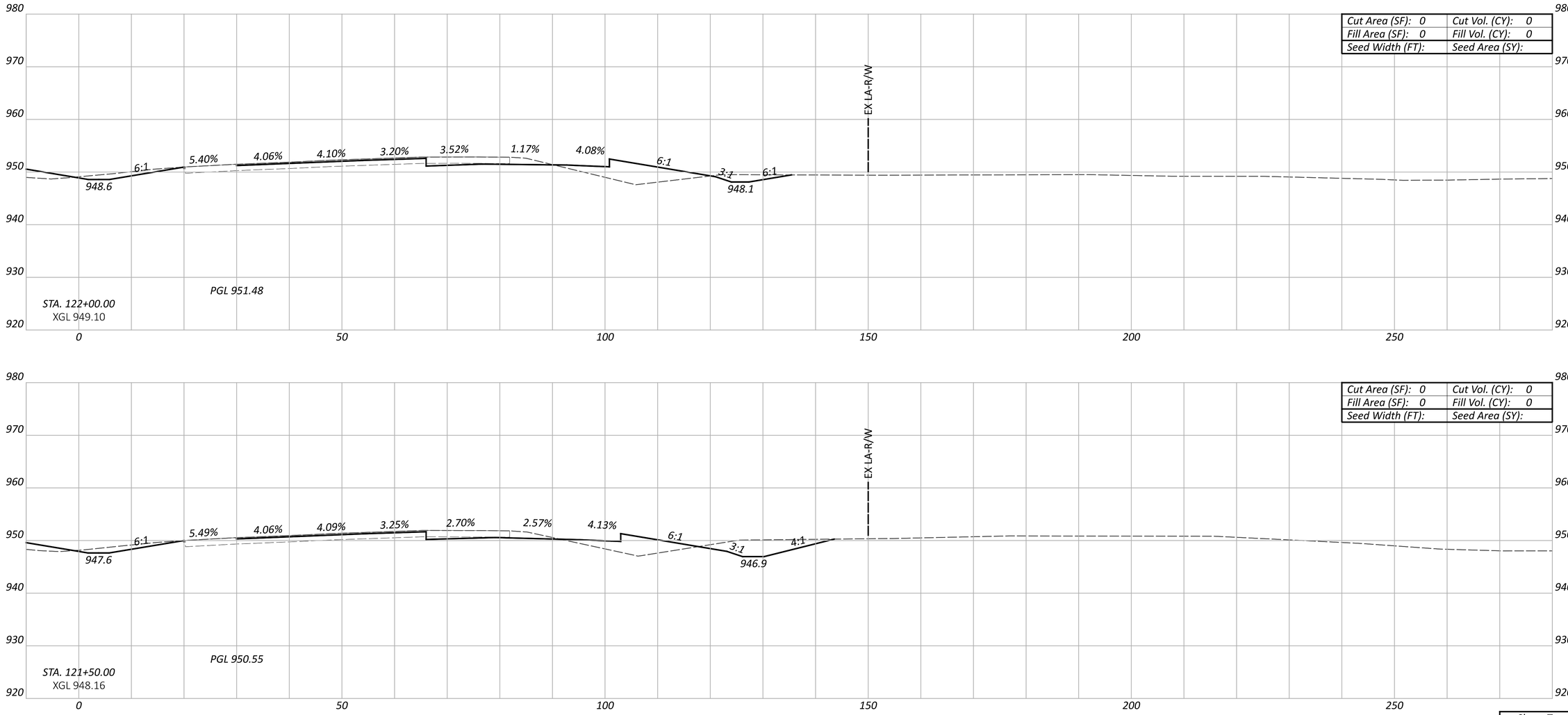
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.410
TOTAL	740



Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 EB
STA. 121+50.00 TO STA. 122+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.411 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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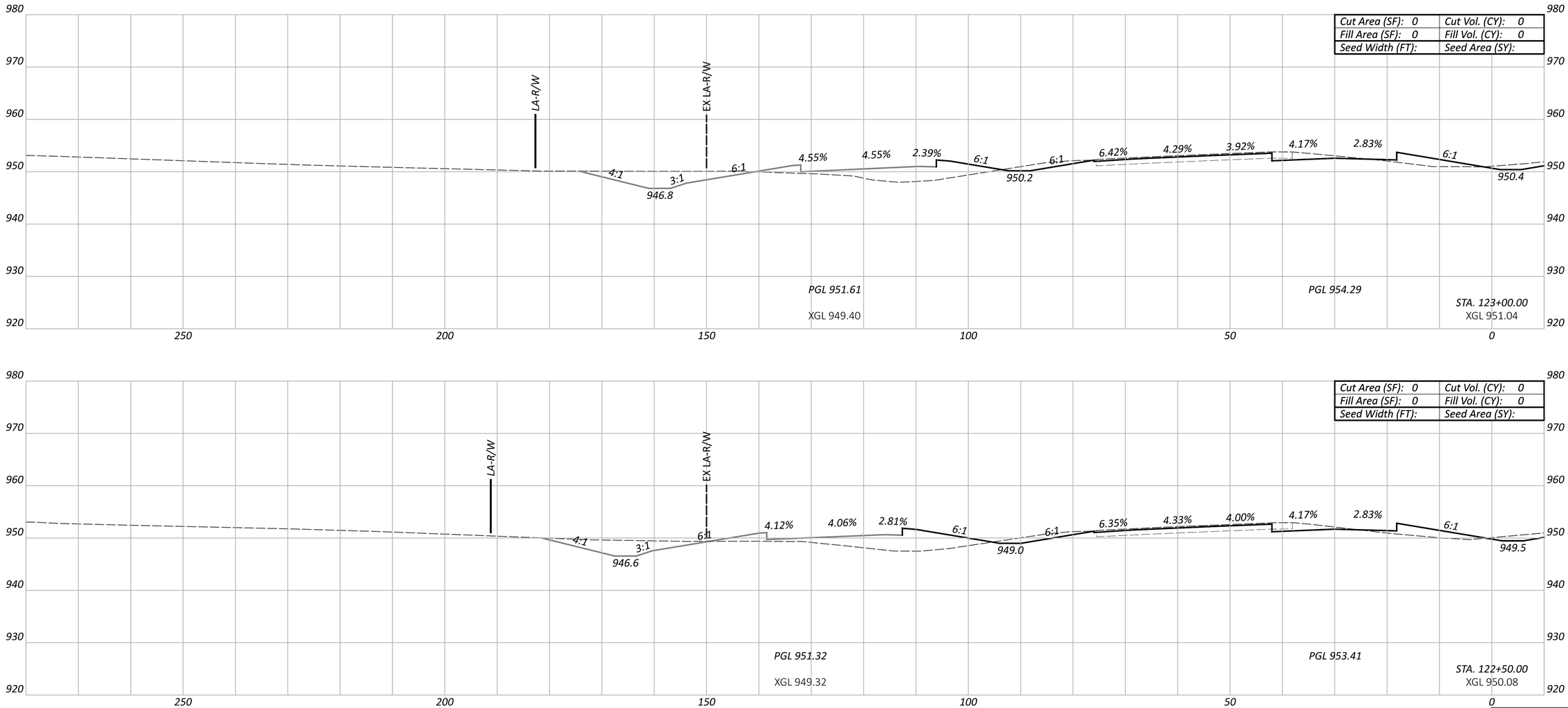

CROSS SECTIONS - IR 70 WB
STA. 122+50.00 TO STA. 123+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.412 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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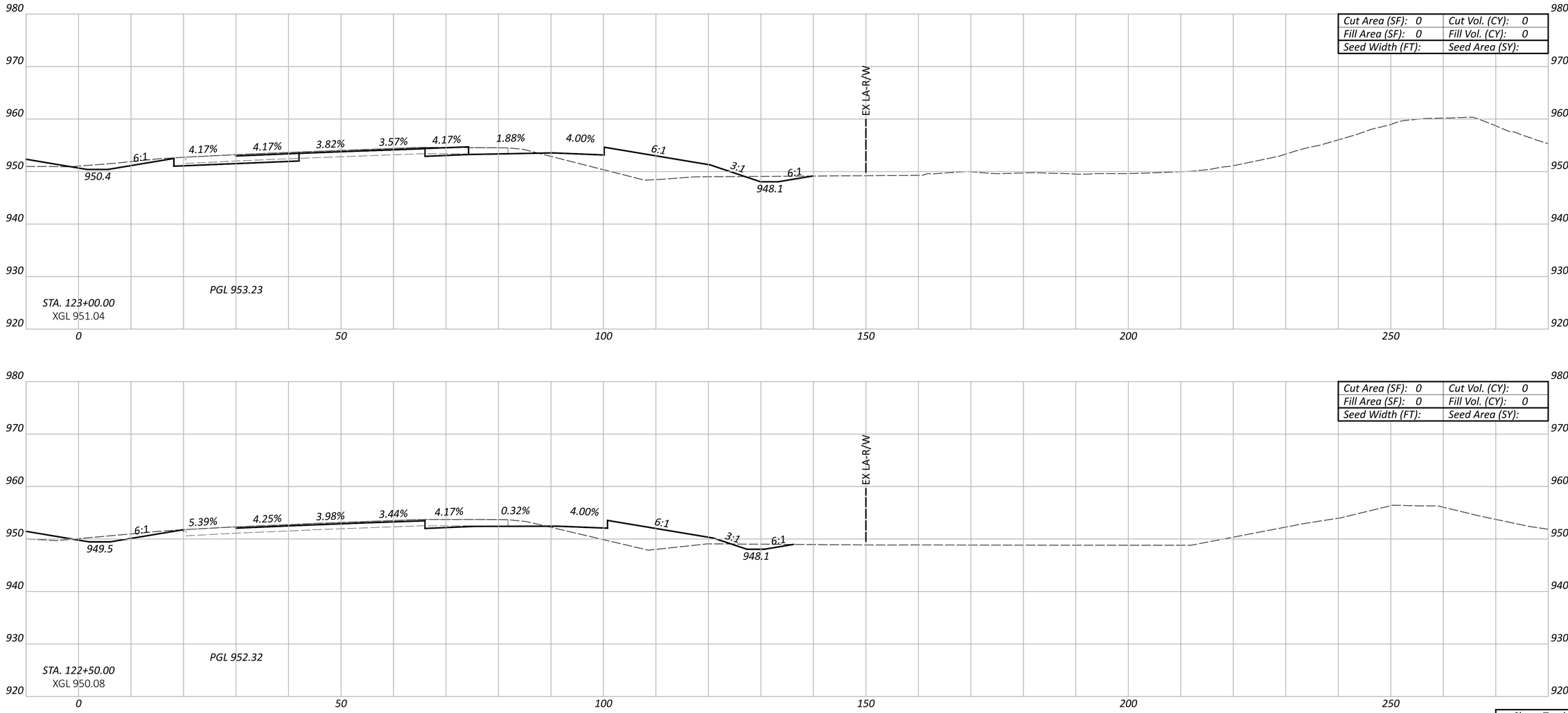

CROSS SECTIONS - IR 70 EB
STA. 122+50.00 TO STA. 123+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

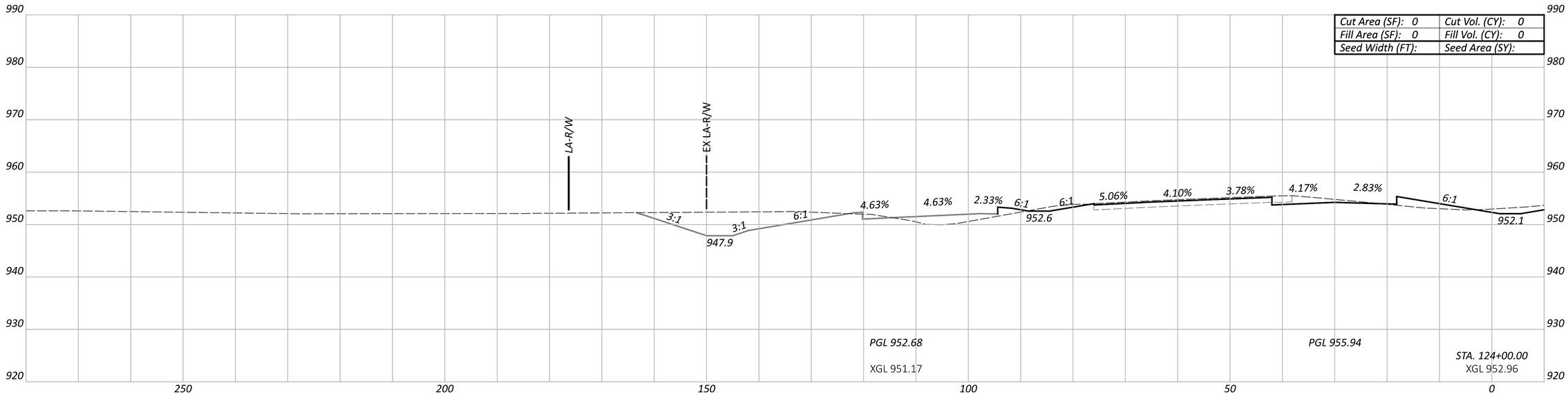
DESIGN AGENCY
STRUCTUREPOINT INC.

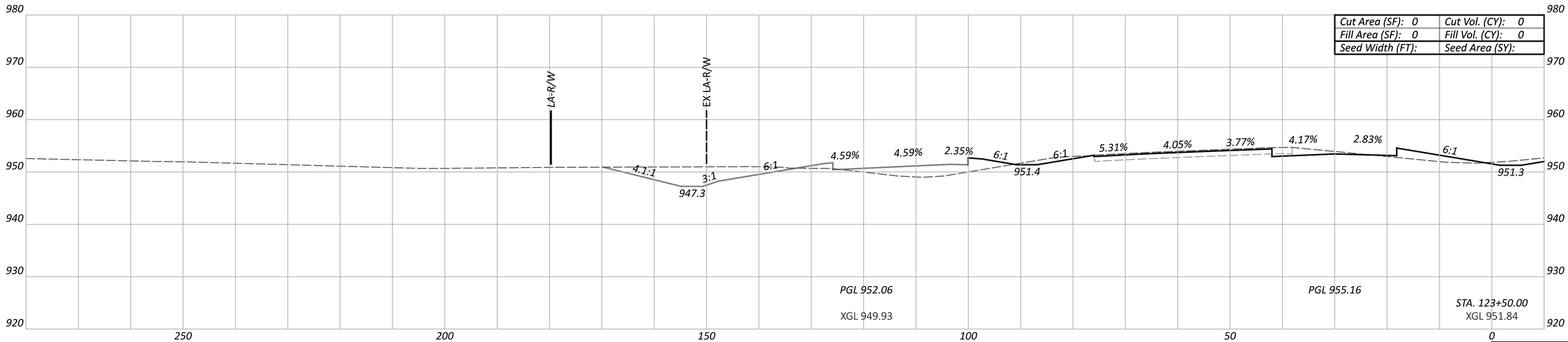
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.413 TOTAL 740





CROSS SECTIONS - IR 70 WB
STA. 123+50.00 TO STA. 124+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

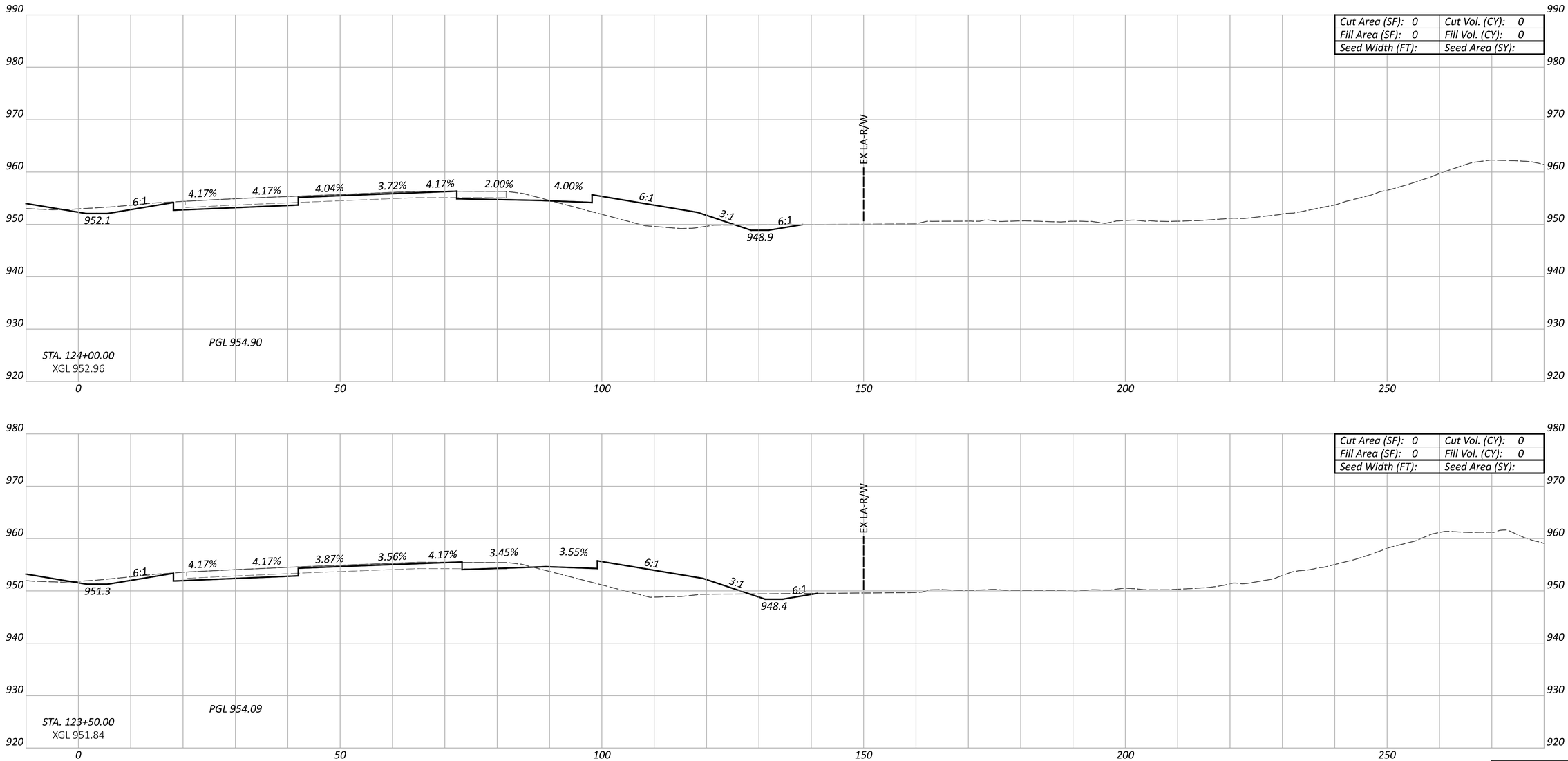
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.414	740



CROSS SECTIONS - IR 70 EB
STA. 123+50.00 TO STA. 124+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.415 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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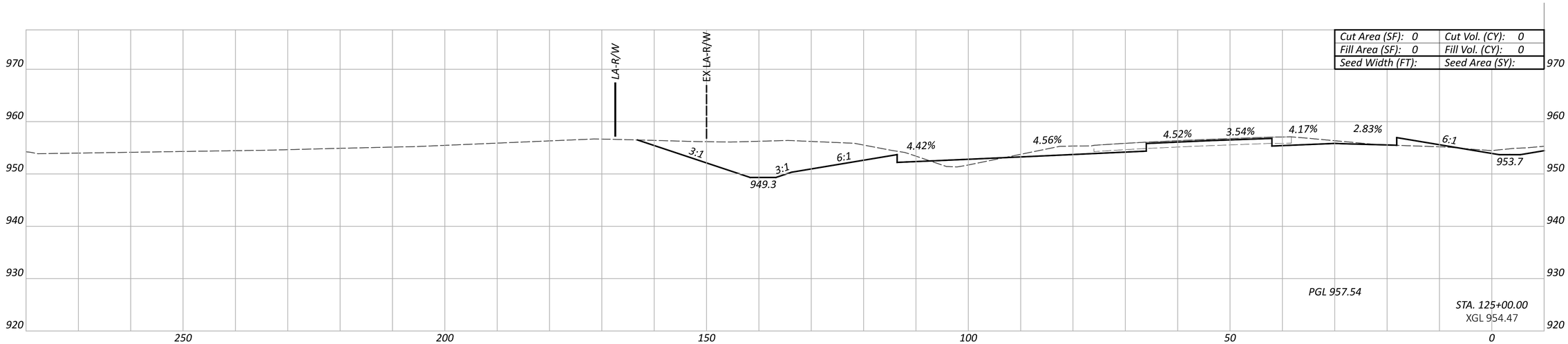

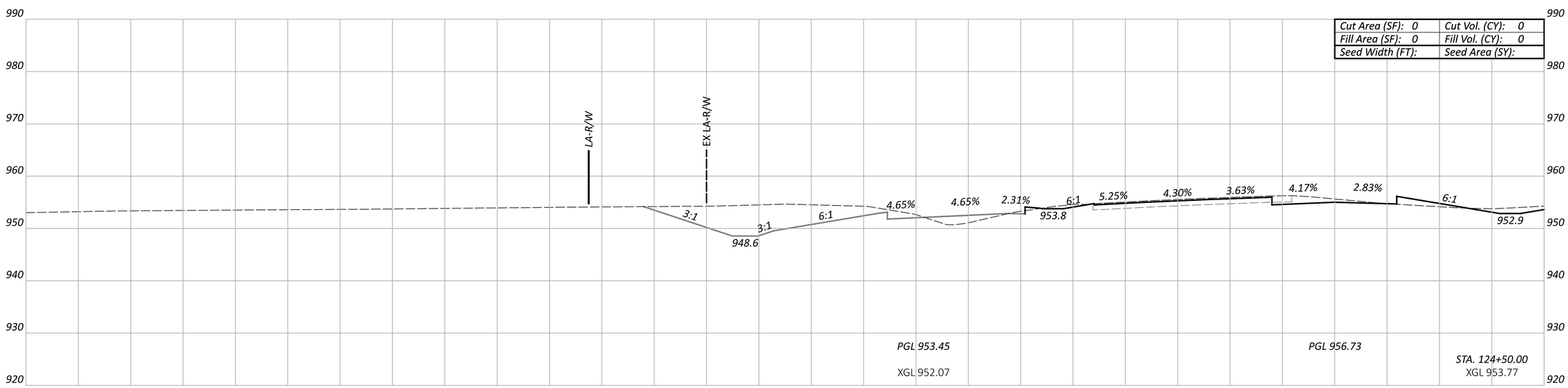

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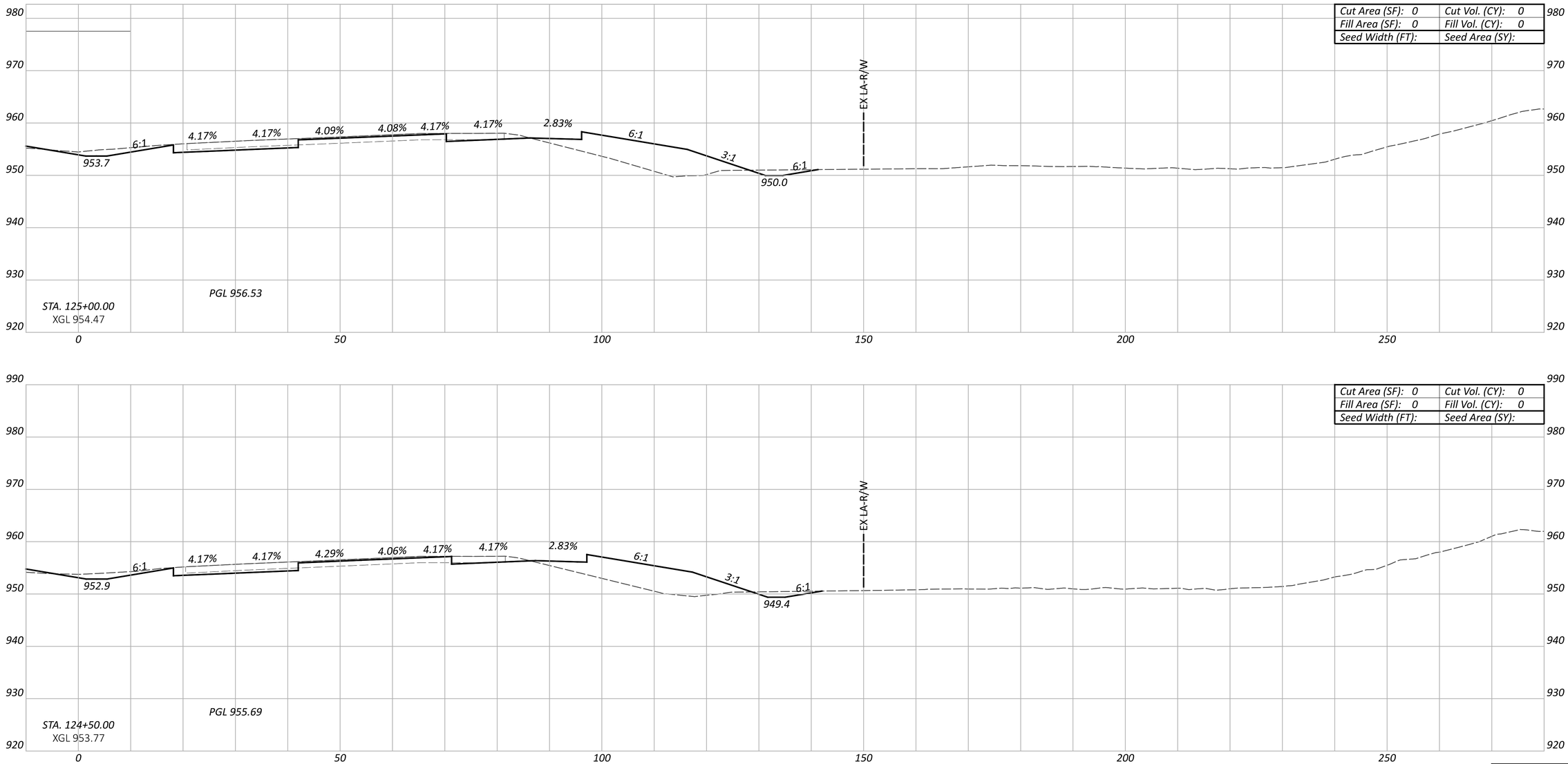
CROSS SECTIONS - IR 70 WB
STA. 124+50.00 TO STA. 125+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.416
TOTAL	740



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CROSS SECTIONS - IR 70 EB
STA. 124+50.00 TO STA. 125+00.00

Sheet Totals		
Seeding	Cut	Fill

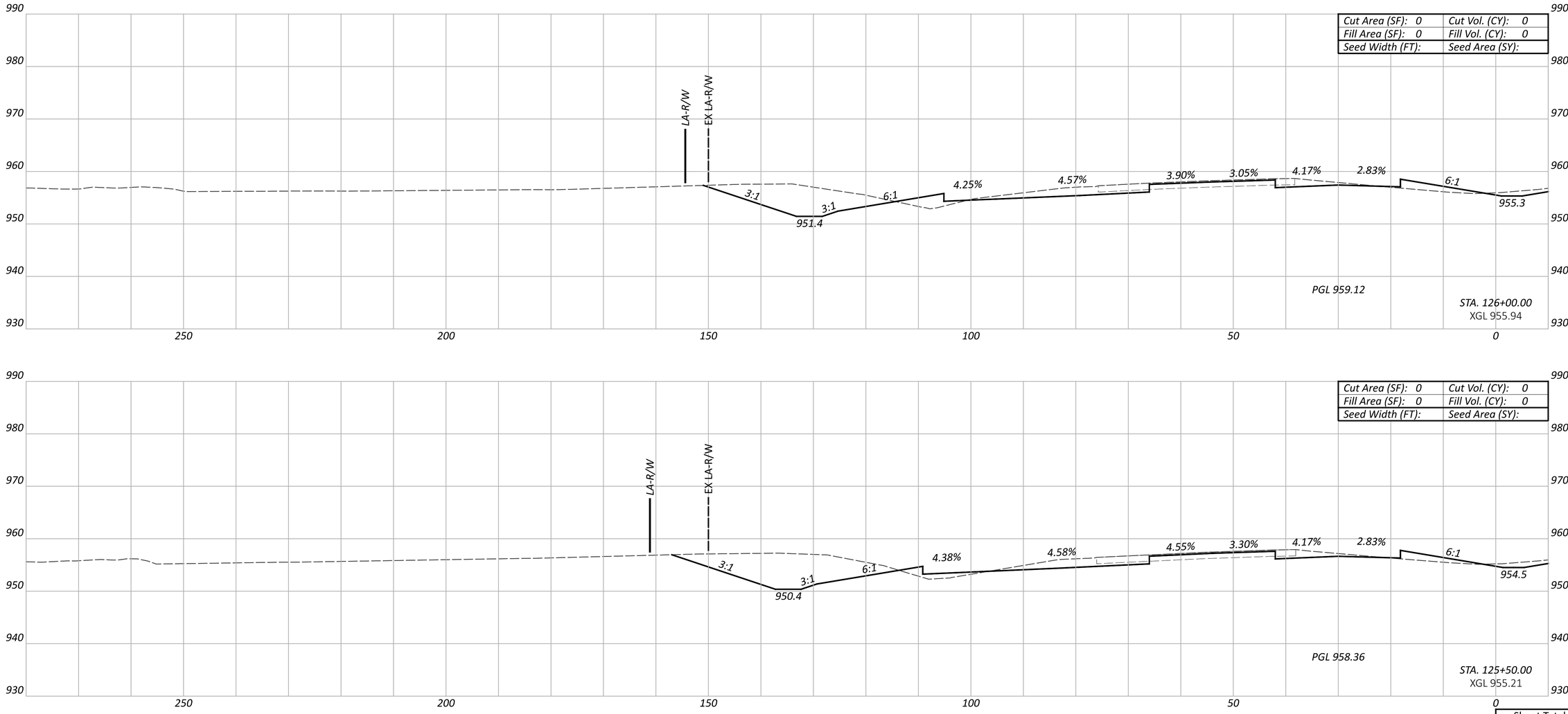
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.417 TOTAL 740



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CROSS SECTIONS - IR 70 WB
STA. 125+50.00 TO STA. 126+00.00

Sheet Totals		
Seeding	Cut	Fill

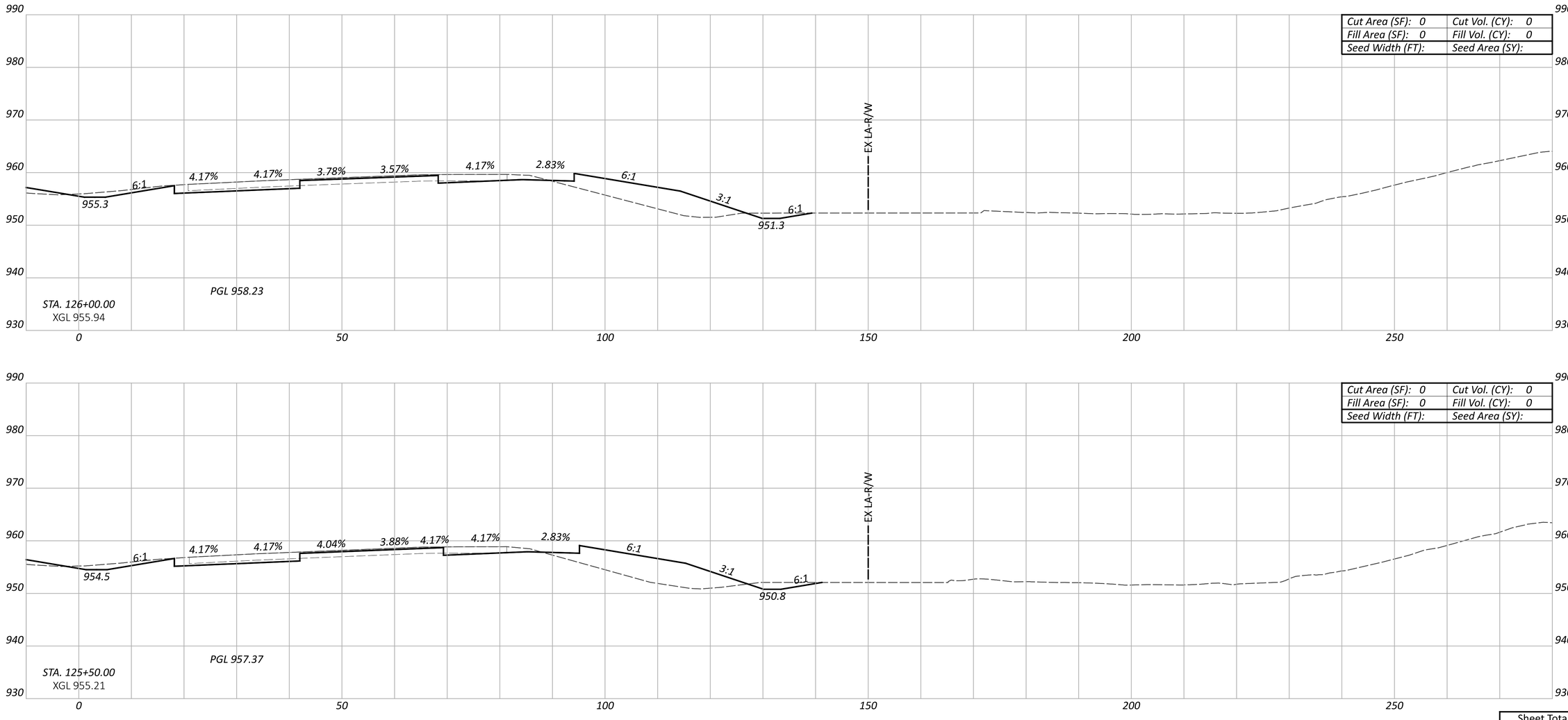
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.418	740



CROSS SECTIONS - IR 70 EB
STA. 125+50.00 TO STA. 126+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

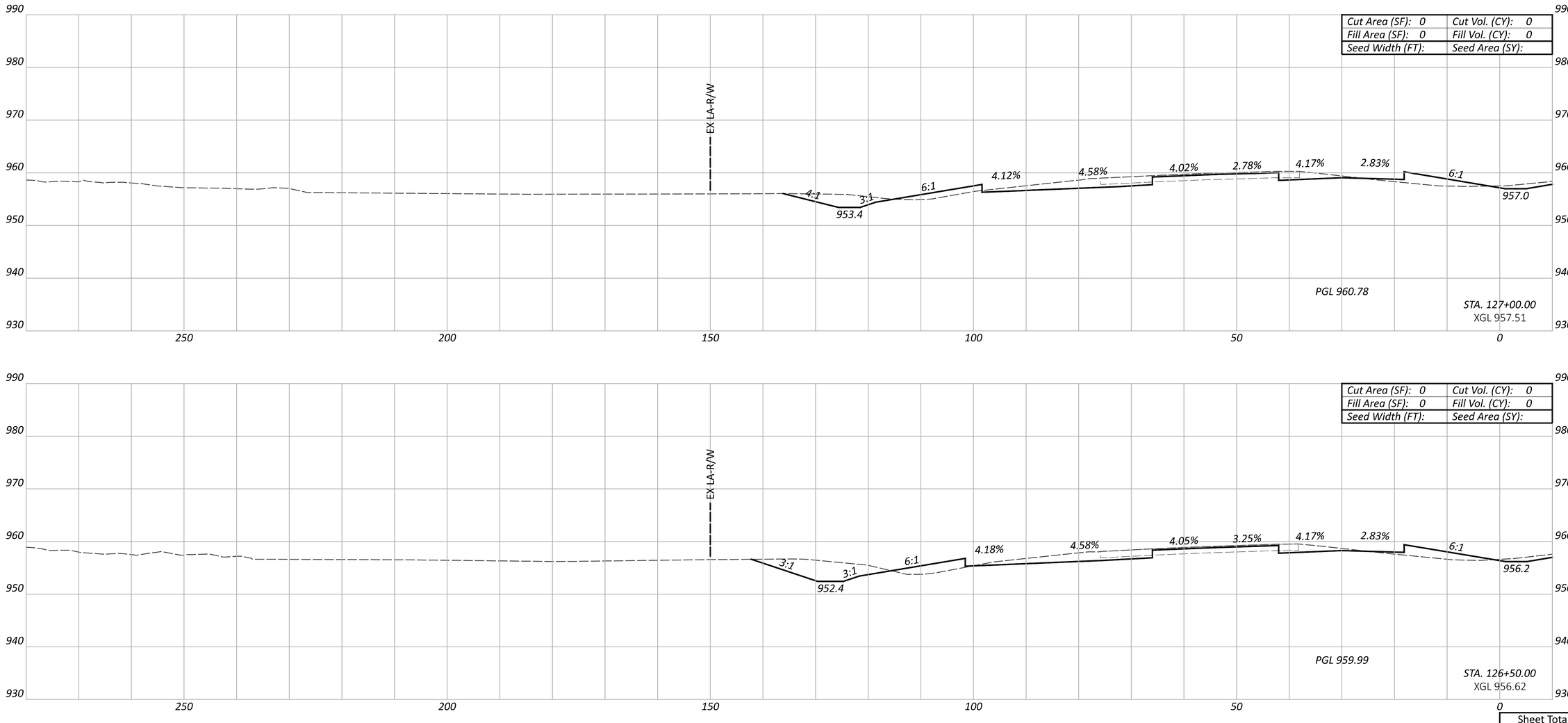
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.419 TOTAL 740

Sheet Totals

Seeding	Cut	Fill



Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70 WB
STA. 126+50.00 TO STA. 127+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.420 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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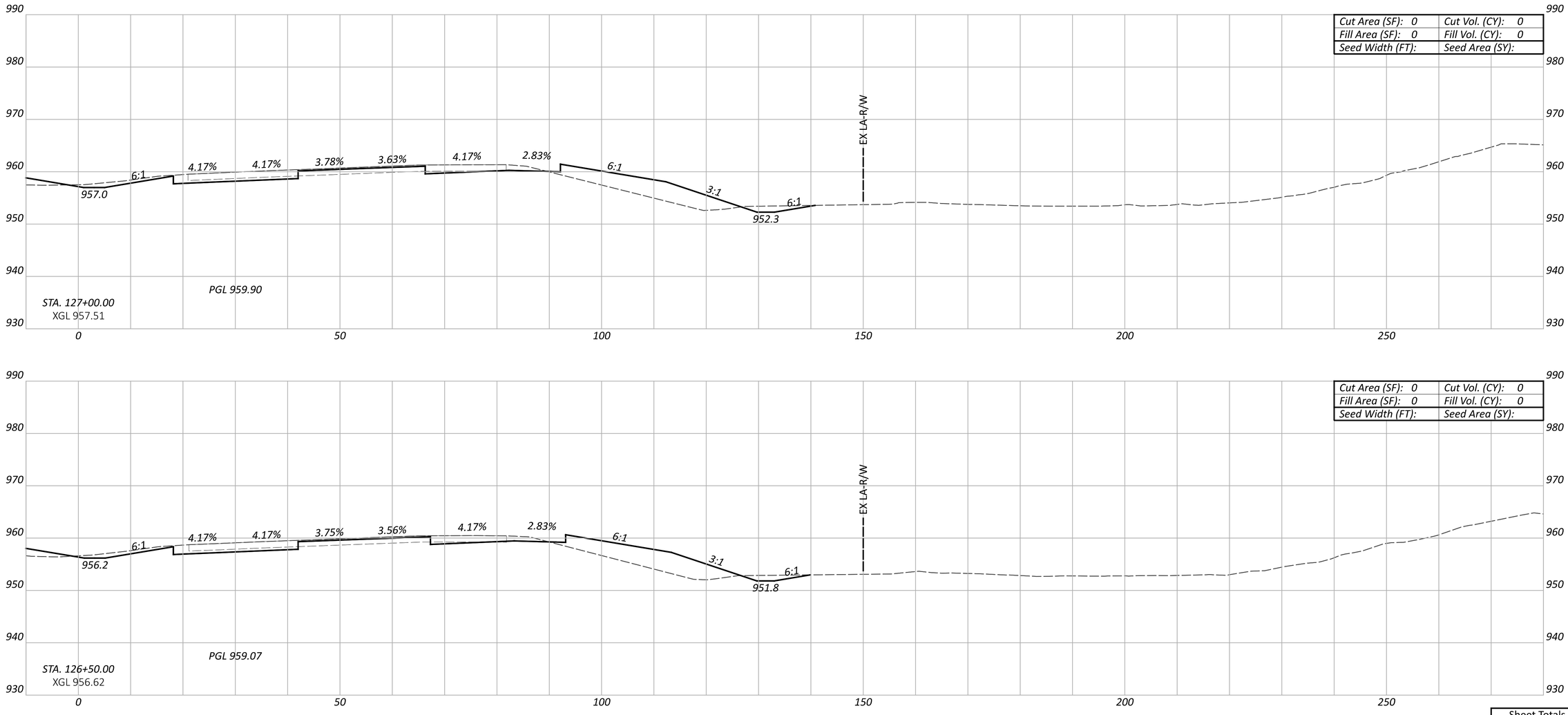

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 EB
STA. 126+50.00 TO STA. 127+00.00

Sheet Totals		
Seeding	Cut	Fill

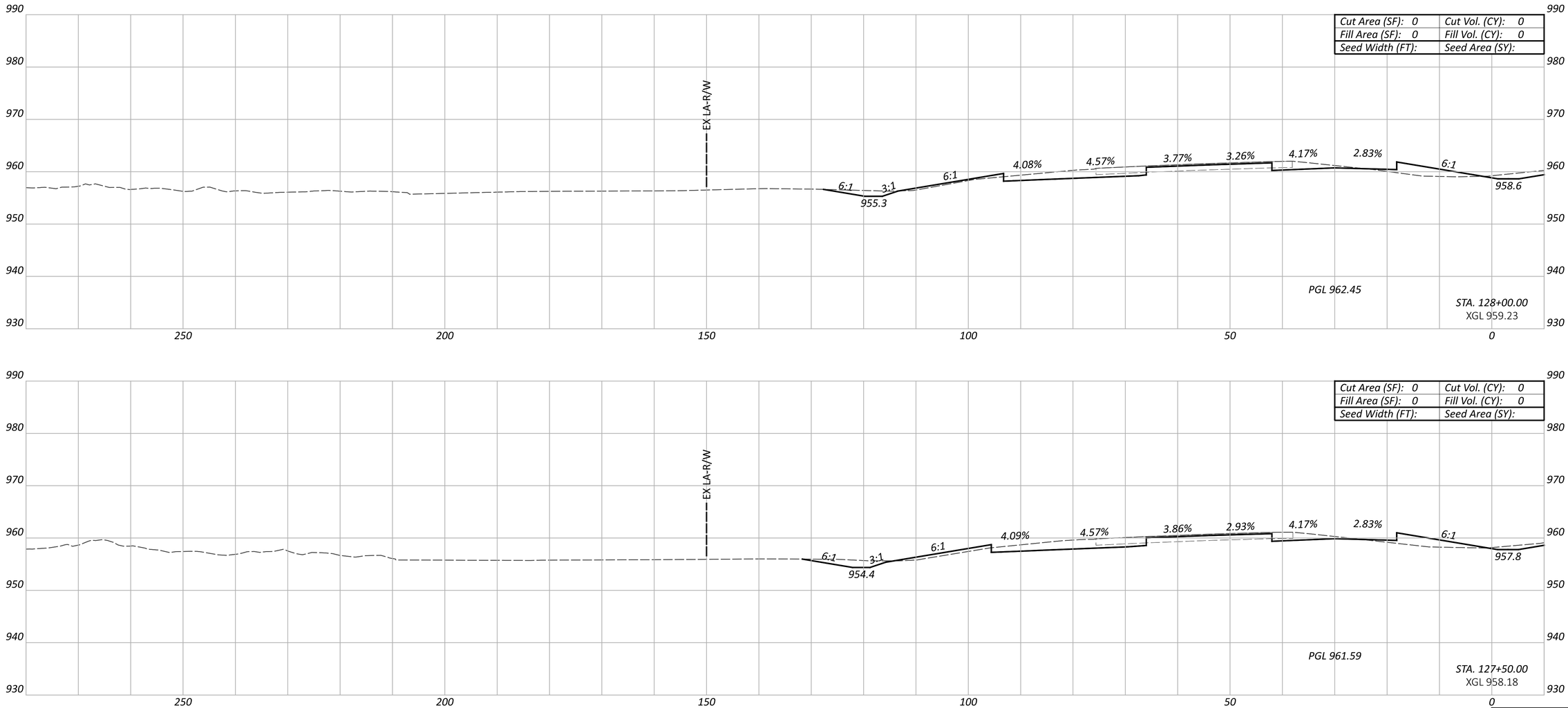
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.421	740



FAI/LIC IR 70 0.00/0.00

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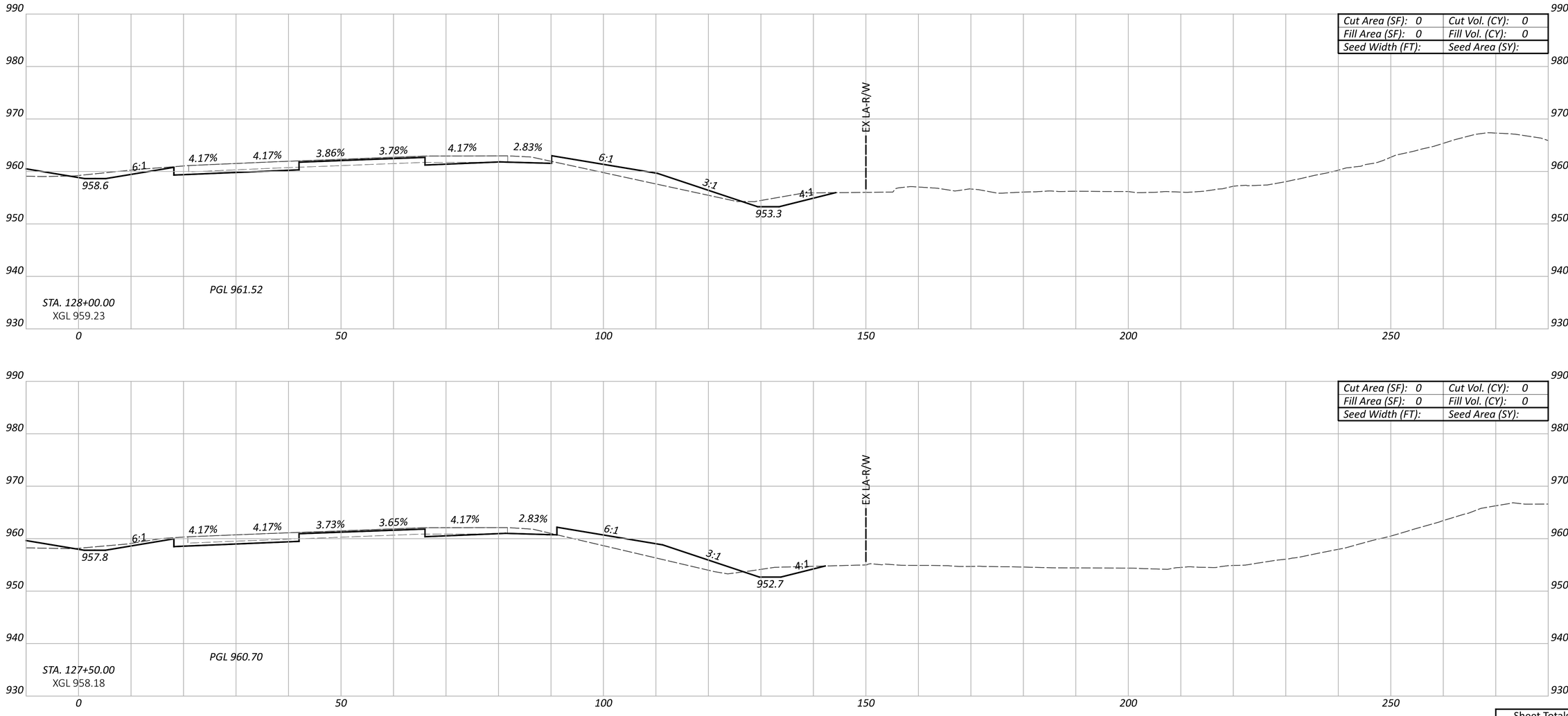
CROSS SECTIONS - IR 70 WB
STA. 127+50.00 TO STA. 128+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.422
TOTAL	740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 EB
STA. 127+50.00 TO STA. 128+00.00

Sheet Totals		
Seeding	Cut	Fill

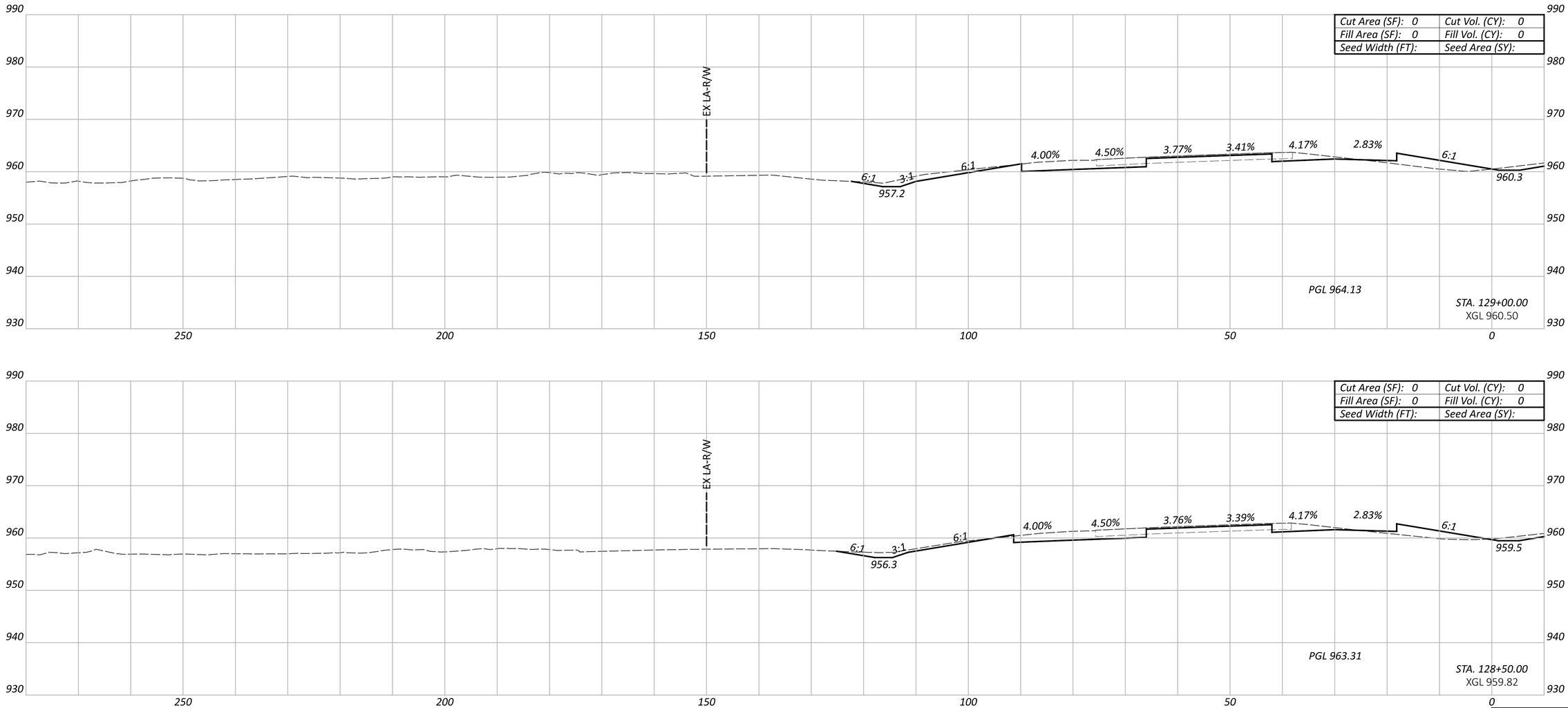
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.423 | TOTAL 740



CROSS SECTIONS - IR 70 WB
STA. 128+50.00 TO STA. 129+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

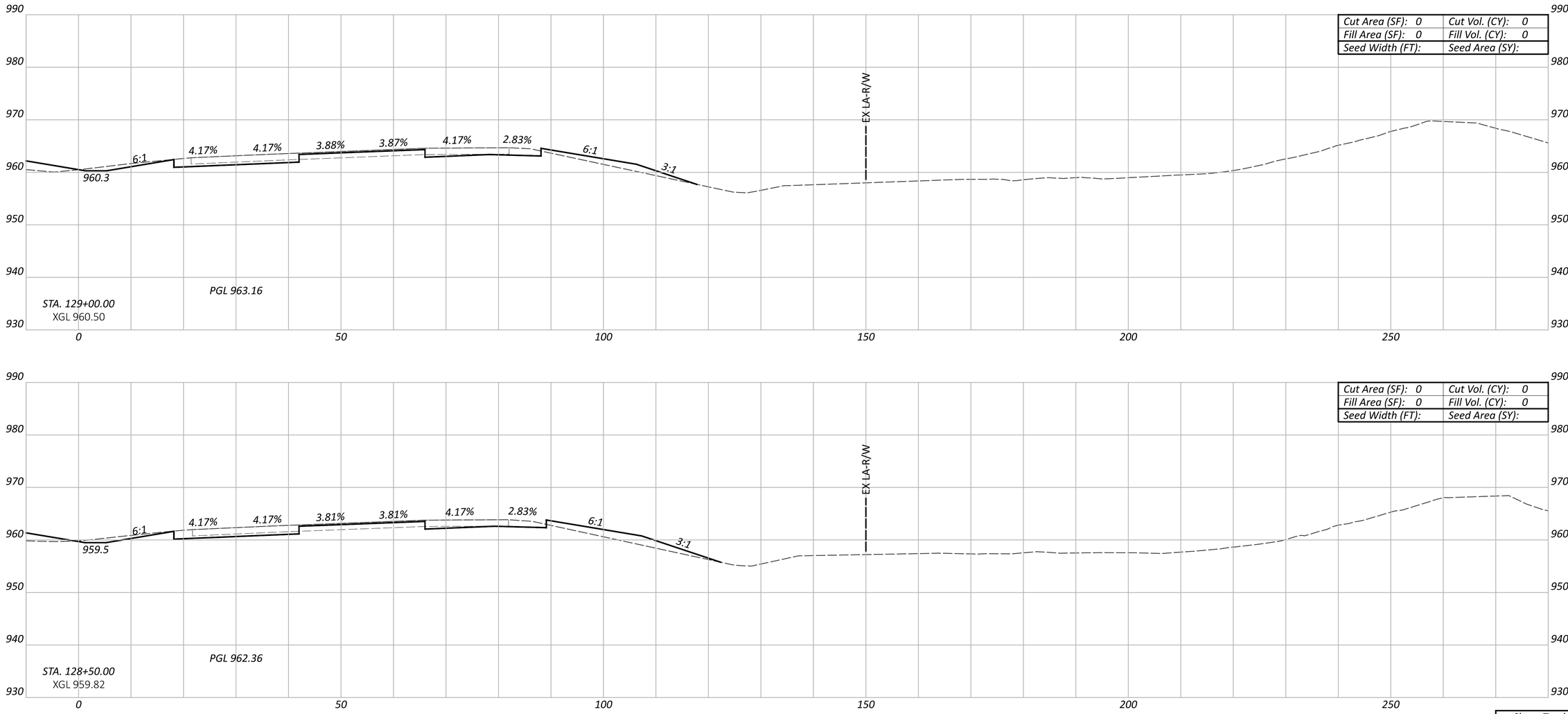
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.424 TOTAL 740



CROSS SECTIONS - IR 70 EB
STA. 128+50.00 TO STA. 129+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

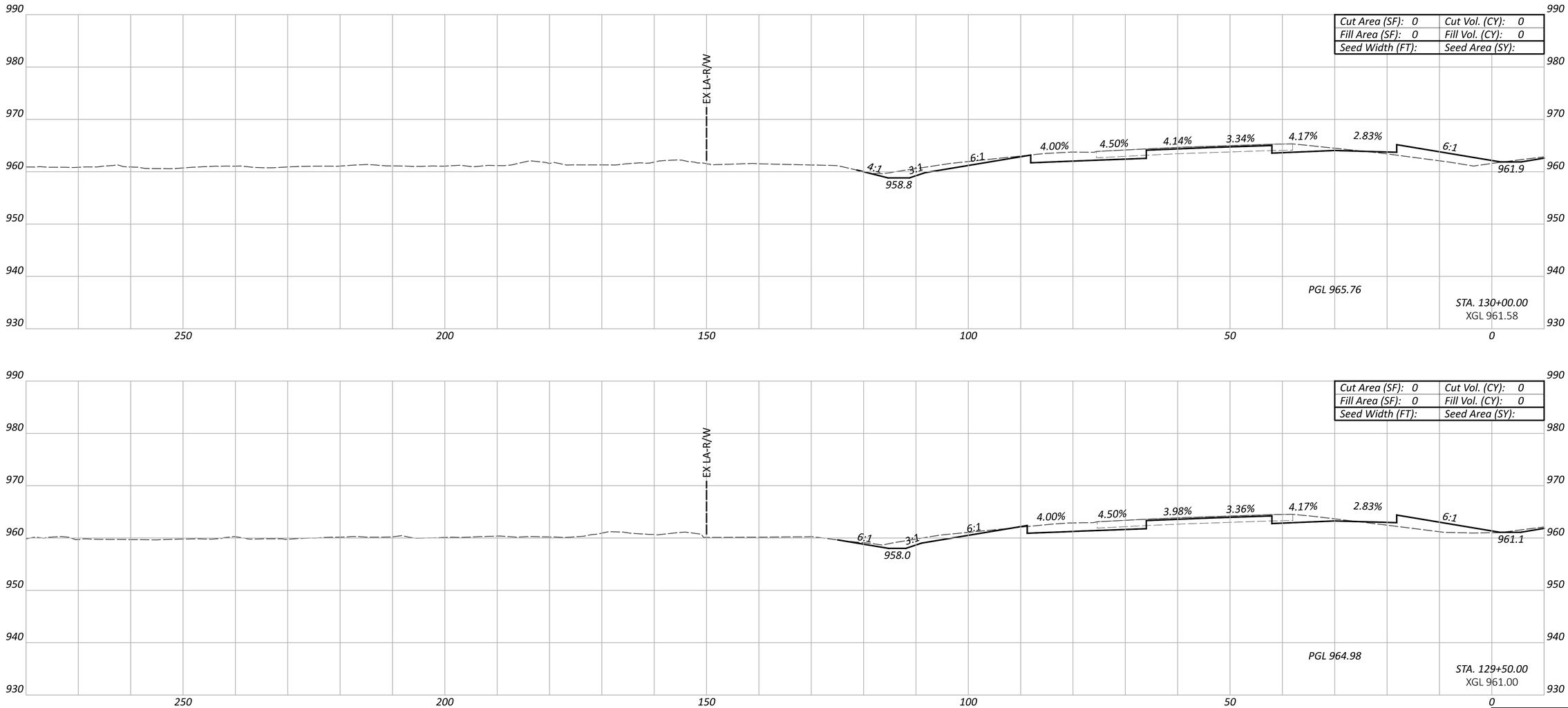
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.425	740



CROSS SECTIONS - IR 70 WB
STA. 129+50.00 TO STA. 130+00.00

FAI/LIC IR 70 0.00/0.00

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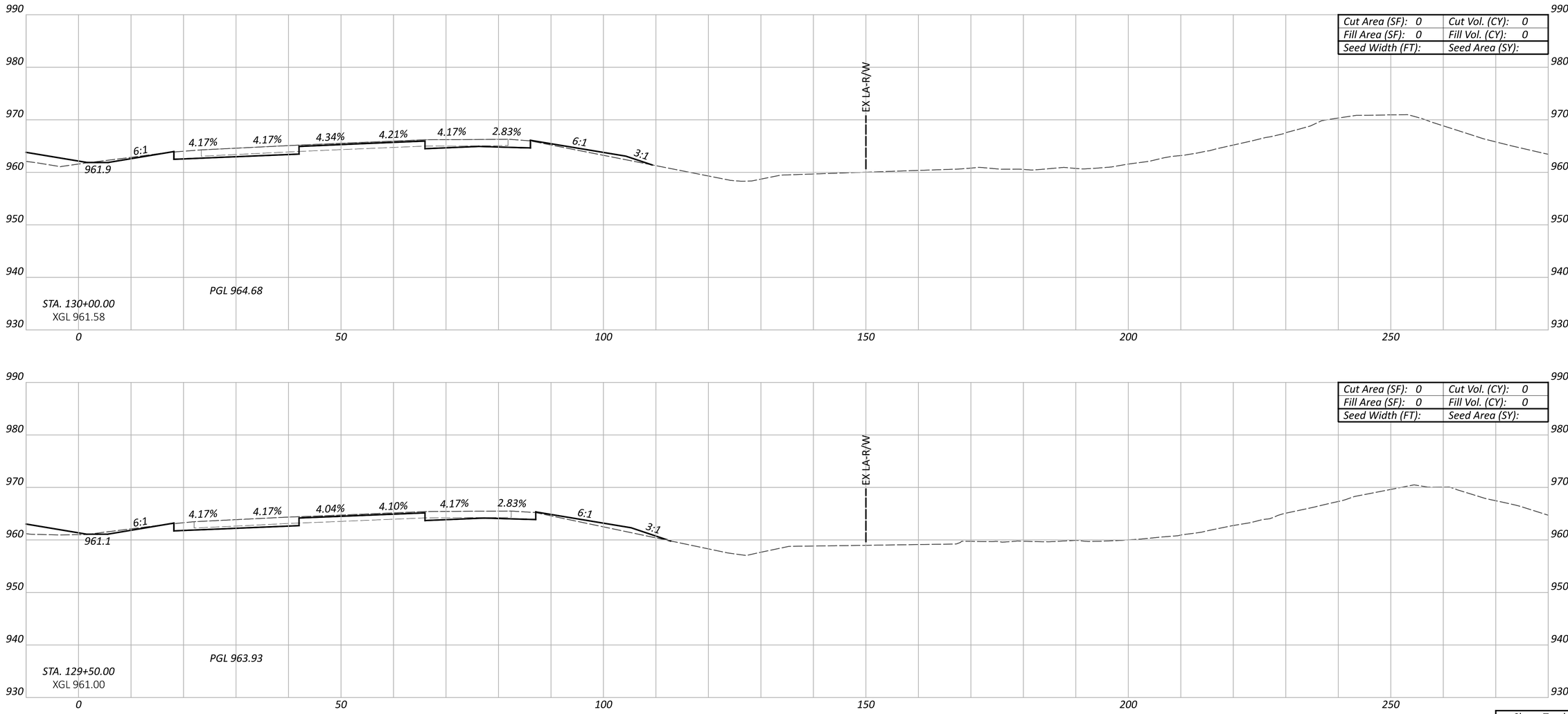
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	TOTAL
P.426	740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70 EB
STA. 129+50.00 TO STA. 130+00.00

Sheet Totals		
Seeding	Cut	Fill

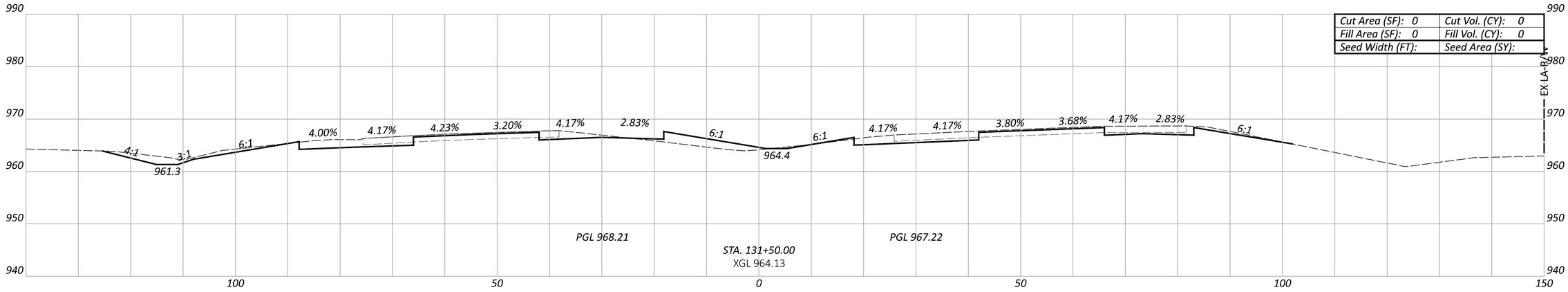
DESIGN AGENCY
STRUCTUREPOINT LLC

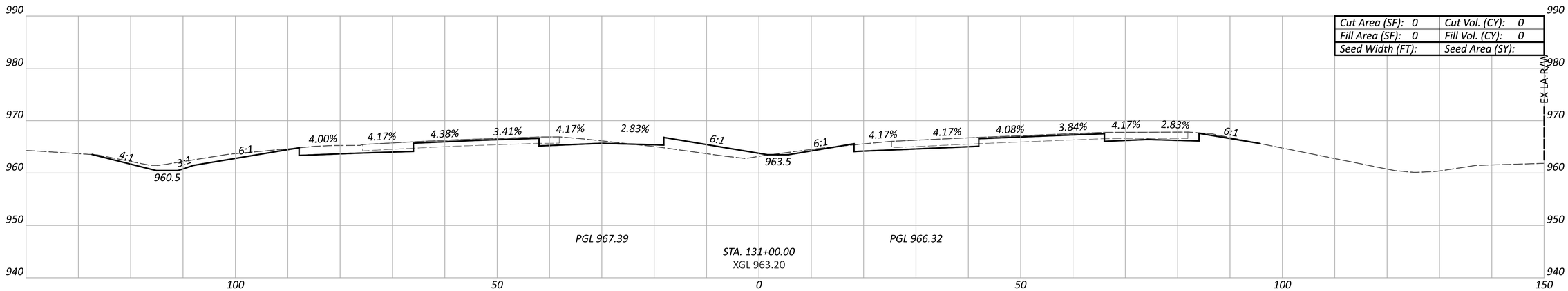
DESIGNER
BER

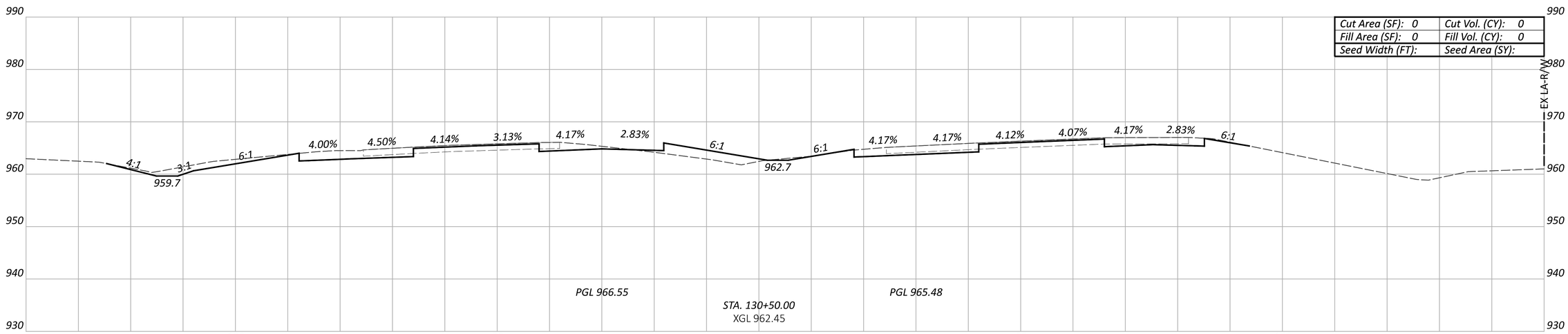
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.427	740







CROSS SECTIONS - IR 70
STA. 130+50.00 TO STA. 131+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.428 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 130+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:26:25 PM USER: aoldaker
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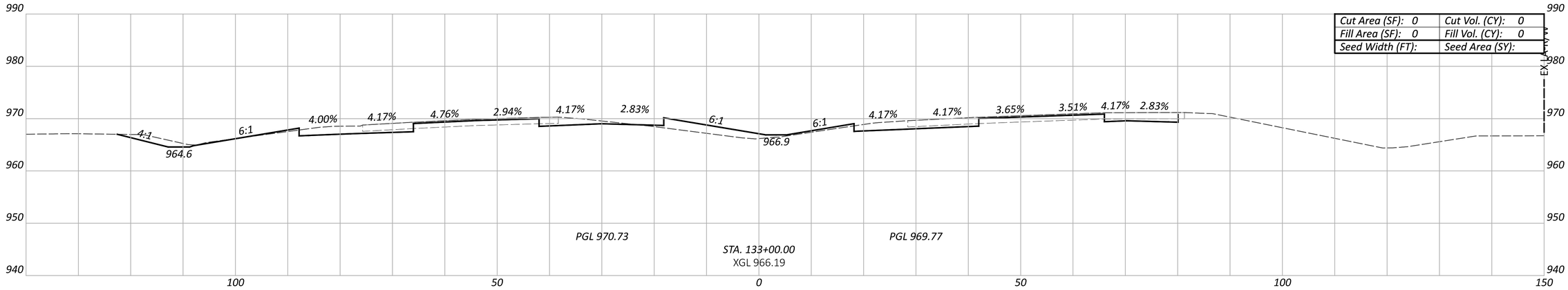

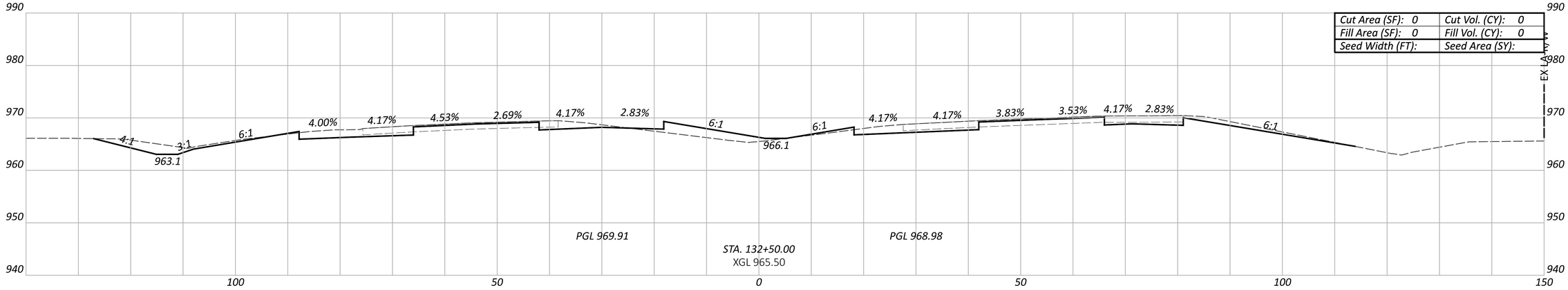

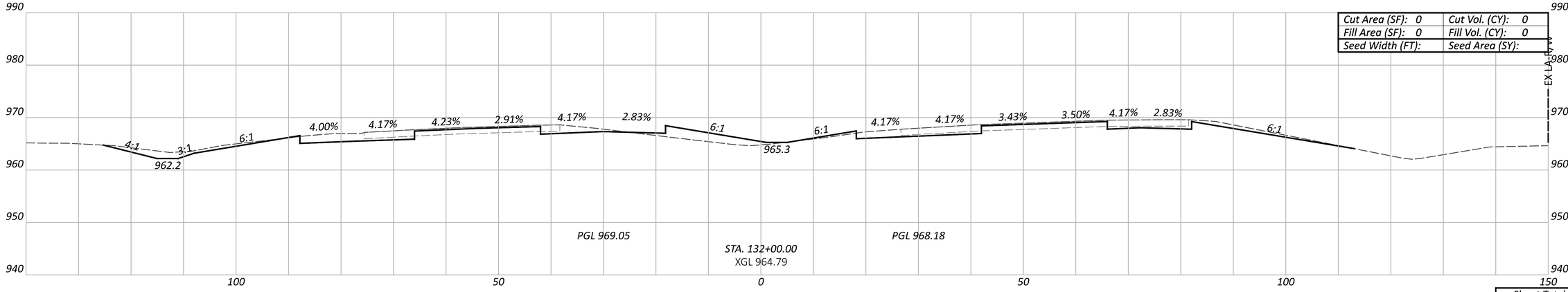

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - IR 70
STA. 132+00.00 TO STA. 133+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.429 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 132+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:26:29 PM USER: aoldaker
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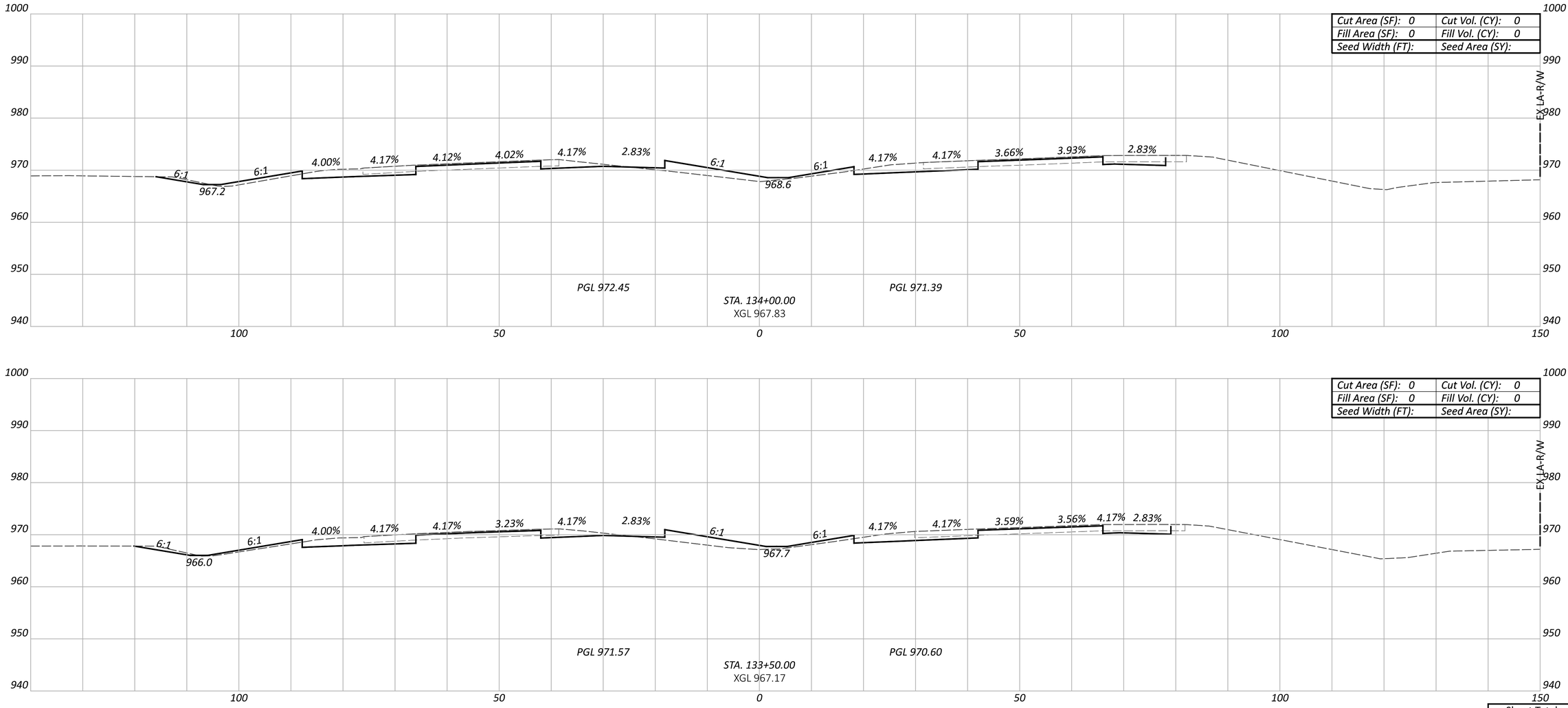

CROSS SECTIONS - IR 70
STA. 133+50.00 TO STA. 134+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.430 TOTAL 740

Sheet Totals

Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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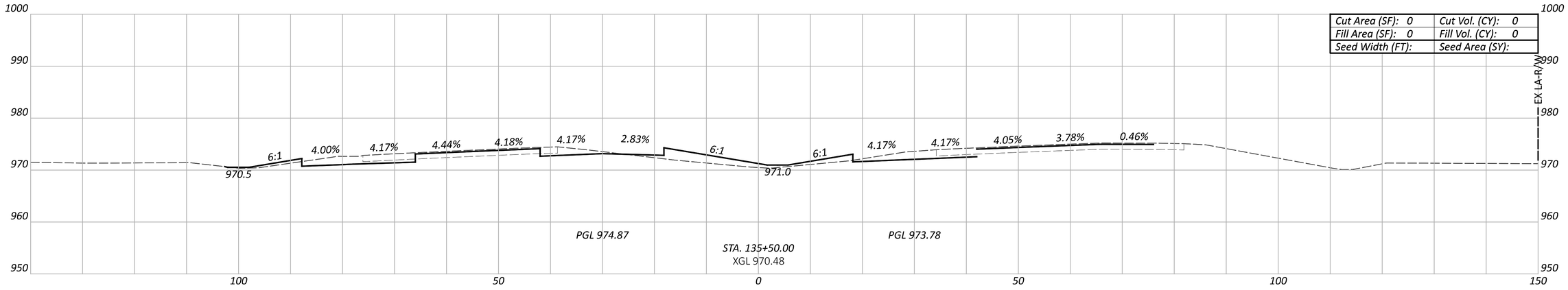

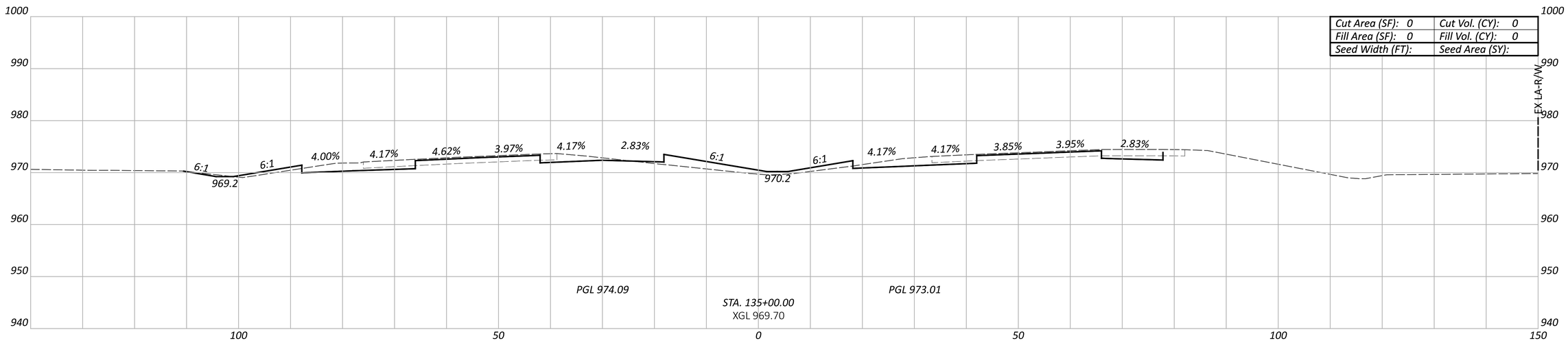

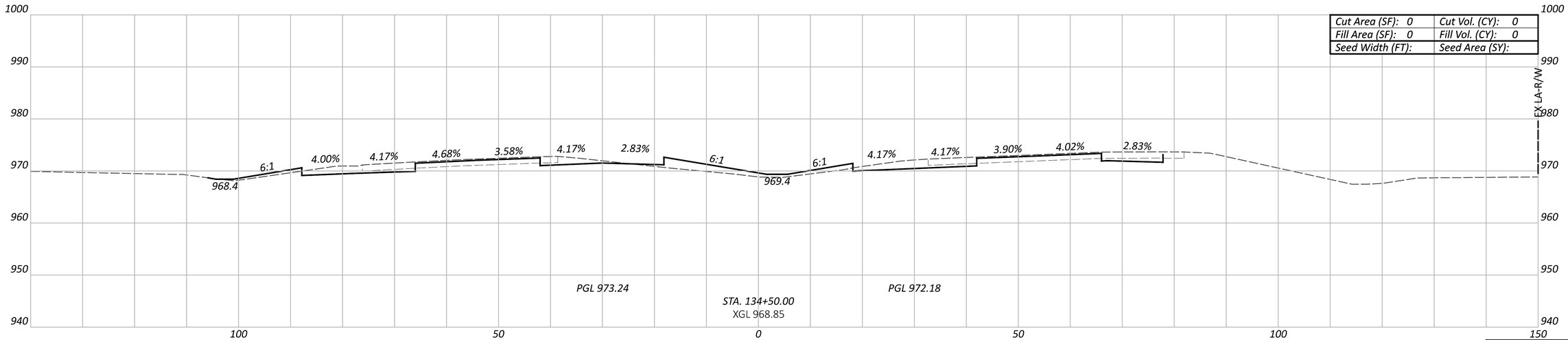

CROSS SECTIONS - IR 70
STA. 134+50.00 TO STA. 135+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.431
TOTAL	740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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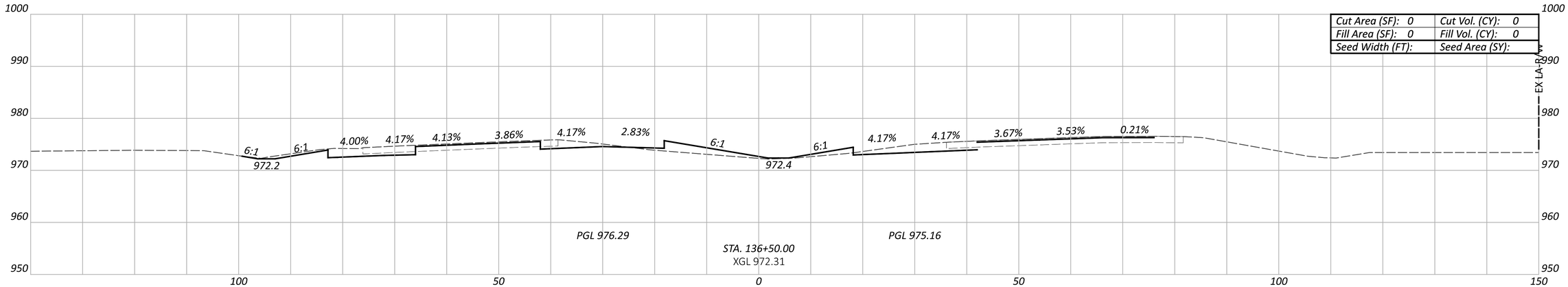

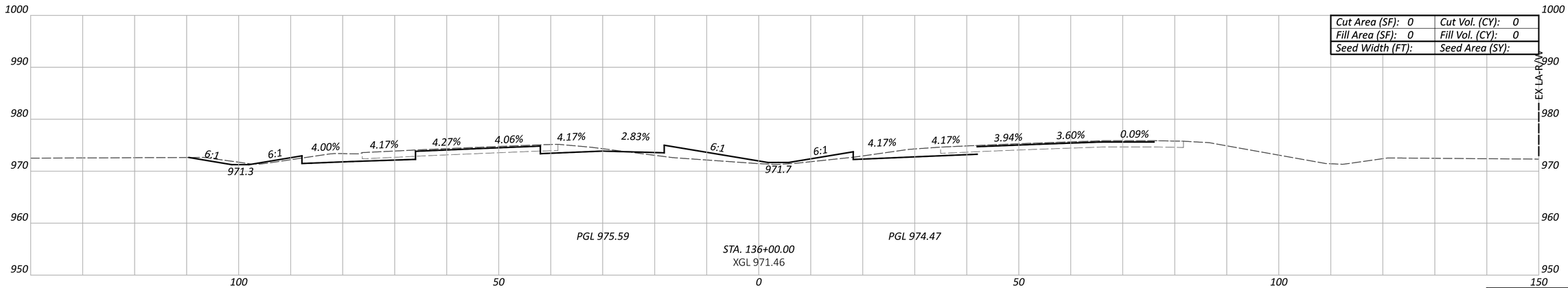

CROSS SECTIONS - IR 70
STA. 136+00.00 TO STA. 137+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 136+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:26:39 PM USER: aoldaker
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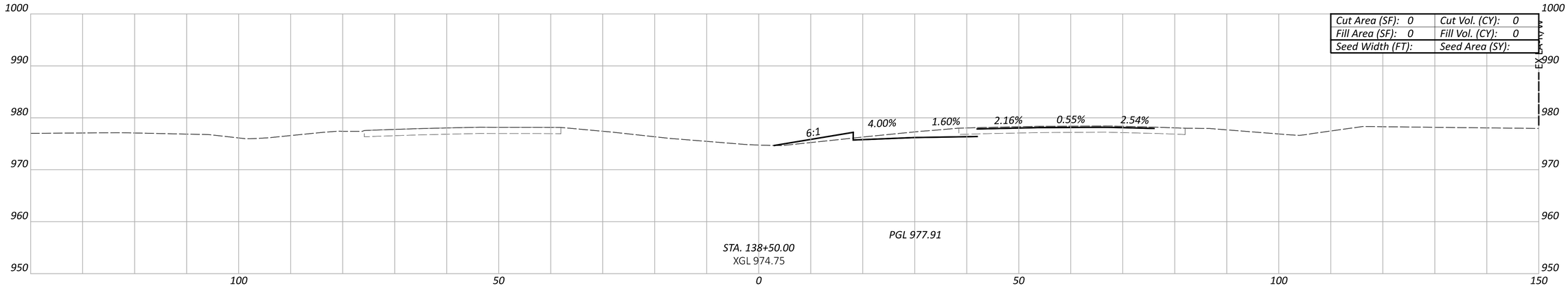
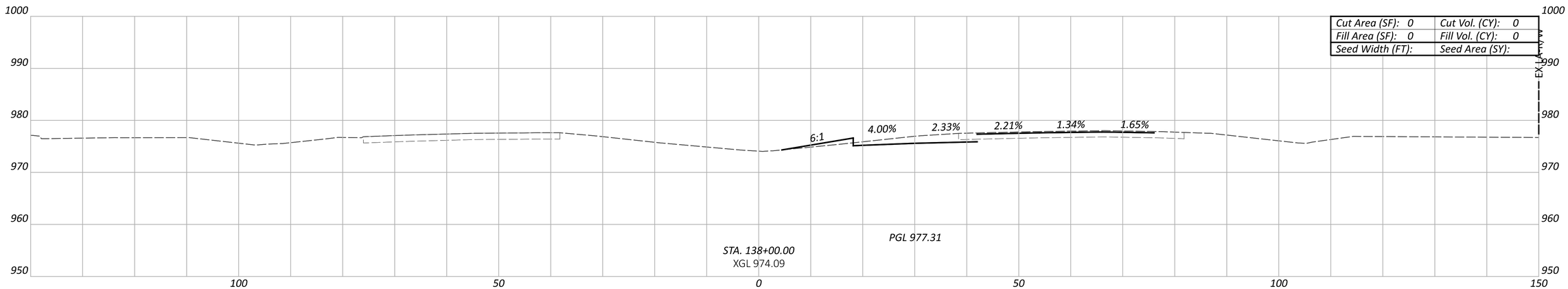
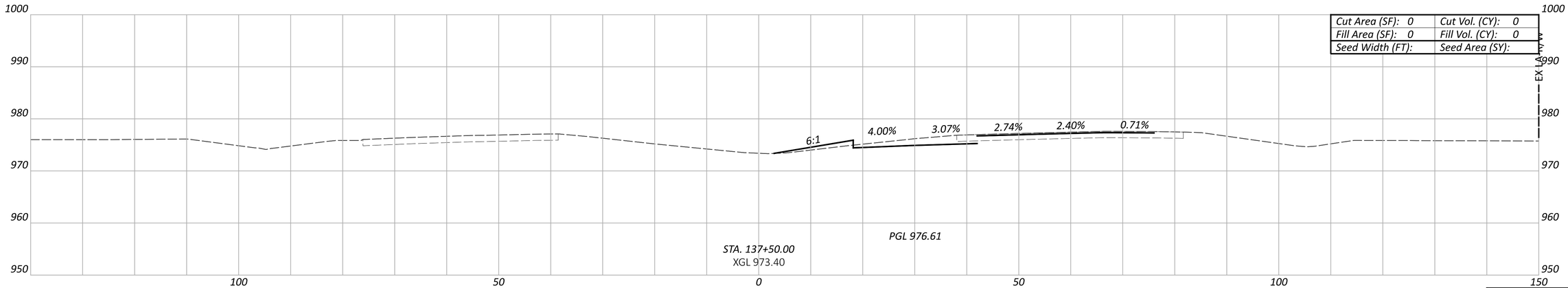
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.432
TOTAL	740







CROSS SECTIONS - IR 70
STA. 137+50.00 TO STA. 138+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 137+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:26:43 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_XS108.dgn

Sheet Totals		
Seeding	Cut	Fill

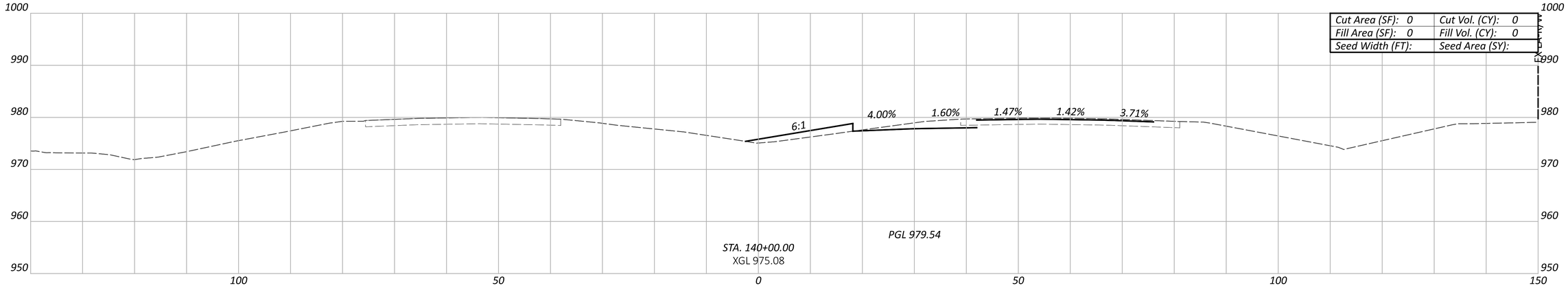
DESIGN AGENCY
STRUCTUREPOINT INC.

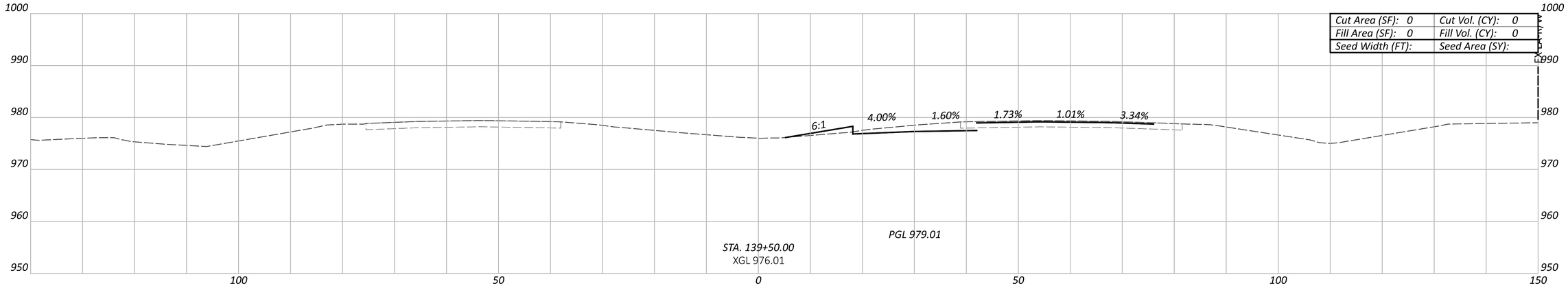
DESIGNER
BER

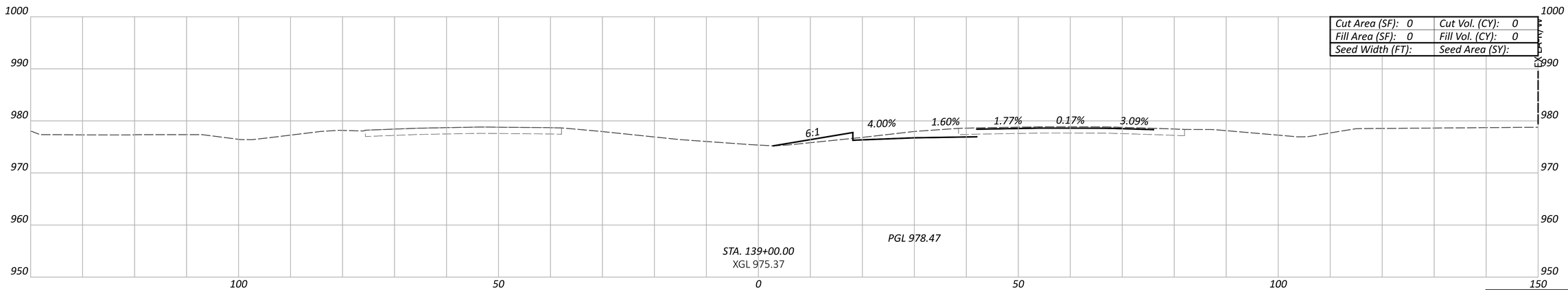
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.433	740







CROSS SECTIONS - IR 70
STA. 139+00.00 TO STA. 140+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 139+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:26:45 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

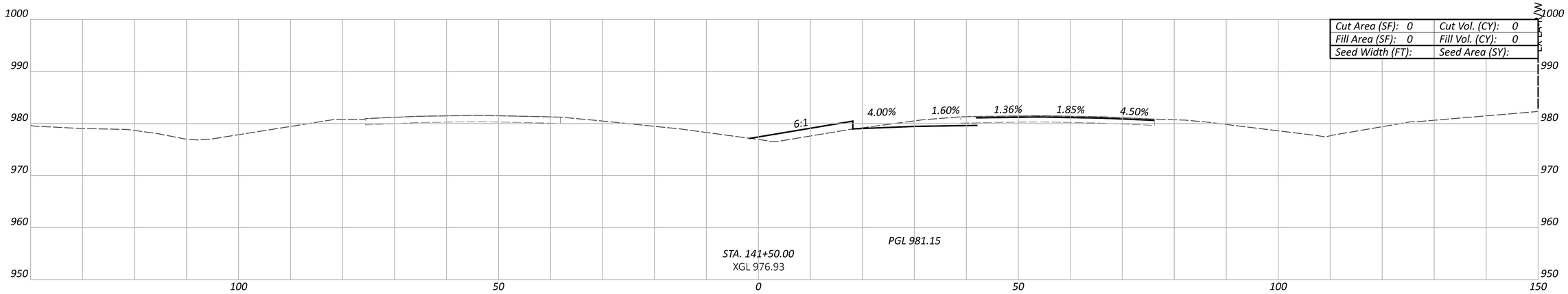
DESIGN AGENCY
STRUCTUREPOINT INC.

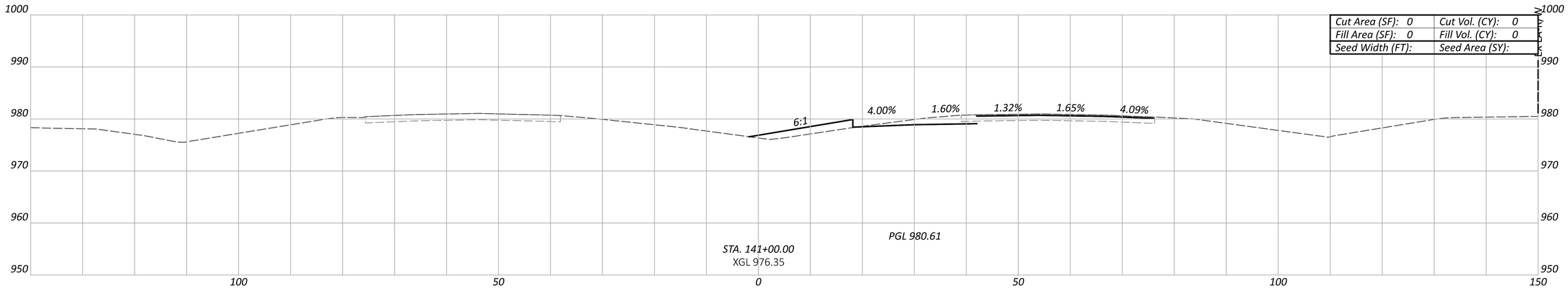
DESIGNER
BER

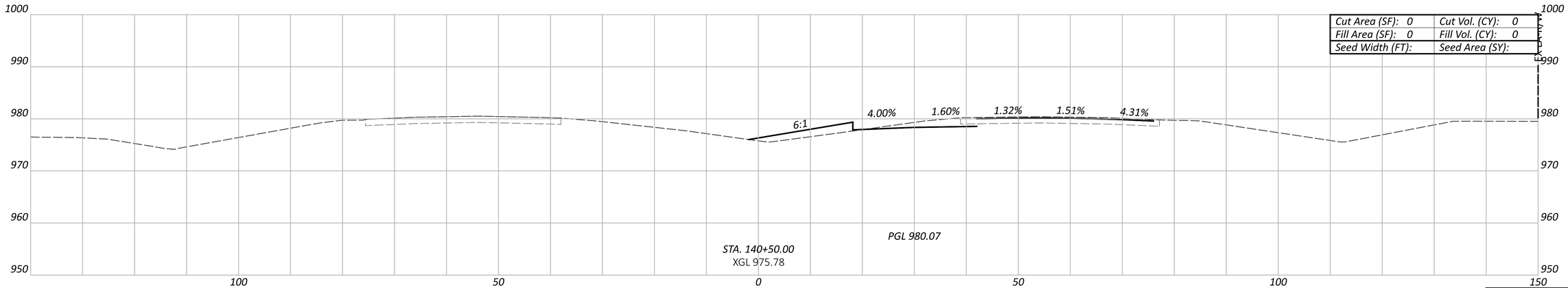
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.434 TOTAL 740







CROSS SECTIONS - IR 70
STA. 140+50.00 TO STA. 141+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

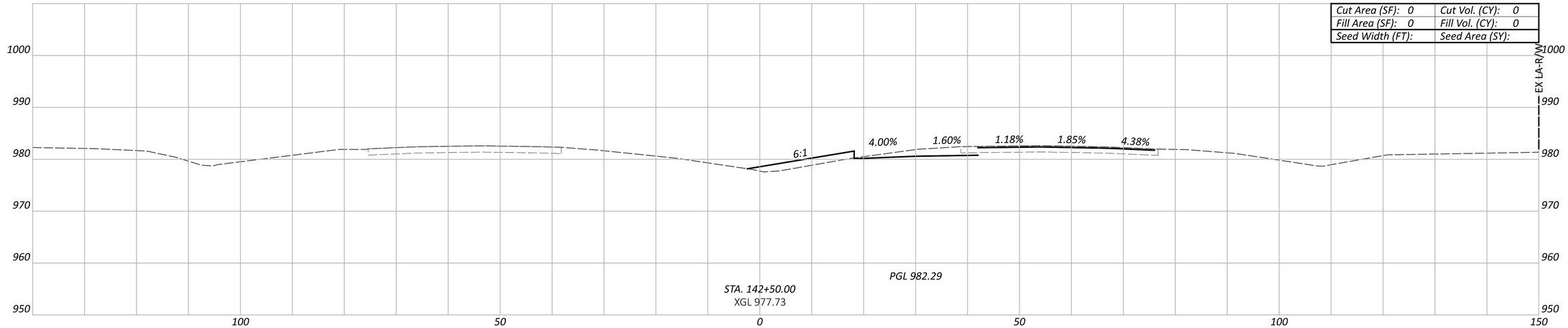
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

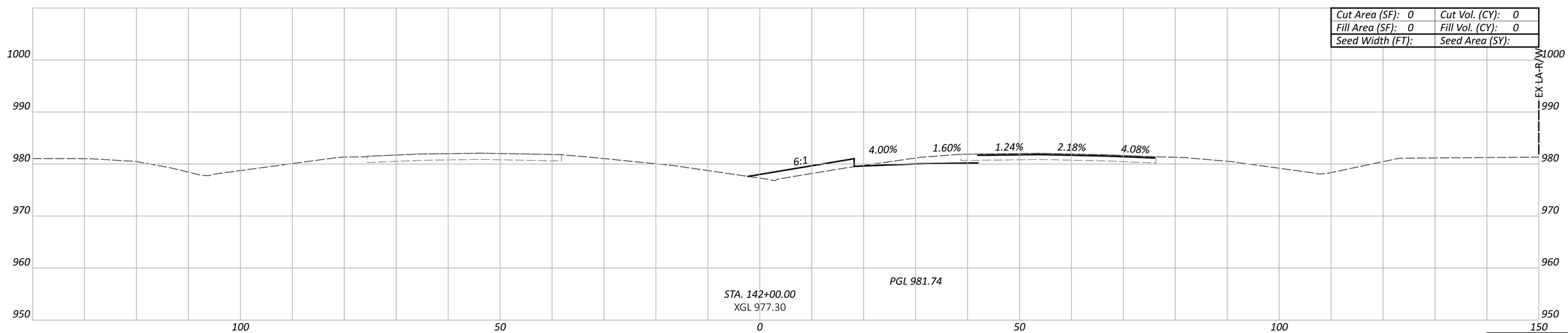
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.435 TOTAL 740





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CROSS SECTIONS - IR 70
STA. 142+00.00 TO STA. 142+50.00

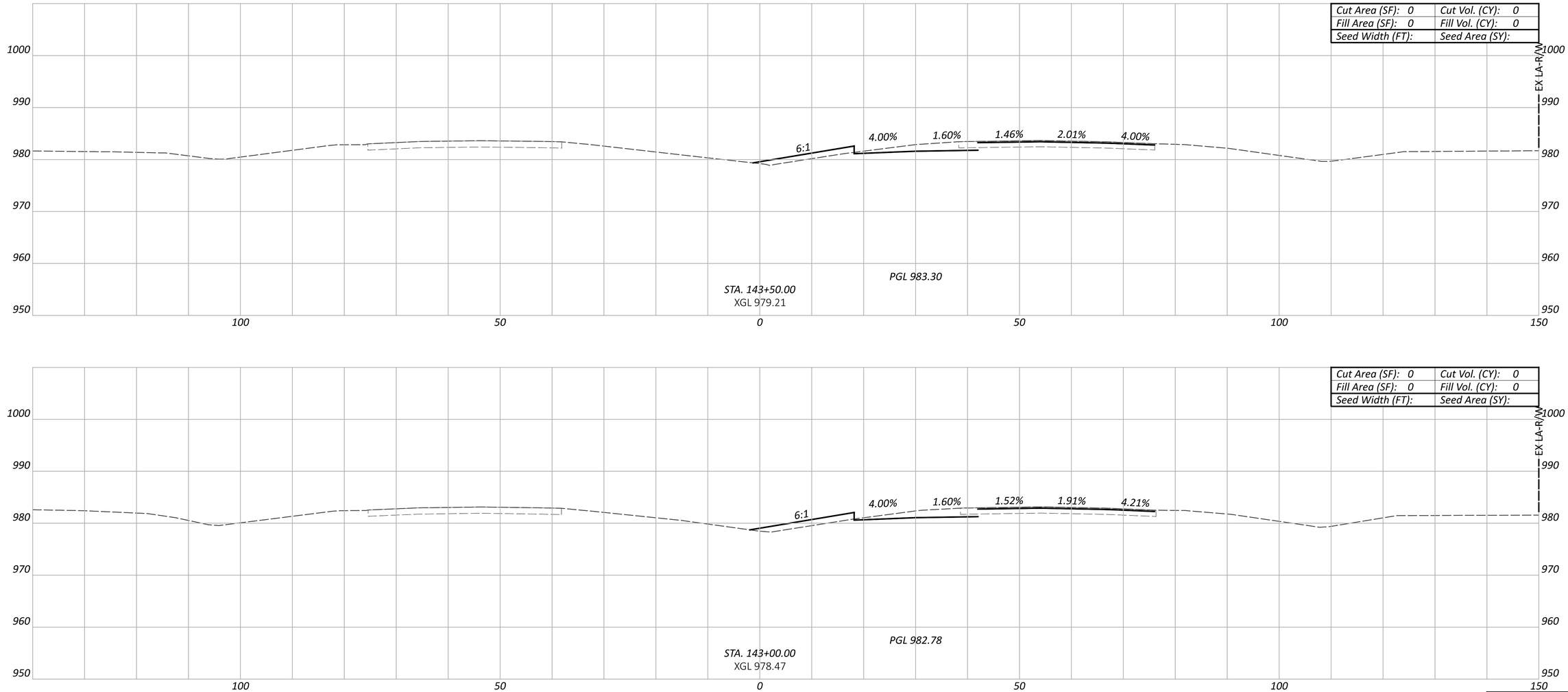
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	
BER	
REVIEWER	
KAM 06/18/23	
PROJECT ID	
96808	

Sheet Totals

Seeding	Cut	Fill

SHEET	TOTAL
P.436	740



Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70
STA. 143+00.00 TO STA. 143+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.437 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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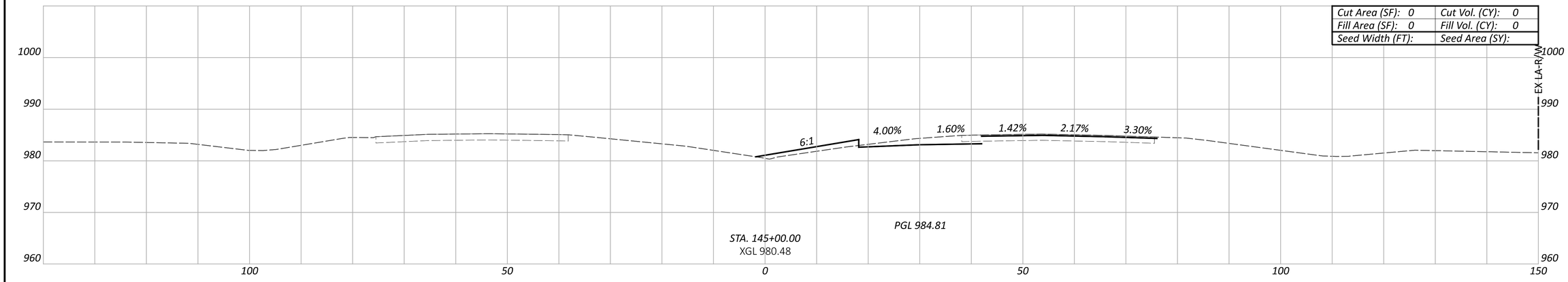

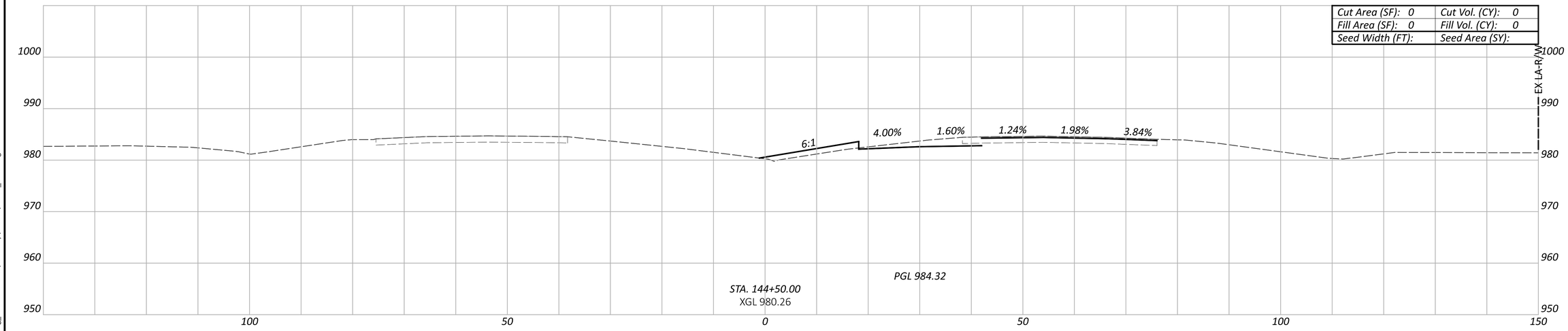

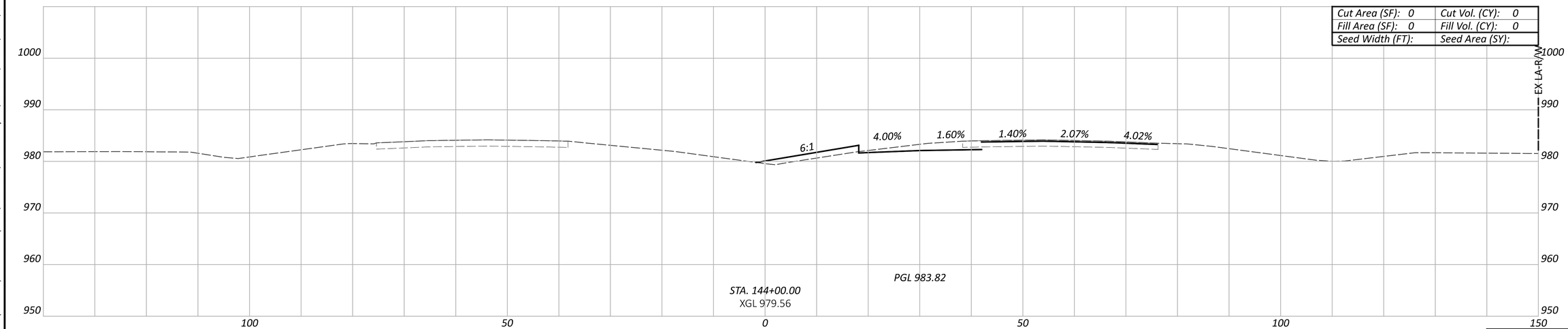

CROSS SECTIONS - IR 70
STA. 144+00.00 TO STA. 145+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.438	740

FAI/LIC IR 70 0.00/0.00

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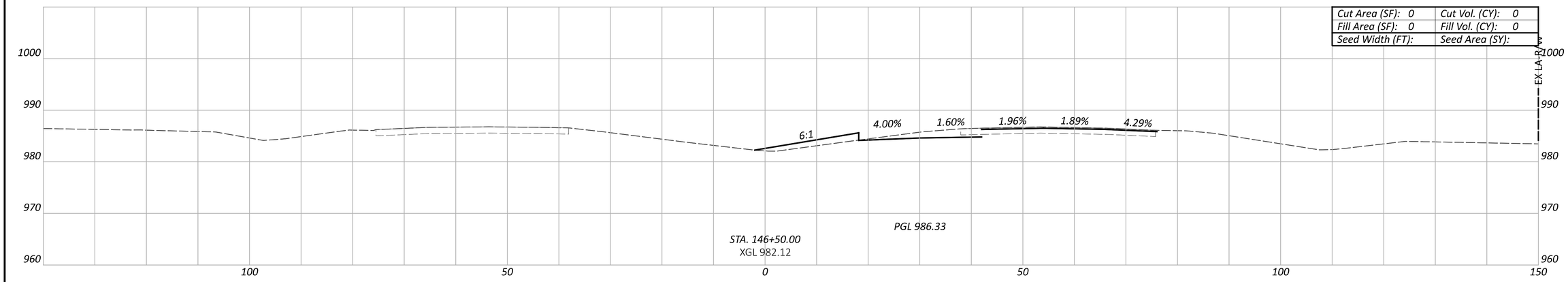

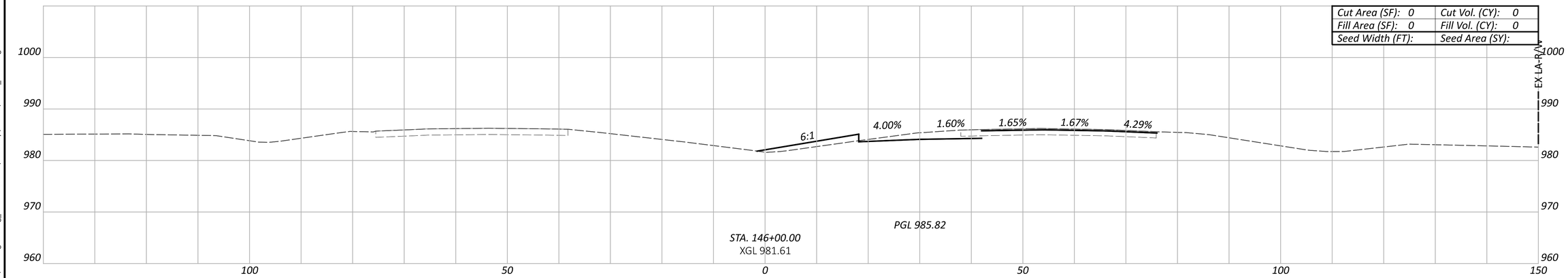

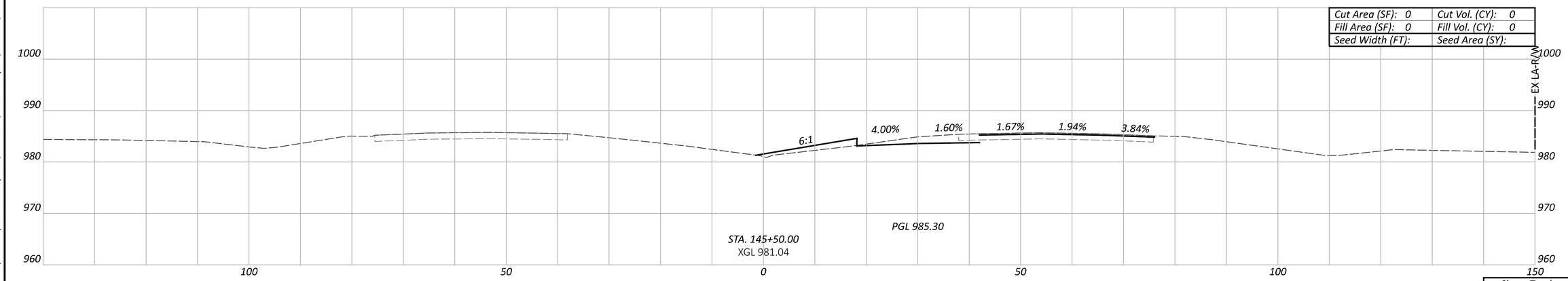

CROSS SECTIONS - IR 70
STA. 145+50.00 TO STA. 146+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.439 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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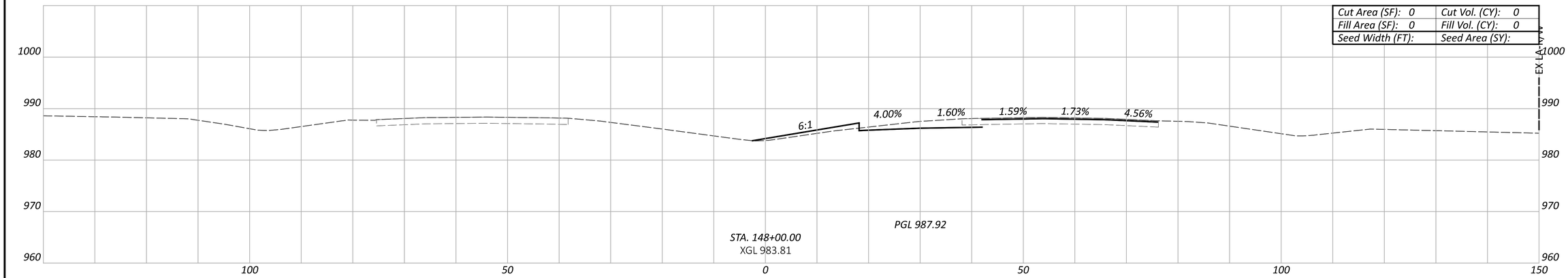

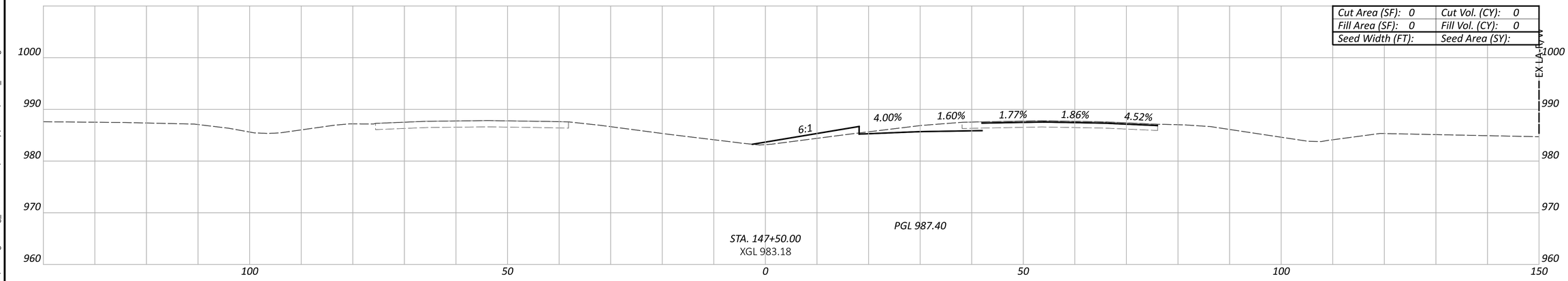

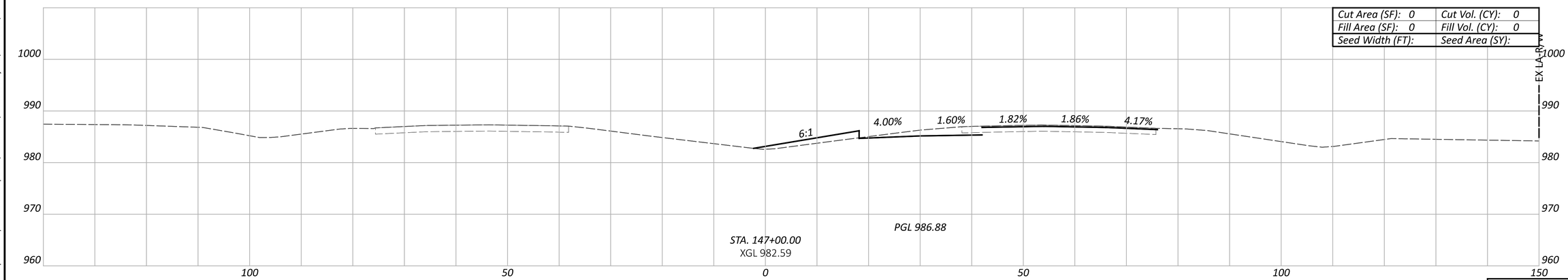

Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70
STA. 147+00.00 TO STA. 148+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.440 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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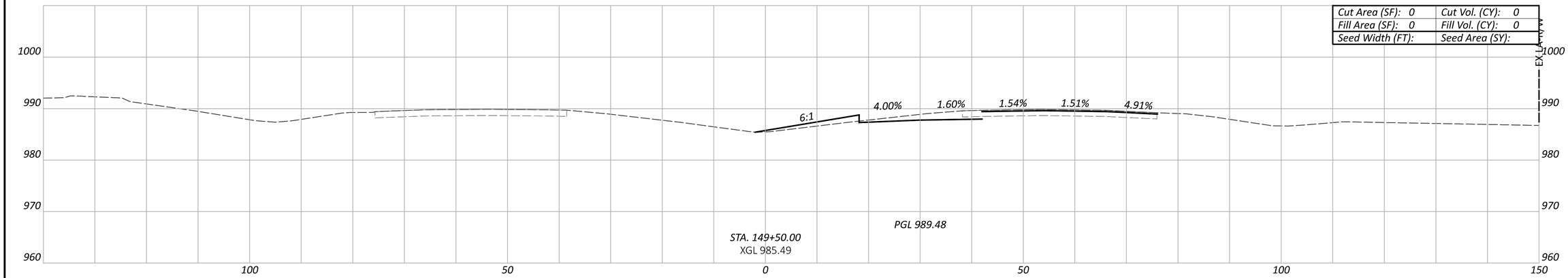

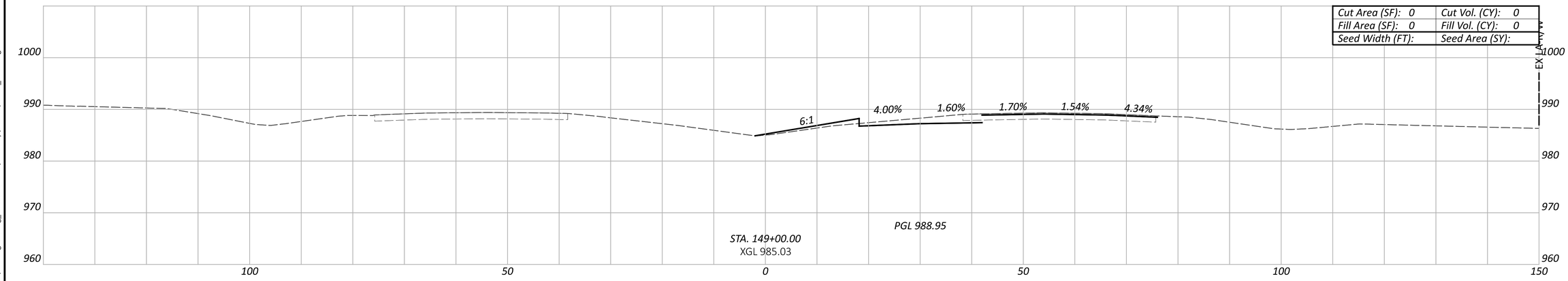

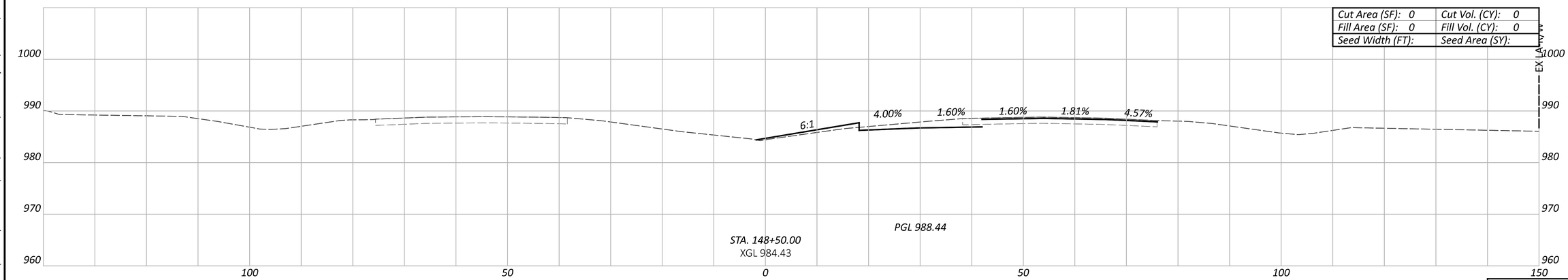

CROSS SECTIONS - IR 70
STA. 148+50.00 TO STA. 149+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.441	740

Sheet Totals

Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_I070 - A 148+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:27:05 PM USER: aoldaker
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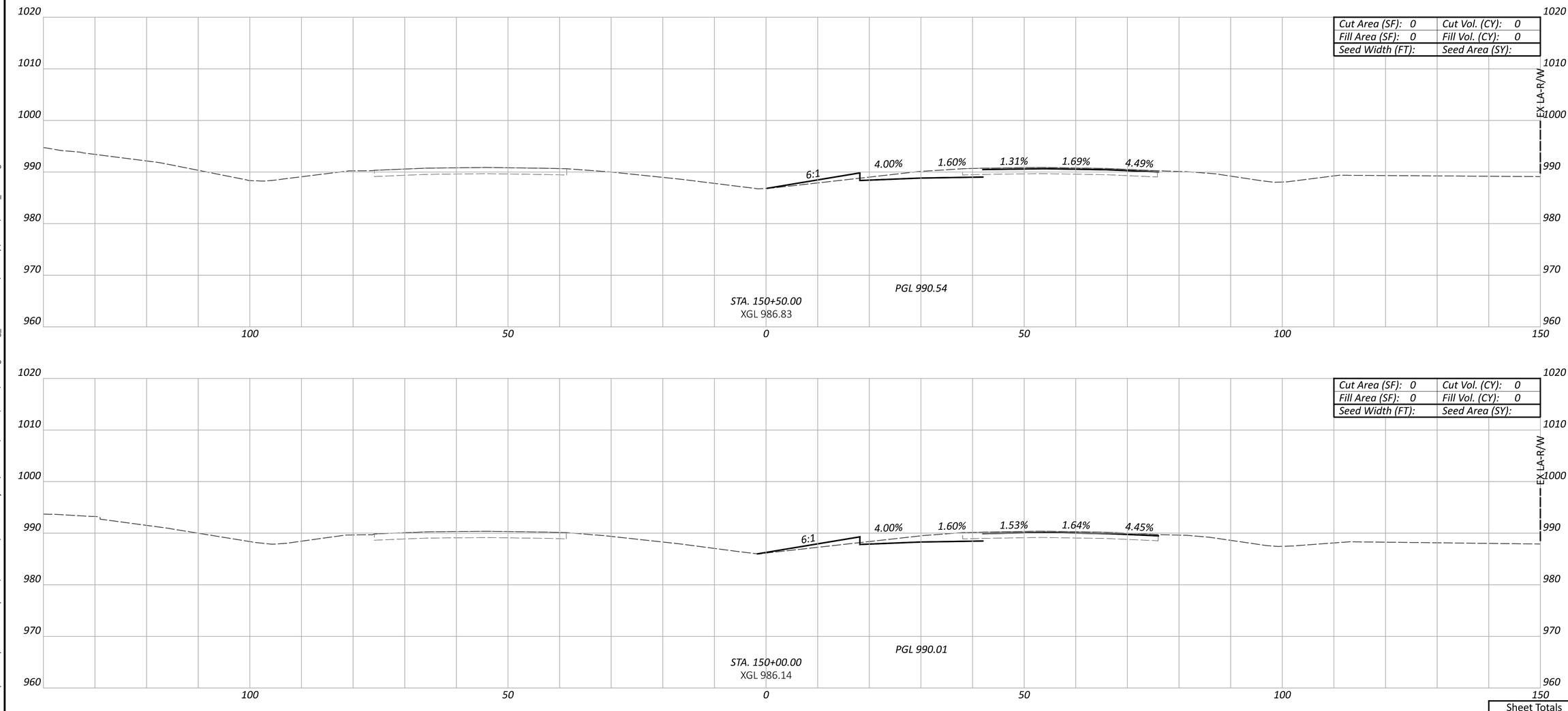

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CROSS SECTIONS - IR 70
STA. 150+00.00 TO STA. 150+50.00

Sheet Totals		
Seeding	Cut	Fill

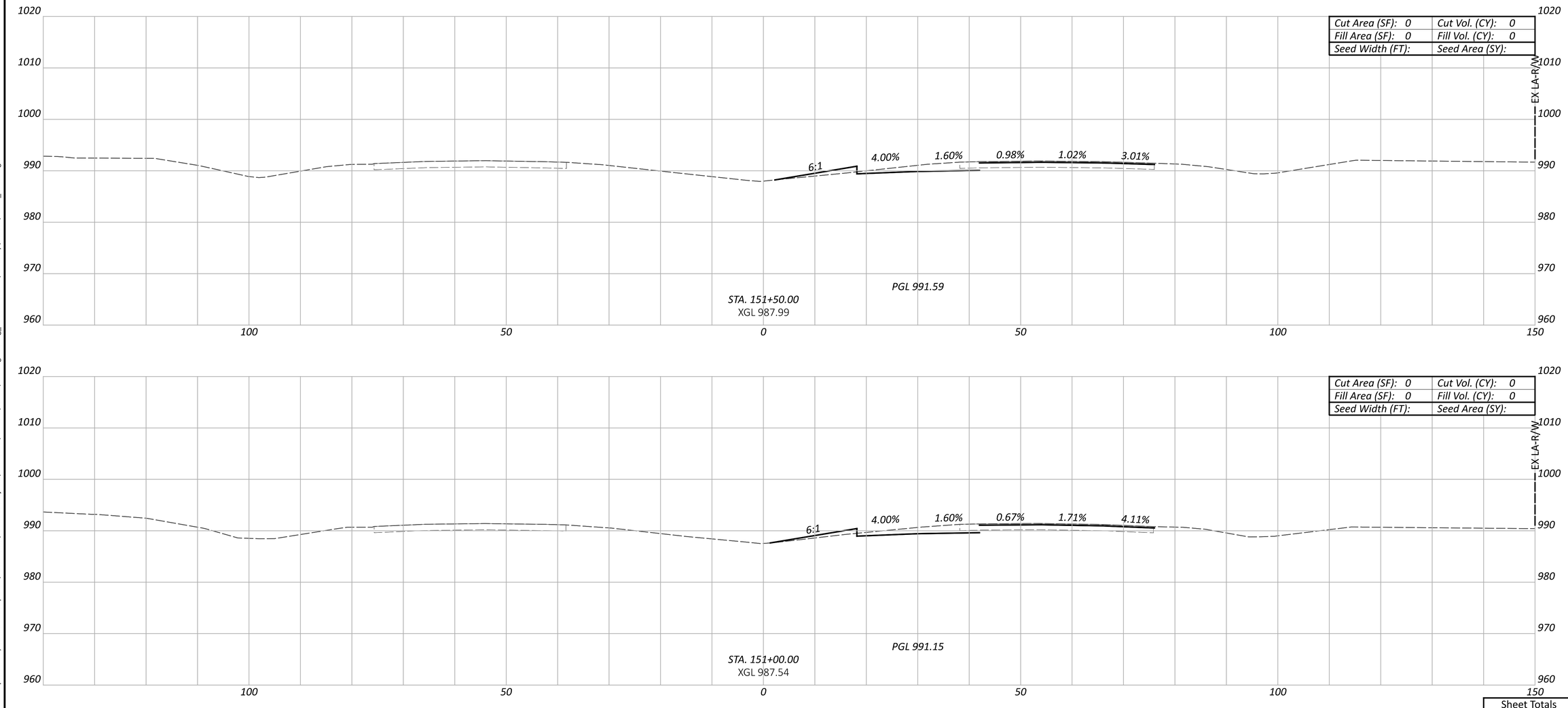
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.442 TOTAL 740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - IR 70
STA. 151+00.00 TO STA. 151+50.00

DESIGN AGENCY
STRUCTUREPOINT INC.

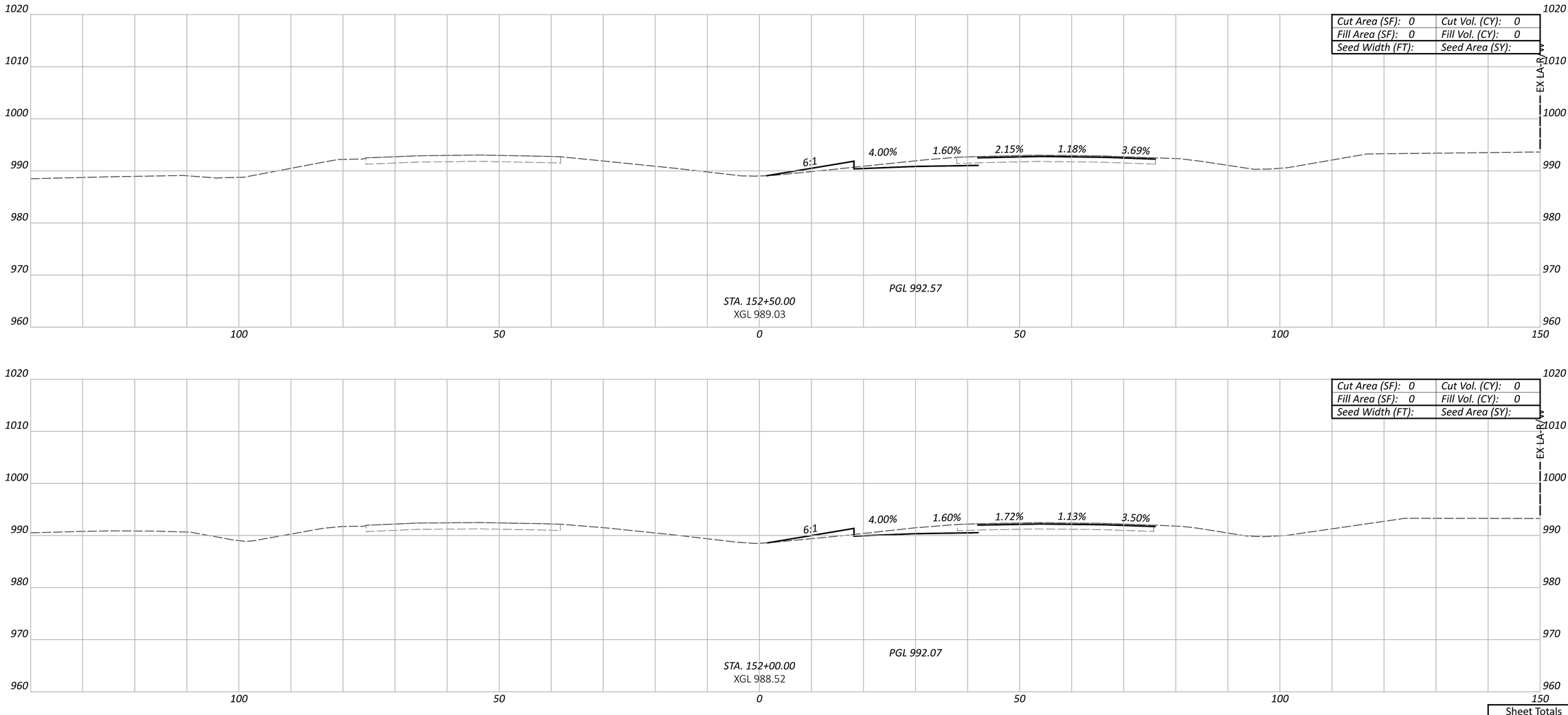
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.443	740



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CROSS SECTIONS - IR 70
STA. 152+00.00 TO STA. 152+50.00

Sheet Totals		
Seeding	Cut	Fill

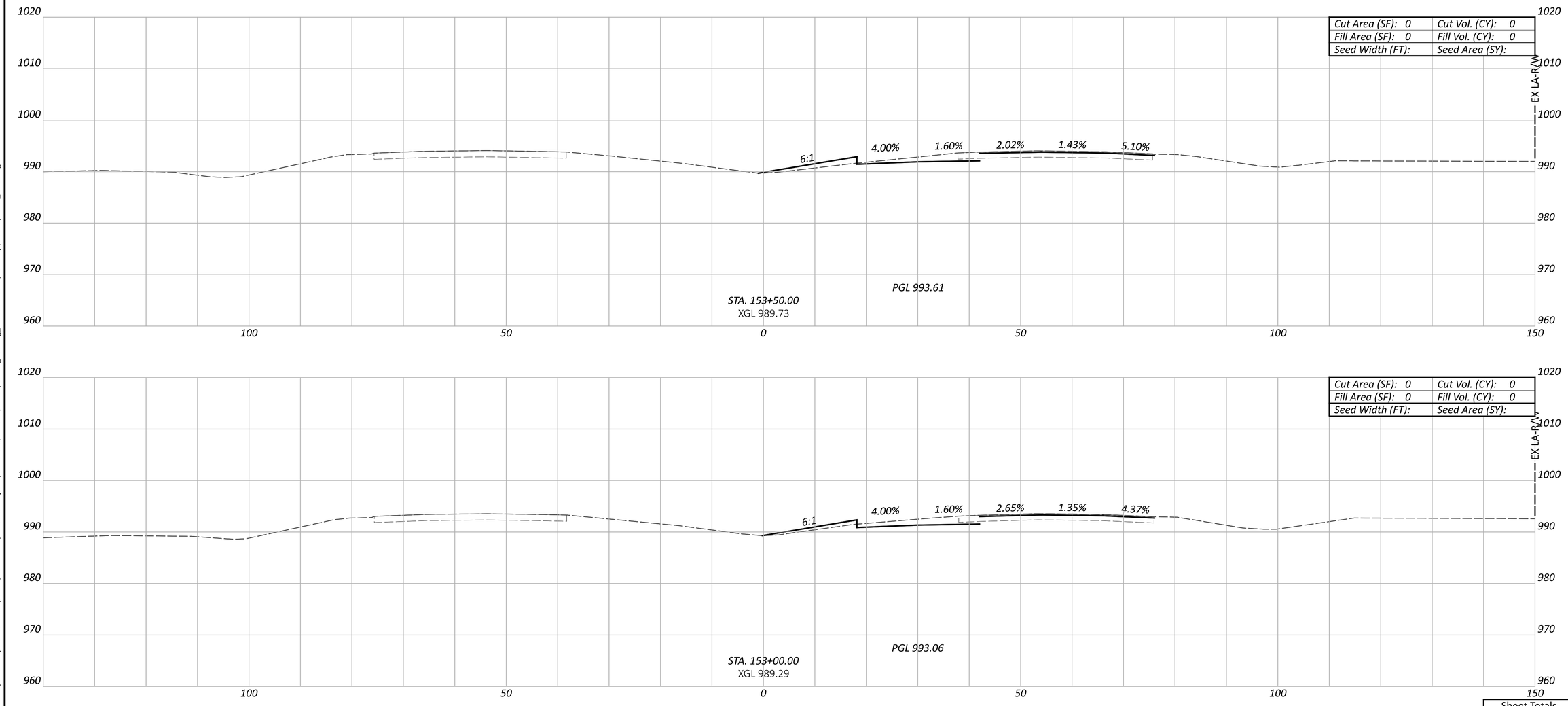
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.444 TOTAL 740



CROSS SECTIONS - IR 70
STA. 153+00.00 TO STA. 153+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.445 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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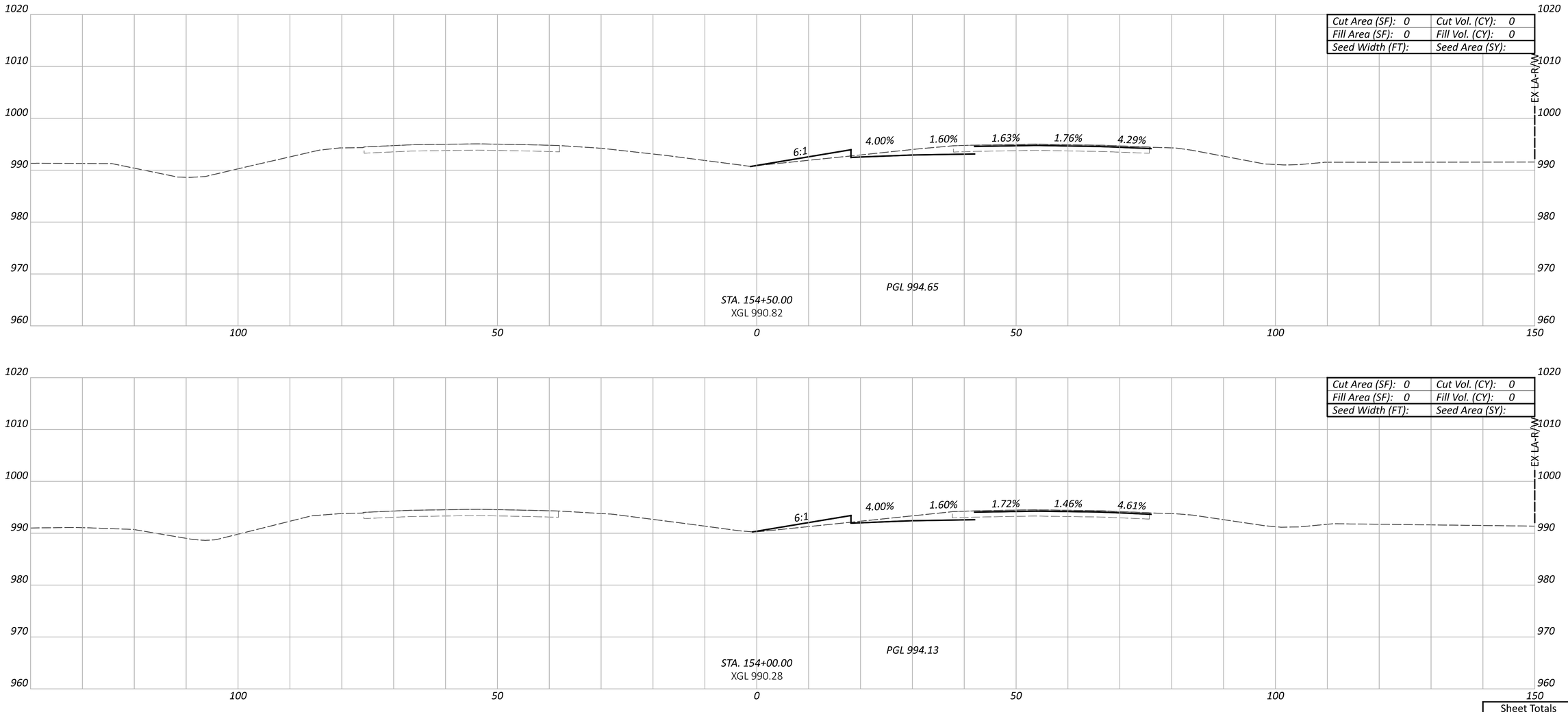

CROSS SECTIONS - IR 70
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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

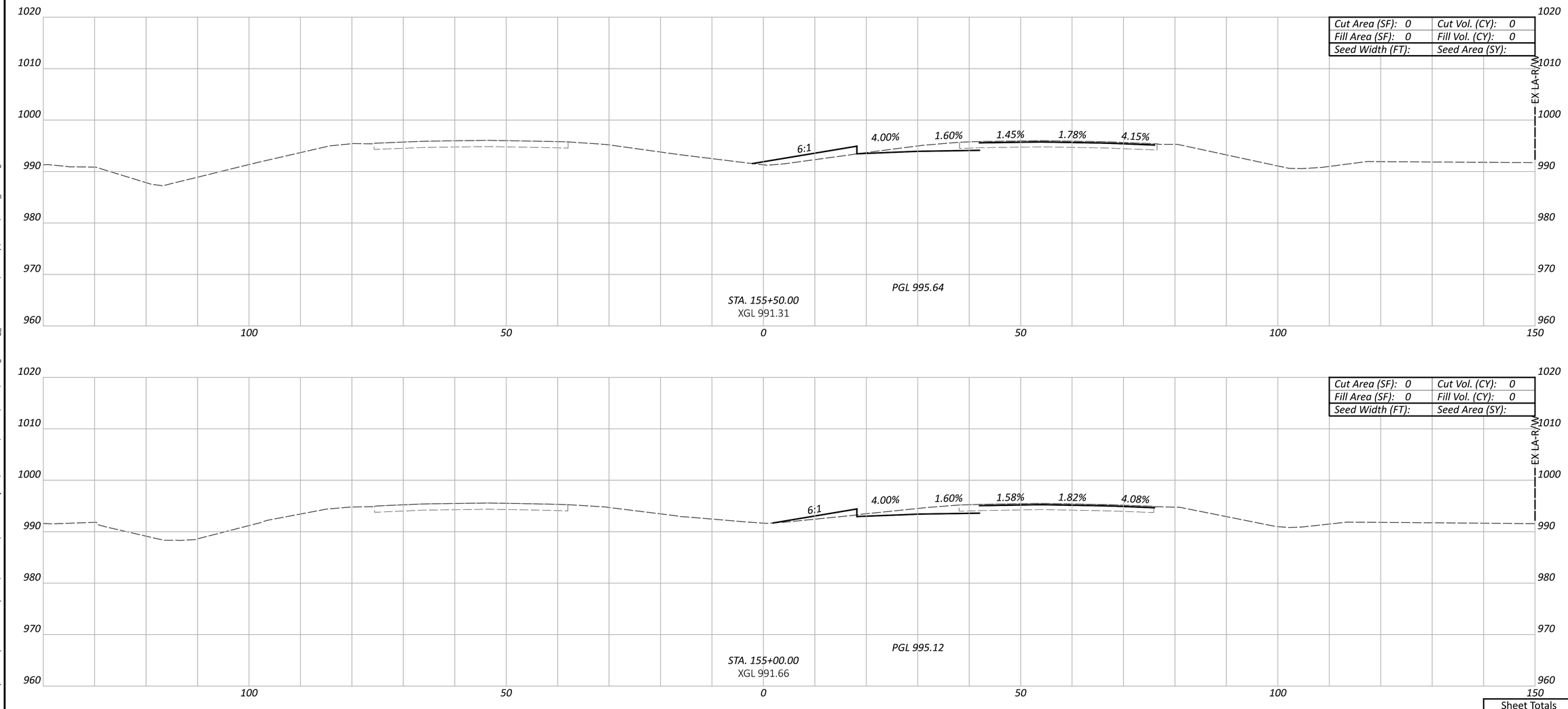
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.446 TOTAL 740



CROSS SECTIONS - IR 70
STA. 155+00.00 TO STA. 155+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

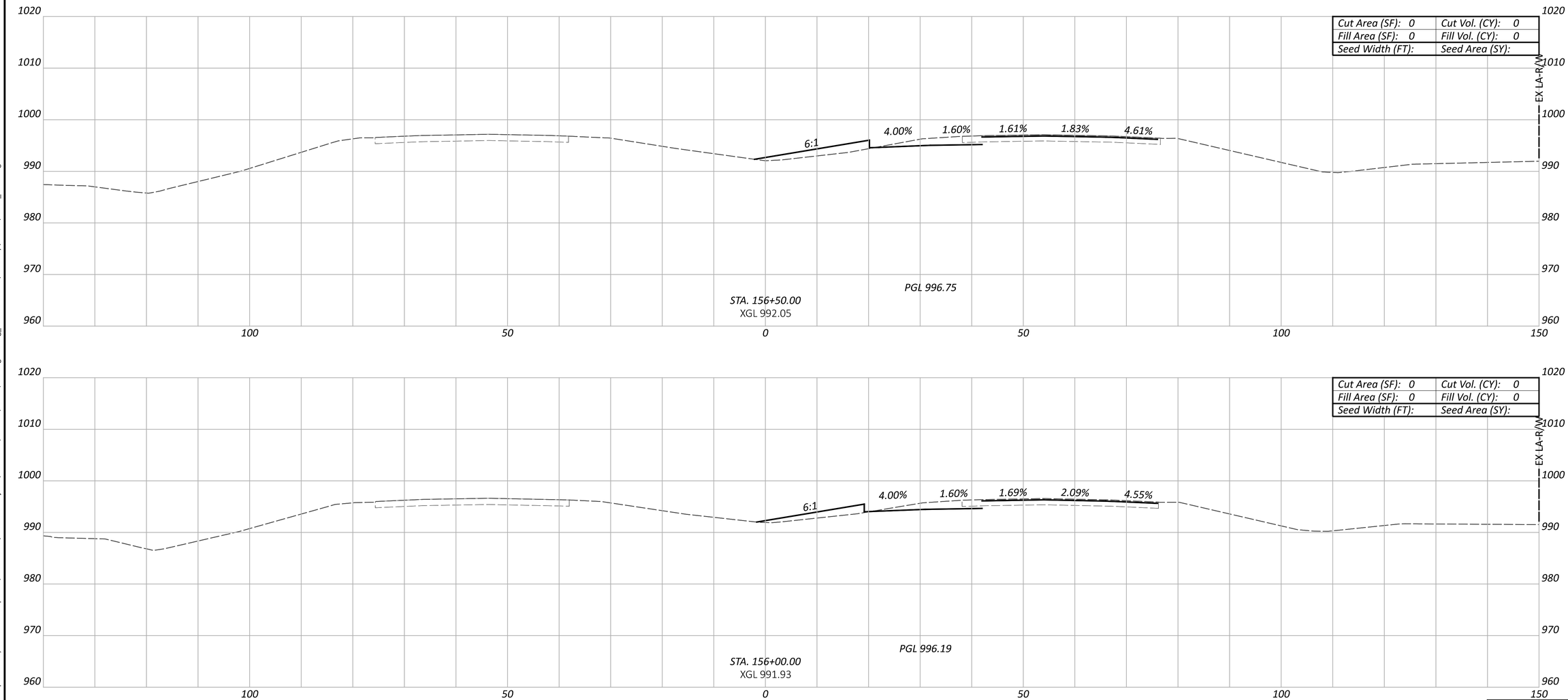
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.447 TOTAL 740



CROSS SECTIONS - IR 70
STA. 156+00.00 TO STA. 156+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

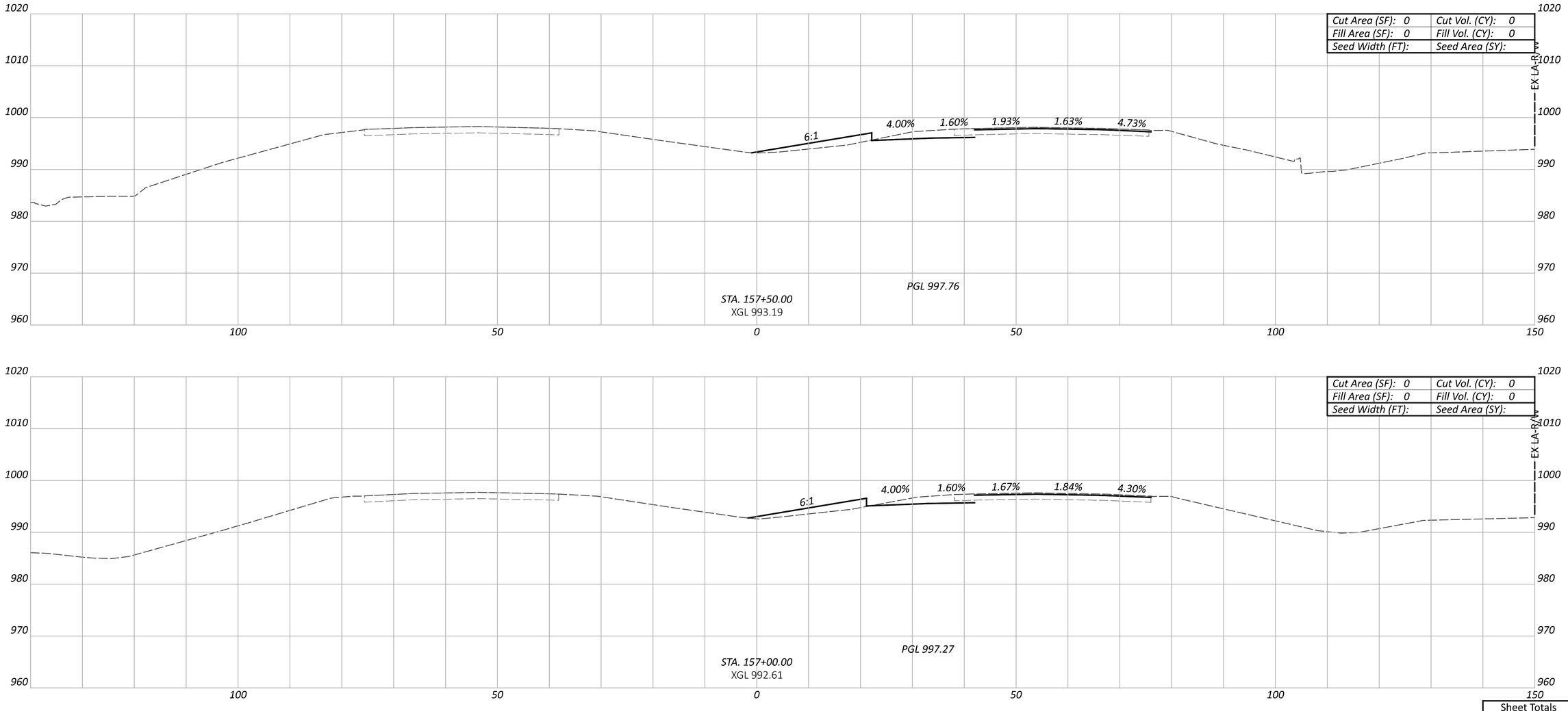
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.448	740



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CROSS SECTIONS - IR 70
STA. 157+00.00 TO STA. 157+50.00

Sheet Totals		
Seeding	Cut	Fill

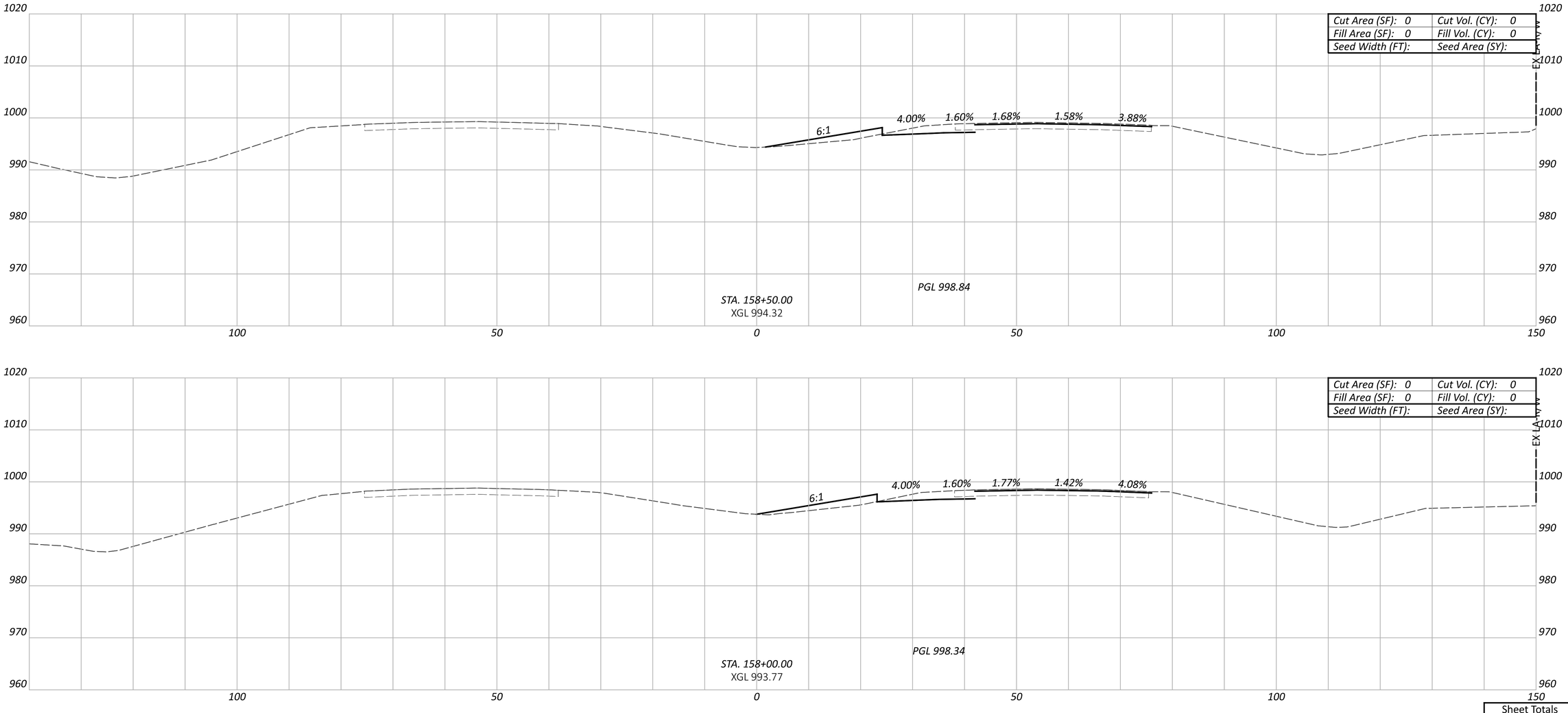
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.449	740



CROSS SECTIONS - IR 70
STA. 158+00.00 TO STA. 158+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

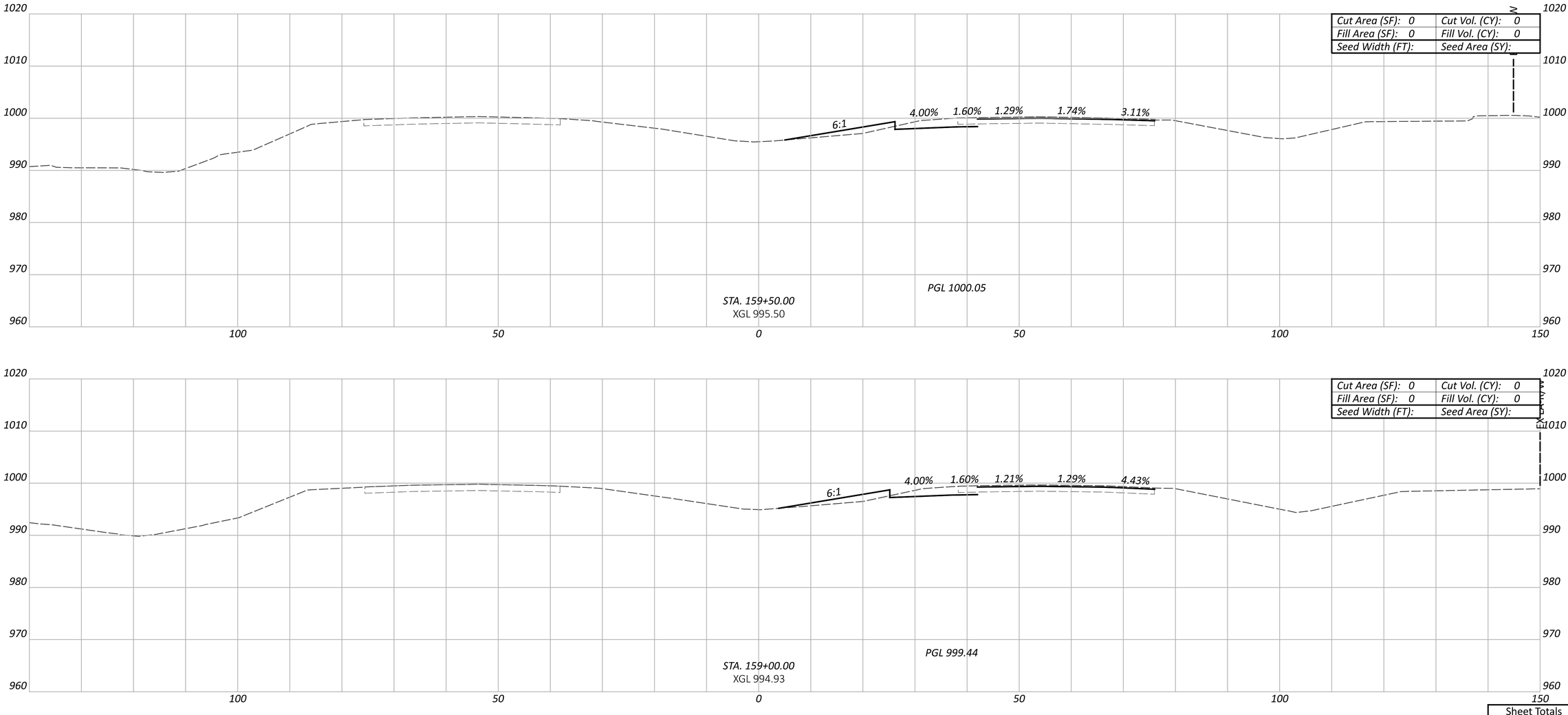
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.450 | TOTAL 740



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CROSS SECTIONS - IR 70
STA. 159+00.00 TO STA. 159+50.00

Sheet Totals		
Seeding	Cut	Fill

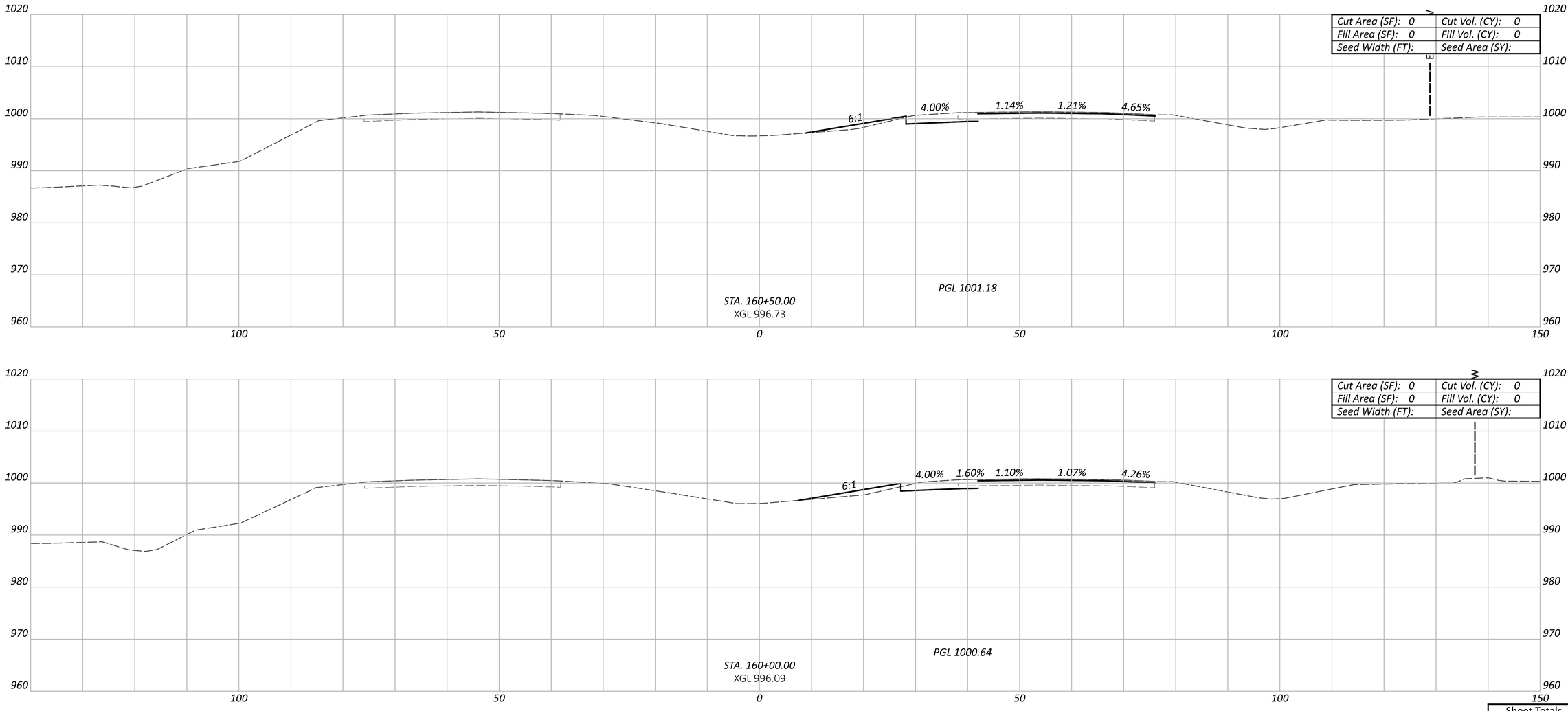
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.451 | TOTAL 740



CROSS SECTIONS - IR 70
STA. 160+00.00 TO STA. 160+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

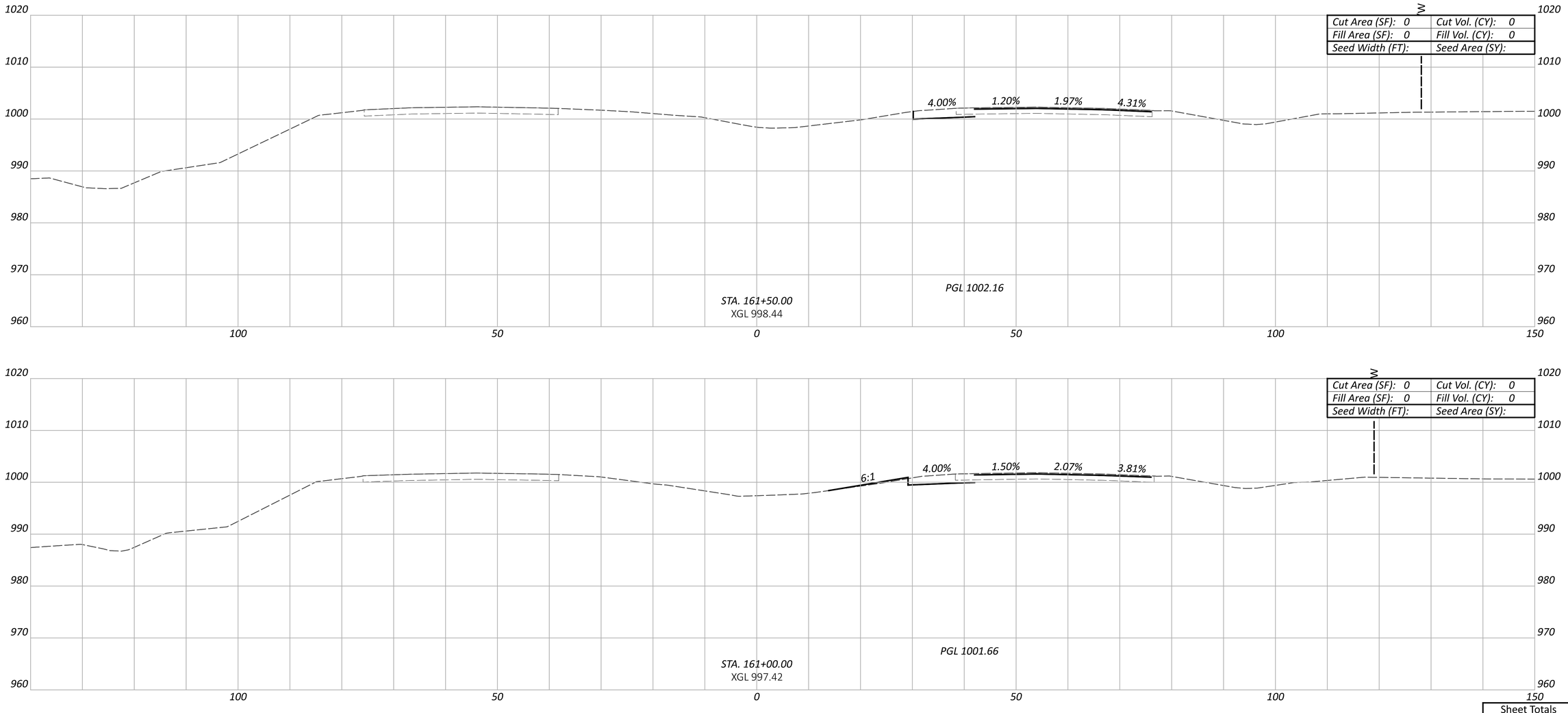
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.452	740



Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - IR 70
STA. 161+00.00 TO STA. 161+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	REVIEWER	PROJECT ID
BER	KAM 06/18/23	96808

SHEET	TOTAL
P.453	740

FAI/LIC IR 70 0.00/0.00

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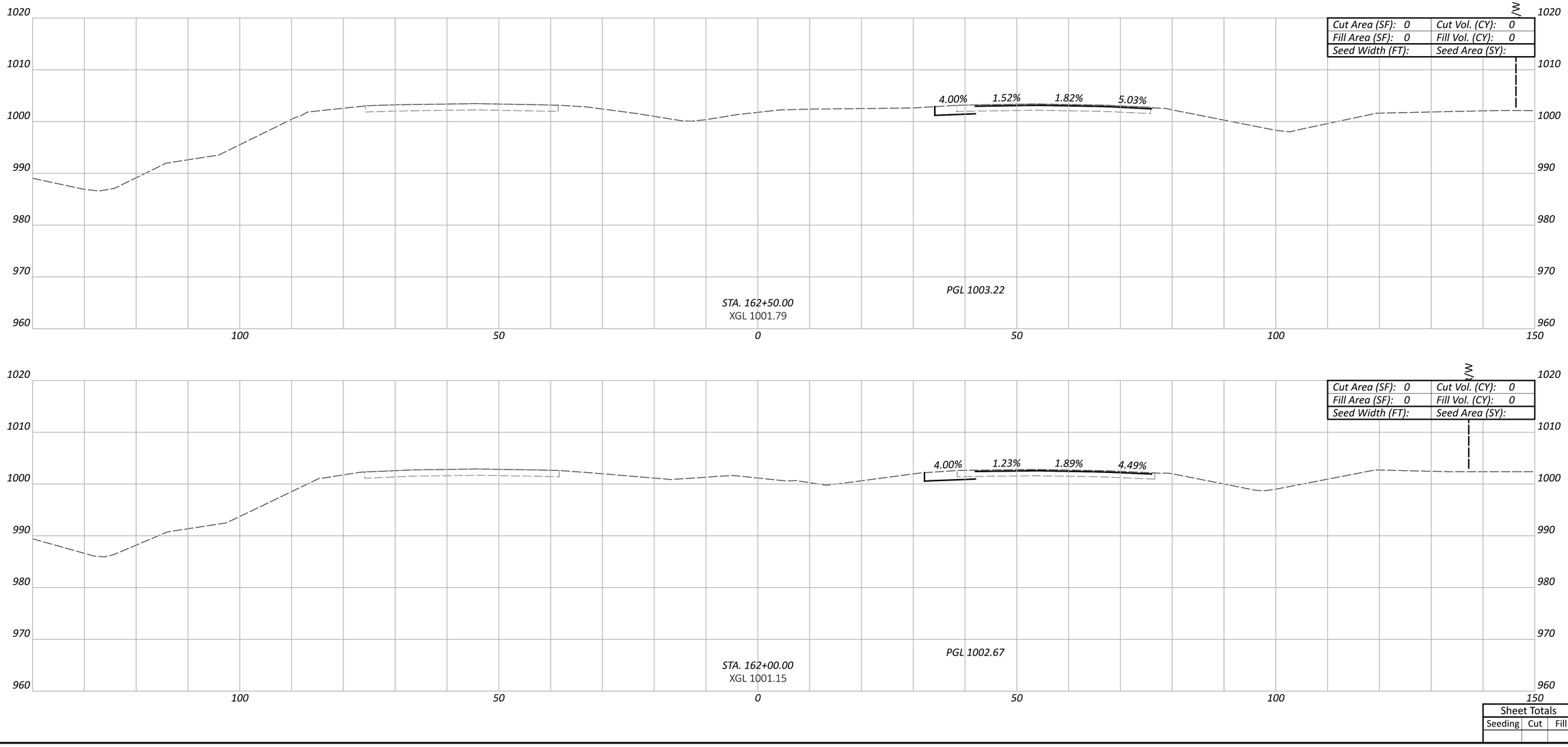

CROSS SECTIONS - IR 70
STA. 162+00.00 TO STA. 162+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

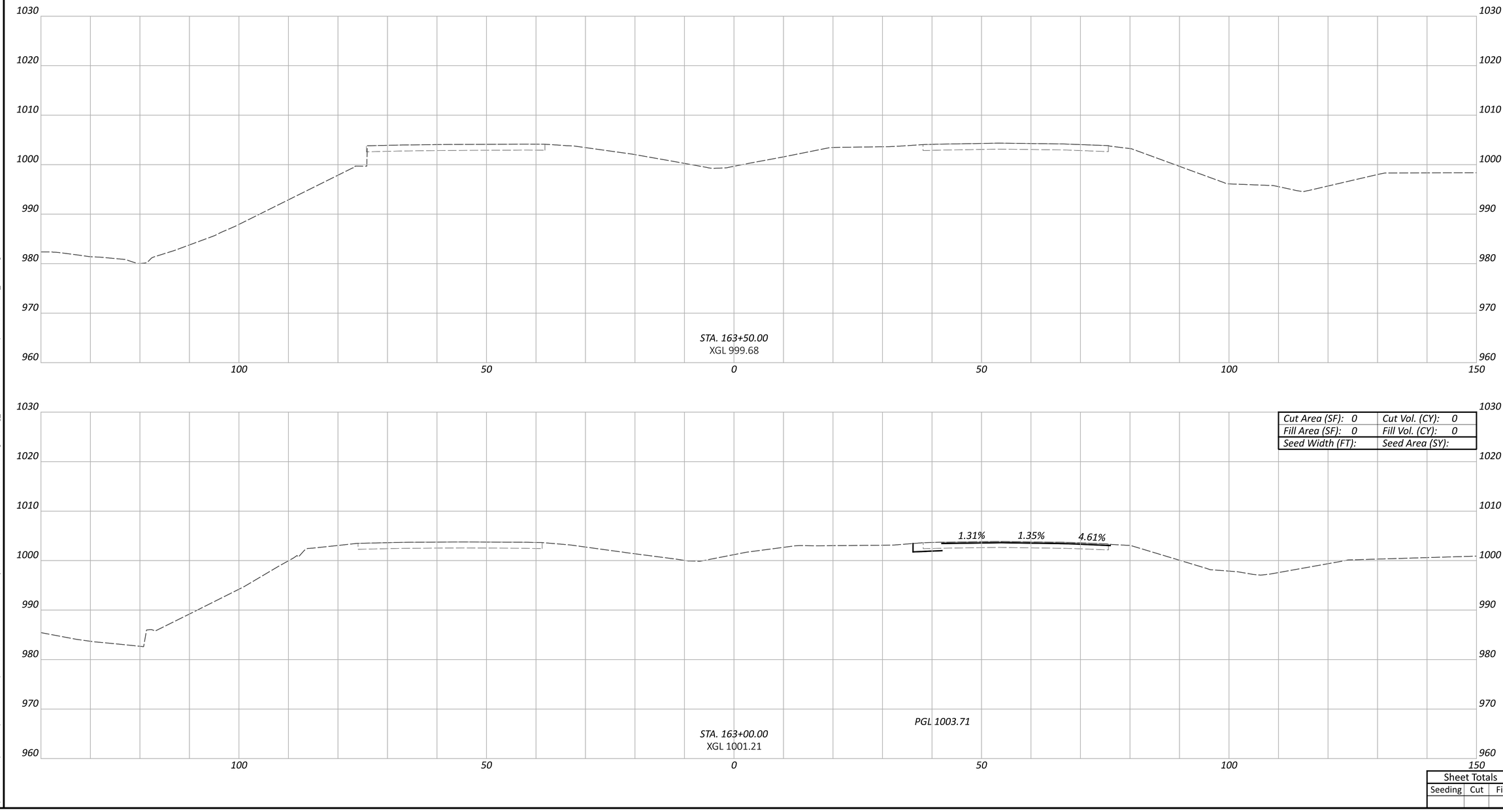
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.454 TOTAL 740



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CROSS SECTIONS - IR 70
STA. 163+00.00 TO STA. 163+50.00

Sheet Totals		
Seeding	Cut	Fill

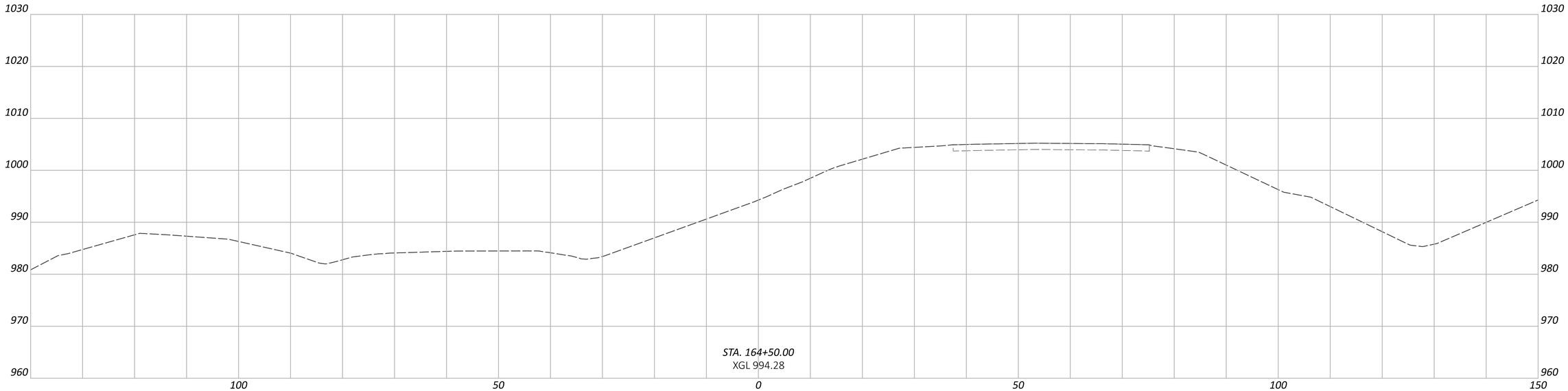
DESIGN AGENCY
STRUCTUREPOINT LLC

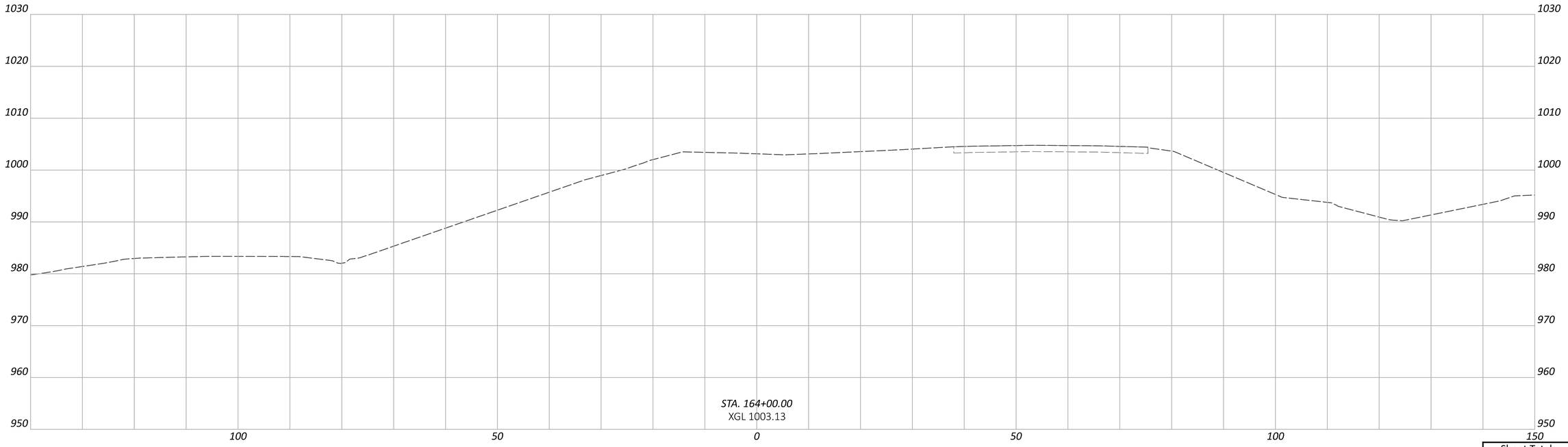
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.455 TOTAL 740





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STA. 164+00.00 TO STA. 165+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

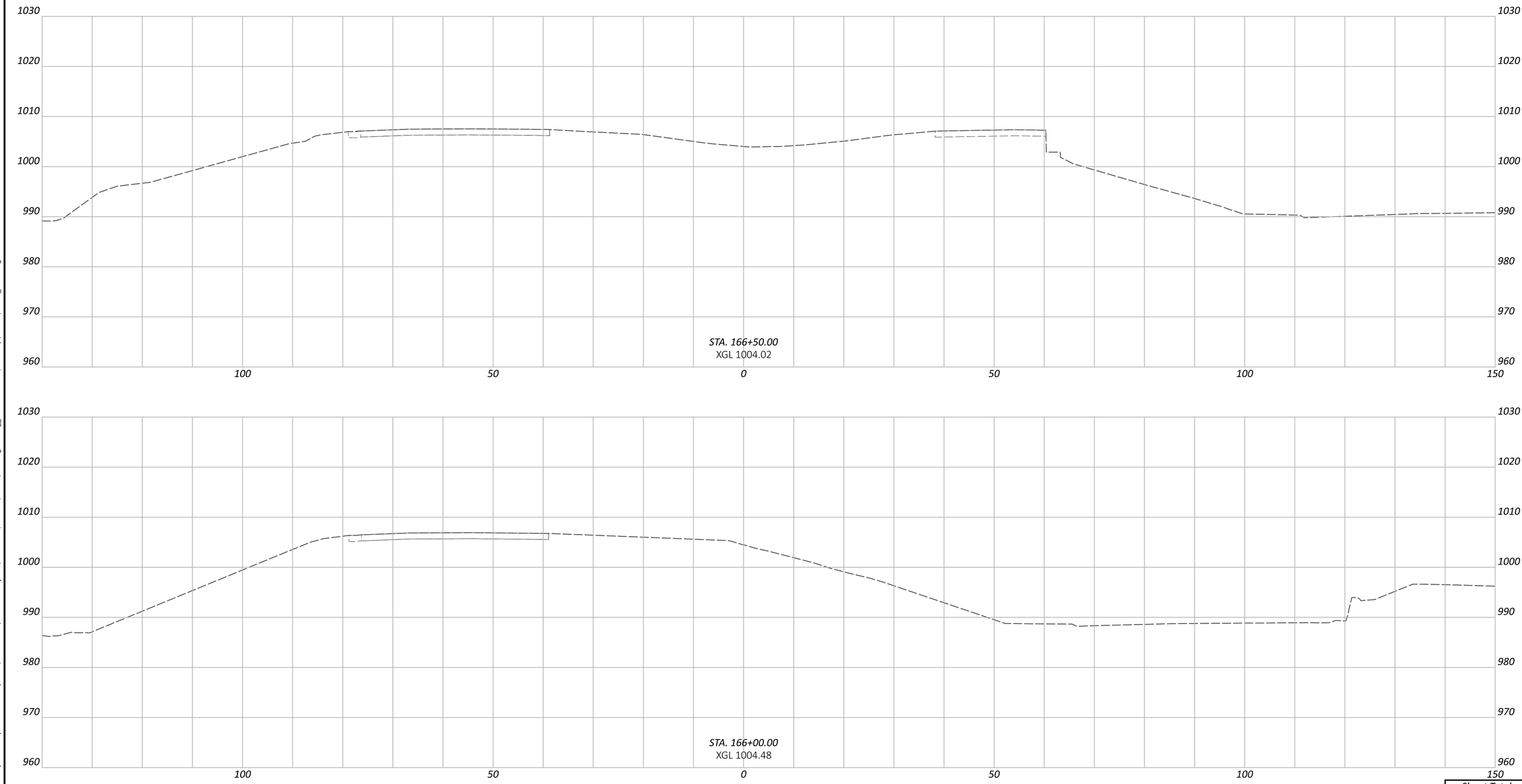
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.456 TOTAL 740



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CROSS SECTIONS - IR 70
STA. 166+00.00 TO STA. 166+50.00

DESIGN AGENCY
STRUCTUREPOINT INC.

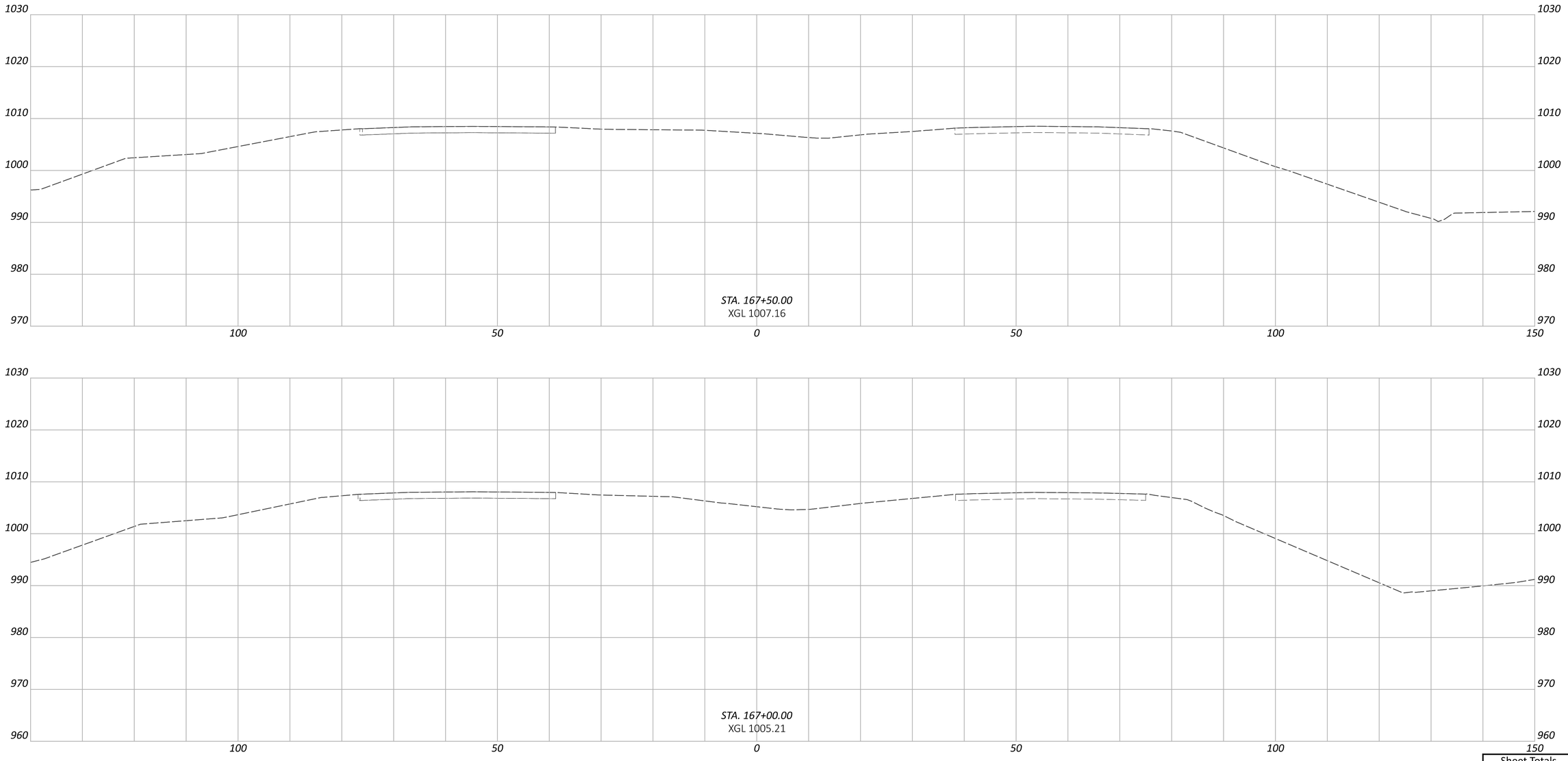
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.457	740



CROSS SECTIONS - IR 70
STA. 167+00.00 TO STA. 167+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

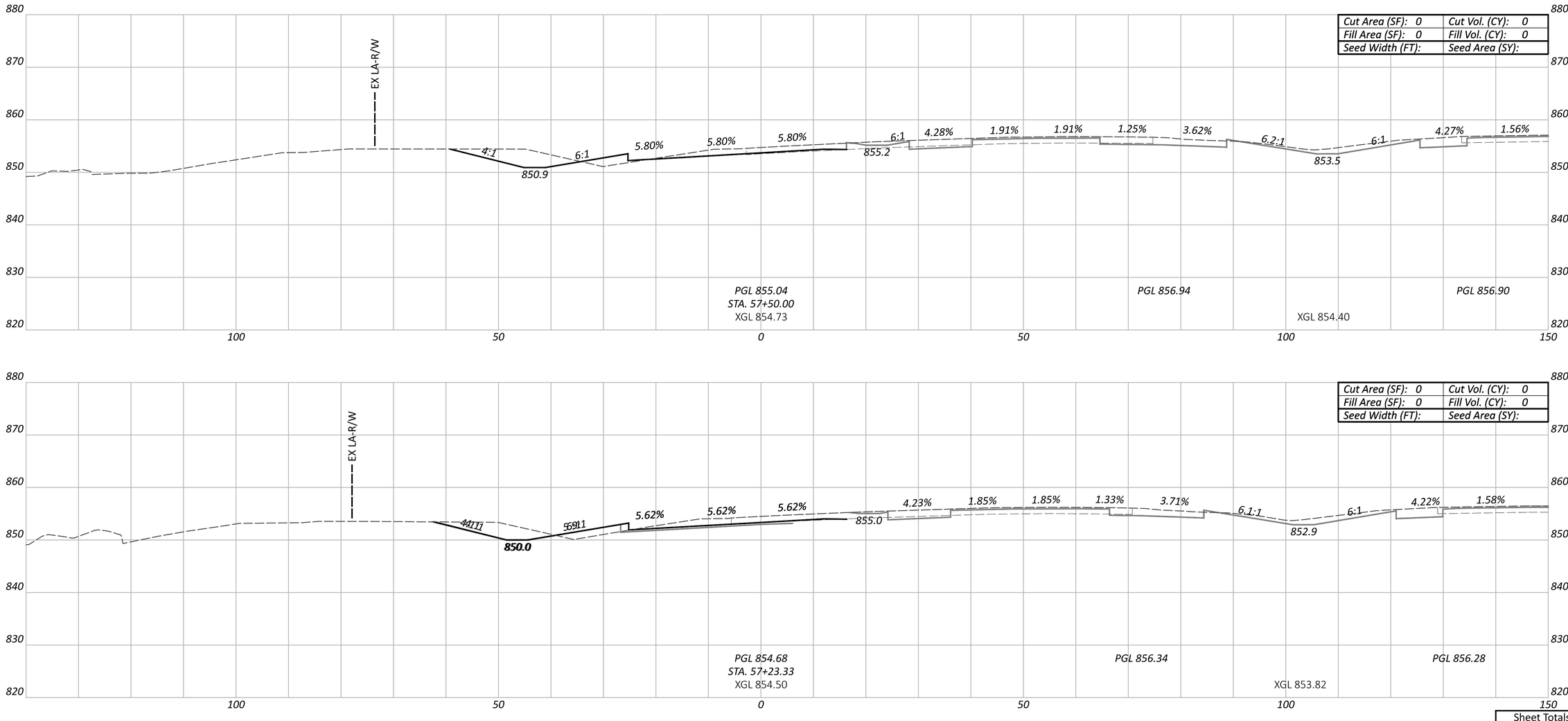
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.458	740



CROSS SECTIONS - RAMP A
STA. 57+23.33 TO STA. 57+50.00

FAI/LIC IR 70 0.00/0.00

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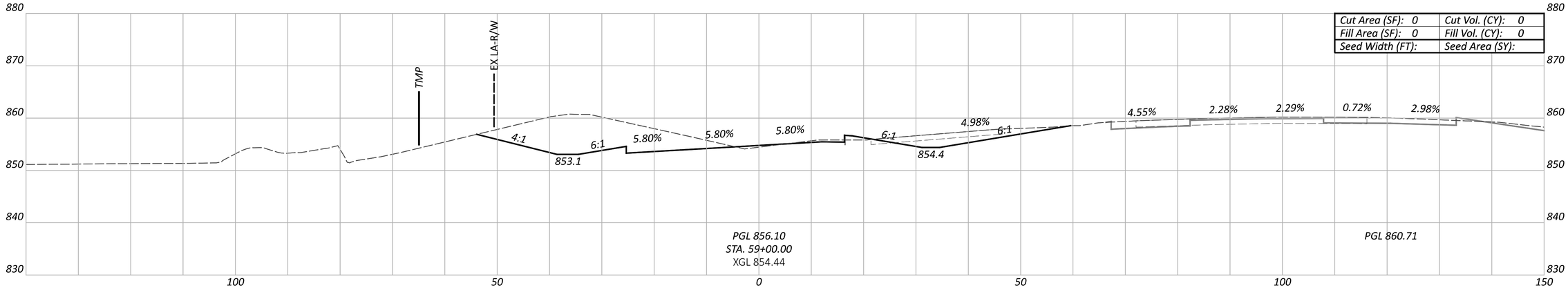
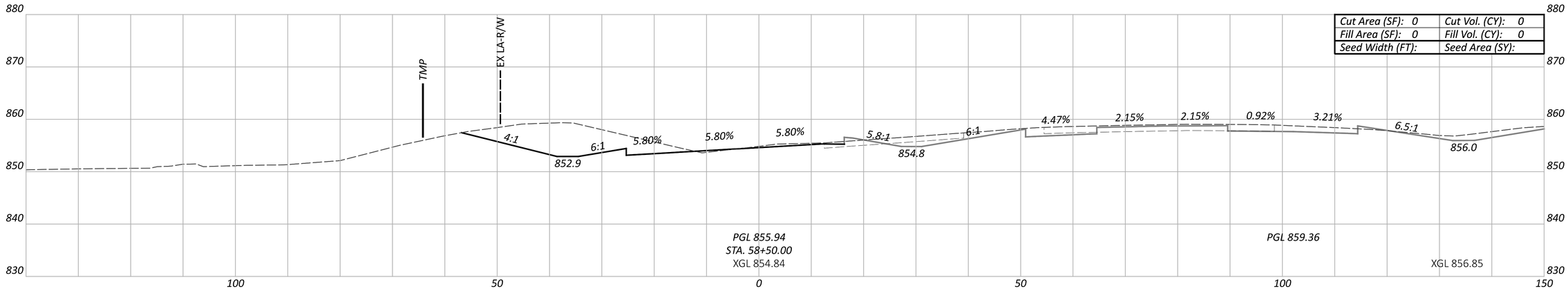
DESIGN AGENCY
STRUCTUREPOINT INC.

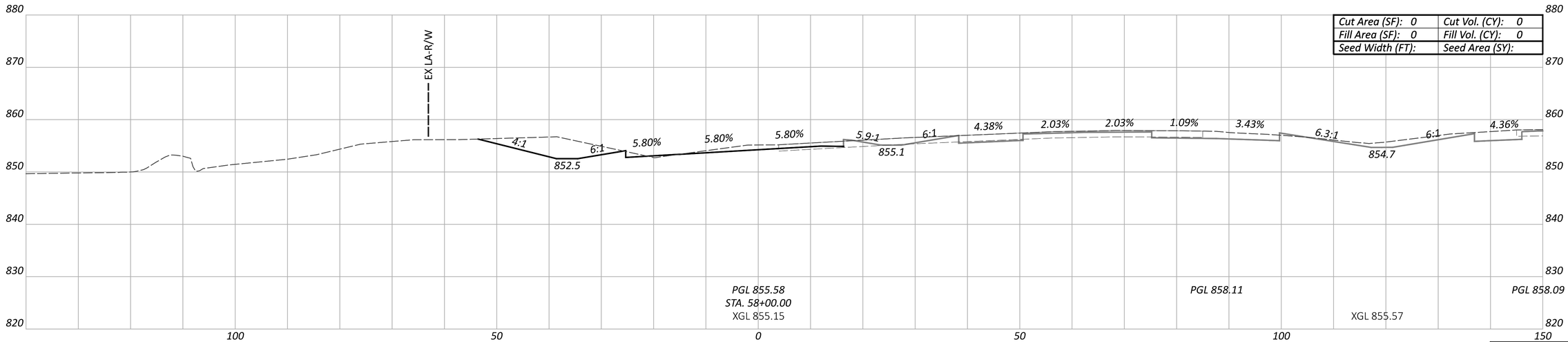
DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.459	740

Sheet Totals

Seeding	Cut	Fill







CROSS SECTIONS - RAMP A
STA. 58+00.00 TO STA. 59+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.460
TOTAL	740

FAI/LIC IR 70 0.00/0.00

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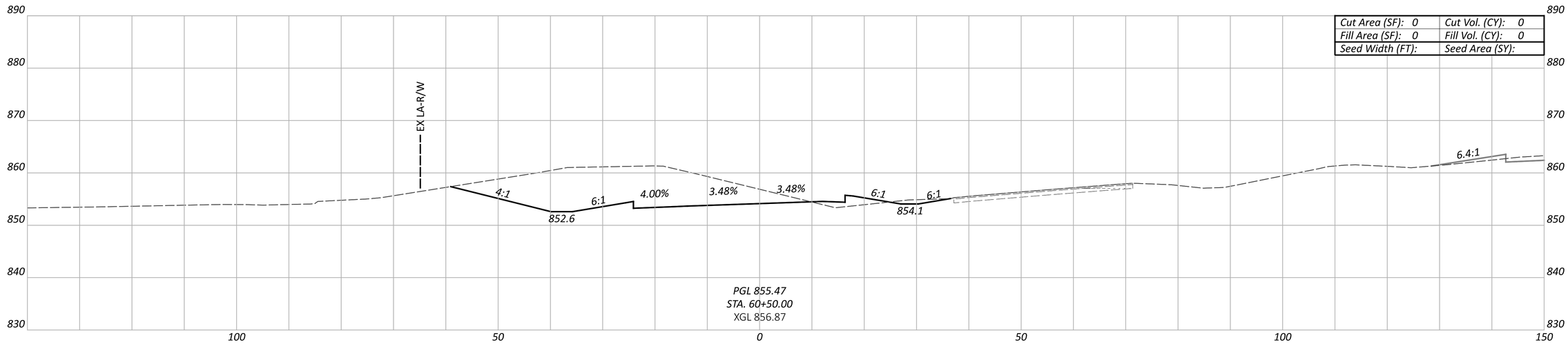

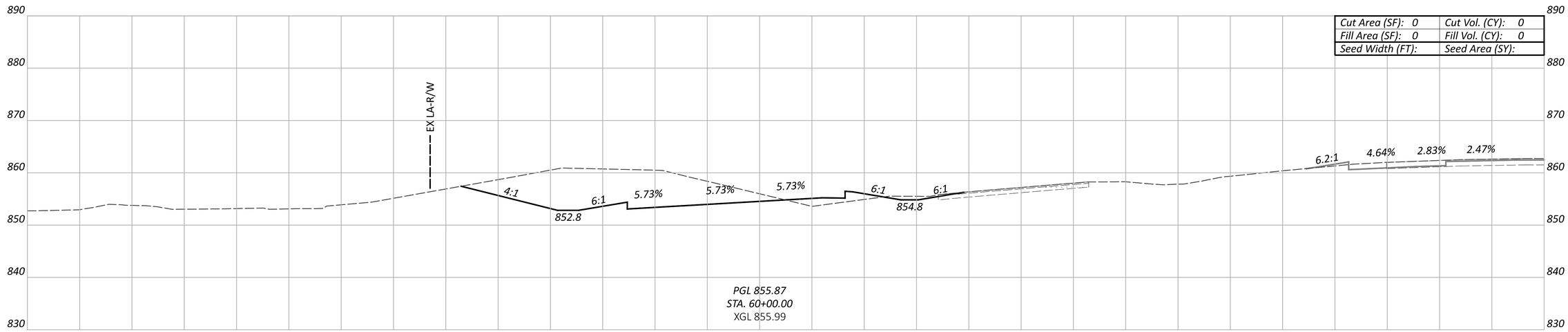

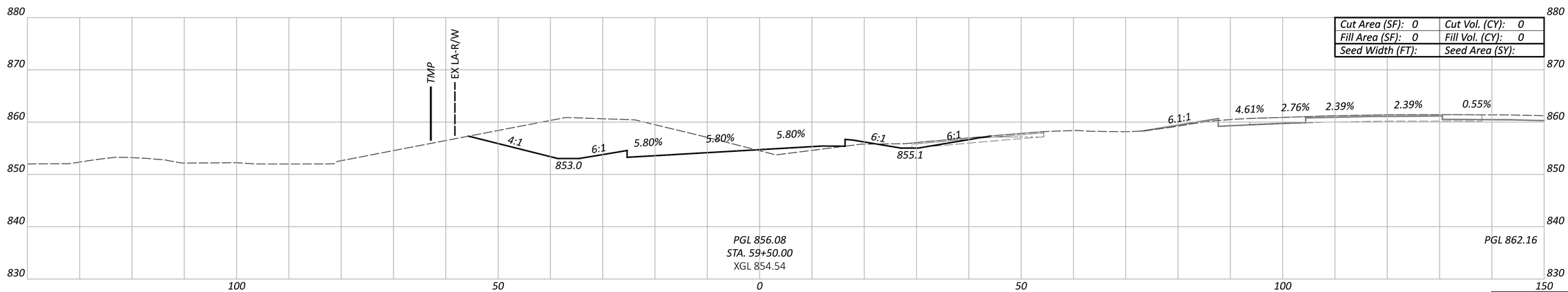

CROSS SECTIONS - RAMP A
STA. 59+50.00 TO STA. 60+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.461 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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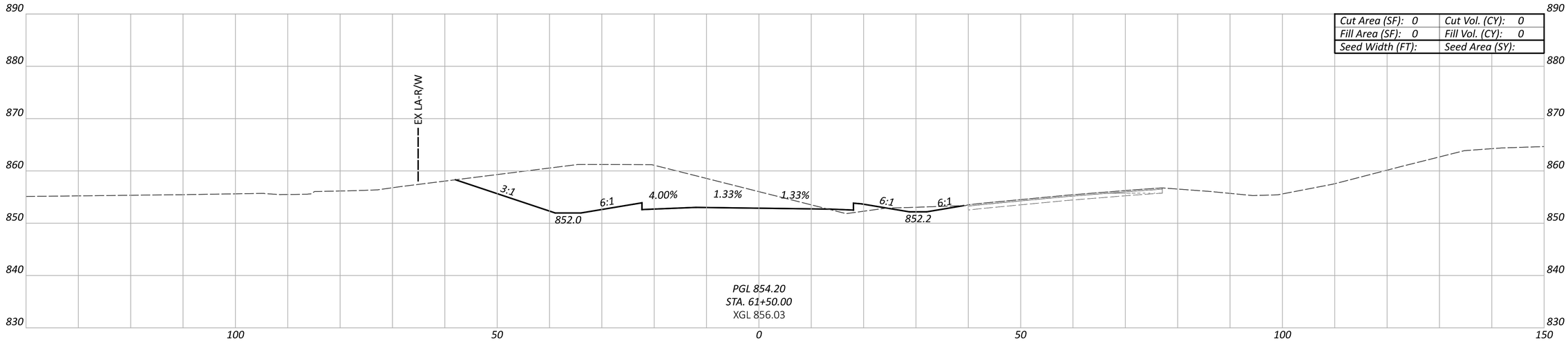

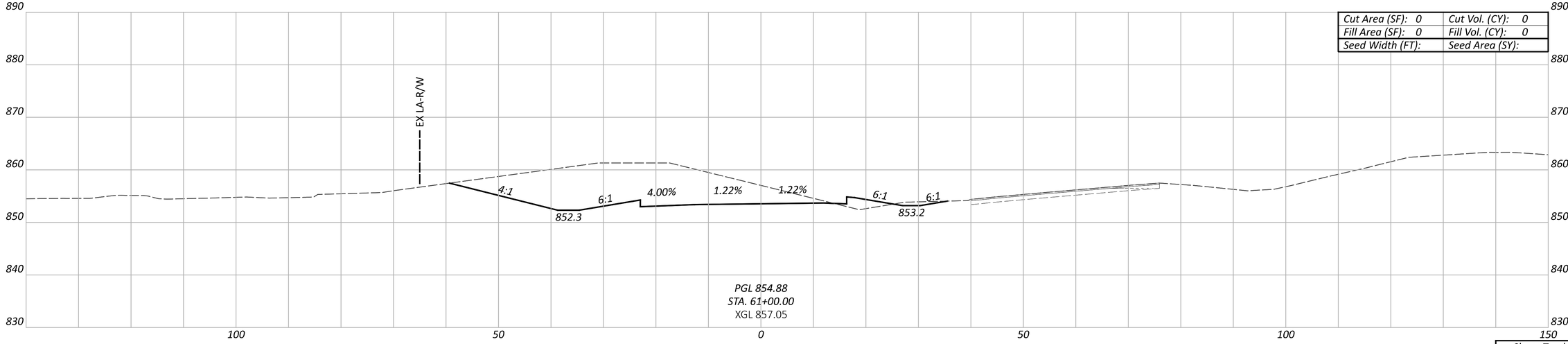

CROSS SECTIONS - RAMP A
STA. 61+00.00 TO STA. 61+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

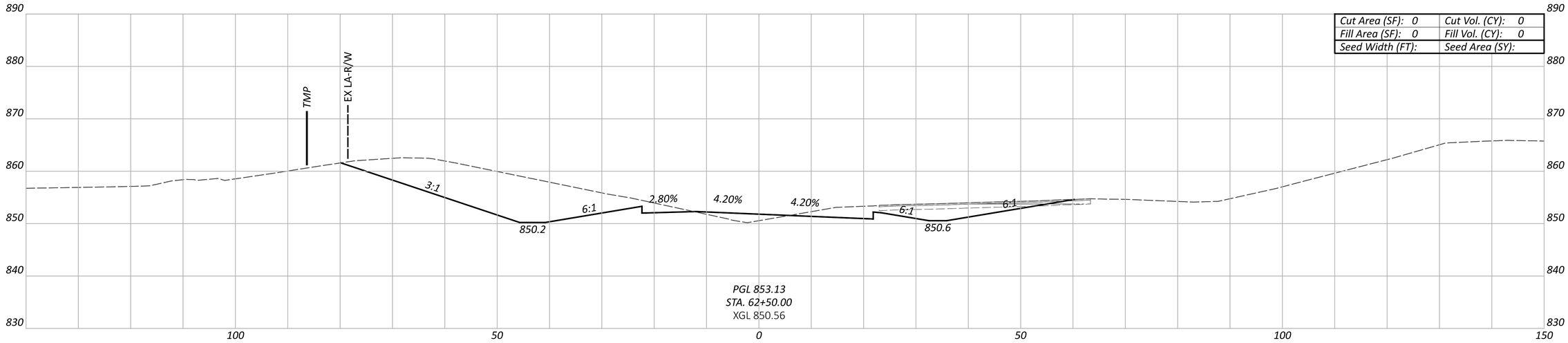
DESIGNER
BER

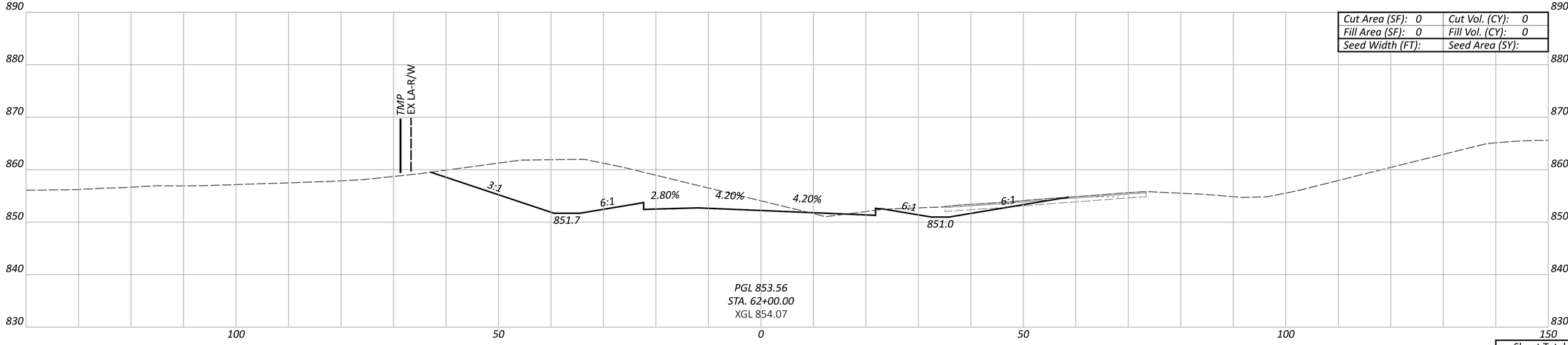
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.462	740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

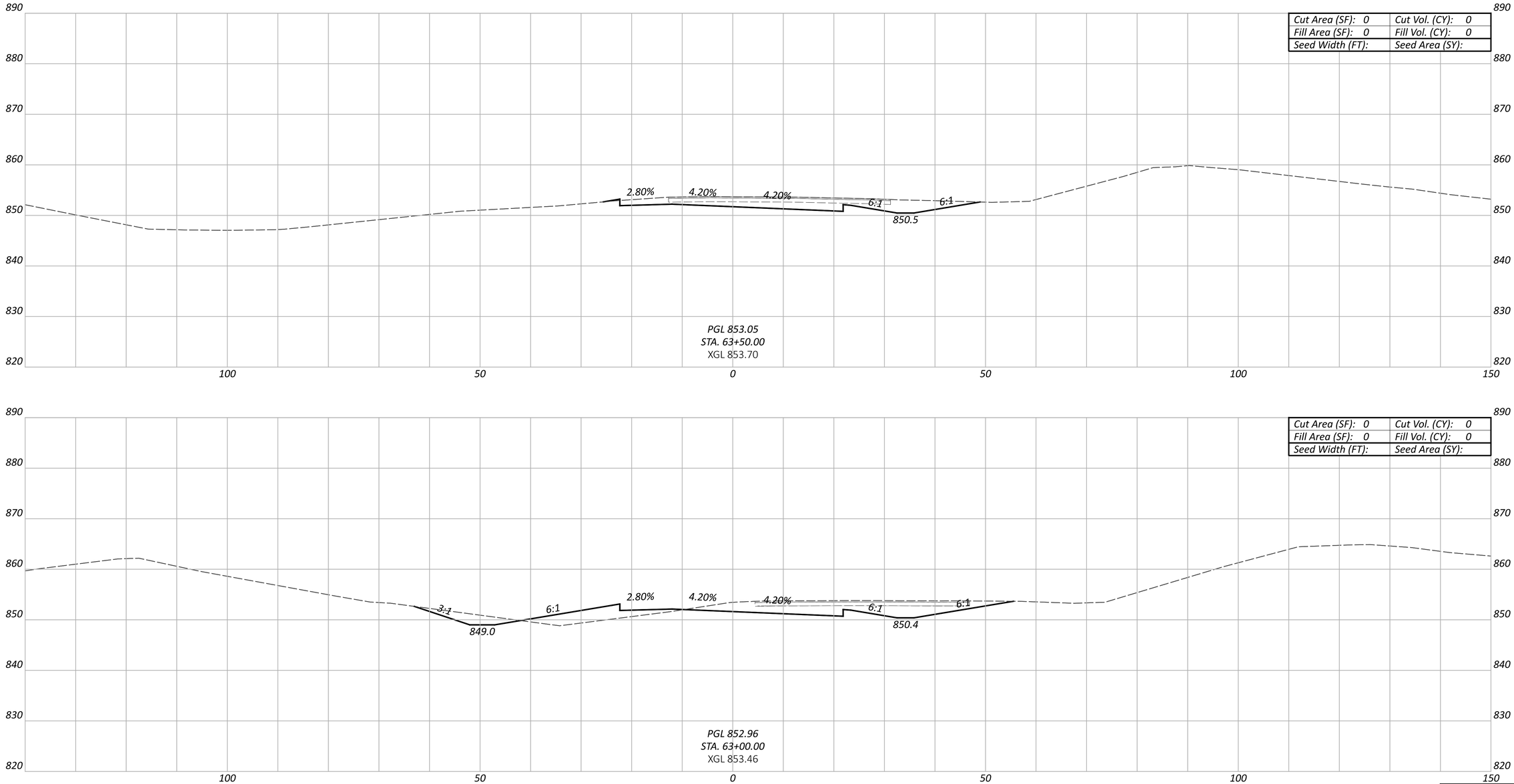
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.463 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.464 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - RAMP A
STA. 64+00.00

Sheet Totals		
Seeding	Cut	Fill

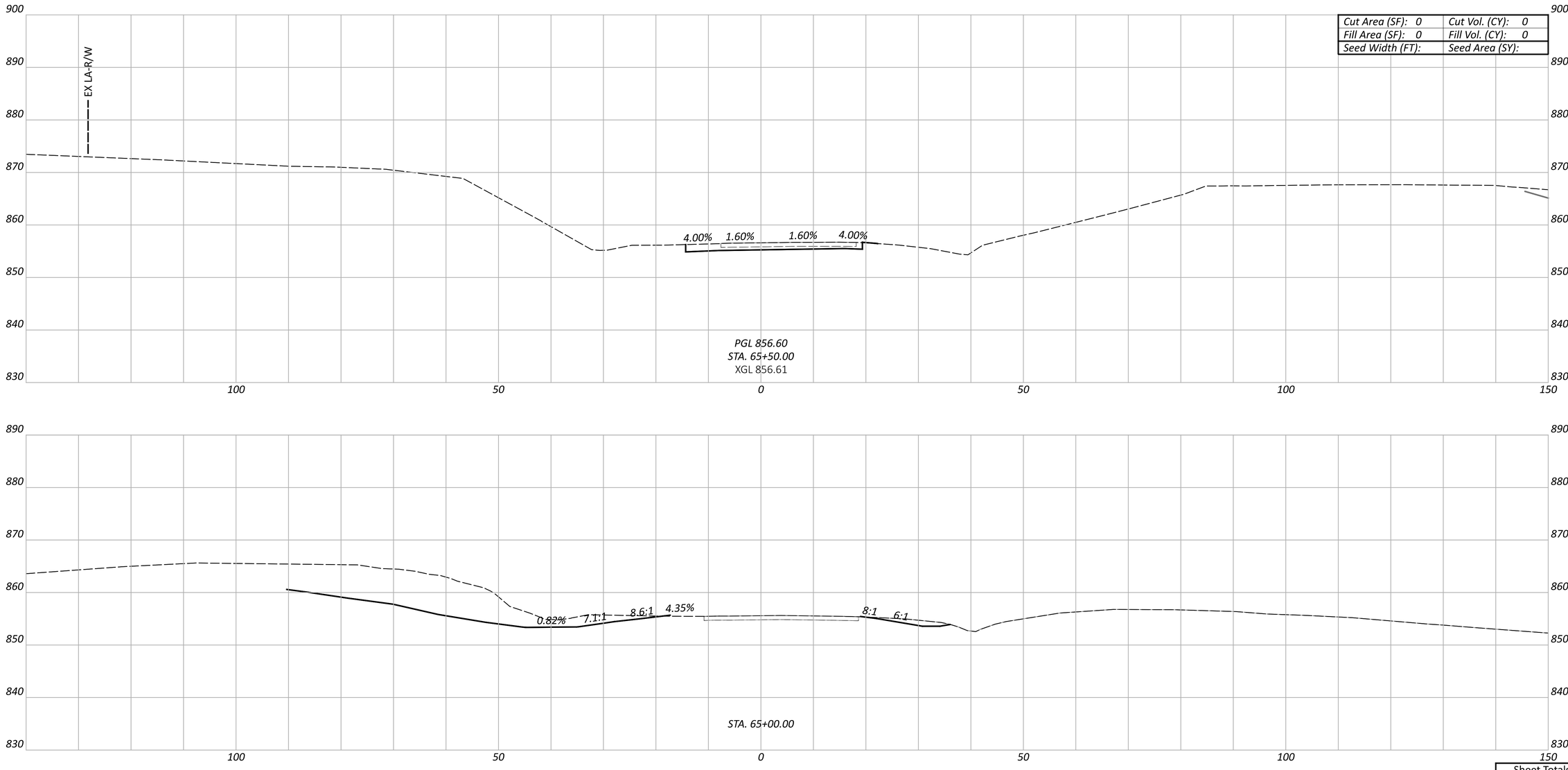
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.465 TOTAL 740



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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

CROSS SECTIONS - RAMP B
STA. 65+00.00 TO STA. 65+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070B - 65+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:28:29 PM USER: aoldaker
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DESIGN AGENCY
STRUCTUREPOINT INC.

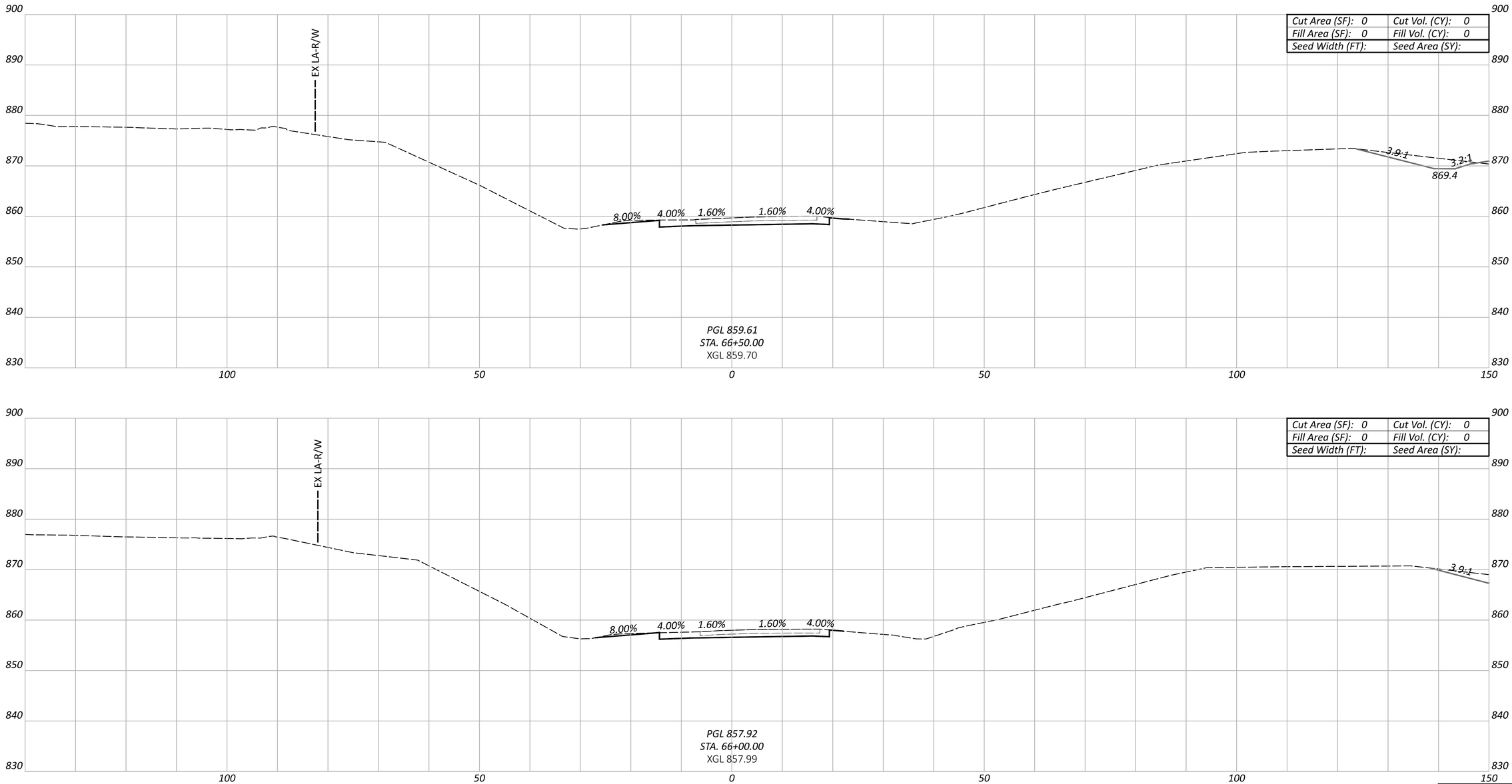
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.466	740



CROSS SECTIONS - RAMP B
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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

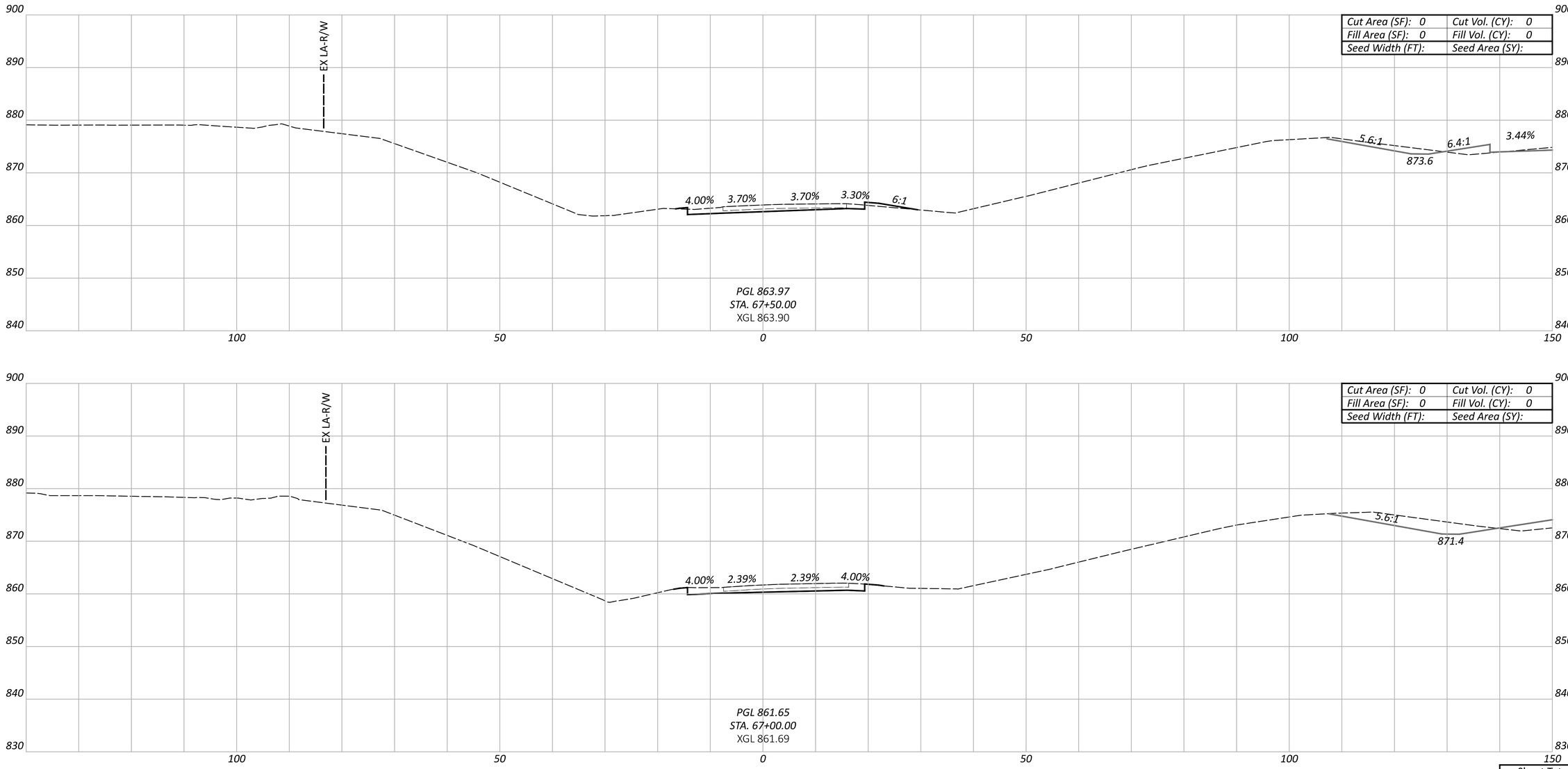
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.467 TOTAL 740



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CROSS SECTIONS - RAMP B
STA. 67+00.00 TO STA. 67+50.00

Sheet Totals		
Seeding	Cut	Fill

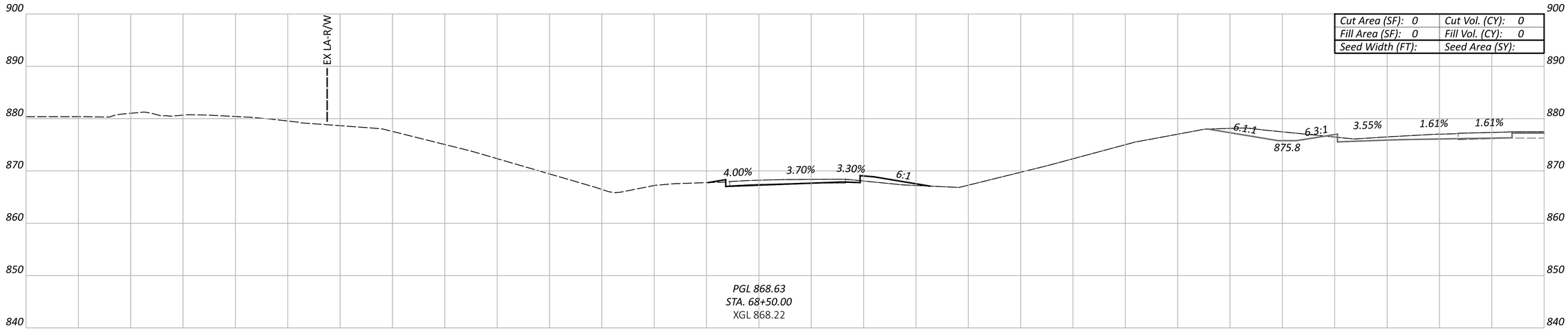
DESIGN AGENCY
STRUCTUREPOINT LLC

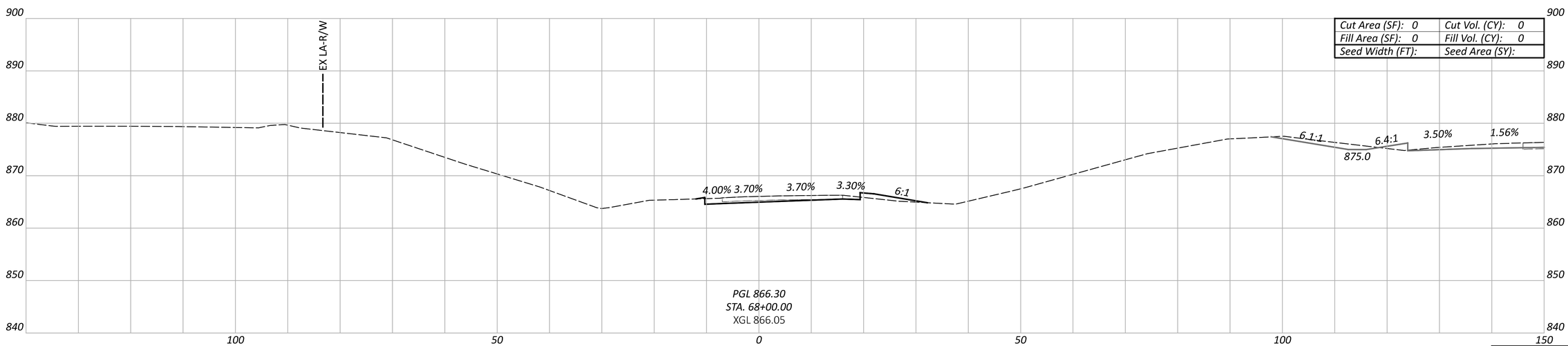
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.468 TOTAL 740





CROSS SECTIONS - RAMP B
STA. 68+00.00 TO STA. 68+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

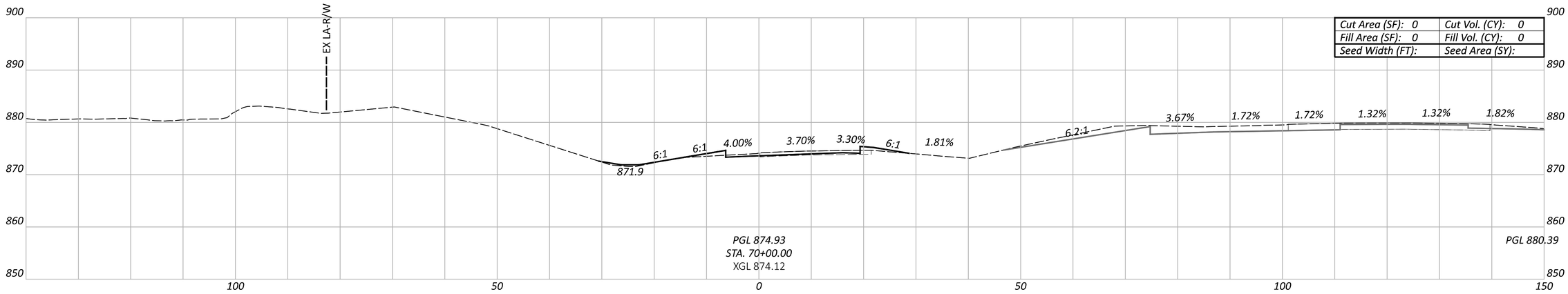
DESIGNER
BER

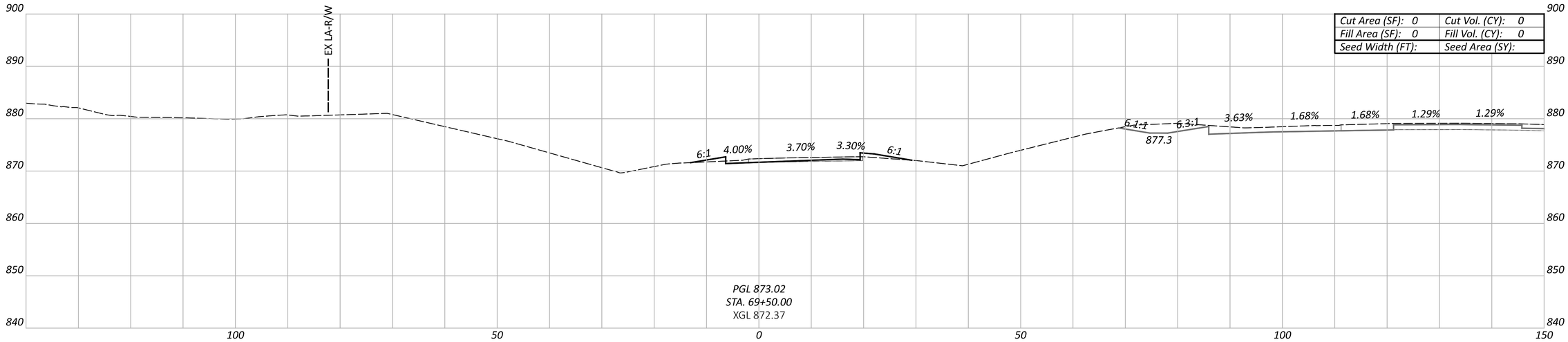
REVIEWER
KAM 06/18/23

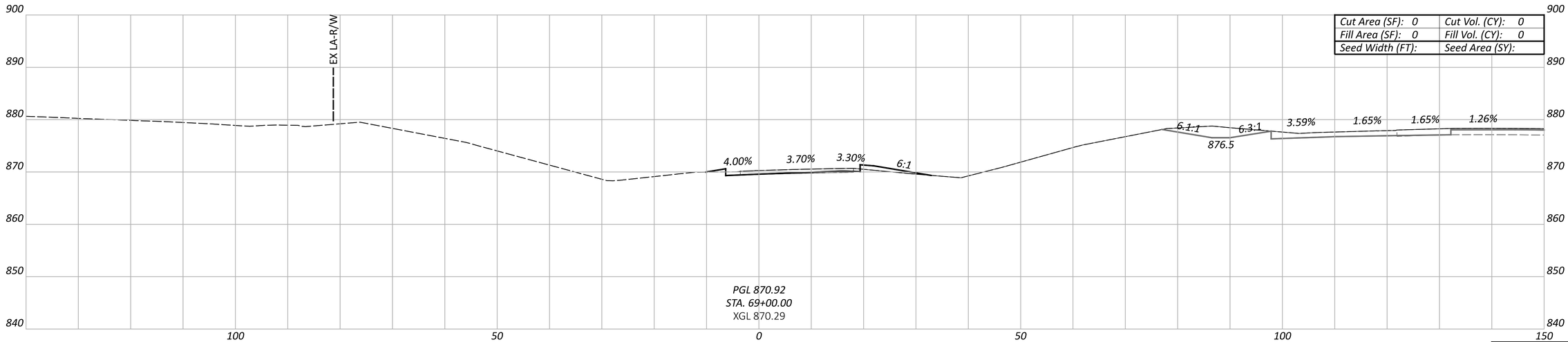
PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.469	740







CROSS SECTIONS - RAMP B
STA. 69+00.00 TO STA. 70+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

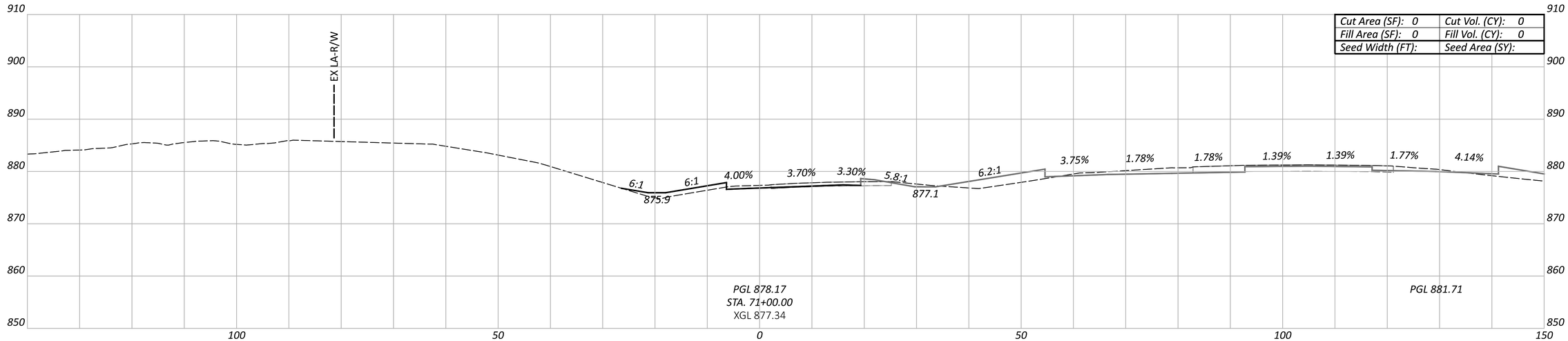
DESIGN AGENCY
STRUCTUREPOINT LLC

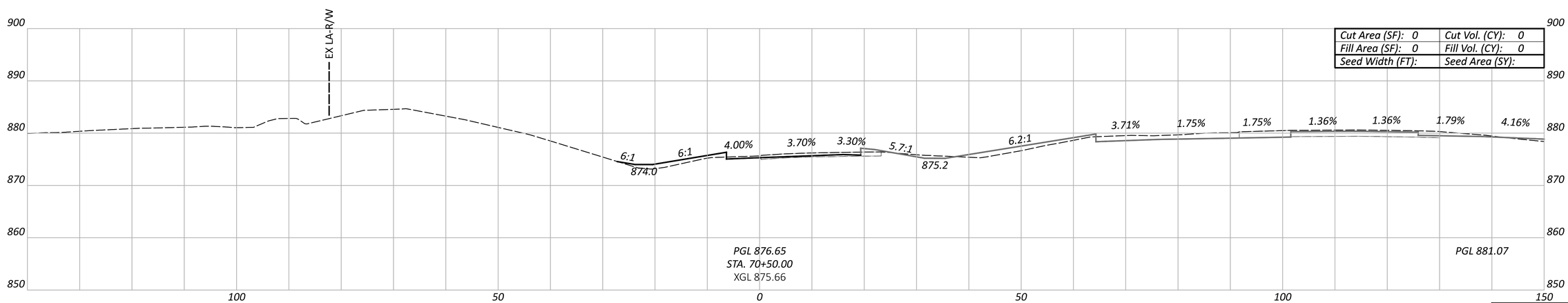
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.470 TOTAL 740





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CROSS SECTIONS - RAMP B
STA. 70+50.00 TO STA. 71+00.00

Sheet Totals		
Seeding	Cut	Fill

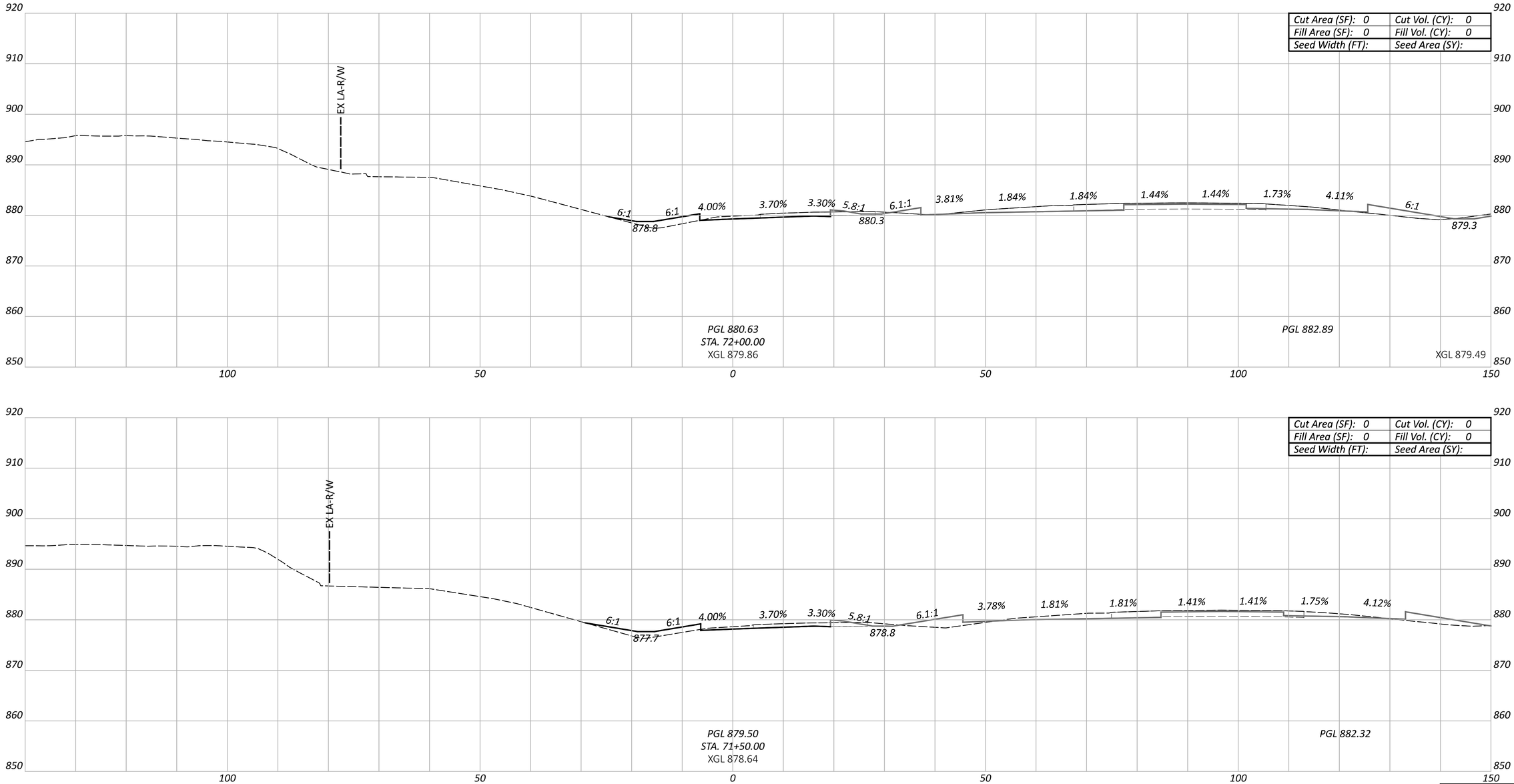
DESIGN AGENCY
MICHAEL BAKER INTERNATIONAL
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.471 TOTAL 740



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CROSS SECTIONS - RAMP B
STA. 71+50.00 TO STA. 72+00.00

Sheet Totals		
Seeding	Cut	Fill

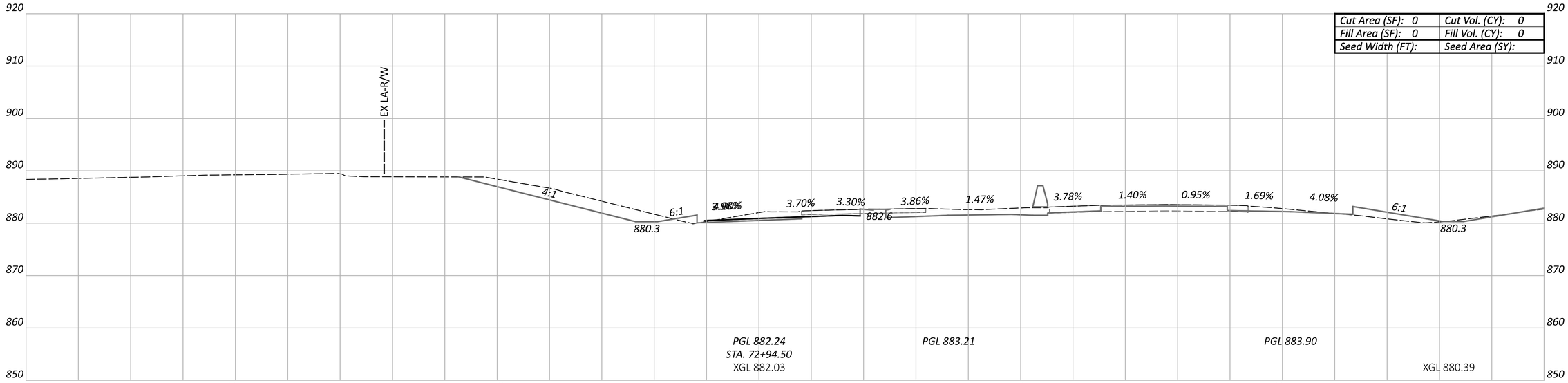
DESIGN AGENCY
STRUCTUREPOINT INC.

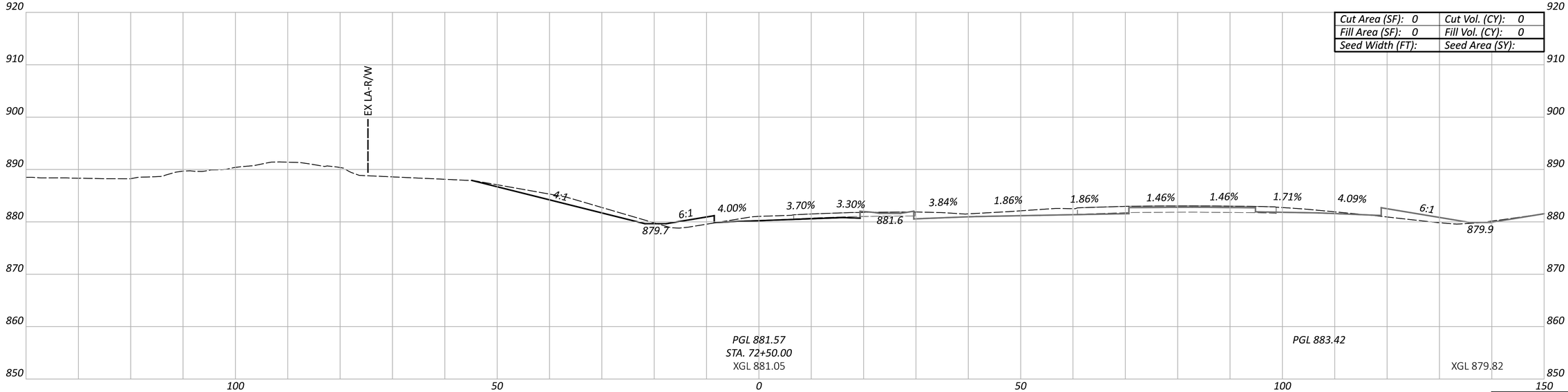
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.472 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

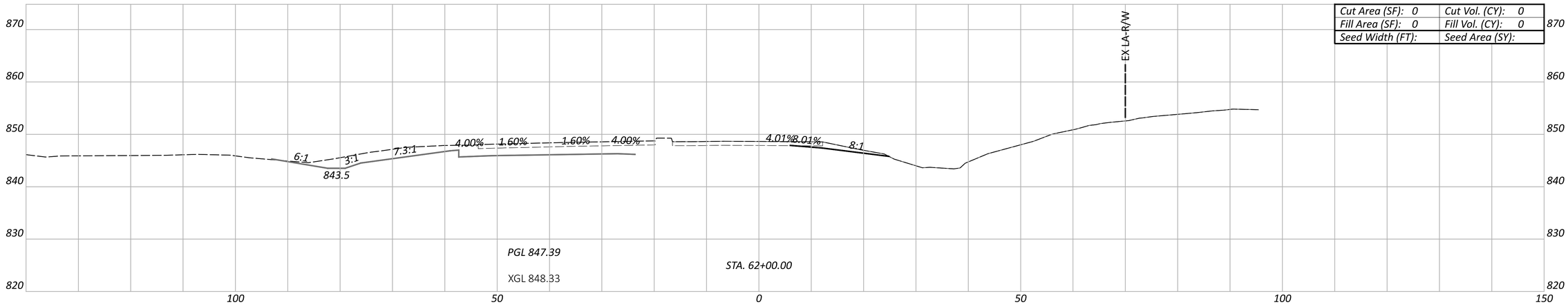
DESIGN AGENCY
STRUCTUREPOINT INC.

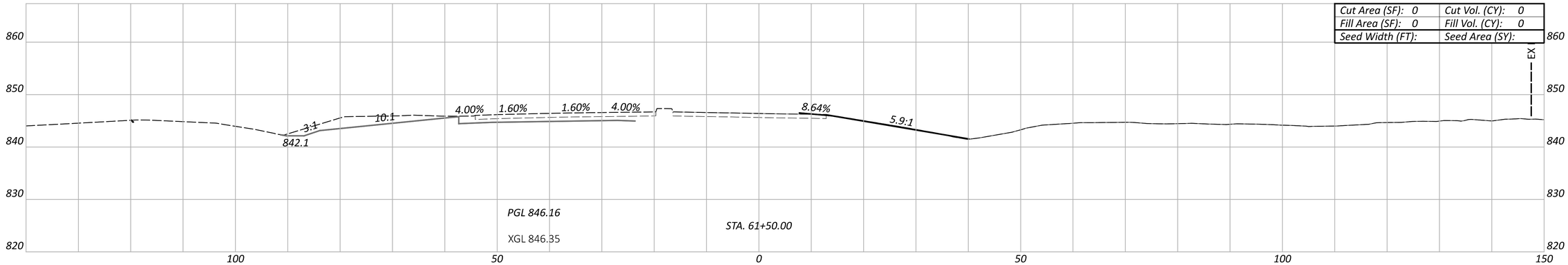
DESIGNER
BER

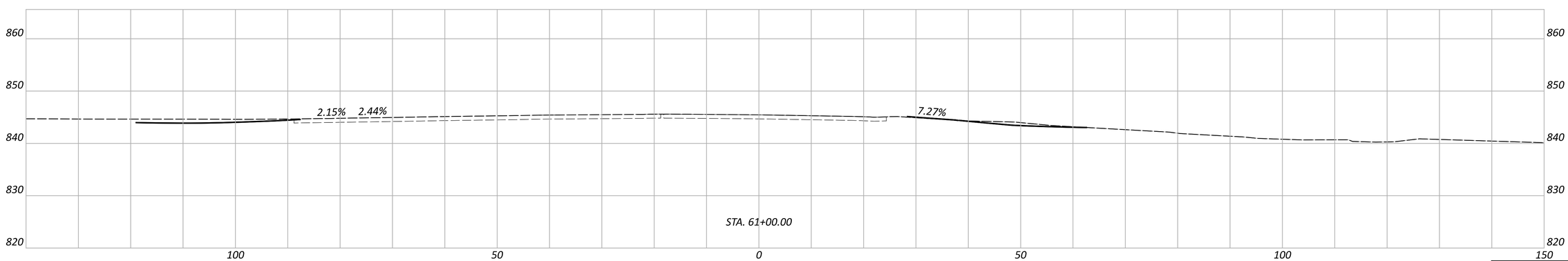
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.473 | TOTAL 740







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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

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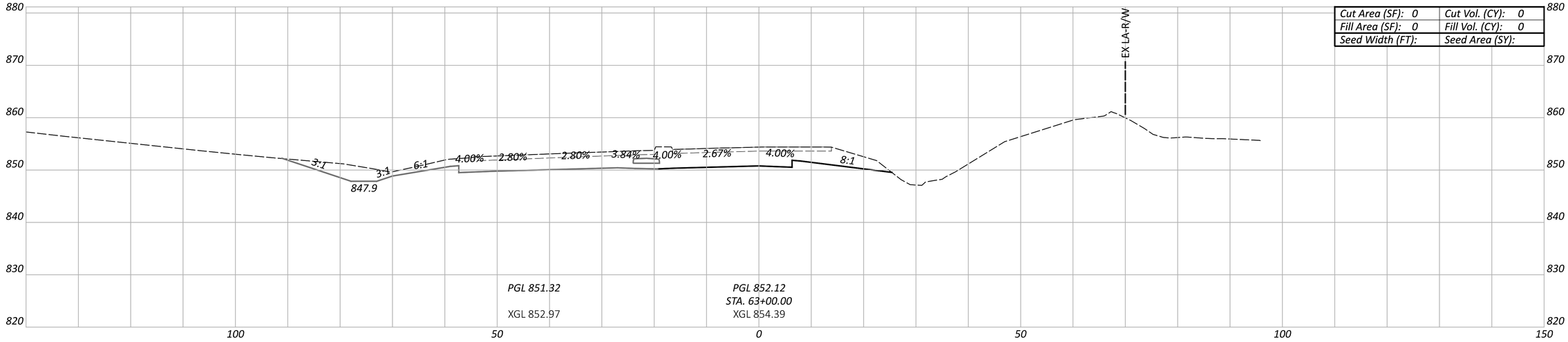
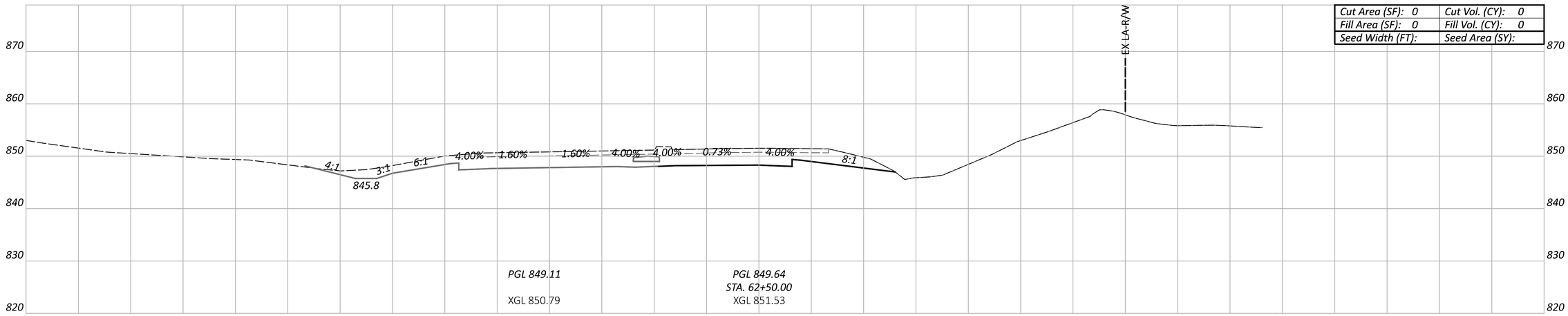
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.474 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

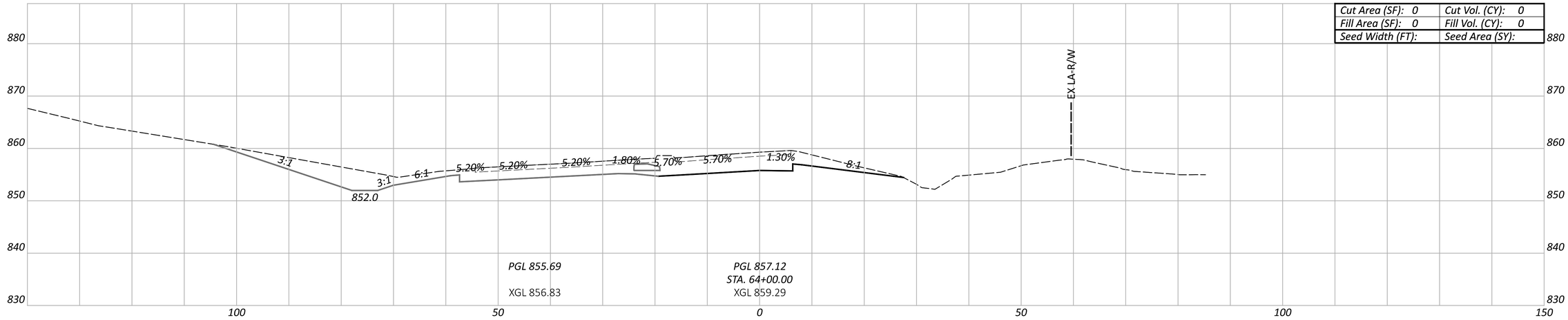
DESIGN AGENCY
STRUCTUREPOINT LLC

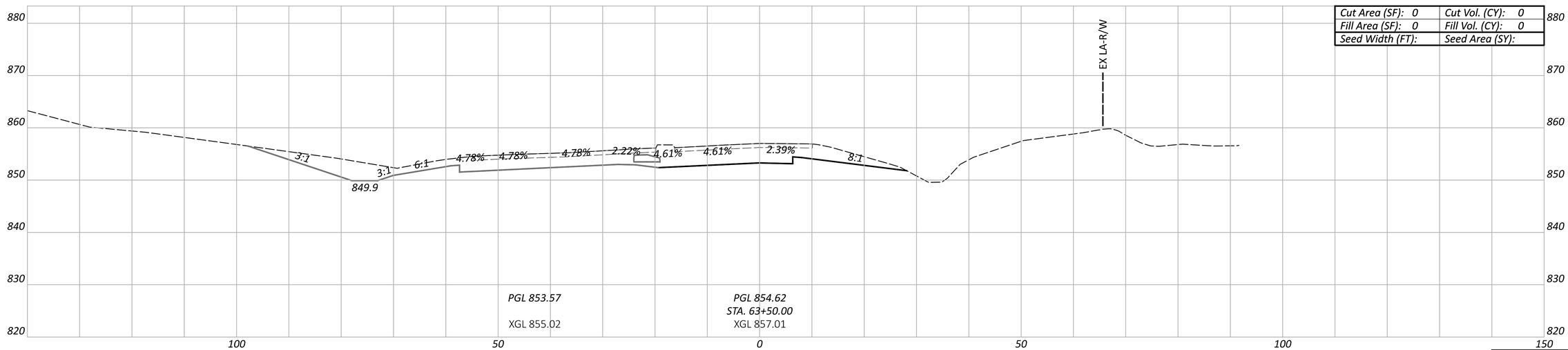
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.475 TOTAL 740





CROSS SECTIONS - RAMP C
STA. 63+50.00 TO STA. 64+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.476 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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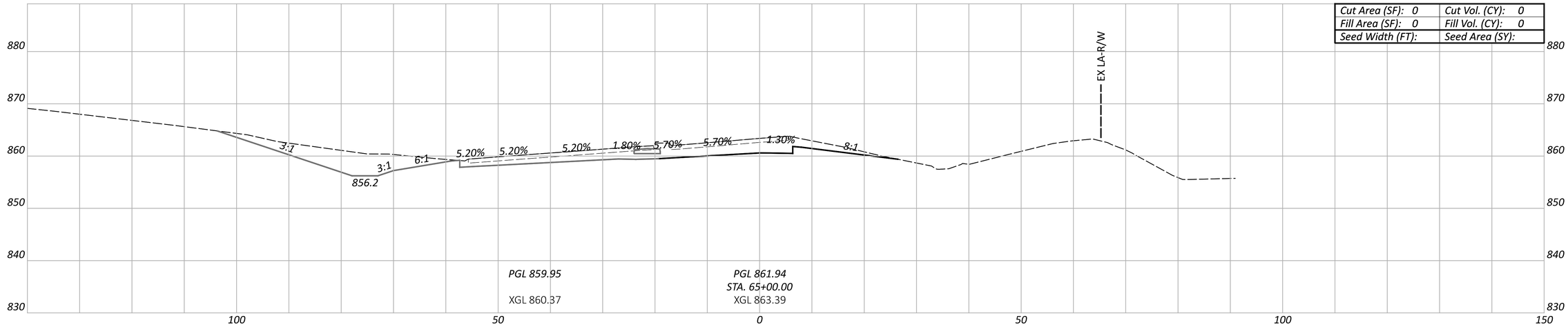

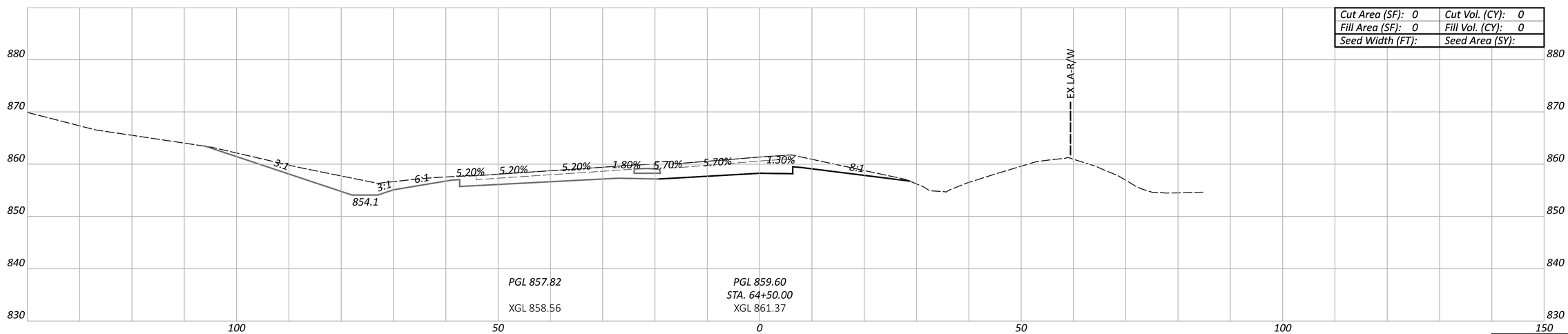

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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

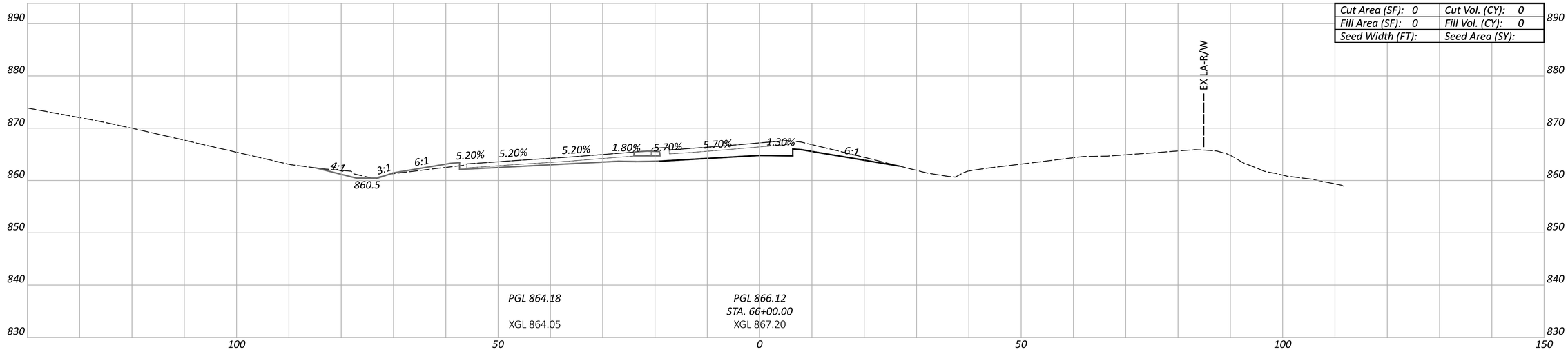
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.477 TOTAL 740



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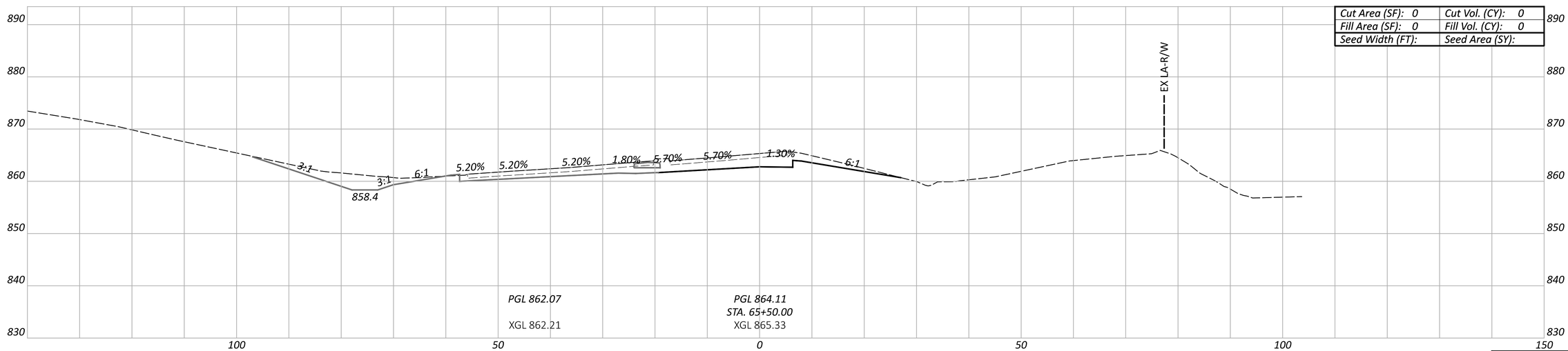

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CROSS SECTIONS - RAMP C
STA. 65+50.00 TO STA. 66+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.478 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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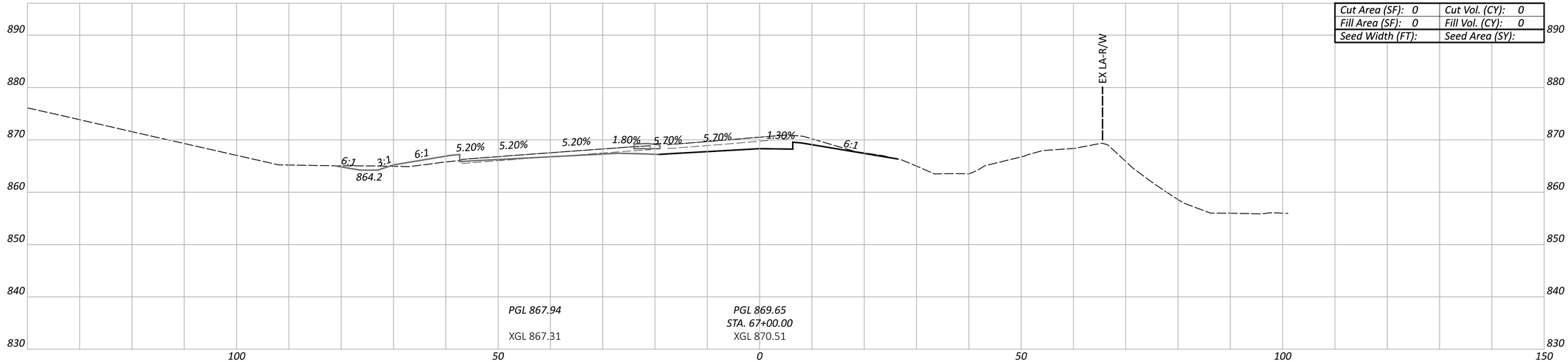

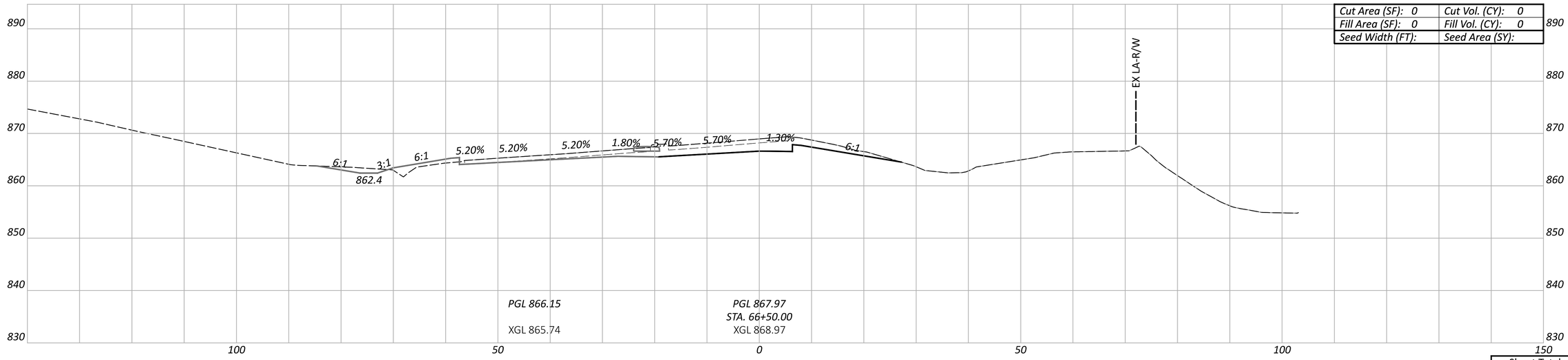

CROSS SECTIONS - RAMP C
STA. 66+50.00 TO STA. 67+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT LLC

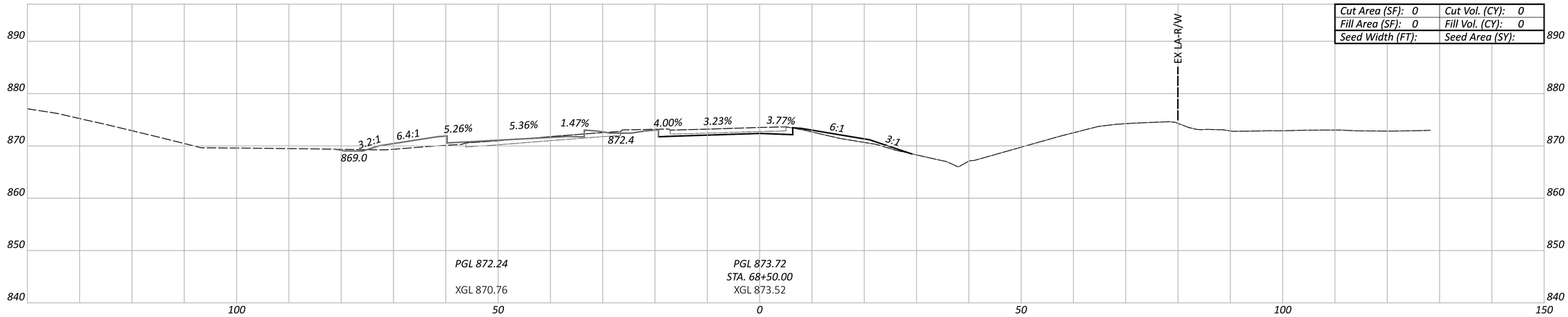
DESIGNER
BER

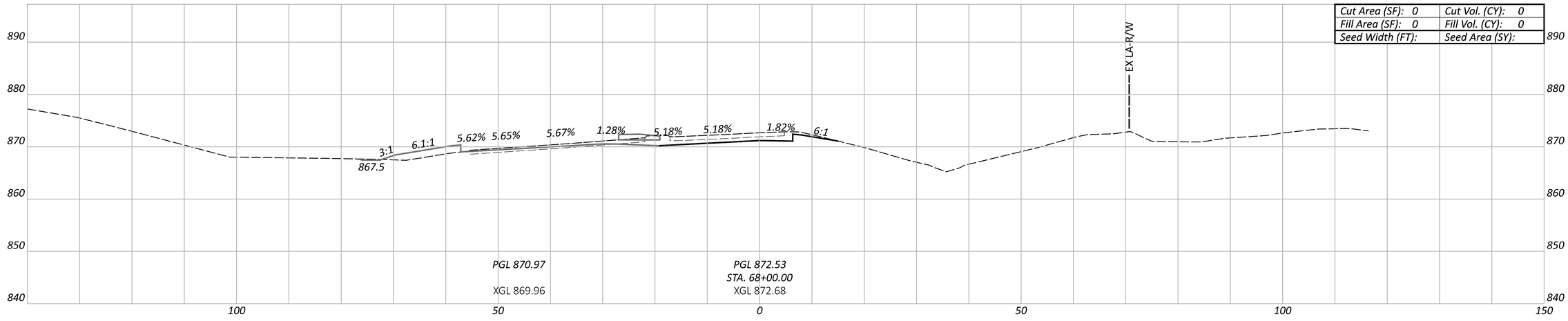
REVIEWER
KAM 06/18/23

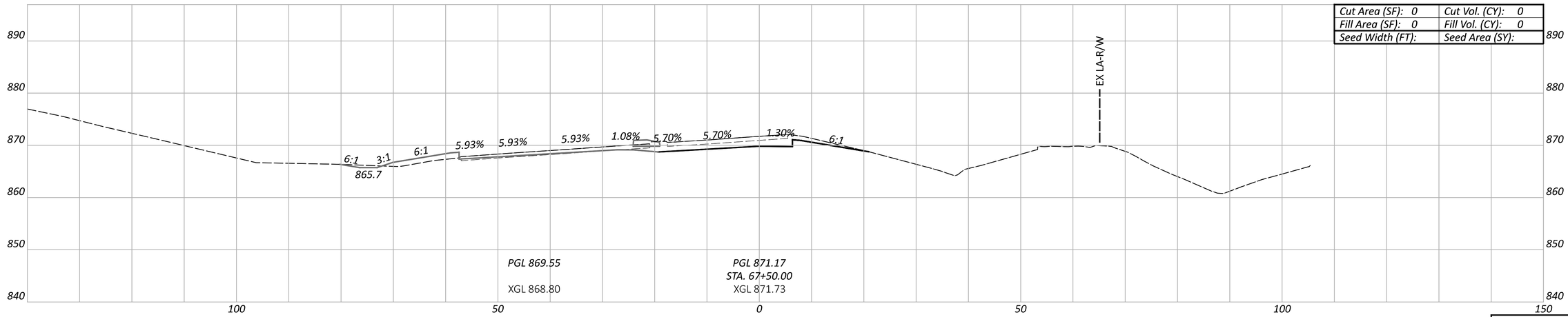
PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.479 TOTAL 740







CROSS SECTIONS - RAMP C
STA. 67+50.00 TO STA. 68+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.480 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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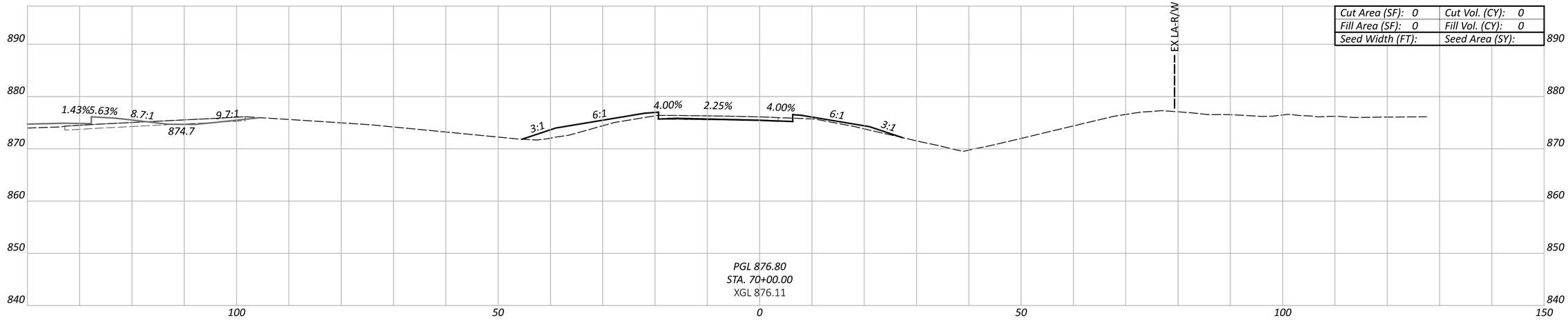

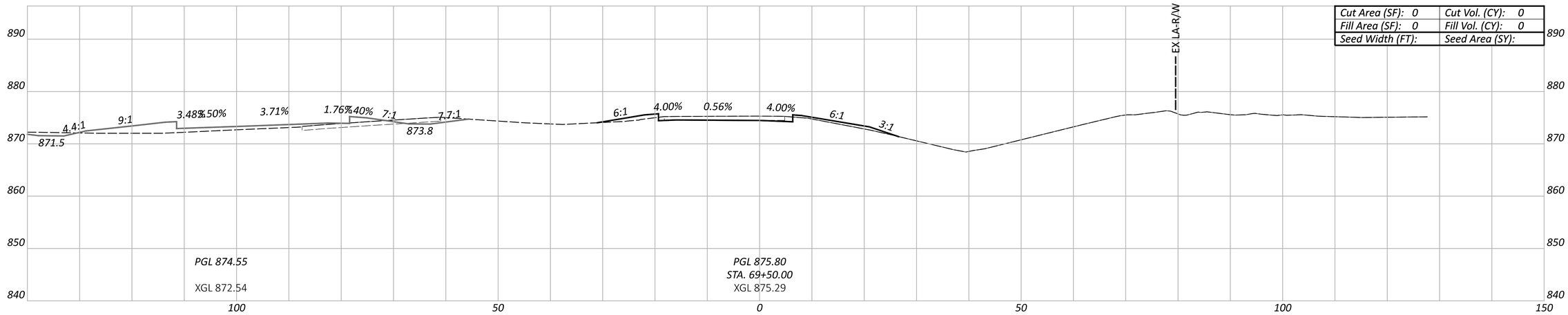

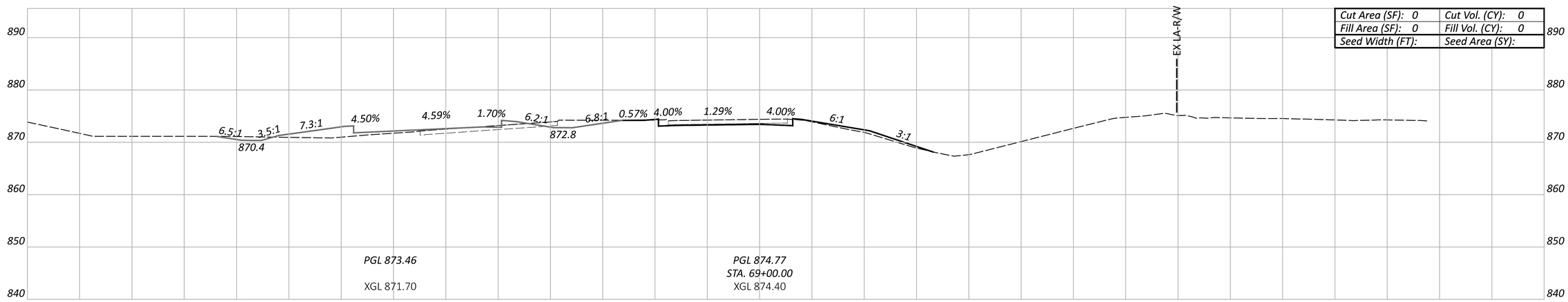

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FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

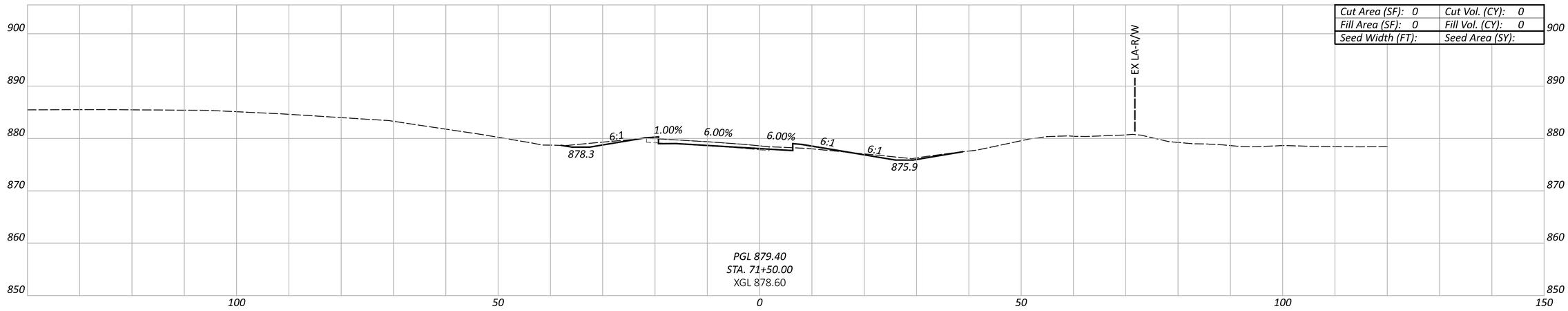
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.481 TOTAL 740



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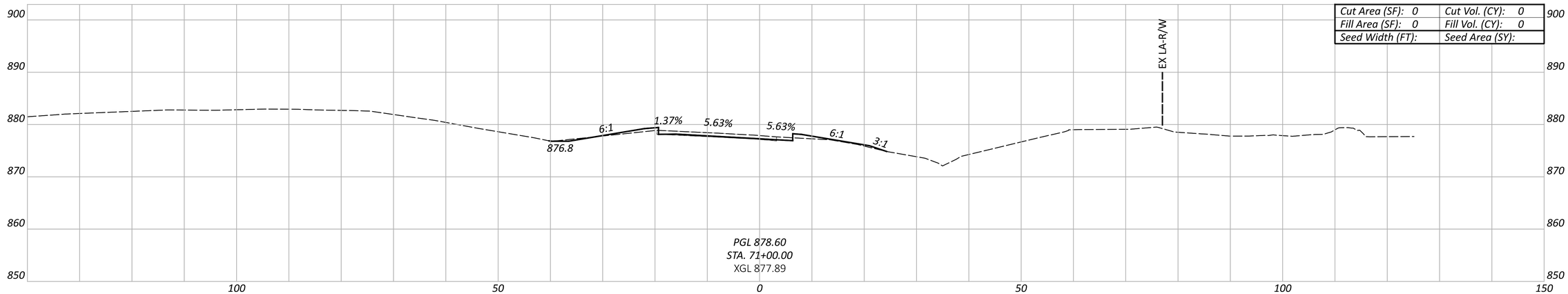

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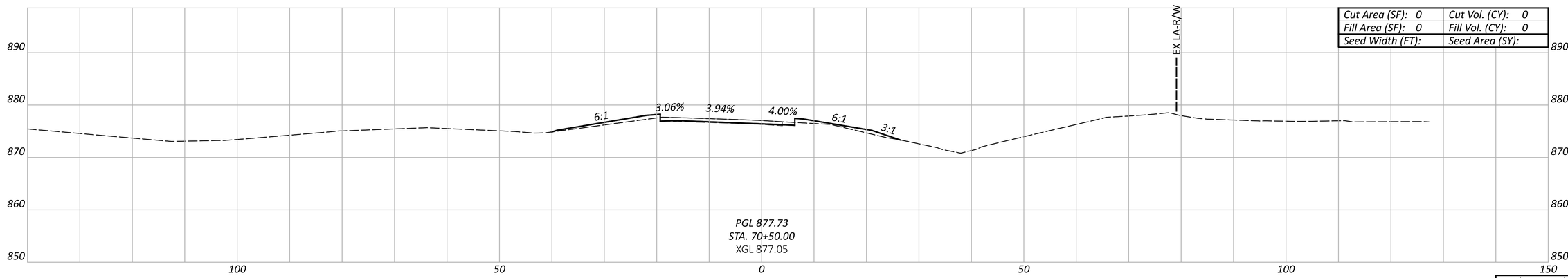

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - RAMP C
STA. 70+50.00 TO STA. 71+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070C - 70+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:29:50 PM USER: aoldaker
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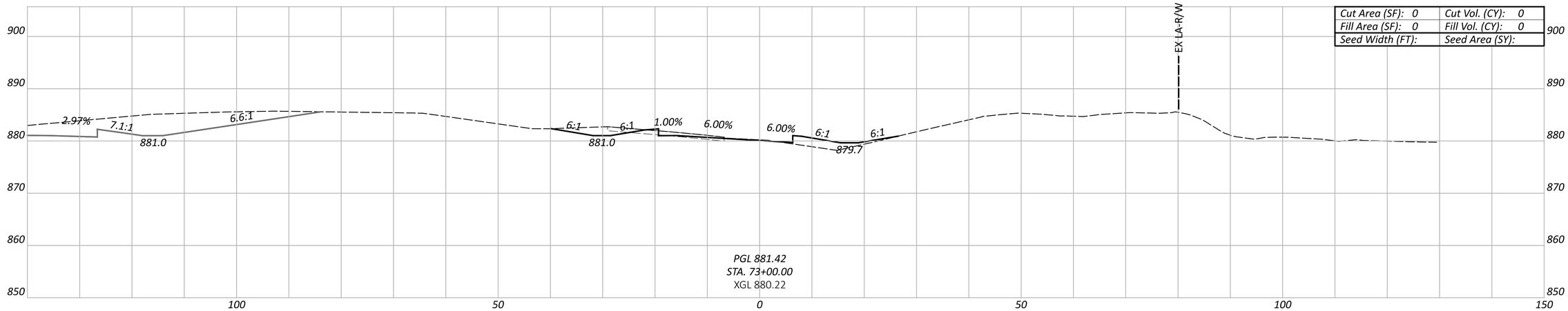
DESIGN AGENCY
STRUCTUREPOINT

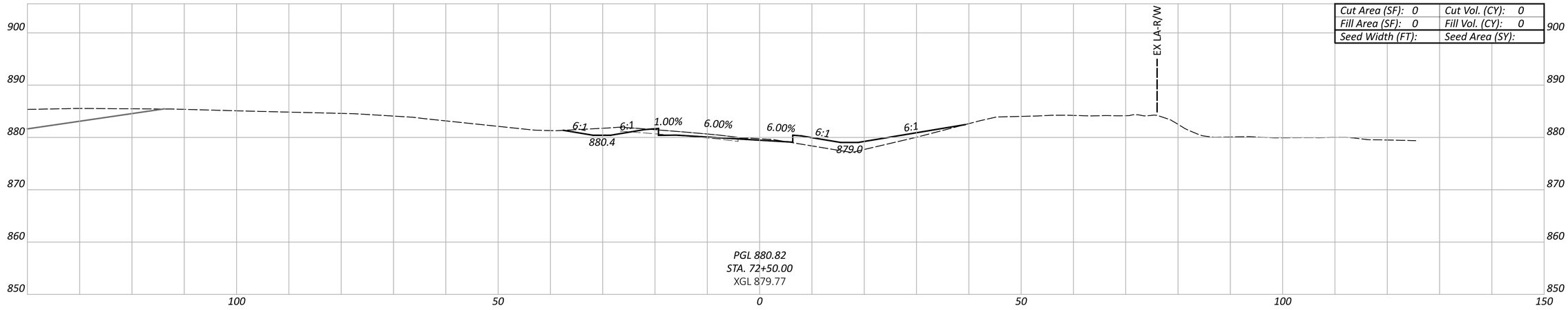
DESIGNER
BER

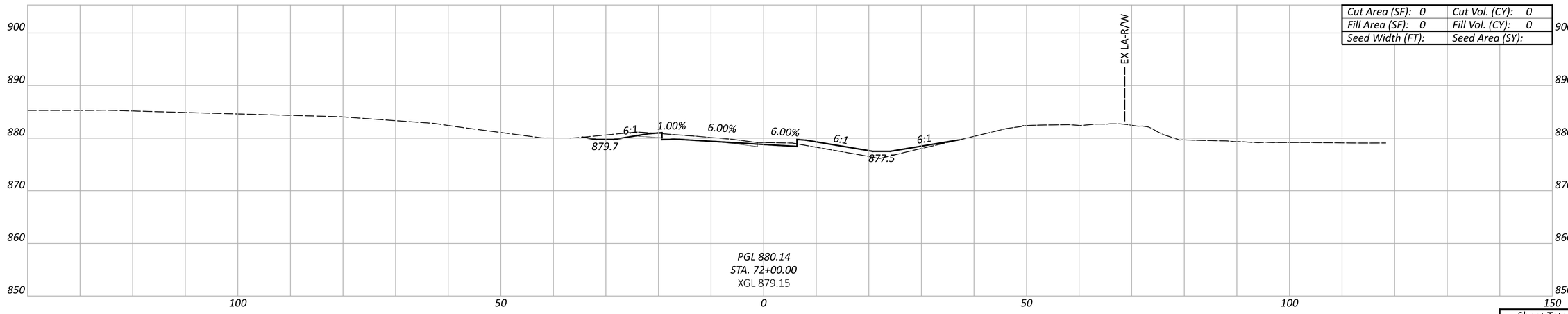
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.482 TOTAL 740







CROSS SECTIONS - RAMP C
STA. 72+00.00 TO STA. 73+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

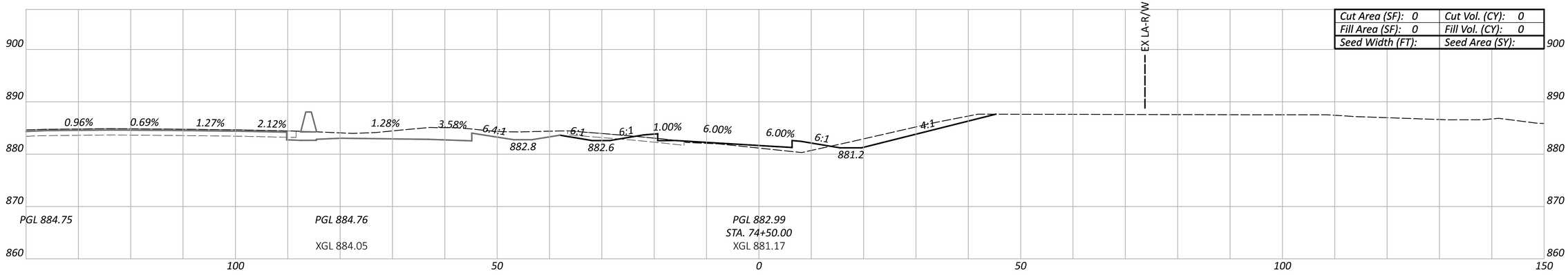
DESIGNER
BER

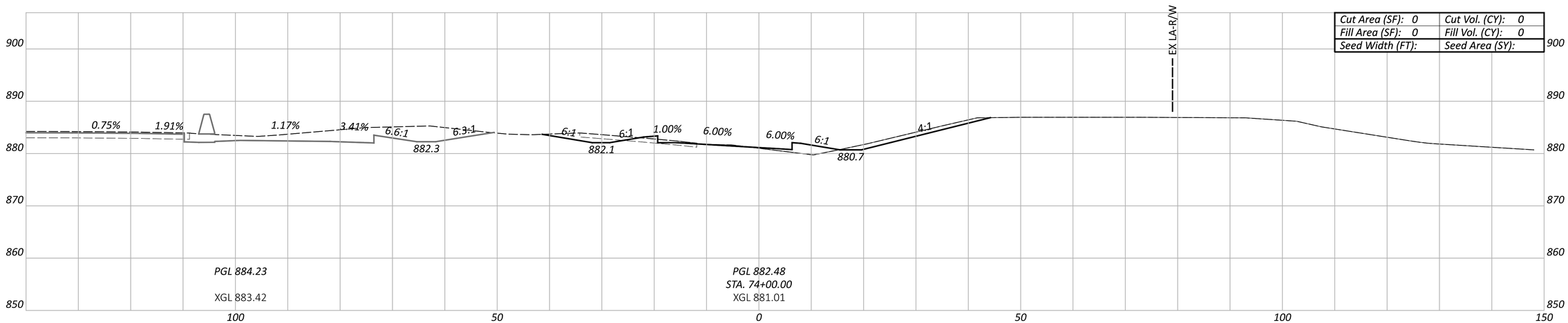
REVIEWER
KAM 06/18/23

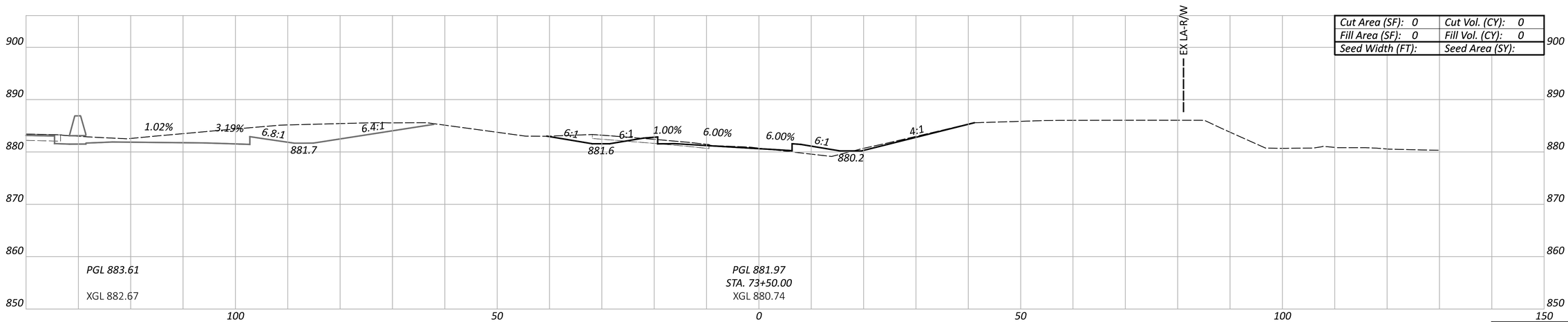
PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.483	740







CROSS SECTIONS - RAMP C
STA. 73+50.00 TO STA. 74+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.484 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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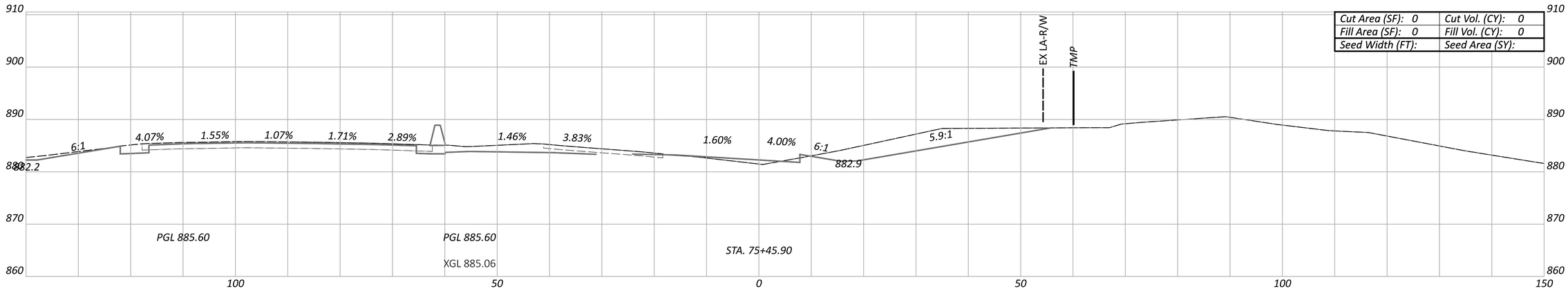

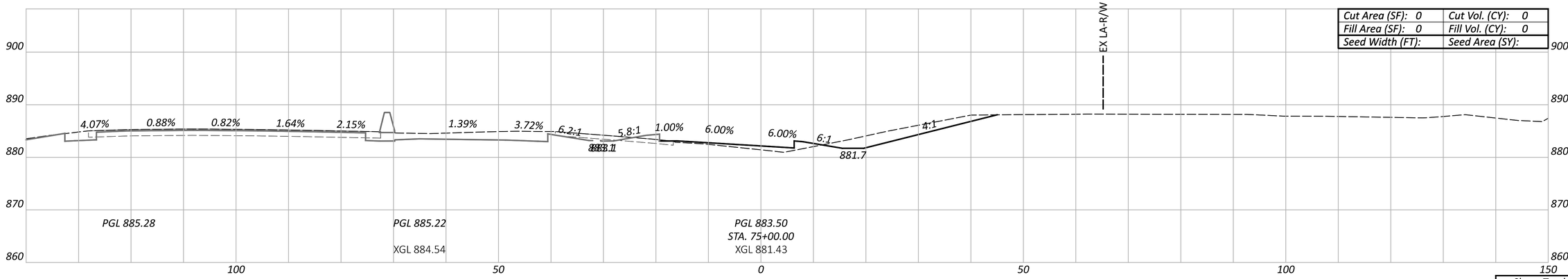

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STA. 75+00.00 TO STA. 75+45.90

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

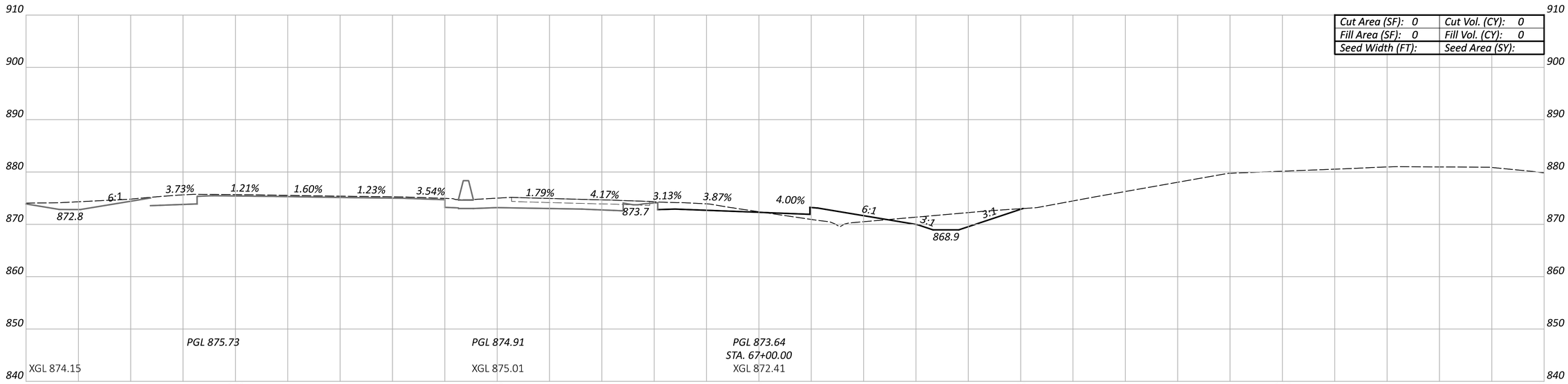
DESIGN AGENCY
MORGAN STRUCTUREPOINT INC.

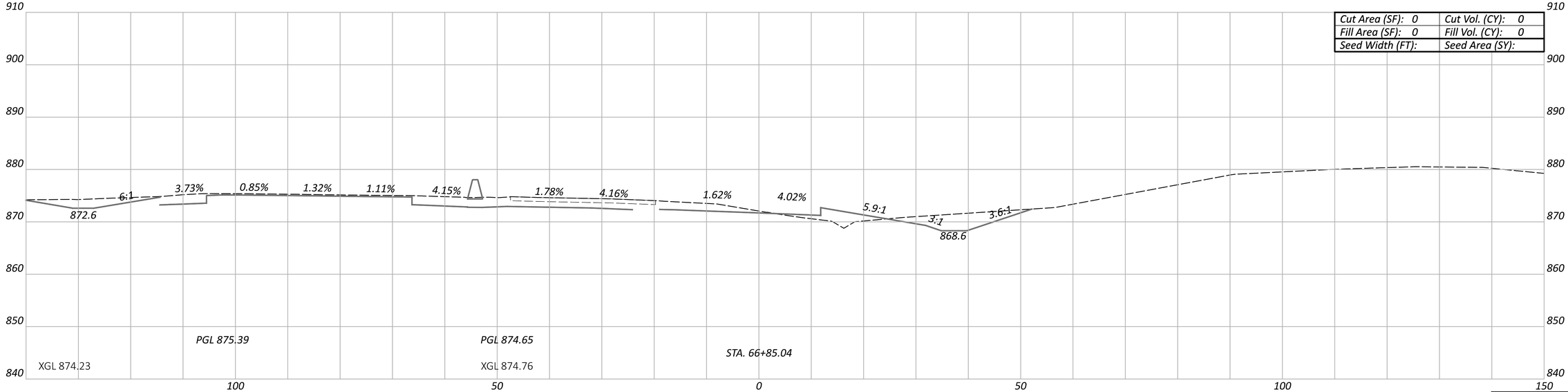
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.485 TOTAL 740





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DESIGN AGENCY
STRUCTUREPOINT INC.

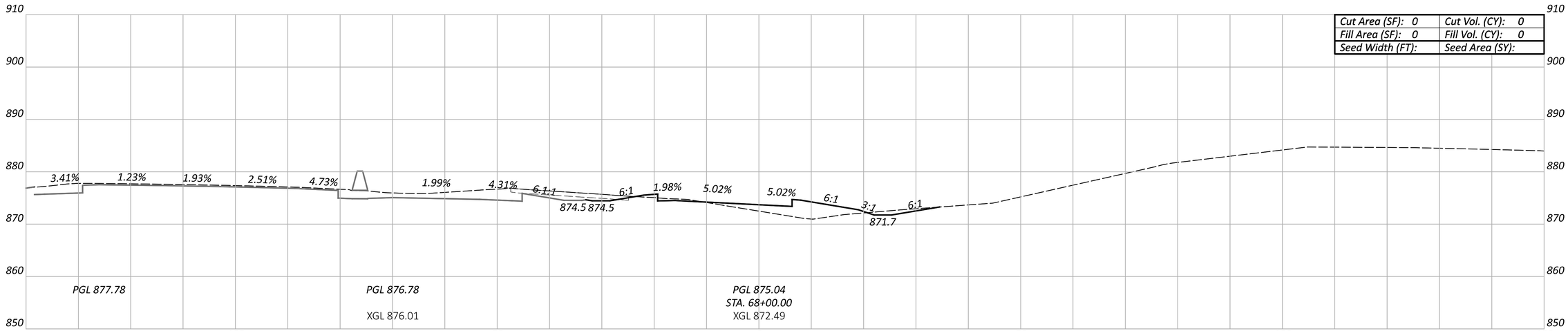
DESIGNER
BER

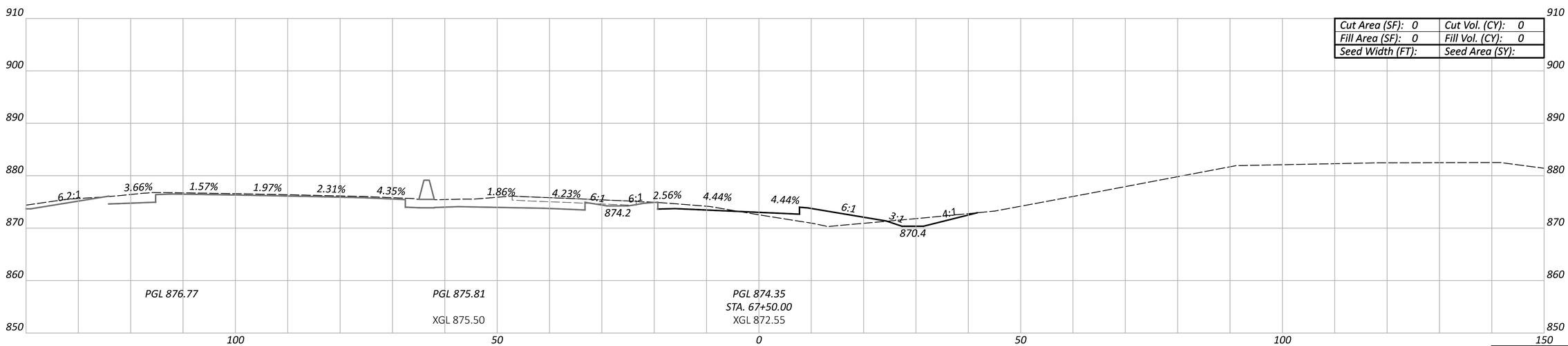
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.486	740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - RAMP D
STA. 67+50.00 TO STA. 68+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.487 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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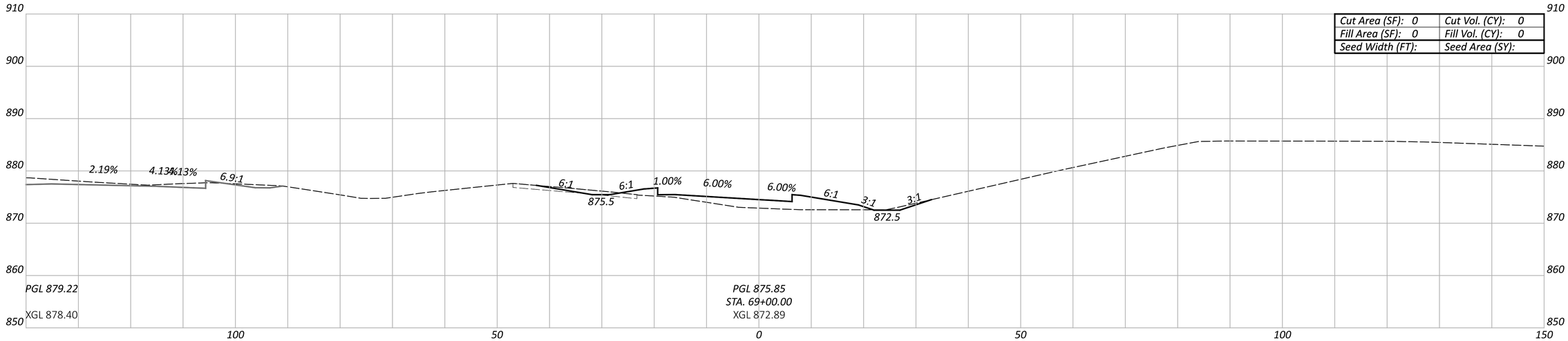

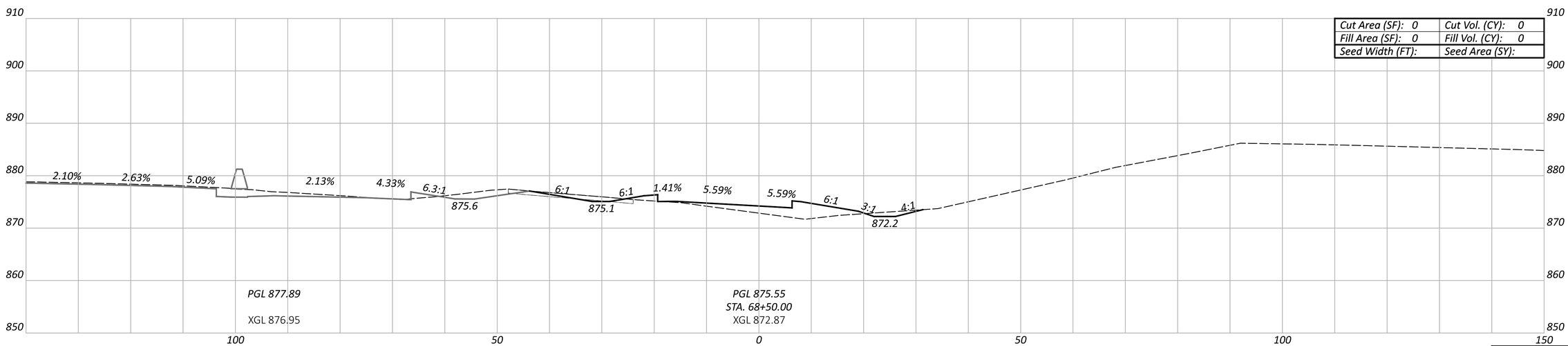

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FAI/LIC IR 70 0.00/0.00

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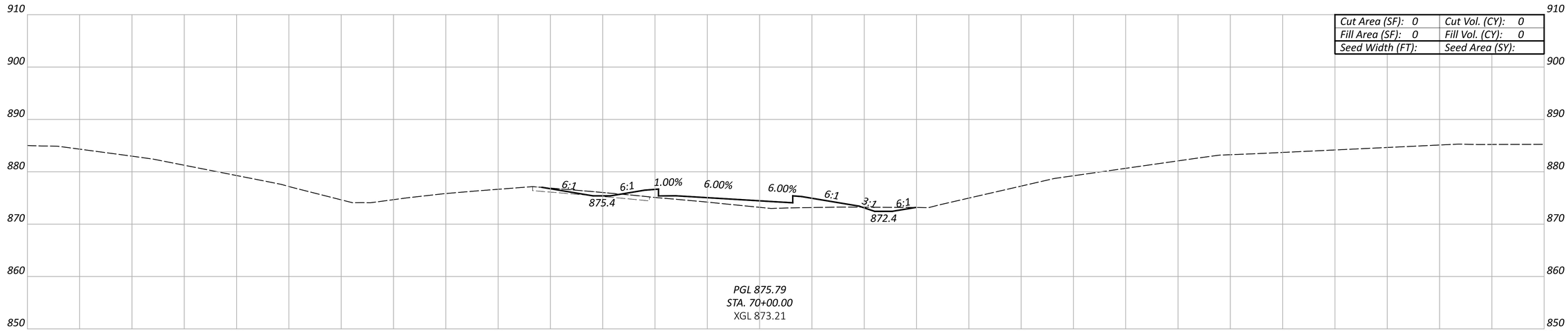
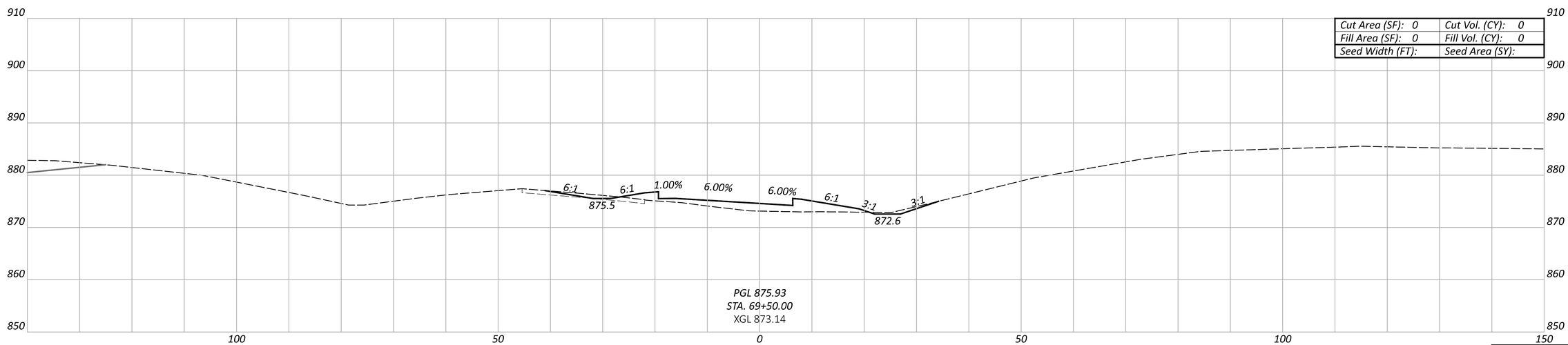
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.488
TOTAL	740





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CROSS SECTIONS - RAMP D
STA. 69+50.00 TO STA. 70+00.00

Sheet Totals		
Seeding	Cut	Fill

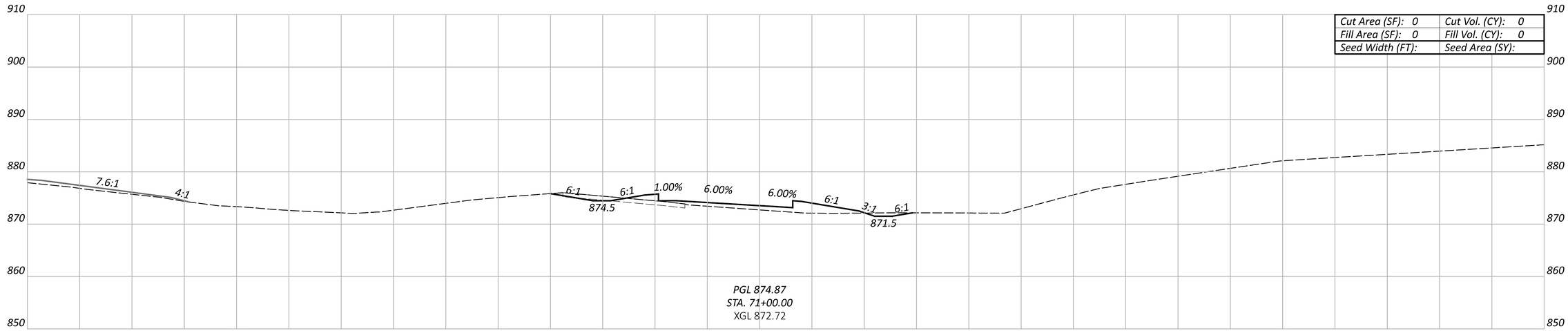
DESIGN AGENCY
STRUCTUREPOINT LLC

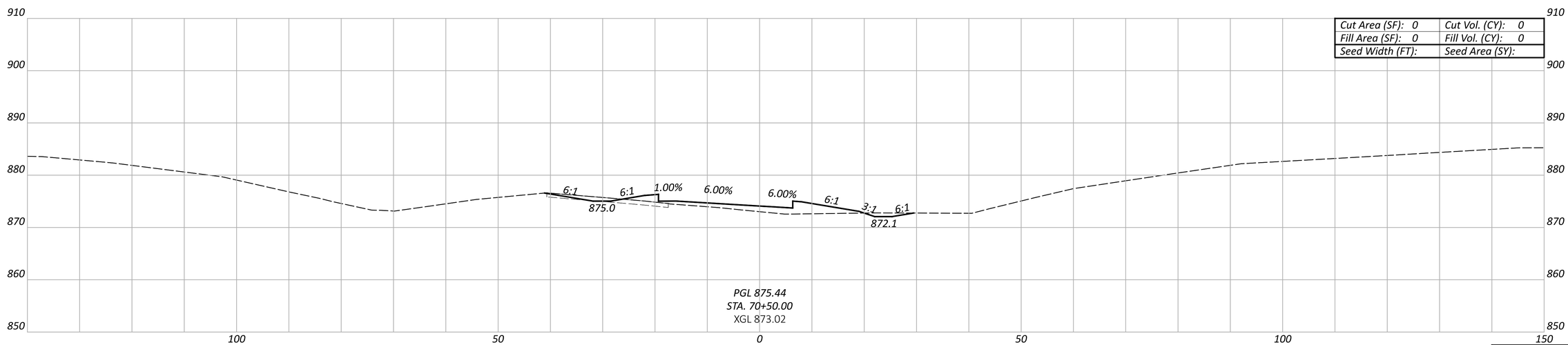
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.489 TOTAL 740





CROSS SECTIONS - RAMP D
STA. 70+50.00 TO STA. 71+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

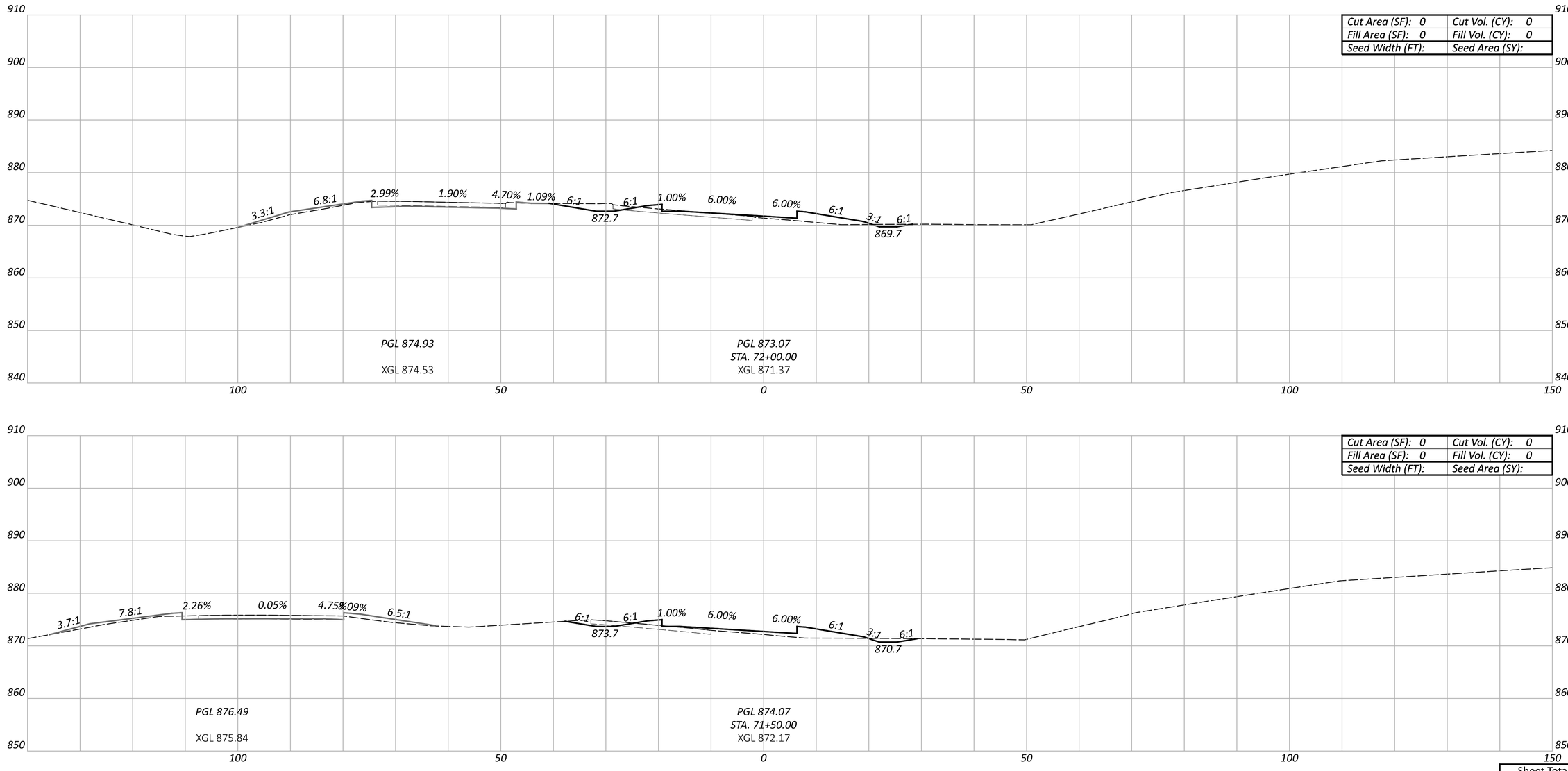
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.490	740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

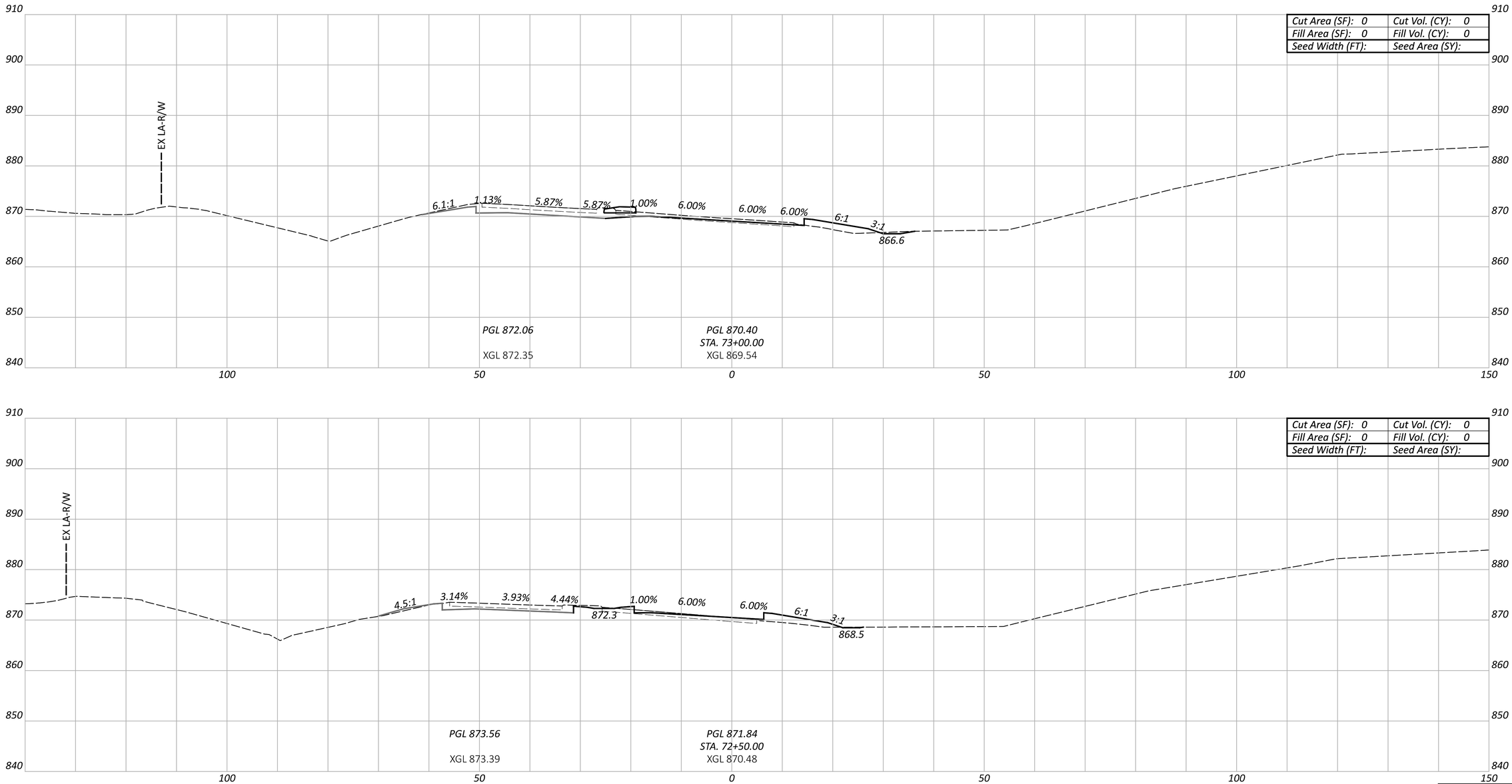
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.491 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

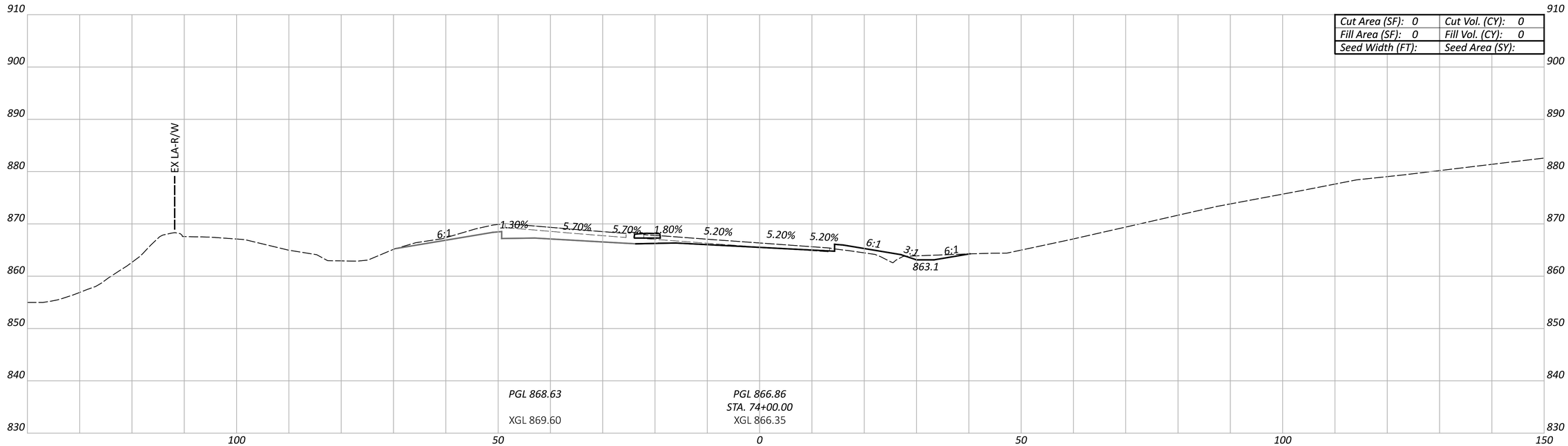
DESIGN AGENCY
STRUCTUREPOINT INC.

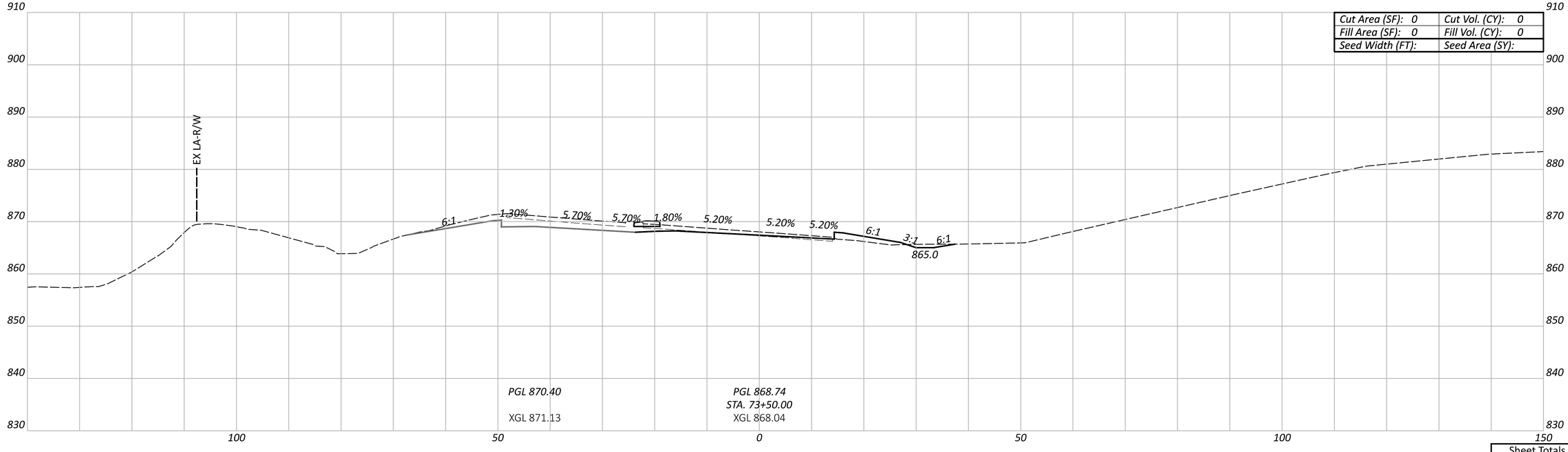
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.492 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

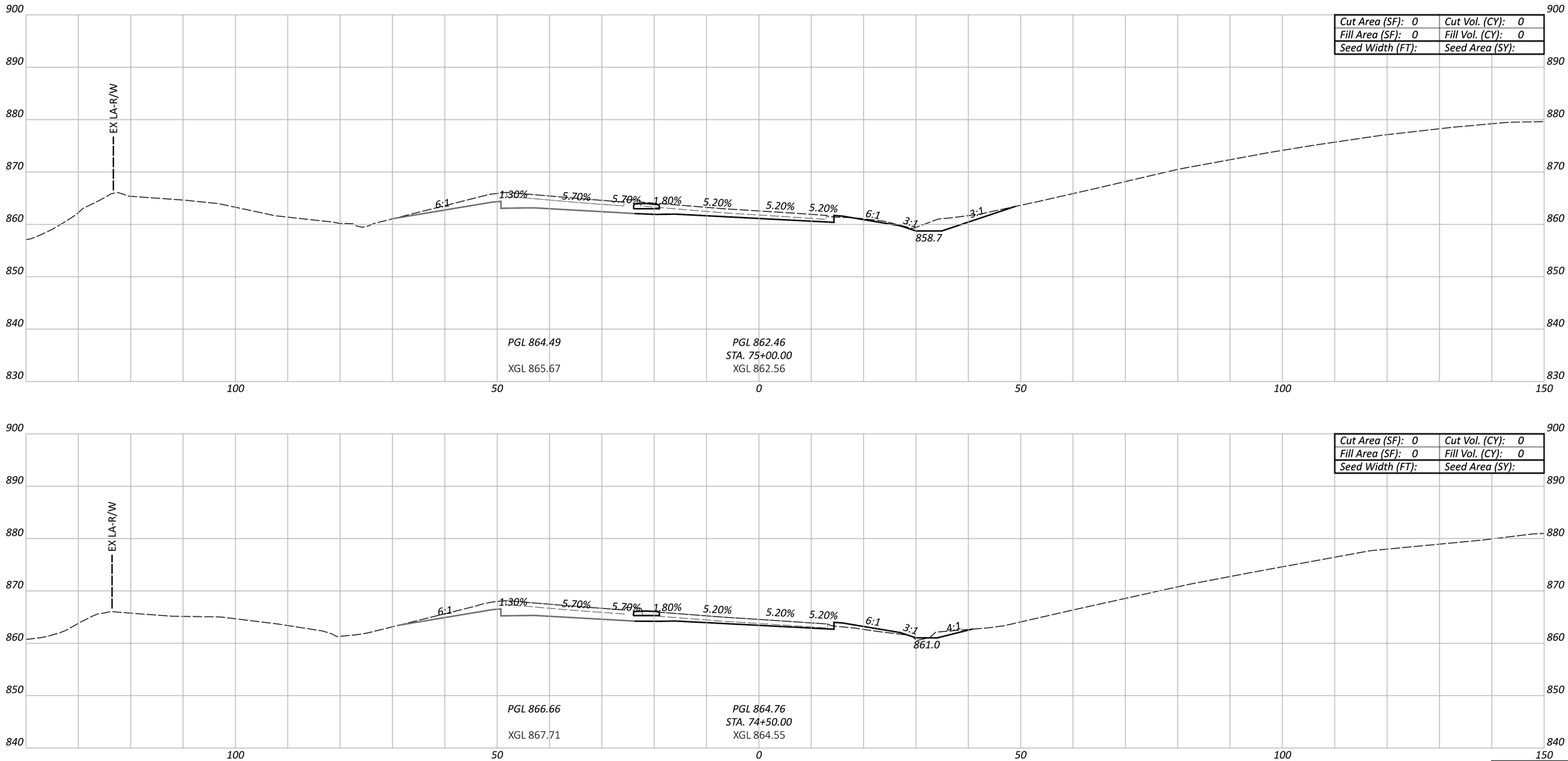
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.493 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

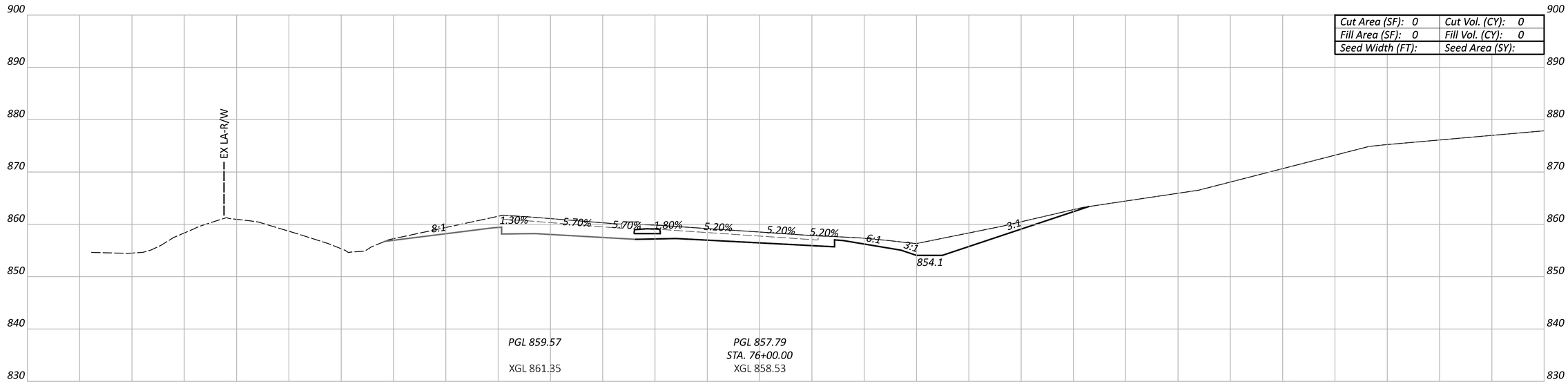
DESIGNER
BER

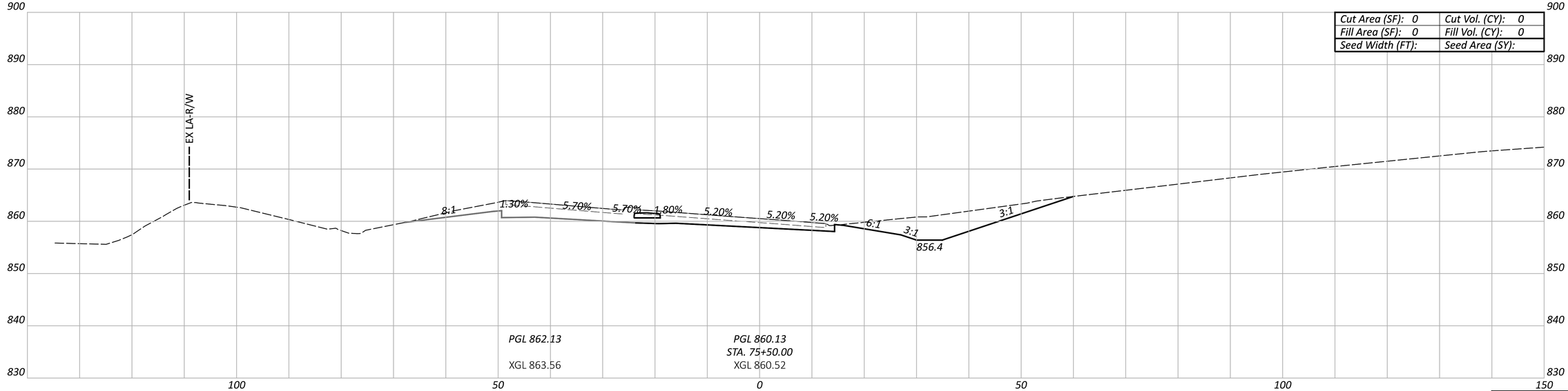
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.494	740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

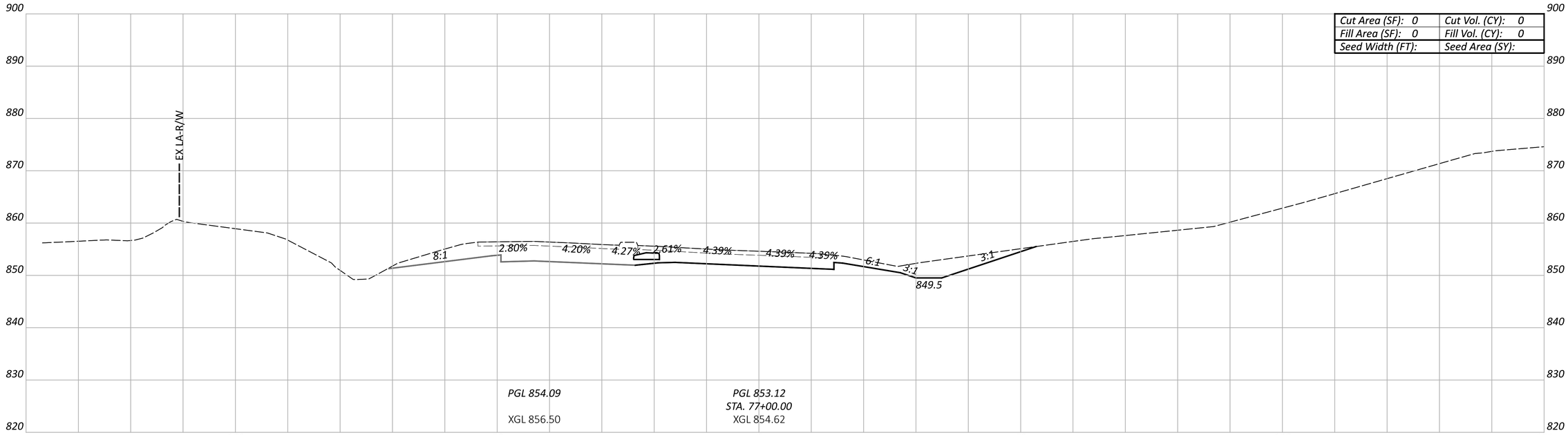
DESIGN AGENCY
STRUCTUREPOINT INC.

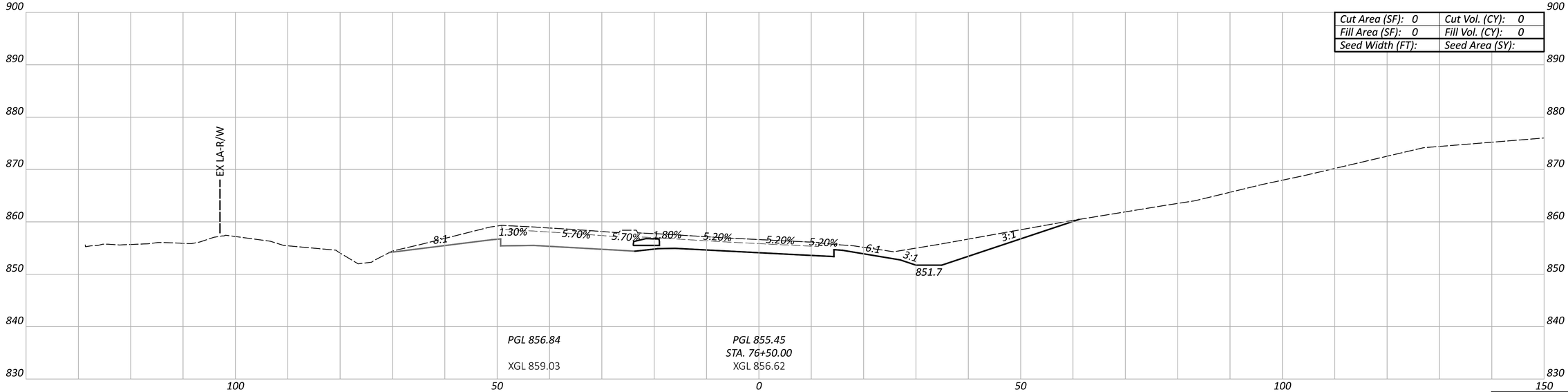
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.495 TOTAL 740





CROSS SECTIONS - RAMP D
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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

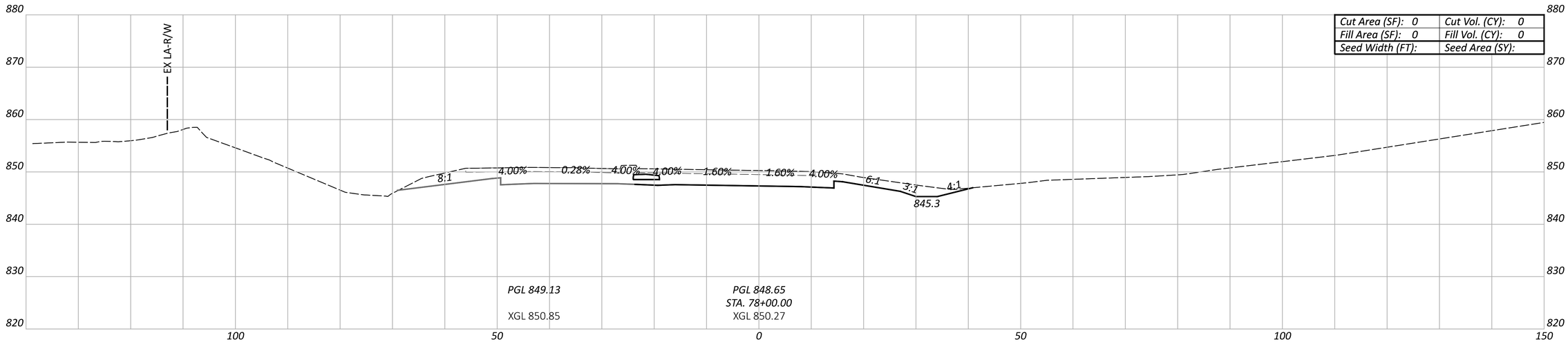
DESIGN AGENCY
STRUCTUREPOINT INC.

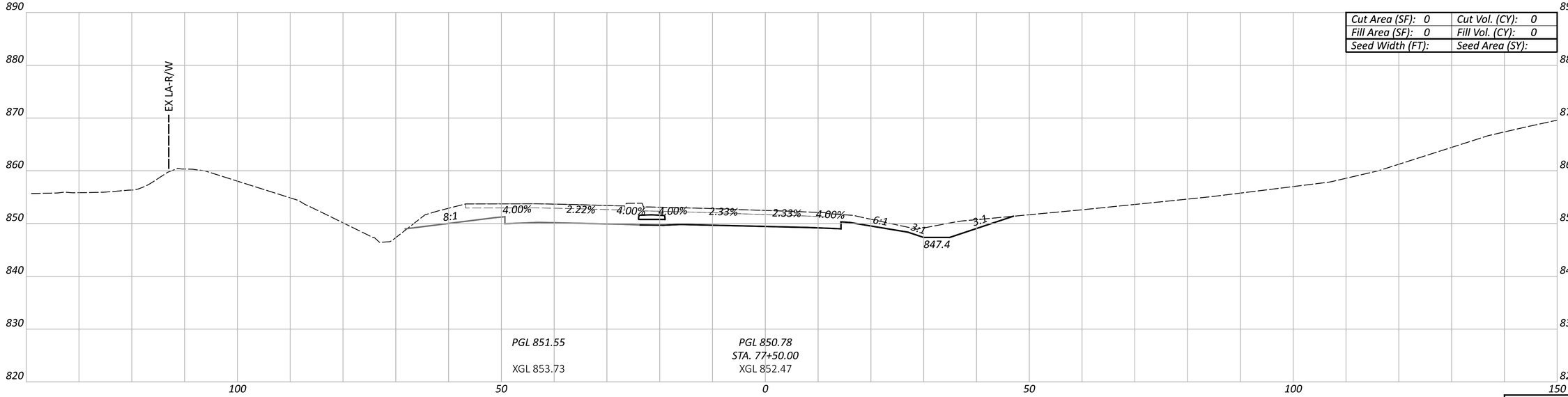
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.496 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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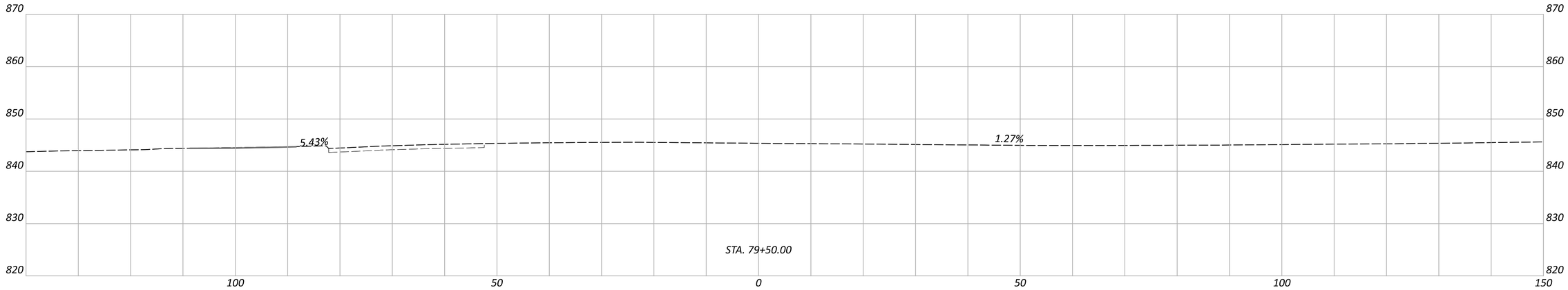
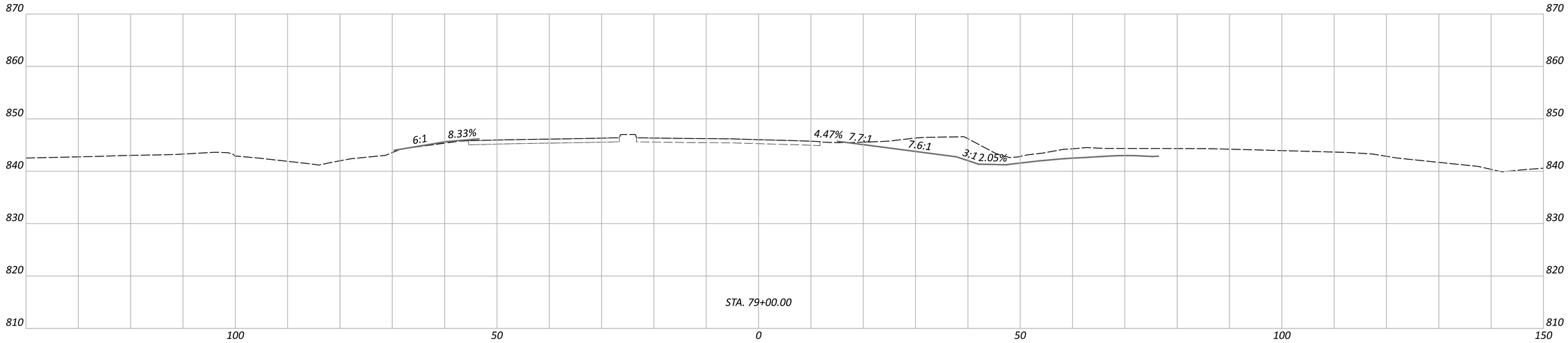
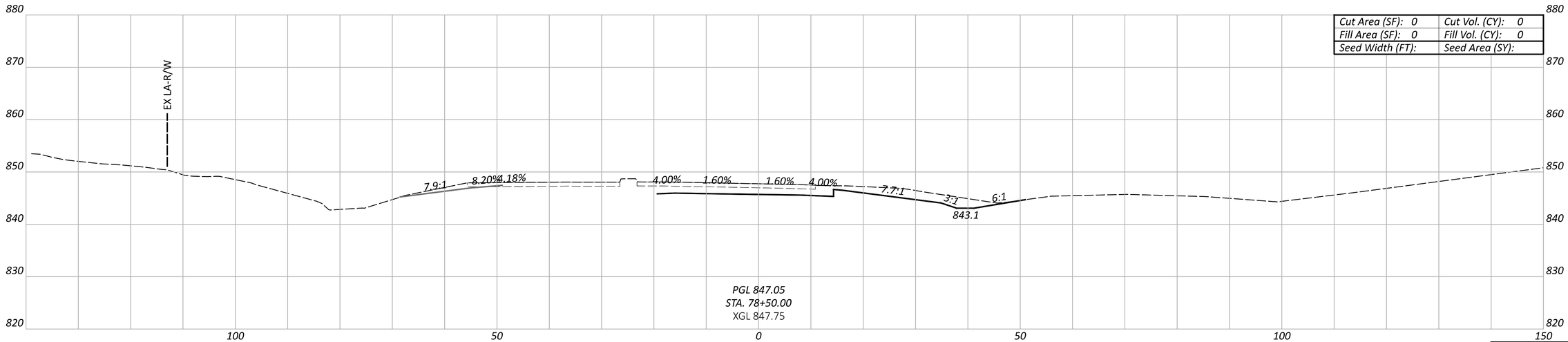
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.497
TOTAL	740







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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - RAMP D
STA. 78+50.00 TO STA. 79+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.498 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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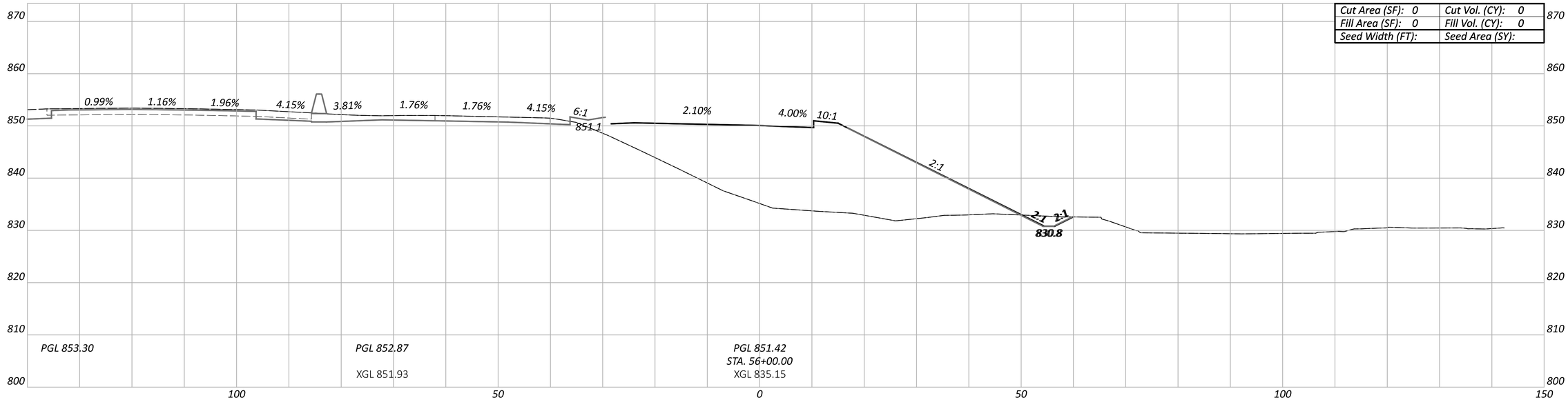

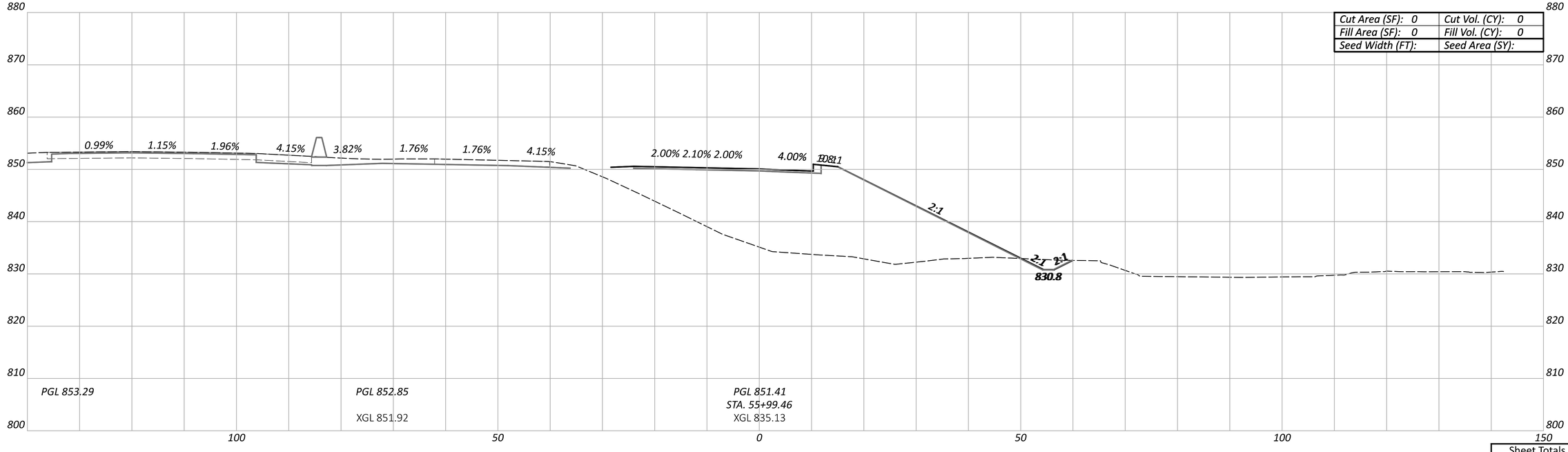

CROSS SECTIONS - RAMP E
STA. 55+99.46 TO STA. 56+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.499 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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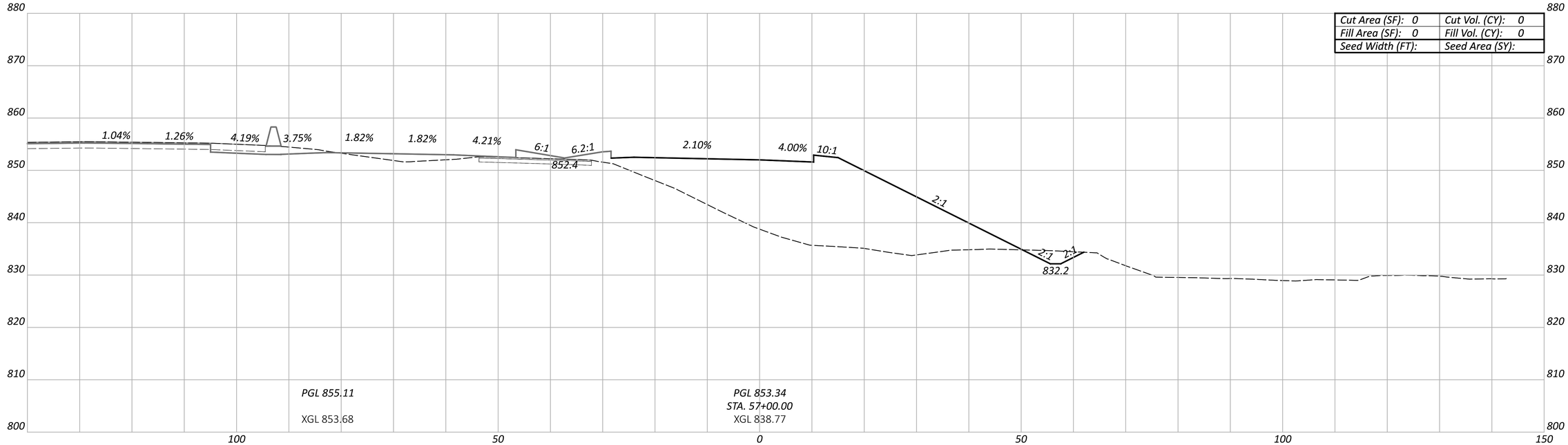

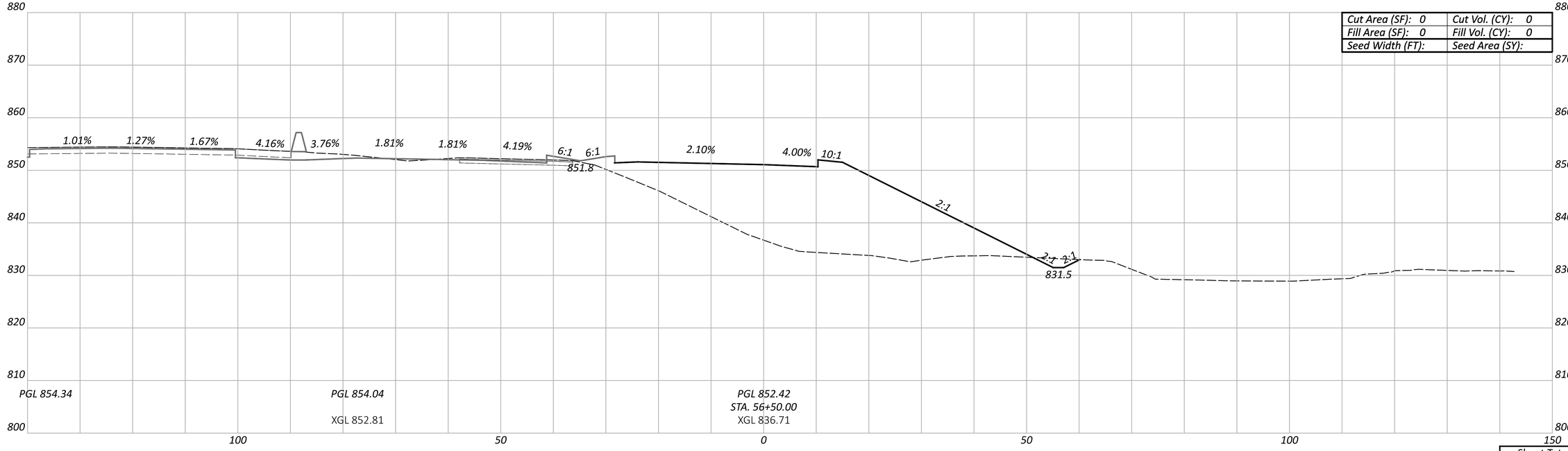

CROSS SECTIONS - RAMP E
STA. 56+50.00 TO STA. 57+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070E - 56+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:31:33 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

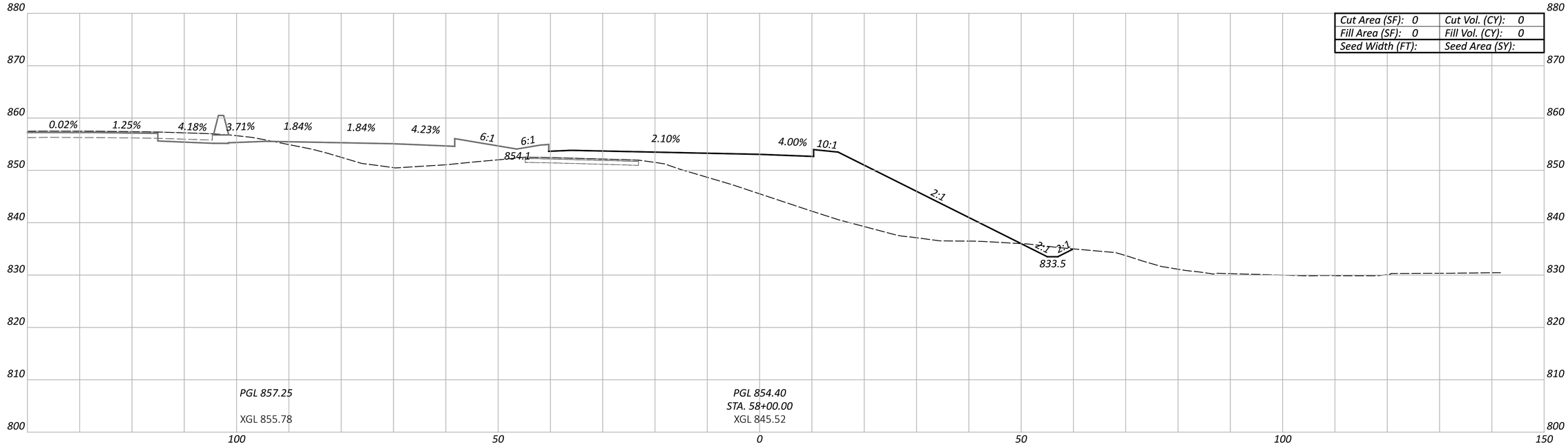
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

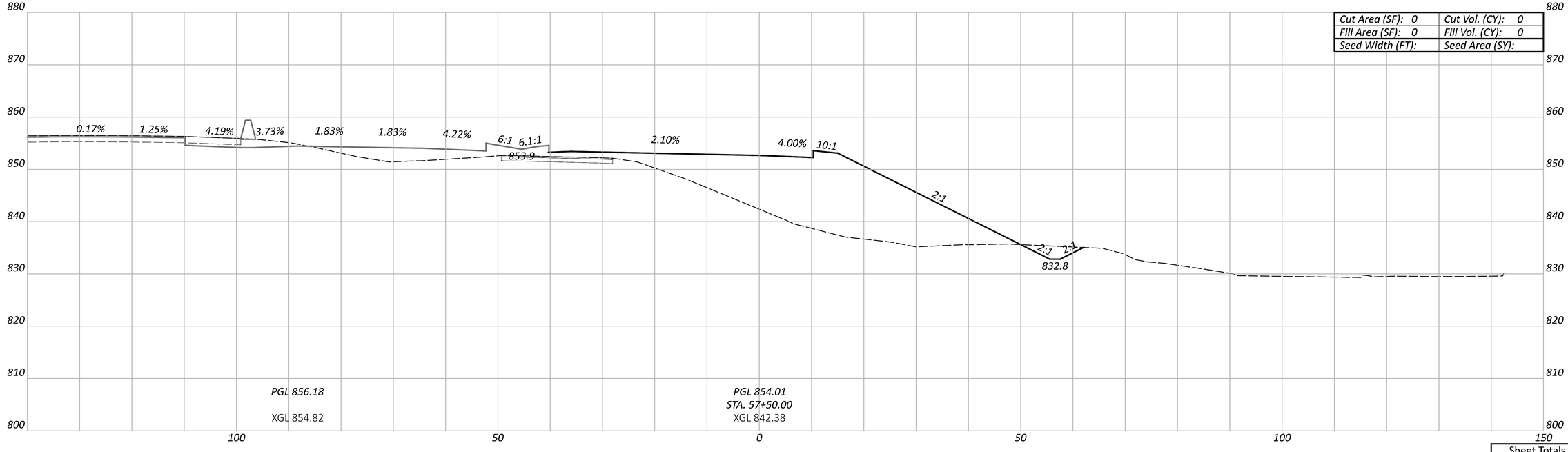
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.500 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

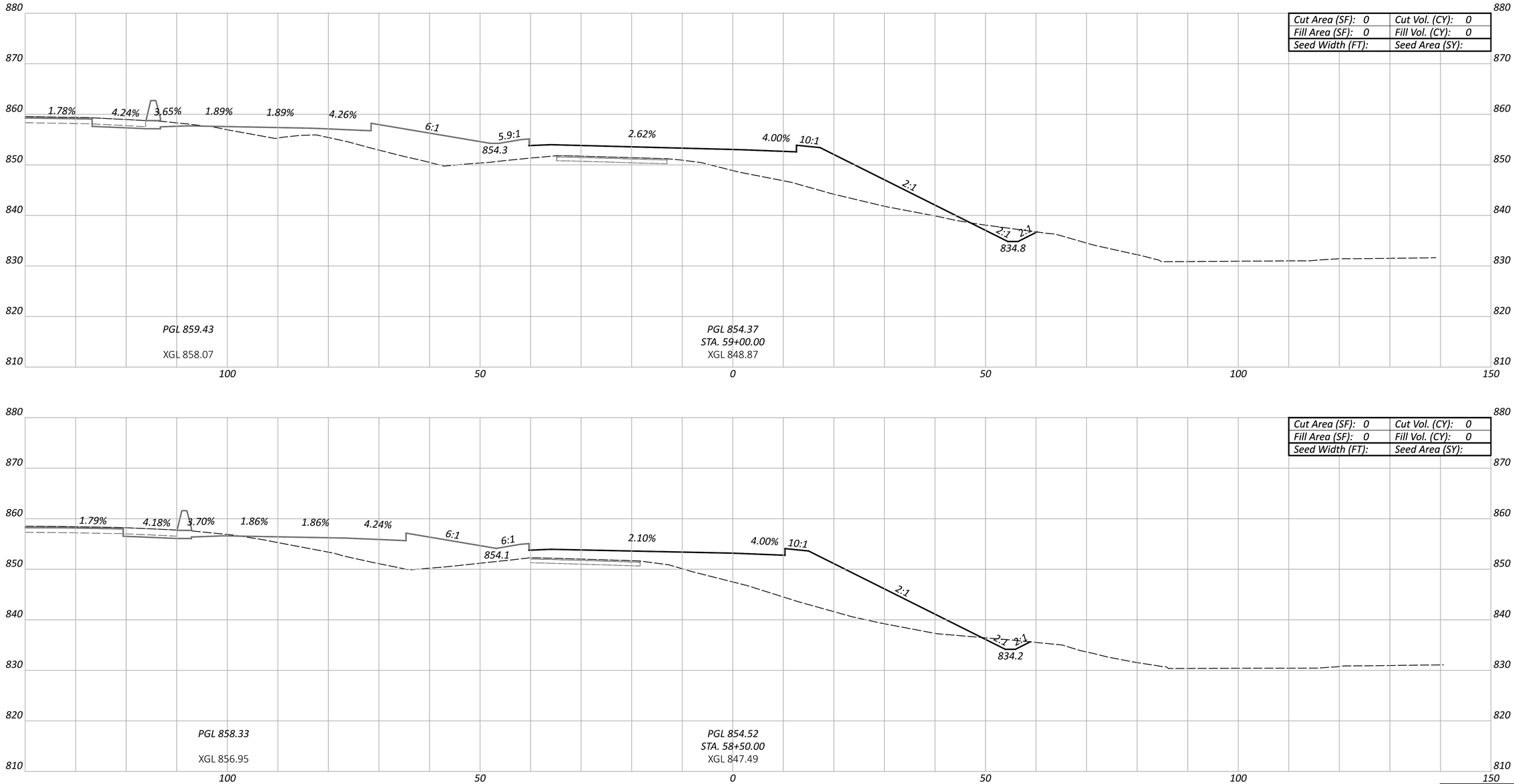
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.501 TOTAL 740



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Sheet Totals		
Seeding	Cut	Fill

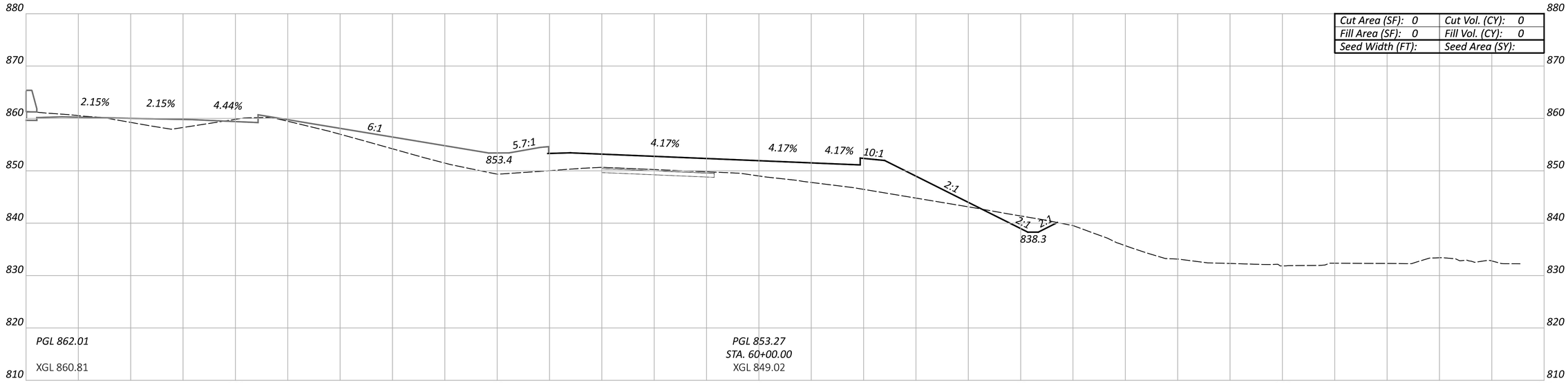
DESIGN AGENCY
STRUCTUREPOINT INC.

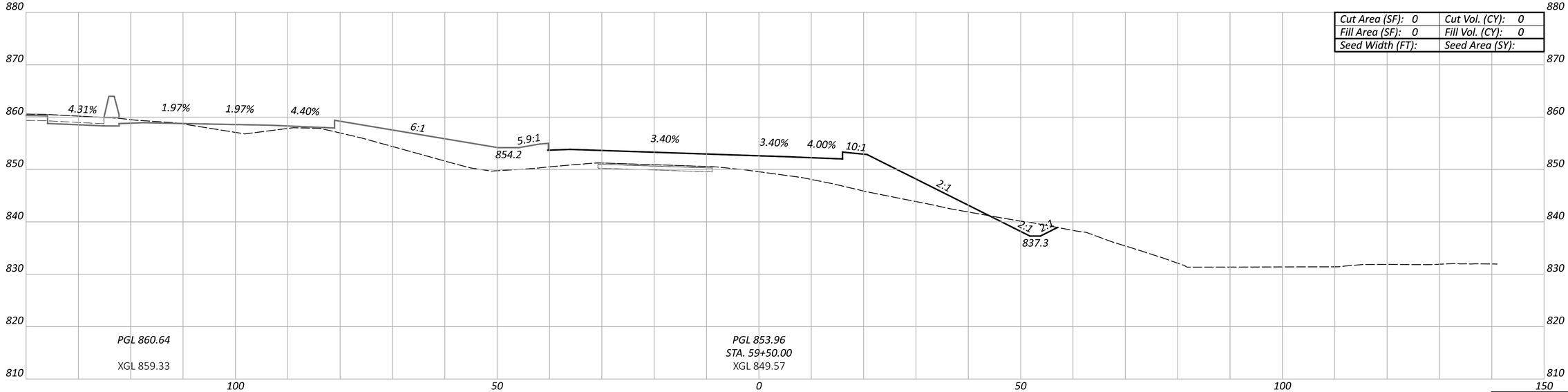
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.502 TOTAL 740





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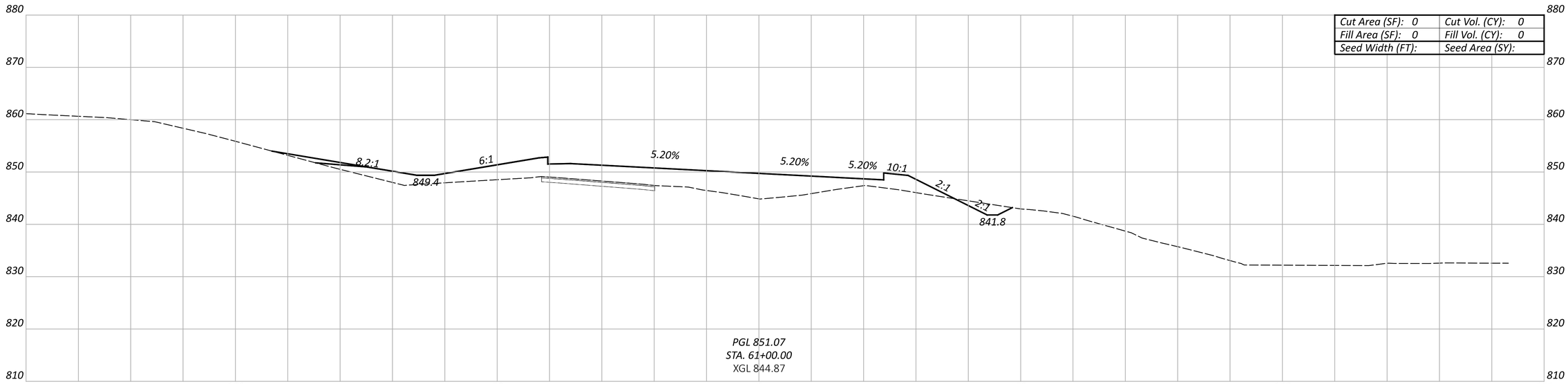
DESIGN AGENCY
STRUCTUREPOINT INC.

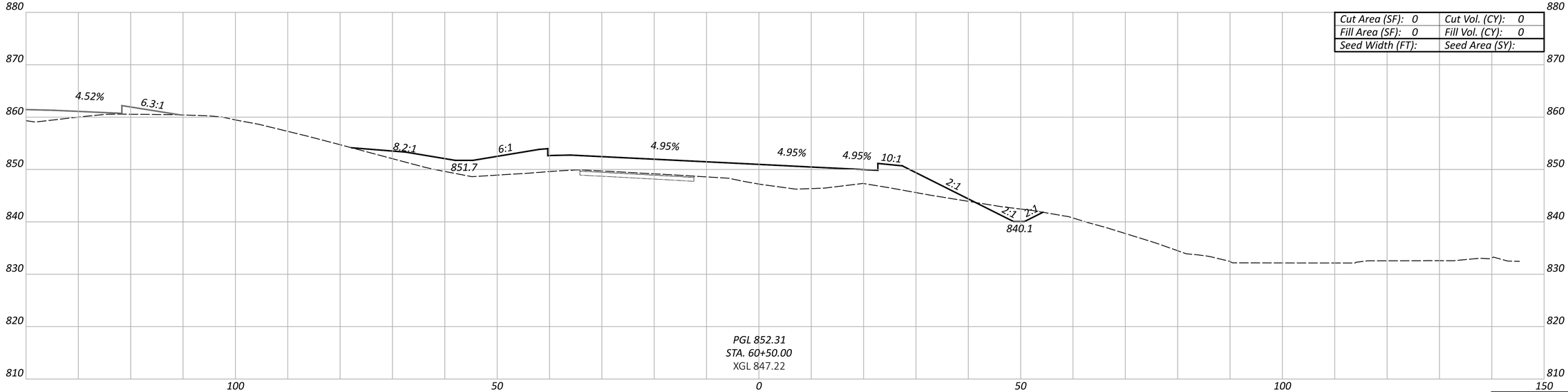
DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808

Sheet Totals

Seeding	Cut	Fill

SHEET	TOTAL
P.503	740





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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.504 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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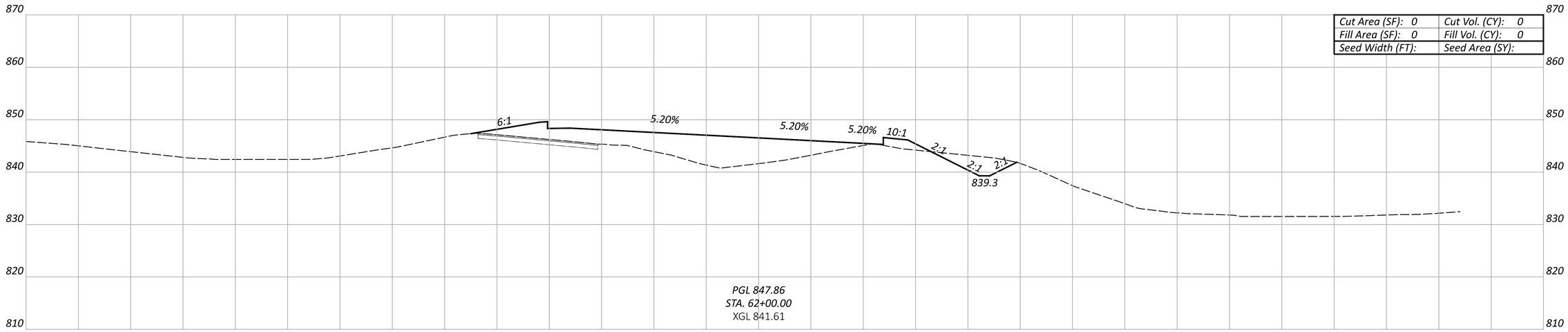

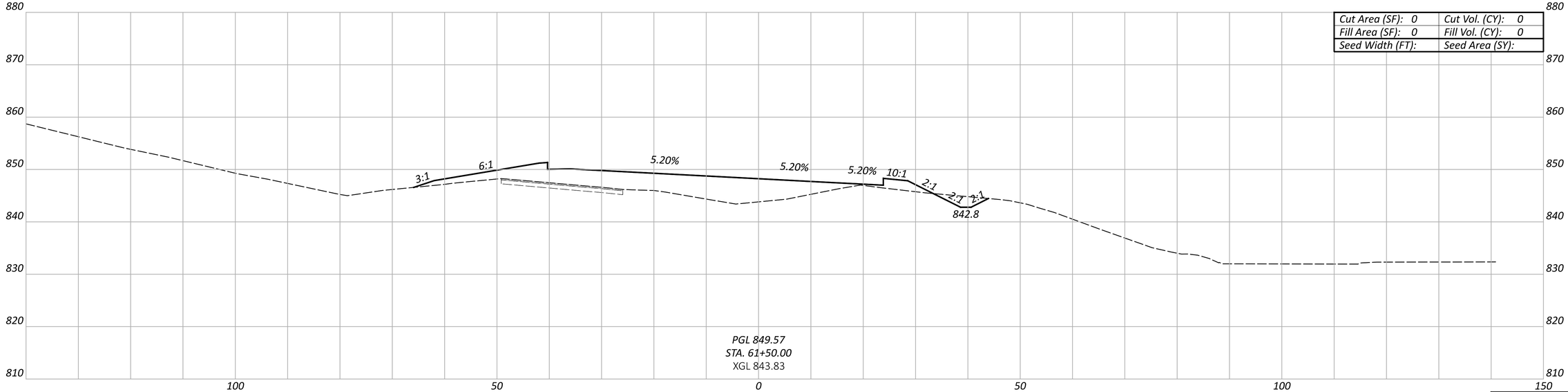

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.505 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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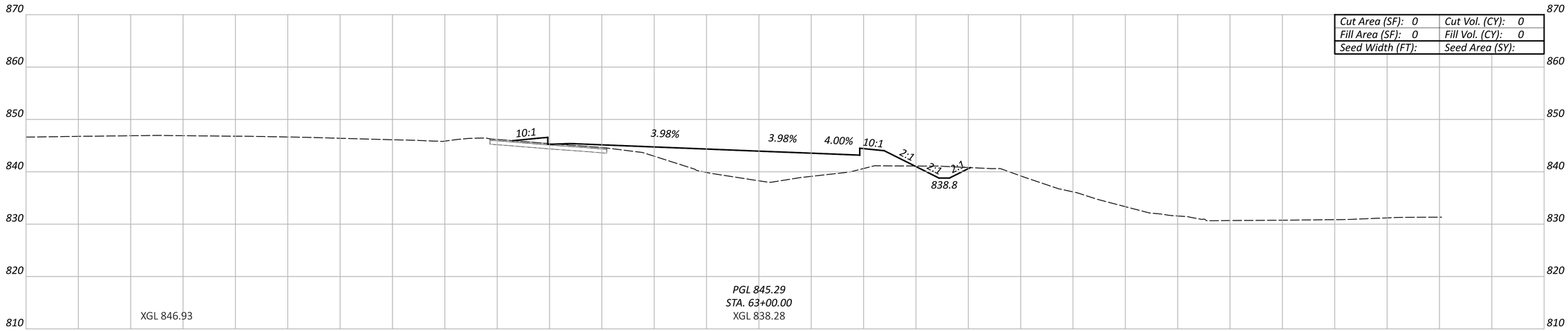

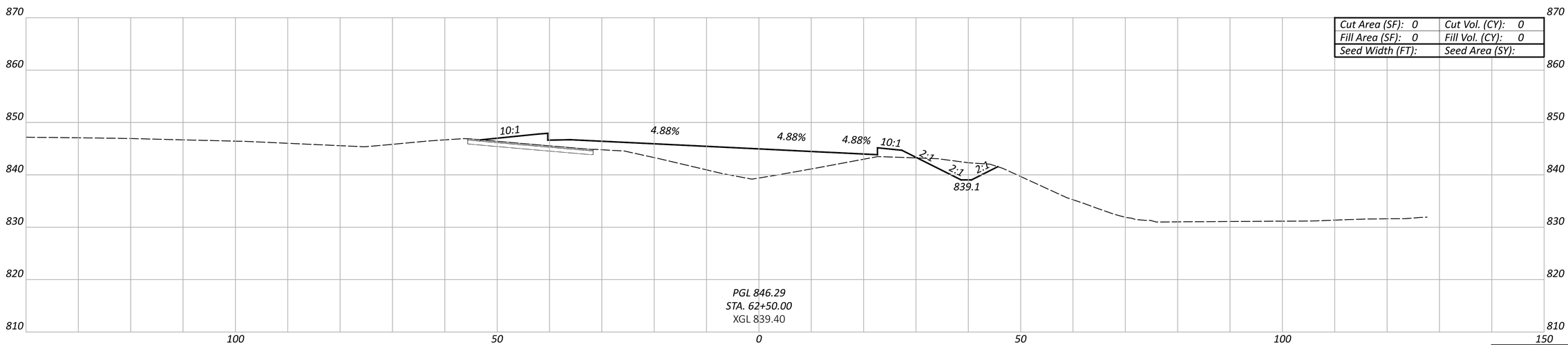

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Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
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REVIEWER
KAM 06/18/23

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96808

SHEET P.506 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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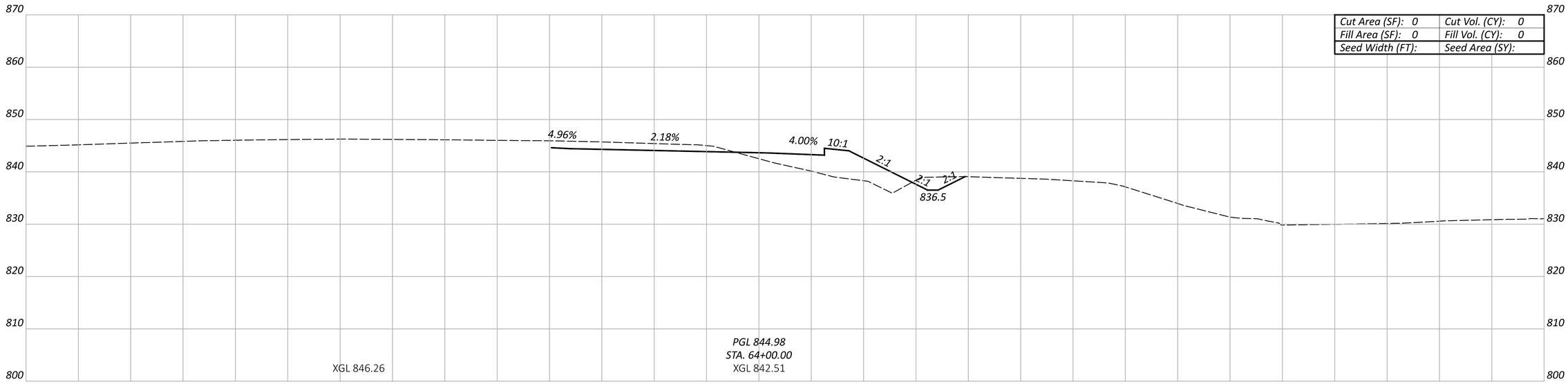

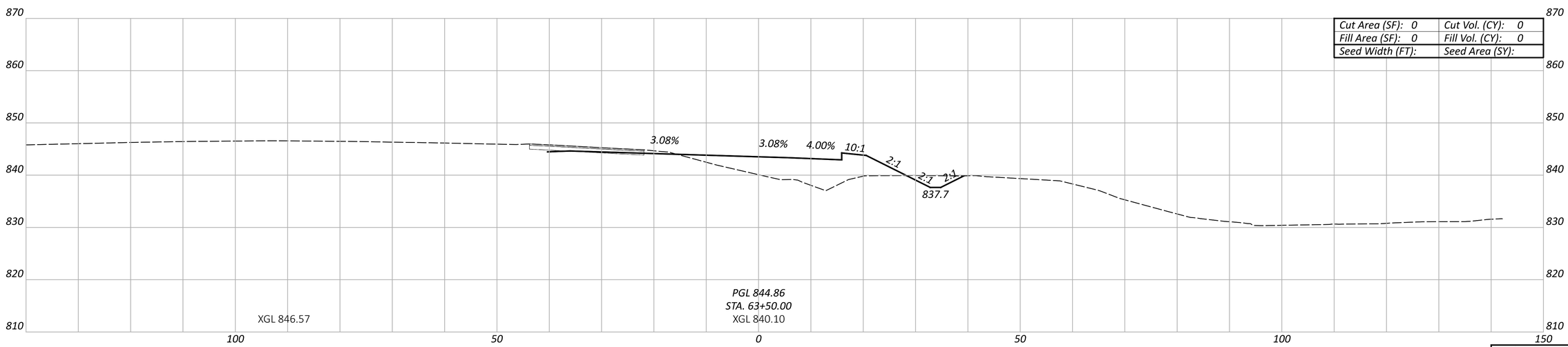

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DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

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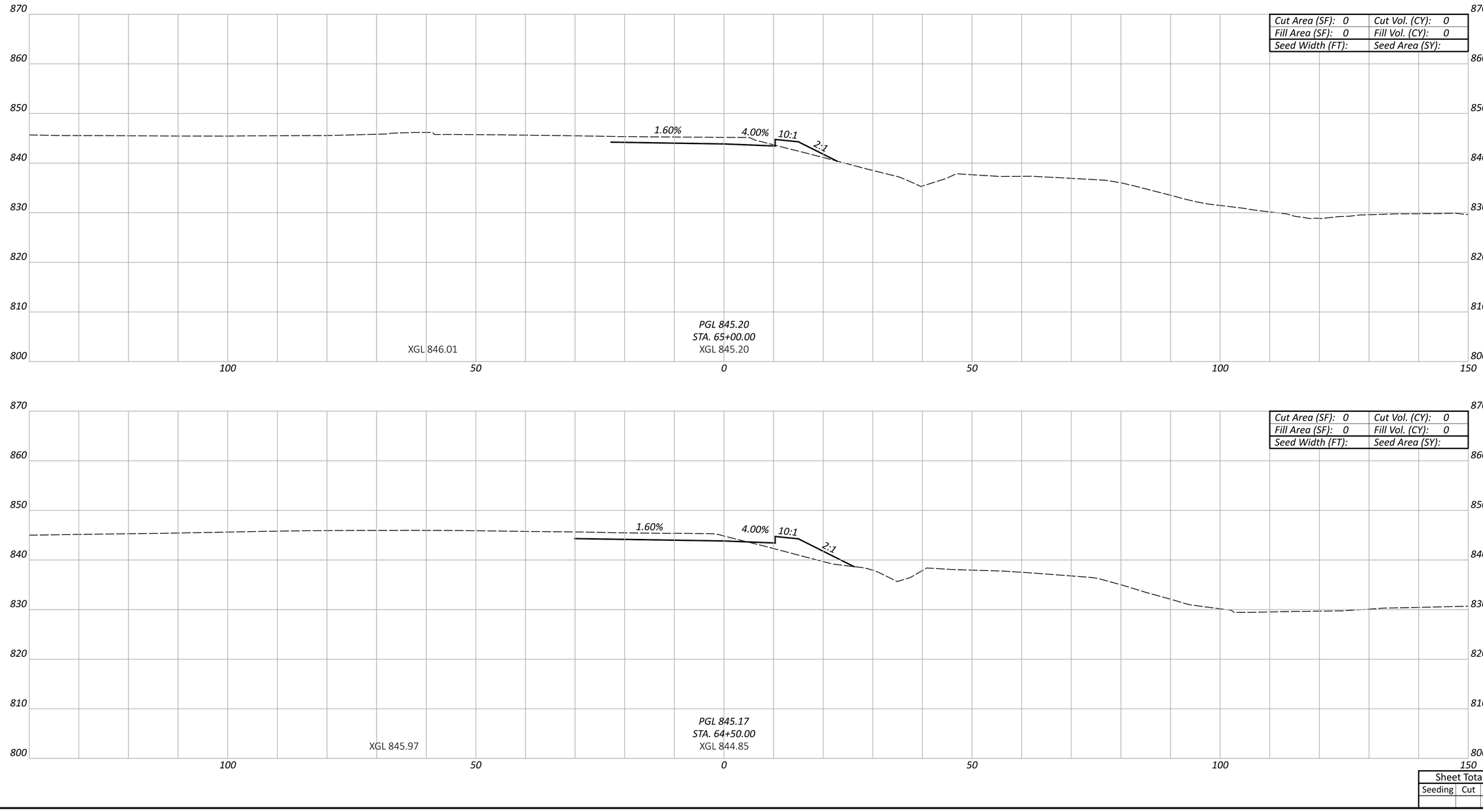
Seeding	Cut	Fill

SHEET	TOTAL
P.507	740



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DESIGN AGENCY
STRUCTUREPOINT INC.

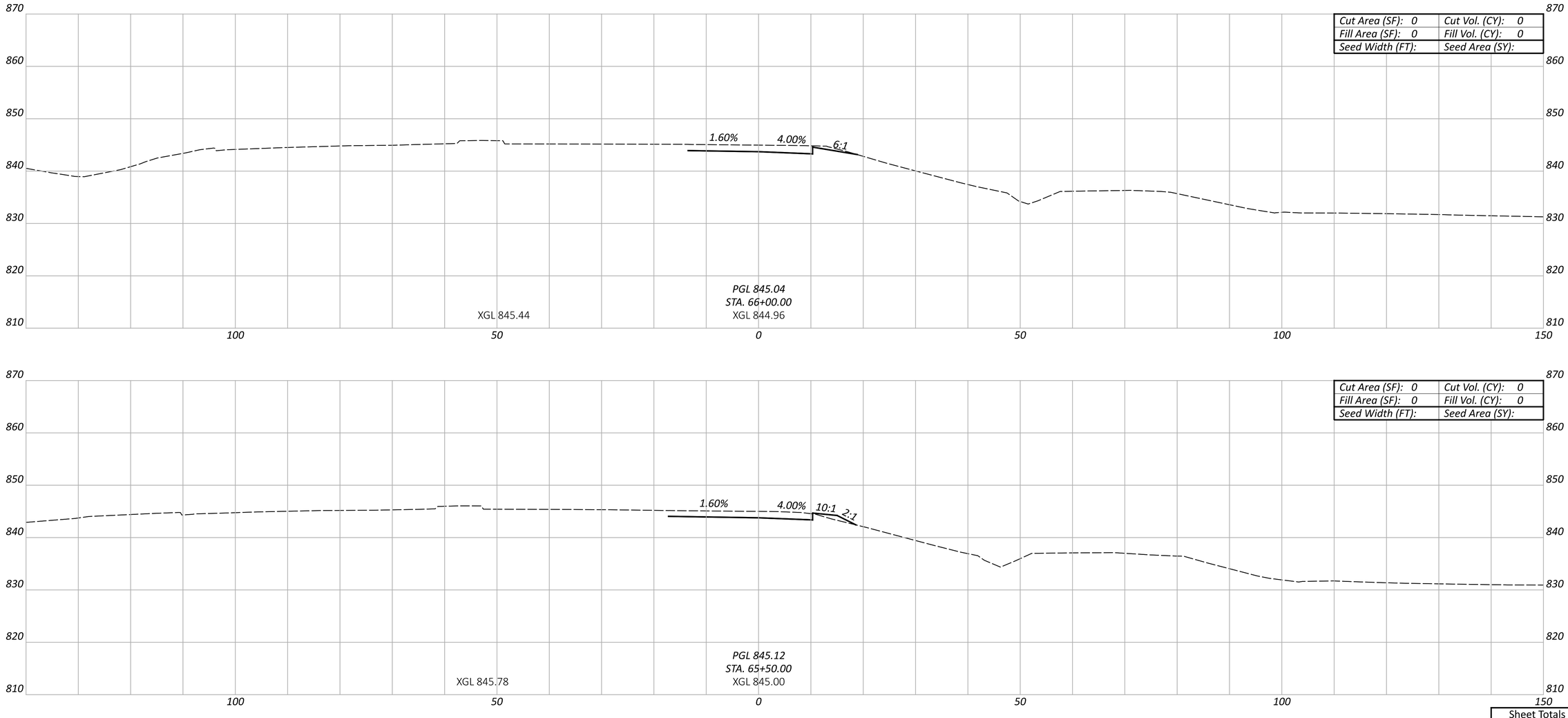
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.508	740



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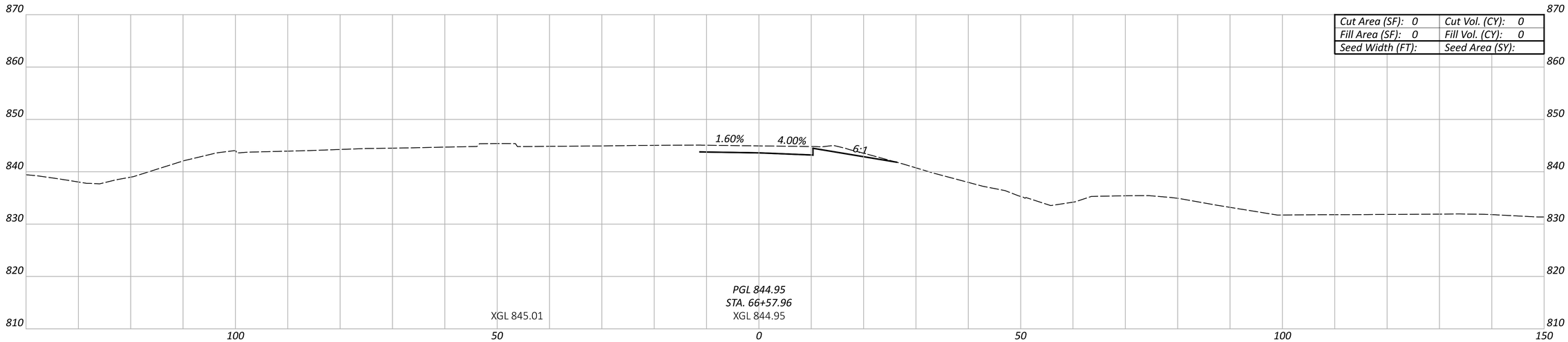
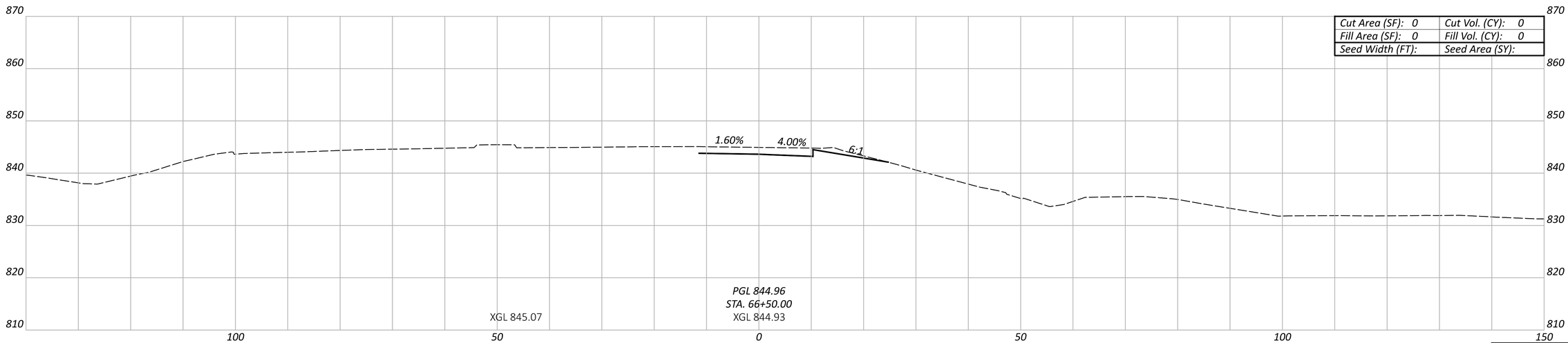
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.509
TOTAL	740





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DESIGN AGENCY
STRUCTUREPOINT INC.

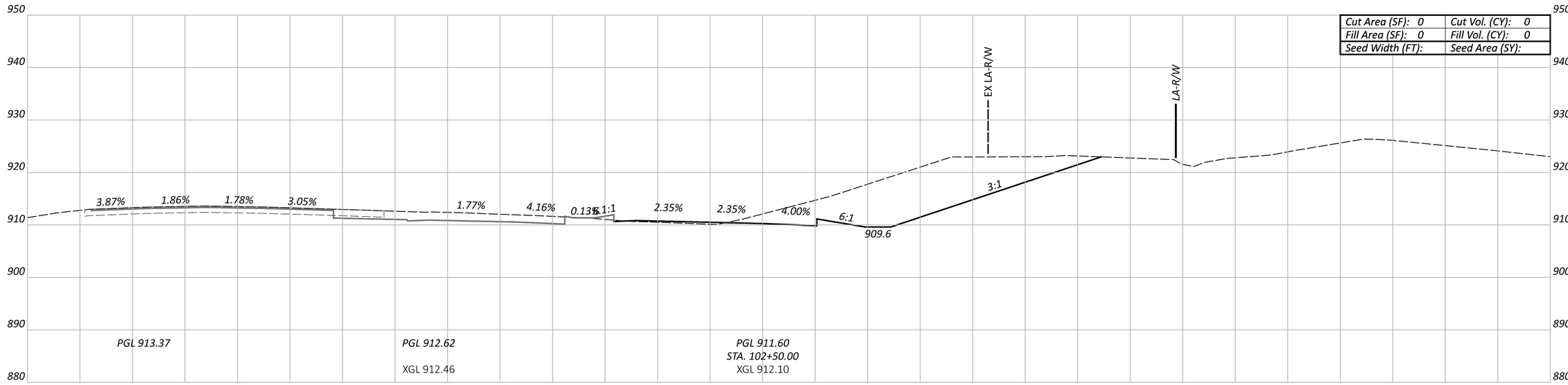
DESIGNER
BER

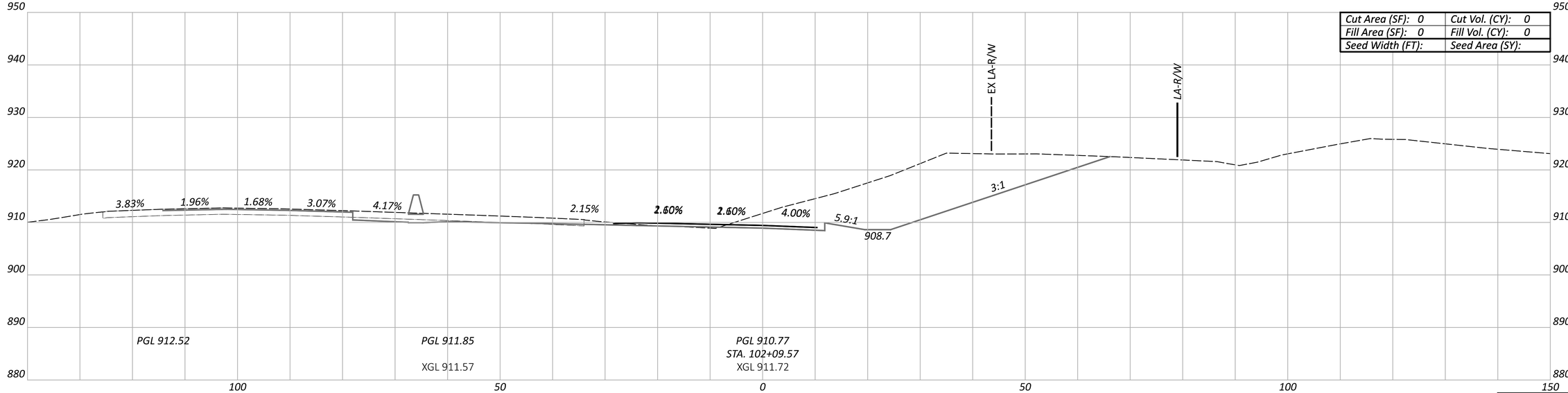
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.510	740





CROSS SECTIONS - RAMP G
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.511 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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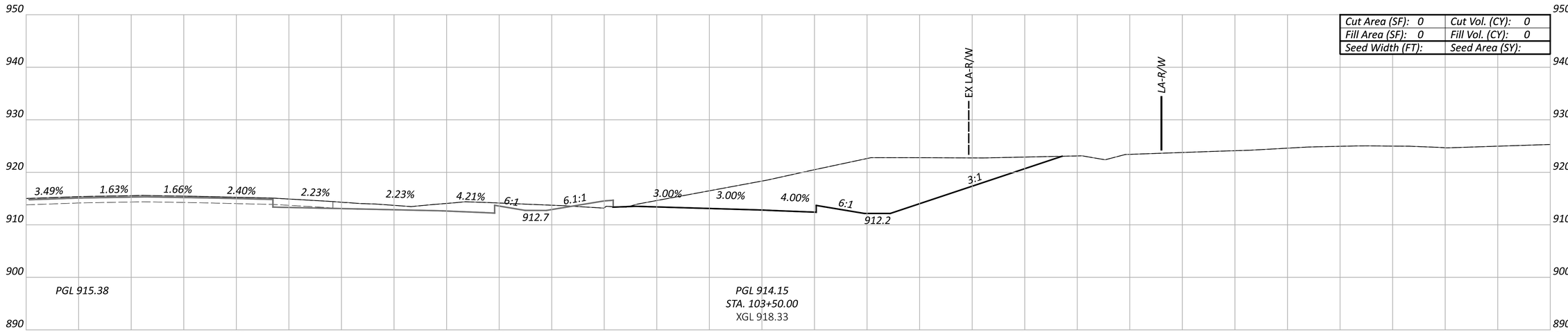

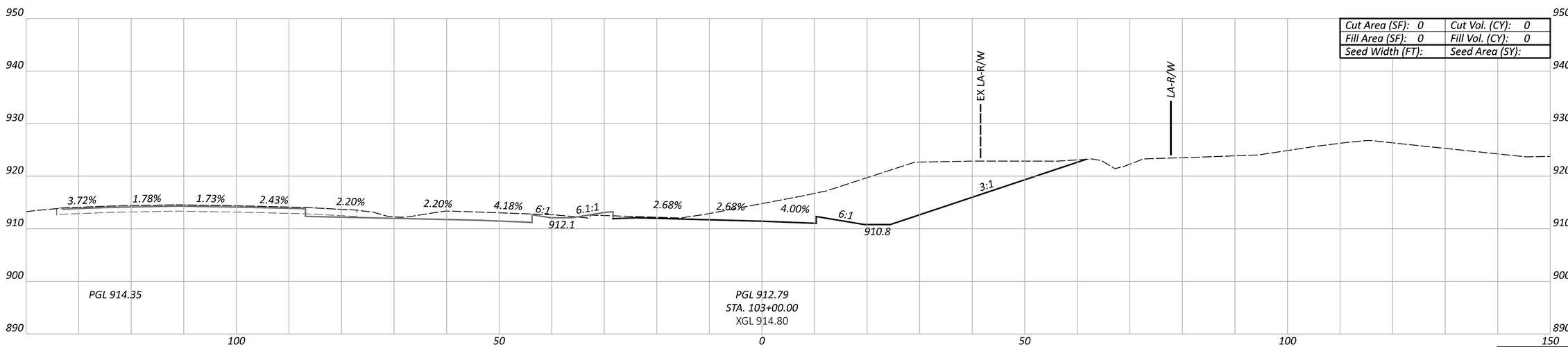

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Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.512 | TOTAL 740

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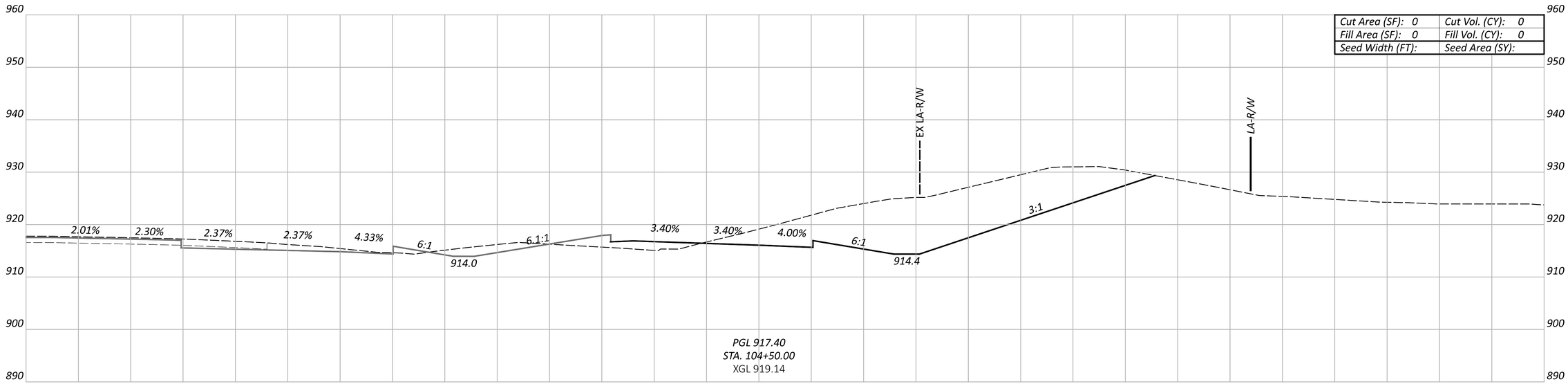

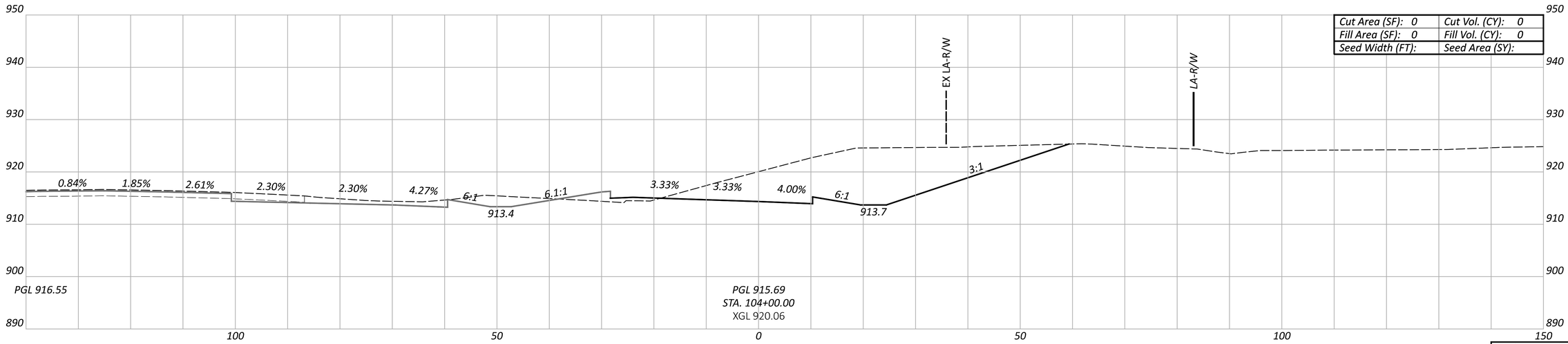

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DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.513 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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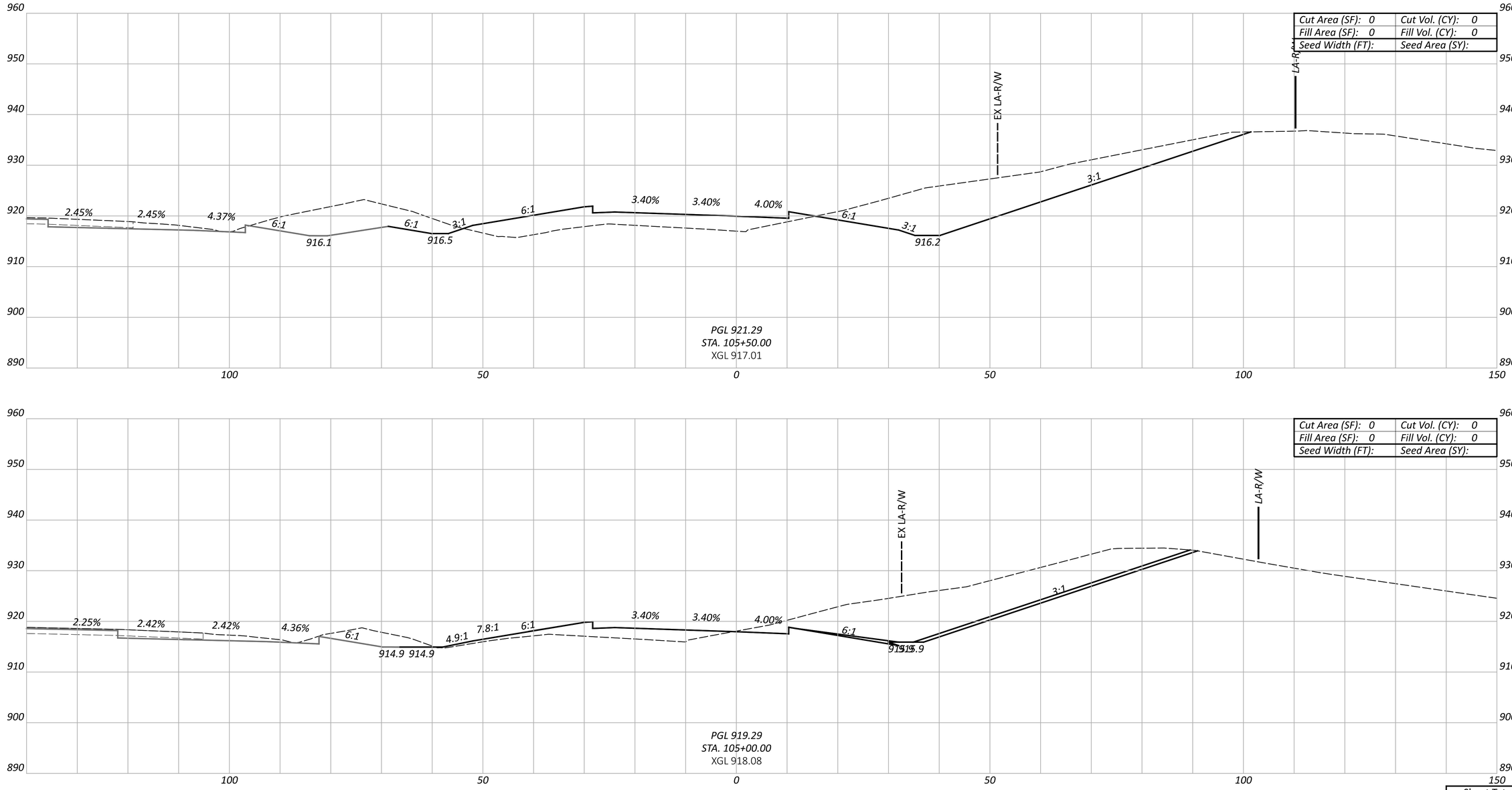

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DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.514 TOTAL 740

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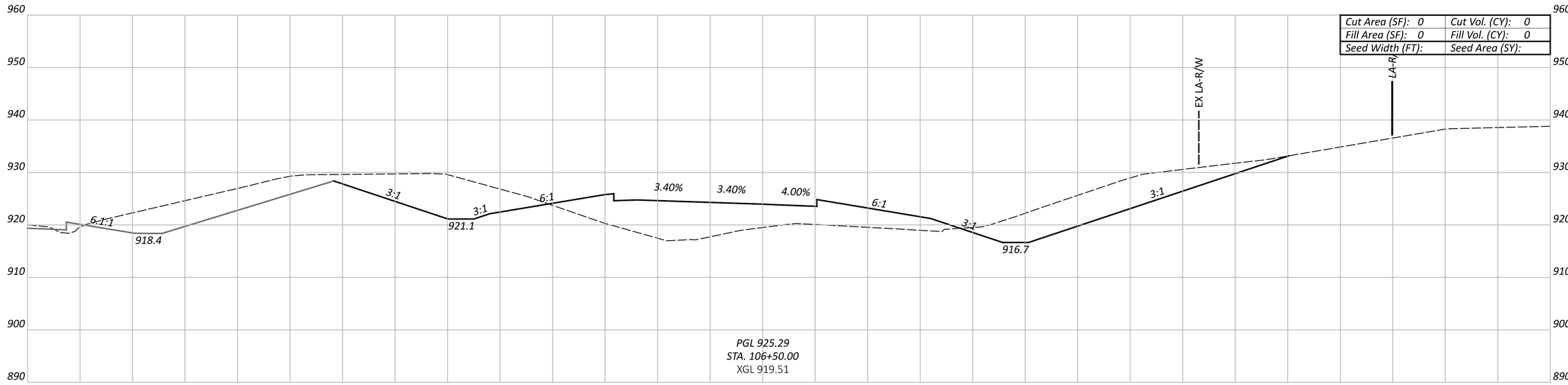

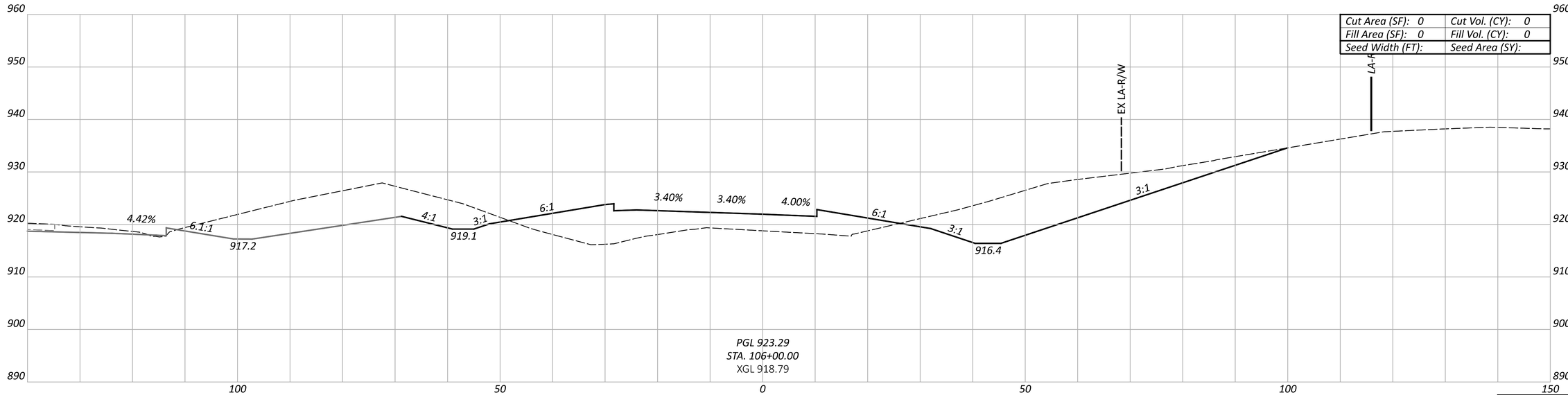

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Sheet Totals		
Seeding	Cut	Fill

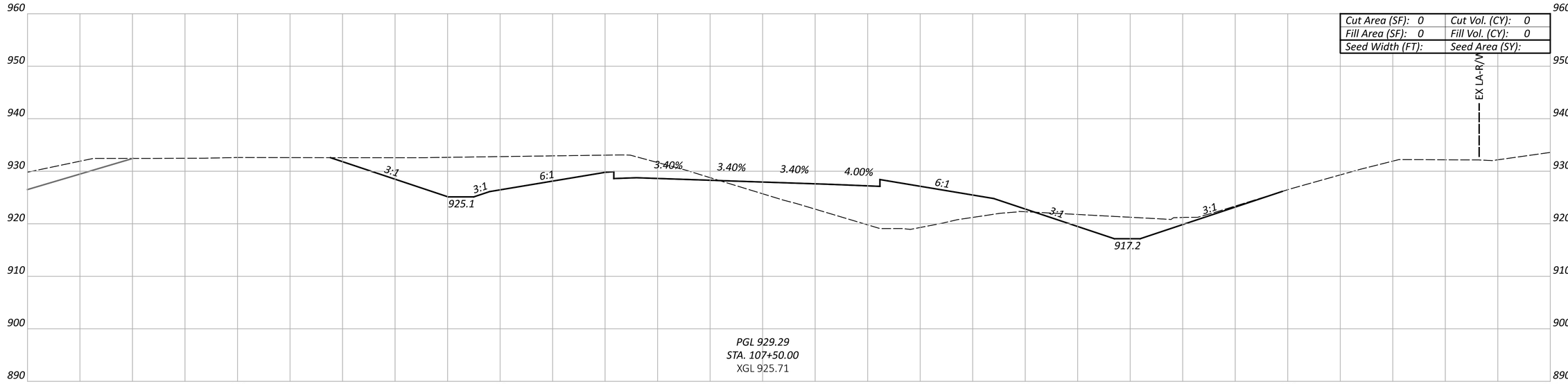
DESIGN AGENCY
STRUCTUREPOINT LLC

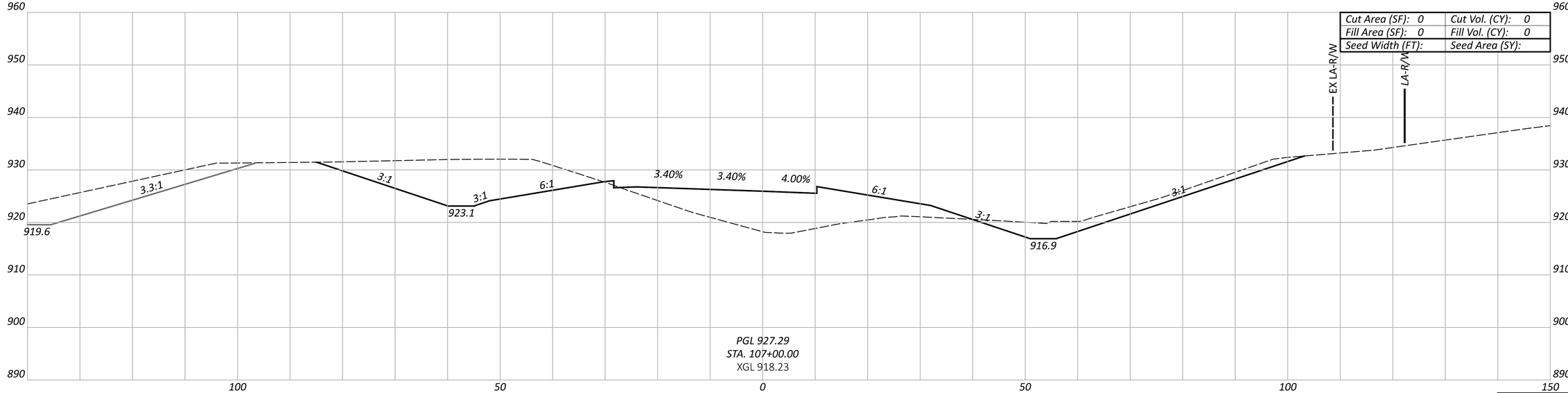
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.515	740





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Sheet Totals		
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DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
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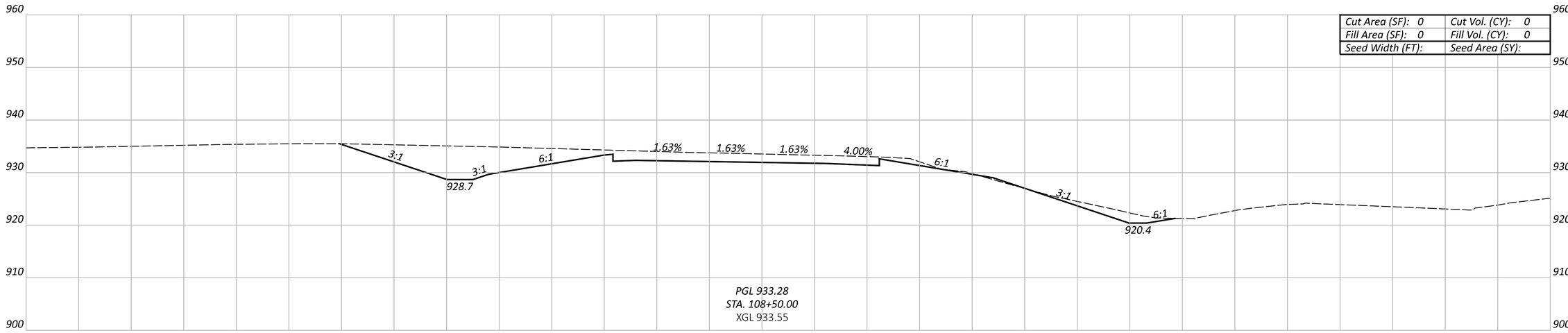
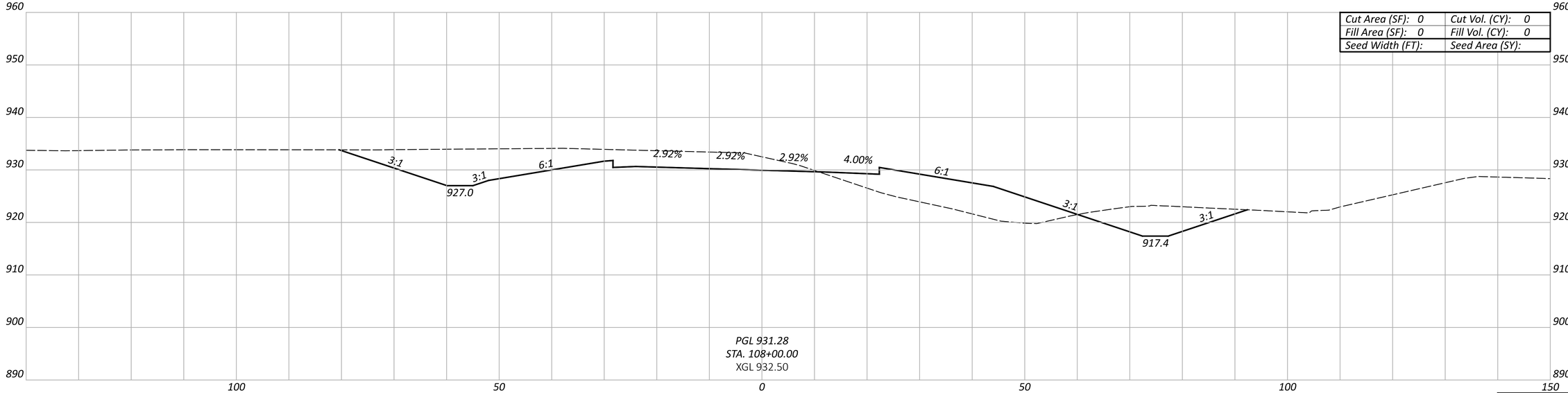
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.516 TOTAL 740





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Sheet Totals

Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

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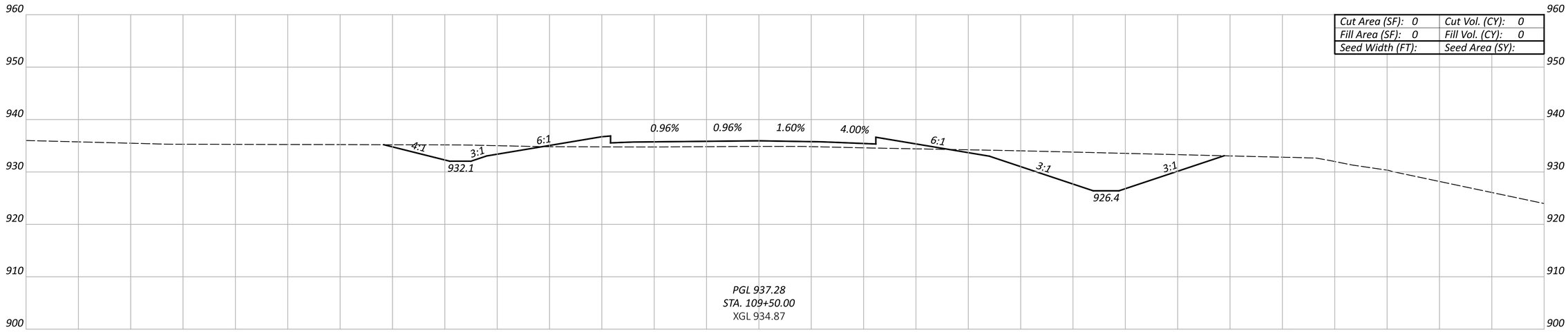
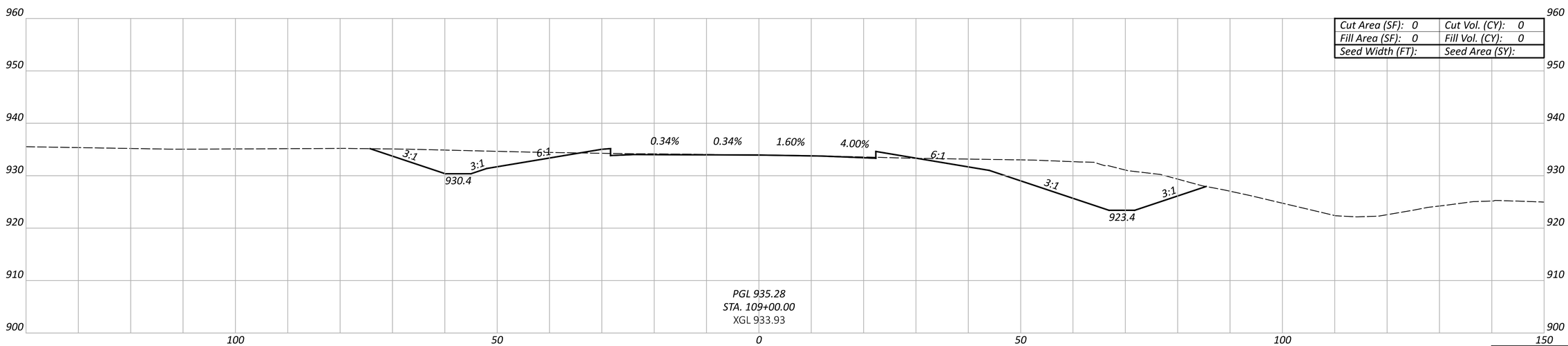
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.517 TOTAL 740





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CROSS SECTIONS - RAMP G
STA. 109+00.00 TO STA. 109+50.00

Sheet Totals		
Seeding	Cut	Fill

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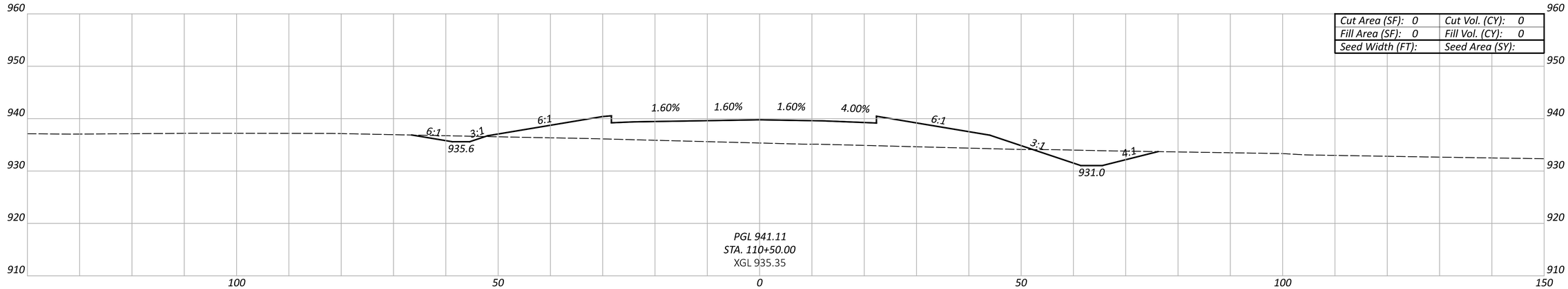
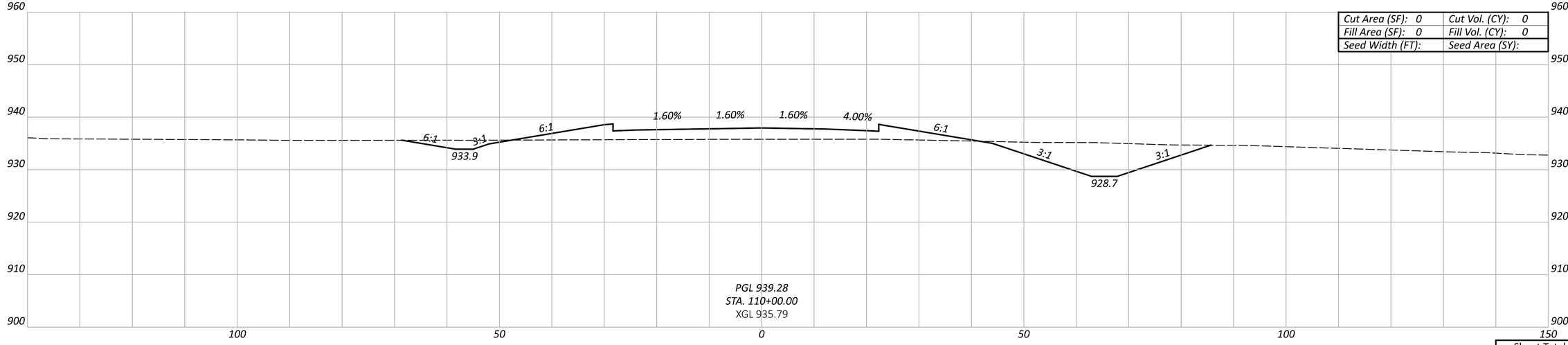
KAM 06/18/23

PROJECT ID
96808

SHEET P.518 TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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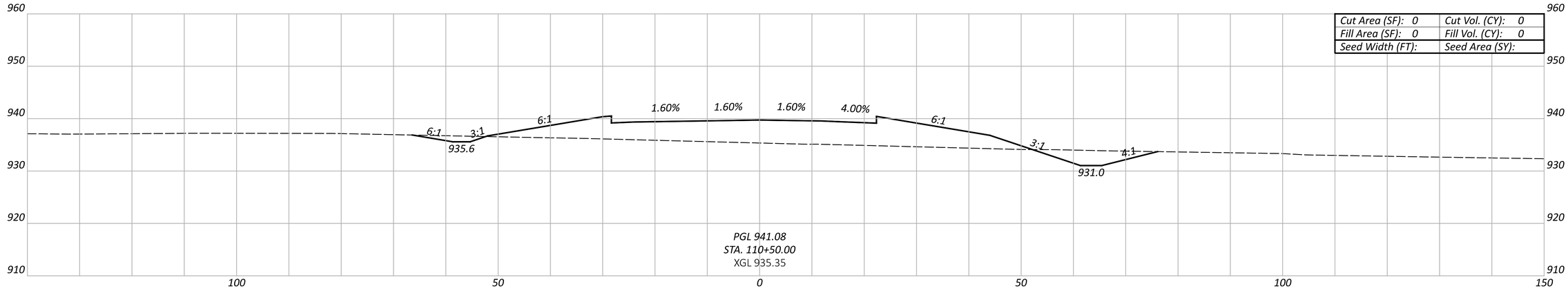
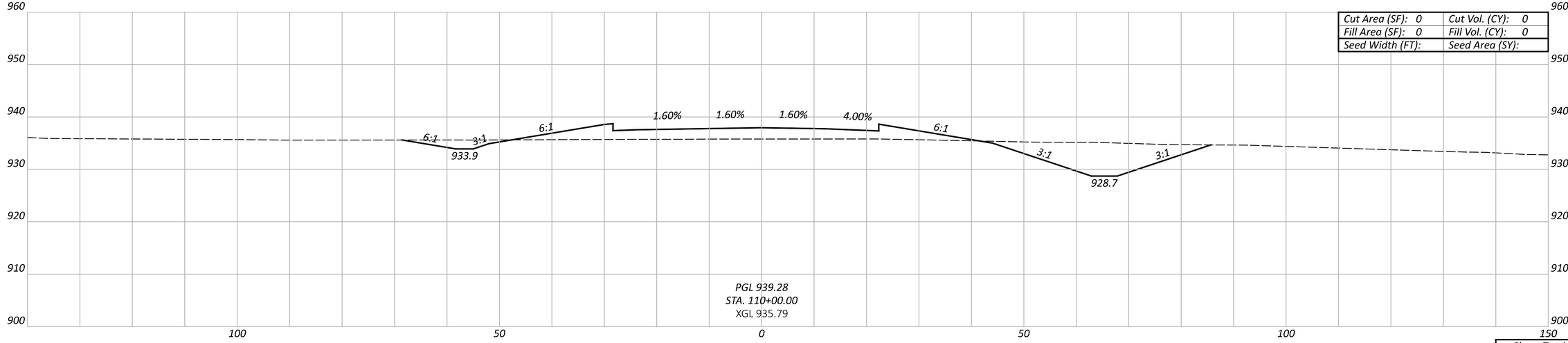
PROJECT ID
96808

SHEET P.519 TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

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PROJECT ID
96808

SHEET P.520 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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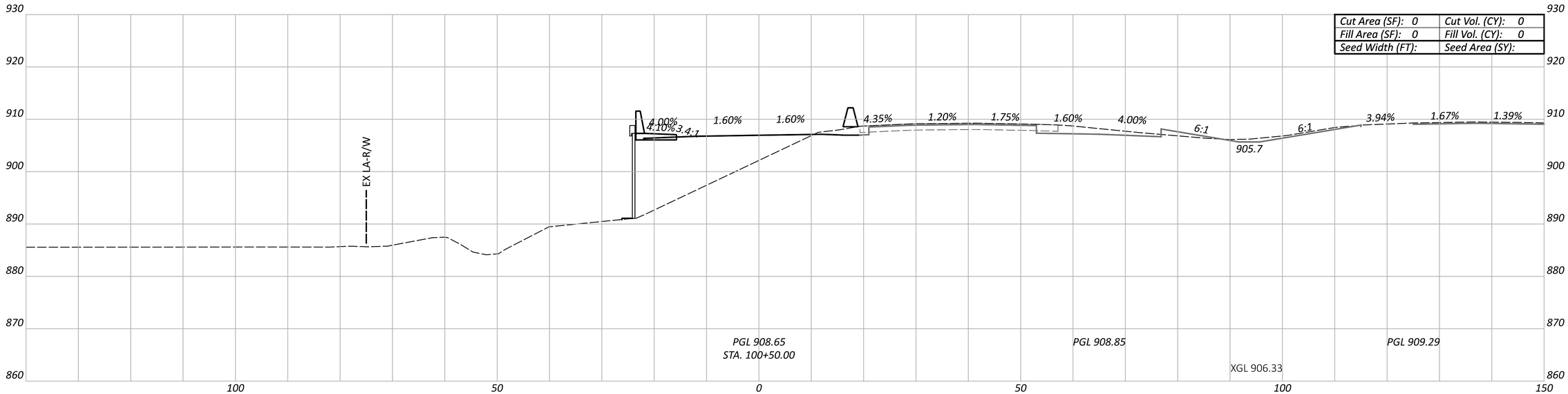

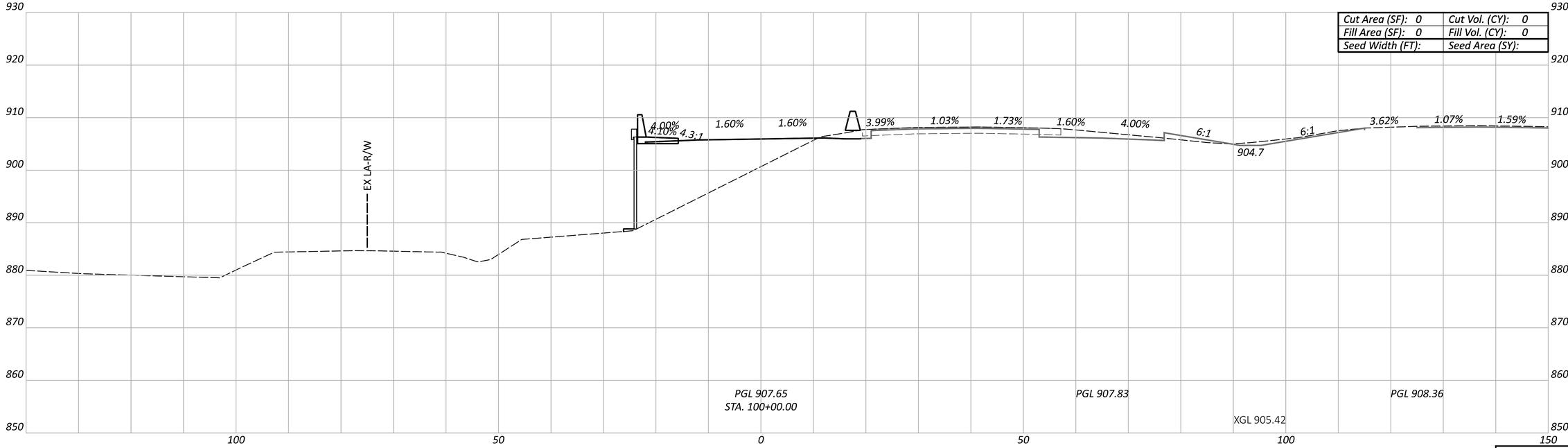

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DESIGN AGENCY
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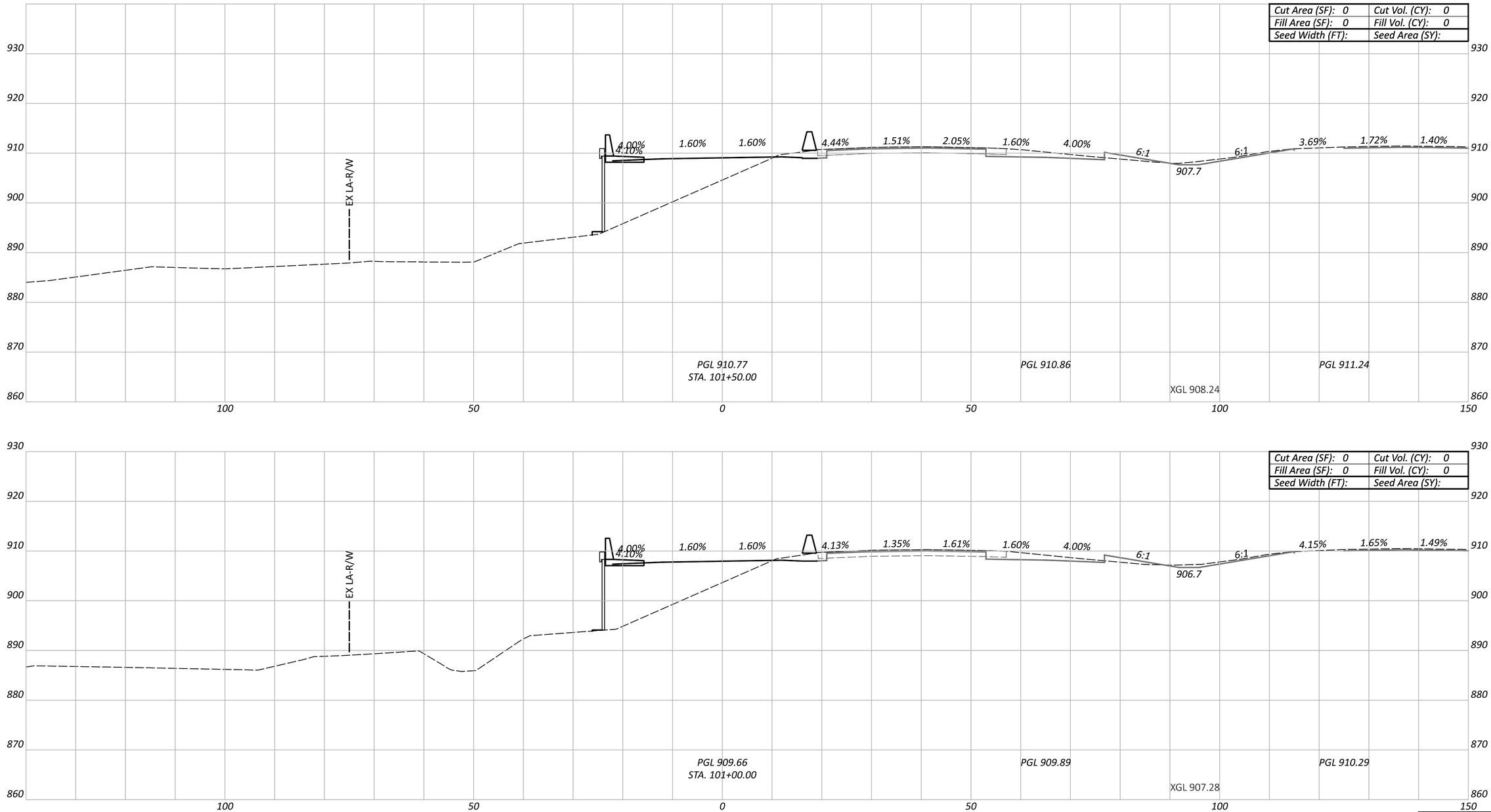
PROJECT ID
96808

SHEET P.547 TOTAL 740



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Sheet Totals		
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DESIGN AGENCY
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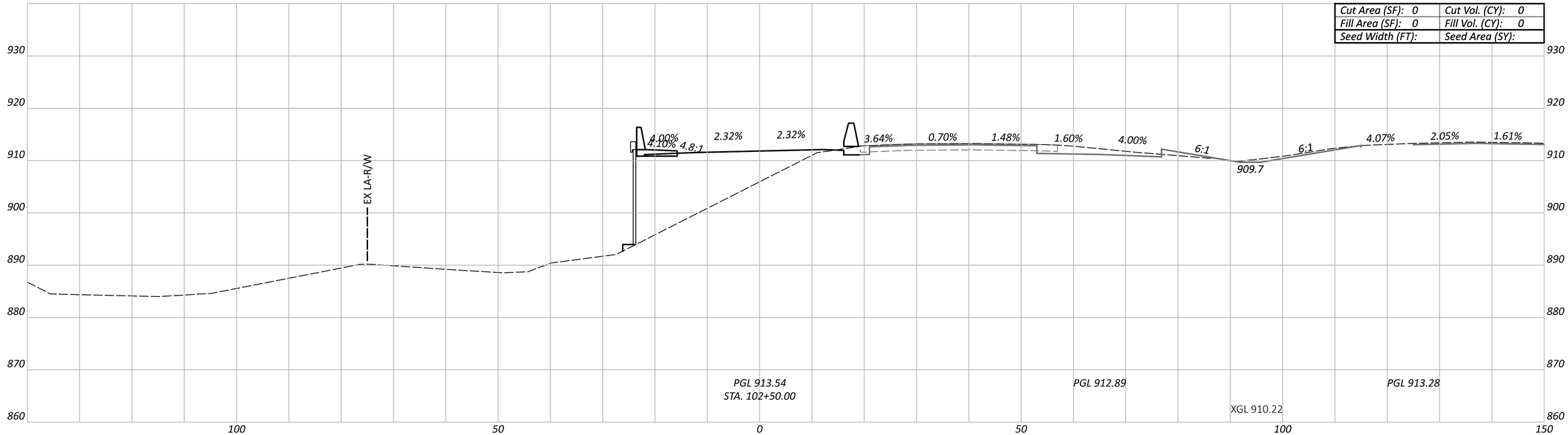
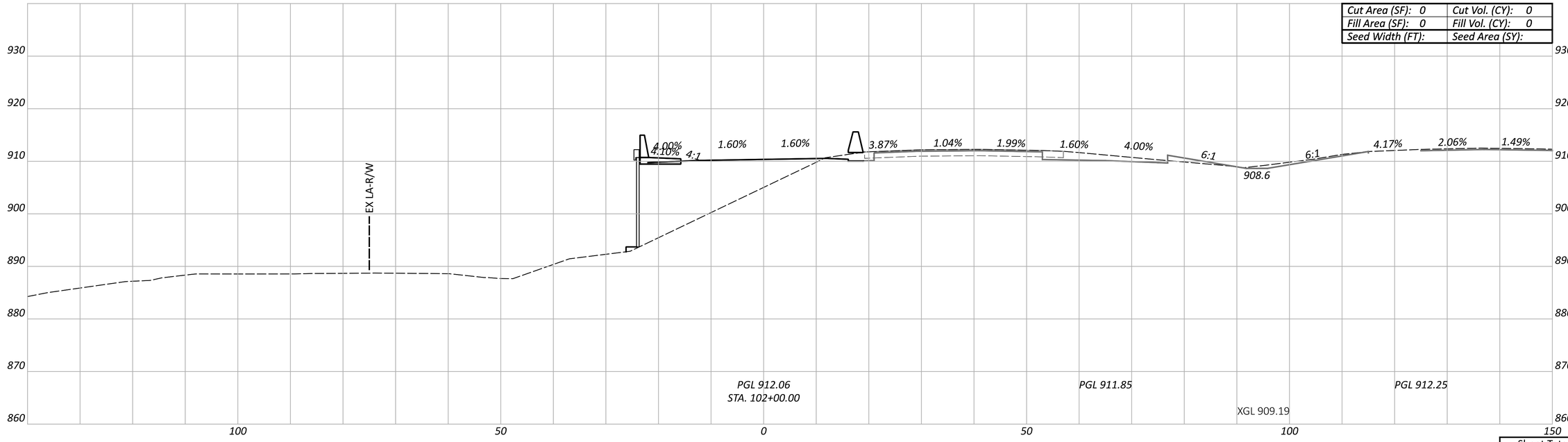
SHEET P.548 TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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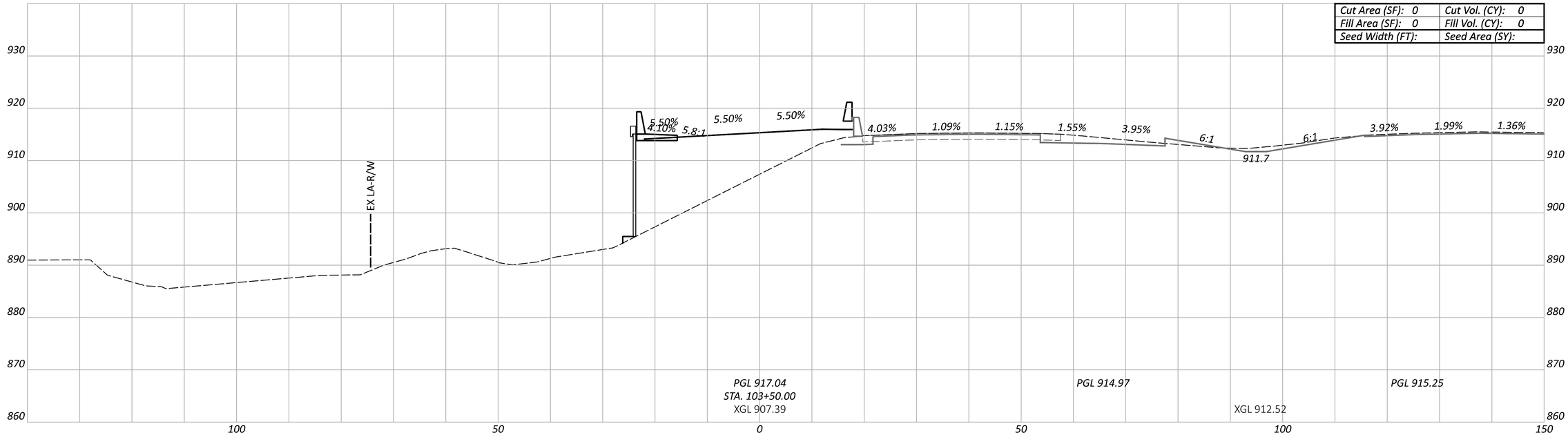
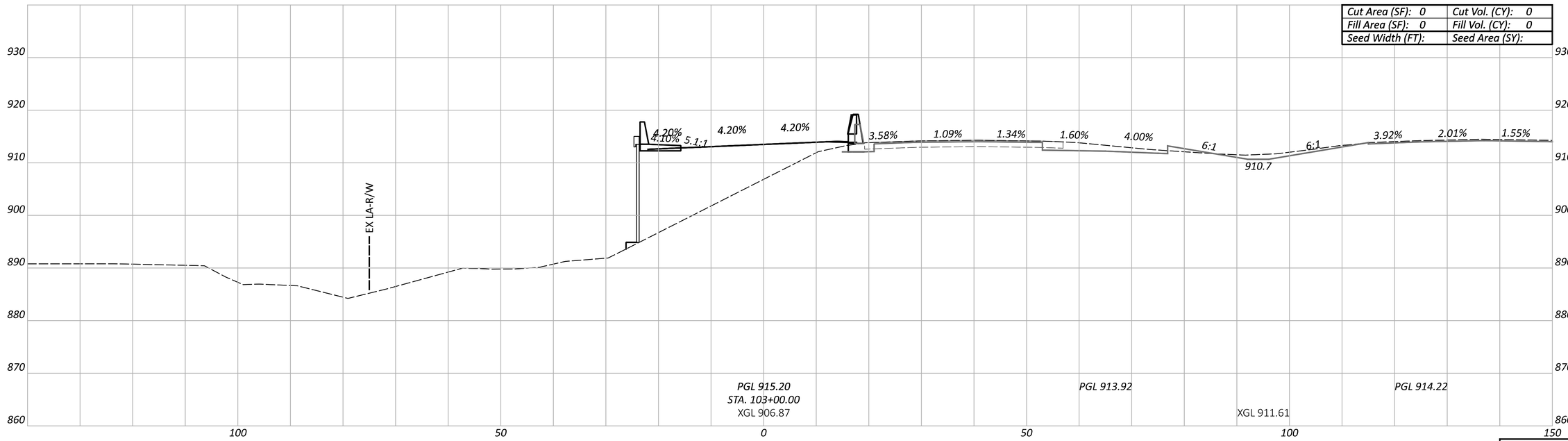
PROJECT ID
96808

SHEET P.549 TOTAL 740





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CROSS SECTIONS - RAMP H
STA. 103+00.00 TO STA. 103+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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PROJECT ID
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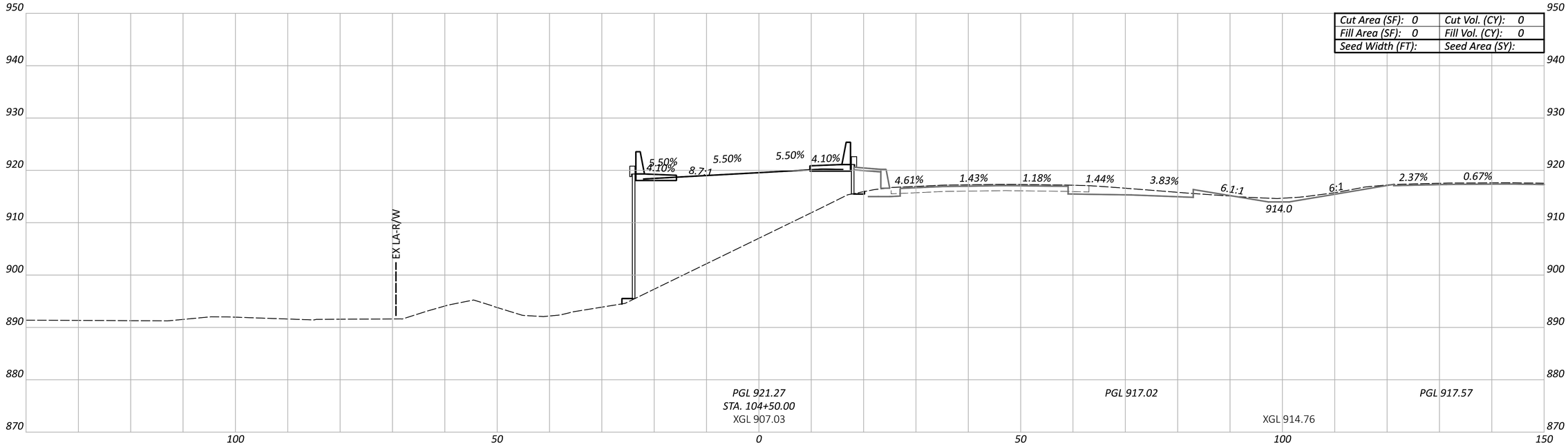
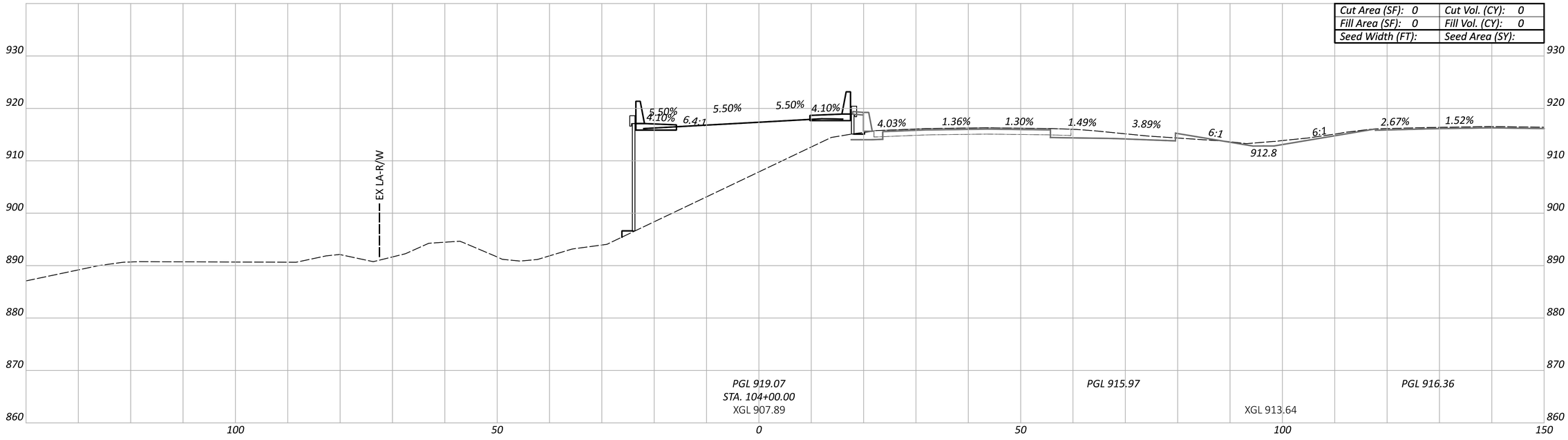
SHEET P.550 TOTAL 740





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DESIGN AGENCY
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SHEET P.551 TOTAL 740

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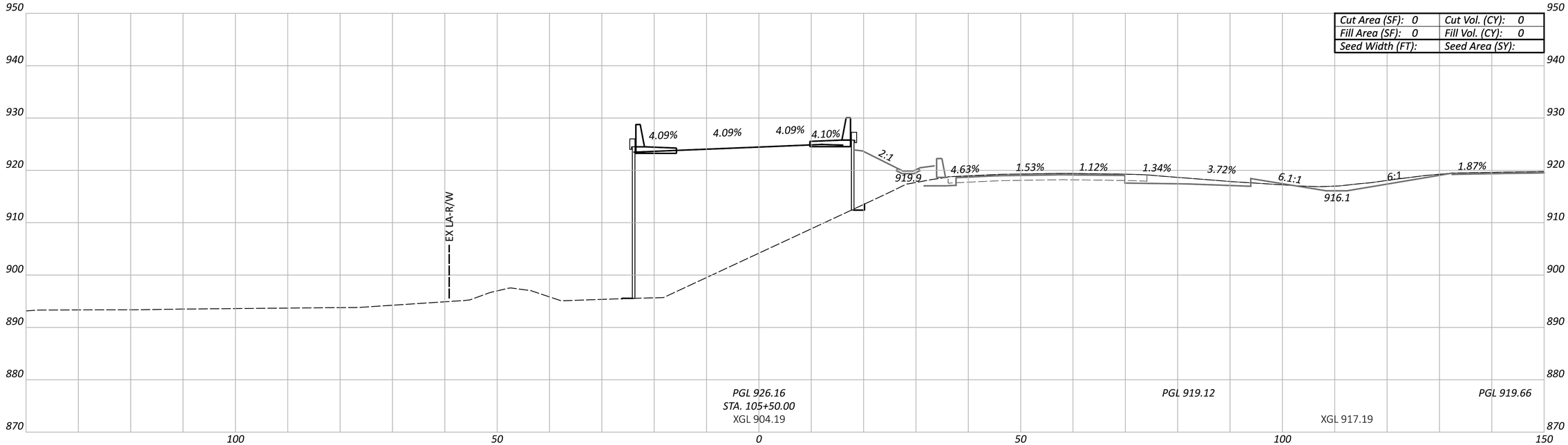

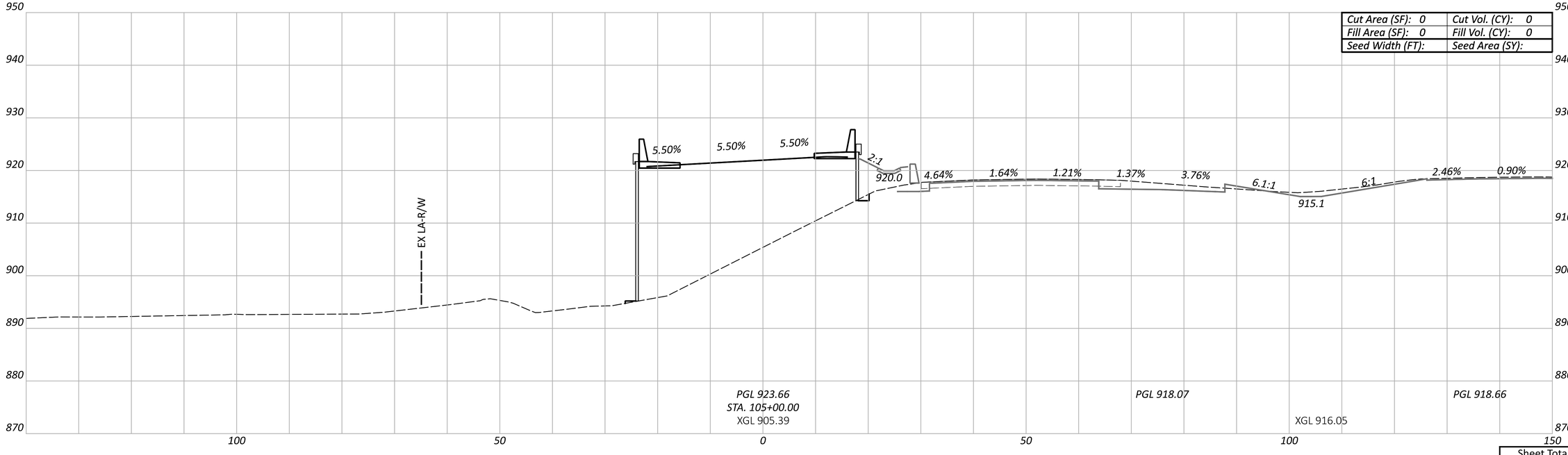

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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PROJECT ID
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SHEET P.552 TOTAL 740

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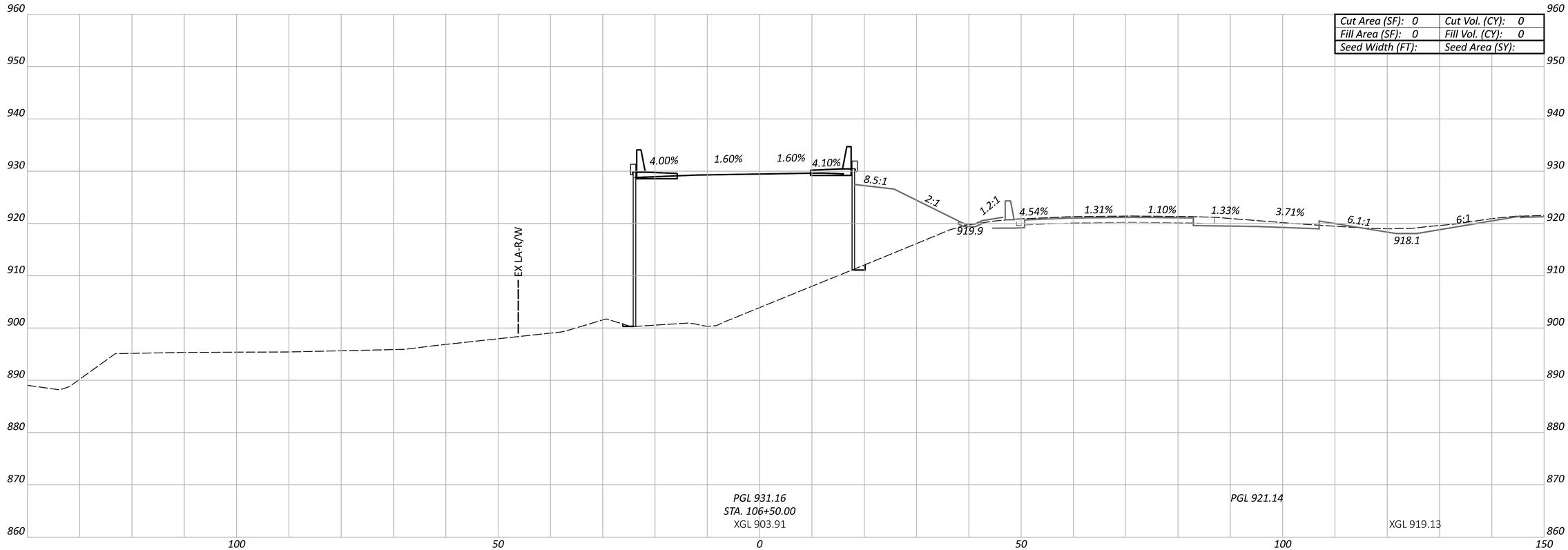

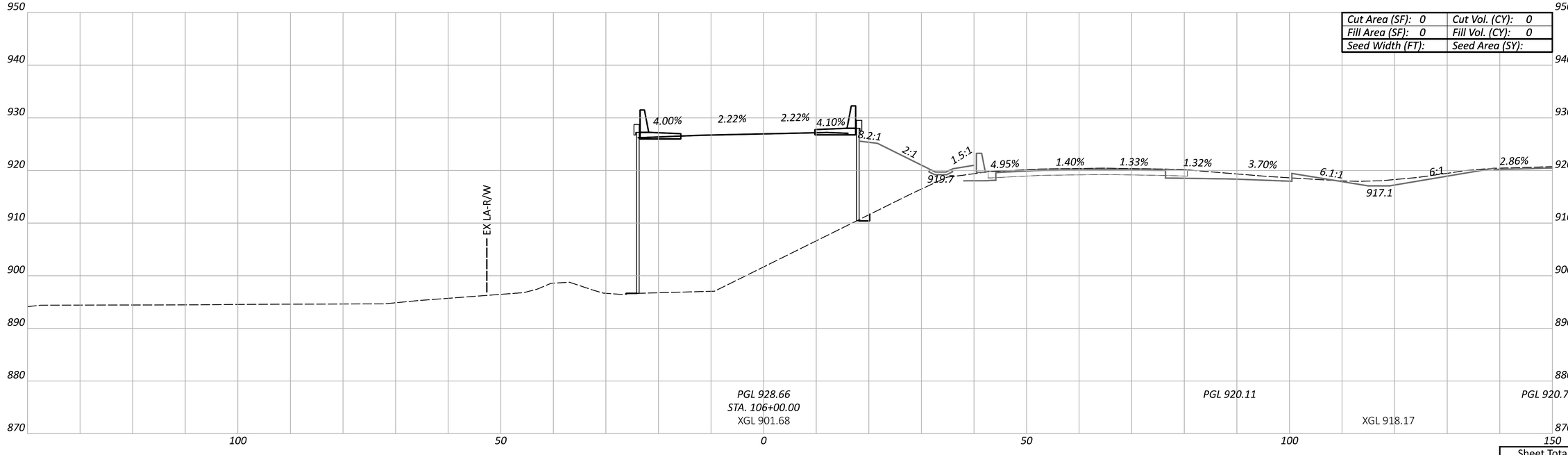

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Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

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PROJECT ID
96808

SHEET P.553 TOTAL 740

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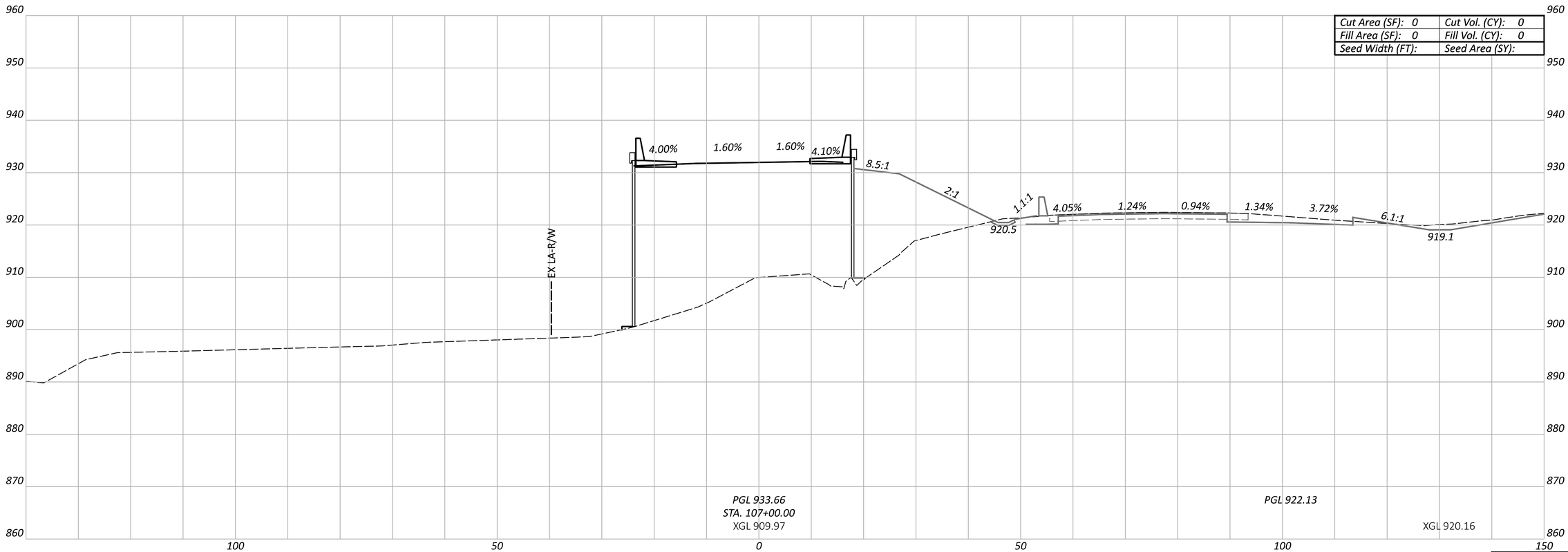

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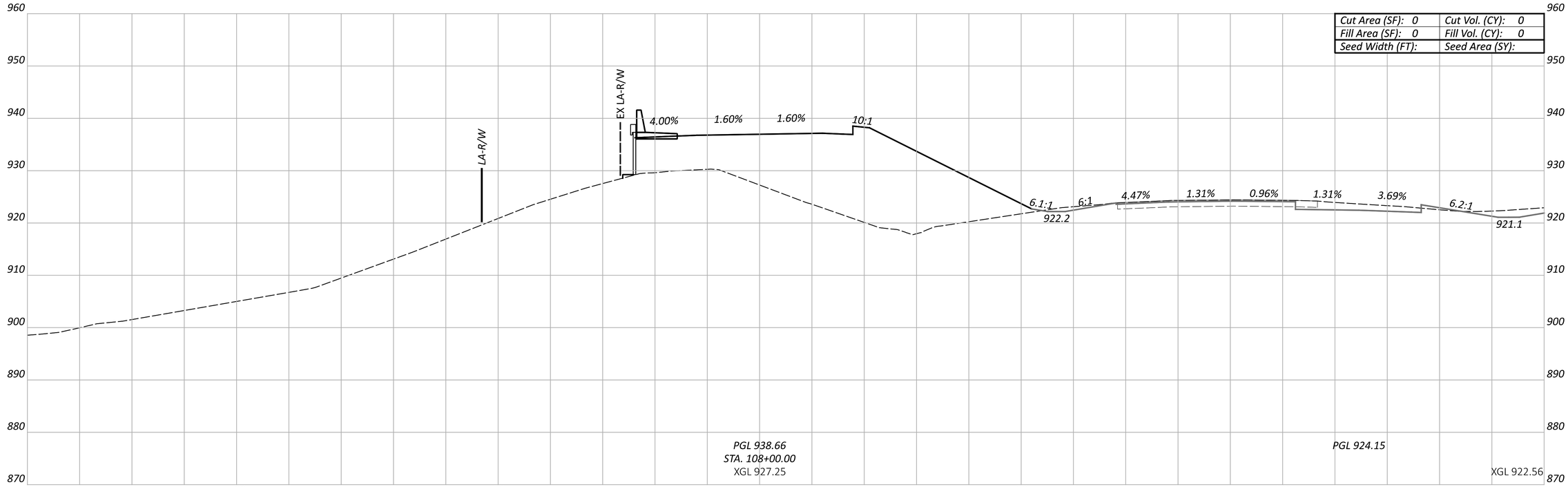
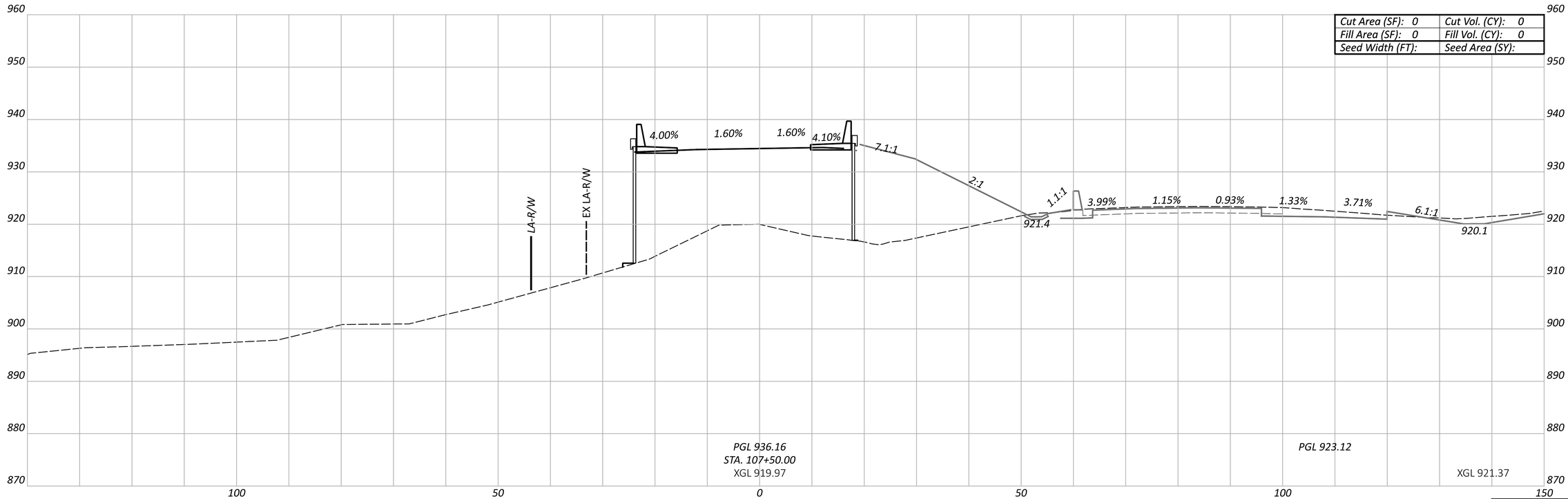
KAM 06/18/23

PROJECT ID
96808

SHEET P.554 | TOTAL 740





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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

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96808

SHEET P.555 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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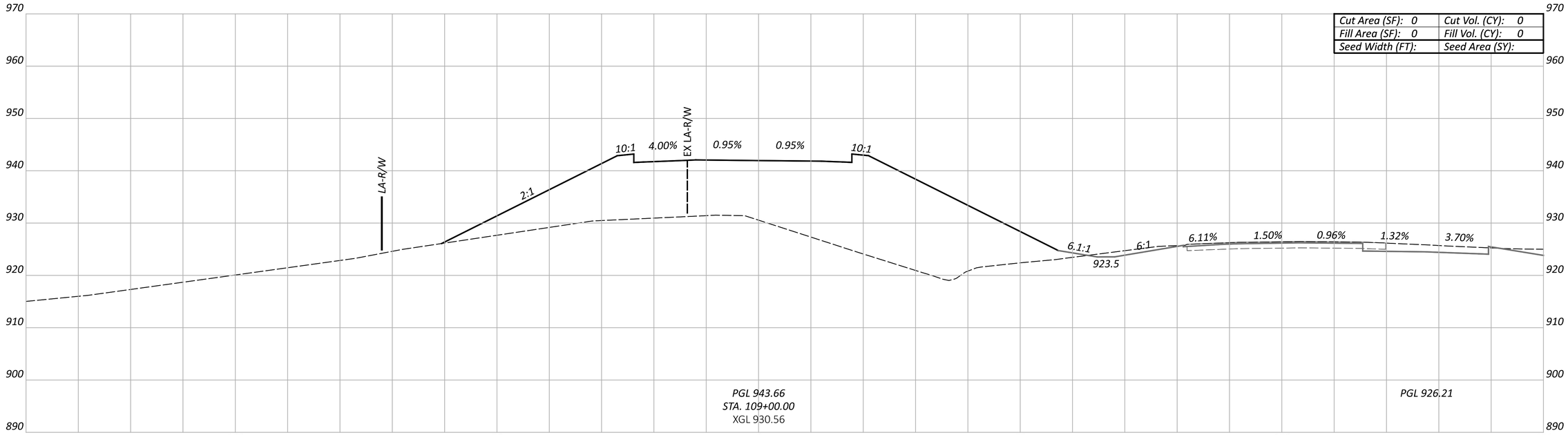

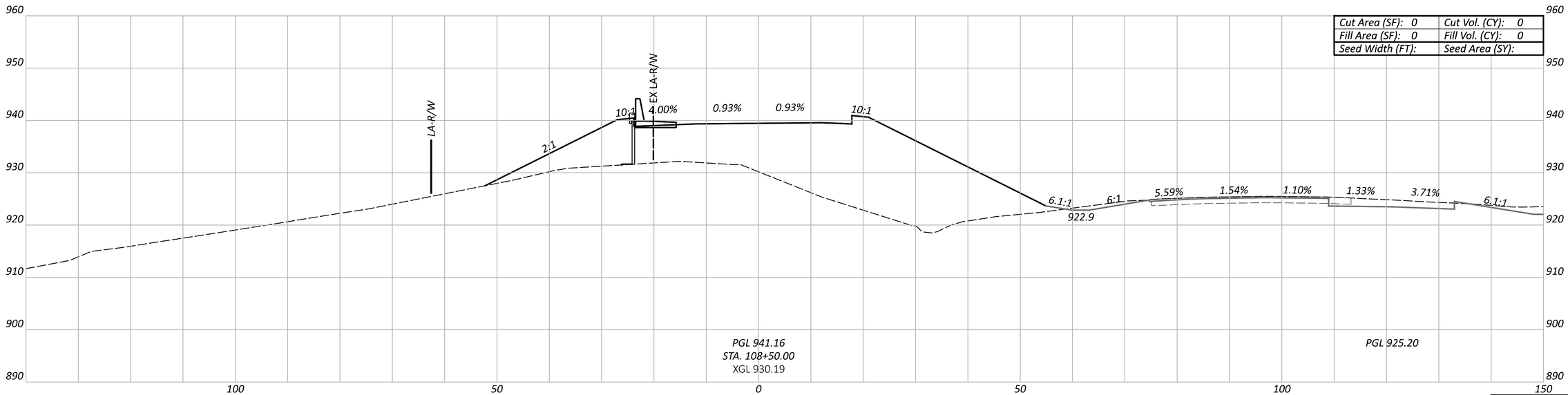

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DESIGN AGENCY
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PROJECT ID
96808

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Seeding	Cut	Fill

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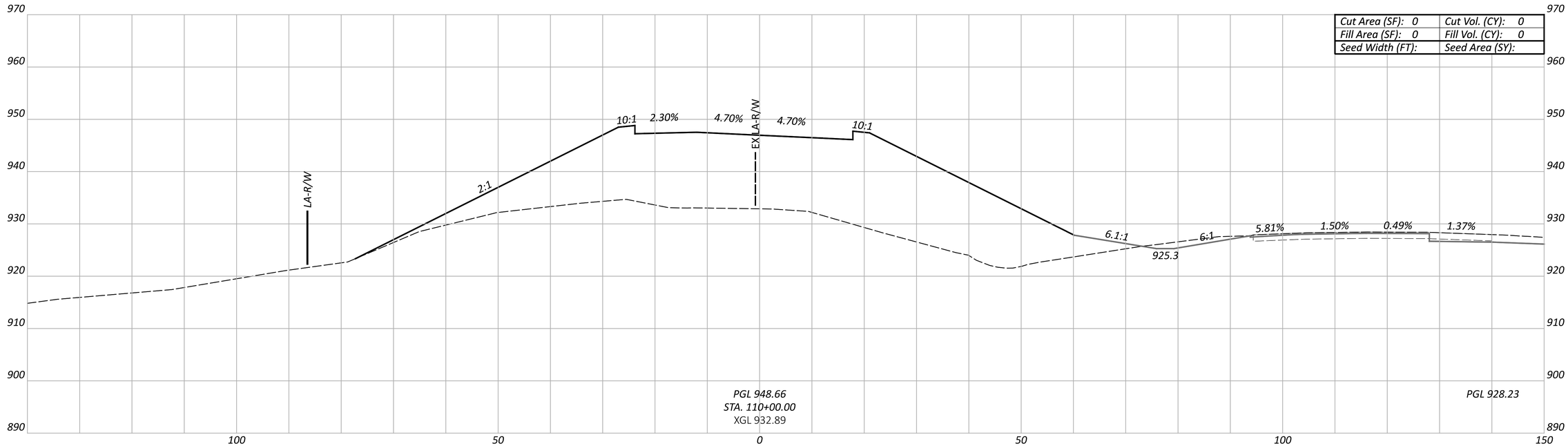

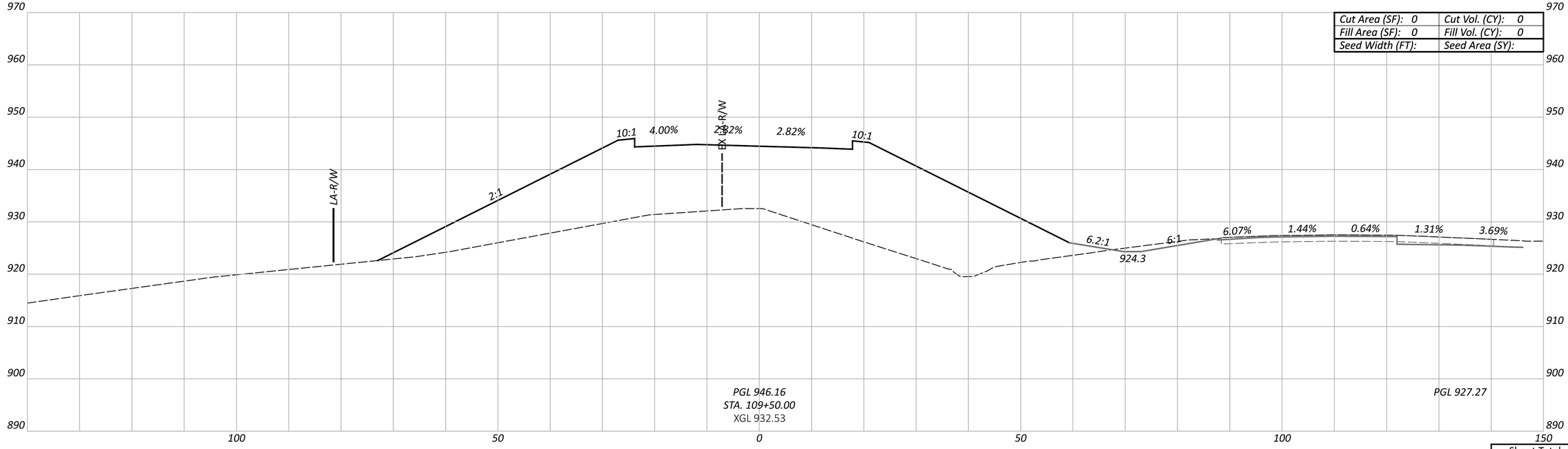

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DESIGN AGENCY
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PROJECT ID
96808

SHEET P.557 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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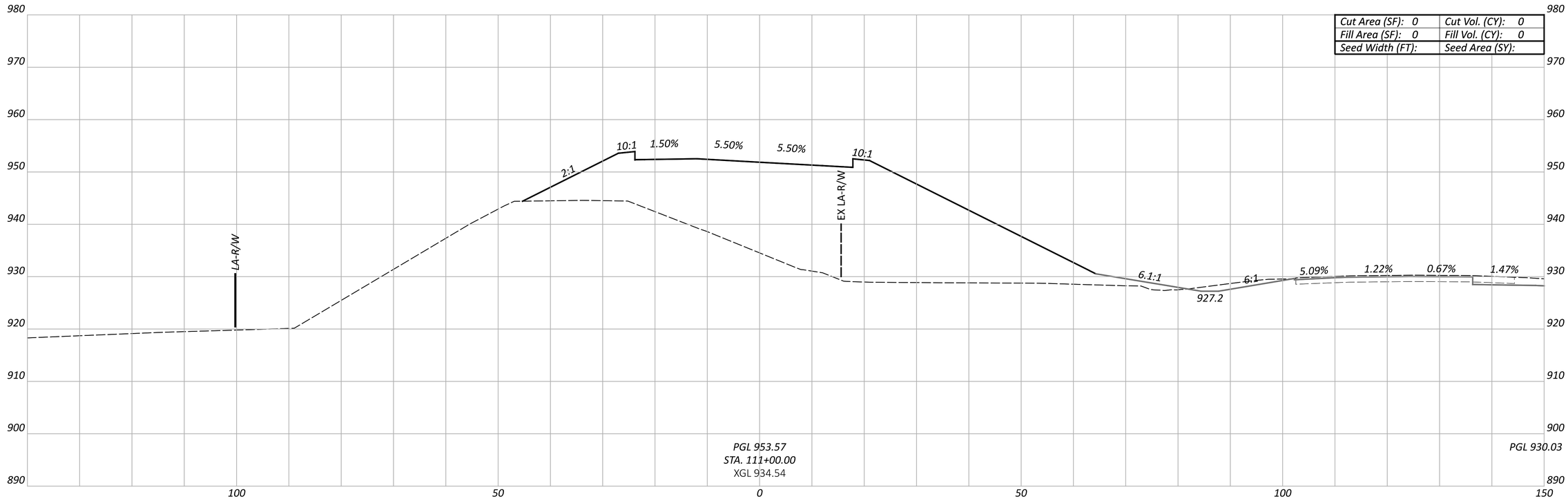

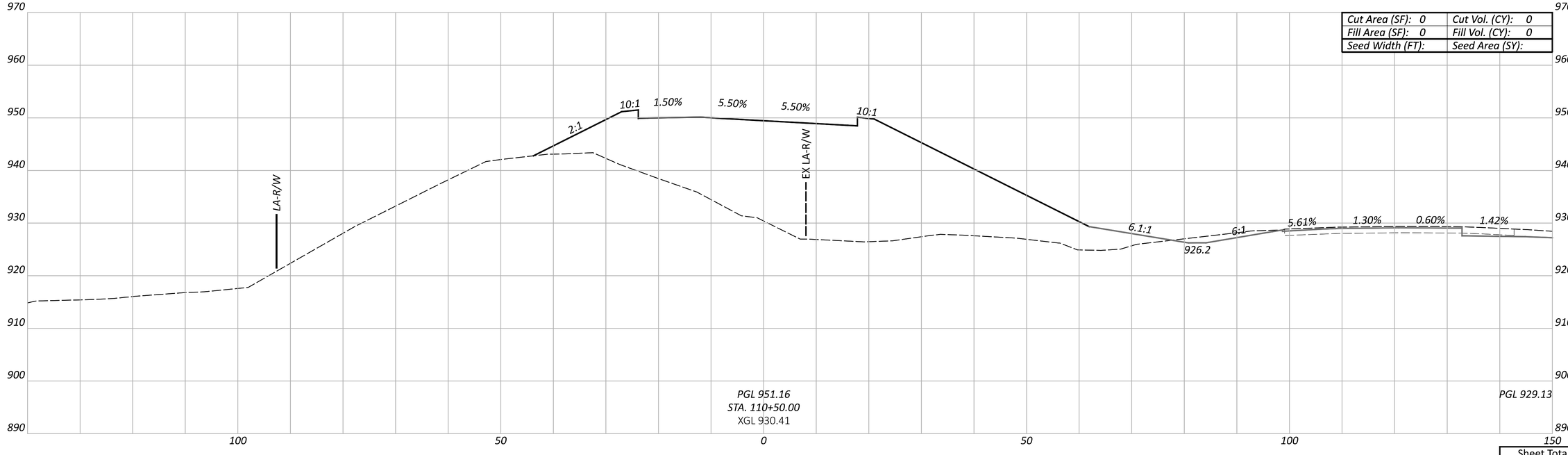

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96808

Sheet Totals

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SHEET P.558 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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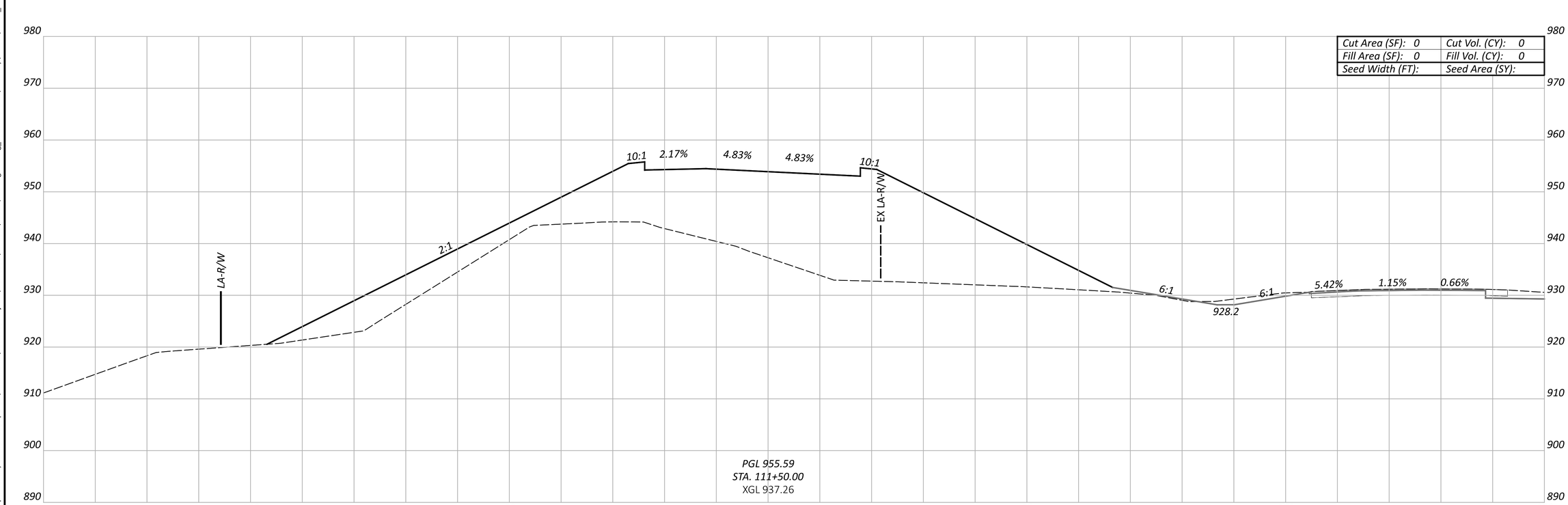

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CROSS SECTIONS - RAMP H
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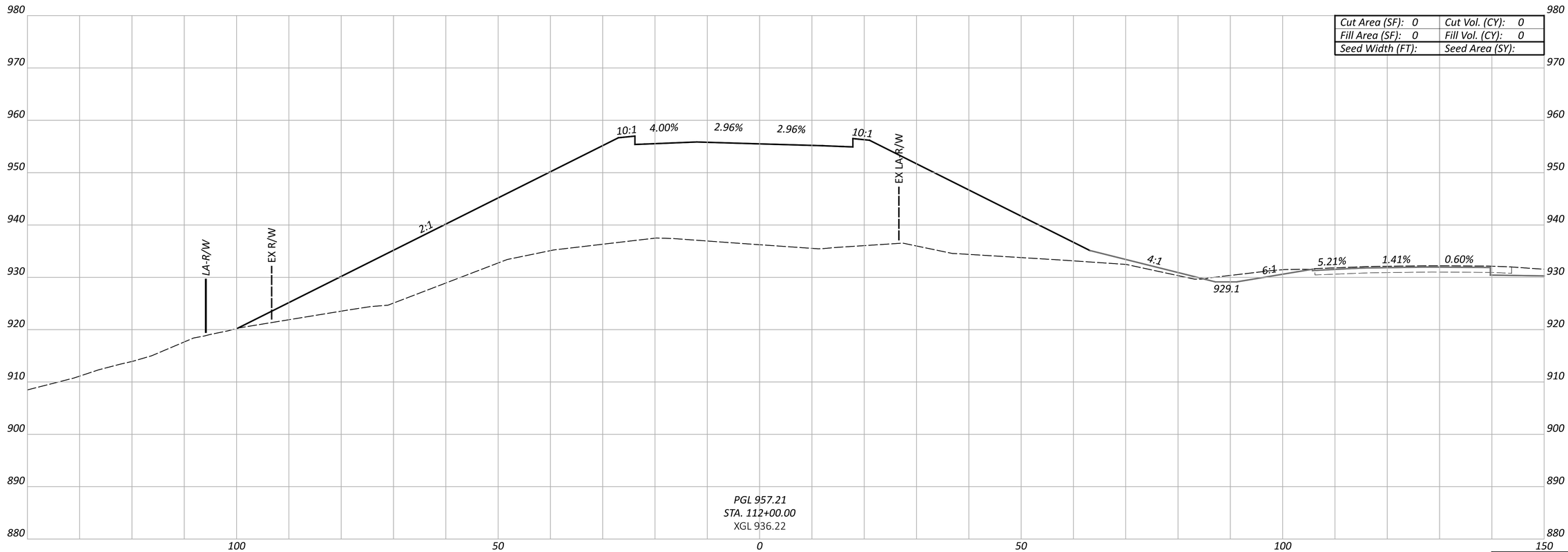
SHEET P.559 TOTAL 740



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CROSS SECTIONS - RAMP H
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Sheet Totals		
Seeding	Cut	Fill

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96808

SHEET P.560 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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FAI/LIC IR 70 0.00/0.00

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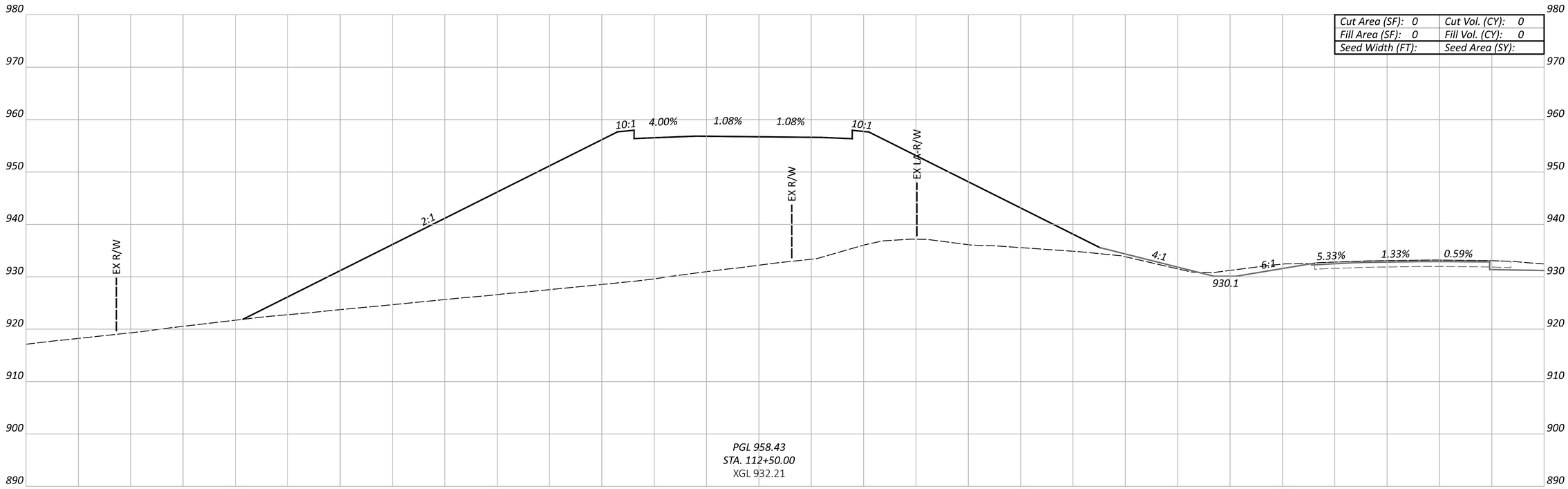

CROSS SECTIONS - RAMP H
STA. 112+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
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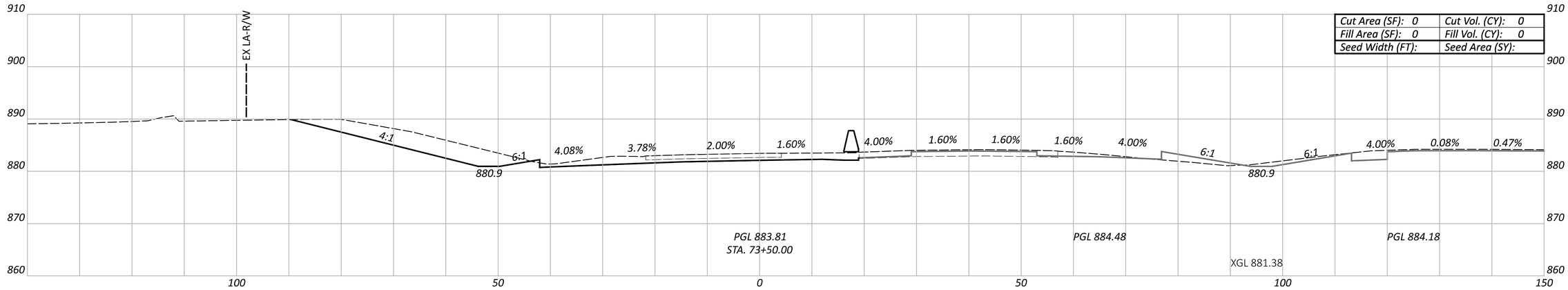
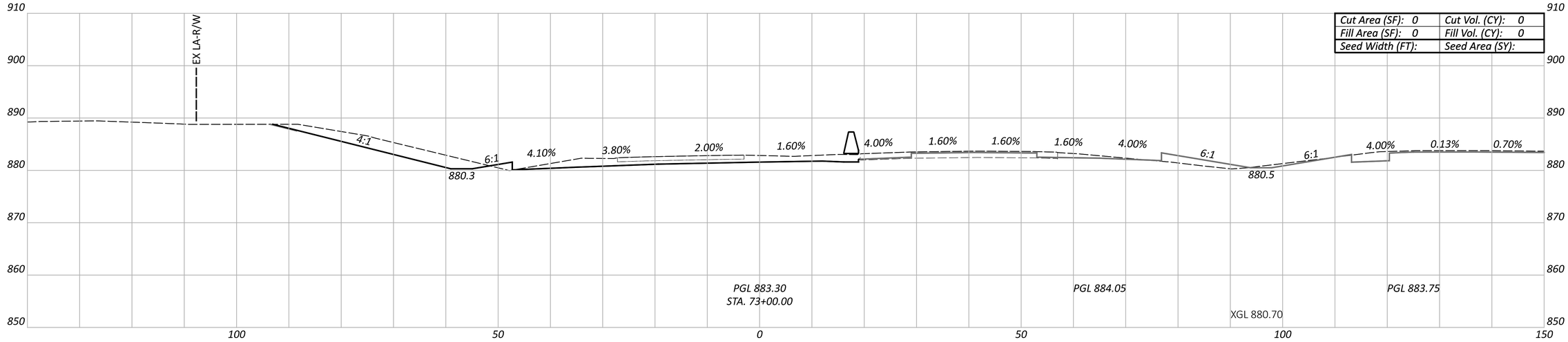
KAM 06/18/23

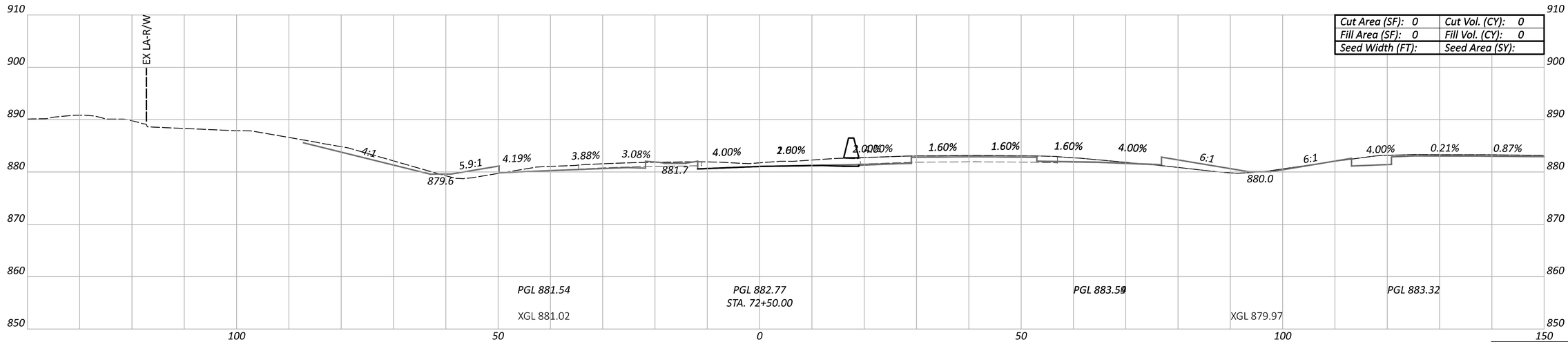
PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.561 TOTAL 740







CROSS SECTIONS - RAMP H
STA. 72+50.00 TO STA. 73+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.521 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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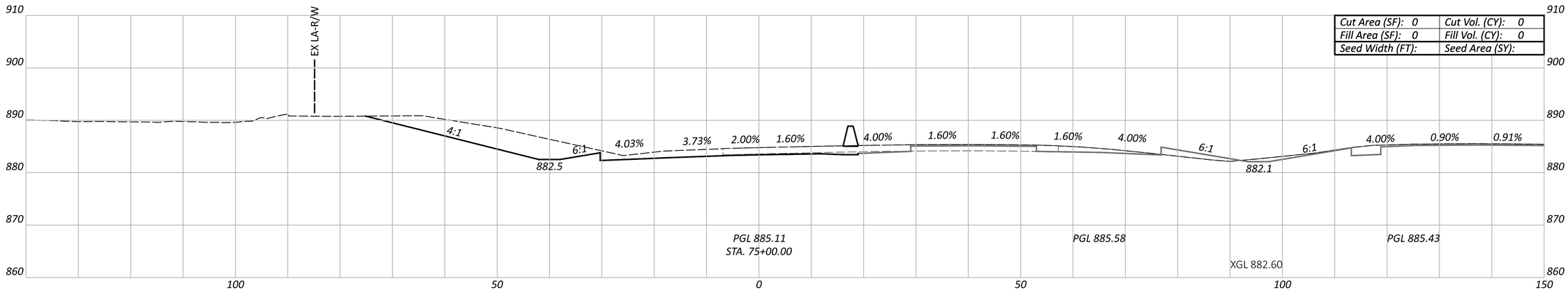

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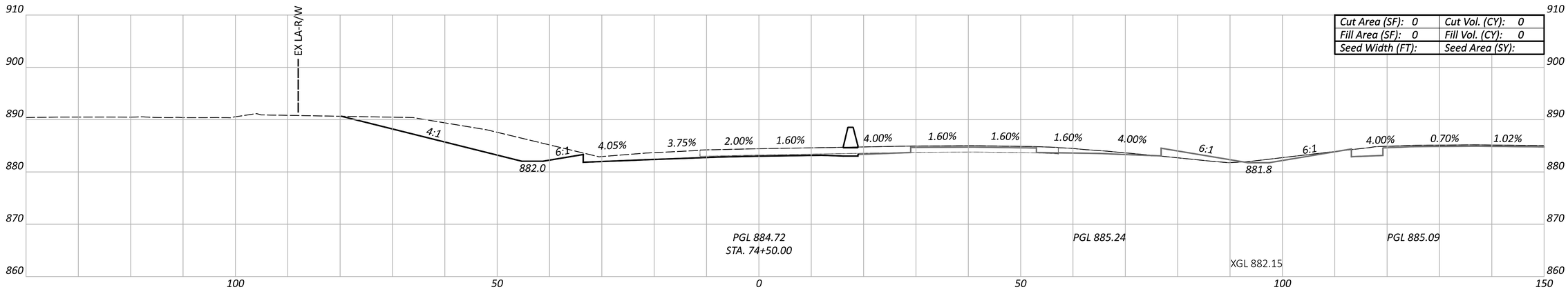

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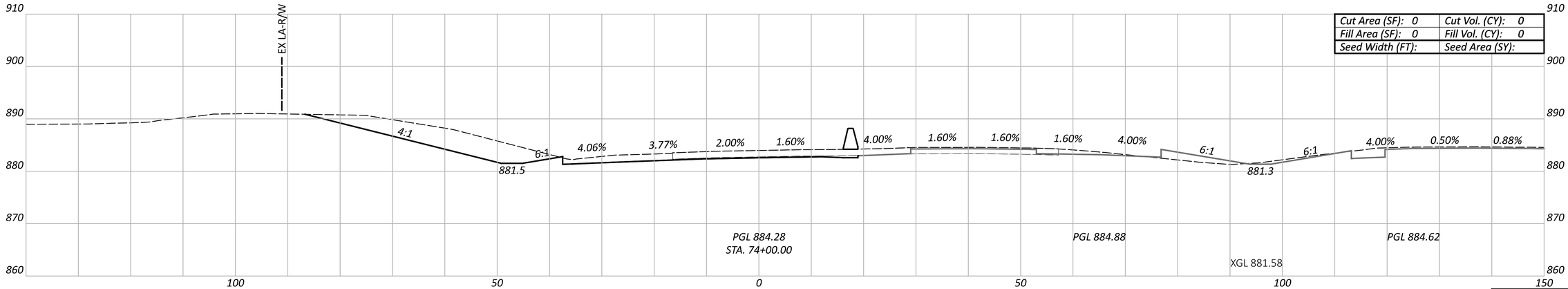

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - RAMP H
STA. 74+00.00 TO STA. 75+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

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PROJECT ID
96808

SHEET P.522 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070H - 74+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:34:35 PM USER: aoldaker
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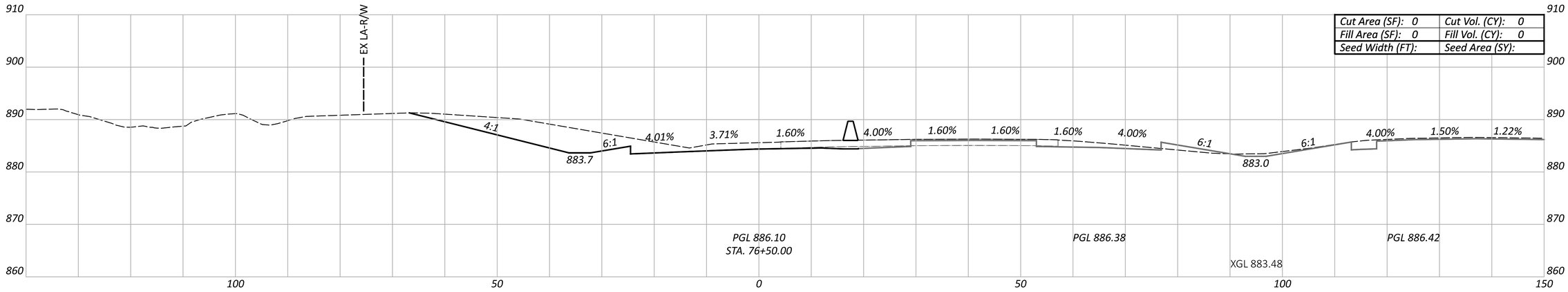

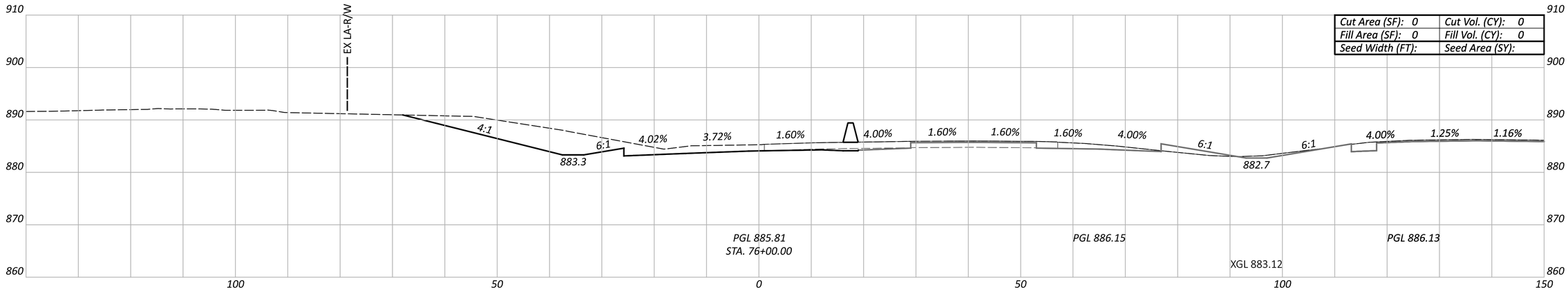

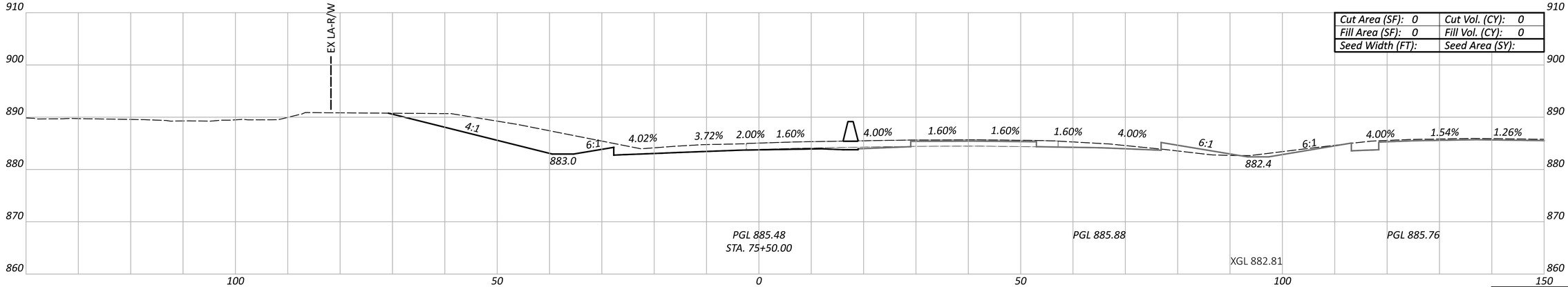

910 900 890 880 870 860

100 50 0 50 100 150

CROSS SECTIONS - RAMP H
STA. 75+50.00 TO STA. 76+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.523 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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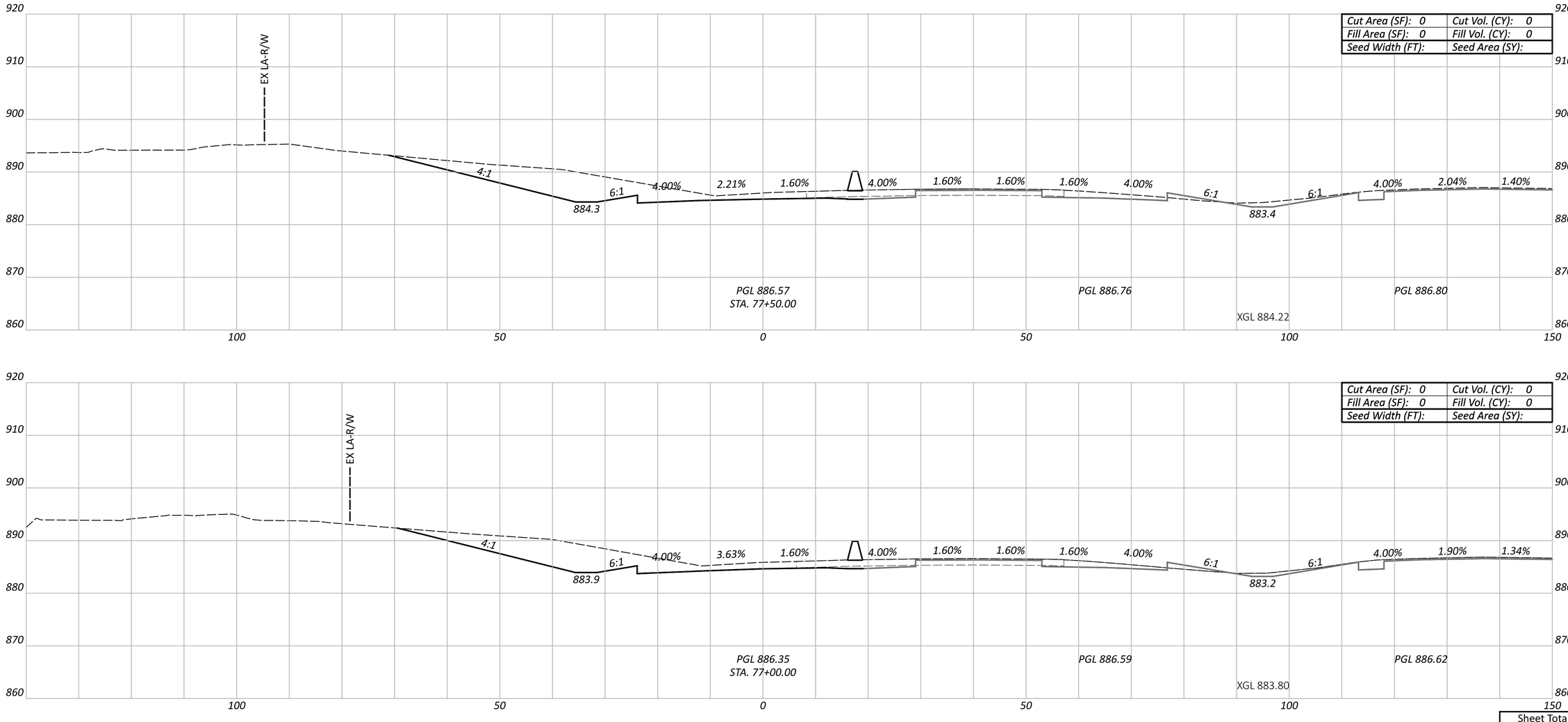

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - RAMP H
STA. 77+00.00 TO STA. 77+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

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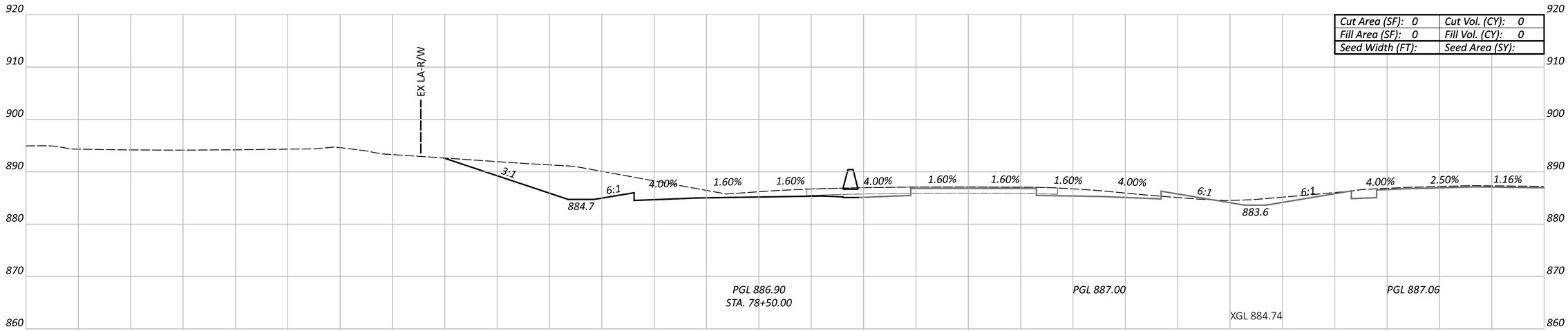
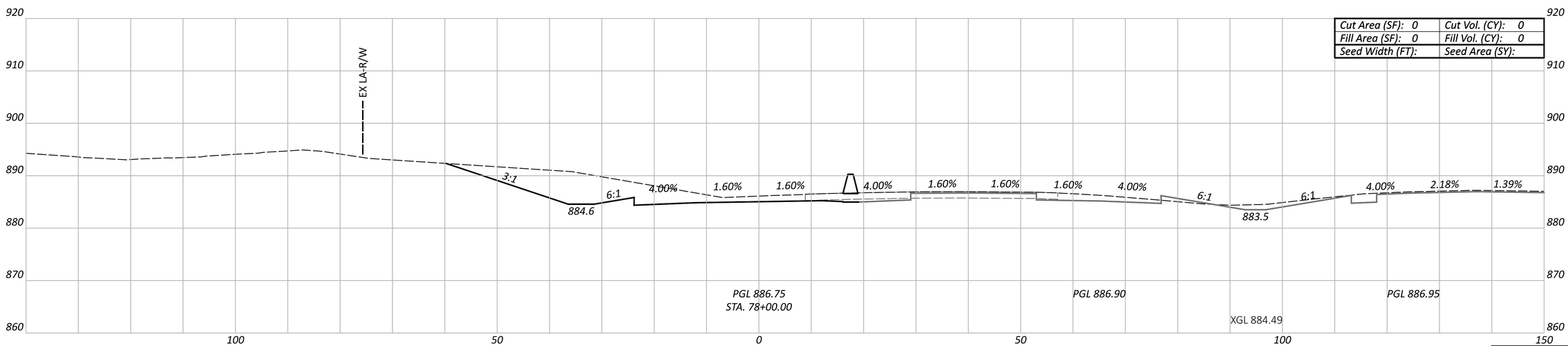
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.524 TOTAL 740





CROSS SECTIONS - RAMP H
STA. 78+00.00 TO STA. 78+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

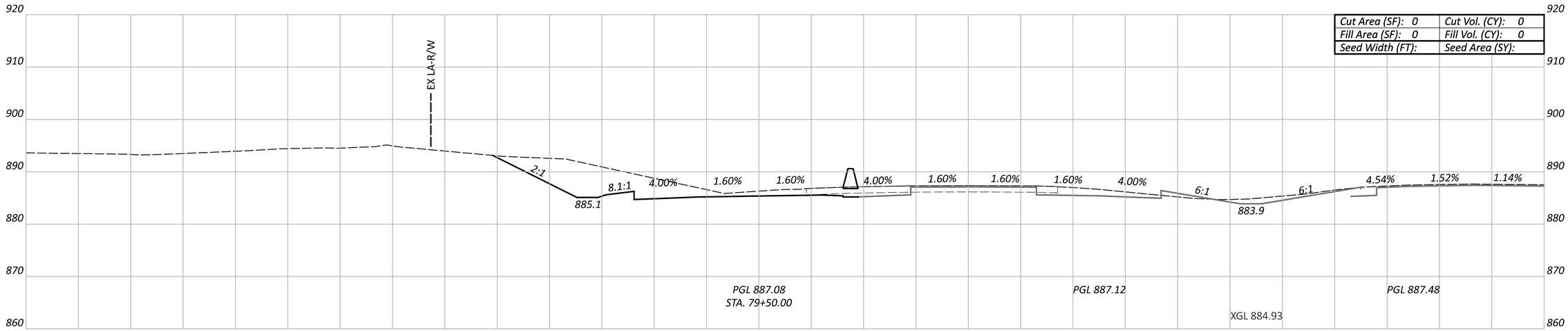
DESIGNER
BER

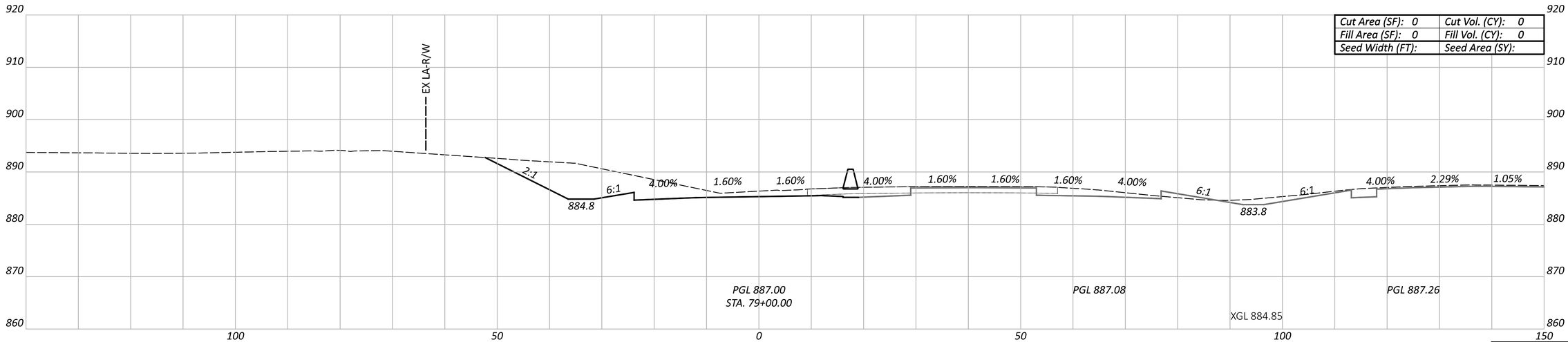
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.525	740





CROSS SECTIONS - RAMP H
STA. 79+00.00 TO STA. 79+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.526 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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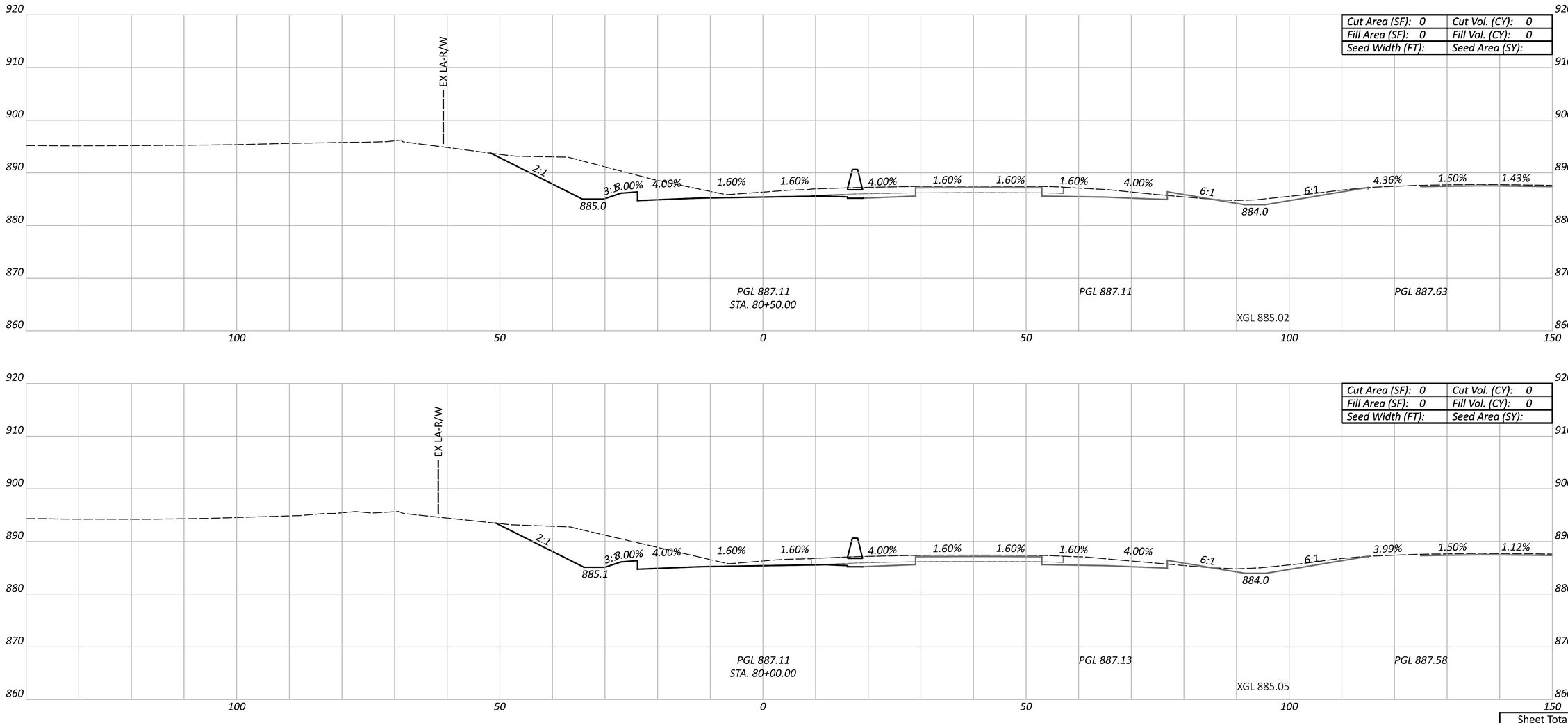

CROSS SECTIONS - RAMP H
STA. 80+00.00 TO STA. 80+50.00

FAI/LIC IR 70 0.00/0.00

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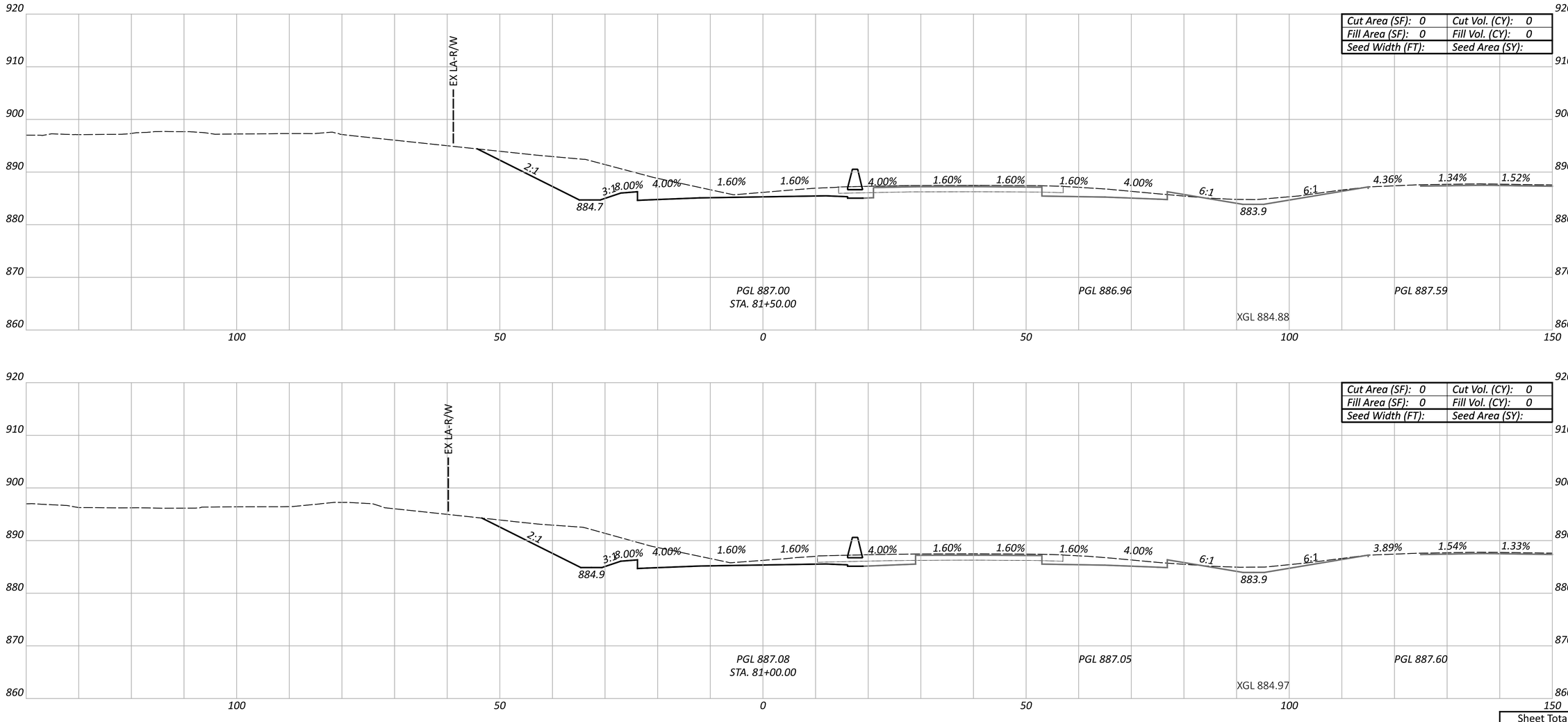
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.527
TOTAL	740



FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - RAMP H
STA. 81+00.00 TO STA. 81+50.00

Sheet Totals		
Seeding	Cut	Fill

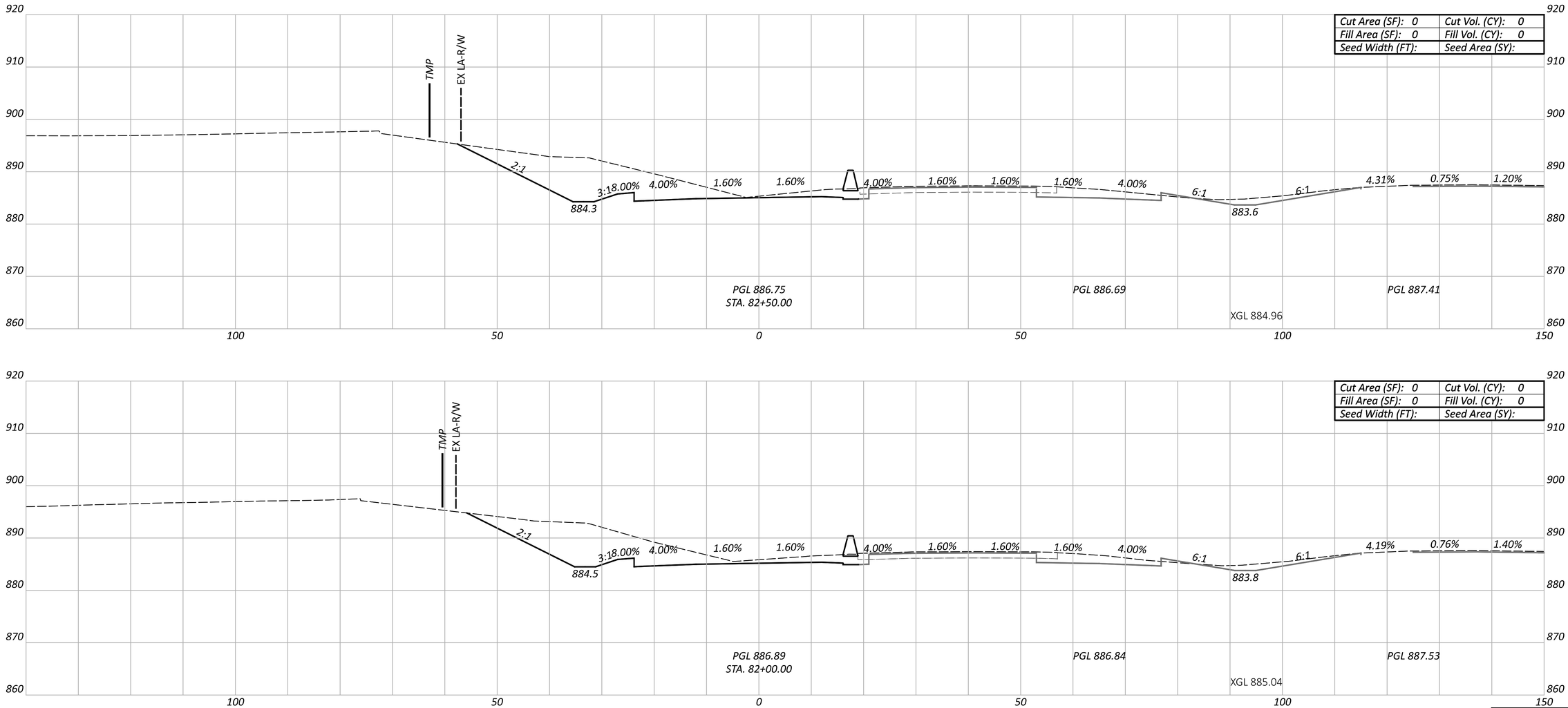
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.528 TOTAL 740



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CROSS SECTIONS - RAMP H
STA. 82+00.00 TO STA. 82+50.00

Sheet Totals		
Seeding	Cut	Fill

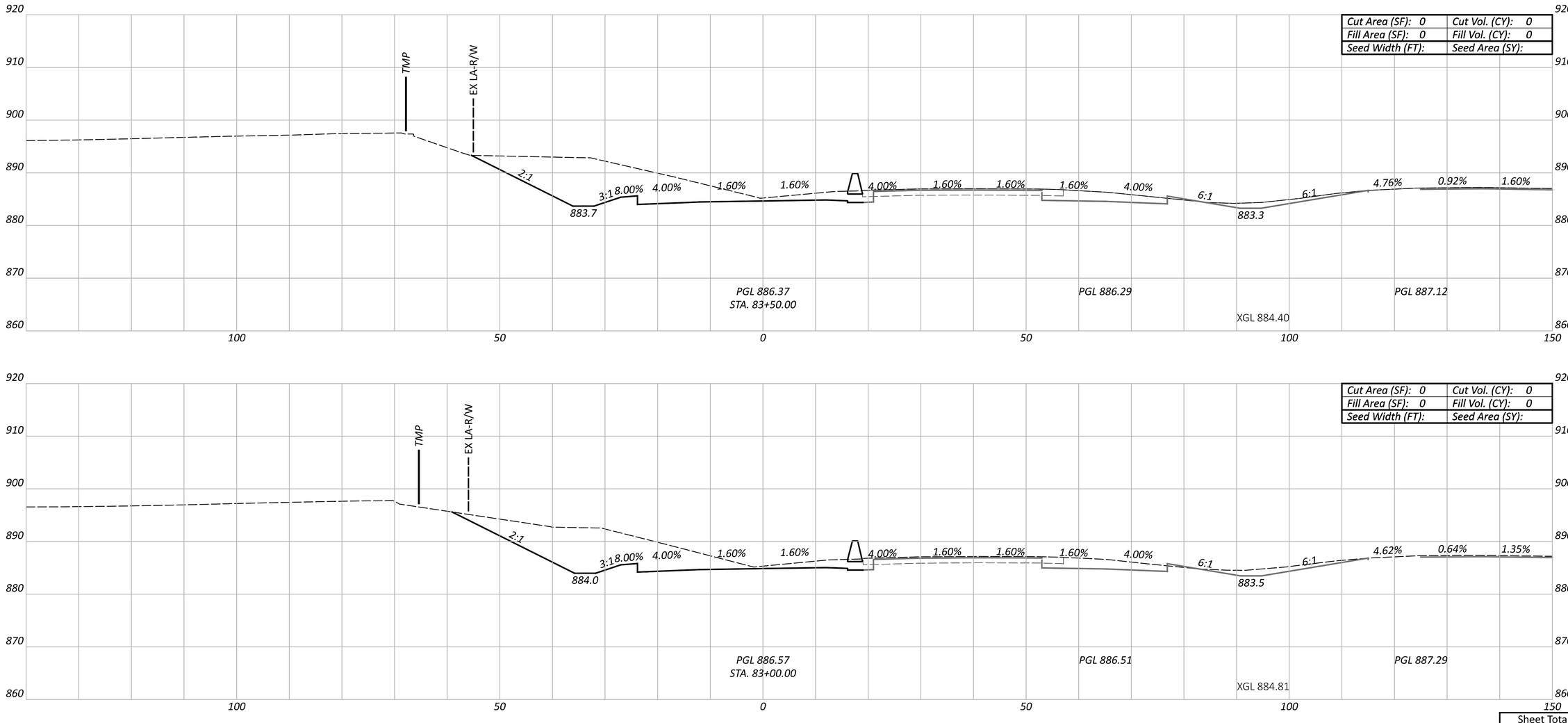
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.529 | TOTAL 740



CROSS SECTIONS - RAMP H
STA. 83+00.00 TO STA. 83+50.00

FAI/LIC IR 70 0.00/0.00

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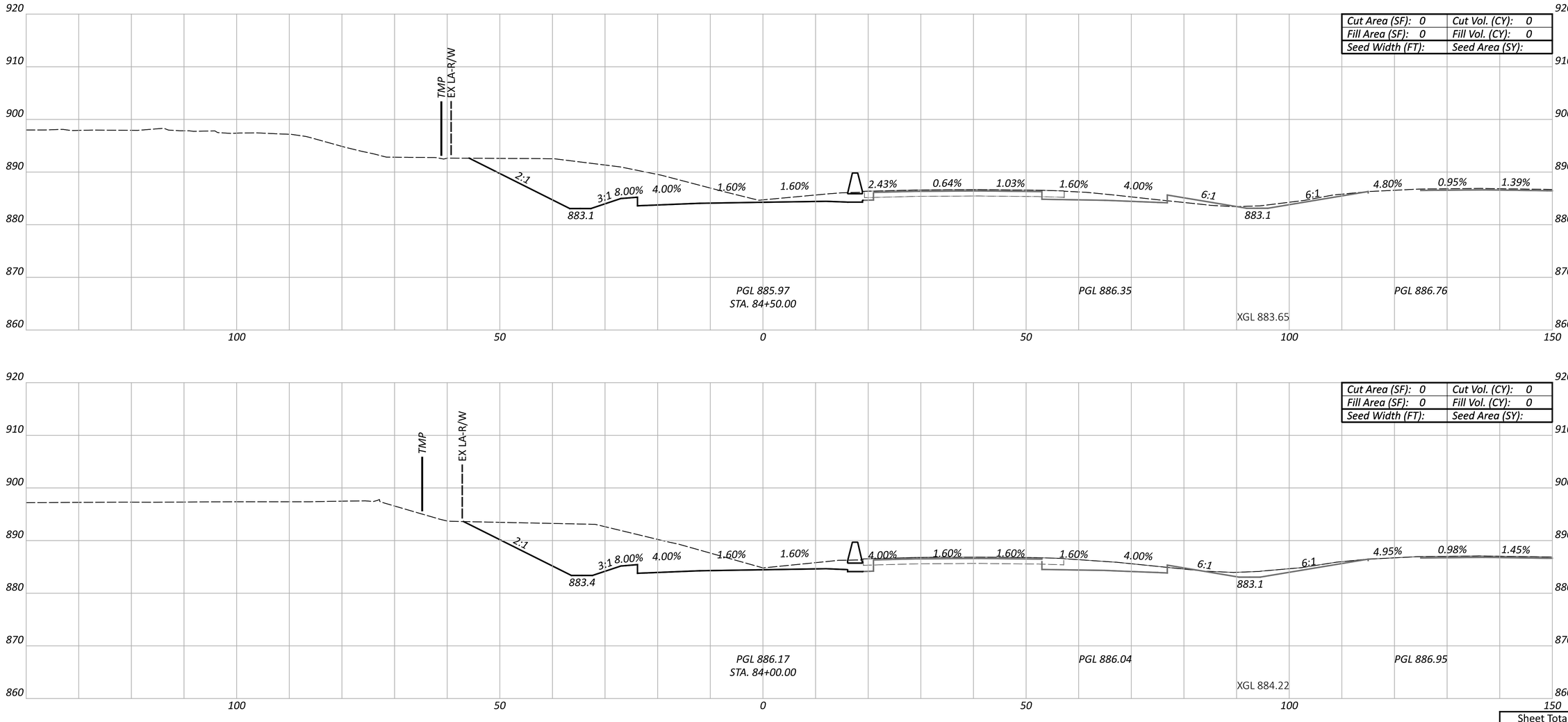
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.530
TOTAL	740



CROSS SECTIONS - RAMP H
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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

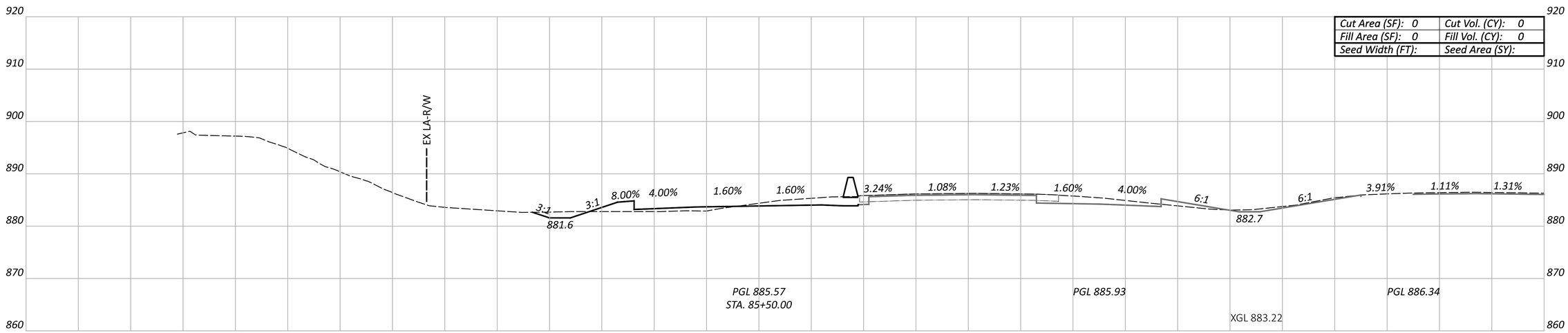
DESIGN AGENCY
STRUCTUREPOINT LLC

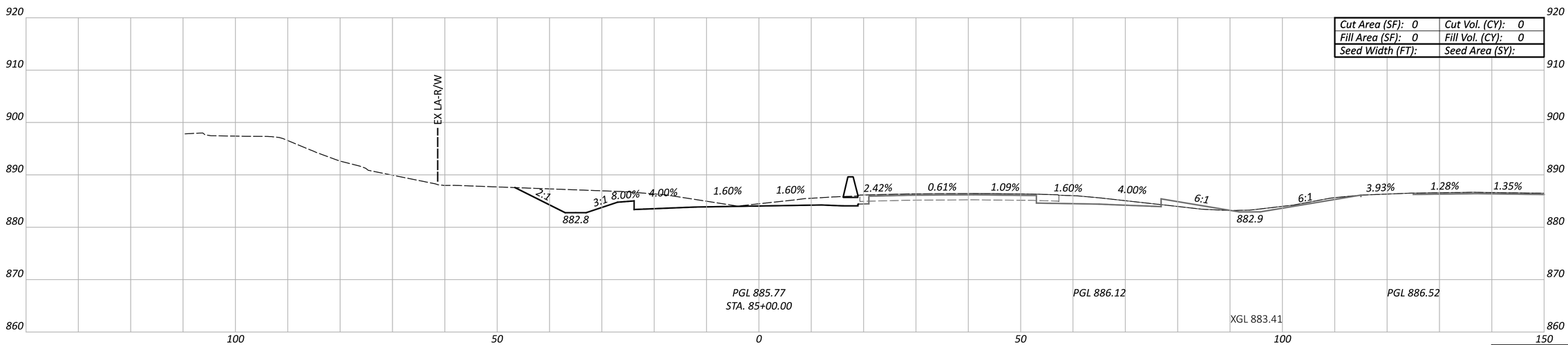
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.531 TOTAL 740





CROSS SECTIONS - RAMP H
STA. 85+00.00 TO STA. 85+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.532 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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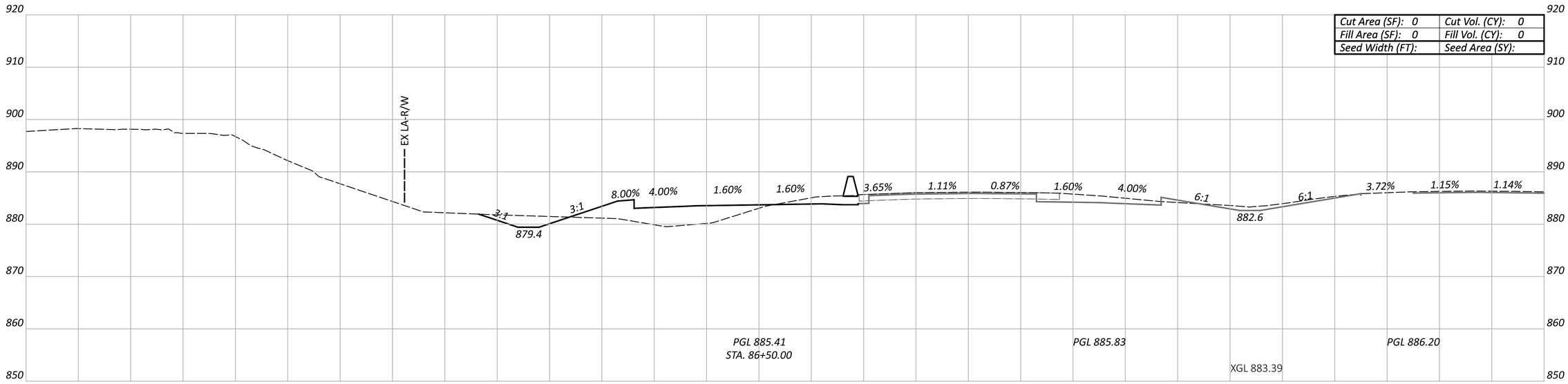

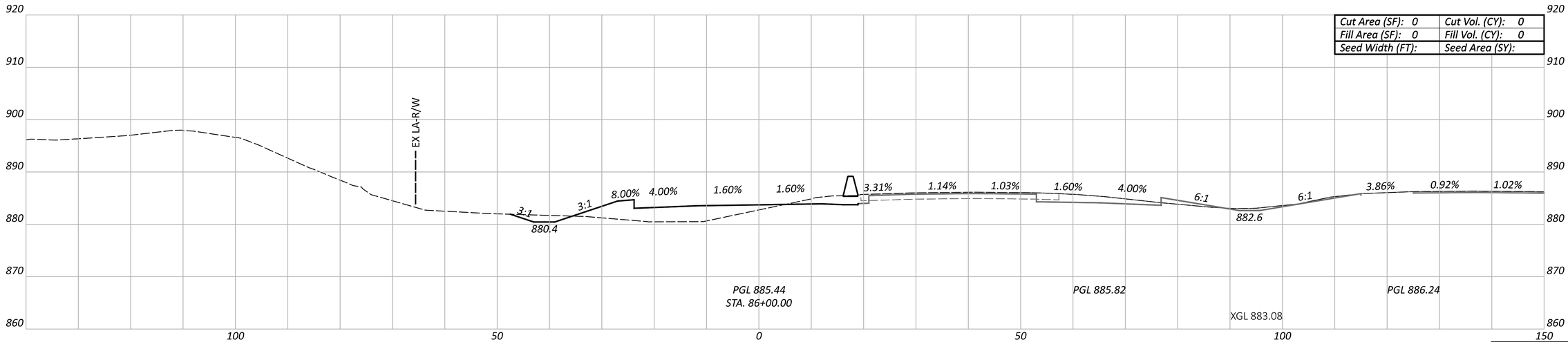

CROSS SECTIONS - RAMP H
STA. 86+00.00 TO STA. 86+50.00

FAI/LIC IR 70 0.00/0.00

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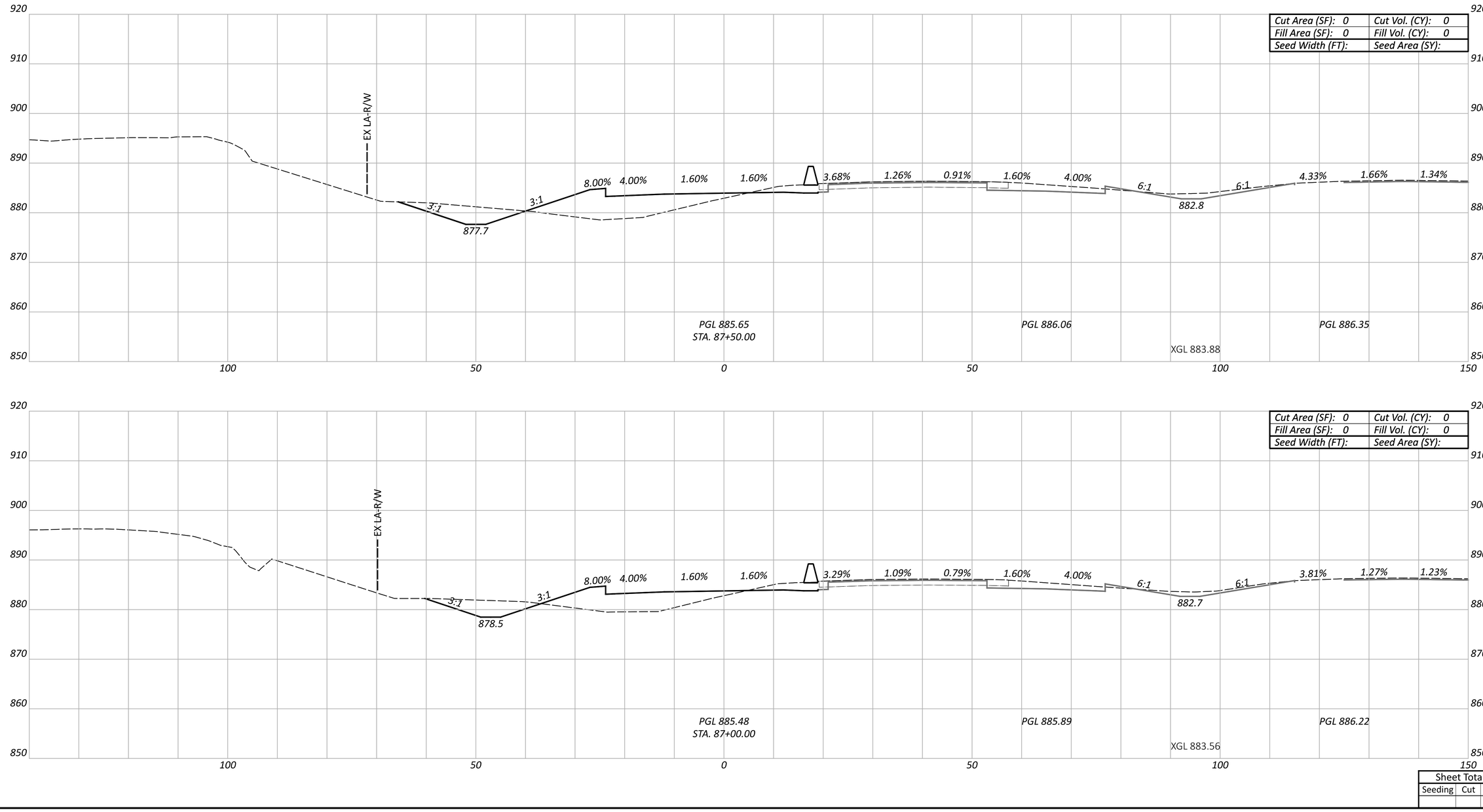
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.533
TOTAL	740



CROSS SECTIONS - RAMP H
STA. 87+00.00 TO STA. 87+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

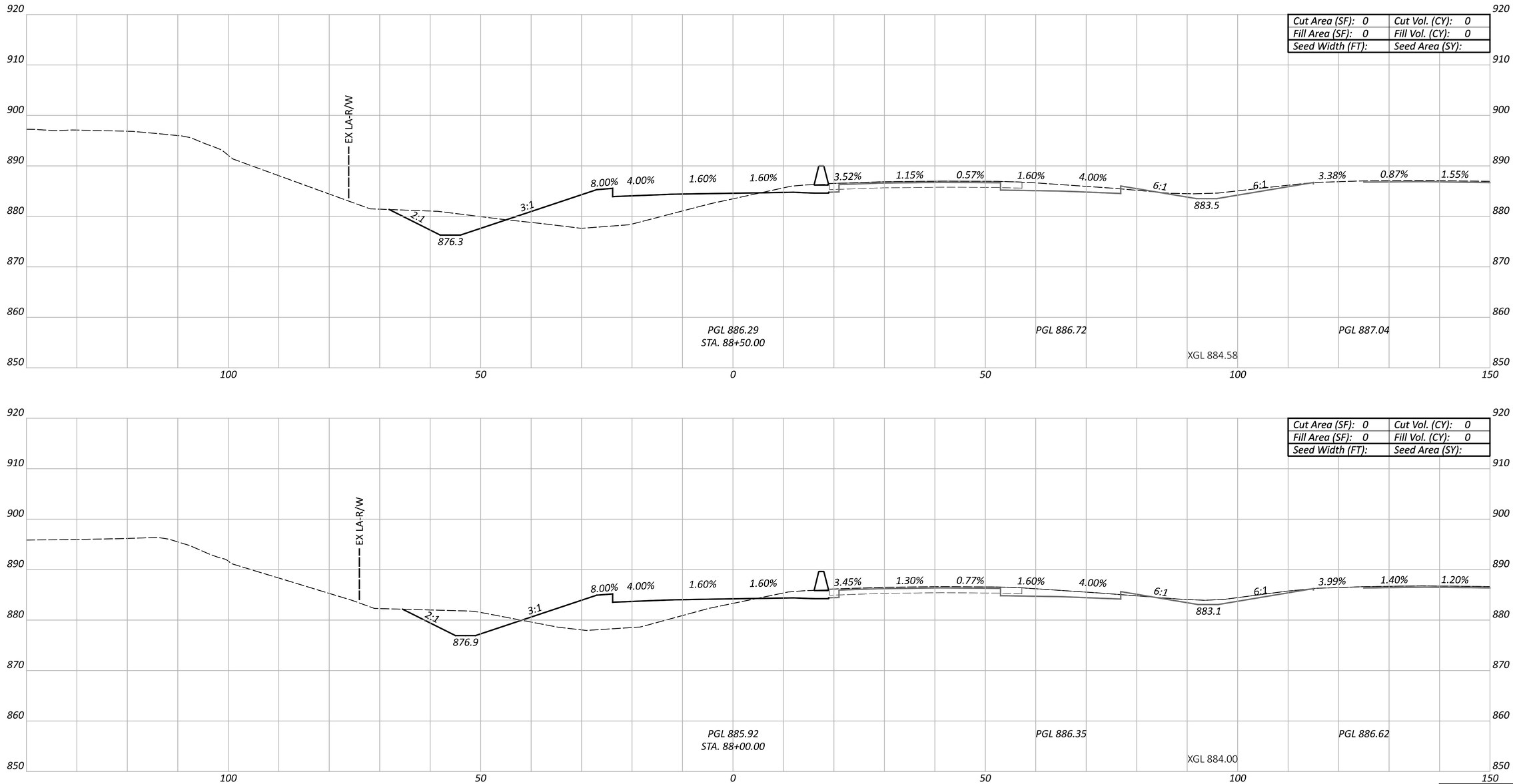
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.534 TOTAL 740



CROSS SECTIONS - RAMP H
STA. 88+00.00 TO STA. 88+50.00

FAI/LIC IR 70 0.00/0.00

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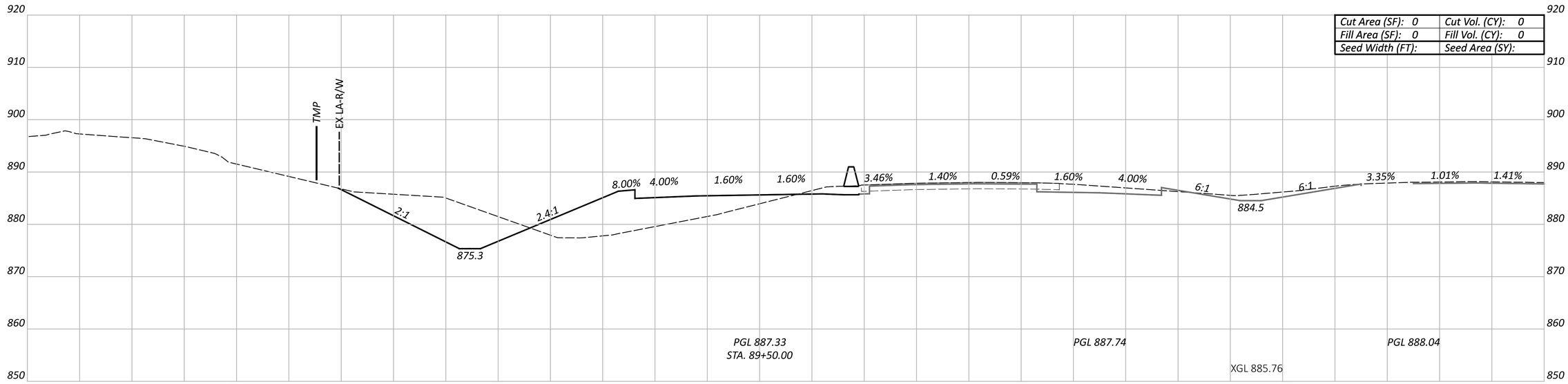
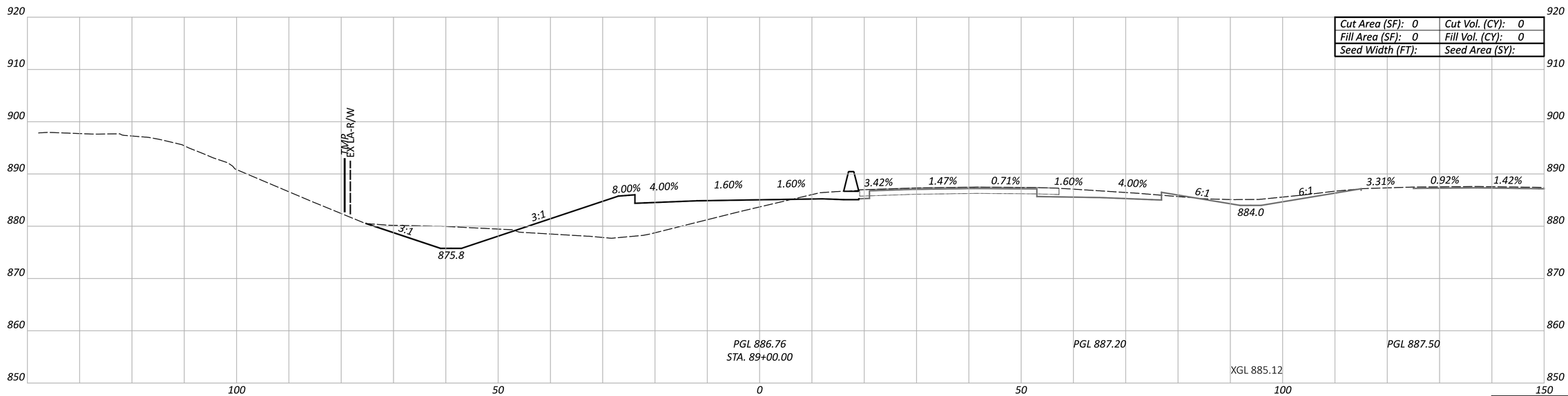
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.535
TOTAL	740





CROSS SECTIONS - RAMP H
STA. 89+00.00 TO STA. 89+50.00

FAI/LIC IR 70 0.00/0.00

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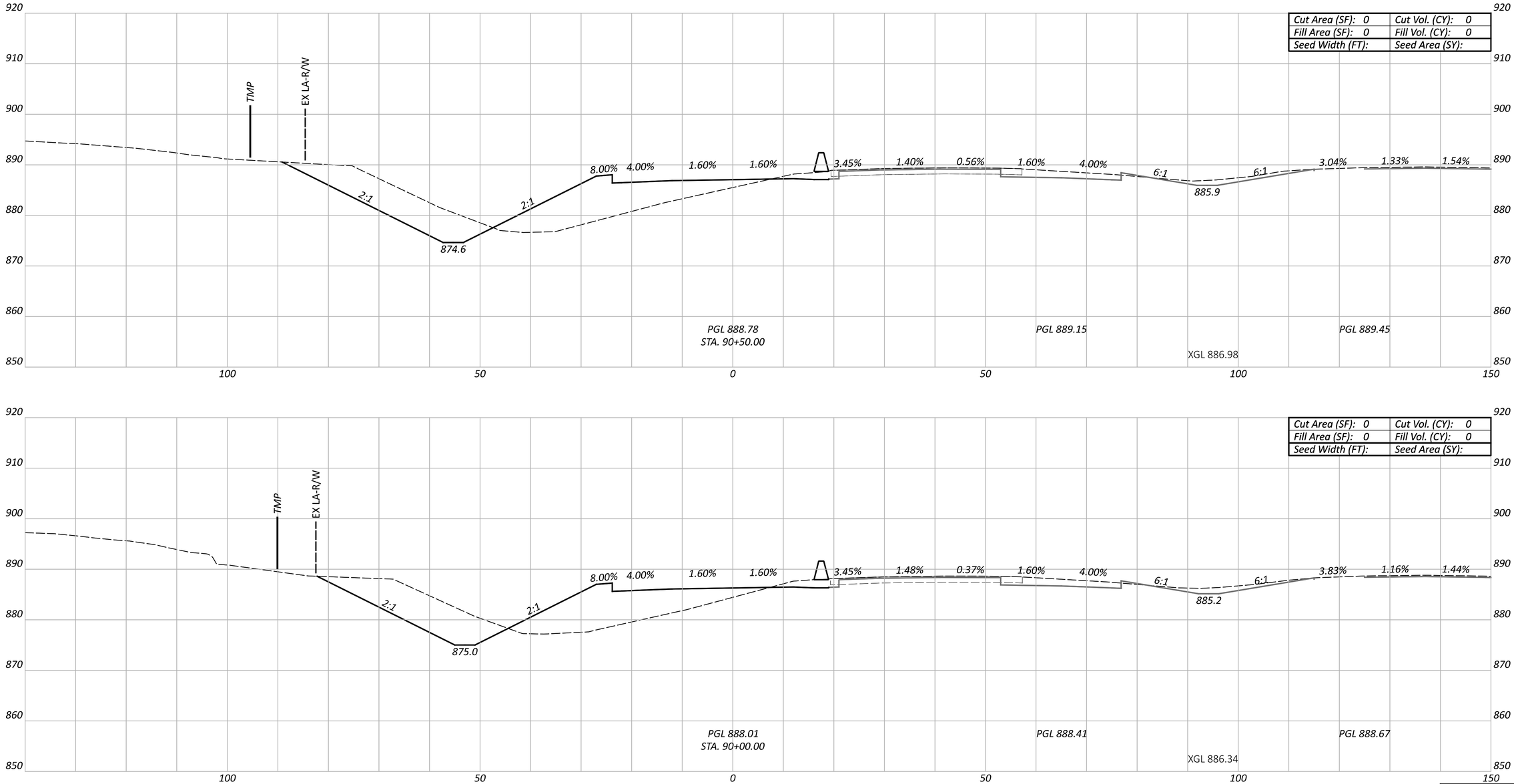
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.536
TOTAL	740



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FAI/LIC IR 70 0.00/0.00

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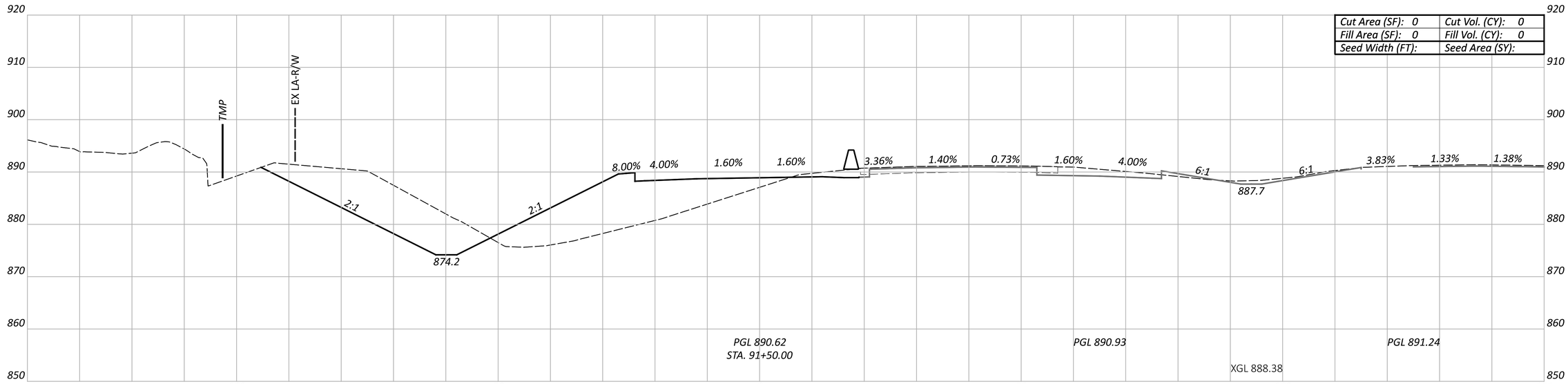
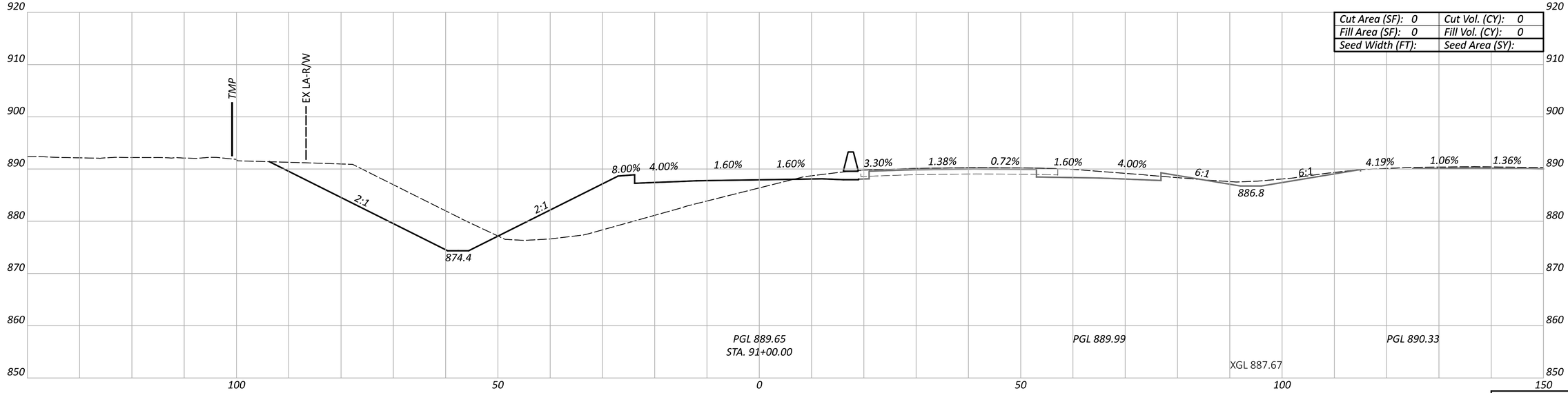
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.537
TOTAL	740





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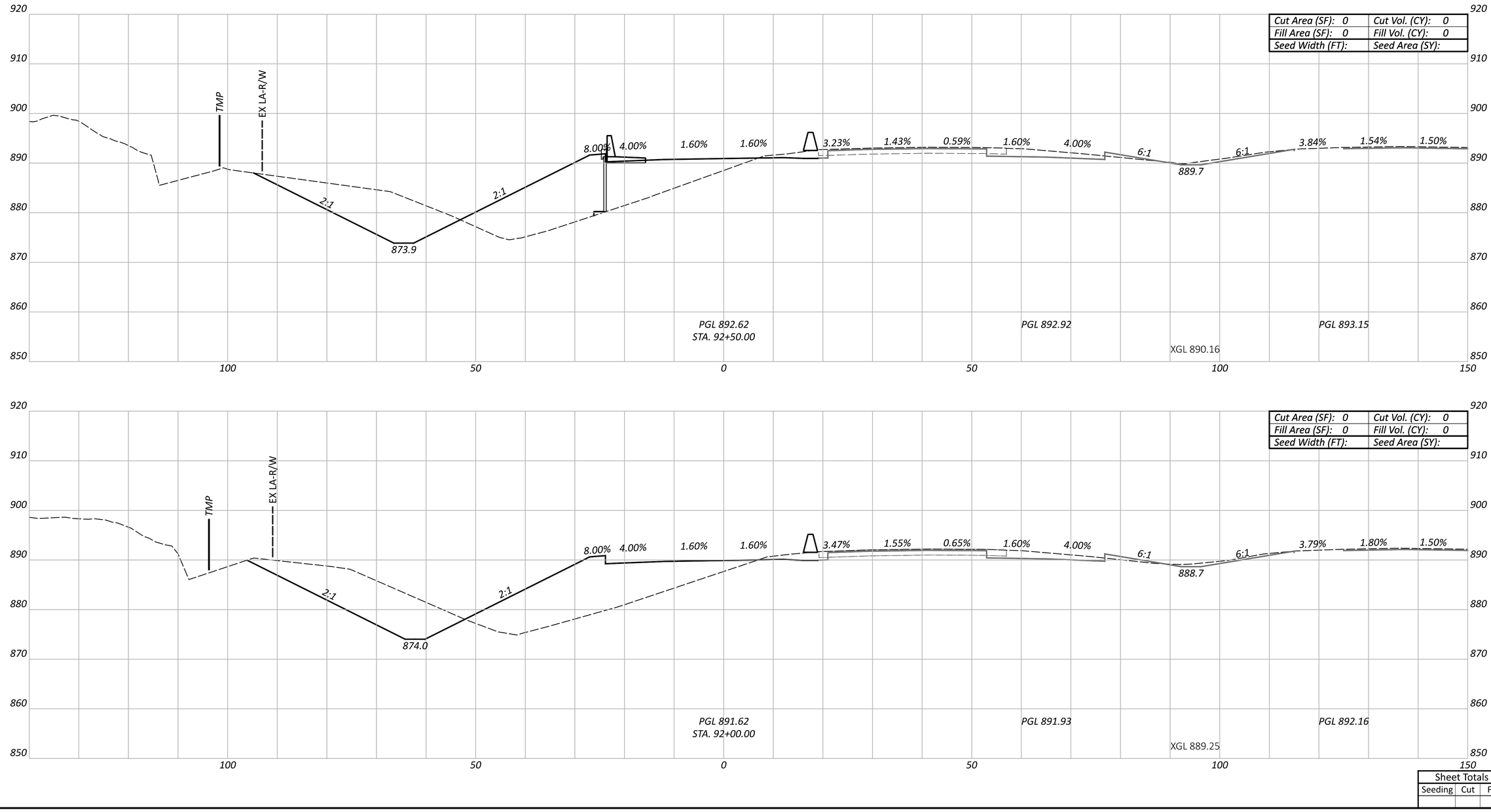
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.538
TOTAL	740



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Sheet Totals		
Seeding	Cut	Fill

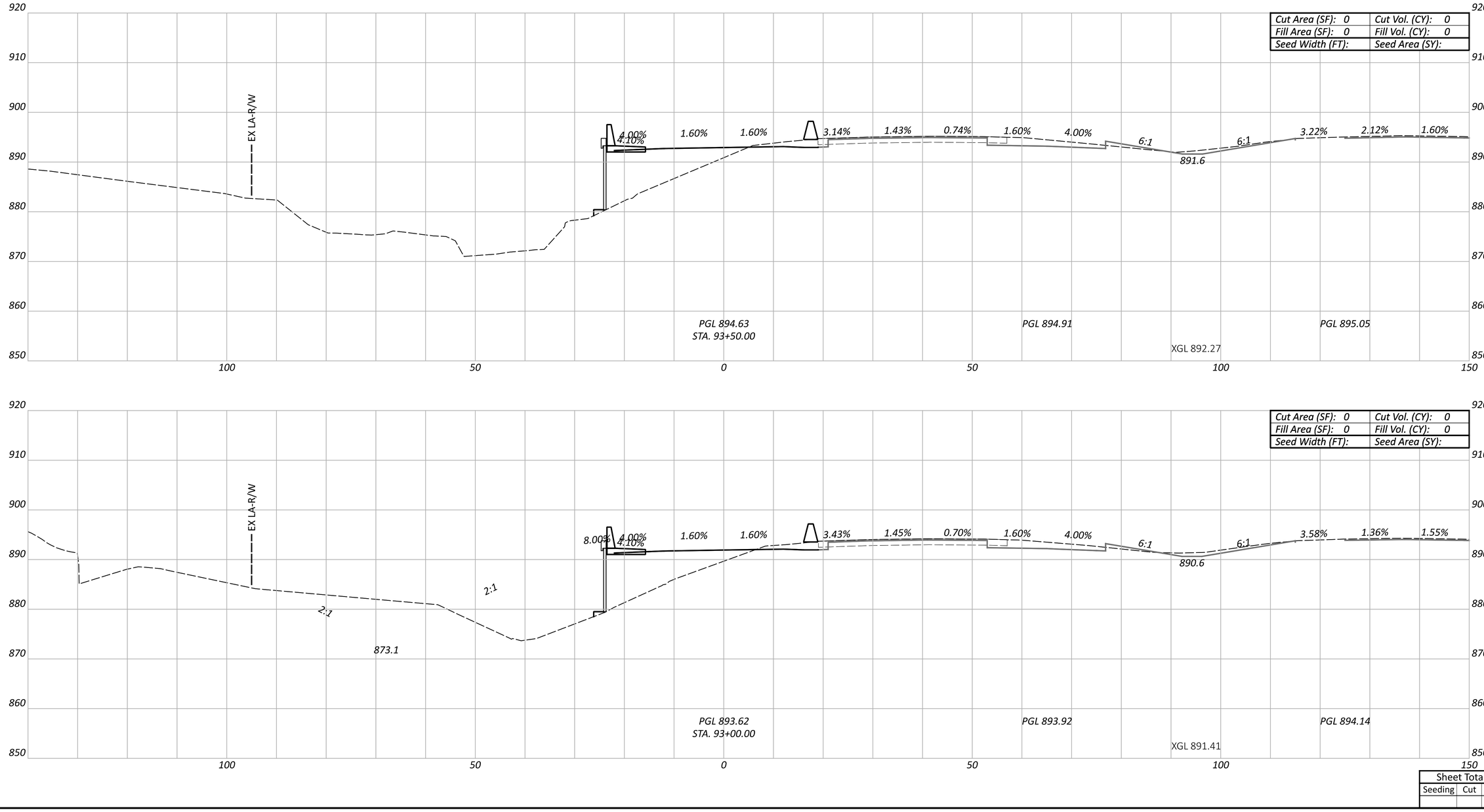
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.539 TOTAL 740



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Sheet Totals		
Seeding	Cut	Fill

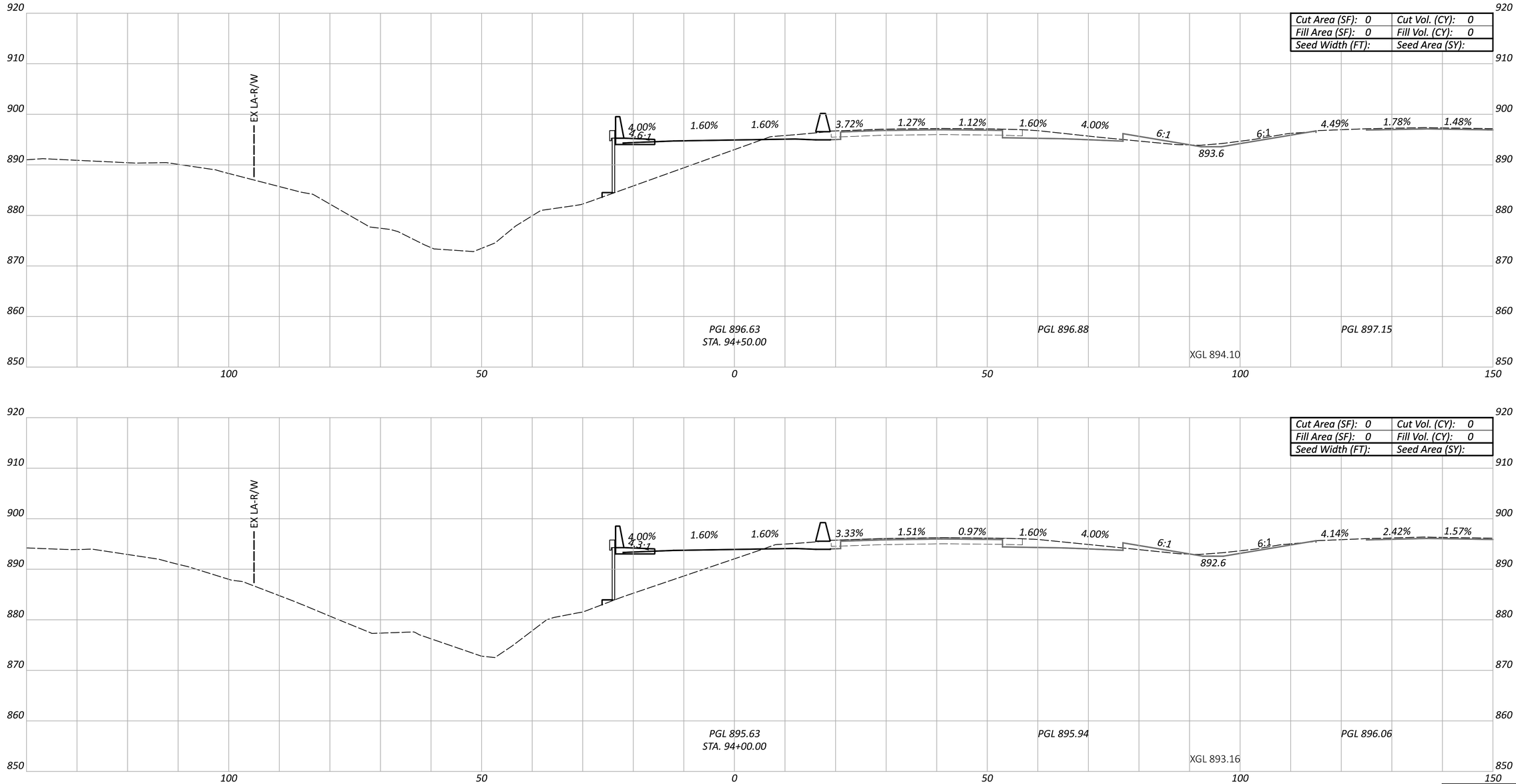
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.540 | TOTAL 740



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Sheet Totals		
Seeding	Cut	Fill

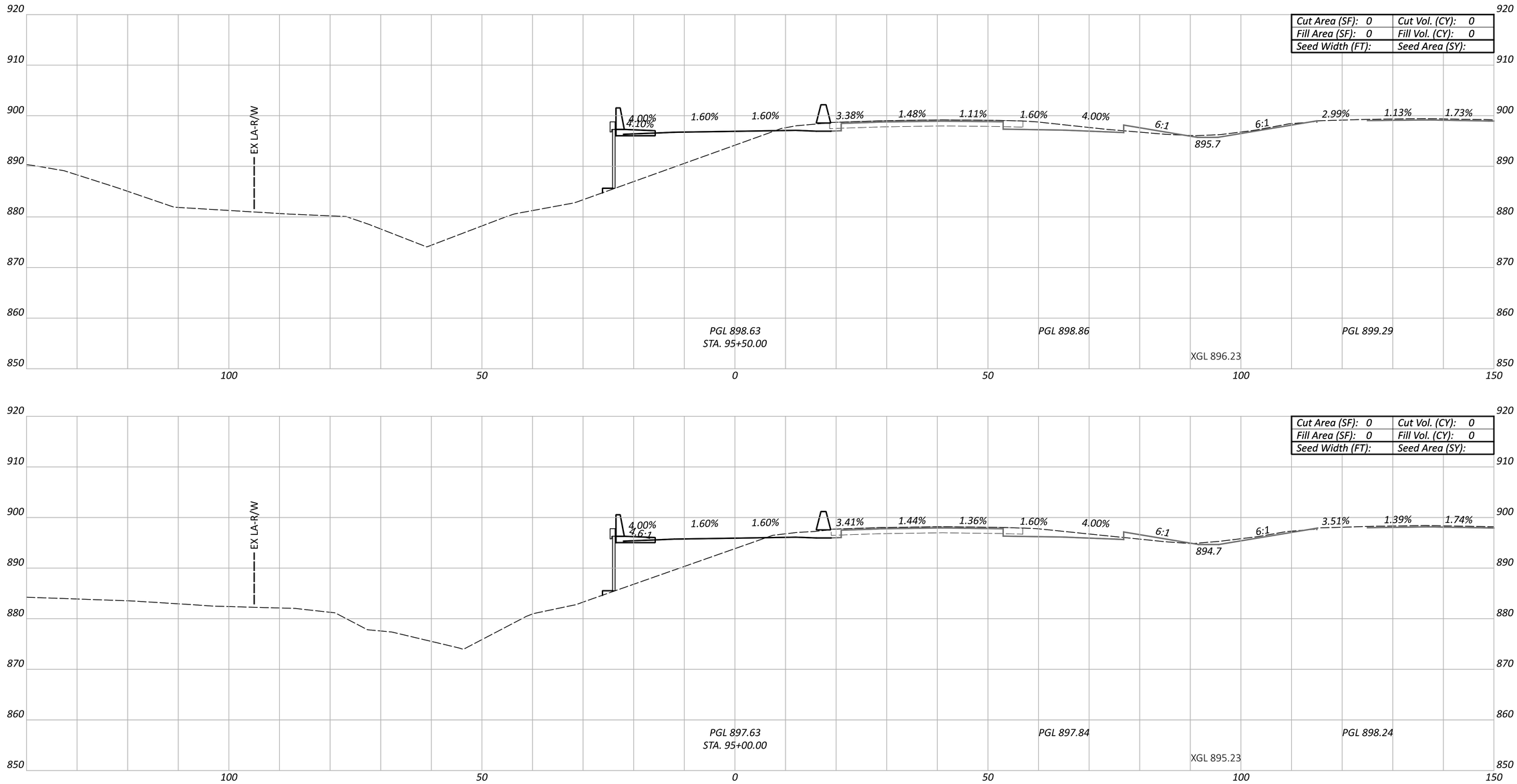
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.541 TOTAL 740



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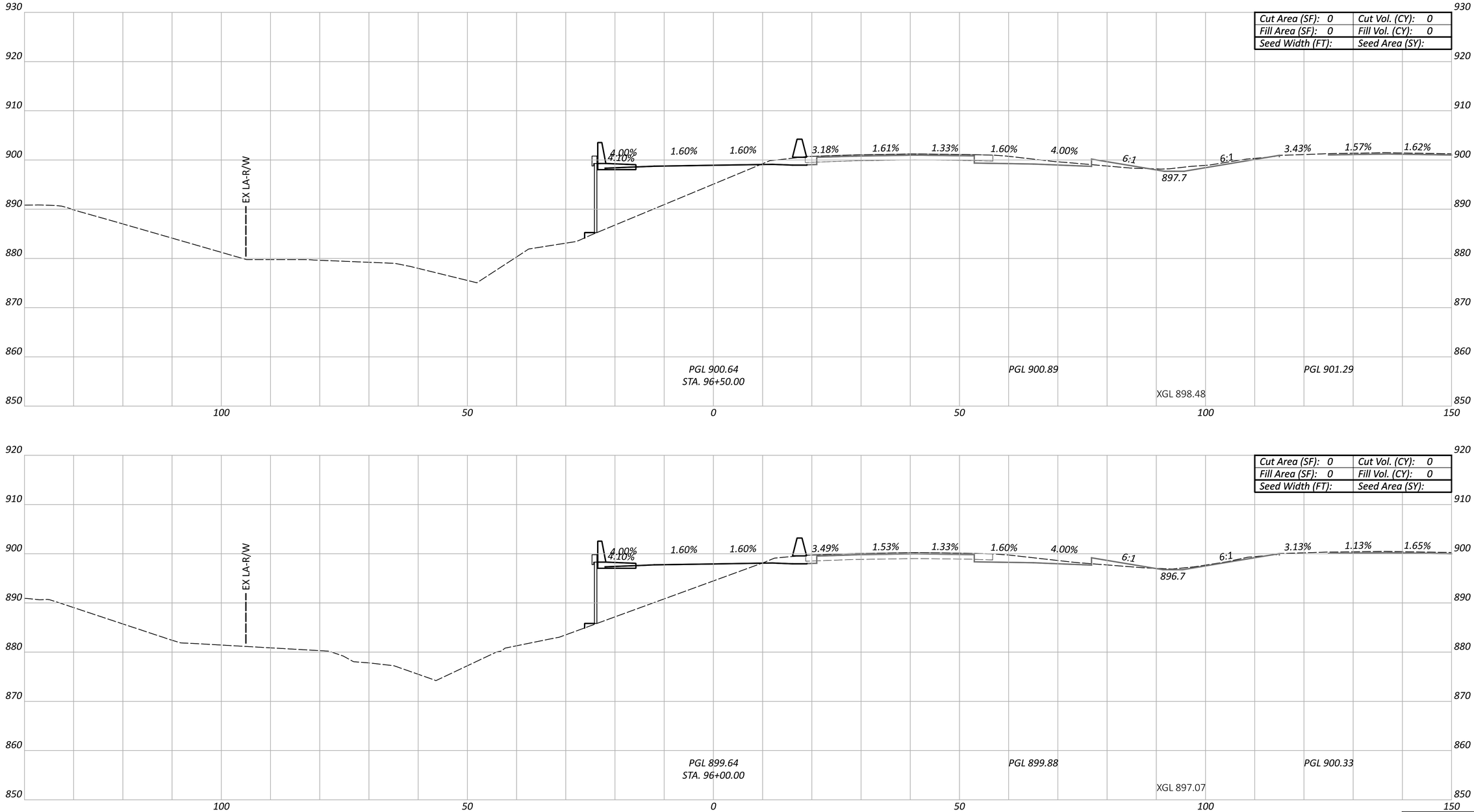
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.542
TOTAL	740



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FAI/LIC IR 70 0.00/0.00

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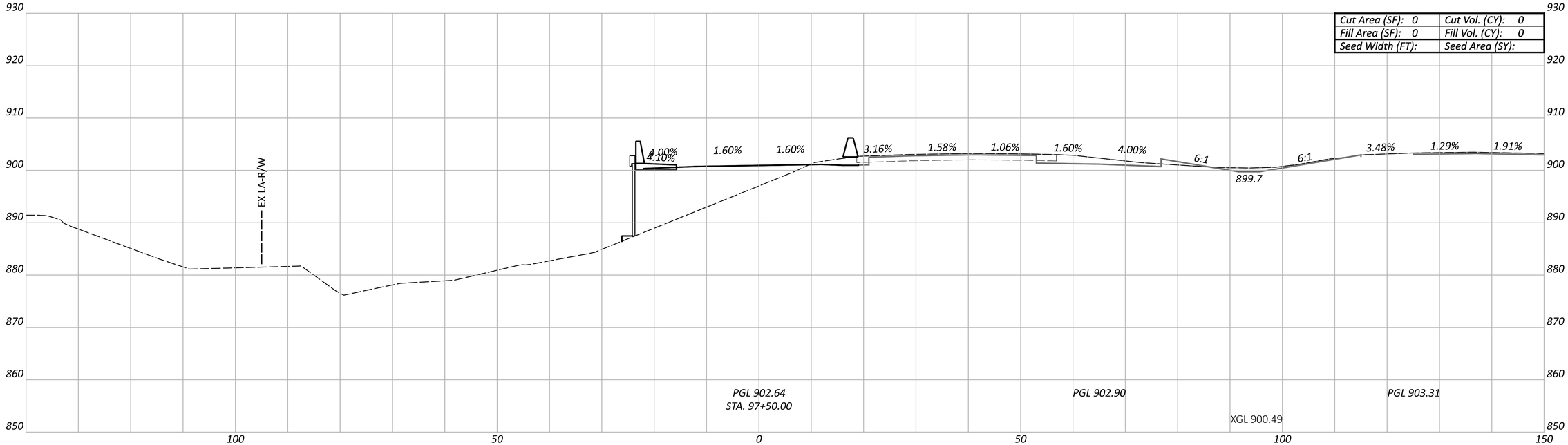
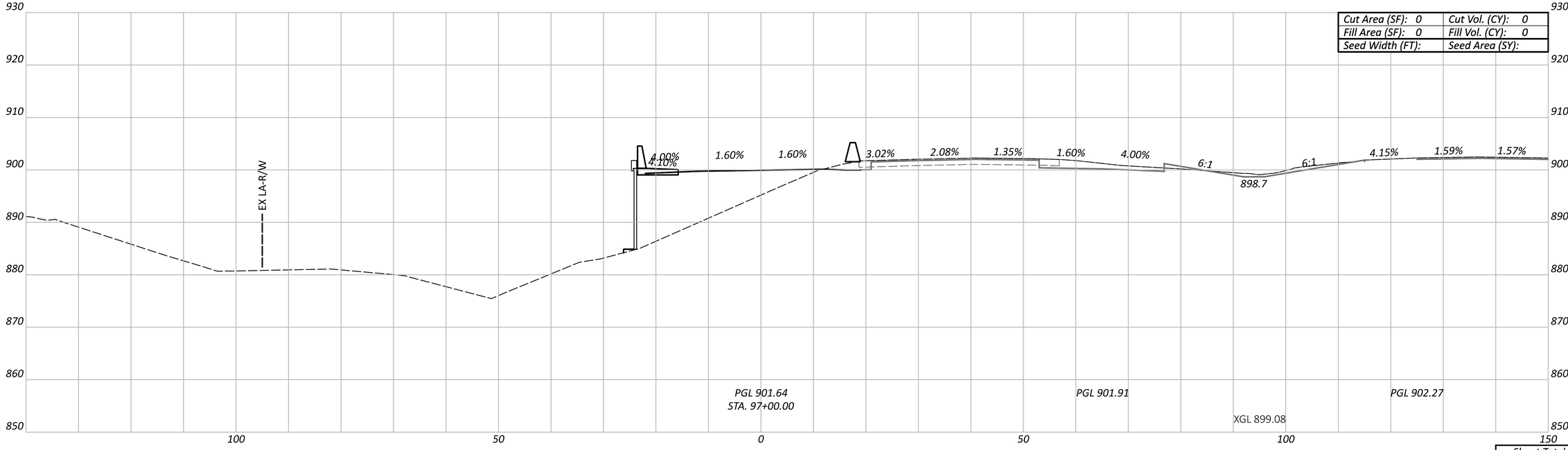
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.543
TOTAL	740





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Sheet Totals		
Seeding	Cut	Fill

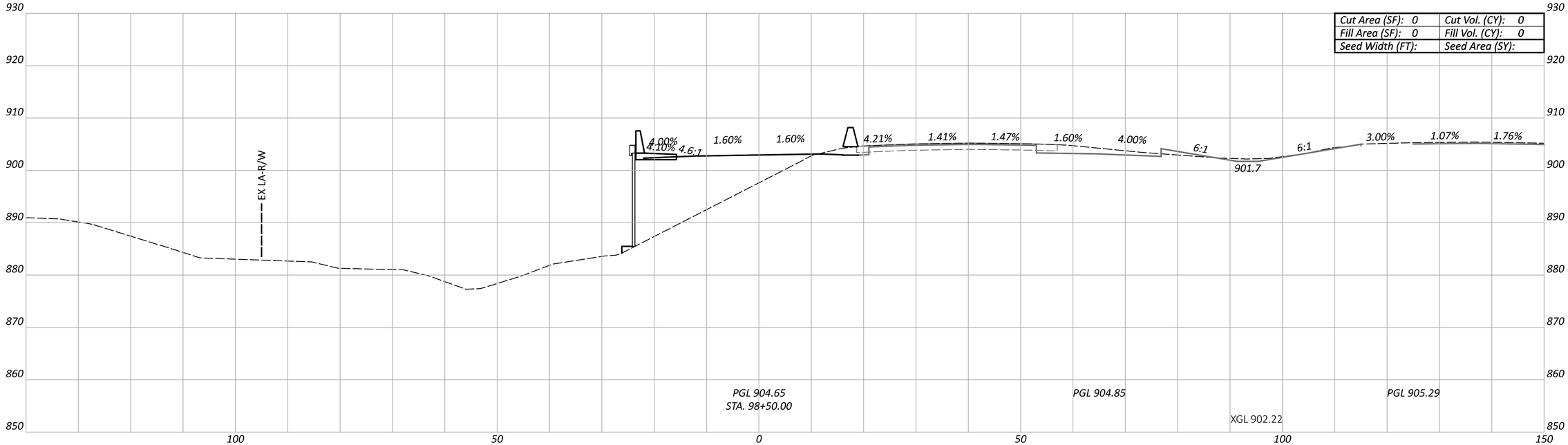
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

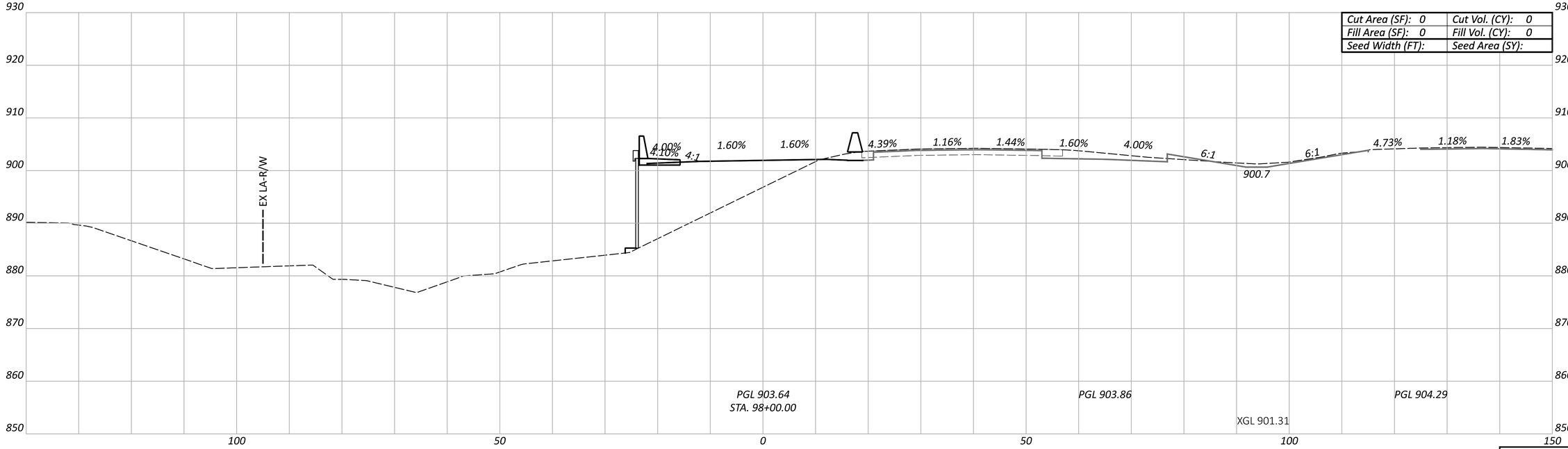
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.544 TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

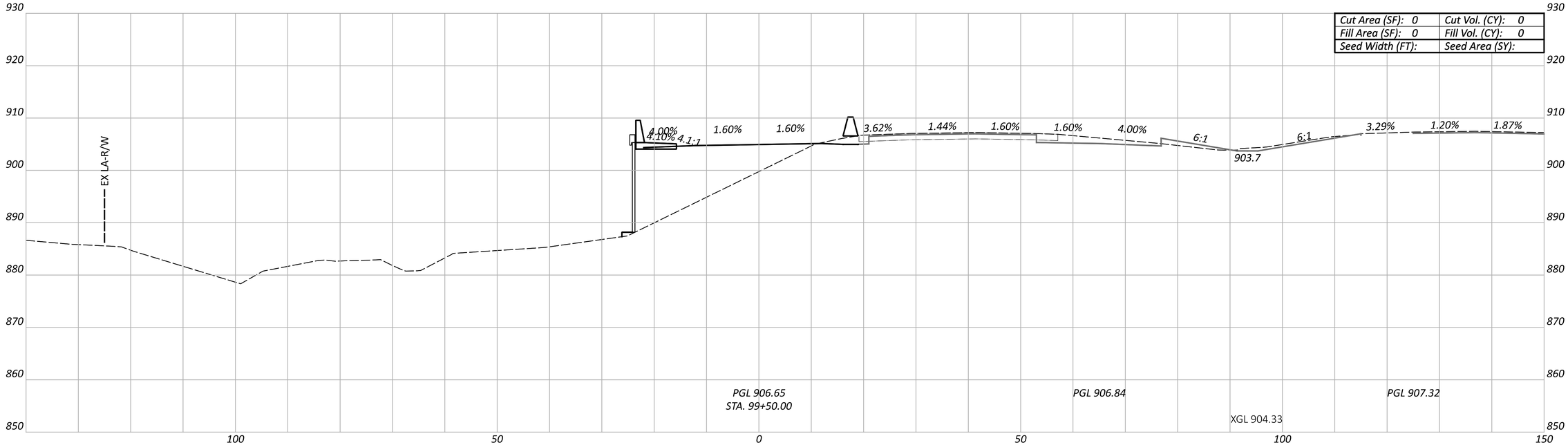
DESIGN AGENCY
STRUCTUREPOINT LLC

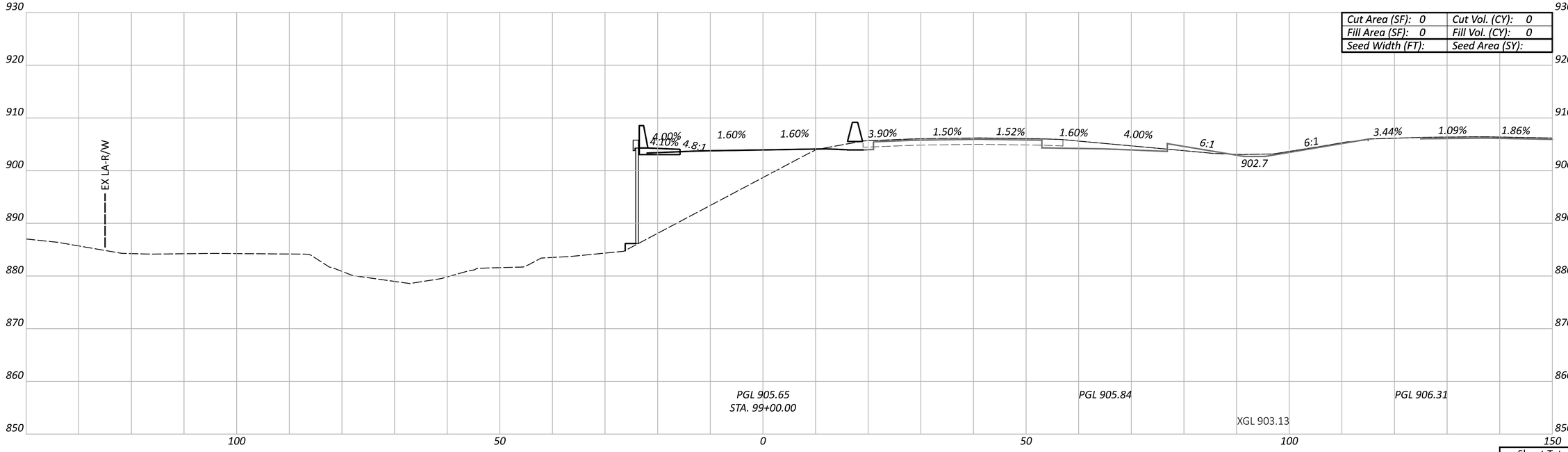
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.545 TOTAL 740





CROSS SECTIONS - RAMP H
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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

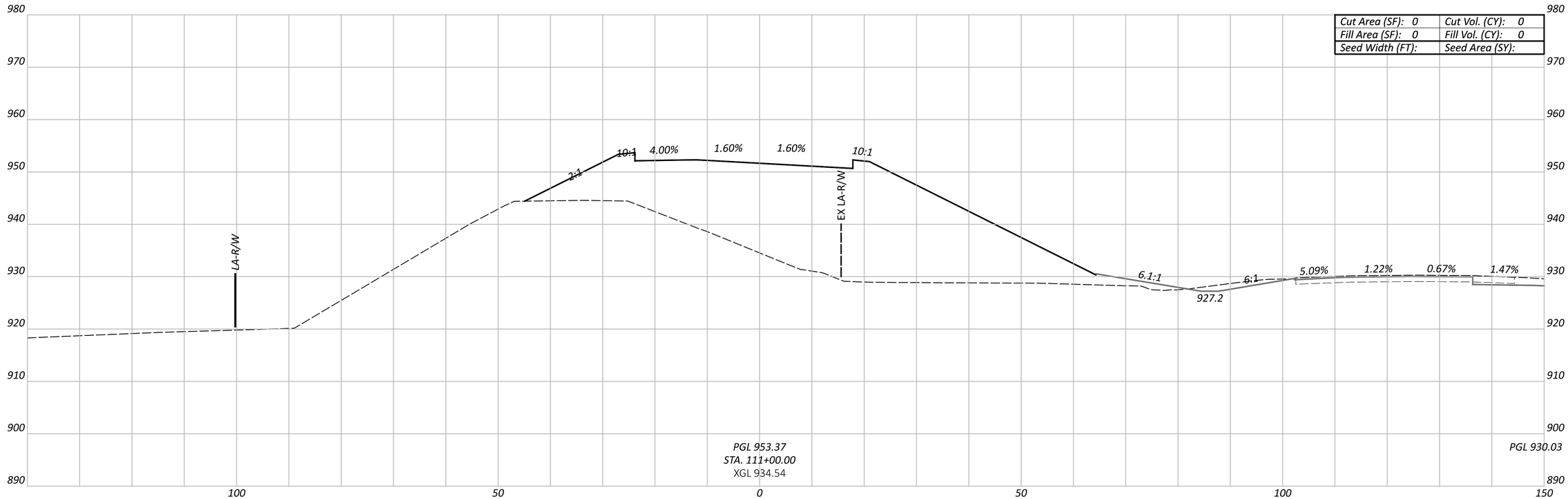
REVIEWER
KAM 06/18/23

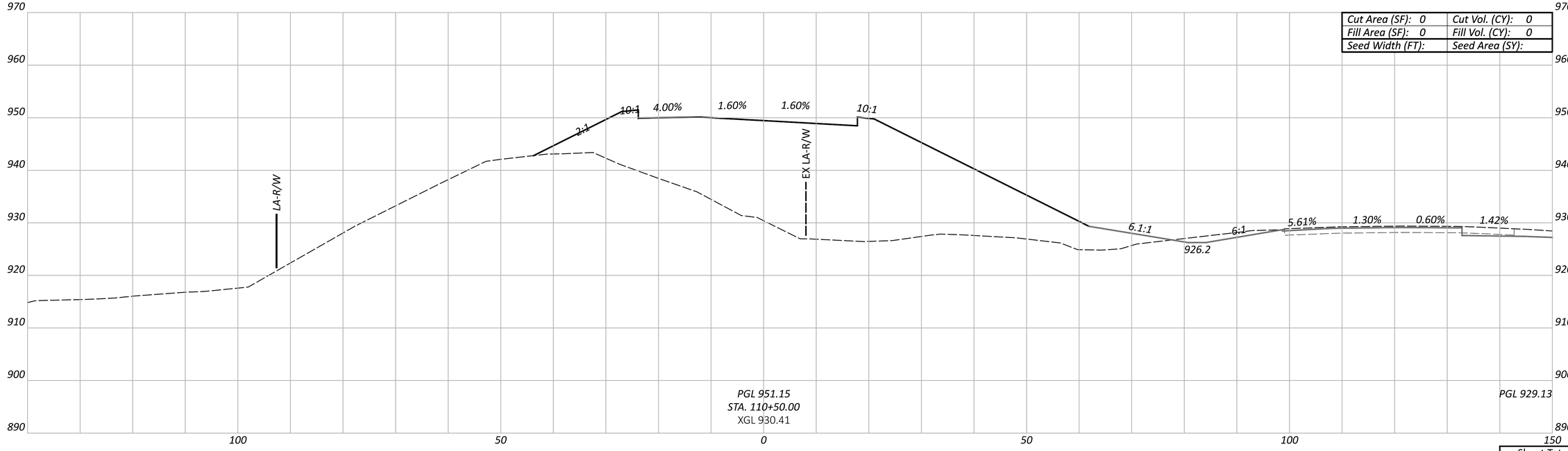
PROJECT ID
96808

SHEET P.546 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





CROSS SECTIONS - RAMP H STEEL
STA. 110+50.00 TO STA. 111+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.562 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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FAI/LIC IR 70 0.00/0.00

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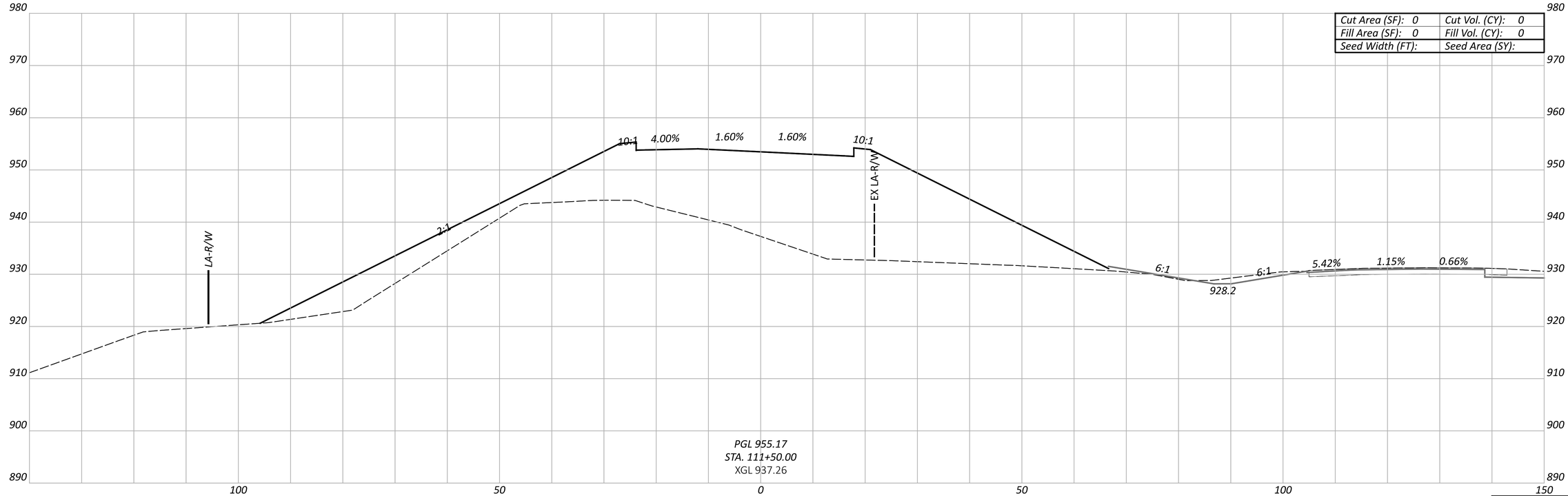
CROSS SECTIONS - RAMP H STEEL
STA. 111+50.00



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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.563 TOTAL 740

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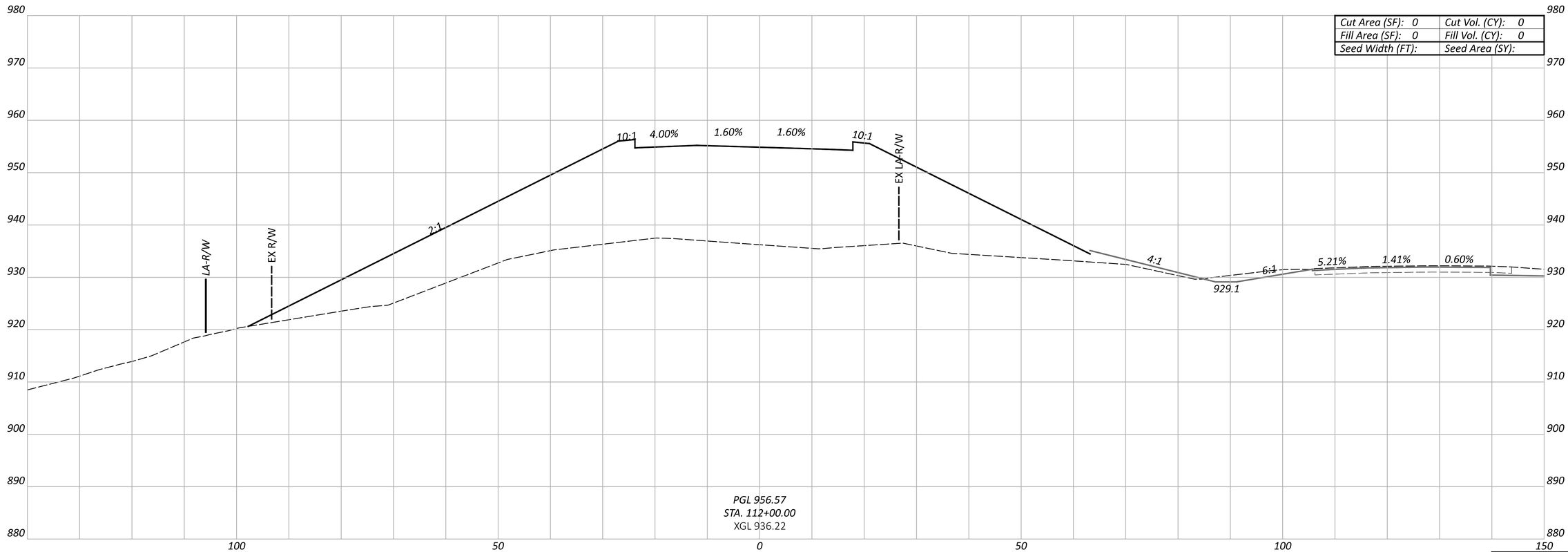

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.564
TOTAL	740

FAI/LIC IR 70 0.00/0.00

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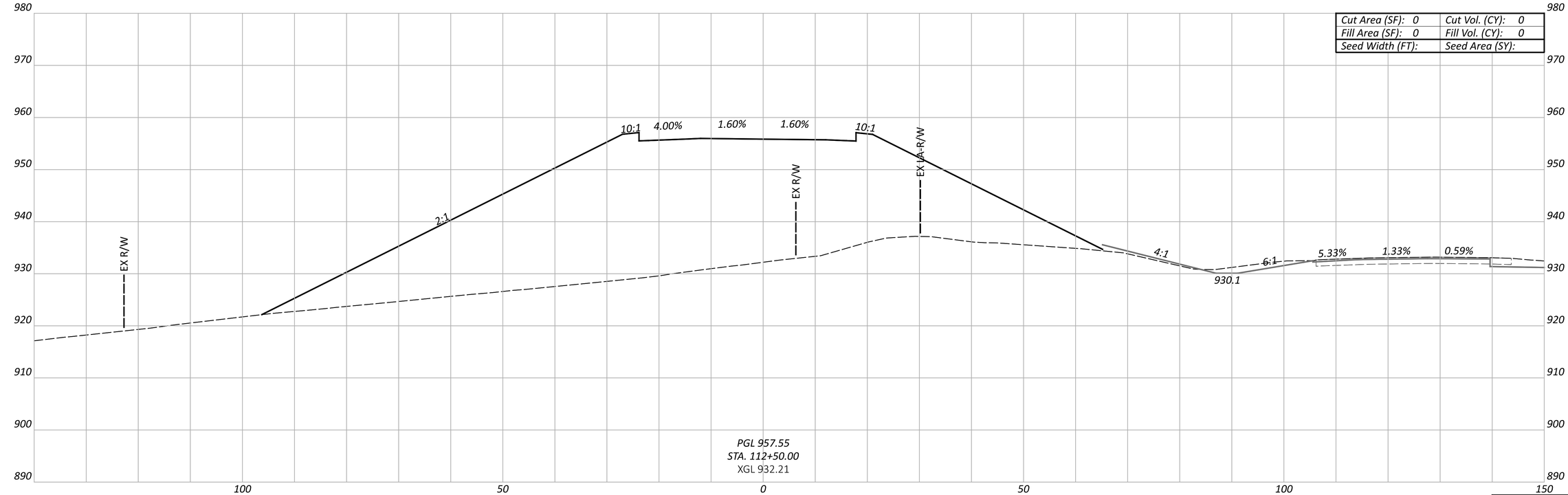

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Sheet Totals

Seeding	Cut	Fill

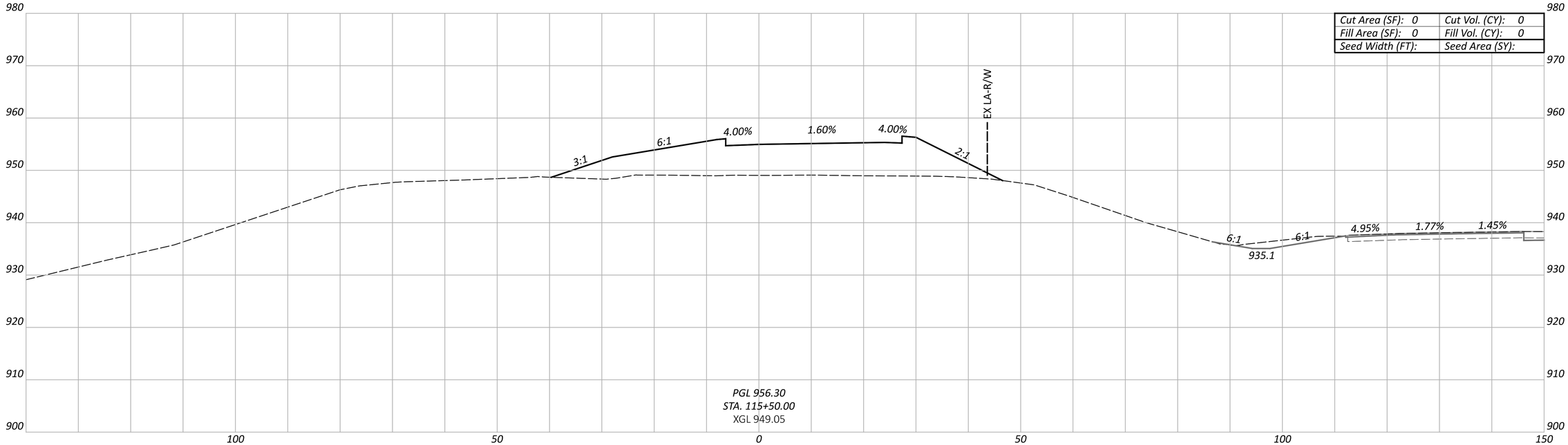
DESIGN AGENCY
STRUCTUREPOINT

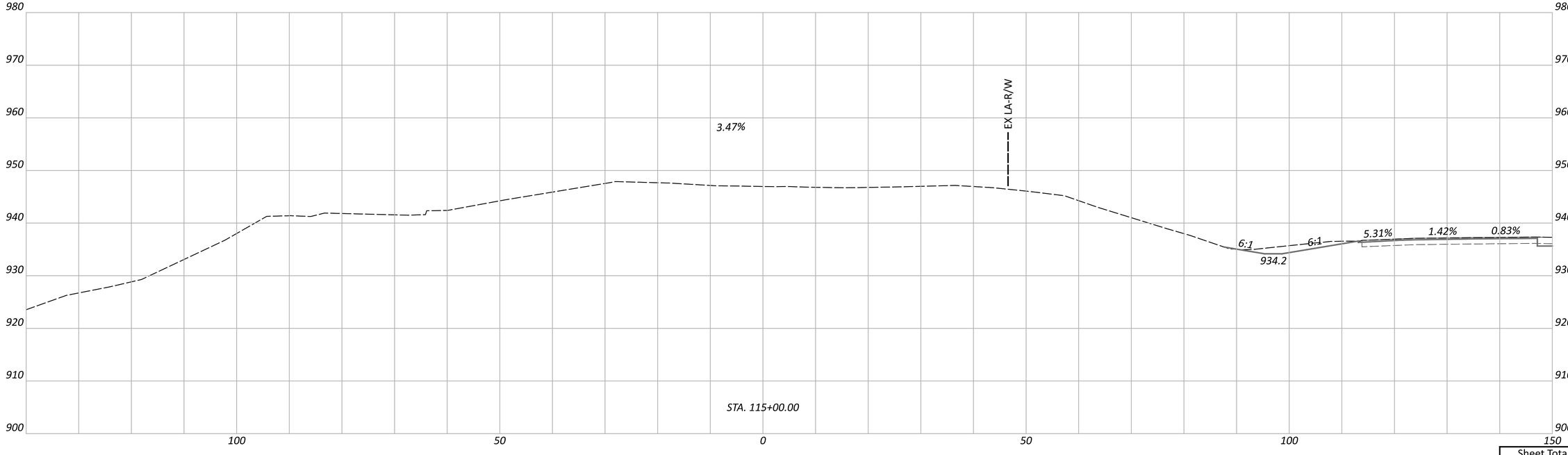
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.565 TOTAL 740





CROSS SECTIONS - RAMP I
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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

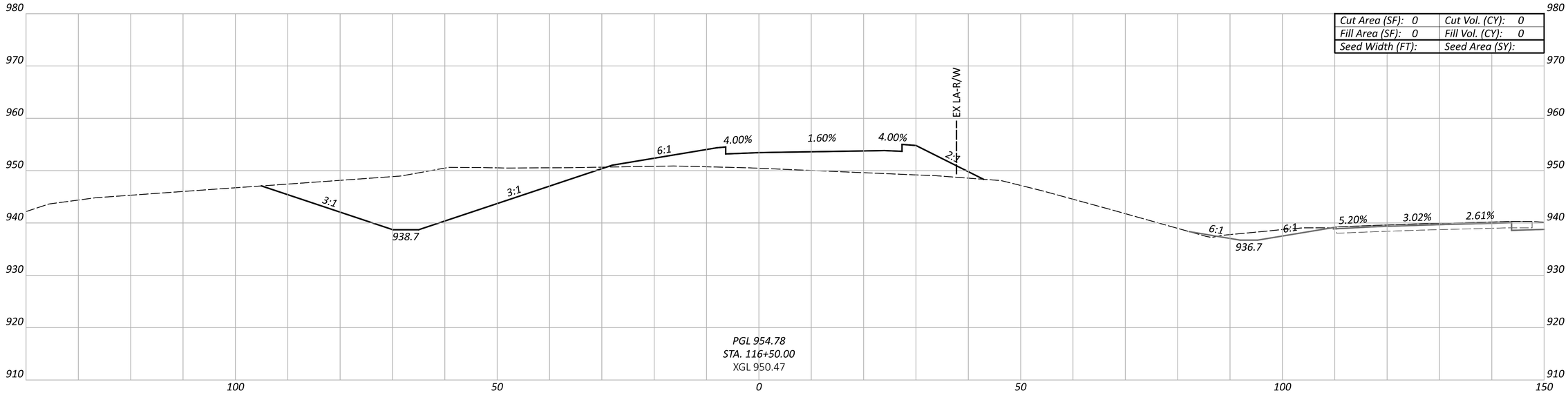
DESIGNER
BER

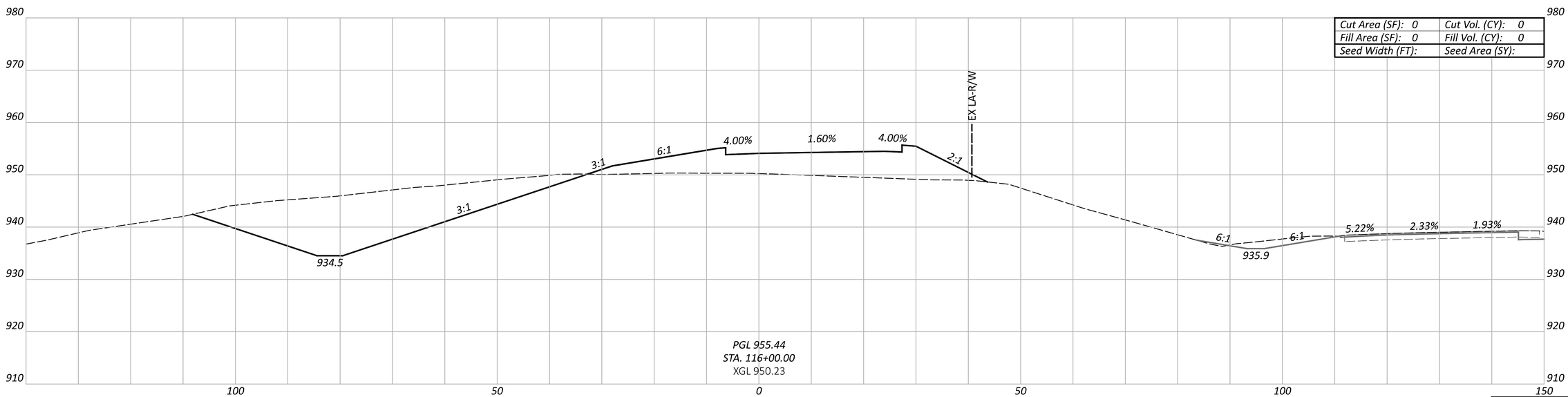
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.566	740





CROSS SECTIONS - RAMP I
STA. 116+00.00 TO STA. 116+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.567 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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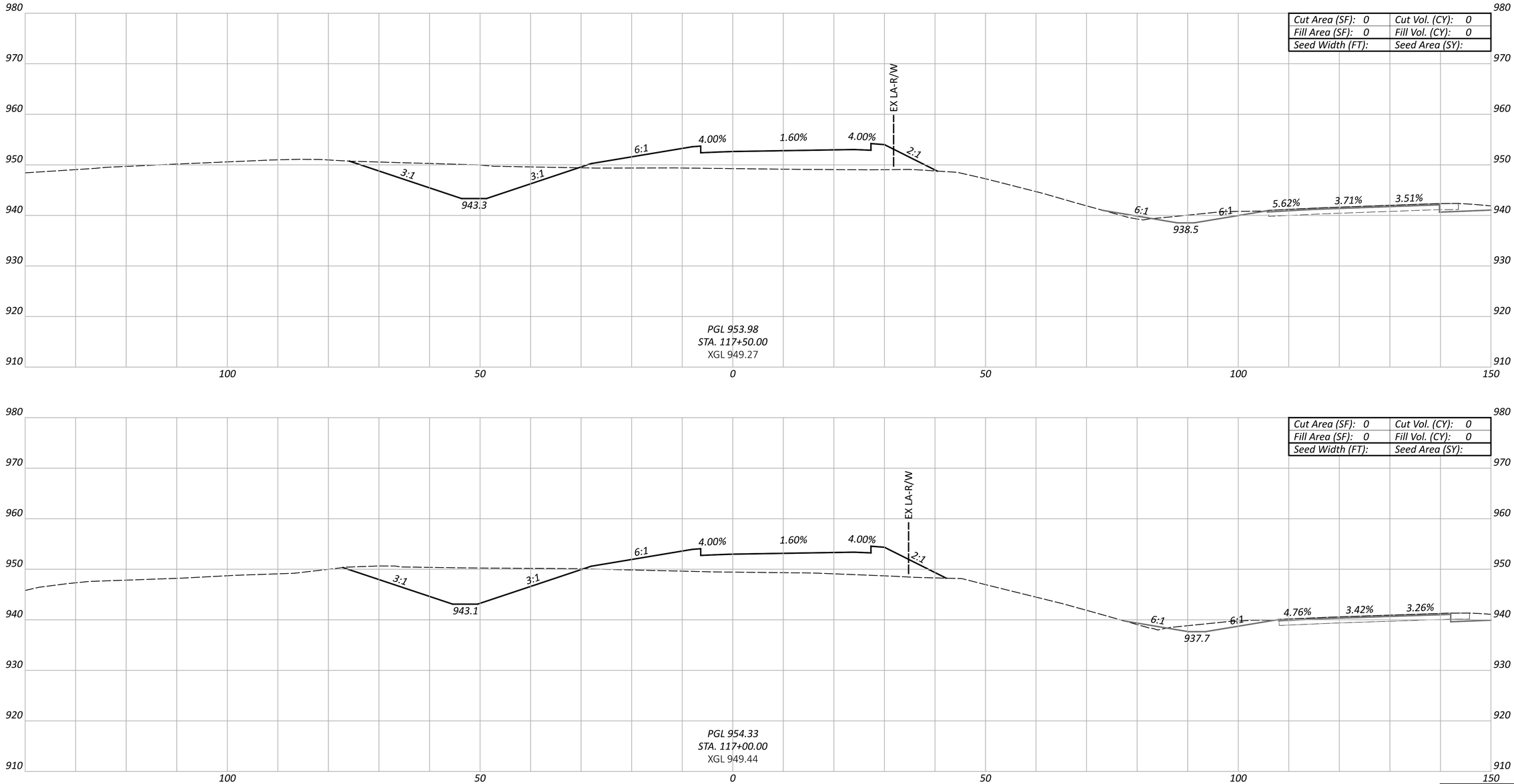

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CROSS SECTIONS - RAMP I
STA. 117+00.00 TO STA. 117+50.00

Sheet Totals		
Seeding	Cut	Fill

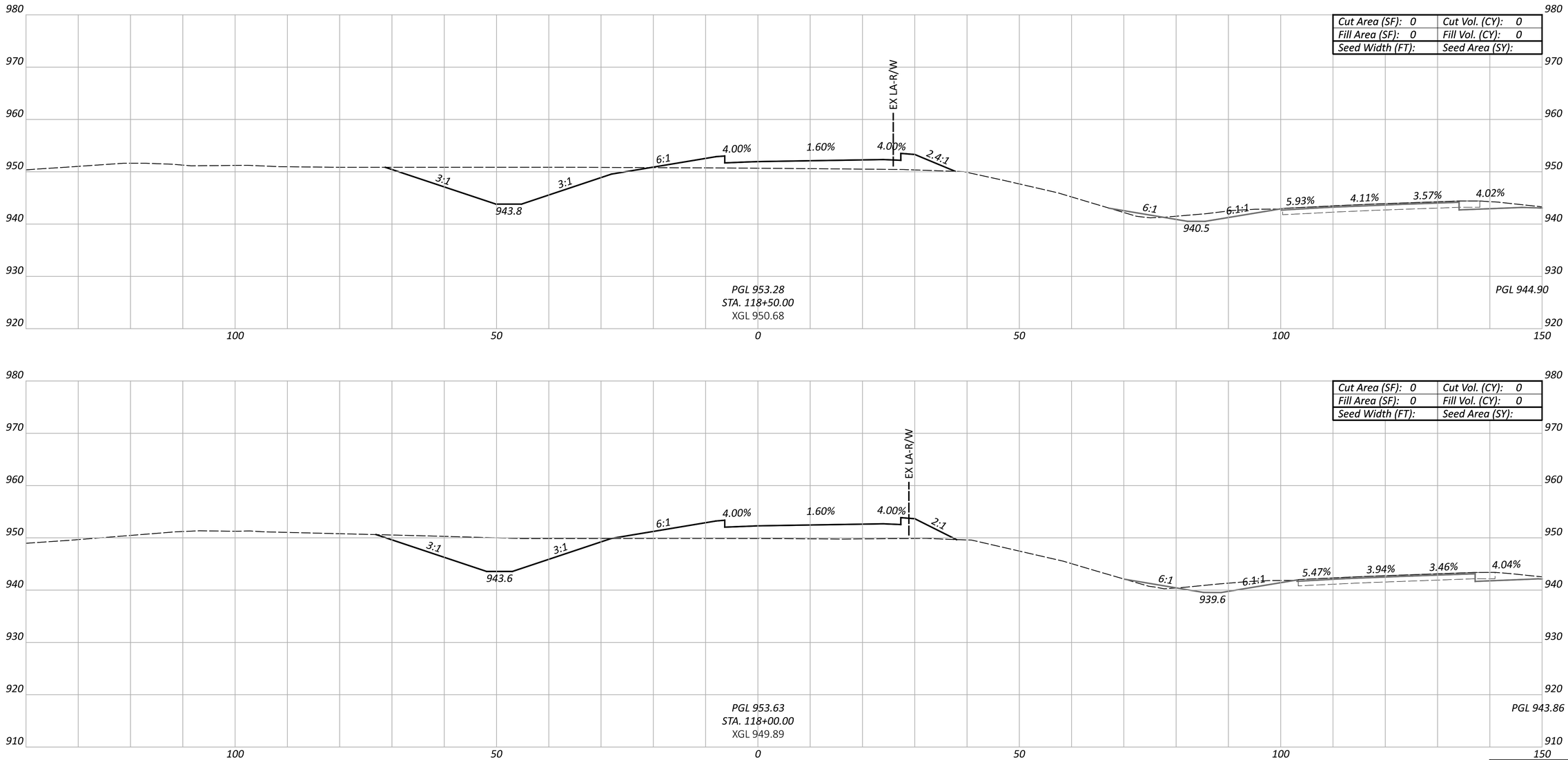
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.568 TOTAL 740



FAI/LIC IR 70 0.00/0.00

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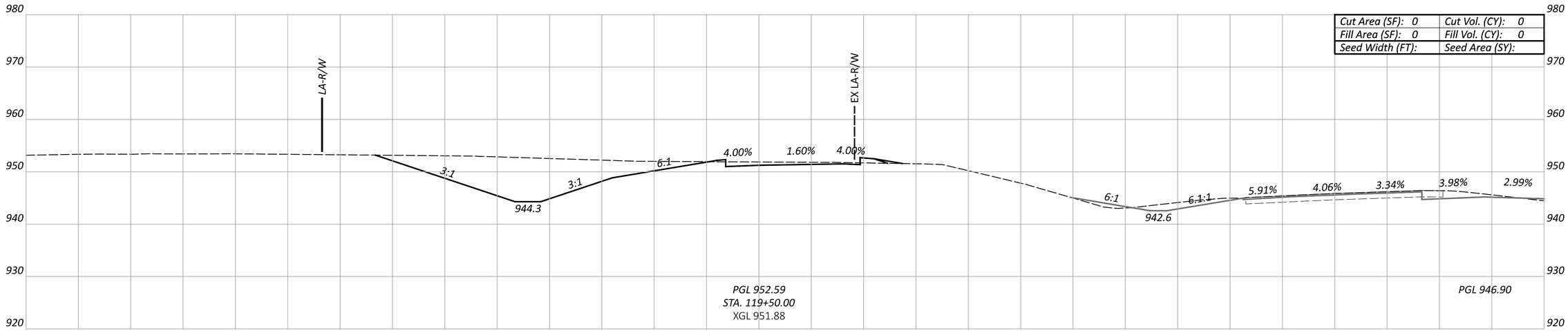
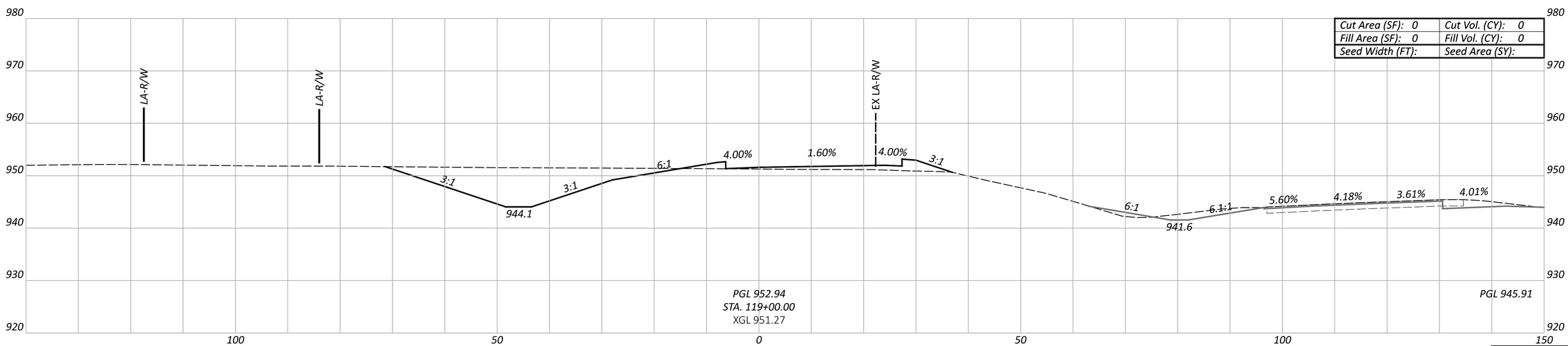
CROSS SECTIONS - RAMP I
STA. 118+00.00 TO STA. 118+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.569
TOTAL	740





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FAI/LIC IR 70 0.00/0.00

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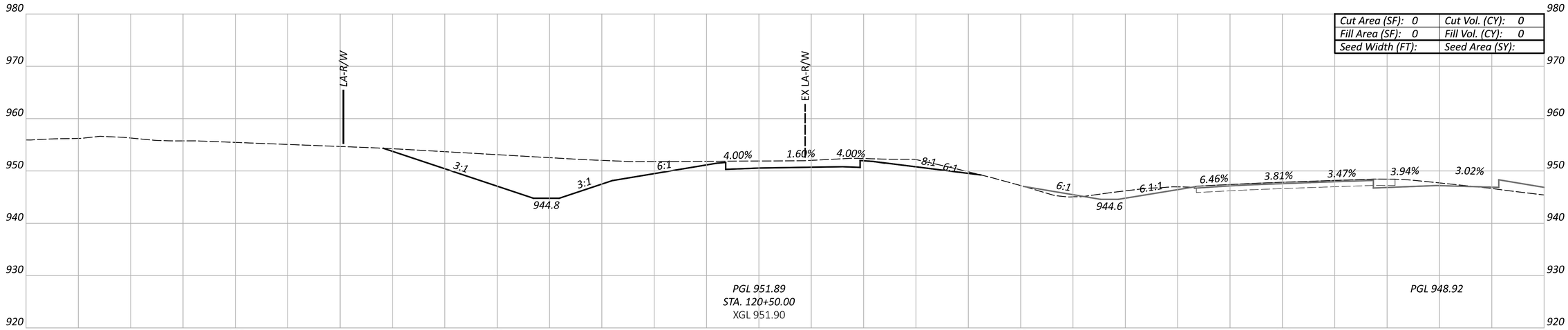
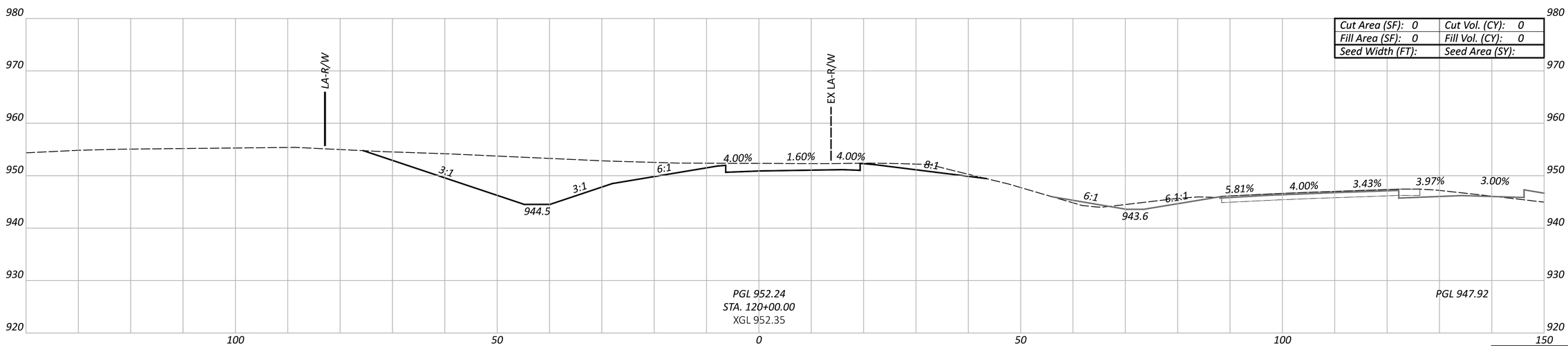
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.570
TOTAL	740





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Sheet Totals		
Seeding	Cut	Fill

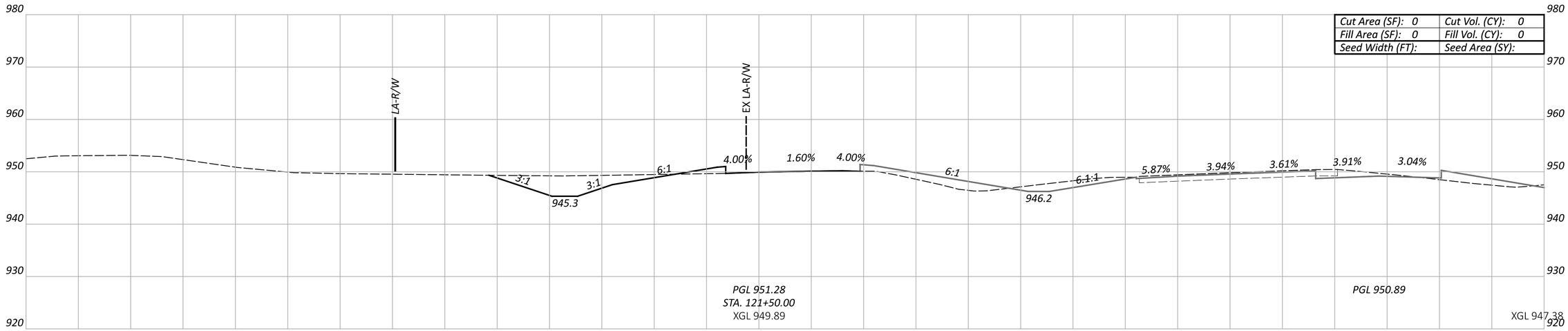
DESIGN AGENCY
STRUCTUREPOINT LLC

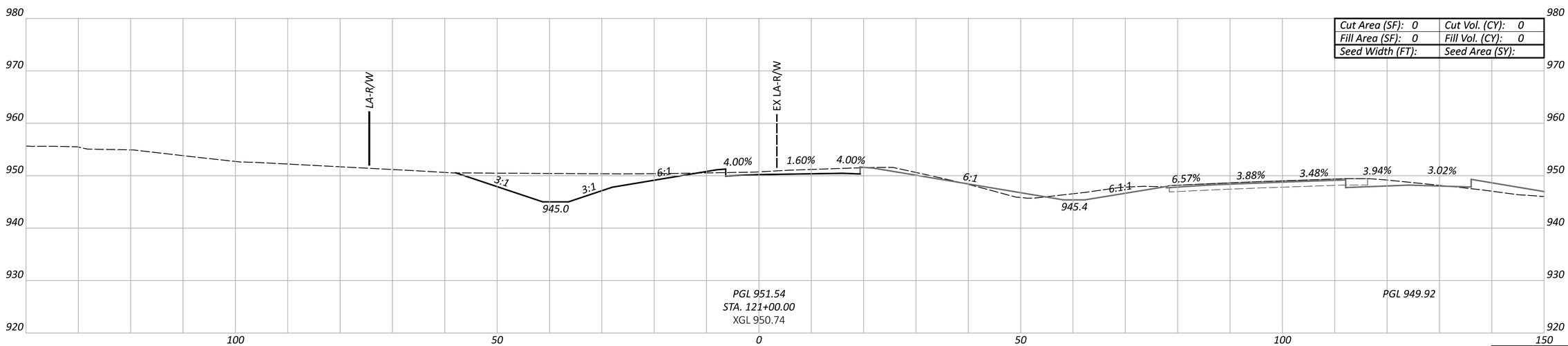
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.571 TOTAL 740





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FAI/LIC IR 70 0.00/0.00

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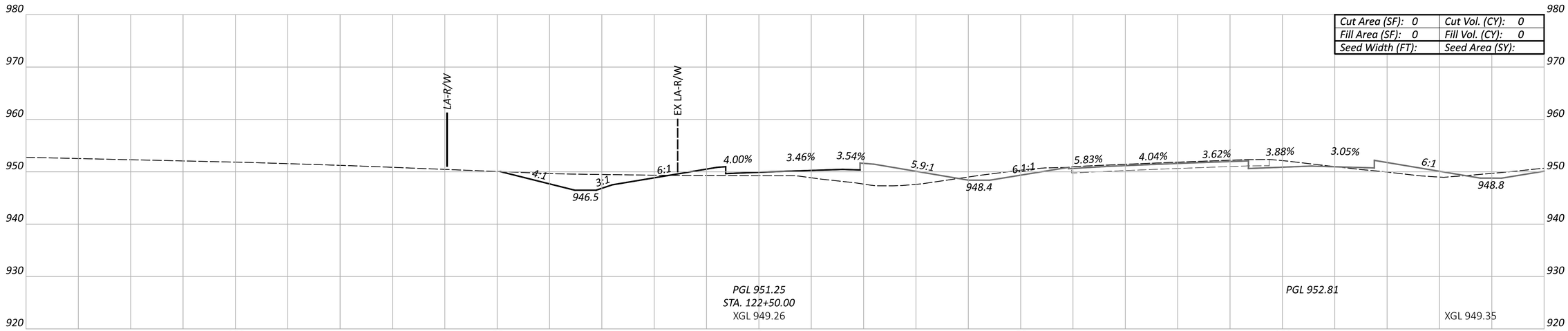
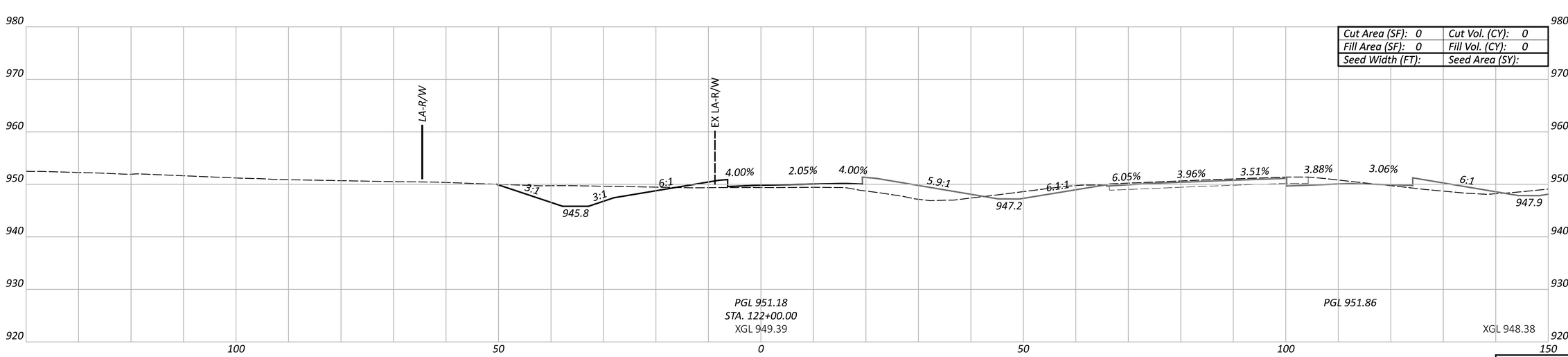
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	
BER	
REVIEWER	
KAM	06/18/23
PROJECT ID	
96808	
SHEET	TOTAL
P.572	740

Sheet Totals

Seeding	Cut	Fill





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CROSS SECTIONS - RAMP I
STA. 122+00.00 TO STA. 122+50.00

Sheet Totals		
Seeding	Cut	Fill

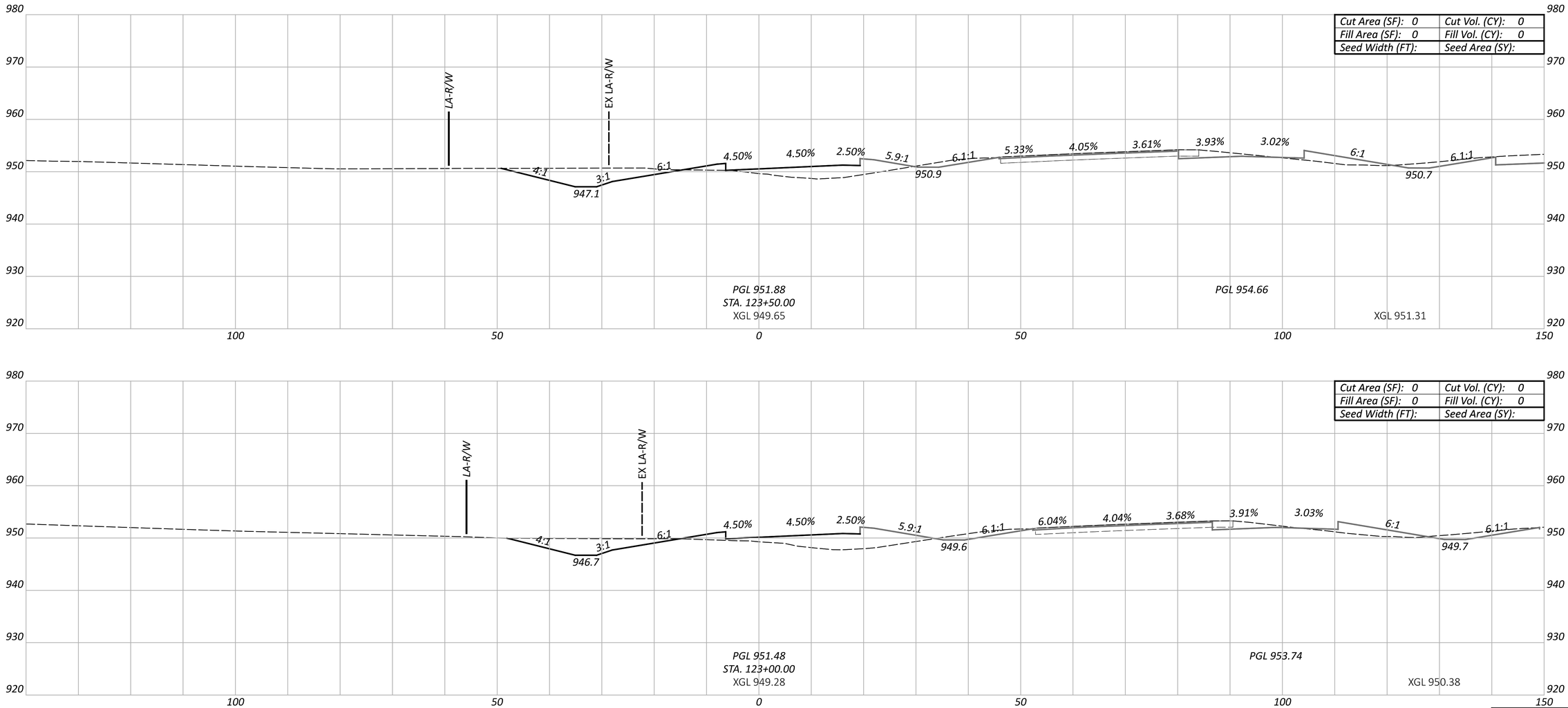
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.573 TOTAL 740



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CROSS SECTIONS - RAMP I
STA. 123+00.00 TO STA. 123+50.00

Sheet Totals		
Seeding	Cut	Fill

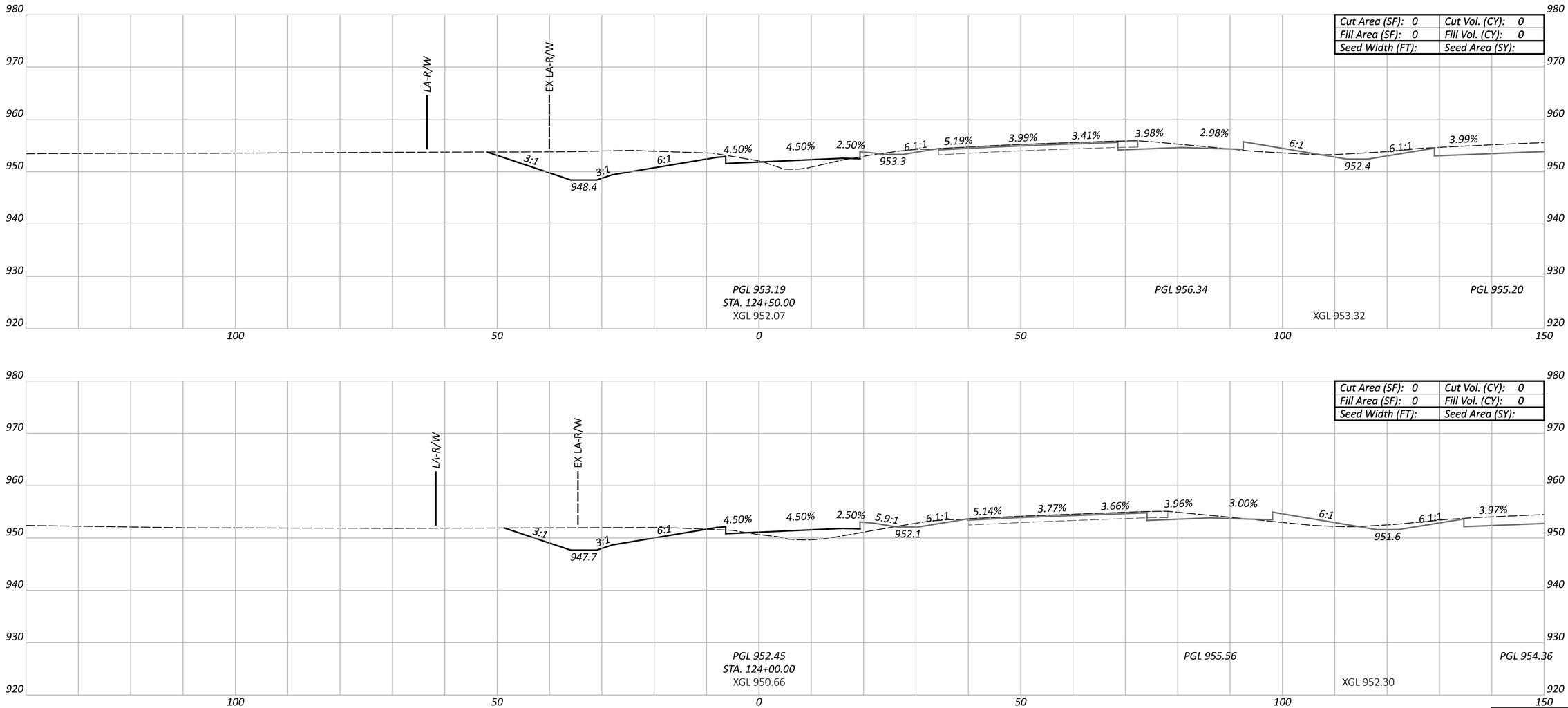
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.574 TOTAL 740



Sheet Totals

Seeding	Cut	Fill

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STA. 124+00.00 TO STA. 124+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.575 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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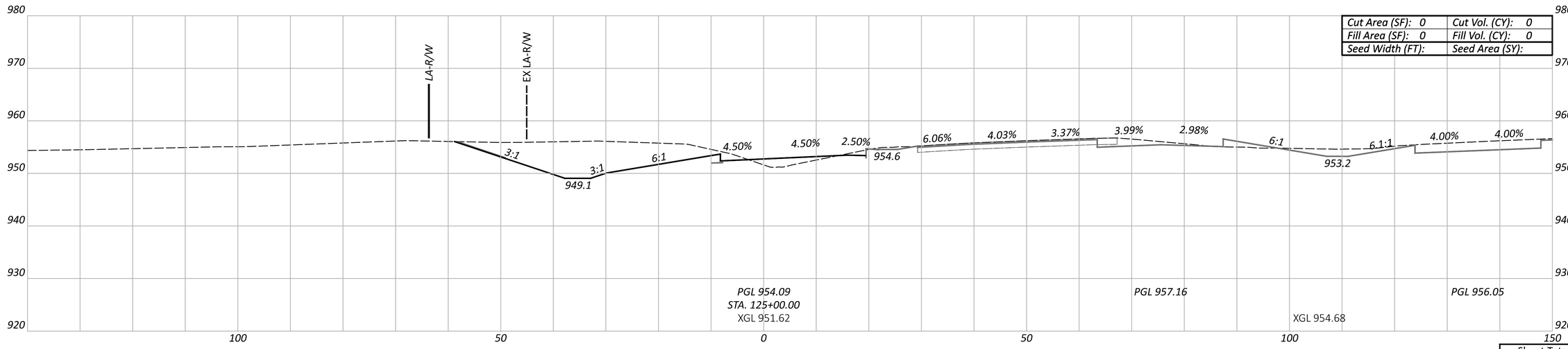

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Seeding	Cut	Fill

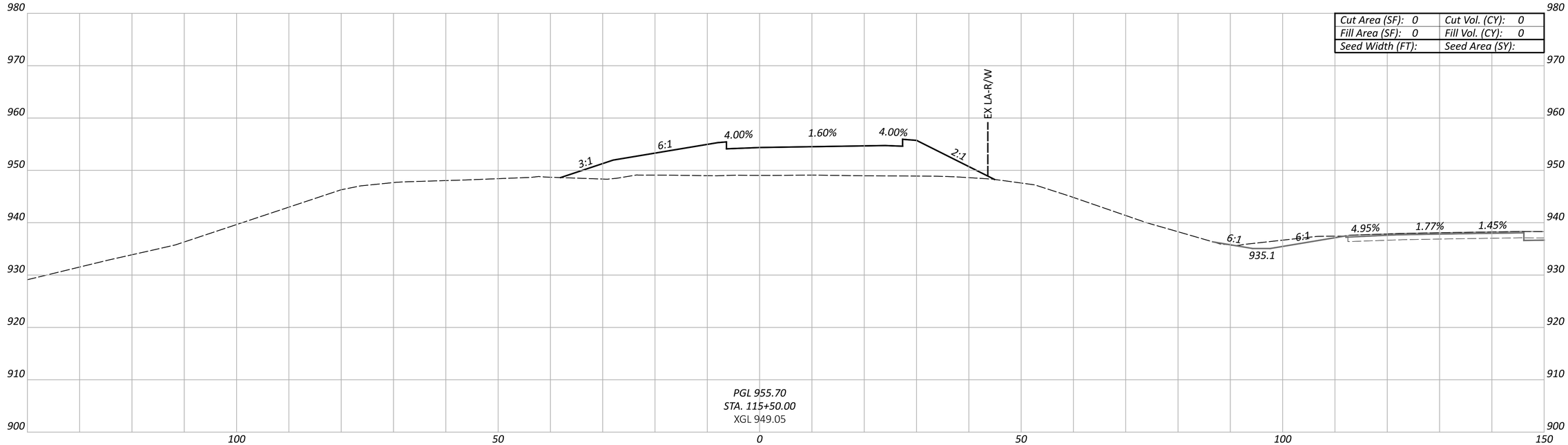
DESIGN AGENCY
STRUCTUREPOINT

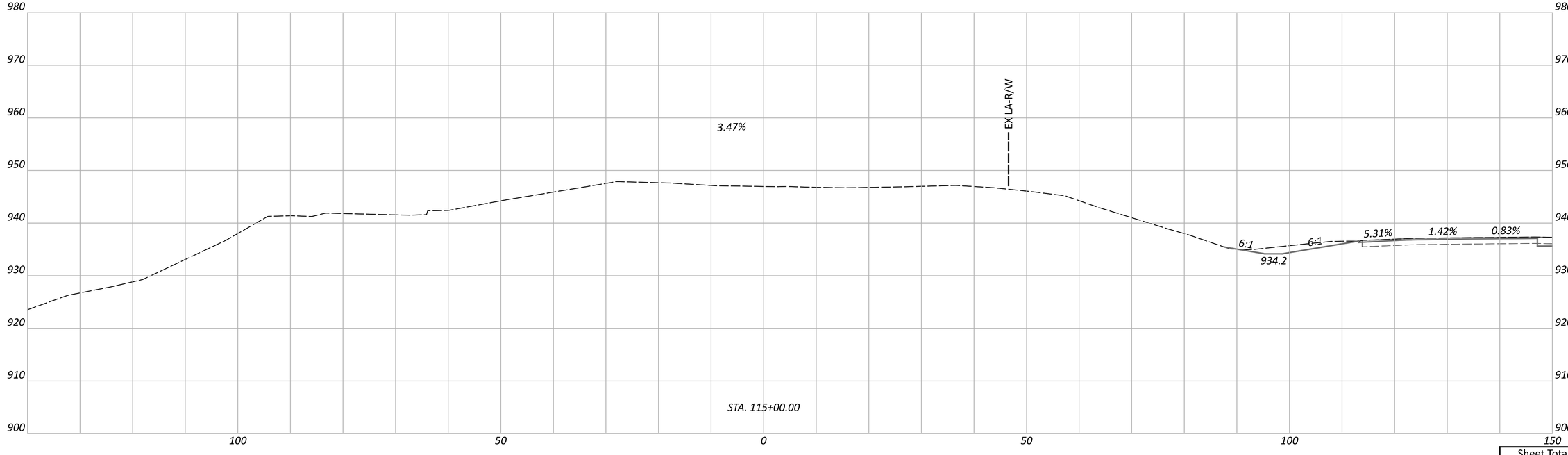
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.576 TOTAL 740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - RAMP I STEEL
STA. 115+00.00 TO STA. 115+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.577 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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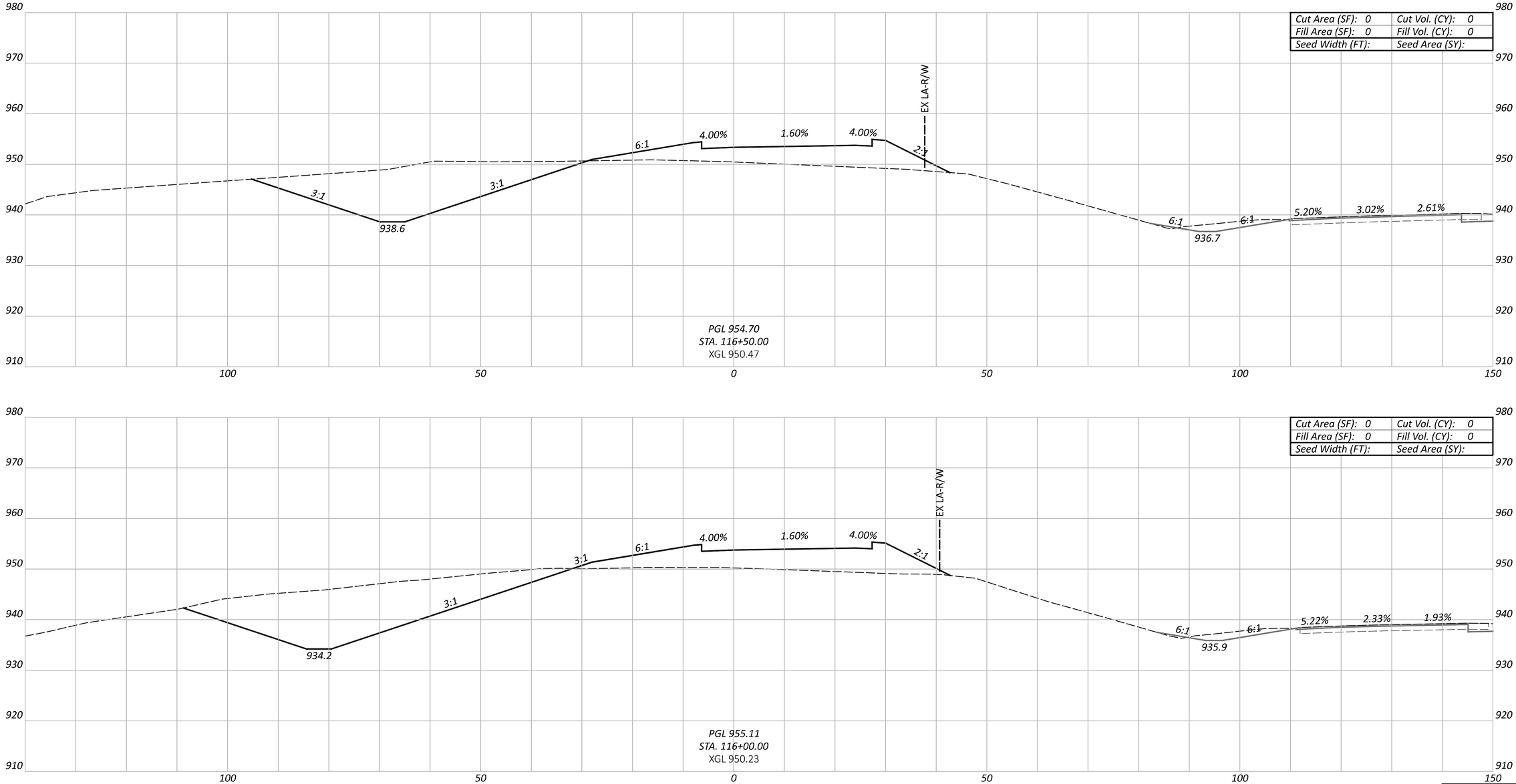

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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

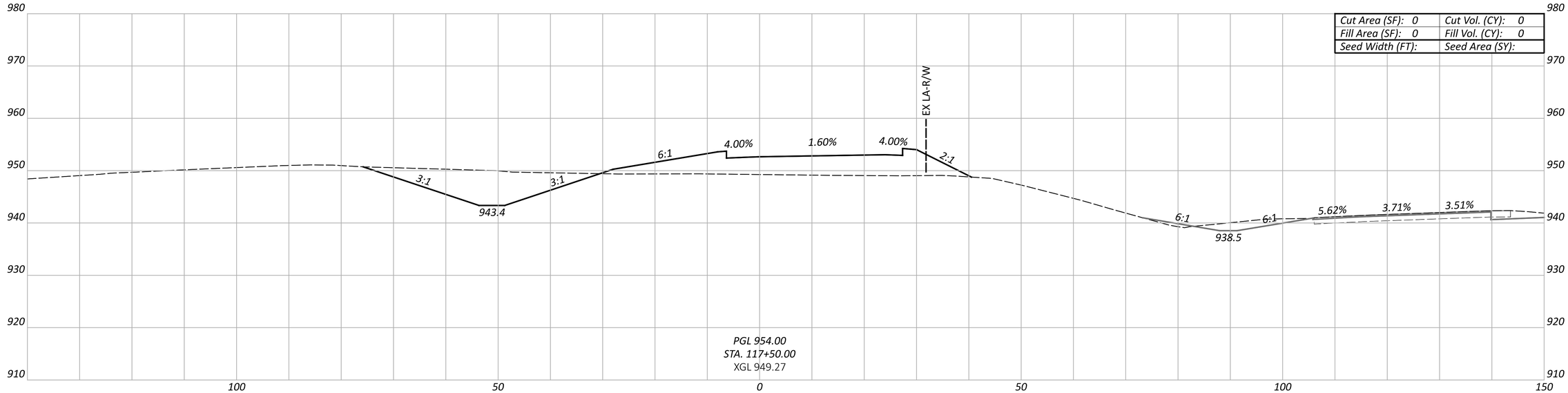
DESIGN AGENCY
STRUCTUREPOINT

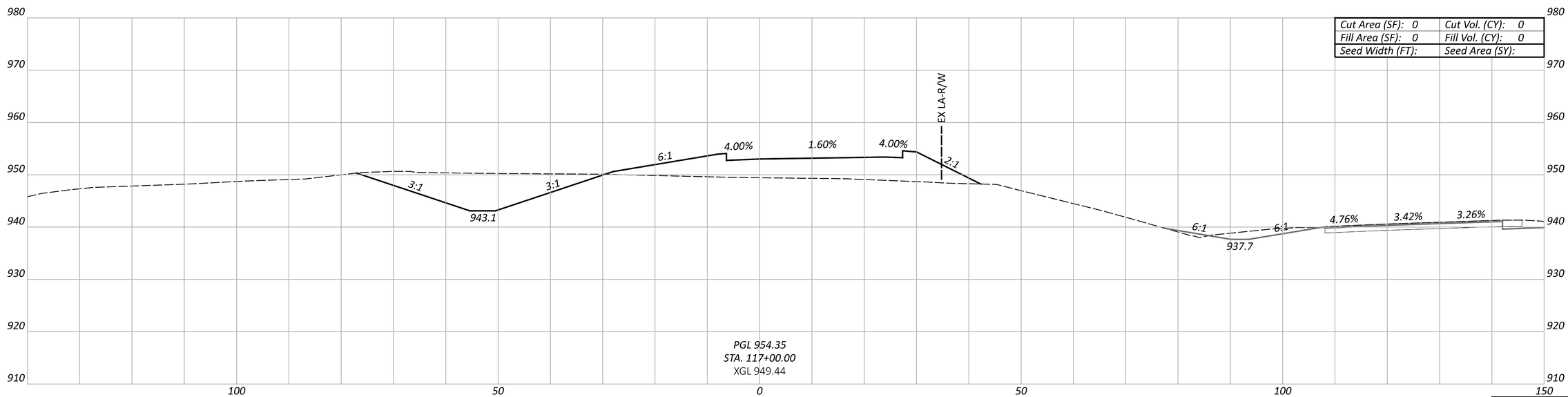
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.578 TOTAL 740





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CROSS SECTIONS - RAMP I STEEL
STA. 117+00.00 TO STA. 117+50.00

Sheet Totals		
Seeding	Cut	Fill

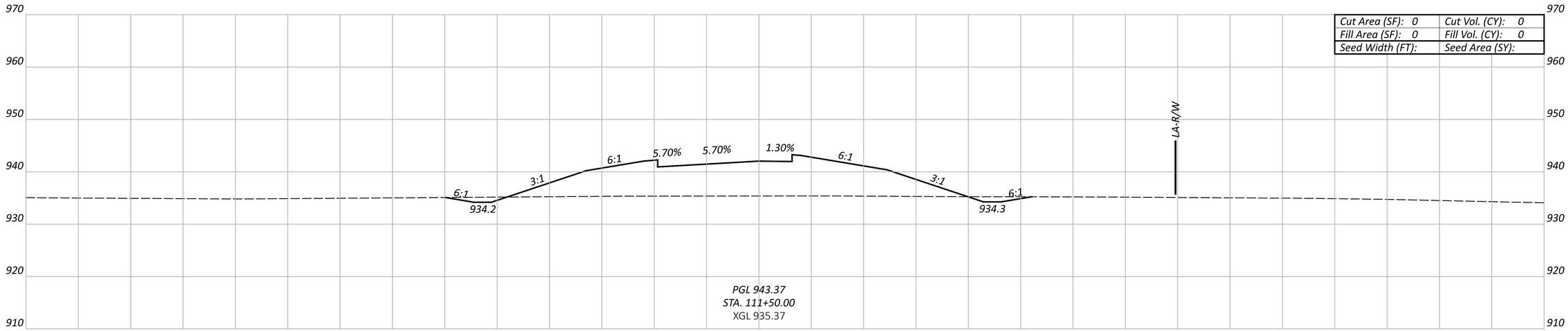
DESIGN AGENCY
STRUCTUREPOINT

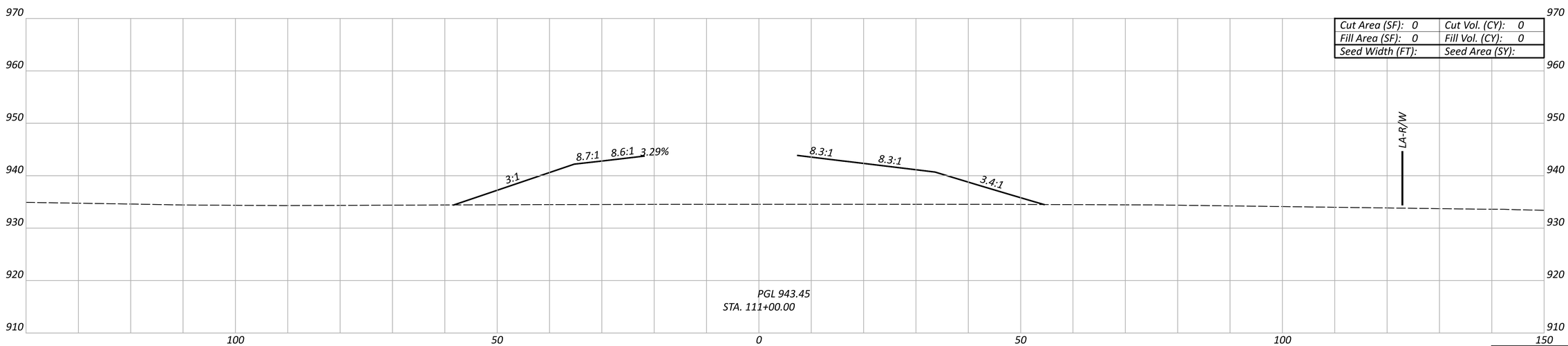
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.579 TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

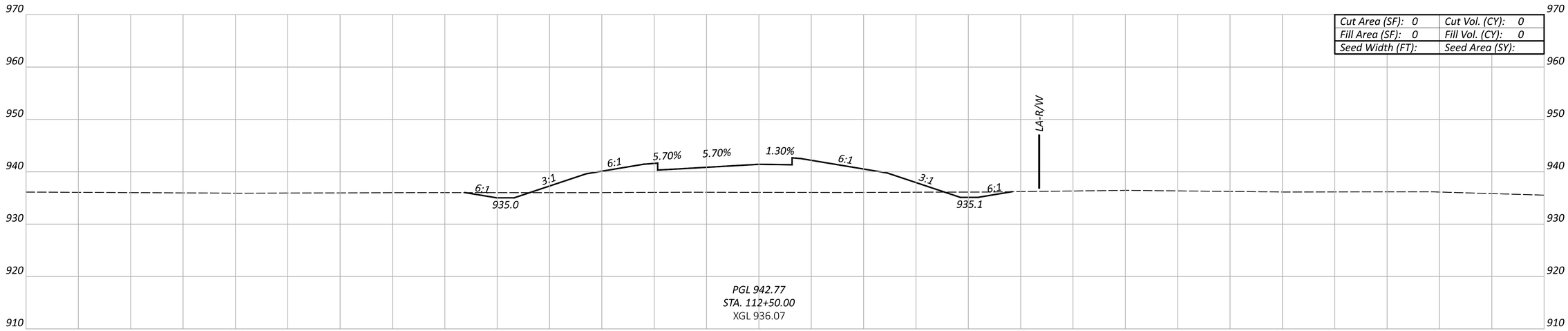
DESIGN AGENCY
STRUCTUREPOINT LLC

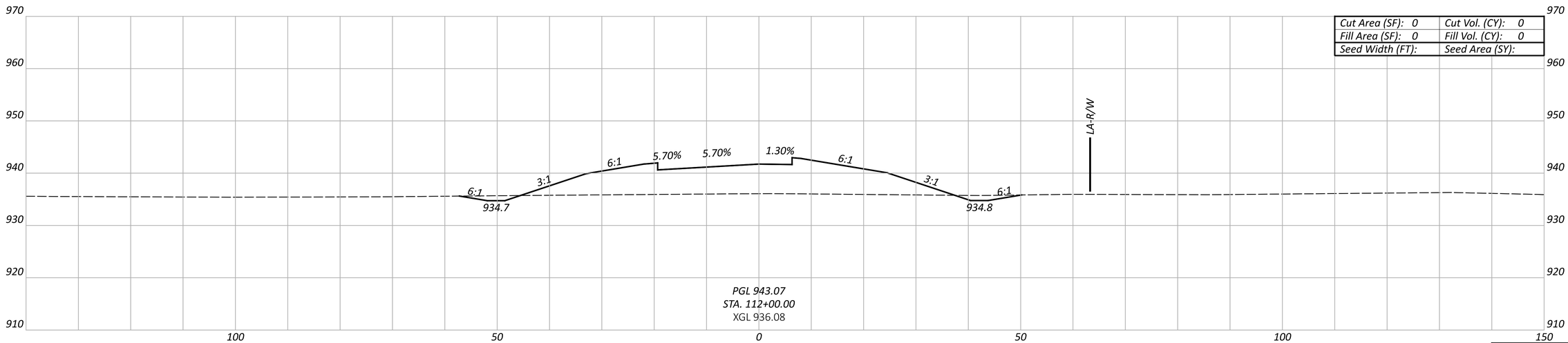
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.580 TOTAL 740





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CROSS SECTIONS - RAMP J
STA. 112+00.00 TO STA. 112+50.00

Sheet Totals		
Seeding	Cut	Fill

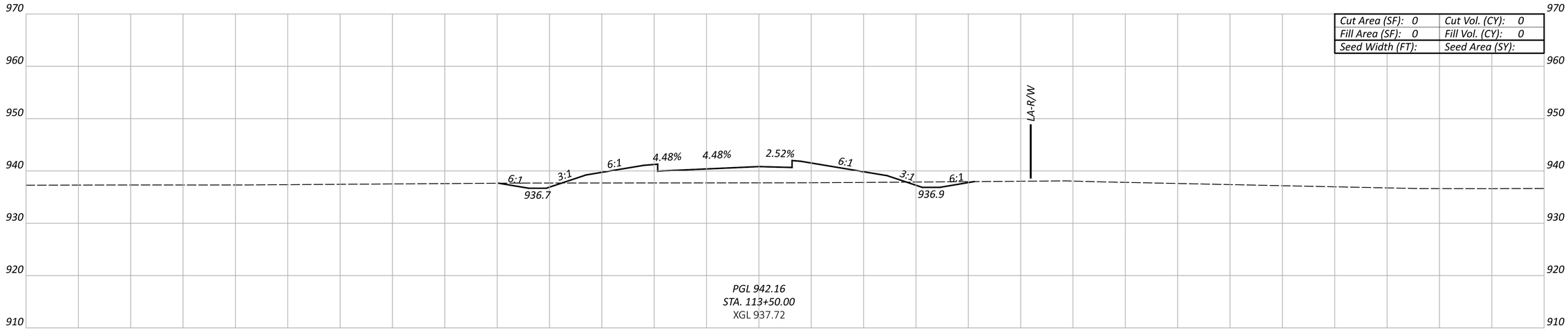
DESIGN AGENCY
STRUCTUREPOINT INC.

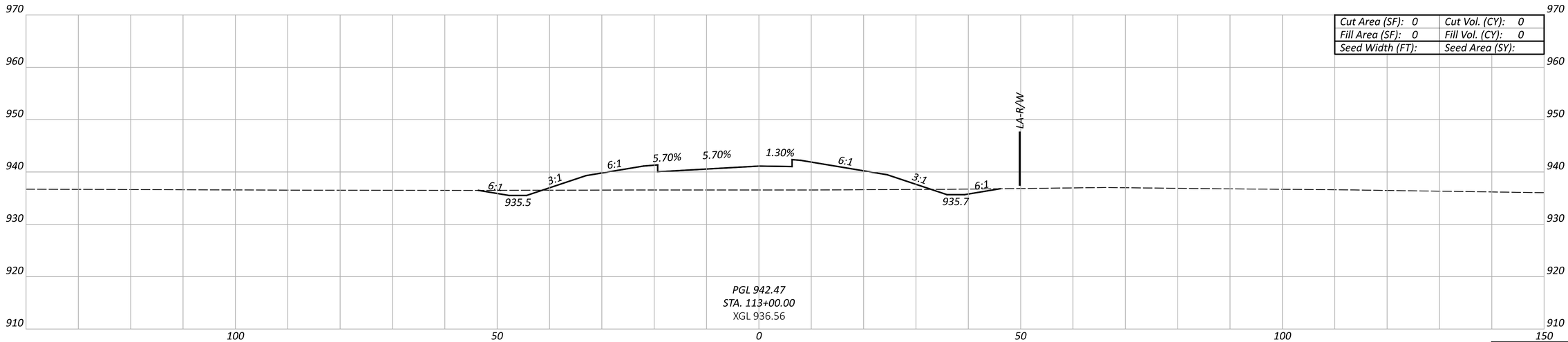
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.581 TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

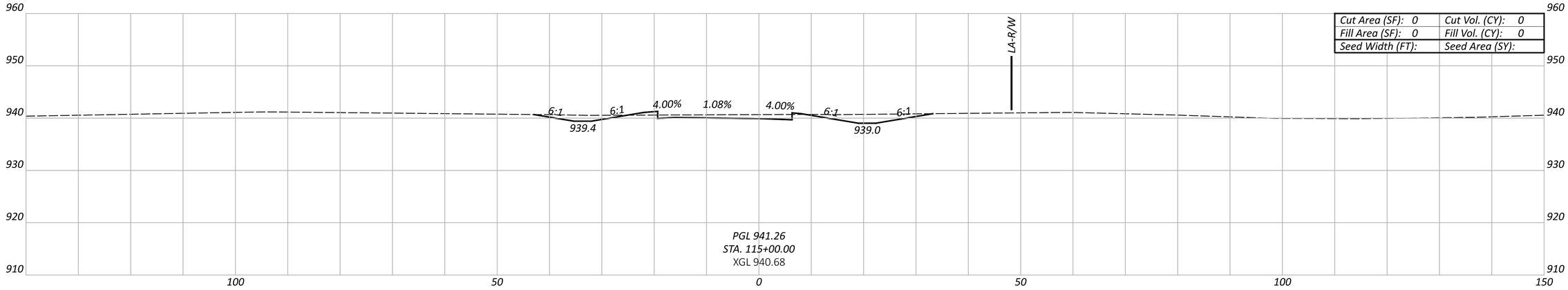
DESIGN AGENCY
STRUCTUREPOINT INC.

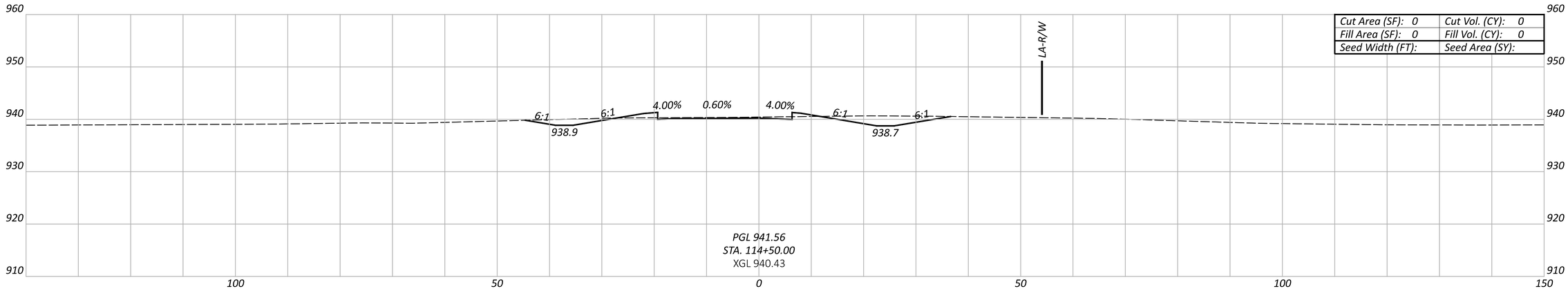
DESIGNER
BER

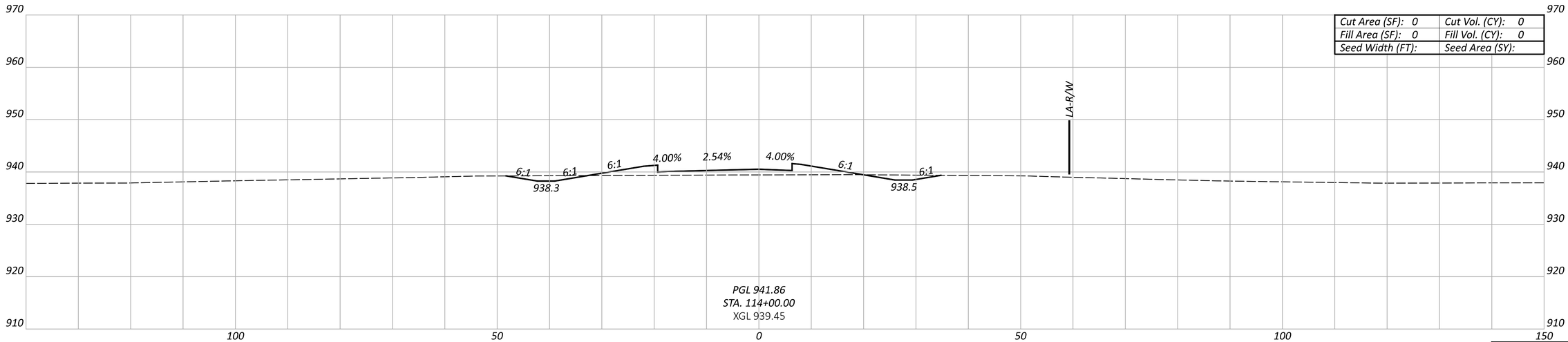
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.582 TOTAL 740







CROSS SECTIONS - RAMP J
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Sheet Totals		
Seeding	Cut	Fill

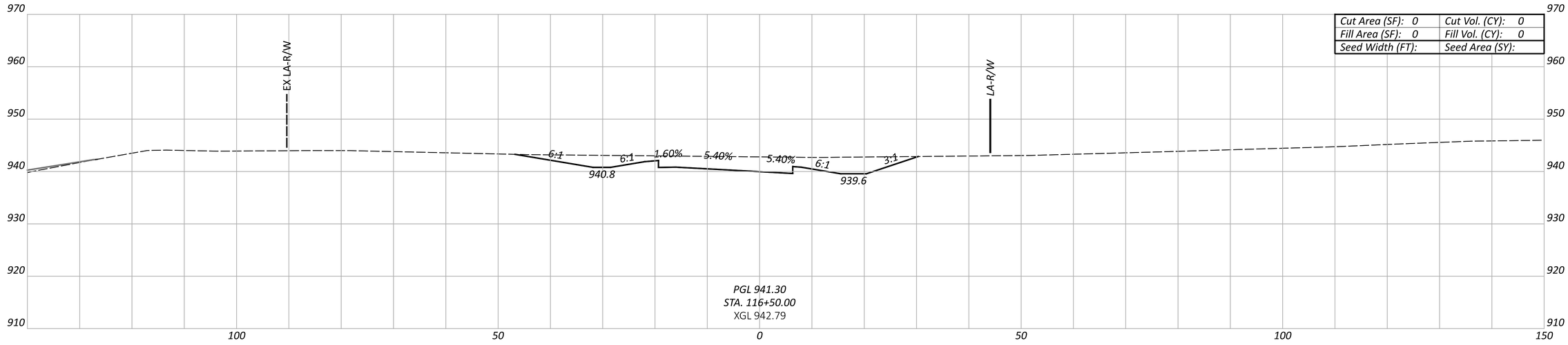
DESIGN AGENCY
STRUCTUREPOINT INC.

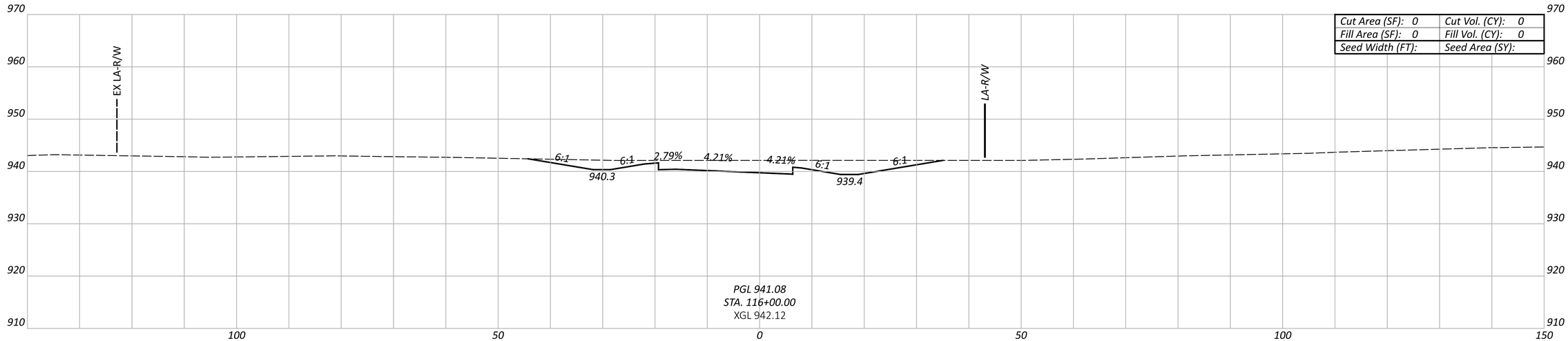
DESIGNER
BER

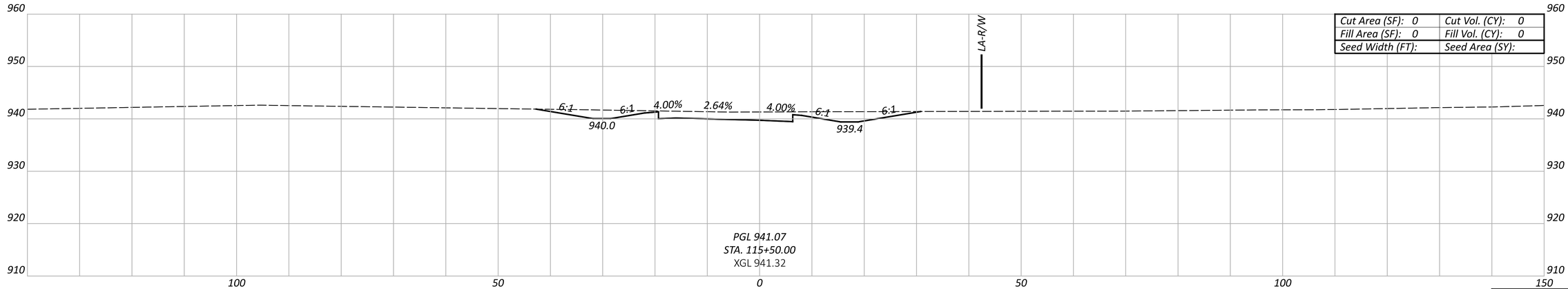
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.583 TOTAL 740







CROSS SECTIONS - RAMP J
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.584 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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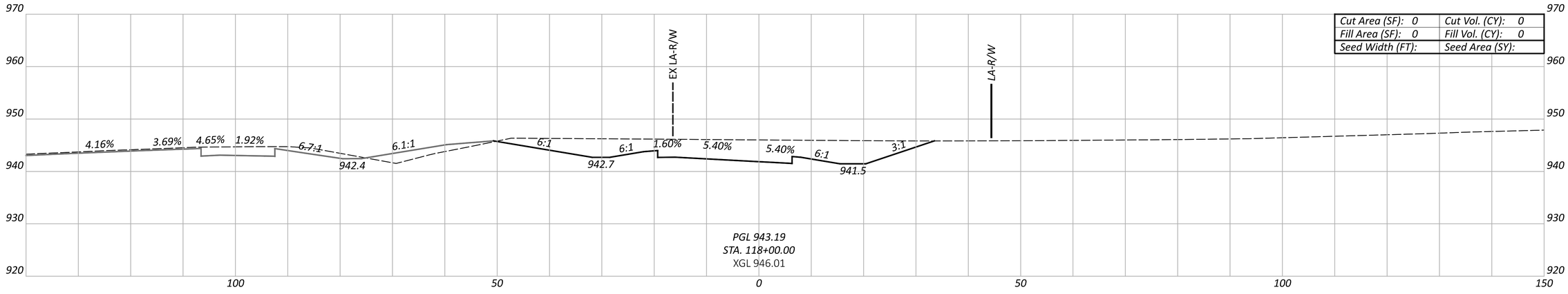

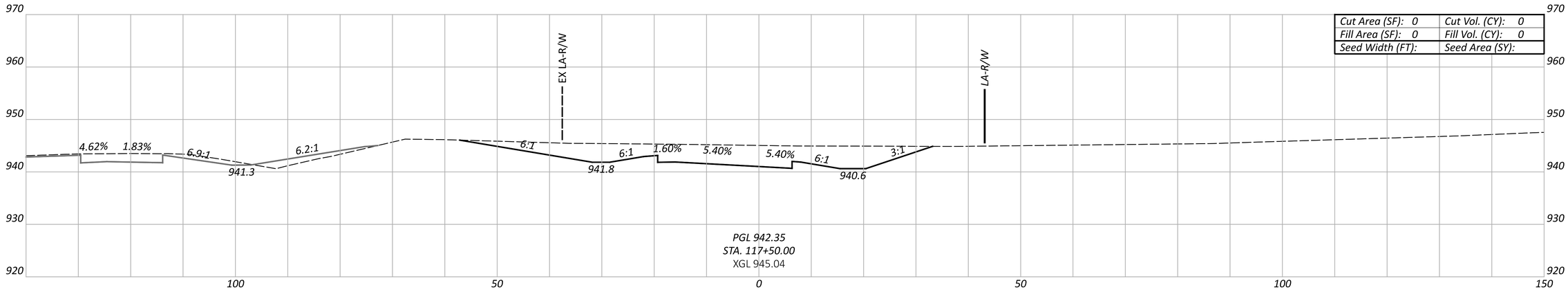

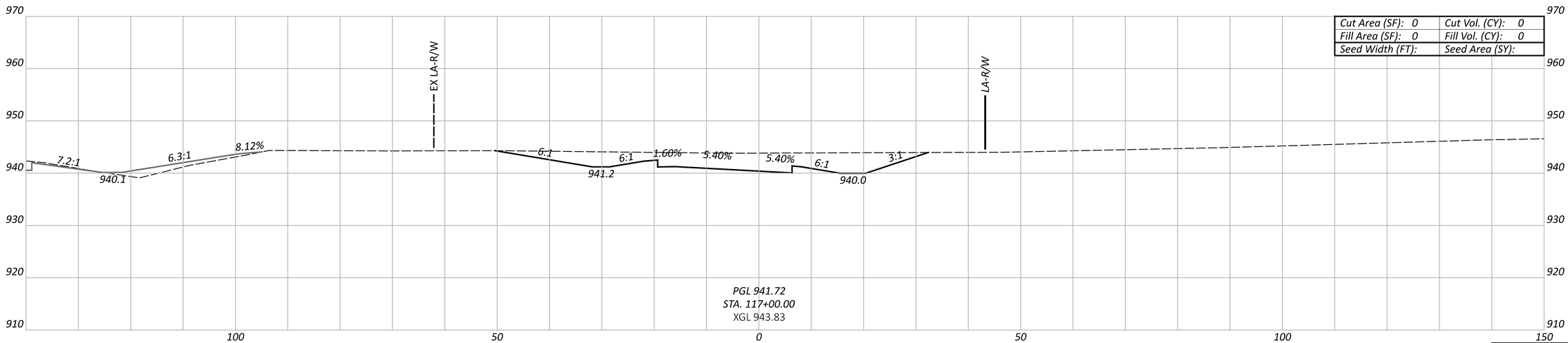

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CROSS SECTIONS - RAMP J
STA. 117+00.00 TO STA. 118+00.00

Sheet Totals		
Seeding	Cut	Fill

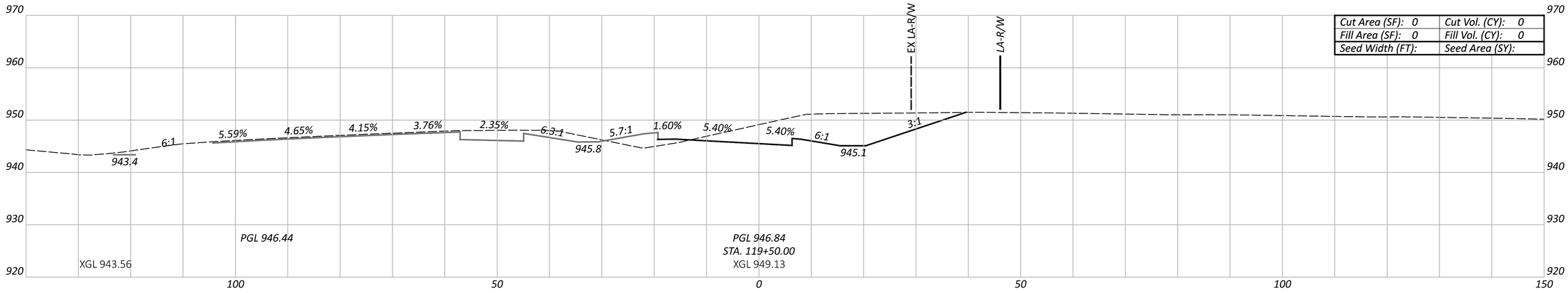
DESIGN AGENCY
STRUCTUREPOINT LLC

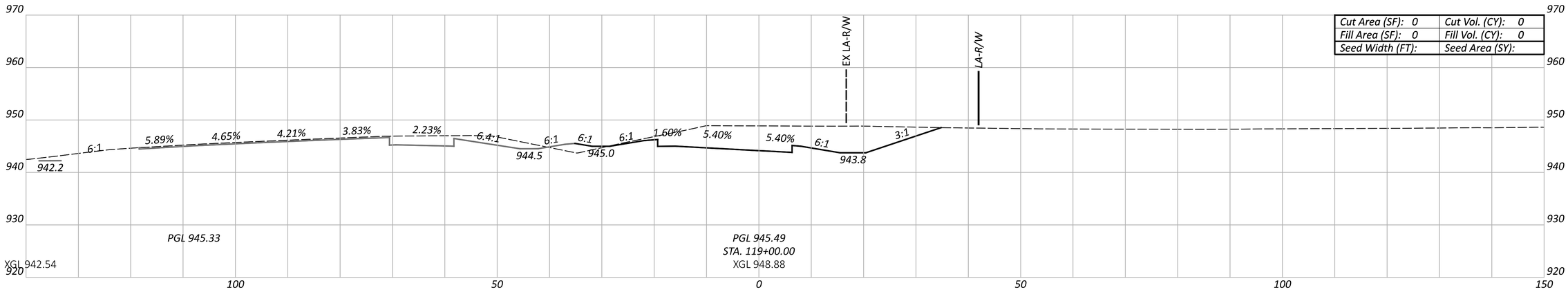
DESIGNER
BER

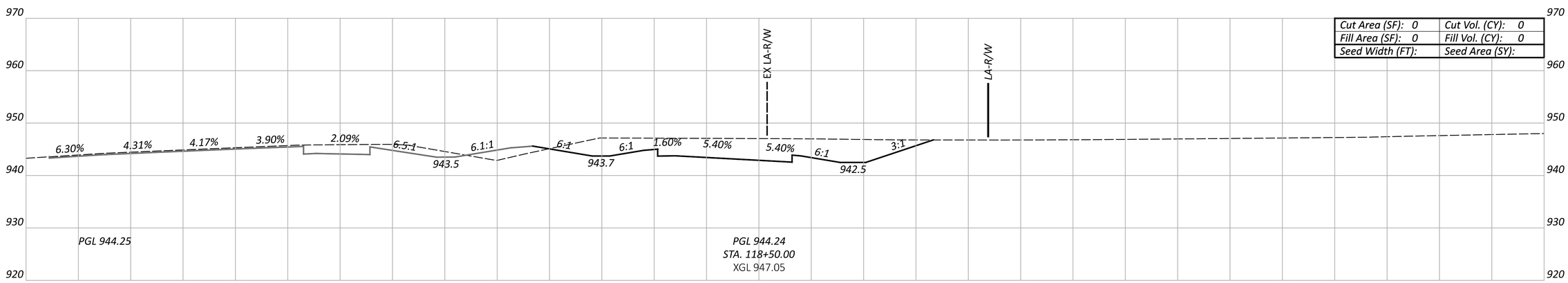
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.585 TOTAL 740







FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - RAMP J
STA. 118+50.00 TO STA. 119+50.00

DESIGN AGENCY
MICHAEL BAKER INTERNATIONAL
STRUCTUREPOINT INC.

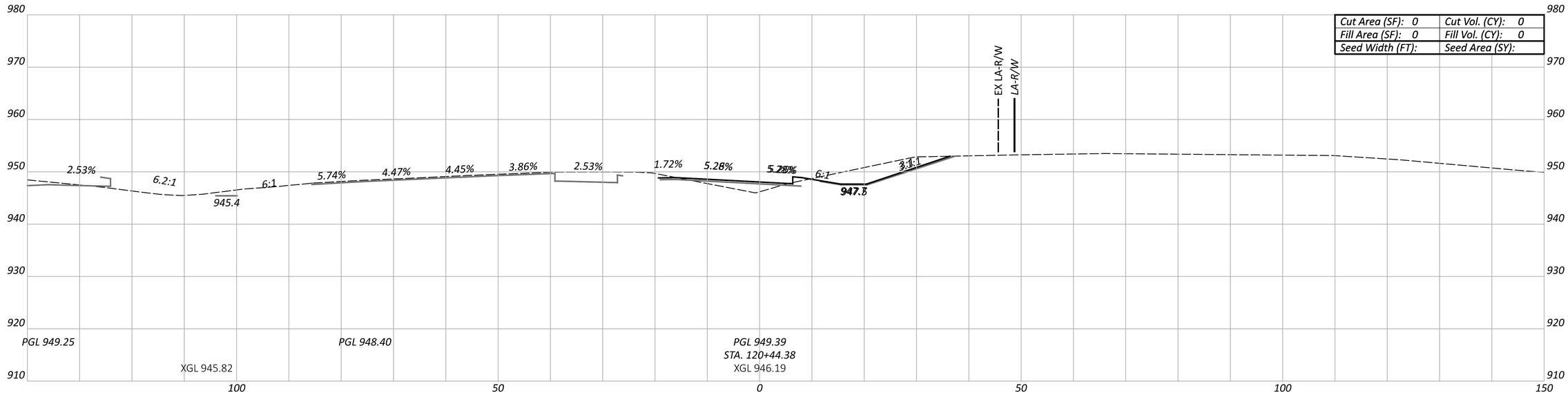
DESIGNER
BER

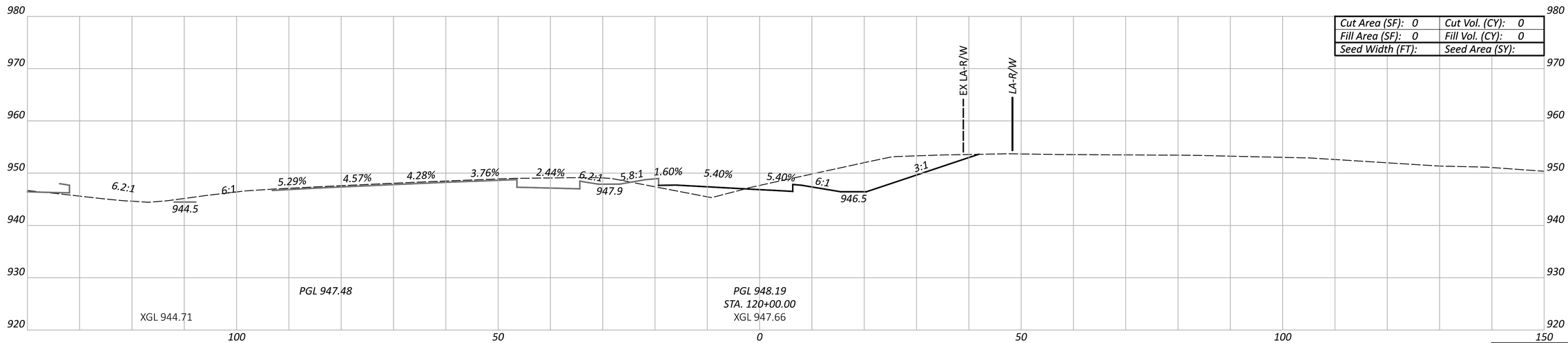
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.586 TOTAL 740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - RAMP J
STA. 120+00.00 TO STA. 120+44.38

DESIGN AGENCY
MICHAEL BAKER INTERNATIONAL STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.587 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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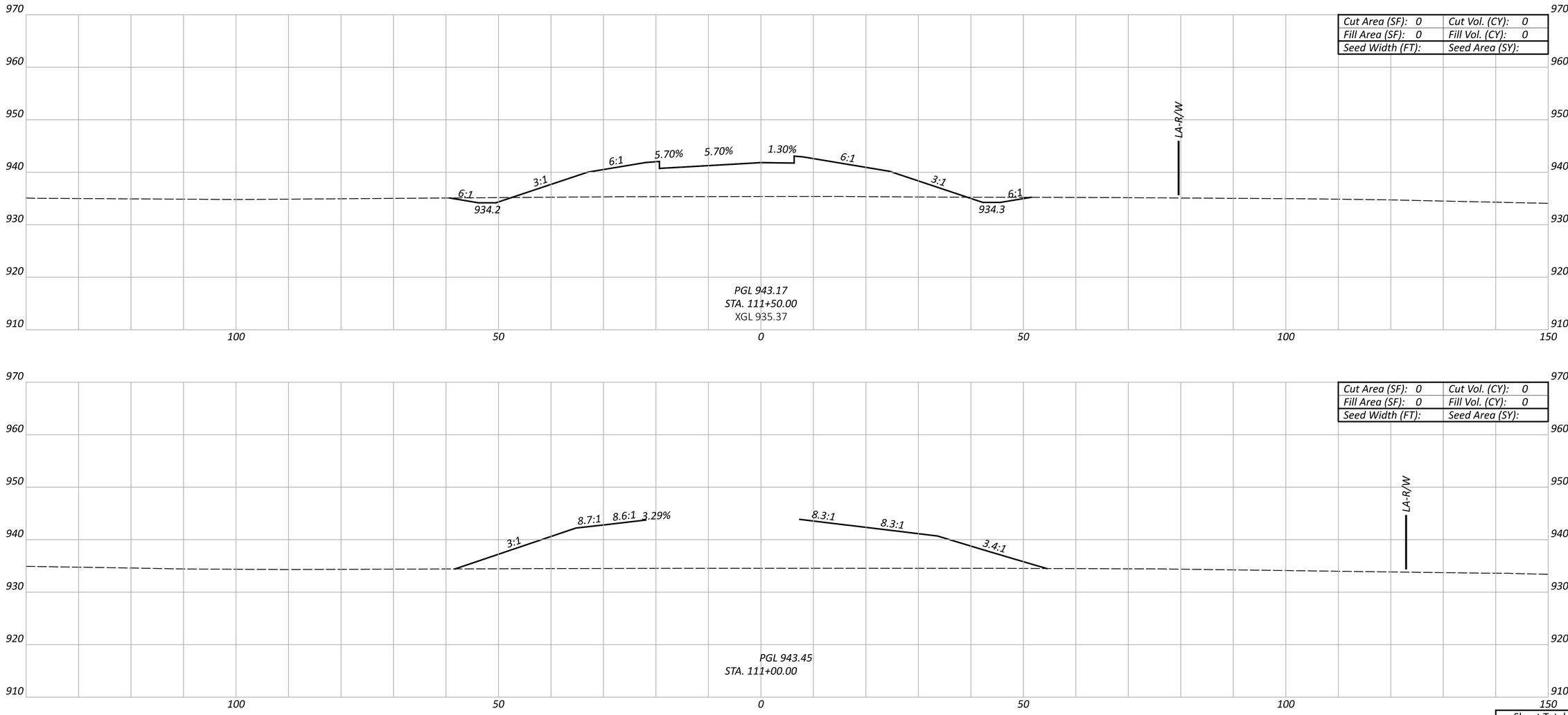

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - RAMP J STEEL
STA. 111+00.00 TO STA. 111+50.00

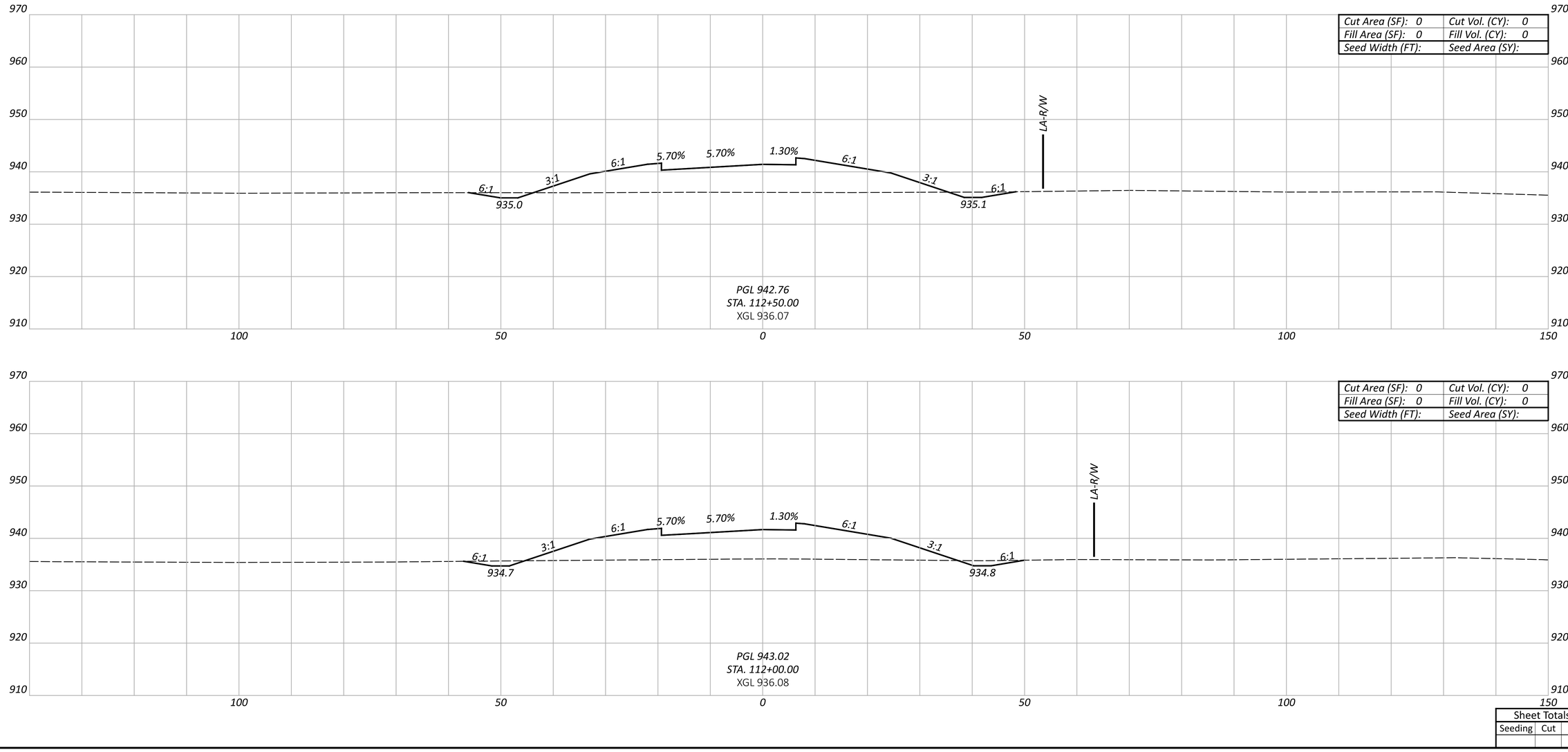
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.588	740



CROSS SECTIONS - RAMP J STEEL
STA. 112+00.00 TO STA. 112+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

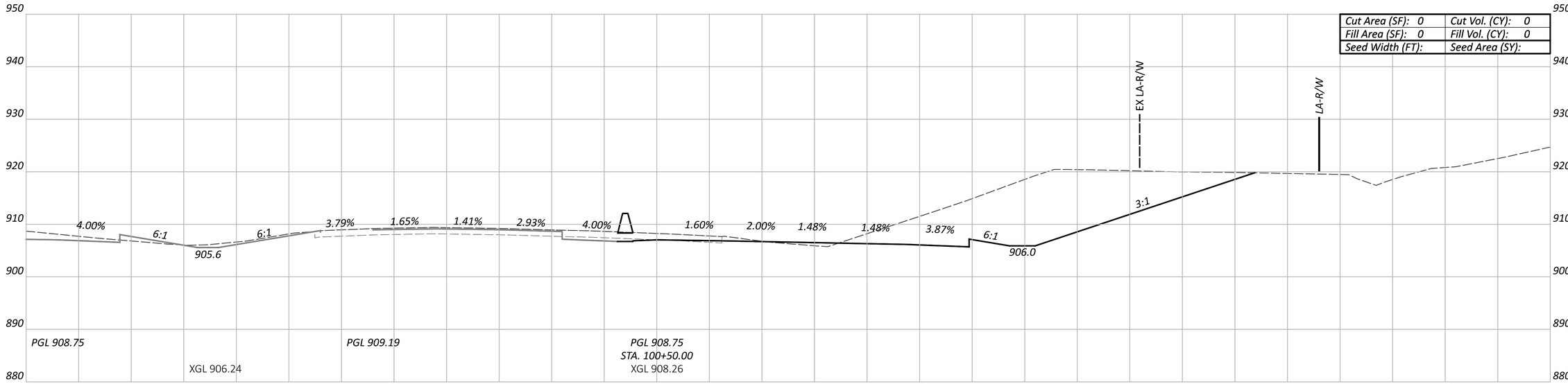
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

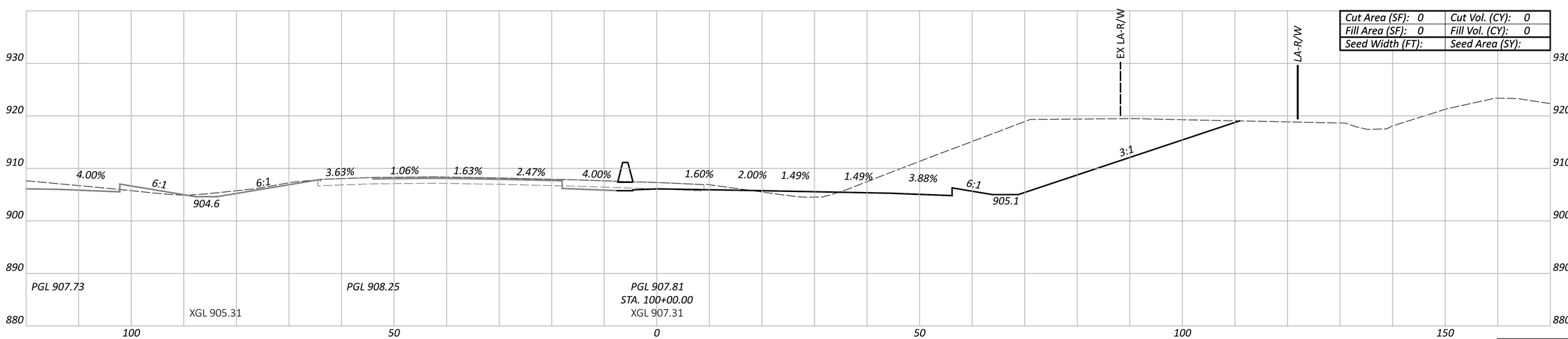
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.589 TOTAL 740





CROSS SECTIONS - RAMP K
STA. 100+00.00 TO STA. 100+50.00

FAI/LIC IR 70 0.00/0.00

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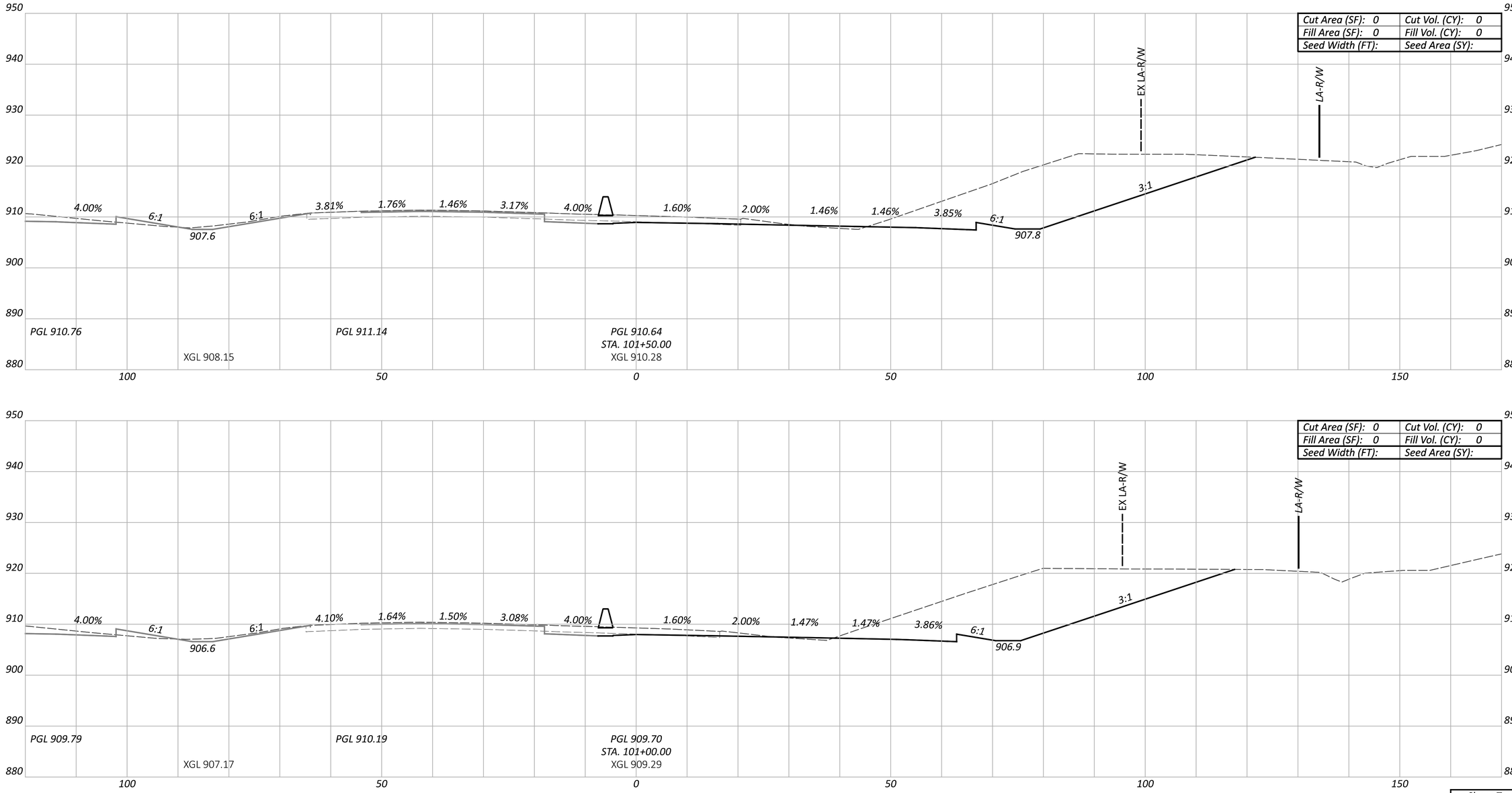
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.640
TOTAL	740



CROSS SECTIONS - RAMP K
STA. 101+00.00 TO STA. 101+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

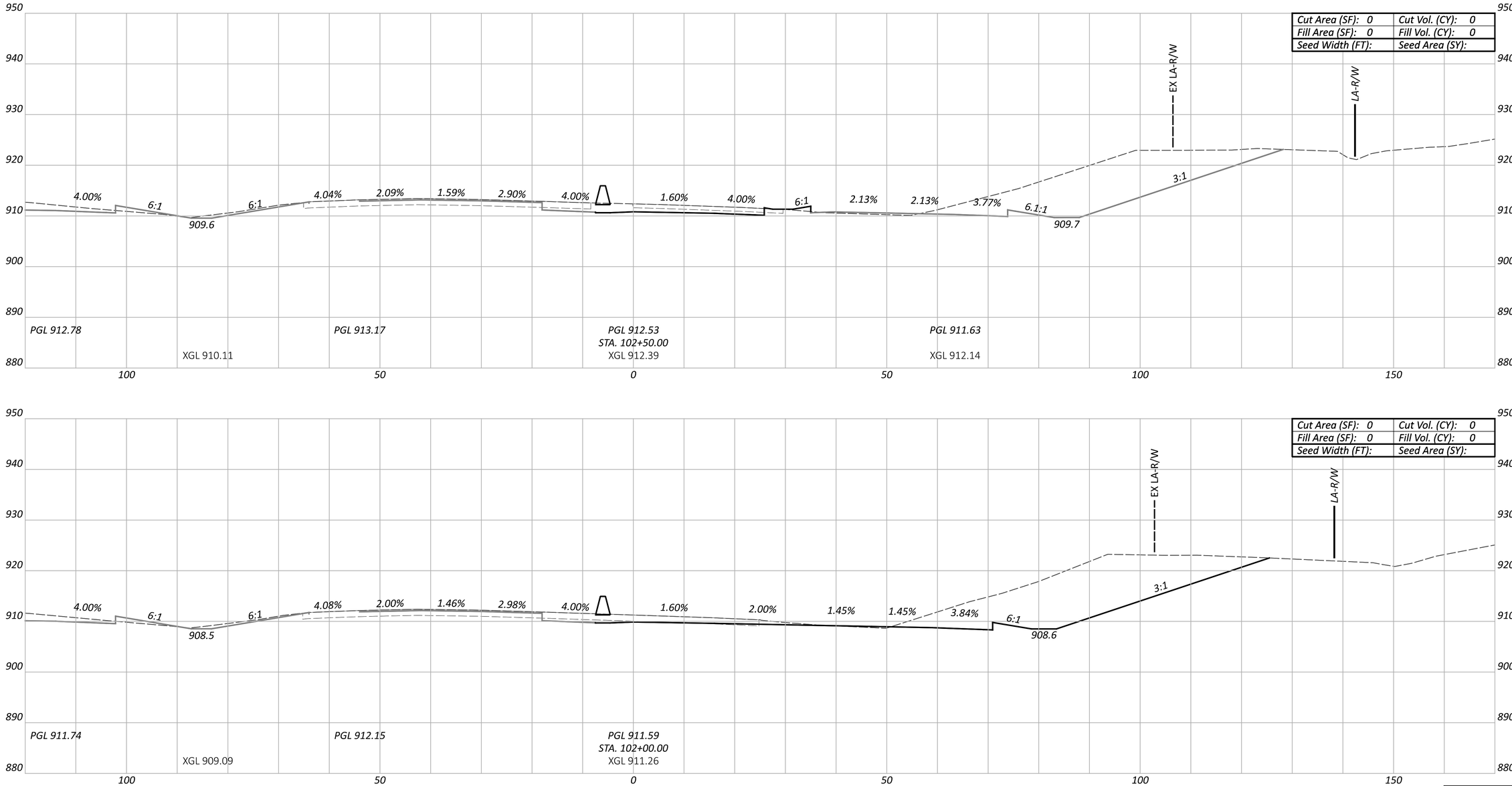
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.641	740



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STA. 102+00.00 TO STA. 102+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.642	740

FAI/LIC IR 70 0.00/0.00

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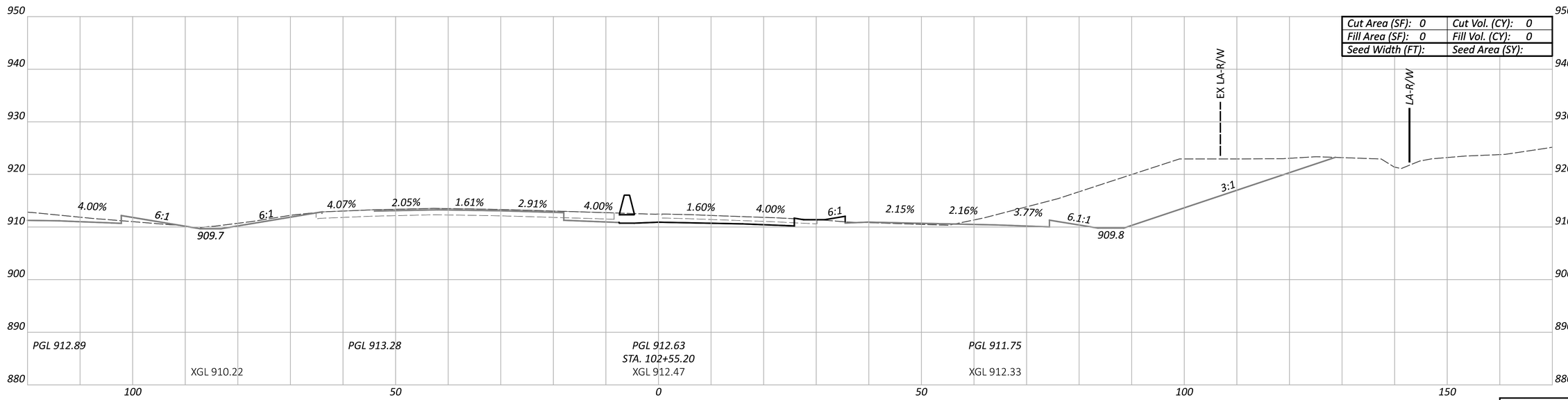
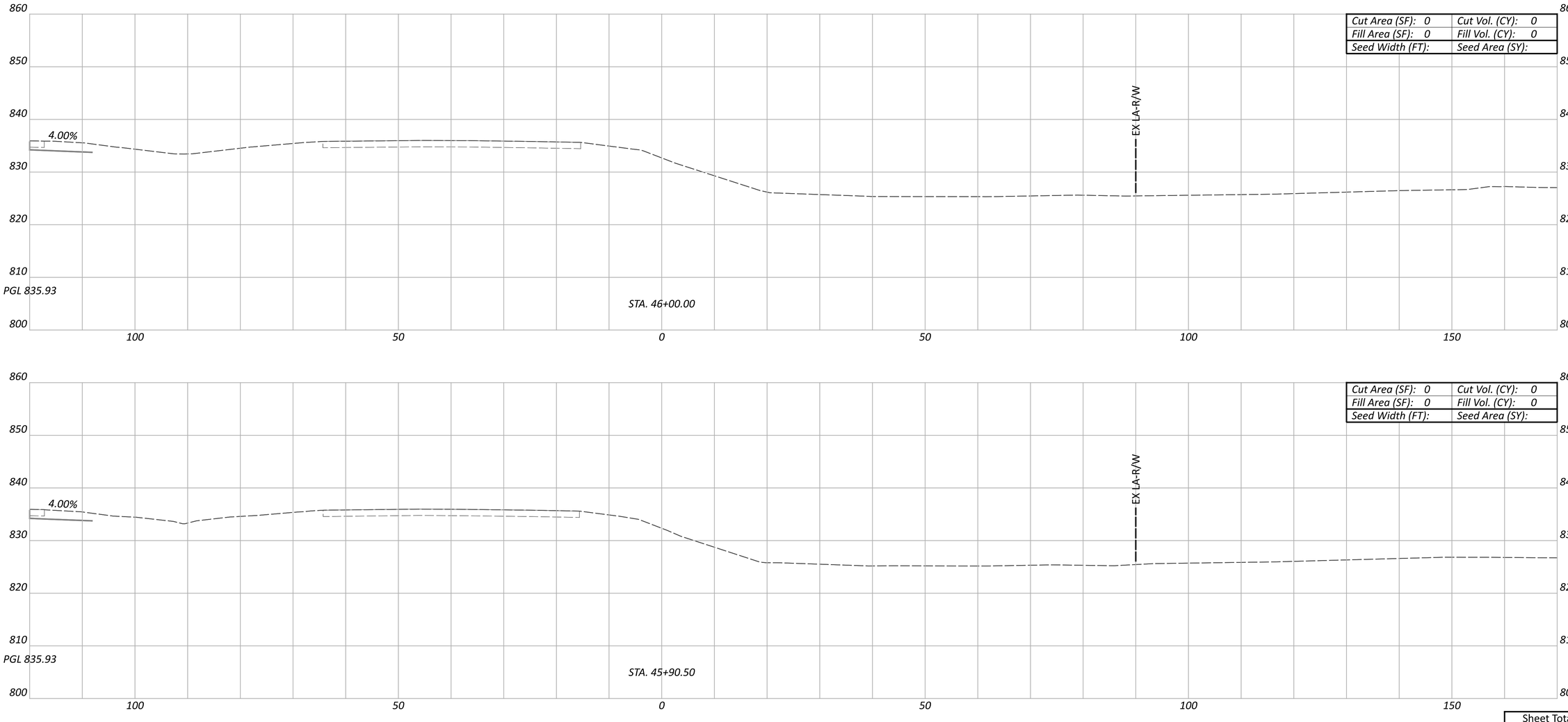
CROSS SECTIONS - RAMP K
STA. 102+55.20



Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.643
TOTAL	740



CROSS SECTIONS - RAMP K
STA. 45+90.50 TO STA. 46+00.00

FAI/LIC IR 70 0.00/0.00

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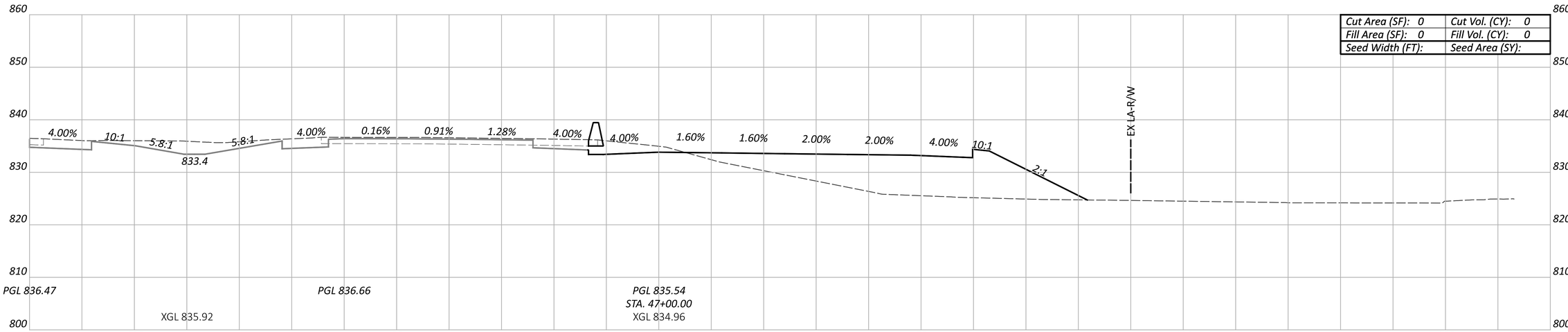
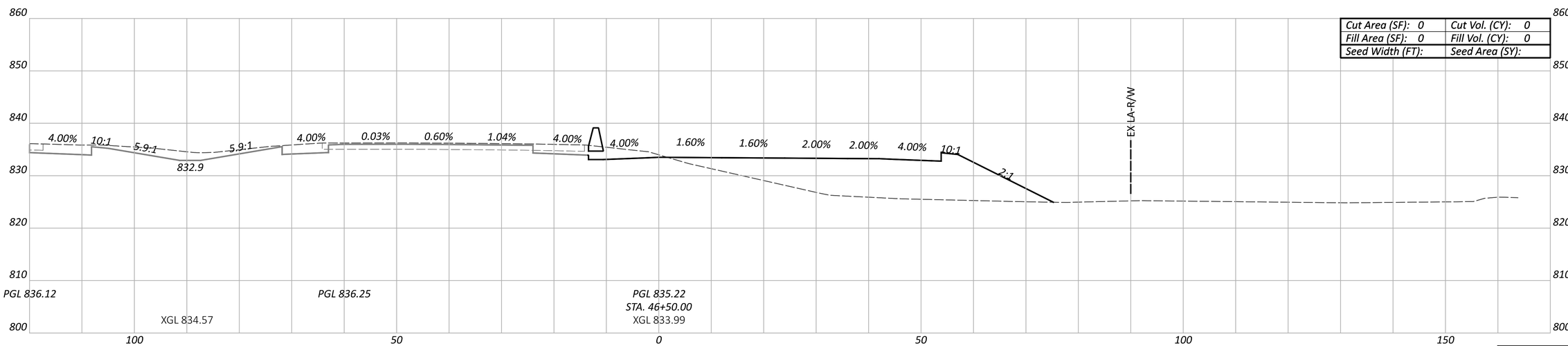
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.590
TOTAL	740





CROSS SECTIONS - RAMP K
STA. 46+50.00 TO STA. 47+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

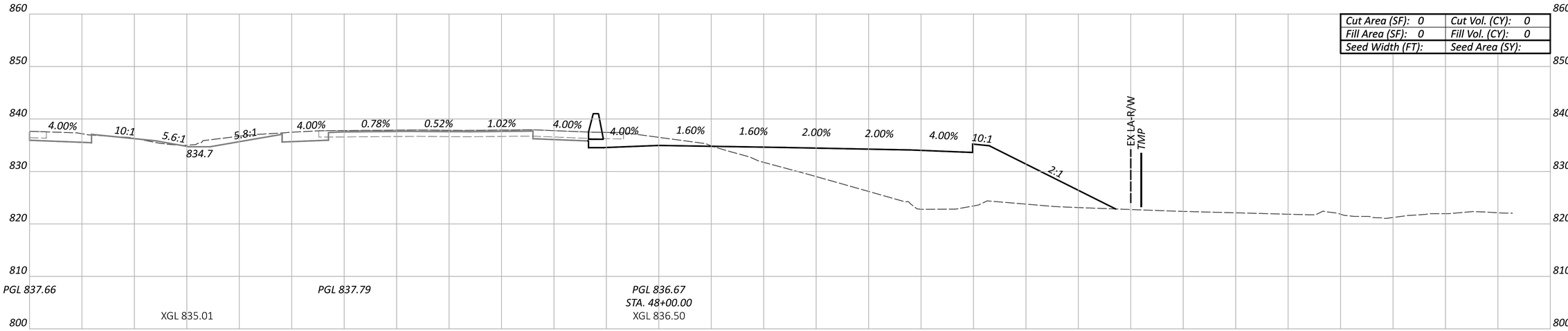
DESIGNER
BER

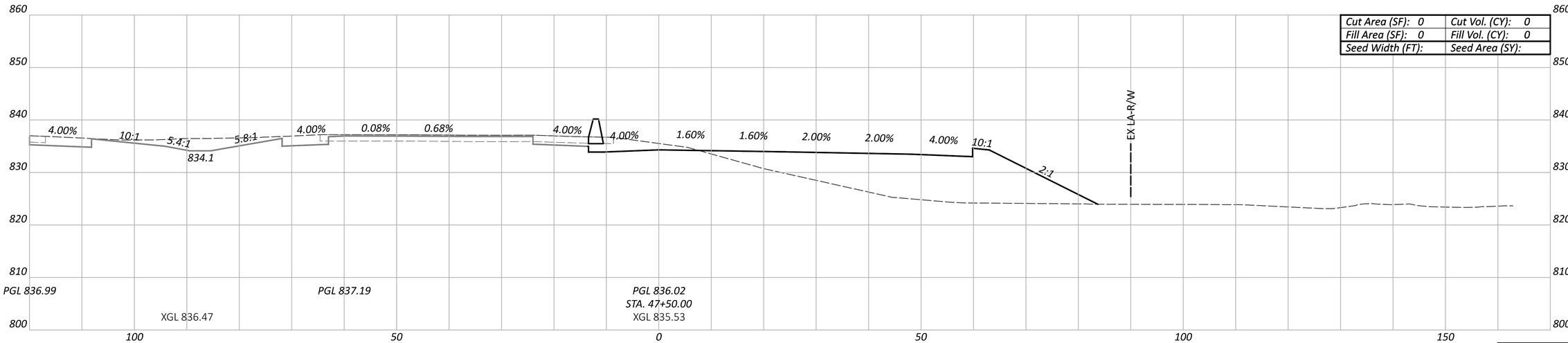
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.591	740





CROSS SECTIONS - RAMP K
STA. 47+50.00 TO STA. 48+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.592
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - 47+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:40:01 PM USER: aoldaker
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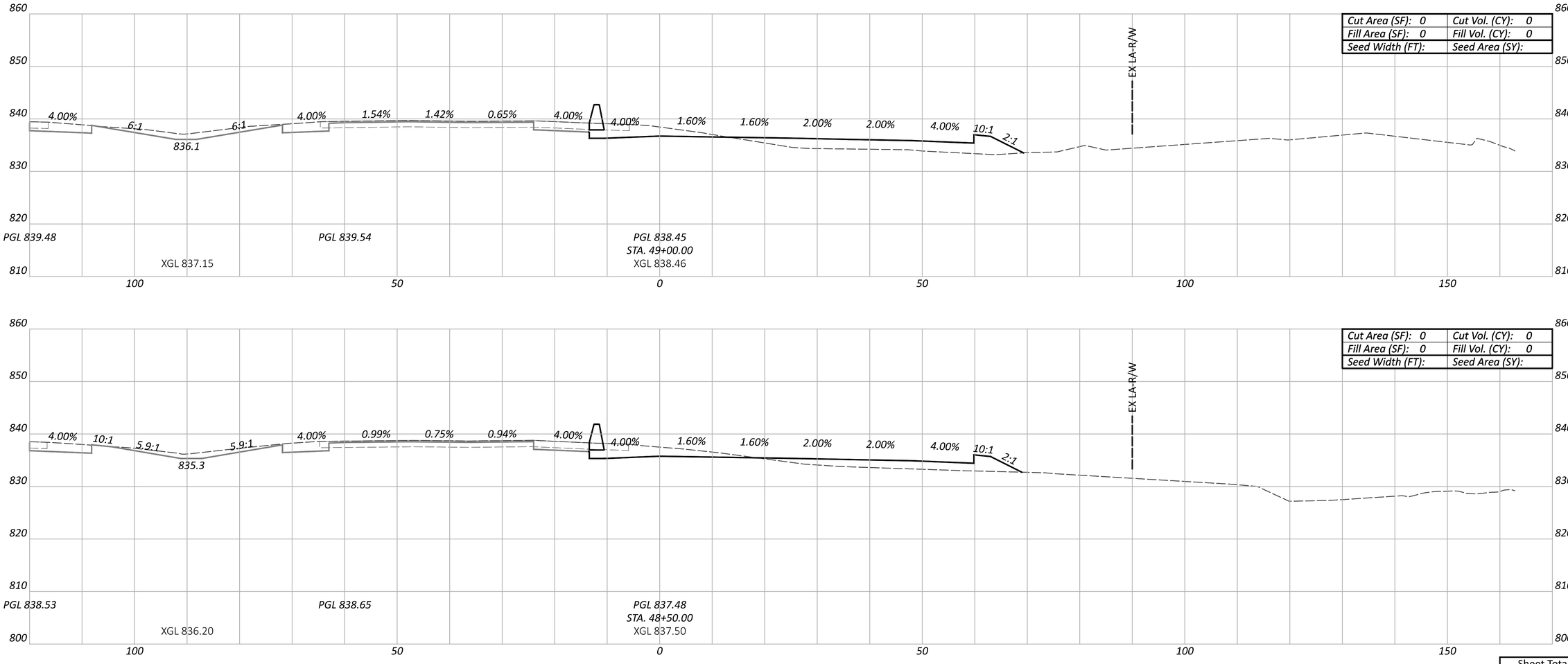

CROSS SECTIONS - RAMP K
STA. 48+50.00 TO STA. 49+00.00

FAI/LIC IR 70 0.00/0.00

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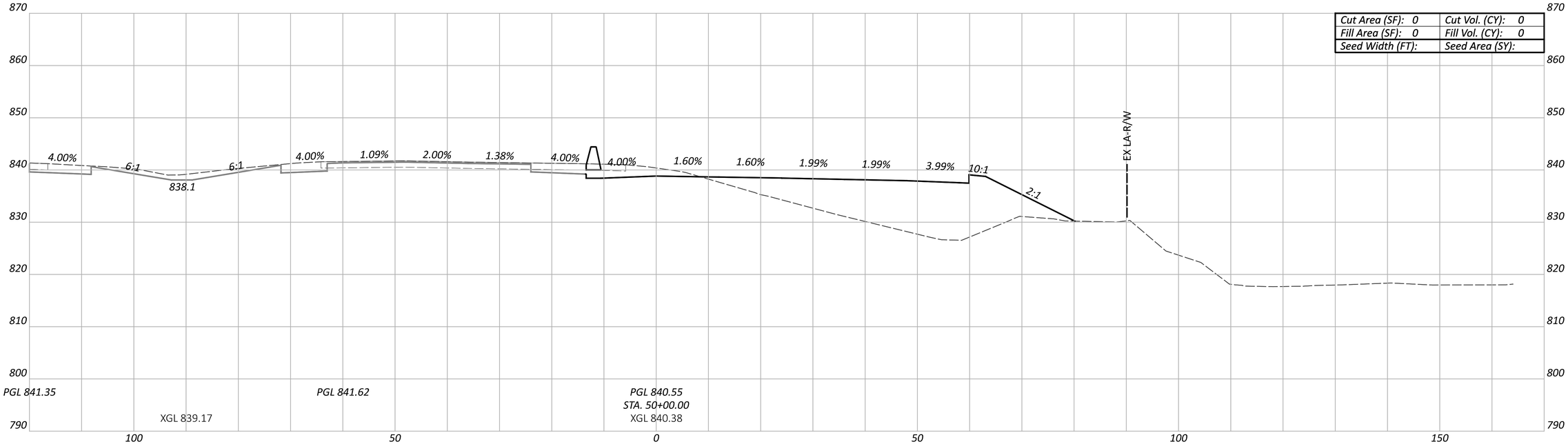
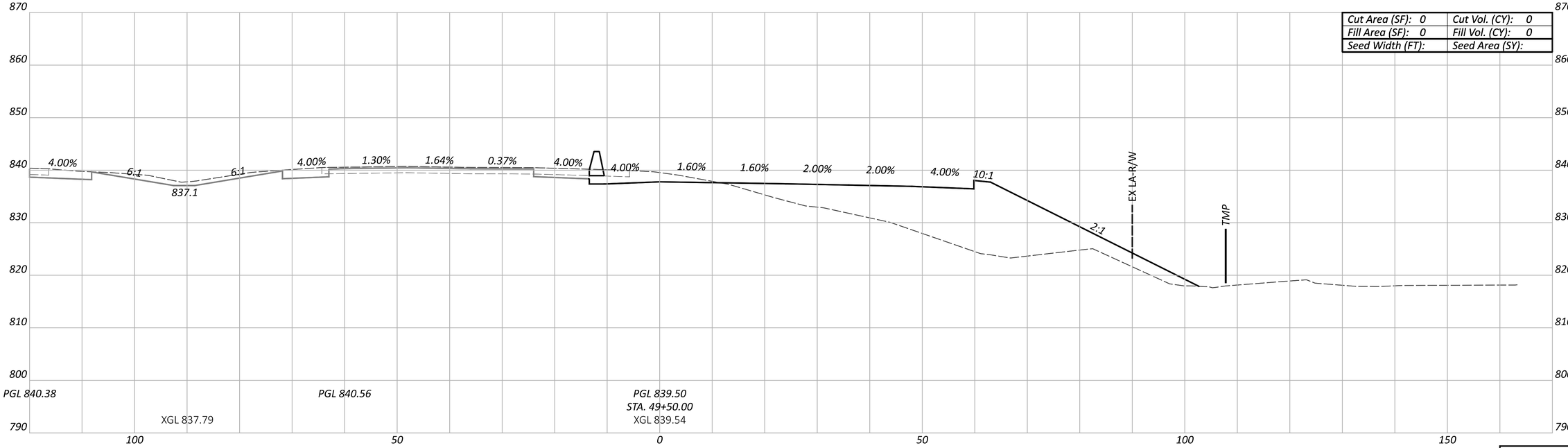
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.593
TOTAL	740





CROSS SECTIONS - RAMP K
STA. 49+50.00 TO STA. 50+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.594 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - 49+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:40:08 PM USER: aoldaker
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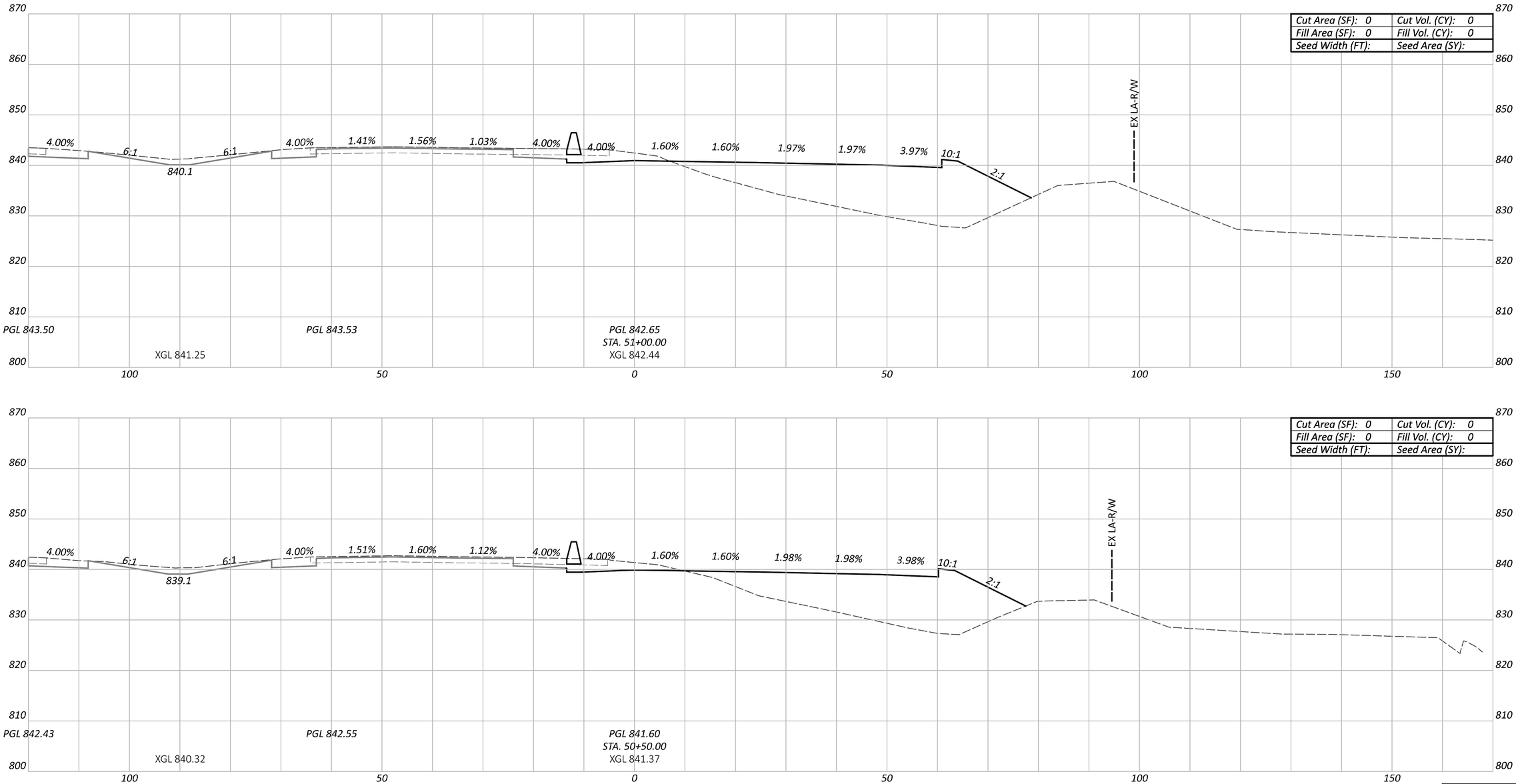

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STA. 50+50.00 TO STA. 51+00.00

FAI/LIC IR 70 0.00/0.00

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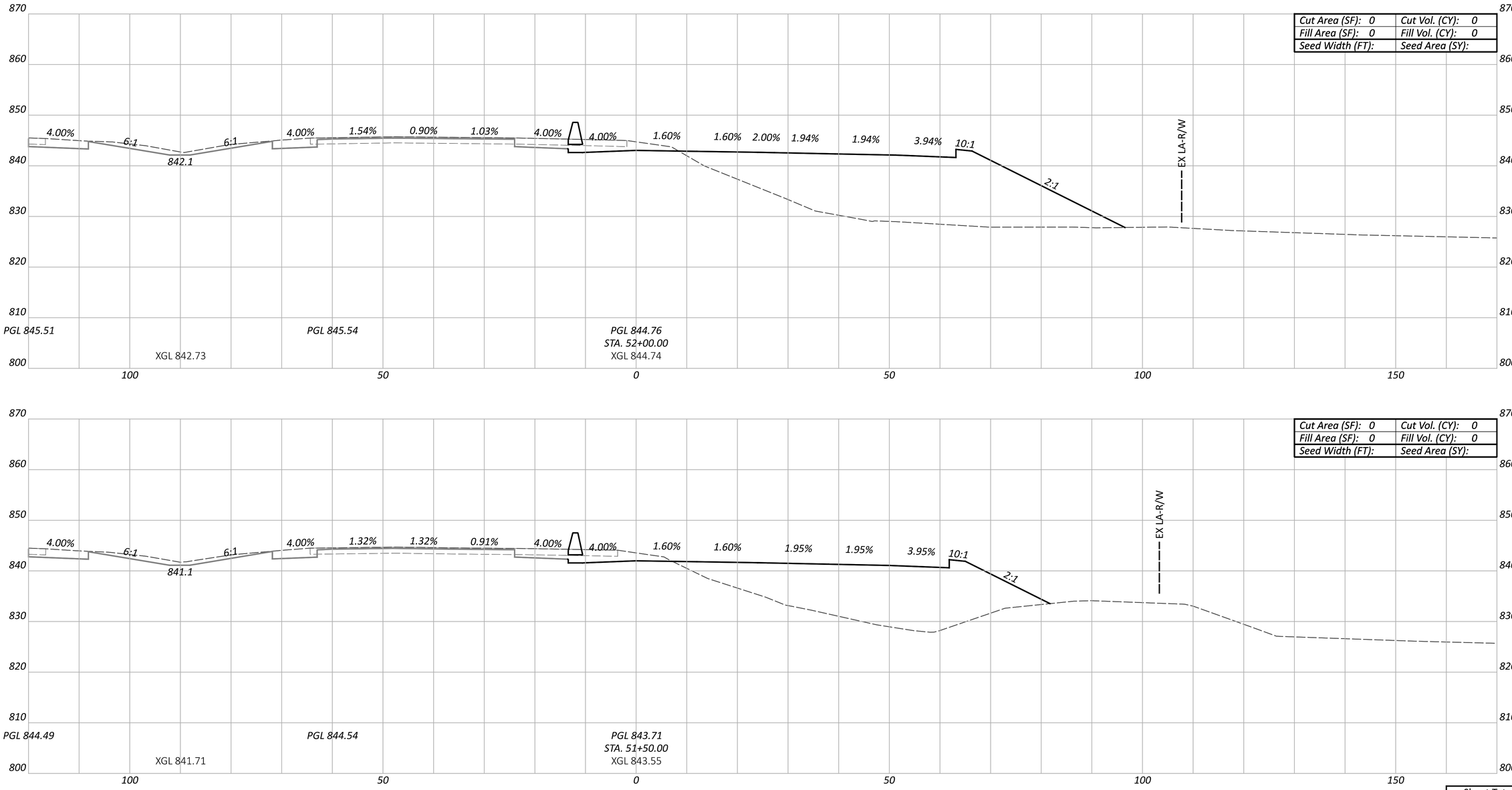
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.595
TOTAL	740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

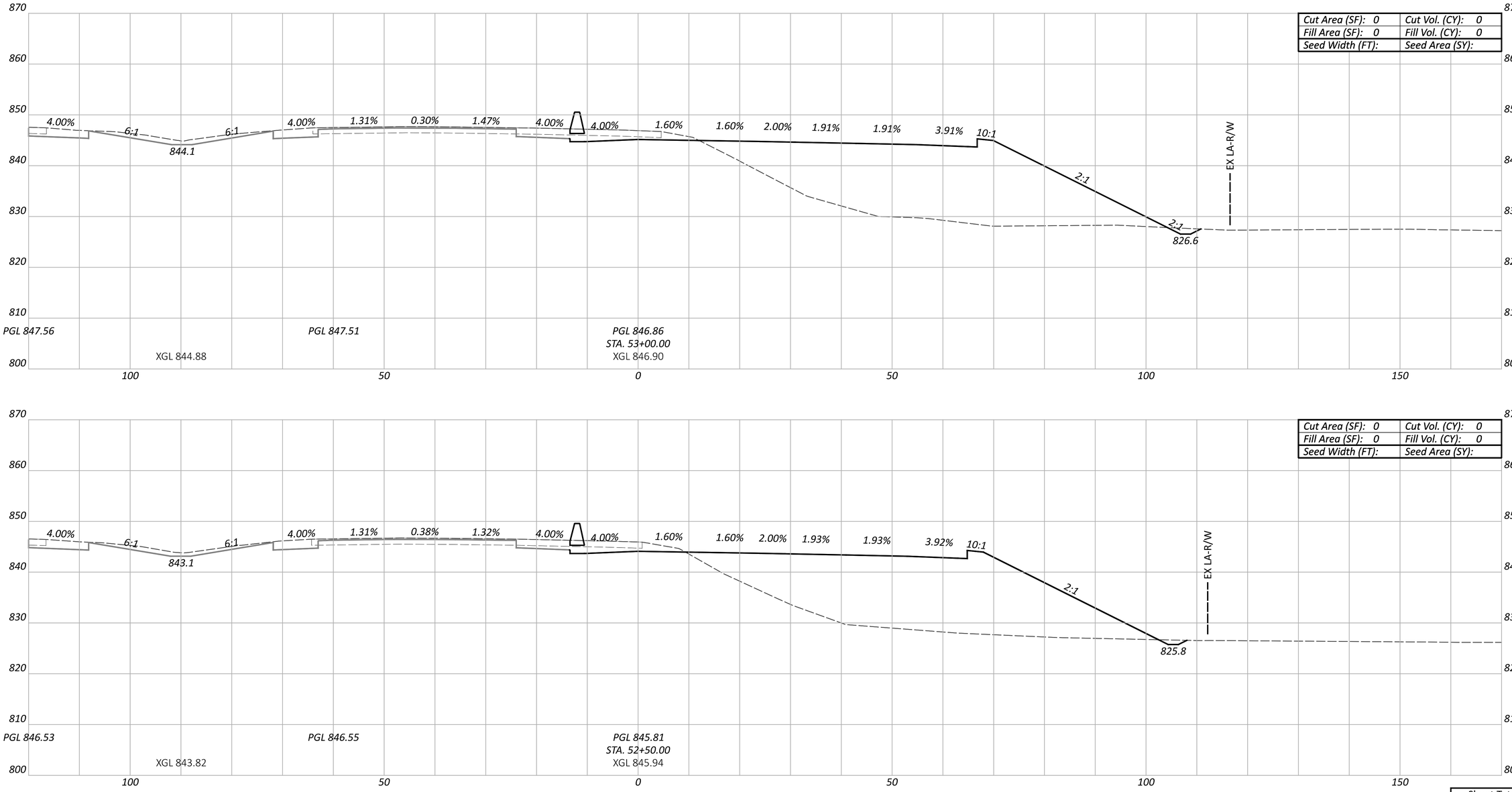
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.596 TOTAL 740



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STA. 52+50.00 TO STA. 53+00.00

FAI/LIC IR 70 0.00/0.00

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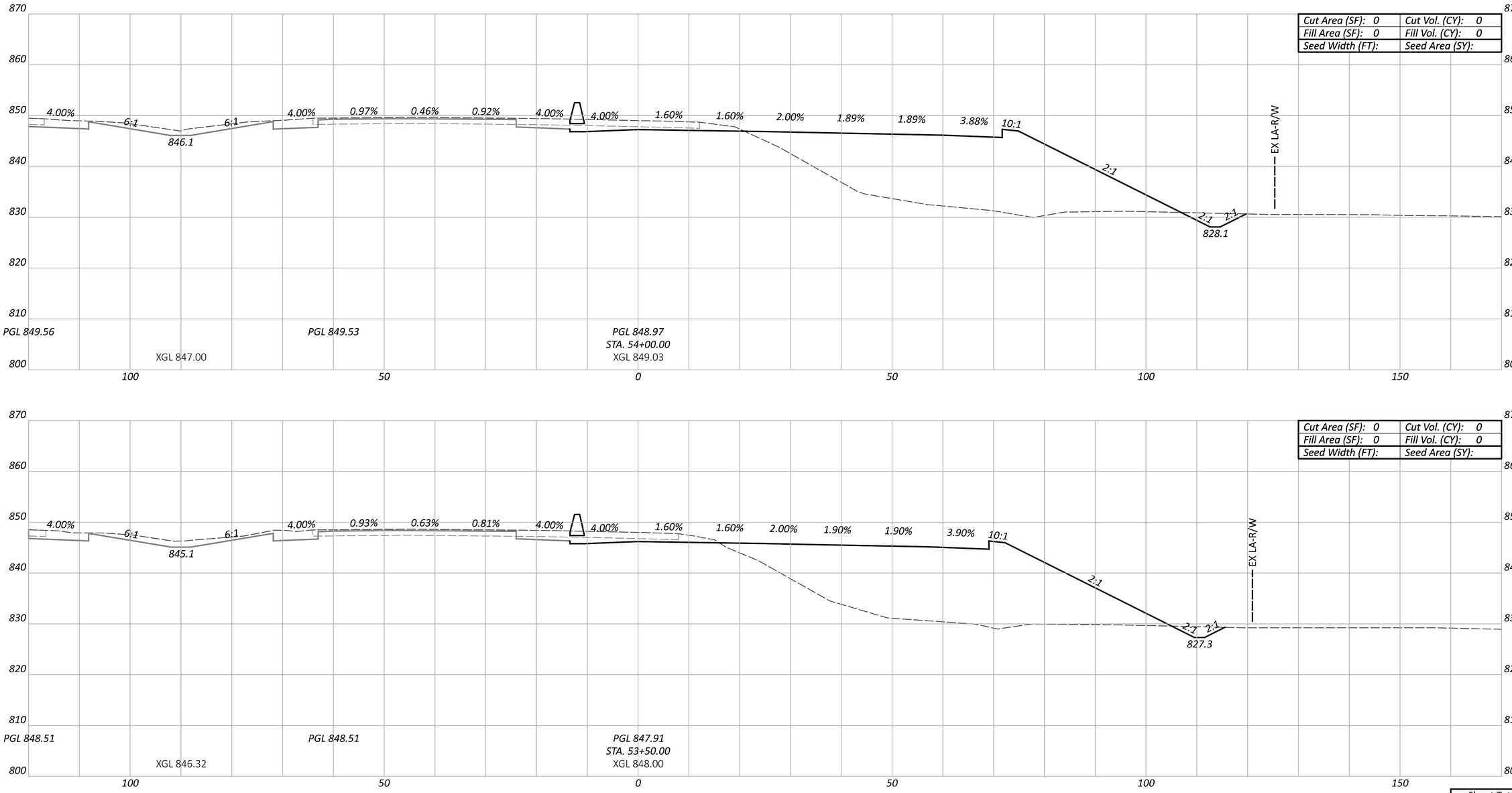
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.597
TOTAL	740



CROSS SECTIONS - RAMP K
STA. 53+50.00 TO STA. 54+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.598 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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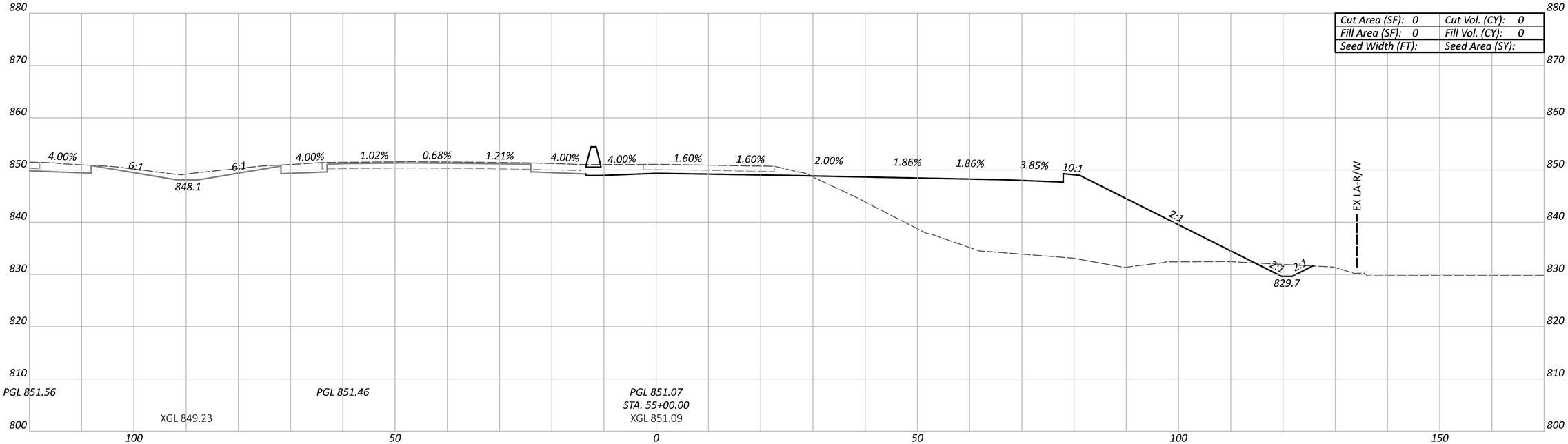

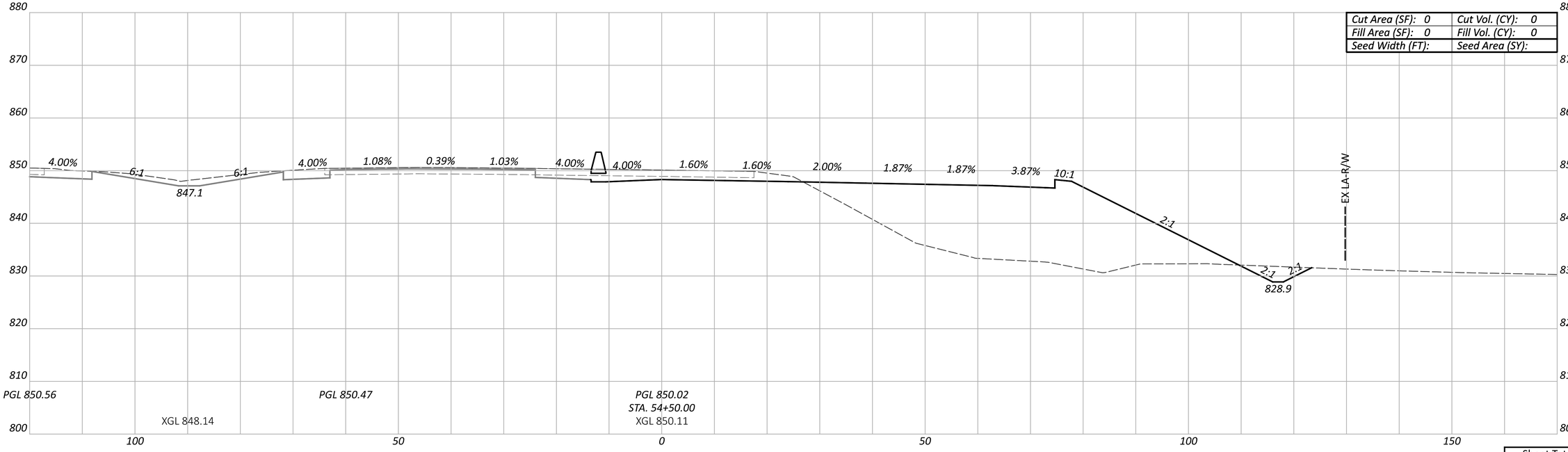

CROSS SECTIONS - RAMP K
STA. 54+50.00 TO STA. 55+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.599 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: BLP_R070K - 54+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:40:24 PM USER: aoldaker
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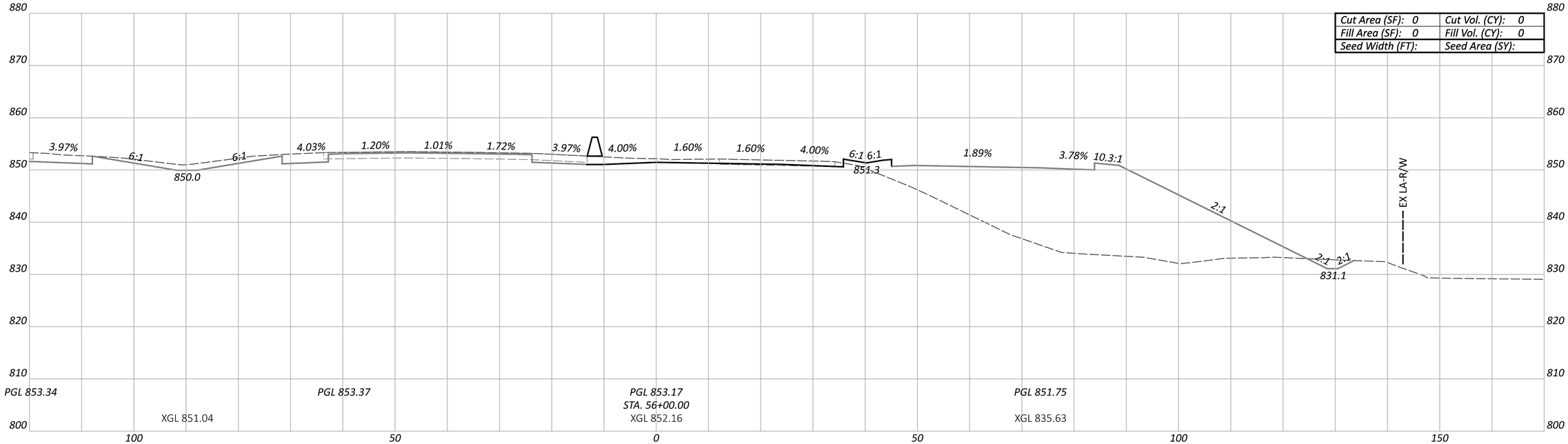

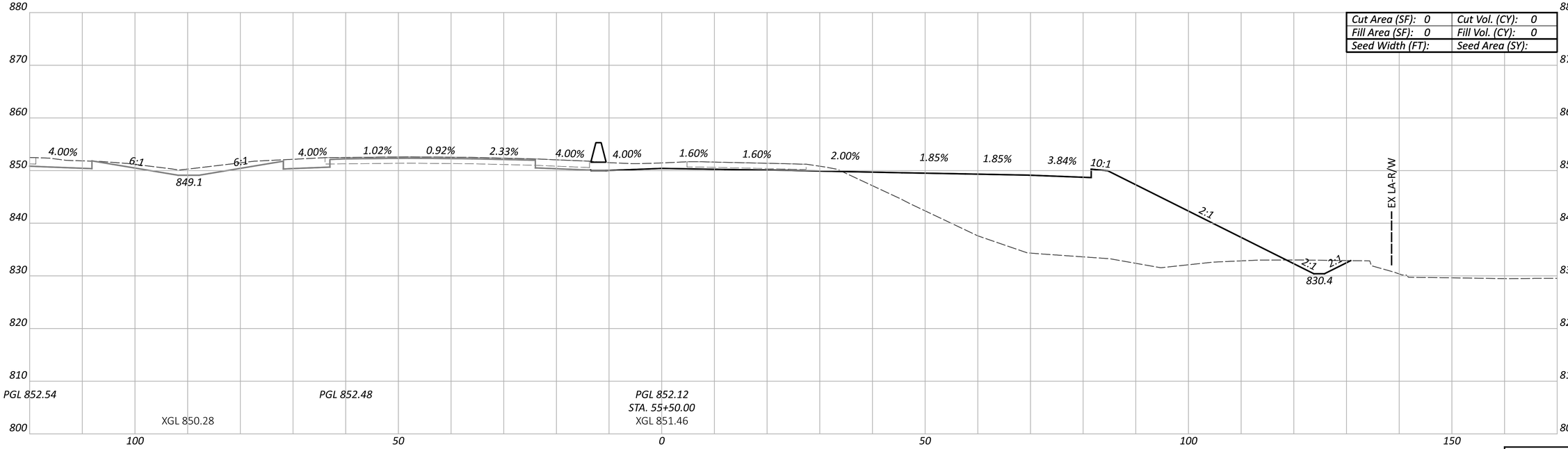

CROSS SECTIONS - RAMP K
STA. 55+50.00 TO STA. 56+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.600 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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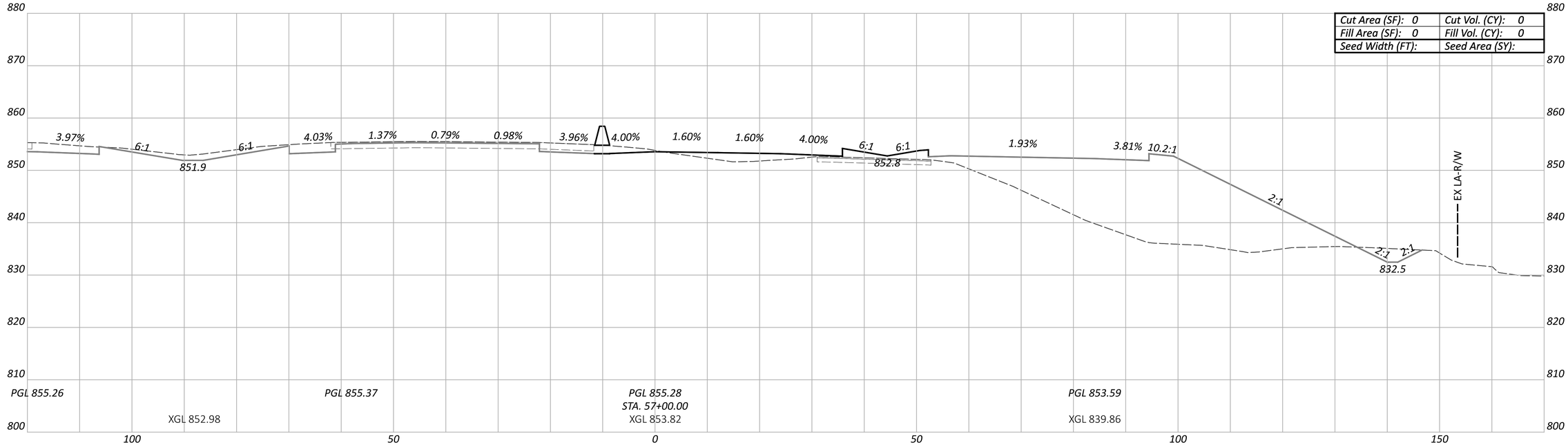

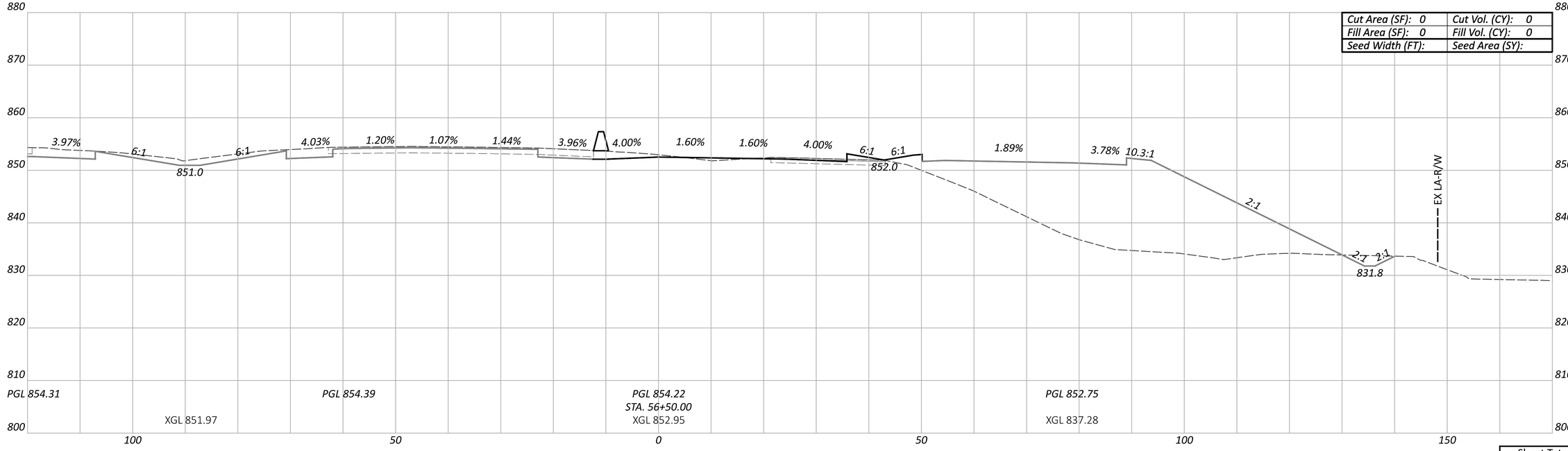

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FAI/LIC IR 70 0.00/0.00

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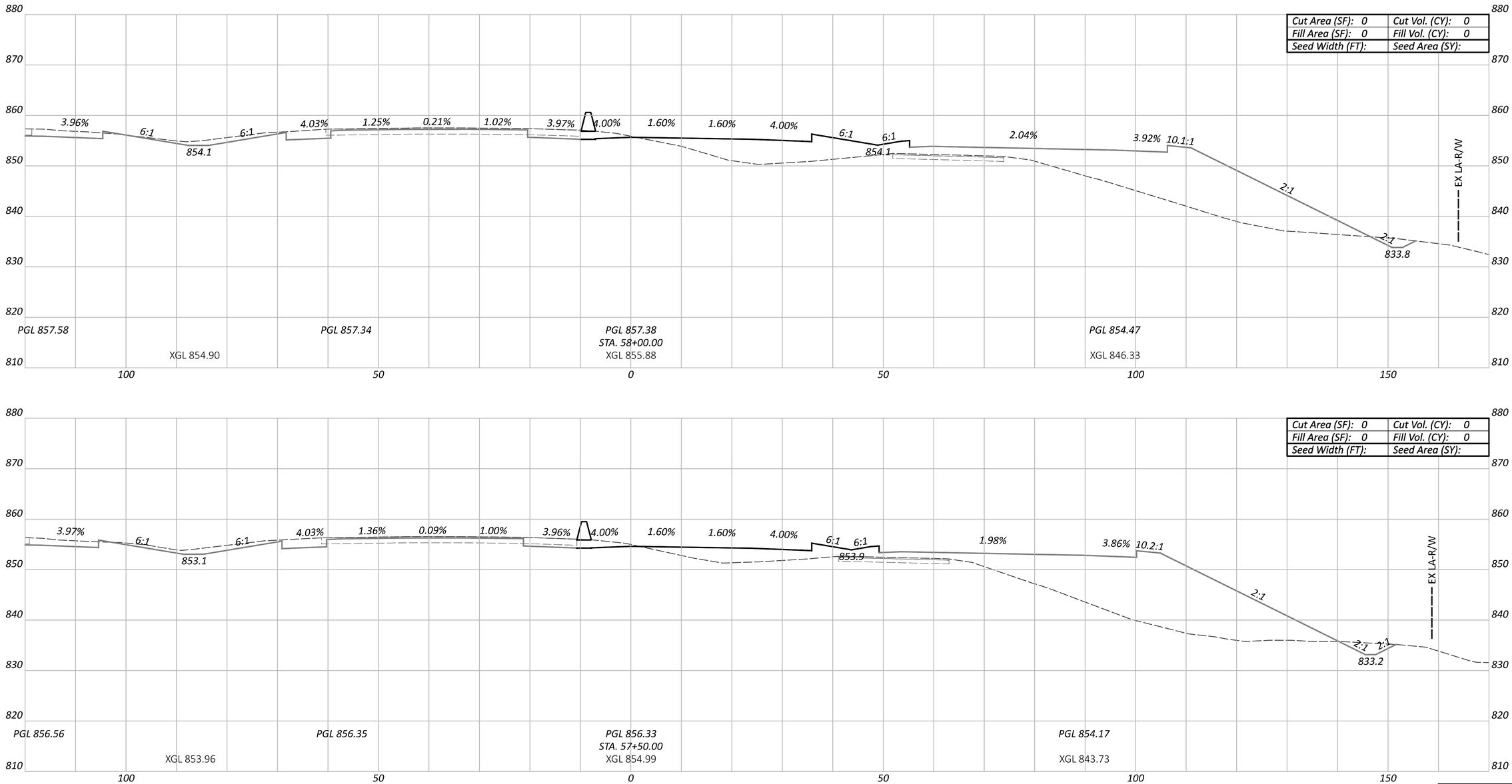
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.601
TOTAL	740



CROSS SECTIONS - RAMP K
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.602 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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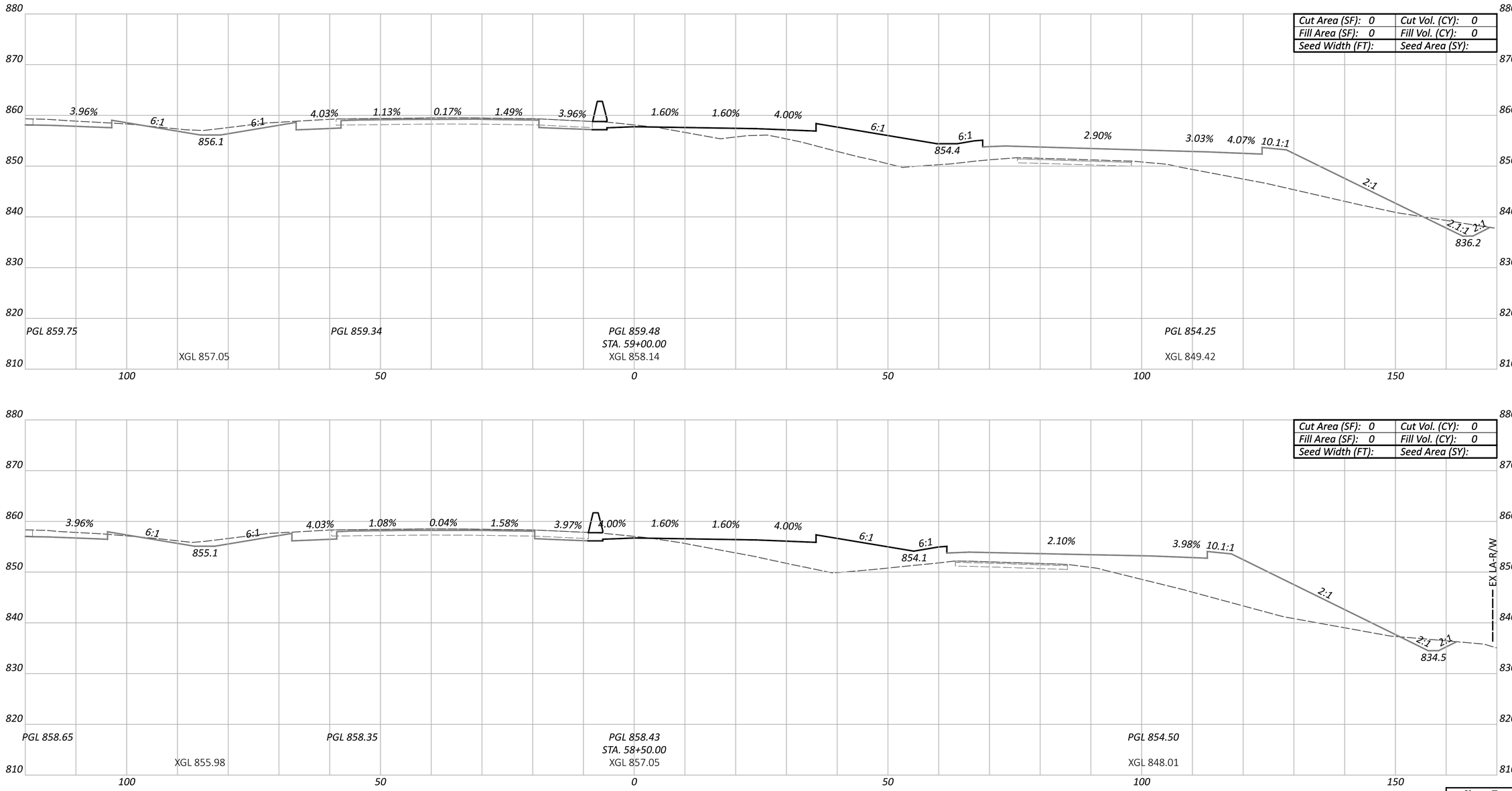

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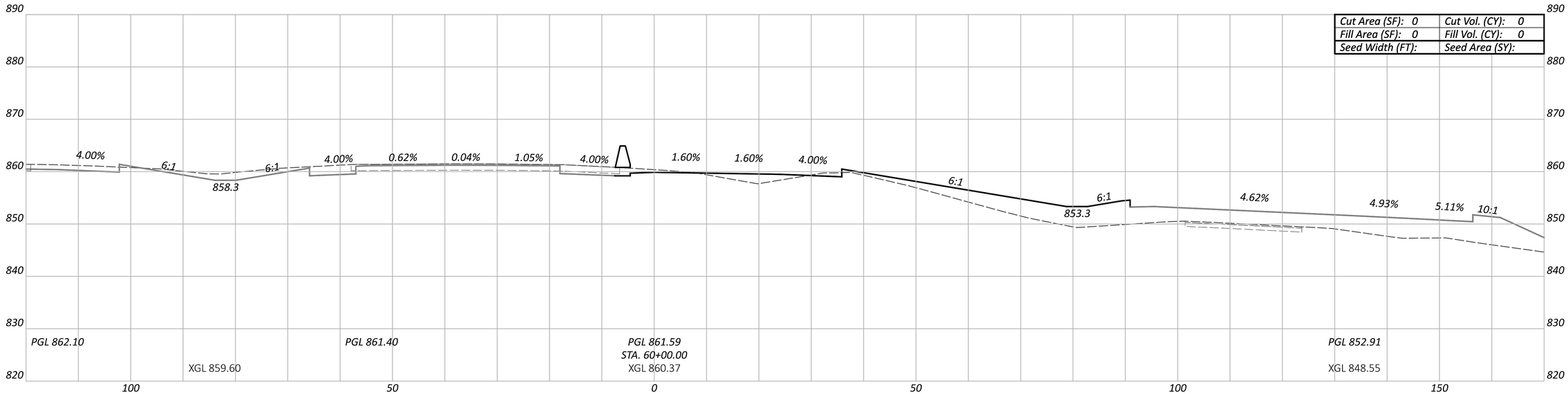
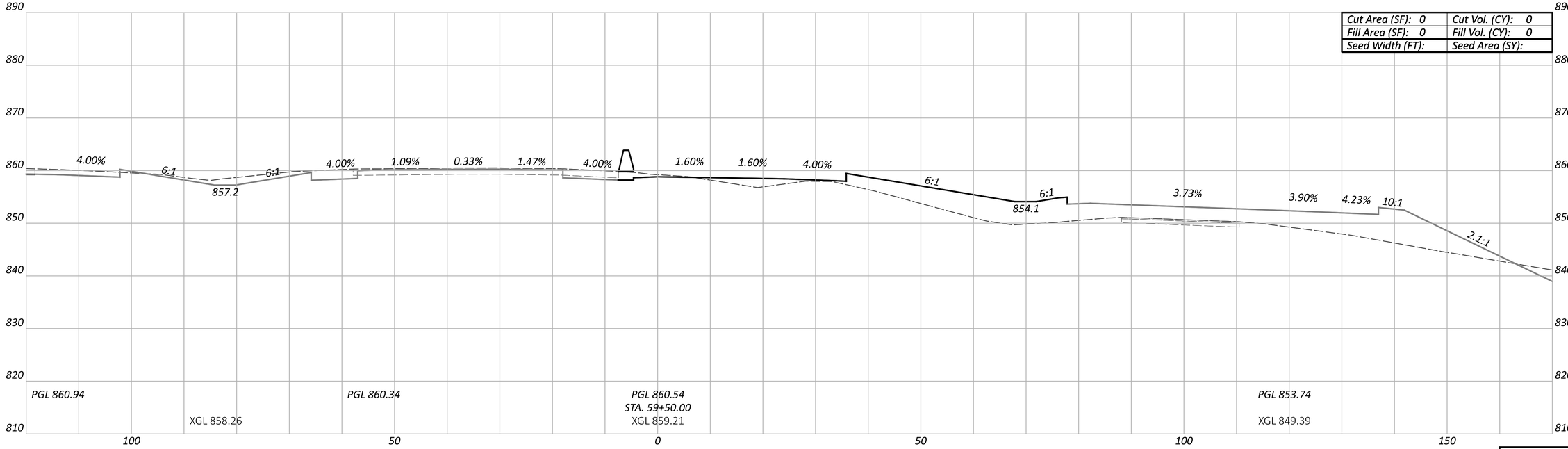
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.603
TOTAL	740





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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

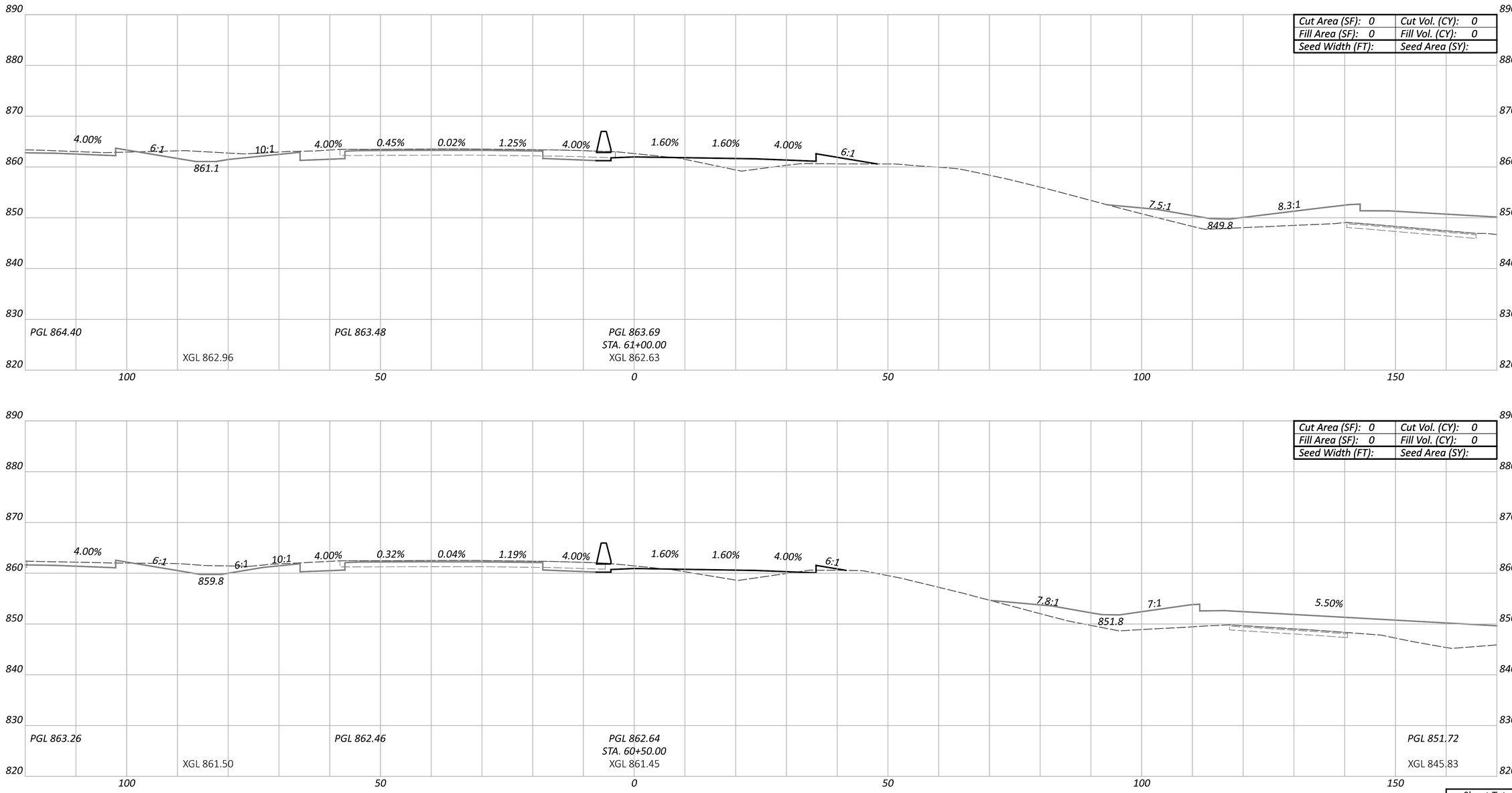
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.604 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

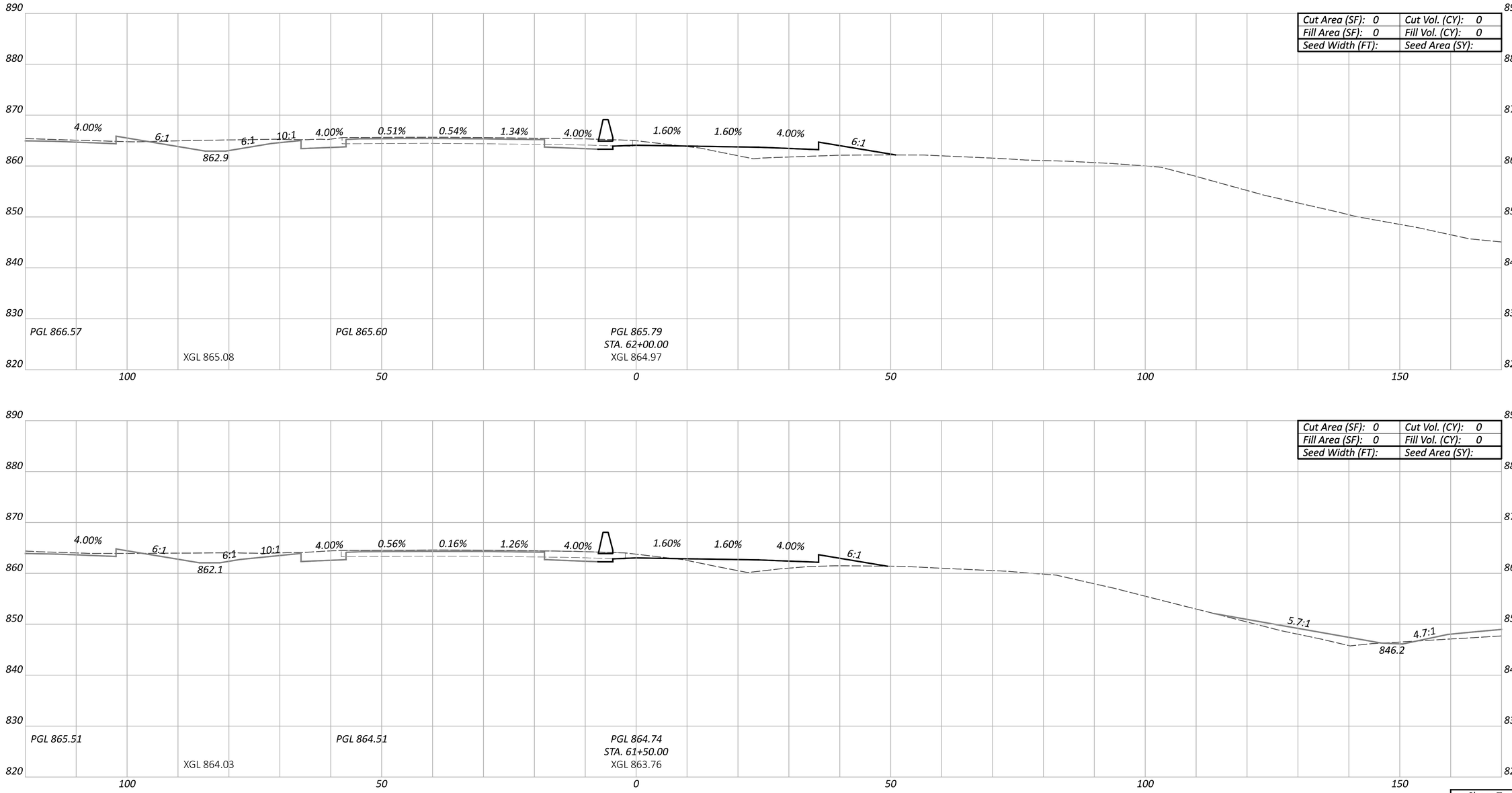
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.605 TOTAL 740



CROSS SECTIONS - RAMP K
STA. 61+50.00 TO STA. 62+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.606	740

FAI/LIC IR 70 0.00/0.00

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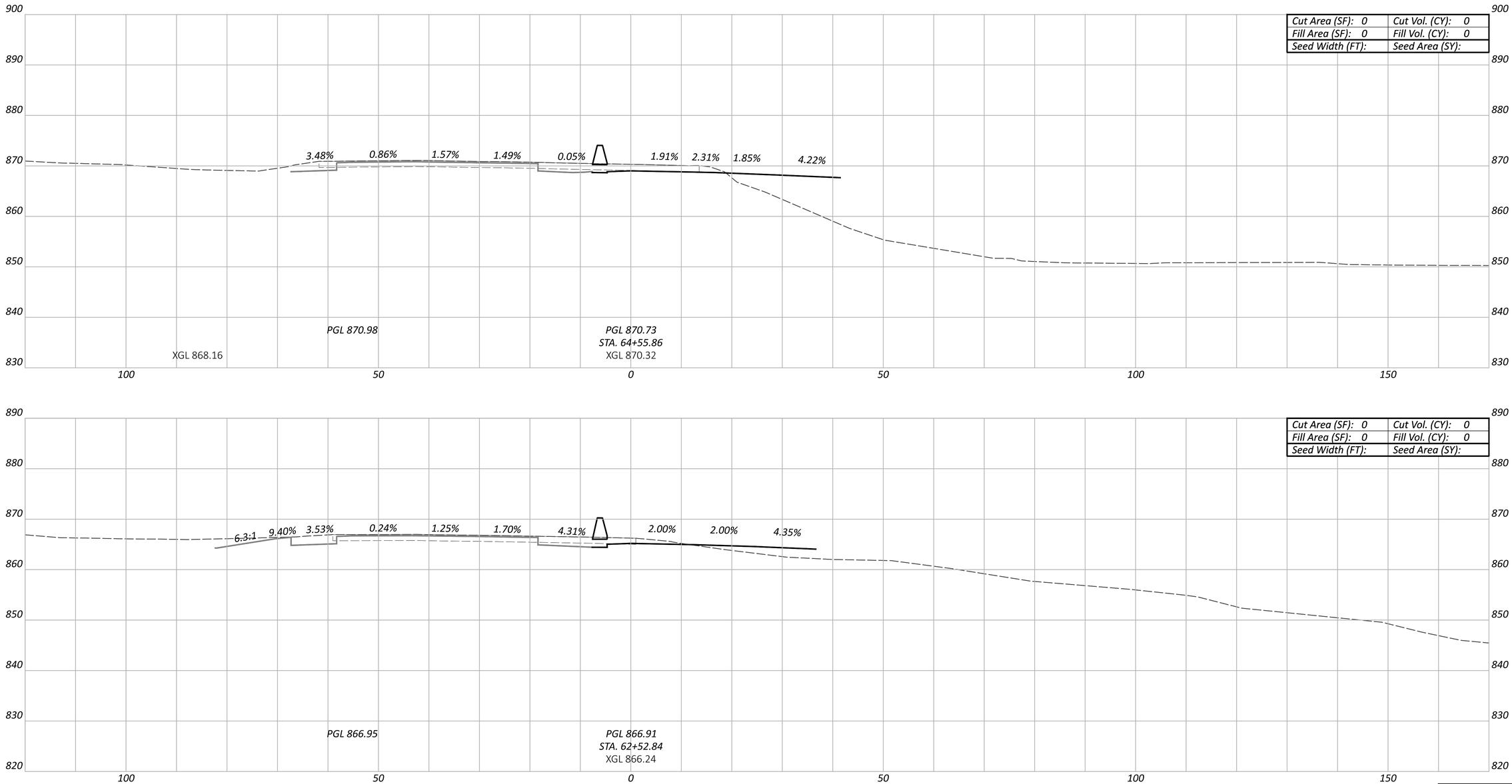

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STA. 62+52.84 TO STA. 64+55.86

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

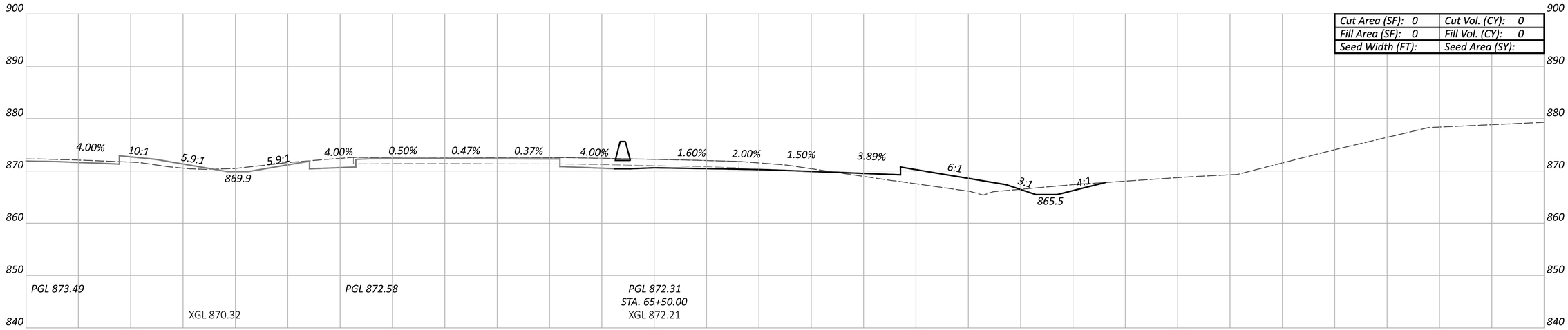
DESIGN AGENCY
STRUCTUREPOINT

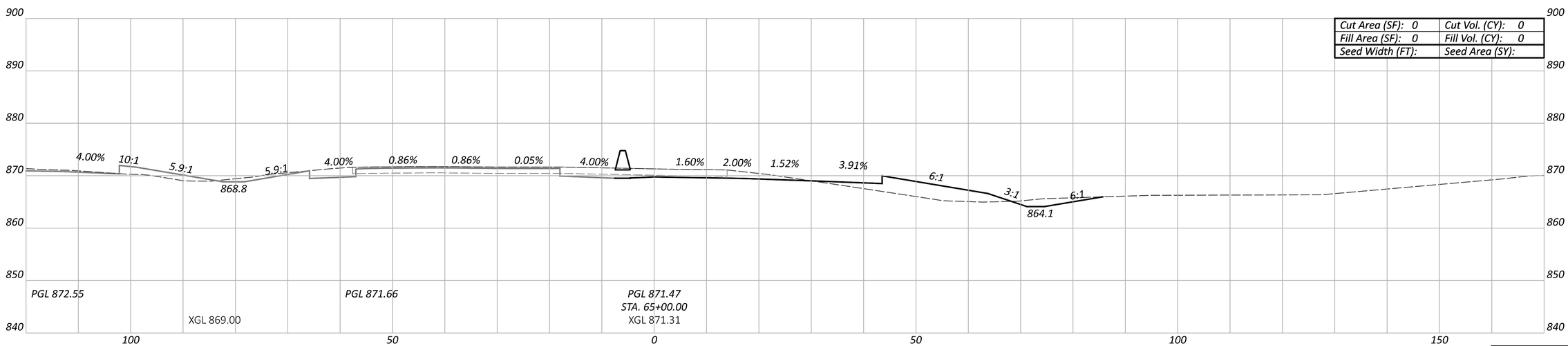
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.607 | TOTAL 740





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Sheet Totals		
Seeding	Cut	Fill

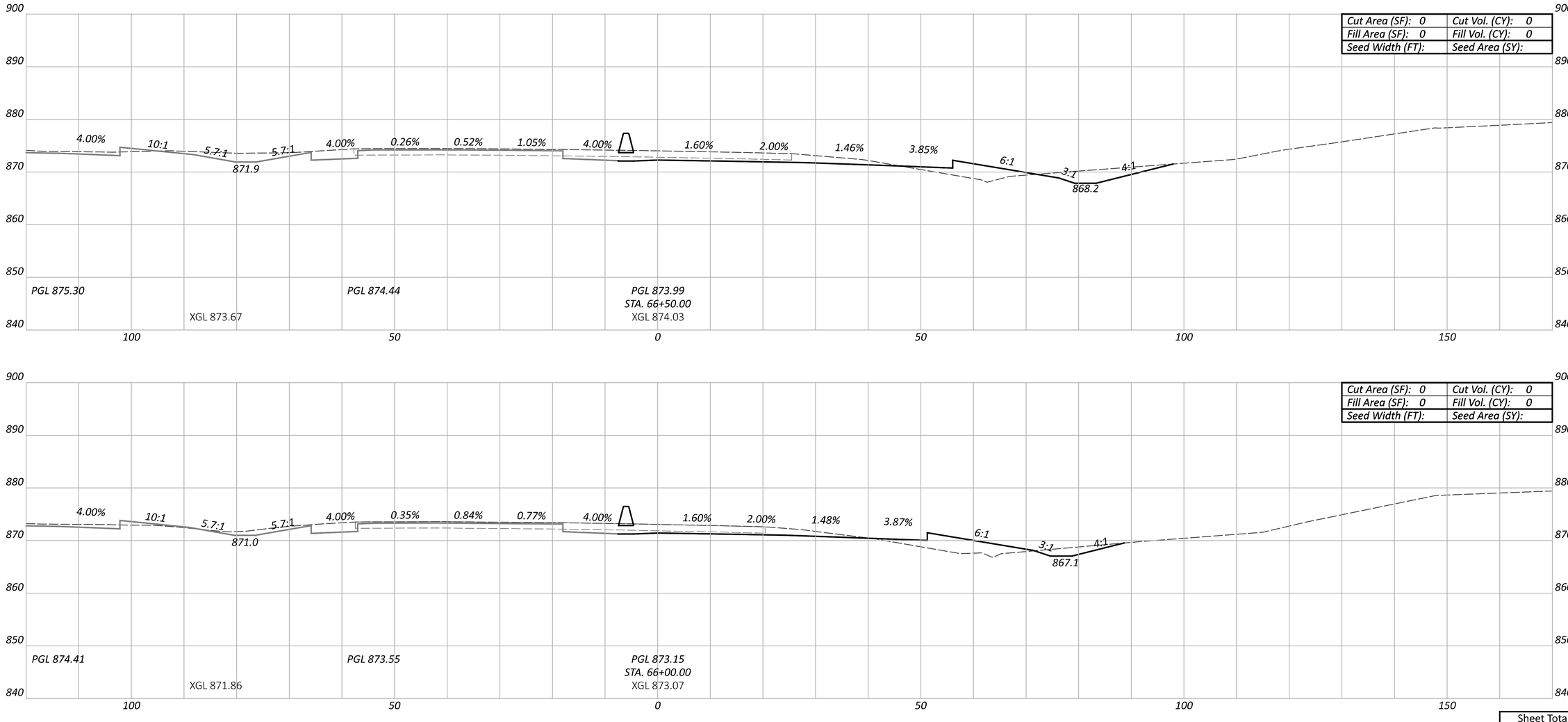
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.608 TOTAL 740



CROSS SECTIONS - RAMP K
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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

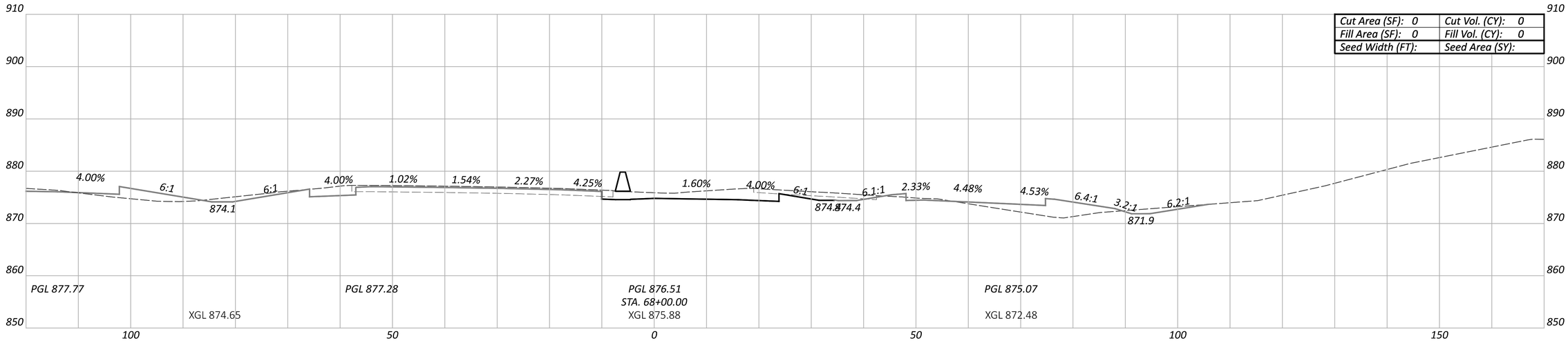
DESIGN AGENCY
STRUCTUREPOINT INC.

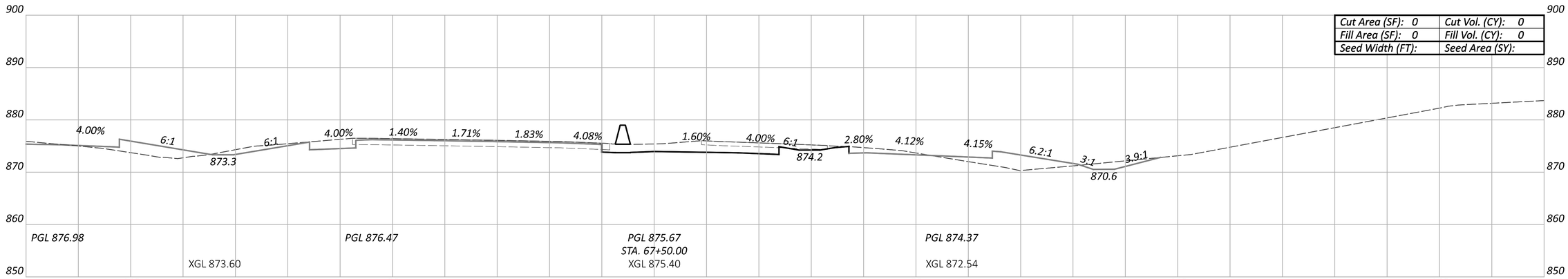
DESIGNER
BER

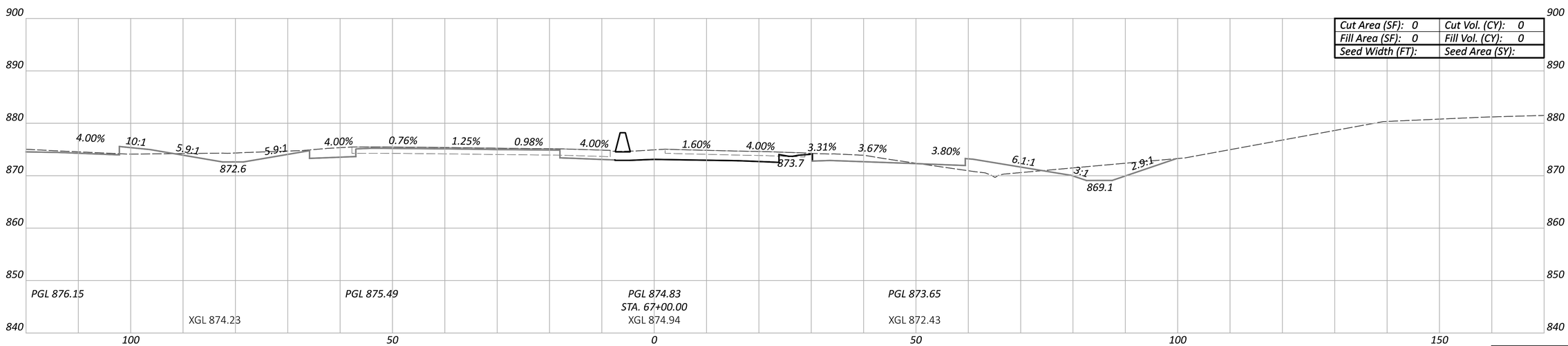
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.609 TOTAL 740







CROSS SECTIONS - RAMP K
STA. 67+00.00 TO STA. 68+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.610 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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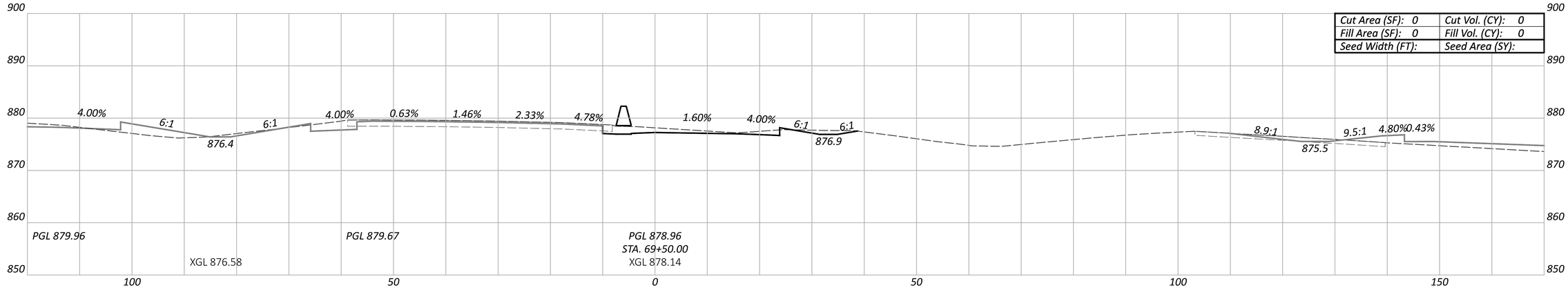

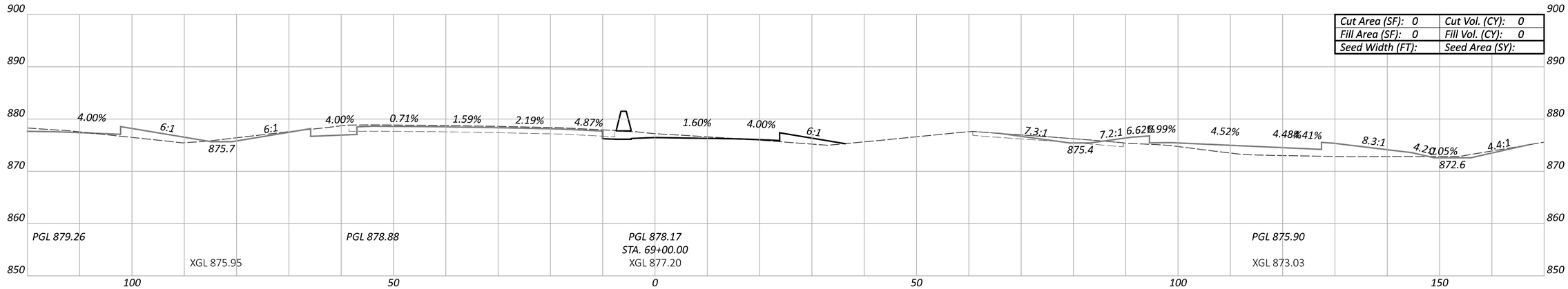

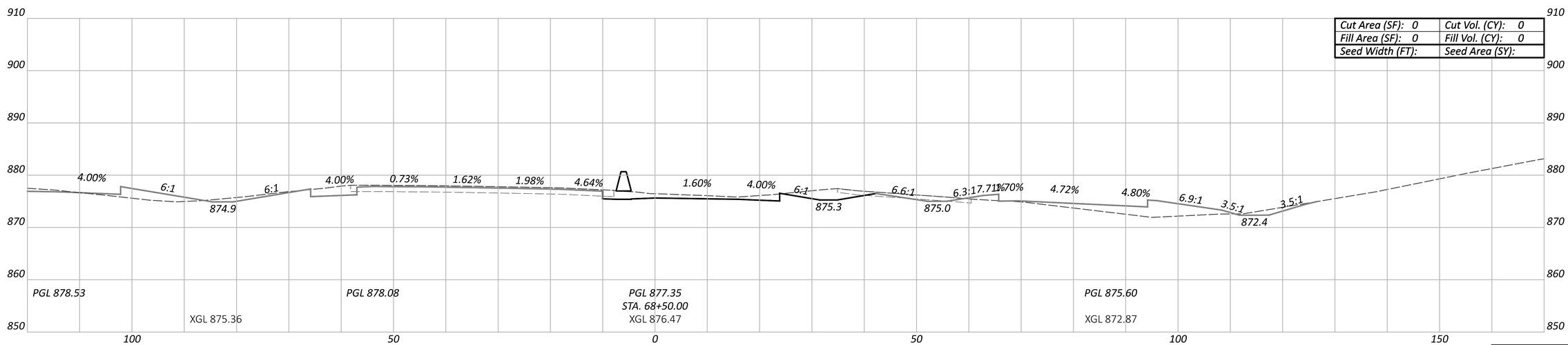

CROSS SECTIONS - RAMP K
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.611	740

FAI/LIC IR 70 0.00/0.00

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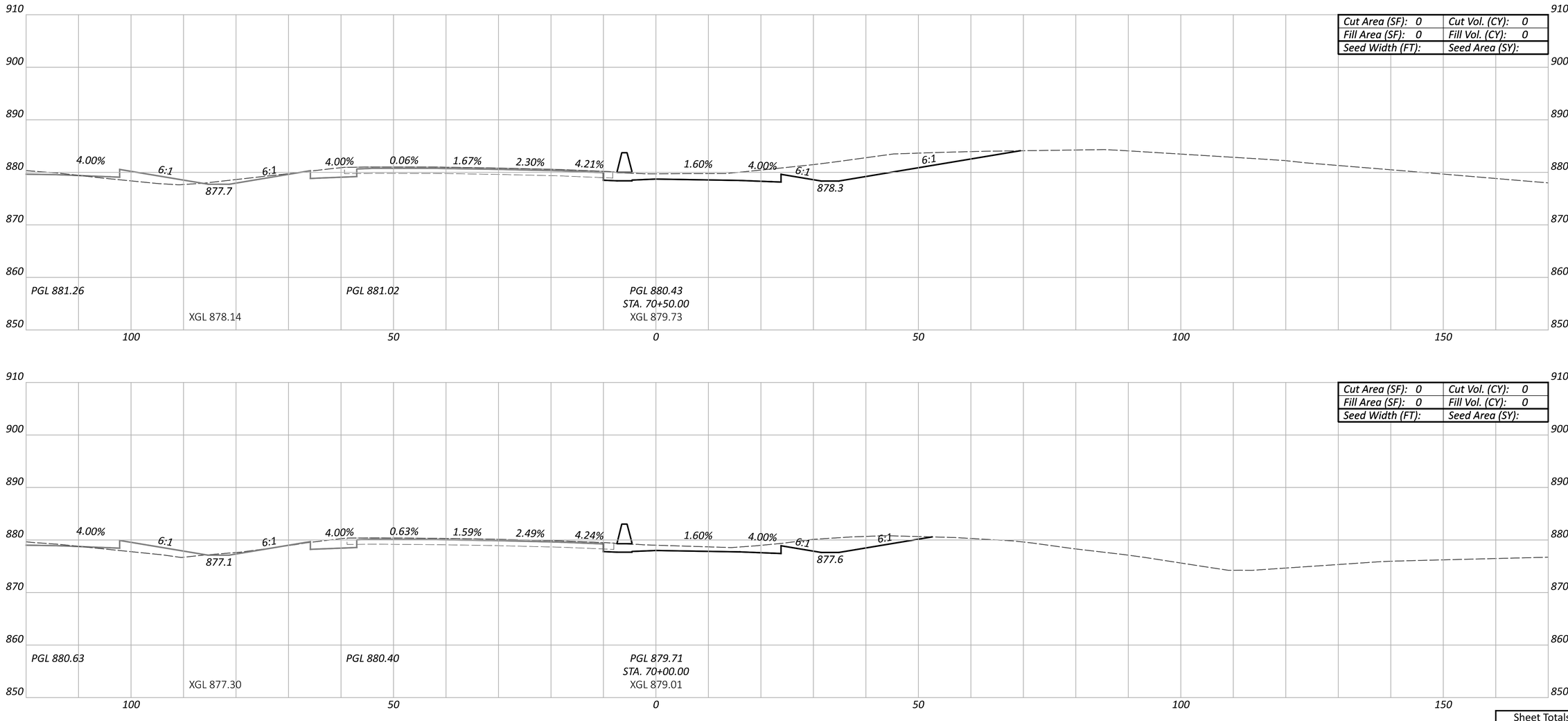

CROSS SECTIONS - RAMP K
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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

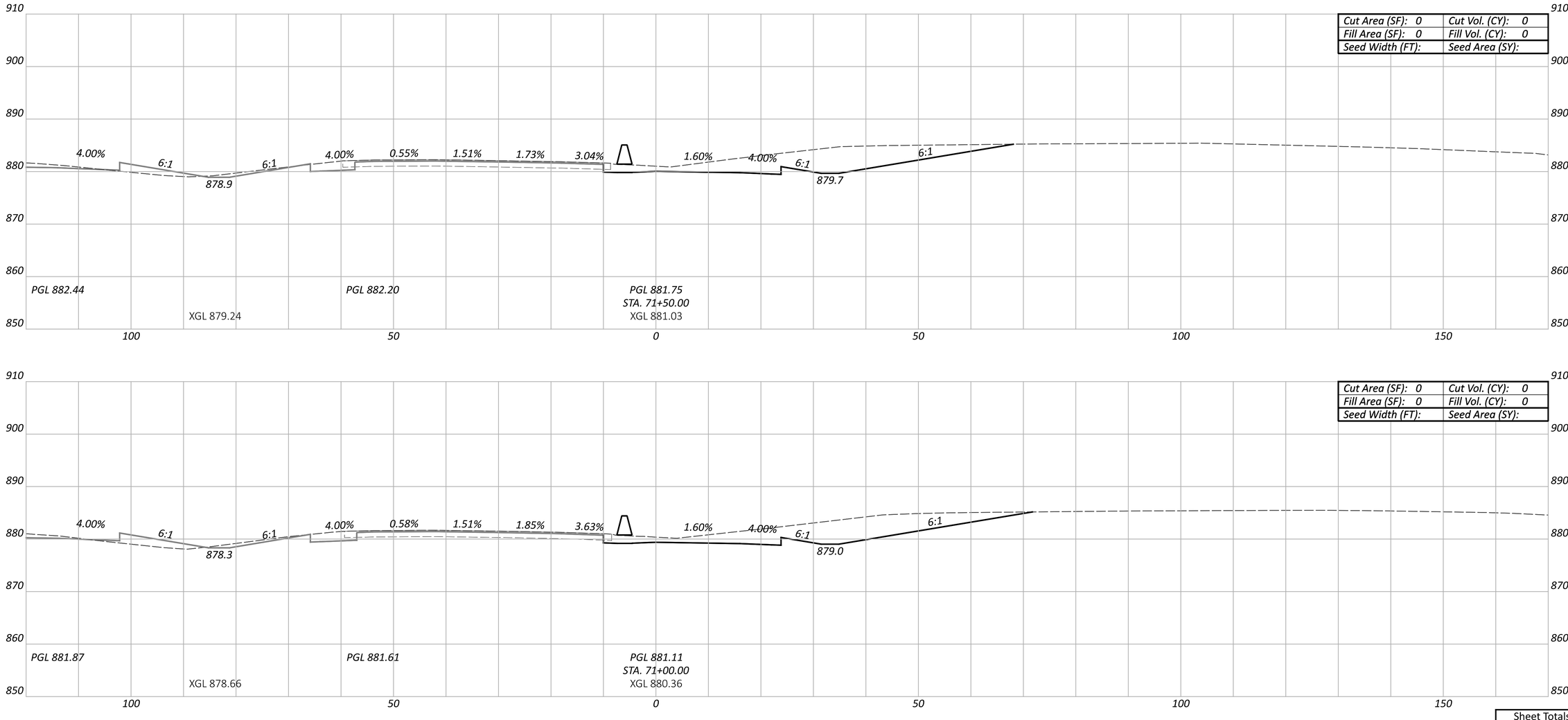
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.612 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

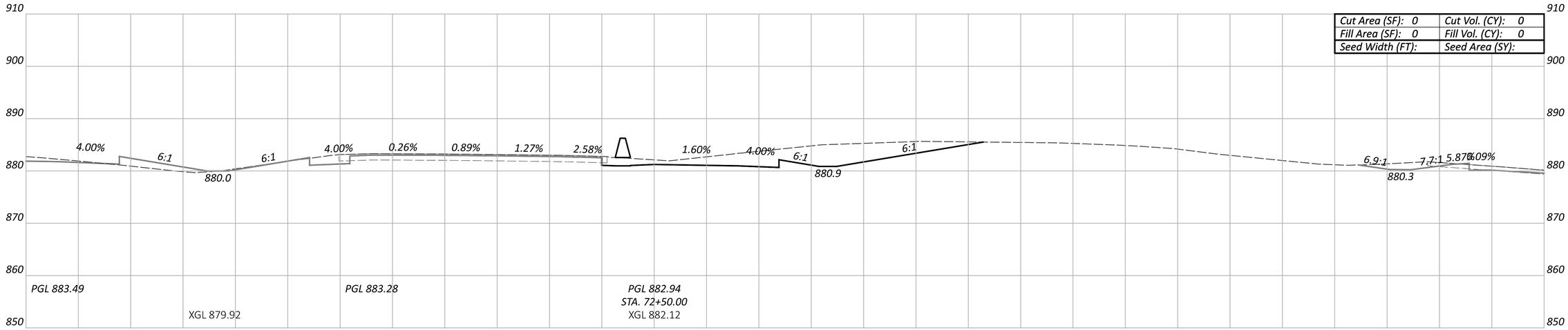
DESIGNER
BER

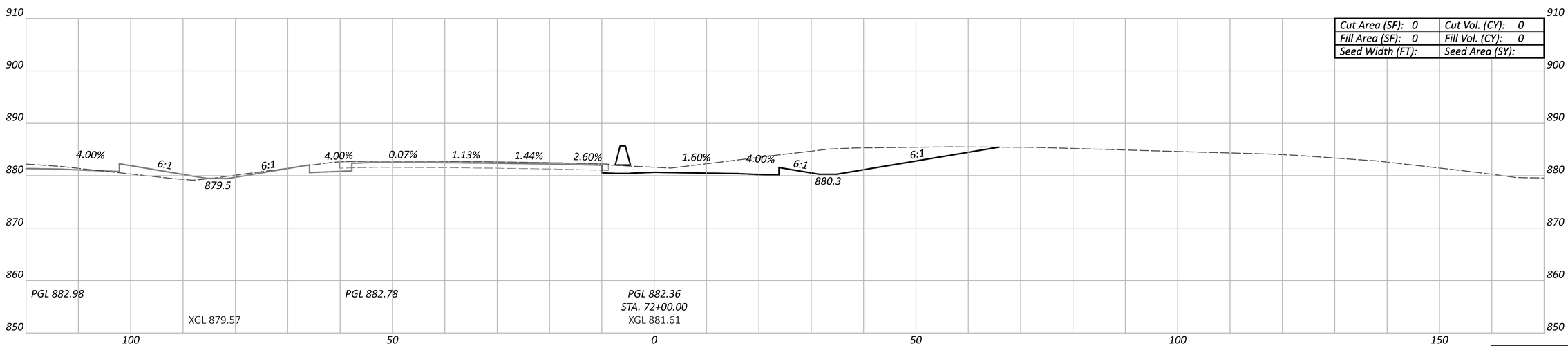
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.613	740





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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

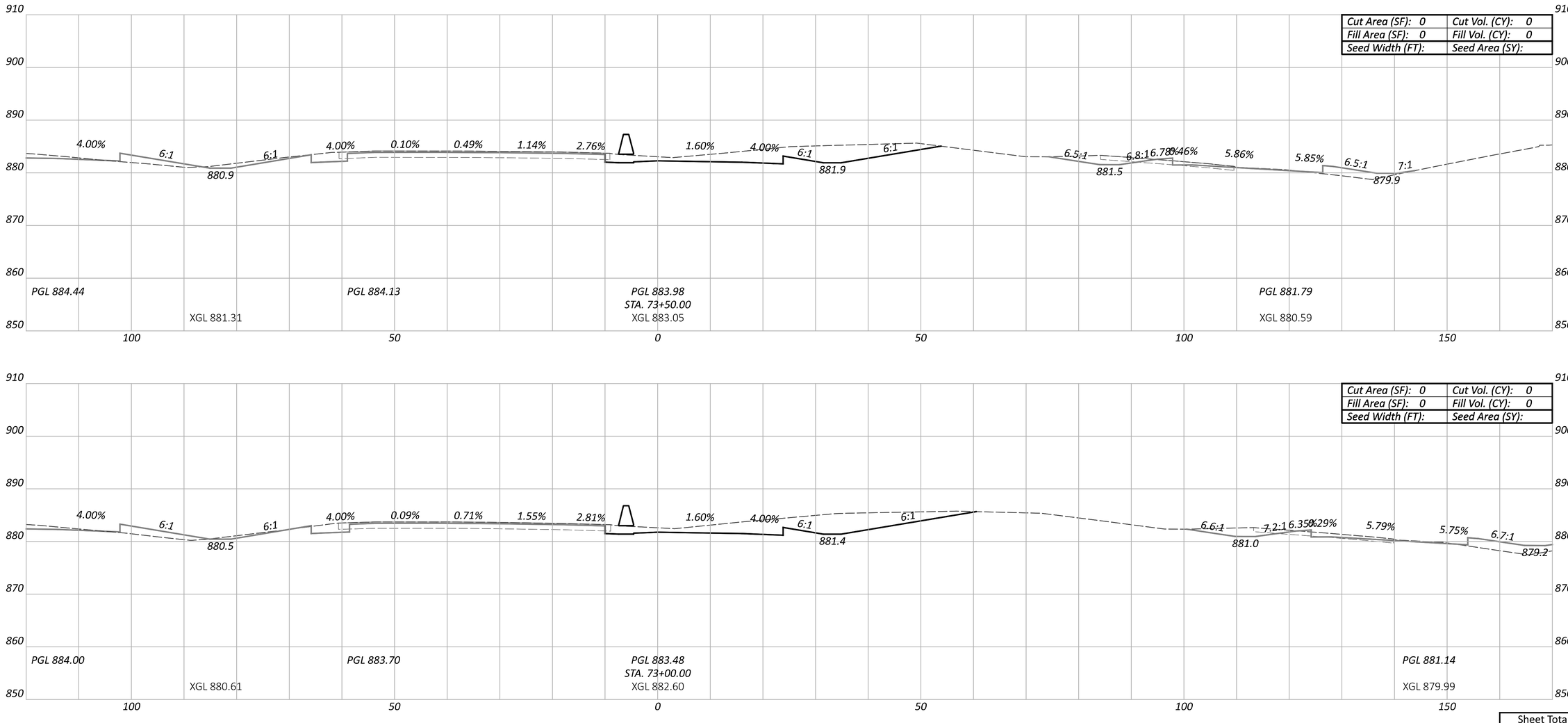
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.614	740



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STA. 73+00.00 TO STA. 73+50.00

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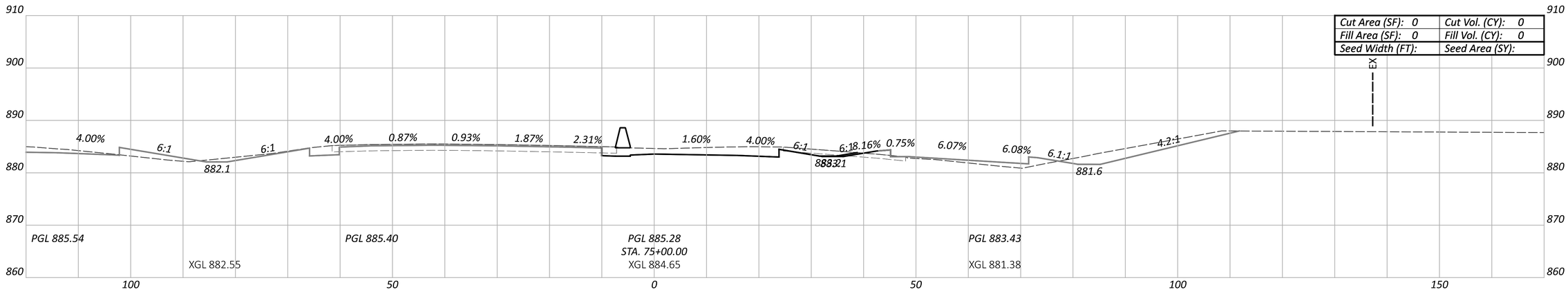
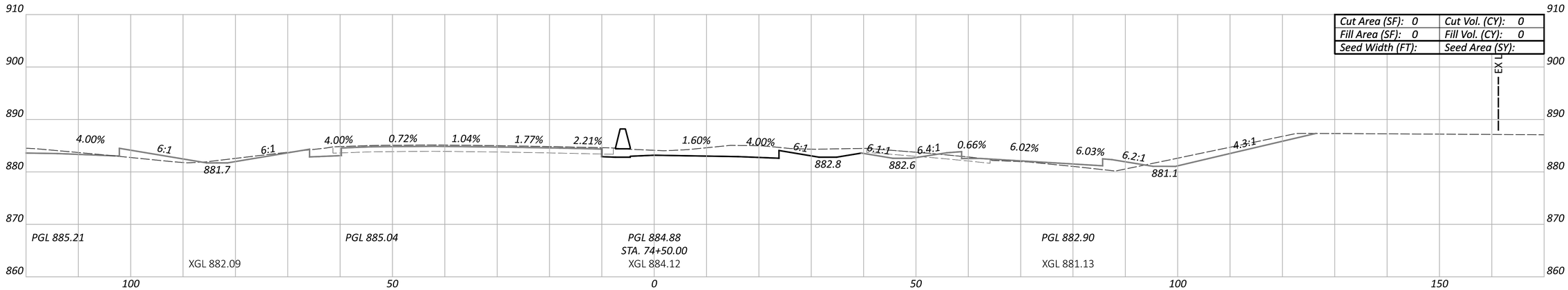
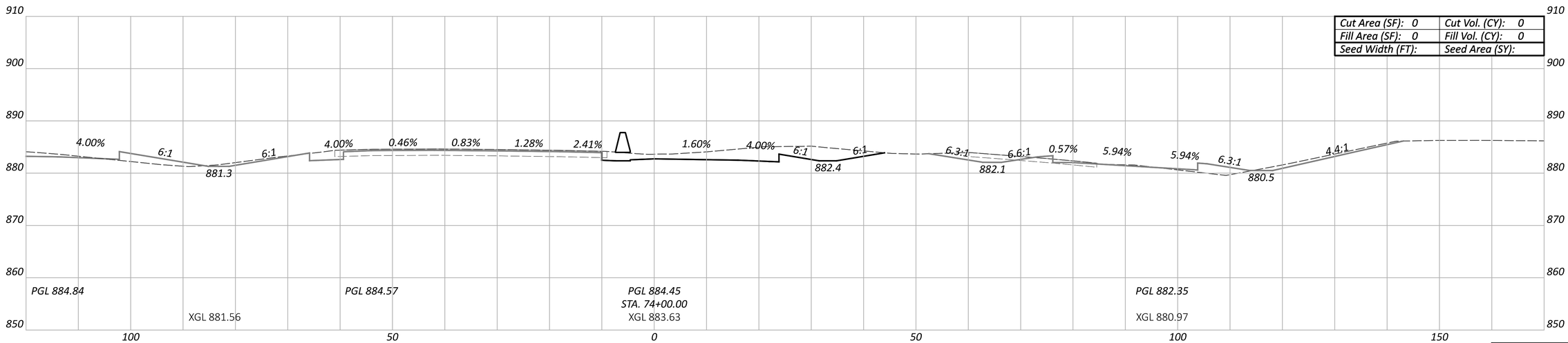
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.615
TOTAL	740







CROSS SECTIONS - RAMP K
STA. 74+00.00 TO STA. 75+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
WSP/PARSONS BRINCKERHOFF
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.616 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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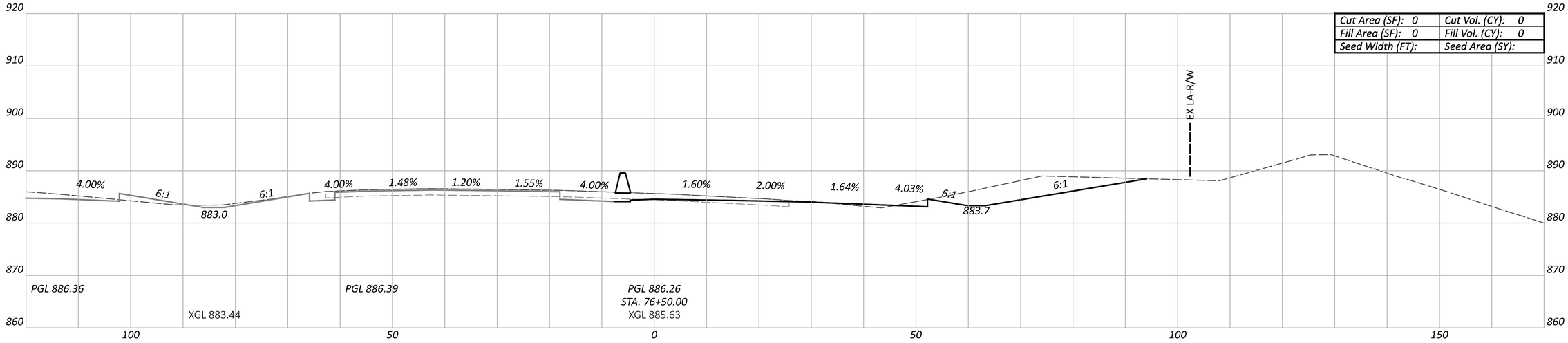

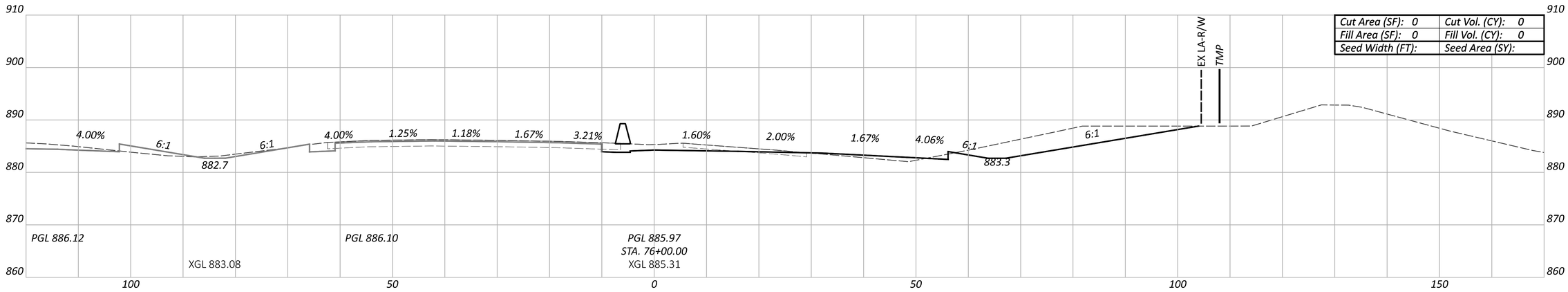

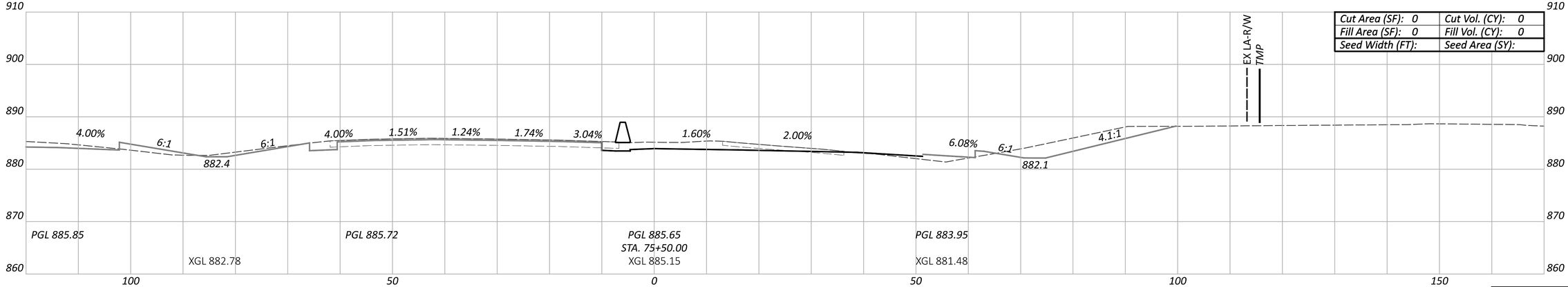

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FAI/LIC IR 70 0.00/0.00

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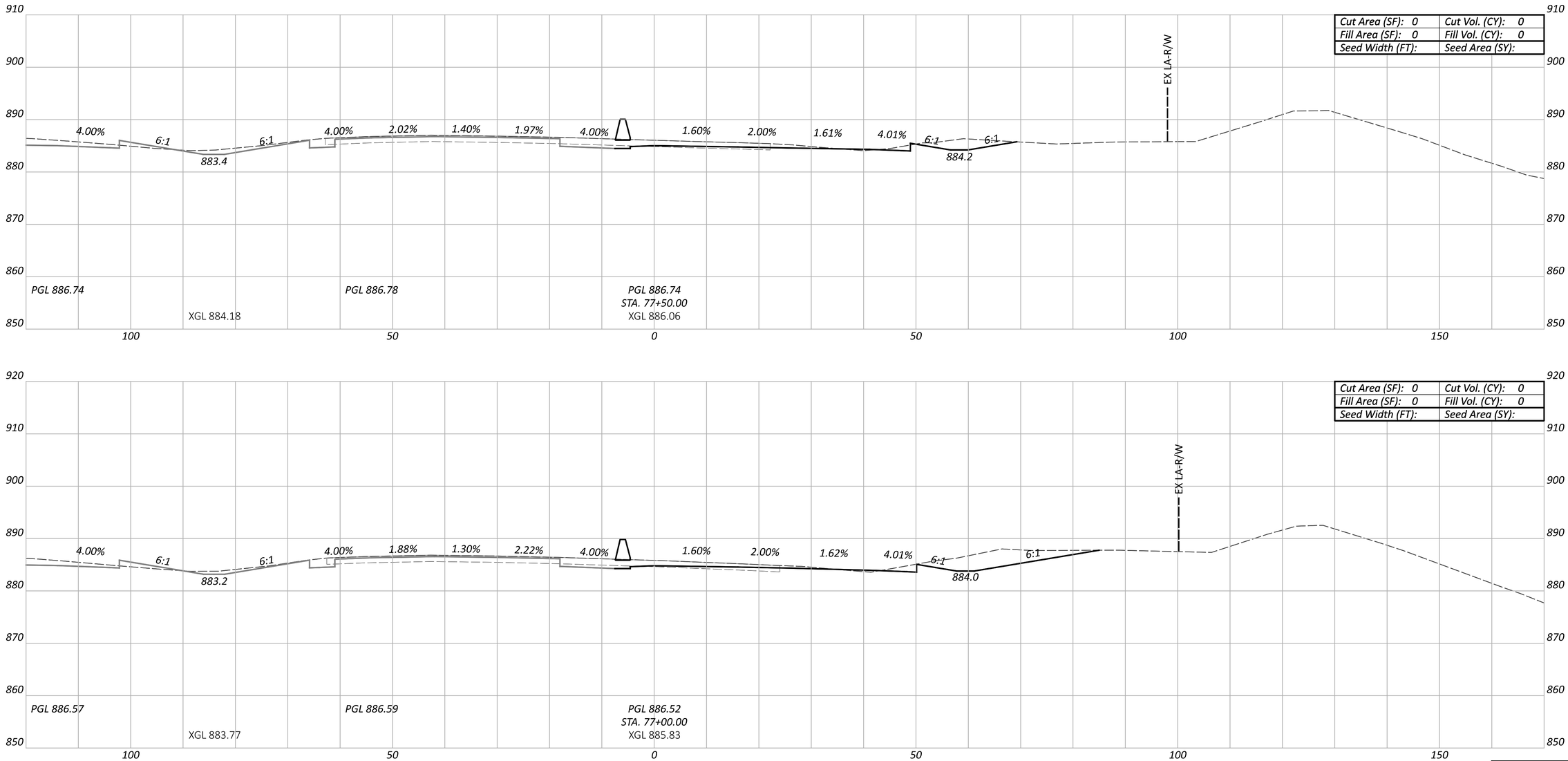
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.617
TOTAL	740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

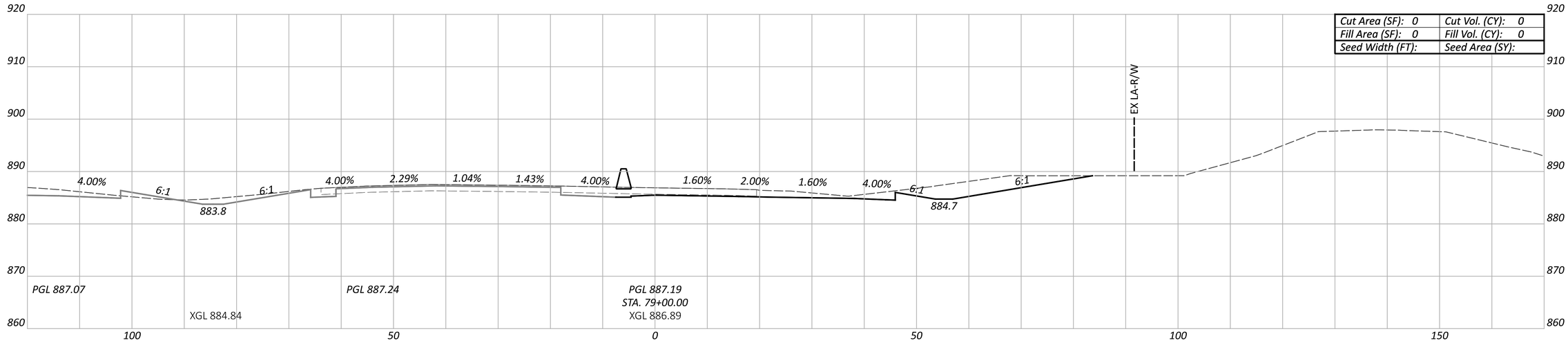
DESIGN AGENCY
STRUCTUREPOINT INC.

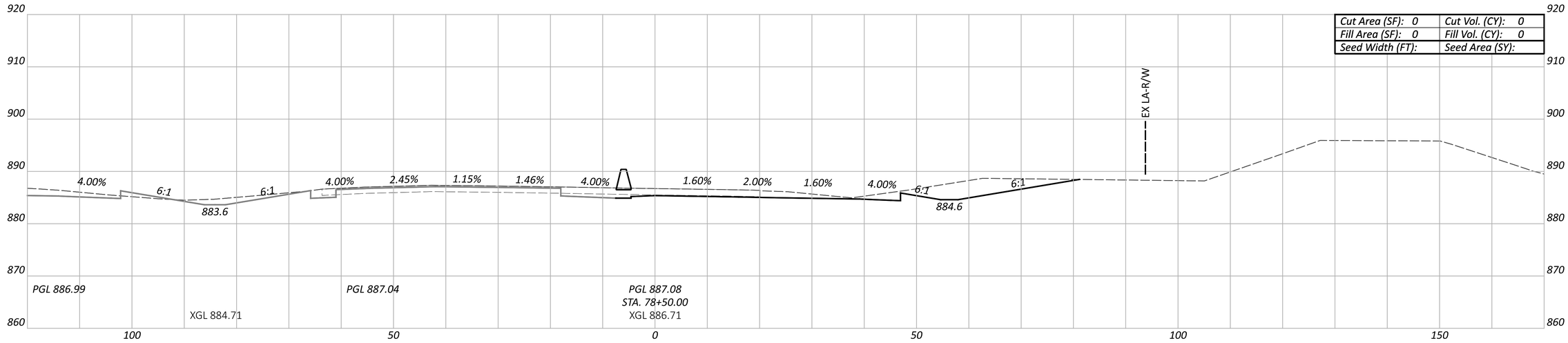
DESIGNER
BER

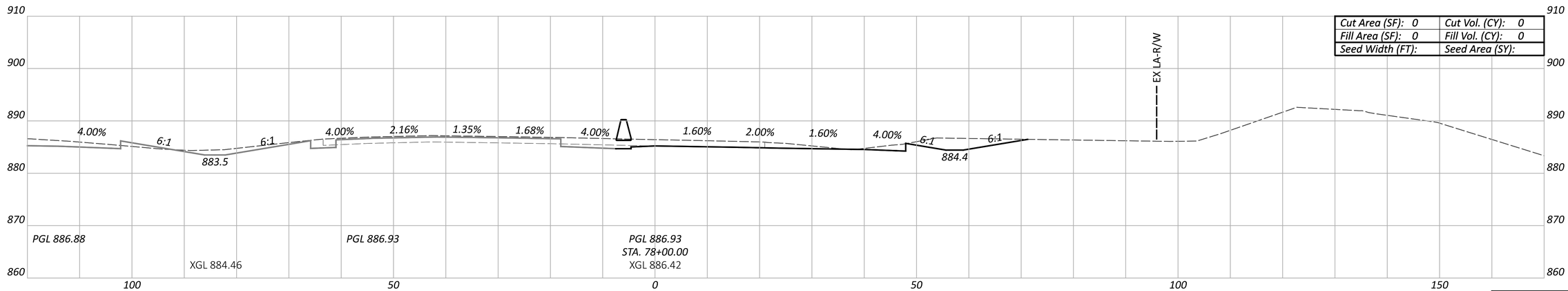
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.618 TOTAL 740







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DESIGN AGENCY
STRUCTUREPOINT INC.

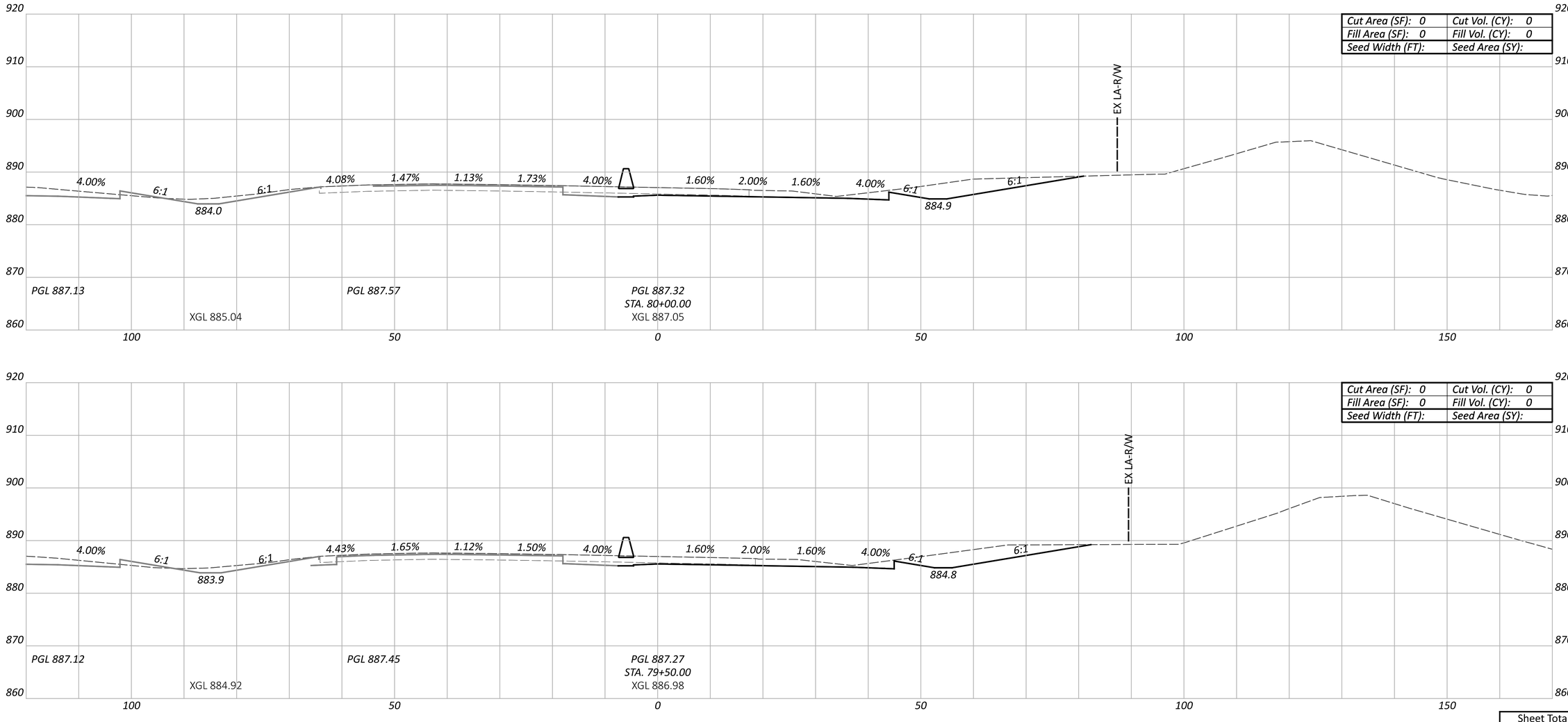
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.619 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill



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FAI/LIC IR 70 0.00/0.00

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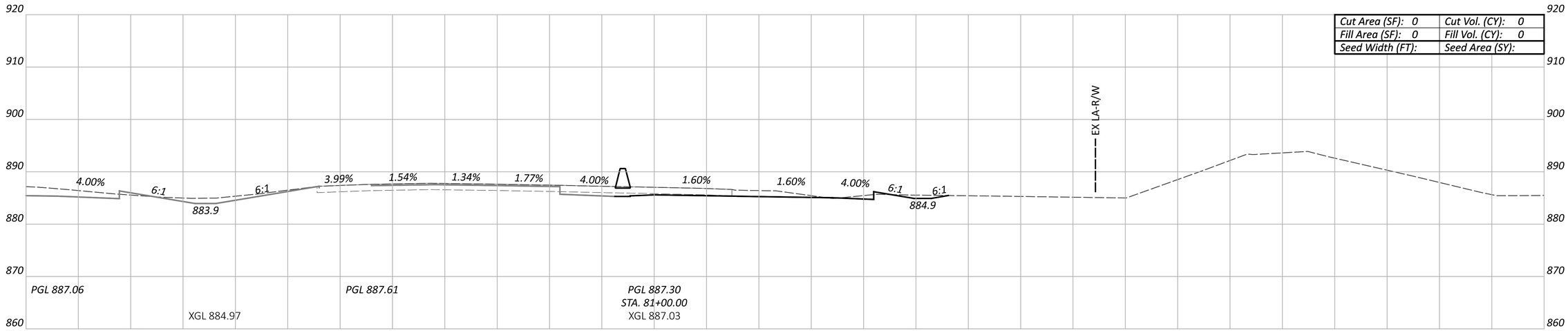
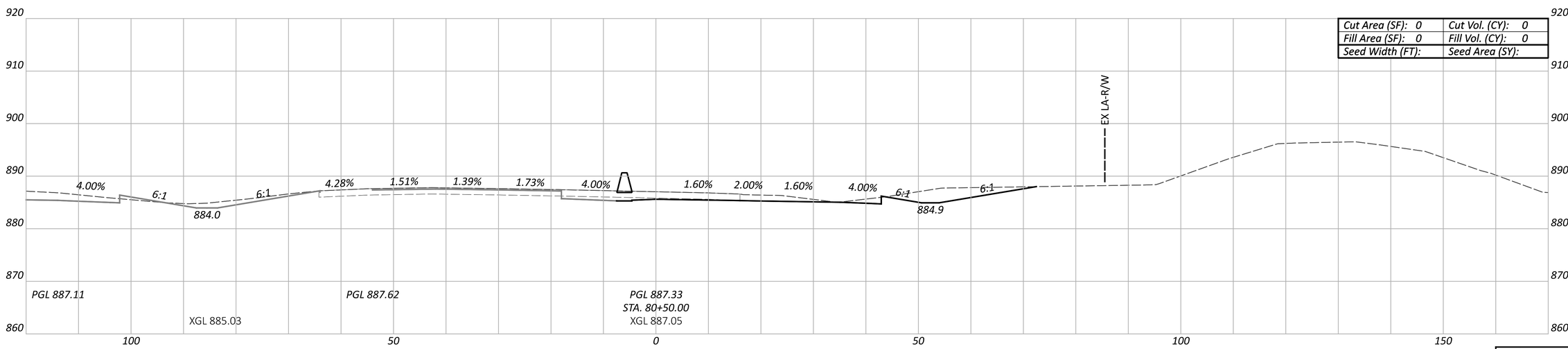
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.620
TOTAL	740





CROSS SECTIONS - RAMP K
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.621 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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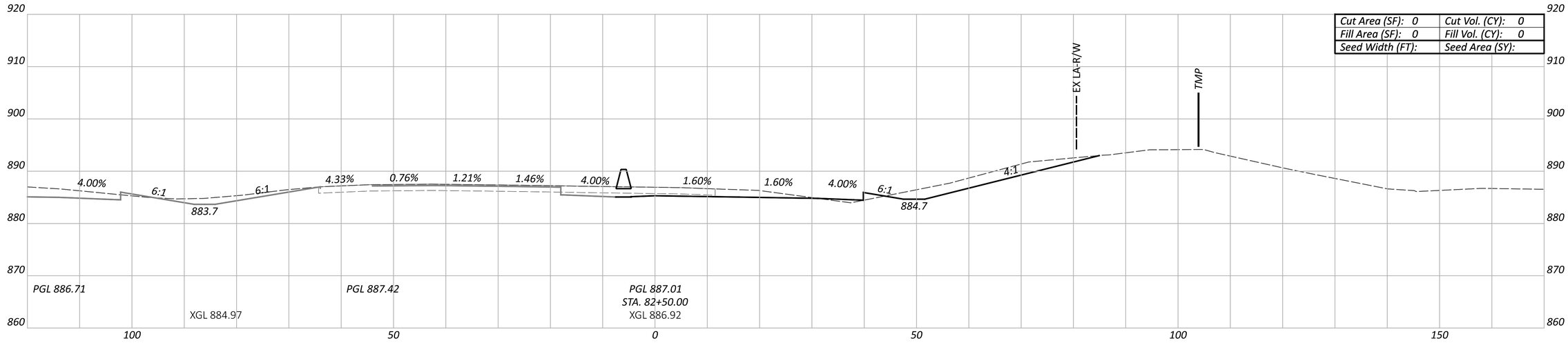

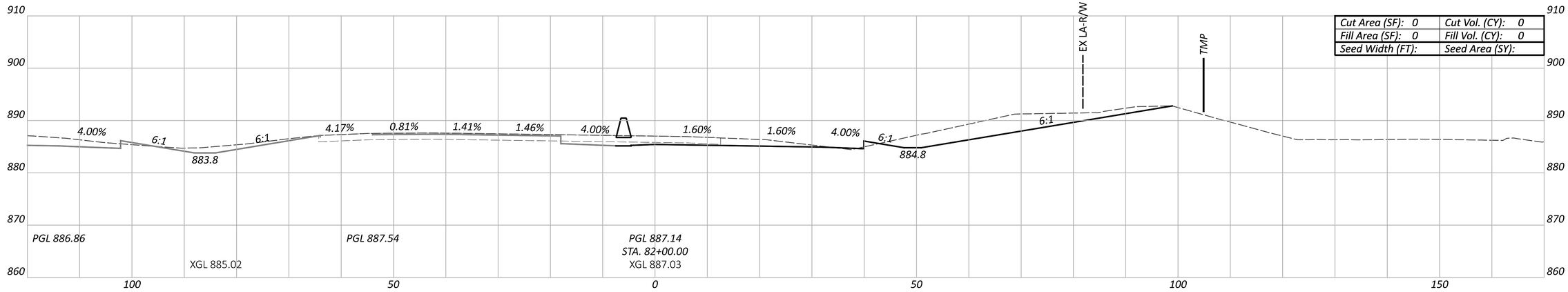

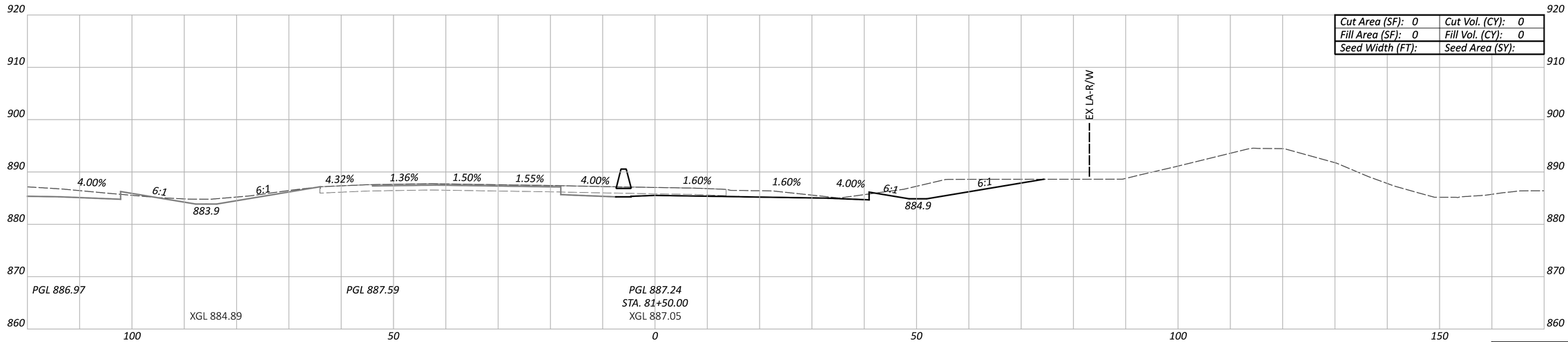

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STA. 81+50.00 TO STA. 82+50.00

FAI/LIC IR 70 0.00/0.00

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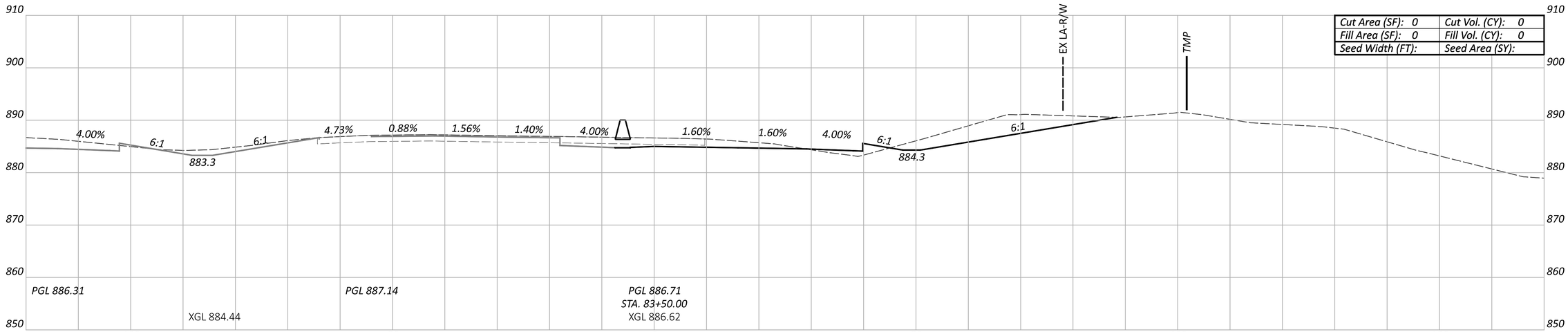
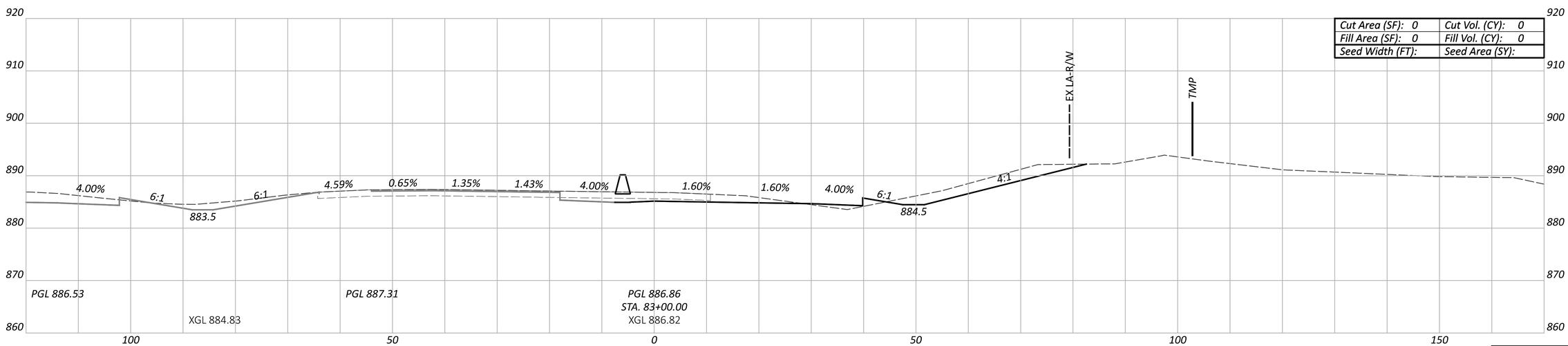
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.622
TOTAL	740





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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

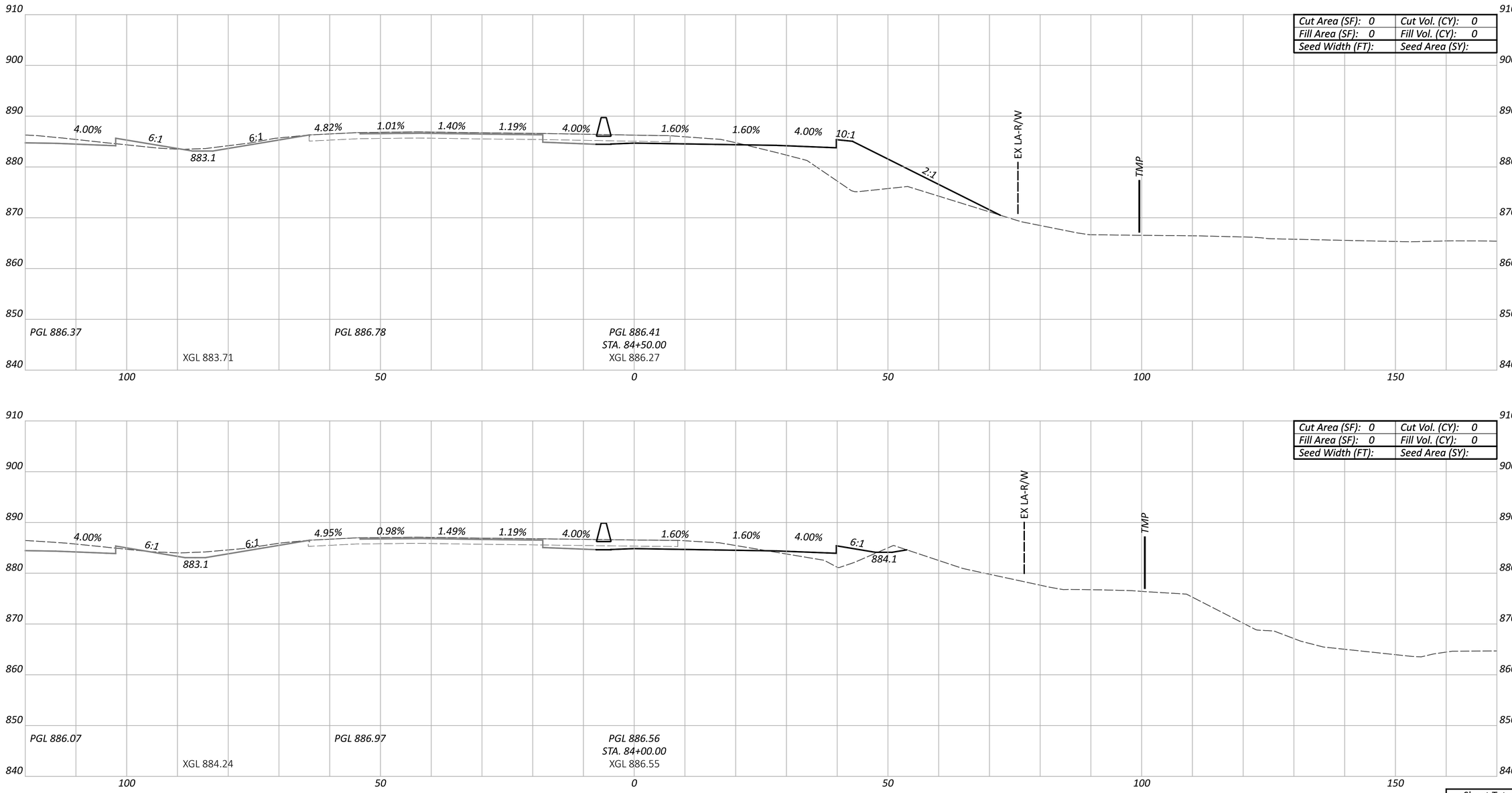
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.623	740



CROSS SECTIONS - RAMP K
STA. 84+00.00 TO STA. 84+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.624 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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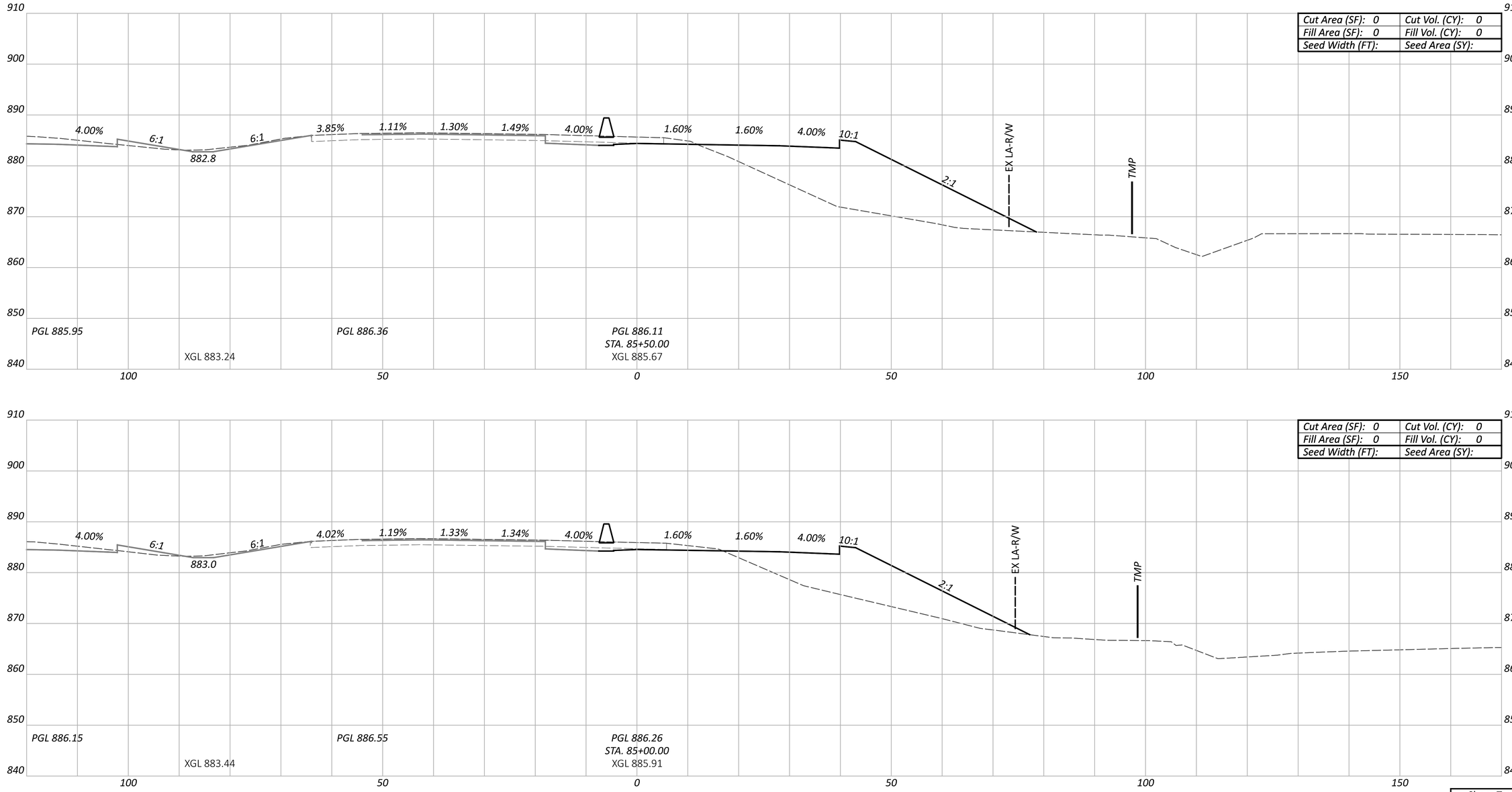

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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

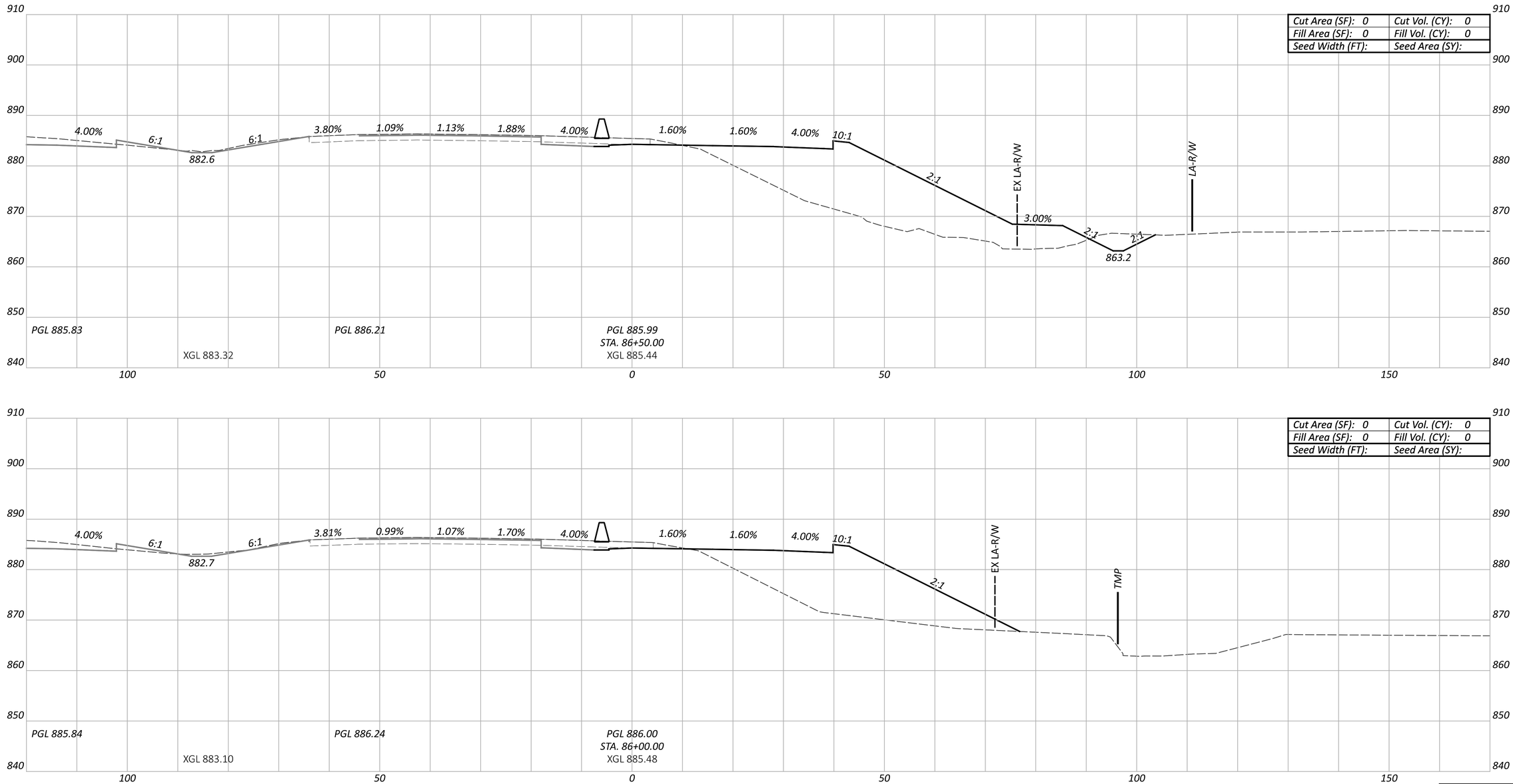
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.625 TOTAL 740



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CROSS SECTIONS - RAMP K
STA. 86+00.00 TO STA. 86+50.00

Sheet Totals		
Seeding	Cut	Fill

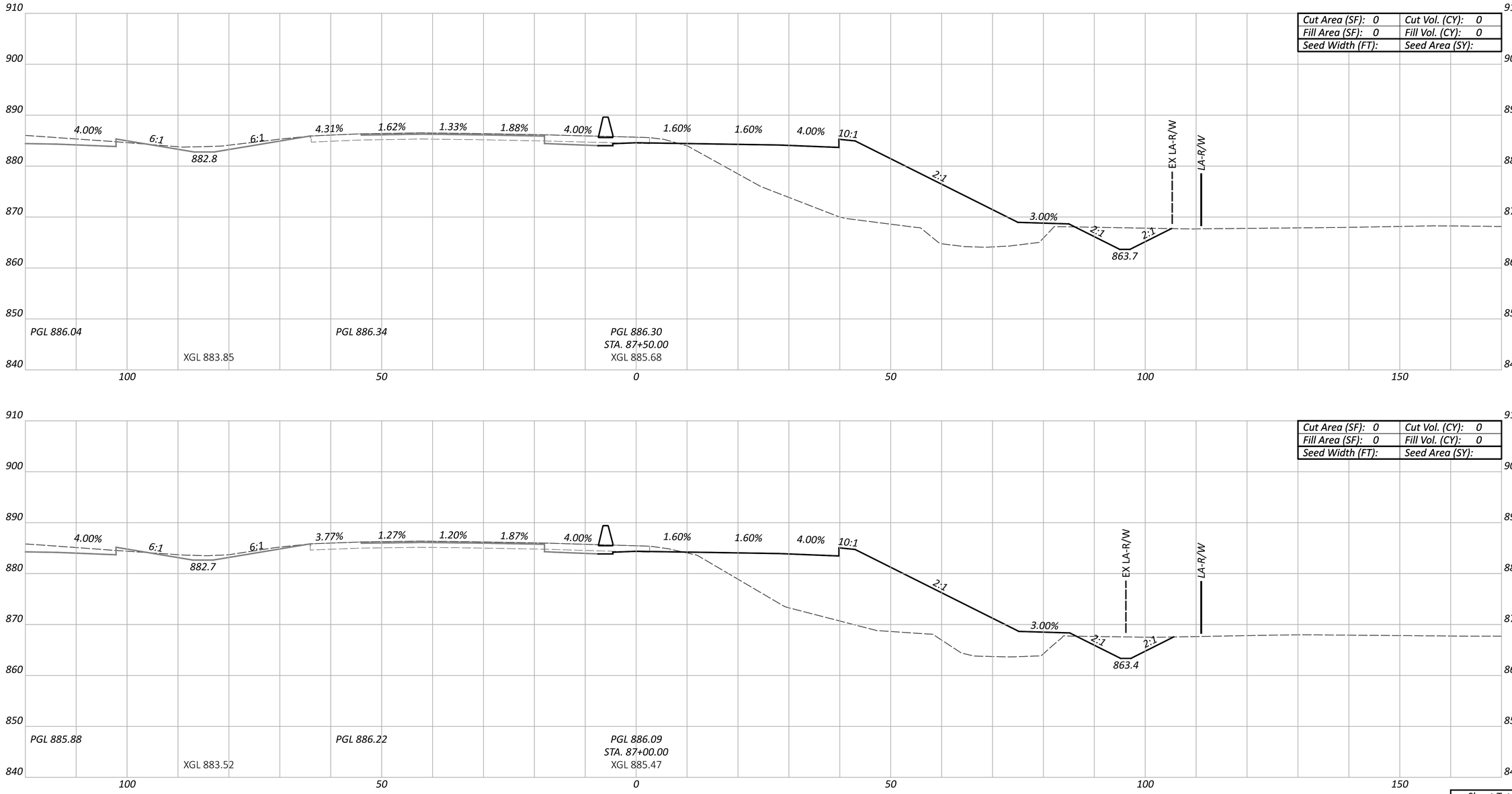
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.626 TOTAL 740



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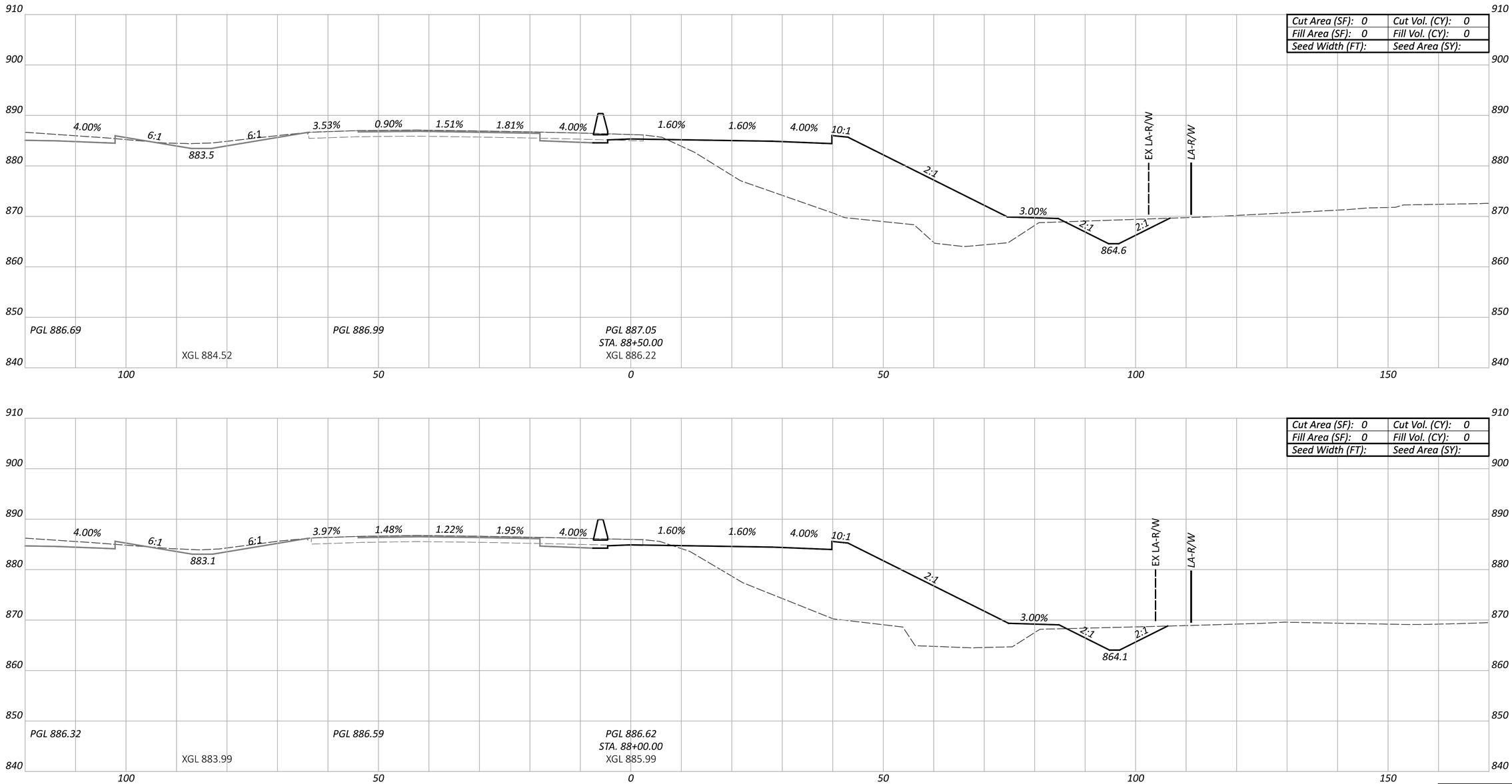
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.627
TOTAL	740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

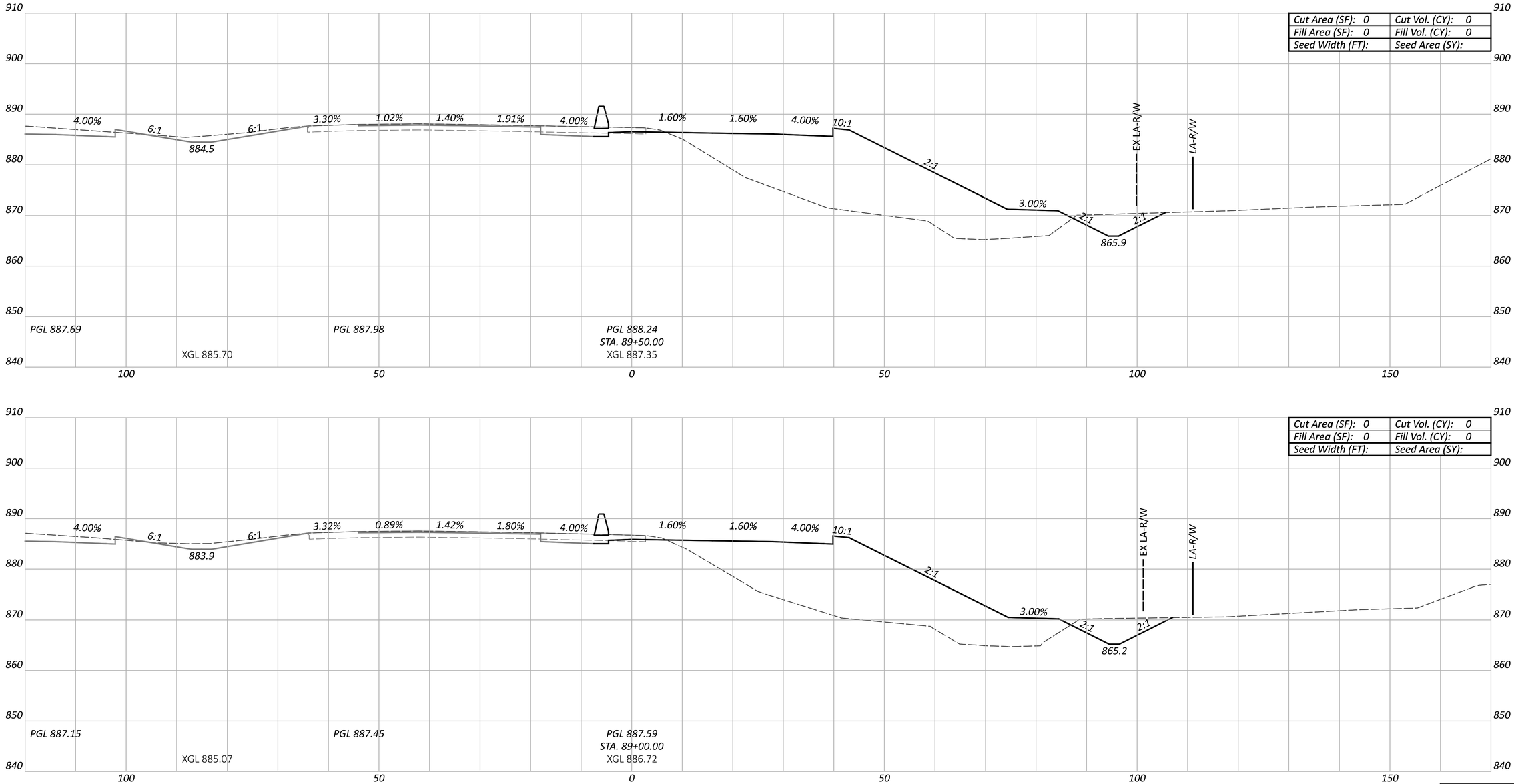
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.628 TOTAL 740



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DESIGN AGENCY
STRUCTUREPOINT INC.

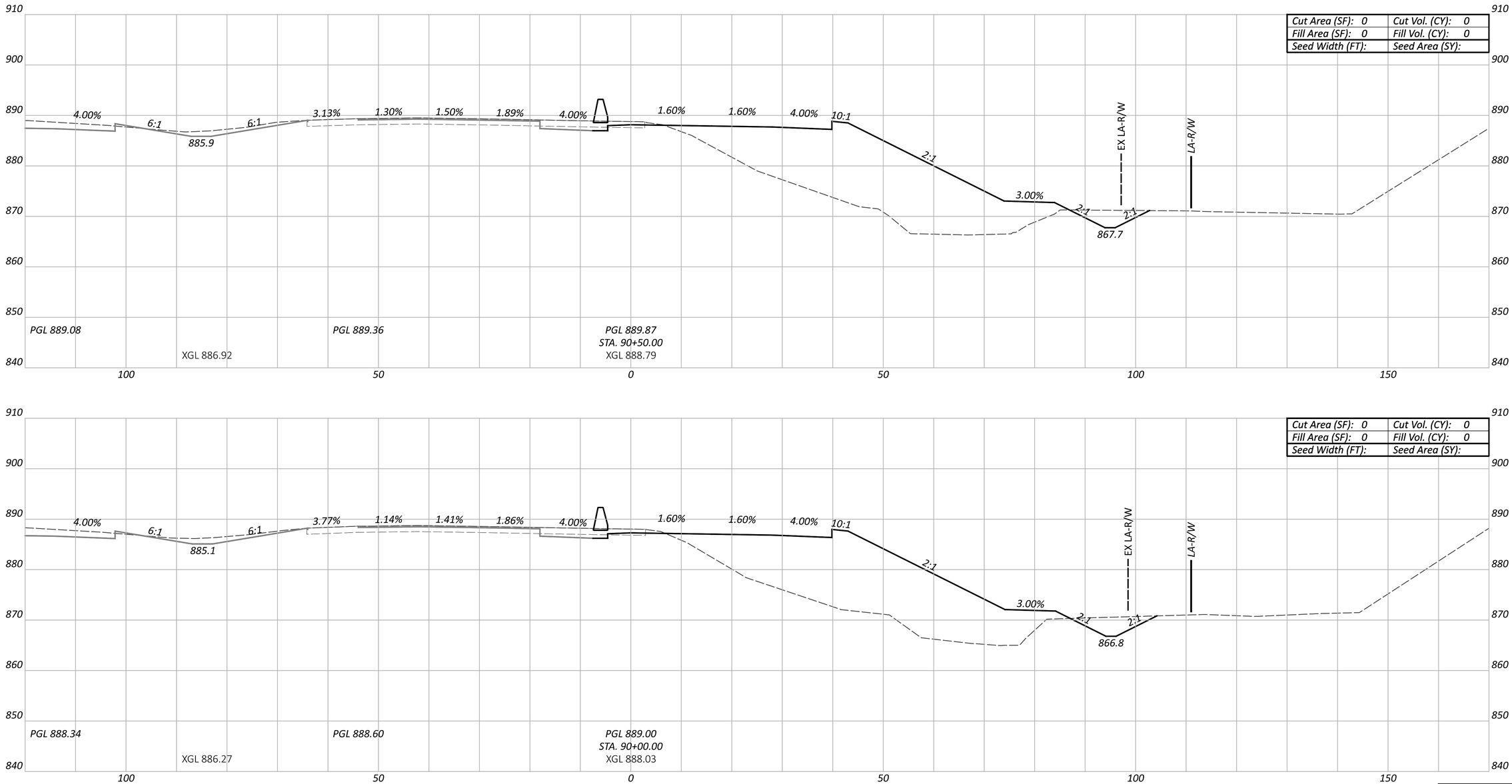
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.629	740



CROSS SECTIONS - RAMP K
STA. 90+00.00 TO STA. 90+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.630 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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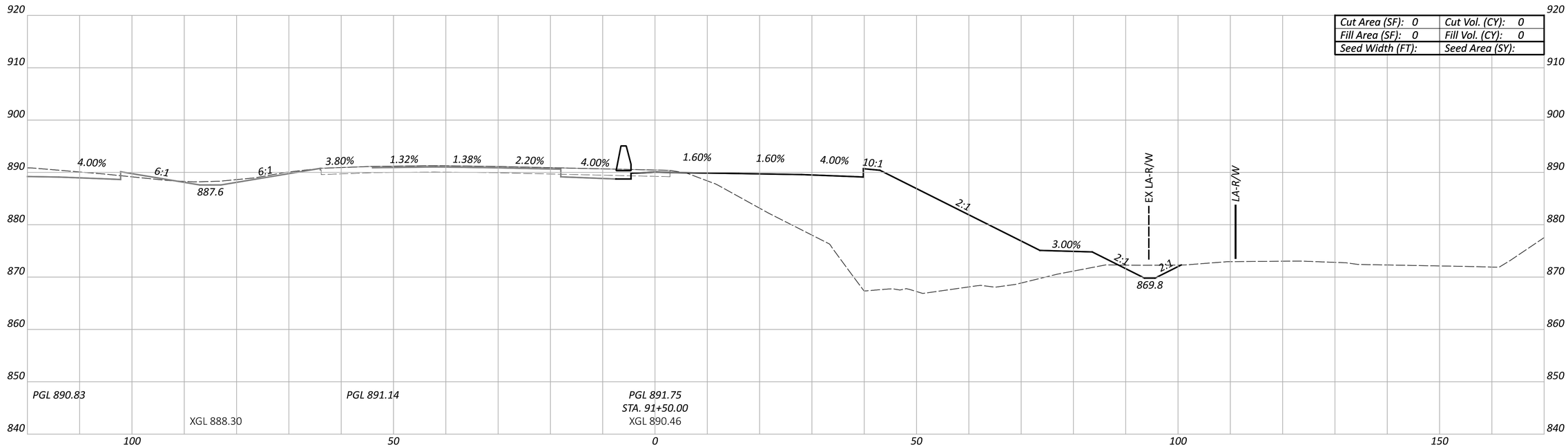

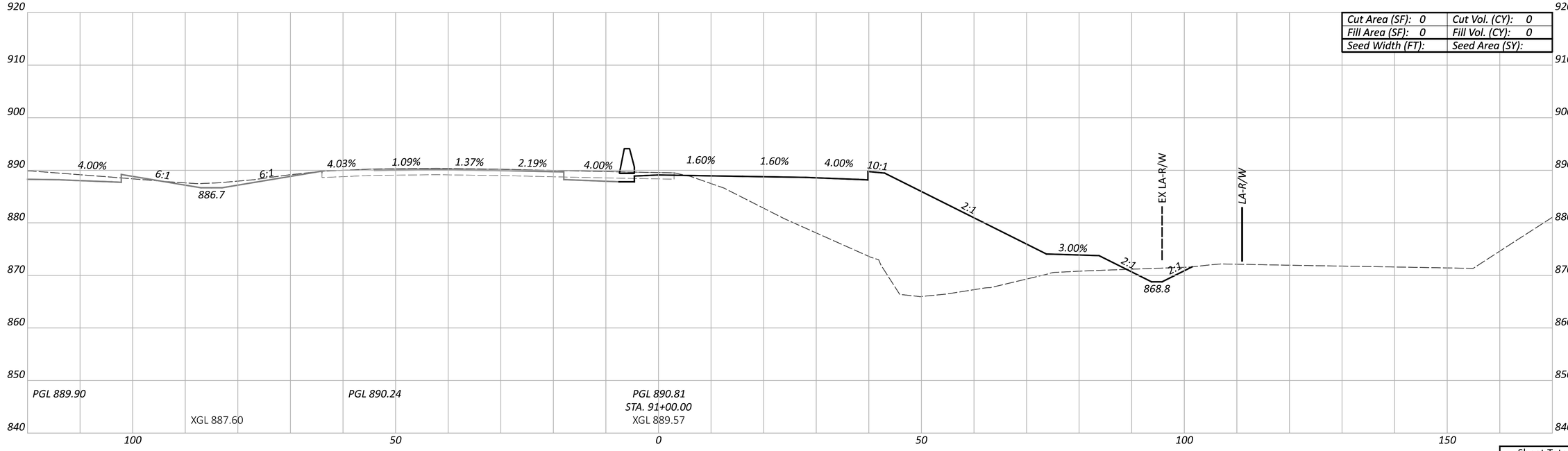

CROSS SECTIONS - RAMP K
STA. 91+00.00 TO STA. 91+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.631 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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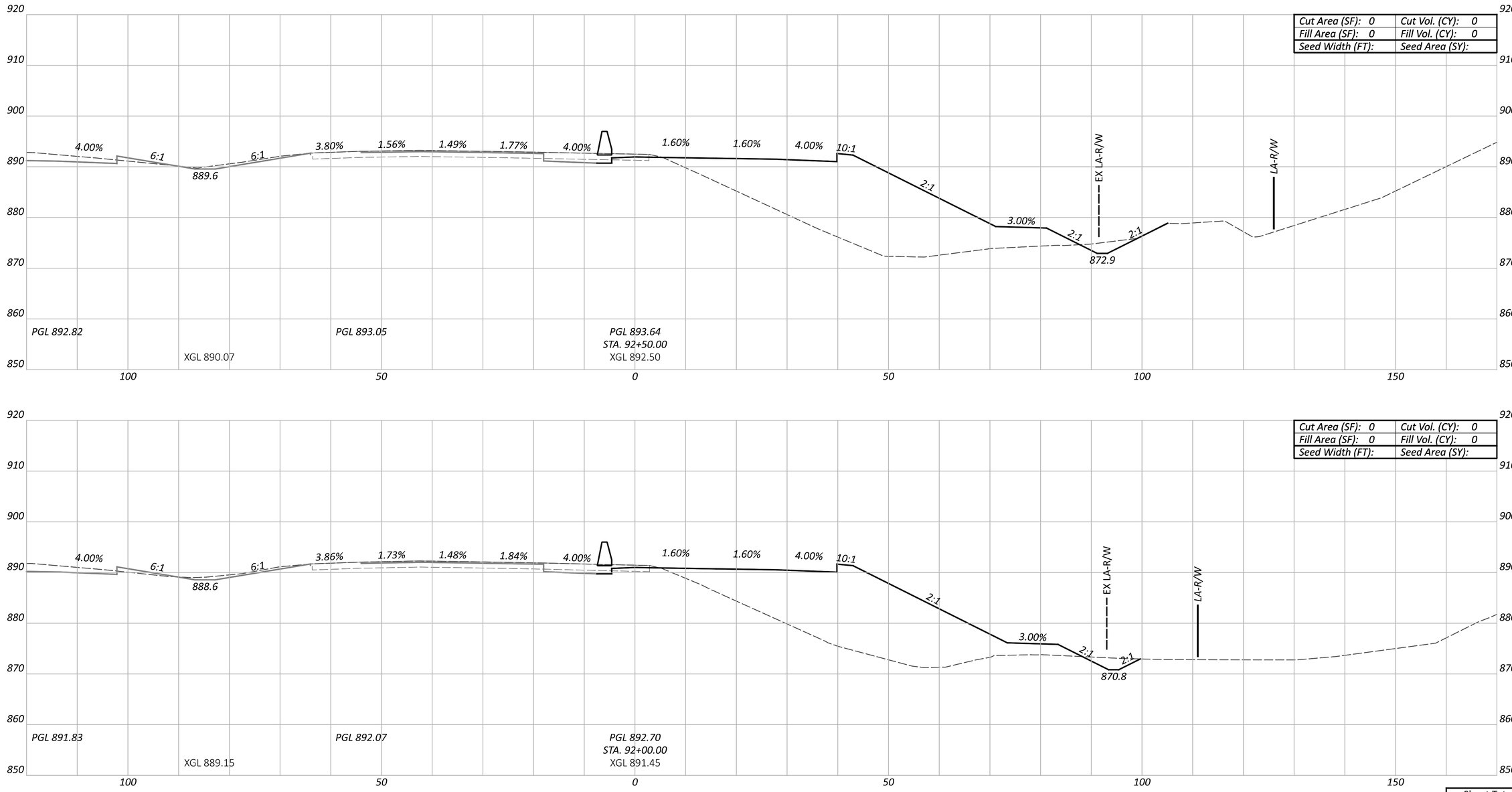

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CROSS SECTIONS - RAMP K
STA. 92+00.00 TO STA. 92+50.00

Sheet Totals		
Seeding	Cut	Fill

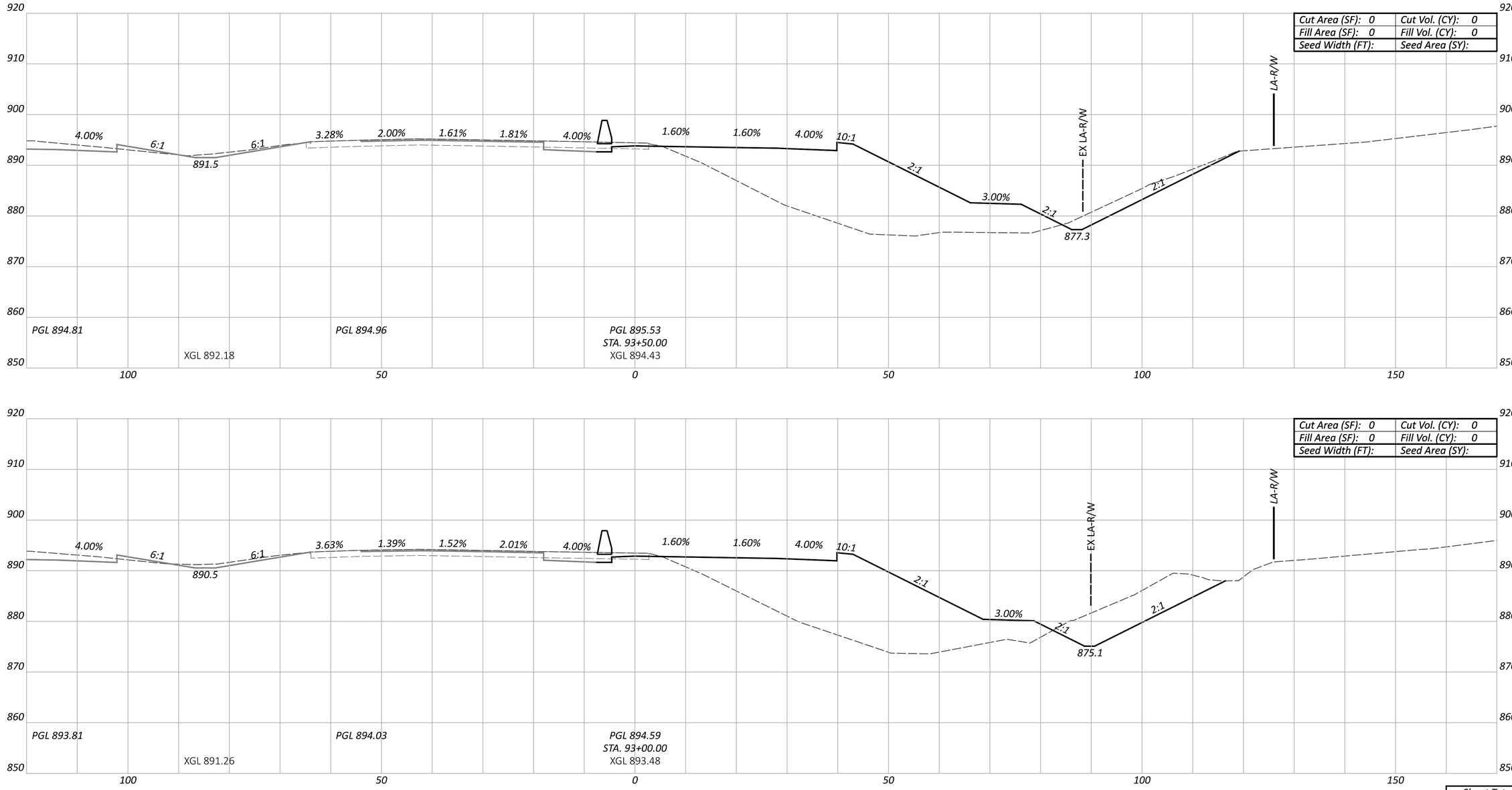
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.632 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

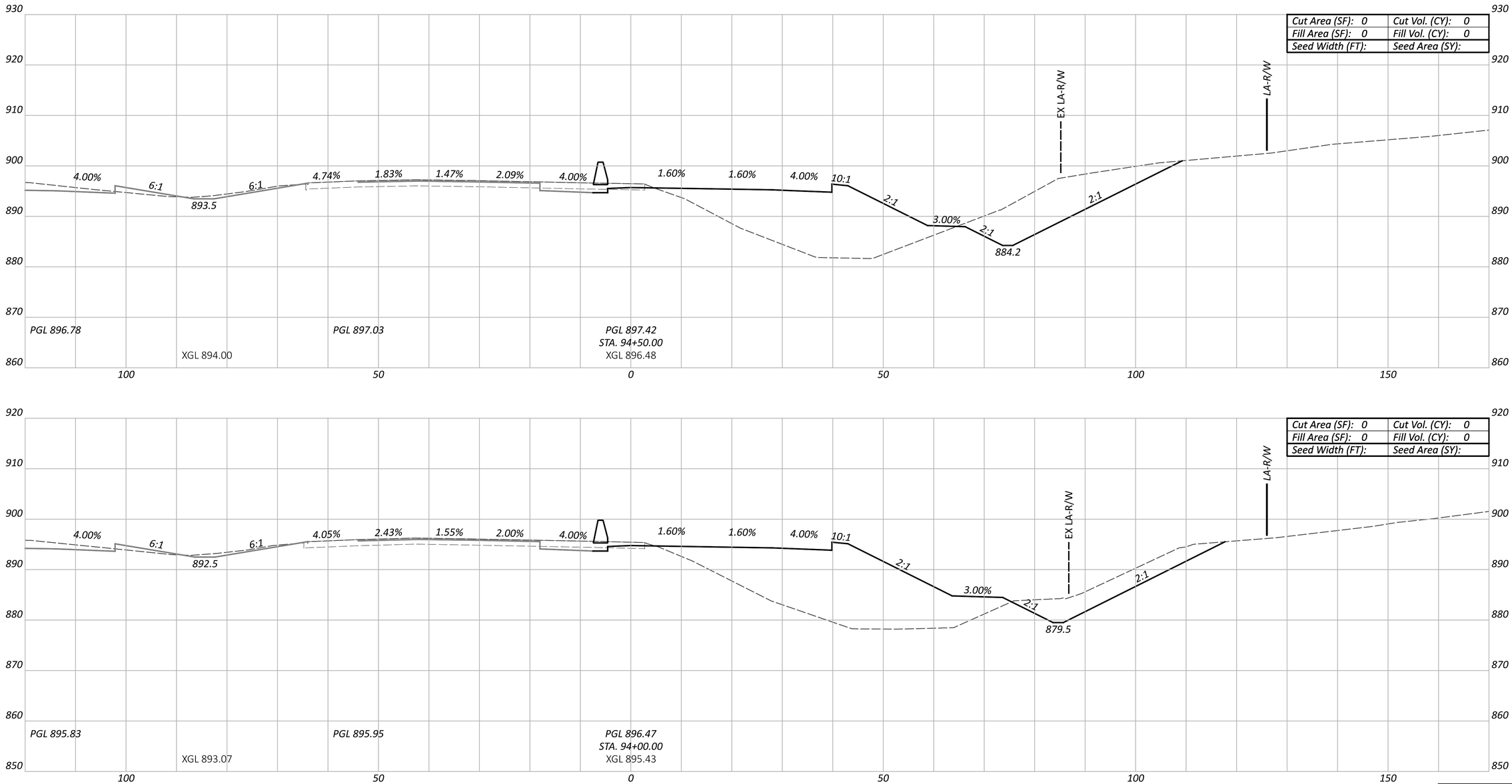
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.633 TOTAL 740



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STA. 94+00.00 TO STA. 94+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

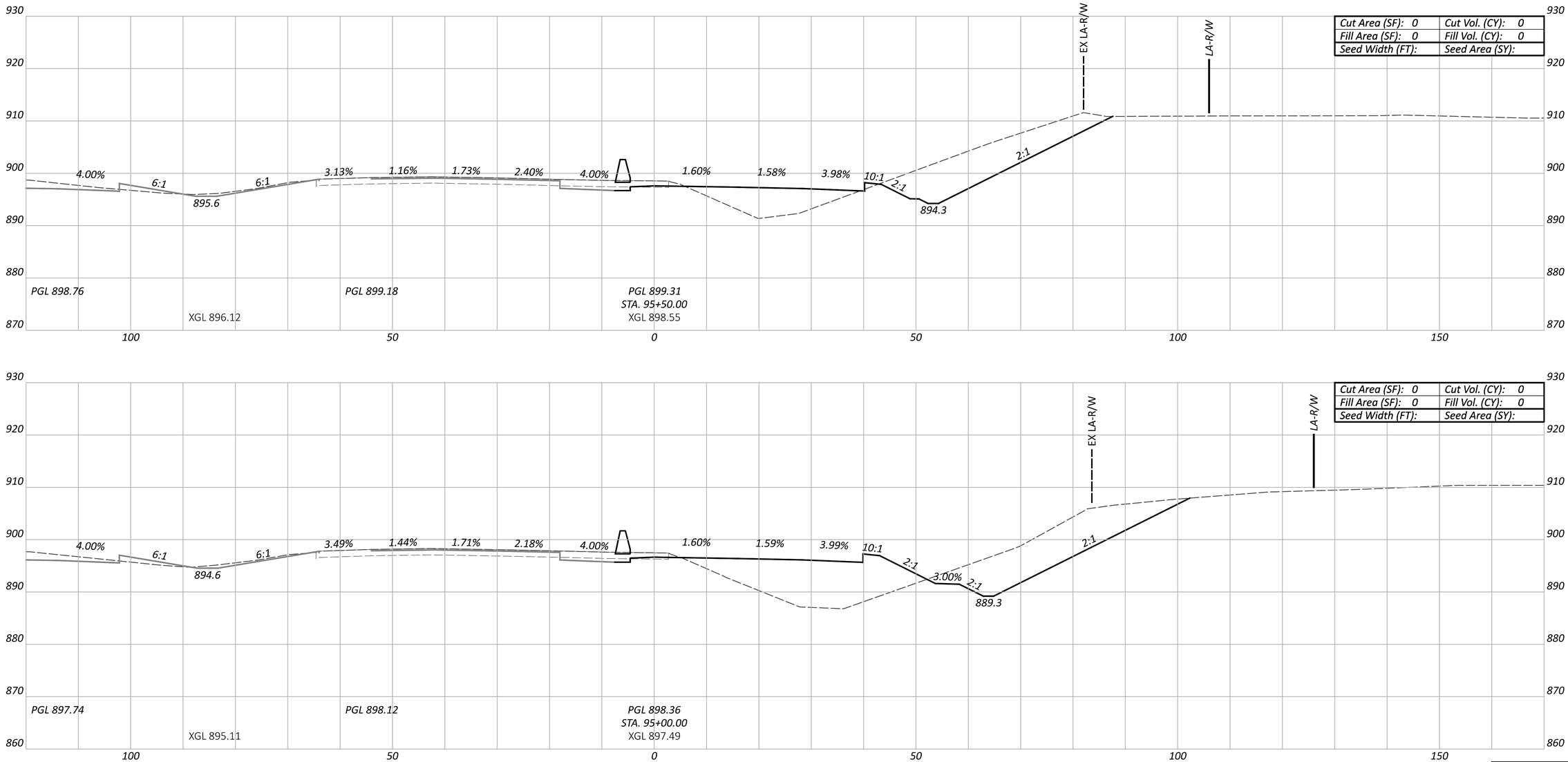
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.634 TOTAL 740



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FAI/LIC IR 70 0.00/0.00

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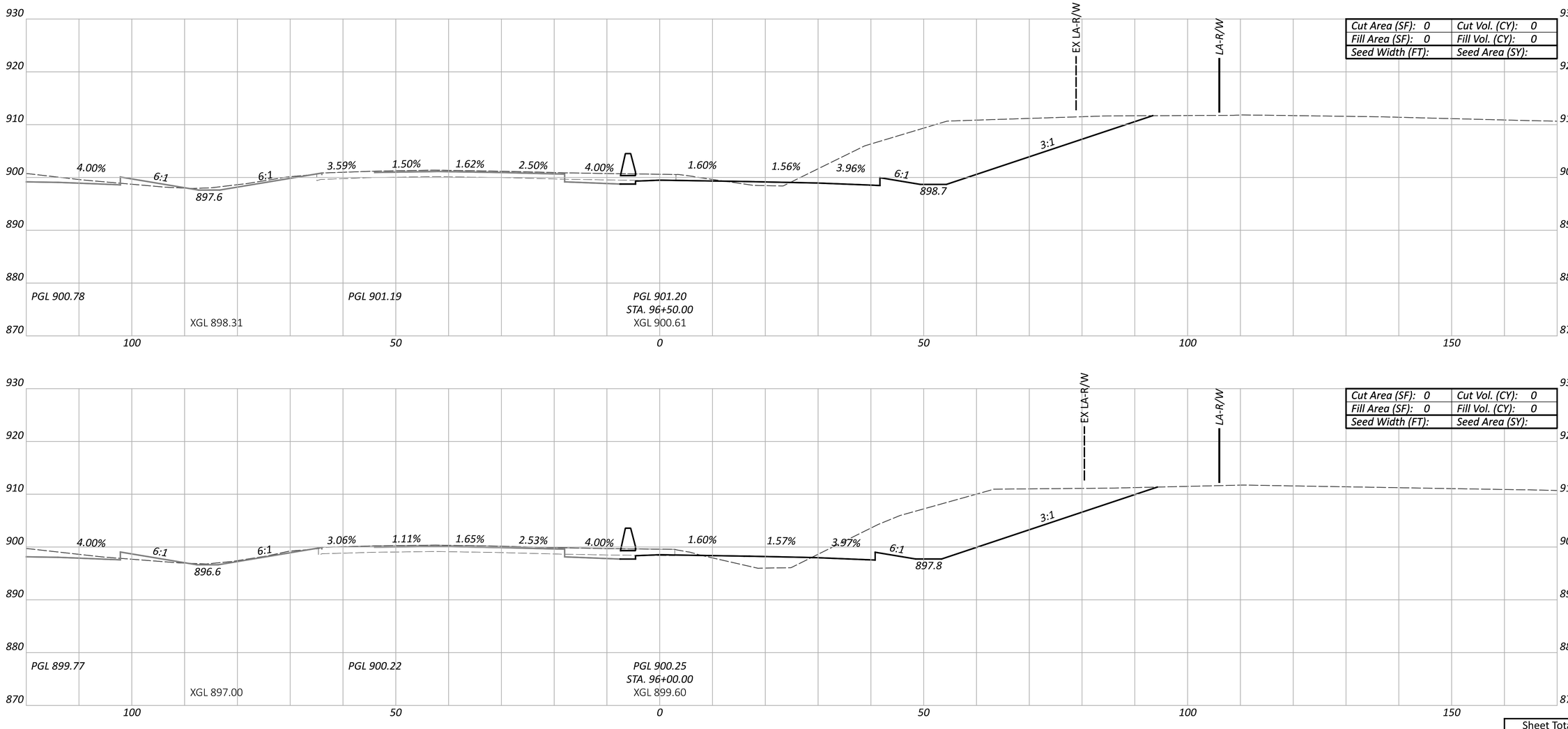
Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.635
TOTAL	740



CROSS SECTIONS - RAMP K
STA. 96+00.00 TO STA. 96+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.636 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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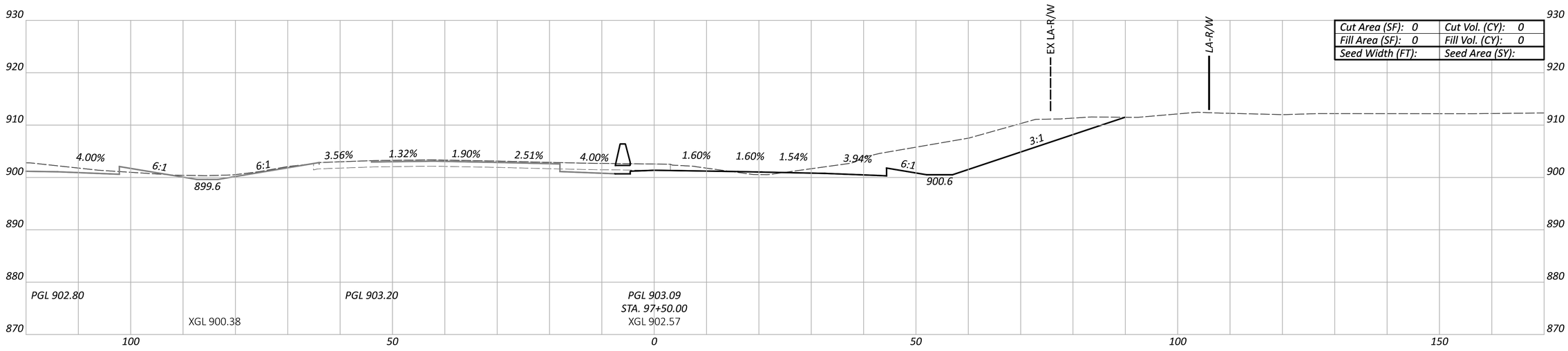

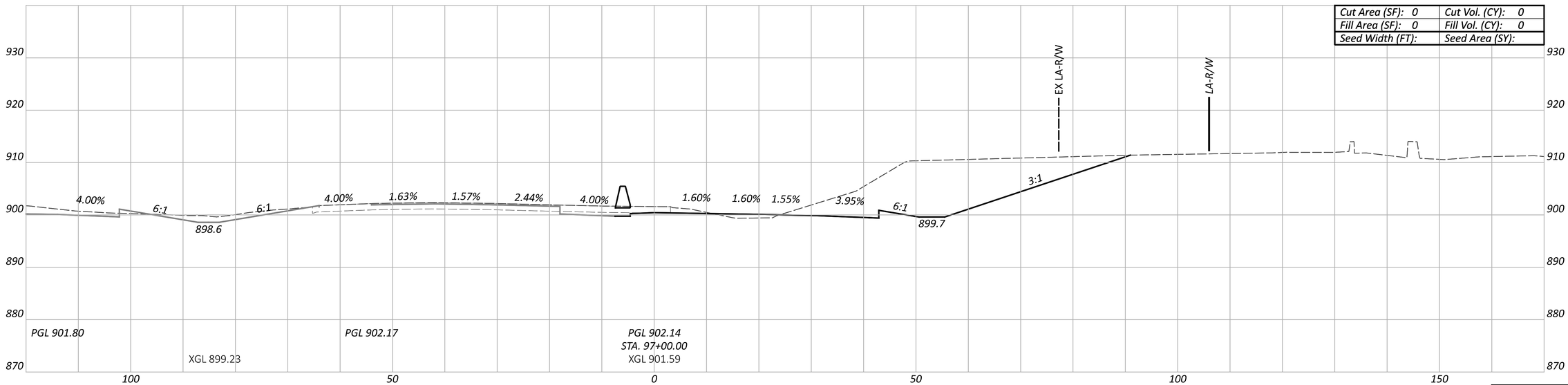

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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

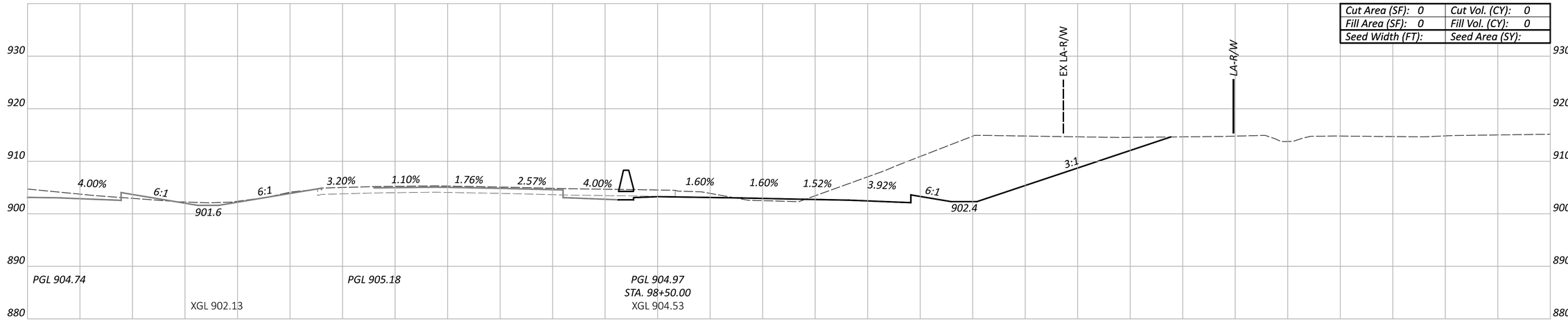
DESIGNER
BER

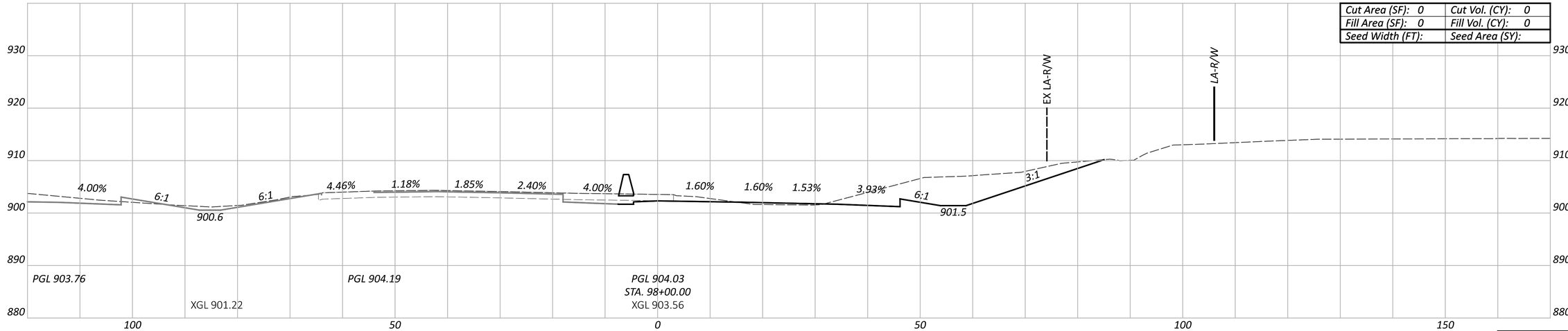
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.637	740





CROSS SECTIONS - RAMP K
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.638 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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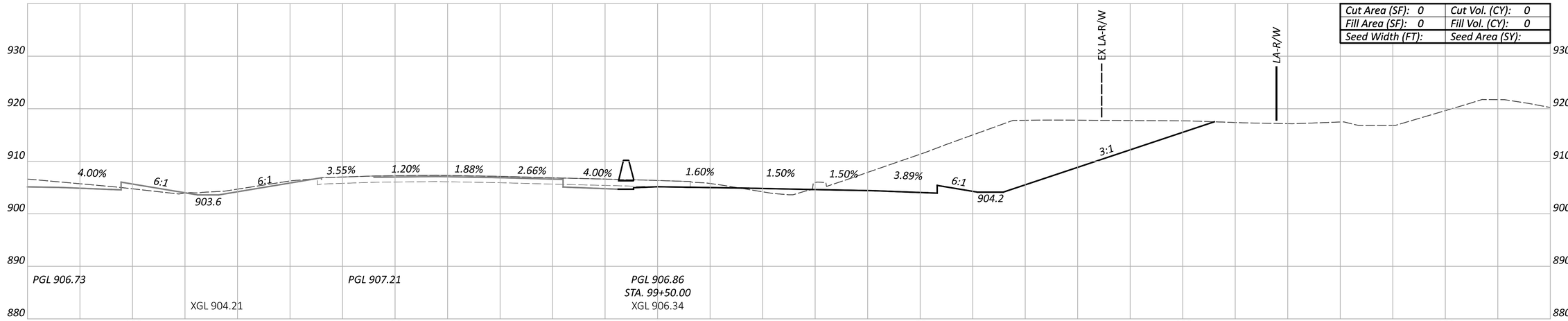

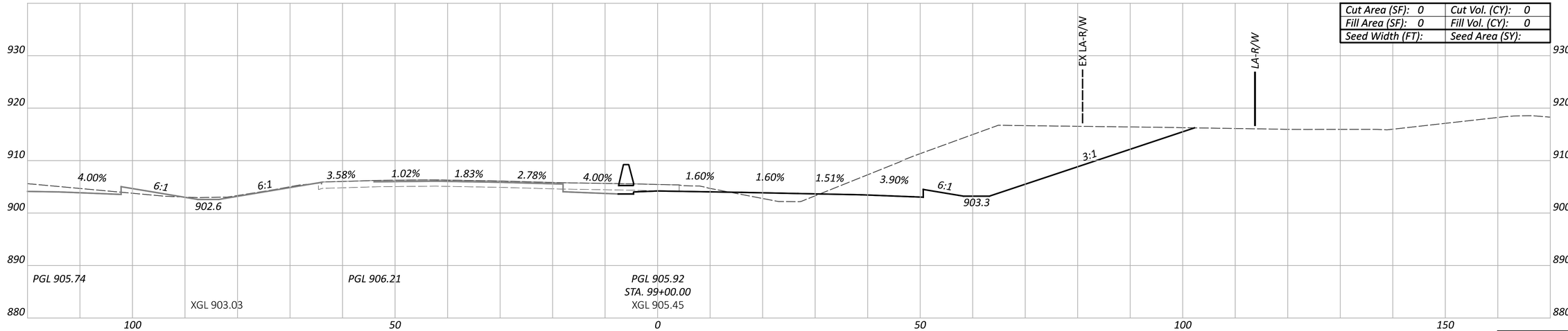

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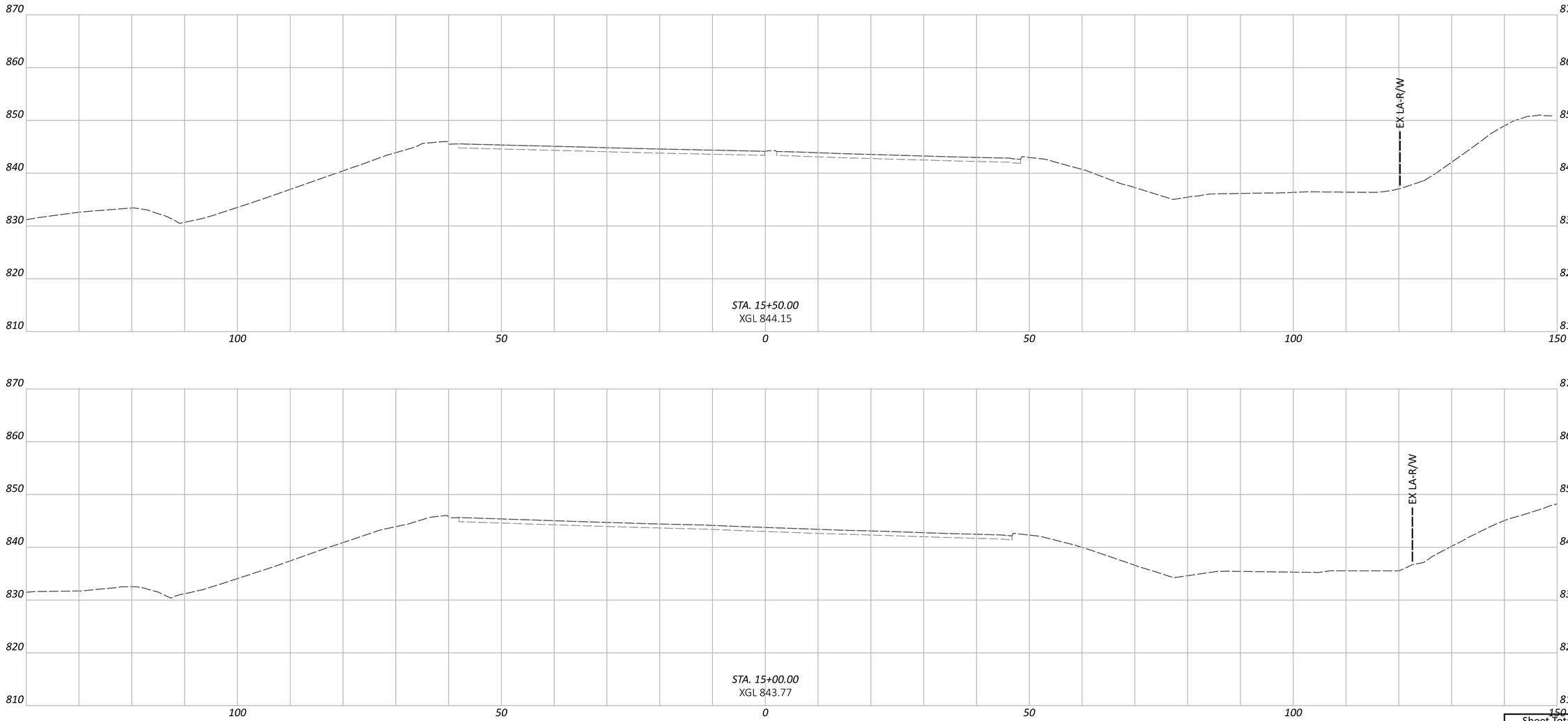
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.639
TOTAL	740

Sheet Totals

Seeding	Cut	Fill



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CROSS SECTIONS - SR 256
STA. 15+00.00 TO STA. 15+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

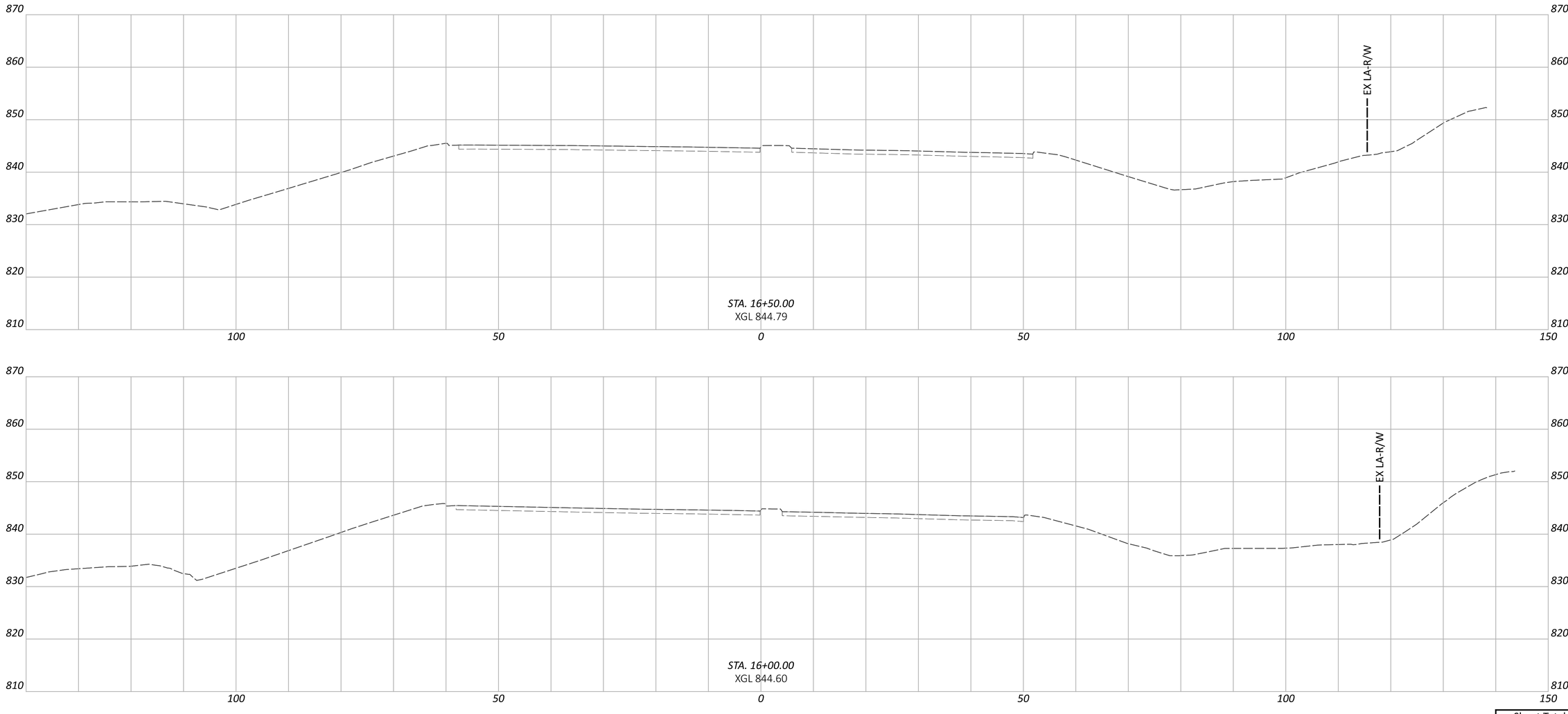
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.644	740



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Sheet Totals		
Seeding	Cut	Fill

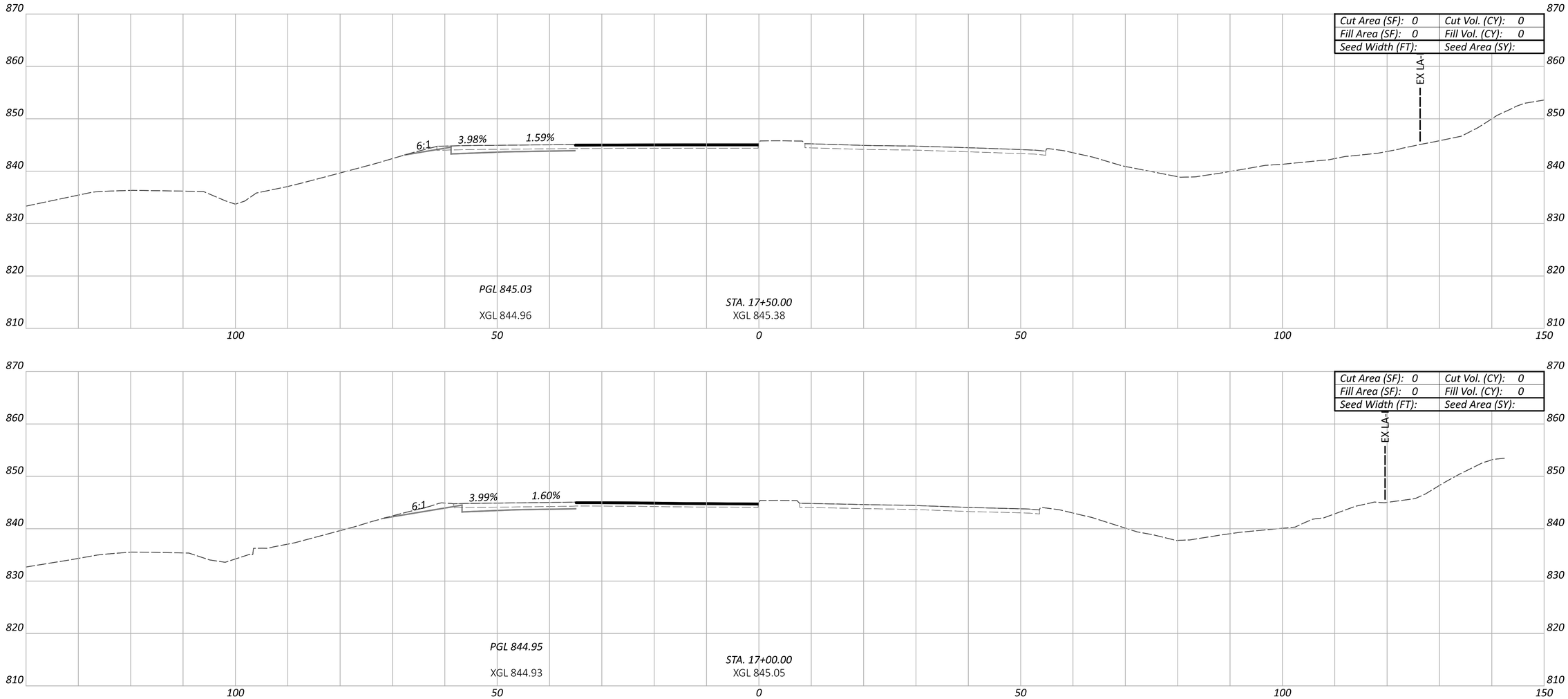
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.645 | TOTAL 740



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CROSS SECTIONS - SR 256
STA. 17+00.00 TO STA. 17+50.00

Sheet Totals		
Seeding	Cut	Fill

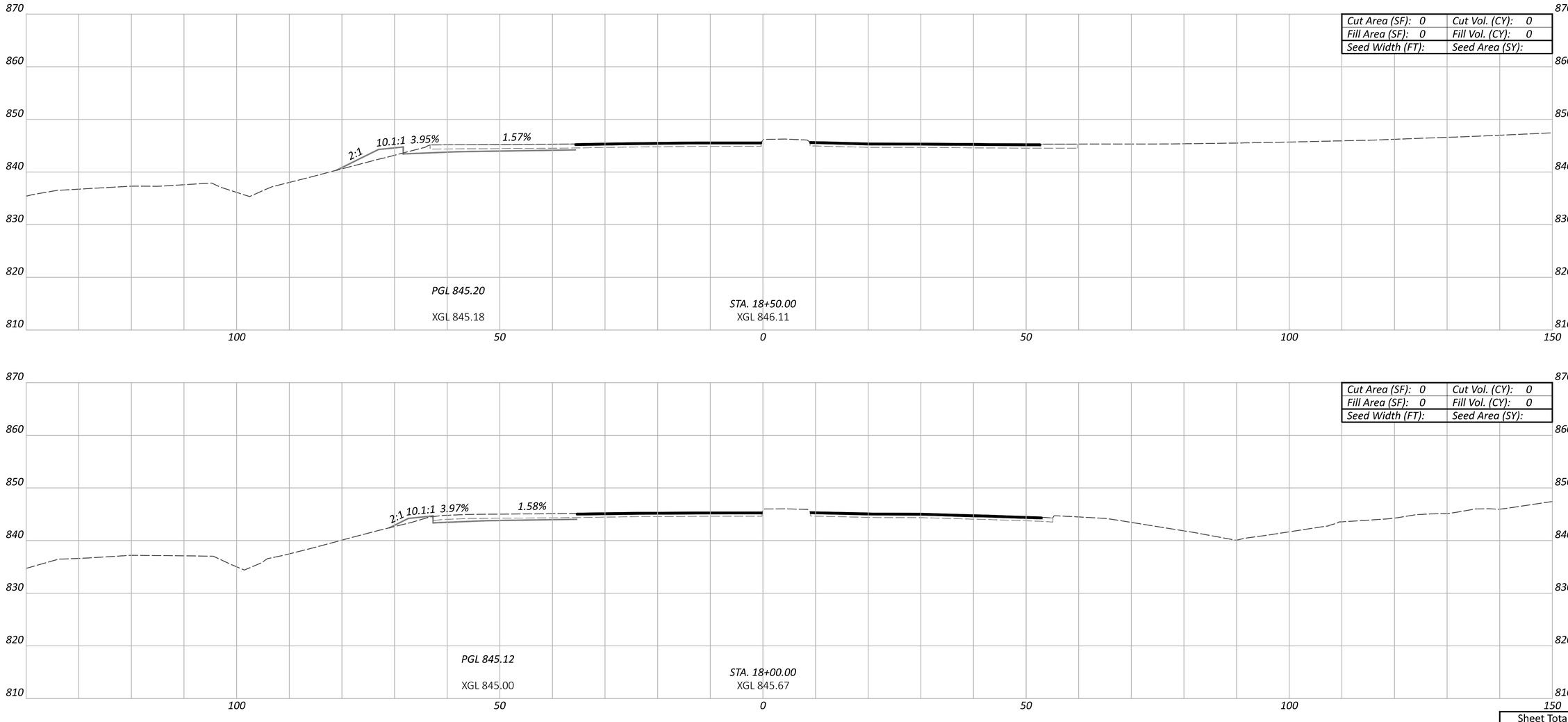
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.646	740



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Sheet Totals		
Seeding	Cut	Fill

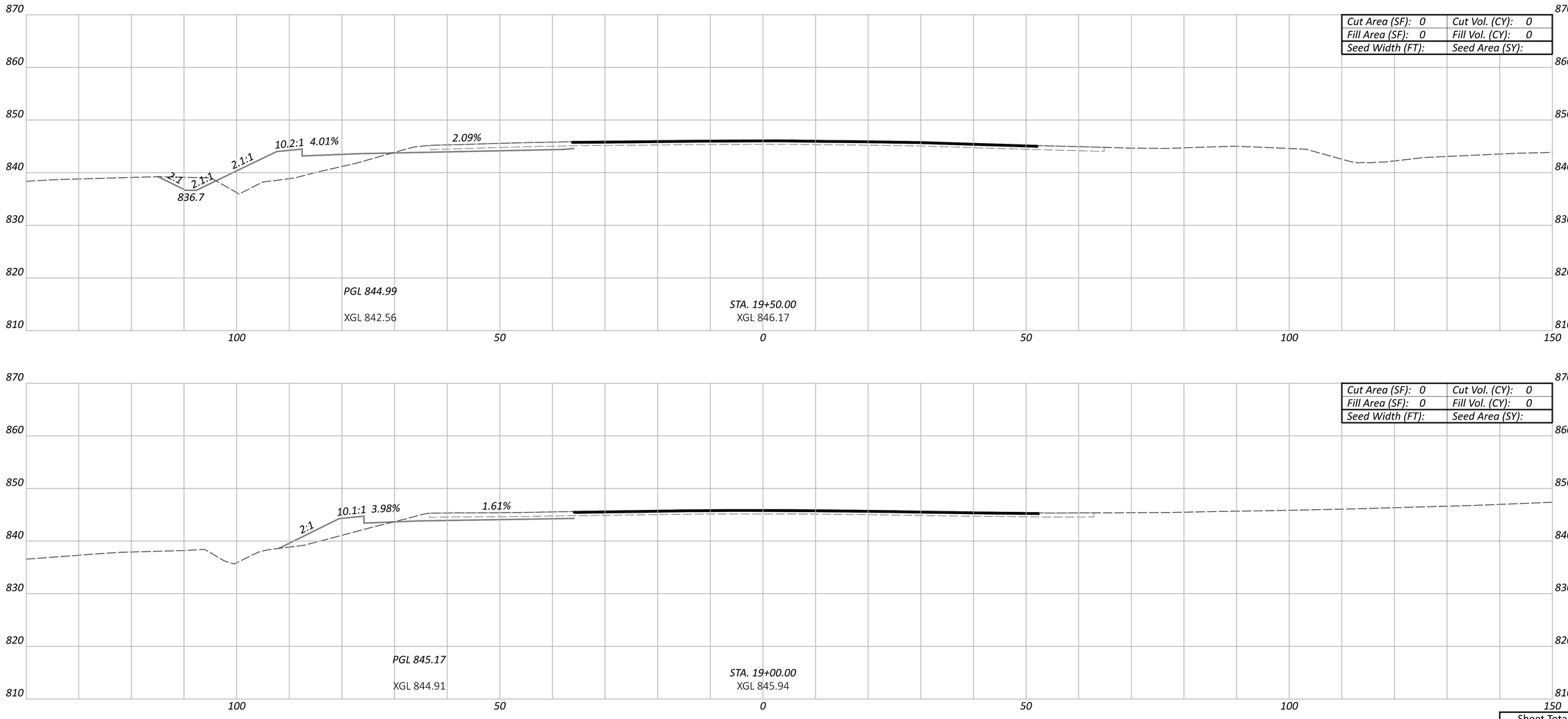
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.647 TOTAL 740



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CROSS SECTIONS - SR 256
STA. 19+00.00 TO STA. 19+50.00

Sheet Totals		
Seeding	Cut	Fill

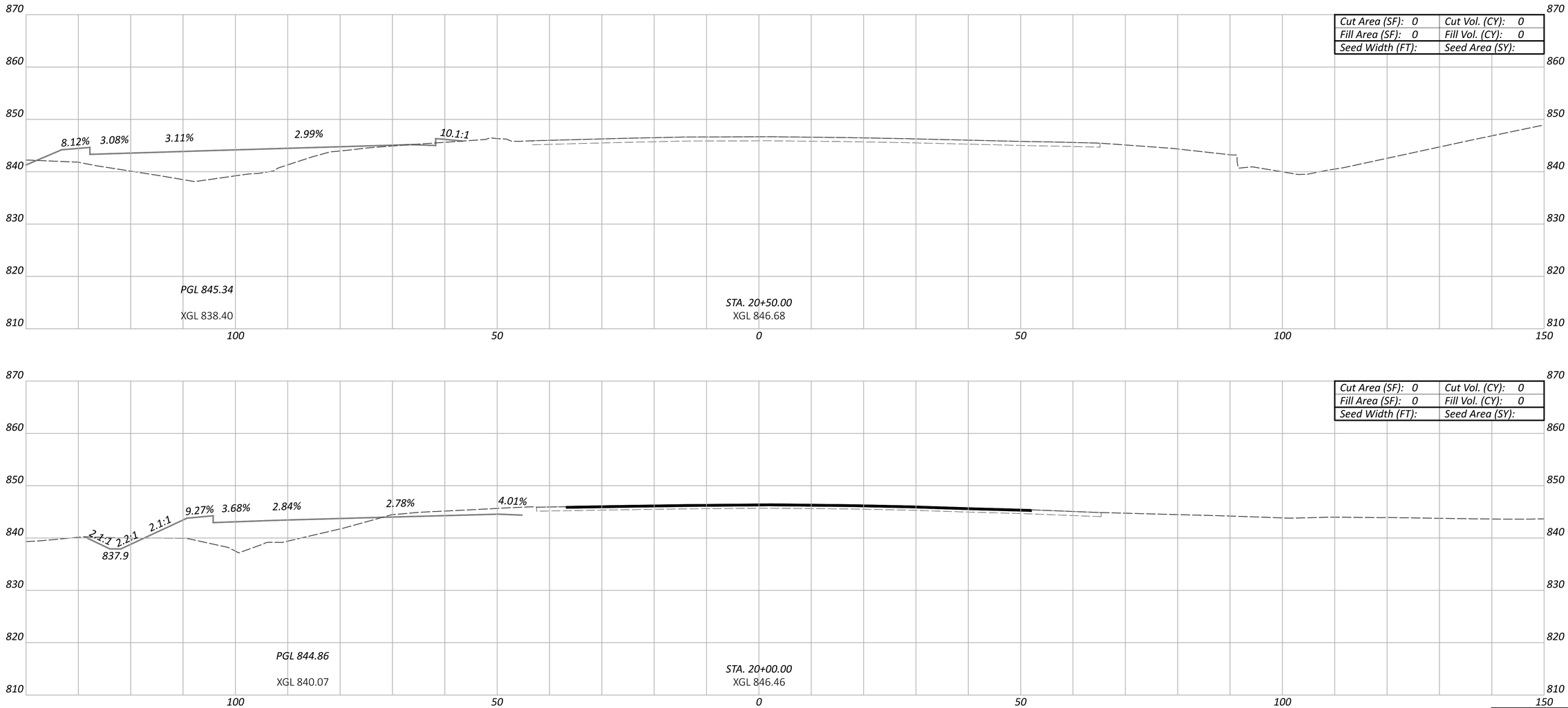
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.648	740



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DESIGN AGENCY
STRUCTUREPOINT INC.

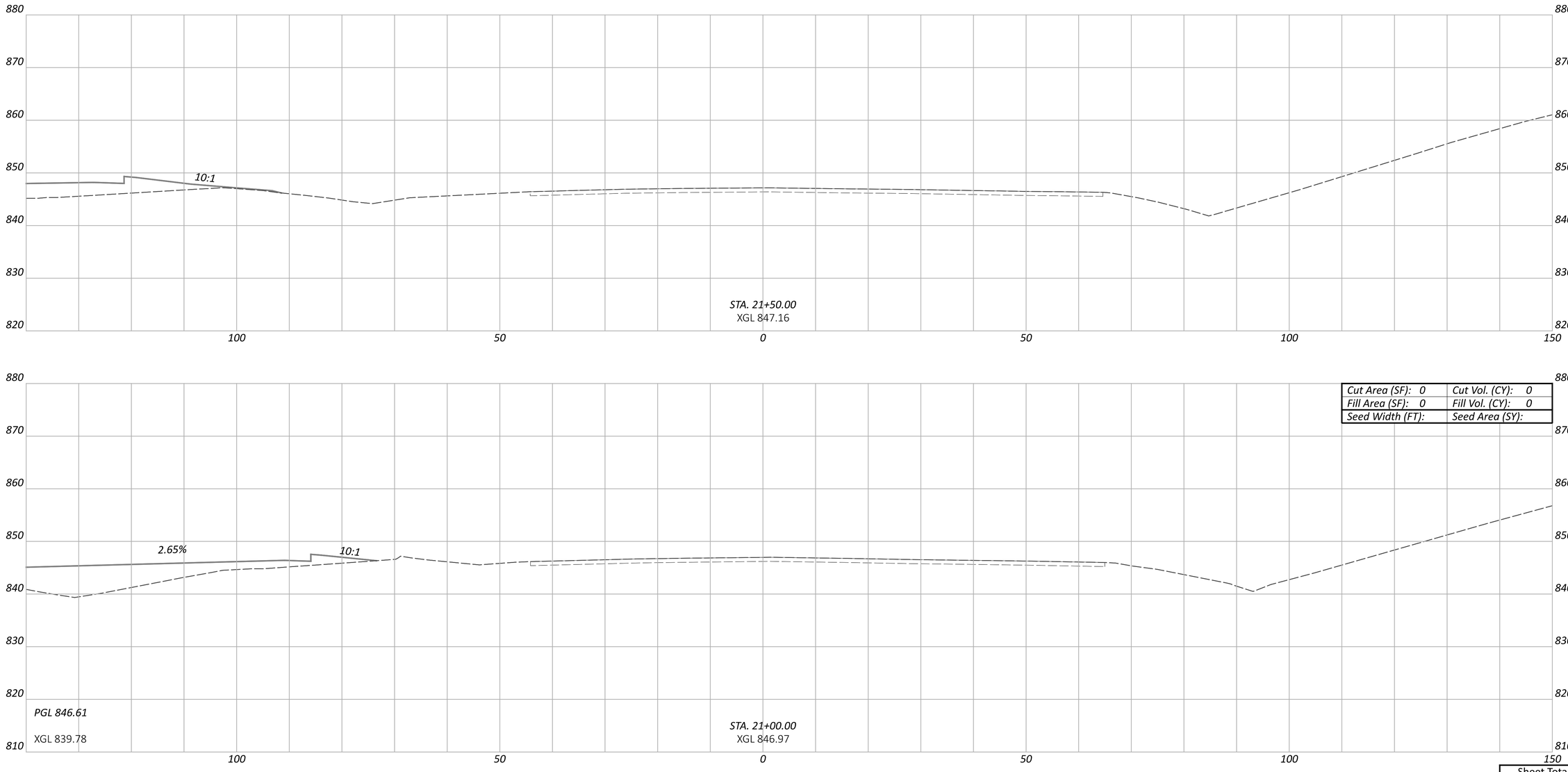
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.649	740



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CROSS SECTIONS - SR 256
STA. 21+00.00 TO STA. 21+50.00

DESIGN AGENCY
STRUCTUREPOINT

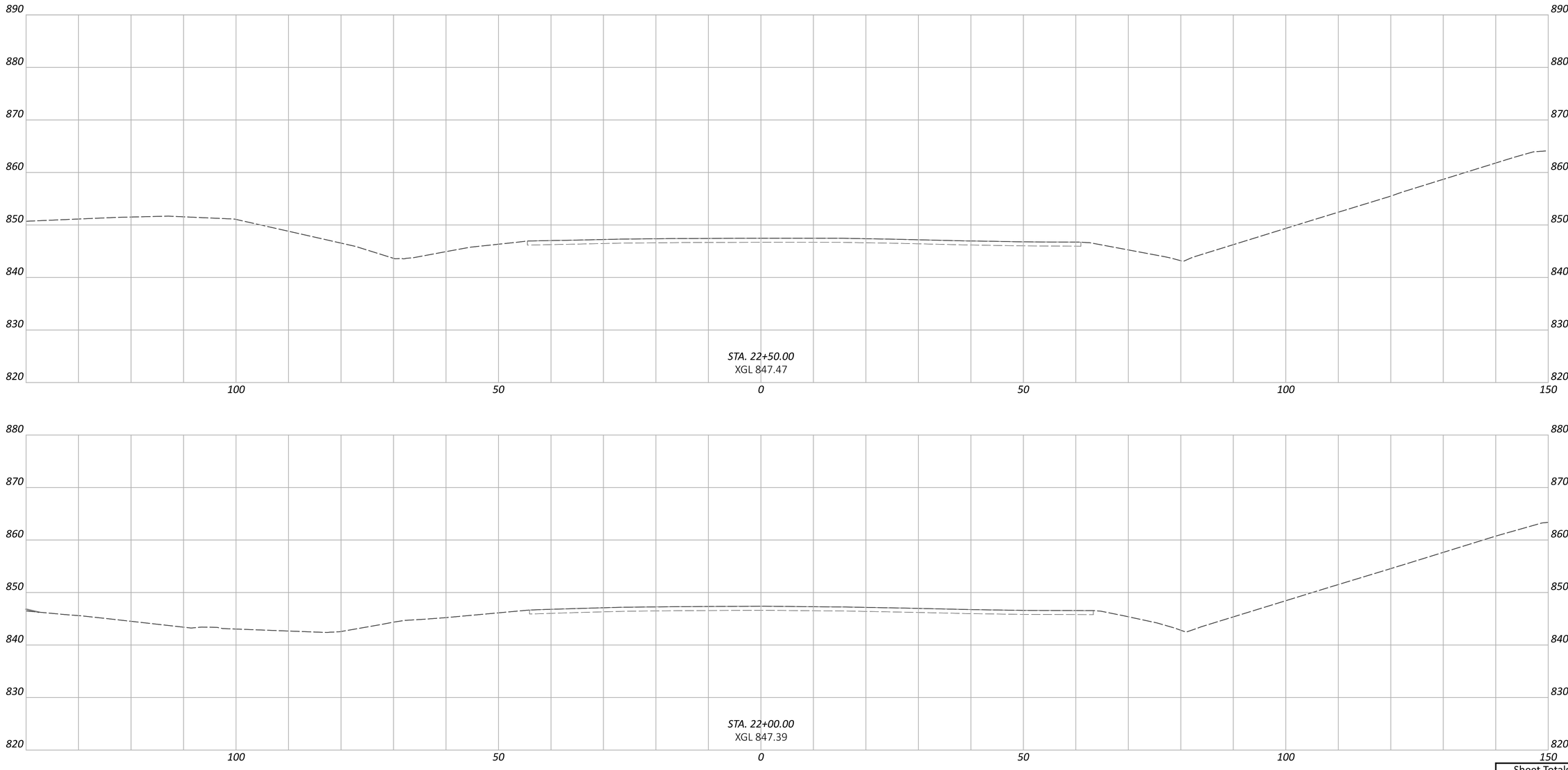
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.650	740



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CROSS SECTIONS - SR 256
STA. 22+00.00 TO STA. 22+50.00

DESIGN AGENCY
STRUCTUREPOINT

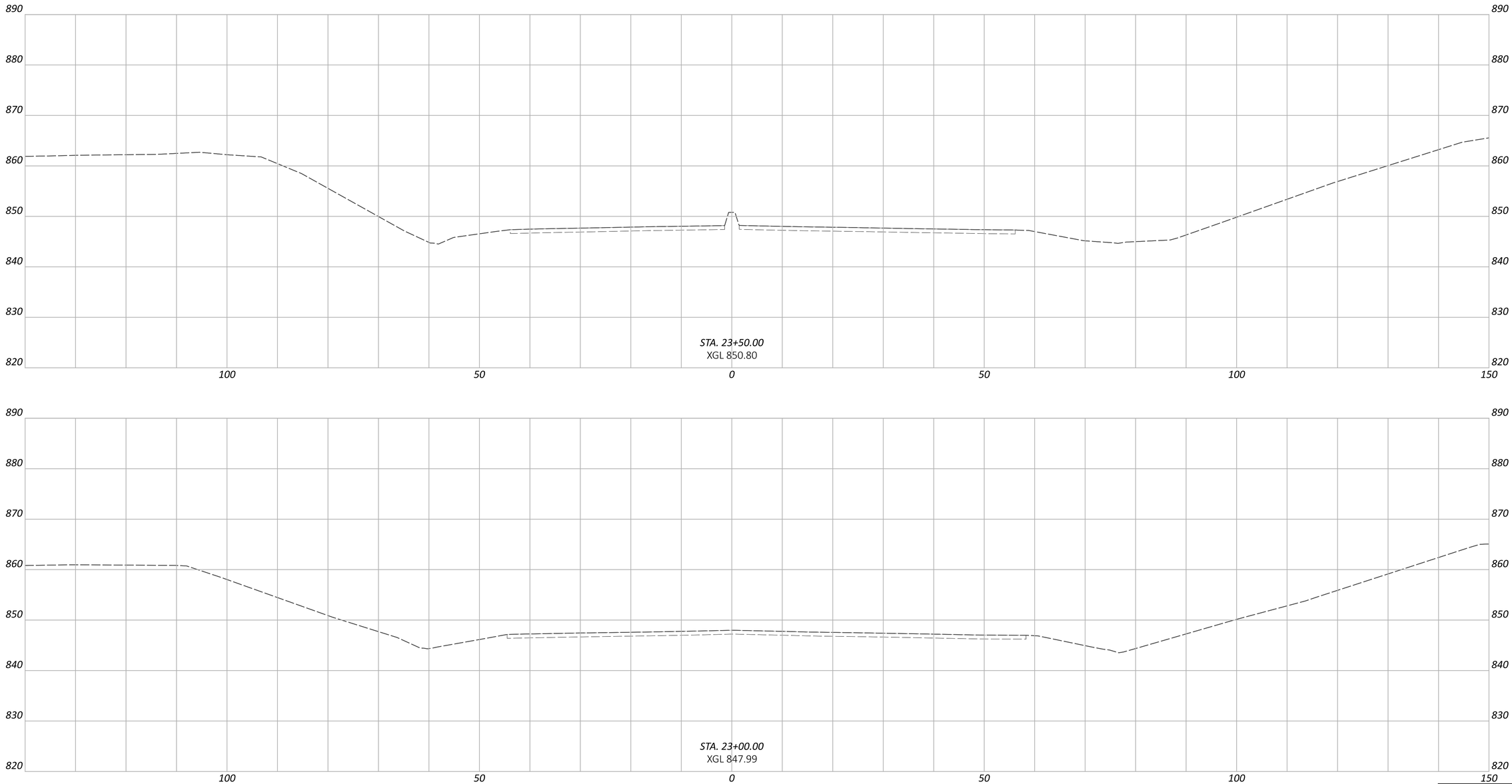
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.651	740



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CROSS SECTIONS - SR 256
STA. 23+00.00 TO STA. 23+50.00

DESIGN AGENCY
STRUCTUREPOINT

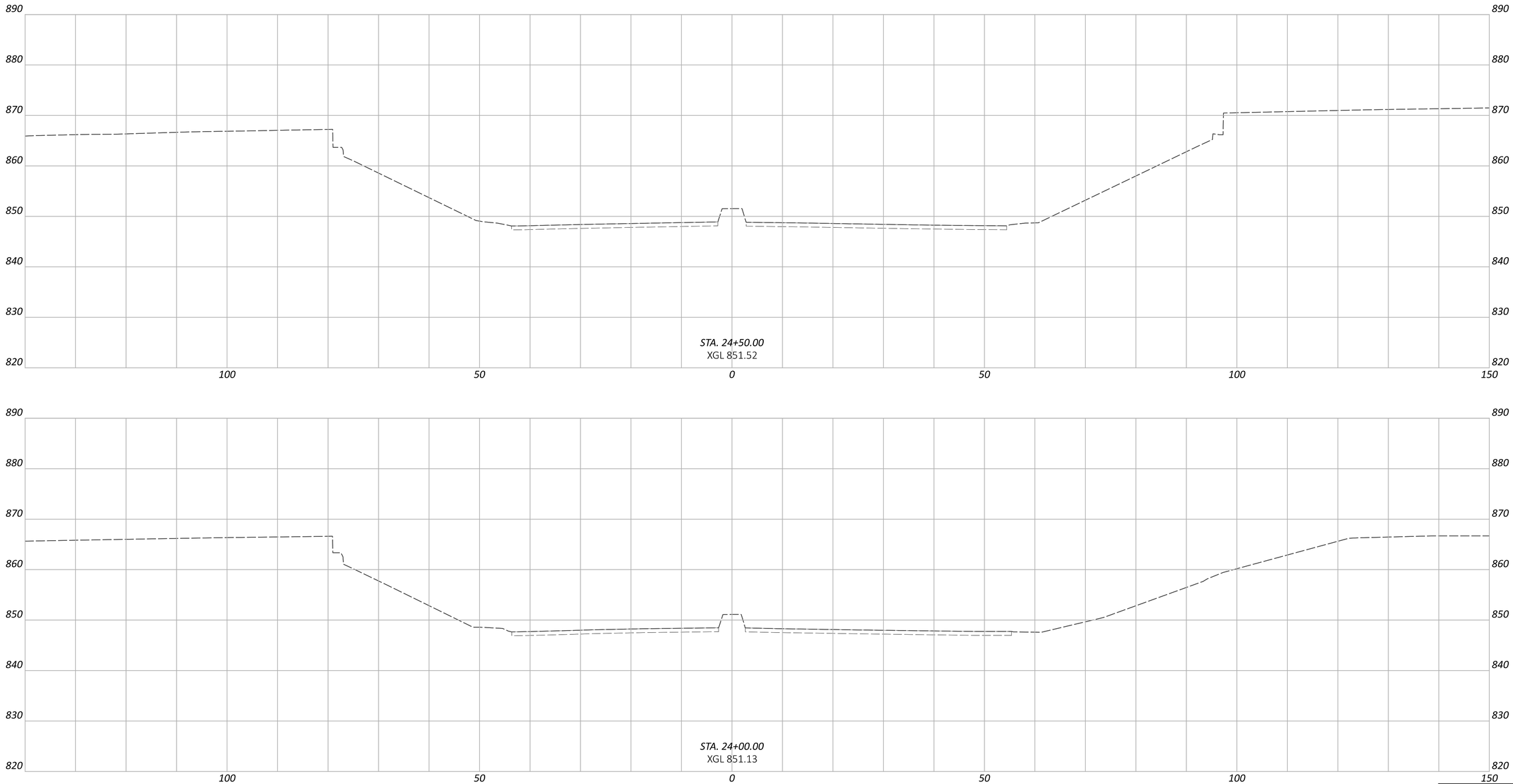
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.652	740



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CROSS SECTIONS - SR 256
STA. 24+00.00 TO STA. 24+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

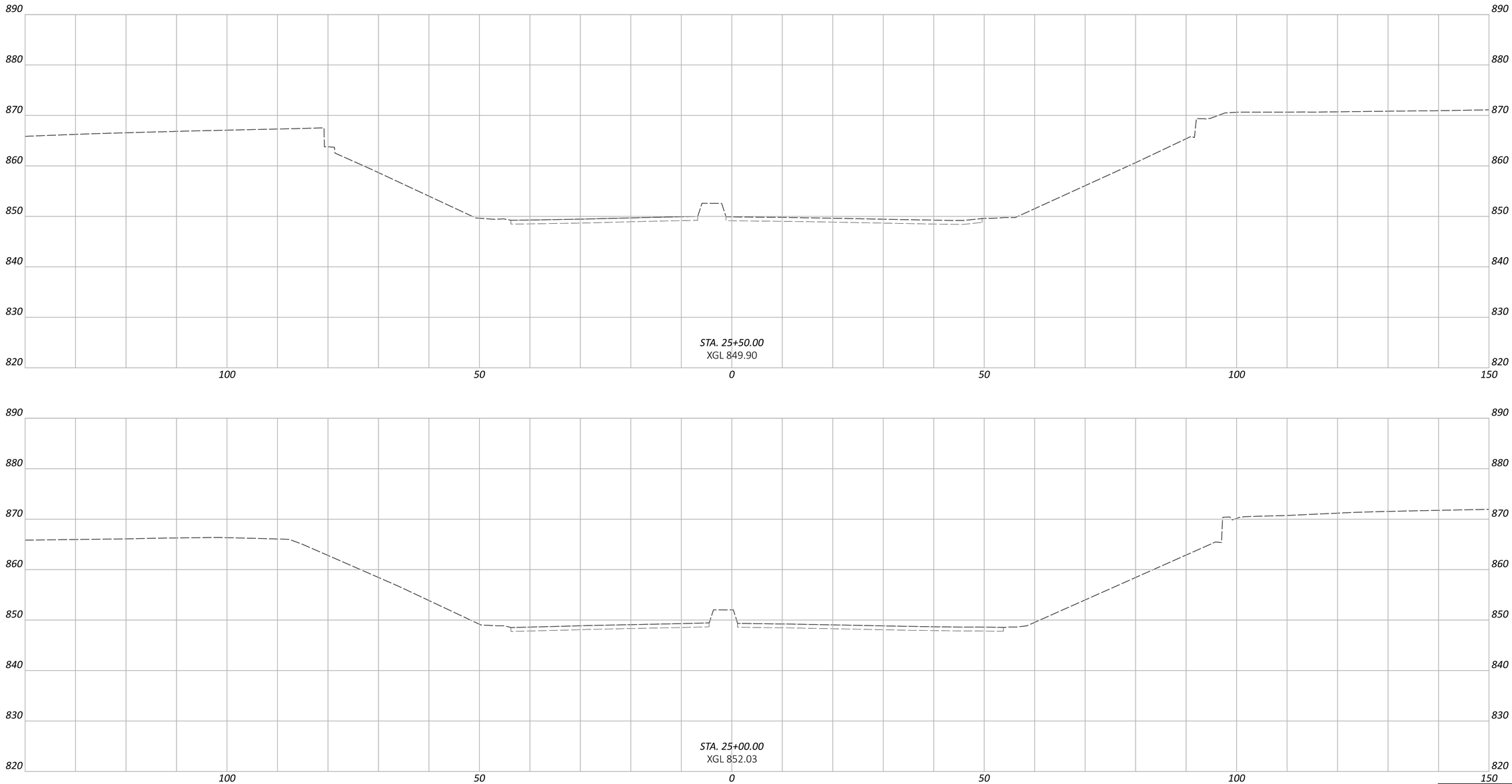
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.653	740



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CROSS SECTIONS - SR 256
STA. 25+00.00 TO STA. 25+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

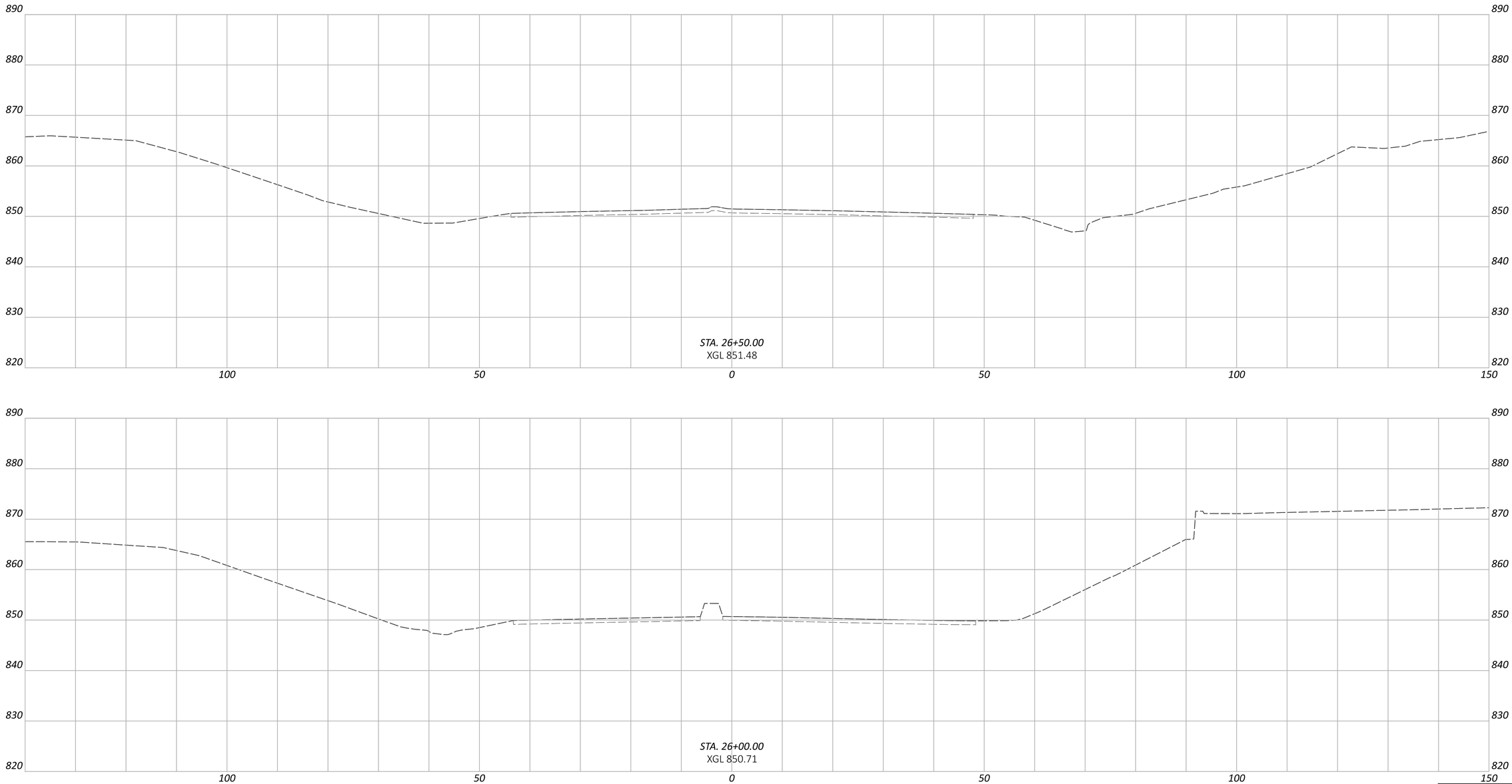
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.654	740



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CROSS SECTIONS - SR 256
STA. 26+00.00 TO STA. 26+50.00

DESIGN AGENCY
STRUCTUREPOINT

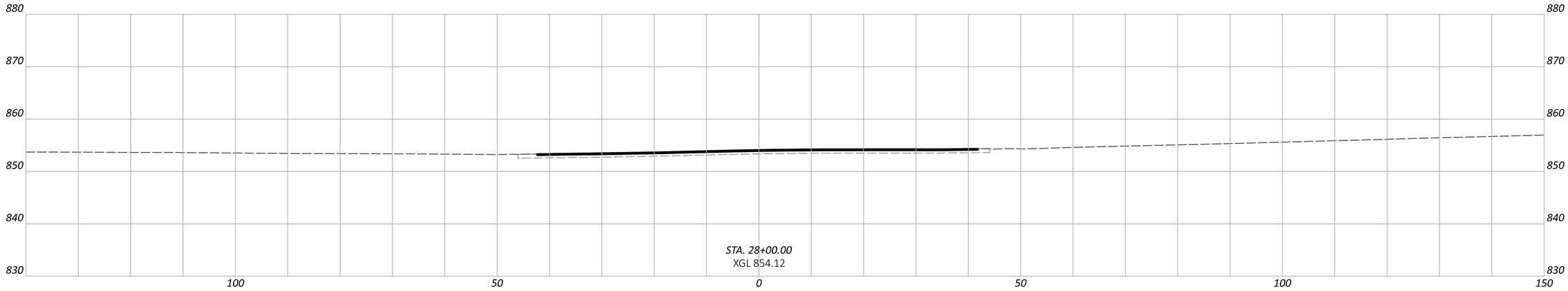
DESIGNER
BER

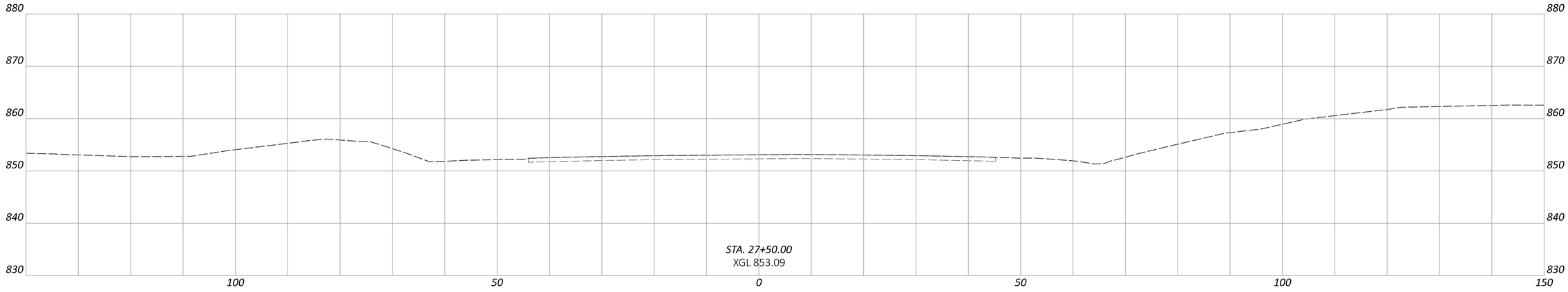
REVIEWER
KAM 06/18/23

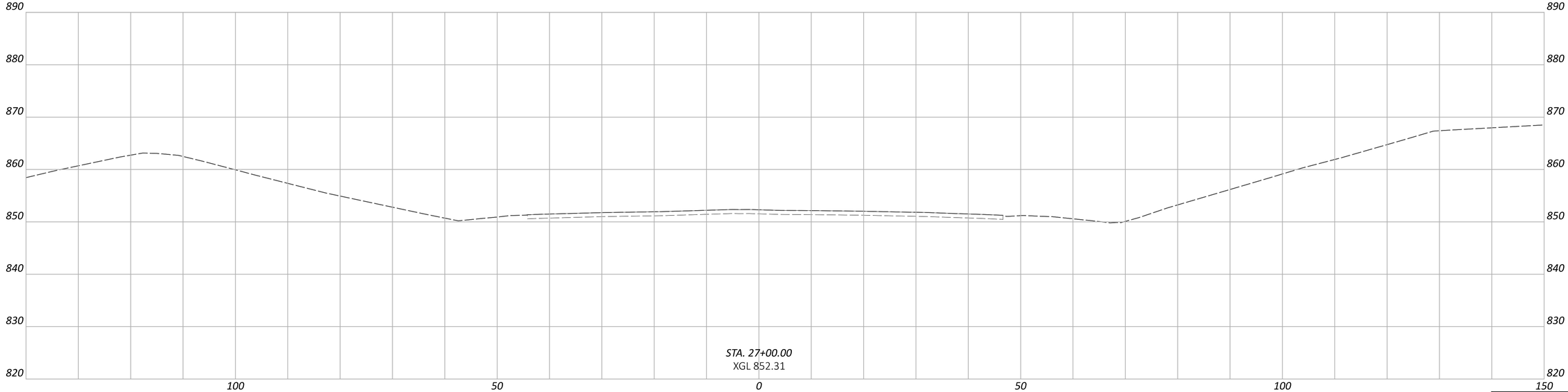
PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.655	740







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FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

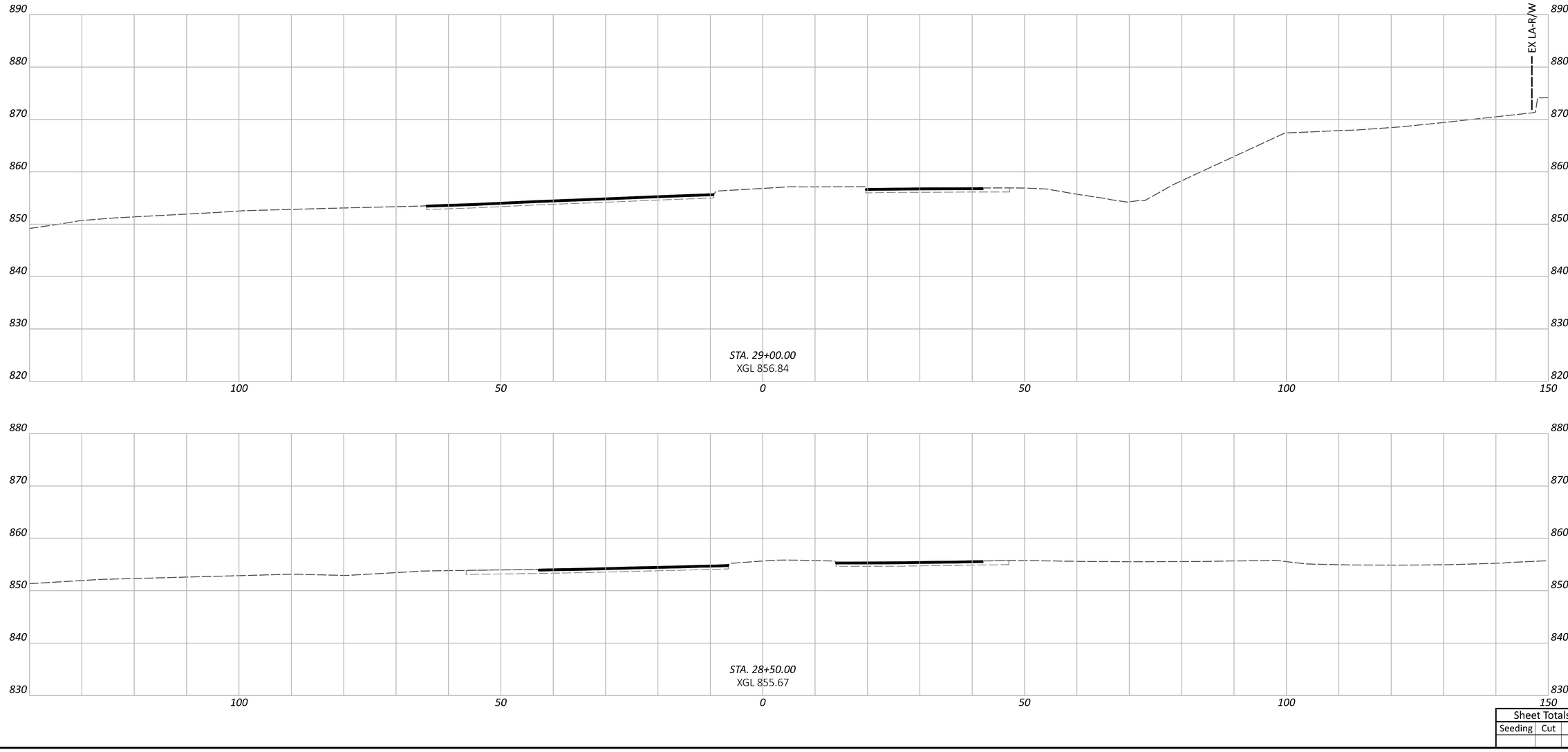
DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.656 TOTAL 740



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CROSS SECTIONS - SR 256
STA. 28+50.00 TO STA. 29+00.00

Sheet Totals		
Seeding	Cut	Fill

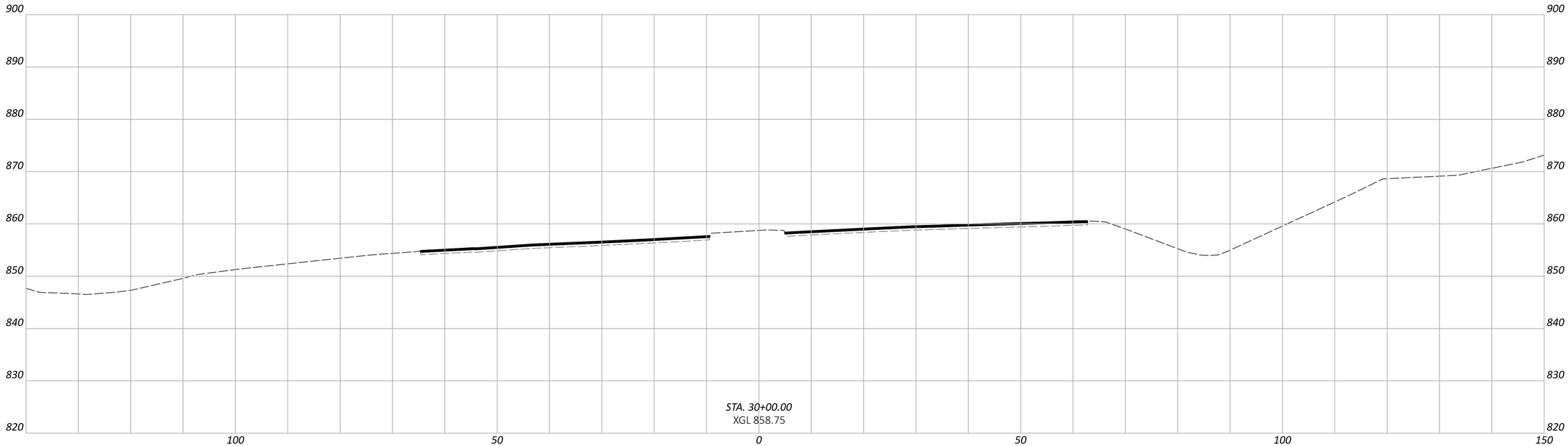
DESIGN AGENCY
STRUCTUREPOINT LLC

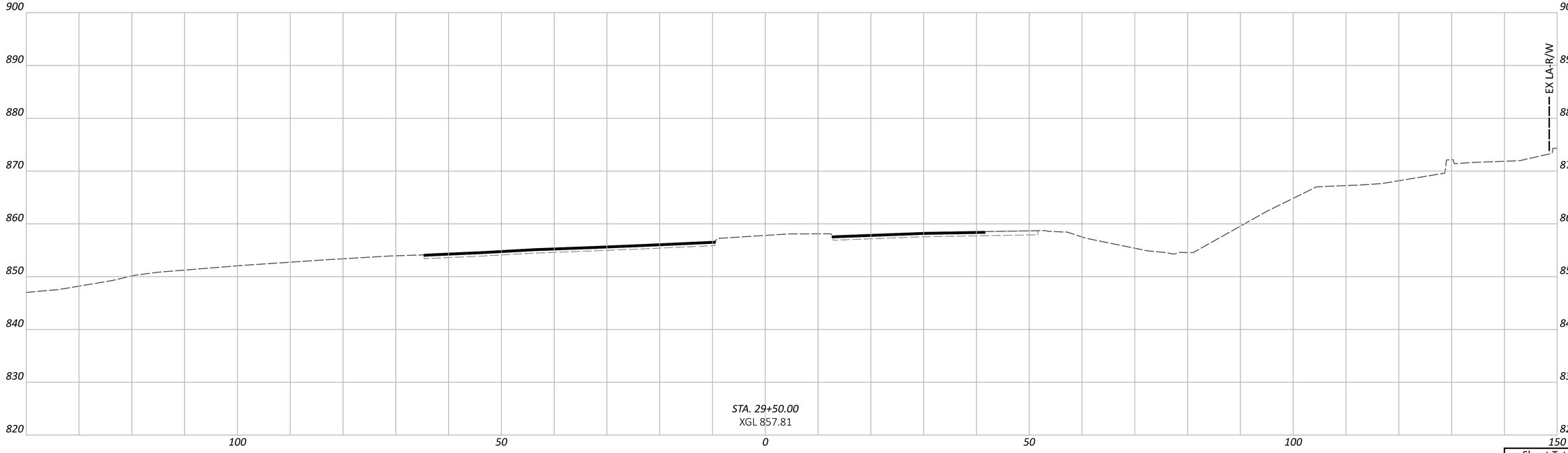
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.657	740





CROSS SECTIONS - SR 256
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FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

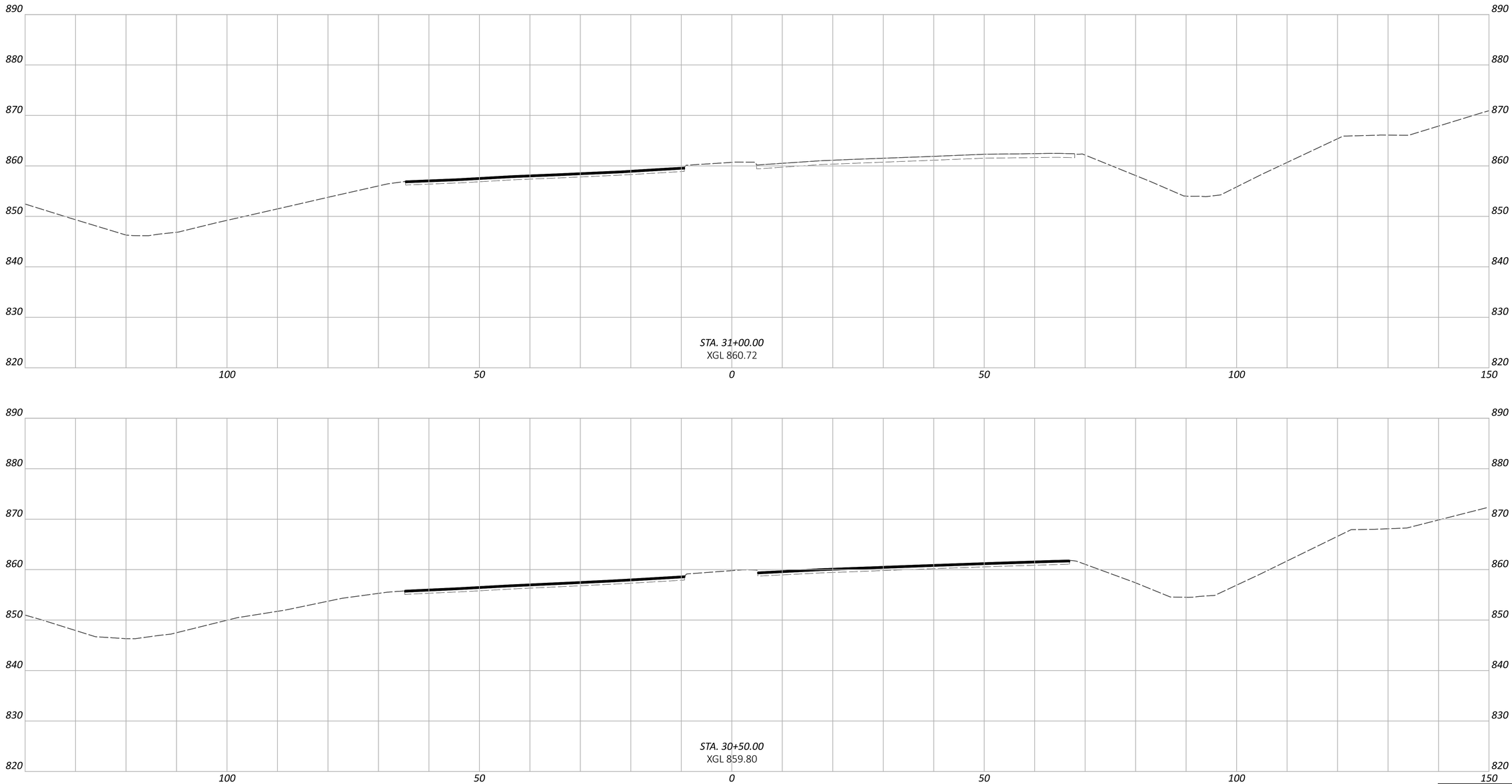
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.658 TOTAL 740



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CROSS SECTIONS - SR 256
STA. 30+50.00 TO STA. 31+00.00

DESIGN AGENCY
STRUCTUREPOINT

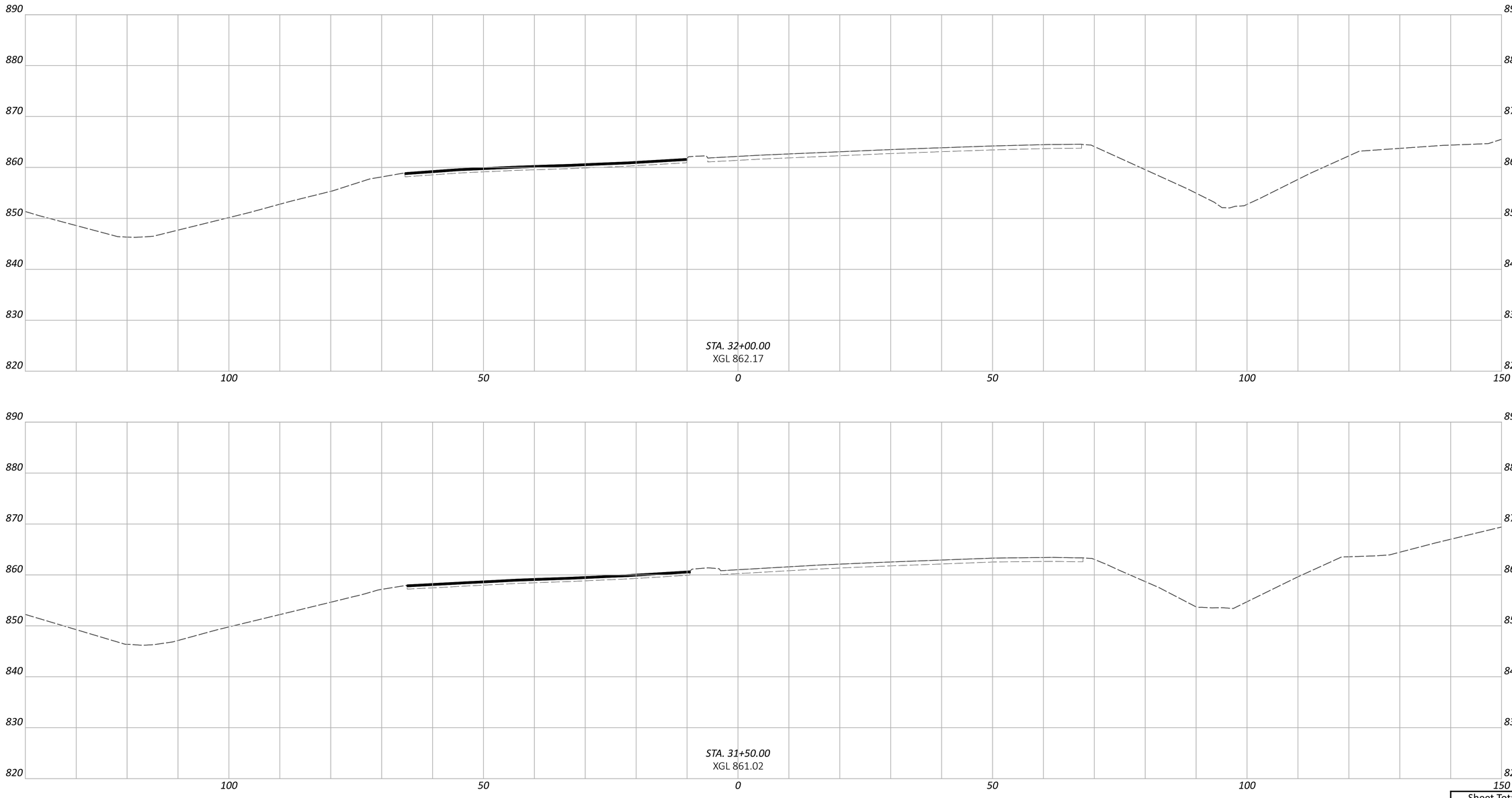
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.659	740



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CROSS SECTIONS - SR 256
STA. 31+50.00 TO STA. 32+00.00

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
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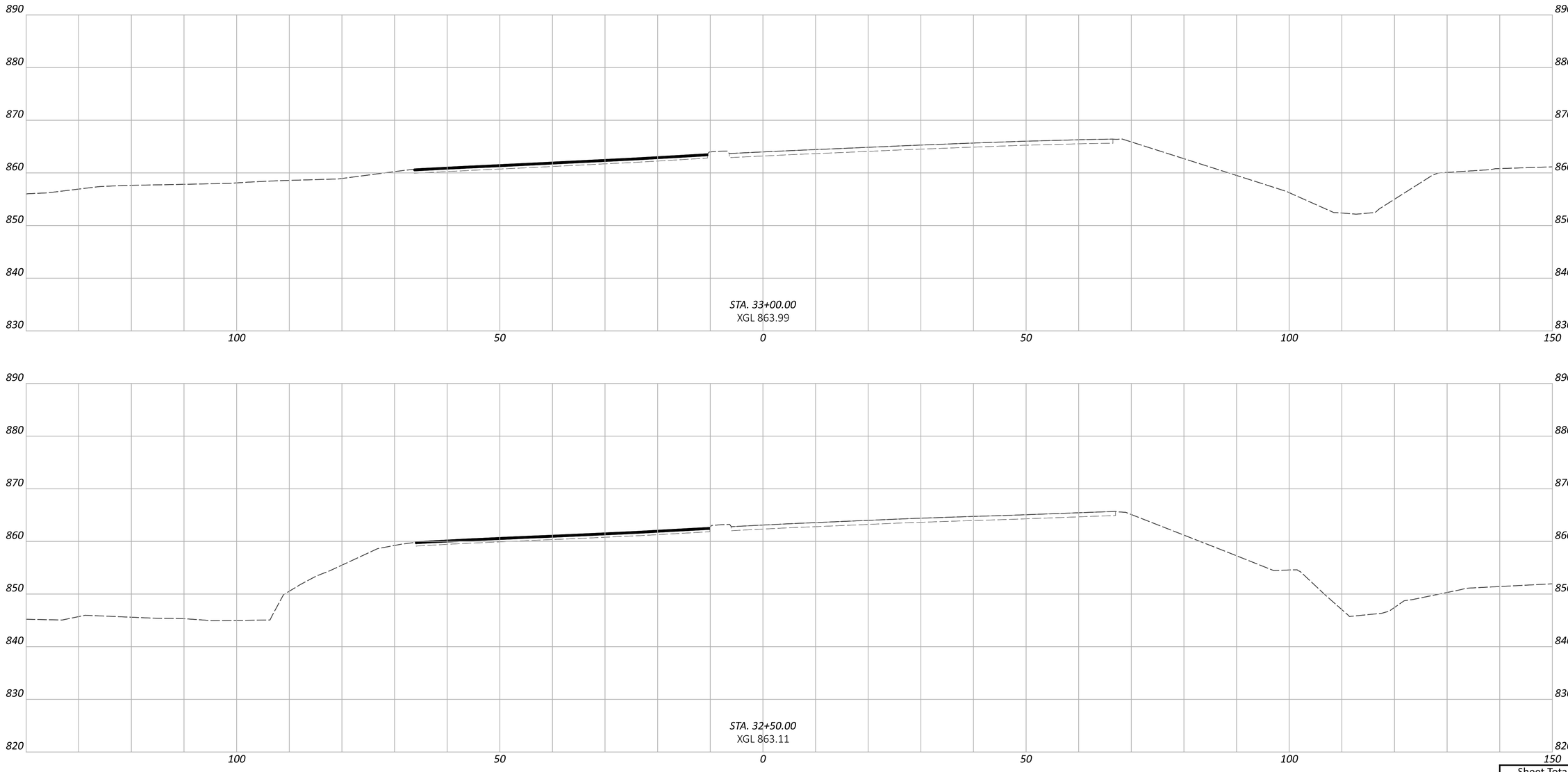
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.660	740



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STA. 32+50.00 TO STA. 33+00.00

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DESIGN AGENCY
STRUCTUREPOINT LLC

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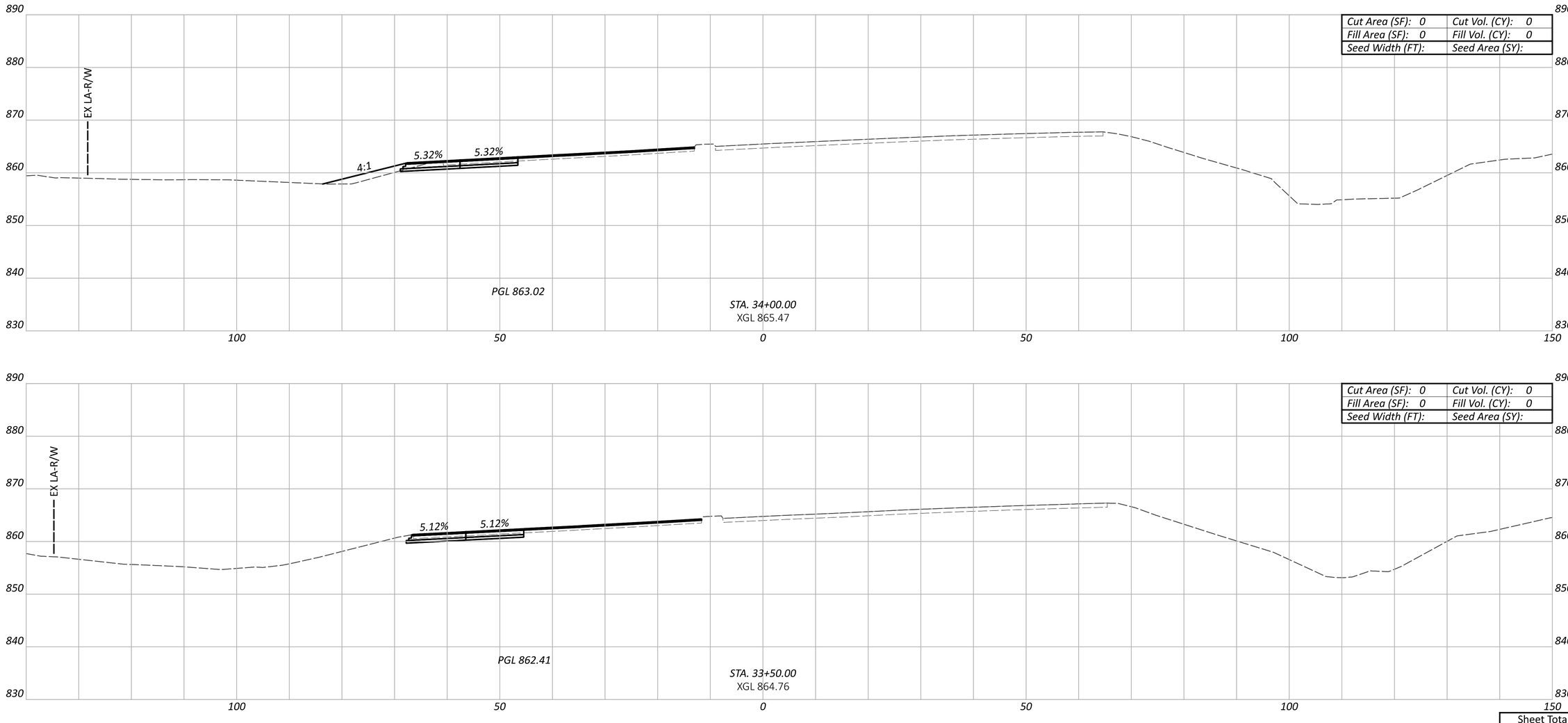
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.661	740



Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - SR 256
STA. 33+50.00 TO STA. 34+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.662 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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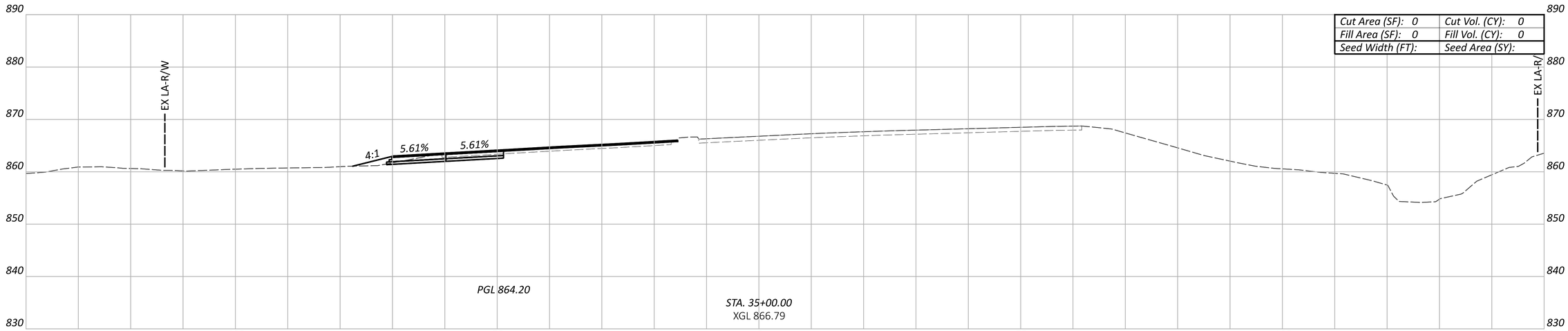

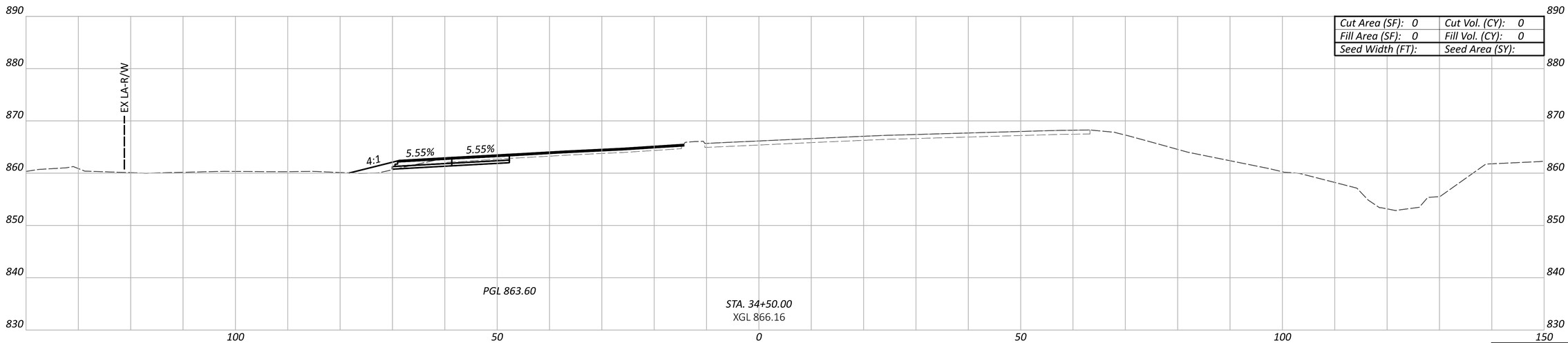

CROSS SECTIONS - SR 256
STA. 34+50.00 TO STA. 35+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

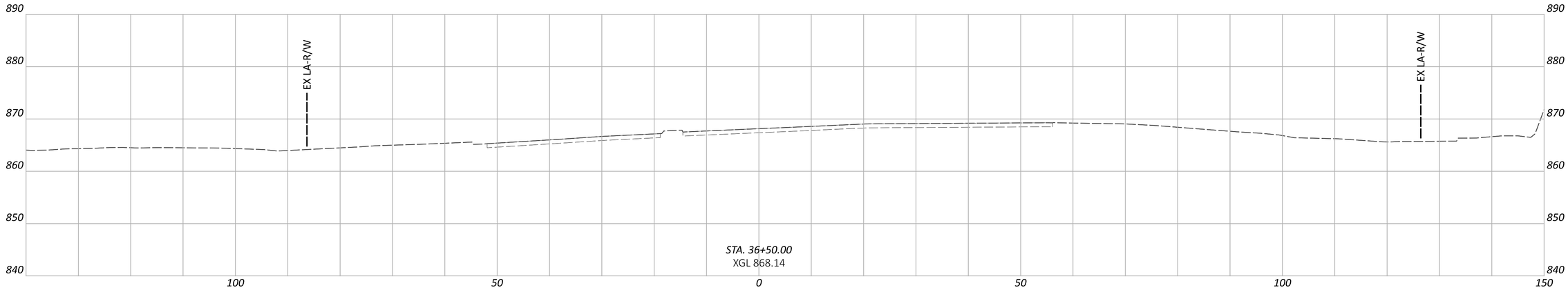
DESIGN AGENCY
STRUCTUREPOINT INC.

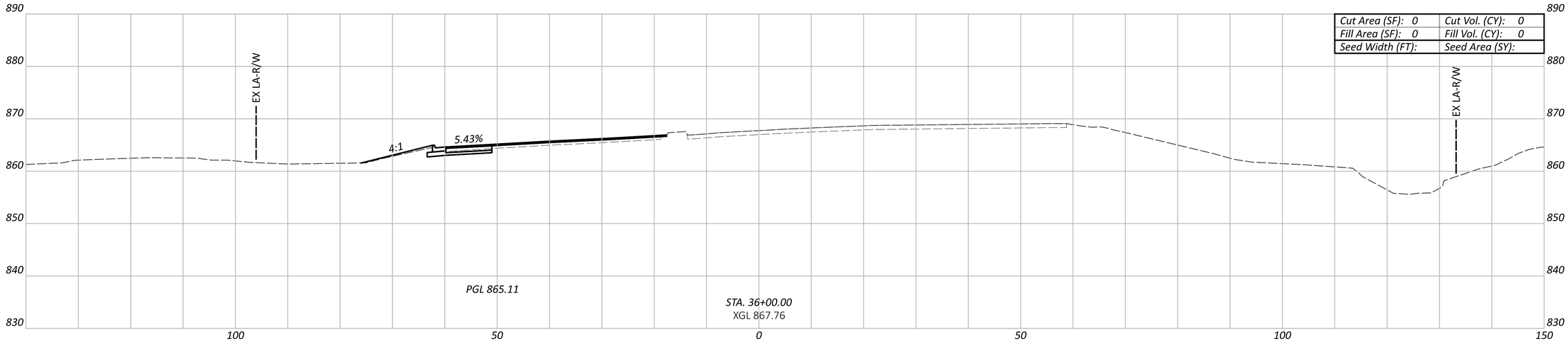
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.663 TOTAL 740





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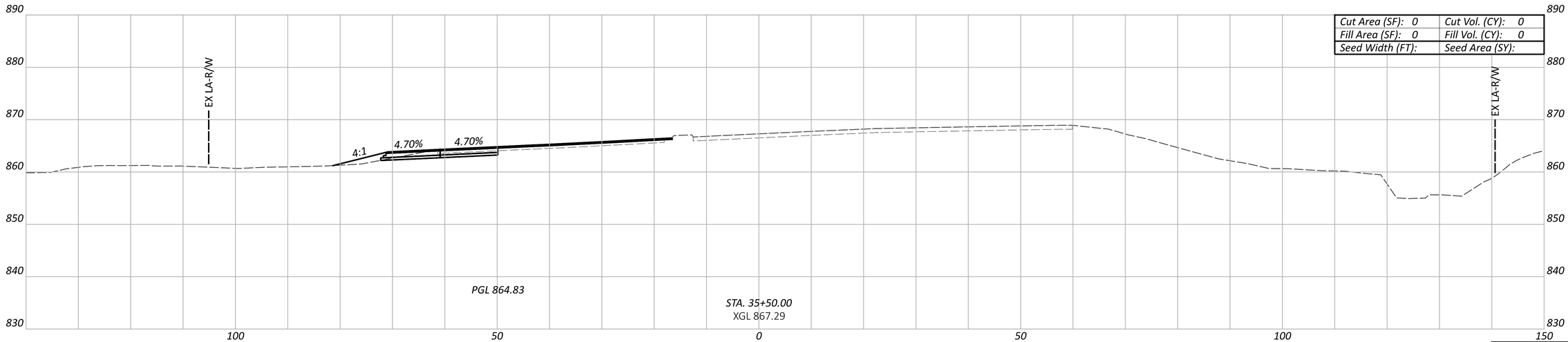

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - SR 256
STA. 35+50.00 TO STA. 36+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.664 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - SR 256
STA. 37+00.00 TO STA. 38+00.00

Sheet Totals		
Seeding	Cut	Fill

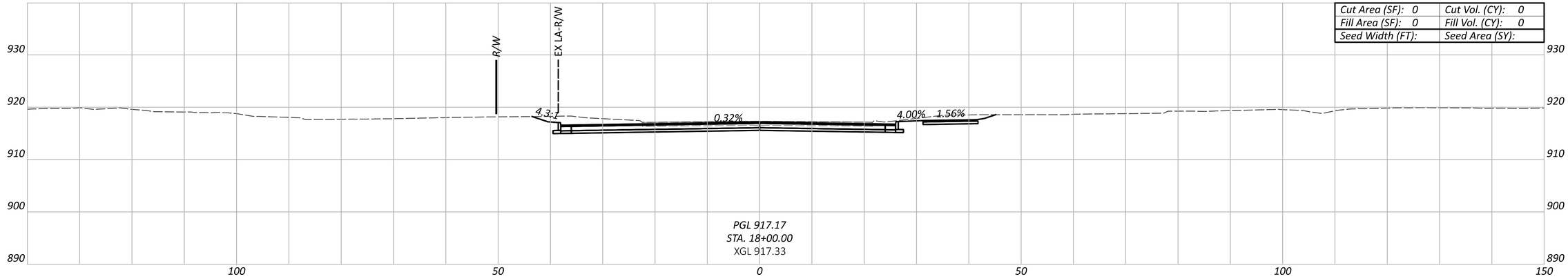
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.665	740



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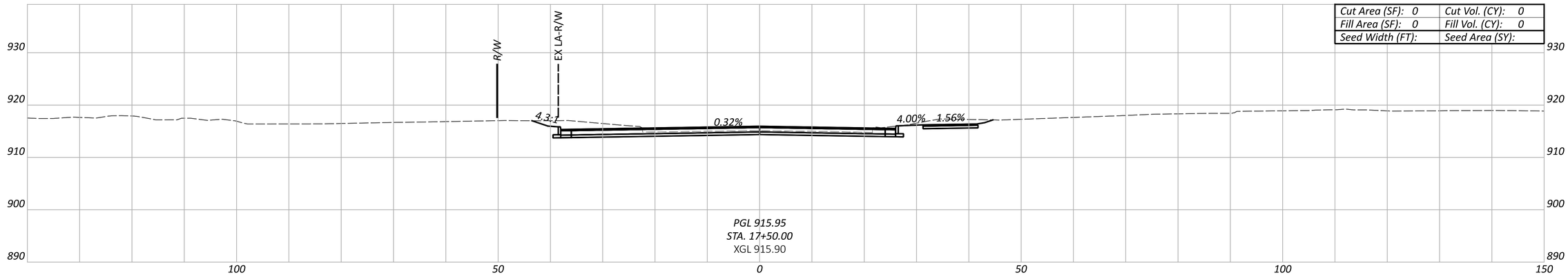
XGL 917.33



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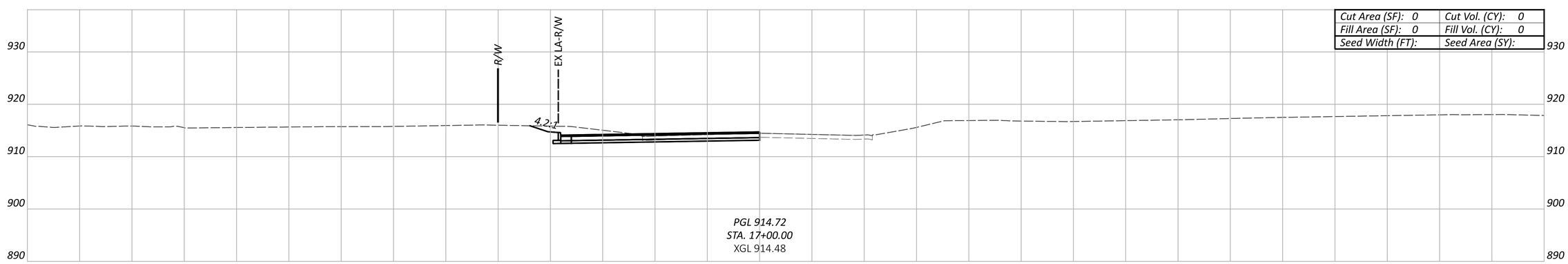
XGL 915.90



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PGL 914.72
STA. 17+00.00
XGL 914.48

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 17+00.00 TO STA. 18+00.00

DESIGN AGENCY
WEILER STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.666 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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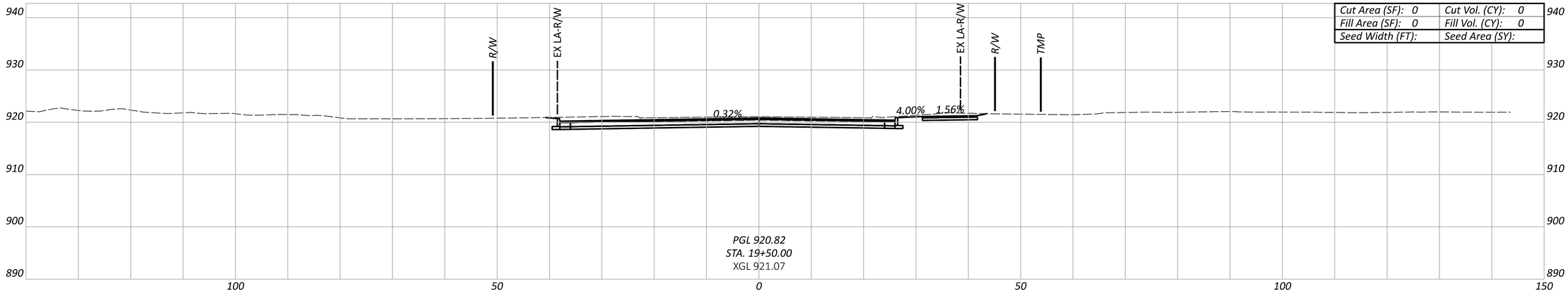

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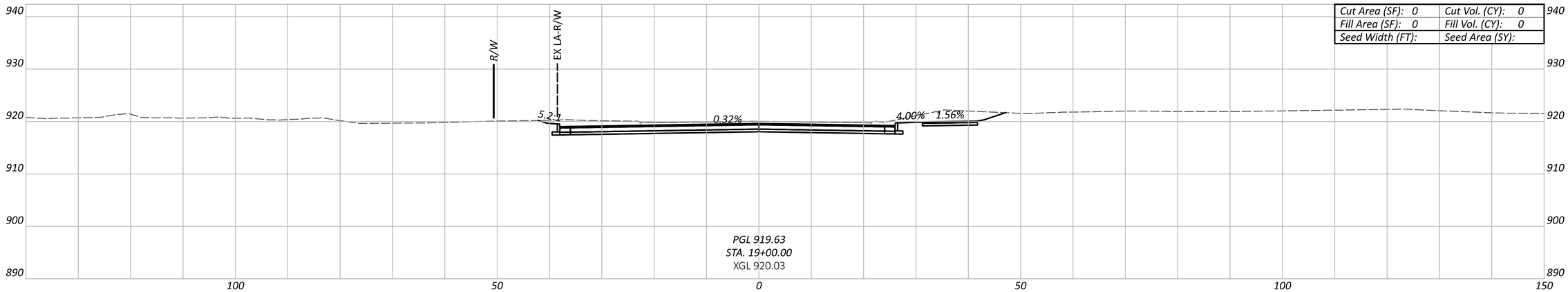

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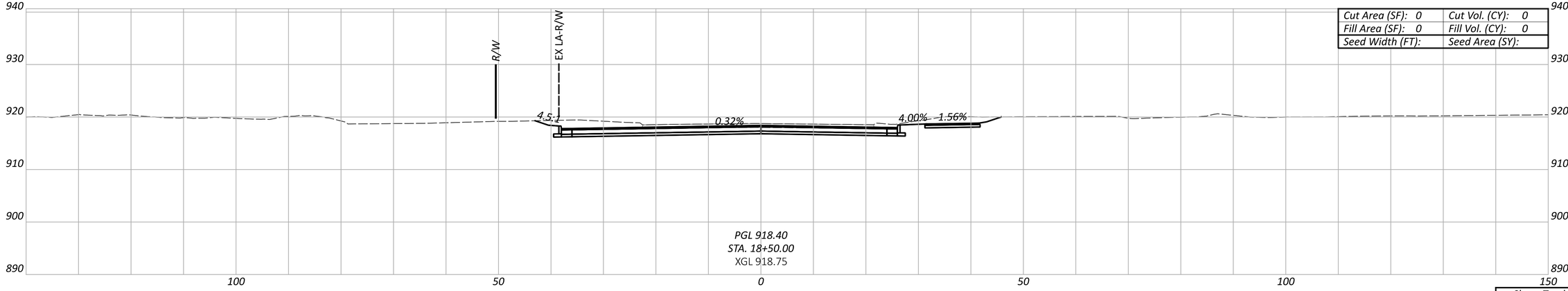

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PGL 918.40
STA. 18+50.00
XGL 918.75

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 18+50.00 TO STA. 19+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.667 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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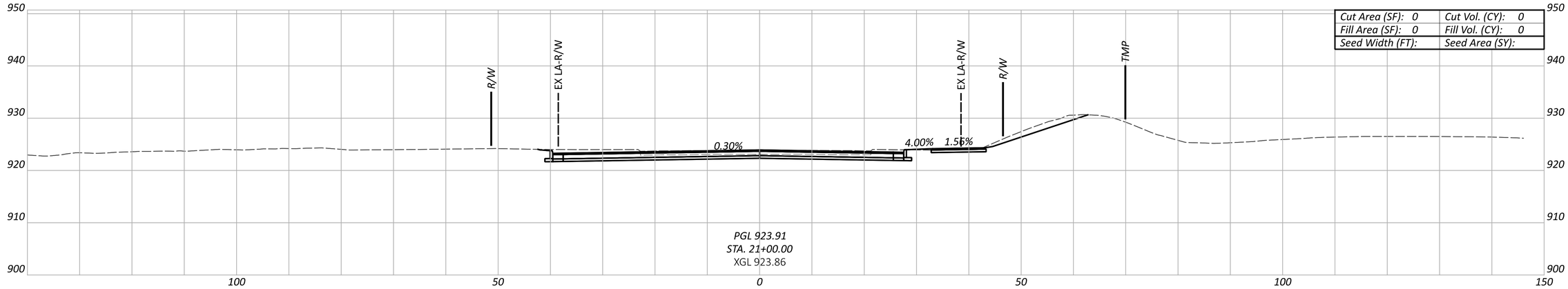

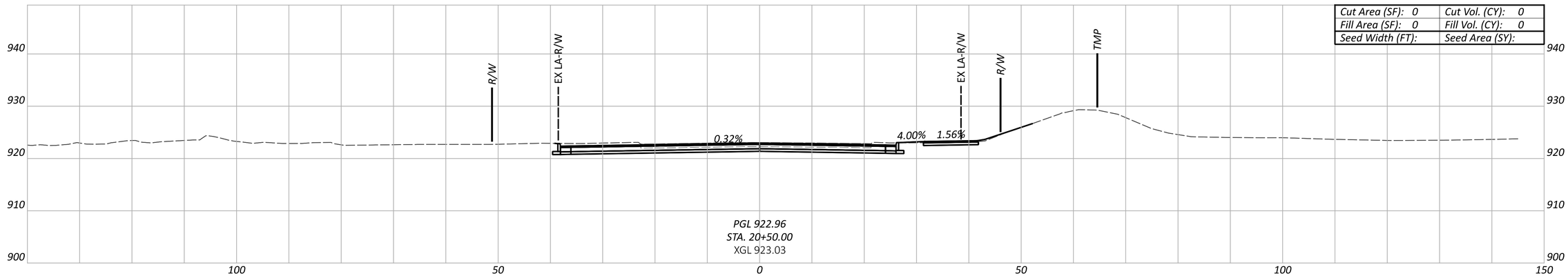

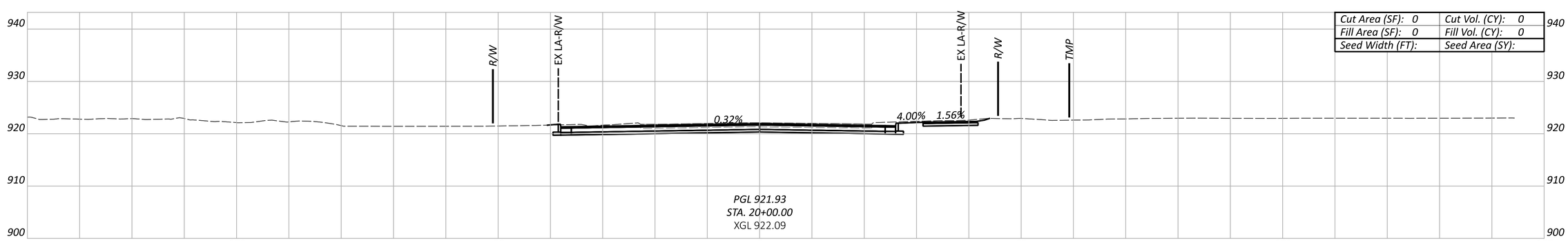

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS - TAYLOR RD
STA. 20+00.00 TO STA. 21+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

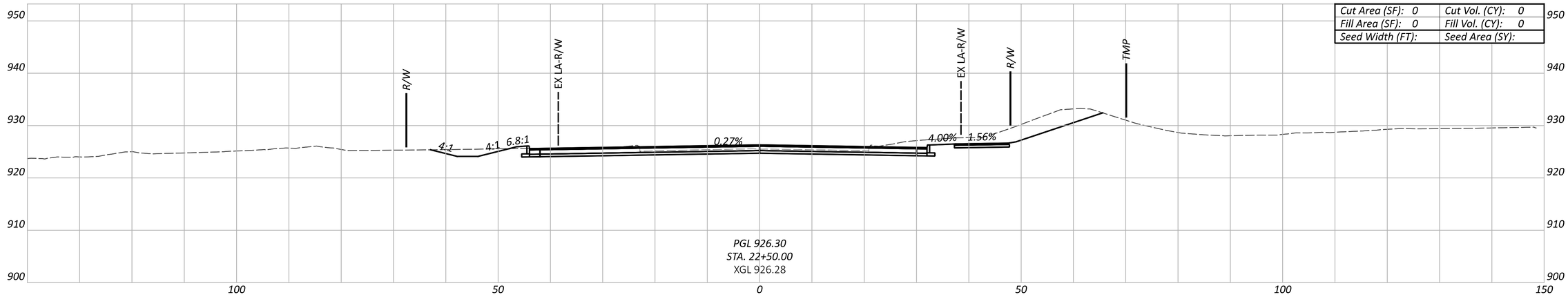
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.668	740



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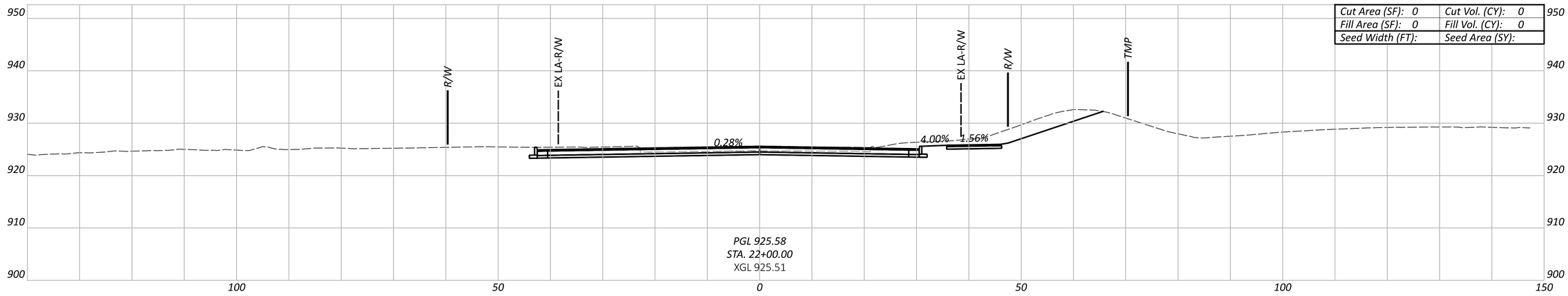

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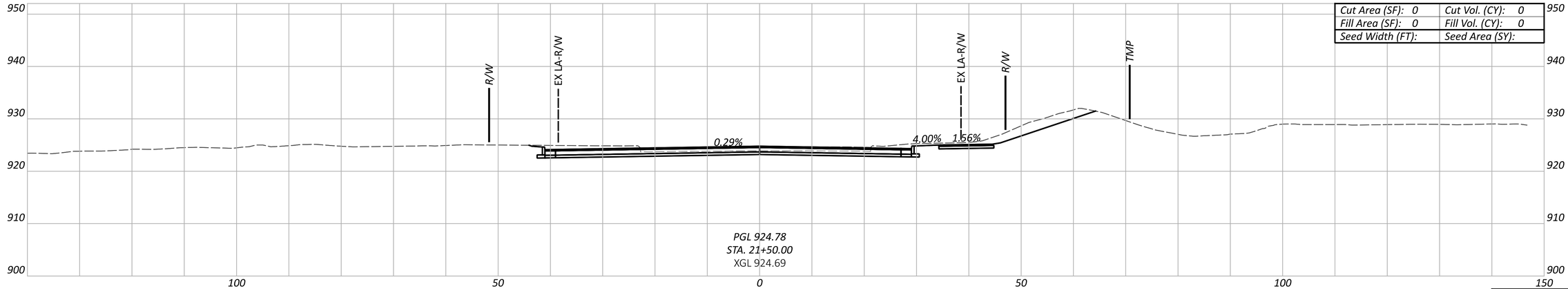

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PGL 924.78
STA. 21+50.00
XGL 924.69

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 21+50.00 TO STA. 22+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.669 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 21+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:45:47 PM USER: aoldaker
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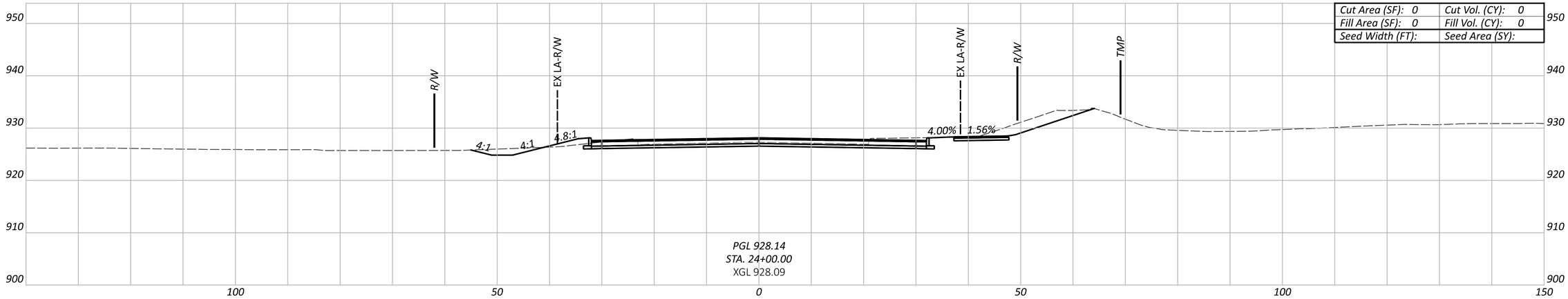

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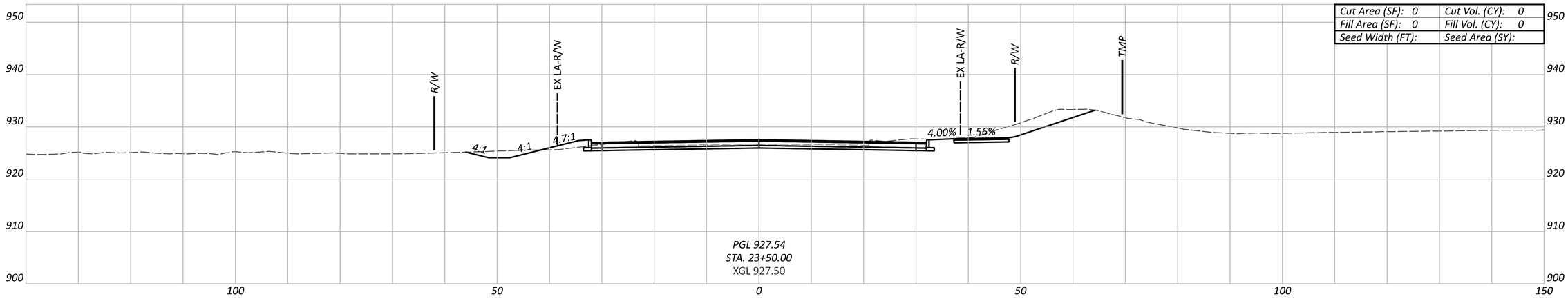

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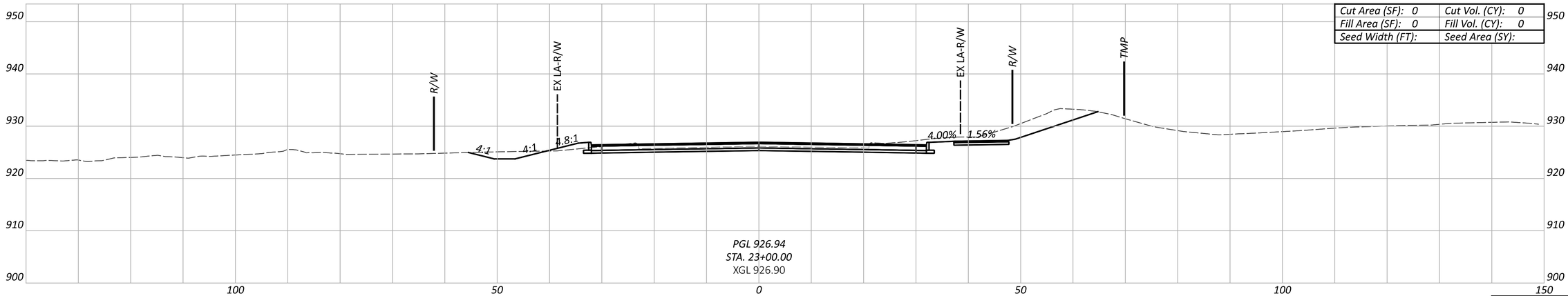

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 23+00.00 TO STA. 24+00.00

DESIGN AGENCY
WEMPE&A STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.670 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 23+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:45:51 PM USER: aoldaker
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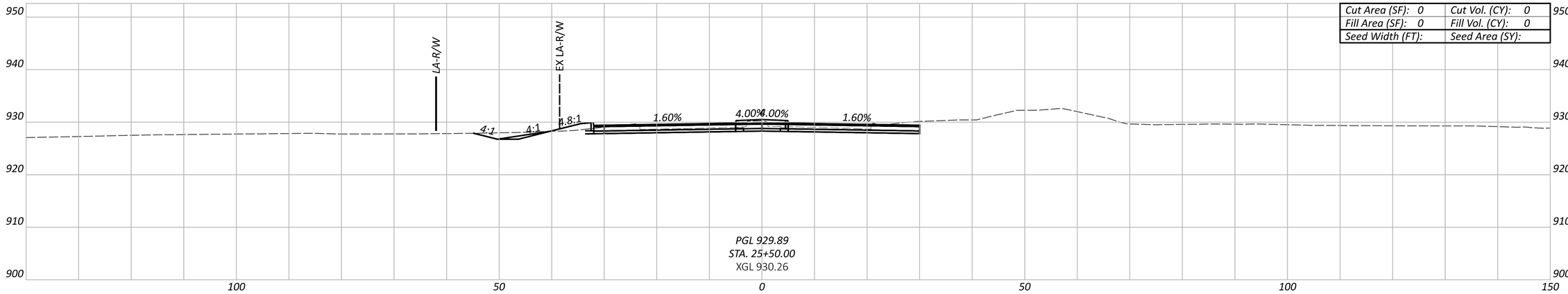

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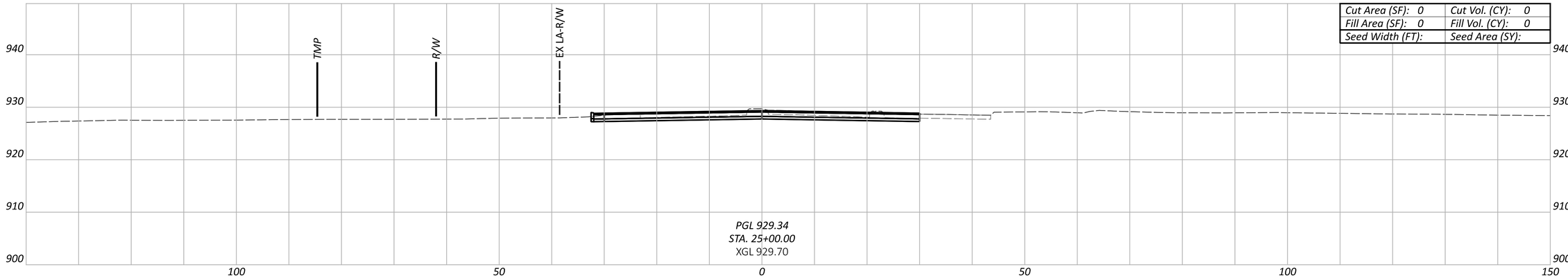

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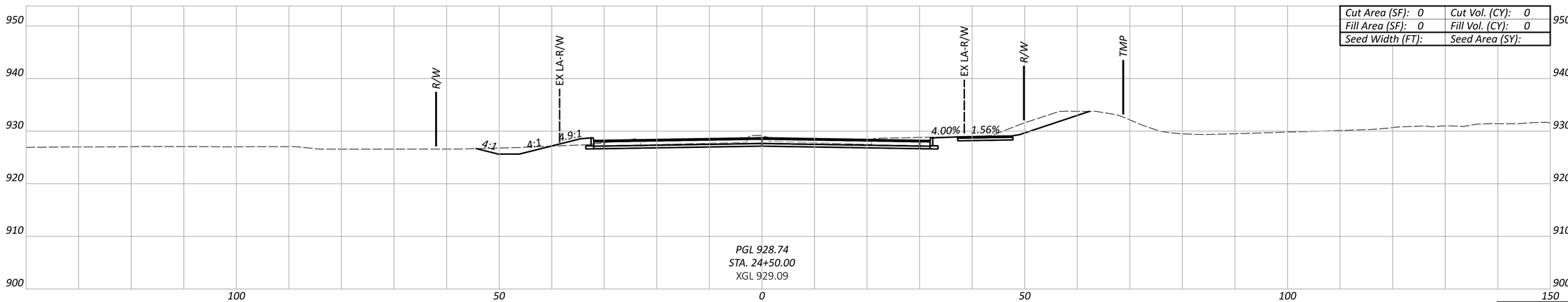

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 24+50.00 TO STA. 25+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 24+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:45:55 PM USER: aoldaker
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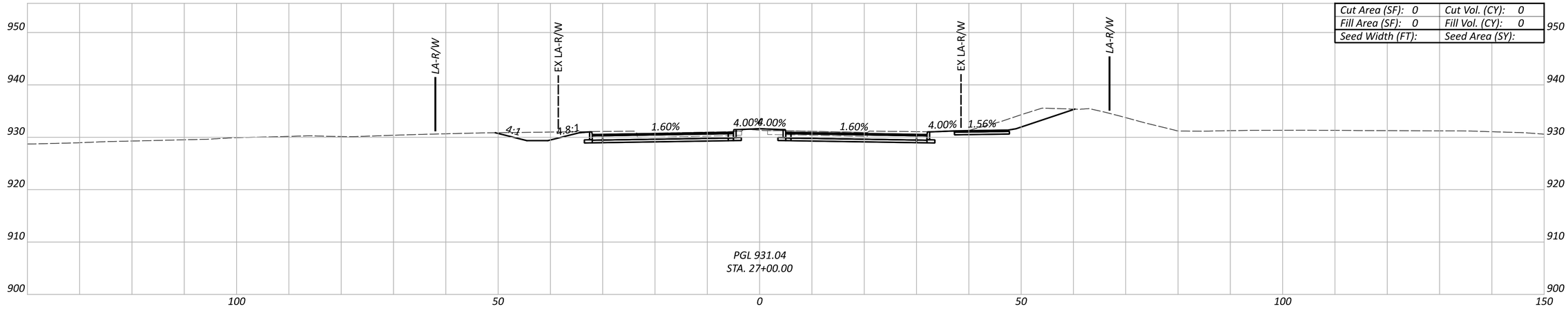
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.671	740



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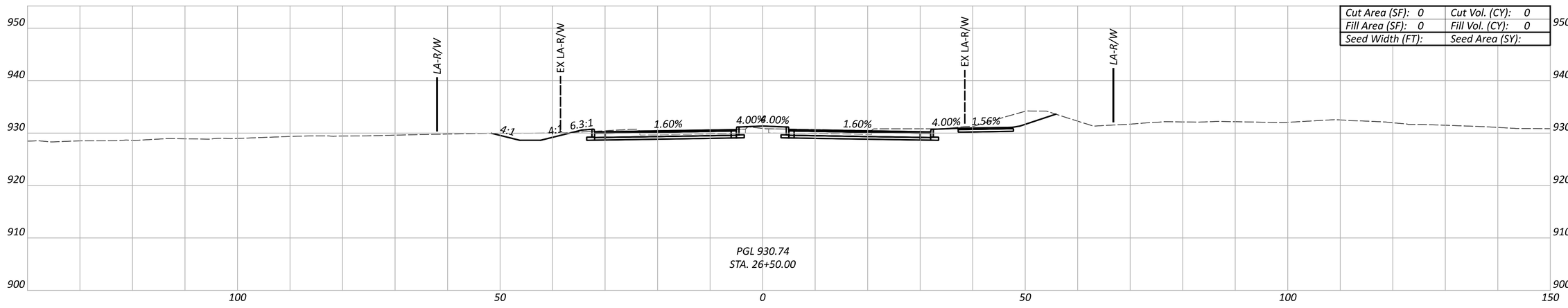

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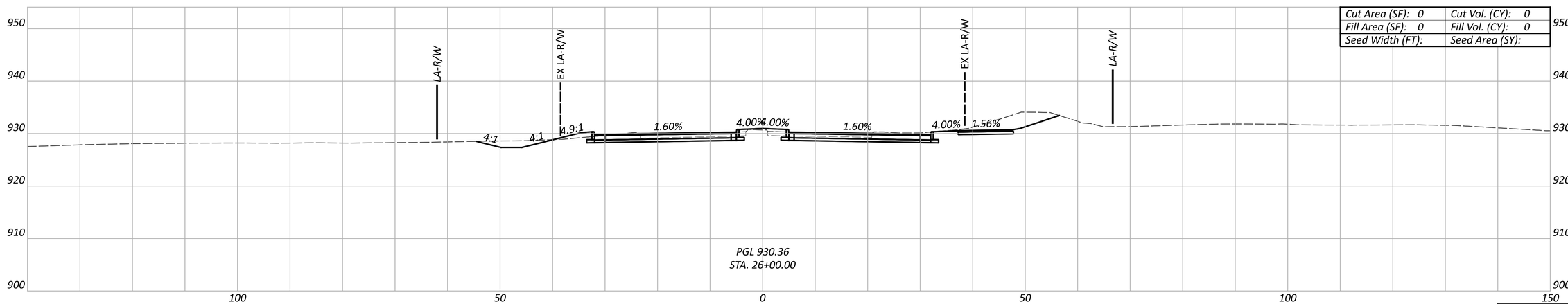

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 26+00.00 TO STA. 27+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.672 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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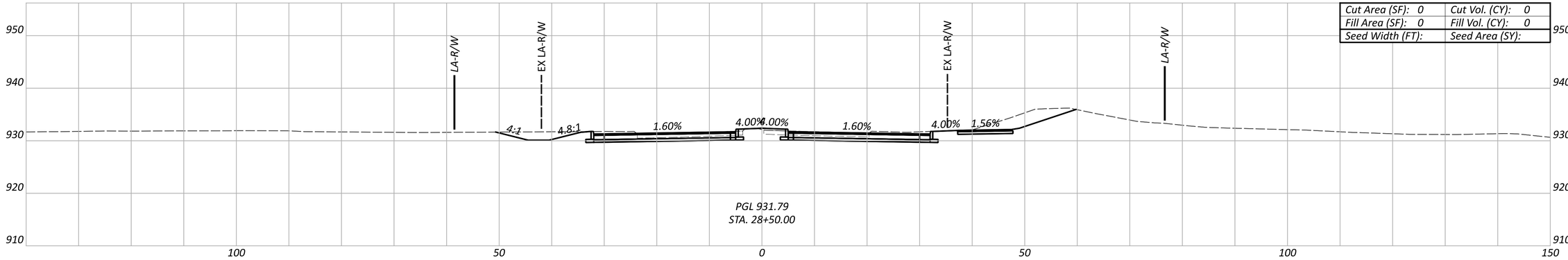

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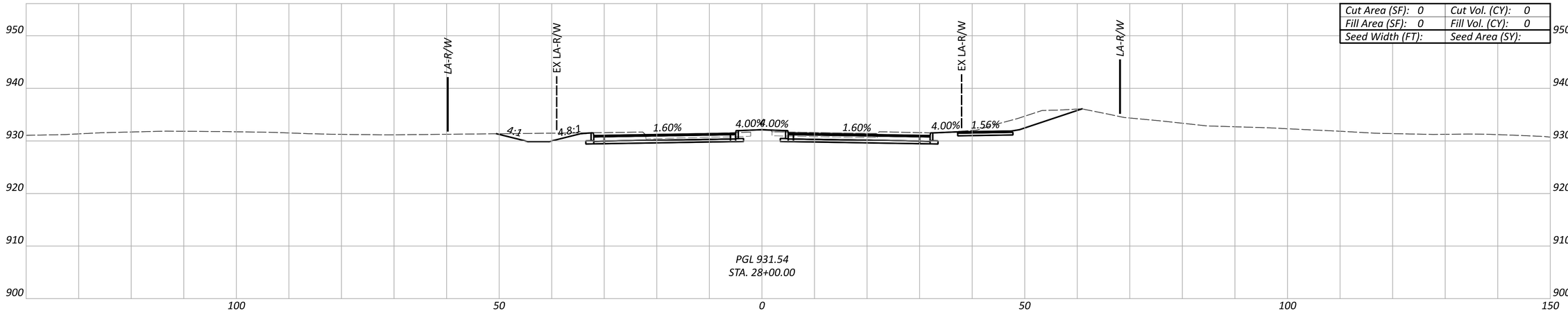
PGL 931.79
STA. 28+50.00



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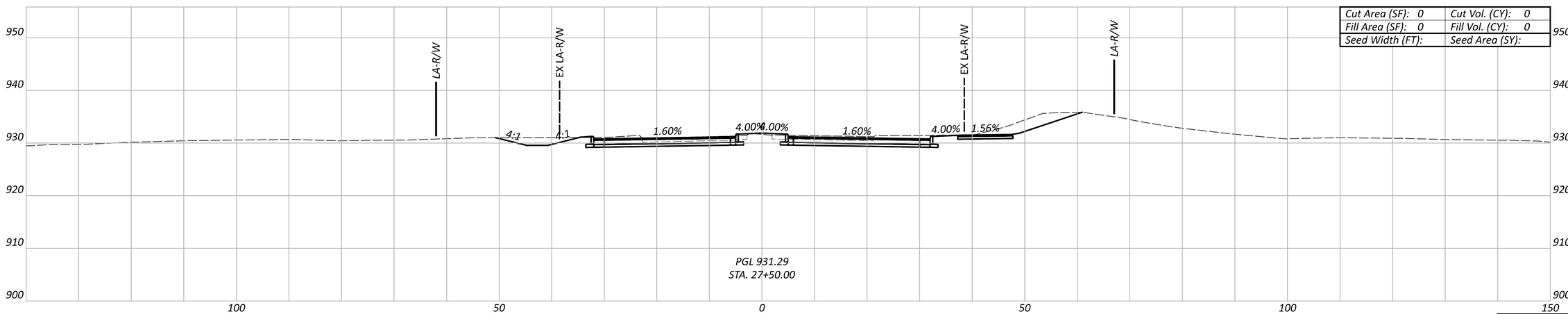
STA. 28+00.00



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PGL 931.29
STA. 27+50.00

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 27+50.00 TO STA. 28+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.673 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 27+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:02 PM USER: aoldaker
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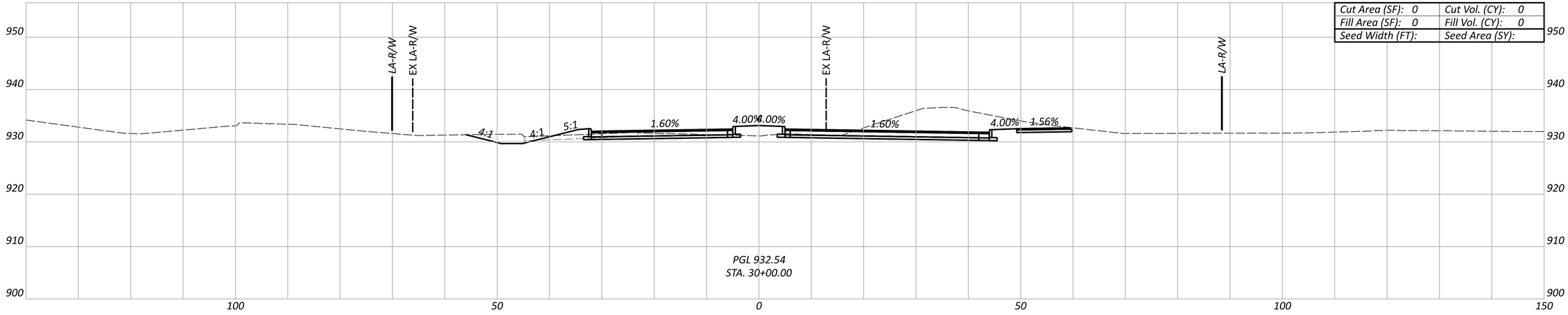

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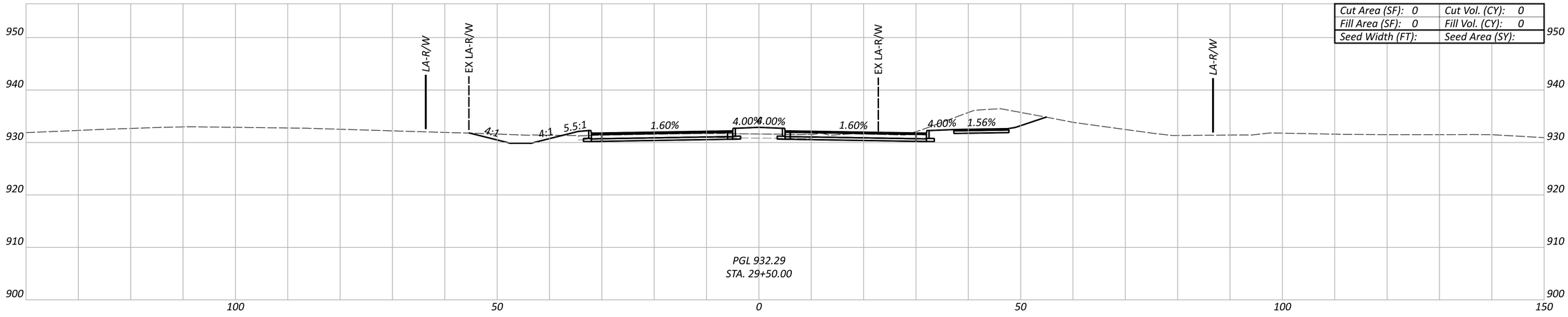

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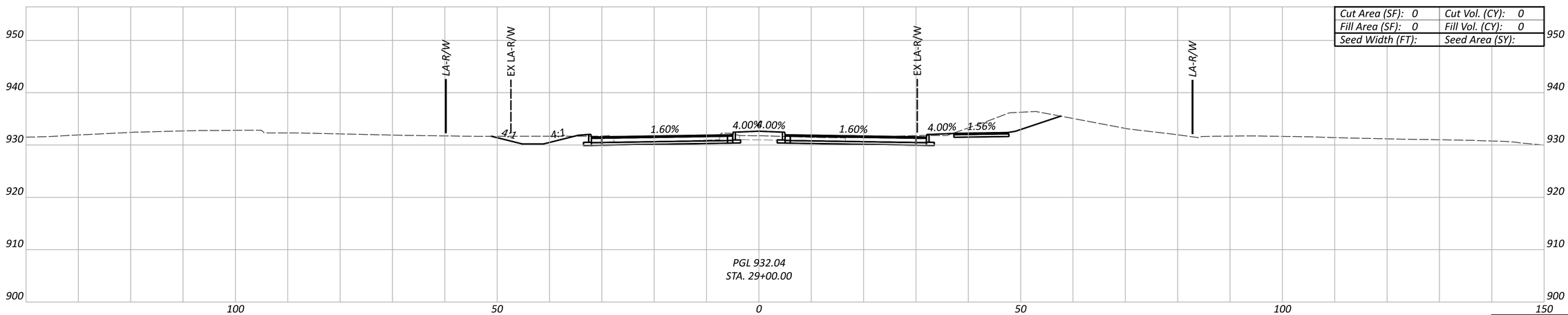

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CROSS SECTIONS - TAYLOR RD
STA. 29+00.00 TO STA. 30+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

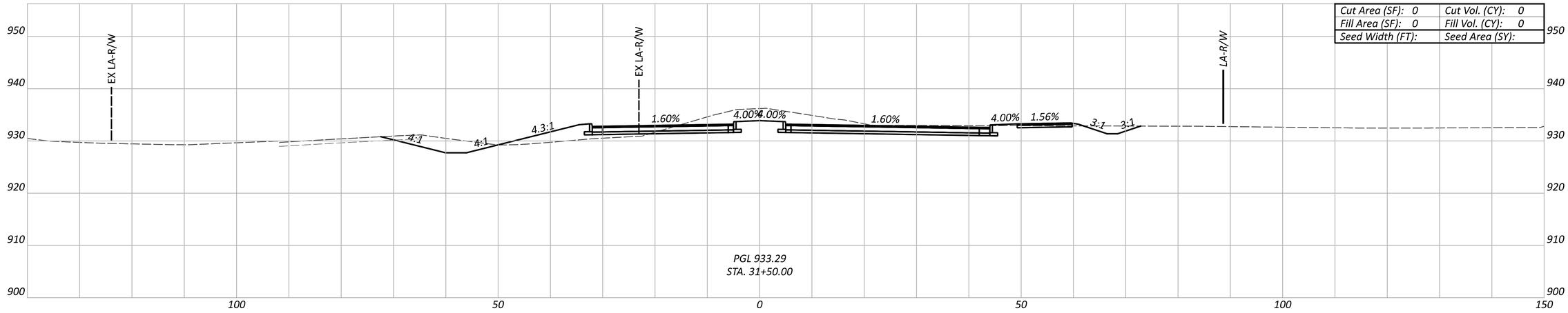
DESIGN AGENCY
STRUCTUREPOINT

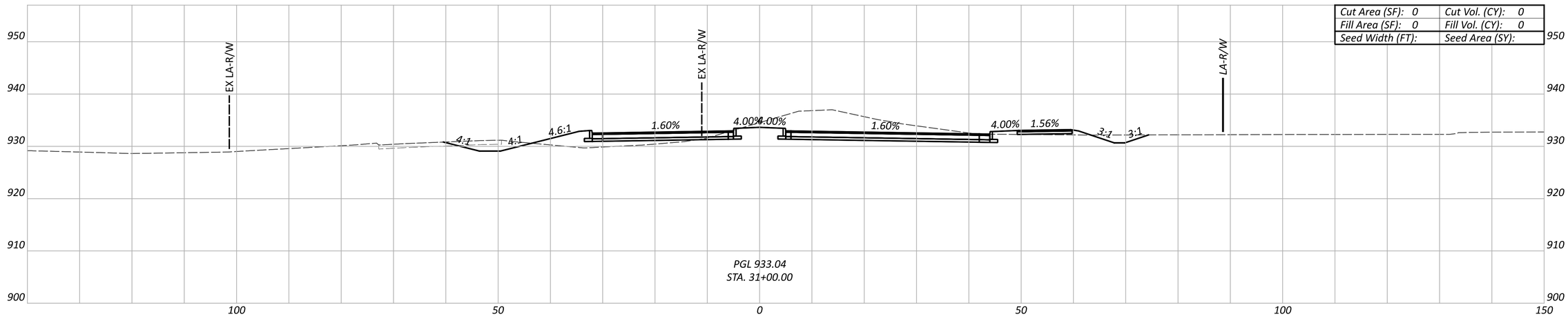
DESIGNER
BER

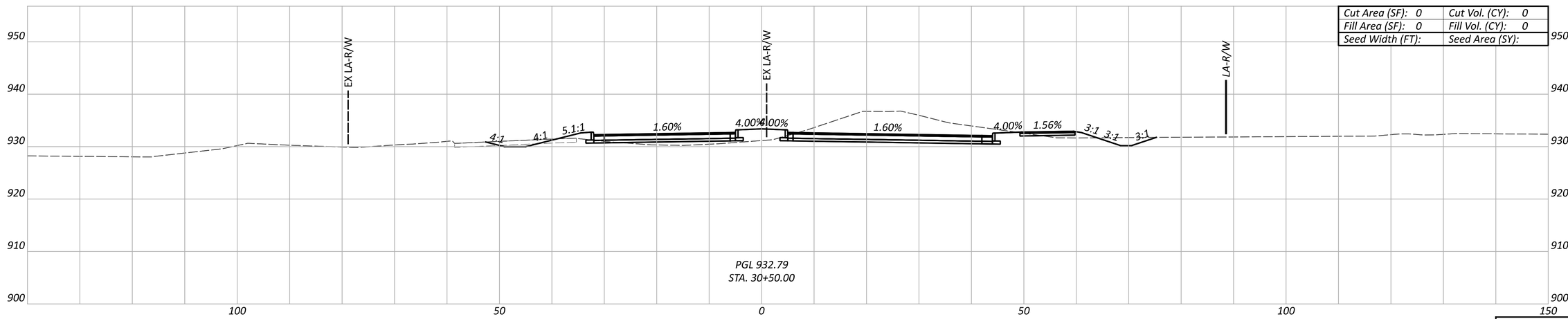
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.674 TOTAL 740







CROSS SECTIONS - TAYLOR RD
STA. 30+50.00 TO STA. 31+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.675 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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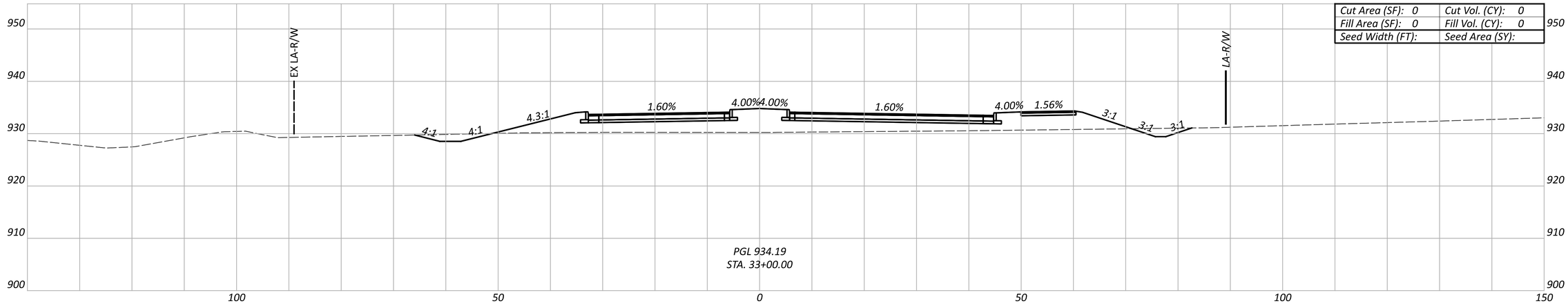

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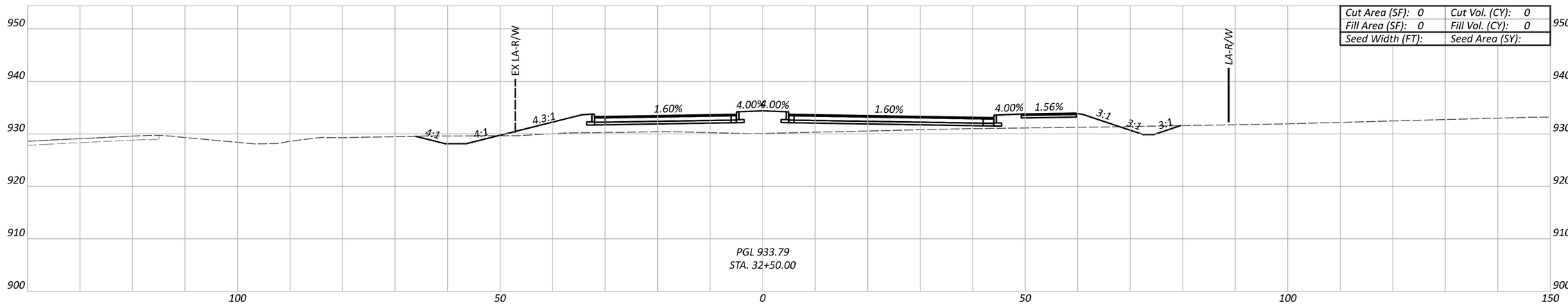

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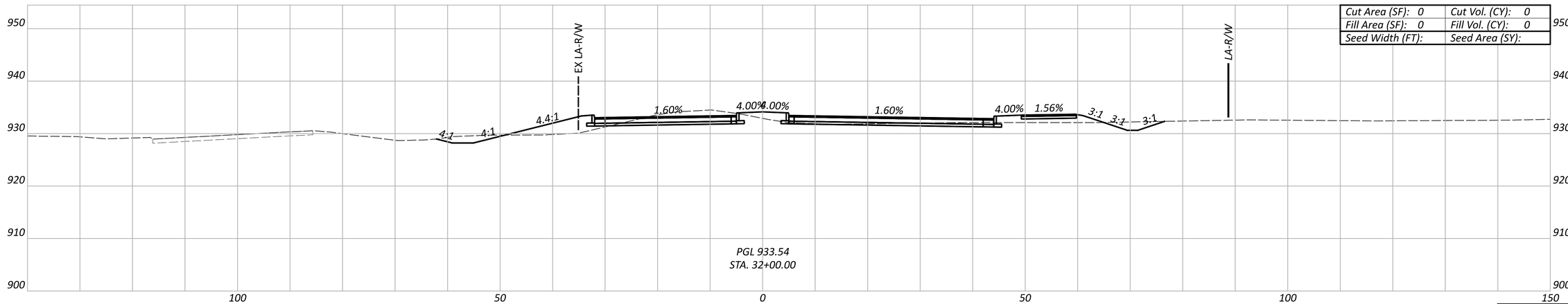

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CROSS SECTIONS - TAYLOR RD
STA. 32+00.00 TO STA. 33+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

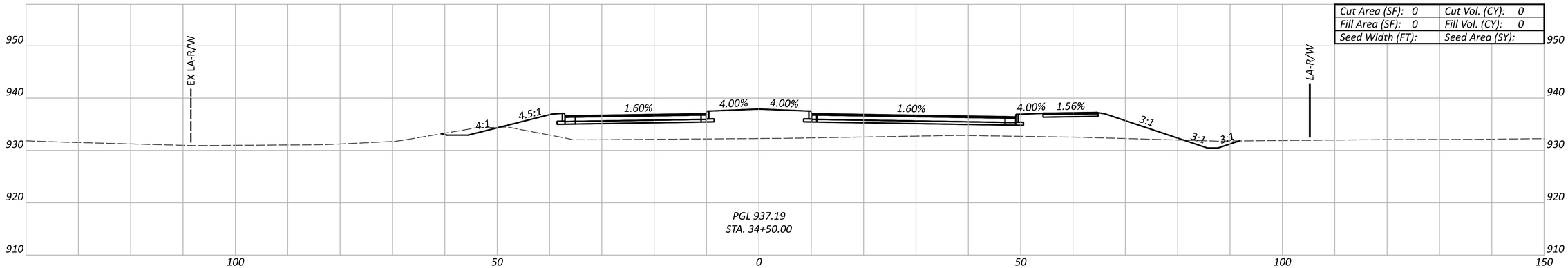
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.676 TOTAL 740



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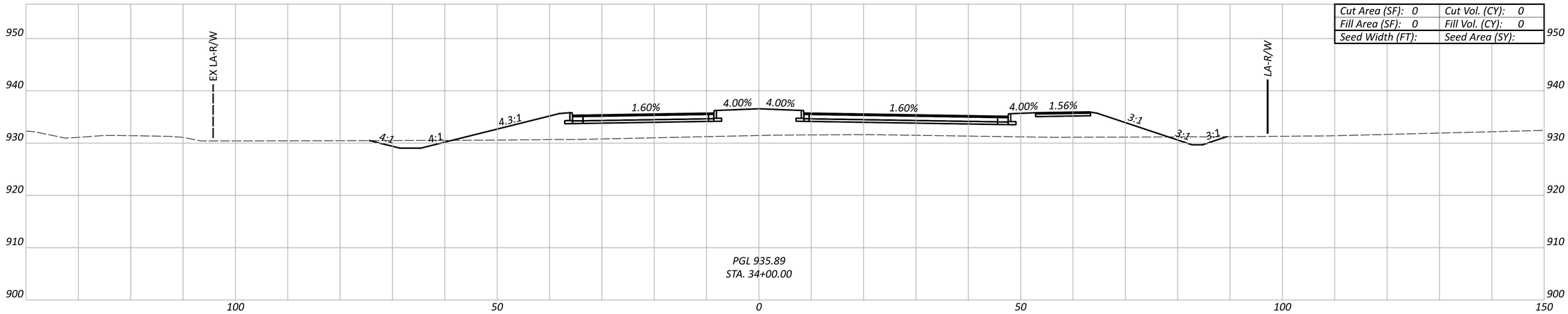

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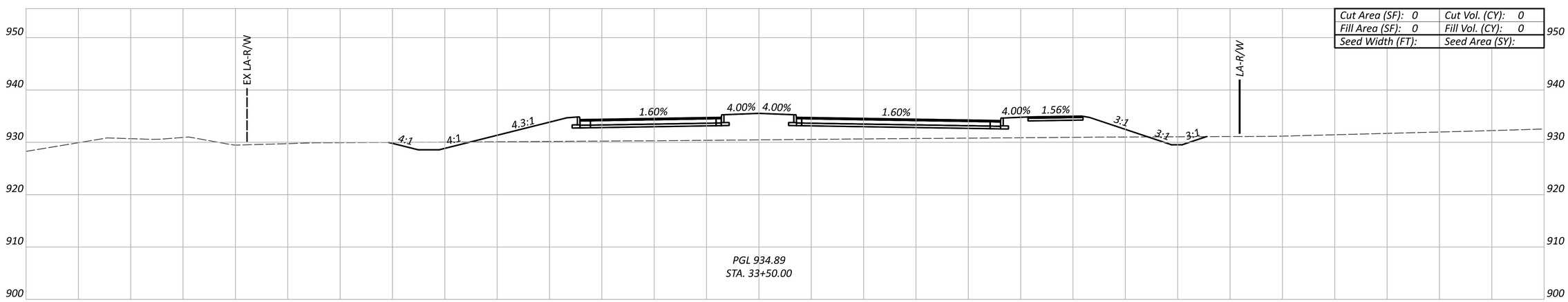

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 33+50.00 TO STA. 34+50.00

FAI/LIC IR 70 0.00/0.00

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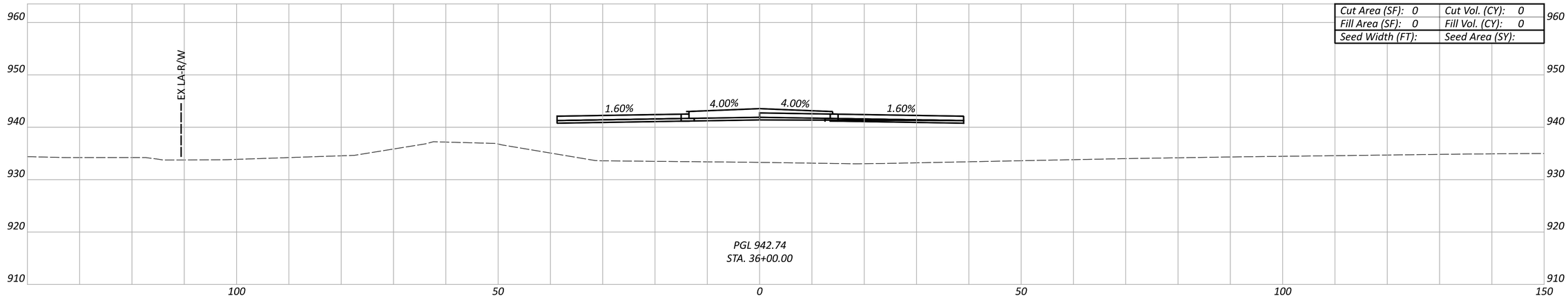
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.677 TOTAL 740



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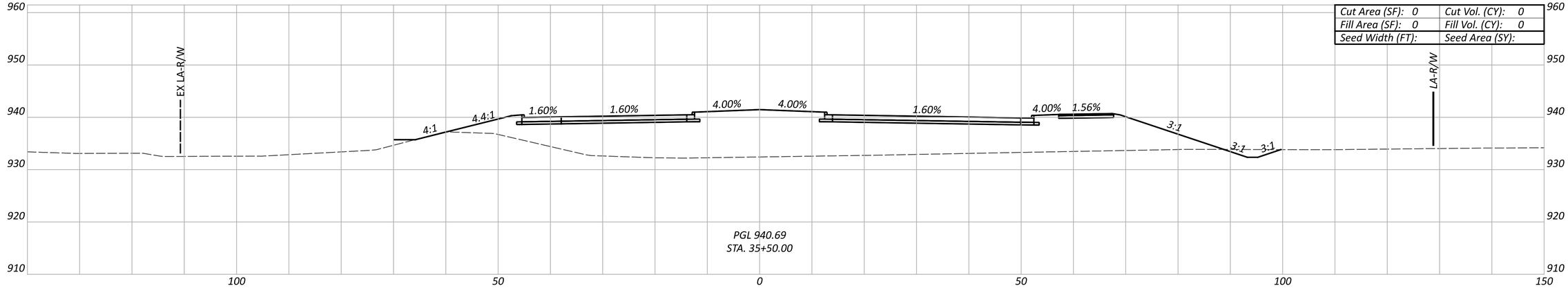

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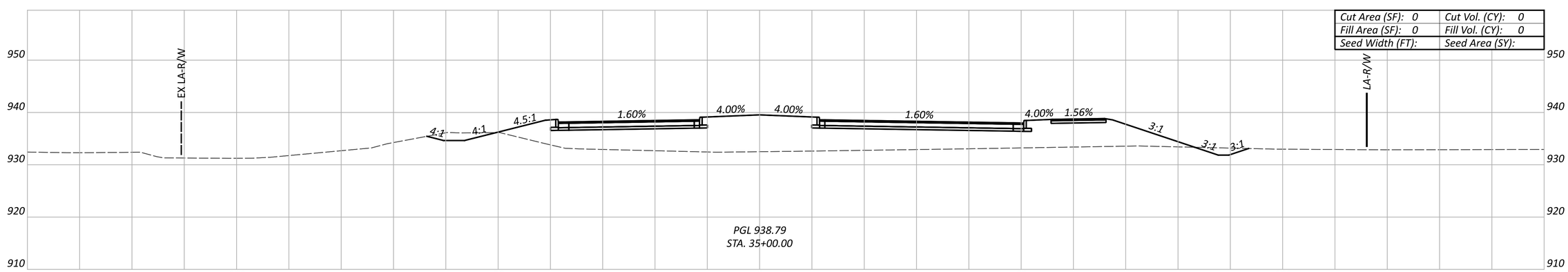

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 35+00.00 TO STA. 36+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	BER
REVIEWER	KAM 06/18/23
PROJECT ID	96808
SHEET	P.678
TOTAL	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 35+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:20 PM USER: aoldaker
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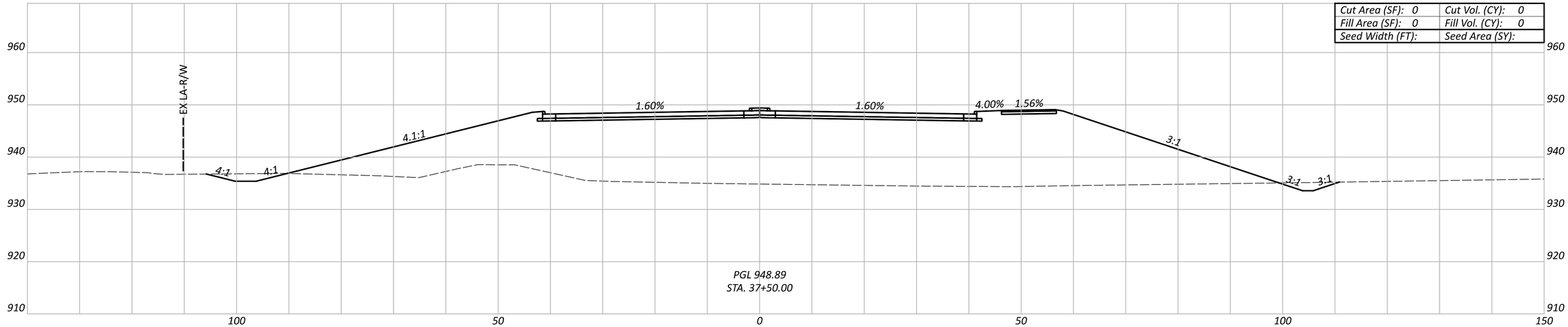

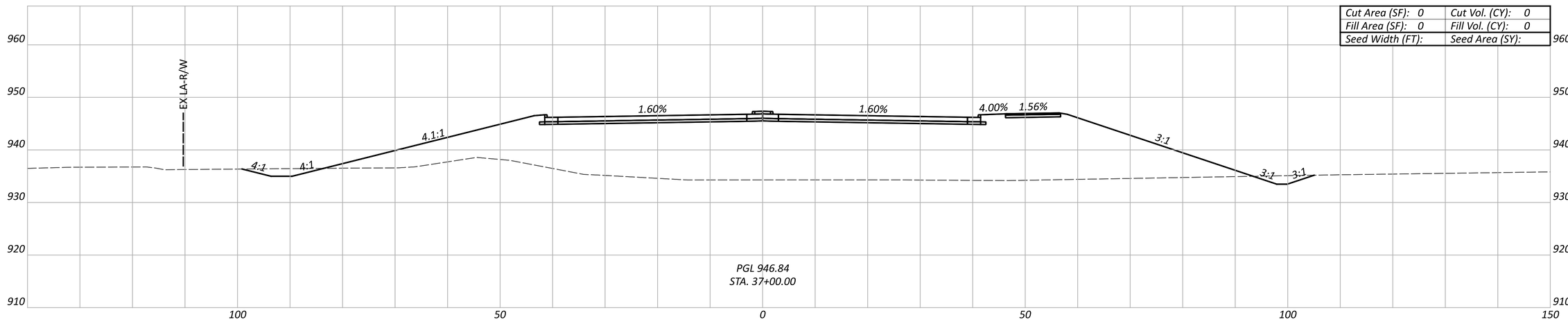

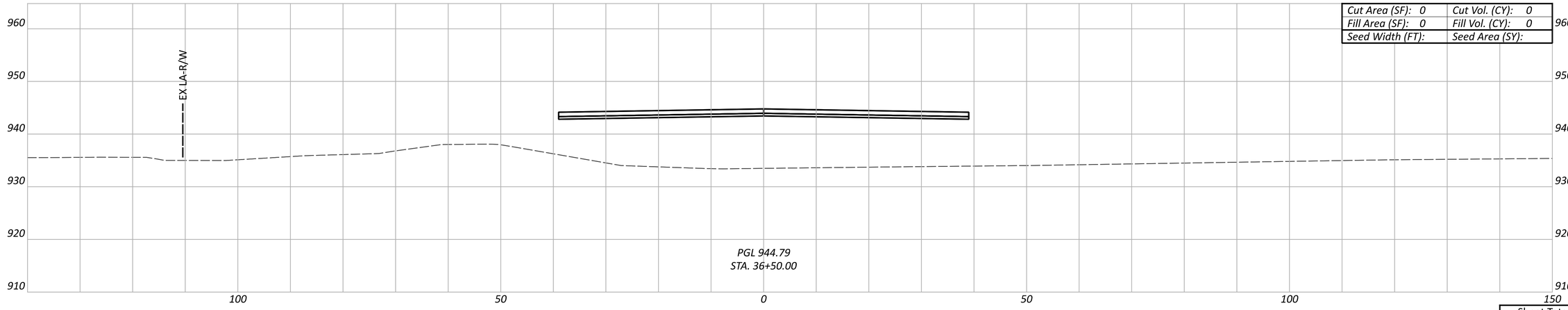

CROSS SECTIONS - TAYLOR RD
STA. 36+50.00 TO STA. 37+50.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

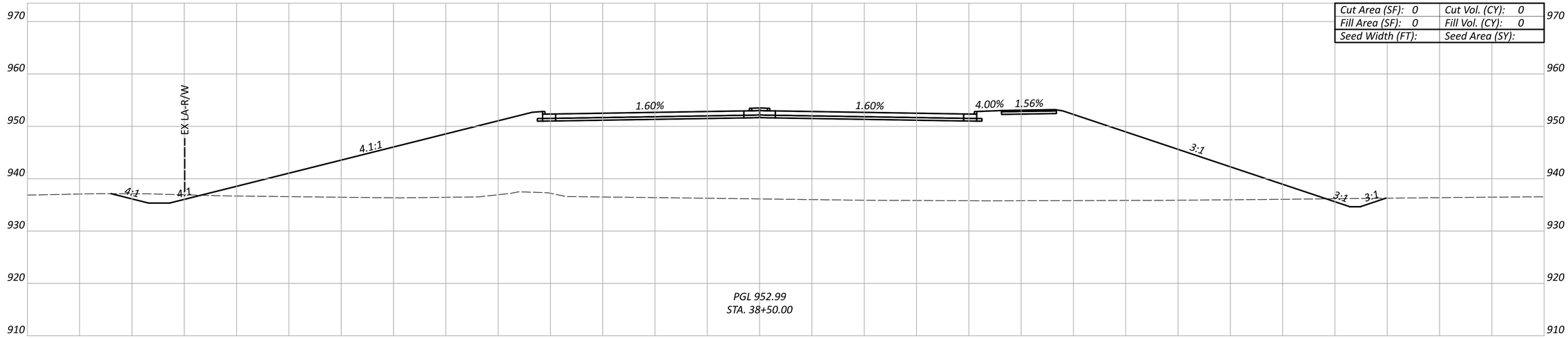
DESIGNER
BER

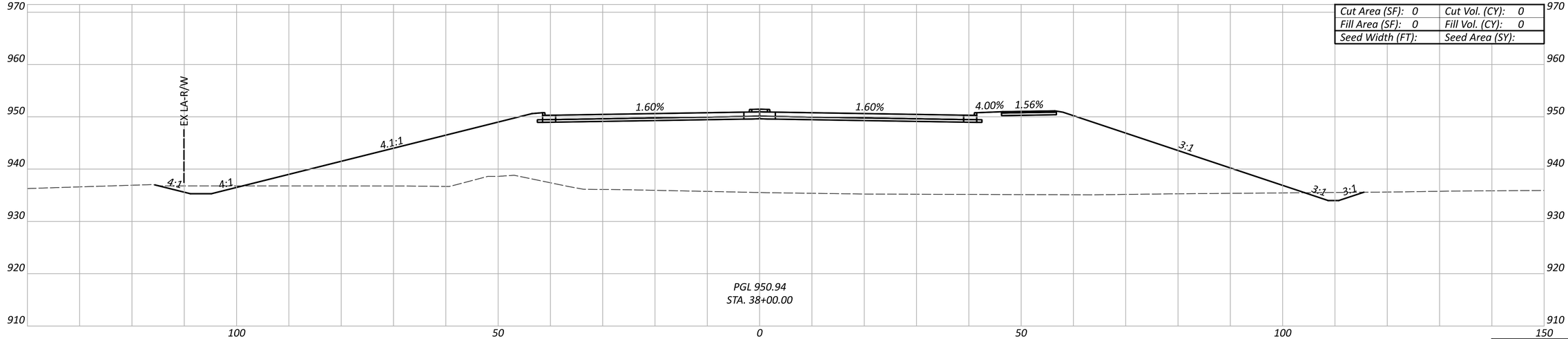
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.679	740





CROSS SECTIONS - TAYLOR RD
STA. 38+00.00 TO STA. 38+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.680 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 38+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:26 PM USER: aoldaker
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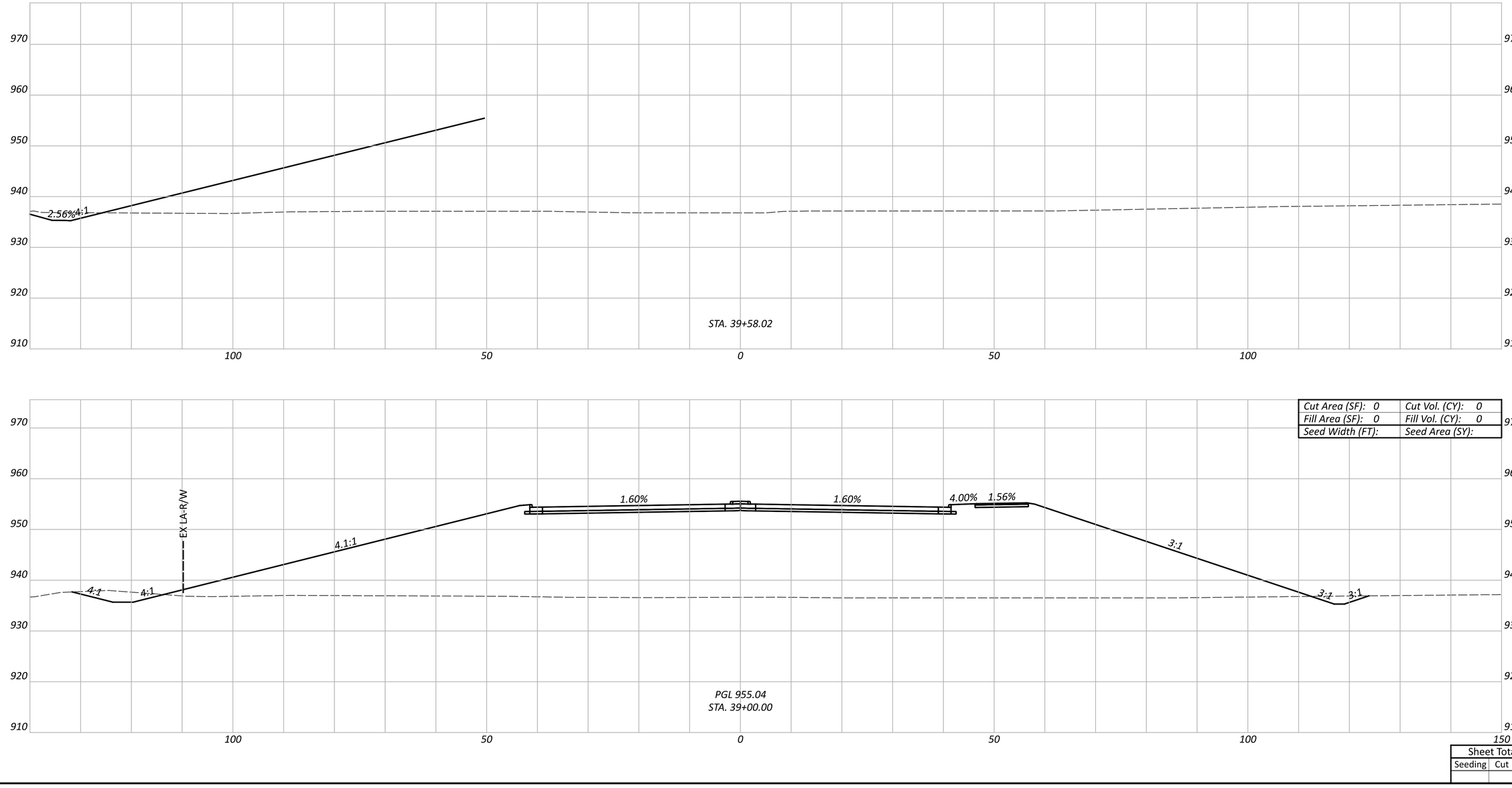

CROSS SECTIONS - TAYLOR RD
STA. 39+00.00 TO STA. 39+58.02

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

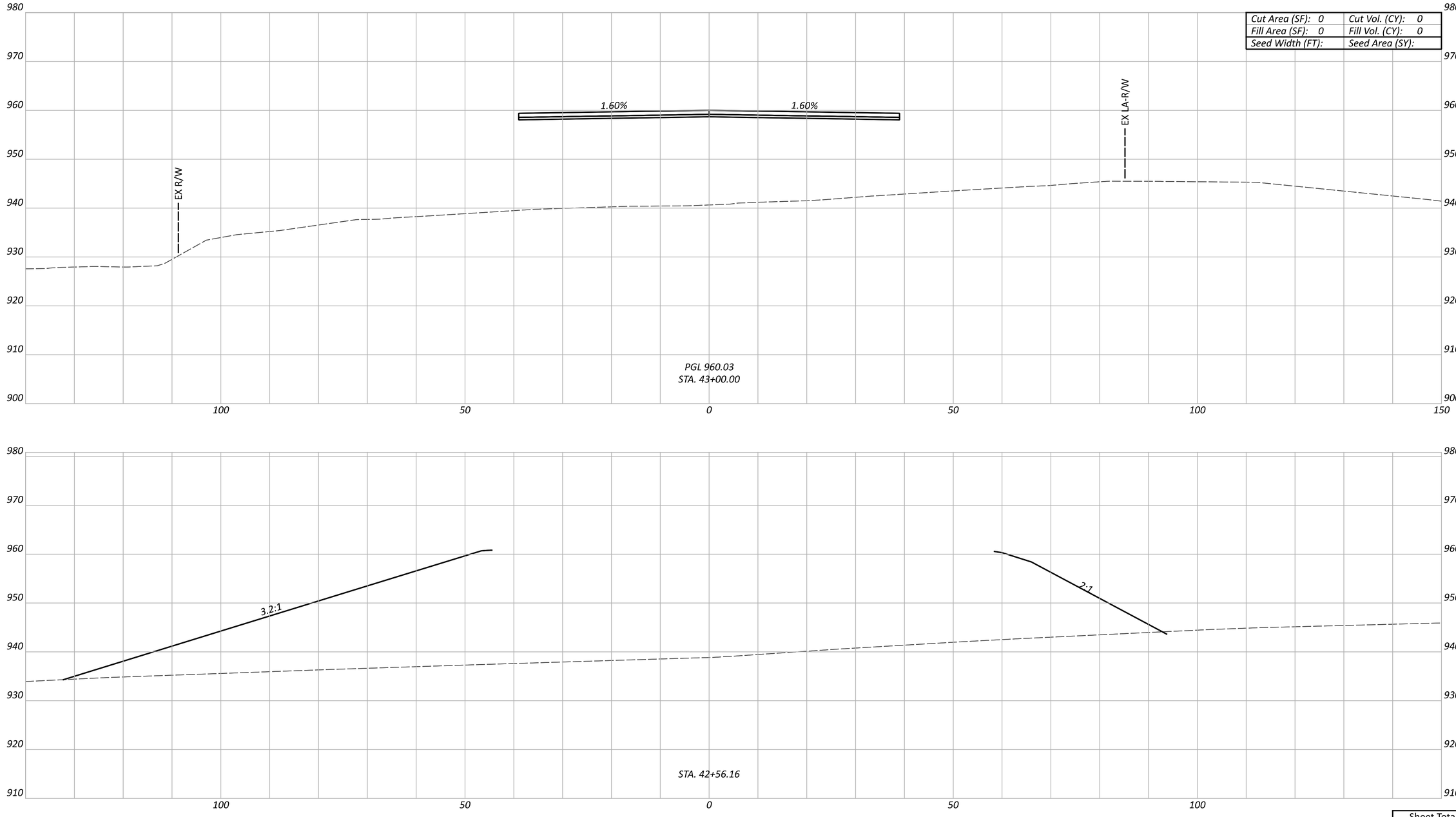
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.681 TOTAL 740



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CROSS SECTIONS - TAYLOR RD
STA. 42+56.10 TO STA. 43+00.00

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

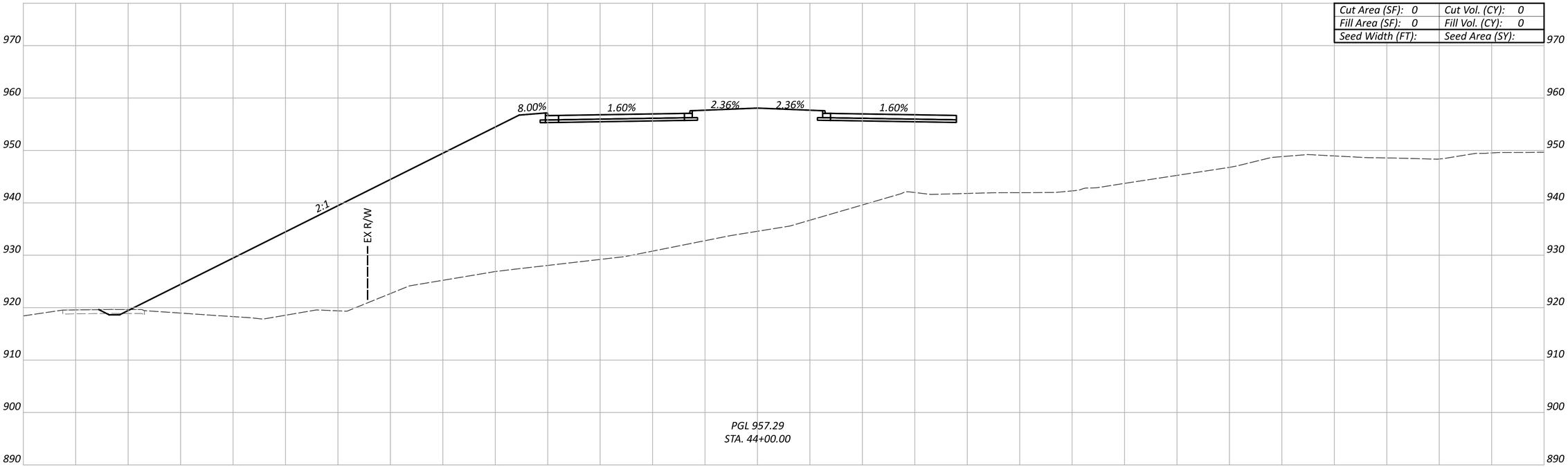
DESIGNER
BER

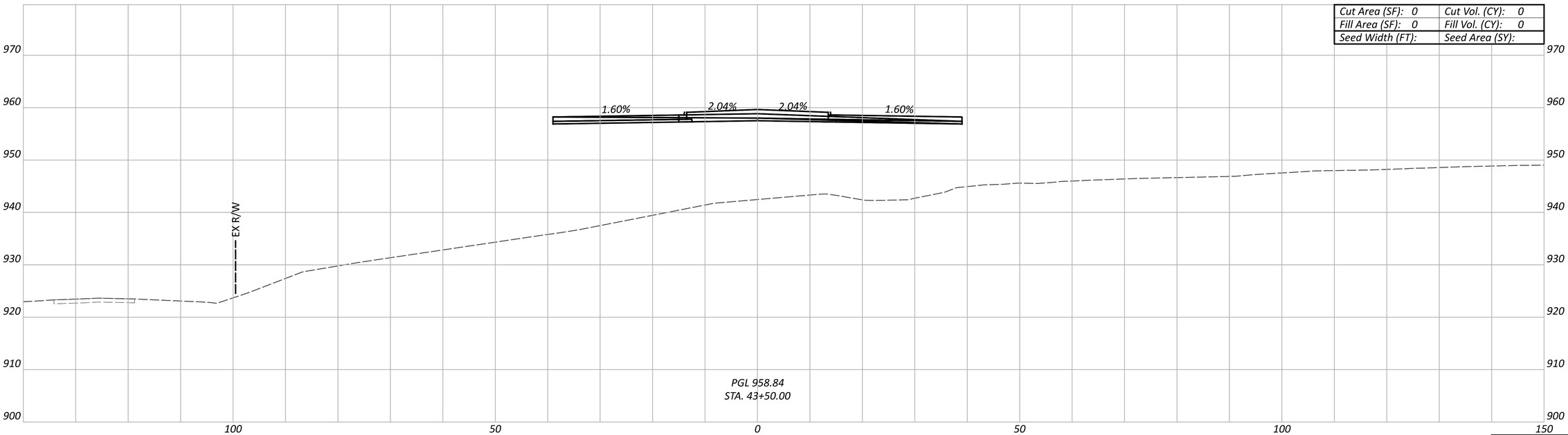
REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET P.682 TOTAL 740





CROSS SECTIONS - TAYLOR RD
STA. 43+50.00 TO STA. 44+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 43+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:36 PM USER: aoldaker
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DESIGN AGENCY
AMEREN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals

Seeding	Cut	Fill

SHEET P.683 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 44+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:39 PM USER: aoldaker
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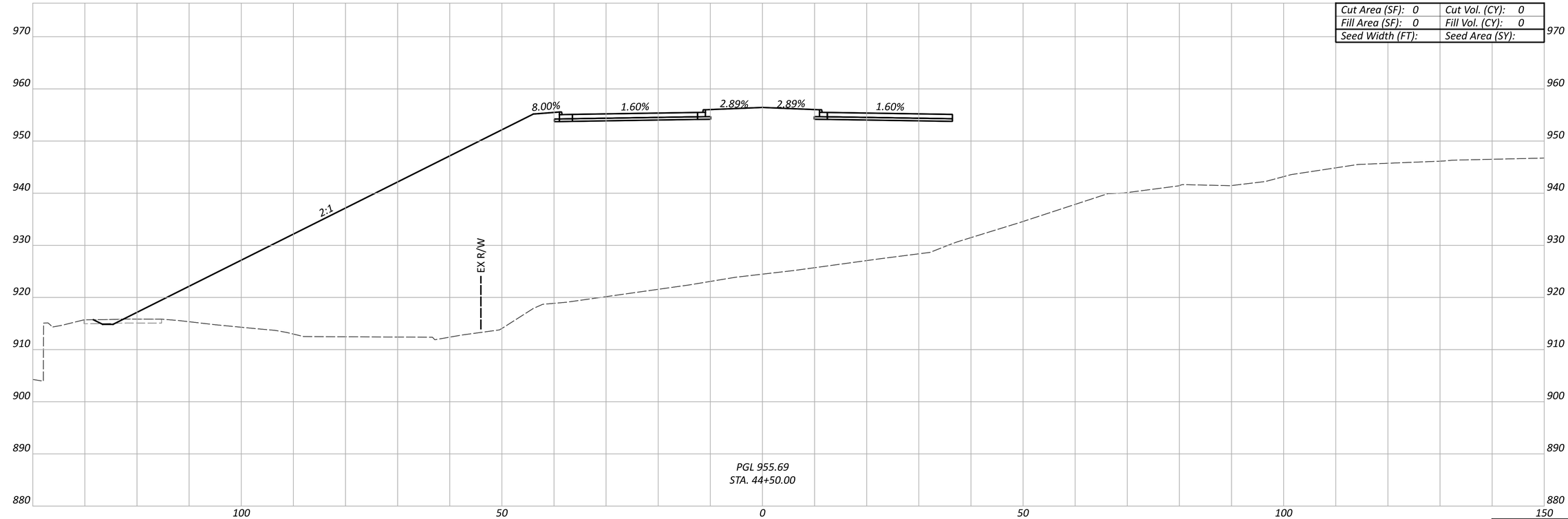
CROSS SECTIONS - TAYLOR RD
STA. 44+50.00



Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.684 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 45+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/23 TIME: 11:46:41 PM USER: aoldaker
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Fill Area (SF): 0	Fill Vol. (CY): 0
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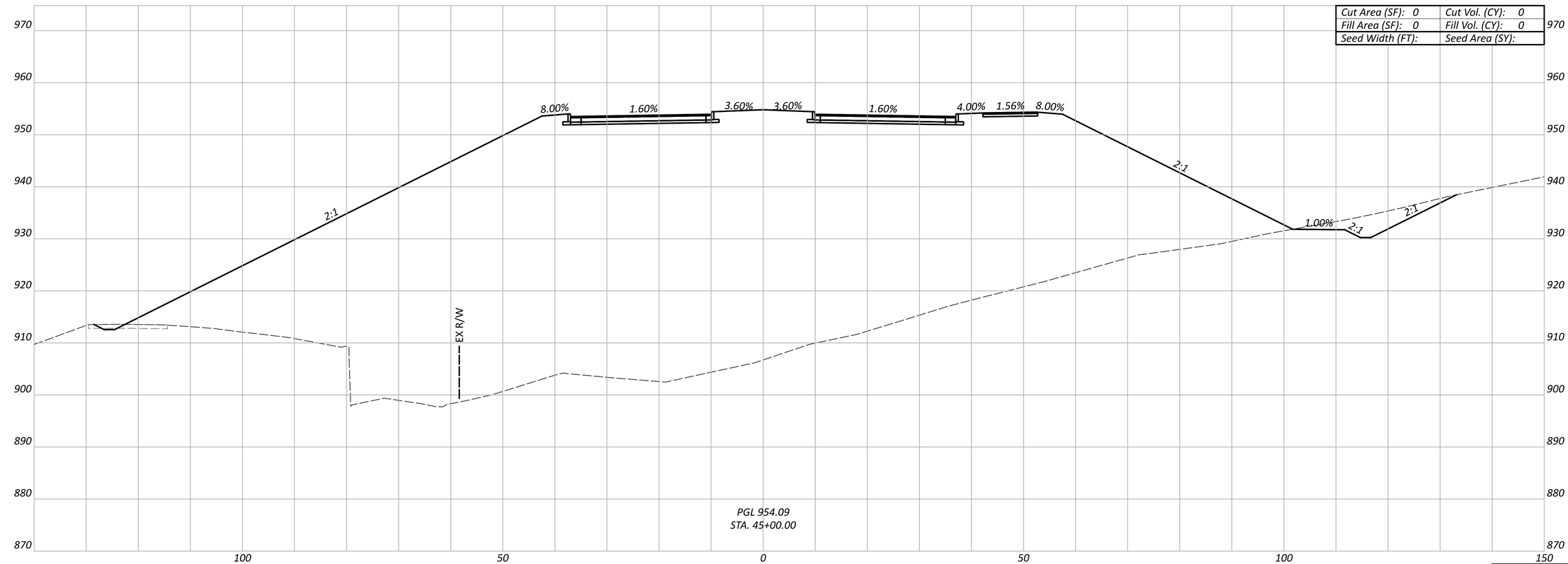

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 45+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.685 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 45+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:44 PM USER: aoldaker
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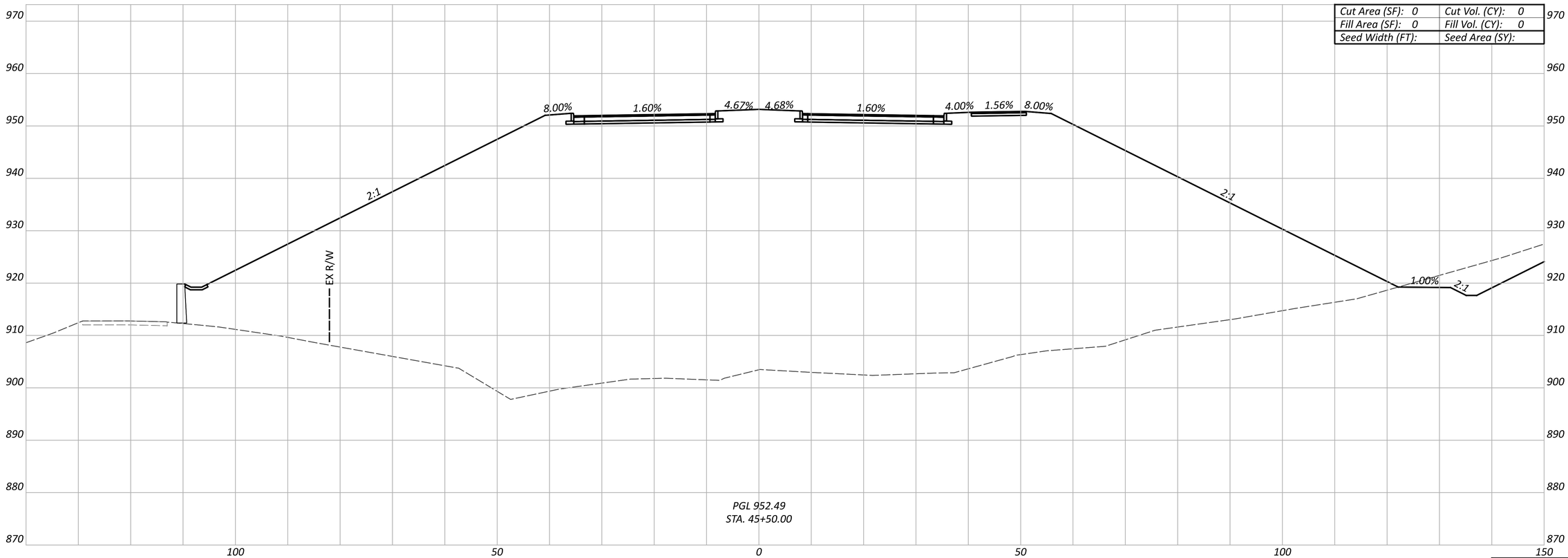
CROSS SECTIONS - TAYLOR RD
STA. 45+50.00



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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

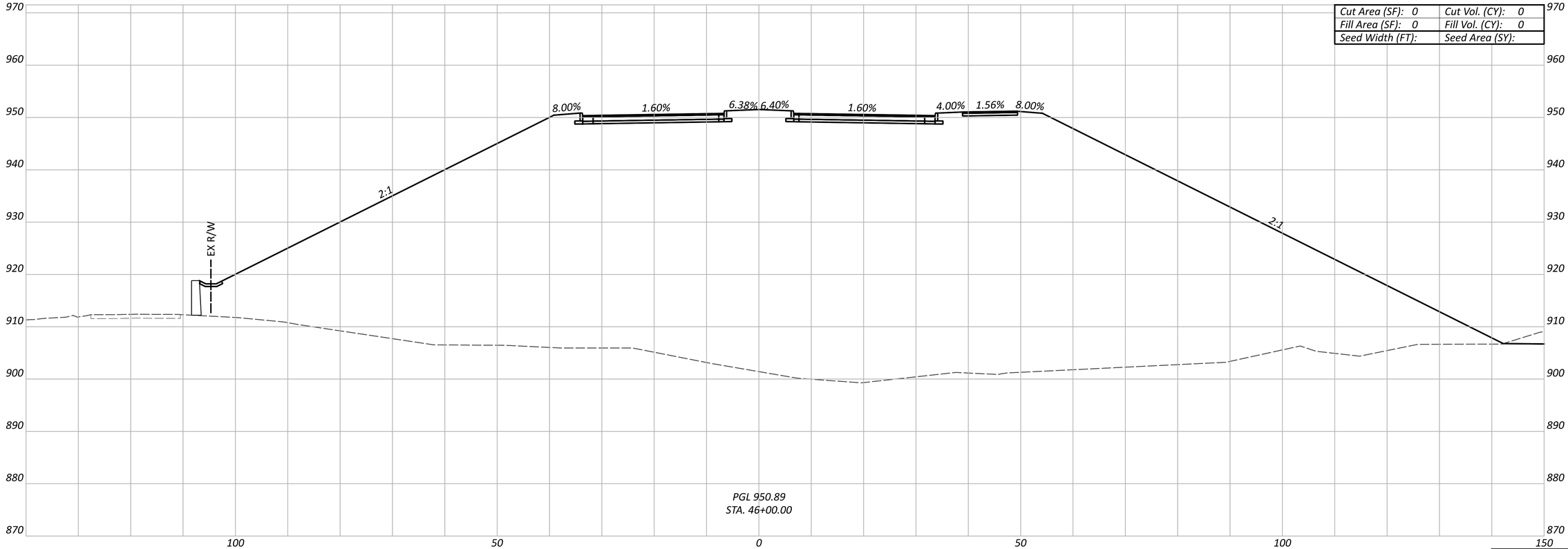
DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.686 TOTAL 740



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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 46+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 46+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:46:47 PM USER: aoldaker
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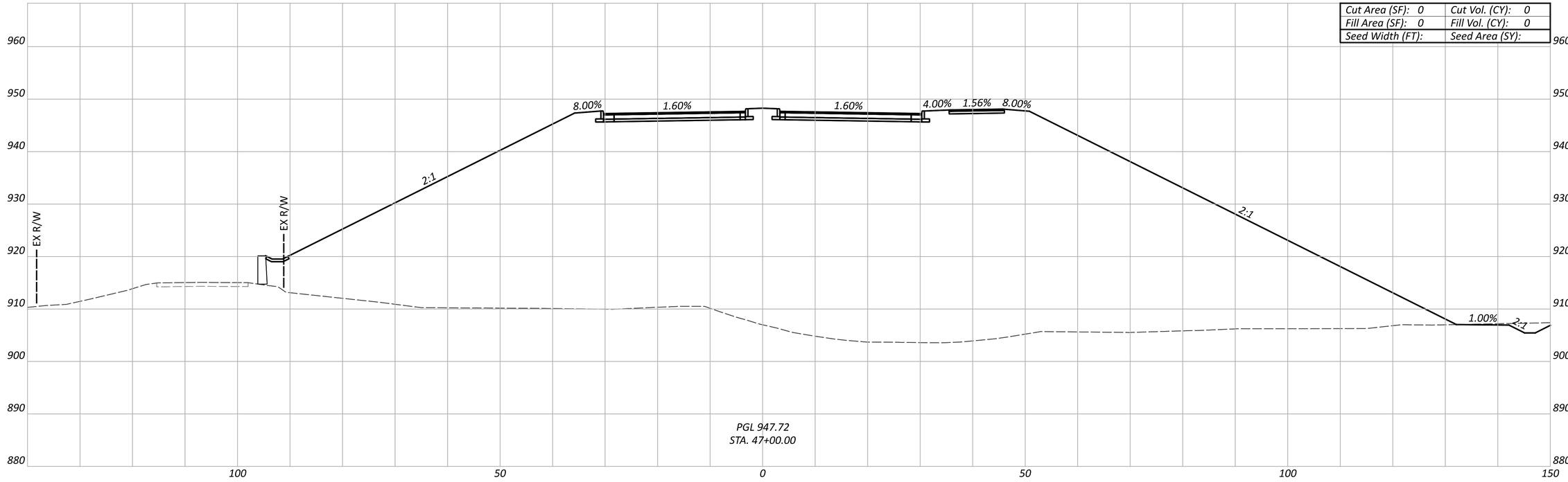
DESIGN AGENCY
STRUCTUREPOINT INC.

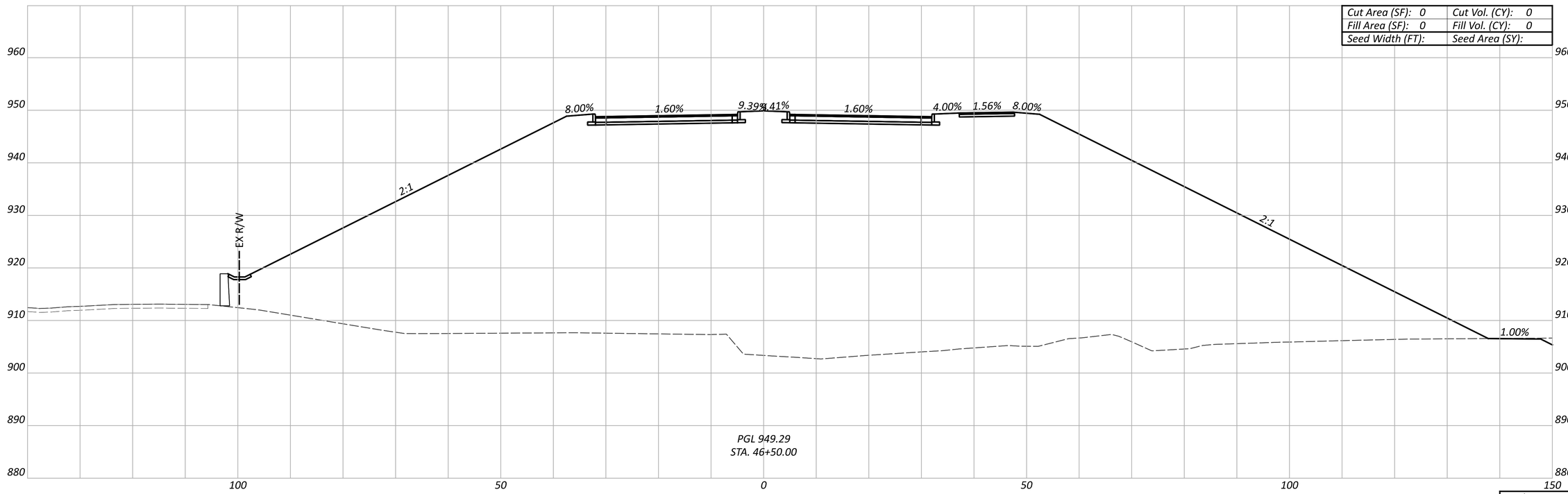
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.687	740





CROSS SECTIONS - TAYLOR RD
STA. 46+50.00 TO STA. 47+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals

Seeding	Cut	Fill

DESIGN AGENCY
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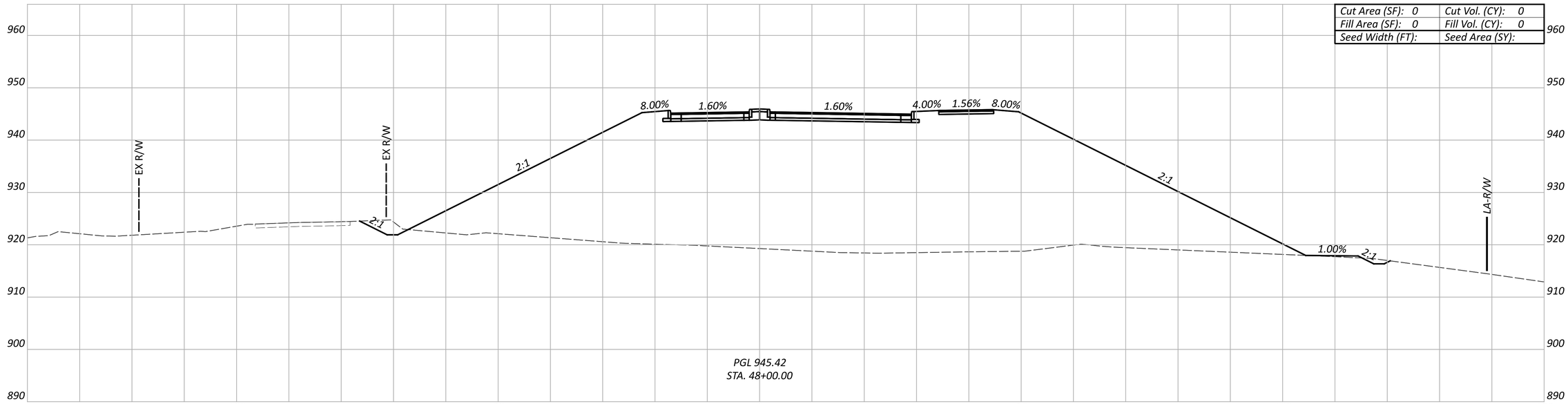
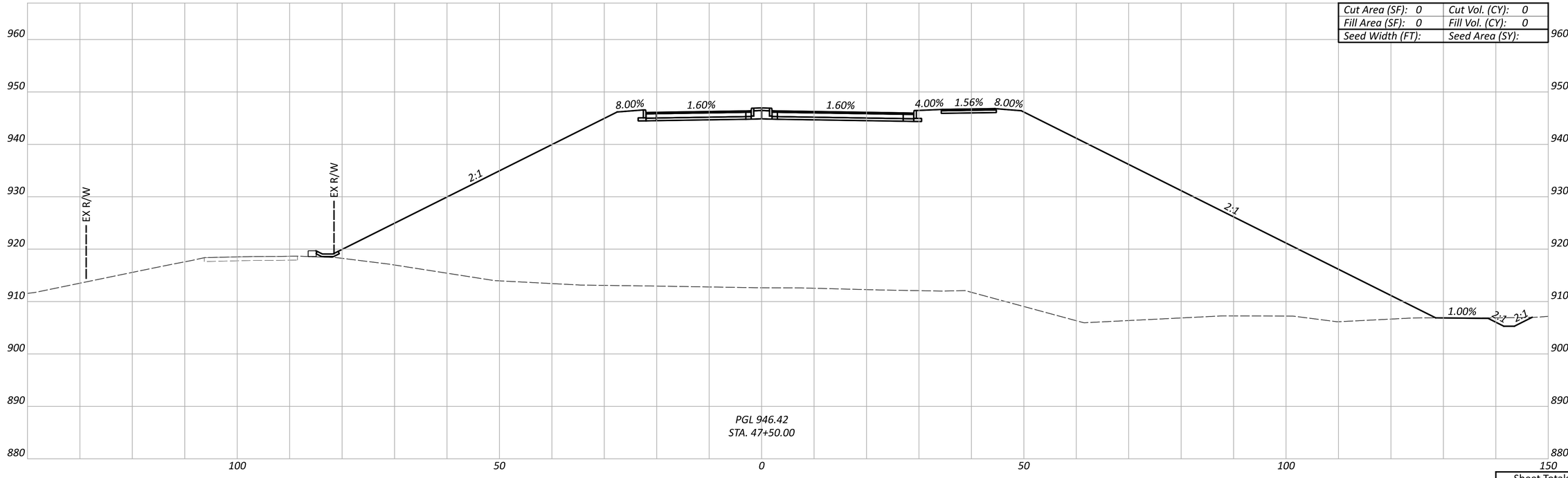
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.688 TOTAL 740





Sheet Totals

Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 47+50.00 TO STA. 48+00.00

DESIGN AGENCY
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SHEET P.689 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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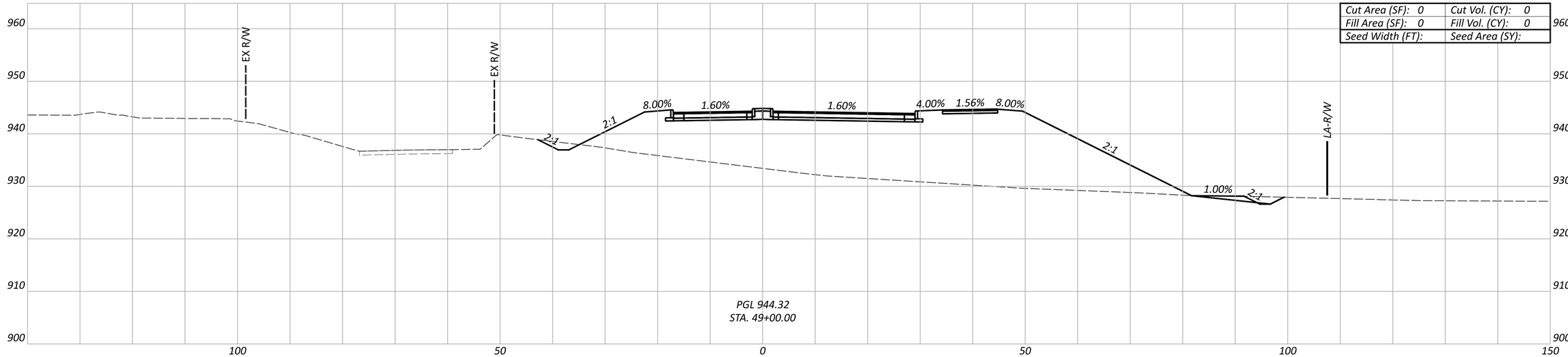

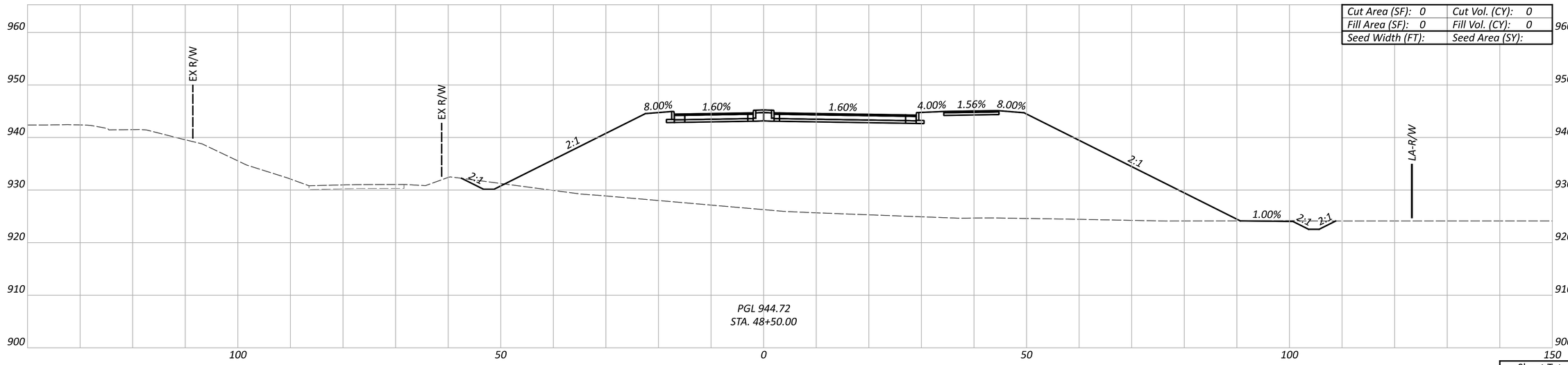

CROSS SECTIONS - TAYLOR RD
STA. 48+50.00 TO STA. 49+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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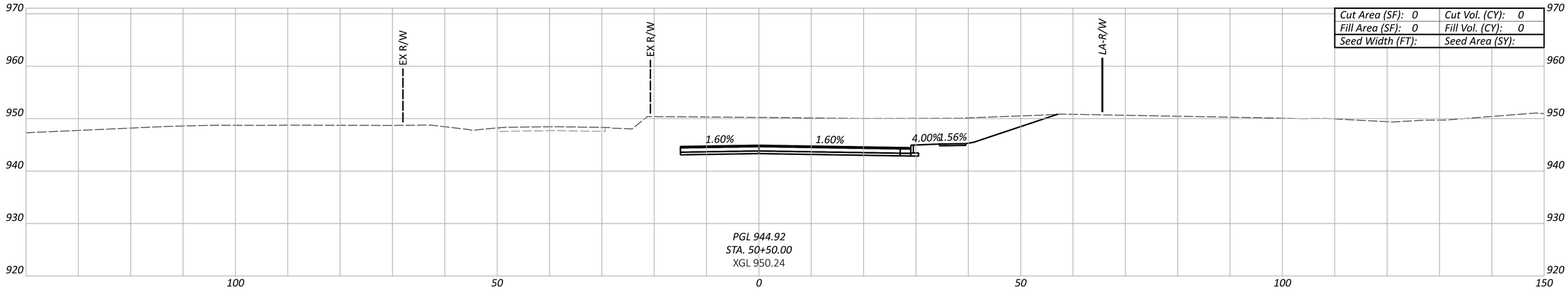
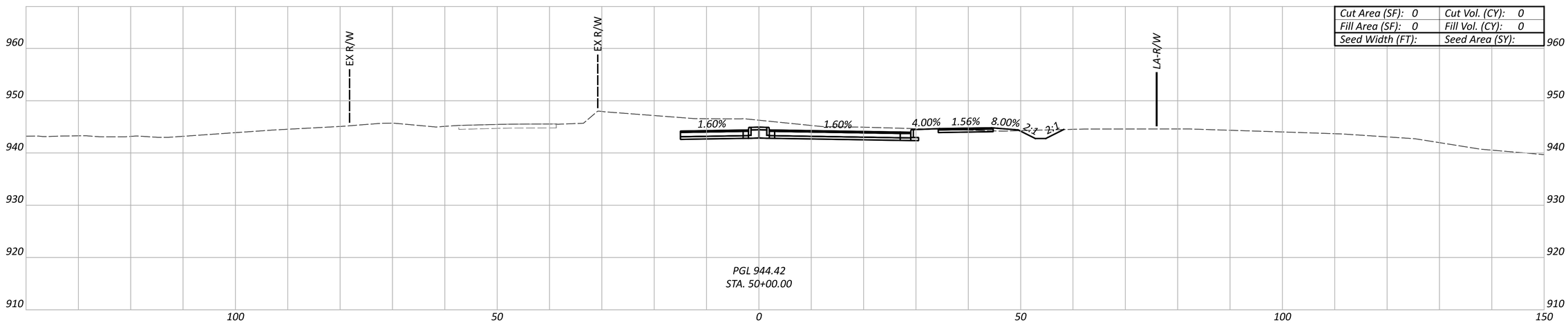
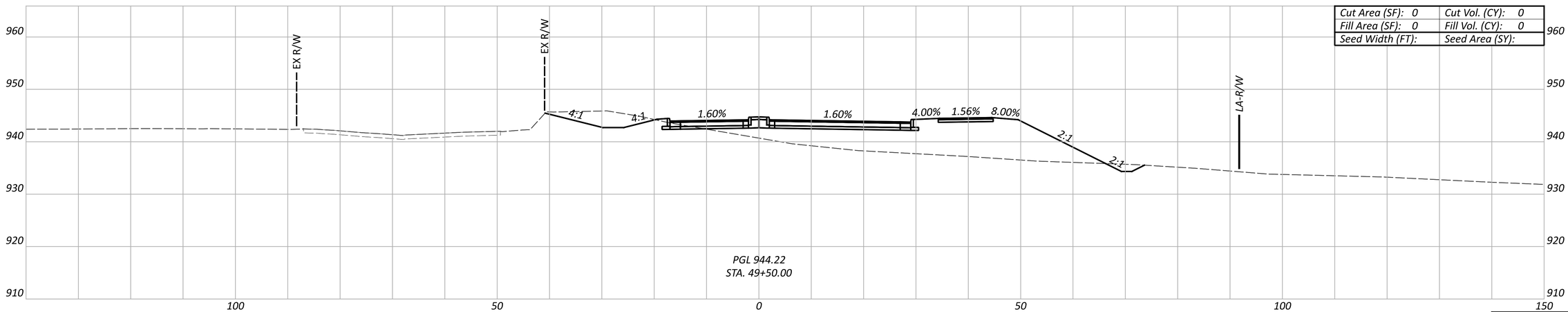
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.690 TOTAL 740







CROSS SECTIONS - TAYLOR RD
STA. 49+50.00 TO STA. 50+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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96808

SHEET P.691 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 49+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:00 PM USER: aoldaker
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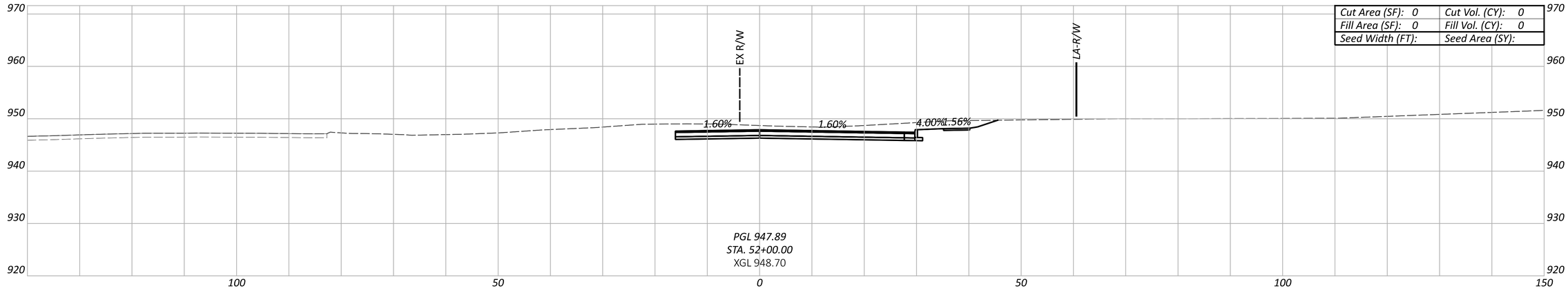

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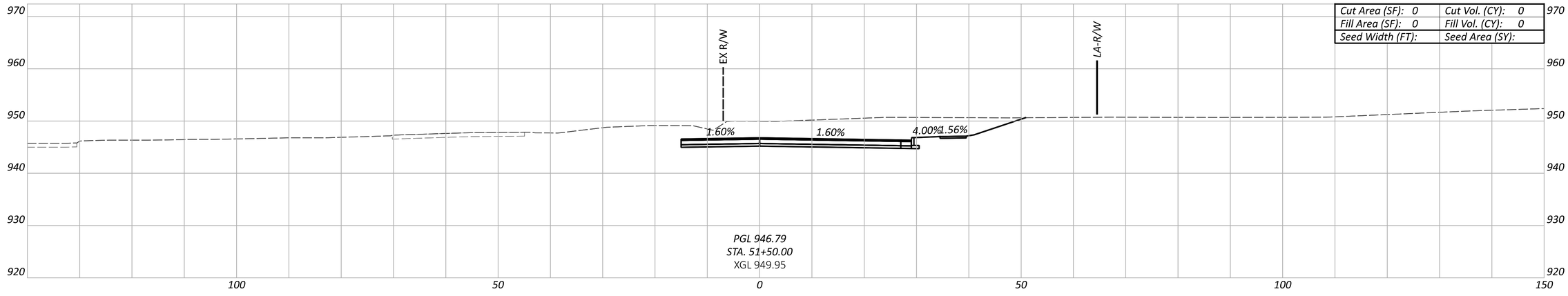

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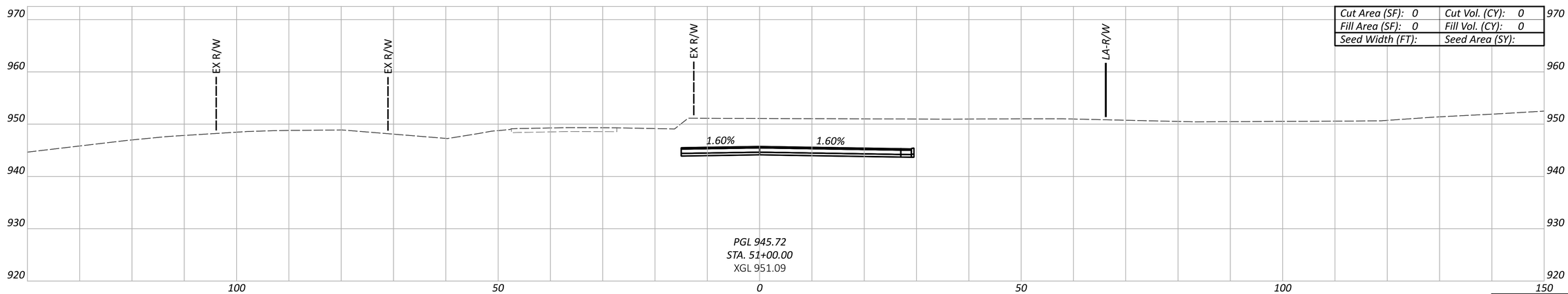

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 51+00.00 TO STA. 52+00.00

DESIGN AGENCY
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SHEET P.692 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 51+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:04 PM USER: aoldaker
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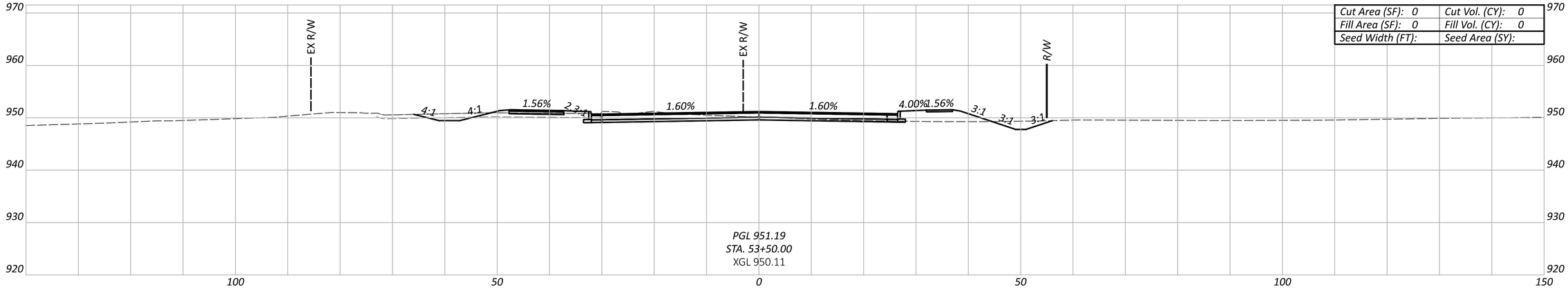

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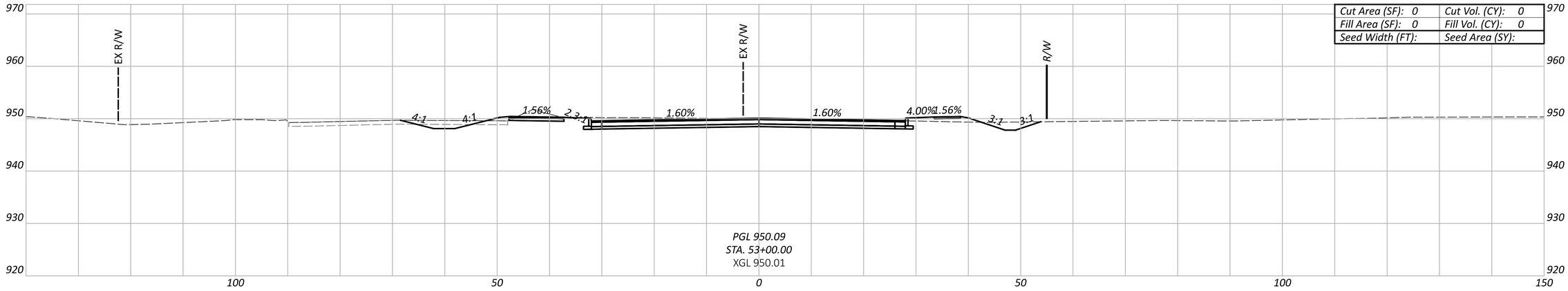
PGL 951.19
STA. 53+50.00
XGL 950.11



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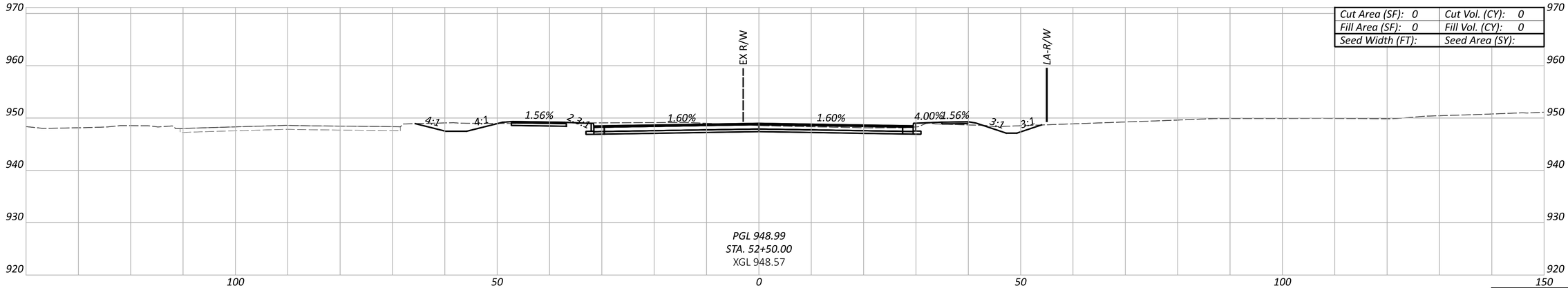
STA. 53+00.00
XGL 950.01



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Seed Width (FT):	Seed Area (SY):

PGL 948.99
STA. 52+50.00
XGL 948.57

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 52+50.00 TO STA. 53+50.00

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96808

SHEET P.693 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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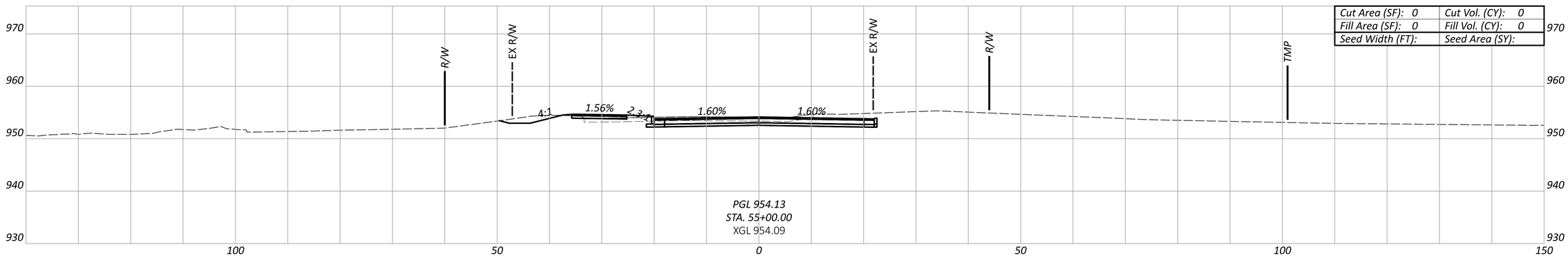

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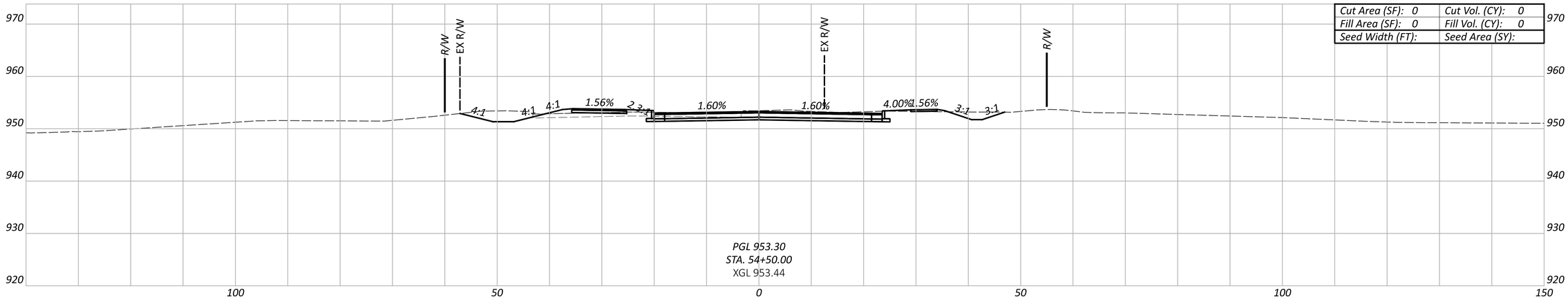

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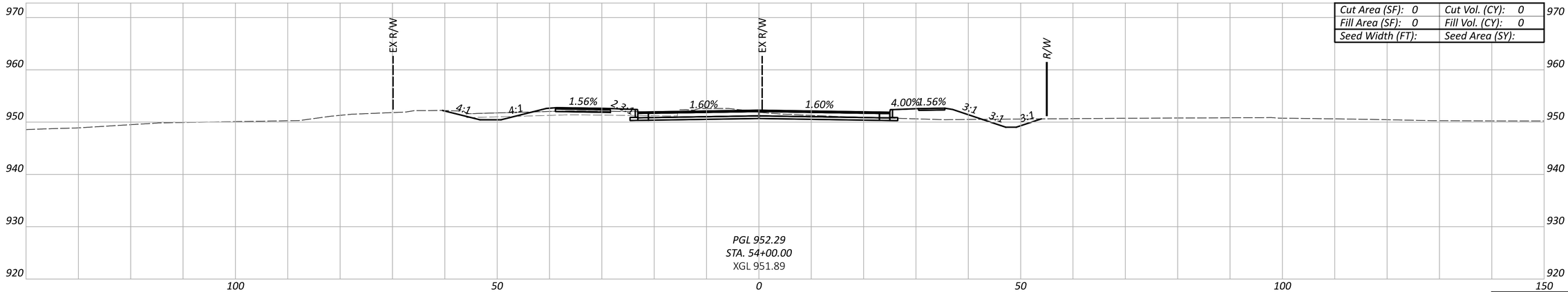

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CROSS SECTIONS - TAYLOR RD
STA. 54+00.00 TO STA. 55+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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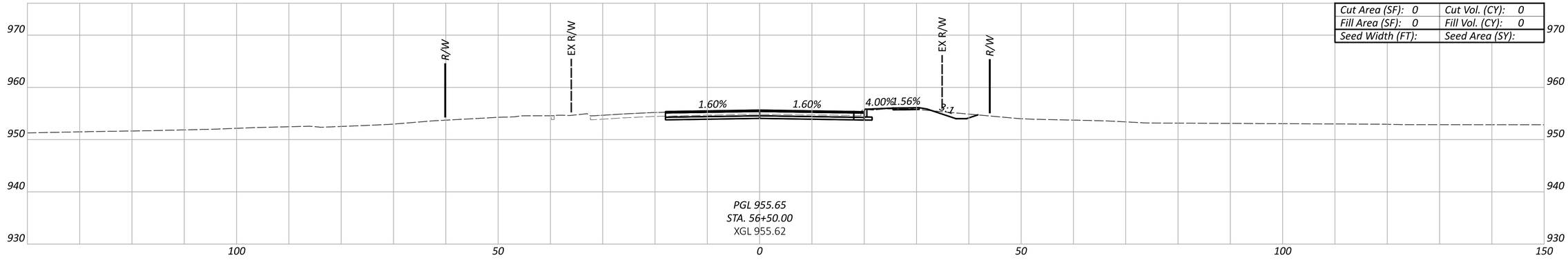
PROJECT ID
96808

SHEET P.694 TOTAL 740



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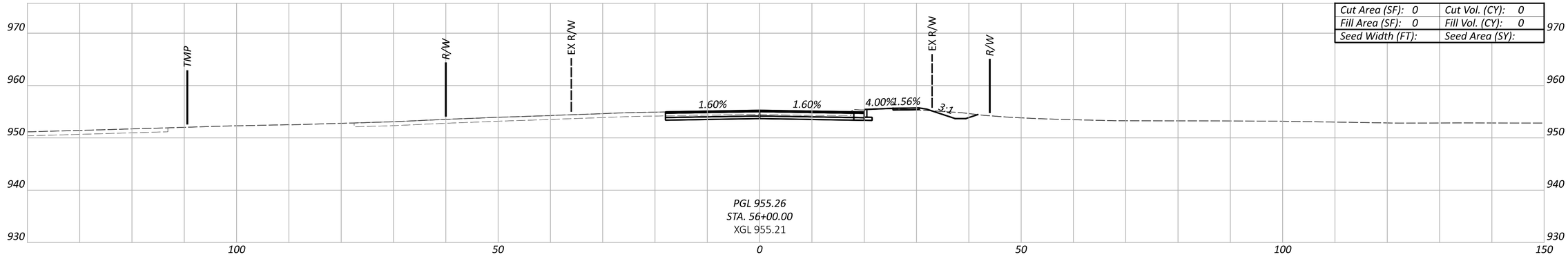

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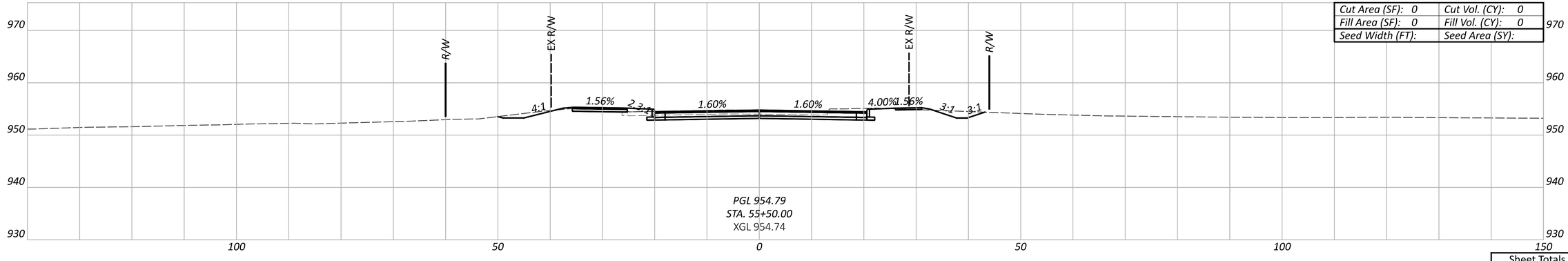

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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD
STA. 55+50.00 TO STA. 56+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 55+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:16 PM USER: aoldaker
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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
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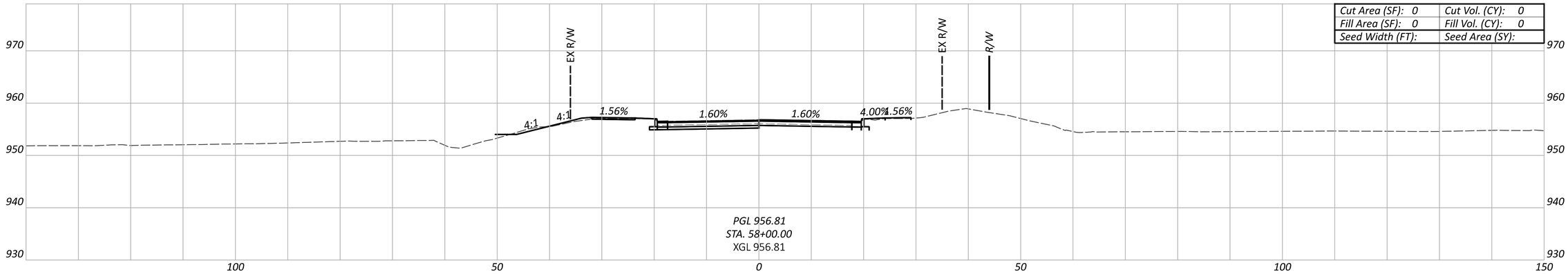
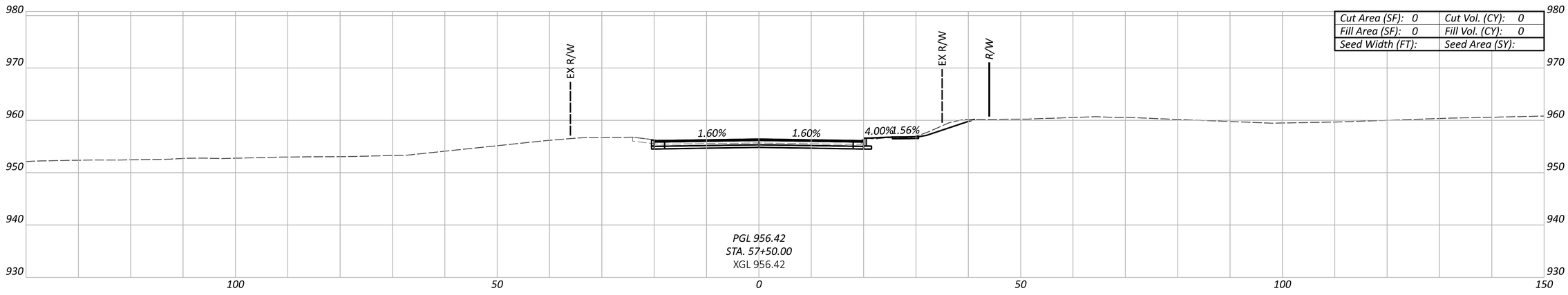
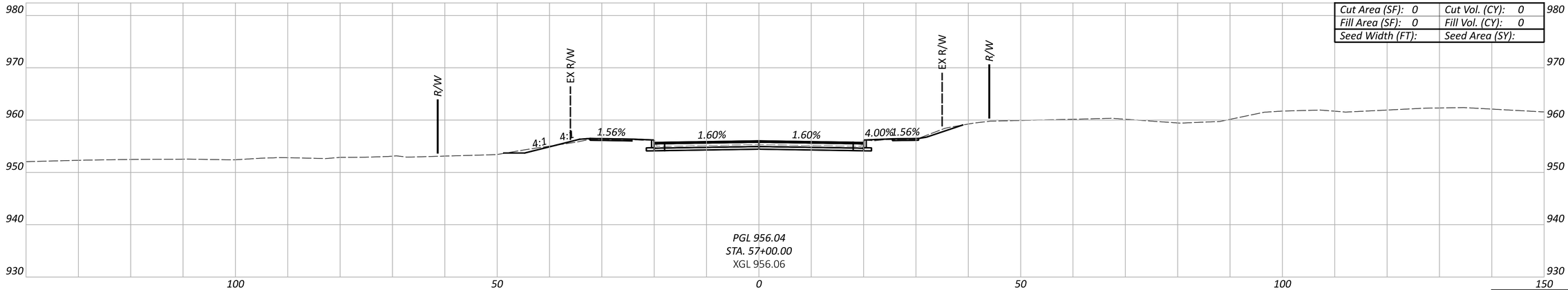
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.695	740







CROSS SECTIONS - TAYLOR RD
STA. 57+00.00 TO STA. 58+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 57+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:19 PM USER: aoldaker
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DESIGN AGENCY
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KAM 06/18/23

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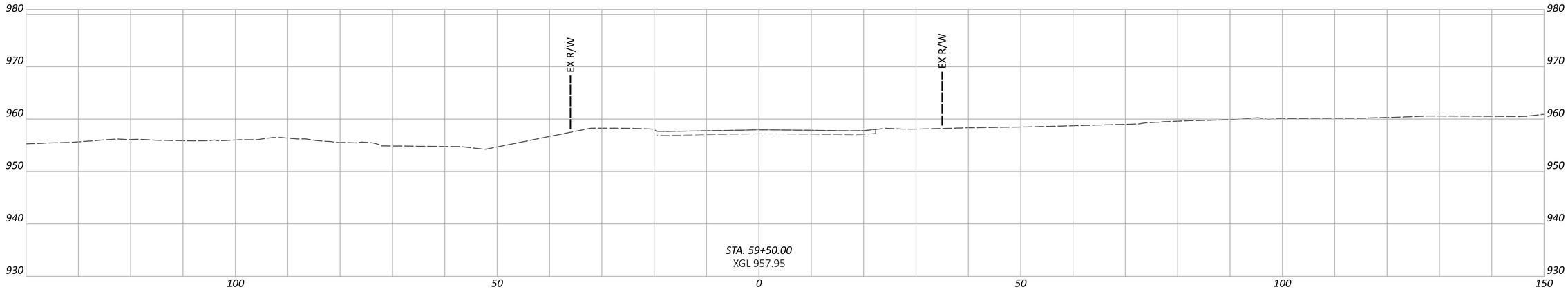
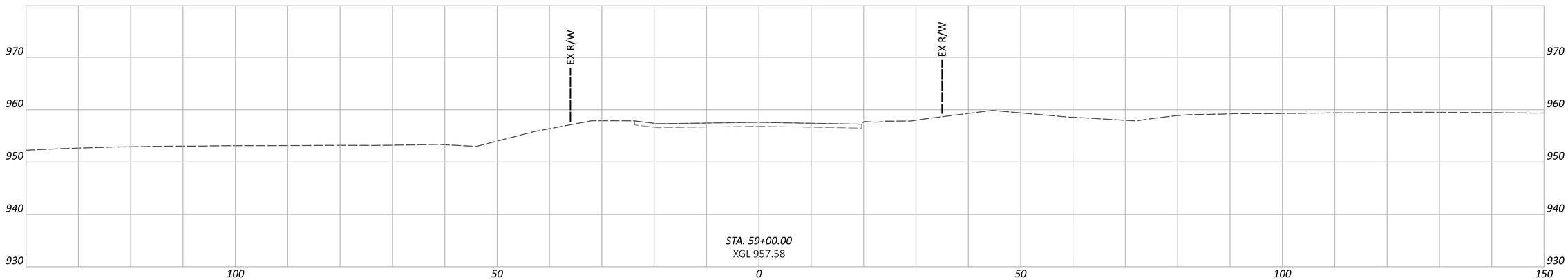
96808

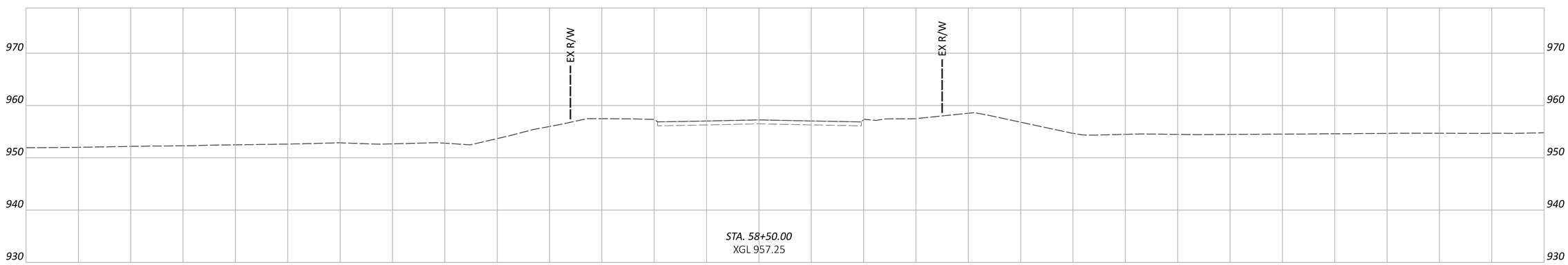
SHEET P.696 TOTAL 740

Sheet Totals

Seeding	Cut	Fill







CROSS SECTIONS - TAYLOR RD
STA. 58+50.00 TO STA. -0+50.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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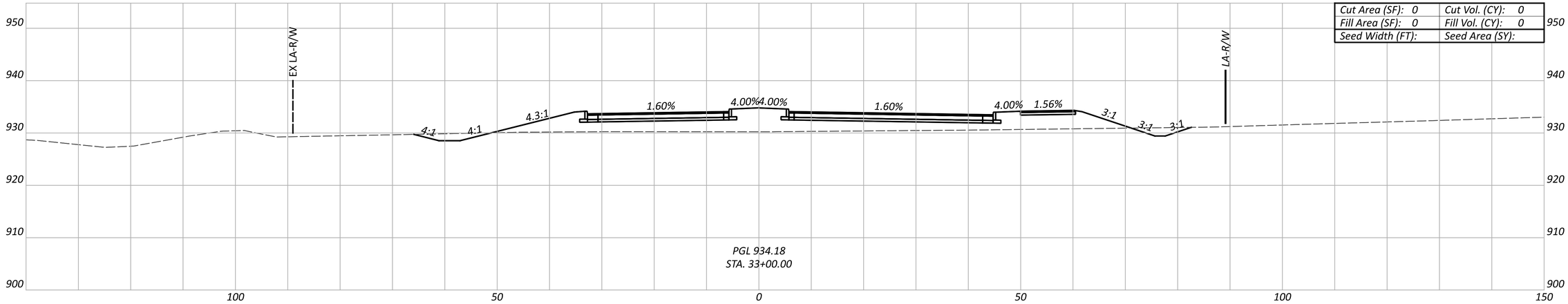
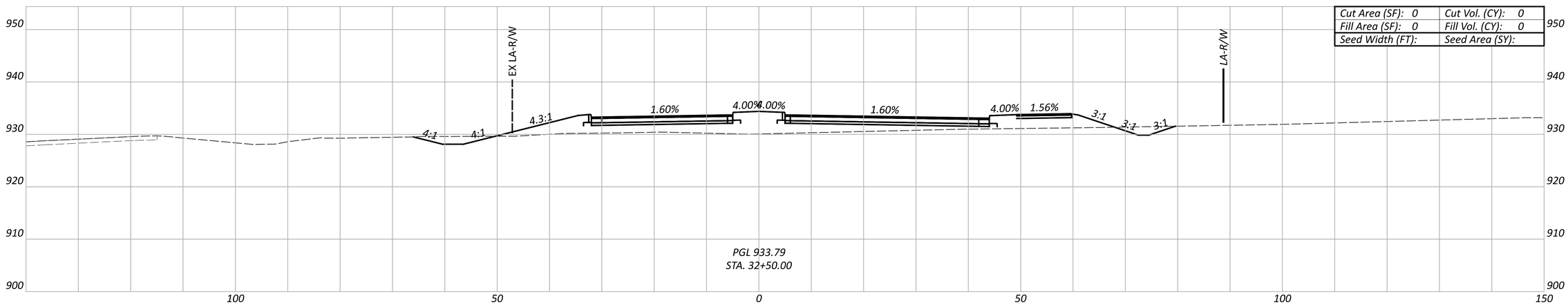
KAM 06/18/23

PROJECT ID
96808

SHEET P.697 TOTAL 740





CROSS SECTIONS - TAYLOR RD STEEL
STA. 32+50.00 TO STA. 33+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
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DESIGNER
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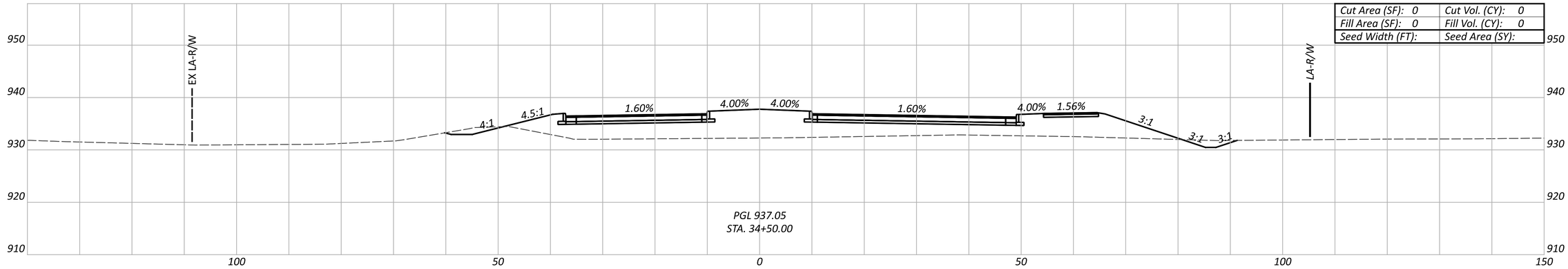
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.698 TOTAL 740



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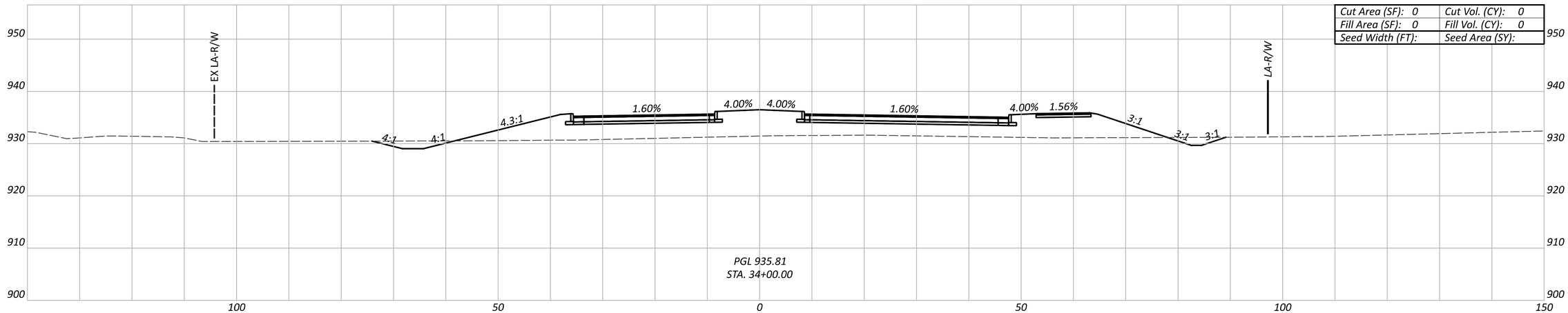
Seed Width (FT):	Seed Area (SY):



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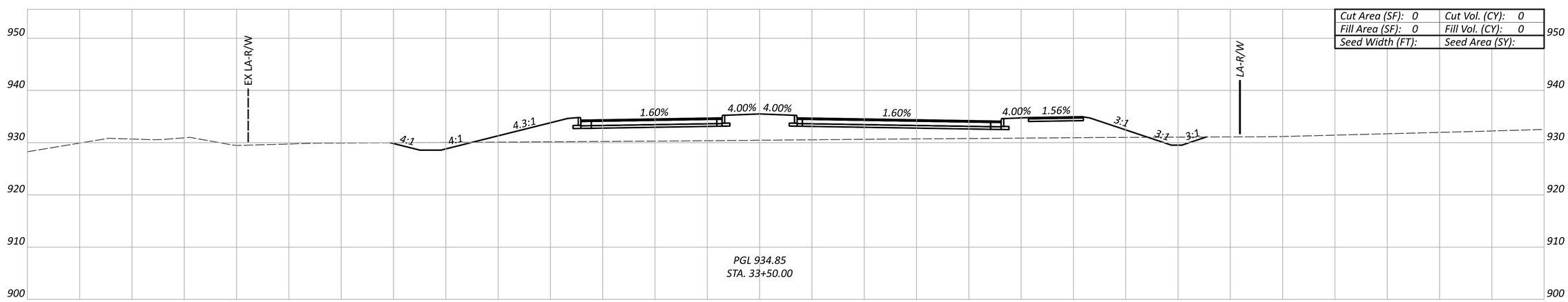

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL
STA. 33+50.00 TO STA. 34+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.699 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 33+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:45 PM USER: aoldaker
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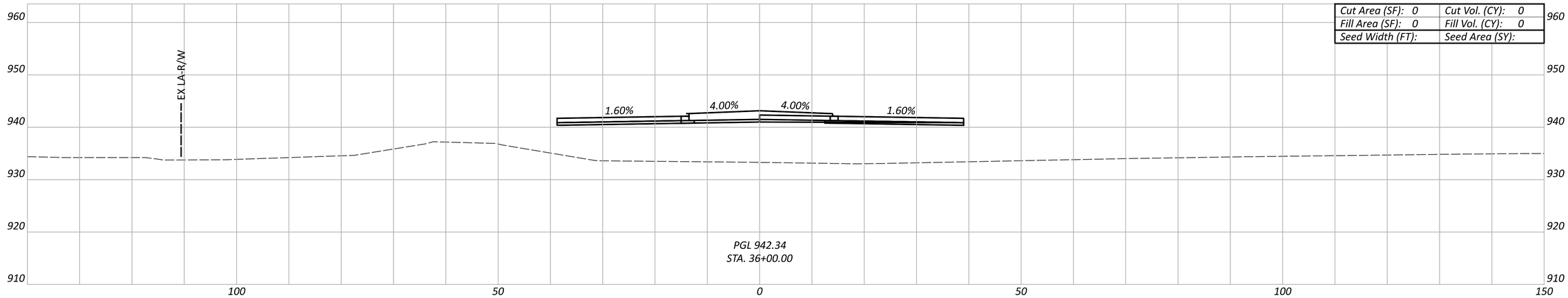

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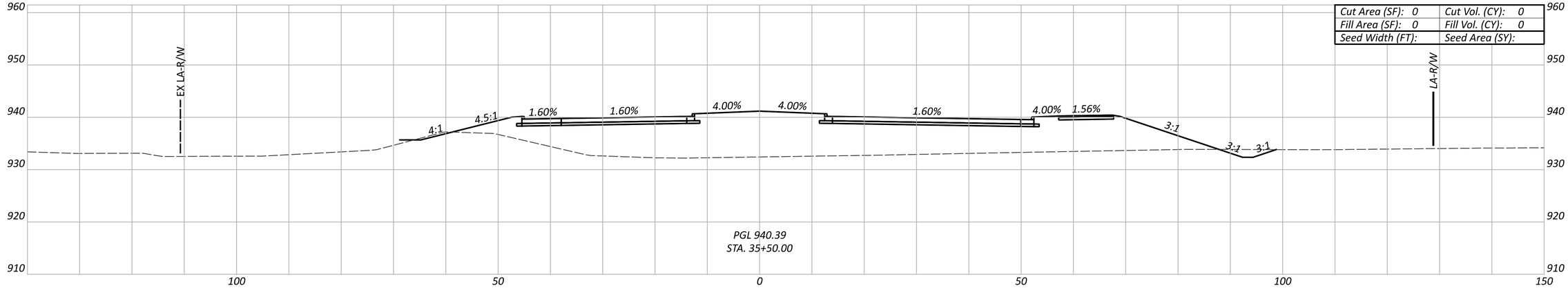

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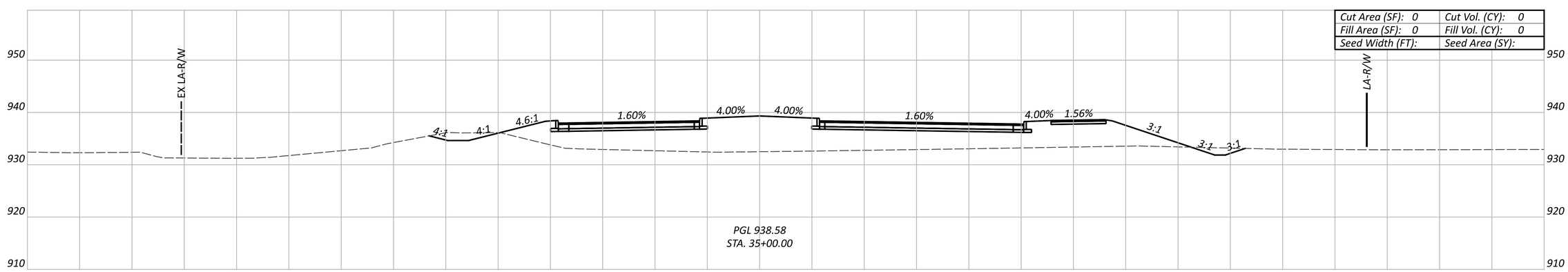

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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL
STA. 35+00.00 TO STA. 36+00.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.700 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 35+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:49 PM USER: aoldaker
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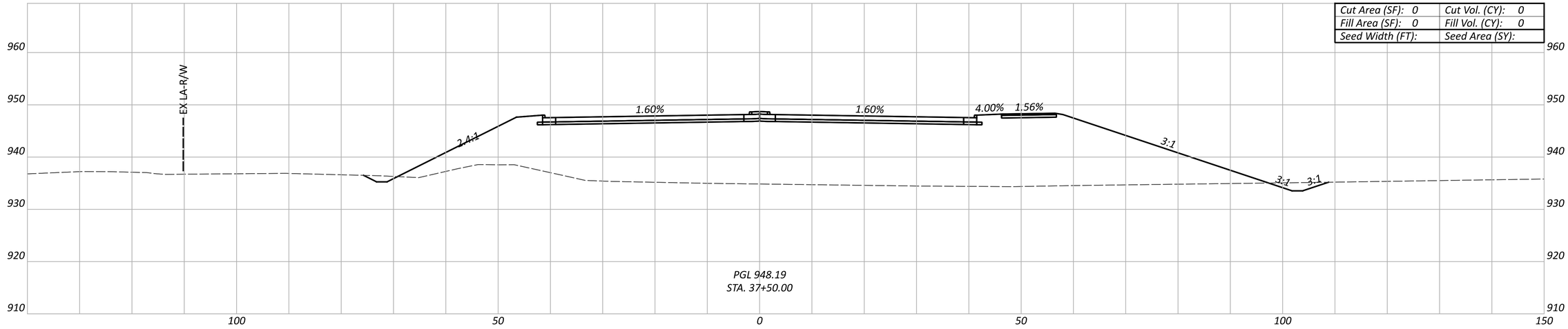

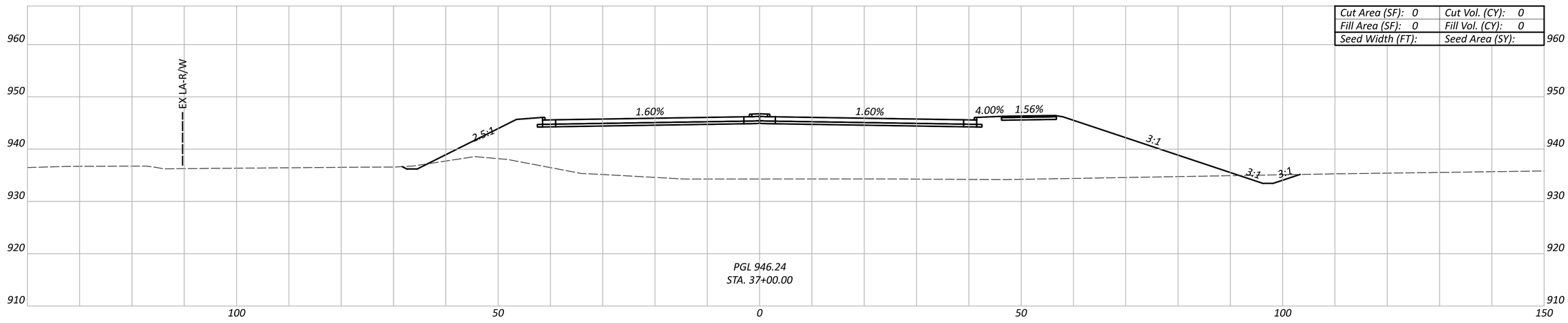

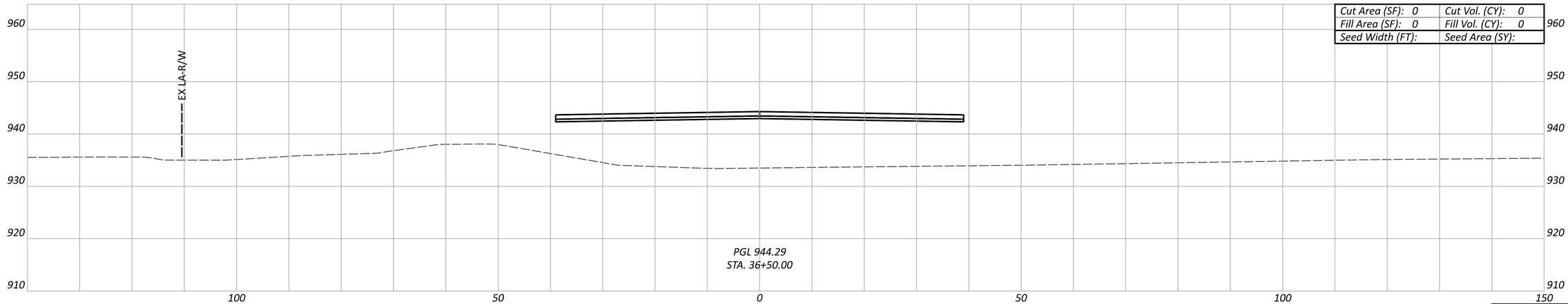

CROSS SECTIONS - TAYLOR RD STEEL
STA. 36+50.00 TO STA. 37+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
MIDWESTERN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.701 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 36+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:52 PM USER: aoldaker
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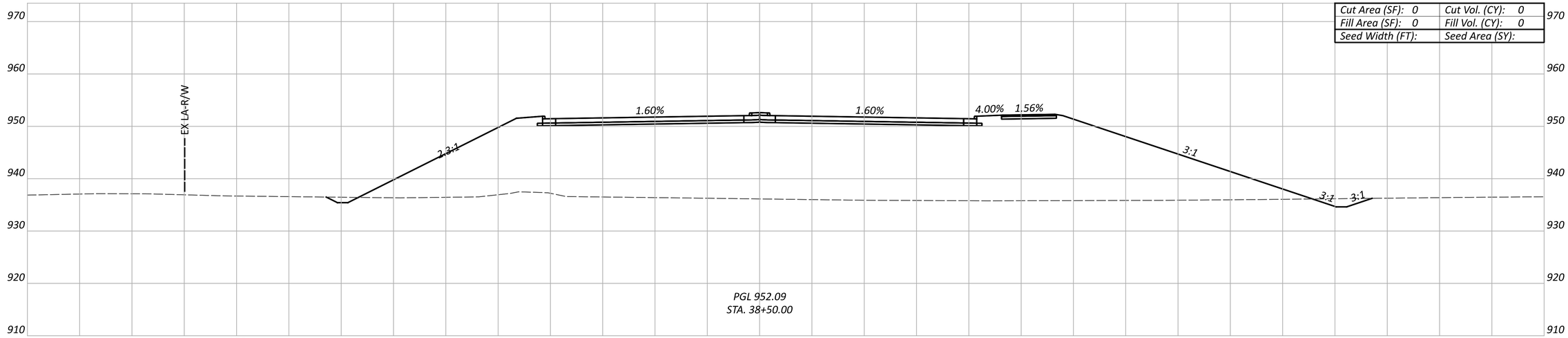

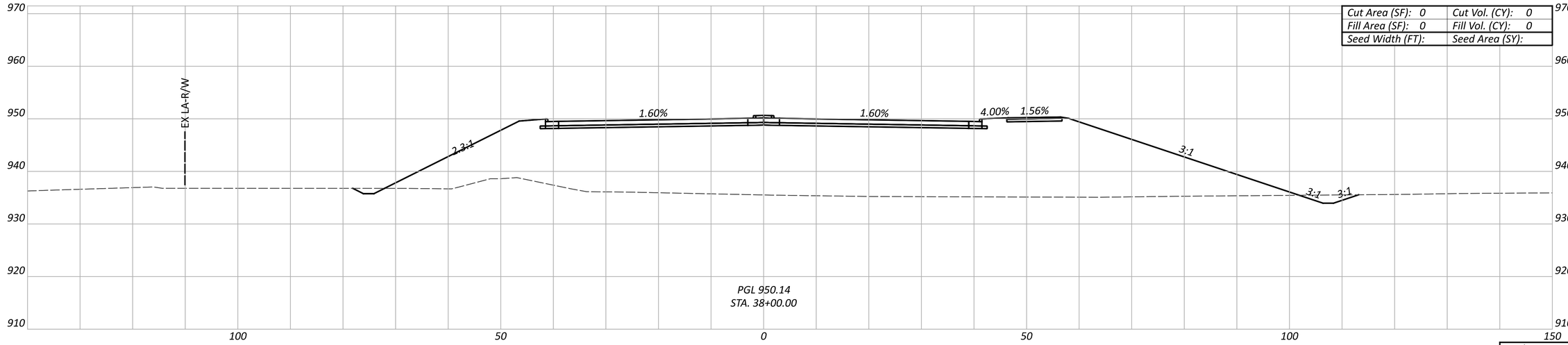

CROSS SECTIONS - TAYLOR RD STEEL
STA. 38+00.00 TO STA. 38+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.702 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 38+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:47:55 PM USER: aoldaker
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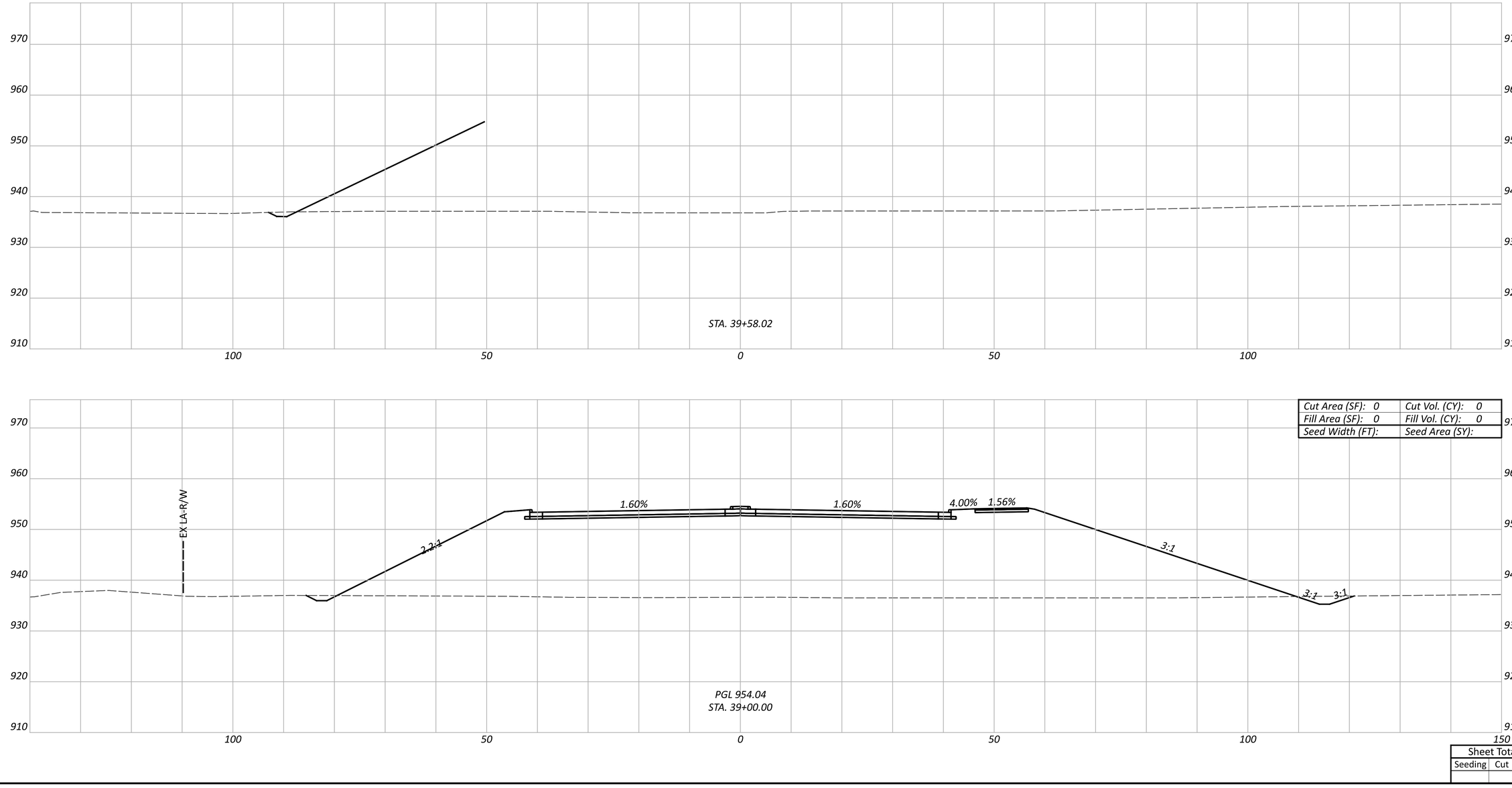

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CROSS SECTIONS - TAYLOR RD STEEL
STA. 39+00.00 TO STA. 39+58.02

Sheet Totals		
Seeding	Cut	Fill

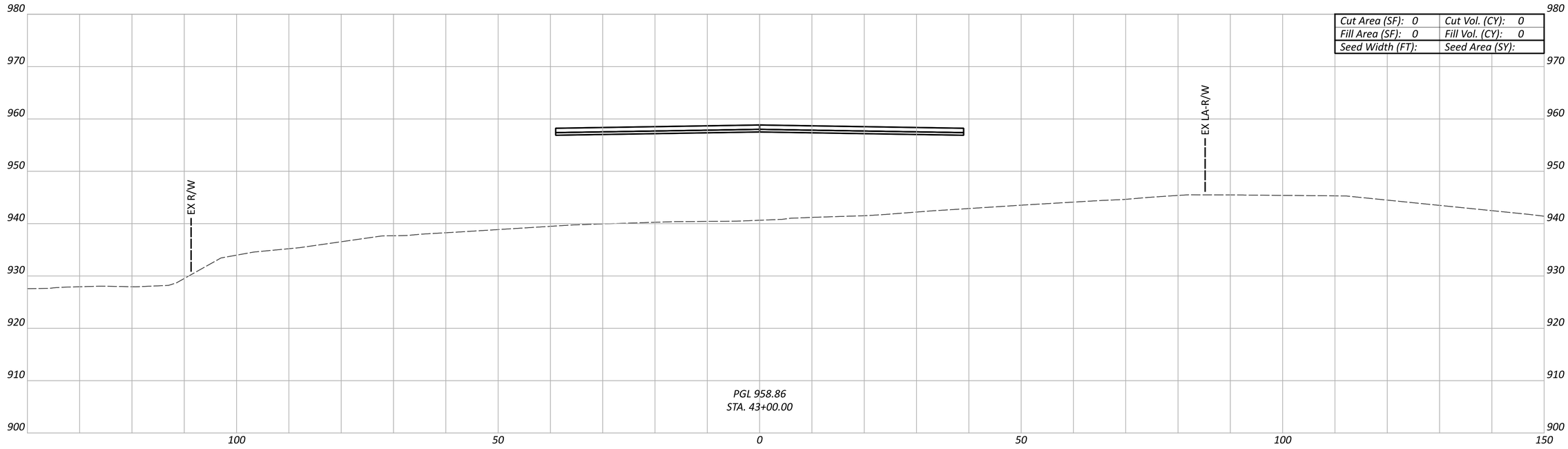
DESIGN AGENCY
STRUCTUREPOINT

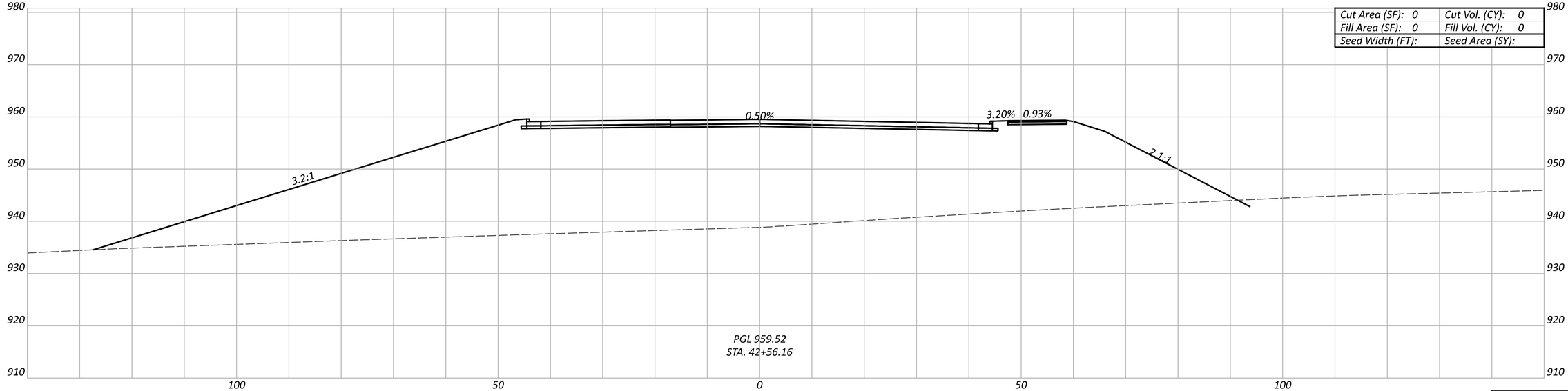
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.703 TOTAL 740





CROSS SECTIONS - TAYLOR RD STEEL
STA. 42+56.10 TO STA. 43+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.704 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 42+56.16 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:01 PM USER: aoldaker
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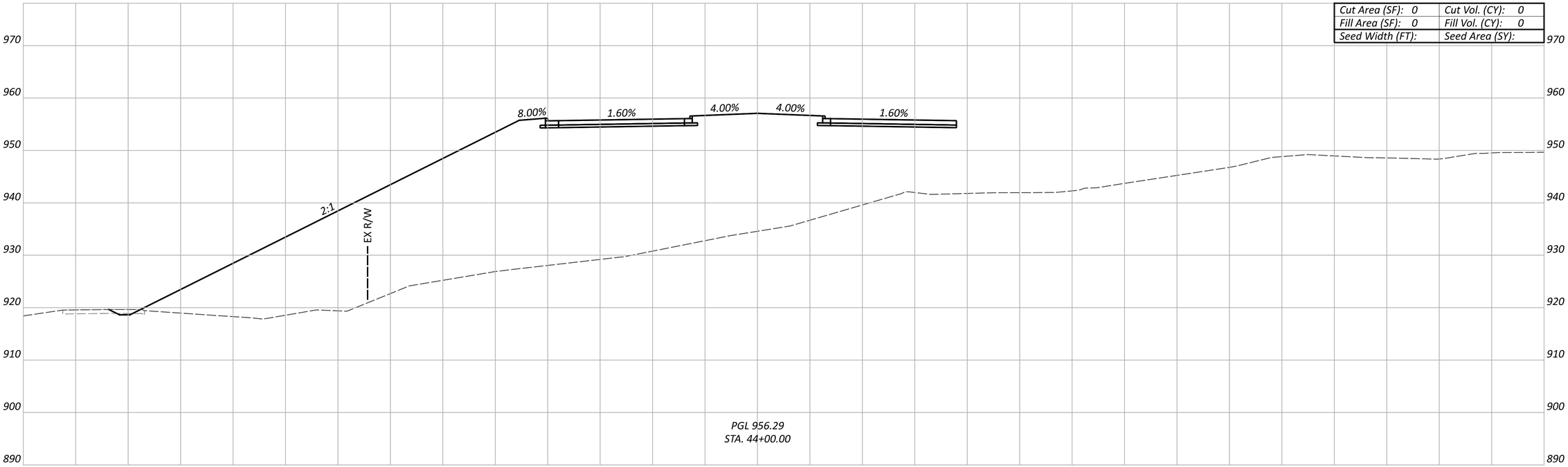

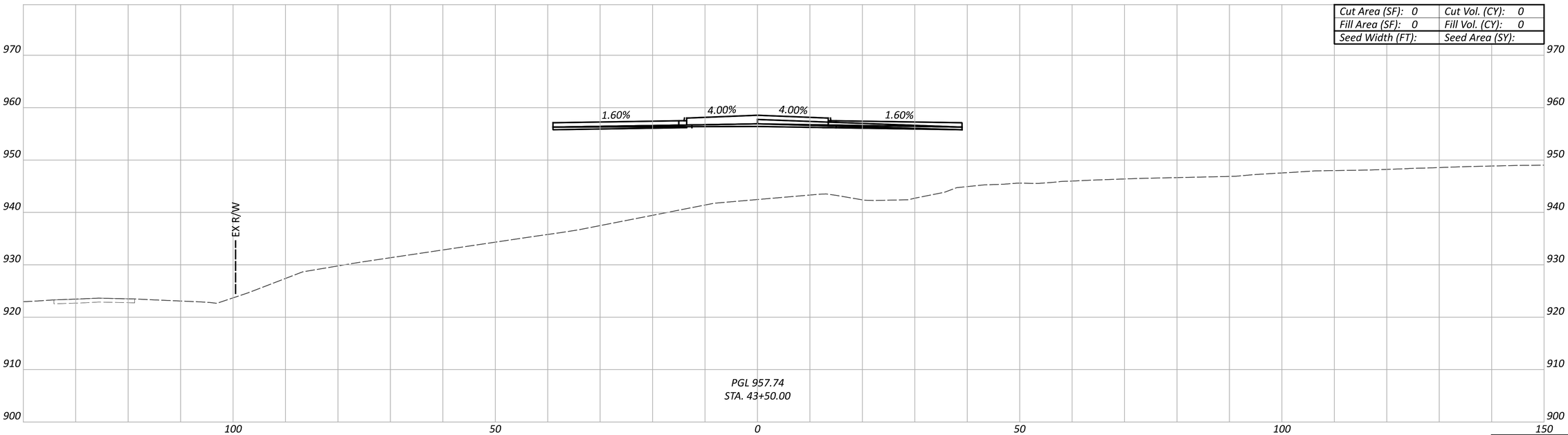

CROSS SECTIONS - TAYLOR RD STEEL
STA. 43+50.00 TO STA. 44+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

Sheet Totals

Seeding	Cut	Fill

SHEET P.705 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 44+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:08 PM USER: aoldaker
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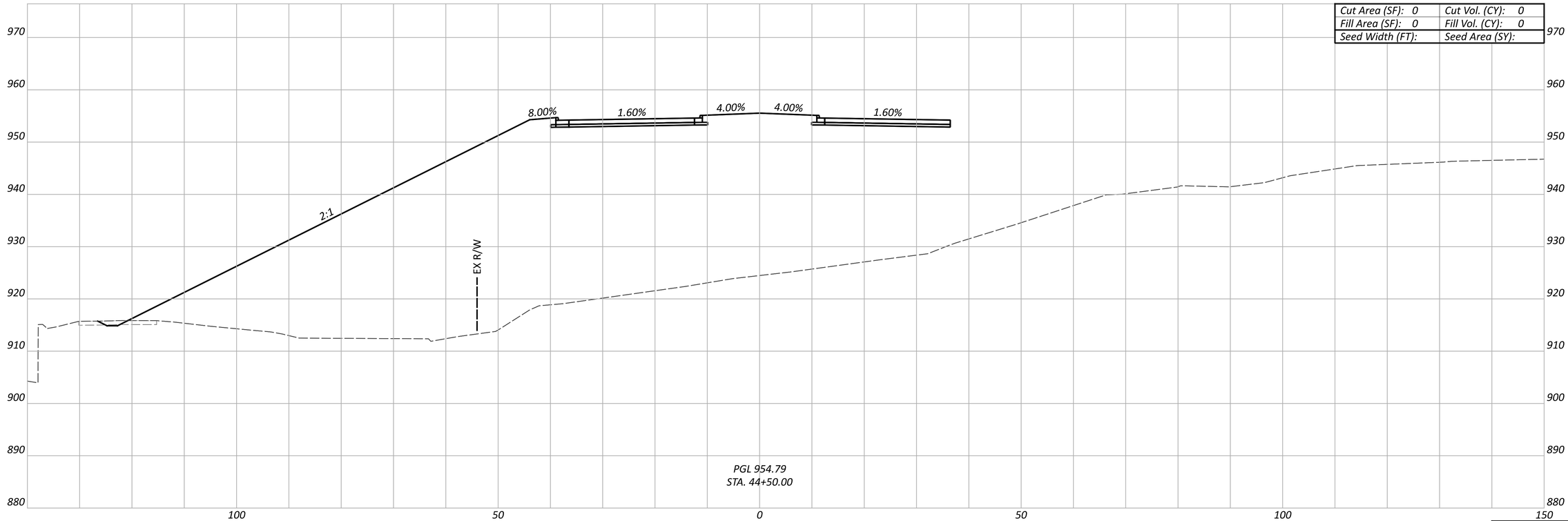

CROSS SECTIONS - TAYLOR RD STEEL
STA. 44+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.706 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 45+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:11 PM USER: aoldaker
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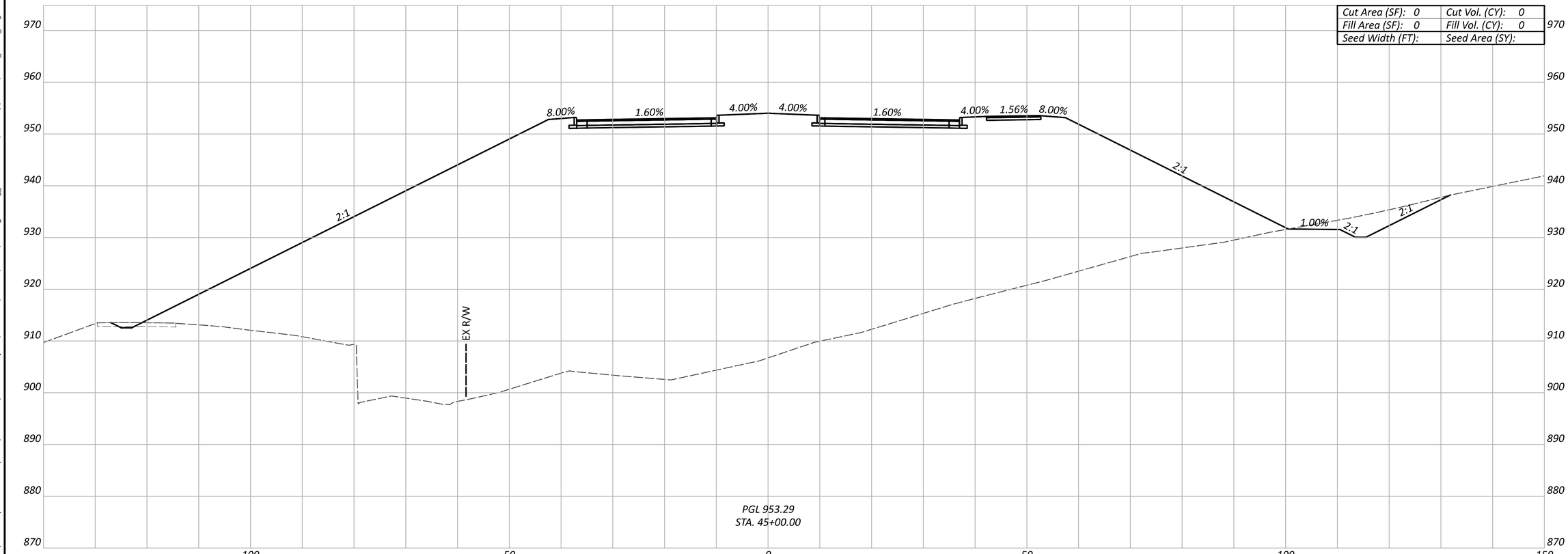

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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL
STA. 45+00.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.707 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 45+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:14 PM USER: aoldaker
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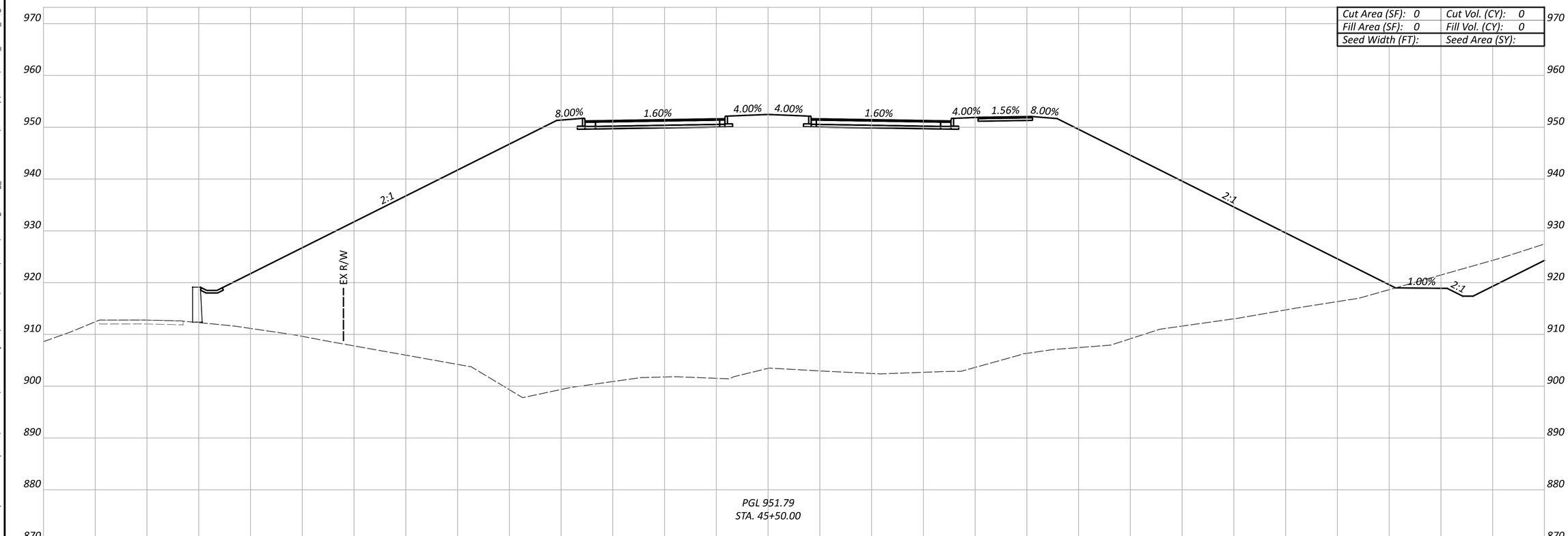

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL
STA. 45+50.00

DESIGN AGENCY
STRUCTUREPOINT

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.708 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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Cut Area (SF): 0	Cut Vol. (CY): 0
Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL STA. 46+00.00

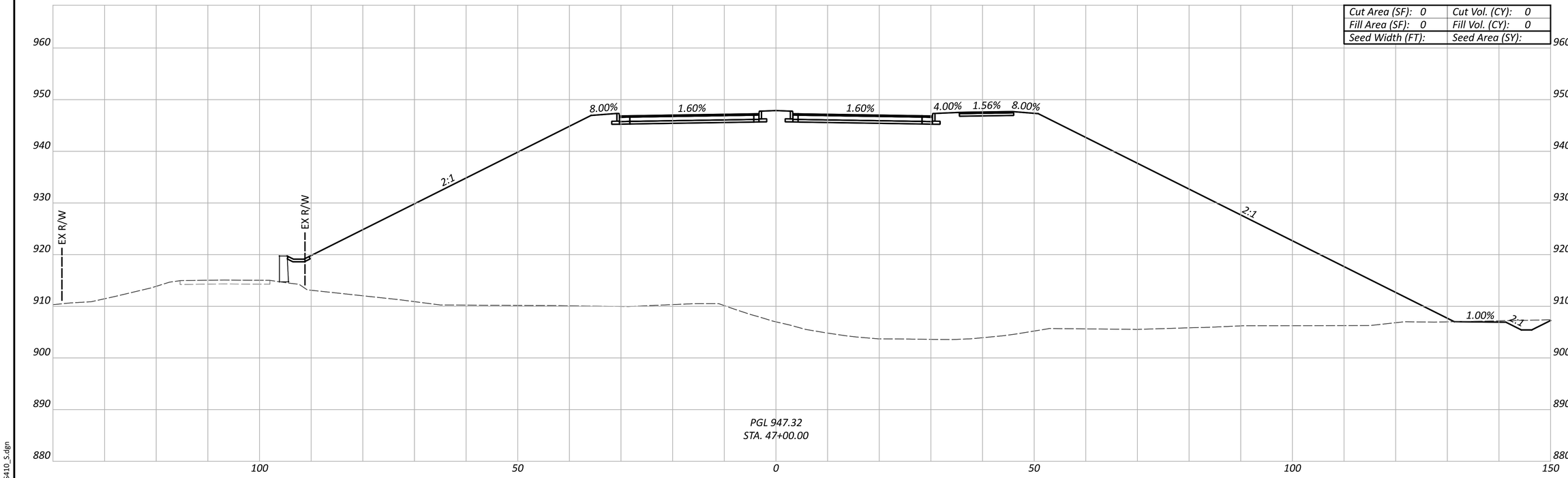
DESIGN AGENCY
STRUCTUREPOINT

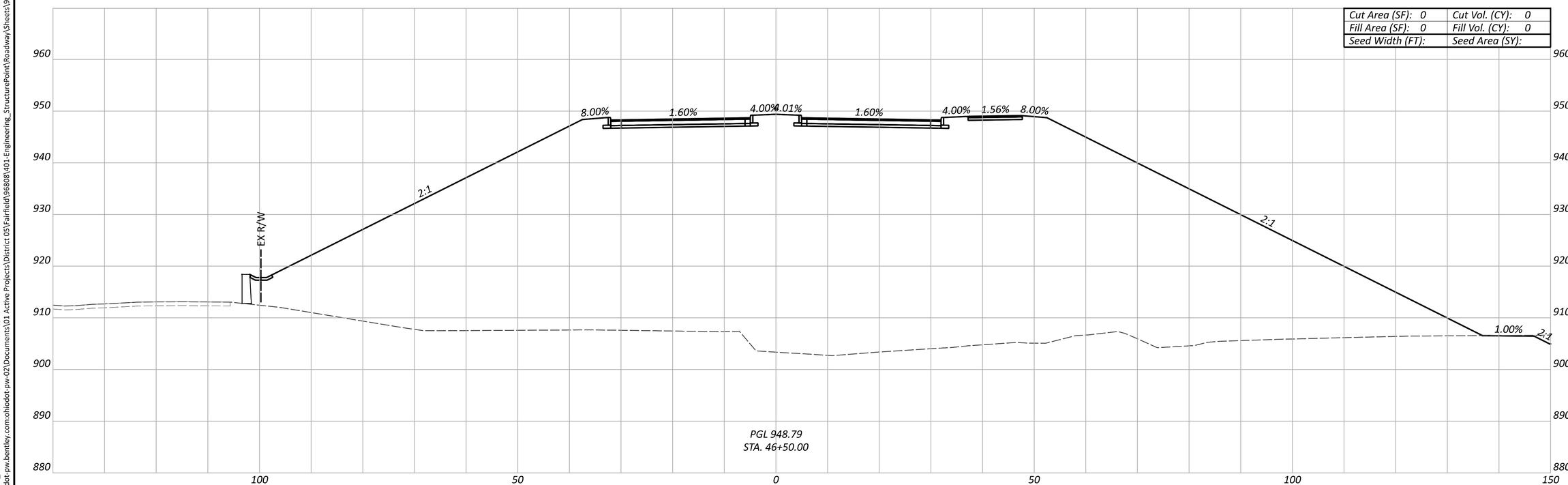
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.709 TOTAL 740





CROSS SECTIONS - TAYLOR RD STEEL
STA. 46+50.00 TO STA. 47+00.00

FAI/LIC IR 70 0.00/0.00

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Sheet Totals		
Seeding	Cut	Fill

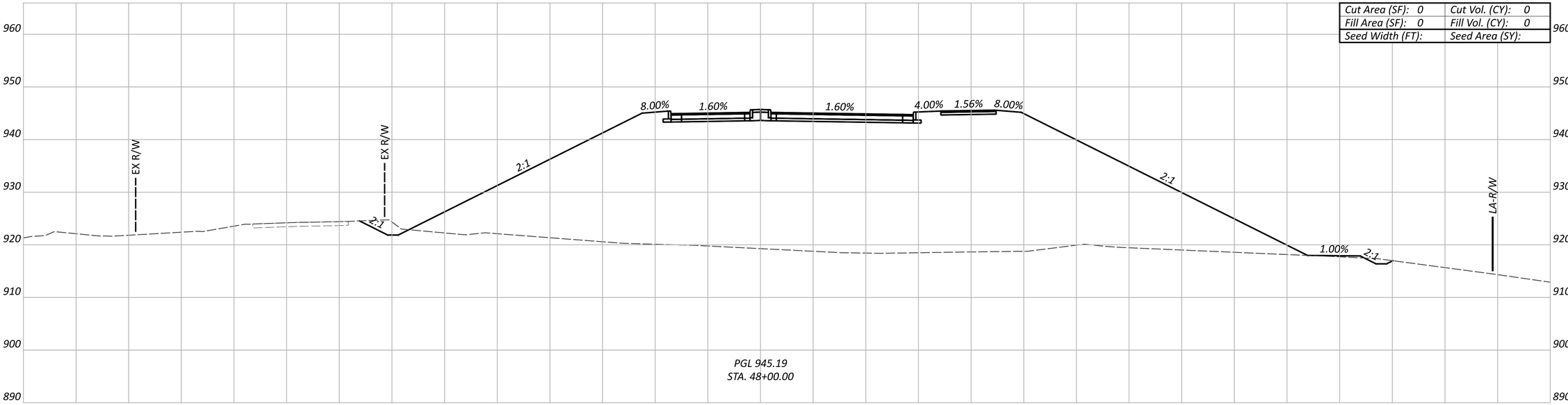
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

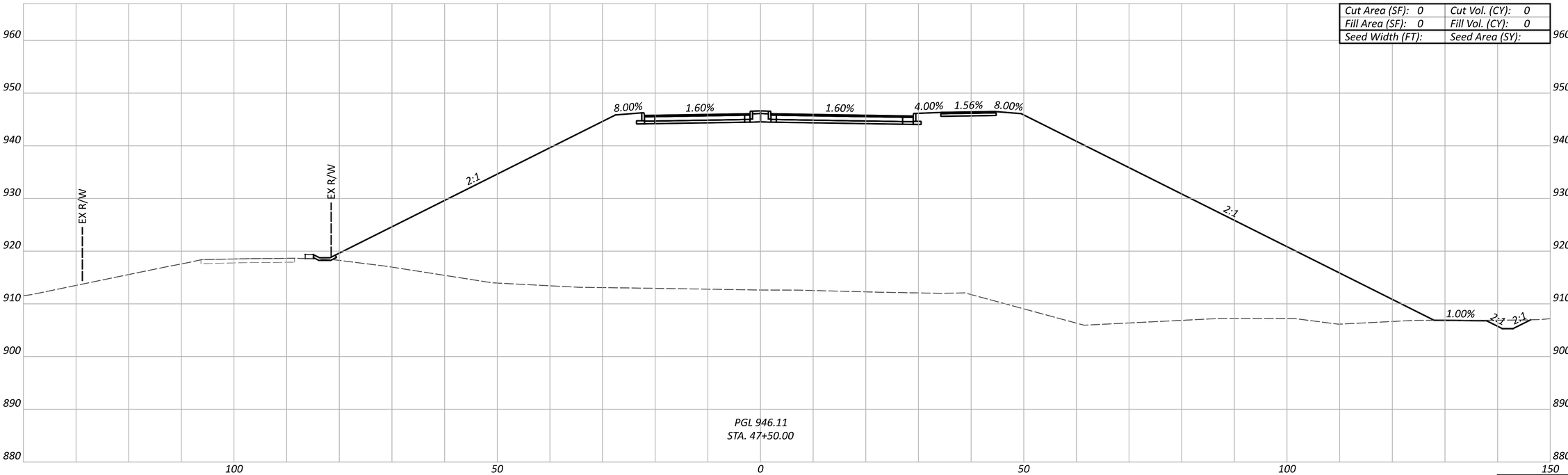
DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.710 TOTAL 740





CROSS SECTIONS - TAYLOR RD STEEL
STA. 47+50.00 TO STA. 48+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 47+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:23 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

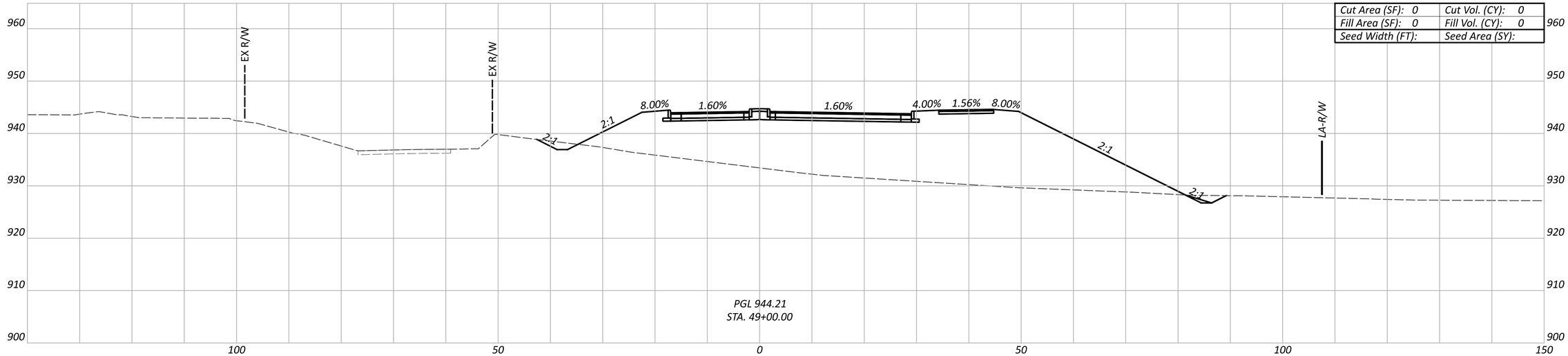
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.711 TOTAL 740



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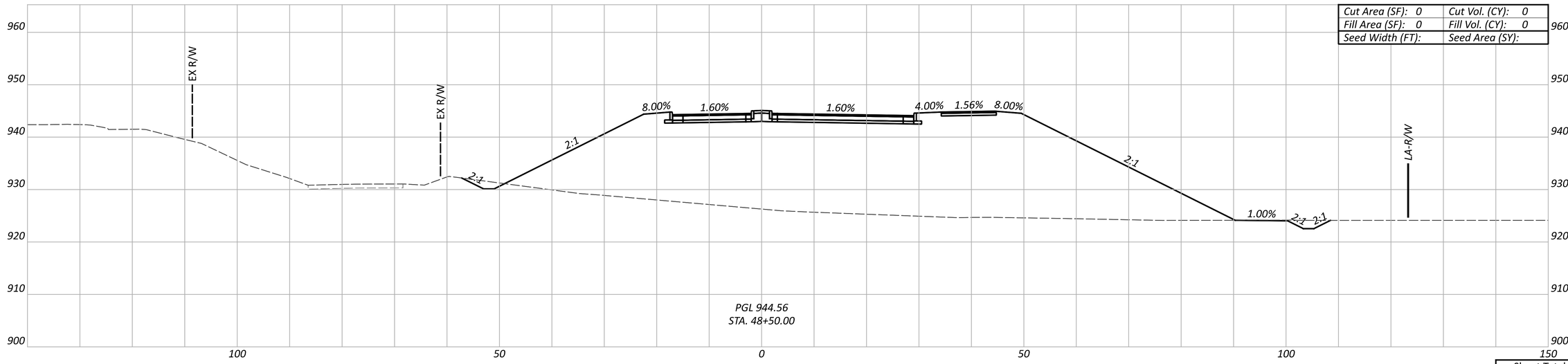

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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL
STA. 48+50.00 TO STA. 49+00.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.712	740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 48+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:26 PM USER: aoldaker
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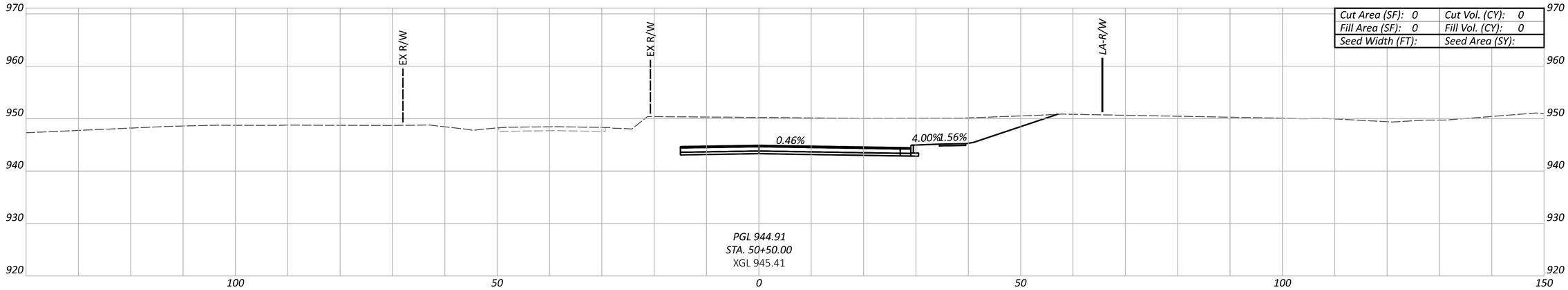

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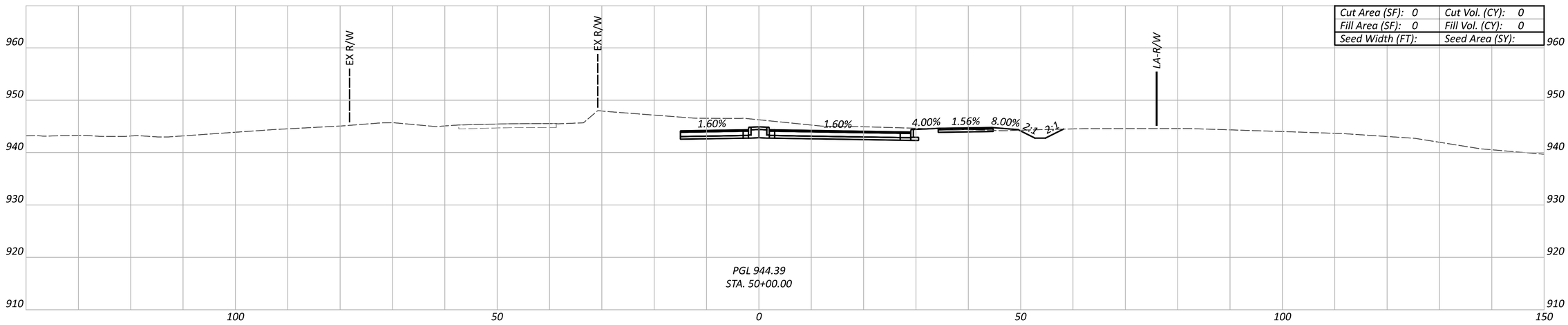

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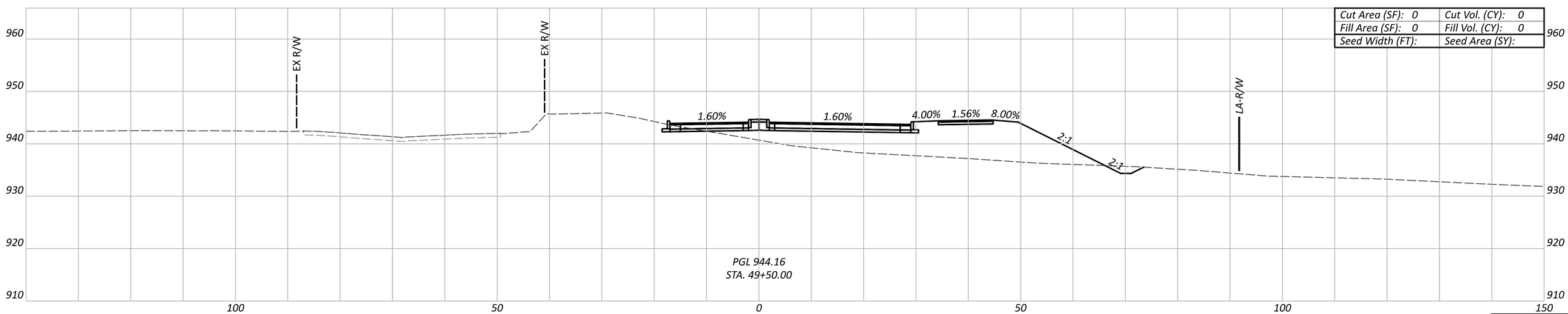

Cut Area (SF): 0	Cut Vol. (CY): 0
Fill Area (SF): 0	Fill Vol. (CY): 0
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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD STEEL
STA. 49+50.00 TO STA. 50+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.713 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 49+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:29 PM USER: aoldaker
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FAI/LIC IR 70 0.00/0.00

MODEL: CLP_TAYLOR - 51+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:33 PM USER: aoldaker
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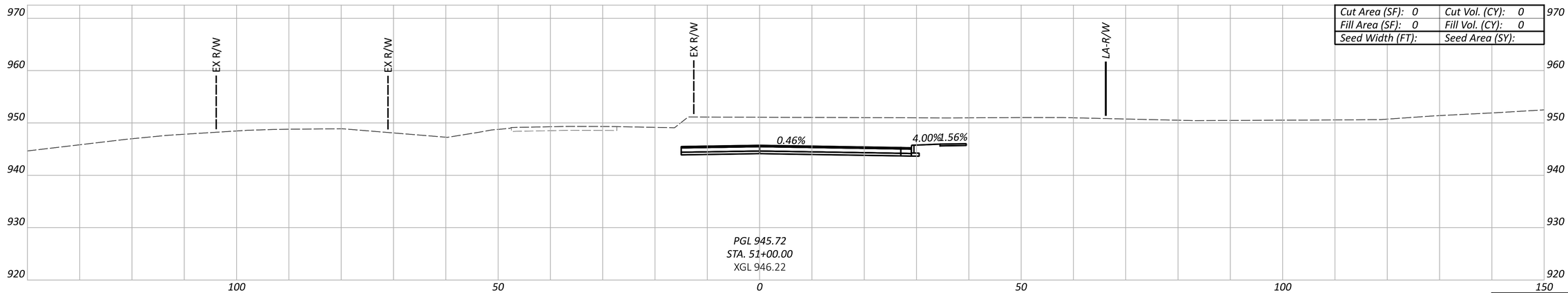
CROSS SECTIONS - TAYLOR RD STEEL
STA. 51+00.00



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Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.714 TOTAL 740

CROSS SECTIONS -SR 204
STA. 35+00.00 TO STA. 36+00.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - 35+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:49 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.715 TOTAL 740

Cut Area (SF): 0	Cut Vol. (CY): 0
Fill Area (SF): 0	Fill Vol. (CY): 0
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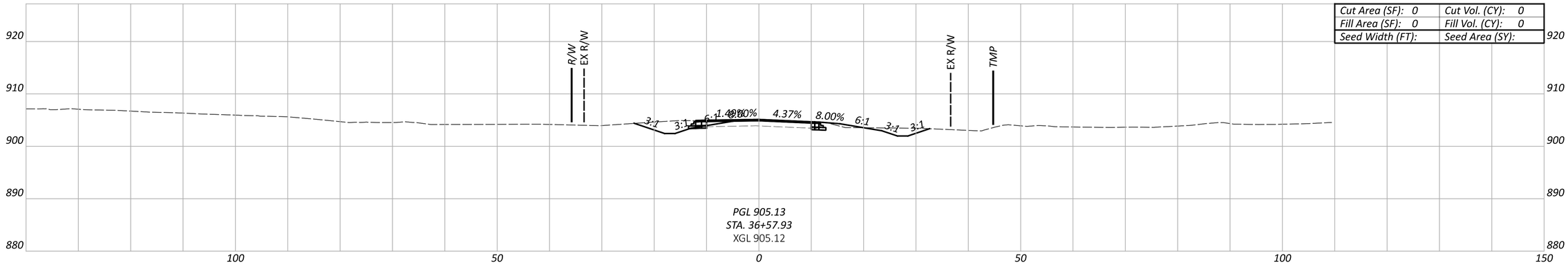

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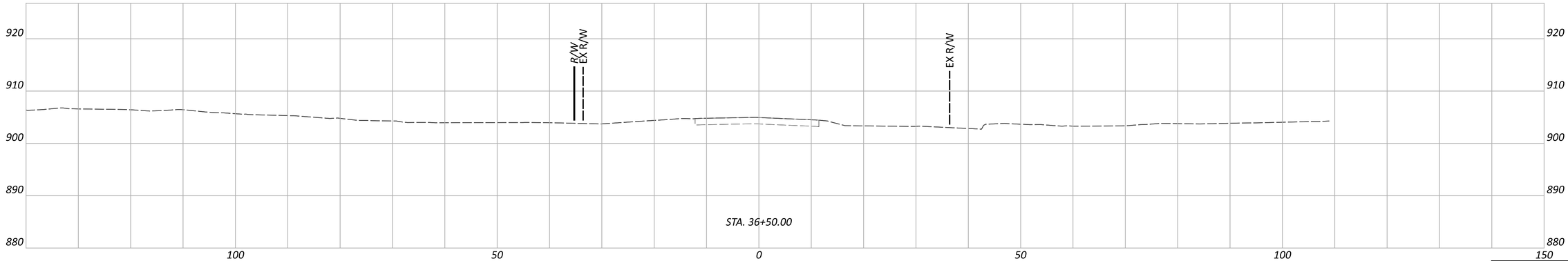

CROSS SECTIONS -SR 204
STA. 36+50.00 TO STA. 37+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.716 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - 36+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:52 PM USER: aoldaker
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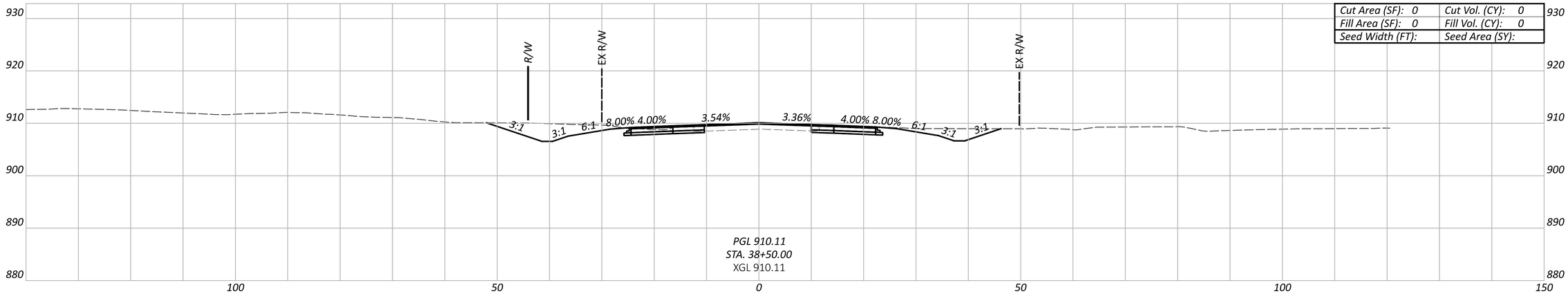

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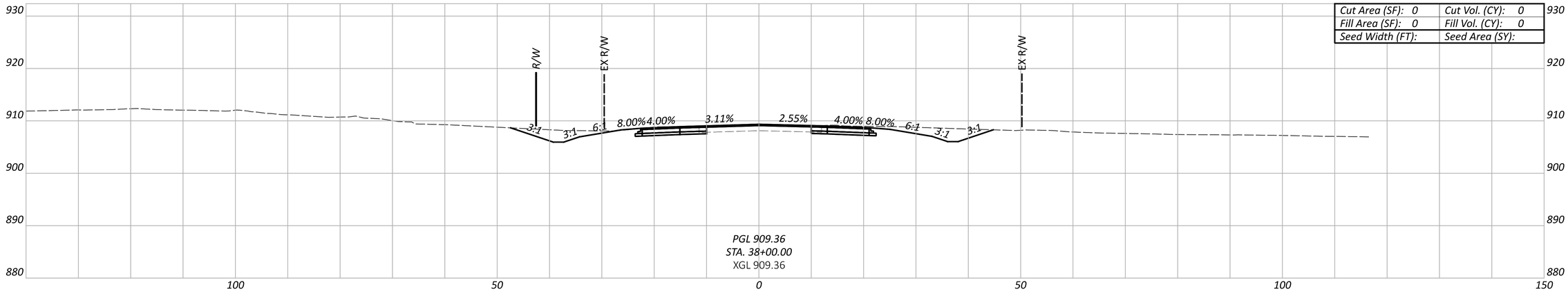

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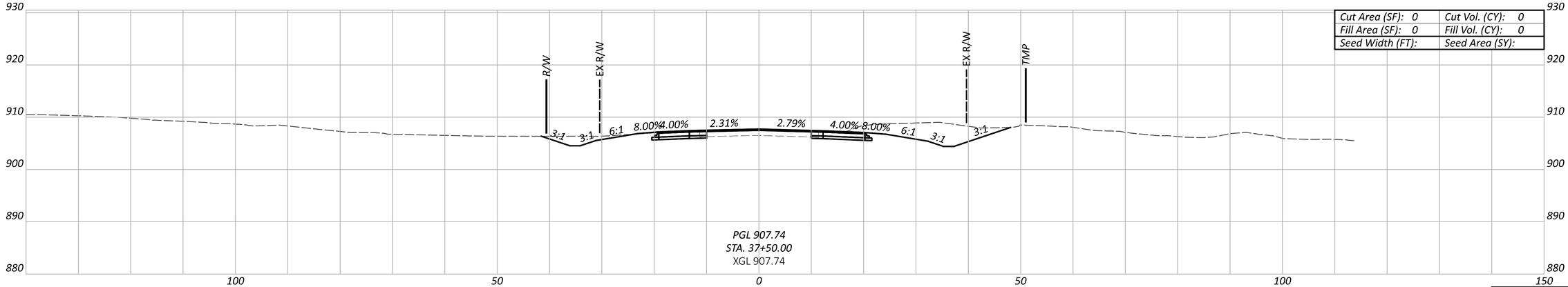

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS -SR 204
STA. 37+50.00 TO STA. 38+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.717 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - 37+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:48:55 PM USER: aoldaker
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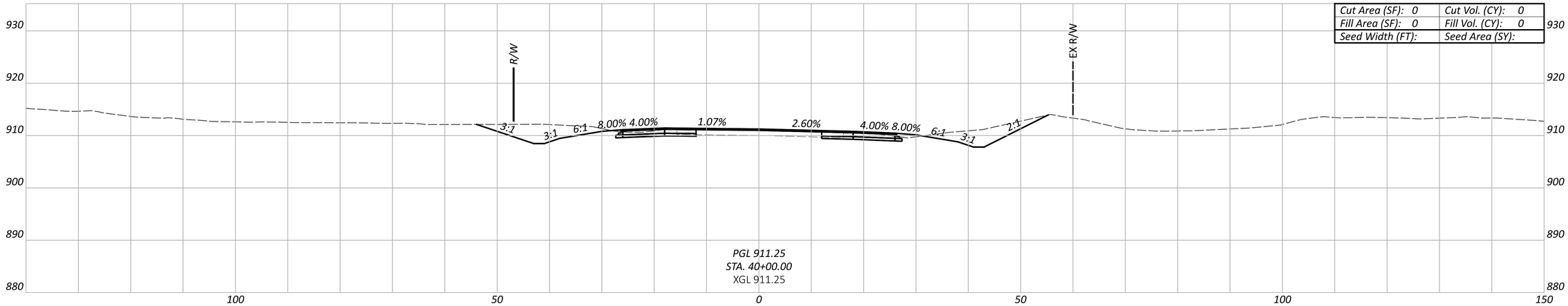

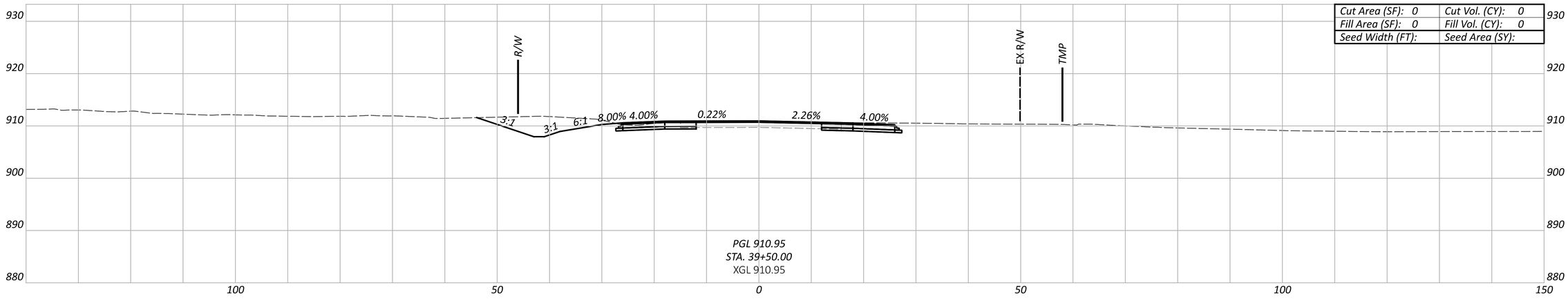

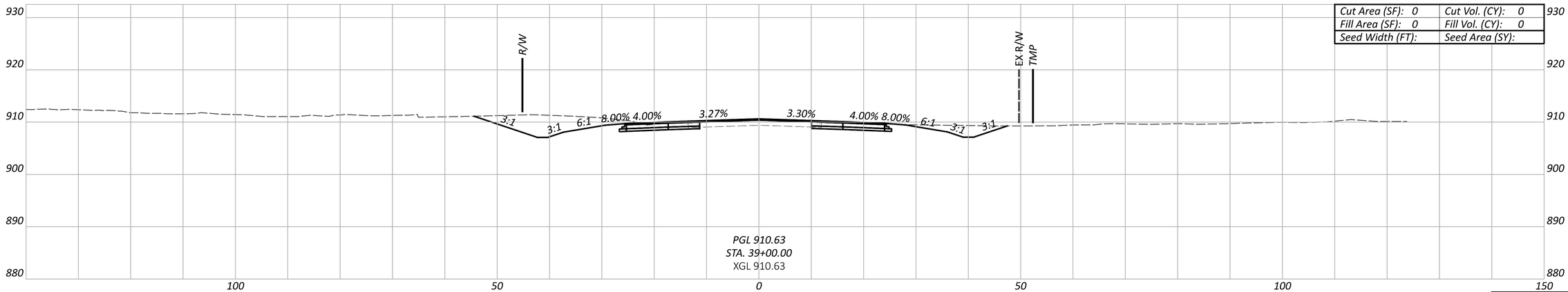

FAI/LIC IR 70 0.00/0.00

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CROSS SECTIONS -SR 204
STA. 39+00.00 TO STA. 40+00.00

Sheet Totals		
Seeding	Cut	Fill

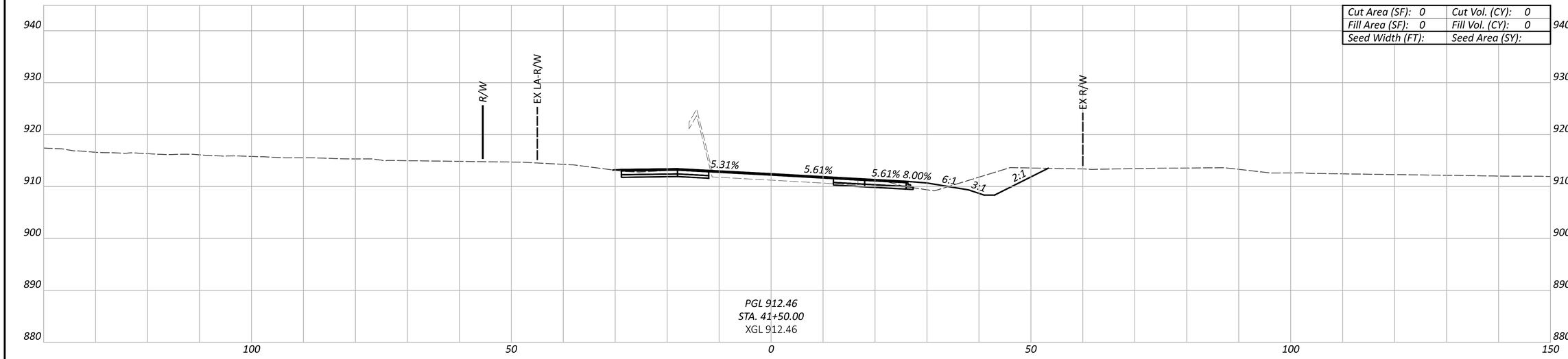
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.718 TOTAL 740



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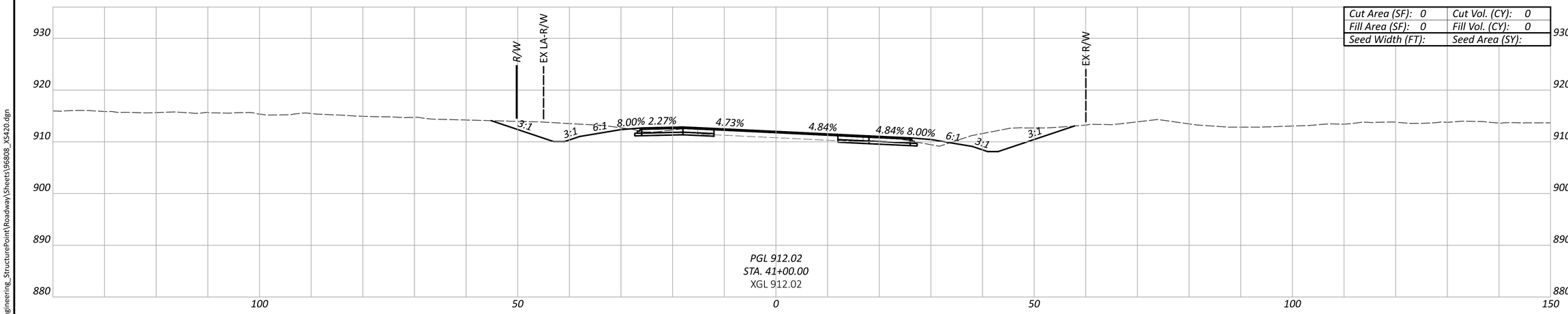

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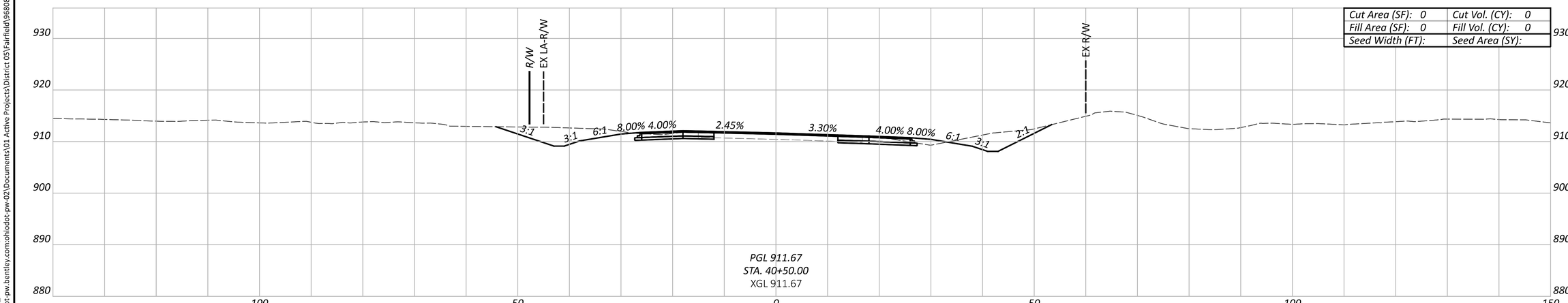

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS -SR 204
STA. 40+50.00 TO STA. 41+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.719 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - 40+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:49:01 PM USER: aoldaker
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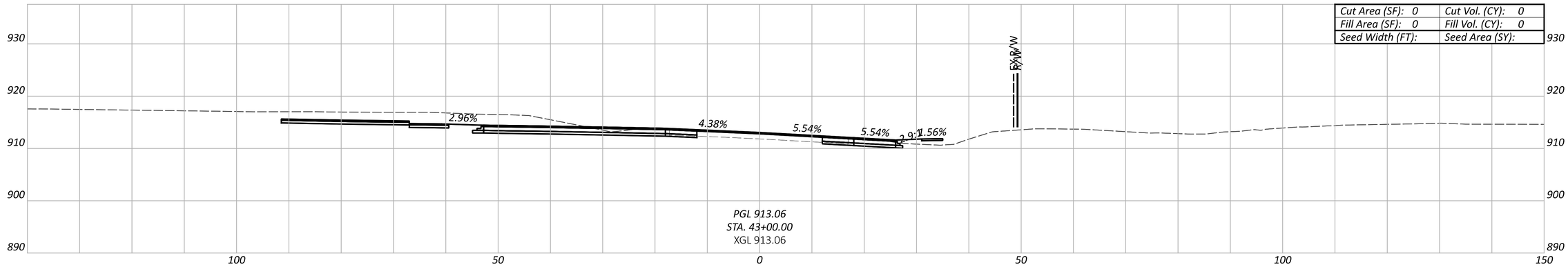

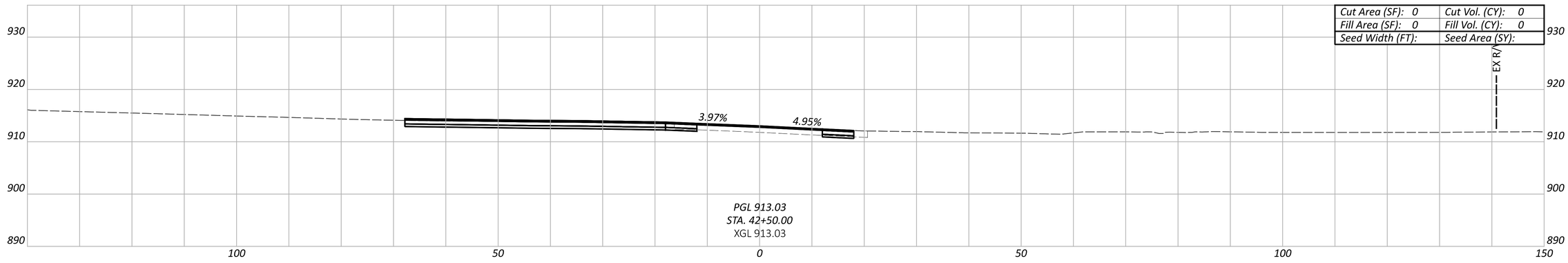

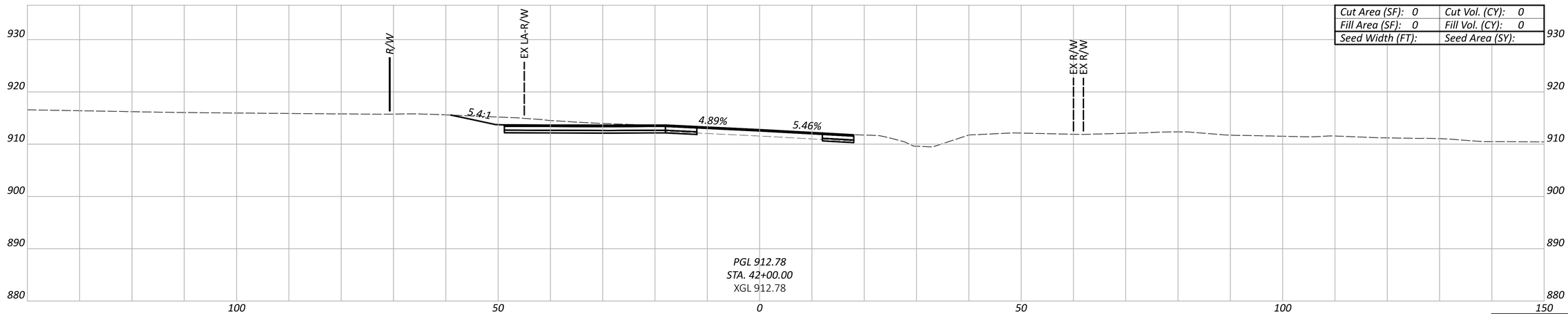

CROSS SECTIONS -SR 204
STA. 42+00.00 TO STA. 43+00.00

FAI/LIC IR 70 0.00/0.00

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DESIGN AGENCY
STRUCTUREPOINT INC.

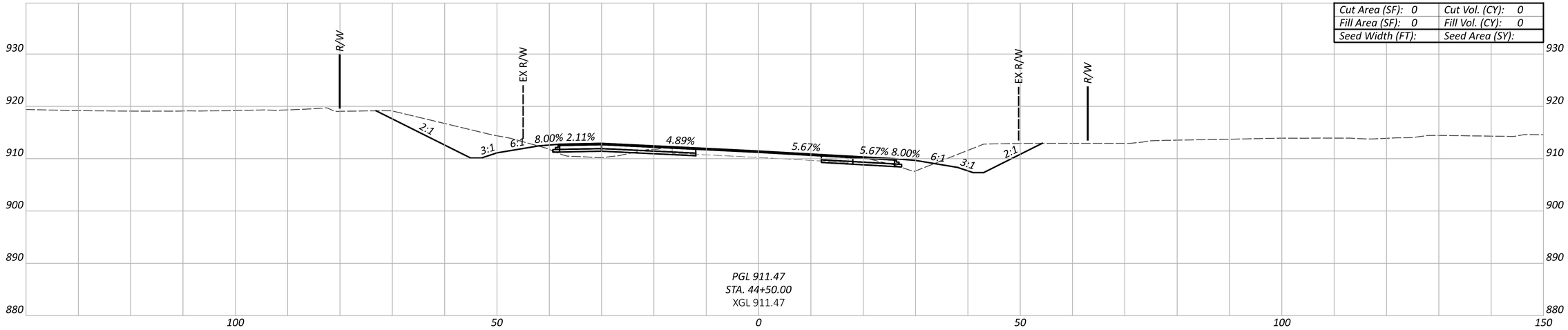
DESIGNER
BER

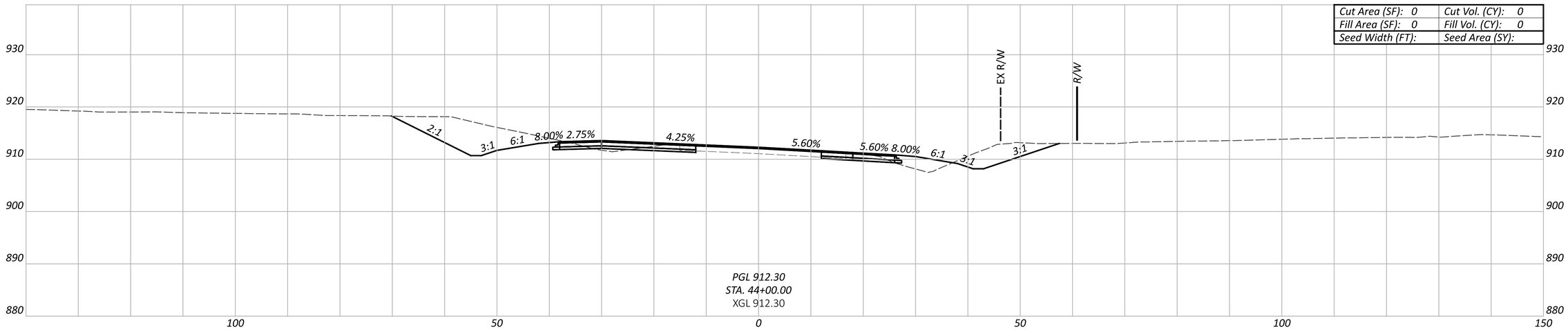
REVIEWER
KAM 06/18/23

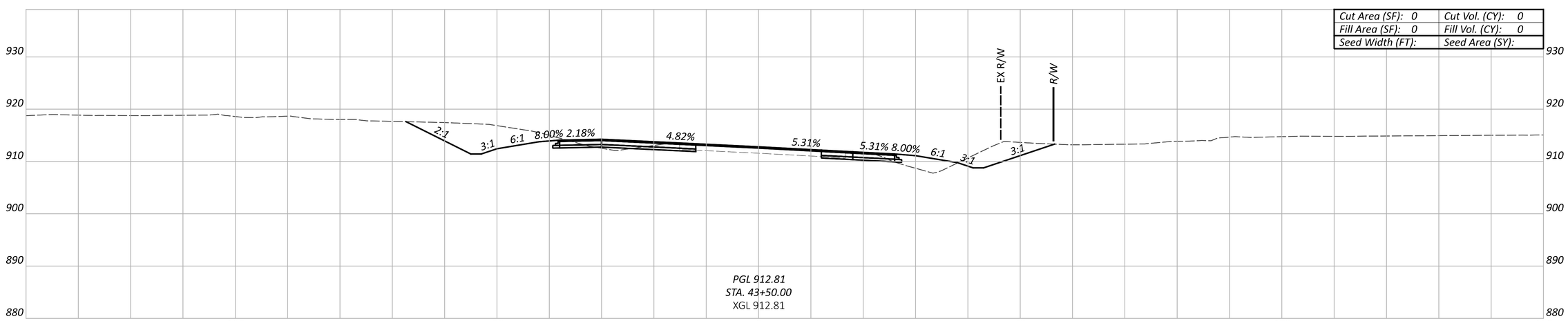
PROJECT ID
96808

Sheet Totals		
Seeding	Cut	Fill

SHEET	TOTAL
P.720	740







CROSS SECTIONS -SR 204
STA. 43+50.00 TO STA. 44+50.00

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_S204 - 43+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:49:07 PM USER: aoldaker
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Sheet Totals		
Seeding	Cut	Fill

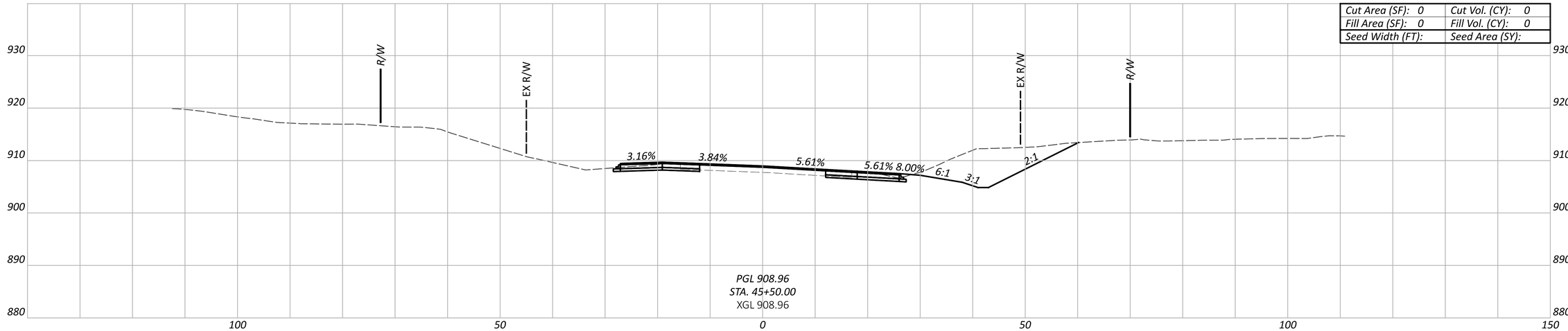
DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.721 TOTAL 740



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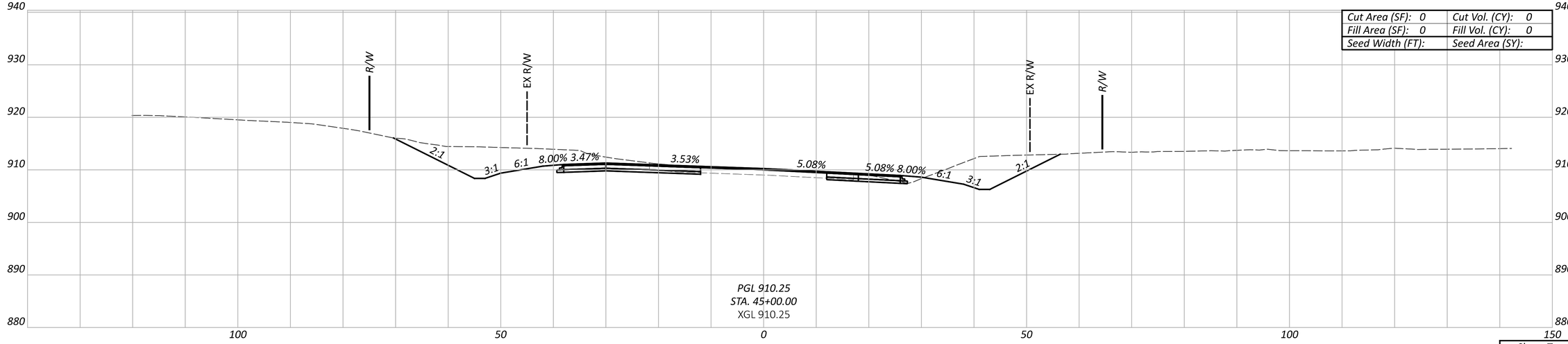

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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS -SR 204
STA. 45+00.00 TO STA. 45+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.722 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_S204 - 45+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:49:10 PM USER: aoldaker
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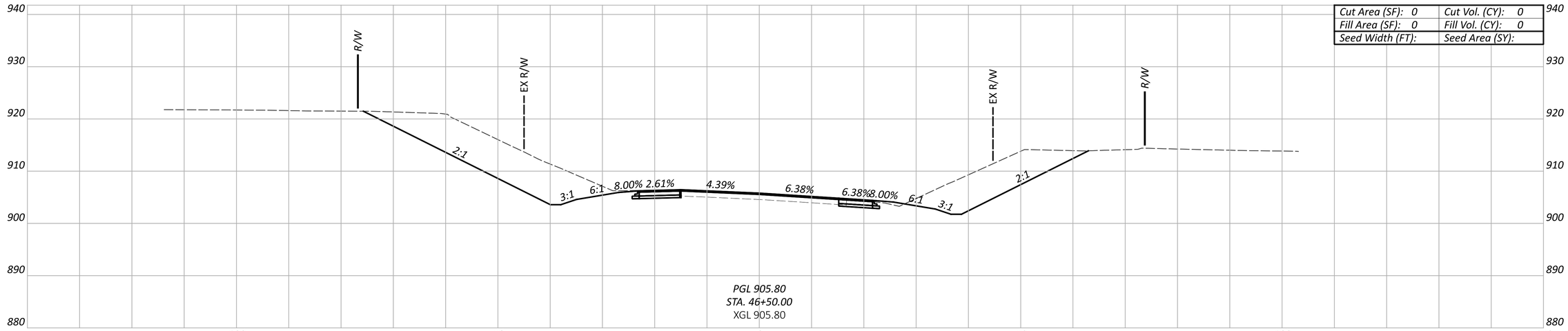

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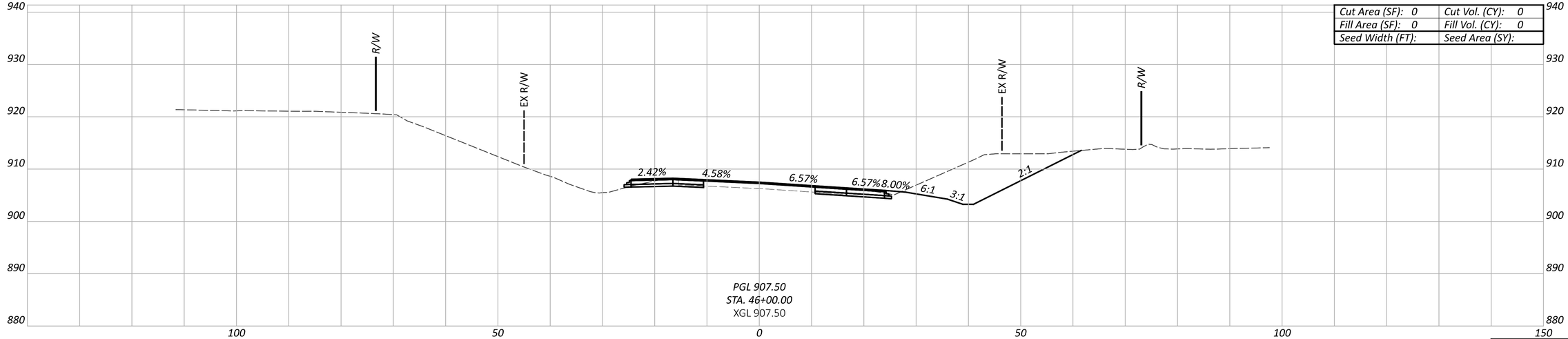

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS -SR 204
STA. 46+00.00 TO STA. 46+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

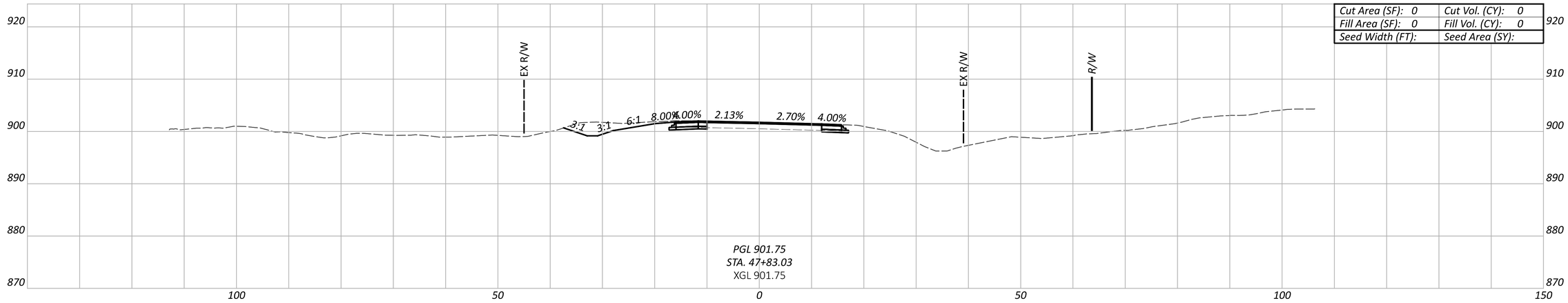
REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.723 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_S204 - 46+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:49:14 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\v401-Engineering_StructurePoint\Roadway\Sheets\96808_XS420.dgn



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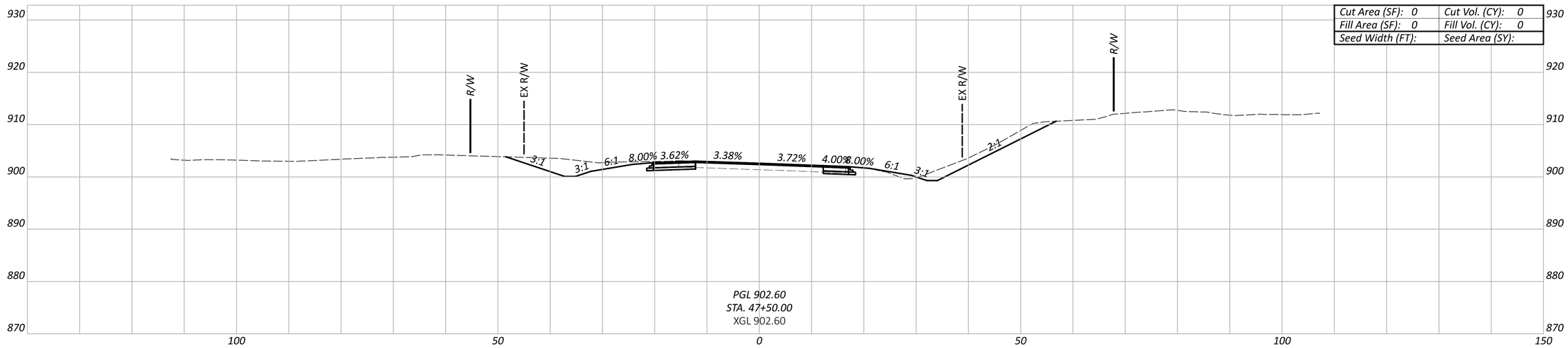

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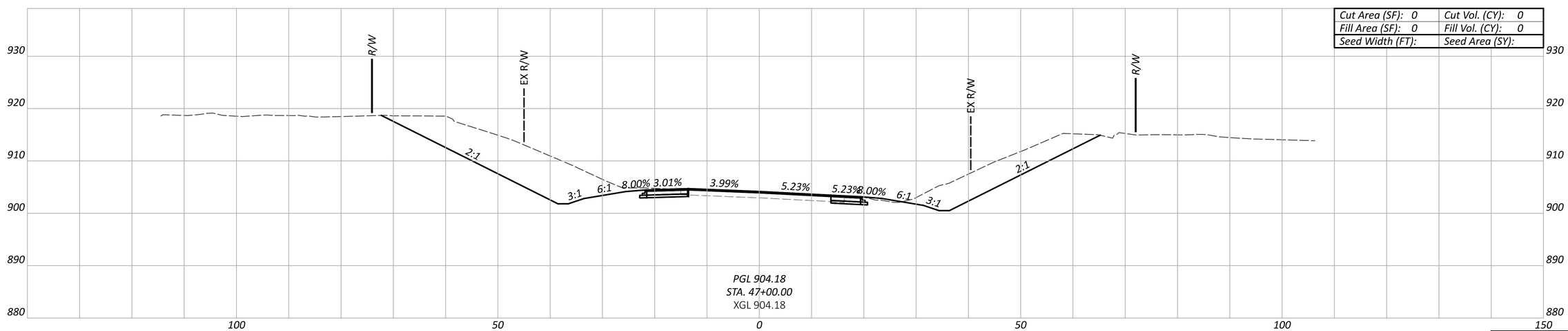

Cut Area (SF): 0	Cut Vol. (CY): 0
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Seed Width (FT):	Seed Area (SY):

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS -SR 204
STA. 47+00.00 TO STA. 47+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC
WITH JEAN

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.724 TOTAL 740

FAI/LIC IR 70 0.00/0.00

MODEL: CLP_5204 - 47+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:49:16 PM USER: aoldaker
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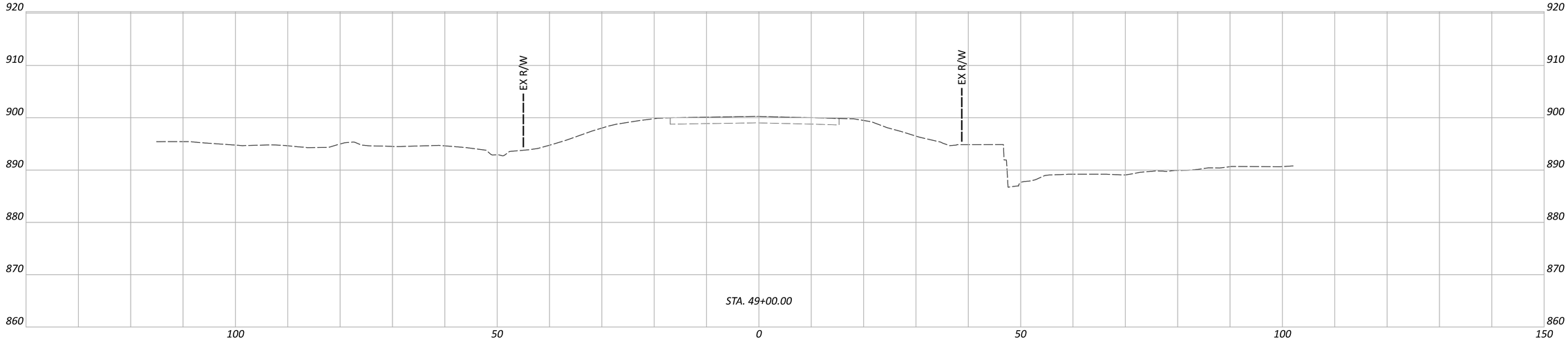
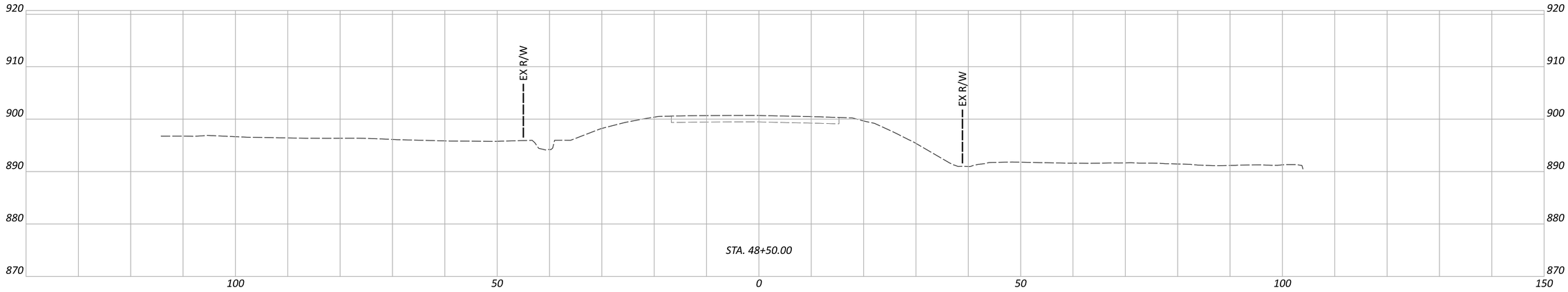
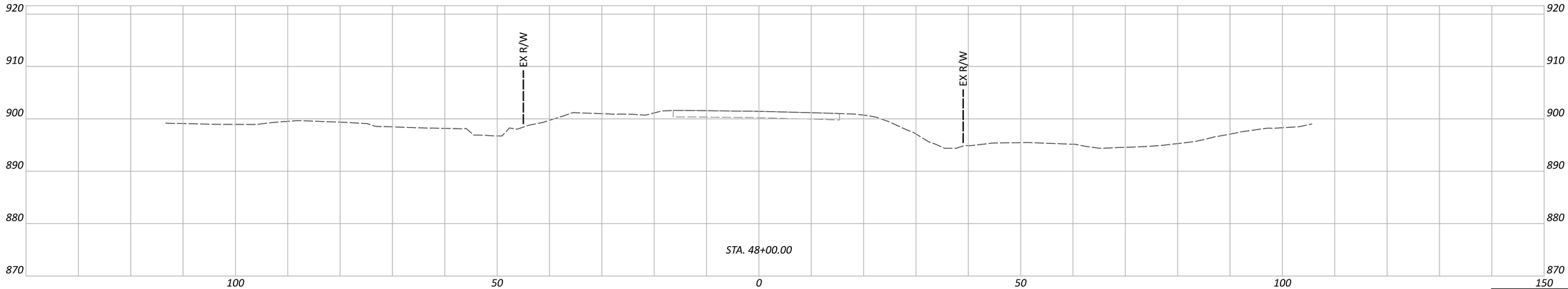






FAI/LIC IR 70 0.00/0.00

MODEL: CLP_S204 - 48+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 11:49:19 PM USER: aoldaker
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\401-Engineering_StructurePoint\Roadway\Sheets\96808_XS420.dgn

CROSS SECTIONS -SR 204
STA. 48+00.00 TO STA. 49+00.00

DESIGN AGENCY
MICHAELS STRUCTUREPOINT INC.

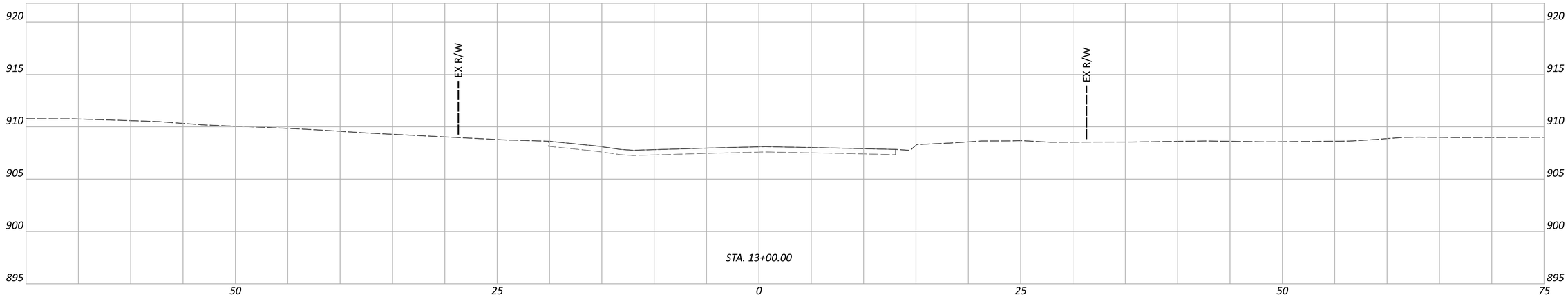
DESIGNER
BER

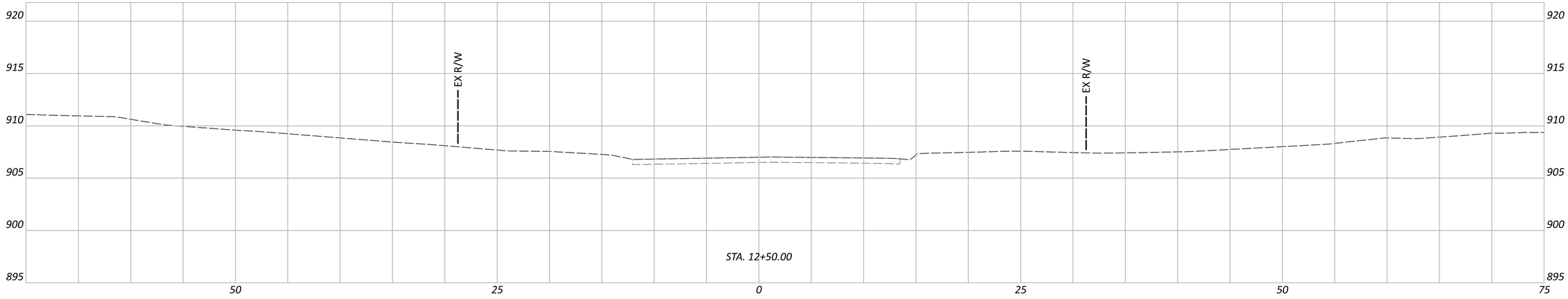
REVIEWER
KAM 06/18/23

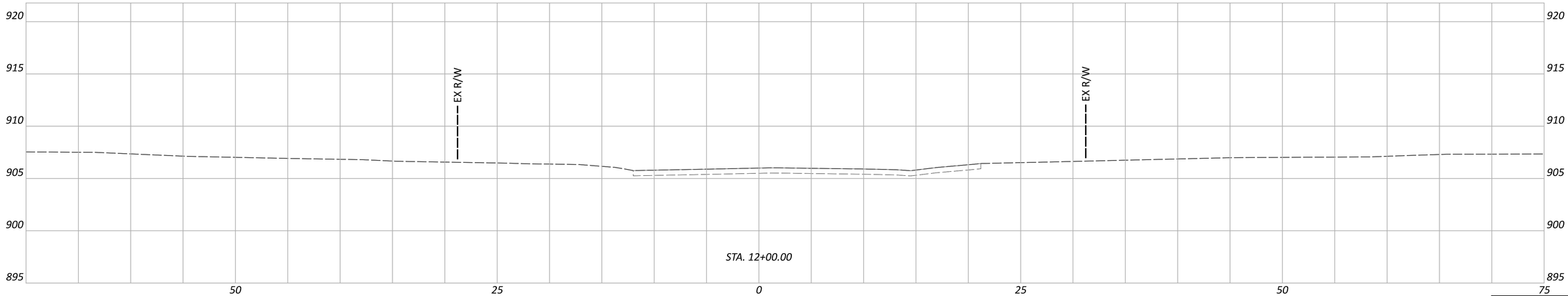
PROJECT ID
96808

SHEET P.725 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill







CROSS SECTIONS - WELLESLEY DR
STA. 12+00.00 TO STA. 13+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.726 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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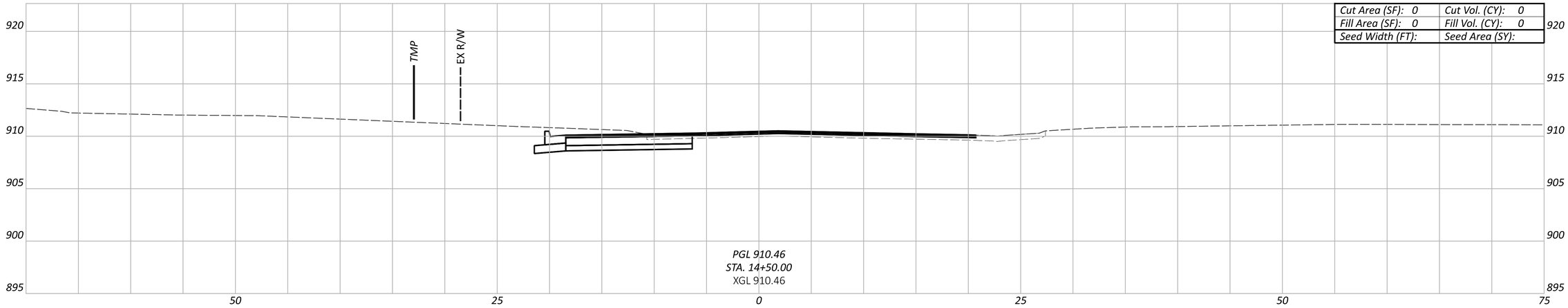

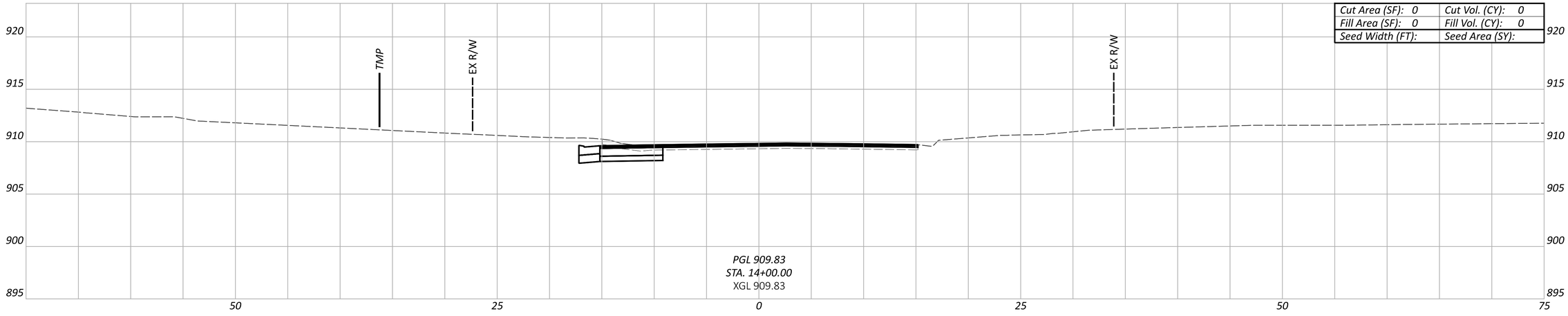

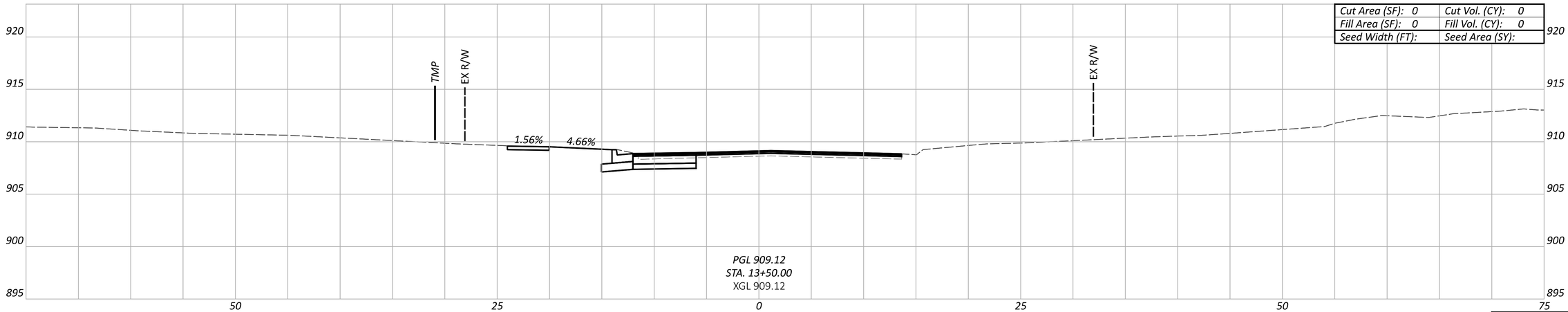

CROSS SECTIONS - WELLESLEY DR
STA. 13+50.00 TO STA. 14+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.727 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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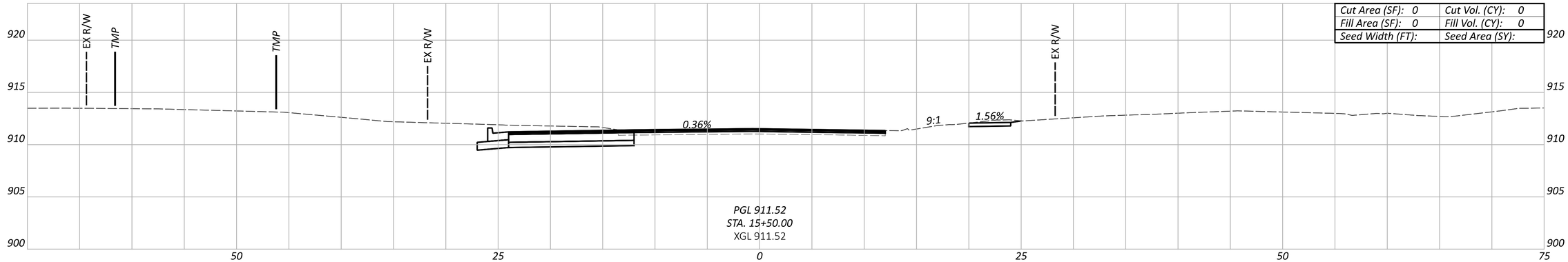

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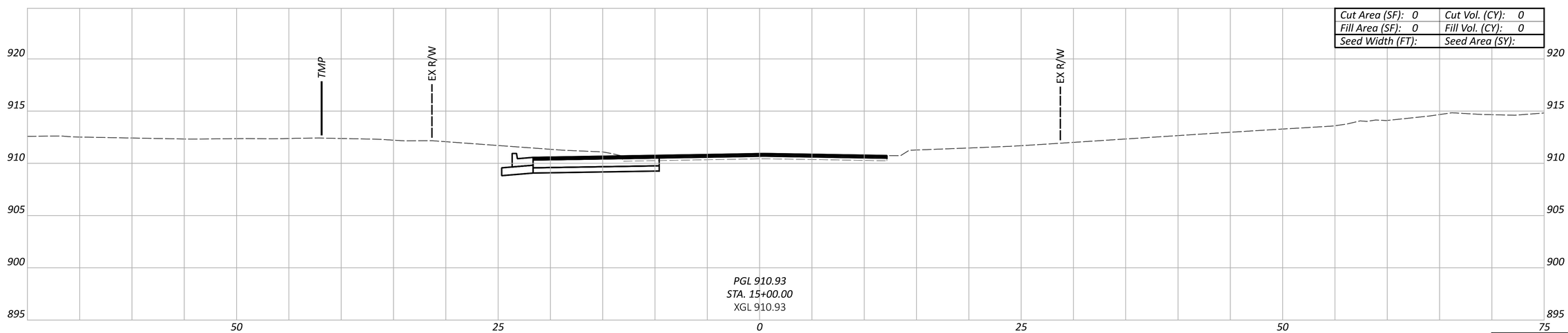

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - WELLESLEY DR
STA. 15+00.00 TO STA. 15+50.00

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.728 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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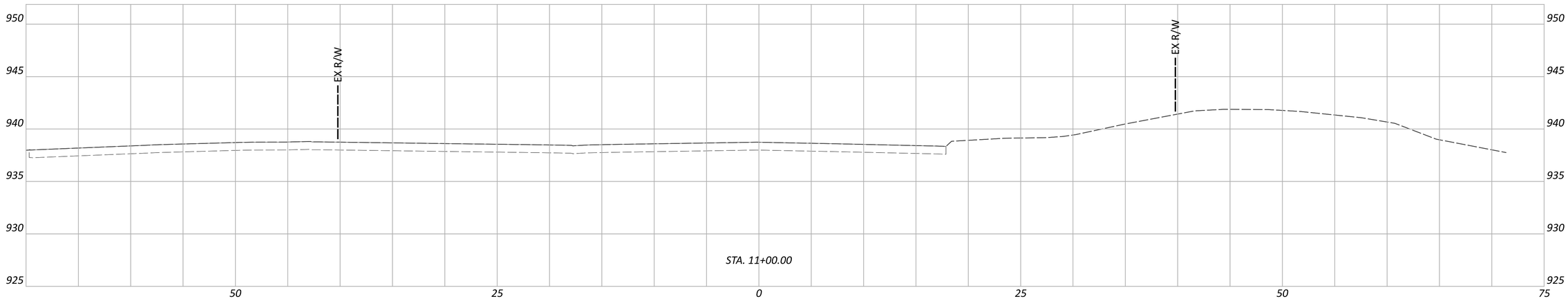

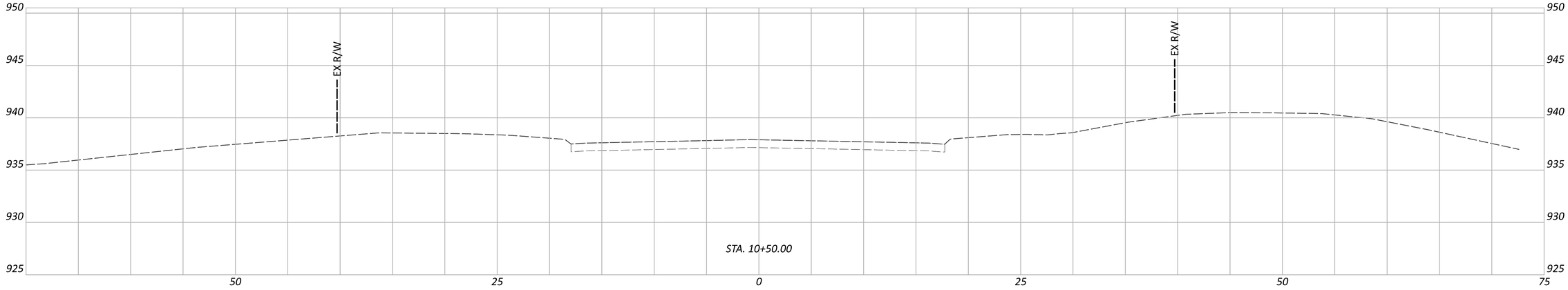

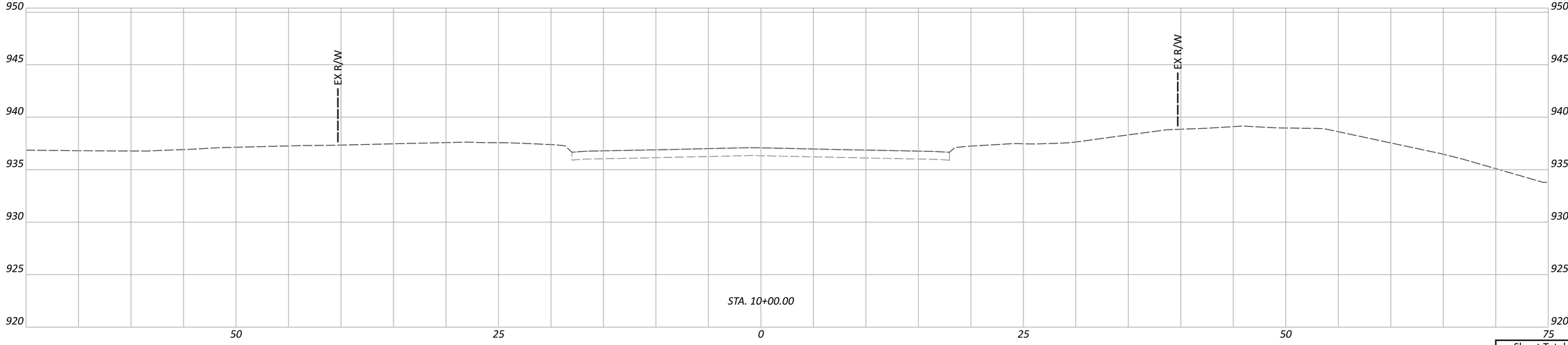

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CROSS SECTIONS - TAYLOR RD SW
STA. 10+00.00 TO STA. 11+00.00

Sheet Totals		
Seeding	Cut	Fill

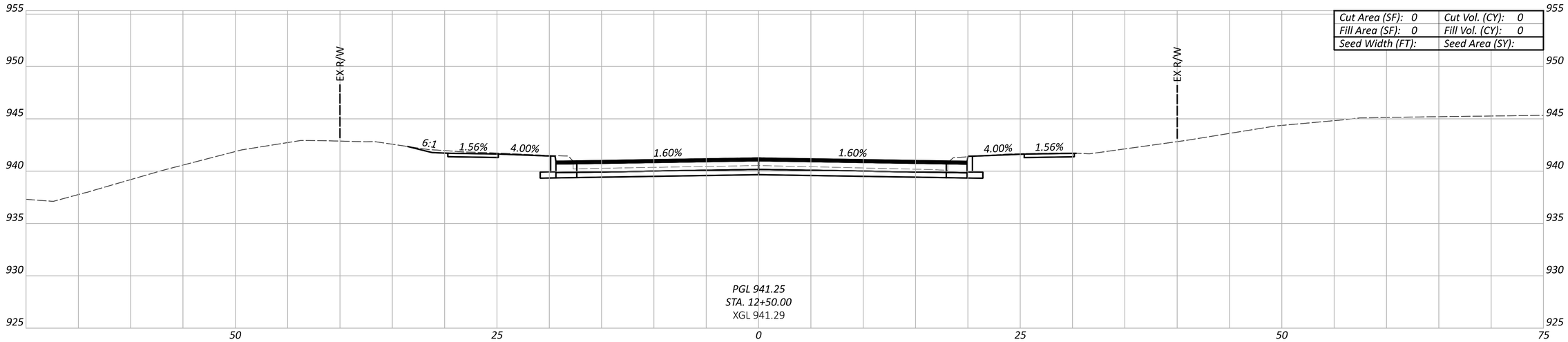
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET	TOTAL
P.729	740



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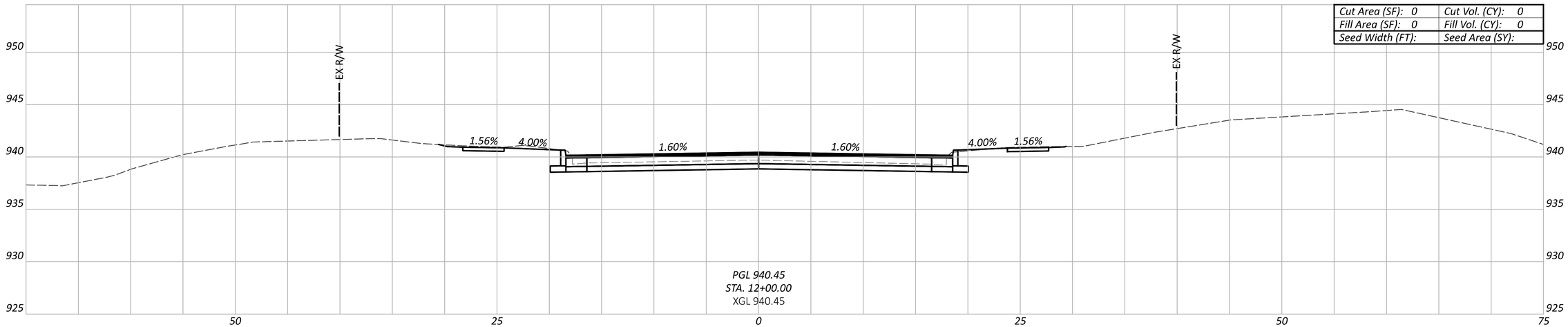

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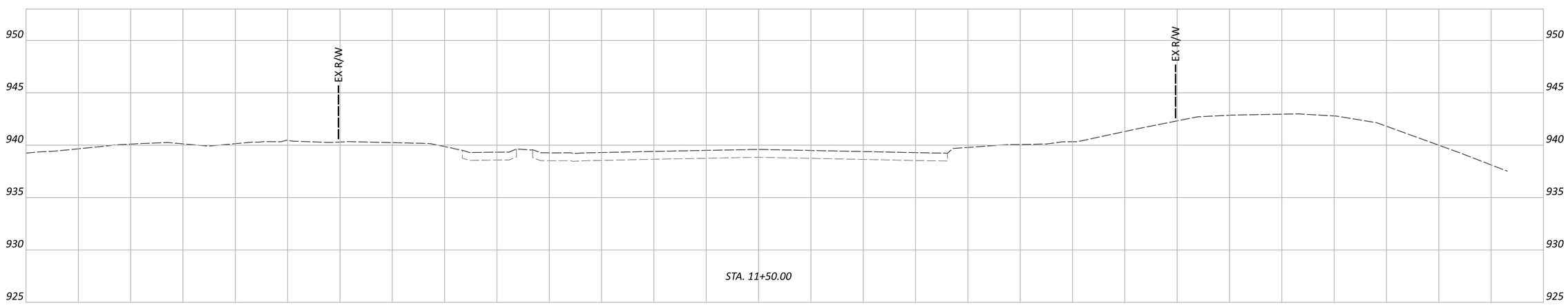

Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD SW
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DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.730 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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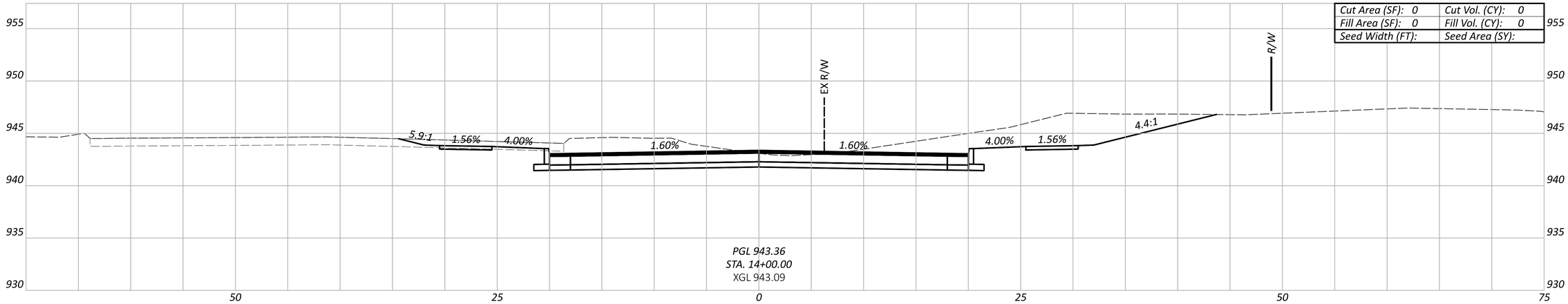

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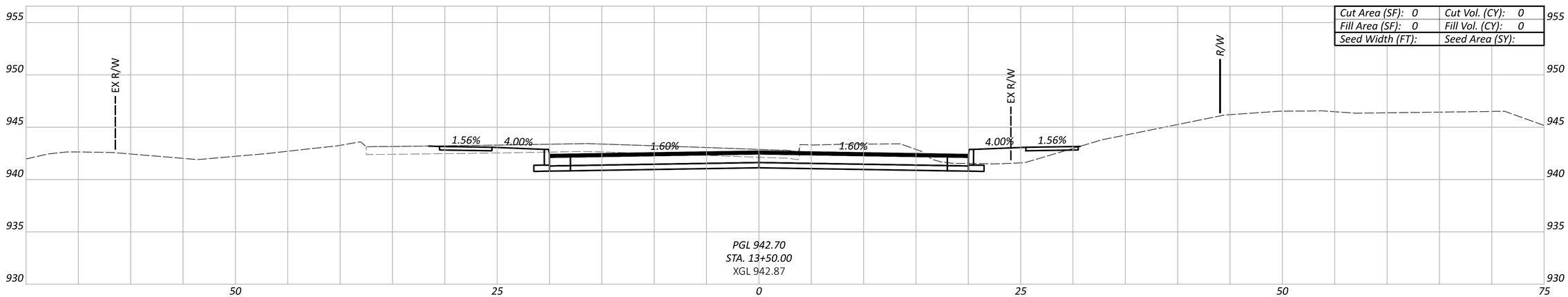
XGL 943.09



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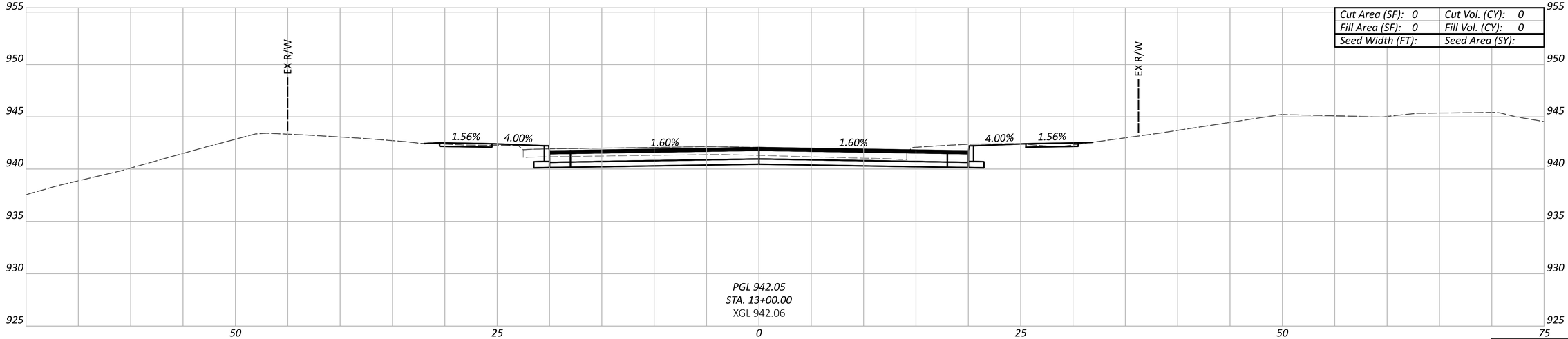
XGL 942.87



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PGL 942.05
STA. 13+00.00
XGL 942.06

CROSS SECTIONS - TAYLOR RD SW
STA. 13+00.00 TO STA. 14+00.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.731 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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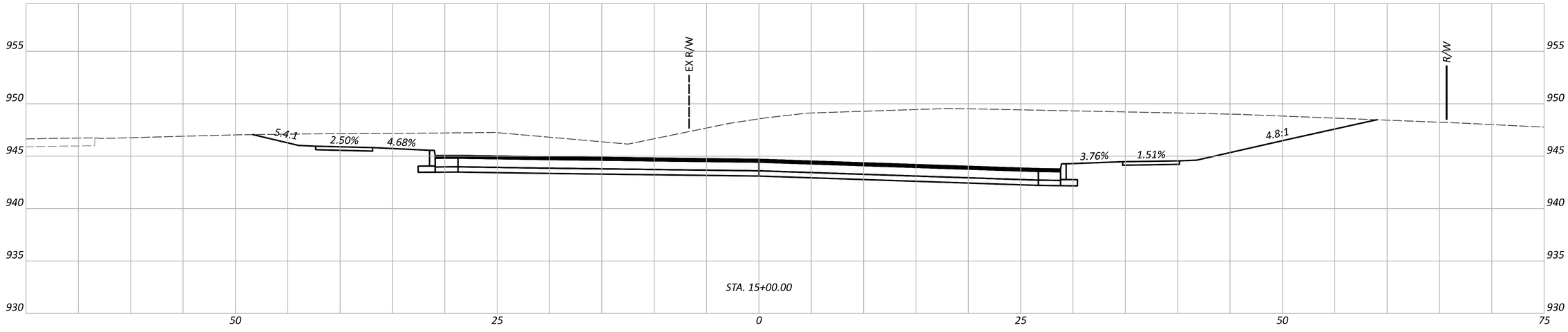

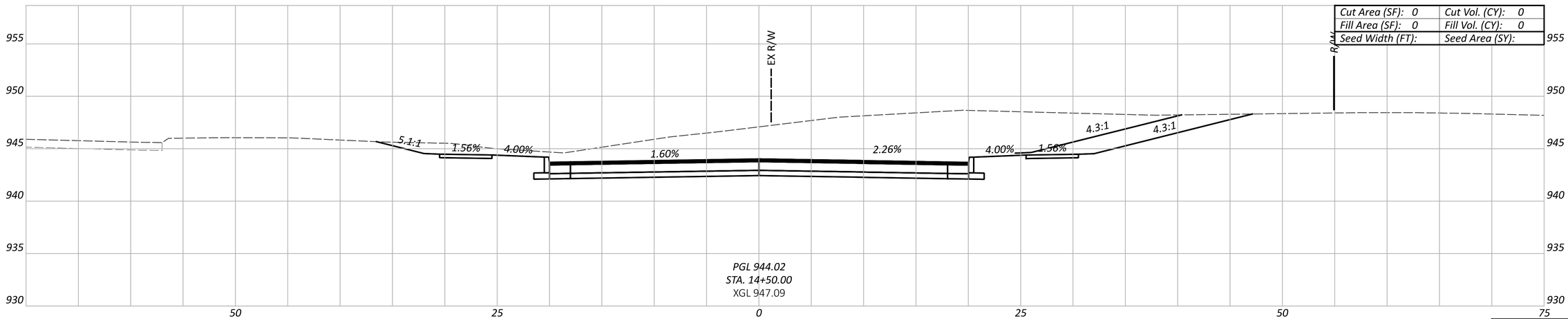

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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - TAYLOR RD SW
STA. 14+50.00 TO STA. 15+00.00

DESIGN AGENCY
WILFLEY STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.732 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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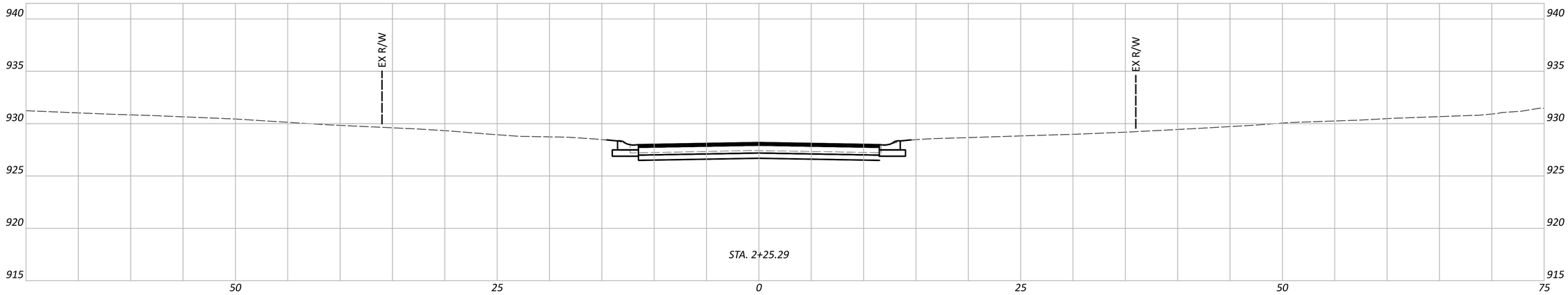

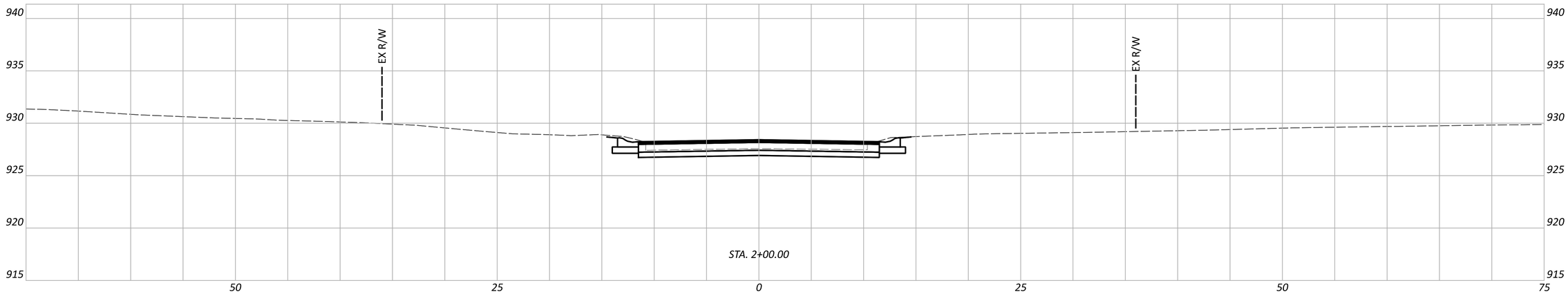

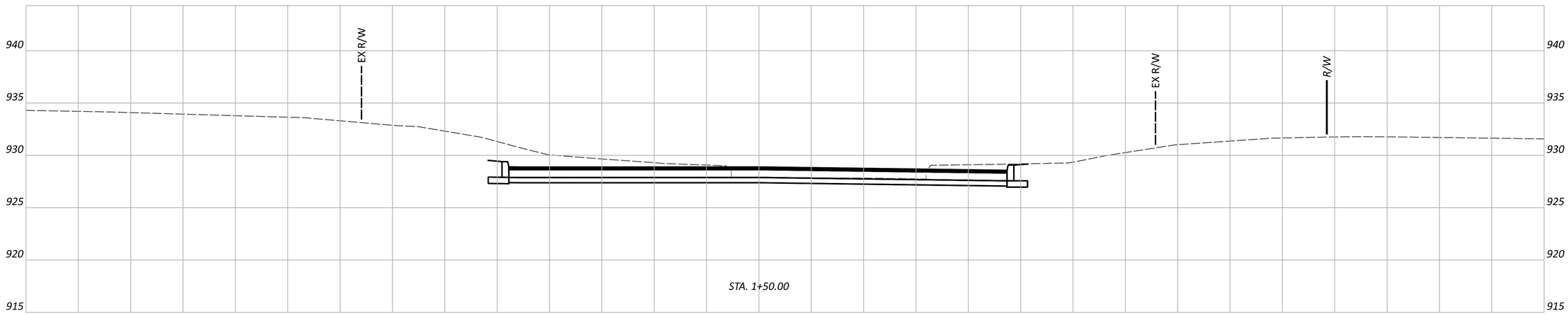

CROSS SECTIONS - HAFF FARM DR
STA. 1+50.00 TO STA. 2+25.29

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.733 TOTAL 740

Sheet Totals		
Seeding	Cut	Fill

FAI/LIC IR 70 0.00/0.00

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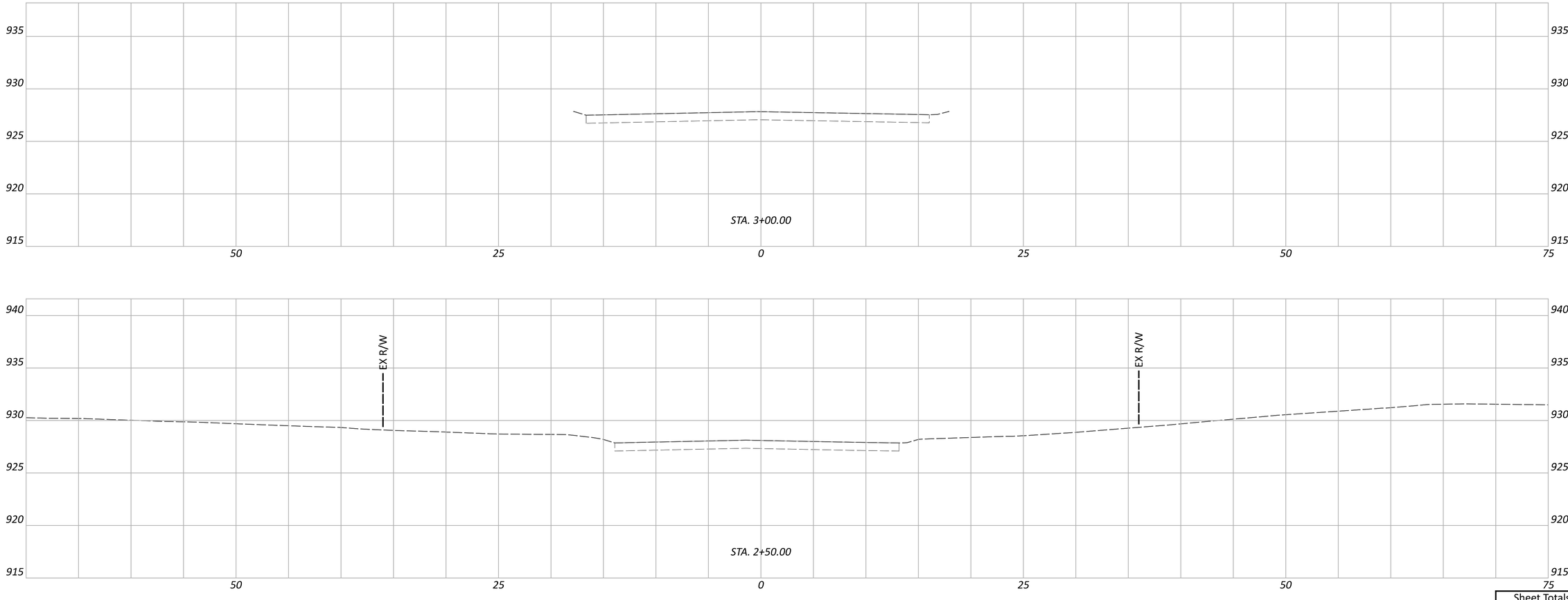

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STA. 2+50.00 TO STA. 3+00.00

Sheet Totals		
Seeding	Cut	Fill

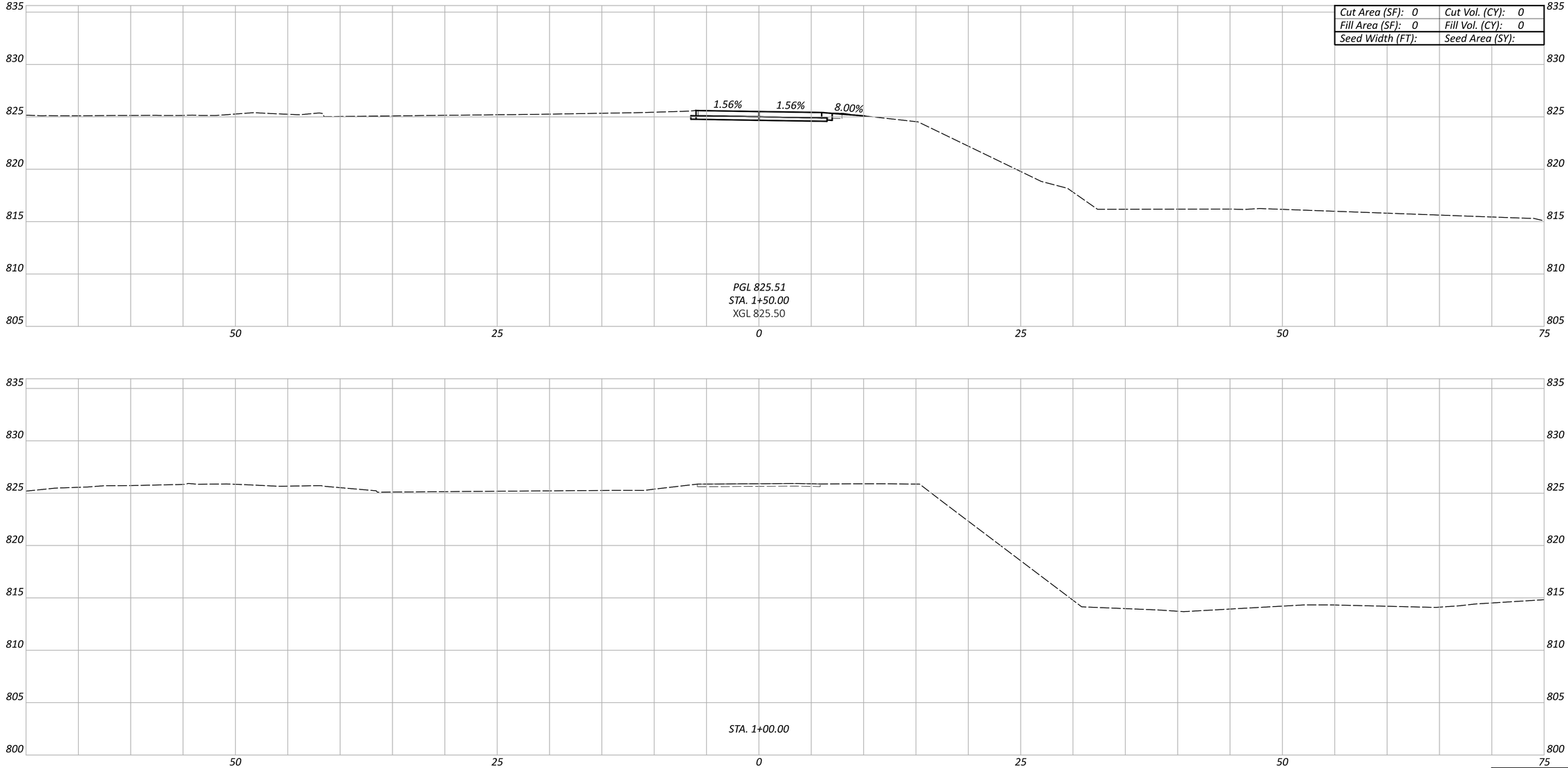
DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.734 TOTAL 740



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Sheet Totals		
Seeding	Cut	Fill

CROSS SECTIONS - BLACKLICK TRAIL
STA. 1+00.00 TO STA. 1+50.00

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.735 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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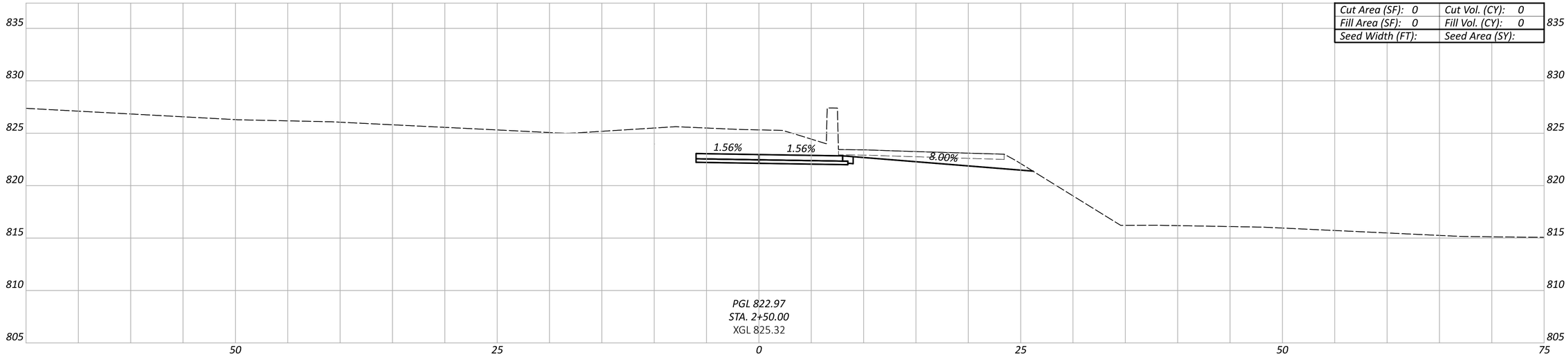

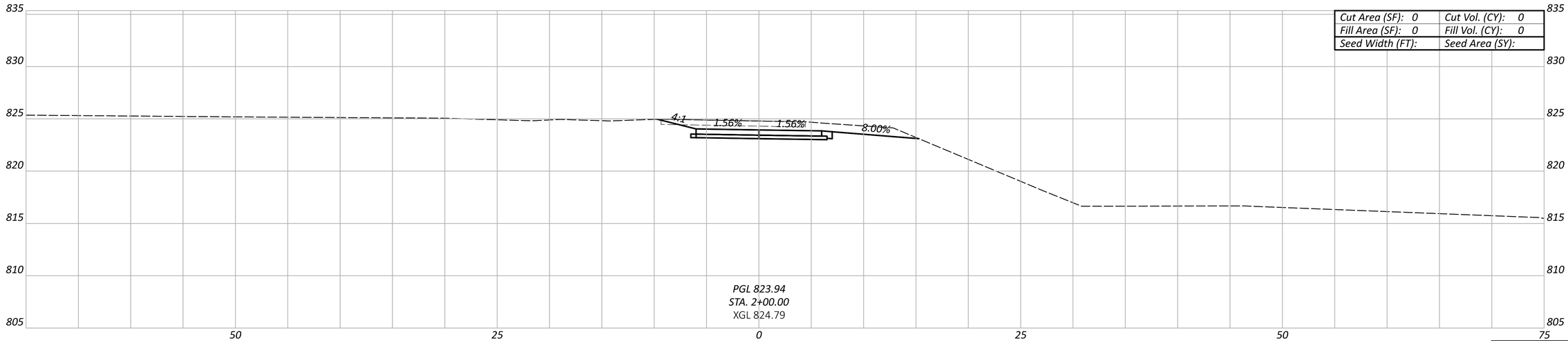

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DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

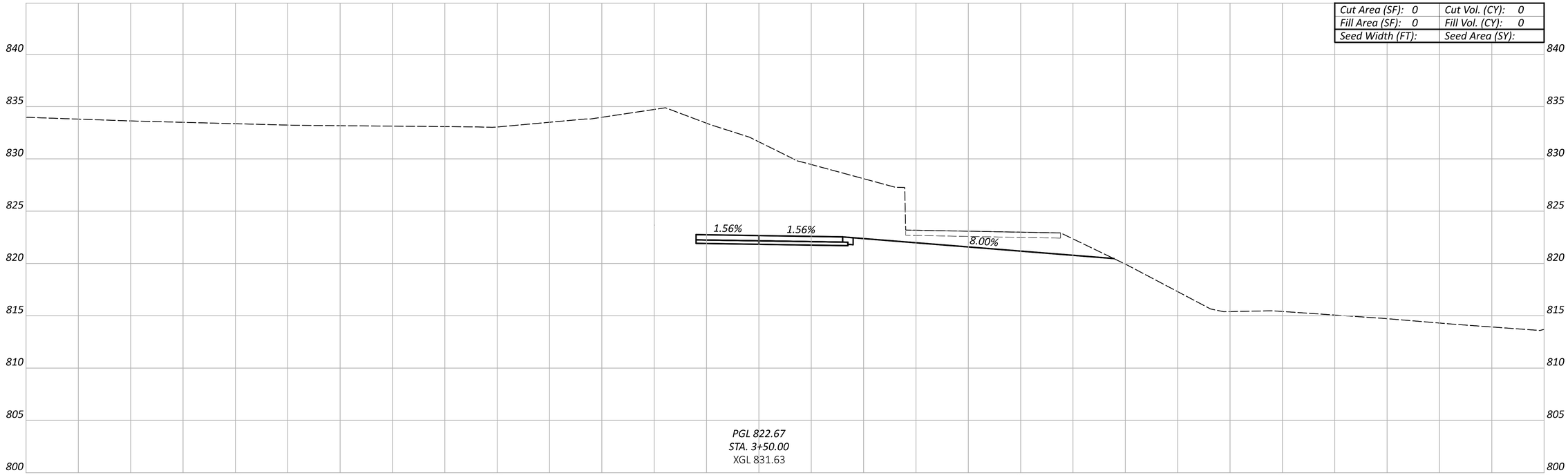
REVIEWER
KAM 06/18/23

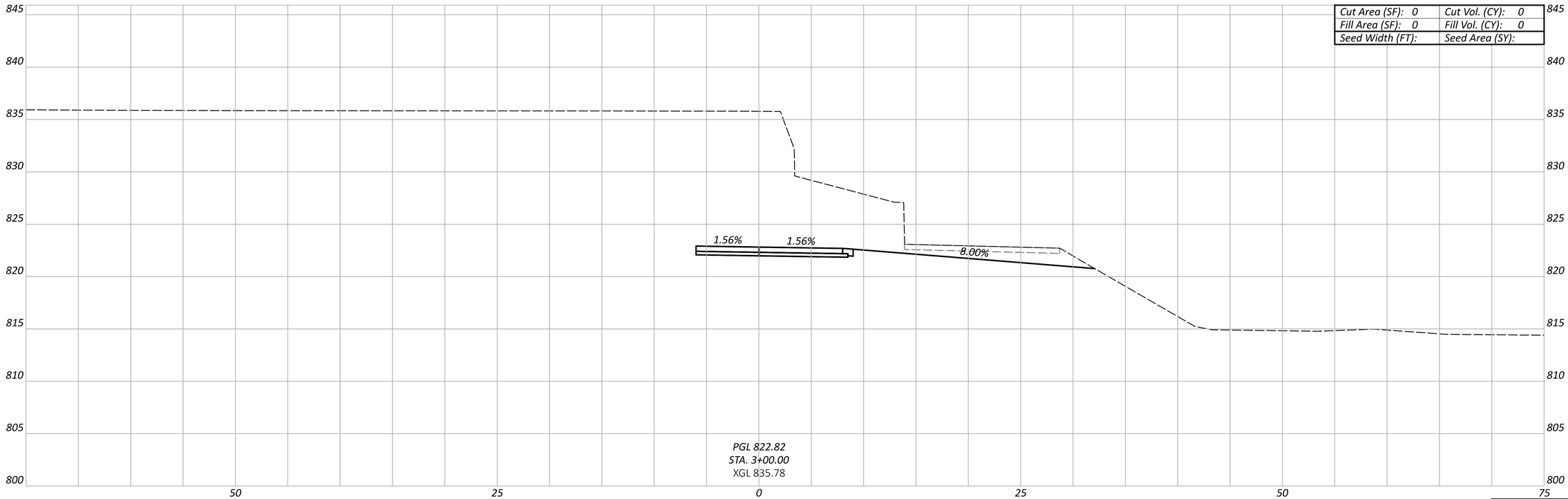
PROJECT ID
96808

SHEET P.736 TOTAL 740

Sheet Totals

Seeding	Cut	Fill





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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
MORPHEUS STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.737 TOTAL 740

FAI/LIC IR 70 0.00/0.00

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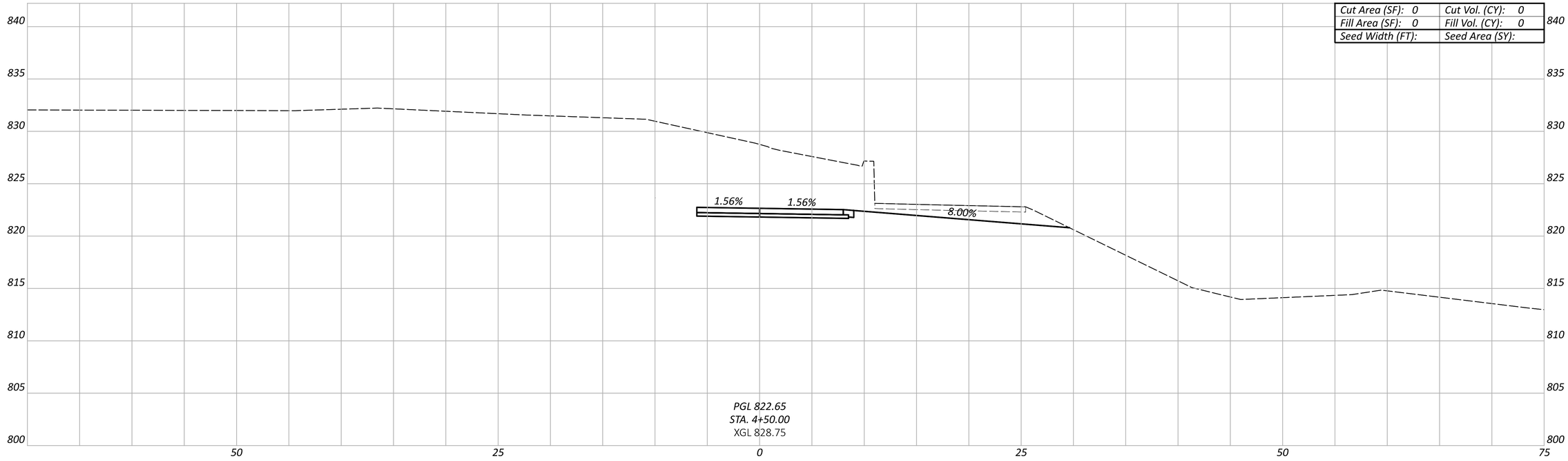

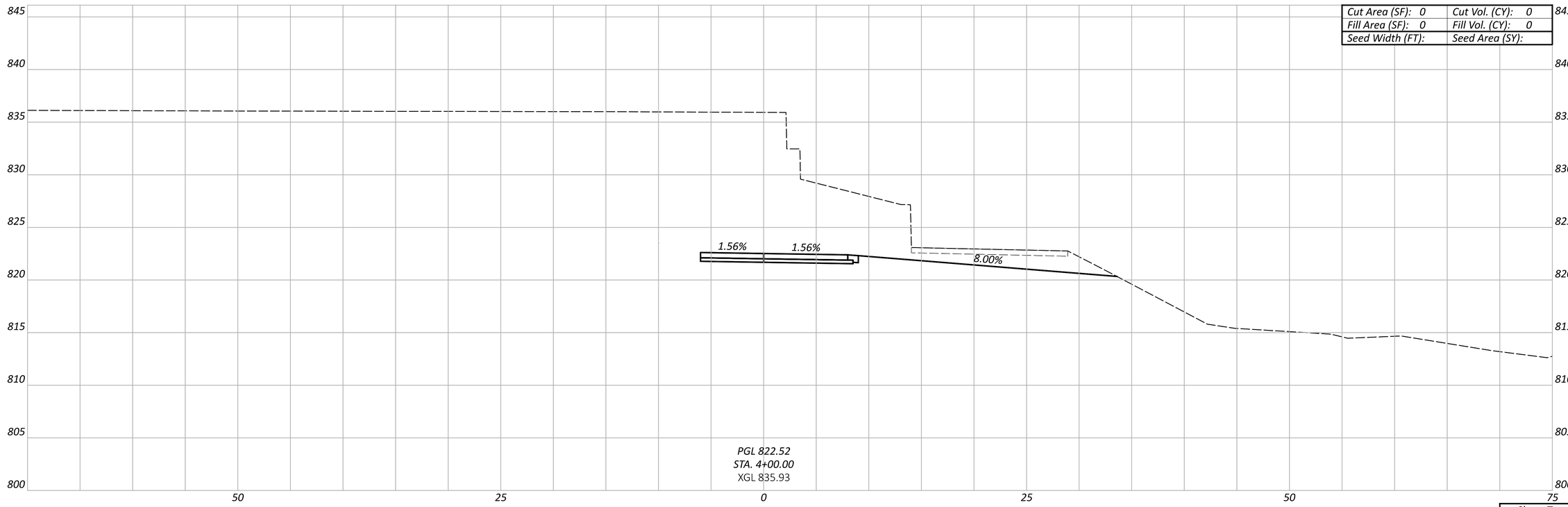

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STA. 4+00.00 TO STA. 4+50.00

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.738 TOTAL 740

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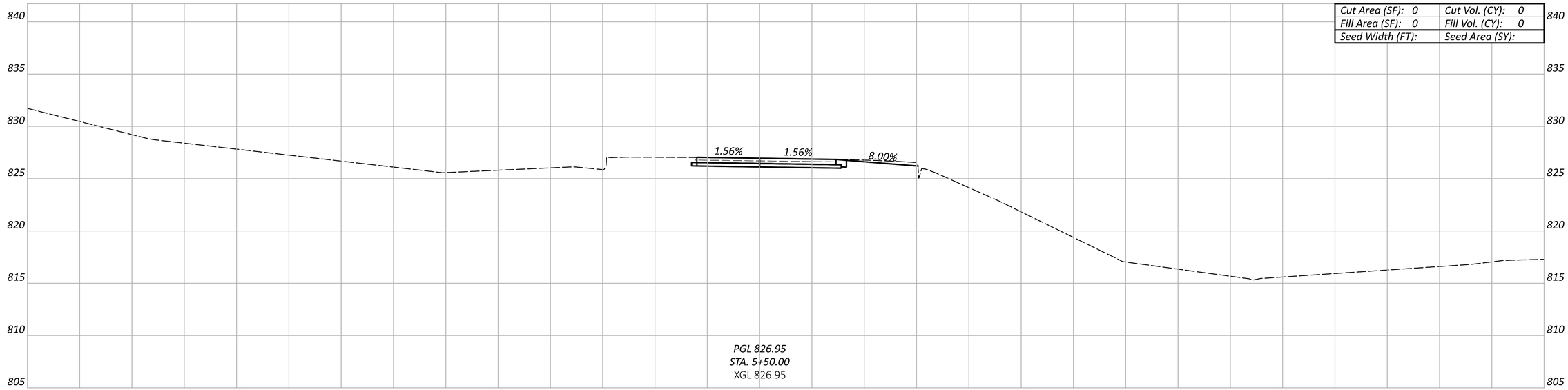

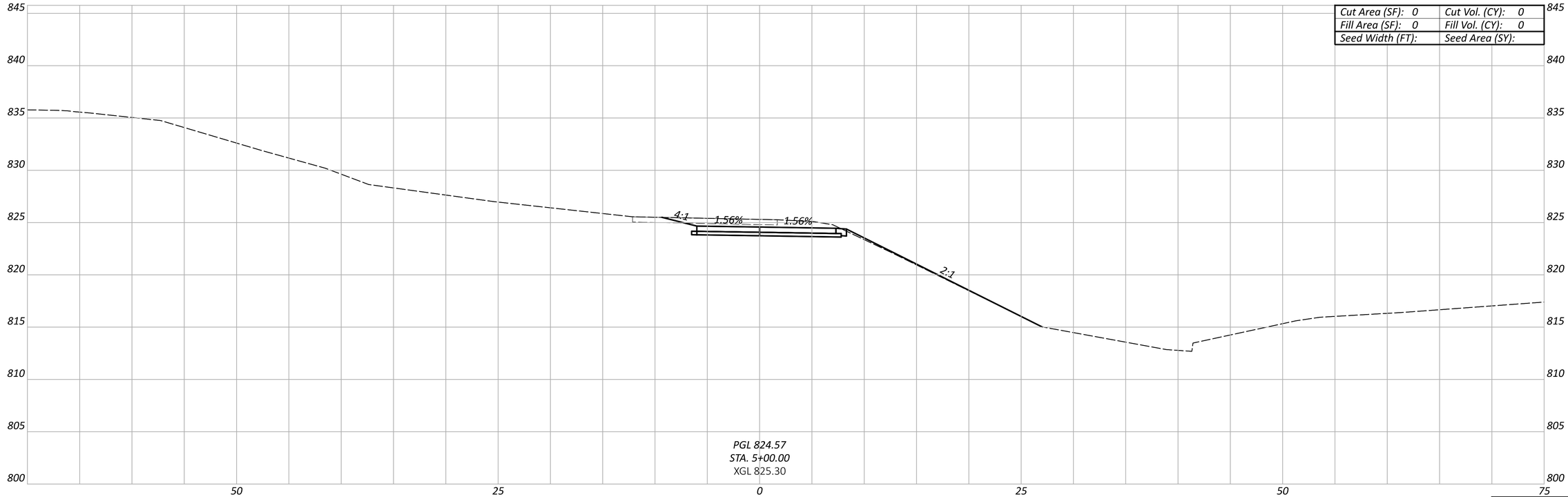

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Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.739 | TOTAL 740

FAI/LIC IR 70 0.00/0.00

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FAI/LIC IR 70 0.00/0.00

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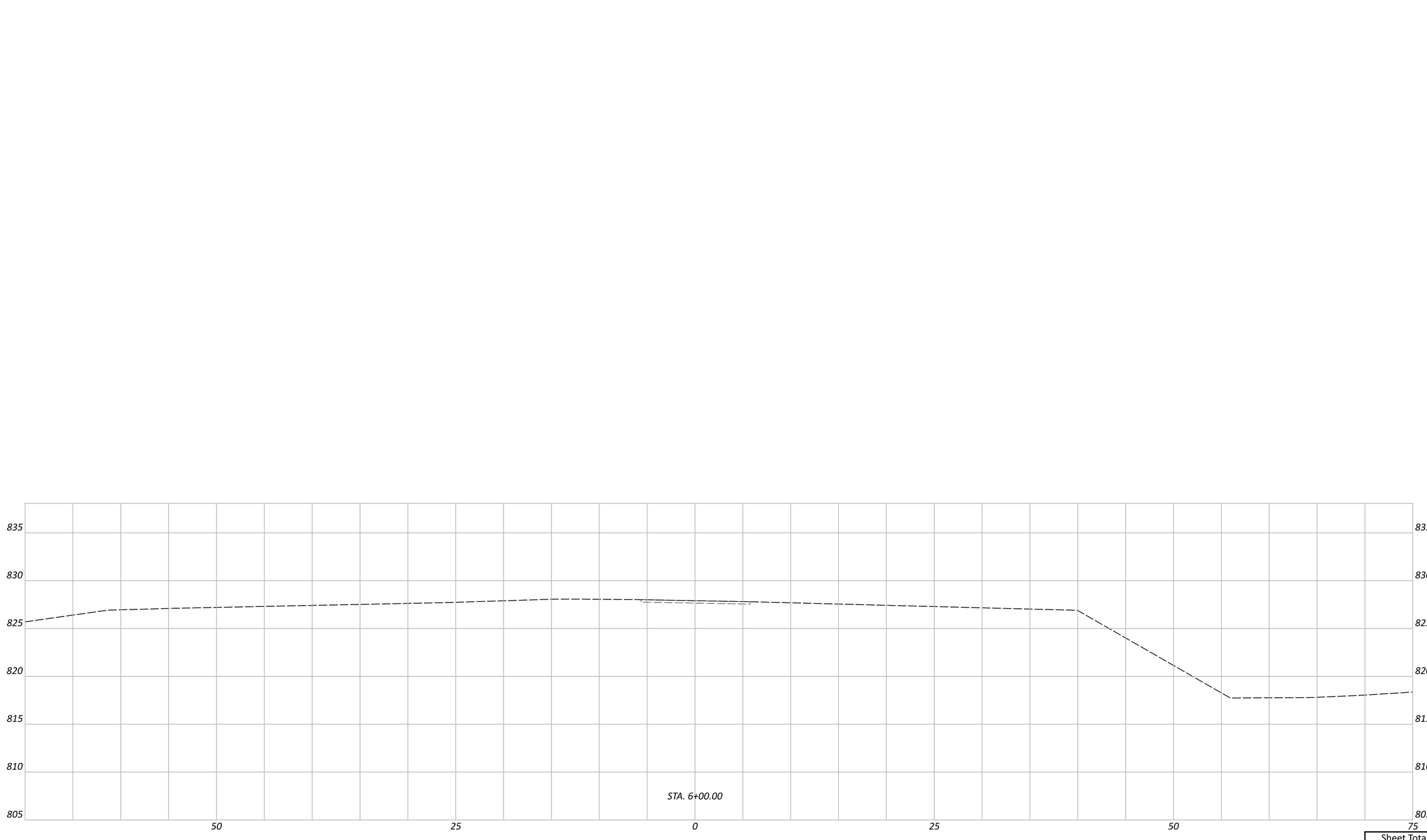

CROSS SECTIONS - BLACKLICK TRAIL
STA. 6+00.00 TO STA. 6+50.00

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER
BER

REVIEWER
KAM 06/18/23

PROJECT ID
96808

SHEET P.740 TOTAL 740

Sheet Totals

Seeding	Cut	Fill

Appendix C – Construction Cost Estimates

Estimate 96808

Estimated Cost:$84,066,452.28

Contingency: 17.50%

Estimated Total: $98,778,081.43

AER

Base Date: 08/28/23

Spec Year: 23

Unit System: E

Work Type: ASPHALT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395616

Longitude of Midpoint: 824623

District: 05

Federal/State Project Number: E220(032)

Prepared by American Structurepoint on 08/28/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 0100: ROADWAY					
0101	202E23000 PAVEMENT REMOVED	78,374.000	SY	$6.50004	$509,434.13
0102	202E30800 TRAFFIC ISLAND REMOVED	533.000	SY	$18.52528	$9,873.97
0103	202E32000 CURB REMOVED	4,820.000	FT	$3.23943	$15,614.05
0104	202E32500 CURB AND GUTTER REMOVED	500.000	FT	$7.90136	$3,950.68
0105	202E38000 GUARDRAIL REMOVED	1,850.000	FT	$2.70969	$5,012.93
0106	202E42010 ANCHOR ASSEMBLY REMOVED, TYPE E	14.000	EACH	$231.91018	$3,246.74
0107	202E47000 BRIDGE TERMINAL ASSEMBLY REMOVED	14.000	EACH	$126.03490	$1,764.49
0108	202E48000 CABLE BARRIER REMOVED	16,161.000	FT	$5.00000	$80,805.00
0109	202E75000 FENCE REMOVED	19,675.000	FT	$3.00000	$59,025.00
0110	203E10000 EXCAVATION	207,843.000	CY	$10.26383	$2,133,265.22
0111	203E20000 EMBANKMENT	338,145.000	CY	$5.39561	$1,824,498.54
0112	206E10500 CEMENT	6,077.200	TON	$180.94806	$1,099,657.55
0113	206E11000 CURING COAT	220,582.000	SY	$1.06670	$235,294.82
0114	206E15010 CEMENT STABILIZED SUBGRADE, 12 INCHES DEEP	234,867.670	SY	$2.46466	$578,868.95
0115	206E30000 MIXTURE DESIGN FOR CHEMICALLY STABILIZED SOILS	1.000	LS	$10,000.00000	$10,000.00
0116	606E15050 GUARDRAIL, TYPE MGS	13,050.000	FT	$17.34667	$226,374.04
0117	606E15550 GUARDRAIL, BARRIER DESIGN, TYPE MGS	275.000	FT	$34.87863	$9,591.62
0118	606E26050	2.000	EACH	$2,201.62232	$4,403.24

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
	ANCHOR ASSEMBLY, MGS TYPE B				
0119	606E26150 ANCHOR ASSEMBLY, MGS TYPE E	27.000	EACH	$2,566.35113	$69,291.48
0120	606E26550 ANCHOR ASSEMBLY, MGS TYPE T	30.000	EACH	$1,158.49304	$34,754.79
0121	606E35002 MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1	13.000	EACH	$2,404.83907	$31,262.91
0122	606E35102 MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2	4.000	EACH	$578.43662	$2,313.75
0123	606E55000 SPECIAL - CABLE BARRIER	10,100.000	FT	$15.00000	$151,500.00
0125	606E55150 SPECIAL - CABLE BARRIER, ANCHOR ASSEMBLY	12.000	EACH	$3,389.52428	$40,674.29
0126	606E60012 IMPACT ATTENUATOR, TYPE 1 (BIDIRECTIONAL)	7.000	EACH	$5,321.89675	$37,253.28
0127	607E23000 FENCE, TYPE CLT	22,125.000	FT	$14.70840	$325,423.35
0128	608E10000 4" CONCRETE WALK	9,425.000	SF	$7.66599	$72,251.96
0129	608E52000 CURB RAMP	2,550.000	SF	$15.83998	$40,391.95
0130	609E12000 COMBINATION CURB AND GUTTER, TYPE 2	350.000	FT	$44.41390	$15,544.87
0131	609E14000 CURB, TYPE 2-A	2,425.000	FT	$11.48056	$27,840.36
0132	609E26000 CURB, TYPE 6	10,120.000	FT	$16.11436	$163,077.32
0133	622E10120 CONCRETE BARRIER, SINGLE SLOPE, TYPE B1	8,384.000	FT	$117.39294	$984,222.41
0134	622E10160 CONCRETE BARRIER, TYPE D	2,400.000	FT	$73.80075	$177,121.80
0167	622E25000 CONCRETE BARRIER END SECTION, TYPE D	2.000	EACH	$4,491.57973	$8,983.16

Total for Group 0100:$8,992,588.65

Group 0200: EROSION CONTROL

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
0201	659E10000 SEEDING AND MULCHING	354,788.000	SY	$0.24057	$85,351.35

Total for Group 0200:$85,351.35

Group 0300: DRAINAGE

0301	202E35100 PIPE REMOVED, 24" AND UNDER	6,560.000	FT	$18.40180	$120,715.81
0302	202E58000 MANHOLE REMOVED	15.000	EACH	$713.34167	$10,700.13
0303	202E58100 CATCH BASIN REMOVED	44.000	EACH	$336.69100	$14,814.40
0304	602E20000 CONCRETE MASONRY	10.000	CY	$1,598.24309	$15,982.43
0305	605E11100 6" SHALLOW PIPE UNDERDRAINS	130,368.000	FT	$8.04578	$1,048,912.25
0306	611E04200 12" CONDUIT, TYPE A	97.000	FT	$92.64555	$8,986.62
0307	611E04400 12" CONDUIT, TYPE B	8,277.000	FT	$65.00000	$538,005.00
0308	611E05700 15" CONDUIT, TYPE A	259.000	FT	$130.95628	$33,917.68
0309	611E05900 15" CONDUIT, TYPE B	818.000	FT	$72.01628	$58,909.32
0310	611E07400 18" CONDUIT, TYPE B	1,343.000	FT	$94.65774	$127,125.34
0311	611E08700 21" CONDUIT, TYPE A	287.000	FT	$140.00000	$40,180.00
0312	611E10200 24" CONDUIT, TYPE A	191.000	FT	$160.00000	$30,560.00
0313	611E10200 24" CONDUIT, TYPE A	1,321.000	FT	$130.00000	$171,730.00
0314	611E13200 30" CONDUIT, TYPE A	255.000	FT	$165.00000	$42,075.00
0315	611E13400 30" CONDUIT, TYPE B	216.000	FT	$167.31696	$36,140.46
0316	611E16200	213.000	FT	$260.73469	$55,536.49

Line #	Item Number	Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
		36" CONDUIT, TYPE A				
0317	611E16400	36" CONDUIT, TYPE B	328.000	FT	$207.18850	$67,957.83
0318	611E20700	48" CONDUIT, TYPE A	279.000	FT	$190.00000	$53,010.00
0319	611E30000	96" CONDUIT, TYPE A	556.000	FT	$300.00000	$166,800.00
0320	611E96490	20' X 9' CONDUIT, TYPE A, 706.05	150.000	FT	$2,000.00000	$300,000.00
0321	611E98150	CATCH BASIN, NO. 3	37.000	EACH	$3,800.00000	$140,600.00
0322	611E98230	CATCH BASIN, NO. 4	16.000	EACH	$5,591.96893	$89,471.50
0323	611E98510	CATCH BASIN, NO. 2-3	1.000	EACH	$2,549.17105	$2,549.17
0324	611E98800	INLET, NO. 3B	1.000	EACH	$3,500.00000	$3,500.00
0325	611E98810	INLET, NO. 3C	24.000	EACH	$3,500.00000	$84,000.00
0326	611E98820	INLET, NO. 3D	5.000	EACH	$3,500.00000	$17,500.00
0327	611E99574	MANHOLE, NO. 3	14.000	EACH	$4,614.57658	$64,604.07

Total for Group 0300:$3,344,283.50

Group 0400: PAVEMENT

0401	254E01000	PAVEMENT PLANING, ASPHALT CONCRETE	125,820.000	SY	$1.45297	$182,812.69
0402	302E56000	ASPHALT CONCRETE BASE, PG64-22, (449)	55,972.000	CY	$118.84775	$6,652,146.26
0403	304E20000	AGGREGATE BASE	37,831.000	CY	$56.35654	$2,132,024.26
0404	407E20000	NON-TRACKING TACK COAT	46,407.000	GAL	$3.26257	$151,406.09
0405	441E50200	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448)	2,229.000	CY	$200.00000	$445,800.00

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
0406	441E50000 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (449), PG64-22	1,593.000	CY	$244.00000	$388,692.00
0407	442E10000 ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446)	11,131.000	CY	$187.56278	$2,087,761.30
0408	442E10080 ASPHALT CONCRETE INTERMEDIATE COURSE, 12.5 MM, TYPE A (446)	13,250.000	CY	$186.17508	$2,466,819.81
0409	452E12010 8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P	637.000	SY	$117.63043	$74,930.58
0410	452E14010 10" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P	38,180.000	SY	$108.31214	$4,135,357.51
0411	609E54000 6" CONCRETE TRAFFIC ISLAND	475.000	SY	$111.94427	$53,173.53
0412	618E40600 RUMBLE STRIPS, SHOULDER (ASPHALT CONCRETE)	14.900	MILE	$845.48430	$12,597.72

Total for Group 0400:$18,783,521.75

Group 0500: SIGNALS

0501	632E99000 SPECIAL - TRAFFIC SIGNALS	5.000	LS	$160,000.00000	$800,000.00

Total for Group 0500:$800,000.00

Group 0600: LIGHTING

0601	625E98100 SPECIAL - LIGHTING Lighting along IR 70	16,200.000	FT	$200.00000	$3,240,000.00
0602	625E99000 SPECIAL - LIGHTING *Lighting at SR 256 and Taylor Rd interchanges*	2.000	LS	$500,000.00000	$1,000,000.00

Total for Group 0600:$4,240,000.00

Group 0700: STRUCTURE

0701	530E00200 SPECIAL - STRUCTURES *IR 70 bridge over Blacklick Creek*	1.000	LS	$6,941,110.00000	$6,941,110.00
0702	530E00200 SPECIAL - STRUCTURES *IR 70 bridge over SR 256*	1.000	LS	$9,507,254.00000	$9,507,254.00
0703	530E00200 SPECIAL - STRUCTURES *Taylor Rd bridge over IR 70*	1.000	LS	$7,630,872.00000	$7,630,872.00
0704	530E00200 SPECIAL - STRUCTURES *Taylor Rd Culvert*	1.000	LS	$2,341,000.00000	$2,341,000.00

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
				Total for Group 0700:	$26,420,236.00
Group 0800: RETAINING WALLS					
0801	530E50000 SPECIAL - RETAINING WALL *Wall 1*	1.000	EACH	$3,443,795.00000	$3,443,795.00
0802	530E50000 SPECIAL - RETAINING WALL *Wall 2*	1.000	EACH	$533,805.00000	$533,805.00
0803	530E50000 SPECIAL - RETAINING WALL *Wall 3*	1.000	EACH	$105,545.00000	$105,545.00
				Total for Group 0800:	$4,083,145.00
Group 0900: TRAFFIC CONTROL					
0631	630E99000 SPECIAL - SIGNS AND SUPPORTS	3.840	LS	$350,000.00000	$1,344,000.00
0901	644E00104 EDGE LINE, 6"	17.570	MILE	$3,896.61183	$68,463.47
0902	644E00204 LANE LINE, 6"	14.180	MILE	$1,339.21392	$18,990.05
0903	644E00300 CENTER LINE	0.990	MILE	$7,546.42752	$7,470.96
0904	644E00404 CHANNELIZING LINE, 12"	16,226.000	FT	$1.84375	$29,916.69
0905	644E00500 STOP LINE	336.000	FT	$8.51735	$2,861.83
0906	644E00620 CROSSWALK LINE, 12"	402.000	FT	$4.38327	$1,762.07
0907	644E01100 SCHOOL SYMBOL MARKING, 72"	1.000	EACH	$853.03510	$853.04
0908	644E01300 LANE ARROW	82.000	EACH	$97.41922	$7,988.38
0909	644E01510 DOTTED LINE, 6"	15,019.000	FT	$0.89801	$13,487.21
0910	646E10010 EDGE LINE, 6"	3.620	MILE	$5,814.91387	$21,049.99
0911	646E10110 LANE LINE, 6"	0.970	MILE	$5,145.60653	$4,991.24
0912	646E10310 CHANNELIZING LINE, 12"	2,232.000	FT	$3.31958	$7,409.30

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
0913	646E10400 STOP LINE	112.000	FT	$13.71484	$1,536.06
0914	646E10510 CROSSWALK LINE, 12"	240.000	FT	$8.07687	$1,938.45
0915	646E20300 LANE ARROW	28.000	EACH	$189.77478	$5,313.69
0916	646E20320 WRONG WAY ARROW	4.000	EACH	$295.28155	$1,181.13

Total for Group 0900:$1,539,213.56

Group 1000: MAINTENANCE OF TRAFFIC

1001	614E11000 MAINTAINING TRAFFIC	1.000	LS	$1,400,000.00000	$1,400,000.00

Total for Group 1000:$1,400,000.00

Group 1100: INCIDENTALS

1101	614E11000 MAINTAINING TRAFFIC	1.000	LS	$2,396,129.05170	$2,396,129.05
1102	619E16020 FIELD OFFICE, TYPE C	31.000	MNTH	$2,131.86529	$66,087.82
1103	623E10000 CONSTRUCTION LAYOUT STAKES AND SURVEYING	1.000	LS	$399,354.84195	$399,354.84
1104	624E10000 MOBILIZATION	1.000	LS	$2,000,000.00000	$2,000,000.00

Total for Group 1100:$4,861,571.71

Group 1200:

1201	690E98400 SPECIAL - *20% Design Contingency*	1.000	LS	$9,516,540.76000	$9,516,540.76

Total for Group 1200:$9,516,540.76

Appendix D – Structure Type Studies

Far East Freeway
FAI-70-00840 L&R
Structure Type Study

Ohio Department of Transportation – District 5
9600 Jacksontown Road
Jacksontown, OH 43030

June 23, 2023

2550 Corporate Exchange Drive, Suite 300
Columbus, Ohio 43231
TEL 614 901 2235
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AMERICAN STRUCTUREPOINT INC.

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Appendix A – Design Criteria

Appendix B – Preliminary Bridge Plans, Preferred Alternative

Appendix C – Preliminary Construction Cost and Lifecycle Cost

Appendix D – Existing Bridge Plans

Appendix E – Bridge Inspection Photographs

1.0 Executive Summary

1.1 Overall Summary and Recommendations

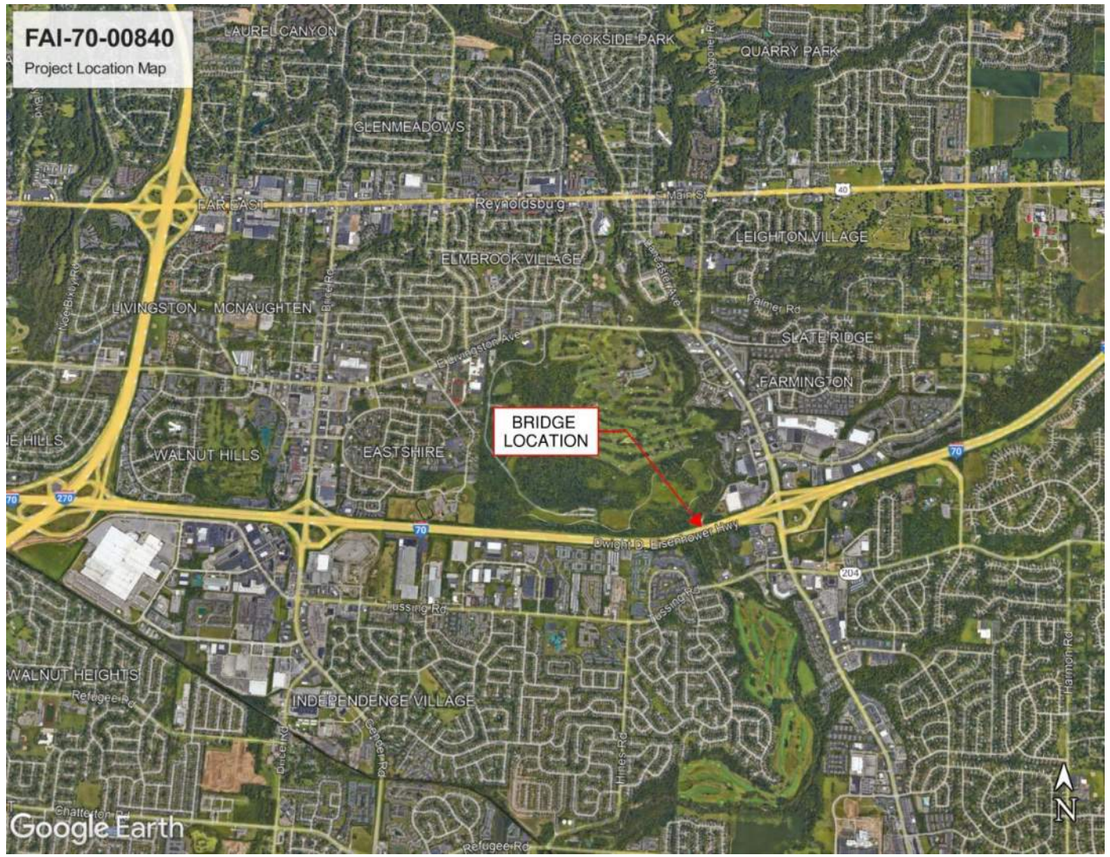
This report has been prepared to determine the preferred structure type for the I-70 over Blacklick Creek crossing as part of the FAI/LIC-0.00/0.00 Far East Freeway project (PID 96808). All alternative layouts are based on the pertinent recommendations from the previously submitted and approved "Far East Freeway FAI/LIC-70-0.00/0.00 Feasibility Study" which include:

- Widening IR 70 to the outside, constructing three through lanes in the eastbound and westbound directions
- Construct a two-lane westbound CD road between SR 256 and Taylor Road

The existing FAI-70-00840 Left (SFN 2301563) and Right (SFN 2301598) bridges are both three-span (34'-6", 43'-0", 34'-6"), continuous rolled steel beam structures with an overall length of 114'-0". The substructures consist of reinforced concrete T-Type piers and integral abutments with a no skew on pile foundations. Originally constructed in 1967, the bridges have had previous rehabilitation work including SDC overlay, parapet replacement, and repairs to strip seal joints performed in 1988. In around 2010 the Blacklick Trail was constructed beneath the Span 1 spill through slope, requiring construction of a small retaining wall on the abutment side, and utilizing grouted rock channel protection on the channel side to create the space necessary for the path. The minimum vertical clearance provided over the Blacklick Trail is currently 9'-0", with the point of minimum clearance occurring at the Left Bridge north fascia beam.

The recommended replacement structure for both the Left, Right, and CD Road Bridges is a three-span (45'-0", 56'-3", 45'-0") continuous reinforced concrete slab on cap and column piers and integral abutments. This structure type has the lowest initial and lifcycle cost, meets all current ODOT hydraulic design criteria, and improves the vertical clearance over the Blacklick Trail.

1.2 Project Location



2.0 Existing Structure Inspection

As part of this Structure Type Study, a routine bridge inspection was performed on 04/12/2023 to assess the substructure condition of both the existing structures. Given that full superstructure replacement is included in all alternatives evaluated, existing superstructure components were not inspected. For bridge inspection photos see Appendix E.

2.1 Left Bridge Substructure Condition Summary

Per the bridge inspection performed on 08/02/2022 by others, the substructure is currently rated as a 6. Based on the inspection findings, American Structurepoint would classify the substructure condition as similar to the Right bridge, and generally in good condition. Below is the summary of findings:

- Severe erosion and washout of crushed aggregate slope protection at the north end of Blacklick Trail retaining wall.
- Steep spill through slopes with grouted RCP between Blacklick Trail and Pier 1.
- Channel alignment meandering to the west at north end of bridge, depositing material along Pier 1.
- Larger dumped rock fill has been placed on F.A. spill through slope.
- Minor spalling and cracking at R.A. southwest wingwall located at beam seat interface.
- Previously patched area at R.A. below Beam 8.
- No other deficiencies noted at substructures.

2.2 Right Bridge Substructure Condition Summary

Per the bridge inspection performed on 08/02/2022 by others, the substructure is currently rated as a 7. Based on the inspection findings, American Structurepoint agrees that the substructure is generally in good condition. Below is the summary of findings:

- Minor erosion and washout of crushed aggregate slope protection at the south end of Blacklick Trail retaining wall, exposed geotextile fabric.
- Steep spill through slopes with grouted RCP between Blacklick Trail and Pier 1.
- Channel depositing material along Pier 1.
- Small spall (18” x 4”) at F.A. below Beam 1.
- Minor corner beam seat spall on east face of Pier 2 near Beam 7.
- No other deficiencies noted at substructures.

3.0 Structure Type Study

3.1 Design Criteria

Pertinent geometric design criteria was developed in accordance with the current ODOT L&D Vol. 1 and Bridge Design Manuals, and is summarized in Appendix A. Design Criteria for the Blacklick Trail shared use path matches, or improves, existing conditions. The proposed trail paved width will be 14’-0” under the bridge, consisting of a 10’ path and 2’ shy distance on each side. For hydraulic design criteria please refer to the “Hydrology and Hydraulics Report” included as a separate document with this submittal.

3.2 Proposed Structure Alternatives

The structure types evaluated are based on site constraints, hydraulic adequacy, accommodating the recommended MOT scheme, constructability, project design criteria, and economy. For hydraulic analysis results and discussion, please refer to the “Hydrology and Hydraulics Report” included as a separate document with this submittal. The three proposed alternatives are:

Left & Right Bridge (SFN 2301563 / 2301598)

- Alternative A – Full replacement with three-span (49’-0”, 65’-0”, 49’-0”) W27 continuous rolled steel beam superstructure on cap and column piers and integral abutments with no skew.
- Alternative B – Full replacement with three-span (45’-0”, 56’-3”, 45’-0”) continuous reinforced concrete slab superstructure on cap and column piers and integral abutments with no skew.
- Alternative C – Full superstructure replacement (34’-6”, 43’-0”, 34’-6”) with W27 continuous rolled steel beam superstructure on widened piers and integral abutments.

For all alternatives the IR 70 eastbound and westbound profile will be maintained to minimize mainline impacts and cost, while the new adjacent CD road to the south will be placed on an independent bridge with an independent profile grade. For hydraulic considerations the controlling bridge low chord location is the center of the Left Bridge north fascia.

CD Road Bridge (SFN 0000001)

- Alternative A – New structure with three-span (49’-0”, 65’-0”, 49’-0”) W27 continuous rolled steel beam superstructure on cap and column piers and integral abutments with no skew.
- Alternative B – New structure with three-span (45’-0”, 56’-3”, 45’-0”) continuous reinforced concrete slab superstructure on cap and column piers and integral abutments with no skew.
- Alternative C – New structure with three-span (48’-3”, 43’-0”, 34’-6”) W27 continuous rolled steel beam superstructure on T-type piers and integral abutments. Piers 1, 2, and F.A. are aligned with Right Bridge, while Span 1 is increased to accommodate the Blacklick Trail beneath.

For all alternatives all new structural components are required. The CD Road profile is based on roadway geometric requirements and differing profiles were not needed for each alternative. To accommodate the departing roadway curvature, a superelevation transition will be required across the proposed bridge.

Alternative A:

The proposed three-span arrangement (49’-0”, 65’-0”, 49’-0) locates the proposed piers just beyond the existing piers and provides balanced end spans. This avoids interference with existing footings and pile foundations, while also lengthening the end span sufficiently to better accommodate the Blacklick Trail shared use path. Spill through slope grading at 2:1 max. will be utilized on both sides of the path, providing an improved channel section through the bridges, as well as eliminating the conditions contributing to the severe erosion at the NW end of the existing path retaining wall. The new substructure locations will also better align with the shifting channel alignment which is migrating west. The existing bridge low chord is matched through slight reduction is superstructure depth, to account for widening IR 70 westbound approximately 20 feet to the north. The current minimum vertical clearance over the Blacklick Trail of 9’-0” will be matched, with the controlling location being the new north fascia beam. Steel costs were balanced with superstructure depth to determine the most efficient beam sections and framing plans. W27 composite rolled steel beams are utilized for all the bridges, with ten beam lines proposed for the Left Bridge and eight

beam lines for both the Right Bridge and CD Road Bridge. All bridges will be square with no skew. Considering the bridge low chord is greater than 10 feet above the Blacklick Creek Ordinary High Water Mark (OHWM), a weathering steel coating system will be utilized for the proposed steel superstructures. Fascia beams and beam ends will be painted as specified in Section 308.2.2.1.d.1 of the 2020 BDM.

Proposed substructures will consist of integral stub abutments and cap and column piers. While capped pile piers are a more economical pier type, it was determined the unsupported height would likely exceed the threshold of 20 feet once scour depths are accounted for, thus precluding their use. This will be confirmed upon completion of the scour analysis. Should calculated scour depths be minimal, the use of capped pile piers may be feasible. To facilitate pier construction and erection of the steel superstructure it is anticipated that a Temporary Access Fill (TAF) will be required in Blacklick Creek.

The advantages associated with Alternative A include:

- No conflicts with existing foundations
- Satisfies “no rise” condition and meets all ODOT hydraulic design criteria

The disadvantages associated with Alternative A include:

- Higher initial and lifecycle cost
- Less vertical clearance provided over Blacklick Creek Trail

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $3,048,119 / $5,119,400
Right Bridge = $2,386,548 / $3,897,600
CD Road Bridge = $2,192,210 / $3,703,300

Total = $7,626,877 / $12,720,300

Alternative B:

The proposed three-span arrangement (45’-0”, 56’-3”, 45’-0”) locates the R.A. as necessary to accommodate the Blacklick Trail shared use path. With this location established, a standard span configuration from Std. Dwg. CS-1-08 was selected to properly span the main channel, and provide the required waterway opening area. This configuration will require partial removal of the existing Pier 2 footing and possibly the removal of multiple piles to construct the proposed pier, though all other existing substructures are avoided. The preferred MOT scheme recommends construction of the Left and Right Bridges offline, each during a separate phase, allowing for full removal of the existing bridge, and substructures, prior to construction of the new bridges. The proposed slab thickness is 26 ½”, resulting in a 1.29' reduction in superstructure depth as compared to the existing superstructure depth of approximately 3.5’. This will increase the minimum vertical clearance over the Blacklick Trail shared use path to the preferred minimum of 10’-0”.

Proposed substructures will consist of integral stub abutments, per Std. Dwg. CPA-1-08, and cap and column piers. Similar to Alternative A, capped pile piers will be further evaluated once the scour analysis has been completed. To facilitate pier construction and support of the slab formwork it is anticipated that a Temporary Access Fill (TAF) will be required in Blacklick Creek.

The advantages associated with Alternative B include:

- Lower initial and lifecycle cost
- Increases vertical clearance over Blacklick Trail
- Satisfies “no rise” condition and meets all ODOT hydraulic design criteria
- Slab type structure can more easily accommodate superelevation transition across CD Road Bridge

The disadvantages associated with Alternative B include:

- Pier 2 construction requires partial removal of existing Pier 2 footing, and possibly multiple piles

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,855,028 / $4,172,100
Right Bridge = $2,140,210 / $3,071,600
CD Road Bridge = $1,945,872 / $2,877,300

Total = $6,941,110 / $10,121,000

Alternative C:

It was determined this alternative was not feasible based on the following:

- Creates a rise in the effective FEMA 1% AEP base flood elevations
- The Blacklick Trail shared use path cannot be accommodated at the northern limits of the Left Bridge without significant impacts to Blacklick Creek

Given this alternative is not capable of satisfying all project design criteria it was eliminated from consideration.

3.3 Foundation Recommendations

This Structure Type Study does not include soil borings or Foundation Recommendations due to multiple span configurations being evaluated. In an effort to reduce costs, soil borings will be taken at the final approved substructure locations. Although the final required pile/shaft lengths may deviate from the lengths assumed in this report, this difference in length will not significantly affect the relative differences in cost between the studied alternatives.

For the purposes of this report, friction piles have been assumed for the new and widened substructure foundations. The driven length required was estimated to be 50-feet for preliminary costs. Foundation Recommendations, and a more refined length of piling/shafts will be calculated and included with the Stage 1 submission.

3.4 Maintenance of Traffic

The proposed bridge work will be completed utilizing a crossover scheme for both alternatives evaluated. The recommendations from the MOTAA indicate that all three structures can be constructed offline during separate phases. This will greatly simplify existing structure removals and construction of the new bridges. Temporary shoring needs will be minimal under this scenario.

3.5 Roadway / Trail Considerations

IR 70 roadway costs and impacts will be similar for all alternatives evaluated. By matching the current IR 70 eastbound and westbound profile grade the low point of a sag curve will be located at approximately the center of the mainline bridges. As a result, scuppers will be required on each side of the Left and Right bridge to accommodate deck drainage. By placing the CD Road bridge on an independent profile, the low point is shifted east of the bridge and scuppers can be avoided.

The Blacklick Creek Trail will be detoured while the proposed bridges are constructed. The duration of detour is anticipated to be similar for both alternatives.

3.6 Utility Impacts

Electrical conduit is currently mounted to the underside of deck on the southern facia of the Right Bridge. Relocation will be required to avoid disturbance during construction. If necessary new conduit will be placed in the concrete parapet. No additional utility impacts are anticipated.

3.7 Preferred Alternative

Alternative B is recommended as the preferred alternative. This recommendation is based on lower initial and lifecycle costs, as well as improved vertical clearance over the Blacklick Trail.

4.0 Conclusion

The preferred replacement structure for both the Left, Right and CD Road Bridges is a three-span (45’-0”, 56’-3”, 45’-0”) continuous reinforced concrete slab superstructure on cap and column piers and integral abutments with no skew.

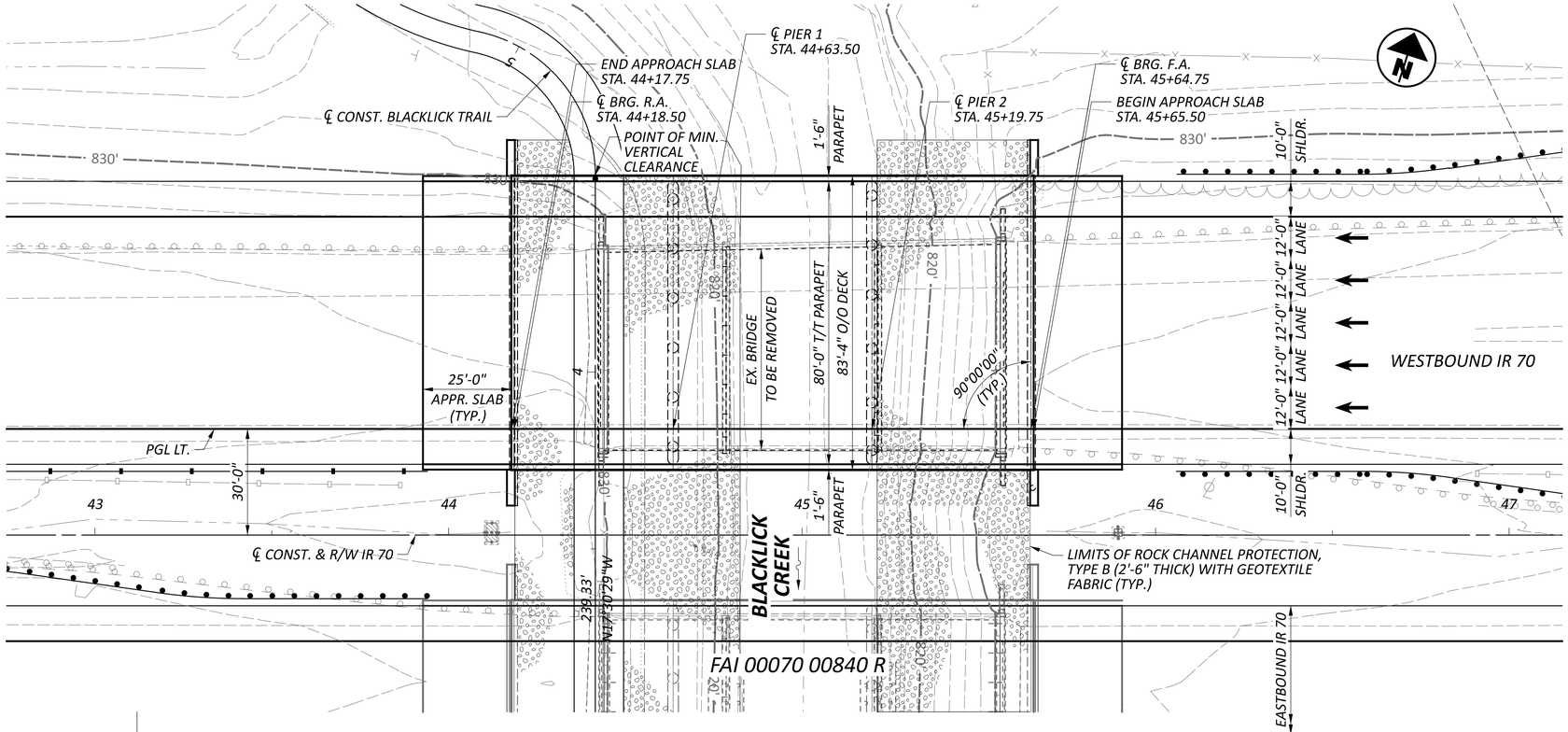
This structure meets all current ODOT hydraulic design criteria and improves the minimum vertical clearance over the Blacklick Trail.

Appendix A – Design Criteria

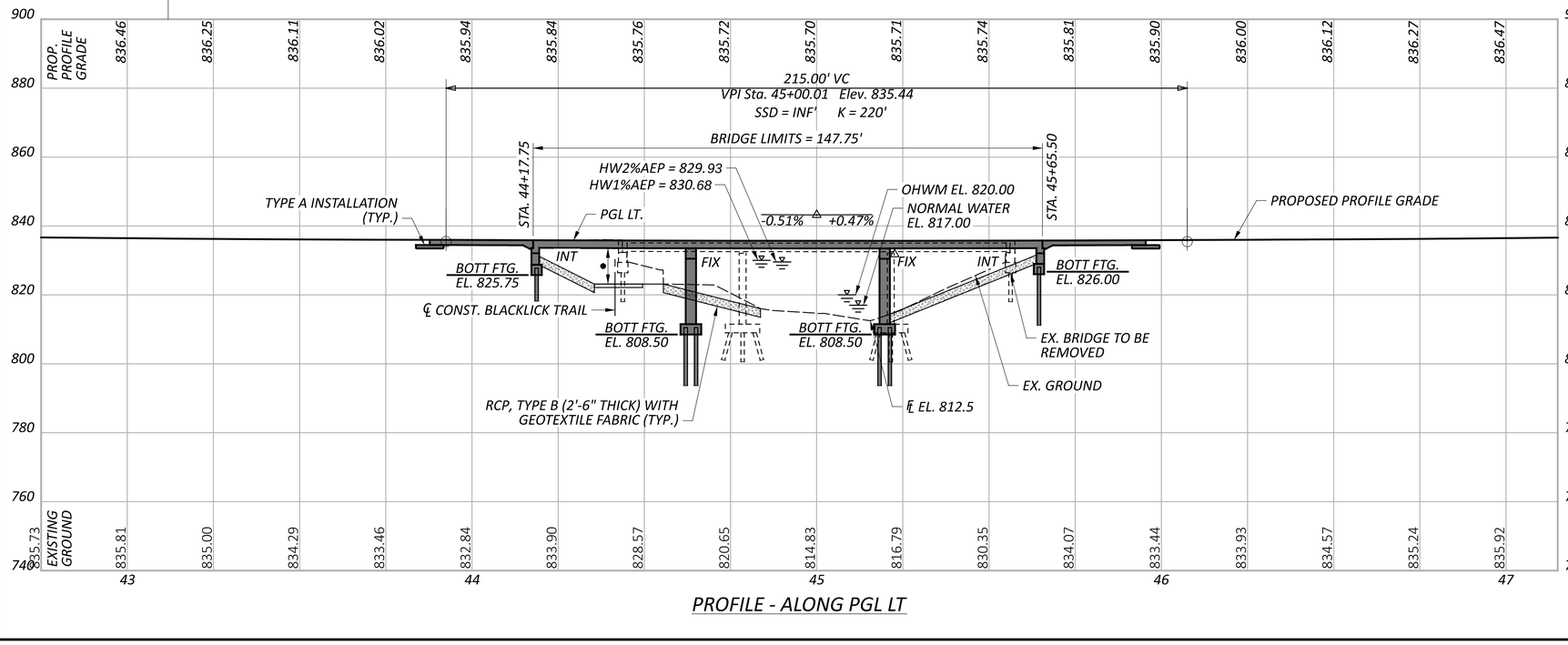
Roadway Design Criteria

			Appropriate Design Criteria Guide (Figure 105-1E, Sections 105.1 & 105.5.1)	
Design Feature / Highway Name	**IR 70**	**Blacklick Creek Trail**	**Normal Design Criteria**	
			Section	**Figure**
Design Designation				
Location	Urban			
Functional Classification	Interstate			
Traffic Volumes				
Opening Day (2030)				
ADT	56,680			
DHV	3,937			
Design Year (2050)				
ADT	76,150			
DHV	5,290			
Directional Distribution	50%			
Trucks (D)	12.0%			
ADTT (2050)	9,138			
Terrain	Level			
Design Speed (mph)	70			
Posted Speed (mph)	65			
NHS Route	Yes			
Design Criteria				
TYPICAL SECTION				
Lane Width	12		301.1.2 & 303.1	301-2 to 4, 303-1
Curve Widening	N/A		301.1.3	301-5a, 5b, 5c
Pavement Cross Slopes	0.016 ft/ft Normal Crown		301.1.5	301-6
Outside Shoulder Width				
Graded Width	15' w/ Barrier 15' w/o Barrier and Foreslope > 6:1 10' w/o Barrier and Foreslope <= 6:1		301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	10'		301.2.3 & 303.1	301-3, 4, 303-1
Median Shoulder Width				
Graded Width	9' w/ Barrier 9' w/o Barrier and Foreslope > 6:1 4' w/o Barrier and Foreslope <= 6:1		301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	4' 10' (6 or more lanes)		301.2.3 & 303.1	301-3, 4, 303-1
Median Width	60'		304.1 to 304.3.2	304-1
Clear Zone Width	30'		600.2	600-1
Foreslopes	≤ 6:1 = 32' (Use 30') > 6:1 to 4:1 = 42' (Use 30')		600.2, 600.2.1	600-1, 2
Backslopes	≤ 6:1 = 28' > 6:1 to 4:1 = 28' > 4:1 = 23'		600.2, 600.2.1	600-1, 2
Type of Grading	307-1, 307-2 Safety Grading Where Possible		307.1 to 307.2	307-1 to 307-6
Shared Use Path Width	N/A	Minimum 11' Constrained 8' 2' Shy Space Each Side	See Multimodal Design Guide	Table 5-1 Section 5.4
Concrete Walk Width	N/A			
Walk/Bike Path Cross Slopes	N/A	0.0156 ft/ft	See Multimodal Design Guide	Section 5.3.5
BRIDGE				
Structural Capacity	HL-93	N/A	302.1	See Bridge Design Manual
New and Reconstructed Bridges				
Lateral Clearance	10' Rt. / 4' Lt.			
On Bridge	N/A	N/A	302.1	302-1
Under Bridge	N/A	N/A	302.1	302-1, 301-3, 301-4, 600-1, & 603-2
Vertical Clearance Over Shared Use Path	N/A	10'-0" Preferred 8'-0" Minimum	See Multimodal Design Guide	Figure 3-14

Appendix B – Preliminary Bridge Plans, Preferred Alternative



PLAN



PROFILE - ALONG PGL LT

BENCHMARK DATA (TO BE COMPLETED AT STAGE 1)

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 28,340 2030 ADTT = 3,401
2050 ADT = 38,075 2050 ADTT = 4,569
DIRECTIONAL DISTRIBUTION = 100%

LEGEND

● 10'-0" PREFERRED MINIMUM VERTICAL CLEARANCE
10'-0⅞" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = 42.27 SQ. MILES
Q (2% AEP) = 8,696 CFS (FIS) V (2% AEP) = 8.18 FT/S
Q (1% AEP) = 10,000 CFS (FIS) V (1% AEP) = 8.84 FT/S
STRUCTURE CLEARS THE 2% AEP
DESIGN HW BY 2.88 FEET.

EXISTING STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE
SPANS: 34'-6"±, 43'-0"±, 34'-6"±
ROADWAY: VARIABLE TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: NONE
WEARING SURFACE: 1"± MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 2301563
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS REINFORCED CONCRETE SLAB SUPPORTED ON REINFORCED CONCRETE ABUTMENTS AND CAP AND COLUMN PIERS
SPANS: 45'-0", 56'-3", 45'-0"
(℄ BRG. R.A/℄ PIER, ℄ PIER/℄PIER, ℄ PIER/℄ BRG. F.A.)
ROADWAY: 80'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: NONE
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0" LONG, 15" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 12,313 SF
COORDINATES: LATITUDE 39°55'55.80"
LONGITUDE -82°47'45.6"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI 00070 00840 L
IR 70 OVER BLACKLICK CREEK

SFN TBD
DESIGN AGENCY STRUCTUREPOINT INC.
DESIGNER MAH | CHECKER SJF
REVIEWER CLB 06-14-23
PROJECT ID 96808
SUBSET 1 | TOTAL 4
SHEET P.0 | TOTAL 0

FAI/LIC-70.0/0.00

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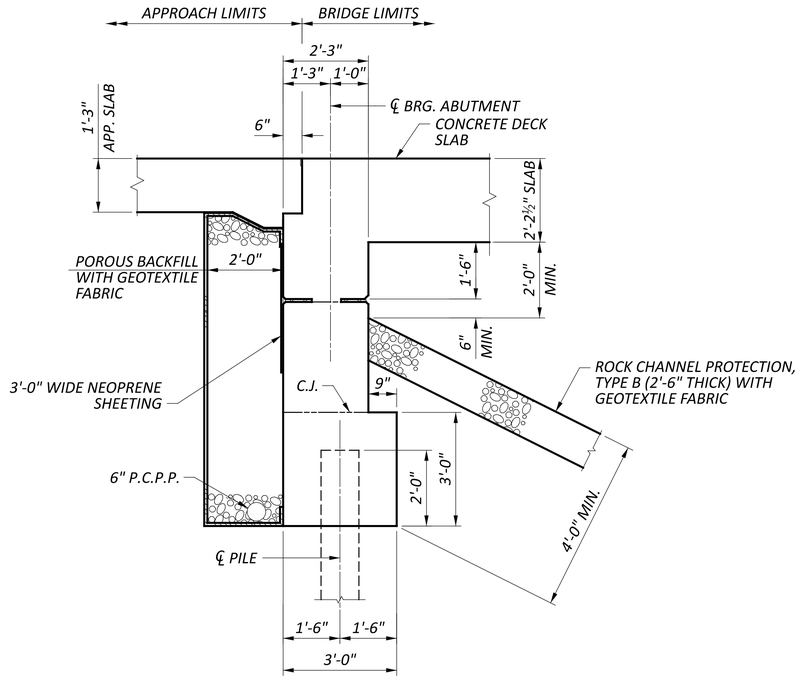

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. FAI 00070 00840 L
IR 70 OVER BLACKLICK CREEK

SFN	TBD
DESIGN AGENCY	MPEAN STRUCTUREPOINT INC.
DESIGNER	MAH
CHECKER	SJF
REVIEWER	CLB 06-14-23
PROJECT ID	96808
SUBSET	2
TOTAL	4
SHEET	P.0
TOTAL	0

FAI/LIC-70.0/0.00

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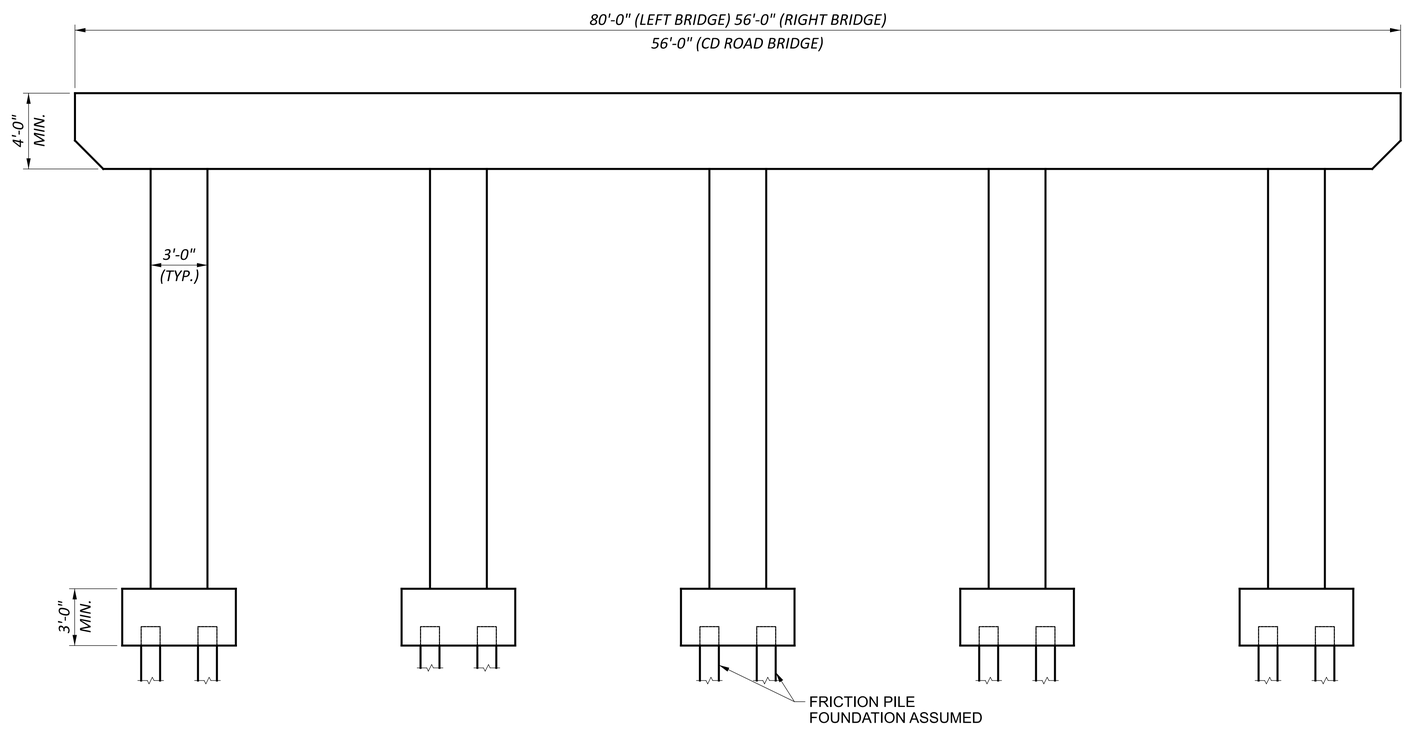

PIER ELEVATION

APPLIES TO LEFT BRIDGE, RIGHT BRIDGE, & CD ROAD BRIDGE

PIER DETAILS
BRIDGE NO. FAI 00070 00840 L
IR 70 OVER BLACKLICK CREEK

SFN	TBD
DESIGN AGENCY	AMERICAN STRUCTUREPOINT INC.
DESIGNER	MAH
CHECKER	SJF
REVIEWER	CLB 06-14-23
PROJECT ID	96808
SUBSET	3
TOTAL	4
SHEET	P.0
TOTAL	0

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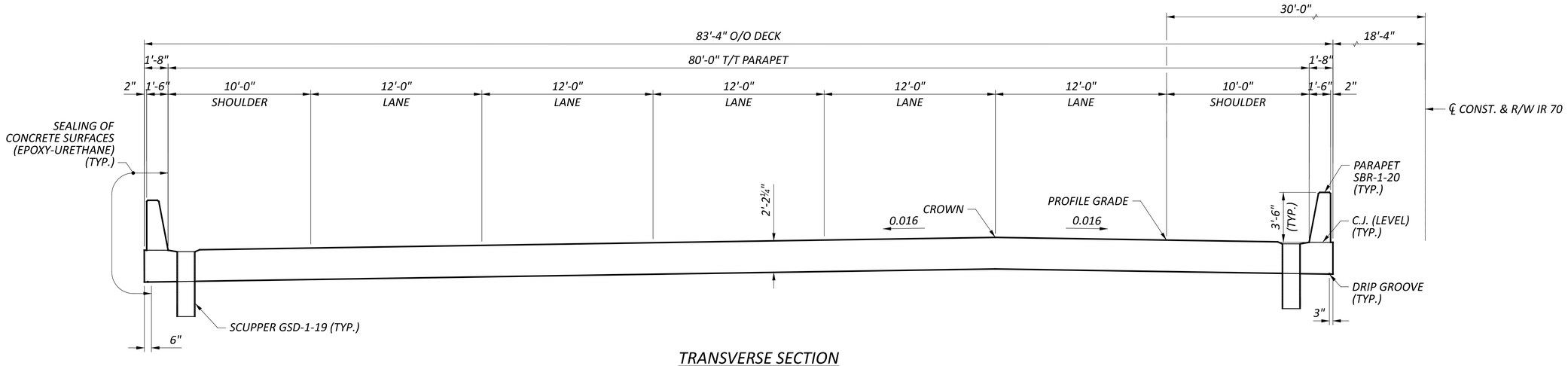

TRANSVERSE SECTION

TRANSVERSE SECTION
BRIDGE NO. FAI 00070 00840 L
IR 70 OVER BLACKLICK CREEK

SFN
TBD

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	CHECKER
MAH	SJF

REVIEWER
CLB 06-14-23

PROJECT ID
96808

SUBSET	TOTAL
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SHEET	TOTAL
P.0	0

FAI/LIC-70.0/0.00

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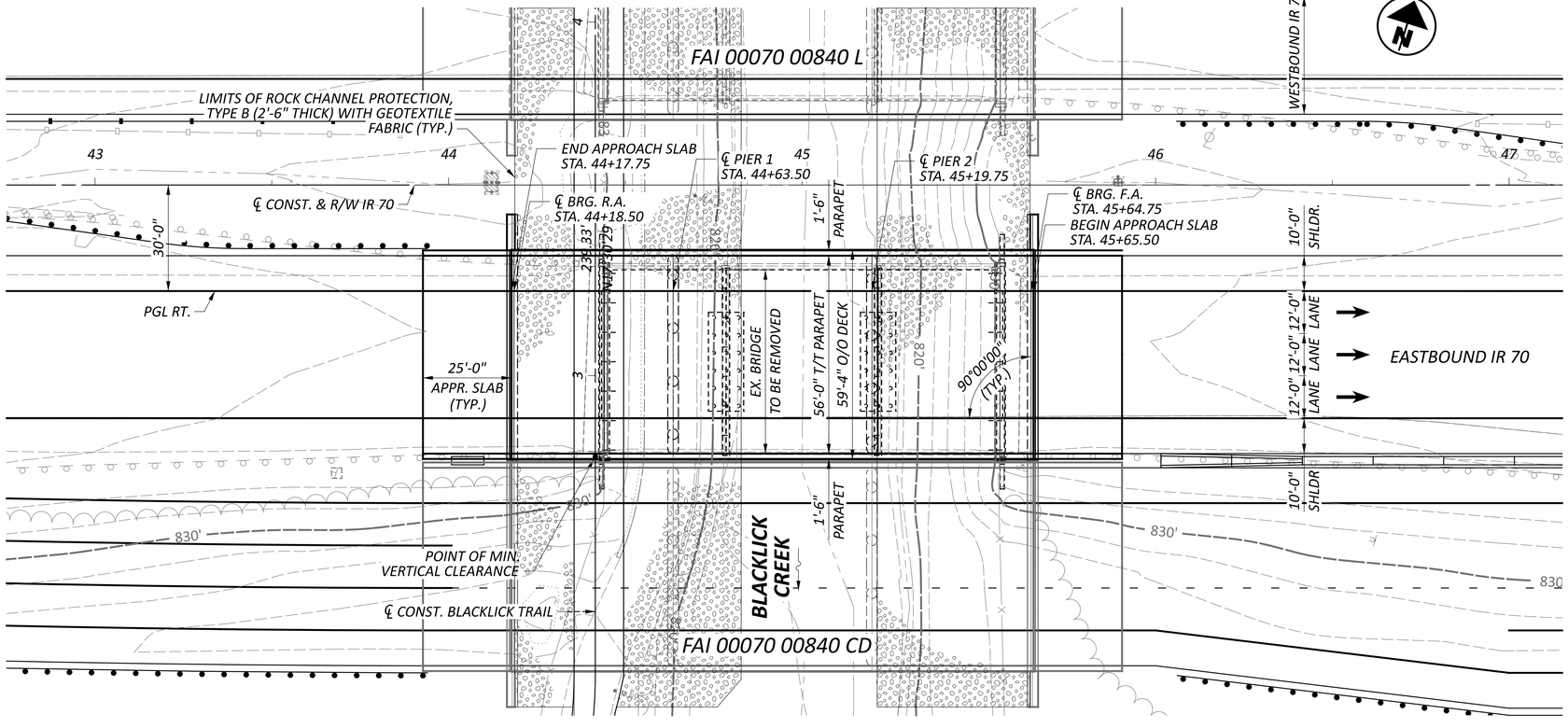

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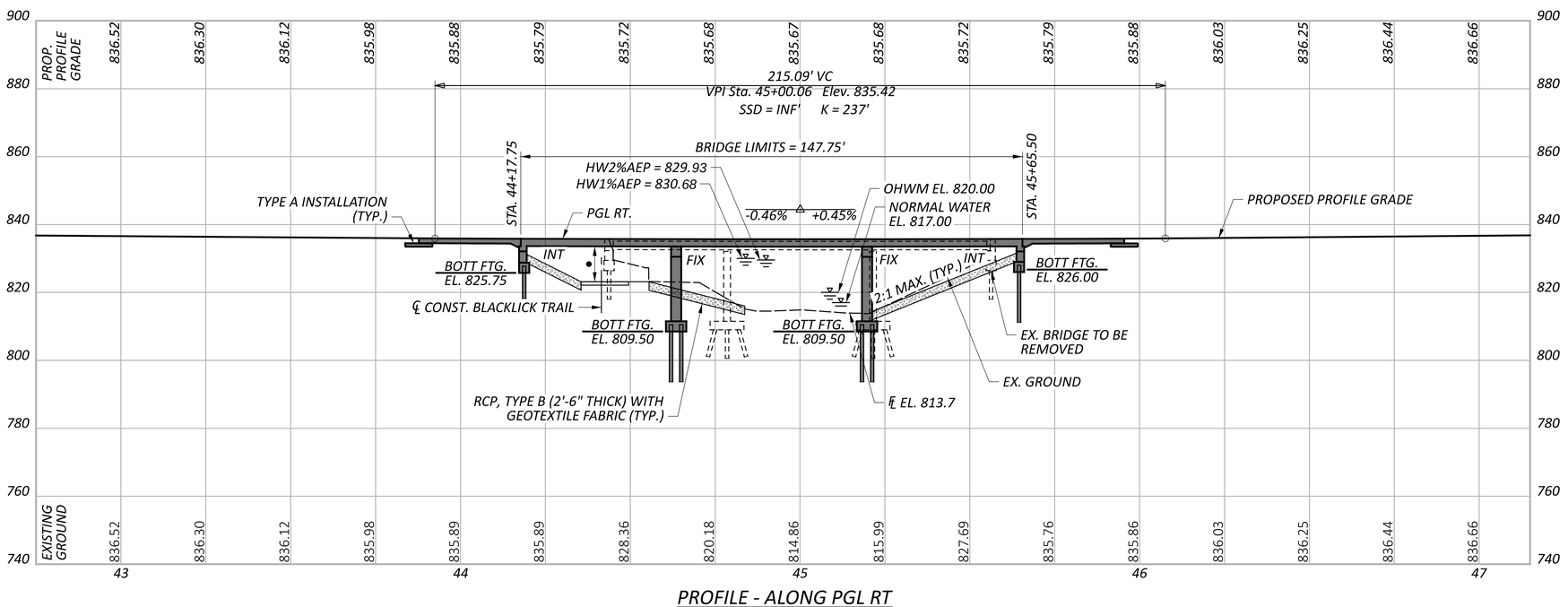

PROFILE - ALONG PGL RT

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 28,340 2030 ADTT = 3,401
2050 ADT = 38,075 2050 ADTT = 4,569
DIRECTIONAL DISTRIBUTION = 100%

LEGEND

● *10'-0" PREFERRED MINIMUM VERTICAL CLEARANCE*
10'-3½" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = 42.27 SQ. MILES
Q (2% AEP) = 8,696 CFS (FIS) V (2% AEP) = 8.18 FT/S
Q (1% AEP) = 10,000 CFS (FIS) V (1% AEP) = 8.84 FT/S
STRUCTURE CLEARS THE 2% AEP
DESIGN HW BY 3.22 FEET.

EXISTING STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE
SPANS: 34'-6"±, 43'-0"±, 34'-6"±
ROADWAY: 52'-0"± TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: NONE
WEARING SURFACE: 1"± MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 2301598
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS REINFORCED CONCRETE SLAB SUPPORTED ON REINFORCED CONCRETE ABUTMENTS AND CAP AND COLUMN PIERS
SPANS: 45'-0", 56'-3", 45'-0"
(℄ BRG. R.A/℄ PIER, ℄ PIER/℄PIER, ℄ PIER/℄ BRG. F.A.)
ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: NONE
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0" LONG, 15" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 8,766 SF
COORDINATES: LATITUDE 39°55'54.9"
LONGITUDE -82°47'45.2"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI 00070 00840 R
IR 70 OVER BLACKLICK CREEK

SFN TBD
DESIGN AGENCY STRUCTUREPOINT INC.
DESIGNER MAH | CHECKER SJF
REVIEWER CLB 06-14-23
PROJECT ID 96808
SUBSET 1 | TOTAL 3
SHEET P.0 | TOTAL 0

FAI/LIC-70.0.00/0.00

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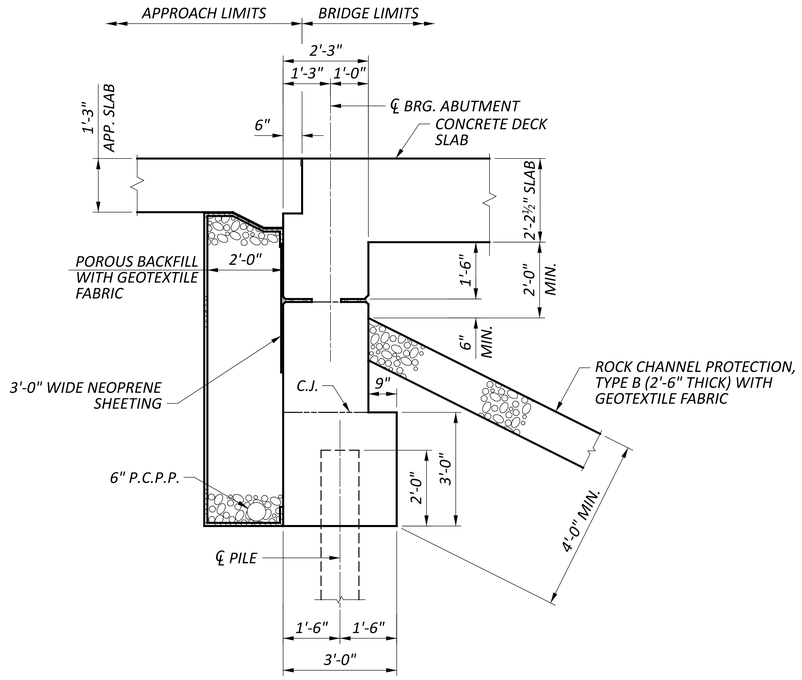

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. FAI 00070 00840 R
IR 70 OVER BLACKLICK CREEK

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DESIGNER	MAH
CHECKER	SJF
REVIEWER	CLB 06-14-23
PROJECT ID	96808
SUBSET	2
TOTAL	3
SHEET	P.0
TOTAL	0

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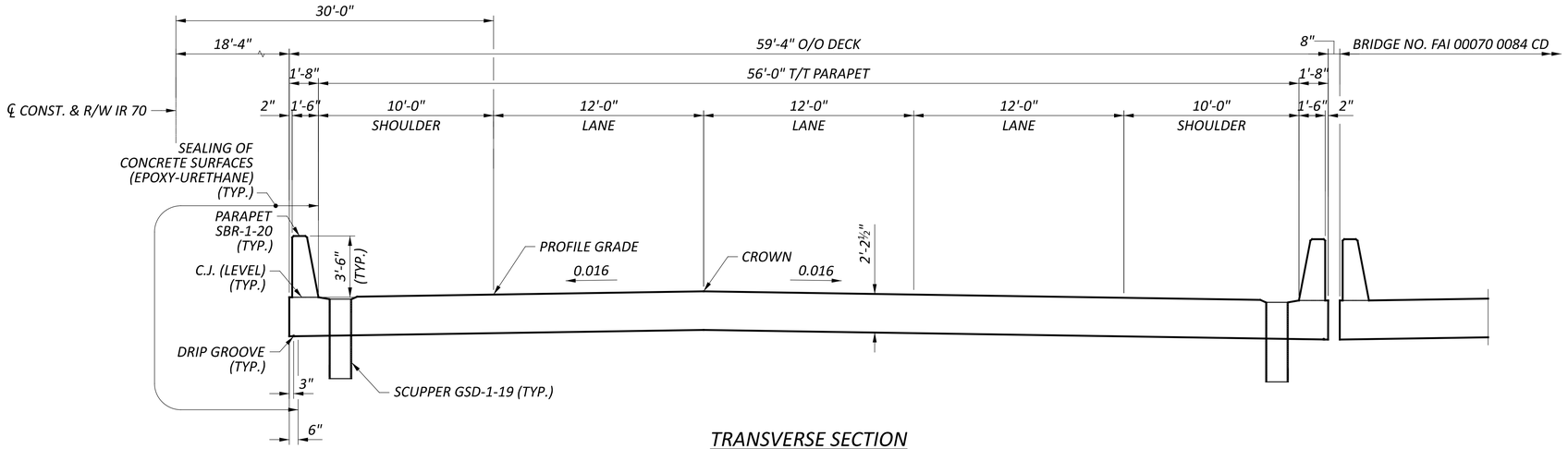

TRANSVERSE SECTION

TRANSVERSE SECTION
BRIDGE NO. FAI 00070 00840 R
IR 70 OVER BLACKLICK CREEK

SFN	TBD
DESIGN AGENCY	AMERICAN STRUCTUREPOINT INC.
DESIGNER	MAH
CHECKER	SJF
REVIEWER	CLB 06-14-23
PROJECT ID	0
SUBSET	3
TOTAL	3
SHEET	P.0
TOTAL	0

FAI/LIC-70.0.00/0.00

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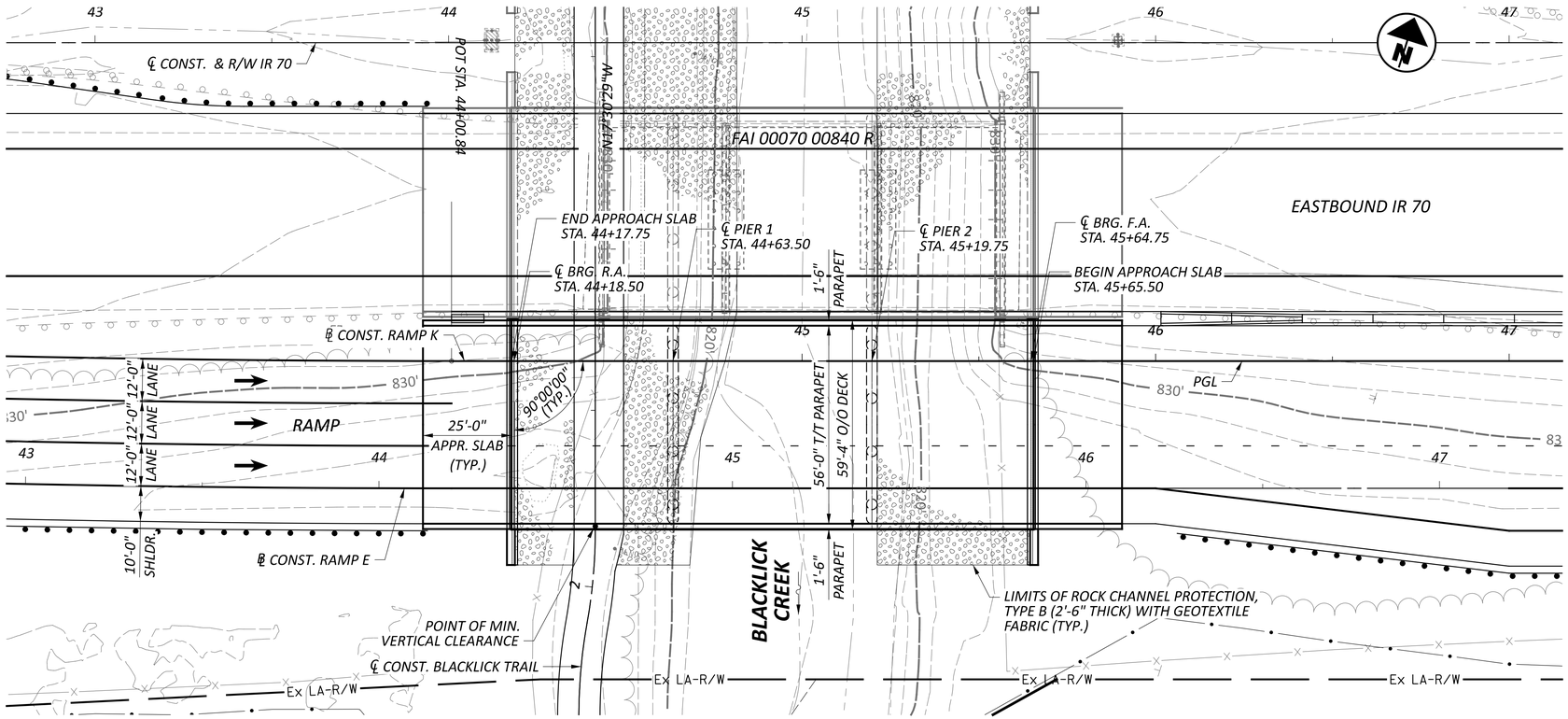
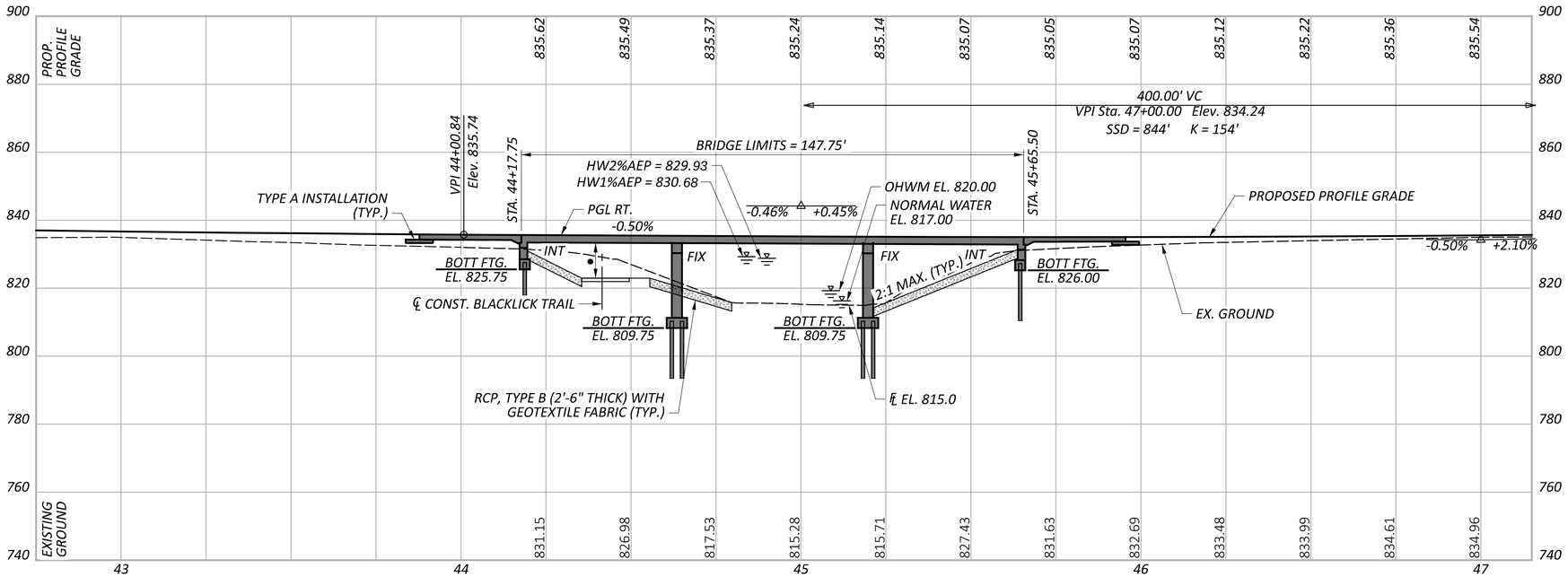


PLAN



PROFILE - ALONG ℄ CONST. RAMP K

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 11,622 2030 ADTT = 465
2050 ADT = 16,062 2050 ADTT = 642
DIRECTIONAL DISTRIBUTION = 100%

LEGEND

● *10'-0" PREFERRED MINIMUM VERTICAL CLEARANCE*
10'-1½" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = 42.27 SQ. MILES
Q (2% AEP) = 8,696 CFS (FIS) V (2% AEP) = 8.18 FT/S
Q (1% AEP) = 10,000 CFS (FIS) V (1% AEP) = 8.84 FT/S
STRUCTURE CLEARS THE 2% AEP
DESIGN HW BY 3.19 FEET.

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS REINFORCED CONCRETE SLAB SUPPORTED ON REINFORCED CONCRETE ABUTMENTS AND CAP AND COLUMN PIERS

SPANS: 45'-0", 56'-3", 45'-0"
(℄ BRG. R.A/℄ PIER, ℄ PIER/℄PIER, ℄ PIER/℄ BRG. F.A.)

ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: NONE
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0" LONG, 15" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
SUPERELEVATION: VARIES FT/FT
DECK AREA: 8,766 SF

COORDINATES: LATITUDE 39°55'54.4"
LONGITUDE -82°47'45.0"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIGDE NO. FAI 00070 00840 CD
CD ROAD OVER BLACKLICK CREEK

SFN TBD
DESIGN AGENCY STRUCTUREPOINT INC.
DESIGNER MAH | CHECKER SJF
REVIEWER CLB 06-14-23
PROJECT ID 96808
SUBSET 1 | TOTAL 3
SHEET P.0 | TOTAL 0

FAI/LIC-70-0.00/0.00

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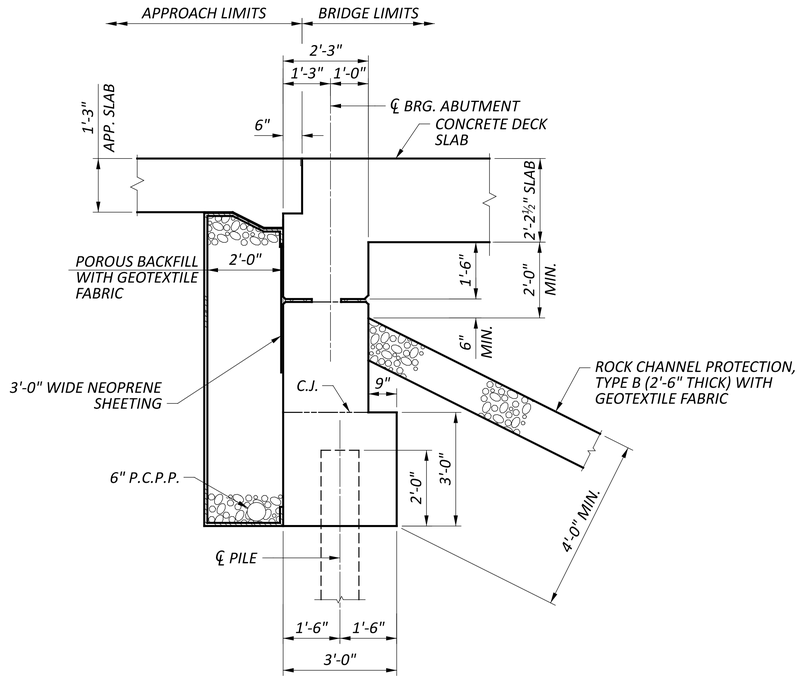

ABUTMENT SECTION

ABUTMENT SECTION
BRIGDE NO. FAI 00070 00840 CD
CD ROAD OVER BLACKLICK CREEK

SFN
TBD

DESIGN AGENCY
MPEAN STRUCTUREPOINT INC.

DESIGNER	CHECKER
MAH	SJF

REVIEWER
CLB 06-14-23

PROJECT ID
96808

SUBSET	TOTAL
2	3

SHEET	TOTAL
P.0	0

FAI/LIC-70-0.00/0.00

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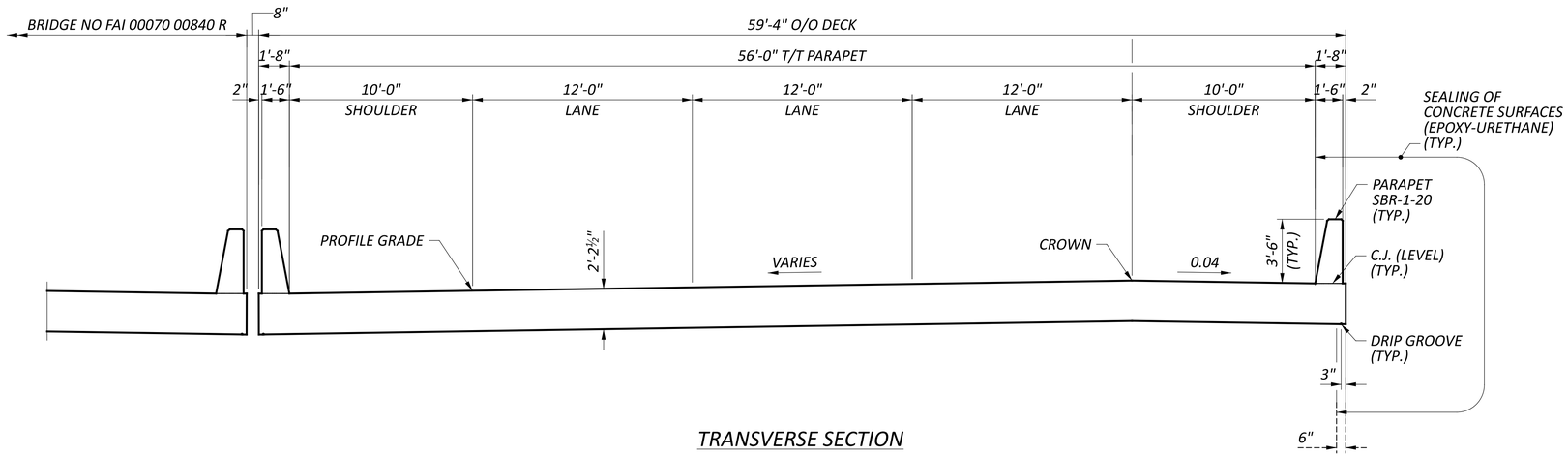

TRANSVERSE SECTION

TRANSVERSE SECTION
BRIGDE NO. FAI 00070 00840 CD
CD ROAD OVER BLACKLICK CREEK

SFN
TBD

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	CHECKER
MAH	SJF

REVIEWER
CLB 06-14-23

PROJECT ID
96808

SUBSET	TOTAL
3	3

SHEET	TOTAL
P.0	0

FAI/LIC-70-0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/19/2023 TIME: 12:46:30 PM USER: tthomas
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Appendix C – Preliminary Construction Cost and Lifecycle Cost

Estimate 96808

Estimated Cost:$2,540,099.19

Contingency: 20.00%

Estimated Total: $3,048,119.03

I-70 over Blacklick Creek (L) Alternative A Structure Type Study Cost Estimate
SFN 2301563

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395556

Longitude of Midpoint: 824745

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Marc Henning on 06/05/23
Checked by Sage Flannagan on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0053	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$170,000.00000	$170,000.00
0054	202E22900 APPROACH SLAB REMOVED	239.000	SY	$35.49494	$8,483.29
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	4,700.000	FT	$12.46246	$58,573.56
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	5,170.000	FT	$48.00000	$248,160.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	212,870.000	LB	$2.00000	$425,740.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	438.000	CY	$900.11905	$394,252.14
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	64.000	CY	$550.71622	$35,245.84
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	121.000	CY	$917.24035	$110,986.08
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	82.000	CY	$827.83508	$67,882.48
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	118.000	CY	$562.74874	$66,404.35
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	288,673.000	LB	$1.80097	$519,891.41
0073	513E20000 WELDED STUD SHEAR CONNECTORS	6,540.000	EACH	$4.60152	$30,093.94
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	4,066.000	SF	$6.35592	$25,843.17
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	4,066.000	SF	$3.18195	$12,937.81
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (?" X ?" X ?")	40.000	EACH	$1,150.00000	$46,000.00
0080	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	123.000	CY	$77.10359	$9,483.74
0082	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	463.000	SY	$330.27077	$152,915.37
0526	526E90010	167.000	FT	$192.85038	$32,206.01

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description ***Supplemental Description***				
	TYPE A INSTALLATION				

Total for Group 1200:$2,540,099.19

Estimate 96808

Estimated Cost:$2,379,190.19

Contingency: 20.00%

Estimated Total: $2,855,028.23

I-70 over Blacklick Creek (L) Alternative B Structure Type Study Cost Estimate
SFN 2301563

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395556

Longitude of Midpoint: 824745

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Marc Henning on 06/05/23
Checked by Sage Flannagan on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0053	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$170,000.00000	$170,000.00
0054	202E22900 APPROACH SLAB REMOVED	239.000	SY	$35.49494	$8,483.29
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	4,300.000	FT	$12.46246	$53,588.58
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	4,730.000	FT	$48.00000	$227,040.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	235,720.000	LB	$2.00000	$471,440.00
0063	511E32212 CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE	1,036.000	CY	$833.00000	$862,988.00
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	59.000	CY	$550.71622	$32,492.26
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	121.000	CY	$917.24035	$110,986.08
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	66.000	CY	$858.29803	$56,647.67
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	117.000	CY	$563.41185	$65,919.19
0073	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	123.000	CY	$77.10359	$9,483.74
0074	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	463.000	SY	$330.27077	$152,915.37
0075	526E90010 TYPE A INSTALLATION	167.000	FT	$192.85038	$32,206.01

Total for Group 1200:$2,379,190.19

Estimate 96808

Estimated Cost:$1,988,790.08

Contingency: 20.00%

Estimated Total: $2,386,548.10

I-70 over Blacklick Creek (R) Alternative A Structure Type Study Cost Estimate
SFN 2301598

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395555

Longitude of Midpoint: 824744

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Marc Henning on 06/05/23
Checked by Sage Flannagan on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0054	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$154,000.00000	$154,000.00
0055	202E22900 APPROACH SLAB REMOVED	222.000	SY	$35.80482	$7,948.67
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0058	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0059	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	3,200.000	FT	$12.46246	$39,879.87
0060	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,520.000	FT	$48.00000	$168,960.00
0063	509E10000 EPOXY COATED REINFORCING STEEL	159,204.000	LB	$2.00000	$318,408.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	312.000	CY	$946.69503	$295,368.85
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	64.000	CY	$550.71622	$35,245.84
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	81.000	CY	$1,005.92850	$81,480.21
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	53.000	CY	$890.22253	$47,181.79
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	112.000	CY	$566.82710	$63,484.64
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	230,938.000	LB	$1.80097	$415,912.41
0073	513E20000 WELDED STUD SHEAR CONNECTORS	5,232.000	EACH	$4.60152	$24,075.15
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	4,066.000	SF	$6.35592	$25,843.17
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	4,066.000	SF	$3.18195	$12,937.81
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (?" X ?" X ?")	32.000	EACH	$1,150.00000	$36,800.00
0080	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	83.000	CY	$80.13918	$6,651.55
0081	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0082	526E90010	119.000	FT	$200.16314	$23,819.41

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description ***Supplemental Description***				
	TYPE A INSTALLATION				

Total for Group 1200:$1,988,790.08

Estimate 96808

Estimated Cost:$1,783,508.33

Contingency: 20.00%

Estimated Total: $2,140,210.00

I-70 over Blacklick Creek (R) Alternative B Structure Type Study Cost Estimate
SFN 2301598

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395555

Longitude of Midpoint: 824744

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Marc Henning on 06/05/23
Checked by Sage Flannagan on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0054	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$154,000.00000	$154,000.00
0055	202E22900 APPROACH SLAB REMOVED	222.000	SY	$35.80482	$7,948.67
0056	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0057	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0058	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0059	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	2,900.000	FT	$12.46246	$36,141.13
0060	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,190.000	FT	$48.00000	$153,120.00
0062	509E10000 EPOXY COATED REINFORCING STEEL	169,979.000	LB	$2.00000	$339,958.00
0064	511E32212 CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE	738.000	CY	$833.00000	$614,754.00
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	59.000	CY	$550.71622	$32,492.26
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	81.000	CY	$1,005.92850	$81,480.21
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	42.000	CY	$925.37495	$38,865.75
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	112.000	CY	$566.82710	$63,484.64
0073	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	83.000	CY	$80.13918	$6,651.55
0074	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0075	526E90010 TYPE A INSTALLATION	119.000	FT	$200.16314	$23,819.41

Total for Group 1200:$1,783,508.33

Estimate 96808

Estimated Cost:$1,826,841.41

Contingency: 20.00%

Estimated Total: $2,192,209.69

I-70 over Blacklick Creek (CD Road) Alternative A Structure Type Study Cost Estimate
SFN 0000001

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395555

Longitude of Midpoint: 824744

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Marc Henning on 06/05/23
Checked by Sage Flannagan on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0058	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0059	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	3,200.000	FT	$12.46246	$39,879.87
0060	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,520.000	FT	$48.00000	$168,960.00
0063	509E10000 EPOXY COATED REINFORCING STEEL	159,204.000	LB	$2.00000	$318,408.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	312.000	CY	$946.69503	$295,368.85
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	64.000	CY	$550.71622	$35,245.84
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	81.000	CY	$1,005.92850	$81,480.21
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	53.000	CY	$890.22253	$47,181.79
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	112.000	CY	$566.82710	$63,484.64
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	230,938.000	LB	$1.80097	$415,912.41
0073	513E20000 WELDED STUD SHEAR CONNECTORS	5,232.000	EACH	$4.60152	$24,075.15
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	4,066.000	SF	$6.35592	$25,843.17
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	4,066.000	SF	$3.18195	$12,937.81
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (?" X ?" X ?")	32.000	EACH	$1,150.00000	$36,800.00
0080	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	83.000	CY	$80.13918	$6,651.55
0081	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0082	526E90010 TYPE A INSTALLATION	119.000	FT	$200.16314	$23,819.41

Total for Group 1200:$1,826,841.41

Estimate 96808

Estimated Cost:$1,621,559.66

Contingency: 20.00%

Estimated Total: $1,945,871.59

I-70 over Blacklick Creek (CD Road) Alternative B Structure Type Study Cost Estimate
SFN 0000001

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395555

Longitude of Midpoint: 824744

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Marc Henning on 06/05/23
Checked by Sage Flannagan on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0056	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0057	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0058	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0059	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	2,900.000	FT	$12.46246	$36,141.13
0060	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,190.000	FT	$48.00000	$153,120.00
0062	509E10000 EPOXY COATED REINFORCING STEEL	169,979.000	LB	$2.00000	$339,958.00
0064	511E32212 CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE	738.000	CY	$833.00000	$614,754.00
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	59.000	CY	$550.71622	$32,492.26
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	81.000	CY	$1,005.92850	$81,480.21
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	42.000	CY	$925.37495	$38,865.75
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	112.000	CY	$566.82710	$63,484.64
0073	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	83.000	CY	$80.13918	$6,651.55
0074	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0075	526E90010 TYPE A INSTALLATION	119.000	FT	$200.16314	$23,819.41

Total for Group 1200:$1,621,559.66

AMERICAN STRUCTUREPOINT, INC.
FAI-70-00840
LIFE CYCLE COST ANALYSIS

	Alt. A (Left)	Alt. B (Left)	Alt. A (Right)	Alt. B (Right)	Alt. A (CD Road)	Alt. B (CD Road)
Number of Spans	3	3	3	3	3	3
Span Length	49'-0", 65'-0", 49'-0"	45'-0", 56'-3", 45'-0"	49'-0", 65'-0", 49'-0"	45'-0", 56'-3", 45'-0"	49'-0", 65'-0", 49'-0"	45'-0", 56'-3", 45'-0"
Superstructure						
Type	W27 ROLLED STEEL BEAM	CONTINUOUS REINFORCED CONCRETE SLAB	W27 ROLLED STEEL BEAM	CONTINUOUS REINFORCED CONCRETE SLAB	W27 ROLLED STEEL BEAM	CONTINUOUS REINFORCED CONCRETE SLAB
Number of Beam Lines	10	N/A	8	N/A	8	N/A
Spacing	8'-8"	N/A	7'-8"	N/A	7'-8"	N/A
Deck/Slab Thickness	8 1/2" Composite	26 1/2"	8 1/2" Composite	26 1/2"	8 1/2" Composite	26 1/2"
Deck Area	**13750 SF**	**12317 SF**	**9790 SF**	**8766 SF**	**9790 SF**	**8766 SF**
Patching Area	**250 SF**	**250 SF**	**150 SF**	**150 SF**	**150 SF**	**150 SF**
Painting Area	**4066 SF**	**0 SF**	**4066 SF**	**0 SF**	**4066 SF**	**0 SF**
Substructure						
Abutment Type	Integral	Integral	Integral	Integral	Integral	Integral
Pier Type	Cap and Column	Cap and Column	Cap and Column	Cap and Column	Cap and Column	Cap and Column
Cost						
Comparative Initial Construction Cost	**$3,048,119**	**$2,855,028**	**$2,386,548**	**$2,140,210**	**$2,192,210**	**$1,945,872**
Life Cycle Cost	**$5,119,400**	**$4,172,100**	**$3,897,600**	**$3,071,600**	**$3,703,300**	**$2,877,300**

i =	**2.00%**
DECK OVERLAY UNIT COST =	**$ 85 /SF**
DECK REPLACEMENT UNIT COST =	**$ 175 /SF**
PATCHING UNIT COST =	**$ 175 /SF**
PAINTING UNIT COST =	**$ 30 /SF**

Alt. A (Left)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$3,048,119	$3,048,100
Painting of Structural Steel	25 years	0.61	$121,980	$74,400
Deck Overlay	25 years	0.61	$1,168,750	$712,400
Substructure Patching	25 years	0.61	$43,750	$26,700
Painting of Structural Steel	50 years	0.37	$121,980	$45,300
Deck Replacement	50 years	0.37	$2,406,250	$894,000
Substructure Patching	50 years	0.37	$43,750	$16,300
Painting of Structural Steel	75 years	0.23	$121,980	$27,600
Deck Overlay	75 years	0.23	$1,168,750	$264,700
Substructure Patching	75 years	0.23	$43,750	$9,900
			LIFE CYCLE COST =	$5,119,400

Alt. B (Left)				
Event	Period	PWF	2021 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,855,028	$2,855,000
Deck Overlay	25 years	0.61	$1,046,945	$638,100
Substructure Patching	25 years	0.61	$43,750	$26,700
Deck Overlay	50 years	0.37	$1,046,945	$389,000
Substructure Patching	50 years	0.37	$43,750	$16,300
Deck Overlay	75 years	0.23	$1,046,945	$237,100
Substructure Patching	75 years	0.23	$43,750	$9,900
			LIFE CYCLE COST =	$4,172,100

Alt. A (Right)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,386,548	$2,386,500
Painting of Structural Steel	25 years	0.61	$121,980	$74,400
Deck Overlay	25 years	0.61	$832,150	$507,200
Substructure Patching	25 years	0.61	$26,250	$16,000
Painting of Structural Steel	50 years	0.37	$121,980	$45,300
Deck Replacement	50 years	0.37	$1,713,250	$636,500
Substructure Patching	50 years	0.37	$26,250	$9,800
Painting of Structural Steel	75 years	0.23	$121,980	$27,600
Deck Overlay	75 years	0.23	$832,150	$188,400
Substructure Patching	75 years	0.23	$26,250	$5,900
			LIFE CYCLE COST =	$3,897,600

Alt. B (Right)				
Event	Period	PWF	2021 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,140,210	$2,140,200
Deck Overlay	25 years	0.61	$745,110	$454,200
Substructure Patching	25 years	0.61	$26,250	$16,000
Deck Overlay	50 years	0.37	$745,110	$276,800
Substructure Patching	50 years	0.37	$26,250	$9,800
Deck Overlay	75 years	0.23	$745,110	$168,700
Substructure Patching	75 years	0.23	$26,250	$5,900
			LIFE CYCLE COST =	$3,071,600

Alt. A (CD Road)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,192,210	$2,192,200
Painting of Structural Steel	25 years	0.61	$121,980	$74,400
Deck Overlay	25 years	0.61	$832,150	$507,200
Substructure Patching	25 years	0.61	$26,250	$16,000
Painting of Structural Steel	50 years	0.37	$121,980	$45,300
Deck Replacement	50 years	0.37	$1,713,250	$636,500
Substructure Patching	50 years	0.37	$26,250	$9,800
Painting of Structural Steel	75 years	0.23	$121,980	$27,600
Deck Overlay	75 years	0.23	$832,150	$188,400
Substructure Patching	75 years	0.23	$26,250	$5,900
			LIFE CYCLE COST =	$3,703,300

Alt. B (CD Road)				
Event	Period	PWF	2021 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$1,945,872	$1,945,900
Deck Overlay	25 years	0.61	$745,110	$454,200
Substructure Patching	25 years	0.61	$26,250	$16,000
Deck Overlay	50 years	0.37	$745,110	$276,800
Substructure Patching	50 years	0.37	$26,250	$9,800
Deck Overlay	75 years	0.23	$745,110	$168,700
Substructure Patching	75 years	0.23	$26,250	$5,900
			LIFE CYCLE COST =	$2,877,300

Appendix D – Existing Bridge Plans

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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FAIRFIELD — LICKING COUNTIES
FAI — 70 — 0.00
LIC — 70 — 0.00

POND
FILL TO ELEV. 821± & GRADE TO DRAIN

BLACKLICK CREEK

WESTBOUND LANES

EASTBOUND LANES

SAWED JOINTS

9' DIRT FIELDET DRIVE

55'-10½" F/F PARAPET AT ℄ BEARING

58'-2½" F/F PARAPET AT ℄ BEARING

END APPROACH SLAB
STA. 44+43.00

BEGIN APPROACH SLAB
STA. 45+57.00

43 ℄ SURVEY I.R.70

STA. 45+00 ℄ SURVEY I.R. 70
STA. 10+00 ℄ PROPOSED CHANNEL IMPROVEMENT

3' TYPICAL

SLOPE PROTECTION (601.05) WITHIN THESE LIMITS AT EACH END OF BOTH BRIDGES.

FLOW

800' VERTICAL CURVE
P.V.I. @ STA. 45+00 ELEV. 832.61

BRIDGE LIMITS 114.00'

50 YEAR HIGHWATER EL. 830.0

PROPOSED GRADE I.R. 70

EXISTING GROUND LINE

826.48 L
826.54 R
EST. AVERAGE PAY LENGTH = 35 FT.

809.00 L & R

826.44 L
826.54 R
EST. AVERAGE PAY LENGTH = 35 FT.

EST. AVERAGE PAY LENGTH 25 FT.

NOTE: ALL PILING 12" CAST-IN-PLACE CONCRETE.

EXISTING GROUND LINE
PROPOSED CHANNEL GRADE
0.00%
815.00
825.50
826.50
827.50

PROPOSED RIGHT STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE.
SPAN: 34.5' - 43.0' - 34.5'
ROADWAY: 52.00' F/F OF PAPAPETS
LOAD FREQUENCY RATING: CF 2000 (57)
ADEQUATE FOR AASHO ALTERNATE LOADING
SKEW: 0°00'
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE
APPROACH SLAB: AS-1-54 25'-0" LONG

D.A. = 41.2 SQ. MI.
1985 ADT = 24,450 V.P.D.

PROPOSED LEFT STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE.
SPAN: 34.5' - 43.0' - 34.5'
ROADWAY: VARIABLE
LOAD FREQUENCY RATING: CF 2000 (57)
ADEQUATE FOR AASHO ALTERNATE LOADING
SKEW: 0°00'
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE
APPROACH SLAB: AS-1-54 25'-0" LONG

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

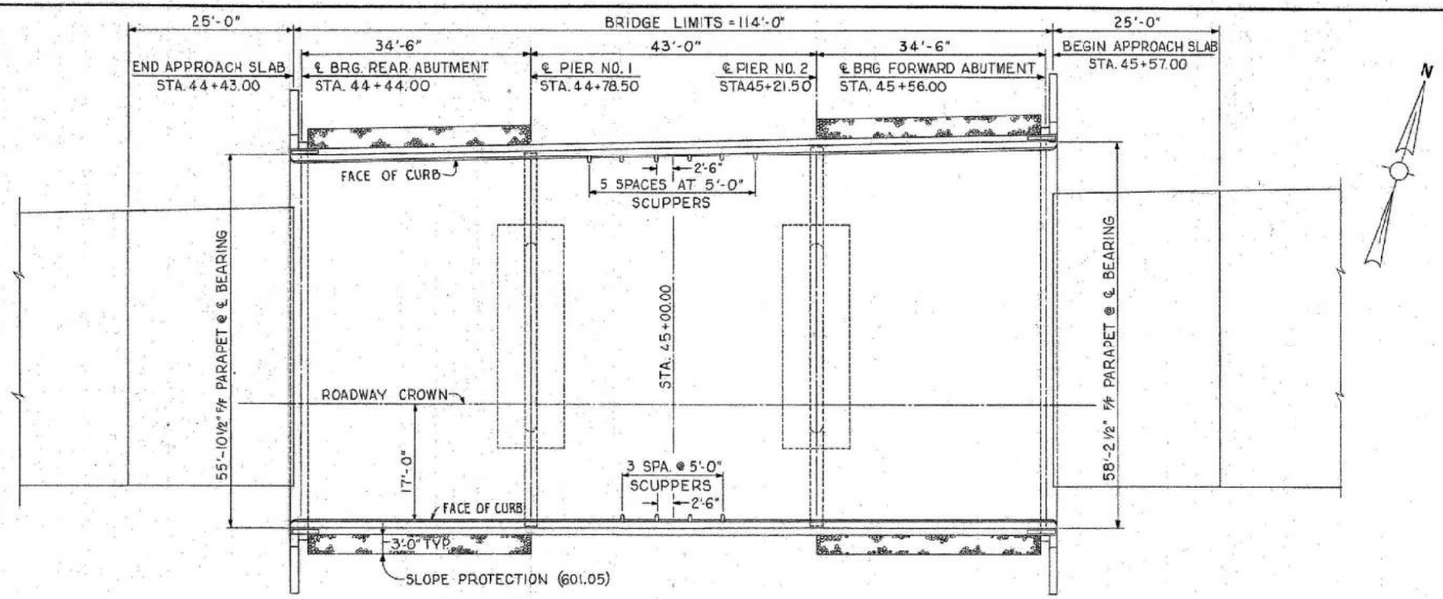
SITE PLAN

BRIDGE NO. FAI-70-0084 L&R
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

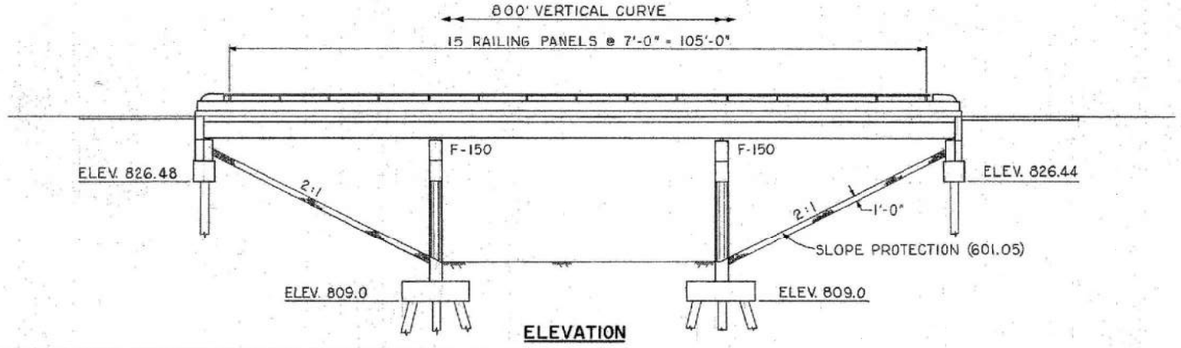
FAI-70-0.00
SEC. LIC.-70-0.00
SCALE 1"=20'

PROPOSED I.R.70
STA. 45+00

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVISED
R.D.M.	R.D.M.	W.G.	H.W.S.	W.G.	



GENERAL PLAN



ELEVATION

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL		
503	352	CU. YDS.	UNCLASSIFIED EXCAVATION		146	206			
503	LUMP	SUM	COFFERDAMS, CRIBS AND SHEETING				LUMP		
511	215	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	215					
511	118	CU. YDS.	CLASS "C" CONCRETE, PIERS ABOVE FOOTINGS			118			
511	93	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS		93				
511	62	CU. YDS.	CLASS "E" CONCRETE, PIER FOOTINGS			62			
509	103,943	LBS.	REINFORCING STEEL	61,091	13,193	29,659			
513	120,649	LBS.	STRUCTURAL STEEL	120,649					
514	120,649	LBS.	FIELD PAINTING OF STRUCTURAL STEEL	120,649					
517	229.34	LIN. FT.	BRIDGE RAILING TYPE I	229.34					
505	LUMP	SUM	FIRST TEST PILE				LUMP		
507	1750	LIN. FT.	12" DIA. CAST-IN-PLACE REINFORCED CONCRETE PILES		700	1050			
518	49	CU. YDS.	POROUS BACKFILL		49				
518	10	EACH	SCUPPERS, INCLUDING SUPPORTS	10					
601	534	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION		534				
808	215	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	215					
518	112	LIN. FT.	6" PERFORATED HELICAL CMP (SEC. 707.06) INCLUDING SPECL'S.		112				
518	40	LIN. FT.	6" HELICAL CMP (SEC. 707.06) NON-PERFORATED		40				
512	119	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		119				
516	74	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER, AASHO M-153		74				
516	101	SQ. FT.	1/4" PREFORMED EXPANSION JOINT FILLER, AASHO M-153		101				

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS BR-1-65 SHEET 1 DATED 2-1-65, SD-1-63 SHEET 3, DATED 11-12-63, FSB-1-62 REV. 1-15-63, SD-2-64 DATED 11-25-64 AND SUPPLEMENTAL SPEC. 808 DATED 7-14-65, AND 811 DATED 3-29-65.

DESIGN SPECIFICATIONS: THESE STRUCTURES CONFORM TO THE REQUIREMENTS OF "DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES" OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS DATED 9-1-57, TOGETHER WITH CURRENT REVISIONS THEREOF.

MACHINE FINISH: THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.

STRUCTURAL STEEL: A.S.T.M. A36-BASIC UNIT STRESS 20,000 P.S.I.

REINFORCING STEEL: A.S.T.M. A15, A16, A160, DEFORMED, INTERMEDIATE OR HARD GRADE BASIC UNIT STRESS 20,000 P.S.I. EXCEPT SPIRAL REINFORCEMENT MAY BE PLAIN STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 P.S.I.

DESIGN LOADING: CF-2000

CONCRETE CLASS "C"
BASIC UNIT STRESS 1,333 P.S.I.

CONCRETE CLASS "E"
BASIC UNIT STRESS 1,133 P.S.I.

PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 25 TONS PER PILE FOR THE ABUTMENTS AND 35 TONS PER PILE FOR THE PIERS

FIRST TEST PILE: ITEM 505 IN THE ESTIMATED QUANTITIES FOR FAI-70-0084 L MAY BE DRIVEN AT EITHER FAI-70-0084 R OR FAI-70-0084 L.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

GENERAL PLAN & ESTIMATED QUANTITIES

BRIDGE NO. FAI-70-0084-L
PROPOSED I.R. 70 OVER
BLACKLICK CREEK
FAIRFIELD COUNTY
PROPOSED I.R. 70
STA. 45+00.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W. C.J.L.	C.J.L.	W.G.	C.T.L.	10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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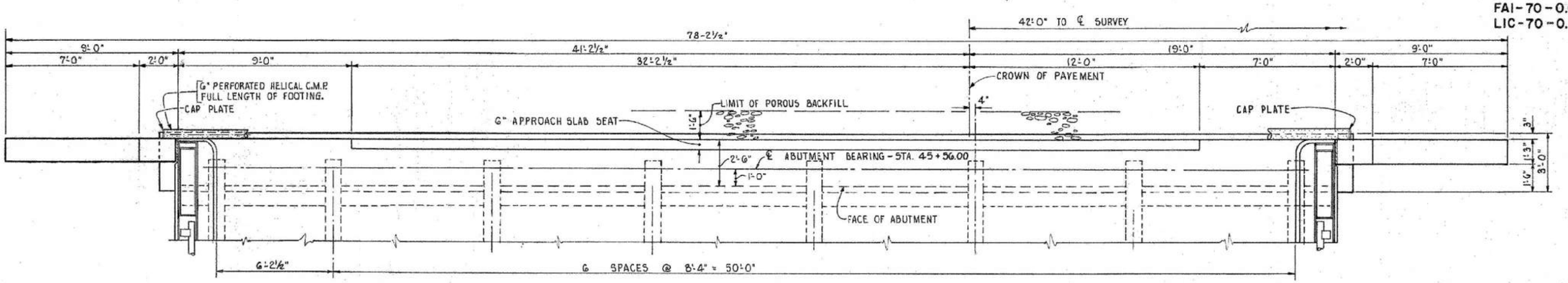
FAIRFIELD–LICKING COUNTIES
FAI–70–0.00
LIC–70–0.00

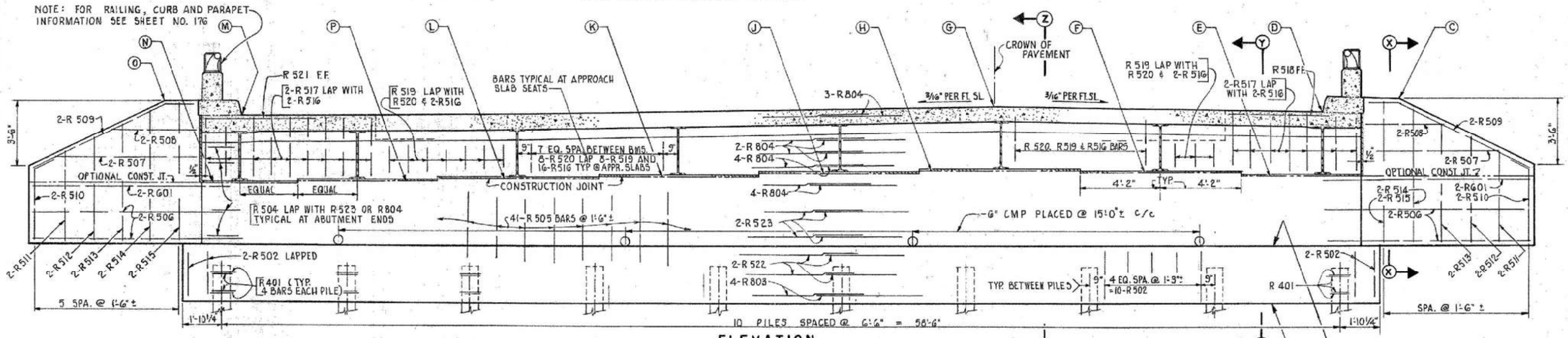
ELEVATIONS

LOCATIONS	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P
FORWARD ABUTMENT	826.44	829.44	837.46	836.61	833.29	833.42	836.88	833.55	833.43	833.30	833.17	836.26	832.94	837.11	833.04

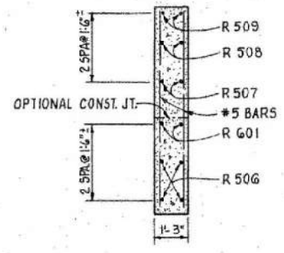


PLAN

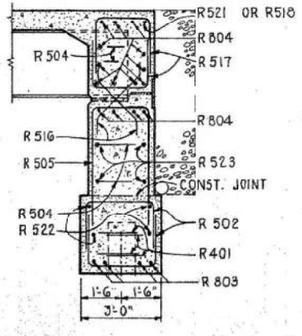
LEFT BRIDGE — FORWARD ABUTMENT



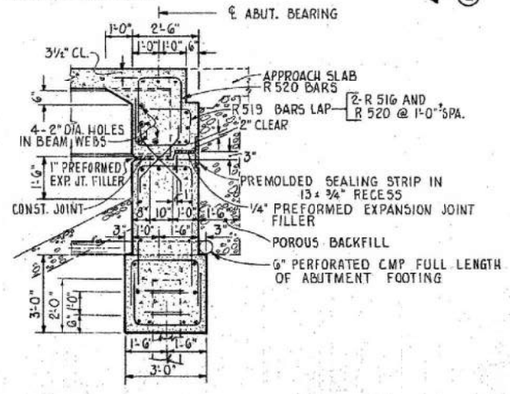
ELEVATION



SECTION X-X



SECTION Y-Y



SECTION Z-Z

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
2. ALL PILING SHALL BE 12" CAST-IN-PLACE CONCRETE.
3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.
4. PROCEDURE: EMBANKMENT SHALL BE PLACED AND COMPACTED UP TO THE FINISHED SPILL-THRU SLOPE AND TO THE LEVEL OF THE SUBGRADE AFTER WHICH EXCAVATION FOR THE ABUTMENT SHALL BE MADE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

ABUTMENT DETAILS

BRIDGE NO. FAI-70-0084-L
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 45 + 00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L.	10-11-65	

ELEVATIONS																
LOCATIONS	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	
REAR ABUTMENT	826.48	829.48	837.46	836.61	833.29	833.42	836.87	833.55	833.43	833.30	833.17	836.30	832.98	837.15	833.04	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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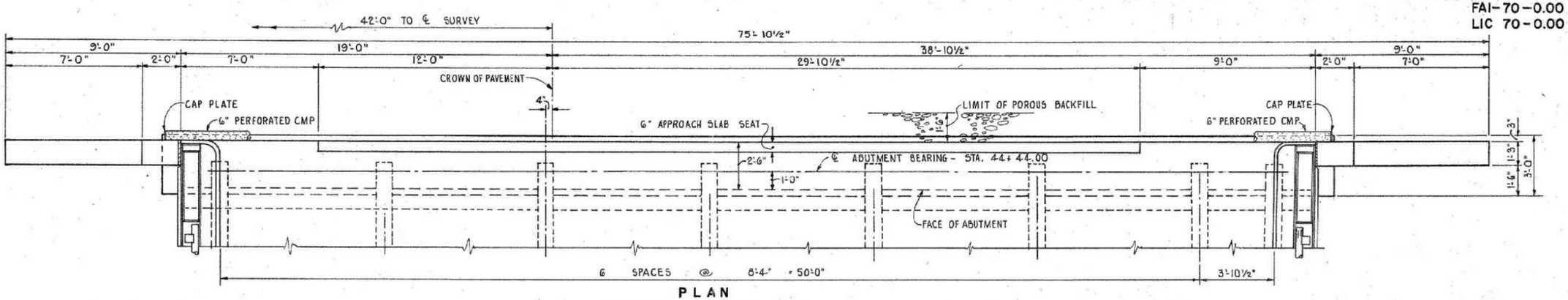
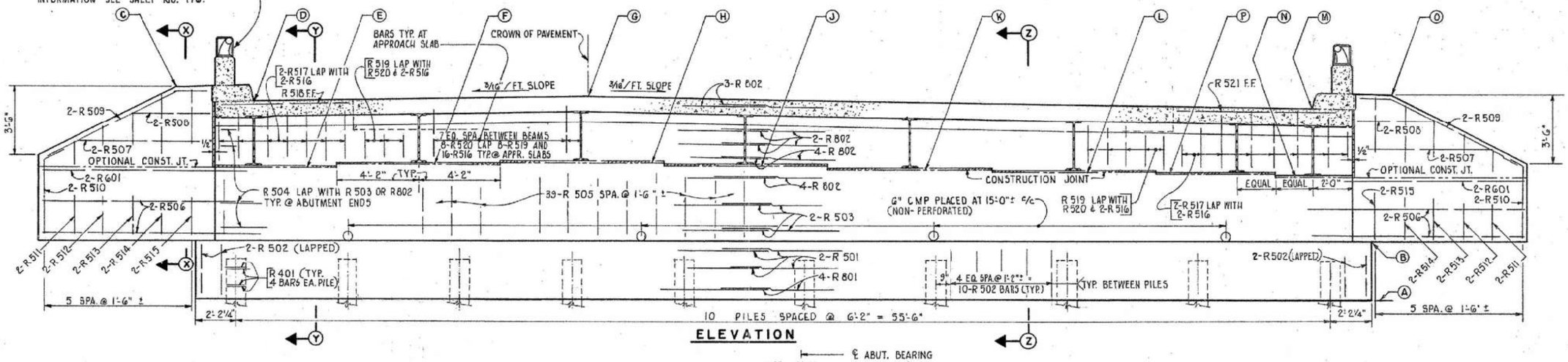
FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC 70-0.00

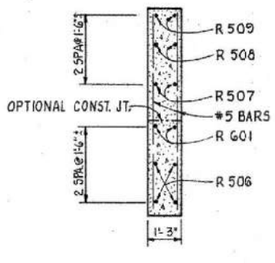


PLAN
LEFT BRIDGE REAR ABUTMENT

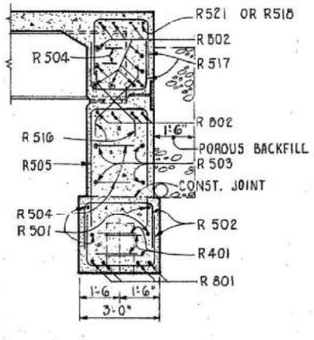
NOTE: FOR RAILING, CURB AND PARAPET INFORMATION SEE SHEET NO. 176.



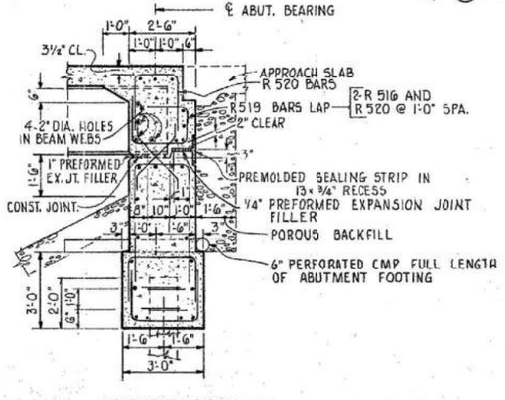
ELEVATION



SECTION X-X



SECTION Y-Y



SECTION Z-Z

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.

2. ALL PILING SHALL BE 12" CAST-IN-PLACE CONCRETE.

3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.

4. PROCEDURE: EMBANKMENT SHALL BE PLACED AND COMPACTED UP TO THE FINISHED SPILL-THRU SLOPE AND TO THE LEVEL OF THE SUBGRADE AFTER WHICH EXCAVATION FOR THE ABUTMENT SHALL BE MADE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

ABUTMENT DETAILS

BRIDGE NO. FAI-70-0084 L.
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 45 + 00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L.	10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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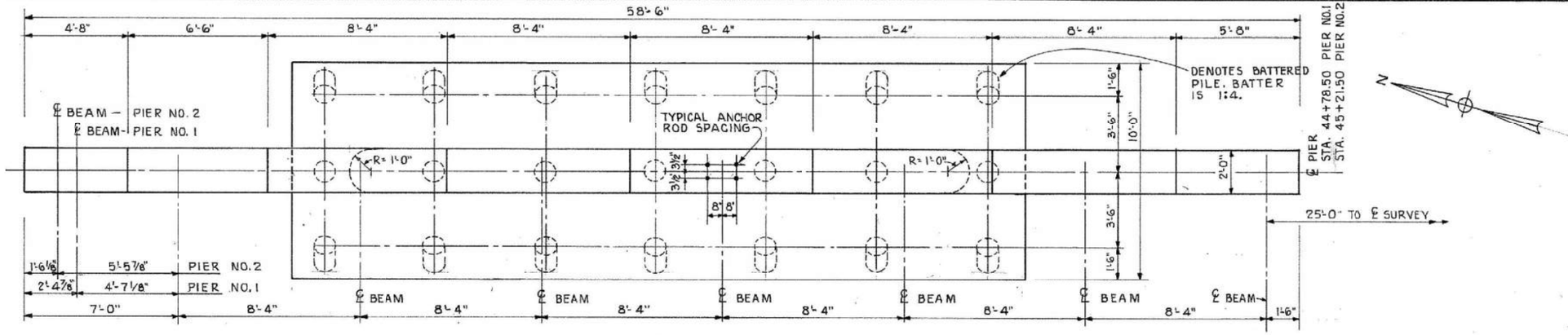
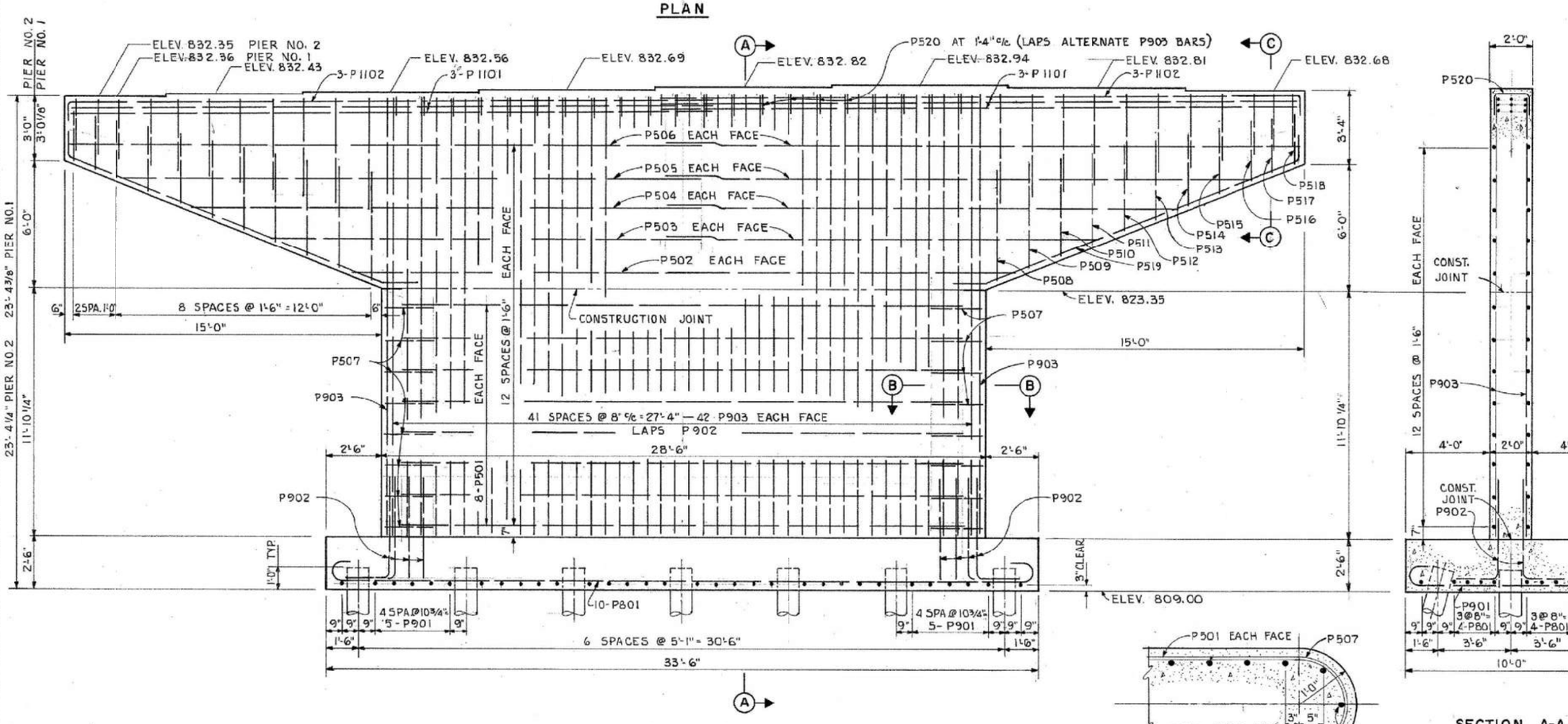
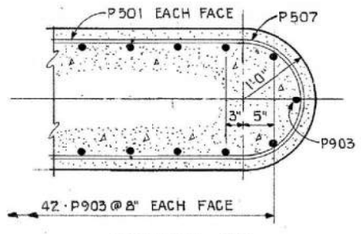
FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00



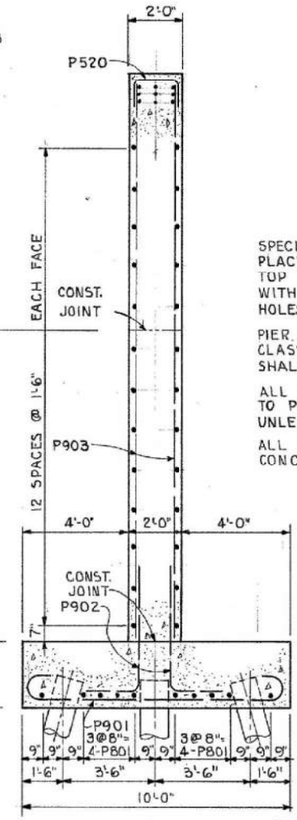
PLAN



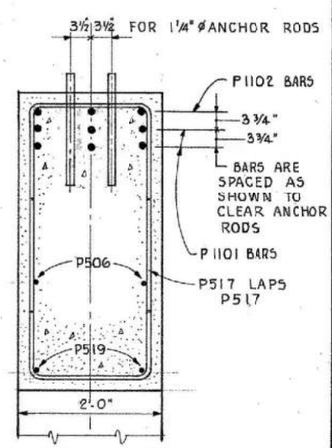
ELEVATION



SECTION B-B



SECTION A-A



SECTION C-C

NOTES

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER TOP SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER STEM AND CANTILEVERS SHALL BE CLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

ALL REINFORCING STEEL SHALL BE PLACED TO PROVIDE A MINIMUM COVER OF 2" UNLESS OTHERWISE SHOWN.

ALL PILING SHALL BE 12" ø CAST-IN-PLACE CONCRETE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIERS NO. 1 & NO. 2

BRIDGE NO. FAI.-70-0084 L
PROPOSED I.R.70 OVER
BLACKLICK CREEK
FAIRFIELD COUNTY

PROPOSED I.R.70
STA. 45+00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
A.C.S.	H.W.S.	H.W.S.	W.G	C.T.L.	10-11-65	

★ THERE SHOULD BE NO CUTOUTS IN THE SIDE PLATES OF THE SCUPPERS FOR A BULB ANGLE GUTTER. AND THE BACK PLATES AT THE FACE OF THE CURB SHOULD BE CUT TO MATCH THE ROADWAY SURFACE. THE CURB PLATES ARE TO MATCH THE CURB SURFACE AS SHOWN ON THIS DRAWING.

FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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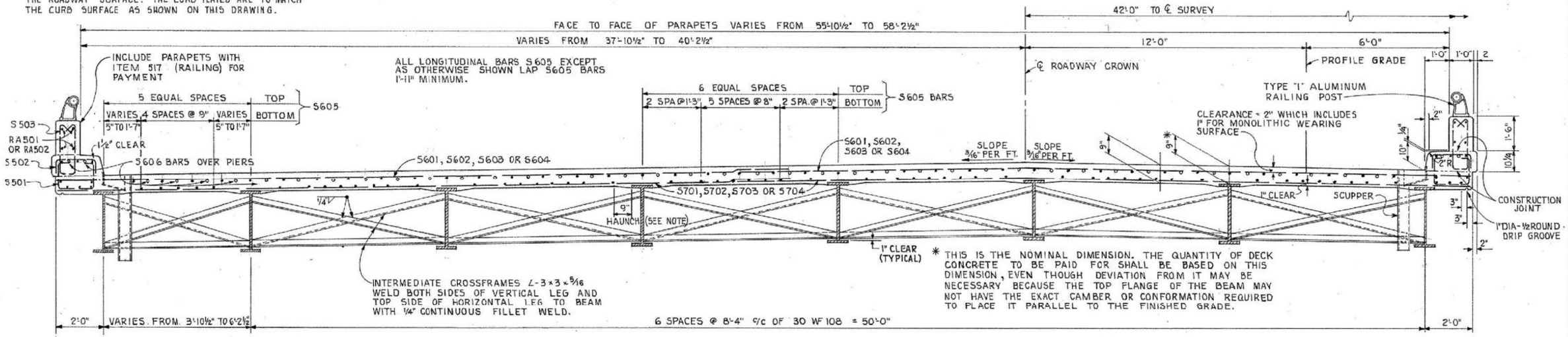
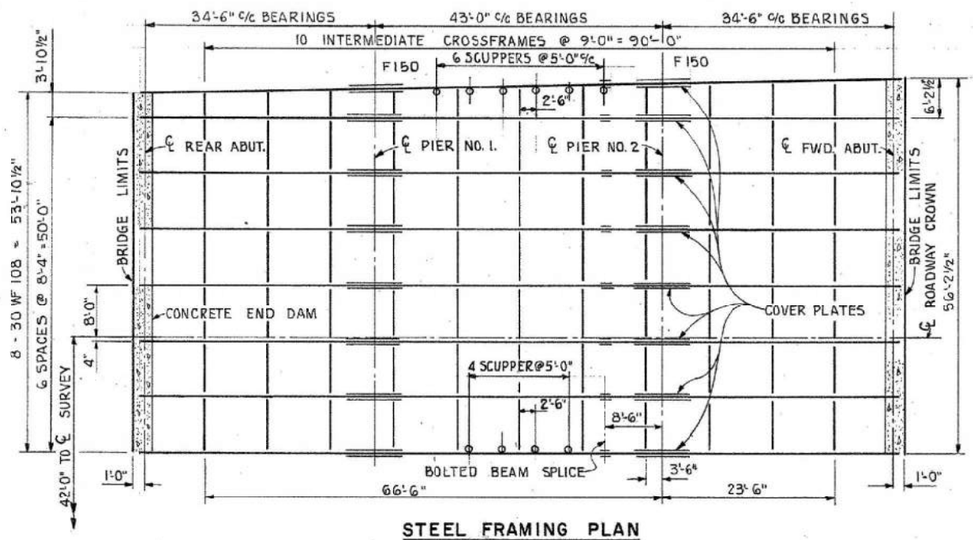
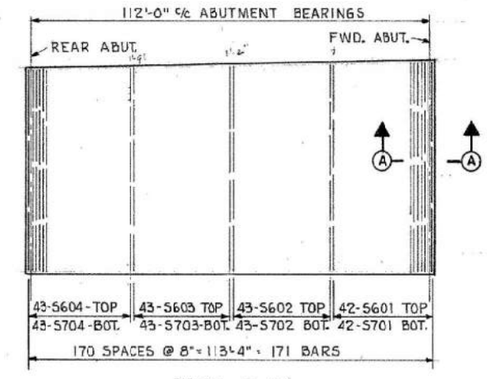


* THIS IS THE NOMINAL DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.



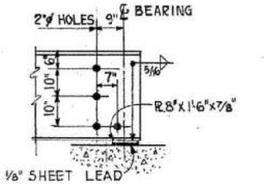
STEEL FRAMING PLAN

TRANSVERSE SECTION



PART PLAN

SHOWING PLACEMENT OF TRANSVERSE REINFORCING STEEL.



BEARING PLATE DETAIL

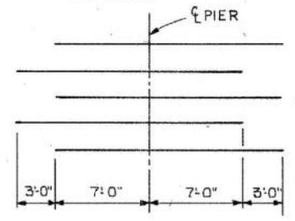


DIAGRAM SHOWING STAGGER OF S606 BARS OVER PIERS

NOTES

FIXED BEARINGS. SHALL BE F-150 AT PIER NO. 1 AND F-150 AT PIER NO. 2 FOR DETAILS SEE STANDARD DRAWING FSB-1-62, REVISED 1-15-63.

FOR BOLTED BEAM SPLICE DETAILS SEE STANDARD DRAWING SD-2-64.

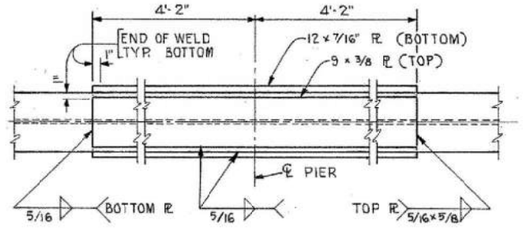
FOR DETAILS OF SCUPPERS AND BRIDGE RAILING SEE STANDARD DRAWING SD-1-63 SHEET NO. 3 AND BR-1-65.

DECK SLAB HAUNCH: A TYPICAL HAUNCH WIDTH OF 9" SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. HOWEVER, THE HAUNCH WIDTH MAY VARY BETWEEN 6" AND 12" PROVIDED THAT THE SLOPE SHALL NOT BE MORE THAN 1:4 FOR A HAUNCH THAT IS LESS THAN 9" IN WIDTH.

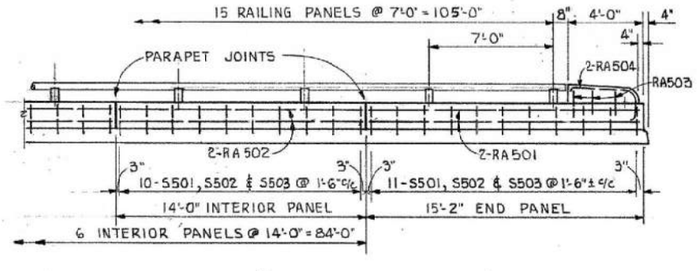
MACHINE FINISH: THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.

FOR DETAILS OF CONCRETE END DAM SEE SHEETS NO. 173 AND 174.

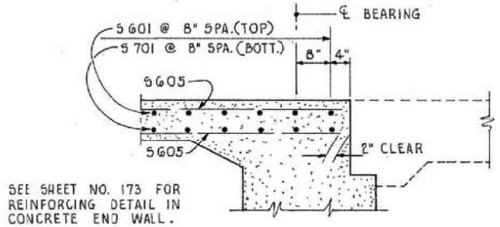
GUTTER ELEVATIONS: SEE SHEET NO. 177.



COVER PLATE DETAIL PIERS NO. 1 & NO. 2



STEEL PLACEMENT DIAGRAM FOR PARAPETS



SEE SHEET NO. 173 FOR REINFORCING DETAIL IN CONCRETE END WALL.

SECTION A-A

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. FAL-70-0084 L
PROPOSED I.R.70 OVER BLACKLICK CREEK

FAIRFIELD COUNTY — PROPOSED I.R.70 STA. 45+00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G	H.W.S	H.W.S	W.G	C.T.L.	10-11-65	

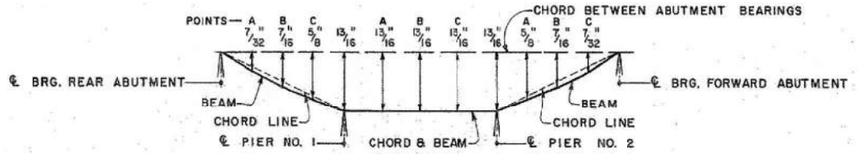
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

177
218

FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

DEFLECTION AND CAMBER

	SPAN NO. 1				SPAN NO. 2				SPAN NO. 3			
	1/4 POINT A	CENTER POINT B	3/4 POINT C		1/4 POINT A	CENTER POINT B	SPLICE POINT C		1/4 POINT A	CENTER POINT B	3/4 POINT C	
DEFLECTION DUE TO WEIGHT OF STEEL	0	0	0		0	+1/32	0		0	0	0	
DEFLECTION DUE TO REMAINING DEAD LOAD	+1/32	+1/16	+1/32		+3/32	+3/32	+3/32		+1/32	+1/16	+1/32	
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	-1/16	-3/32	-1/16		-3/32	-1/8	-3/32		-1/16	-3/32	-1/16	
REQUIRED SHOP CAMBER	-1/32	-1/32	-1/32		0	0	0		-1/32	-1/32	-1/32	



CAMBER DIAGRAM – LEFT & RIGHT BRIDGES

GUTTER ELEVATIONS*

RIGHT BRIDGE				LEFT BRIDGE			
LEFT GUTTER		RIGHT GUTTER		LEFT GUTTER		RIGHT GUTTER	
STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
44+44.00	836.61	44+44.00	836.36	44+44.00	836.30	44+44.00	836.61
44+52.63	836.59	44+52.63	836.34	44+52.63	836.28	44+52.63	836.59
44+61.25	836.57	44+61.25	836.32	44+61.25	836.25	44+61.25	836.57
44+69.88	836.55	44+69.88	836.31	44+69.88	836.24	44+69.88	836.55
44+78.50	836.54	44+78.50	836.30	44+78.50	836.22	44+78.50	836.54
44+89.25	836.54	44+89.25	836.29	44+89.25	836.21	44+89.25	836.54
45+00.00	836.54	45+00.00	836.29	45+00.00	836.21	45+00.00	836.54
45+10.75	836.54	45+10.75	836.29	45+10.75	836.20	45+10.75	836.54
45+21.50	836.54	45+21.50	836.30	45+21.50	836.21	45+21.50	836.54
45+30.13	836.55	45+30.13	836.31	45+30.13	836.22	45+30.13	836.55
45+38.75	836.57	45+38.75	836.32	45+38.75	836.23	45+38.75	836.57
45+47.38	836.59	45+47.38	836.34	45+47.38	836.24	45+47.38	836.59
45+56.00	836.61	45+56.00	836.36	45+56.00	836.26	45+56.00	836.61

*NOTE: ELEVATIONS INCLUDE AN ALLOWANCE FOR DEAD LOAD DEFLECTION OF CONCRETE SLAB. ELEVATIONS ARE AT THE FACE OF THE CURB.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

BRIDGE NO. FAI-70-0084 L.& R.
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

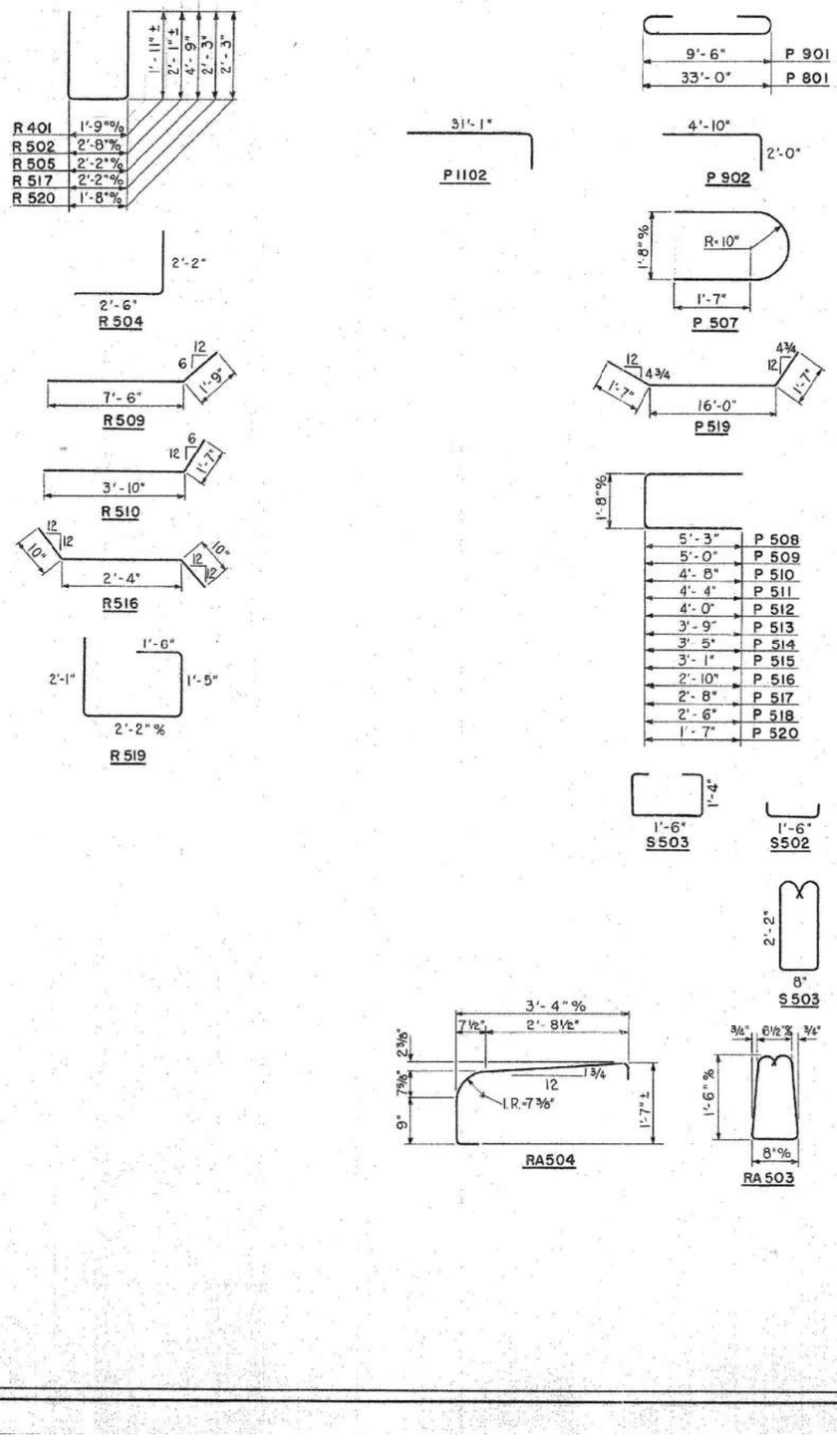
FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 45 + 00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED: DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L. 10-11-65	

STEEL LIST

MARK	NO.	LENGTH	WEIGHT	SHAPE
ABUTMENTS				
R 801	8	31'- 0"	662	S
R 802	30	30'- 0"	2403	S
R 803	8	32'- 2"	687	S
R 804	30	31'- 2"	2496	S
R 601	8	10'- 11"	131	S
R 501	8	30'- 5"	254	S
R 502	196	6'- 7"	1346	B
R 503	8	29'- 5"	246	S
R 504	16	4'- 7"	76	B
R 505	80	11'- 5"	953	B
R 506	16	10'- 7"	177	S
R 507	8	7'- 8"	64	S
R 508	8	4'- 8"	39	S
R 509	8	9'- 2"	76	B
R 510	8	5'- 4"	45	B
R 511	8	4'- 8"	39	S
R 512	8	5'- 5"	45	S
R 513	8	6'- 2"	51	S
R 514	8	6'- 11"	58	S
R 515	8	7'- 4"	61	S
R 516	226	3'- 11"	923	B
R 517	62	6'- 6"	420	B
R 518	2	6'- 8"	14	S
R 519	82	6'- 10"	584	B
R 520	82	6'- 0"	513	B
R 521	2	8'- 8"	18	S
R 522	8	31'- 10"	266	S
R 523	8	30'- 10"	257	S
R 401	80	5'- 5"	289	B

BENDING DIAGRAM



MARK	NO.	LENGTH	WEIGHT	SHAPE
PIERS				
P 1101	24	30'- 11"	3942	S
P 1102	12	32'- 9"	2088	B
P 901	64	12'- 0"	2611	B
P 902	172	6'- 7"	3830	B
P 903	172	20'- 7"	12 037	S
P 801	20	35'- 2"	1878	B
P 501	32	26'- 6"	884	S
P 502	4	31'- 3"	130	S
P 503	8	20'- 6"	171	S
P 504	8	24'- 0"	200	S
P 505	8	27'- 6"	229	S
P 506	8	30'- 0"	250	S
P 507	32	5'- 10"	195	B
P 508	8	12'- 0"	100	B
P 509	8	11'- 6"	96	B
P 510	8	10'- 10"	90	B
P 511	8	10'- 2"	85	B
P 512	8	9'- 6"	79	B
P 513	8	9'- 0"	75	B
P 514	8	8'- 4"	70	B
P 515	8	7'- 8"	64	B
P 516	8	7'- 2"	60	B
P 517	8	6'- 10"	57	B
P 518	8	6'- 6"	54	B
P 519	8	19'- 2"	160	B
P 520	42	4'- 8"	204	B
RAILING				
RA 501	16	14'- 10"	INCLUDE WITH RAILING FOR PAYMENT	S
RA 502	48	13'- 8"		S
RA 503	12	4'- 2"		B
RA 504	8	5'- 4"		B
SUPERSTRUCTURE				
S 701	84	31'- 1"	5337	S
S 702	86	30'- 9"	5405	S
S 703	86	30'- 6"	5361	S
S 704	86	30'- 3"	5317	S
S 601	84	30'- 11"	3901	S
S 602	86	30'- 7"	3951	S
S 603	86	30'- 4"	3918	S
S 604	86	30'- 1"	3886	S
S 605	436	29'- 11"	19594	S
S 606	86	17'- 0"	2196	S
S 501	164	4'- 11"	841	B
S 502	164	2'- 6"	428	B
S 503	164	5'- 7"	956	B
REPLACEMENT BARS				
RE 401	1	5'- 3"		S
RE 501	1	5'- 7"		S
RE 601	2	5'- 11"		S
RE 701	2	6'- 3"		S
RE 801	1	6'- 6"		S
RE 901	1	6'- 10"		S

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

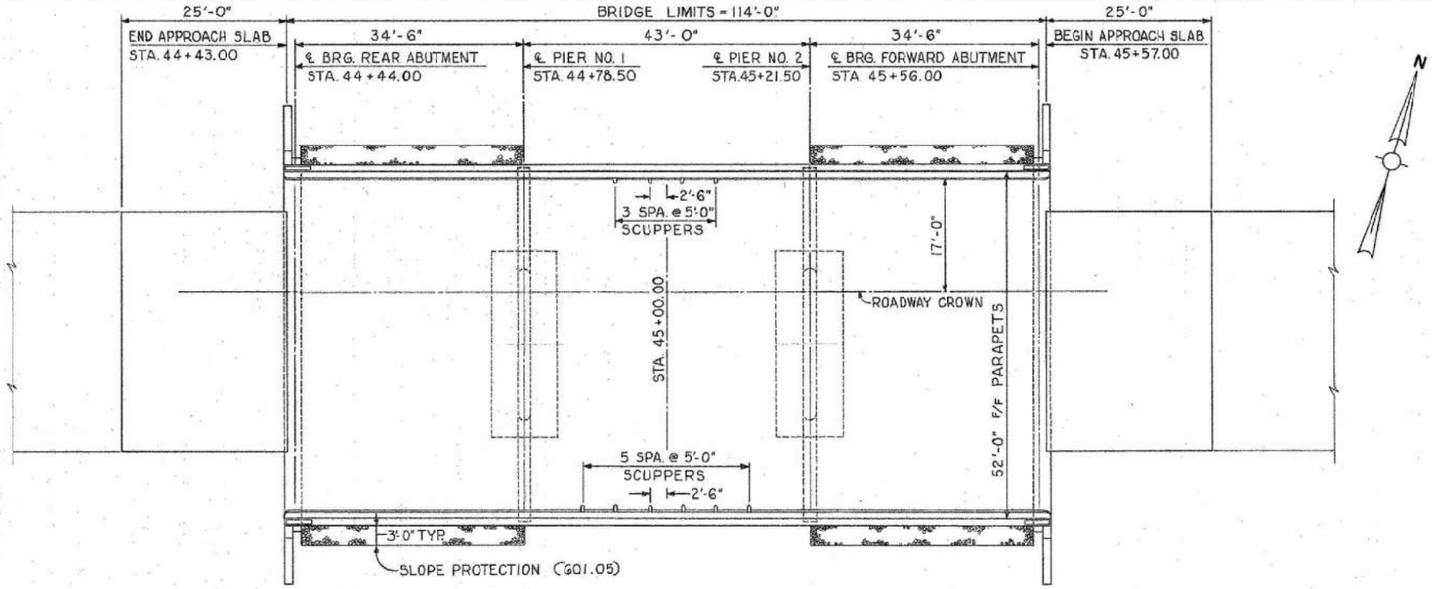
REINFORCING STEEL LIST

BRIDGE NO. FAI-70-0084 L
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

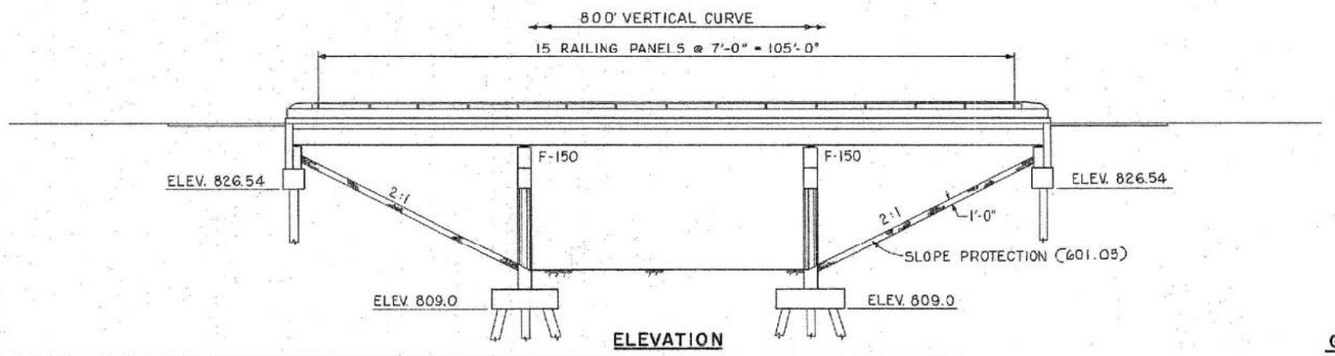
FAIRFIELD COUNTY

PROPOSED I.R. 70
STA. 45+00.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	C.J.L.	C.J.L.	W.G.	C.T.L.	10-11-65	



GENERAL PLAN



ELEVATION

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL		
503	308	CU. YDS.	UNCLASSIFIED EXCAVATION		134	174			
503	LUMP	SUM	COFFERDAMS CRIBS AND SHEETING				LUMP		
511	202	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	202					
511	100	CU. YDS.	CLASS "C" CONCRETE, PIERS *ABOVE FOOTINGS*			100			
511	86	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS		86				
511	52	CU. YDS.	CLASS "E" CONCRETE, PIER FOOTINGS			52			
509	76,057	LBS.	REINFORCING STEEL	38,896	12,318	24,843			
513	105,902	LBS.	STRUCTURAL STEEL	105,902					
514	105,902.	LBS.	FIELD PAINTING OF STRUCTURAL STEEL	105,902					
517	229.34	LIN. FT.	BRIDGE RAILING TYPE I	229.34					
507	1530	LIN. FT.	12" DIA. CAST-IN-PLACE REINFORCED CONCRETE PILES		630	900			
518	46	CU. YDS.	POROUS BACKFILL		46				
518	10	EACH	SCUPPERS, INCLUDING SUPPORTS	10					
601	493	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION		493				
808	202	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	202					
518	112	LIN. FT.	6" PERFORATED HELICAL CMP (SEC. 707.06) INCLUDING SPEC'LS.		112				
518	40	LIN. FT.	6" HELICAL CMP (SEC. 707.06) NON-PERFORATED		40				
512	108	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		108				
516	68	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER AASHO M-153		68				
516	92	SQ. FT.	1/4" PREFORMED EXPANSION JOINT FILLER AASHO M-153		92				

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS BR-1-65 SHEET 1 DATED 2-1-65, SD-1-63 SHEET 3, DATED 11-12-63, FSB-1-62 REV. 1-15-63, SD-2-64 DATED 11-25-64 AND SUPPLEMENTAL SPEC. 808 DATED 7-14-65. AND 811 DATED 3-29-65.

DESIGN SPECIFICATIONS: THESE STRUCTURES CONFORM TO THE REQUIREMENTS OF "DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES" OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS DATED 9-1-57, TOGETHER WITH CURRENT REVISIONS THEREOF.

MACHINE FINISH: THE CONCRETE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.

STRUCTURAL STEEL: A.S.T.M. A36-BASIC UNIT STRESS 20,000 P.S.I.

REINFORCING STEEL: A.S.T.M. A15, A16, A160, DEFORMED, INTERMEDIATE OR HARD GRADE BASIC UNIT STRESS 20,000 P.S.I. EXCEPT SPIRAL REINFORCEMENT MAY BE PLAIN STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 P.S.I.

DESIGN LOADING: C F = 2000

CONCRETE CLASS "C"
BASIC UNIT STRESS 1,333 P.S.I.

CONCRETE CLASS "E"
BASIC UNIT STRESS 1,133 P.S.I.

PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 25 TONS PER PILE FOR THE ABUTMENTS AND 35 TONS PER PILE FOR THE PIERS

FIRST TEST PILE: PAYMENT WILL BE MADE FOR ONLY ONE FIRST TEST PILE, ITEM 505. IT MAY BE DRIVEN AT EITHER FAI-70-0084 R OR FAI-70-0084 L.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

GENERAL PLAN & ESTIMATED QUANTITIES

BRIDGE NO. FAI-70-0084-R
PROPOSED I. R. 70 OVER
BLACKLICK CREEK
FAIRFIELD COUNTY
PROPOSED I. R. 70
STA. 45+00.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	C.J.L. G.E.W.	C.J.L.	W.G.	C.T.L.	10-11-65	

ELEVATIONS

LOCATIONS	A	B	C	D	E	F	G	H	J	K	L	M	N	O		
REAR ABUTMENT AND FORWARD ABUTMENT	826.54	829.54	837.46	836.61	833.29	833.42	836.88	833.55	833.43	833.30	833.17	836.36	833.04	837.21		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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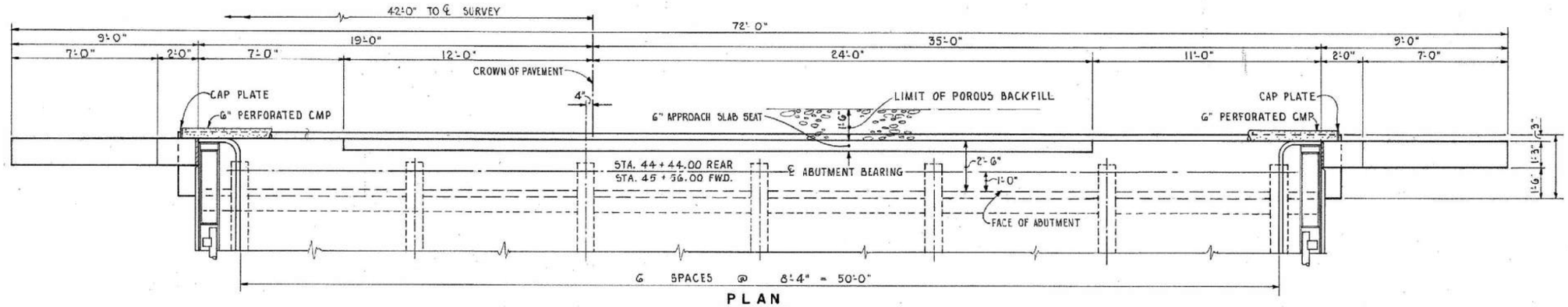
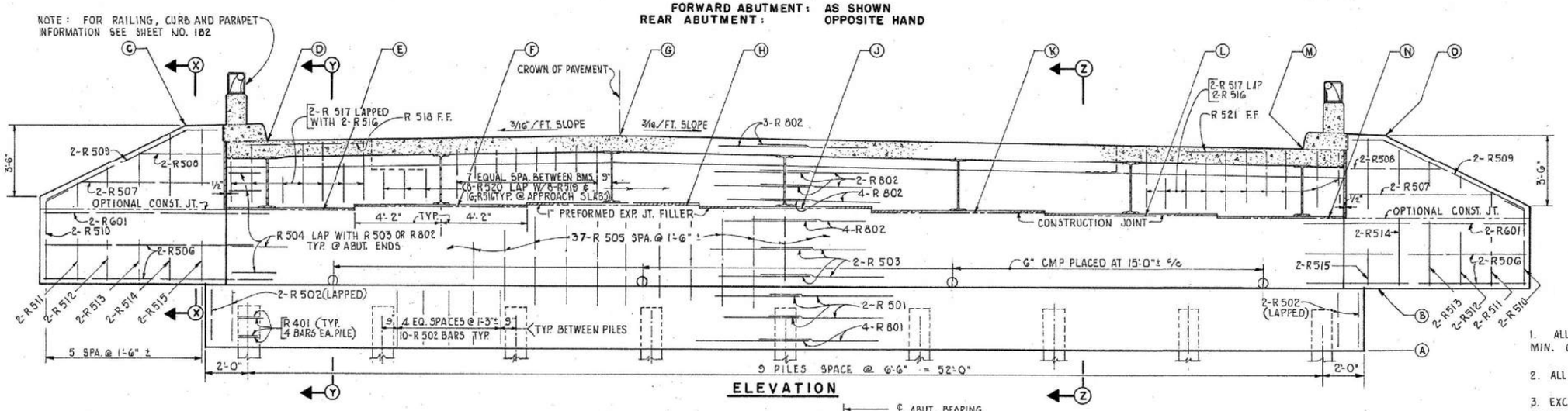
FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00



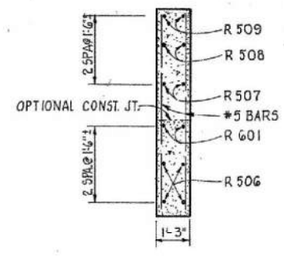
PLAN

FORWARD ABUTMENT: AS SHOWN
REAR ABUTMENT: OPPOSITE HAND

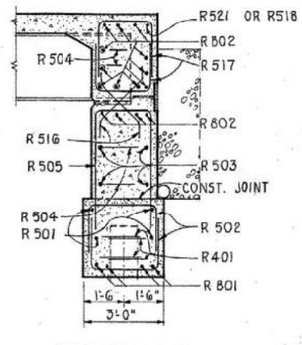
NOTE: FOR RAILING, CURB AND PARAPET INFORMATION SEE SHEET NO. 182



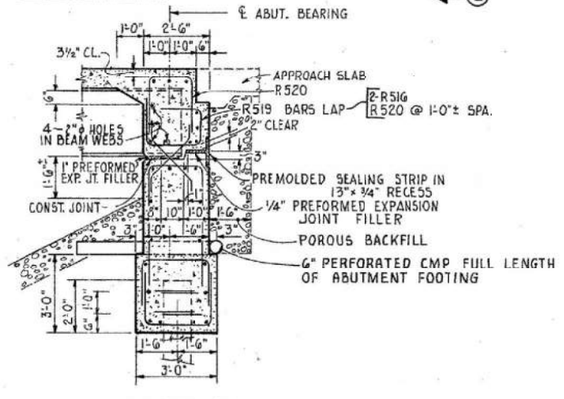
ELEVATION



SECTION X-X



SECTION Y-Y



SECTION Z-Z

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
2. ALL PILING SHALL BE 12" CAST-IN-PLACE CONCRETE.
3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.
4. PROCEDURE: EMBANKMENT SHALL BE PLACED AND COMPACTED UP TO THE FINISHED SPILL-THRU SLOPE AND TO THE LEVEL OF THE SUBGRADE AFTER WHICH EXCAVATION FOR THE ABUTMENT SHALL BE MADE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

ABUTMENT DETAILS

BRIDGE NO. FAI-70-0084 R.
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 45+00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED: DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L. 10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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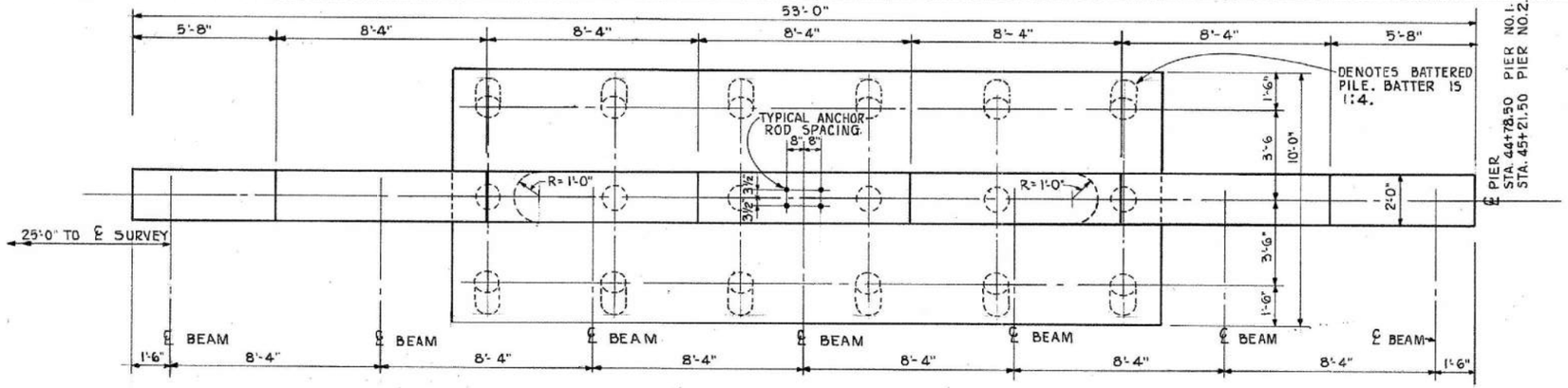
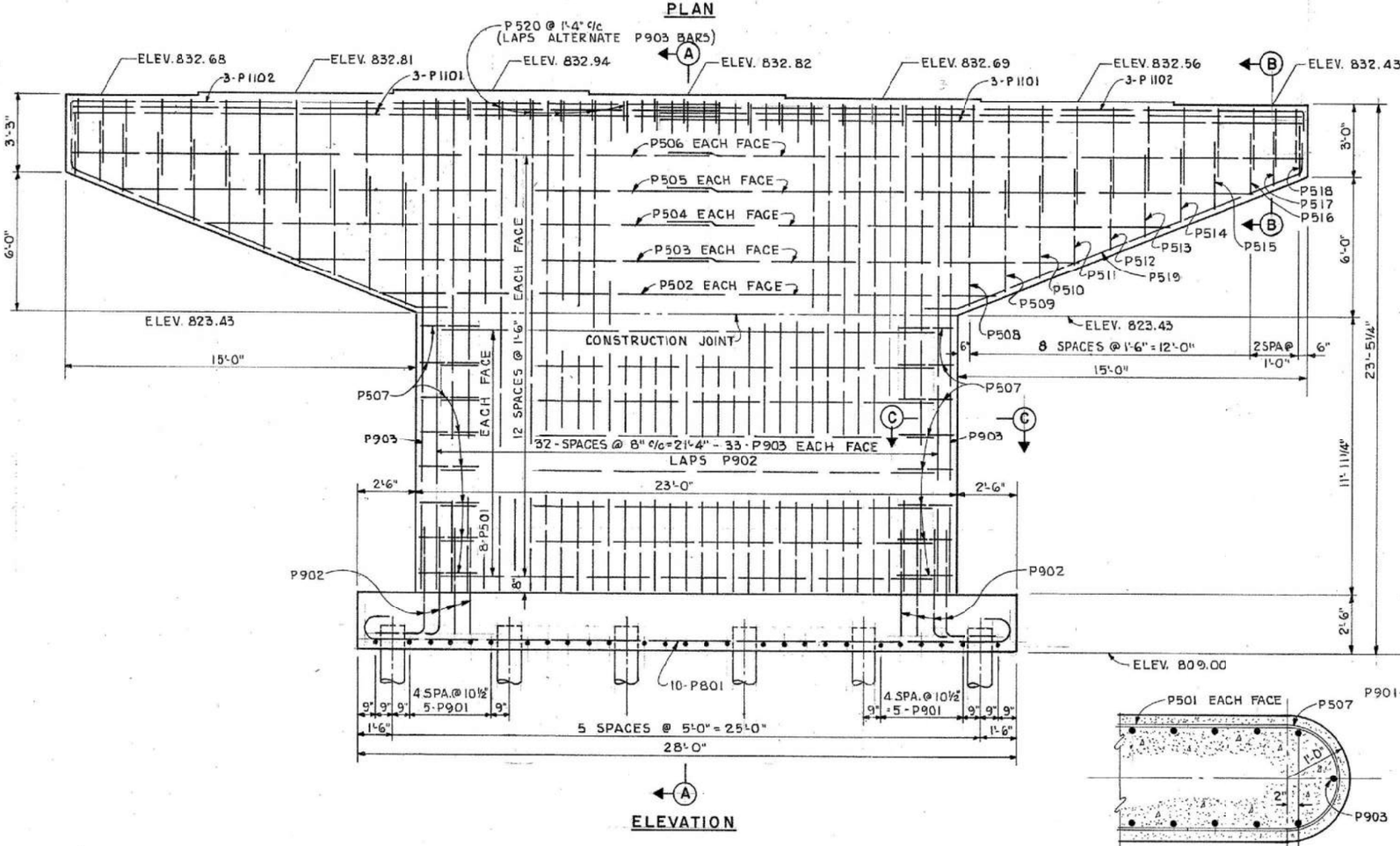
218

FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00



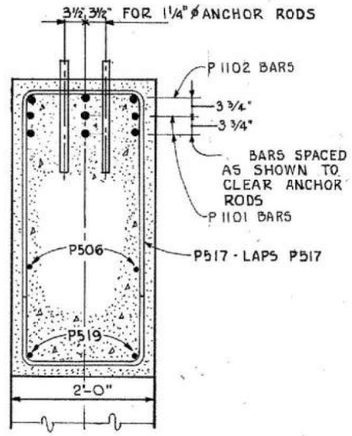
PLAN



ELEVATION

SECTION A-A

SECTION C-C



SECTION B-B

NOTES

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER TOP SO AS AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER STEM AND CANTILEVERS SHALL BE CLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

ALL REINFORCING STEEL SHALL BE PLACED TO PROVIDE A MINIMUM COVER OF 2" UNLESS OTHERWISE SHOWN.

ALL PILING SHALL BE 12" ø CAST-IN-PLACE CONCRETE

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIERS NO. 1 & NO. 2

BRIDGE NO. FAI.-70-0084 R
PROPOSED I.R.70 OVER
BLACKLICK CREEK
FAIRFIELD COUNTY

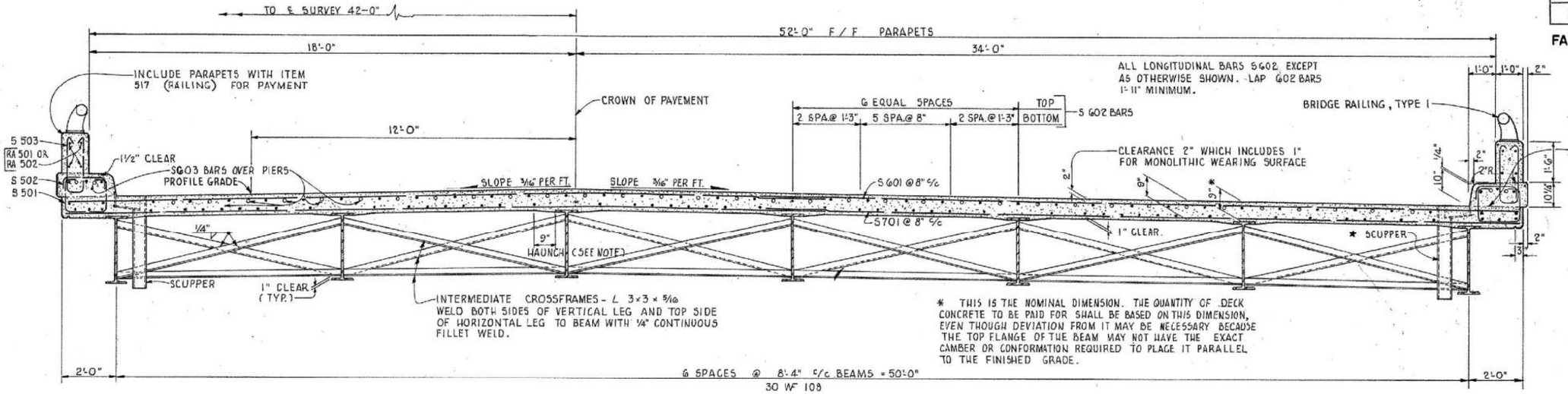
PROPOSED I.R.70
STA. 45+00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
A.C.S.	H.W.S.	H.W.S.	W.G.	C.T.L.	10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

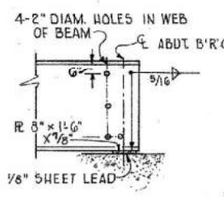
182
218

FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

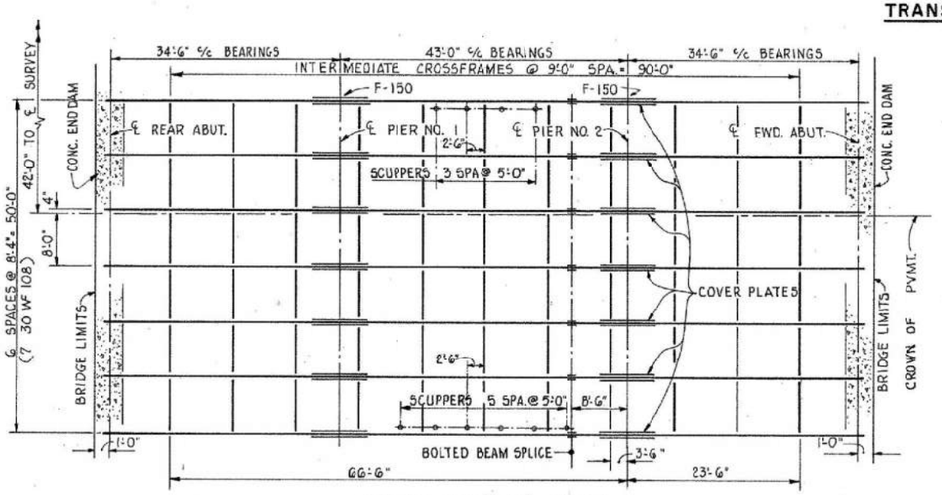


TRANSVERSE SECTION

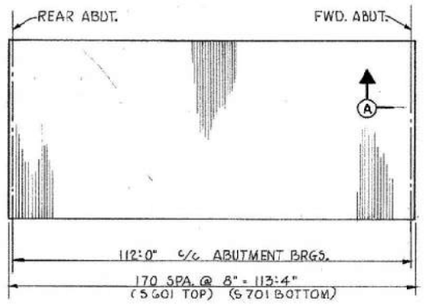
★ THERE SHOULD BE NO CUTOUTS IN THE SIDEPLATES OF THE SCUPPERS FOR A BULB ANGLE GUTTER AND THE BACK PLATES AT THE FACE OF THE CURB SHOULD BE CUT TO MATCH THE ROADWAY SURFACE. THE CURB PLATES ARE TO MATCH THE CURB SURFACE AS SHOWN ON THIS DRAWING.



BEARING PLATE DETAIL



STEEL FRAMING PLAN



PART PLAN

SHOWING PLACEMENT OF TRANSVERSE REINFORCING STEEL

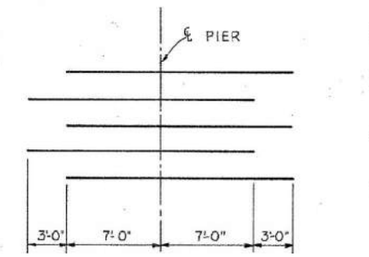
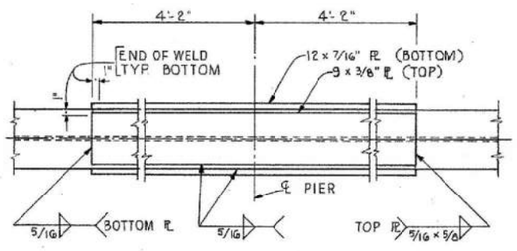
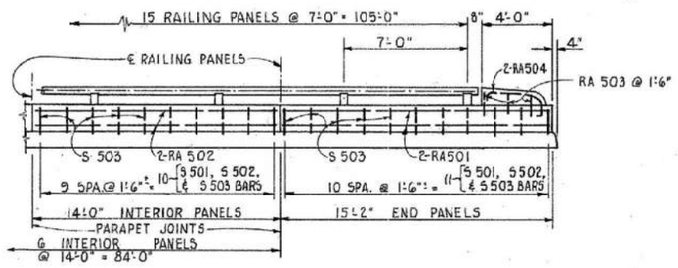


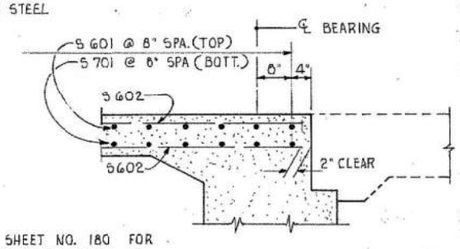
DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS



COVER PLATE DETAIL
PIERS NO. 1 & NO. 2



STEEL PLACEMENT DIAGRAM FOR PARAPETS



SEE SHEET NO. 180 FOR REINFORCING DETAIL IN CONCRETE END WALL.

SECTION A-A

NOTES

FIXED BEARINGS SHALL BE F-150 AT PIER NO.1 AND PIER NO.2. FOR DETAILS SEE STANDARD DRAWING FSB-1-62. REVISED 1-15-63.

FOR BOLTED BEAM SPLICE DETAILS SEE STANDARD DWG. SD 2-64.

FOR DETAILS OF SCUPPERS AND BRIDGE RAILING SEE STANDARD DRAWINGS SD-1-63 SHEET 3 AND BR-1-65.

DECK SLAB HAUNCH: A TYPICAL HAUNCH WIDTH OF 9" SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. HOWEVER, THE HAUNCH WIDTH MAY VARY BETWEEN 6" AND 12" PROVIDED THAT THE SLOPE SHALL NOT BE MORE THAN 1:4 FOR A HAUNCH THAT IS LESS THAN 9" IN WIDTH.

MACHINE FINISH: THE CONCRETE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.

FOR DETAILS OF CONCRETE END DAM. SEE SHEET NO. 180.

GUTTER ELEVATIONS: SEE SHEET NO. 177.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

BRIDGE NO. FAI-70-0084 R.
PROPOSED I.R. 70 OVER
BLACKLICK CREEK

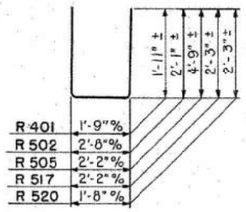
FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 45 + 00

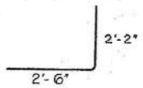
DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L.	10-11-65	

STEEL LIST

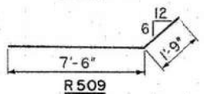
MARK	NO.	LENGTH	WEIGHT	SHAPE
ABUTMENTS				
R 801	16	29'- 0"	1239	S
R 802	60	28'- 0"	4485	S
R 601	8	10'- 11"	131	S
R 501	16	28'- 8"	478	S
R 502	176	6'- 7"	1208	B
R 503	16	27'- 8"	462	S
R 504	16	4'- 7"	76	B
R 505	74	11'- 5"	888	B
R 506	16	10'- 7"	177	S
R 507	8	7'- 8"	63	S
R 508	8	4'- 8"	39	S
R 509	8	9'- 2"	76	B
R 510	8	5'- 6"	46	B
R 511	8	4'- 9"	40	S
R 512	8	5'- 6"	46	S
R 513	8	6'- 3"	52	S
R 514	8	7'- 0"	58	S
R 515	8	7'- 6"	63	S
R 516	208	3'- 11"	850	B
R 517	68	6'- 6"	461	B
R 518	2	6'- 8"	14	S
R 519	70	6'- 10"	499	B
R 520	70	6'- 0"	438	B
R 521	2	10'- 8"	22	S
R 401	72	5'- 5"	407	B

BENDING DIAGRAM

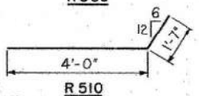




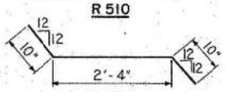
R 504



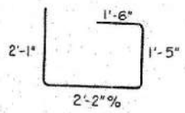
R 509



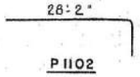
R 510



R 516



R 519



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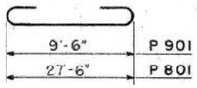
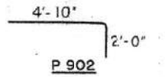


P 901
P 801



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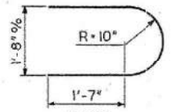

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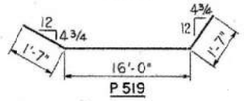

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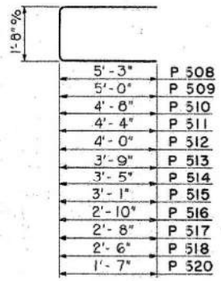

P 508
P 509
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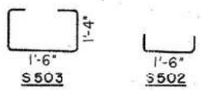
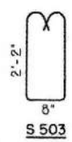
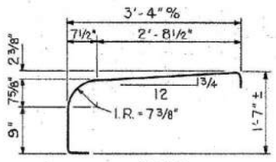
P 520



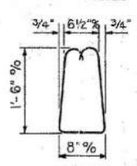
S 503
S 502



S 503



RA504



RA503

MARK	NO.	LENGTH	WEIGHT	SHAPE
PIERS				
P 1101	24	28'- 2"	3591	S
P 1102	12	29'-10"	1902	B
P 901	54	12'- 0"	2203	B
P 902	136	6'- 7"	3044	B
P 903	136	20'- 9"	9595	S
P 801	20	29'- 8"	1584	B
P 501	32	21'- 0"	701	S
P 502	4	26'- 3"	110	S
P 503	8	17'- 9"	148	S
P 504	8	21'- 6"	179	S
P 505	8	25'- 0"	209	S
P 506	8	27'- 2"	227	S
P 507	32	5'- 10"	195	B
P 508	8	12'- 0"	100	B
P 509	8	11'- 6"	96	B
P 510	8	10'- 10"	90	B
P 511	8	10'- 2"	85	B
P 512	8	9'- 6"	79	B
P 513	8	9'- 0"	75	B
P 514	8	8'- 4"	70	B
P 515	8	7'- 8"	64	B
P 516	8	7'- 2"	60	B
P 517	8	6'- 10"	57	B
P 518	8	6'- 6"	54	B
P 519	8	19'- 2"	160	B
P 520	34	4'- 8"	165	B
RAILING				
RA 501	16	14'- 10"	INCLUDE WITH RAILING FOR PAYMENT	S
RA 502	48	13'- 8"		S
RA 503	12	4'- 2"		B
RA 504	8	5'- 4"		B
SUPERSTRUCTURE				
S 701	171	28'- 0"	9787	S
S 601	171	27'- 10"	7149	S
S 602	396	29'- 11"	17,794	S
S 603	76	17'- 0"	1941	S
S 501	164	4'- 11"	841	B
S 502	164	2'- 6"	428	B
S 503	164	5'- 7"	956	B
REPLACEMENT BARS				
RE 401	1	5'- 3"		S
RE 501	1	5'- 7"		S
RE 601	2	5'- 11"		S
RE 701	2	6'- 3"		S
RE 801	1	6'- 6"		S
RE 901	1	6'- 10"		S

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

183
218

FAIRFIELD-LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

REINFORCING STEEL LIST

BRIDGE NO. FAI-70-0084 R
PROPOSED I. R. 70 OVER
BLACKLICK CREEK

FAIRFIELD COUNTY

PROPOSED I. R. 70
STA. 45+00.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W. G.	C. J. L.	C. J. L.	W. G.	C. T. L.	10-11-65	

DESIGN DESIGNATION		FAIRFIELD COUNTY	LICKING COUNTY
t Year ADT (1988)	=	56,625	32,400
Year ADT (2008)	=	79,725	45,360
(2008)	=	7,930	4,536
ctional Distribution)	=	Equal	Equal
cent B & C Trucks)	=	14%	23%
ign Speed)	=	70	70
Speed	=	(55 URBAN / 65 RURAL)	65
onal Classification	=	Interstate	Interstate

DESIGN EXCEPTION
Horizontal Clearance (S.R. 158)

APPROVED
2/22/88

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

CALC. BY DPC DATE 2-29-88
CHECK. BY R.M DATE 3-4-88

OHIO	
FHWA REGION	5
IR-70-7(101) 117	FEDERAL PROJECT

FAI-70-0.00
LIC-70-0.00

FAI-70-0.00
LIC-70-0.00

CITY OF COLUMBUS, VILLAGE OF PICKERINGTON, VILLAGE OF KIRKERSVILLE
VIOLET AND ETNA TOWNSHIP
FAIRFIELD AND LICKING COUNTY
(FRANKLIN CO.)

ROFILMED
6 28 1992

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line
Fence Line(existing) (proposed)
Center Line
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA&RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)
Detour

INDEX OF SHEETS

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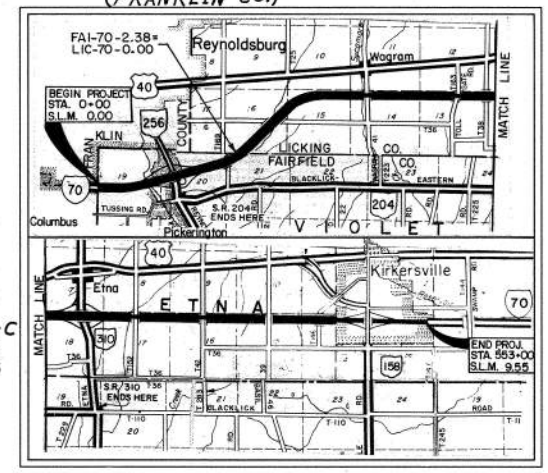
CATION PLAN	2-3	INTERCHANGE DETAILS	68-78
PICAL SECTION	4-7	CALCULATIONS	79-86
PICAL DETAILS	7-A, 7-B*, 14, 14A	PAVEMENT MARKINGS	87-88
MPORARY CROSSOVER DETAILS	15-22	DRAINAGE DETAILS	89-105A-C
NERAL NOTES	23-30A-B	STRUCTURES, OVER 20'	106-118
VEMENT ELEVATIONS	31-47	MAINTAINING TRAFFIC	119-126
NERAL SUMMARY	48-49		



LOCATION MAP

SCALE IN MILES
0 1 2 3 4

Portion to be Improved
State & Federal Routes
Other Roads

SCALES
Plan
0 50' 100'

LINE DATA

BEGIN PROJECT	STA.0+00
STATION EQUATION	STA.641+09.49 BACK = STA.0+00.00 AHEAD
STATION EQUATION	STA.143+21.06 BACK = STA.250+00.00 AHEAD
STATION EQUATION	STA.733+97.69 BACK = STA.550+00.00 AHEAD
END PROJECT	STA.553+00
NET LENGTH OF PROJECT =	63,018.75 LIN.FT. OR 11.935 MILES
BEGIN WORK	STA.586+50
STATION EQUATION	STA.641+09.49 BACK = STA.0+00.00 AHEAD
STATION EQUATION	STA.143+21.06 BACK = STA.250+00.00 AHEAD
STATION EQUATION	STA.733+97.69 BACK = STA.550+00.00 AHEAD
END WORK	STA.600+67.19
NET LENGTH OF WORK =	7324543 LIN.FT. OR 13.872 MILES

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
Call 800-362-2764 (Toll Free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

Plan Prepared By:
DISTRICT NO.5
OHIO DEPARTMENT OF TRANSPORTATION

t FAI-70-0.00
LIC-70-0.00
of Letting 19 Contract No.

SUPPLEMENTAL SPECIFICATIONS

846	11-24-86	849	12-24-85
847	10-17-83	850	2-25-86
947	10-17-83	852	6-10-87
824	10-8-82	853	6-26-78
921	12-4-72	949	9-26-86
		952	6-10-87
		956	6-26-78

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-5	10-1-87	TC-72.20	2-26-82	MC-4	7-26-76	TC-18.24	4-25-79
GR-1	1-11-85	MT-99.10	11-14-86	TC-6L10	4-5-82	TC-31.21	3-6-79
GR-2B	2-5-82	MT-99.20	11-14-86	CB-2-6	5-1-79	TC-32.11	3-21-79
GR-3	1-21-85	BR-1	5-29-79	HW-4A	4-1-80	TC-51.10	1-20-84
GR-4	2-5-82	EXJ-2-81	4-2-84R	MC-11	8-1-78	TC-51.11	1-20-84
GR-4A	1-30-84	SD-1-65	11-8-65	MH-2	6-12-75	TC-65.10	2-26-82
GR-5	2-5-82	CB-2-2B	5-1-79	TC-22.20	3-1-79	TC-65.11	4-5-82
GR-6	2-5-82	CB-4	11-10-83	GR-7	2-5-82		
GR-6A	2-5-82	CB-5	11-10-83				
MC-9	1-30-84	CB-8	11-10-83				
MC-9A	1-11-85	MH-1	12-18-84				
TC-35.10	8-29-84	MH-3	12-18-84				
TC-71.10	4-9-79						

LIMITED ACCESS

This improvement is especially designed for throug traffic and has been declared a limited access high or freeway by action of the Director in accordance the provisions of Section 5511.02 of the Revised Code of Ohio.

1987 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway, except as noted on sheet 22, and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved John W. Hayes
Date 3-3-88 District Deputy Director of Transportation

Approved R. D. Nicholson
Date 3-10-88 Engineer, Bureau of Bridges and Structural Design

Approved George E. Anderson
Date 3-25-88 Chief Engineer, Planning & Desig

Approved Ronald R. Hurst
Date 3-25-88 Director, Department of Transpo

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

DIVISION ADMINISTRATOR DA

BRIDGE NOTES

CALC. BY
DATE
CHK'D BY
DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI -70-0.00
LIC -70-0.00

REFERENCE

DETAILED DRAWINGS OF THE EXISTING STRUCTURE MAY BE INSPECTED IN THE DISTRICT 5 OFFICE OF THE OHIO DEPARTMENT OF TRANSPORTATION, JACKSONTOWN, OHIO.

REMOVED MATERIALS

ALL REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY HIM FROM THE JOB SITE, UNLESS OTHERWISE NOTED.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND/ OR FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK, BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

AREAS OF WORK

THE GENERAL AREAS OF WORK AS INDICATED ON THE PLAN AND PROFILE AND DETAIL SHEETS ARE:

REMOVALS:
1. REMOVE ASPHALT WEARING COURSE,BRIDGE RAILINGS,PARAPETS AND PORTIONS OF EXISTING DECK

CONSTRUCTION:
1. INSTALL EXPANSION JOINTS AND PARAPETS
2. PATCH CONCRETE DECKS
3.OVERLAY BRIDGE DECKS

REPLACEMENT OF EXISTING REINFORCING STEEL

ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT HIS COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. AN ADDITIONAL 3,000 LBS. IS INCLUDED IN ITEM 824 FOR THIS PURPOSE.

ESTIMATED QUANTITIES

AN ESTIMATED AMOUNT OF THE FOLLOWING QUANTITIES HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR BIDDING PURPOSES, BUT FINAL QUANTITIES SHALL BE DETERMINED BY ACTUAL FIELD MEASUREMENTS AT THE COMPLETION OF THE WORK.

BRIDGE NUMBERS	0084L	0084R	0119L	0119R	0074L	0074R	TOTAL
ITEM 850-SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VARIABLE THICKNESS)	30	30	35	75	30	30	230
ITEM 850-FULL DEPTH REPAIR	3	3	3	6	3	3	21

ITEM 202-ALUMINUM BRIDGE RAILING REMOVED FOR STORAGE

CARE SHALL BE TAKEN NOT TO DAMAGE THE ALUMINUM RAIL AND SUPPORTS. IT SHALL BE CAREFULLY REMOVED AND NEATLY STORED ON THE JOB SITE FOR REMOVAL BY STATE FORCES.

PAYMENT SHALL BE PER LINEAR FOOT ITEM 202 ALUMINUM BRIDGE RAILING REMOVED FOR STORAGE.

FAI-70-0084L	212 LIN FT.	FAI-70-0119R	348 LIN FT.
FAI-70-0084R	212 LIN FT.	LIC-70-0074L	321 LIN FT.
FAI-70-0119L	342 LIN FT.	LIC-70-0074R	300 LIN FT.
			1735 LIN.FT.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05 AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

PROTECTION OF TRAFFIC UNDER OVERHEAD STRUCTURES

THE CONTRACTOR SHALL PROVIDE A SAFETY NET OR PLATFORM OF SUITABLE STRENGTH AT THE UNDERSIDE OF THE DECK TO PROTECT PEDESTRAIN AND VEHICULAR TRAFFIC DURING WORK BEING DONE ON THE OVERHEAD STRUCTURE. THE DESIGN OF THE NET OR PLATFORM SHALL CONFORM WITH O.S.H.A. REQUIREMENTS AND THE APPROVAL OF THE ENGINEER AND SHALL REMAIN IN PLACE UNTIL THE WORK HAS BEEN COMPLETED AND ACCEPTED OR AS DIRECTED BY THE ENGINEER.

PAYMENT TO BE INCLUDED UNDER ITEM 614, MAINTAINING TRAFFIC.

REMOVAL OF CONCRETE PARAPETS AND EDGES

CONCRETE REMOVALS ON PARAPETS & EDGES SHALL BE DONE BY THE USE OF 40 - 65 LB. CLASS JACK HAMMERS ONLY. NO OTHER METHOD SHALL BE USED UNLESS APPROVED BY THE DISTRICT 5 CONSTRUCTION ENGINEER.

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

BR-1	DATED	5-29-79
EXJ-2-81	DATED	4-2-84R
SD-1-65	DATED	11-8-65
GR-1	DATED	1-11-85
GR-3	DATED	1-21-85
GR-2B	DATED	2-5-82

AND TO SUPPLEMENTAL SPECIFICATIONS:

824	DATED	10-8-82
850	DATED	2-25-86
849	DATED	12-24-85
949	DATED	9-26-86
852	DATED	6-10-87
853	DATED	6-26-78
952	DATED	6-10-87
956	DATED	6-26-78

Revised 4-6-88

ITEM 516-MODIFICATION OF STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 5-INCH WIDTH, AS PER PLAN

THIS ITEM SHALL INCLUDE ALL THE WORK AND MATERIALS NECESSARY TO MODIFY AND ENCLOSE THE EXPANSION JOINTS. REMOVAL OF EXISTING CONCRETE AND STEEL CURB PLATES SHALL BE IN ACCORDANCE WITH 202.03.
THE PROPOSED SUPERSTRUCTURE EXPANSION JOINT AND BARS SHALL BE FURNISH IN MAXIMUM LENGTHS POSSIBLE TO ALLOW FOR TRAFFIC MAINTENANCE AND SHALL BE BUTT WELDED TOGETHER TO FORM A WATERTIGHT JOINT. THE COMPRESSION S SHALL NOT BE INSTALLED UNTIL ALL OTHER WORK HAS BEEN COMPLETED ON THE MATERIALS: STEEL PLATE BARS AND ANGLES SHALL CONFORM TO ASTM A36 OR A
THE COMPRESSION SEAL SHALL BE AS PER STD. DWG. EXJ-2-81.
SPLICE OR JOINT IN COMPRESSION SEAL: COMPRESSION SEAL FOR BRIDGE DECK JOINTS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS A SHOP FABRICA SPLICE, FIELD SPLICE OR FIELD BUTT JOINT IS APPROVED BY THE DIRECTOR.
FOR OTHER THAN STRAIGHT SEALS WITHOUT INTERMEDIATE SPLICES, SEAL GLANDS SHALL BE SHOP FABRICATED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS.
DRAWING DIMENSIONS FOR EXISTING JOINTS OR FOR JOINTS WHICH ARE BEING MODIFIED SHALL BE BASED ON FIELD MEASUREMENTS PROVIDED BY THE CONTRACT
THE COMPRESSION SEAL SHALL BE AS MANUFACTURED BY THE WATSON-BOWMAN ACME CORPORATION, 95 PINEVIEW DRIVE, AMHERST, NEW YORK 14120; THE D. S. BROWN COMPANY, P.O. BOX 158, NORTH BALTIMORE, OHIO 45872 OR AN APPROVE ALTERNATE.
MEASUREMENT FOR PAY PURPOSES SHALL BE BASED ON THE LINEAR FEET OF SEA JOINT SYSTEM MEASURED HORIZONTALLY ALONG THE BACK OF THE STEEL RETAINE AND BETWEEN THE FACES OF THE DECK.

PAYMENT SHALL BE MADE PER LINEAR FOOT FOR ITEM 516, MODIFICATION OF STRU EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 5-INCH WIDTH, AS PER PLAN, WHICH SHALL INCLUDE ALL REMOVALS, CONCRETE, STEEL BARS, AN COMPRESSION SEAL, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLE THE WORK.

WJ-500
WATSON-BOWMAN & ACME CORP.

CV-5000
D.S. BROWN COMPANY

COMPRESSION SEALS

ITEM 601-ROCK CHANNEL PROTECTION, TYPE B WITH FILTER

THE QUANTITY OF 553 CU. YDS. HAS BEEN INCLUDED IN THE GENERAL SUMMARY ON SHT. 48 FOR EROSION CONTROL TO BE USED AT FAI-70-0084L,R REAR ABUTMENT. PLACEMENT OF THE ROCK SHALL BE AT THE DISCRETION OF THE ENGINEER. FINAL QUANTITY SHALL BE DETERMINED AFTER COMPLETION OF WORK. FOR LOCATION OF ROCK PLACEMENT SEE SHEET 108.

BRIDGE DECK CONDITION SURVEY (GEN. INFORM. ONLY)

	BRIDGE Nº	Deck Area	Sounded		
			Method	Date	Area
	FAI-70-0084 L	710	cored	2-29-88	710
	FAI-70-0084 R	646	cored	2-2-88	646
	FAI-70-0119 L	761	cored	2-29-88	761
	FAI-70-0119 R	1326	cored	3-2-88	1326
*	LIC-70-0074 L	711	visual	3-3-88	711
*	LIC-70-0074 R	696	visual	3-3-88	696

*Bridges to prior to le project.

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AUG 28 1992

BRIDGE SUMMARY

CALC. BY [illegible] DATE 1-15-88
CHKD. BY AJD DATE 1-21-88

FAI-70-0.00
LIC-70-0.00

OHIO
FHWA REGION
FEDERAL PROJECT

SHEET NUMBER	BRIDGE NUMBER						ITEM	QUANT.	UNIT	DESCRIPTION
	FAI. 70 0084L	FAI. 70 0084R	FAI. 70 0119 L	FAI. 70 0119 R	LIC. 70 0074L	LIC. 70 0074 R				STRUCTURES OVER 20' SPAN
	29	29	45/5	46/6	40/7	38/7	202	252	CU.YD.	PORTIONS OF STRUCTURES REMOVED, SUPERSTRUCTURE
			78	138	110	110	202	436	LIN.FT.	PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN
	697	633	741	1306	693	667	202	4737	SQ.YD.	WEARING COURSE REMOVED
	212	212	342	348	321	300	202	1735	LIN.FT.	ALUMINUM BRIDGE RAIL REMOVED FOR STORAGE
	188	188	292	298	262	246	510	1474	EACH	DOWEL HOLES
	25	25	38/5	39/6	35/7	33/7	511	220	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE
			86	142	121.83	121.83	516	471.66	LIN.FT.	MODIFICATION OF STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION 5-INCH WIDTH, AS PER
106 3000	3655	3655	5563	5669	5094	4877	824	31,513	POUND	EPOXY COATED REINFORCING STEEL, GRADE 60
	710	646	761	1326	711	693	850	4847	SQ.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (1 3/4" THICK) (SEE PROPOSAL NOTE)
	30						850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0084L) (SEE PROPOSA
	3	3	3	6	3	3	850	21	CU.YD.	FULL DEPTH REPAIR (SEE PROPOSAL NOTE)
	—	—	—	—	—	—	850	LUMP		TEST SLAB (SEE PROPOSAL NOTE)
			1391	2395	1391	1391	513	6568	POUND	STRUCTURAL STEEL, AS PER PLAN
	198	198	304	310	281	263	SPEC	1554	SQ.YD.	SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE)
	10	10	8	12	8	8	518	56	EACH	VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN
	10	10	8	12	8	8	518	56	EACH	VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN
		30					850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0084R) (SEE PROP. NO
			35				850	35	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0119L) (SEE PROP. NO
				75			850	75	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0119R) (SEE PROP. NO
					30		850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (LIC-70-0074L) (SEE PROP. NO
						30	850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (LIC-70-0074R) (SEE PROP. NO

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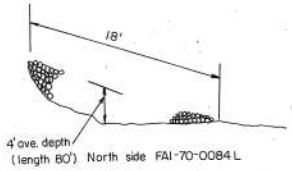
AUG 28 1992

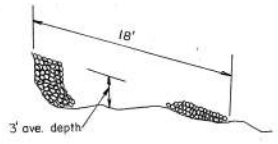
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

CALCULATED BY _____ DATE 1-15-88
CHECKED BY _____ DATE 1-21-88

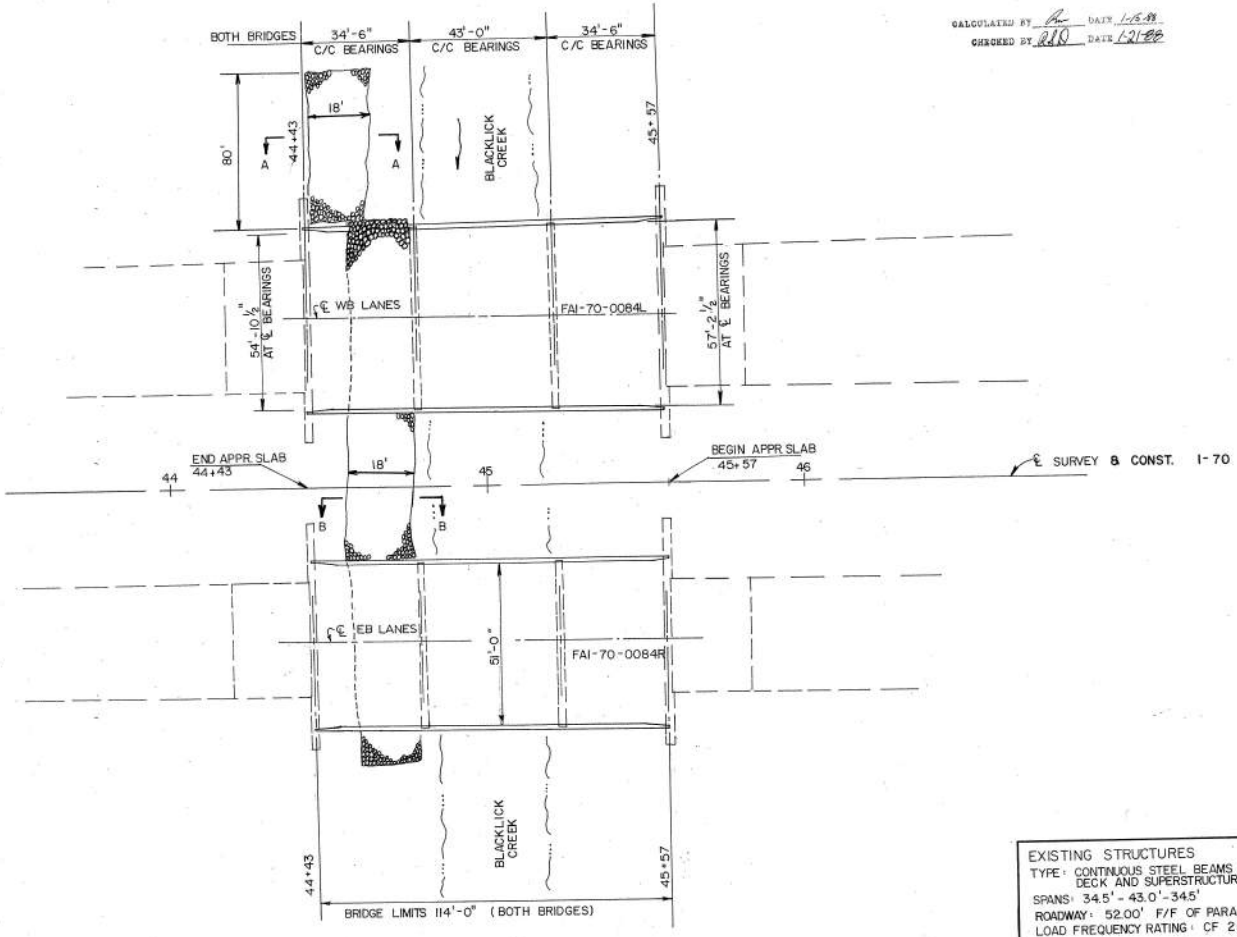


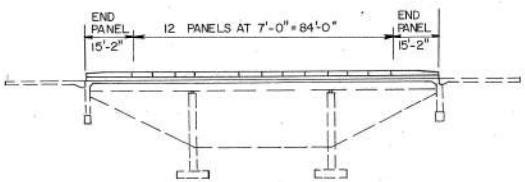
SECTION A-A



SECTION B-B

ROCK CHANNEL PROTECTION TYPE B WITH FILTER





EXISTING STRUCTURES
TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPANS: 34.5' - 43.0' - 34.5'
ROADWAY: 52.00' F/F OF PARAPETS
LOAD FREQUENCY RATING: CF 2000 (57)

SKEW: 0°00
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3 3/4" ASPHALT
APPROACH SLAB: AS-1-54 (25'-0" LONG)

REHABILITATED STRUCTURES
ROADWAY: 51'-0" (0084) — VARIES AS SHOWN (0084L) F/F PARAPET CURBS
BRIDGE RAILING: DEFLECTOR PARAPET TYPE
WEARING SURFACE: 1 3/4" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

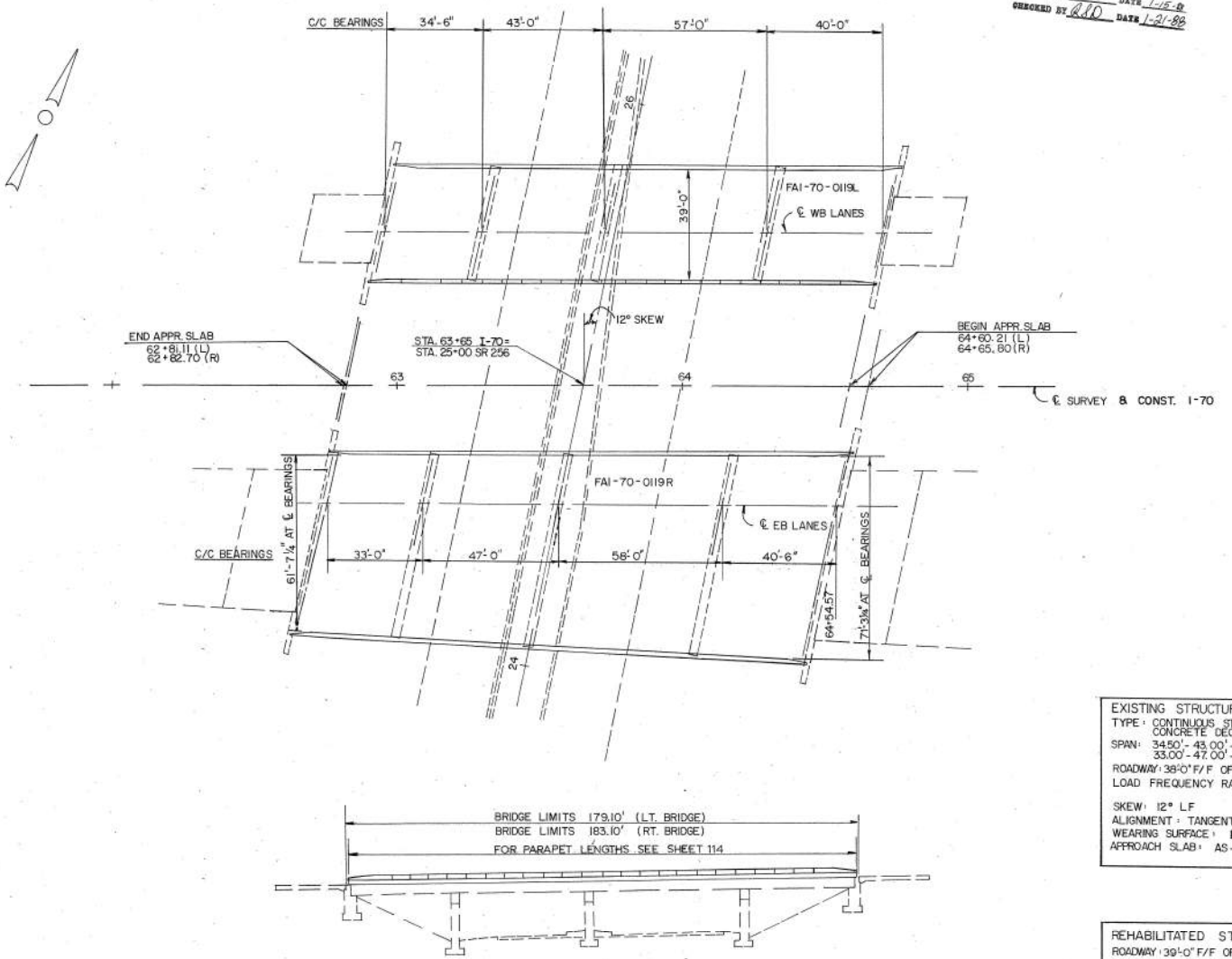
Br. № FAI-70-00

GENERAL PLAN & ELEV

FHWA REGION	STATE	PROJECT	
15	OHIO		

FAI-70-0.00
LIC-70-0.00

CALCULATED BY [illegible] DATE 1-15-86
CHECKED BY RBD DATE 1-21-86



EXISTING STRUCTURES
TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPAN: 34.50' - 43.00' - 57.00' - 40.00' (L)
33.00' - 47.00' - 58.00' - 40.50' (R)
ROADWAY: 38'-0" F/F OF CURB (L) VARIABLE (R)
LOAD FREQUENCY RATING: CF 2000 (57)

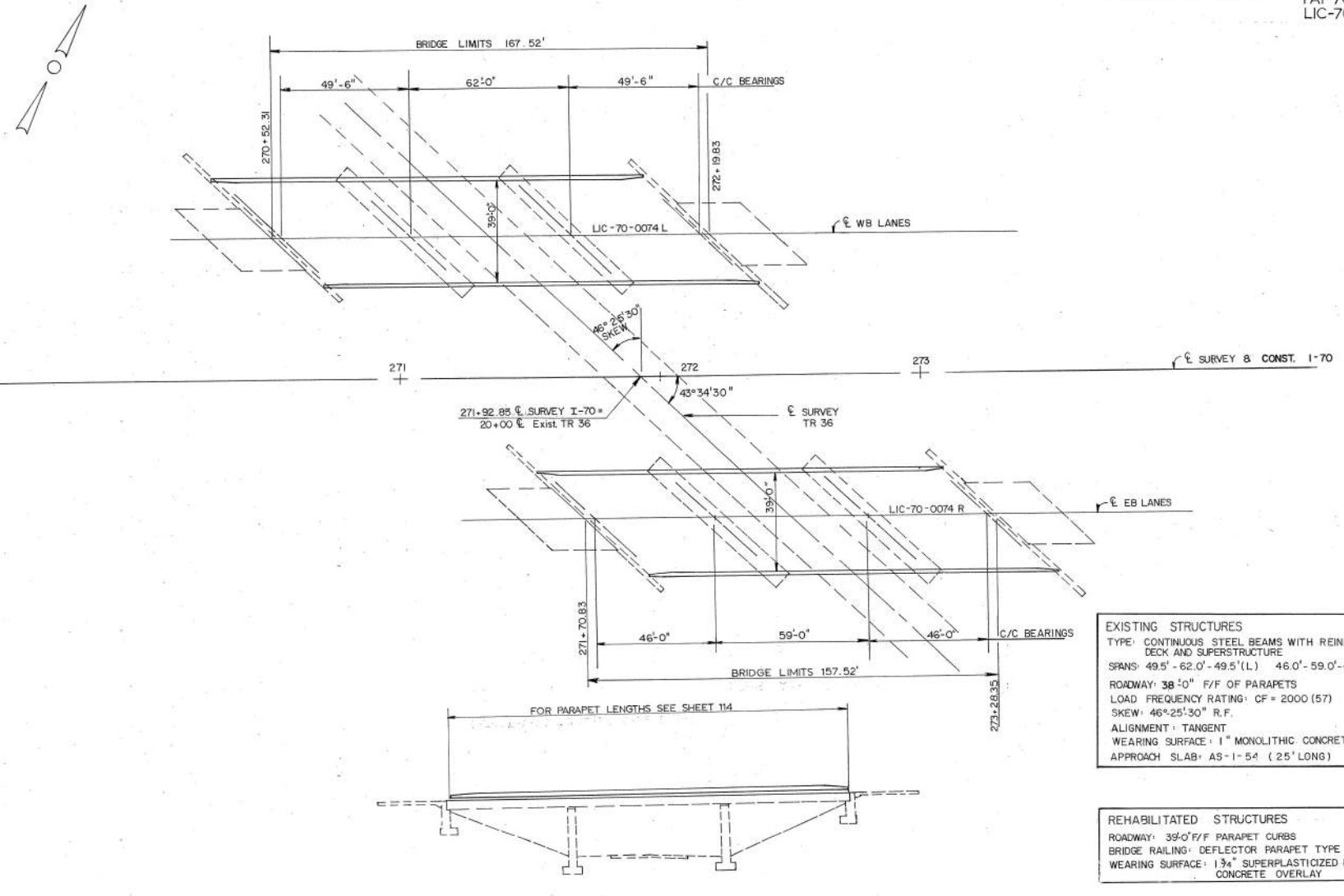
SKEW: 12° L.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3¾" ASPHALT
APPROACH SLAB: AS-1-54 (25' LONG)

REHABILITATED STRUCTURES
ROADWAY: 39'-0" F/F OF PARAPET CURBS (L) VARIABLE AS SHOWN(R)
BRIDGE RAILING: DEFLECTOR PARAPET TYPE
WEARING SURFACE: 1¾" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

CALCULATED BY	DATE
CHECKED BY	DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



EXISTING STRUCTURES

TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE

SPANS: 49.5' - 62.0' - 49.5'(L) 46.0' - 59.0' - 46.0'(R)

ROADWAY: 38'-0" F/F OF PARAPETS

LOAD FREQUENCY RATING: CF = 2000 (57)

SKEW: 46°-25'-30" R.F.

ALIGNMENT: TANGENT

WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3¾" ASPHALT

APPROACH SLAB: AS-1-54 (25' LONG)

REHABILITATED STRUCTURES

ROADWAY: 39'-0" F/F PARAPET CURBS

BRIDGE RAILING: DEFLECTOR PARAPET TYPE

WEARING SURFACE: 1¾" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

Br. № LIC-70-0

GENERAL PLAN & ELE

AUG 31 1992

CALC BY DATE 6-29-98
CHKD BY DATE 6-29-98

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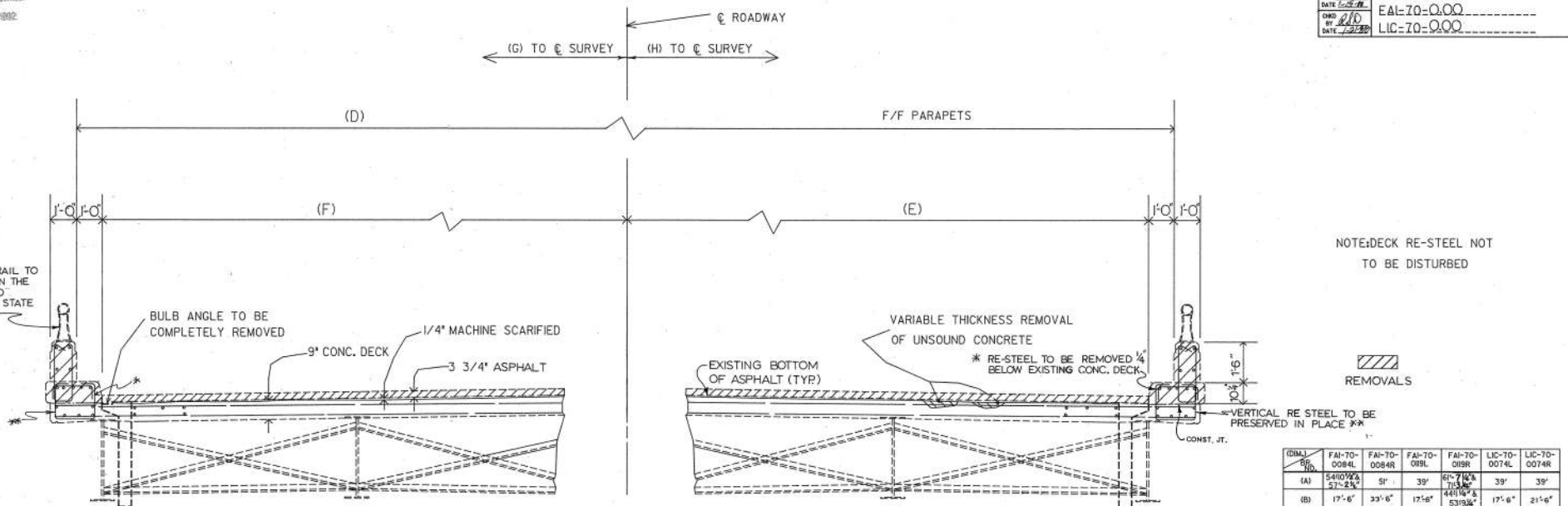
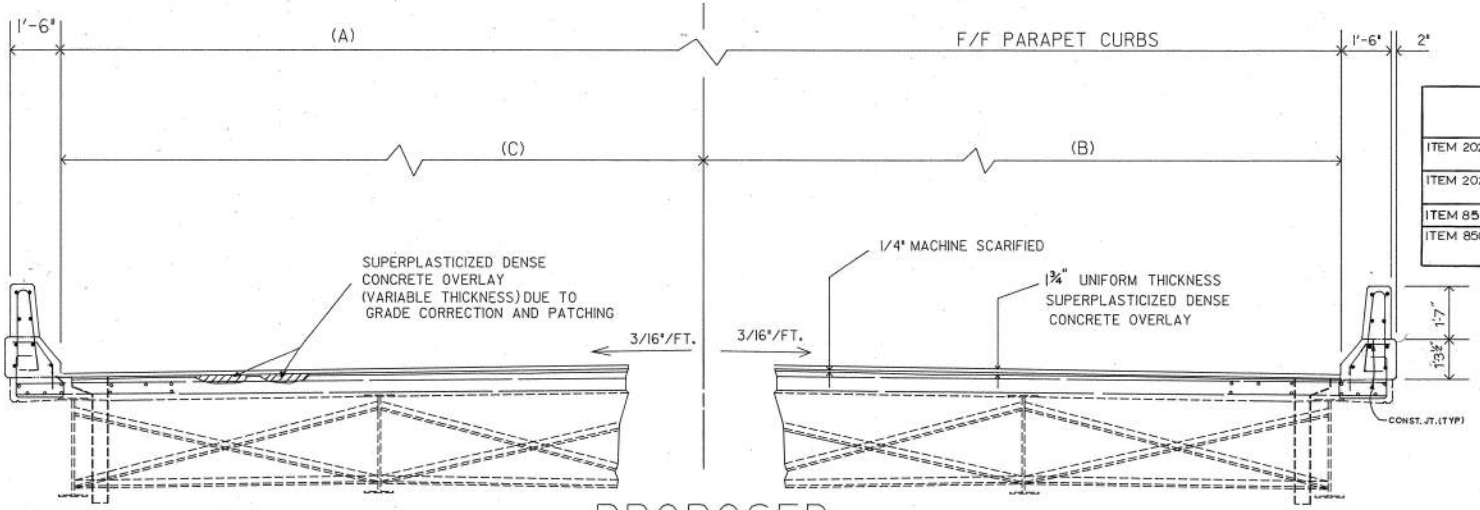
LIC-70-0.00

OHIO
FHWA REGION 5



EXISTING

(DIM.) / Br. No.	FAI-70-0084L	FAI-70-0084R	FAI-70-0119L	FAI-70-0119R	LIC-70-0074L	LIC-70-0074R
(A)	54°10'52" & 57°-2 1/4"	51'	39'	61°-7 1/4" & 71°13 1/2"	39'	39'
(B)	17'-6"	33'-6"	17'-6"	44°16'9" & 53°33 1/4"	17'-6"	21'-6"
(C)	37°14'52" & 39°8 1/2"	17'-6"	21'-6"	17'-6"	21'-6"	17'-6"
(D)	55°40'52" & 58°2 1/2"	52'	40'	62°7'52" & 72°3 3/4"	40'	40'
(E)	17'	33'	17'	43°7'52" & 53°3 1/8"	17'	21'
(F)	36°40'52" & 39°2 1/2"	17'	21'	17'	21'	17'
(G)	—	42'	—	42'	—	54'
(H)	42'	—	54'	—	54'	—



PROPOSED

DESCRIPTION		Br. No. FAI-70-0084L	Br. No. FAI-70-0084R	Br. No. FAI-70-0119L	Br. No. FAI-70-0119R	Br. No. LIC-70-0074L	Br. No. LIC-70-0074R	Unit
ITEM 202	PORTIONS OF STRUCTURES REMOVED, SUPERSTRUCTURE	29	29	45	46	40	38	Cu.
ITEM 202	WEARING COURSE REMOVED	697	633	741	1306	693	667	Sq.
ITEM 850	TEST SLAB	—	—	—	—	—	—	Lun
ITEM 850	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (1 3/4" THICK)	710	646	761	1326	711	693	Sq.

TRANSVERSE SEC

MICROFILMED
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CALC BY	DATE	CHKD BY	DATE
	1-15-88	RJD	1-21-88

FAI-70-0.00
LIC-70-0.00

OHIO
FHWA REGION 5

FAI-70-0084L/R

MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	168	168	5'-8"	BT.	993	993
ES502	24	24	30'-0"	ST.	751	751
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	96	96	6'-8"	ST.	668	668
ES520	168	168	2'-5"	BT.	423	423
ES521	8	8	29'-0"	ST.	242	242
ES522	16	16	12'-10"	ST.	214	214
TOTALS					3655	3655

LIC-70-0074L/R

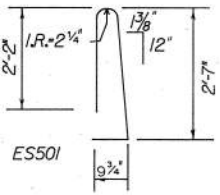
MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	242	226	5'-8"	BT.	1430	1336
ES502	40	40	30'-0"	ST.	1252	1252
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	96	96	6'-8"	ST.	668	668
ES520	242	226	2'-5"	BT.	610	570
ES523	8	8	20'-0"	ST.	167	167
ES524	16		15'-8"	ST.	261	
ES525	24	24	13'-8"	ST.	342	342
ES526		16	10'-8"	ST.		178
TOTALS					5094	4877

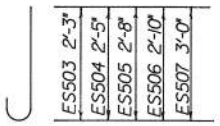
FAI-70-0119L/R

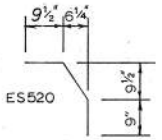
MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	272	278	5'-8"	BT.	1608	1643
ES502	48	48	30'-0"	ST.	1502	1502
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	144	144	6'-8"	ST.	1001	1001
ES520	272	278	2'-5"	BT.	686	701
ES525	16	16	13'-8"	ST.	228	228
ES527	8		5'-5"	ST.	45	
ES528		4	7'-8"	ST.		32
ES529		4	9'-10"	ST.		41
ES530	16		7'-9"	ST.	129	
ES531		8	8'-10"	ST.		74
ES532		8	9'-11"	ST.		83
TOTALS					5563	5669

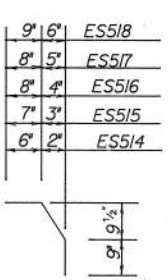
DESCRIPTION	Br. N° FAI-70 0084L	Br. N° FAI-70 0084R	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 0074R
Item 510 Dowel holes	188	188	292	298	262	24
Item 511 Class 'S' conc. superstructure	25	25	38	39	35	3
Item special Sealing of conc. surfaces (epoxy)	198	198	304	310	281	28

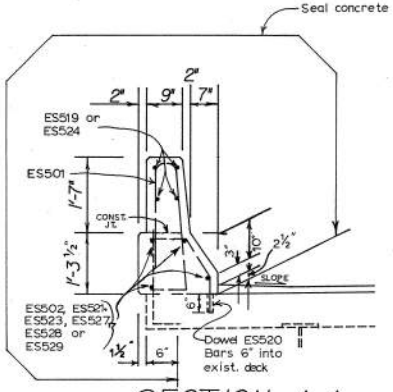
BENDING DIAGRAMS





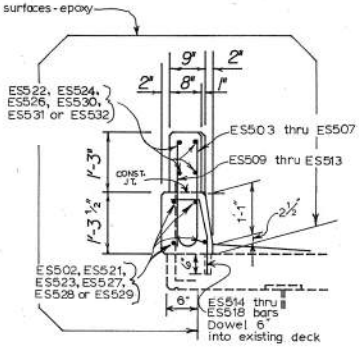






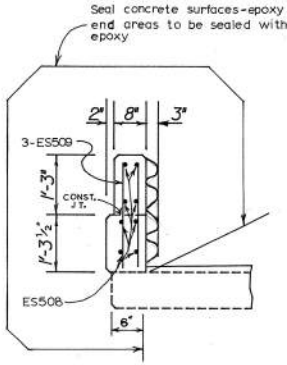
SECTION A-A

(SHEET //3)



SECTION B-B

(SHEET //3)



SECTION C

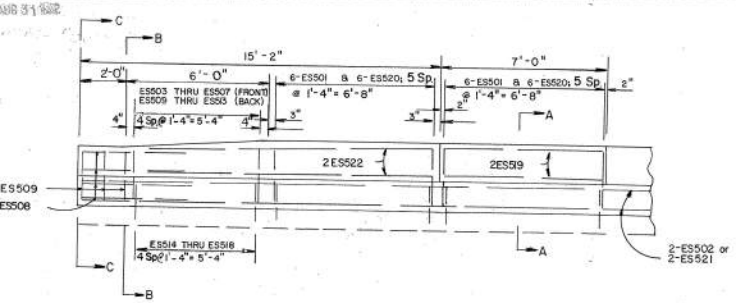
(SHEET //3)

ELEVATION TYPICAL PARAPET REINFORCING

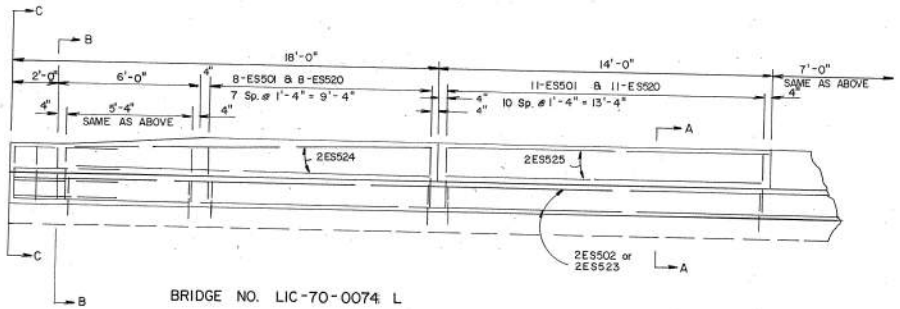
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

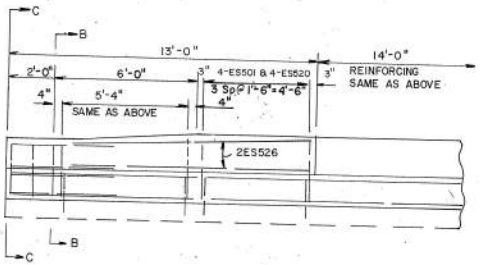
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RBD DATE 1-21-88



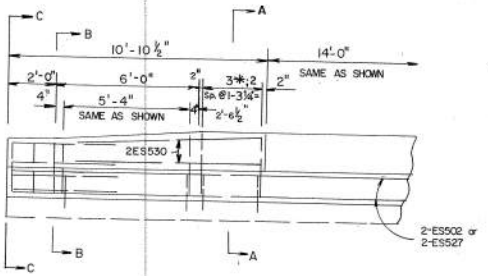
BRIDGE NO. FAI-70-0084 L/R



BRIDGE NO. LIC-70-0074 L



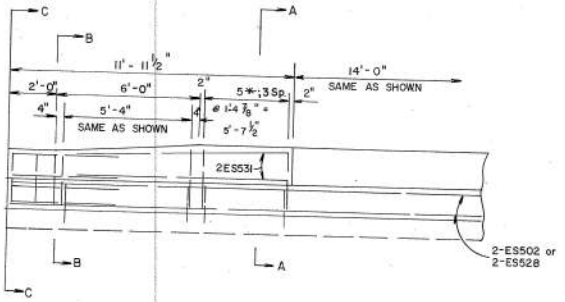
BRIDGE NO. LIC-70-0074 R



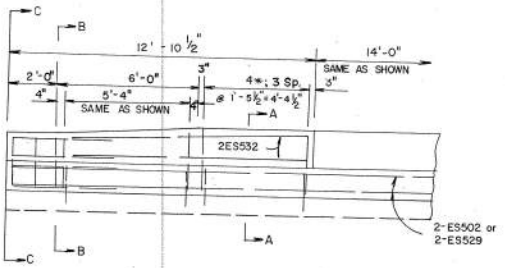
* ES501 & ES520

SEE SHEET 112 FOR SEC. A-A, B-B, C-C AND BENDING DIAGRAMS AND REINFORCING STEEL TABLES.

BRIDGE NO. FAI-70-0119L



BRIDGE NO. FAI-70-0119R
(NORTH PARAPET)



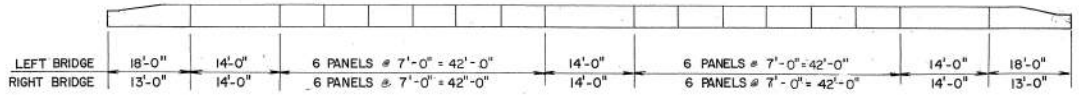
BRIDGE NO. FAI-70-0119R
(SOUTH PARAPET)

JOINT SPACING FOR BRIDGE RAILING, DEFLECTOR PARAPET TYPE

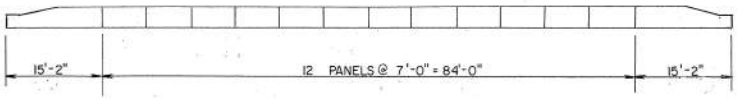
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RJD DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

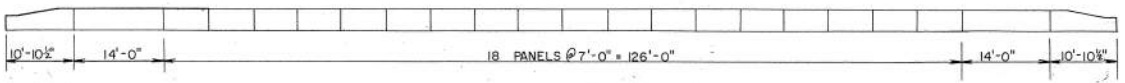
FAI-70-0.00
LIC-70-0.00



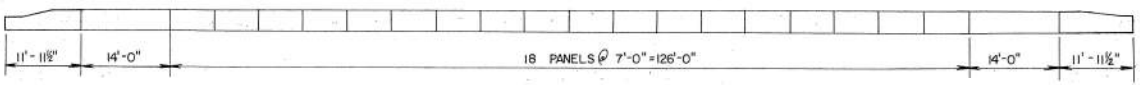
BRIDGE NO. LIC-70-0074 L/R



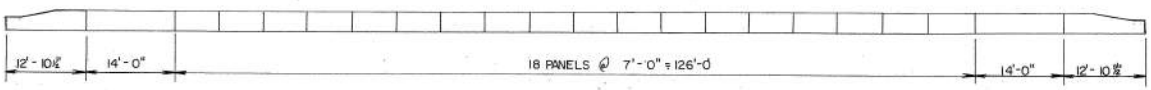
BRIDGE NO. FAI-70-0084 L/R



BRIDGE NO. FAI-70-0119L



BRIDGE NO. FAI-70-0119 R
(NORTH PARAPET)



BRIDGE NO. FAI-70-0119 R
(SOUTH PARAPET)

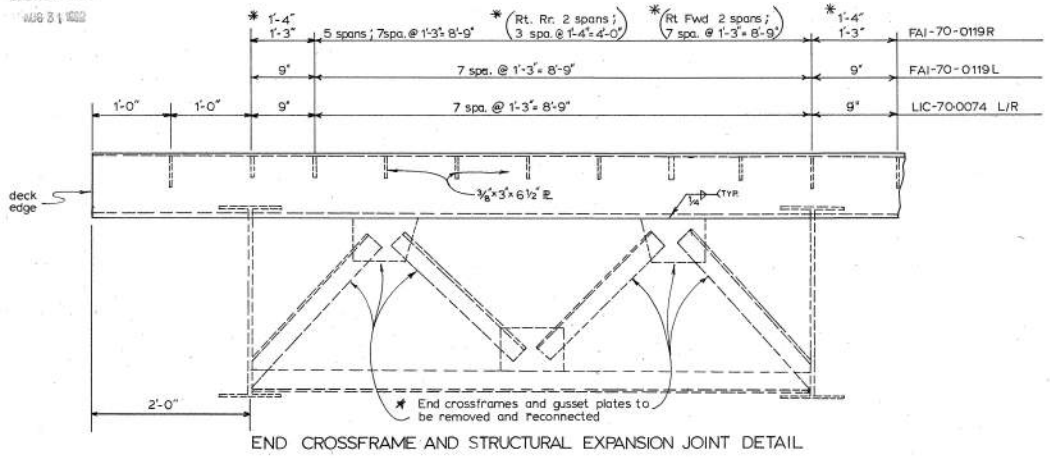
Existing end crossframes and gusset plates shall be removed and reconnected to allow new expansion joint armor to be installed. Any cutting of the crossframes or gusset plates shall be as directed by the Engineer to ensure proper installation of the expansion joint armor. An estimated amount of 6568 pounds of Item 513-Structural Steel as Per Plan has been included in the Bridge Summary for removal, replacement and reconnection of any crossframes or gusset plates deemed necessary by the Engineer.

MICROFILMED
AUG 31 1988

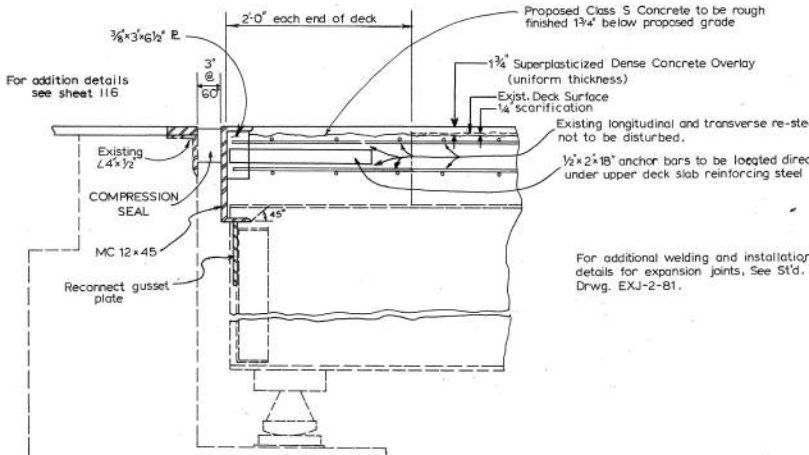
CALCULATED BY RM DATE 1-15-88
CHECKED BY RBD DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

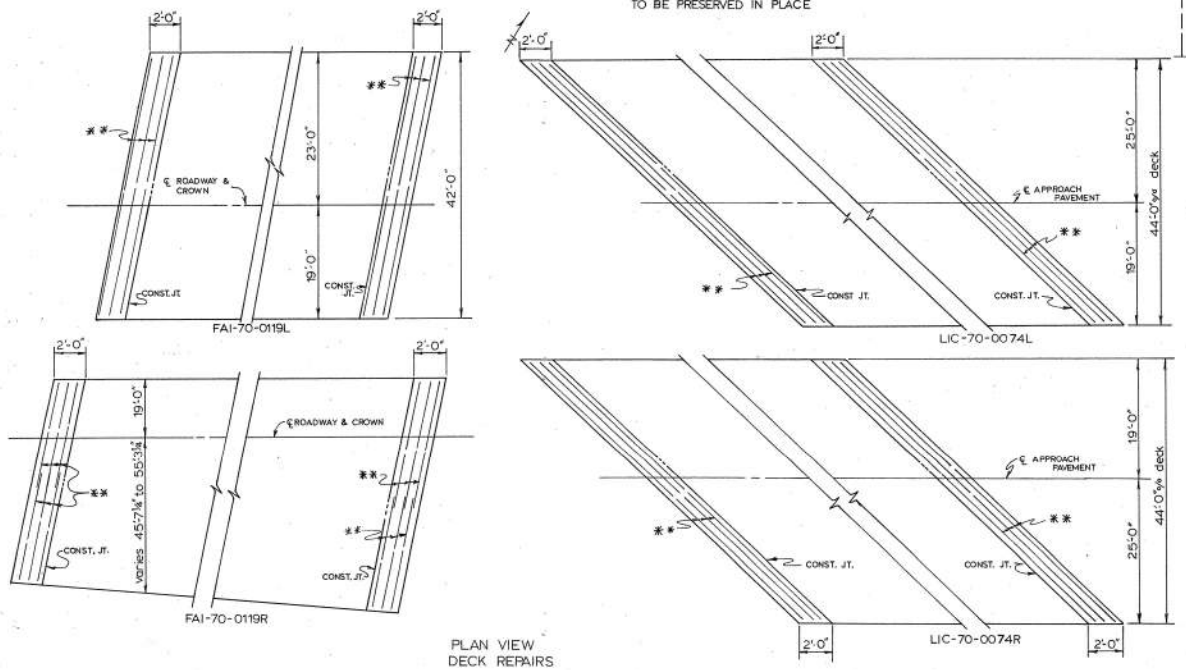


END CROSSFRAME AND STRUCTURAL EXPANSION JOINT DETAIL



FAI-70-0119 L/R
LIC-70-0074 L/R
SECTION ON ℄

** EXISTING TRANSVERSE RESTEEL (TOP AND BOTTOM) TO BE PRESERVED IN PLACE



PLAN VIEW
DECK REPAIRS

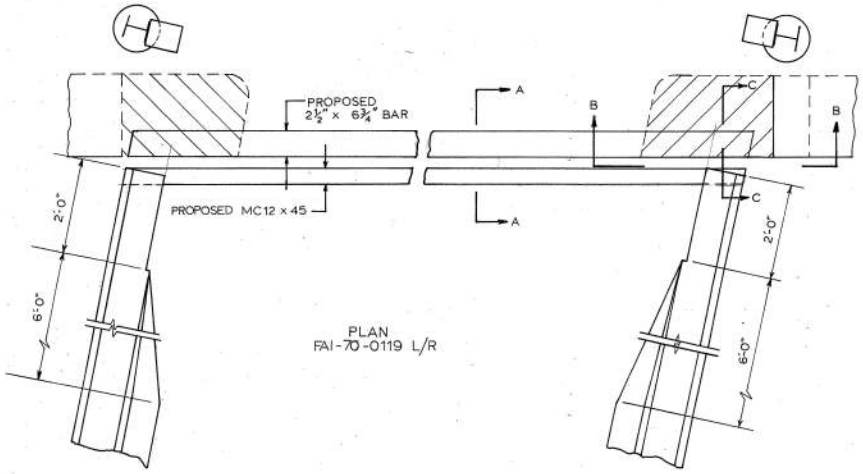
DESCRIPTION	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 0074R	U
ITEM 202 Portions of structures removed, superstructure	5	6	7	7	C
ITEM 511 Class S concrete, superstructure	5	6	7	7	C
ITEM 513 Structural steel	1391	2395	1391	1391	Po

MICROFILMED
AUG 3 1 2010

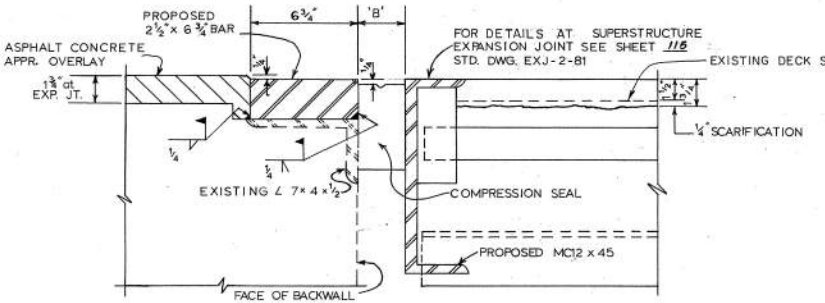
CALCULATED BY Rm DATE 1-15-88
CHECKED BY RJO DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

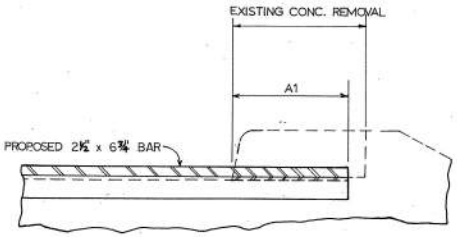
FAI-70-0.00
LIC-70-0.00



PLAN
FAI-70-0119 L/R

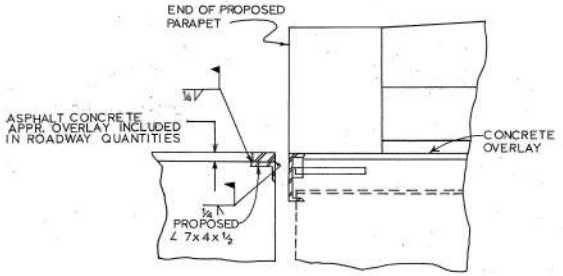


SECTION A-A

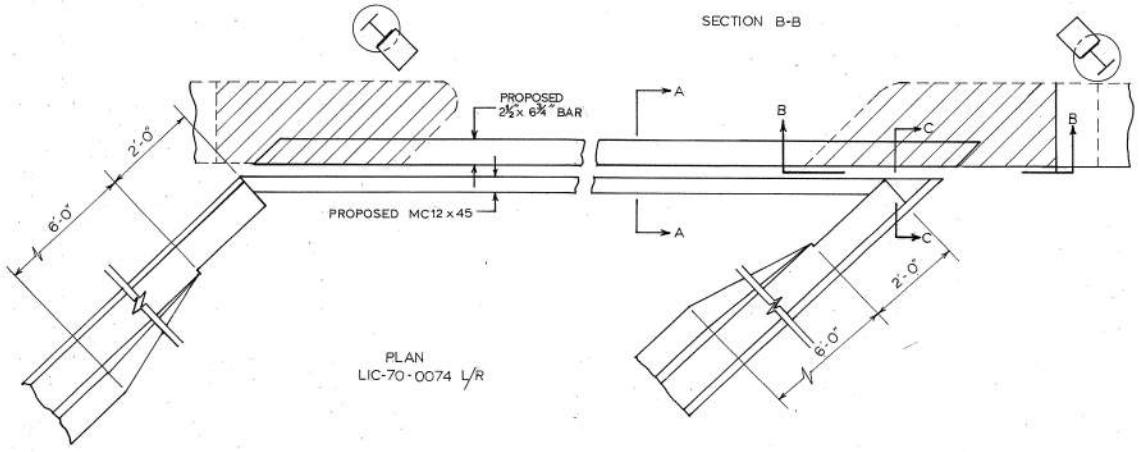


SECTION B-B

AMBIENT TEMP F°	DIMENSION 'B'			
	FAI-70-0119 L/R		LIC-70-0074 L/R	
	REAR	FWD	REAR	FWD
90	3¼"	3¼"	3¼"	3¼"
80	3⅛"	3⅛"	3⅛"	3⅛"
70	3⅛"	3⅛"	3⅛"	3⅛"
60	3"	3"	3"	3"
50	2⅞"	2⅞"	2⅞"	2⅞"
40	2¹³⁄₁₆"	2¹³⁄₁₆"	2¹³⁄₁₆"	2¾"
30	2¾"	2¾"	2¾"	2⅝"



SECTION C-C



PLAN
LIC-70-0074 L/R

BRIDGE NUMBER	ANGLE LT. RR. ABUT.	ANGLE RT. RR. ABUT.	ANGLE LT. FWD. ABUT.	ANGLE RT. FWD. ABUT.	DIM A-1	CONCRETE REMOVALS				EXPANSION JOINT PAY LENGTH	
						LT. RR.	RT. RR.	LT. FWD.	RT. FWD.	RR.	FWD.
FAI-70-0119 L	12°	12°	12°	12°	2'-2"	2'-9"	3'-0"	3'-0"	2'-7"	43'-0"	43'-0"
FAI-70-0119 R	12°	12°	12°	12°	2'-2"	2'-7"	2'-9"	2'-9"	2'-10"	66'-1"	75'-11"
LIC-70-0074 L	46°25'30"	46°25'30"	46°25'30"	46°25'30"	3'-1"	6'-6"	2'-6"	3'-11"	5'-2"	60'-11"	60'-11"
LIC-70-0074 R	46°25'30"	46°25'30"	46°25'30"	46°25'30"	3'-1"	5'-2"	3'-11"	2'-6"	6'-6"	60'-11"	60'-11"

ESTIMATED LENGTH: CONTRACTOR SHALL VERIFY ACTUAL LENGTH NEEDED
LEGEND RR - REAR
FWD - FORWARD

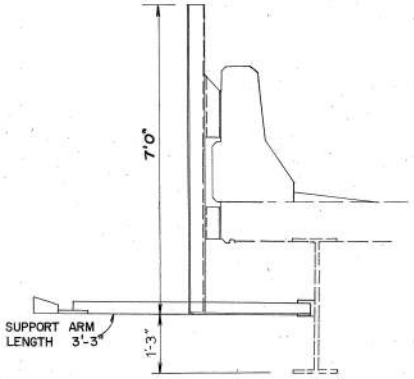
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RJD DATE 1-21-88

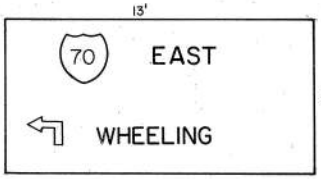
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

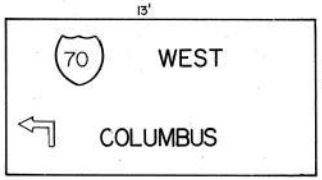
BRIDGE NO. FAI-70 0119 L	BRIDGE NO. FAI-70 0119 R			ITEM	QUANT.	UNIT	DESCRIPTION
845	845			630	169	SQFT.	SIGNS, EXTRUSHEET, TYPE G
1	1			630	2	EACH	OVERPASS STRUCTURE MOUNTED SIGN SUPPORT, TYPE TC-18.24
1	1			630	2	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND STORAGE
1	1			630	2	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND STORAGE, TYPE TC-1824
1	1			631	2	EACH	SIGNS WIRED, OVERPASS STRUCTURE MOUNTED
2	2			631	4	EACH	MERCURY VAPOR LUMINAIRE, TYPE TC-31.21, WITH 175-WATT LAMP
2	2			631	4	EACH	REMOVAL OF LUMINAIRE AND STORAGE

QUANTITIES CARRIED TO SHEET 49





6.5' (INCLUDES 6" GLARE SHIELD)
LEVEL II



6.5' (INCLUDES 6" GLARE SHIELD)
LEVEL II

FAI-70-0119 L

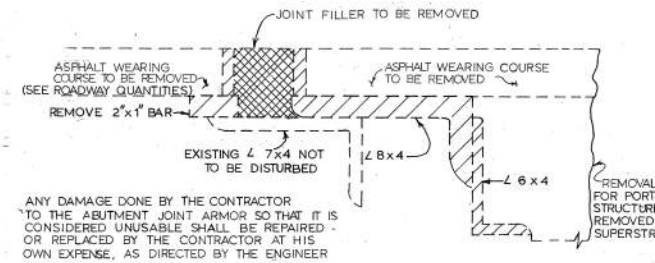
FAI-70-0119 R

TC-18.24

SIGN BRACKET SPACING

6", 72", 72", 6",

MOUNT SIGNS HORIZONTALLY IN THE APPROXIMATE LOCATION OF THE EXISTING SIGNS. THEY MAY BE MOVED SLIGHTLY TO ALLOW FOR THE INSERTION OF THE EXPANSION ANCHOR BOLTS.



ANY DAMAGE DONE BY THE CONTRACTOR TO THE ABUTMENT JOINT ARMOR SO THAT IT IS CONSIDERED UNUSABLE SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE, AS DIRECTED BY THE ENGINEER

ITEM 202 - PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN.

CARE SHALL BE TAKEN IN THE REMOVAL OF THE EXISTING 2"x1" EDGE BARS, VERTICAL EXTENSIO ∠ 8x4; ∠6x4 & JOINT FILLER SO AS NOT TO DAMAGE THE EXPANSION JOINT ARMOR ANGLE AT THE ABUTMENT.

THE BARS SHALL BE REMOVED BY FLAME CUTTING FROM THE END FINISH AND DISPOSED OF BY THE CONTRACTOR. THE SURFACE OF THE END FINISH SHALL BE LEFT FREE OF ANY ROUGH AREAS. THE ENGINEER SHALL DETERMINE IF THE END FINISH IS SMOOTH ENOUGH TO ENSURE PROPER INSTALLATION OF THE NEW 2½"x 6¾" BARS. SEE DETAIL ON SHEET 116.

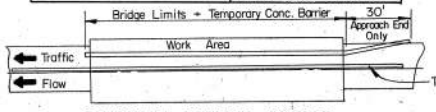
PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR 436 LIN. FT. OF ITEM 202-PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN WHICH SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO REMOVE THE LISTED PARTS.

DESCRIPTION	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 007AR	UN
ITEM 202 PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN	78	138	110	110	LI

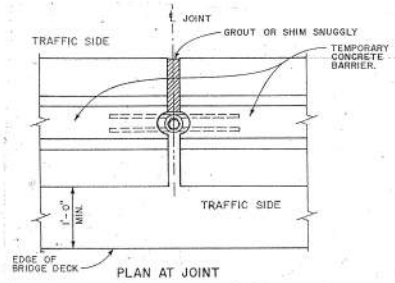
ITEM 622 - TEMPORARY CONCRETE BARRIER *BRIDGE MOUNTED*

THE CONTRACTOR SHALL INSTALL THE BARRIER AS PER STD. DRAWING MC-9A. THE QUANTITY SHALL ALSO INCLUDE REMOVING AND REUSING THE BARRIER AS SHOWN IN PHASES 1A & 2A. AFTER THE PROJECT HAS BEEN COMPLETED THE BARRIER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED BY HIM. ANCHORING OF ALL TEMPORARY CONCRETE BARRIER A.P.P. 2, LOCATED ON THE BRIDGES SHALL NOT BE REQUIRED. CONNECTIONS OF THE PARAPETS SHALL BE DONE BY USING 1¼" x 27" DIA. HIGH STENGTH BOLTS THREADED 8" ON EACH END. PAYMENT FOR BOLTS, NUTS, WASHERS, LABOR, MATERIALS AND INCIDENTALS SHALL BE INCLUDED IN ITEM 622. TEMPORARY CONCRETE BARRIER *BRIDGE MOUNTED* QUANTITIES SHOWN ARE CARRIED IN THE GENERAL SUMMARY ON SHT. 48

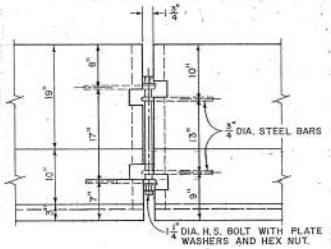
FAI-70-0084 L/R	150	LIN. FT.
FAI-70-0119 L/R	210	LIN. FT.
TOTAL	360	LIN. FT.



CONCRETE BARRIER DETAIL

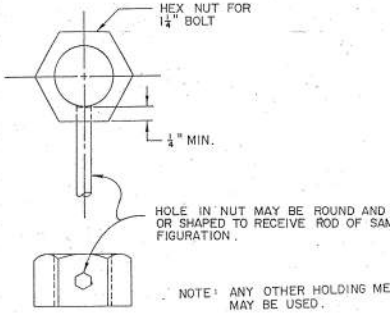


PLAN AT JOINT



ELEVATION AT JOINT

MODIFIED BARRIER



EXAMPLE OF METHOD FOR HOLDING NUT DURING THREADED ROD INSTALLATION

Br. № FAI-70-0

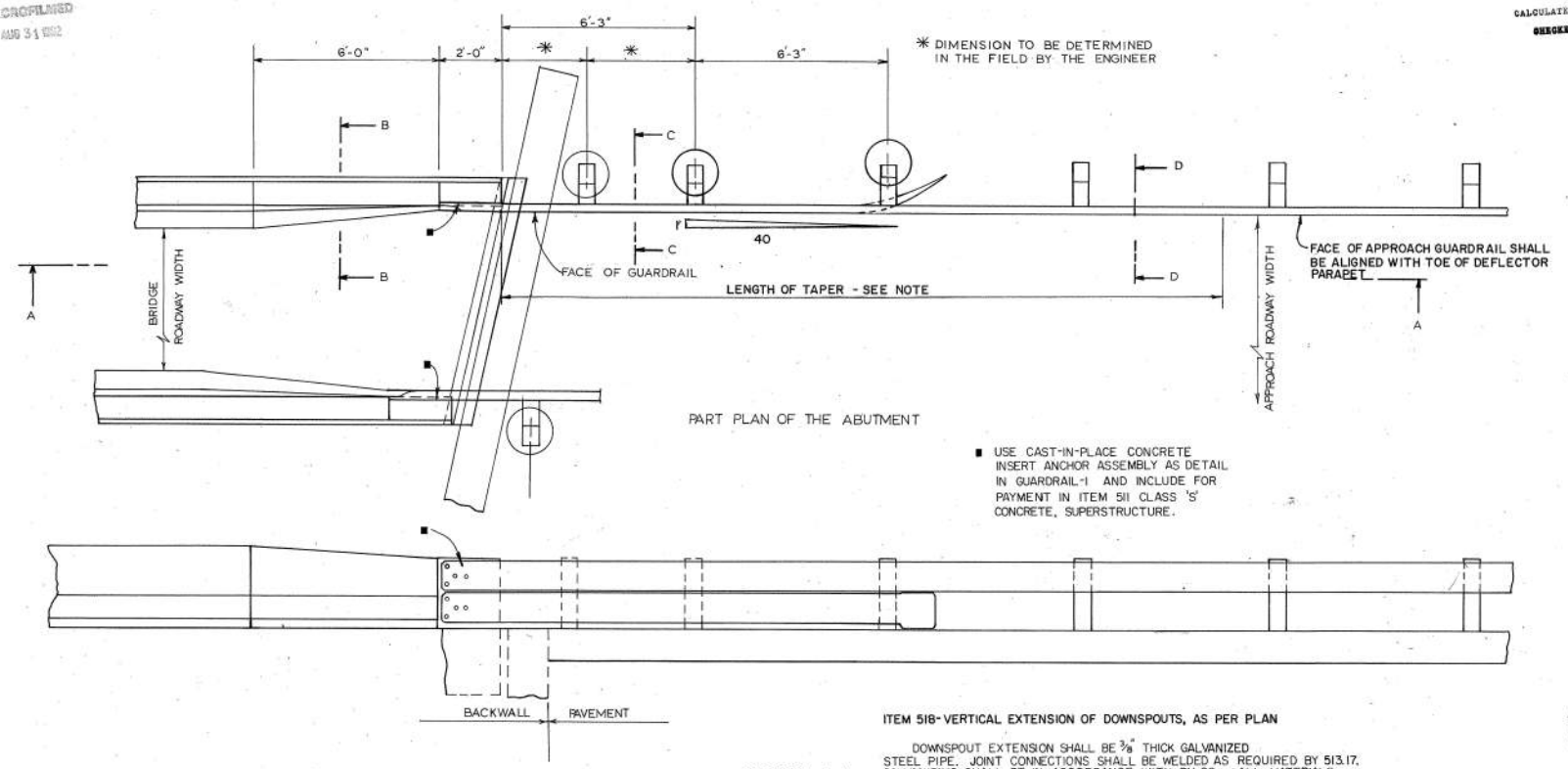
EXPANSION JOINT & SIGN DE

MICROFILMED
AUG 31 1992

CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY [illegible] DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



SECTION A-A

REFERENCE FOR ADDITIONAL DETAILS AND DETAILS NOT SHOWN, SEE STANDARD DRAWINGS BR-1, GR-1, GR-2B, GR-3, & GR-7.

NOTE: ALL HOLES IN THE FIRST APPROACH GUARDRAIL PANEL ADJACENT TO THE BRIDGE SHALL BE SLOTTED ¾" x 2½" AND BOLTS SHALL BE TIGHTENED AS SPECIFIED FOR EXPANSION JOINTS AS PER 606.05.

TAPER: The 40:1 taper shown is de able. However, any taper 25:1 or flatter is acceptable. The length of taper will vary depending o the rate of taper and the alignm of the approach guardrail with respect to the toe of the parapet

SECTION A-A

ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN

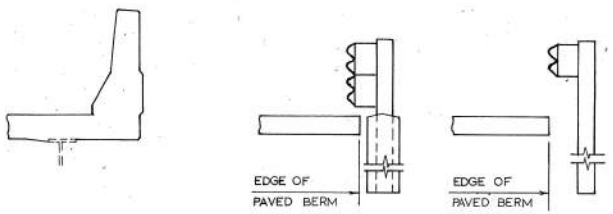
DOWNSPOUT EXTENSION SHALL BE ⅜" THICK GALVANIZED STEEL PIPE. JOINT CONNECTIONS SHALL BE WELDED AS REQUIRED BY 513.17. GALVANIZING SHALL BE IN ACCORDANCE WITH 711.02. ALL MATERIALS, LABOR, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK SHALL BE PAID FOR UNDER ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN. PAINTING OF THE VERTICAL EXTENSION AND DAMAGED AREAS SHALL BE INCLUDED IN ITEM 518 AT THE CONTRACTORS EXPENSE. PAINTING SHALL BE ACCORDING TO 514 SYSTEM B. FINISH PAINT SHALL BE 708.08. PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN.

ITEM 518-VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN

WORK PERFORMED UNDER THIS ITEM SHALL CONSIST OF THE FURNISHINGS AND INSTALLATION OF VERTICAL EXTENSIONS TO EXISTING SCUPPERS IN THE BRIDGE DECKS AS DETAILED ABOVE AND IN ACCORDANCE WITH SECTION 518.06 OF THE SPECIFICATIONS AND REPLACING ANY CONCRETE REMOVED FOR INSTALLATION OF THE VERTICAL EXTENSION OF SCUPPERS. ACTUAL DIMENSION OF THE EXTENSIONS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE EXTENSIONS SHALL BE WELDED TO THE EXISTING SCUPPERS BEFORE THE DECK IS OVERLAYED.

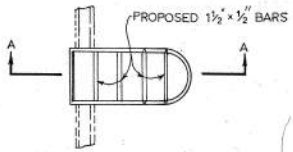
THE MATERIAL UTILIZED FOR THE EXTENSIONS MAY BE WELDABLE GRADE OF LOW OR MILD CARBON STEEL AVAILABLE COMMERCIALLY. THIS MATERIAL IS TO BE EXCLUDED FROM THE REQUIREMENTS OF GALVANIZING ACCORDING TO 711.02 AND FROM THE MILL TEST REPORTS ACCORDING TO 501.07.

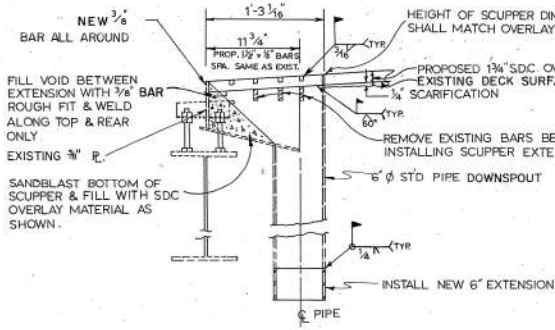
PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 518-VERTICAL EXTENSIONS OF SCUPPERS, AS PER PLAN.



SECTION B-B SECTION C-C SECTION D-D

DESCRIPTION	Br. N° FAI-70 0084 L	Br. N° FAI-70 0084 R	Br. N° FAI-70 0119 L	Br. N° FAI-70 0119 R	Br. N° LIC-70 0074 L	Br. N° LIC-70 0074 R	TOTAL
ITEM 518 VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN	10	10	8	12	8	8	56
ITEM 518 VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN	10	10	8	12	8	8	56





SECTION A-A

VERTICAL EXTENSION OF SCUPPER & DOWNSPOUT

GUARDRAIL TRANS

Appendix E – Bridge Inspection Photographs

Photograph 1: Shared Use Path End View (Looking North)

Photograph 2: Shared Use Path Min. Vertical Clearance Signage

Photograph 3: Left Bridge / R.A., Cracking @ SW Wingwall & Patch Under Beam 8

Photograph 4: Left Bridge / Grout RCP @ Pier 1

Photograph 5: Left Bridge / Silt Deposits Along Pier 1

Photograph 6: Channel Section Through Bridges (Looking South)

Photograph 7: Left Bridge / Pier 1 East Face (Typical Pier Condtion)

Photograph 8: Left Bridge / F.A., Dumped Rock Fill Repair

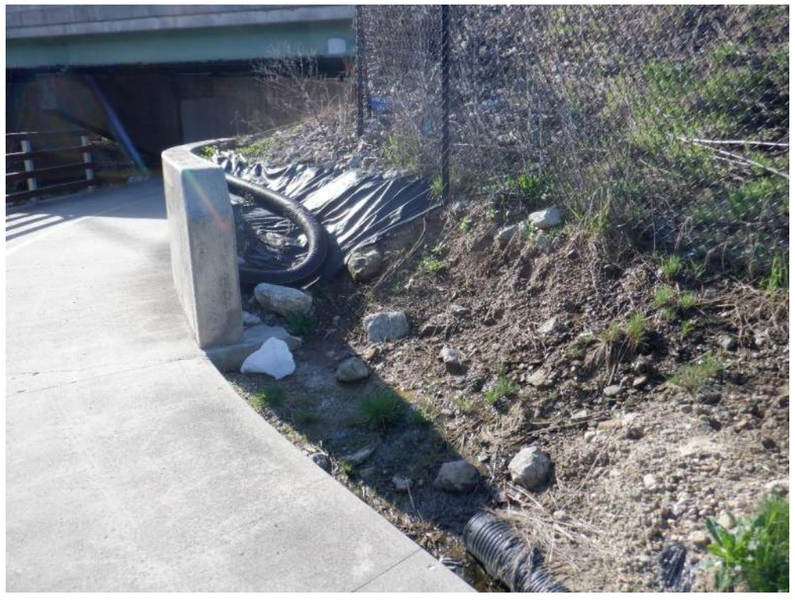
Photograph 9: Left Bridge / F.A., Typical Abutment Condition

Photograph 10: Right Bridge / F.A., Small Spall at Beam 1

Photograph 11: Right Bridge / F.A., Typical Abutment Condition

Photograph 12: Right Bridge / Pier 2, Minor Corner Spall East Face

Photograph 13: Right Bridge / Pier 2 West Face (Typical Pier Condition)



Photograph 14: Severe Erosion at North End of Path Retaining Wall

Photograph 15: Minor Erosion at South End of Path Retaining Wall

Photograph 16: Right Bridge / Electrical Conduit Mounted to Deck

Far East Freeway over Blacklick Creek
FAI-70-00840 L/R
Hydrology and Hydraulics Report

Ohio Department of Transportation – District 5
9600 Jacksontown Road
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June 20, 2023

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AMERICAN STRUCTUREPOINT INC.

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Appendix A – Applicable FIS Data
Appendix B – FEMA FIRMs
Appendix C – Preliminary Site Plan
Appendix D – Channel Cross Section Plan / HEC-RAS Output
Appendix E – Hydraulic Calculations
Appendix F – Site Photos

Summary

The following report has been prepared for the replacement of the existing structure carrying IR-70 over Blacklick Creek in Fairfield County, Ohio. Impacts of the proposed structure replacement on existing channel hydraulics and FEMA flood elevations are evaluated herein, with reference to the ODOT *Location and Design Manual, Volume 2* to ensure all applicable design criteria is met.

The existing IR-70 over Blacklick Creek bridges (FAI-70-00840 L, SFN 2301563; FAI-70-00840 R, SFN 2301598) are three-span (34'-6"±, 43'-0"±, 34'-6"±) continuous rolled steel beam structures with an overall length of 114'-0" ± each. The substructures are comprised of reinforced concrete integral abutments and T-type piers with no skew. The width of the left bridge varies from 55'-10$\frac{1}{2}$"± to 58'-2$\frac{1}{2}$"± face-to-face of parapet. The width of the right bridge is 52'-0"± F/F of parapet. Originally built in 1967, the structures are to be replaced based on current condition and roadway widening requirements. Additional consideration is The Blacklick Creek Greenway Trail which crosses under IR-70 in the west end span of the bridges alongside Blacklick Creek. The proposed structure will maintain or improve the existing minimum vertical clearance of 9'-0".

The recommended replacement structures are three-span (45'-0", 56'-3", 45'-0") continuous reinforced concrete slab bridges on integral abutments and cap and column piers. The proposed Left and Right structures are 83'-4" and 59'-4" wide, respectively. A third, 59'-4" wide structure would carry three lanes of the proposed IR-70 EB CD Road. Due to proximity and similarity of hydraulic cross-section, eastbound and CD Road structures are modeled as a single bridge. The preferred alternative was found to clear the 50-year and 100-year design flood elevations by 2.81 feet and 2.06 feet, respectively. The proposed 26.5" thick slab design reduces structural depth and therefore improves vertical clearance above the shared use path that runs under the bridges. The low chord of the recommended replacement structure is 0.93 feet higher than the existing structure.

The recommended replacement structure meets all hydraulic design criteria, as well as satisfying a "no rise" condition with respect to the effective FEMA 100-year flood elevations.

Project Location

The project is located at the IR-70 crossing over Blacklick Creek in Fairfield County, Ohio. The IR-70 structures are located approximately 0.35 miles west of SR-256.

Hydraulic Narrative

According to the Flood Insurance Study (FIS), Blacklick Creek drains approximately 42.27 square miles to the project site. The location is within the limits of a FEMA designated Zone AE, with established floodway (FIRM Panels 39049C0366K, revised 06/17/2008 and 39045C0020G, effective 01/06/2012); therefore a “no rise” condition is required for the proposed improvements. Based on the FIS performed for Franklin County, Ohio (revised 06/16/2011) a base flood elevation of 831.9’ has been established just upstream of the Left IR-70 bridge (FIS Cross-Section AI). The effective FIRM indicates the roadway is overtopped during the 1% AEP event, thought the analysis did not confirm this. The area immediately surrounding the bridge is comprised primarily of wooded land. Commercial properties are located to the northeast and southeast of the structure. Blacklick Woods Metro Park is located immediately northwest of the structure. The Blacklick Creek Greenway Trail crosses under the structures on the west side.

1 Design Year Frequency and Allowable Headwater

IR-70 is functionally classified as an "urban interstate" roadway with a design year ADT (2050) of 76,150. Based on this information the design flood frequency is the 2% AEP event (50 year), in accordance with Section 1004.2 of the ODOT *Location & Design Manual Volume 2*.

According to the criteria stated in the ODOT *Location & Design Manual Volume 2*, Section 1006.3, the bridge low chord is required to clear the water surface profile of the design year storm. Additionally, the existing headwater for the 2% design AEP and 1% AEP (100 year) events shall be approximately matched or lowered.

2 Hydraulic Analysis

The process to develop the HEC-RAS model used for the hydraulic analysis is discussed below. Hydraulic analysis was conducted using HEC-RAS (v.5.0.6) software. Procedures outlined by FEMA were followed to ensure consistency with the Flood Insurance Study and effective Flood Insurance Rate Mapping. Though the proposed replacement alternatives will not completely span the established floodway, a no-rise condition will be satisfied and no coordination with FEMA is anticipated to be necessary.

A. Effective Model

The data from the FEMA request was received on January 10th, 2023, and consisted of WSPRO model printouts for 100-year (1% AEP), 500-year (0.2% AEP) and floodway runs, a Franklin countywide study with HEC-2 and TR-20 effective models, and 3 LOMRs (00-05-319P, 02-05-3227P, and 98-05-381P). The WSPRO printouts include the section of Blacklick Creek above Main Street, approximately two miles upstream of the structure. The HEC-2 and TR-20 models from the Franklin countywide study include the same section of Blacklick Creek located approximately 15 miles upstream of the structure. The provided LOMRs are located outside the study area, with the closest (98-05-381P) located approximately 5 miles upstream of the bridge. Based on this information, it was determined that an effective model was not available.

B. Duplicate Effective Model

There was insufficient information to recreate a "duplicate effective" model using what was provided by FEMA. As a result, the duplicate effective HEC-RAS model was created using the field survey information, supplemented by GIS data, and the flow rates and Manning's 'n' values from the current Franklin County FIS Study. The model was calibrated using the "Known W.S." boundary condition option in HEC-RAS, with 1% AEP water surface elevations from the Franklin County FIS flood profiles used as input. With no FIS flood profiles for the 0.2% AEP, 2% AEP, 10% AEP, and 20% AEP events provided downstream of the bridge, the local channel slope was calculated from survey data and used as the final boundary condition to include these AEP events in the analysis. The model extends approximately 650' upstream and 750' downstream of IR-70. The results of the duplicate effective model indicate an effective tie-in is achieved with the effective FEMA model at the upstream and downstream limits (RS 2450 and RS 1050). The calculated BFEs at these tie-in points are within 0.5' of the corresponding graphical elevations from the effective Franklin County FIS Flood Profiles (see table in Section C below).

C. Corrected Effective & Existing Model

The corrected effective model is the duplicate effective model. The existing model is the corrected effective model with the addition of the shared use path. Based on satellite imagery, the path was completed around 2010, after the effective FIRM date of June 17th, 2008.

The existing IR-70 bridge is a three-span (34'-6", 43'-0", 34'-6") structure, comprised of continuous rolled steel beams with reinforced concrete deck. The superstructure depth is approximately 3.5' at the upstream face.

Cross Section	Effective Flood Profile (FIS)	Duplicate Effective (Known W.S. Boundary Condition)	Duplicate Effective (Slope Boundary Condition)	Corrected Effective (Slope Boundary Condition)	Existing Condition (Slope Boundary Condition)
RS 2450.00	832.50	832.25	832.32	832.35	832.35
RS 1050.00	827.60	827.60	828.01	828.01	828.01

The results of the hydraulic analysis indicate that the existing structure is adequately sized for peak storm events. The existing low chord clears the 2% AEP event by 1.36 feet at the upstream face of the structure and the structure is not overtopped by the 1% AEP event. However, the existing structure is overtopped by the 0.2% AEP event. Outlet velocities at the structure downstream cross section are 8.05 fps and 8.67 fps for the 2% AEP and 1% AEP events respectively.

D. Proposed Model

Alternative A

Alternative A consists of a 3-span (49'-0", 65'-0", 49'-0") continuous steel beam superstructure on integral abutments and reinforced concrete cap and column piers. The proposed span arrangement was developed to better accommodate the Blacklick Trail shared use path by increasing the current end span lengths. Reduction in beam depth from the existing 30" wide-flange beam to a W27 section allows widening of the bridge while maintaining the existing low chord elevation. The overall length of the structure increases from 112 feet to 163 feet.

The results of the hydraulic analysis indicate that this alternative meets all hydraulic design criteria and satisfies the "no rise" condition. The proposed low chord clears the 2% AEP event by 2.03 feet at the upstream face of the structure and the structure is not overtopped by the 1% AEP event. Outlet velocities at the structure downstream cross section are 8.10 fps and 8.73 fps for the 2% AEP and 1% AEP events respectively.

Alternative B

Alternative B consists of a 3-span (45'-0", 56'-3", 45'-0") reinforced concrete slab superstructure on integral abutments and cap and column piers. The proposed span arrangement was selected from the standard continuous slab bridge designs to better accommodate the Blacklick Trail, by increasing the current end span lengths. The proposed superstructure depth is approximately 2.21 feet. Reduced structural depth raises the bridge low chord by 0.93 feet, increasing path vertical clearance and waterway opening area.

The results of the hydraulic analysis indicate that this alternative meets all hydraulic design criteria and satisfies the "no rise" condition. The proposed low chord clears the 2% AEP event by 2.81 feet at the upstream face of the structure and the structure is not overtopped by the 1% AEP event. Outlet velocities at the structure downstream cross section are 8.18 fps and 8.84 fps for the 2% AEP event and 1% AEP event respectively.

Alternative C

The Widening Alternative maintains the existing three-span (34’-6”, 43’-0”, 34’-6”) arrangement for the Left and Right bridges. The CD Road Bridge matches the locations of the Forward Abutment and Piers 1 and 2, while lengthening Span 1 to 48’-3” to accommodate the Blacklick Trail. The Left and Right structures are widened to 83’-4” and 59’-4” respectively. The proposed low chord clears the 2% AEP event by 1.27 feet at the upstream face of the structure and the structure is not overtopped by the 1% AEP event. However, the proposed widening does not satisfy a “no rise” condition with respect to the effective FEMA base flood elevations. Outlet velocities at the structure downstream cross section are 8.30 fps and 8.99 fps for the 2% AEP and 1% AEP events respectively.

Refer to the Structure Type Study for more information on the Existing and Proposed Structures.

Hydraulic Analysis Summary

	Existing	Proposed Alt. A	Proposed Alt. B (Recommended)	Proposed Alt. C
Q_{50} (CFS)	8,696	8,696	8,696	8,696
Q_{100} (CFS)	10,000	10,000	10,000	10,000
Bridge Type	Rolled Steel Beam	Rolled Steel Beam	Concrete Slab	Rolled Steel Beam
Waterway Opening Area (SFT)	±1,283 (L) ±1,275 (R)	1,712 (L) 1,748 (R)	1,748 (L) 1,742 (R)	1,336 (L) 1,332 (R)
Span Arrangement (FT)	Three Span: ±34’-6”, ±43’-0”, ±34’-6”	Three Span: 49’-0”, 65’-0”, 49’-0”	Three Span: 45’-0”, 56’-3”, 45’-0”	Three Span: ±34’-6”, ±43’-0”, ±34’-6”
Bridge Width (FT)	±55.88’ - 58.21’ (L) ±52.0’ (R)	83.33’ (L) 59.33’ (R) 59.33’ (CD Road)	83.33’ (L) 59.33’ (R) 59.33’ (CD Road)	83.33’ (L) 59.33’ (R) 59.33’ (CD Road)
Low Chord Elevation	±831.81	831.81	832.74	831.81
HW_{50} (Upstream)	830.45	829.78	829.93	830.54
HW_{100} (Upstream)	831.29	830.51	830.68	832.65
$Velocity_{50}$ (FPS) (Downstream)	8.05	8.10	8.18	8.30
$Velocity_{100}$ (FPS) (Downstream)	8.67	8.73	8.84	8.99

Scour Analysis

A detailed scour analysis was not done as part of this report, as the geotechnical exploration has yet to be performed and the D50 particle size was unavailable. This analysis will be completed once the required information is provided. Field observations indicated no evidence of scour at the existing bridges, though the channel is migrating to the west immediately north of the crossing. Based on the existing conditions and low channel velocities, long term scour does not appear to be the major concern. Per Section 1008.10.1 of the ODOT Location & Design Manual, Volume 2 the scour design and check flood frequencies are Q1% and Q0.2% respectively.

Deep foundations are proposed for the replacement substructures, reducing the severity of any long-term scour concerns. Additionally, countermeasures in the form of Type C Rock Channel Protection (RCP) to armor the end slopes are warranted and recommended to prevent scour/erosion and resulting loss of pile embedment length. The deep foundation design will account for calculated potential scour depth and tip elevations extended accordingly.

Evaluation of Shared-Use Path

The Blacklick Creek Greenway Trail crosses under IR-70 alongside Blacklick Creek. The trail is situated between the R.A. and Pier 1 of the existing bridges. According to Section 1004.2 of ODOT *Location & Design Volume 2*, bikeways are required to clear the 20% AEP (5-year) event unless approved by ODOT's Office of Hydraulic Engineering. Peak discharge data for the 20% AEP event was not available in the FIS report but was estimated by regession of 10%, 2%, 1% and 0.2% peak discharge rates at cross section AI. The 20% AEP event discharge was included in HEC-RAS steady flow data for existing and proposed models. The following table provides a summary of this analysis.

	Existing	Proposed Alt. A	Proposed Alt. B (Recommended)	Proposed Alt. C
Q_5 (CFS)	5,799	5,799	5,799	5,799
Vertical Clearance (FT)	±9.00'	9.04'	10.07'	9.04'
Low Chord Elevation	±831.90	831.81	832.84	831.81
Path Elevation	±822.90	822.77	822.77	822.77
HW_5 (Upstream)	828.30	827.91	828.01	828.35

Though the path does not clear the design year 20% AEP event, inundation depths are reduced for both Alternatives A and B compared to Existing.

Flood Hazard Evaluation

The proposed structure alternatives will have no upstream or downstream flooding impacts. Existing flood elevations are either reduced or unchanged along the modeled portion of the channel.

Bridge Deck Drainage

The proposed structure will utilize 42” single slope concrete bridge railing (SBR-1-13). With the proposed IR-70 profile matching existing, a sag curve low point will be placed in the middle of the bridge. As a result, scuppers will be required at both the inside and outside shoulders of the bridges. The need for additional temporary scuppers to accommodate deck drainage during phase construction will be evaluated once an approved MOT scheme has been determined.

Conclusion

The preferred replacement structure is Alternative B, a three-span (45’-0”, 56’-3”, 45’-0”) reinforced concrete slab superstructure on integral abutments and cap and column piers.

The recommended replacement structure meets all hydraulic design criteria, as well as satisfying a “no rise” condition with respect to the effective FEMA 1% AEP base flood elevations.

Appendix A – Applicable FIS Data

FLOOD INSURANCE STUDY

VOLUME 1 of 4

FRANKLIN COUNTY, OHIO
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BEXLEY, CITY OF	390168
BRICE, VILLAGE OF	390898
CANAL WINCHESTER, VILLAGE OF	390169
COLUMBUS, CITY OF	390170
DUBLIN, CITY OF	390673
FRANKLIN COUNTY (UNINCORPORATED AREAS)	390167
GAHANNA, CITY OF	390171
GRANDVIEW HEIGHTS, CITY OF	390172
GROVE CITY, CITY OF	390173
GROVEPORT, VILLAGE OF	390174
HARRISBURG, VILLAGE OF	390897
HILLIARD, CITY OF	390175
LOCKBOURNE, VILLAGE OF	390691
MARBLE CLIFF, VILLAGE OF	390896
*MINERVA PARK, VILLAGE OF	390791
NEW ALBANY, VILLAGE OF	390895
OBETZ, VILLAGE OF	390176
REYNOLDSBURG, CITY OF	390177
RIVERLEA, VILLAGE OF	390692
UPPER ARLINGTON, CITY OF	390178
URBANCREST, VILLAGE OF	390893
VALLEYVIEW, VILLAGE OF	390669
WESTERVILLE, CITY OF	390179
WHITEHALL, CITY OF	390180
WORTHINGTON, CITY OF	390181

Franklin County

* NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED WITHIN COMMUNITY

REVISED:
June 16 2011

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
39049CV001D

Table 7. Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cfs)			
		10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
Billingsley Ditch					
At confluence with the Scioto River	1.8	490	750	870	1,120
Bishop Run					
At confluence with Little Walnut Creek	3.70	914	1,425	1,668	2,542
At Lithopolis Road	2.18	613	957	1,117	1,654
At county boundary	1.90	568	891	1,041	1,551
Blacklick Creek					
At confluence with Big Walnut	*	7,300[1]	*	8,800	*
DS of Hamilton Road	*	7,300[1]	*	8,800	*
DS of U.S. Route 33	*	7,400[1]	*	8,600	*
Just DS of confluence of Powell Ditch	*	7,250[1]	*	8,700	*
Just DS of Long Road	*	8,550[1]	*	10,800	*
Approximately 9,000 feet DS of Tussing Road	50.6	*	*	10,900	*
At cross-section Al	42.27	6,540	8,696	10,000	13,066
Just US of Livingston Avenue	*	7,900[1]	*	10,000	*
Just US of Blacklick Creek Lateral K	38.53	6,185	8,243	9,500	12,471
Just US of French Run	32.20	5,096	6,832	7,900	10,352
Just US of Dysar Ditch	26.96	4,548	6,101	7,000	9,212
Just DS of confluence of Utzinger Ditch	*	5,550[1]	*	7,000	*
Just US of State Route 6	*	5,200[1]	*	6,800	*
Just US of confluence with Blacklick Creek Tributary C	*	4,750[1]	*	6,000	*
Just US of Clark State Road	*	4,200[1]	*	5,300	*
Just US of Dublin-Granville Road	*	2,825[1]	*	3,500	*
Just DS of Central College Road	4.72	742	157	1,341	1,976
Just DS of Tributary A	3.73	619	966	1,120	1,654
Just US of Tributary Al	2.12	402	630	731	1,084
Blacklick Creek Lateral D					
At confluence with Blacklick Creek	0.80	313	425	495	652
Blacklick Creek Lateral G-B					
At confluence with French Run	0.35	194	256	297	385
Blacklick Creek Lateral K					
At cross-section H	1.17	240	315	361	465
Blacklick Creek Tributary C					
At confluence with Blacklick Creek	2.2	*	*	1,150	*
Blau Ditch					
At Wilson Road	0.97	485	698	804	1,200
Brown Run					
At Hoover Road	1.53	270	490	660	1,200
At CSX Transportation	1.00	150	310	410	780

Table 8. Summary of Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Alum Creek	0.036-0.050	0.042-0.140
Barbee Ditch	0.035-0.055	0.080-0.150
Barnes Ditch	0.035-0.050	0.060-0.200
Baumgardner Ditch	0.030-0.048	0.030-0.080
Beem Ditch	0.035-0.040	0.030-0.110
Big Darby Creek	0039-0.064	0.043-0.068
Big Run	0035-0.040	0.045-0.300
Big Walnut Creek	0.035-0.050	0.020-0.085
Billingsley Ditch	0.040-0.050	0.550-0.070
Bishop Run	0.030-0.035	0.040-0.080
Blacklick Creek	0.025-0.062	0.035-0.100
Blacklick Creek Lateral D	0.045-0.072	0.042-0.091
Blacklick Creek Lateral G-B	0.075	0.092
Blacklick Creek Lateral K	0.049-0.078	0.032-0.083
Blacklick Creek Tributary C	0.075	0.083-0.090
Blau Ditch	0.040-0.055	0.080-0.160
Brown Run	0.030-0.060	0.035-0.110
Clover Groff Ditch	0.028-0.036	0.045-0.070
Coble-Bowman Ditch	0.058-0.073	0.090-0.105
Cosgray Ditch	0.030-0.060	0.080-0.200
Cramer Ditch	0.035-0.055	0.060-0.120
Dry Run	0.040-0.060	0.080-0.160
Dysar Ditch	0.036-0.063	0.060-0.095
Early Run	0.045-0.050	0.050-0.075
French Run	0.048-0.061	0.065-0.085
French Run (Lateral G-A)	0.028-0.059	0.034-0.090
Georges Creek	030-0.050	0.030-0.100
Grant Run	0.012-0.048	0.060-0.078
Grove City Creek 1	0.040-0.075	0.030-0.075
Grove City Creek 2	0.020-0.045	0.040-0.080
Haines Ditch	0.050	0.085-0.090
Hamilton Ditch	0.035-0.045	0.050-0.075
Hayden Run	0.030-0.050	0.040-0.075
Faust County Ditch	0.030-0.050	0.040-0.150
Hellbranch Run	0.035-0.040	0.045-0.065
McCoy Ditch	0.035-0.040	0.045-0.065
Indian Run	0.025-0.050	0.055-0.100
North Fork Indian Run	0.025-0.050	0.055-0.100
Lisle Ditch	0.035-0.040	0.060-0.070
Little Darby Creek	0.045-0.060	0.053-0.079
Little Walnut Creek	0.030-0.050	0.030-0.080
Marsh Run	0.030-0.048	0.030-0.080
Martin Grove Ditch	0.042-0.083	0.041-0.076
Mason Run	0.035-0.054	0.043-0.090
Molcomb Ditch	0.035-0.050	0.045-0.150
Mulberry Run	0.040-0.075	0.030-0.075
West Water Run	0.020-0.045	0.004-0.080
Olentangy River	0.032-0.062	0.025-0.138

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	WIDTH REDUCED FROM PRIOR STUDY	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Blacklick Creek									
AE	48,250	486/402[2]		2,961	3.7	804.8	804.8	805.3	0.5
AF	50,680	462/240[2]		2,848	3.8	811.9	811.9	812.4	0.5
AG	53,300	325		1,911	5.6	819.7	819.7	820.2	0.5
AH	54,700	482	246[3]	2,948	3.6	822.6	822.6	823.1	0.5
AI	57,050	993		6,626	1.5	831.9	831.9	832.4	0.5
AJ	61,125	488		3,155	3.2	840.0	840.0	840.5	0.5
AK	62,775	520		3,517	2.8	845.4	845.4	845.9	0.5
AL	63,200	318		2,545	3.9	847.2	847.2	847.7	0.5
AM	63,300	460		3,958	2.4	849.8	849.8	850.3	0.5
AN	63,575	460		3,958	2.4	850.0	850.0	850.5	0.5
AO	64,275	543		4,070	2.3	850.4	850.4	850.9	0.5
AP	65,085	509		2,352	4.0	851.7	851.7	852.2	0.5
AQ	66,135	353		1,785	5.3	855.6	855.6	856.1	0.5
AR	66,980	118		1,458	6.5	859.4	859.4	859.9	0.5
AS	67,110	160		1,251	7.6	859.4	859.4	859.9	0.5
AT	67,460	590		3,349	2.4	860.7	860.7	861.1	0.4
AU	68,680	480		2,547	3.1	861.1	861.1	861.5	0.4
AV	69,330	520		2,534	3.1	861.8	861.8	862.3	0.5
AW	70,030	220		1,152	6.9	863.4	863.4	863.8	0.4
AX	70,430	510		1,724	4.6	865.6	865.6	865.6	0.0
AY	70,740	675		3,015	2.6	866.5	866.5	866.9	0.4
AZ	71,390	530		2,166	3.7	867.6	867.6	867.9	0.3
BA	72,090	395		2,317	3.4	869.3	869.3	869.6	0.3
BB	72,310	246		1,327	6.0	869.5	869.5	869.8	0.3

[1]Feet above confluence with Big Walnut Creek [2]Total width/width within county boundary [3]See explanation in Section 4.2

Table 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

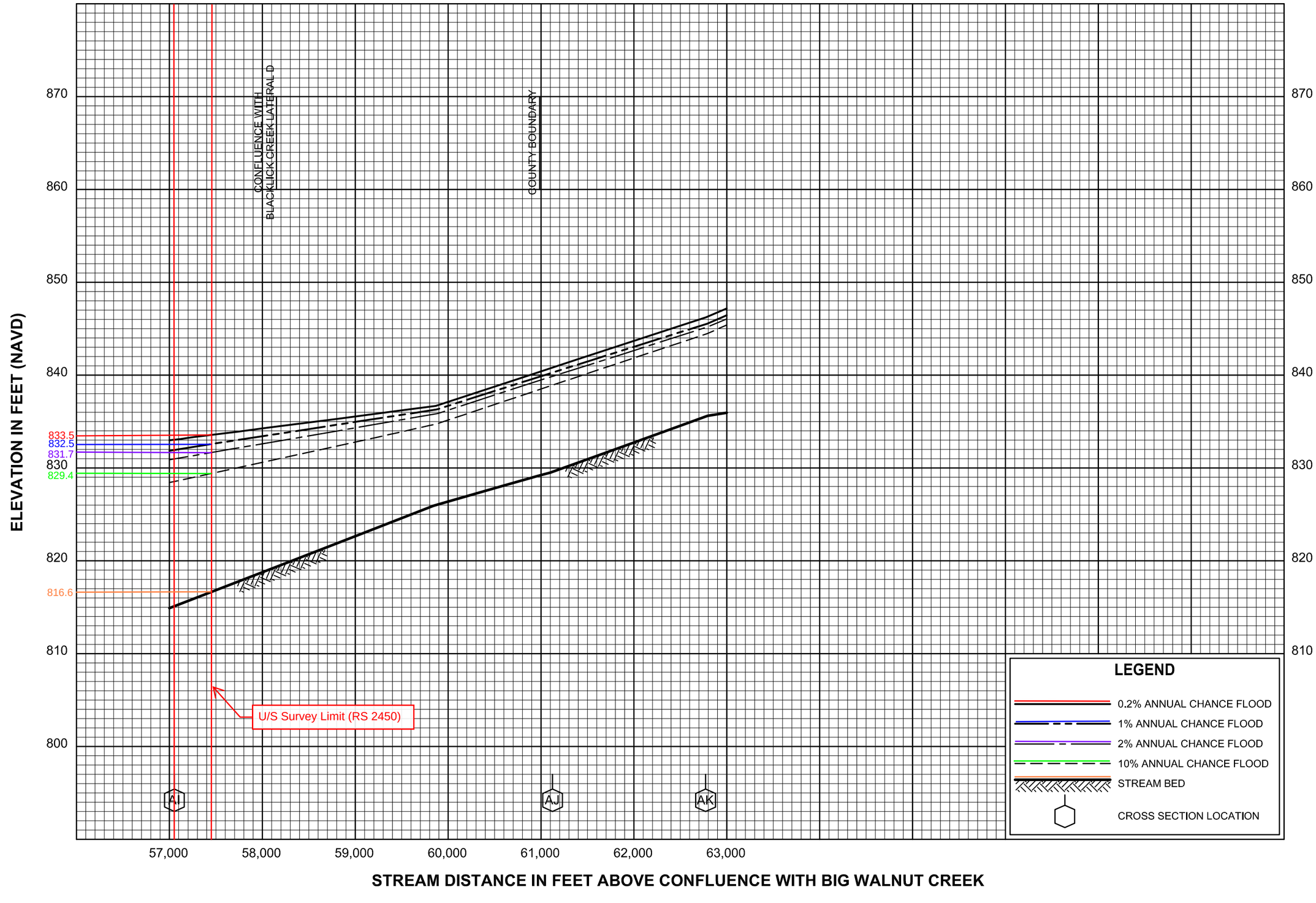
FRANKLIN COUNTY, OHIO
AND INCORPORATED AREAS

FLOODWAY DATA

Blacklick Creek

39049CV001D

39049CV002D



FLOOD PROFILES

BLACKLICK CREEK

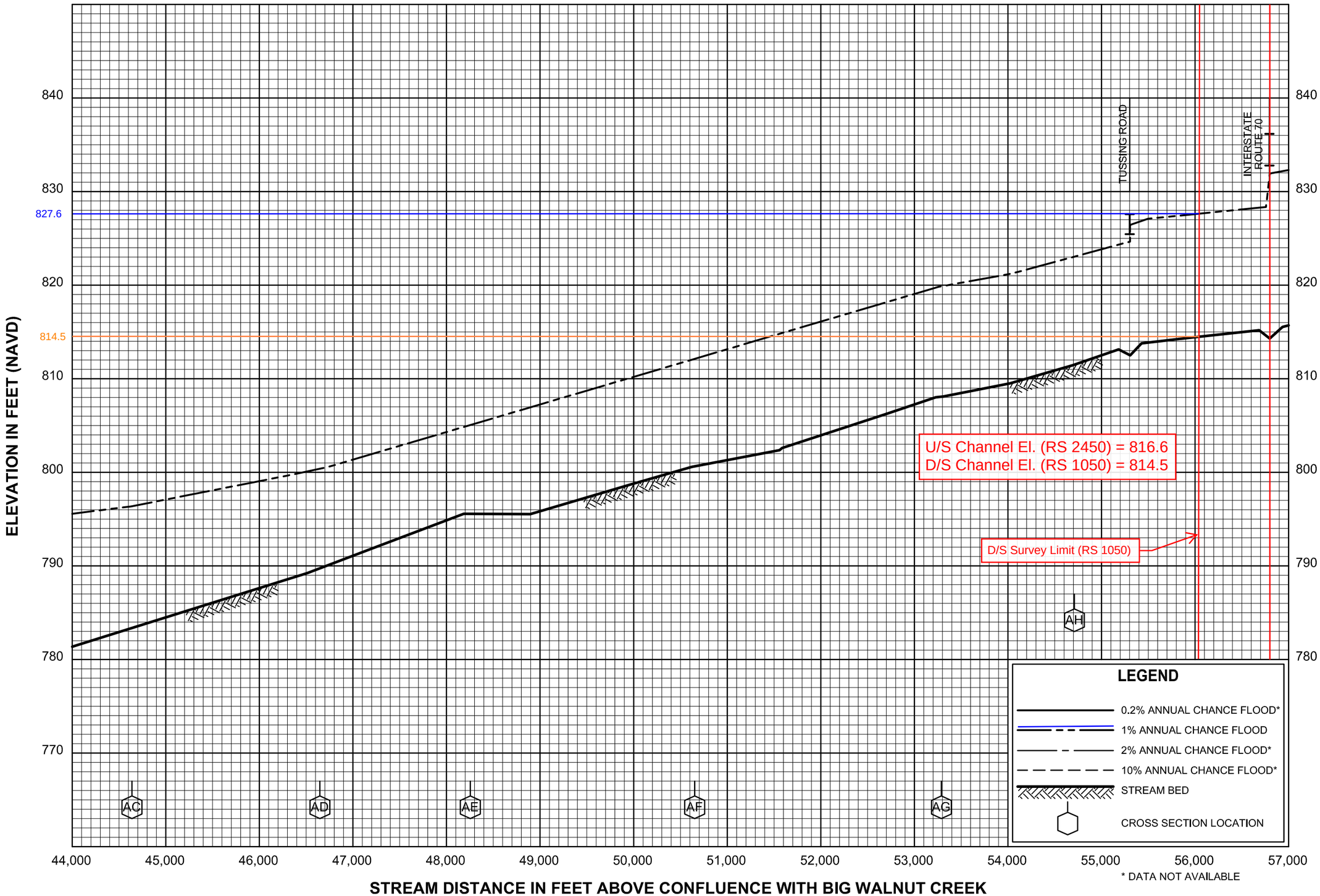
FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OH

AND INCORPORATED AREAS

44P

39049CV002D



FLOOD PROFILES

BLACKLICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OH

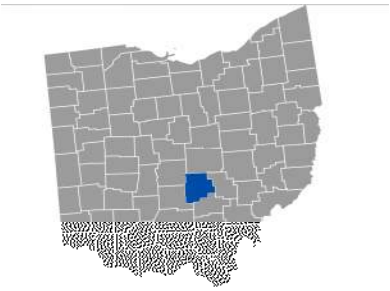
AND INCORPORATED AREAS

43P

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 3



FAIRFIELD COUNTY, OHIO

AND INCORPORATED AREAS

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
AMANDA, VILLAGE OF *	390688	PICKERINGTON, CITY OF	390162
BALTIMORE, VILLAGE OF	390159	PLEASANTVILLE, VILLAGE OF *	391097
BREMEN, VILLAGE OF	390160	RUSHVILLE, VILLAGE OF *	390997
BUCKEYE LAKE, VILLAGE OF	390882	STOUTSVILLE, VILLAGE OF *	390998
CARROLL, VILLAGE OF	390817	SUGAR GROVE, VILLAGE OF	390163
FAIRFIELD COUNTY, UNINCORPORATED AREAS	390158	TARLTON, VILLAGE OF *	390902
LANCASTER, CITY OF	390161	THURSTON, VILLAGE OF	390690
LITHOPOLIS, VILLAGE OF *	390044	WEST RUSHVILLE, VILLAGE OF *	391098
MILLERSPORT, VILLAGE OF	390689		

*No Special Flood Hazard Areas Identified

REVISED:

APRIL 17, 2020

FLOOD INSURANCE STUDY NUMBER
39045CV001C
Version Number 2.3.3.6

FEMA

39045CV001C

Peak discharge data from Fairfield County FIS; Location outside area of hydraulic study

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Plus	0.2% Annual Chance
Baldwin Run	At mouth	13.1	4,400	*	6,300	7,300	*	9,100
Baltimore Tributary	At confluence with Pawpaw Creek	6.7	1,270	*	1,890	2,730	*	3,490
Blacklick Creek	Approximately 9,000 feet downstream of Tussing Road	50.6	*	*	*	10,900	*	*
Blue Valley Lateral	At confluence with Hocking River	6.6	1,184	*	1,866	2,251	*	3,036
Clark Run	At mouth	12.9	*	*	*	1,205	*	1,500
Claypools Run	At mouth	5.9	953	*	1,470	1,690	*	2,220
Claypools Run	Approximately 570 feet downstream of Havensport Road	4.6	849	*	1,320	1,530	*	2,020
Crumley Creek	At mouth	1.9	471	*	610	678	*	802
Ewing Run	At mouth	5.2	2,300	*	3,200	3,700	*	4,700
Ewing Run	Just upstream of Tiki Lane Road	3.7	2,100	*	2,900	3,400	*	4,200

*Data not available / not calculated for this Flood Risk Project

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BLACKLICK CREEK								
A	47,500	455	2,233	4.9	804.0	804.0	804.3	0.3
B	50,985	480	2,167	4.9	814.4	814.4	815.0	0.6
C	55,430	480	3,013	3.5	825.6	825.6	825.8	0.2
D	56,630	480	1,828	5.5	827.9	827.9	828.3	0.4

[1] Feet above confluence with Big Walnut Creek

TABLE 24

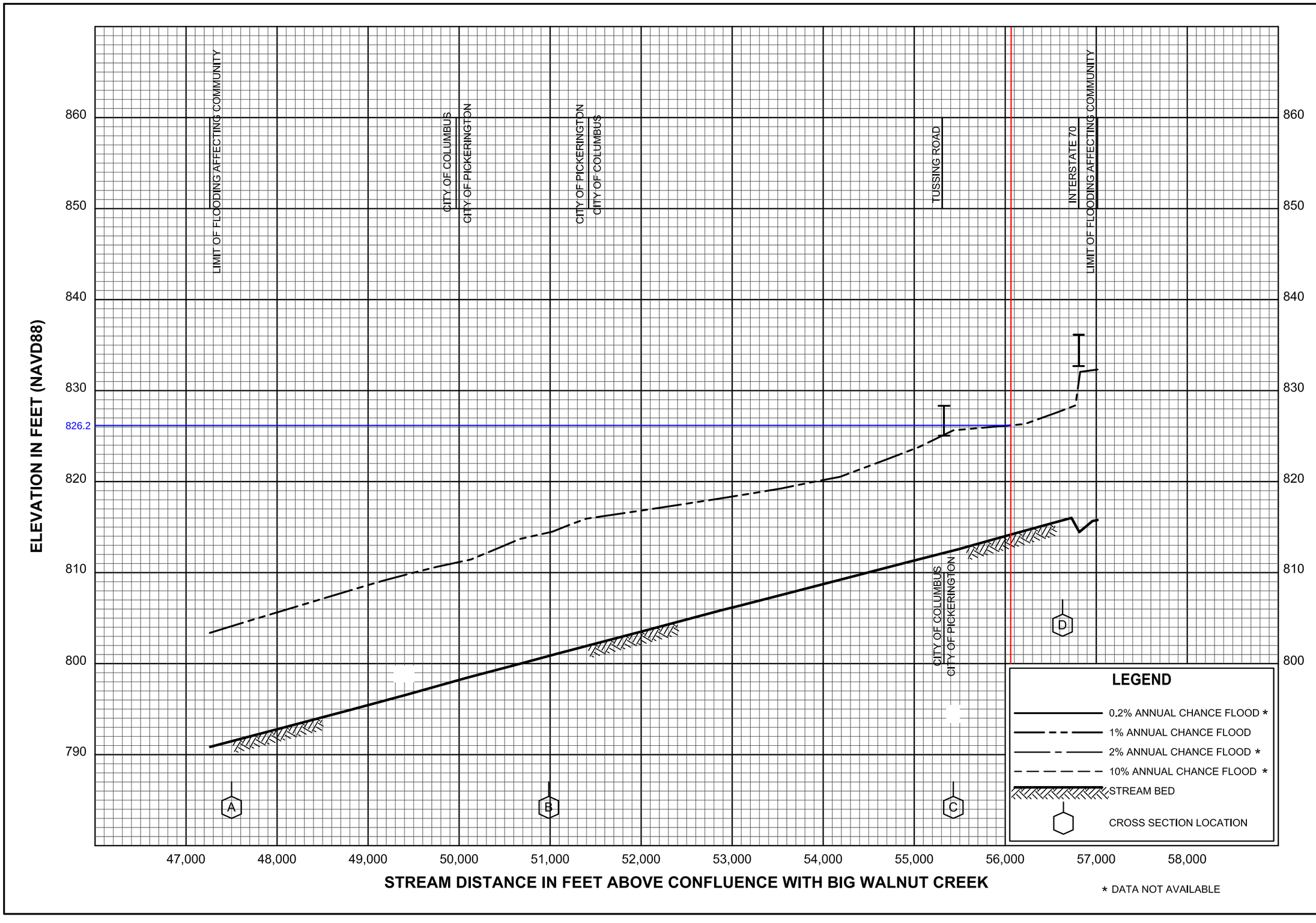
FEDERAL EMERGENCY MANAGEMENT AGENCY

FAIRFIELD COUNTY, OHIO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BLACKLICK CREEK



FLOOD PROFILES

BLACKLICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FAIRFIELD COUNTY, OH

AND INCORPORATED AREAS

003P

39045CV002C

Appendix B – FEMA FIRMs

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane South Zone 5001 (FIPSZONE 3402). The **horizontal datum** was NAD83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Franklin County and the Fairfield County, Ohio GIS Department. This information was produced at scales of 1:1,200 and 1:12,000 respectively from aerial photography dated 2000 or later, and from USGS digital orthophoto quadrangles dated 1998 or later.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

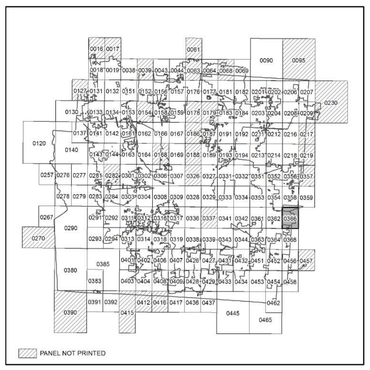
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

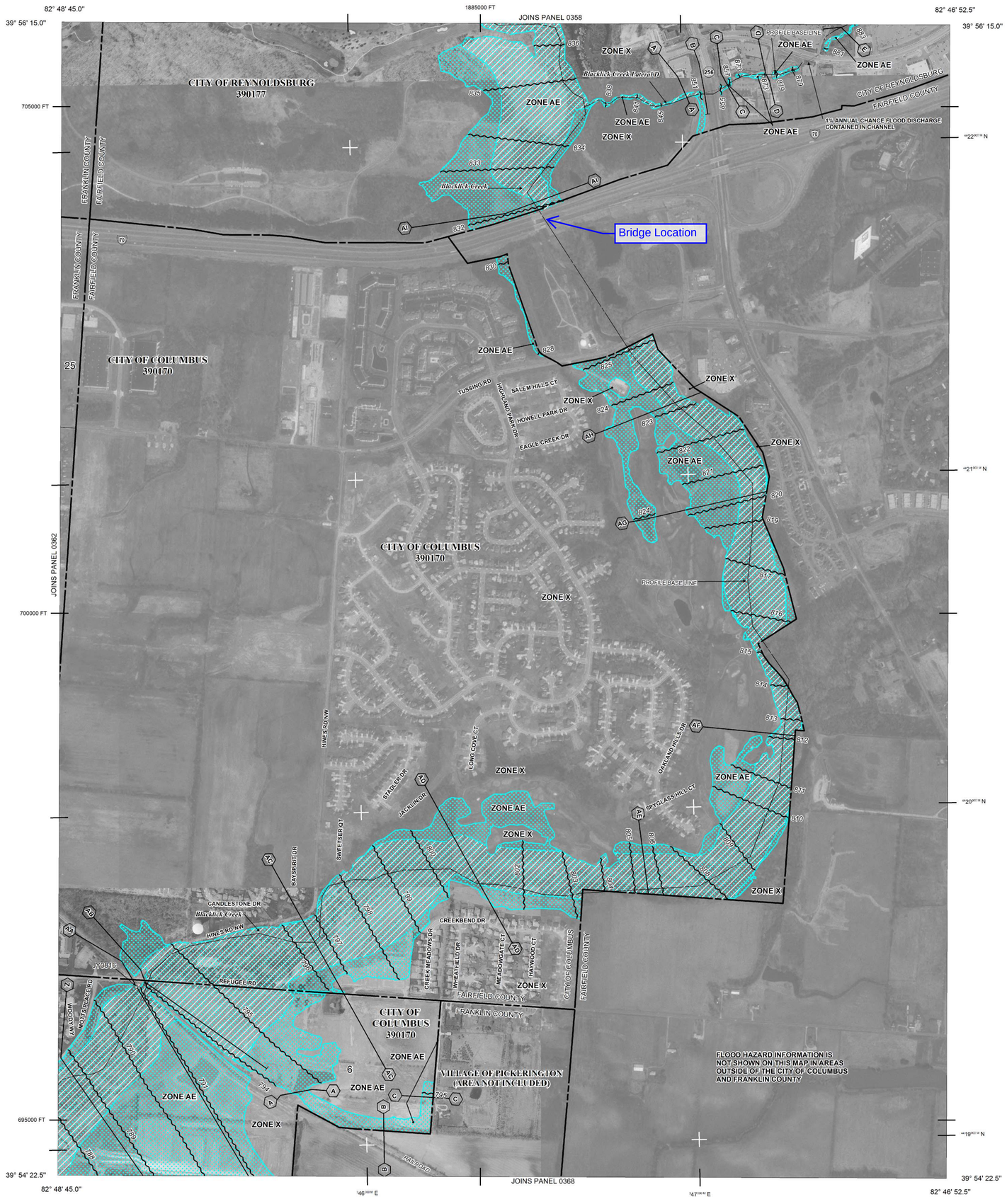
Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

PANEL INDEX





LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100 year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside of the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 10)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
85°03'45.0", 41°24'22.5"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4587000 M	1000-meter Universal Transverse Mercator grid values, zone 17
2250000 FT	5000-foot grid ticks: Ohio State Plane South Coordinate System, 5001 Zone (FIPSZONE 3402) Lambert Conformal Conic
KA0015 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
AUGUST 2, 1995
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
7/16/1997
4/21/1999
3/16/2004
9/19/2007

June 17, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0366K

FIRM

FLOOD INSURANCE RATE MAP

FRANKLIN COUNTY, OHIO AND INCORPORATED AREAS

PANEL 366 OF 465

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBUS, CITY OF	390170	0366	K
PICKERINGTON, VILLAGE OF	390162	0366	K
REYNOLDSBURG, CITY OF	390177	0366	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
39049C0366K

MAP REVISED
JUNE 17, 2008

Federal Emergency Management Agency

NOTES TO USERS

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NOAA, N/NGS12
National Geodetic Survey
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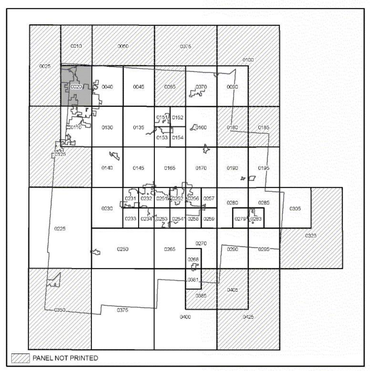
PANEL INDEX



82° 48' 45.0"
82° 45' 00.0"
39° 56' 15.0"
39° 52' 30.0"
1885000 FT
1890000 FT
1895000 FT
705000 FT
700000 FT
695000 FT
690000 FT
685000 FT
JOINS PANEL 0010
JOINS PANEL 0025
JOINS PANEL 0040
JOINS PANEL 0110
Bridge Location
CITY OF REYNOLDSBURG (AREA NOT INCLUDED)
FAIRFIELD COUNTY UNINCORPORATED AREAS 390158
CITY OF PICKERINGTON 390162
CITY OF COLUMBUS (AREA NOT INCLUDED)
FRANKLIN COUNTY
FAIRFIELD COUNTY
ZONE AE
ZONE A
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
Blacklick Creek
PROFILE BASE LINE
Georges Creek
WINDERLY LN
CREEKSIDE LN
FREEDOM WAY
SALEM HILLS CT
WHITNEY CIR
BARKLEY DR
TURNBERRY DR
CHARLES CT
RIDGECLIFF PL
WELLINGTON DR
HILLRD
CENTER
OVERLOOK CT
POSTAGE DR
BELLSTONE ST
POSTAGE CIR
STONECREEK DR
CREEKMEADOWS DR
WHEATFIELD DR
MEADOWGATE CT
FULLERS WAY
FULLER'S CIR
GLADES ST
PICKERINGTON RIDGE DR
REFUGEE RD
TREEMOSS ST
ELLIS ST
McCUNN ST
WASHINGTON ST
RAILROAD
WRIGHT RD
LEACH DR
LONG RD
OLEY RD
W COLUMBUS ST
LORRAINE DR
KAYE DR
WILLOW RUN DR
LEANING FENCE CT
BRANDYHILL AVE
STONEBRIDGE BLVD
MISTY HOLLOW ST
HARVEST CT
CHATHAM CT
FIELD HARVEST AVE
THERON DR
CANTERIDGE DR
TURNERS MILL CT
RAMBLING BROOK DR
OPPORTUNITY WAY
PEARL ST
WOODCUTTERS LN
RAMBLEWOOD CT
EASTON DR
McLEOD PKWY
ABBEY CT
EASTFIELD CT
STREAMSIDE DR
VILLAGE MILLROD
COURTRIGHT DR
JERICHO RD
COURTLAND LN
WAGNALLS CT
JAMIE LYNN CIR
KINGSTON CIR
ROBIN CT
LONGVIEW ST
EVENING WAY
MEADOWS BLVD
CARDINAL CT
PHEASANT LN
STREAMVIEW CT
BRACKBILL CT
KNOWLTON CT
PRUDEN DR
Willow Run
STEIGER CT
LODGE CT
SHERYL DR
WILLOW PL
CHURCH ST
COLUMBUS ST
PARKWAY
FANCHERS ST
EARLAND ST
CENTER ST
EAST ST
Sycamore Creek
FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE VILLAGE OF PICKERINGTON AND FAIRFIELD COUNTY
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 15 NORTH, RANGE 20 WEST AND TOWNSHIP 16 NORTH, RANGE 20 WEST.
T. 16 N.
T. 15 N.
JY0819
JY0820
JY0822
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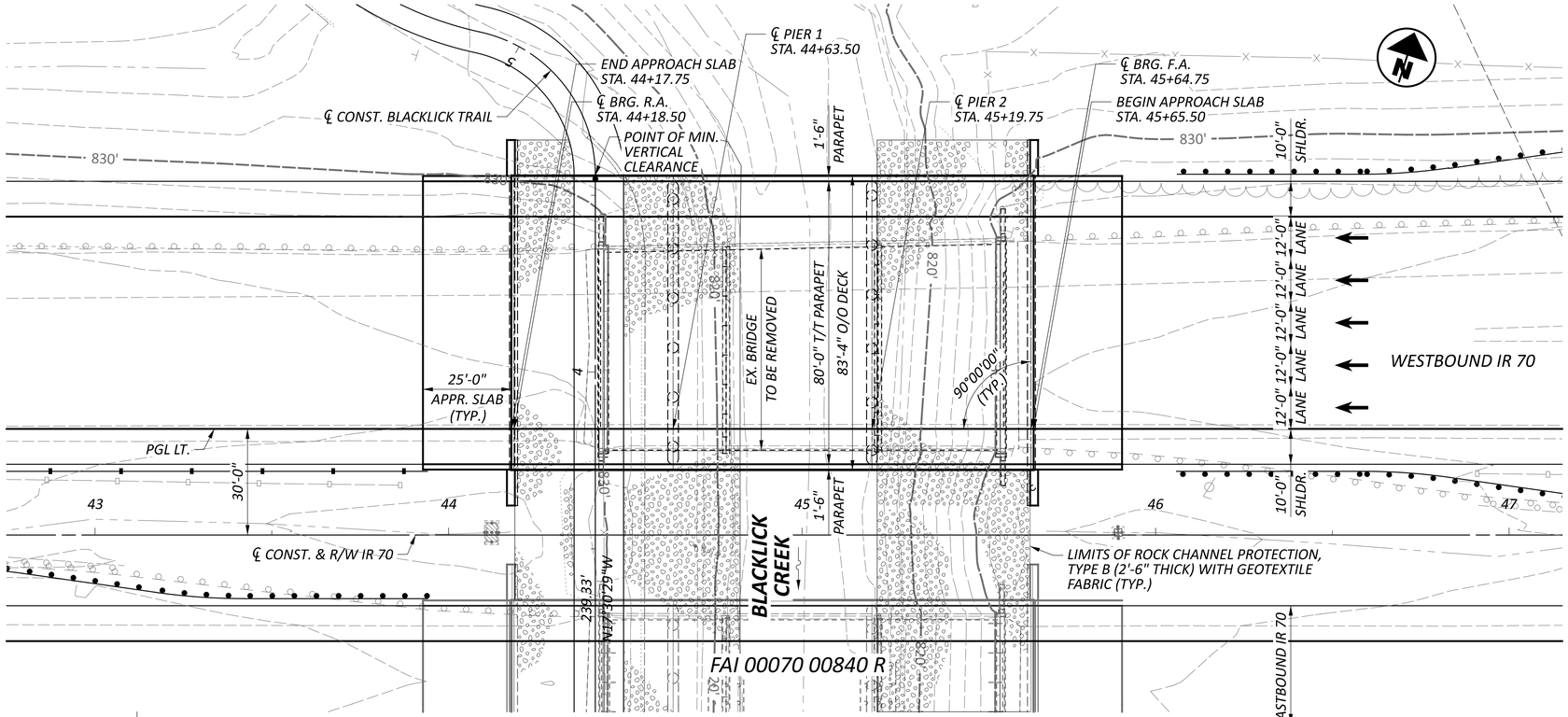
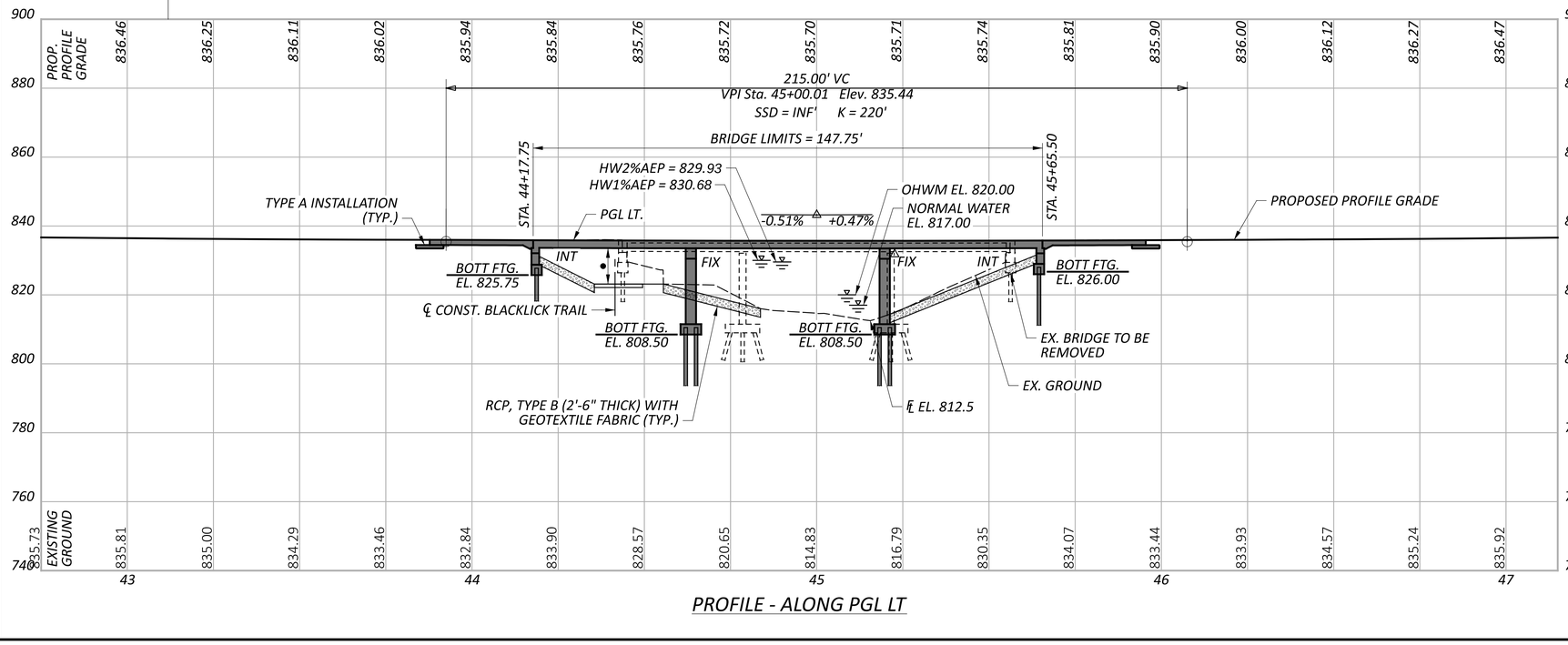
Appendix C – Preliminary Site Plan



PLAN



PROFILE - ALONG PGL LT

BENCHMARK DATA (TO BE COMPLETED AT STAGE 1)

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 28,340 2030 ADTT = 3,401
2050 ADT = 38,075 2050 ADTT = 4,569
DIRECTIONAL DISTRIBUTION = 100%

LEGEND

● 10'-0" PREFERRED MINIMUM VERTICAL CLEARANCE
10'-0⅞" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = 42.27 SQ. MILES
Q (2% AEP) = 8,696 CFS (FIS) V (2% AEP) = 8.18 FT/S
Q (1% AEP) = 10,000 CFS (FIS) V (1% AEP) = 8.84 FT/S
STRUCTURE CLEARS THE 2% AEP
DESIGN HW BY 2.88 FEET.

EXISTING STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE
SPANS: 34'-6"±, 43'-0"±, 34'-6"±
ROADWAY: VARIABLE TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: NONE
WEARING SURFACE: 1"± MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 2301563
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS REINFORCED CONCRETE SLAB SUPPORTED ON REINFORCED CONCRETE ABUTMENTS AND CAP AND COLUMN PIERS
SPANS: 45'-0", 56'-3", 45'-0"
(℄ BRG. R.A/℄ PIER, ℄ PIER/℄PIER, ℄ PIER/℄ BRG. F.A.)
ROADWAY: 80'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: NONE
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0" LONG, 15" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 12,313 SF
COORDINATES: LATITUDE 39°55'55.80"
LONGITUDE -82°47'45.6"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI 00070 00840 L
IR 70 OVER BLACKLICK CREEK

SFN TBD
DESIGN AGENCY STRUCTUREPOINT INC.
DESIGNER MAH | CHECKER SJF
REVIEWER CLB 06-14-23
PROJECT ID 96808
SUBSET 1 | TOTAL 4
SHEET P.0 | TOTAL 0

FAI/LIC-70.0/0.00

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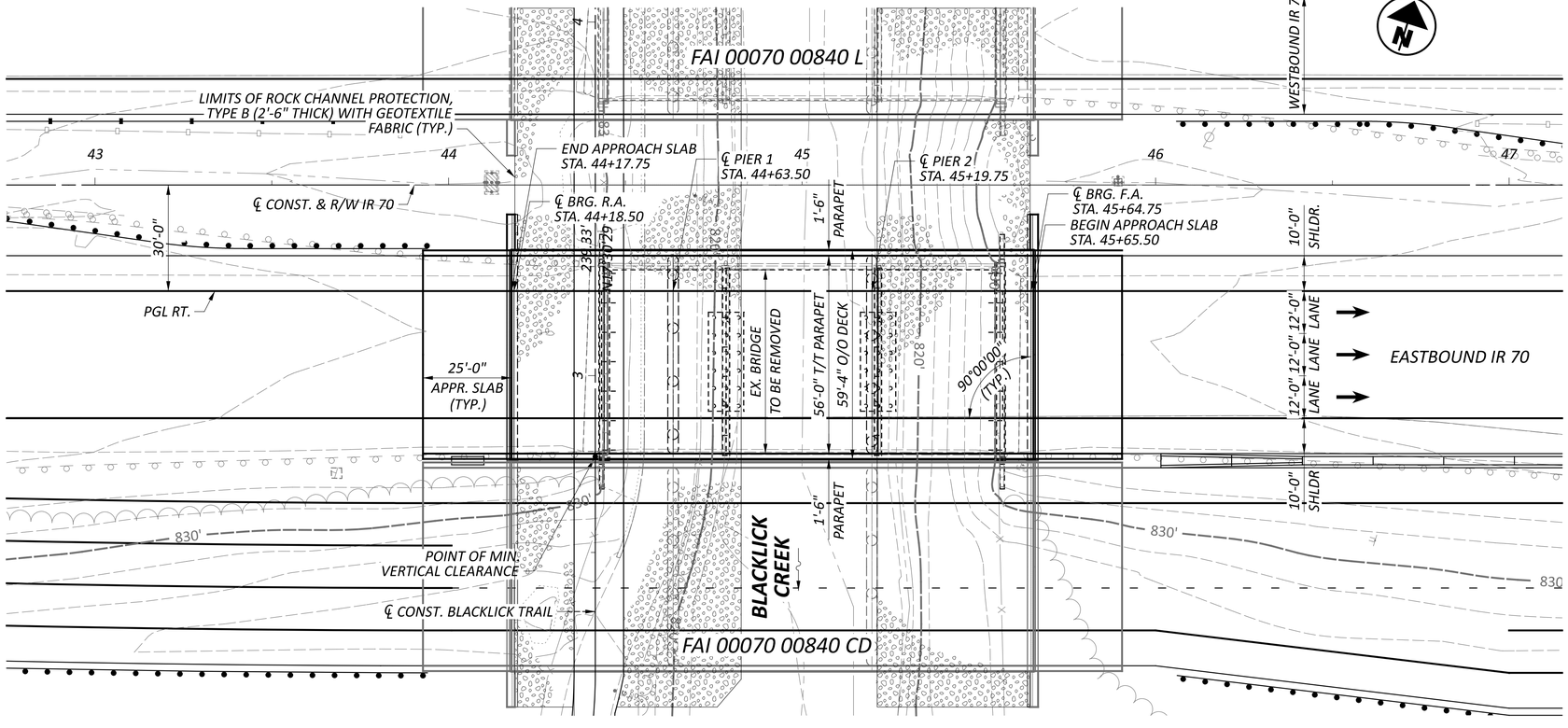
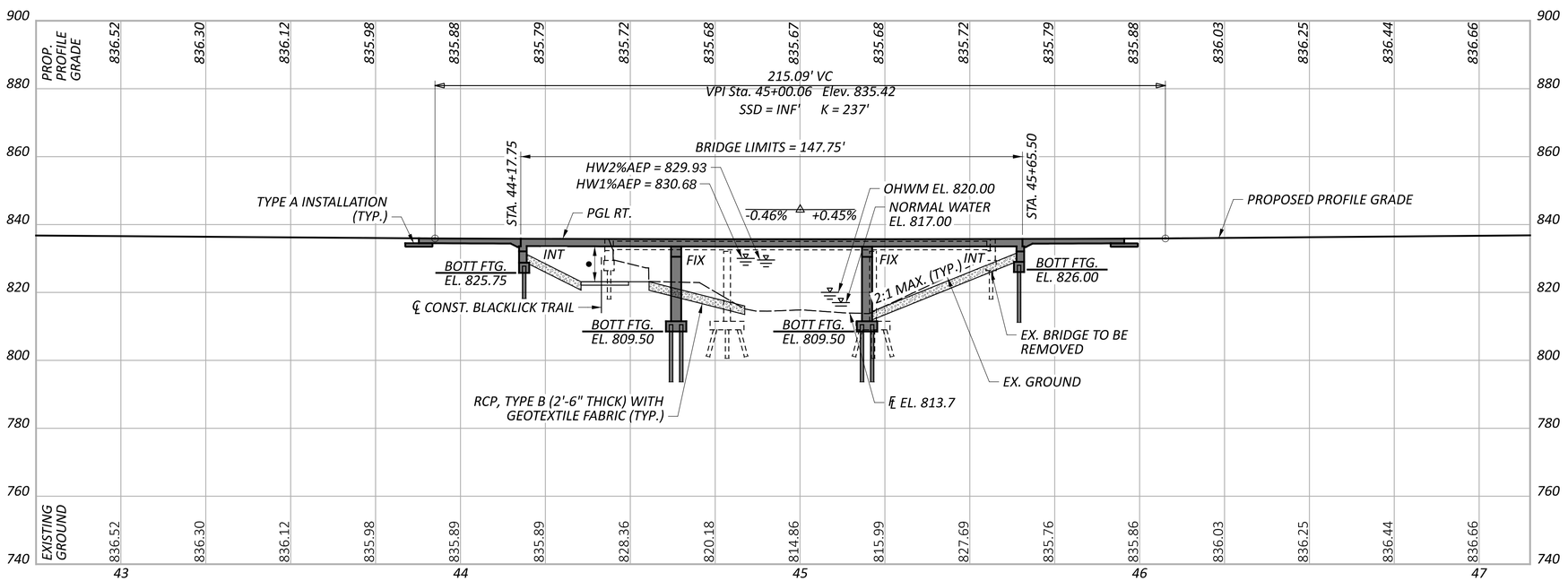


PLAN



PROFILE - ALONG PGL RT

BENCHMARK DATA (TO BE COMPLETED AT STAGE 1)

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 28,340 2030 ADTT = 3,401
2050 ADT = 38,075 2050 ADTT = 4,569
DIRECTIONAL DISTRIBUTION = 100%

LEGEND

● *10'-0" PREFERRED MINIMUM VERTICAL CLEARANCE*
10'-3½" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = 42.27 SQ. MILES
Q (2% AEP) = 8,696 CFS (FIS) V (2% AEP) = 8.18 FT/S
Q (1% AEP) = 10,000 CFS (FIS) V (1% AEP) = 8.84 FT/S
STRUCTURE CLEARS THE 2% AEP
DESIGN HW BY 3.22 FEET.

EXISTING STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE
SPANS: 34'-6"±, 43'-0"±, 34'-6"±
ROADWAY: 52'-0"± TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: NONE
WEARING SURFACE: 1"± MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 2301598
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS REINFORCED CONCRETE SLAB SUPPORTED ON REINFORCED CONCRETE ABUTMENTS AND CAP AND COLUMN PIERS
SPANS: 45'-0", 56'-3", 45'-0"
(℄ BRG. R.A/℄ PIER, ℄ PIER/℄PIER, ℄ PIER/℄ BRG. F.A.)
ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: NONE
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0" LONG, 15" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 8,766 SF
COORDINATES: LATITUDE 39°55'54.9"
LONGITUDE -82°47'45.2"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI 00070 00840 R
IR 70 OVER BLACKLICK CREEK

SFN TBD
DESIGN AGENCY STRUCTUREPOINT INC.
DESIGNER MAH | CHECKER SJF
REVIEWER CLB 06-14-23
PROJECT ID 96808
SUBSET 1 | TOTAL 3
SHEET P.0 | TOTAL 0

FAI/LIC-70.0.00/0.00

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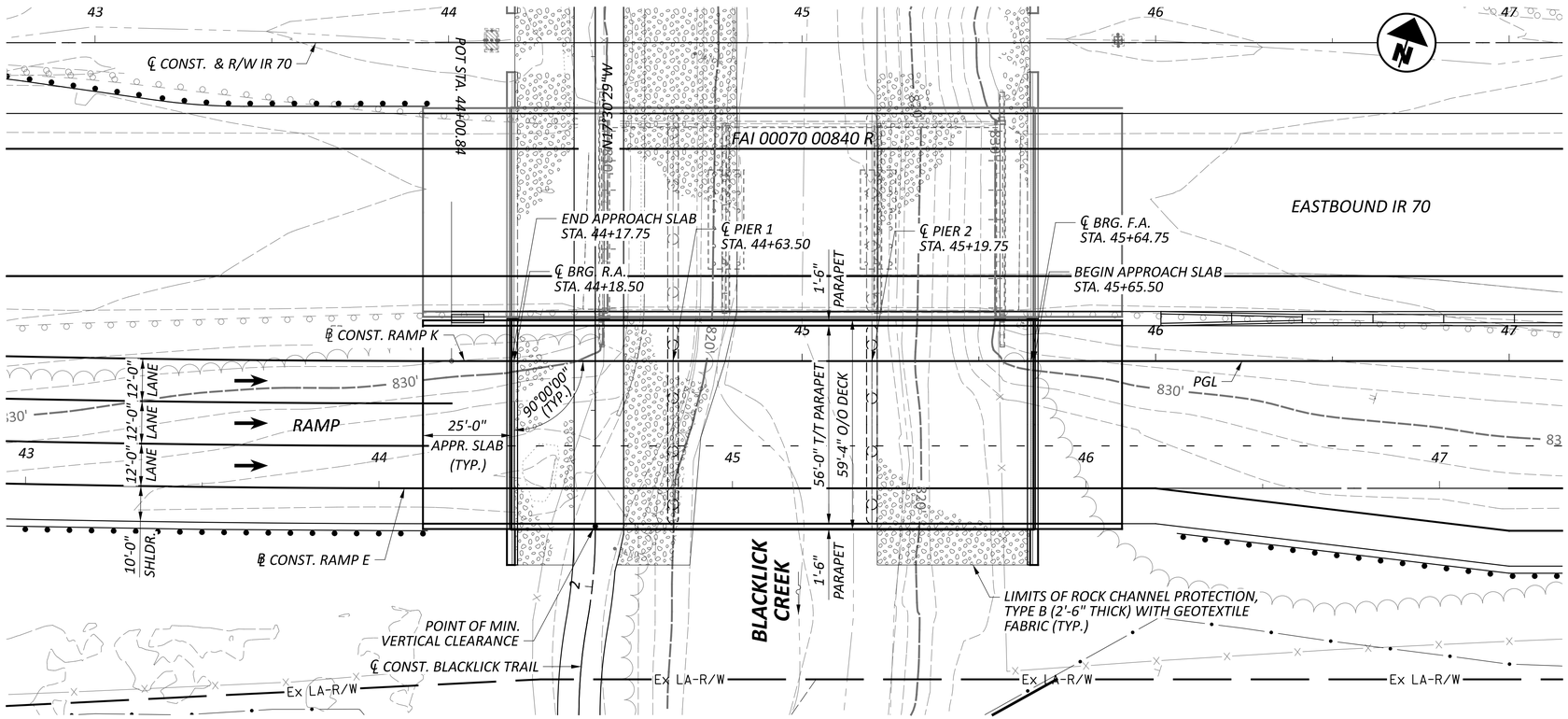
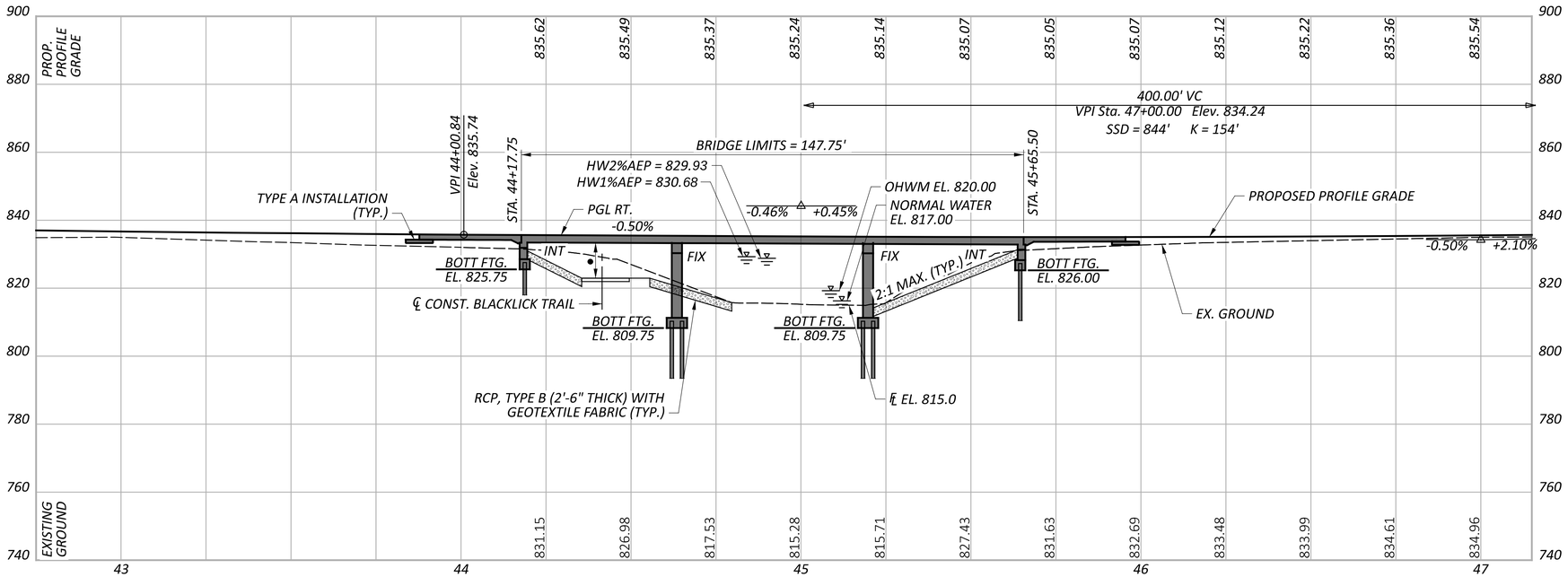


PLAN



PROFILE - ALONG ℄ CONST. RAMP K

BENCHMARK DATA (TO BE COMPLETED AT STAGE 1)

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 11,622 2030 ADTT = 465
2050 ADT = 16,062 2050 ADTT = 642
DIRECTIONAL DISTRIBUTION = 100%

LEGEND

● *10'-0" PREFERRED MINIMUM VERTICAL CLEARANCE*
10'-1½" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = 42.27 SQ. MILES
Q (2% AEP) = 8,696 CFS (FIS) V (2% AEP) = 8.18 FT/S
Q (1% AEP) = 10,000 CFS (FIS) V (1% AEP) = 8.84 FT/S
STRUCTURE CLEARS THE 2% AEP
DESIGN HW BY 3.19 FEET.

PROPOSED STRUCTURE

TYPE: 3 SPAN CONTINUOUS REINFORCED CONCRETE SLAB SUPPORTED ON REINFORCED CONCRETE ABUTMENTS AND CAP AND COLUMN PIERS

SPANS: 45'-0", 56'-3", 45'-0"
(℄ BRG. R.A/℄ PIER, ℄ PIER/℄PIER, ℄ PIER/℄ BRG. F.A.)

ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: NONE
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 25'-0" LONG, 15" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
SUPERELEVATION: VARIES FT/FT
DECK AREA: 8,766 SF

COORDINATES: LATITUDE 39°55'54.4"
LONGITUDE -82°47'45.0"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIGDE NO. FAI 00070 00840 CD
CD ROAD OVER BLACKLICK CREEK

SFN TBD
DESIGN AGENCY STRUCTUREPOINT INC.
DESIGNER MAH | CHECKER SJF
REVIEWER CLB 06-14-23
PROJECT ID 96808
SUBSET 1 | TOTAL 3
SHEET P.0 | TOTAL 0

FAI/LIC-70-0.00/0.00

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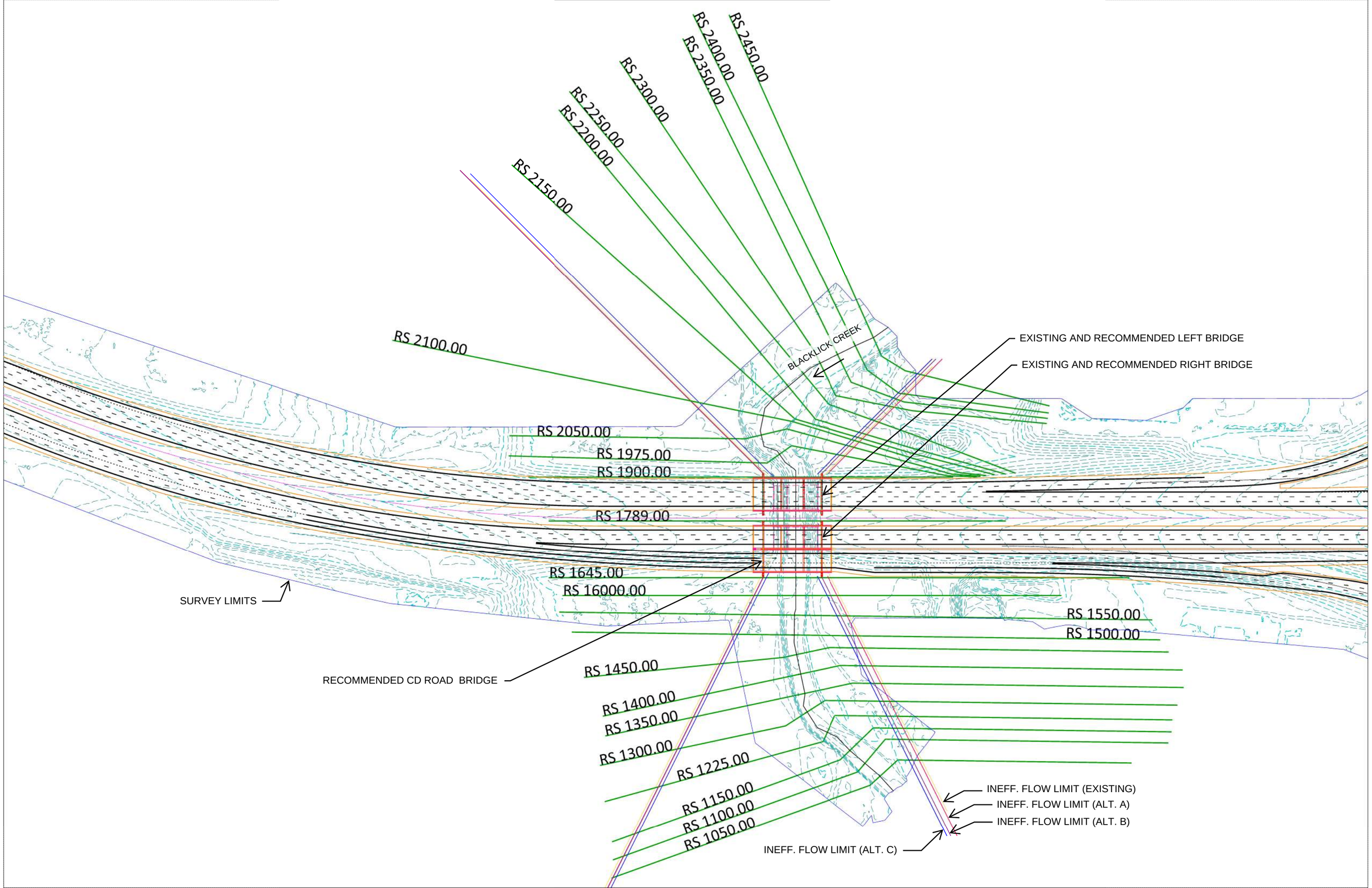
Appendix D – Channel Cross Section Plan / HEC-RAS Output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RS 2400.00
RS 2350.00
RS 2300.00
RS 2250.00
RS 2200.00
RS 2150.00
RS 2100.00
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RS 1975.00
RS 1900.00
RS 1789.00
RS 1645.00
RS 16000.00
RS 1550.00
RS 1500.00
RS 1450.00
RS 1400.00
RS 1350.00
RS 1300.00
RS 1225.00
RS 1150.00
RS 1100.00
RS 1050.00
BLACKLICK CREEK
EXISTING AND RECOMMENDED LEFT BRIDGE
EXISTING AND RECOMMENDED RIGHT BRIDGE
SURVEY LIMITS
RECOMMENDED CD ROAD BRIDGE
INEFF. FLOW LIMIT (EXISTING)
INEFF. FLOW LIMIT (ALT. A)
INEFF. FLOW LIMIT (ALT. B)
INEFF. FLOW LIMIT (ALT. C)

KNOWN WATER SURFACE BOUNDARY CONDITION:

HEC-RAS Plan: Duplicate Effective and Corrected Effective - Known W.S. River: Blacklick Cre Reach: Reach Profile: 100 YR

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	2450.000	100 YR	10000.00	819.02	832.25	826.96	832.40	0.000897	4.33	4563.12	1186.75	0.22
Reach	2400.000	100 YR	10000.00	818.87	832.16	826.66	832.35	0.000800	4.68	4467.78	1202.77	0.24
Reach	2350.000	100 YR	10000.00	818.55	832.22	825.10	832.29	0.000255	2.68	5309.06	1130.05	0.13
Reach	2300.000	100 YR	10000.00	818.01	832.14	825.61	832.27	0.000525	3.98	5504.23	1095.43	0.20
Reach	2250.000	100 YR	10000.00	817.57	832.11	825.31	832.24	0.000535	3.95	5503.66	1266.09	0.19
Reach	2200.000	100 YR	10000.00	817.41	832.11	824.78	832.21	0.000424	3.42	6048.35	1305.86	0.17
Reach	2150.000	100 YR	10000.00	817.26	832.08	824.59	832.18	0.000460	3.41	6084.13	1335.39	0.16
Reach	2100.000	100 YR	10000.00	816.68	831.99	824.07	832.15	0.000595	3.79	3911.53	1151.82	0.18
Reach	2050.000	100 YR	10000.00	815.46	831.87	824.31	832.12	0.000734	4.59	3205.20	1075.07	0.22
Reach	1975.000	100 YR	10000.00	812.37	831.60	825.11	832.03	0.001252	6.15	2462.99	1048.89	0.29
Reach	1900.000	100 YR	10000.00	813.04	831.16	824.24	831.90	0.001599	6.94	1484.52	299.60	0.34
Reach	1848.7		Bridge									
Reach	1789.000	100 YR	10000.00	813.61	829.74	825.32	831.10	0.004009	9.35	1069.95	107.44	0.52
Reach	1746.2		Bridge									
Reach	1645.000	100 YR	10000.00	814.88	828.68	825.45	829.81	0.003452	8.86	1341.67	1213.72	0.49
Reach	1600.000	100 YR	10000.00	814.56	828.23	825.40	829.55	0.006043	9.58	1294.08	1008.67	0.54
Reach	1550.000	100 YR	10000.00	813.73	827.97	824.49	829.30	0.004193	9.54	1345.60	1301.77	0.53
Reach	1500.000	100 YR	10000.00	813.08	827.95	824.66	829.01	0.004087	8.61	1543.25	1334.27	0.50
Reach	1450.000	100 YR	10000.00	813.09	827.92	824.66	828.75	0.003465	7.77	1834.91	1321.17	0.45
Reach	1400.000	100 YR	10000.00	814.33	827.93	824.53	828.51	0.003002	6.65	2199.40	1279.17	0.39
Reach	1350.000	100 YR	10000.00	813.91	827.94	824.09	828.35	0.001700	5.61	2695.72	1313.26	0.33
Reach	1300.000	100 YR	10000.00	814.91	827.92	824.25	828.24	0.001557	5.15	3108.28	1345.93	0.31
Reach	1225.000	100 YR	10000.00	812.25	827.88	823.11	828.11	0.001191	4.43	3590.66	1350.53	0.26
Reach	1150.000	100 YR	10000.00	812.69	827.80	822.94	828.00	0.001704	4.35	3729.02	1312.08	0.24
Reach	1100.000	100 YR	10000.00	814.51	827.69	823.22	827.92	0.001371	4.66	3870.29	1327.07	0.25
Reach	1050.000	100 YR	10000.00	813.60	827.60	823.24	827.86	0.001028	4.90	4113.66	1279.68	0.27

Upstream Tie-In Point

Headwater Elevation

Tailwater Velocities

Downstream Tie-In Point

SLOPE BOUNDARY CONDITION:

Upstream Tie-In Point

Headwater Elevations

HEC-RAS Plan: Duplicate Effective and Corrected Effective - Local Slope River: Blacklick Cre Reach: Reach

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	2450.000	5 YR	5799.00	819.02	829.01	825.58	829.28	0.001793	4.96	2045.92	651.04	0.30
Reach	2450.000	10 YR	6540.00	819.02	829.67	825.87	829.91	0.001574	4.88	2483.70	677.54	0.28
Reach	2450.000	50 YR	8696.00	819.02	831.39	826.56	831.56	0.001052	4.47	3790.03	1111.43	0.24
Reach	2450.000	100 YR	10000.00	819.02	832.32	826.96	832.47	0.000867	4.27	4628.57	1195.36	0.22
Reach	2450.000	500 YR	13066.00	819.02	836.94	827.87	836.99	0.000226	2.71	9619.69	1325.52	0.12
Reach	2400.000	5 YR	5799.00	818.87	828.93	825.15	829.20	0.001311	4.93	2085.36	452.79	0.29
Reach	2400.000	10 YR	6540.00	818.87	829.57	825.47	829.84	0.001242	5.01	2434.10	605.62	0.29
Reach	2400.000	50 YR	8696.00	818.87	831.29	826.25	831.51	0.000919	4.78	3710.16	1077.05	0.25
Reach	2400.000	100 YR	10000.00	818.87	832.23	826.66	832.42	0.000773	4.61	4535.34	1206.01	0.23
Reach	2400.000	500 YR	13066.00	818.87	836.92	827.60	836.98	0.000205	2.92	9692.85	1392.18	0.13
Reach	2350.000	5 YR	5799.00	818.55	829.03	824.72	829.11	0.000356	2.63	2813.85	531.30	0.15
Reach	2350.000	10 YR	6540.00	818.55	829.67	825.00	829.75	0.000332	2.65	3206.24	686.73	0.15
Reach	2350.000	50 YR	8696.00	818.55	831.37	825.01	831.44	0.000276	2.67	4521.66	957.01	0.14
Reach	2350.000	100 YR	10000.00	818.55	832.30	825.10	832.36	0.000248	2.66	5378.36	1150.79	0.13
Reach	2350.000	500 YR	13066.00	818.55	836.94	825.72	836.97	0.000082	1.87	10621.89	1396.48	0.08
Reach	2300.000	5 YR	5799.00	818.01	828.88	824.19	829.07	0.000855	4.19	2656.43	676.96	0.24
Reach	2300.000	10 YR	6540.00	818.01	829.54	824.46	829.71	0.000791	4.21	3113.95	727.00	0.23
Reach	2300.000	50 YR	8696.00	818.01	831.27	825.20	831.41	0.000603	4.07	4616.96	1012.57	0.21
Reach	2300.000	100 YR	10000.00	818.01	832.21	825.61	832.34	0.000508	3.93	5580.79	1104.28	0.19
Reach	2300.000	500 YR	13066.00	818.01	836.92	826.47	836.96	0.000142	2.54	11116.92	1449.41	0.11
Reach	2250.000	5 YR	5799.00	817.57	828.82	823.94	829.02	0.000911	4.27	2496.29	711.48	0.24
Reach	2250.000	10 YR	6540.00	817.57	829.48	824.18	829.67	0.000836	4.26	2961.14	912.05	0.23
Reach	2250.000	50 YR	8696.00	817.57	831.24	824.92	831.38	0.000614	4.04	4610.58	1168.22	0.21
Reach	2250.000	100 YR	10000.00	817.57	832.19	825.31	832.31	0.000517	3.90	5582.42	1271.04	0.19
Reach	2250.000	500 YR	13066.00	817.57	836.91	826.14	836.95	0.000149	2.56	11186.49	1490.97	0.11
Reach	2200.000	5 YR	5799.00	817.41	828.82	823.37	828.97	0.000719	3.68	2909.88	830.24	0.21
Reach	2200.000	10 YR	6540.00	817.41	829.48	823.64	829.62	0.000655	3.67	3447.06	1057.49	0.20
Reach	2200.000	50 YR	8696.00	817.41	831.24	824.32	831.34	0.000481	3.48	5138.41	1255.56	0.17
Reach	2200.000	100 YR	10000.00	817.41	832.18	824.78	832.28	0.000410	3.37	6127.12	1308.77	0.16
Reach	2200.000	500 YR	13066.00	817.41	836.90	825.27	836.94	0.000130	2.33	11668.74	1452.55	0.10
Reach	2150.000	5 YR	5799.00	817.26	828.80	822.80	828.93	0.000627	3.32	2943.96	691.58	0.18
Reach	2150.000	10 YR	6540.00	817.26	829.46	823.00	829.59	0.000621	3.44	3417.52	1043.85	0.19
Reach	2150.000	50 YR	8696.00	817.26	831.20	824.17	831.32	0.000516	3.46	5134.58	1298.50	0.17
Reach	2150.000	100 YR	10000.00	817.26	832.15	824.59	832.26	0.000445	3.37	6166.53	1338.02	0.16
Reach	2150.000	500 YR	13066.00	817.26	836.89	825.69	836.93	0.000159	2.45	11791.07	1455.70	0.10
Reach	2100.000	5 YR	5799.00	816.68	828.76	822.21	828.90	0.000642	3.28	2517.21	869.80	0.18
Reach	2100.000	10 YR	6540.00	816.68	829.41	822.54	829.56	0.000626	3.38	2800.60	941.51	0.18
Reach	2100.000	50 YR	8696.00	816.68	831.13	823.61	831.29	0.000593	3.62	3542.71	1084.16	0.18
Reach	2100.000	100 YR	10000.00	816.68	832.06	824.07	832.23	0.000581	3.76	3944.31	1164.71	0.18
Reach	2100.000	500 YR	13066.00	816.68	836.77	825.09	836.91	0.000353	3.58	7027.53	1501.35	0.15
Reach	2050.000	5 YR	5799.00	815.46	828.67	822.26	828.86	0.000728	3.83	2183.43	853.61	0.21
Reach	2050.000	10 YR	6540.00	815.46	829.32	822.80	829.52	0.000723	3.97	2391.55	989.68	0.21
Reach	2050.000	50 YR	8696.00	815.46	831.03	823.80	831.25	0.000717	4.35	2935.89	1057.28	0.21
Reach	2050.000	100 YR	10000.00	815.46	831.95	824.31	832.19	0.000718	4.55	3230.07	1076.82	0.22
Reach	2050.000	500 YR	13066.00	815.46	836.62	825.10	836.88	0.000507	4.65	5445.74	1179.26	0.19
Reach	1975.000	5 YR	5799.00	812.37	828.46	822.56	828.78	0.001201	5.11	1693.37	964.83	0.27
Reach	1975.000	10 YR	6540.00	812.37	829.10	823.12	829.44	0.001202	5.31	1850.82	990.15	0.27
Reach	1975.000	50 YR	8696.00	812.37	830.78	824.49	831.17	0.001212	5.82	2261.80	1030.53	0.28
Reach	1975.000	100 YR	10000.00	812.37	831.68	825.11	832.11	0.001223	6.10	2483.36	1050.77	0.28
Reach	1975.000	500 YR	13066.00	812.37	836.25	826.79	836.80	0.001041	6.75	4025.29	1149.44	0.27
Reach	1900.000	5 YR	5799.00	813.04	828.23	821.48	828.67	0.001361	5.36	1089.53	135.11	0.30
Reach	1900.000	10 YR	6540.00	813.04	828.83	822.05	829.33	0.001406	5.68	1168.00	150.65	0.31
Reach	1900.000	50 YR	8696.00	813.04	830.40	823.49	831.05	0.001509	6.47	1379.97	236.03	0.33
Reach	1900.000	100 YR	10000.00	813.04	831.25	824.24	831.97	0.001558	6.88	1497.04	306.54	0.34
Reach	1900.000	500 YR	13066.00	813.04	836.08	825.82	836.72	0.000910	6.52	2392.28	920.69	0.27
Reach	1848.7		Bridge									
Reach	1789.000	5 YR	5799.00	813.61	827.41	822.52	828.17	0.002679	6.96	833.21	96.06	0.42
Reach	1789.000	10 YR	6540.00	813.61	827.92	823.08	828.77	0.002916	7.41	882.41	98.59	0.44
Reach	1789.000	50 YR	8696.00	813.61	829.21	824.52	830.35	0.003541	8.58	1013.69	105.08	0.49
Reach	1789.000	100 YR	10000.00	813.61	829.88	825.31	831.20	0.003841	9.22	1085.05	107.99	0.51
Reach	1789.000	500 YR	13066.00	813.61	834.33	826.94	835.39	0.001989	8.28	1582.09	215.35	0.39
Reach	1746.2		Bridge									

HEC-RAS Plan: Duplicate Effective and Corrected Effective - Local Slope River: Blacklick Cre Reach: Reach (Continued)

Tailwater Velocities

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	1645.000	5 YR	5799.00	814.88	826.80	822.67	827.44	0.002361	6.56	1007.78	872.20	0.40
Reach	1645.000	10 YR	6540.00	814.88	827.24	823.20	827.95	0.002517	6.96	1085.50	947.55	0.41
Reach	1645.000	50 YR	8696.00	814.88	828.31	824.55	829.26	0.002970	8.05	1276.52	1154.70	0.45
Reach	1645.000	100 YR	10000.00	814.88	828.87	825.45	829.95	0.003239	8.67	1374.61	1235.96	0.47
Reach	1645.000	500 YR	13066.00	814.88	829.98	826.76	831.40	0.003860	10.02	1571.59	1353.18	0.52
Reach	1600.000	5 YR	5799.00	814.56	826.47	822.59	827.26	0.004452	7.19	903.62	856.47	0.45
Reach	1600.000	10 YR	6540.00	814.56	826.88	823.12	827.76	0.004647	7.60	996.47	962.01	0.46
Reach	1600.000	50 YR	8696.00	814.56	827.94	824.55	829.04	0.005144	8.66	1230.87	993.25	0.50
Reach	1600.000	100 YR	10000.00	814.56	828.49	825.40	829.72	0.005422	9.24	1353.51	1015.48	0.52
Reach	1600.000	500 YR	13066.00	814.56	829.63	827.28	831.16	0.006009	10.46	1606.62	1095.51	0.55
Reach	1550.000	5 YR	5799.00	813.73	826.34	821.49	827.07	0.002578	6.92	926.10	1093.65	0.42
Reach	1550.000	10 YR	6540.00	813.73	826.74	822.42	827.57	0.002827	7.39	1017.48	1196.56	0.44
Reach	1550.000	50 YR	8696.00	813.73	827.74	823.77	828.82	0.003446	8.56	1283.55	1292.02	0.48
Reach	1550.000	100 YR	10000.00	813.73	828.27	824.49	829.49	0.003757	9.16	1428.74	1329.59	0.50
Reach	1550.000	500 YR	13066.00	813.73	829.39	826.72	830.89	0.004363	10.37	1733.35	1396.94	0.54
Reach	1500.000	5 YR	5799.00	813.08	826.27	822.31	826.92	0.002707	6.52	1011.33	1075.72	0.42
Reach	1500.000	10 YR	6540.00	813.08	826.67	822.73	827.39	0.002918	6.89	1134.92	1186.28	0.43
Reach	1500.000	50 YR	8696.00	813.08	827.71	823.99	828.59	0.003388	7.76	1468.03	1322.57	0.46
Reach	1500.000	100 YR	10000.00	813.08	828.27	824.66	829.22	0.003606	8.20	1647.40	1348.42	0.47
Reach	1500.000	500 YR	13066.00	813.08	829.45	826.73	830.57	0.003997	9.07	2026.65	1409.78	0.49
Reach	1450.000	5 YR	5799.00	813.09	826.22	822.41	826.75	0.002438	6.02	1197.38	1077.74	0.38
Reach	1450.000	10 YR	6540.00	813.09	826.63	822.88	827.21	0.002590	6.33	1344.21	1204.10	0.39
Reach	1450.000	50 YR	8696.00	813.09	827.69	824.03	828.37	0.002889	7.02	1746.15	1318.08	0.41
Reach	1450.000	100 YR	10000.00	813.09	828.26	824.66	828.99	0.003022	7.37	1962.01	1324.43	0.42
Reach	1450.000	500 YR	13066.00	813.09	829.47	826.37	830.30	0.003250	8.05	2419.12	1338.76	0.43
Reach	1400.000	5 YR	5799.00	814.33	826.18	822.57	826.59	0.002600	5.35	1419.58	1123.08	0.35
Reach	1400.000	10 YR	6540.00	814.33	826.60	822.98	827.03	0.002589	5.54	1607.81	1219.22	0.35
Reach	1400.000	50 YR	8696.00	814.33	827.69	823.98	828.17	0.002557	6.02	2092.22	1271.31	0.36
Reach	1400.000	100 YR	10000.00	814.33	828.27	824.53	828.79	0.002551	6.28	2350.94	1326.73	0.36
Reach	1400.000	500 YR	13066.00	814.33	829.50	825.46	830.08	0.002548	6.82	2896.59	1360.79	0.37
Reach	1350.000	5 YR	5799.00	813.91	826.18	822.26	826.46	0.001403	4.46	1819.25	1145.71	0.29
Reach	1350.000	10 YR	6540.00	813.91	826.60	822.60	826.90	0.001418	4.64	2029.09	1192.40	0.30
Reach	1350.000	50 YR	8696.00	813.91	827.70	823.57	828.04	0.001440	5.07	2574.29	1309.38	0.30
Reach	1350.000	100 YR	10000.00	813.91	828.29	824.09	828.64	0.001458	5.31	2865.08	1320.83	0.31
Reach	1350.000	500 YR	13066.00	813.91	829.52	825.36	829.93	0.001498	5.82	3478.32	1343.17	0.32
Reach	1300.000	5 YR	5799.00	814.91	826.14	822.40	826.37	0.001352	4.21	2082.76	1188.47	0.28
Reach	1300.000	10 YR	6540.00	814.91	826.57	822.76	826.81	0.001338	4.34	2331.79	1203.46	0.28
Reach	1300.000	50 YR	8696.00	814.91	827.68	823.76	827.94	0.001323	4.67	2968.91	1336.93	0.28
Reach	1300.000	100 YR	10000.00	814.91	828.27	824.25	828.55	0.001325	4.86	3308.35	1360.50	0.28
Reach	1300.000	500 YR	13066.00	814.91	829.51	825.21	829.83	0.001337	5.27	4024.19	1482.64	0.29
Reach	1225.000	5 YR	5799.00	812.25	826.10	821.62	826.26	0.000992	3.50	2447.80	1093.16	0.23
Reach	1225.000	10 YR	6540.00	812.25	826.54	821.87	826.71	0.000989	3.63	2720.44	1120.08	0.23
Reach	1225.000	50 YR	8696.00	812.25	827.64	822.68	827.84	0.000991	3.97	3435.84	1312.03	0.23
Reach	1225.000	100 YR	10000.00	812.25	828.23	823.11	828.44	0.001008	4.18	3831.26	1405.95	0.24
Reach	1225.000	500 YR	13066.00	812.25	829.48	824.24	829.72	0.001010	4.54	4675.38	1513.83	0.24
Reach	1150.000	5 YR	5799.00	812.69	826.02	821.45	826.17	0.001504	3.59	2516.49	1065.06	0.22
Reach	1150.000	10 YR	6540.00	812.69	826.46	821.72	826.61	0.001479	3.68	2807.31	1101.28	0.22
Reach	1150.000	50 YR	8696.00	812.69	827.58	822.47	827.74	0.001438	3.94	3572.83	1282.58	0.22
Reach	1150.000	100 YR	10000.00	812.69	828.17	822.94	828.34	0.001428	4.08	3990.76	1355.68	0.22
Reach	1150.000	500 YR	13066.00	812.69	829.43	824.42	829.62	0.001415	4.39	4897.28	1536.87	0.23
Reach	1100.000	5 YR	5799.00	814.51	825.92	821.10	826.10	0.001189	3.83	2573.32	1119.96	0.23
Reach	1100.000	10 YR	6540.00	814.51	826.36	821.56	826.54	0.001174	3.93	2889.95	1140.40	0.23
Reach	1100.000	50 YR	8696.00	814.51	827.48	822.48	827.67	0.001146	4.20	3717.58	1285.63	0.23
Reach	1100.000	100 YR	10000.00	814.51	828.08	823.22	828.28	0.001140	4.35	4165.00	1350.12	0.23
Reach	1100.000	500 YR	13066.00	814.51	829.34	824.82	829.55	0.001137	4.68	5128.99	1608.07	0.24
Reach	1050.000	5 YR	5799.00	813.60	825.85	820.80	826.05	0.000850	4.00	2709.11	1134.00	0.24
Reach	1050.000	10 YR	6540.00	813.60	826.29	821.20	826.49	0.000850	4.11	3054.07	1153.61	0.24
Reach	1050.000	50 YR	8696.00	813.60	827.41	822.34	827.62	0.000851	4.41	3960.17	1265.20	0.24
Reach	1050.000	100 YR	10000.00	813.60	828.01	823.24	828.23	0.000851	4.56	4447.93	1292.25	0.24
Reach	1050.000	500 YR	13066.00	813.60	829.27	824.84	829.50	0.000851	4.87	5483.05	1588.55	0.25

Downstream Tie-In Point

Upstream Tie-In Point

Headwater Elevations

HEC-RAS Plan: Existing Condition - Local Slope River: Blacklick Cre Reach: Reach

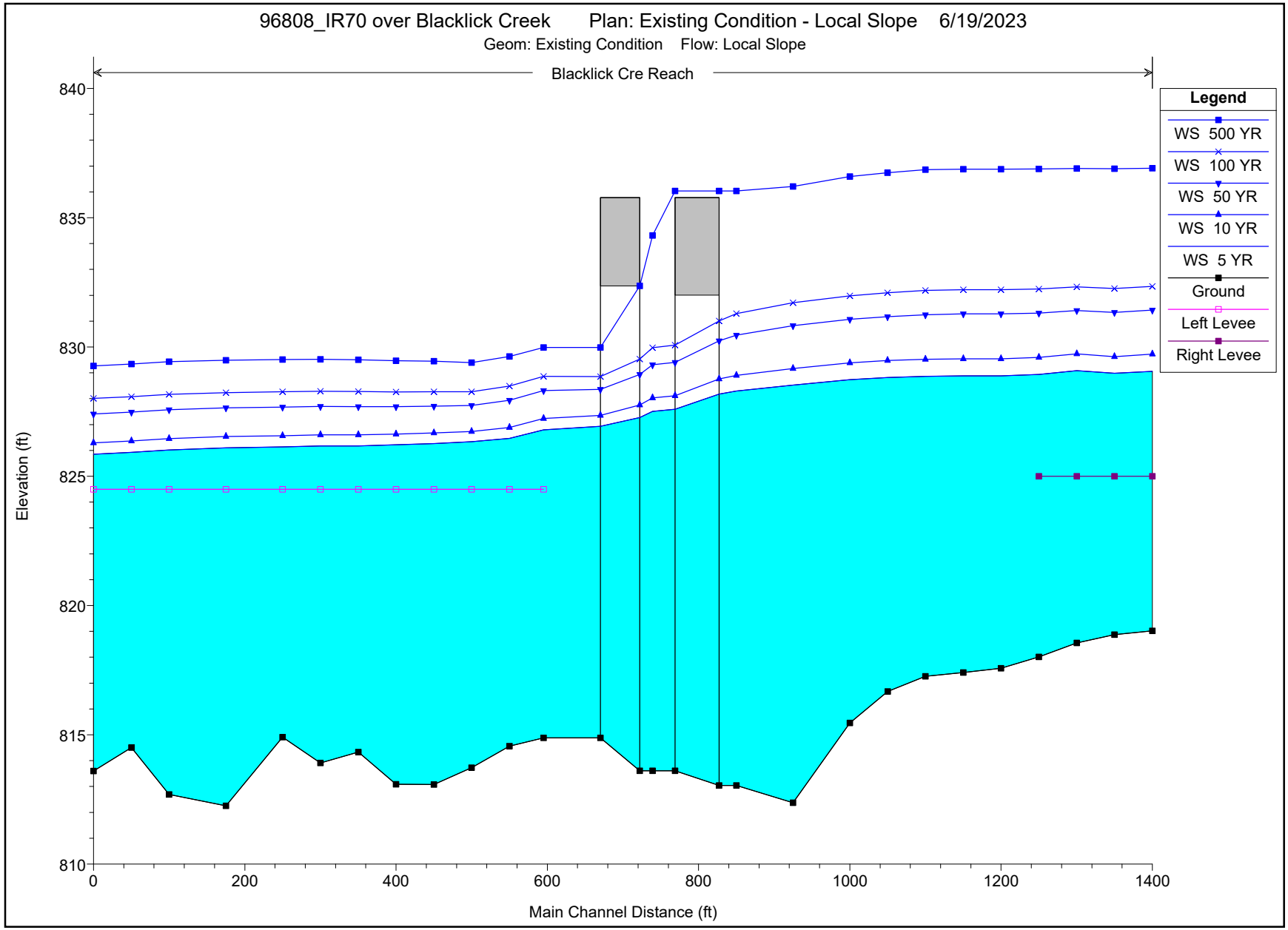
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	2450.000	5 YR	5799.00	819.02	829.06	825.58	829.33	0.001798	4.99	2075.85	652.96	0.30
Reach	2450.000	10 YR	6540.00	819.02	829.73	825.87	829.96	0.001520	4.82	2523.55	685.39	0.28
Reach	2450.000	50 YR	8696.00	819.02	831.43	826.56	831.60	0.001032	4.43	3823.81	1117.80	0.23
Reach	2450.000	100 YR	10000.00	819.02	832.35	826.96	832.49	0.000854	4.25	4657.71	1198.30	0.22
Reach	2450.000	500 YR	13066.00	819.02	836.91	827.87	836.96	0.000228	2.72	9580.78	1325.17	0.12
Reach	2400.000	5 YR	5799.00	818.87	828.98	825.15	829.25	0.001277	4.88	2111.49	481.71	0.29
Reach	2400.000	10 YR	6540.00	818.87	829.63	825.47	829.89	0.001205	4.95	2471.12	627.95	0.28
Reach	2400.000	50 YR	8696.00	818.87	831.34	826.25	831.55	0.000900	4.74	3743.95	1080.70	0.25
Reach	2400.000	100 YR	10000.00	818.87	832.26	826.66	832.45	0.000761	4.59	4565.29	1207.45	0.23
Reach	2400.000	500 YR	13066.00	818.87	836.89	827.60	836.95	0.000207	2.94	9651.65	1391.57	0.13
Reach	2350.000	5 YR	5799.00	818.55	829.08	824.72	829.16	0.000346	2.60	2843.09	543.48	0.15
Reach	2350.000	10 YR	6540.00	818.55	829.73	825.00	829.81	0.000323	2.62	3245.54	690.59	0.15
Reach	2350.000	50 YR	8696.00	818.55	831.41	825.01	831.48	0.000271	2.65	4555.97	961.89	0.14
Reach	2350.000	100 YR	10000.00	818.55	832.33	825.10	832.39	0.000247	2.65	5409.17	1161.31	0.13
Reach	2350.000	500 YR	13066.00	818.55	836.91	825.72	836.94	0.000083	1.88	10580.81	1395.95	0.08
Reach	2300.000	5 YR	5799.00	818.01	828.94	824.19	829.12	0.000830	4.15	2696.31	680.67	0.24
Reach	2300.000	10 YR	6540.00	818.01	829.60	824.46	829.77	0.000767	4.16	3158.42	735.08	0.23
Reach	2300.000	50 YR	8696.00	818.01	831.31	825.20	831.45	0.000591	4.04	4658.67	1019.09	0.21
Reach	2300.000	100 YR	10000.00	818.01	832.24	825.61	832.37	0.000501	3.91	5614.73	1107.56	0.19
Reach	2300.000	500 YR	13066.00	818.01	836.89	826.47	836.93	0.000143	2.55	11073.93	1449.01	0.11
Reach	2250.000	5 YR	5799.00	817.57	828.88	823.94	829.08	0.000885	4.22	2534.44	731.33	0.24
Reach	2250.000	10 YR	6540.00	817.57	829.55	824.18	829.73	0.000811	4.22	3013.35	971.14	0.23
Reach	2250.000	50 YR	8696.00	817.57	831.28	824.92	831.42	0.000601	4.01	4652.19	1171.13	0.20
Reach	2250.000	100 YR	10000.00	817.57	832.22	825.31	832.34	0.000509	3.87	5617.24	1273.22	0.19
Reach	2250.000	500 YR	13066.00	817.57	836.88	826.14	836.92	0.000151	2.57	11142.28	1490.06	0.11
Reach	2200.000	5 YR	5799.00	817.41	828.88	823.37	829.02	0.000697	3.64	2953.59	849.64	0.20
Reach	2200.000	10 YR	6540.00	817.41	829.55	823.64	829.68	0.000635	3.63	3503.92	1070.14	0.20
Reach	2200.000	50 YR	8696.00	817.41	831.28	824.32	831.38	0.000472	3.45	5181.73	1258.49	0.17
Reach	2200.000	100 YR	10000.00	817.41	832.22	824.78	832.31	0.000404	3.35	6161.90	1310.01	0.16
Reach	2200.000	500 YR	13066.00	817.41	836.87	825.27	836.91	0.000132	2.34	11625.66	1451.88	0.10
Reach	2150.000	5 YR	5799.00	817.26	828.86	822.80	828.98	0.000612	3.30	2978.73	709.73	0.18
Reach	2150.000	10 YR	6540.00	817.26	829.52	823.00	829.65	0.000603	3.41	3472.63	1048.19	0.18
Reach	2150.000	50 YR	8696.00	817.26	831.24	824.17	831.36	0.000506	3.43	5180.91	1301.85	0.17
Reach	2150.000	100 YR	10000.00	817.26	832.18	824.59	832.29	0.000439	3.35	6202.80	1339.17	0.16
Reach	2150.000	500 YR	13066.00	817.26	836.86	825.69	836.90	0.000161	2.46	11747.54	1455.28	0.10
Reach	2100.000	5 YR	5799.00	816.68	828.82	822.21	828.95	0.000625	3.25	2543.81	879.79	0.18
Reach	2100.000	10 YR	6540.00	816.68	829.48	822.54	829.62	0.000611	3.35	2828.11	945.31	0.18
Reach	2100.000	50 YR	8696.00	816.68	831.17	823.61	831.33	0.000585	3.61	3561.27	1093.28	0.18
Reach	2100.000	100 YR	10000.00	816.68	832.09	824.07	832.26	0.000575	3.75	3958.70	1168.78	0.18
Reach	2100.000	500 YR	13066.00	816.68	836.74	825.09	836.88	0.000357	3.59	6980.71	1500.66	0.15
Reach	2050.000	5 YR	5799.00	815.46	828.74	822.26	828.92	0.000711	3.80	2202.06	876.73	0.21
Reach	2050.000	10 YR	6540.00	815.46	829.39	822.80	829.58	0.000707	3.94	2410.85	1005.70	0.21
Reach	2050.000	50 YR	8696.00	815.46	831.07	823.80	831.29	0.000708	4.33	2948.37	1058.19	0.21
Reach	2050.000	100 YR	10000.00	815.46	831.98	824.31	832.22	0.000711	4.54	3239.41	1077.46	0.21
Reach	2050.000	500 YR	13066.00	815.46	836.59	825.10	836.85	0.000513	4.67	5405.18	1178.75	0.19
Reach	1975.000	5 YR	5799.00	812.37	828.52	822.56	828.84	0.001179	5.08	1702.89	968.48	0.27
Reach	1975.000	10 YR	6540.00	812.37	829.17	823.12	829.51	0.001181	5.28	1860.81	991.89	0.27
Reach	1975.000	50 YR	8696.00	812.37	830.82	824.49	831.21	0.001203	5.81	2266.04	1031.48	0.28
Reach	1975.000	100 YR	10000.00	812.37	831.72	825.10	832.14	0.001219	6.10	2484.99	1051.52	0.28
Reach	1975.000	500 YR	13066.00	812.37	836.21	826.80	836.77	0.001061	6.81	3968.97	1148.53	0.28
Reach	1900.000	5 YR	5799.00	813.04	828.30	821.44	828.74	0.001358	5.32	1098.54	136.89	0.30
Reach	1900.000	10 YR	6540.00	813.04	828.90	821.97	829.39	0.001402	5.63	1177.60	152.52	0.31
Reach	1900.000	50 YR	8696.00	813.04	830.45	823.70	831.09	0.001520	6.44	1386.86	239.71	0.33
Reach	1900.000	100 YR	10000.00	813.04	831.29	824.36	832.01	0.001575	6.86	1502.44	330.12	0.34
Reach	1900.000	500 YR	13066.00	813.04	836.03	825.79	836.69	0.000943	6.55	2353.42	917.83	0.28
Reach	1848.7		Bridge									
Reach	1789.000	5 YR	5799.00	813.61	827.51	822.62	828.25	0.002719	6.89	841.63	98.80	0.42
Reach	1789.000	10 YR	6540.00	813.61	828.03	823.55	828.86	0.002915	7.32	893.44	100.81	0.43
Reach	1789.000	50 YR	8696.00	813.61	829.31	824.82	830.43	0.003482	8.48	1025.55	105.77	0.48
Reach	1789.000	100 YR	10000.00	813.61	829.97	825.56	831.27	0.003770	9.12	1096.25	108.35	0.50
Reach	1789.000	500 YR	13066.00	813.61	834.31	827.07	835.38	0.002017	8.28	1581.36	210.40	0.39
Reach	1746.2		Bridge									

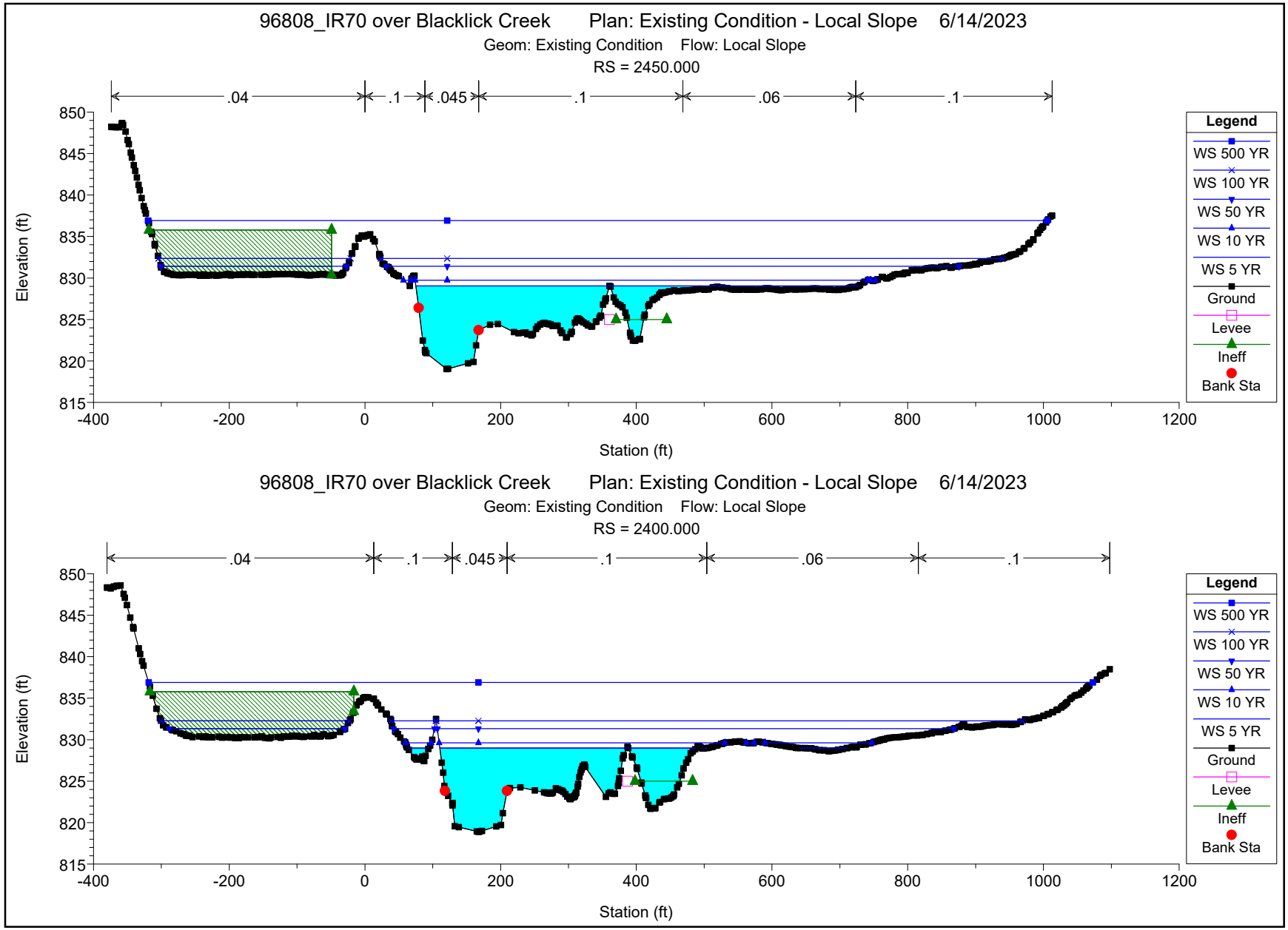
HEC-RAS Plan: Existing Condition - Local Slope River: Blacklick Cre Reach: Reach (Continued)

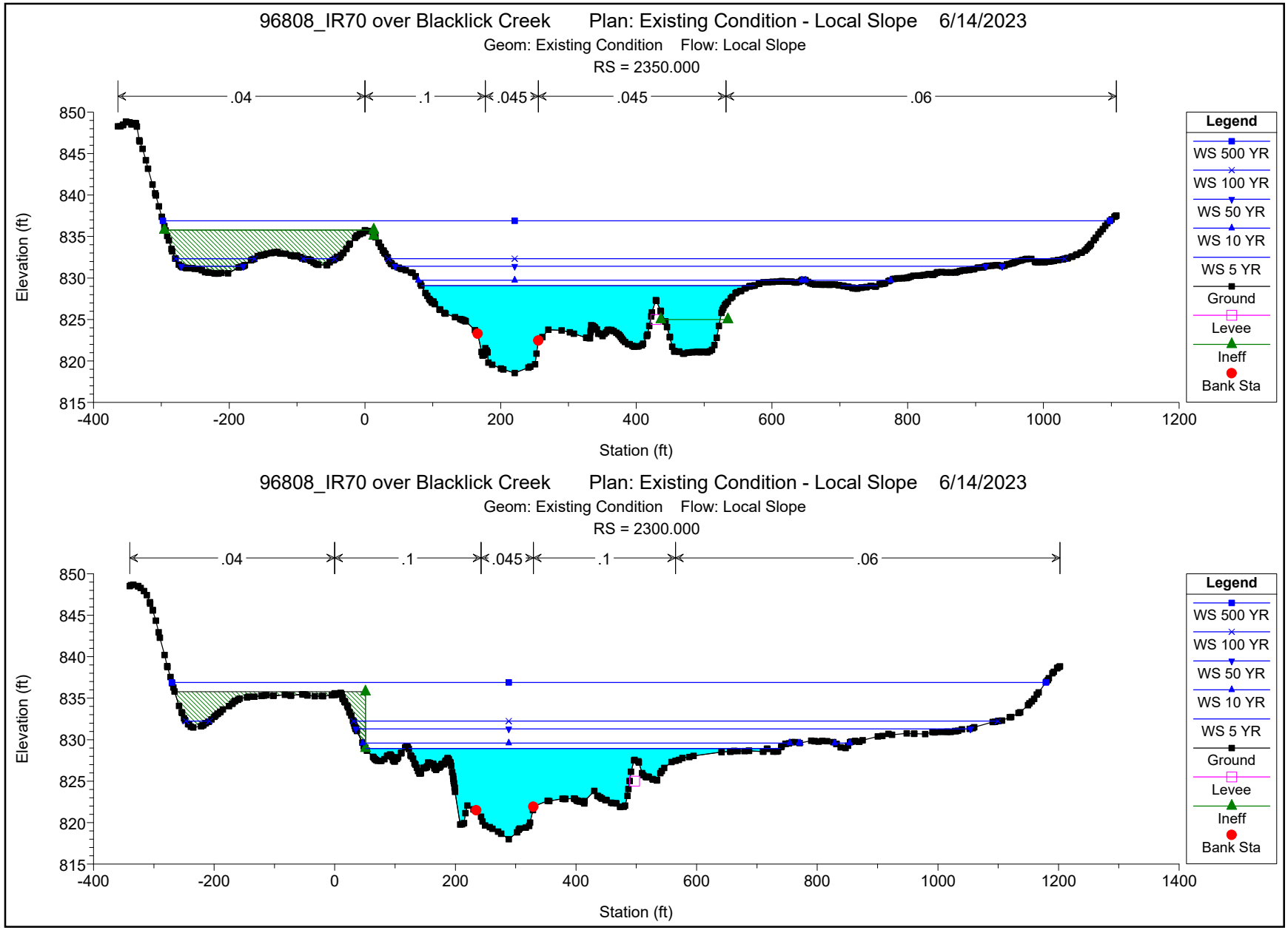
Tailwater Velocities

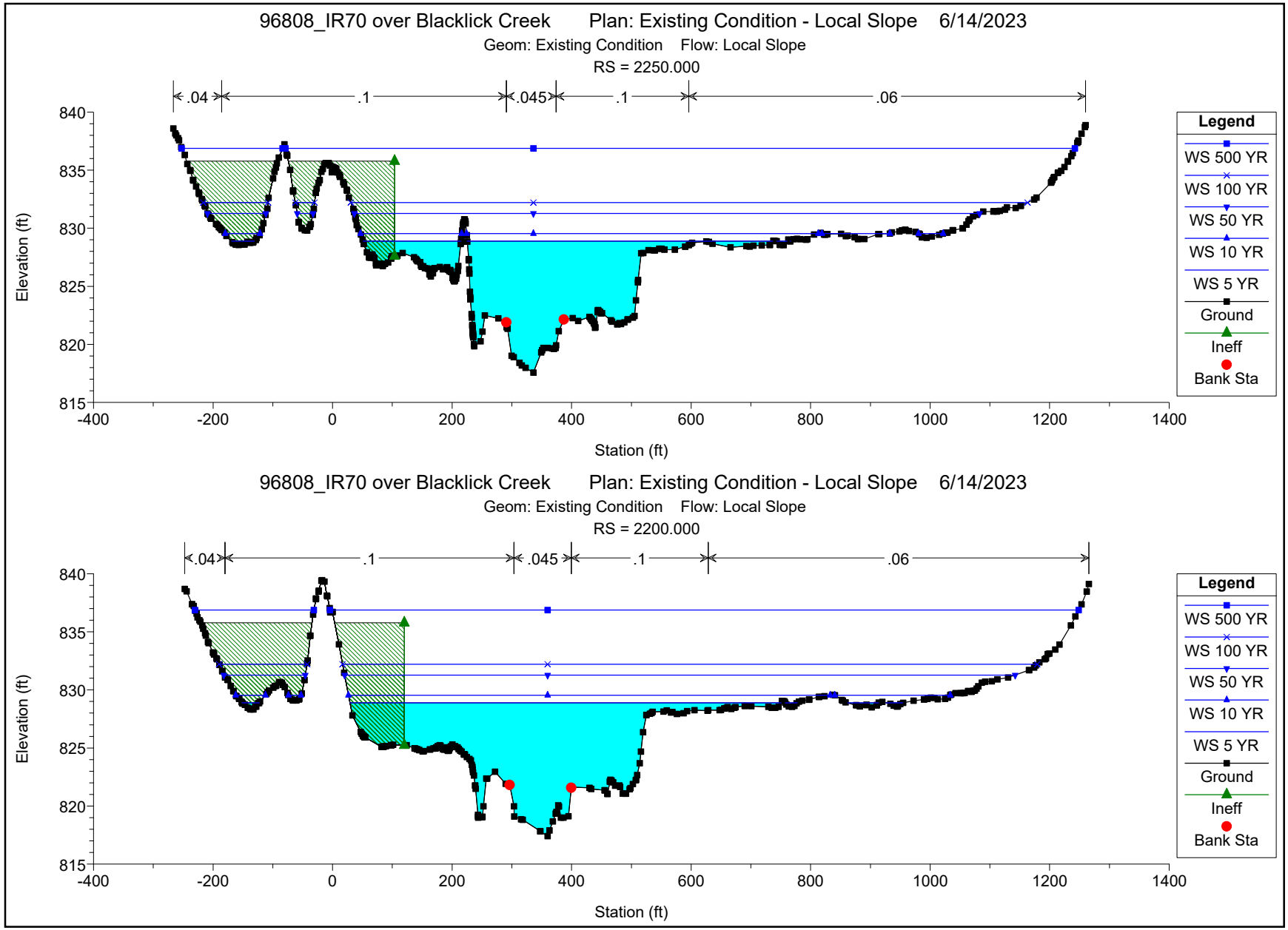
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	1645.000	5 YR	5799.00	814.88	826.80	822.67	827.44	0.002361	6.56	1007.74	872.19	0.40
Reach	1645.000	10 YR	6540.00	814.88	827.23	823.20	827.95	0.002517	6.96	1085.46	947.54	0.41
Reach	1645.000	50 YR	8696.00	814.88	828.31	824.55	829.26	0.002970	8.05	1276.48	1154.64	0.45
Reach	1645.000	100 YR	10000.00	814.88	828.87	825.46	829.95	0.003239	8.67	1374.55	1235.94	0.47
Reach	1645.000	500 YR	13066.00	814.88	829.98	826.80	831.40	0.003861	10.02	1571.55	1353.18	0.52
Reach	1600.000	5 YR	5799.00	814.56	826.47	822.59	827.26	0.004452	7.19	903.62	856.47	0.45
Reach	1600.000	10 YR	6540.00	814.56	826.88	823.12	827.76	0.004647	7.60	996.47	962.01	0.46
Reach	1600.000	50 YR	8696.00	814.56	827.94	824.55	829.04	0.005144	8.66	1230.87	993.25	0.50
Reach	1600.000	100 YR	10000.00	814.56	828.49	825.40	829.72	0.005422	9.24	1353.51	1015.48	0.52
Reach	1600.000	500 YR	13066.00	814.56	829.63	827.28	831.16	0.006009	10.46	1606.62	1095.51	0.55
Reach	1550.000	5 YR	5799.00	813.73	826.34	821.49	827.07	0.002578	6.92	926.10	1093.65	0.42
Reach	1550.000	10 YR	6540.00	813.73	826.74	822.42	827.57	0.002827	7.39	1017.48	1196.56	0.44
Reach	1550.000	50 YR	8696.00	813.73	827.74	823.77	828.82	0.003446	8.56	1283.55	1292.02	0.48
Reach	1550.000	100 YR	10000.00	813.73	828.27	824.49	829.49	0.003757	9.16	1428.74	1329.59	0.50
Reach	1550.000	500 YR	13066.00	813.73	829.39	826.72	830.89	0.004363	10.37	1733.35	1396.94	0.54
Reach	1500.000	5 YR	5799.00	813.08	826.27	822.31	826.92	0.002707	6.52	1011.33	1075.72	0.42
Reach	1500.000	10 YR	6540.00	813.08	826.67	822.73	827.39	0.002918	6.89	1134.92	1186.28	0.43
Reach	1500.000	50 YR	8696.00	813.08	827.71	823.99	828.59	0.003388	7.76	1468.03	1322.57	0.46
Reach	1500.000	100 YR	10000.00	813.08	828.27	824.66	829.22	0.003606	8.20	1647.40	1348.42	0.47
Reach	1500.000	500 YR	13066.00	813.08	829.45	826.73	830.57	0.003997	9.07	2026.65	1409.78	0.49
Reach	1450.000	5 YR	5799.00	813.09	826.22	822.41	826.75	0.002438	6.02	1197.38	1077.74	0.38
Reach	1450.000	10 YR	6540.00	813.09	826.63	822.88	827.21	0.002590	6.33	1344.21	1204.10	0.39
Reach	1450.000	50 YR	8696.00	813.09	827.69	824.03	828.37	0.002889	7.02	1746.15	1318.08	0.41
Reach	1450.000	100 YR	10000.00	813.09	828.26	824.66	828.99	0.003022	7.37	1962.01	1324.43	0.42
Reach	1450.000	500 YR	13066.00	813.09	829.47	826.37	830.30	0.003250	8.05	2419.12	1338.76	0.43
Reach	1400.000	5 YR	5799.00	814.33	826.18	822.57	826.59	0.002600	5.35	1419.58	1123.08	0.35
Reach	1400.000	10 YR	6540.00	814.33	826.60	822.98	827.03	0.002589	5.54	1607.81	1219.22	0.35
Reach	1400.000	50 YR	8696.00	814.33	827.69	823.98	828.17	0.002557	6.02	2092.22	1271.31	0.36
Reach	1400.000	100 YR	10000.00	814.33	828.27	824.53	828.79	0.002551	6.28	2350.94	1326.73	0.36
Reach	1400.000	500 YR	13066.00	814.33	829.50	825.46	830.08	0.002548	6.82	2896.59	1360.79	0.37
Reach	1350.000	5 YR	5799.00	813.91	826.18	822.26	826.46	0.001403	4.46	1819.25	1145.71	0.29
Reach	1350.000	10 YR	6540.00	813.91	826.60	822.60	826.90	0.001418	4.64	2029.09	1192.40	0.30
Reach	1350.000	50 YR	8696.00	813.91	827.70	823.57	828.04	0.001440	5.07	2574.29	1309.38	0.30
Reach	1350.000	100 YR	10000.00	813.91	828.29	824.09	828.64	0.001458	5.31	2865.08	1320.83	0.31
Reach	1350.000	500 YR	13066.00	813.91	829.52	825.36	829.93	0.001498	5.82	3478.32	1343.17	0.32
Reach	1300.000	5 YR	5799.00	814.91	826.14	822.40	826.37	0.001352	4.21	2082.76	1188.47	0.28
Reach	1300.000	10 YR	6540.00	814.91	826.57	822.76	826.81	0.001338	4.34	2331.79	1203.46	0.28
Reach	1300.000	50 YR	8696.00	814.91	827.68	823.76	827.94	0.001323	4.67	2968.91	1336.93	0.28
Reach	1300.000	100 YR	10000.00	814.91	828.27	824.25	828.55	0.001325	4.86	3308.35	1360.50	0.28
Reach	1300.000	500 YR	13066.00	814.91	829.51	825.21	829.83	0.001337	5.27	4024.19	1482.64	0.29
Reach	1225.000	5 YR	5799.00	812.25	826.10	821.62	826.26	0.000992	3.50	2447.80	1093.16	0.23
Reach	1225.000	10 YR	6540.00	812.25	826.54	821.87	826.71	0.000989	3.63	2720.44	1120.08	0.23
Reach	1225.000	50 YR	8696.00	812.25	827.64	822.68	827.84	0.000991	3.97	3435.84	1312.03	0.23
Reach	1225.000	100 YR	10000.00	812.25	828.23	823.11	828.44	0.001008	4.18	3831.26	1405.95	0.24
Reach	1225.000	500 YR	13066.00	812.25	829.48	824.24	829.72	0.001010	4.54	4675.38	1513.83	0.24
Reach	1150.000	5 YR	5799.00	812.69	826.02	821.45	826.17	0.001504	3.59	2516.49	1065.06	0.22
Reach	1150.000	10 YR	6540.00	812.69	826.46	821.72	826.61	0.001479	3.68	2807.31	1101.28	0.22
Reach	1150.000	50 YR	8696.00	812.69	827.58	822.47	827.74	0.001438	3.94	3572.83	1282.58	0.22
Reach	1150.000	100 YR	10000.00	812.69	828.17	822.94	828.34	0.001428	4.08	3990.76	1355.68	0.22
Reach	1150.000	500 YR	13066.00	812.69	829.43	824.42	829.62	0.001415	4.39	4897.28	1536.87	0.23
Reach	1100.000	5 YR	5799.00	814.51	825.92	821.10	826.10	0.001189	3.83	2573.32	1119.96	0.23
Reach	1100.000	10 YR	6540.00	814.51	826.36	821.56	826.54	0.001174	3.93	2889.95	1140.40	0.23
Reach	1100.000	50 YR	8696.00	814.51	827.48	822.48	827.67	0.001146	4.20	3717.58	1285.63	0.23
Reach	1100.000	100 YR	10000.00	814.51	828.08	823.22	828.28	0.001140	4.35	4165.00	1350.12	0.23
Reach	1100.000	500 YR	13066.00	814.51	829.34	824.82	829.55	0.001137	4.68	5128.99	1608.07	0.24
Reach	1050.000	5 YR	5799.00	813.60	825.85	820.80	826.05	0.000850	4.00	2709.11	1134.00	0.24
Reach	1050.000	10 YR	6540.00	813.60	826.29	821.20	826.49	0.000850	4.11	3054.07	1153.61	0.24
Reach	1050.000	50 YR	8696.00	813.60	827.41	822.34	827.62	0.000851	4.41	3960.17	1265.20	0.24
Reach	1050.000	100 YR	10000.00	813.60	828.01	823.24	828.23	0.000851	4.56	4447.93	1292.25	0.24
Reach	1050.000	500 YR	13066.00	813.60	829.27	824.84	829.50	0.000851	4.87	5483.05	1588.55	0.25

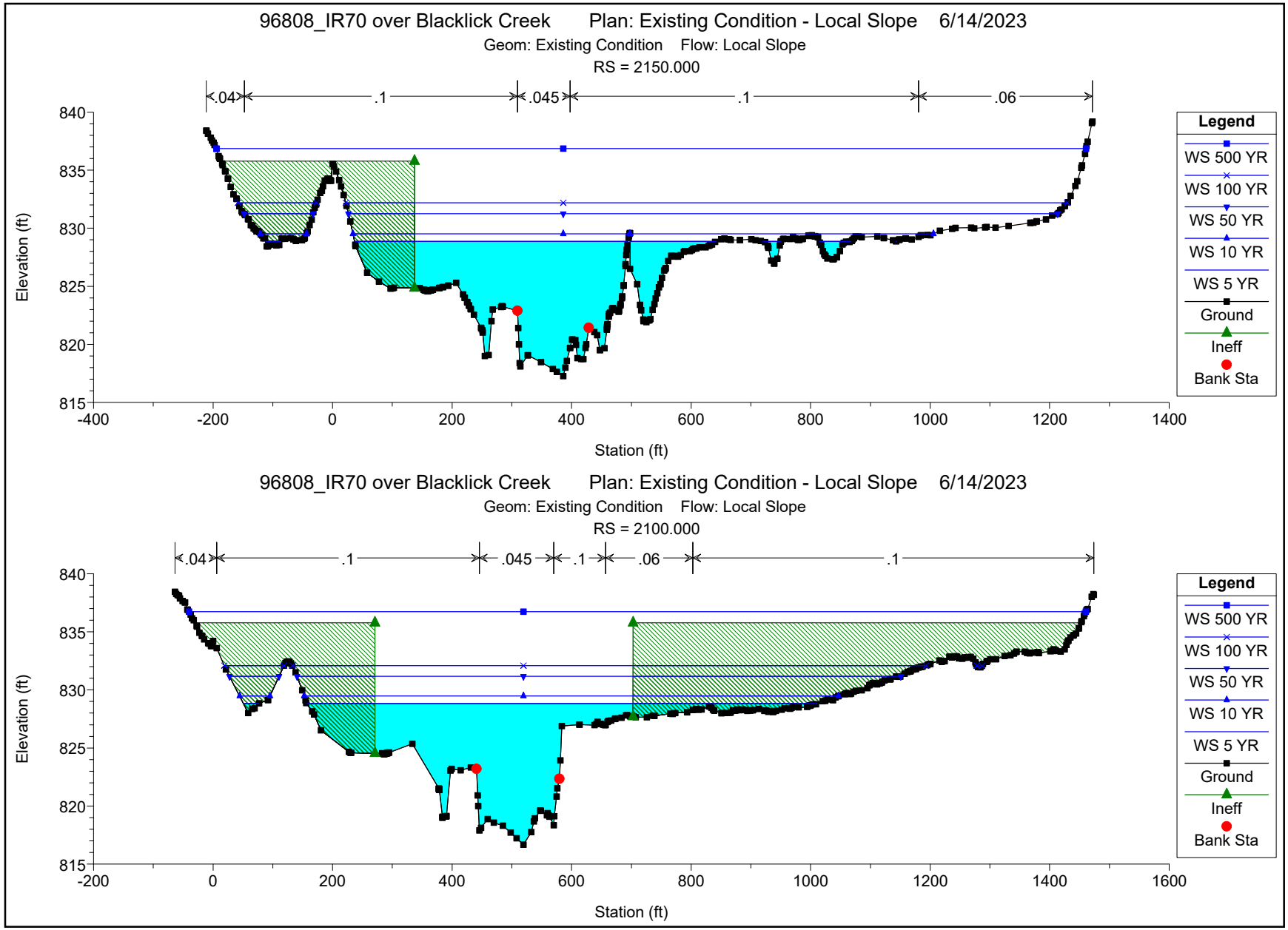
Downstream Tie-In Point

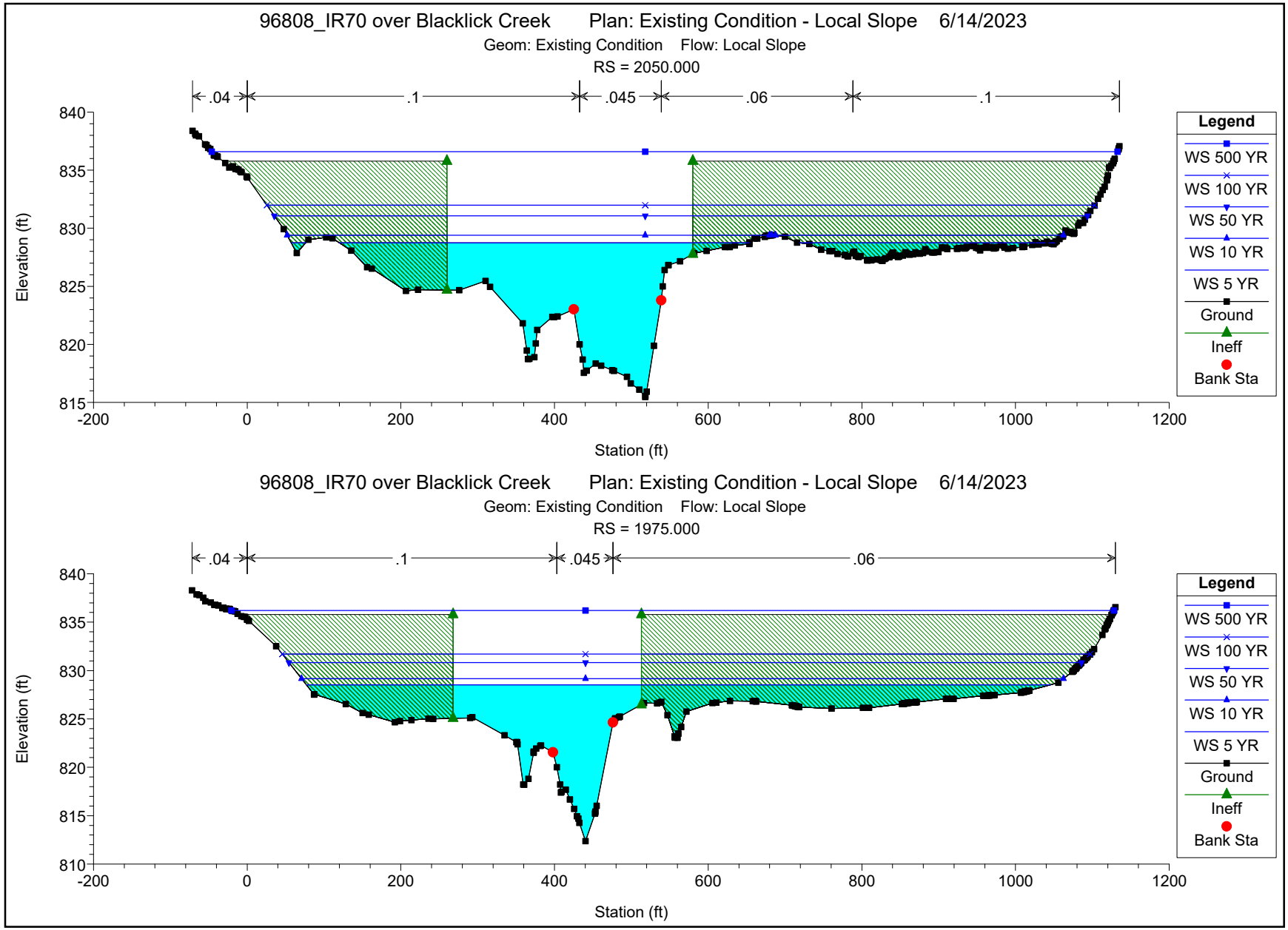

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/19/2023
Geom: Existing Condition Flow: Local Slope
Blacklick Cre Reach
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Left Levee
Right Levee
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
Main Channel Distance (ft)

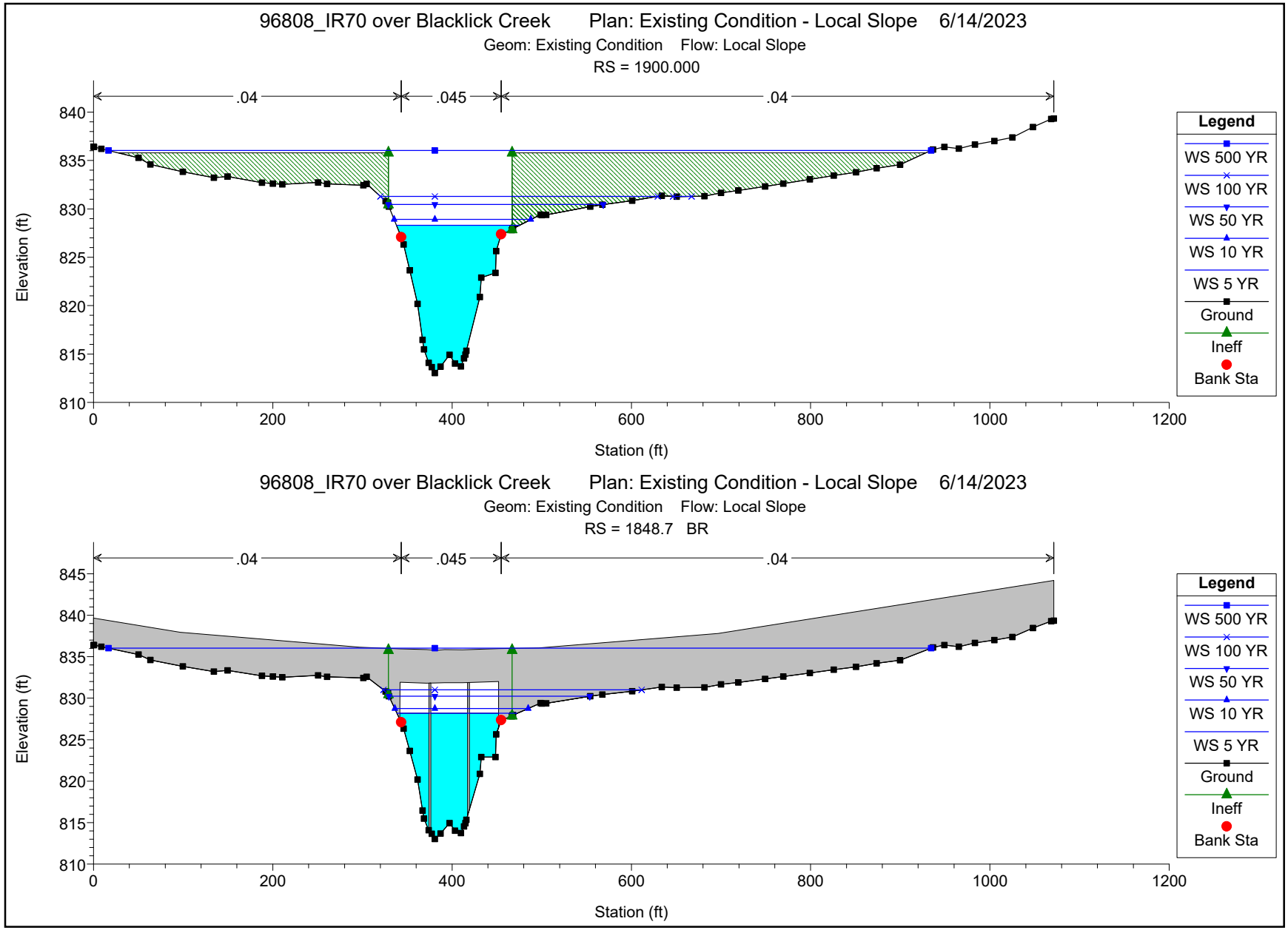

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2450.000
.04
.1
.045
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2400.000
.04
.1
.045
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

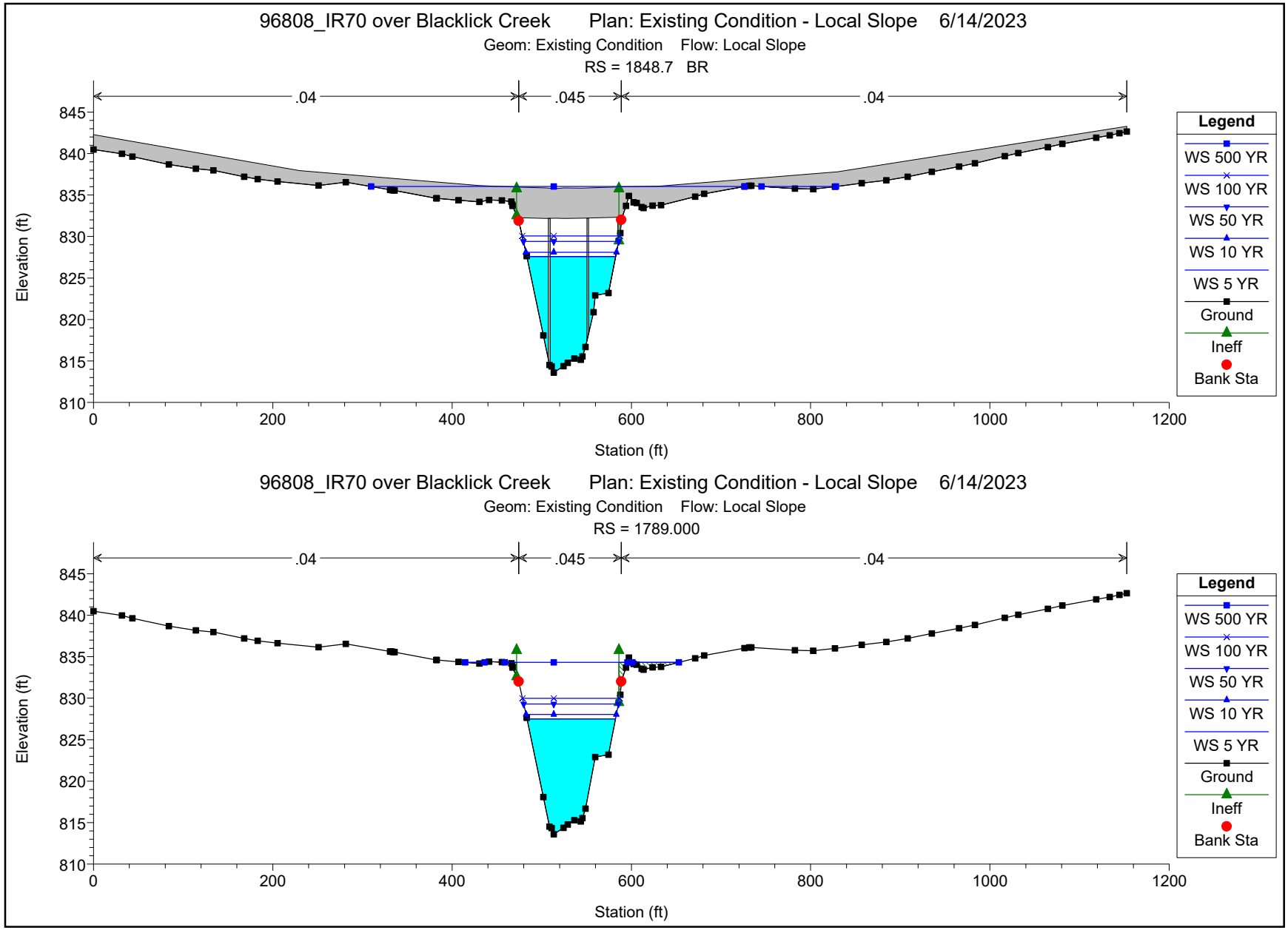

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2350.000
.04
.1
.045
.045
.06
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2300.000
.04
.1
.045
.1
.06
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

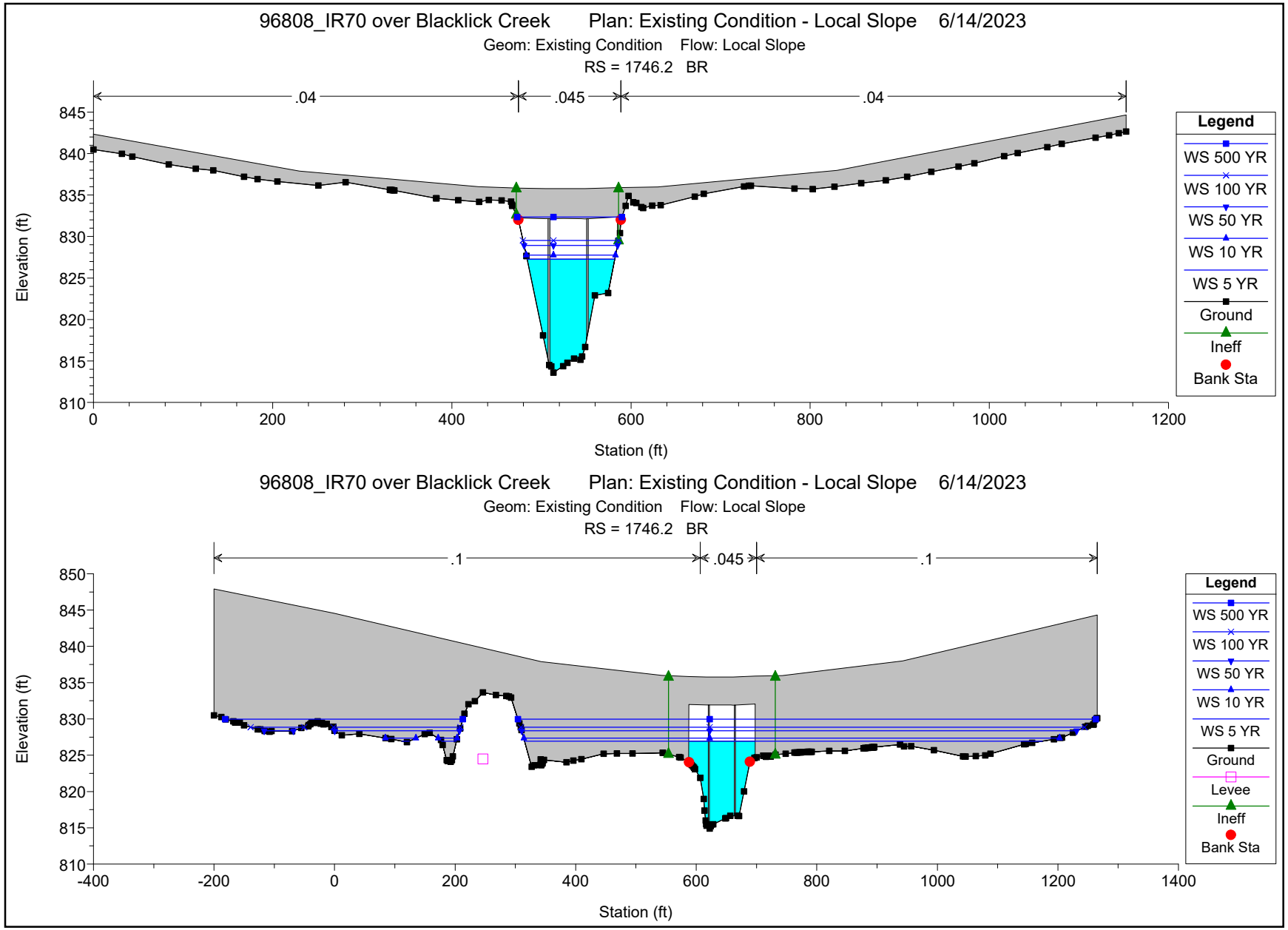

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2250.000
.04
.1
.045
.1
.06
Elevation (ft)
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2200.000
.04
.1
.045
.1
.06
Elevation (ft)
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

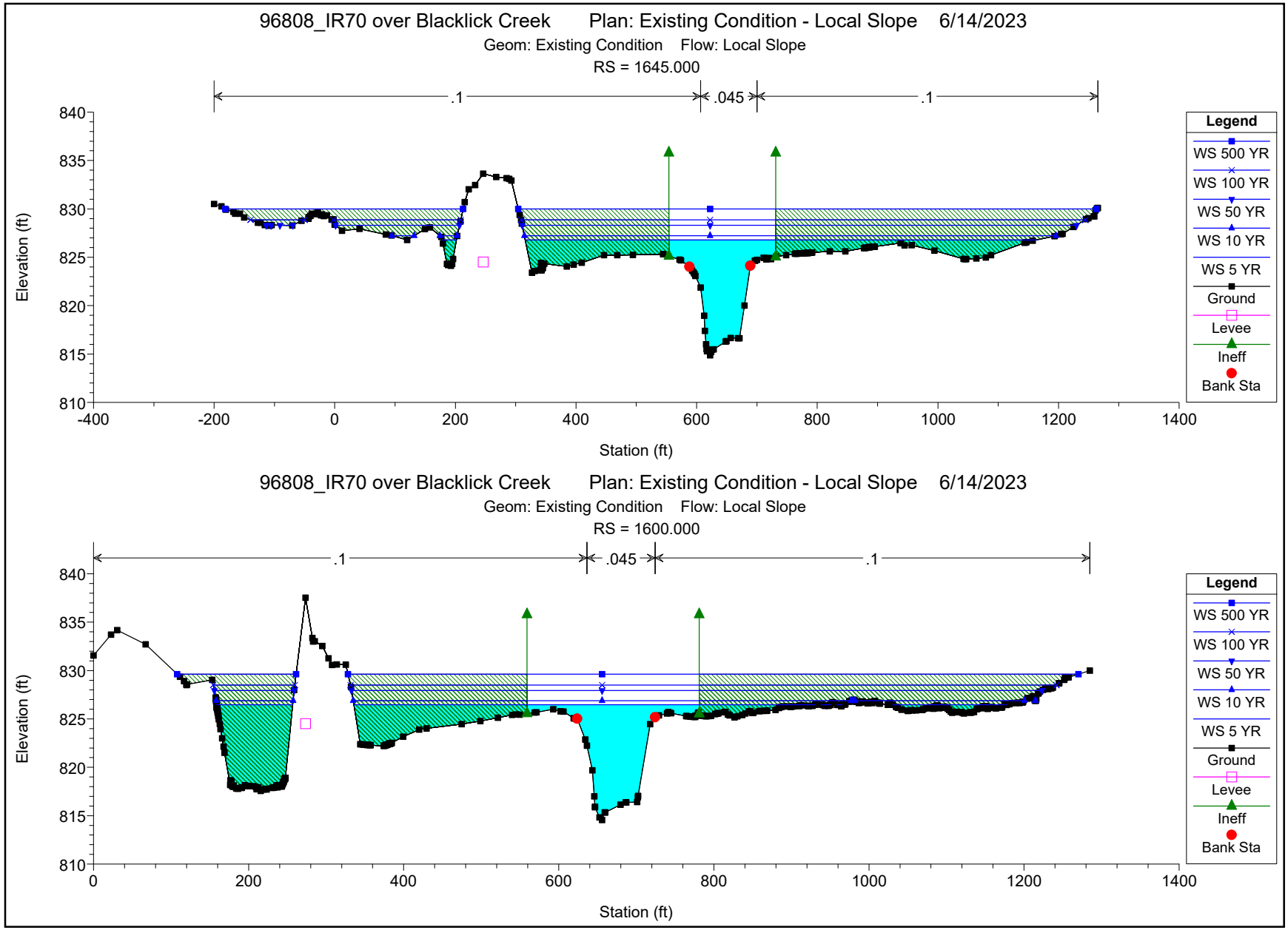

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2150.000
.04
.1
.045
.1
.06
Elevation (ft)
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2100.000
.04
.1
.045
.1
.06
.1
Elevation (ft)
840
835
830
825
820
815
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

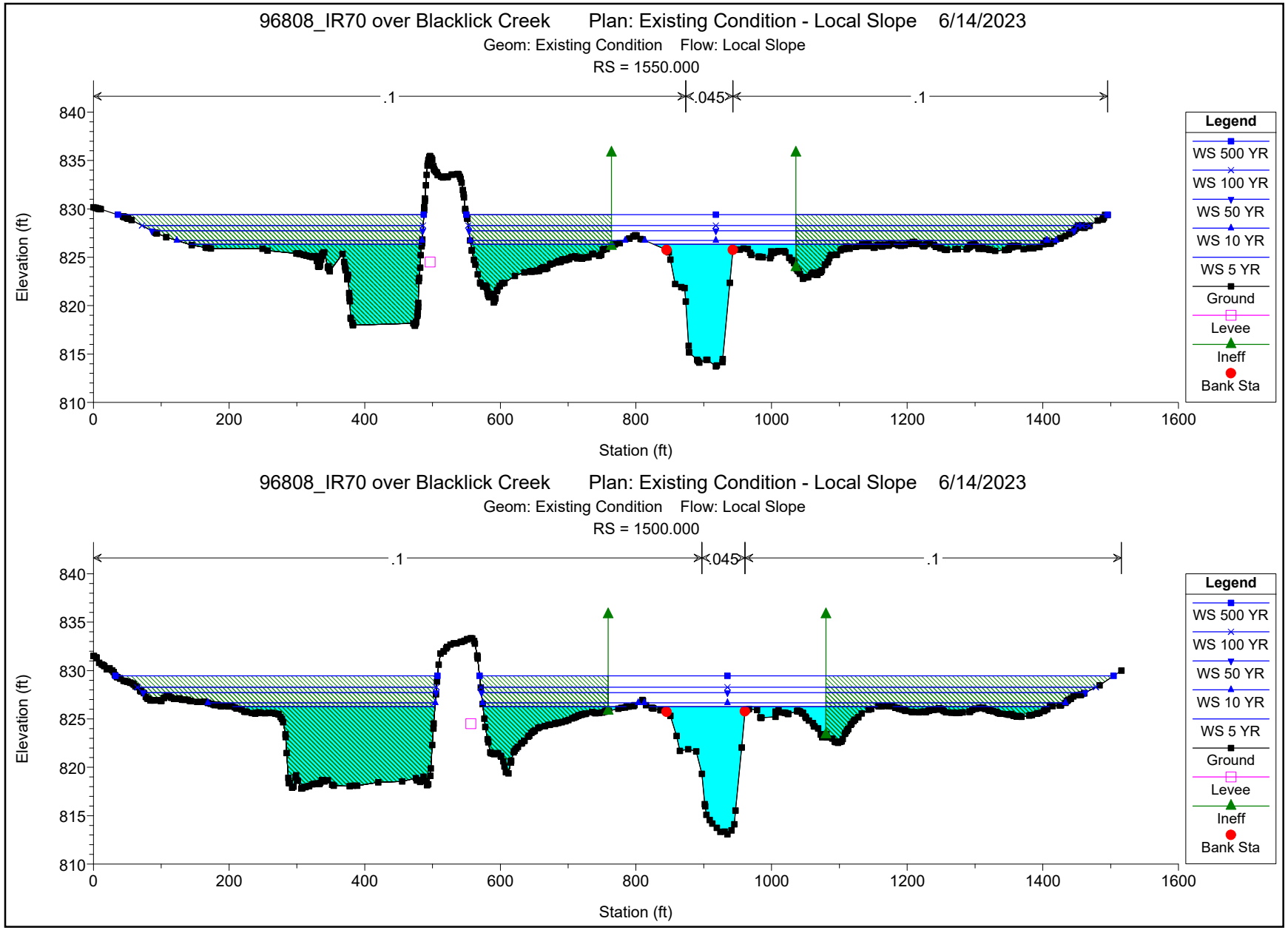

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 2050.000
.04
.1
.045
.06
.1
Elevation (ft)
840
835
830
825
820
815
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1975.000
.04
.1
.045
.06
Elevation (ft)
840
835
830
825
820
815
810
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

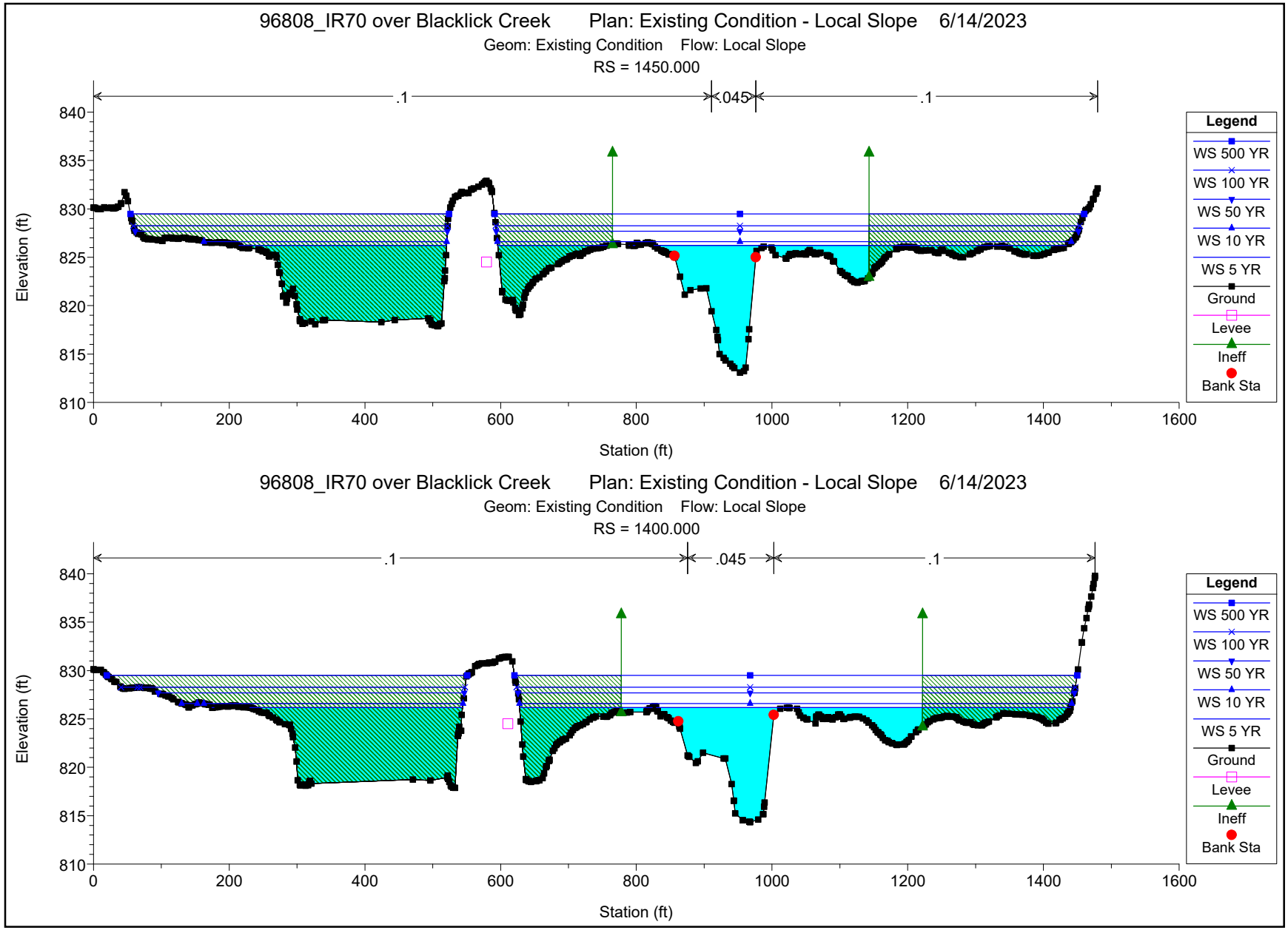

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1900.000
.04
.045
.04
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1848.7 BR
.04
.045
.04
Elevation (ft)
845
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

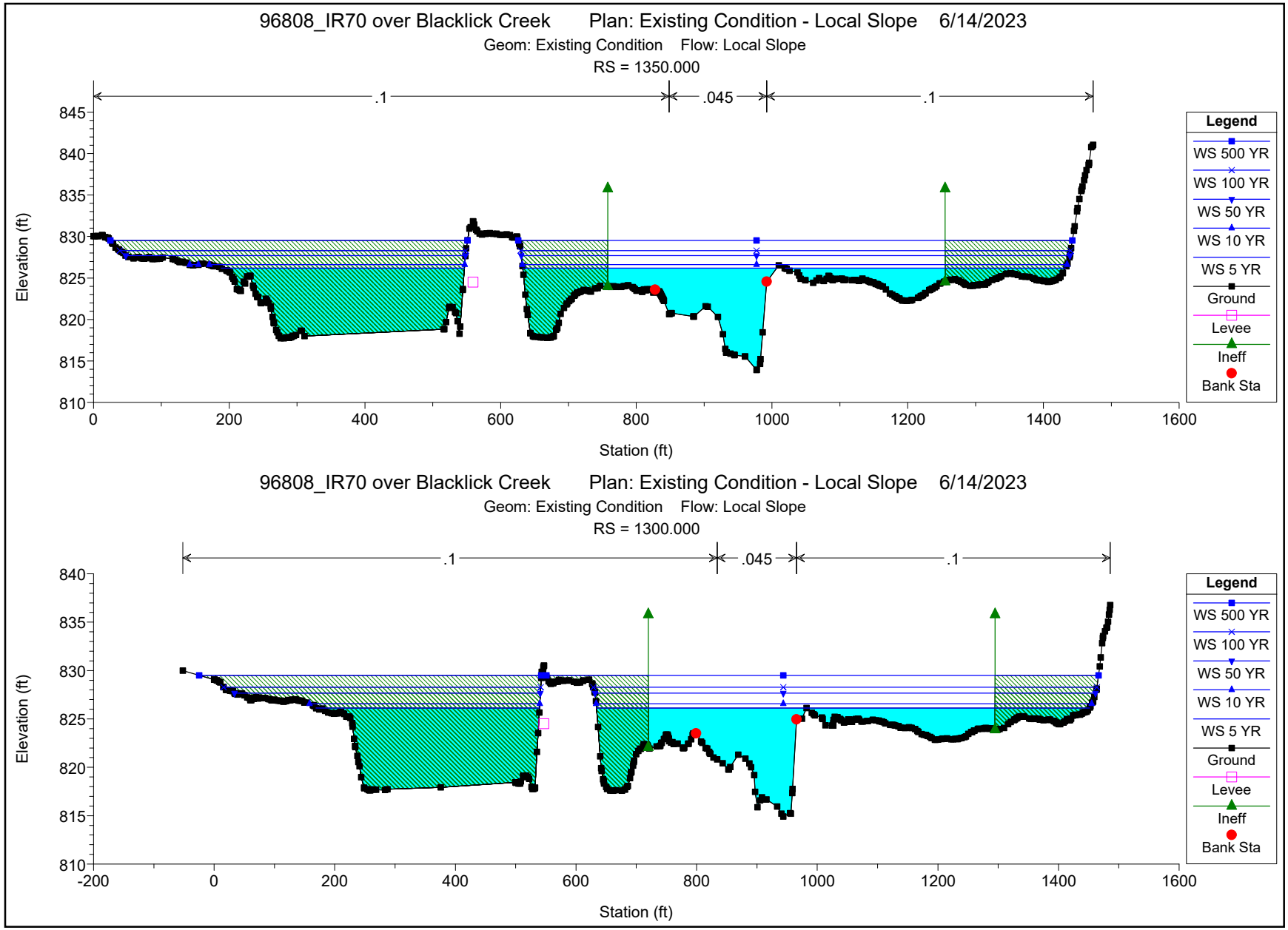

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1848.7 BR
.04
.045
.04
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1789.000
.04
.045
.04
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

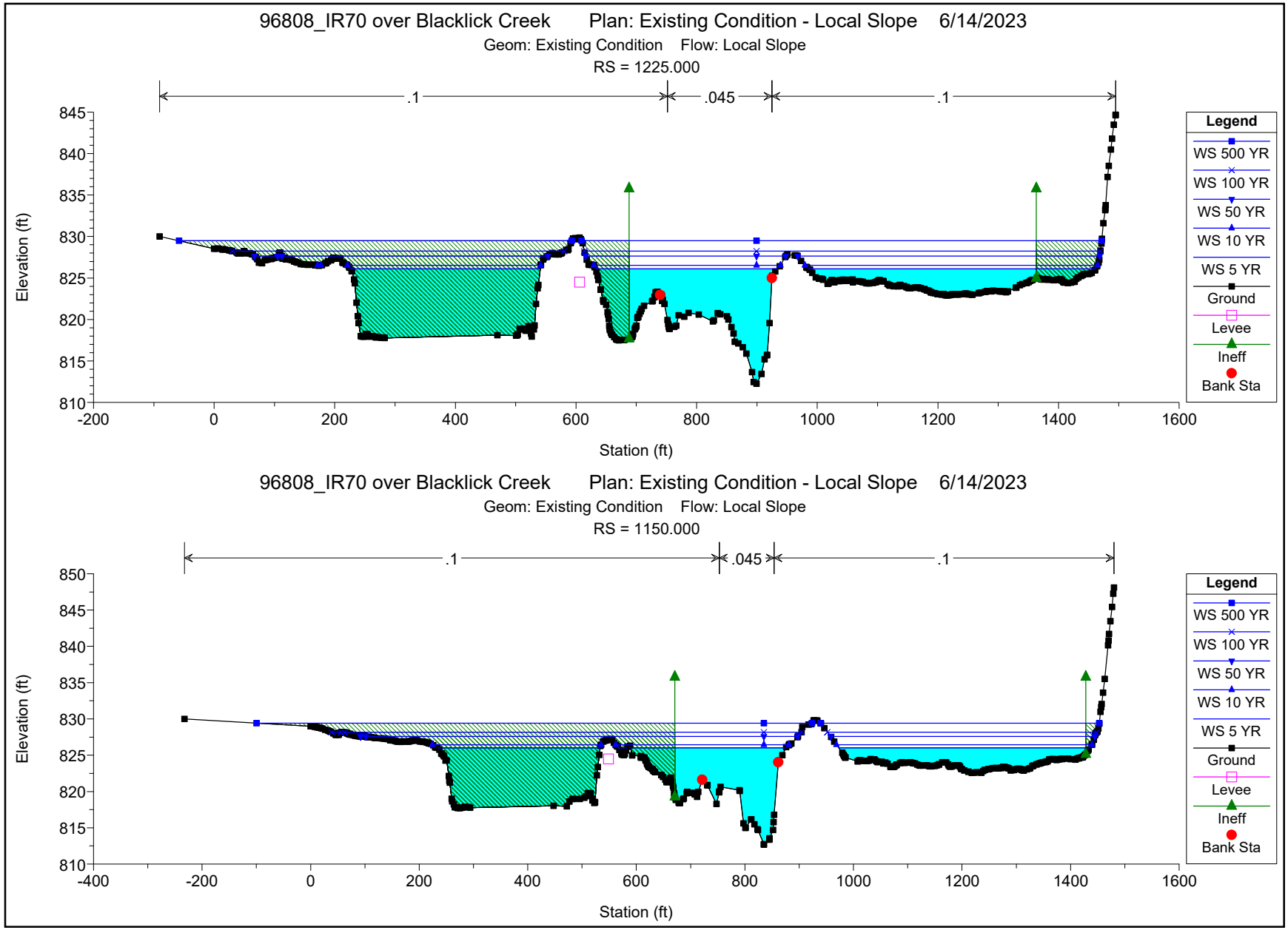

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1746.2 BR
.04
.045
.04
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1746.2 BR
.1
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

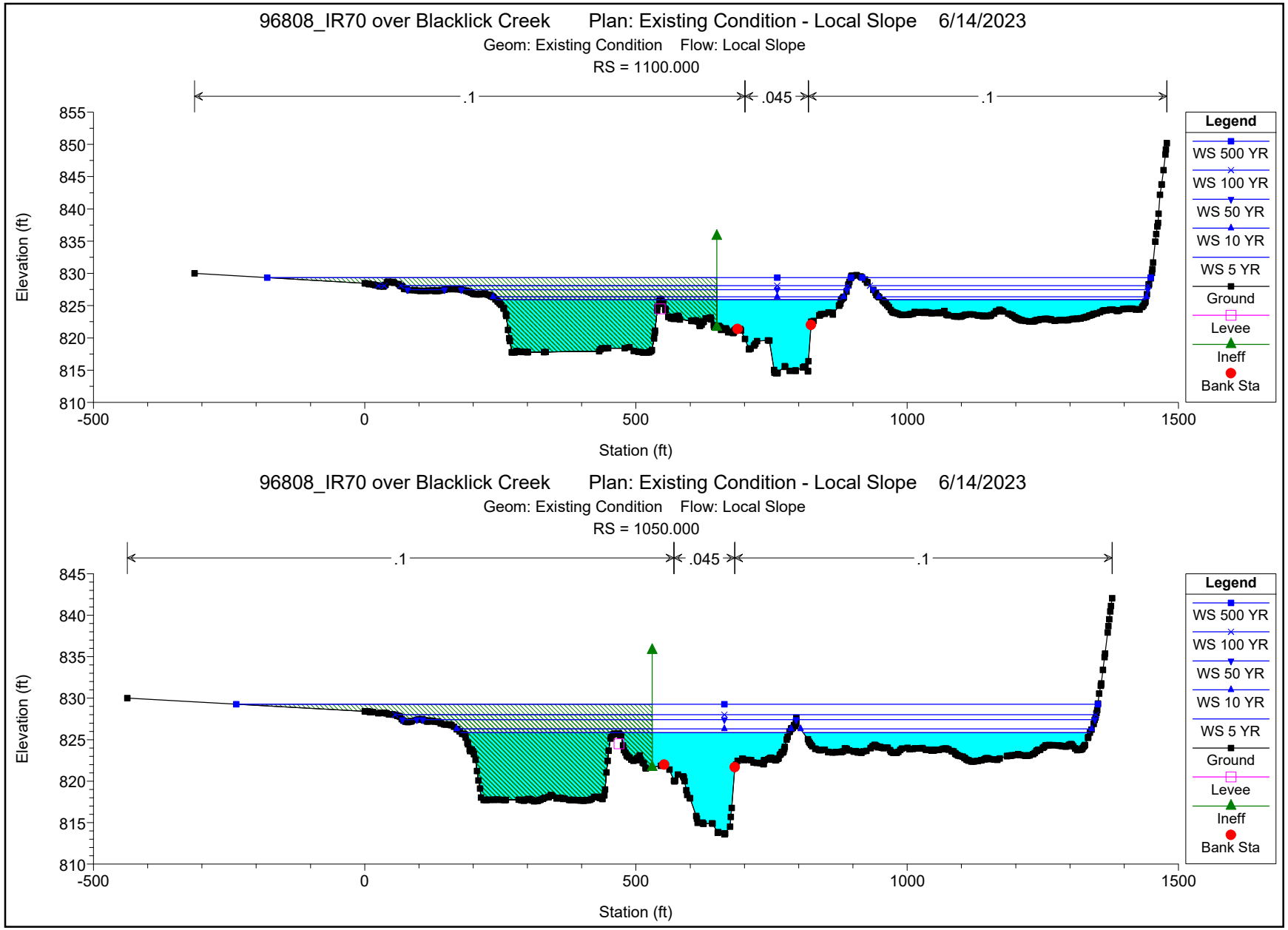

96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1645.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1600.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1550.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1500.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1450.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1400.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1350.000
.1
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1300.000
.1
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1225.000
.1
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1150.000
.1
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1100.000
.1
.045
.1
Elevation (ft)
855
850
845
840
835
830
825
820
815
810
-500
0
500
1000
1500
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Existing Condition - Local Slope 6/14/2023
Geom: Existing Condition Flow: Local Slope
RS = 1050.000
.1
.045
.1
Elevation (ft)
845
840
835
830
825
820
815
810
-500
0
500
1000
1500
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

HEC-RAS Plan: Proposed Condition - Local Slope River: Blacklick Cre Reach: Reach

Upstream Tie-In Point

Headwater Elevations

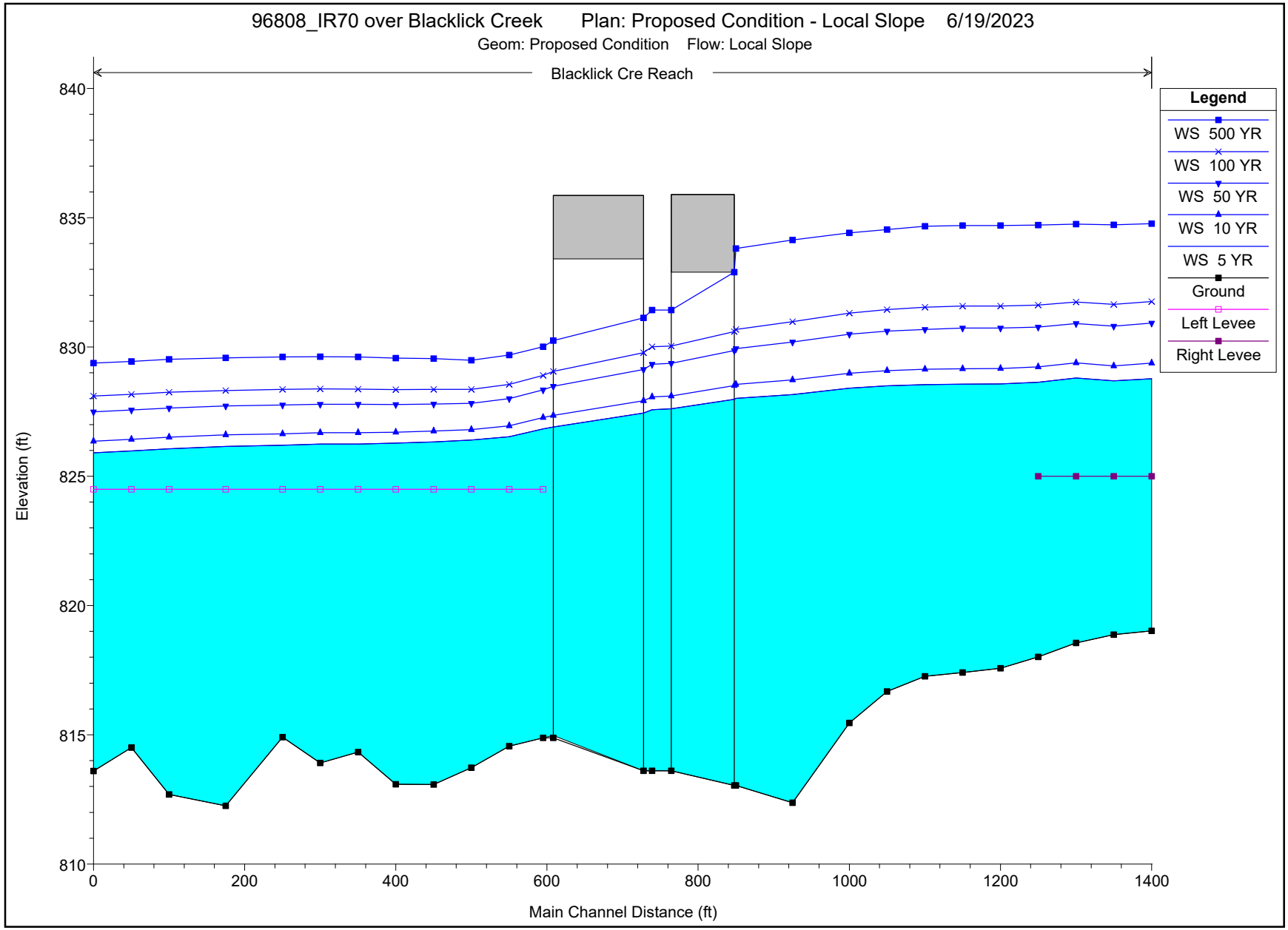
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	2450.000	5 YR	5799.00	819.02	828.78	825.58	829.08	0.002050	5.21	1898.17	611.03	0.32
Reach	2450.000	10 YR	6540.00	819.02	829.38	825.87	829.66	0.001880	5.22	2287.43	664.29	0.31
Reach	2450.000	50 YR	8696.00	819.02	830.93	826.56	831.15	0.001350	4.92	3406.32	1035.30	0.27
Reach	2450.000	100 YR	10000.00	819.02	831.76	826.96	831.95	0.001153	4.78	4103.36	1156.66	0.25
Reach	2450.000	500 YR	13066.00	819.02	834.77	827.87	834.87	0.000506	3.70	7003.69	1277.40	0.17
Reach	2400.000	5 YR	5799.00	818.87	828.69	825.15	828.99	0.001462	5.12	1983.93	409.42	0.31
Reach	2400.000	10 YR	6540.00	818.87	829.27	825.47	829.58	0.001444	5.29	2260.69	552.08	0.31
Reach	2400.000	50 YR	8696.00	818.87	830.81	826.25	831.08	0.001174	5.26	3318.47	1015.08	0.28
Reach	2400.000	100 YR	10000.00	818.87	831.65	826.66	831.89	0.001020	5.14	4007.93	1129.21	0.27
Reach	2400.000	500 YR	13066.00	818.87	834.72	827.60	834.84	0.000459	4.00	6991.51	1328.04	0.18
Reach	2350.000	5 YR	5799.00	818.55	828.80	824.72	828.89	0.000398	2.74	2699.65	487.23	0.16
Reach	2350.000	10 YR	6540.00	818.55	829.39	825.00	829.48	0.000380	2.78	3021.23	614.17	0.16
Reach	2350.000	50 YR	8696.00	818.55	830.91	825.01	830.99	0.000336	2.87	4128.65	866.39	0.15
Reach	2350.000	100 YR	10000.00	818.55	831.74	825.10	831.82	0.000313	2.90	4847.70	1033.63	0.15
Reach	2350.000	500 YR	13066.00	818.55	834.76	825.72	834.81	0.000167	2.44	7924.52	1334.46	0.11
Reach	2300.000	5 YR	5799.00	818.01	828.64	824.19	828.84	0.000970	4.39	2491.34	643.61	0.25
Reach	2300.000	10 YR	6540.00	818.01	829.23	824.46	829.43	0.000927	4.47	2887.74	707.74	0.25
Reach	2300.000	50 YR	8696.00	818.01	830.77	825.20	830.96	0.000767	4.47	4116.02	944.82	0.23
Reach	2300.000	100 YR	10000.00	818.01	831.62	825.61	831.79	0.000673	4.39	4943.83	1050.24	0.22
Reach	2300.000	500 YR	13066.00	818.01	834.71	826.47	834.79	0.000304	3.41	8233.83	1238.92	0.15
Reach	2250.000	5 YR	5799.00	817.57	828.57	823.94	828.79	0.001032	4.47	2337.62	625.98	0.26
Reach	2250.000	10 YR	6540.00	817.57	829.16	824.18	829.38	0.000982	4.53	2709.07	804.49	0.25
Reach	2250.000	50 YR	8696.00	817.57	830.73	824.92	830.92	0.000783	4.44	4094.69	1135.13	0.23
Reach	2250.000	100 YR	10000.00	817.57	831.58	825.31	831.75	0.000693	4.38	4920.81	1219.80	0.22
Reach	2250.000	500 YR	13066.00	817.57	834.70	826.14	834.78	0.000303	3.34	8251.84	1392.20	0.15
Reach	2200.000	5 YR	5799.00	817.41	828.56	823.37	828.73	0.000826	3.88	2696.47	704.23	0.22
Reach	2200.000	10 YR	6540.00	817.41	829.16	823.64	829.32	0.000782	3.93	3122.61	952.54	0.22
Reach	2200.000	50 YR	8696.00	817.41	830.73	824.32	830.87	0.000624	3.86	4564.64	1205.09	0.20
Reach	2200.000	100 YR	10000.00	817.41	831.58	824.78	831.71	0.000550	3.79	5417.63	1279.39	0.19
Reach	2200.000	500 YR	13066.00	817.41	834.69	825.89	834.76	0.000258	3.00	8736.69	1392.91	0.13
Reach	2150.000	5 YR	5799.00	817.26	828.55	822.80	828.68	0.000708	3.47	2767.97	650.19	0.20
Reach	2150.000	10 YR	6540.00	817.26	829.13	823.00	829.28	0.000715	3.62	3118.22	917.04	0.20
Reach	2150.000	50 YR	8696.00	817.26	830.68	824.17	830.83	0.000667	3.83	4532.36	1261.45	0.20
Reach	2150.000	100 YR	10000.00	817.26	831.54	824.66	831.68	0.000592	3.77	5440.89	1314.27	0.19
Reach	2150.000	500 YR	13066.00	817.26	834.67	825.67	834.74	0.000289	3.04	8857.50	1418.88	0.13
Reach	2100.000	5 YR	5799.00	816.68	828.50	822.21	828.65	0.000724	3.43	2372.07	817.01	0.19
Reach	2100.000	10 YR	6540.00	816.68	829.09	822.54	829.25	0.000722	3.55	2624.02	911.88	0.19
Reach	2100.000	50 YR	8696.00	816.68	830.62	823.61	830.80	0.000717	3.88	3277.21	1045.93	0.20
Reach	2100.000	100 YR	10000.00	816.68	831.45	824.07	831.64	0.000716	4.05	3631.52	1108.21	0.20
Reach	2100.000	500 YR	13066.00	816.68	834.55	825.07	834.72	0.000499	3.90	4955.21	1452.72	0.17
Reach	2050.000	5 YR	5799.00	815.46	828.40	822.26	828.61	0.000819	3.99	2064.28	761.10	0.22
Reach	2050.000	10 YR	6540.00	815.46	828.99	822.80	829.21	0.000831	4.17	2247.74	914.69	0.22
Reach	2050.000	50 YR	8696.00	815.46	830.49	823.80	830.76	0.000863	4.64	2722.37	1046.76	0.23
Reach	2050.000	100 YR	10000.00	815.46	831.31	824.30	831.60	0.000881	4.89	2979.48	1063.16	0.24
Reach	2050.000	500 YR	13066.00	815.46	834.42	825.11	834.68	0.000646	4.82	3957.71	1119.99	0.21
Reach	1975.000	5 YR	5799.00	812.37	828.16	822.56	828.52	0.001370	5.36	1587.54	947.92	0.29
Reach	1975.000	10 YR	6540.00	812.37	828.73	823.12	829.12	0.001402	5.61	1722.73	979.94	0.29
Reach	1975.000	50 YR	8696.00	812.37	830.19	824.49	830.66	0.001489	6.26	2071.53	1017.45	0.31
Reach	1975.000	100 YR	10000.00	812.37	830.98	825.15	831.50	0.001536	6.61	2260.01	1035.15	0.31
Reach	1975.000	500 YR	13066.00	812.37	834.14	826.81	834.60	0.001121	6.48	3010.15	1099.84	0.28
Reach	1900.000	5 YR	5799.00	813.04	828.01	821.49	828.41	0.001411	5.07	1143.24	132.56	0.30
Reach	1900.000	10 YR	6540.00	813.04	828.55	822.07	829.00	0.001515	5.38	1215.37	136.07	0.32
Reach	1900.000	50 YR	8696.00	813.04	829.93	823.79	830.52	0.001765	6.17	1409.58	193.23	0.35
Reach	1900.000	100 YR	10000.00	813.04	830.68	824.40	831.35	0.001848	6.59	1517.64	259.01	0.36
Reach	1900.000	500 YR	13066.00	813.04	833.81	825.72	834.49	0.001314	6.62	1975.26	750.53	0.32
Reach	1856.17		Bridge									
Reach	1789.000	5 YR	5799.00	813.61	827.58	822.32	828.06	0.001844	5.59	1037.01	127.77	0.35
Reach	1789.000	10 YR	6540.00	813.61	828.07	822.84	828.62	0.001972	5.94	1100.81	130.14	0.36
Reach	1789.000	50 YR	8696.00	813.61	829.33	824.25	830.06	0.002315	6.86	1268.42	136.17	0.40
Reach	1789.000	100 YR	10000.00	813.61	830.01	824.85	830.84	0.002499	7.35	1361.43	139.40	0.41
Reach	1789.000	500 YR	13066.00	813.61	831.43	826.14	832.51	0.002814	8.35	1564.88	149.02	0.45
Reach	1718.17		Bridge									

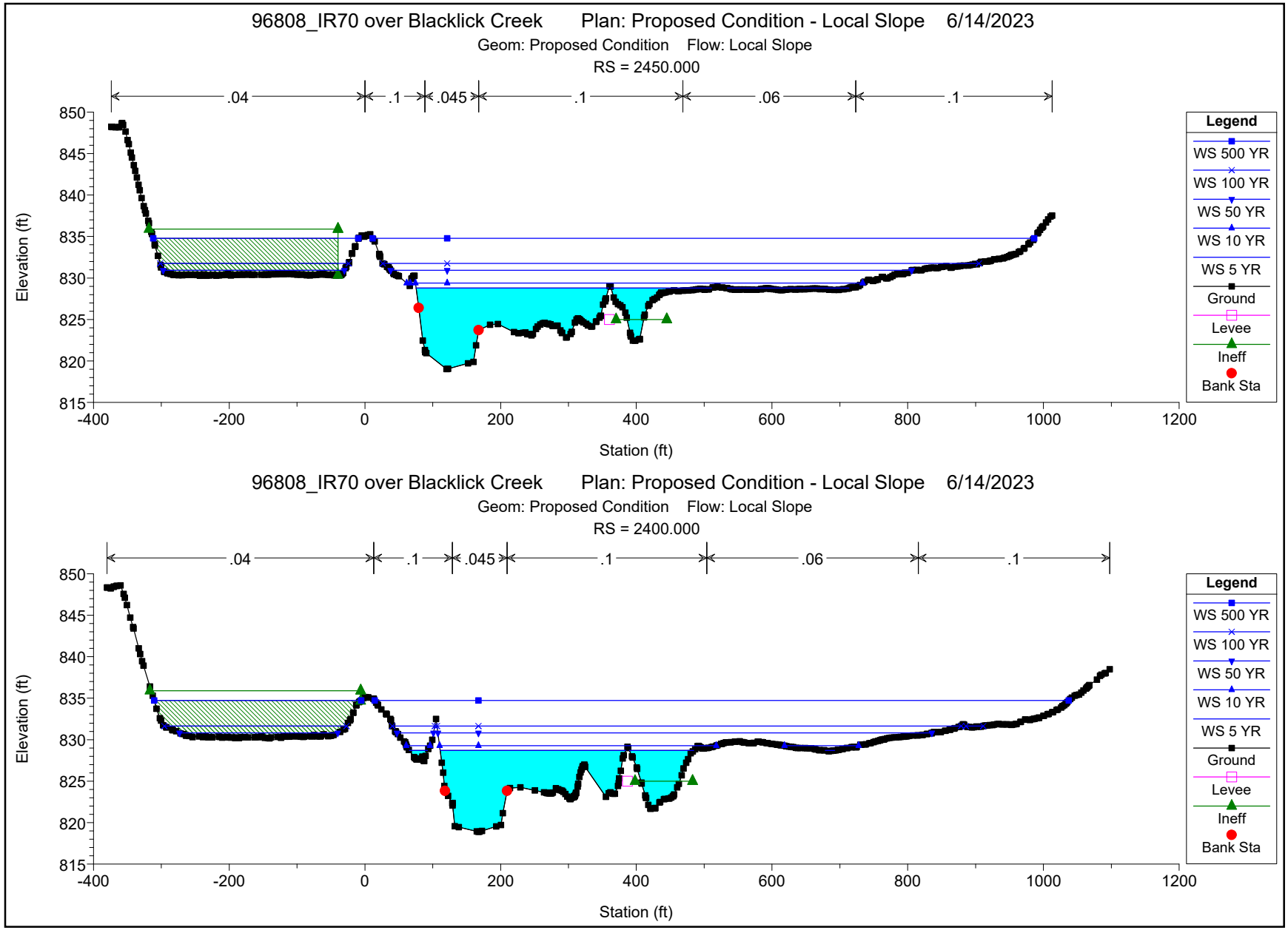
HEC-RAS Plan: Proposed Condition - Local Slope River: Blacklick Cre Reach: Reach (Continued)

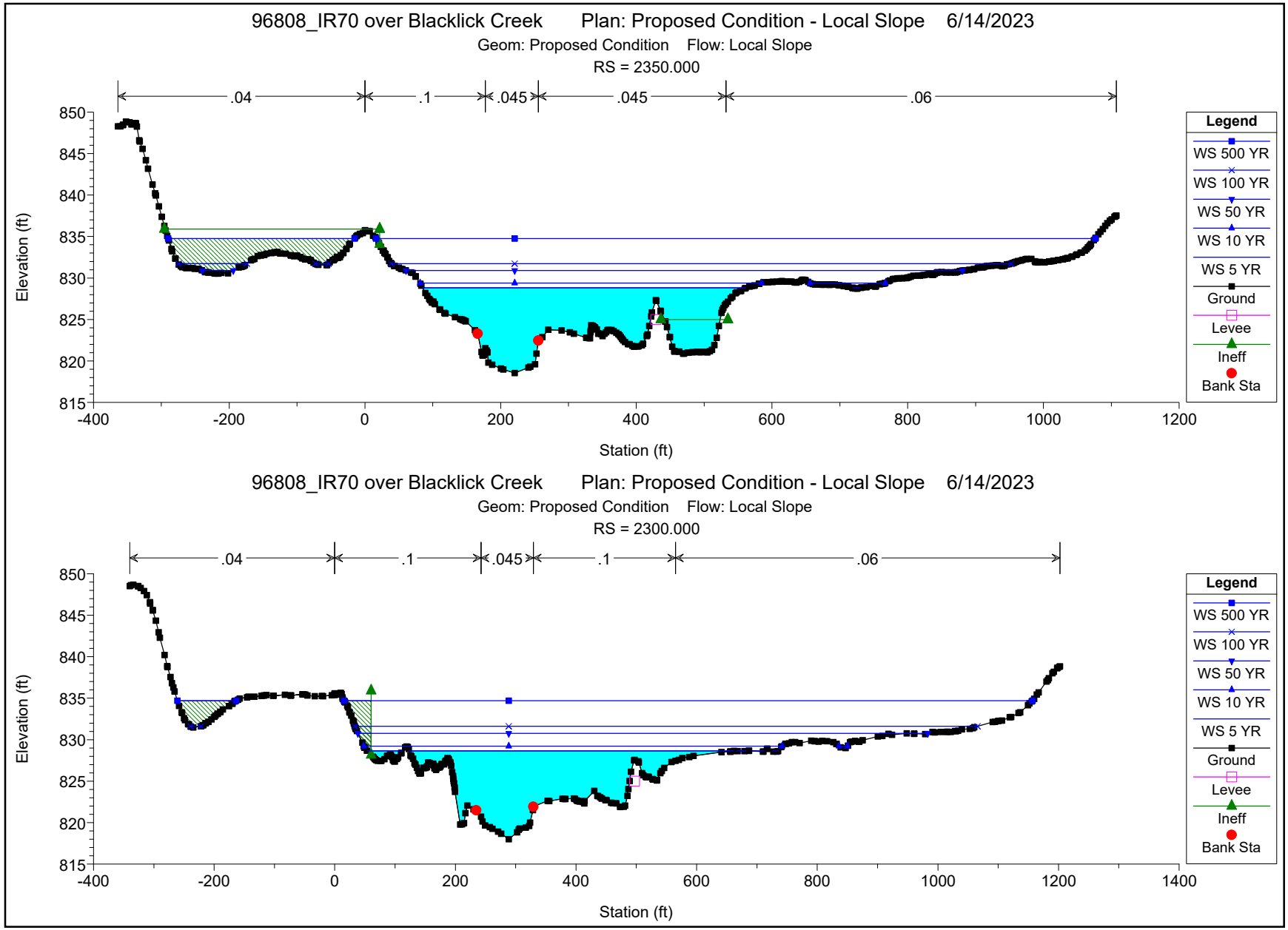
Tailwater Velocities

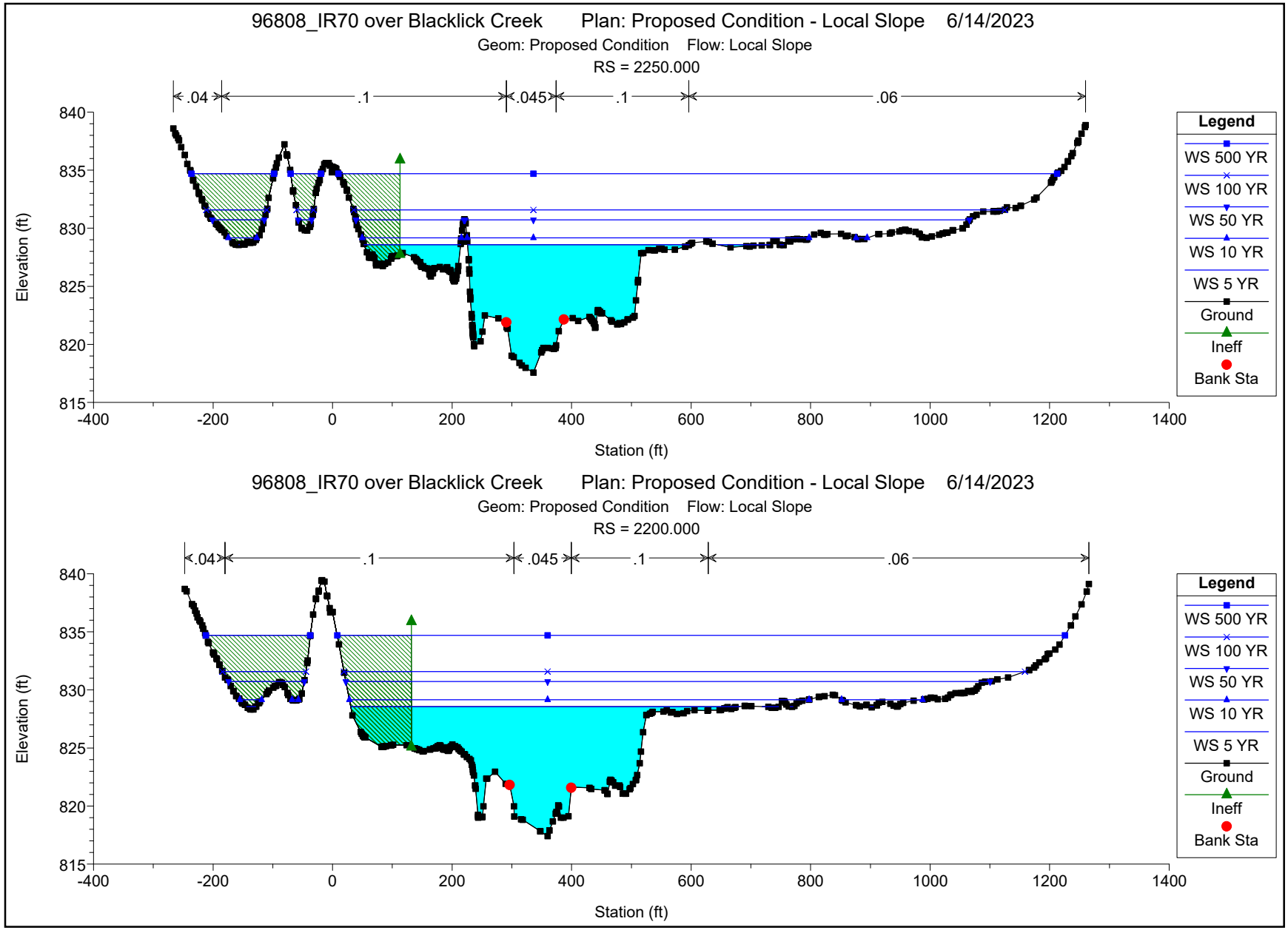
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	1645.000	5 YR	5799.00	814.88	826.83	822.67	827.49	0.002374	6.59	960.63	878.31	0.40
Reach	1645.000	10 YR	6540.00	814.88	827.27	823.20	828.01	0.002549	7.02	1025.99	954.29	0.41
Reach	1645.000	50 YR	8696.00	814.88	828.34	824.55	829.33	0.003061	8.18	1186.21	1173.73	0.46
Reach	1645.000	100 YR	10000.00	814.88	828.90	825.35	830.05	0.003363	8.84	1268.84	1241.18	0.48
Reach	1645.000	500 YR	13066.00	814.88	830.01	826.69	831.55	0.004060	10.29	1435.30	1354.51	0.53
Reach	1600.000	5 YR	5799.00	814.56	826.53	822.59	827.31	0.004361	7.15	892.29	878.76	0.45
Reach	1600.000	10 YR	6540.00	814.56	826.95	823.12	827.82	0.004570	7.58	974.56	967.19	0.46
Reach	1600.000	50 YR	8696.00	814.56	828.00	824.55	829.12	0.005157	8.71	1178.74	995.21	0.50
Reach	1600.000	100 YR	10000.00	814.56	828.55	825.40	829.82	0.005486	9.33	1285.79	1018.02	0.52
Reach	1600.000	500 YR	13066.00	814.56	829.69	827.16	831.31	0.006195	10.66	1506.00	1098.72	0.56
Reach	1550.000	5 YR	5799.00	813.73	826.40	821.49	827.13	0.002528	6.88	927.23	1124.90	0.42
Reach	1550.000	10 YR	6540.00	813.73	826.81	822.42	827.63	0.002769	7.34	1013.81	1206.97	0.43
Reach	1550.000	50 YR	8696.00	813.73	827.82	823.77	828.90	0.003394	8.53	1256.56	1295.65	0.48
Reach	1550.000	100 YR	10000.00	813.73	828.36	824.49	829.59	0.003717	9.15	1388.30	1335.52	0.50
Reach	1550.000	500 YR	13066.00	813.73	829.49	826.63	831.02	0.004377	10.42	1661.76	1401.41	0.54
Reach	1500.000	5 YR	5799.00	813.08	826.33	822.31	826.97	0.002654	6.48	1007.62	1130.65	0.41
Reach	1500.000	10 YR	6540.00	813.08	826.75	822.73	827.46	0.002862	6.85	1123.94	1192.86	0.43
Reach	1500.000	50 YR	8696.00	813.08	827.80	823.96	828.67	0.003352	7.75	1432.23	1327.03	0.45
Reach	1500.000	100 YR	10000.00	813.08	828.36	824.65	829.33	0.003587	8.21	1598.20	1353.50	0.47
Reach	1500.000	500 YR	13066.00	813.08	829.55	826.66	830.69	0.004030	9.14	1946.50	1413.33	0.49
Reach	1450.000	5 YR	5799.00	813.09	826.28	822.41	826.81	0.002391	5.98	1197.75	1094.13	0.38
Reach	1450.000	10 YR	6540.00	813.09	826.70	822.87	827.28	0.002533	6.28	1341.90	1207.33	0.39
Reach	1450.000	50 YR	8696.00	813.09	827.78	824.02	828.46	0.002845	7.00	1717.96	1319.72	0.41
Reach	1450.000	100 YR	10000.00	813.09	828.36	824.57	829.09	0.002988	7.36	1920.35	1325.37	0.41
Reach	1450.000	500 YR	13066.00	813.09	829.57	826.35	830.42	0.003252	8.09	2346.02	1340.12	0.43
Reach	1400.000	5 YR	5799.00	814.33	826.25	822.57	826.65	0.002511	5.29	1425.75	1151.08	0.35
Reach	1400.000	10 YR	6540.00	814.33	826.68	822.98	827.11	0.002502	5.49	1606.27	1230.28	0.35
Reach	1400.000	50 YR	8696.00	814.33	827.78	824.00	828.26	0.002497	5.99	2064.39	1275.09	0.36
Reach	1400.000	100 YR	10000.00	814.33	828.37	824.49	828.89	0.002502	6.27	2310.00	1332.31	0.36
Reach	1400.000	500 YR	13066.00	814.33	829.61	825.46	830.20	0.002528	6.84	2825.10	1364.12	0.37
Reach	1350.000	5 YR	5799.00	813.91	826.24	822.26	826.52	0.001379	4.44	1787.23	1149.58	0.29
Reach	1350.000	10 YR	6540.00	813.91	826.68	822.60	826.98	0.001395	4.63	1989.25	1203.17	0.30
Reach	1350.000	50 YR	8696.00	813.91	827.79	823.57	828.13	0.001430	5.09	2506.41	1310.86	0.30
Reach	1350.000	100 YR	10000.00	813.91	828.38	824.08	828.75	0.001453	5.34	2783.44	1322.47	0.31
Reach	1350.000	500 YR	13066.00	813.91	829.63	825.32	830.05	0.001505	5.87	3364.51	1345.02	0.32
Reach	1300.000	5 YR	5799.00	814.91	826.20	822.37	826.44	0.001367	4.26	2013.01	1190.09	0.28
Reach	1300.000	10 YR	6540.00	814.91	826.64	822.73	826.89	0.001352	4.38	2254.46	1206.90	0.28
Reach	1300.000	50 YR	8696.00	814.91	827.76	823.74	828.04	0.001346	4.74	2864.97	1338.76	0.28
Reach	1300.000	100 YR	10000.00	814.91	828.36	824.25	828.65	0.001349	4.93	3192.36	1362.25	0.29
Reach	1300.000	500 YR	13066.00	814.91	829.61	825.29	829.95	0.001368	5.36	3878.36	1489.13	0.29
Reach	1225.000	5 YR	5799.00	812.25	826.16	821.70	826.33	0.001047	3.61	2316.77	1096.02	0.23
Reach	1225.000	10 YR	6540.00	812.25	826.60	822.00	826.78	0.001040	3.74	2582.47	1143.18	0.23
Reach	1225.000	50 YR	8696.00	812.25	827.72	822.77	827.93	0.001042	4.09	3272.73	1318.35	0.24
Reach	1225.000	100 YR	10000.00	812.25	828.32	823.28	828.54	0.001056	4.30	3658.21	1412.54	0.24
Reach	1225.000	500 YR	13066.00	812.25	829.58	824.45	829.84	0.001056	4.67	4473.20	1521.31	0.25
Reach	1150.000	5 YR	5799.00	812.69	826.06	821.54	826.24	0.001658	3.78	2371.46	1068.96	0.23
Reach	1150.000	10 YR	6540.00	812.69	826.51	821.86	826.69	0.001620	3.87	2656.19	1106.17	0.23
Reach	1150.000	50 YR	8696.00	812.69	827.64	822.68	827.83	0.001562	4.12	3398.36	1293.27	0.23
Reach	1150.000	100 YR	10000.00	812.69	828.25	823.35	828.44	0.001543	4.26	3806.44	1365.96	0.23
Reach	1150.000	500 YR	13066.00	812.69	829.52	824.50	829.73	0.001521	4.57	4688.11	1560.57	0.24
Reach	1100.000	5 YR	5799.00	814.51	825.98	821.11	826.16	0.001208	3.88	2511.75	1122.83	0.23
Reach	1100.000	10 YR	6540.00	814.51	826.43	821.52	826.62	0.001191	3.98	2826.40	1144.38	0.23
Reach	1100.000	50 YR	8696.00	814.51	827.56	822.42	827.76	0.001162	4.25	3639.35	1301.19	0.23
Reach	1100.000	100 YR	10000.00	814.51	828.17	823.18	828.37	0.001155	4.40	4081.96	1358.60	0.24
Reach	1100.000	500 YR	13066.00	814.51	829.44	824.89	829.66	0.001153	4.74	5031.22	1630.76	0.24
Reach	1050.000	5 YR	5799.00	813.60	825.91	820.80	826.11	0.000851	4.02	2664.70	1136.34	0.24
Reach	1050.000	10 YR	6540.00	813.60	826.36	821.20	826.56	0.000850	4.13	3008.20	1157.39	0.24
Reach	1050.000	50 YR	8696.00	813.60	827.49	822.29	827.71	0.000851	4.43	3900.83	1277.99	0.24
Reach	1050.000	100 YR	10000.00	813.60	828.10	823.16	828.32	0.000851	4.58	4383.97	1305.65	0.24
Reach	1050.000	500 YR	13066.00	813.60	829.38	824.89	829.61	0.000851	4.90	5403.34	1617.81	0.25

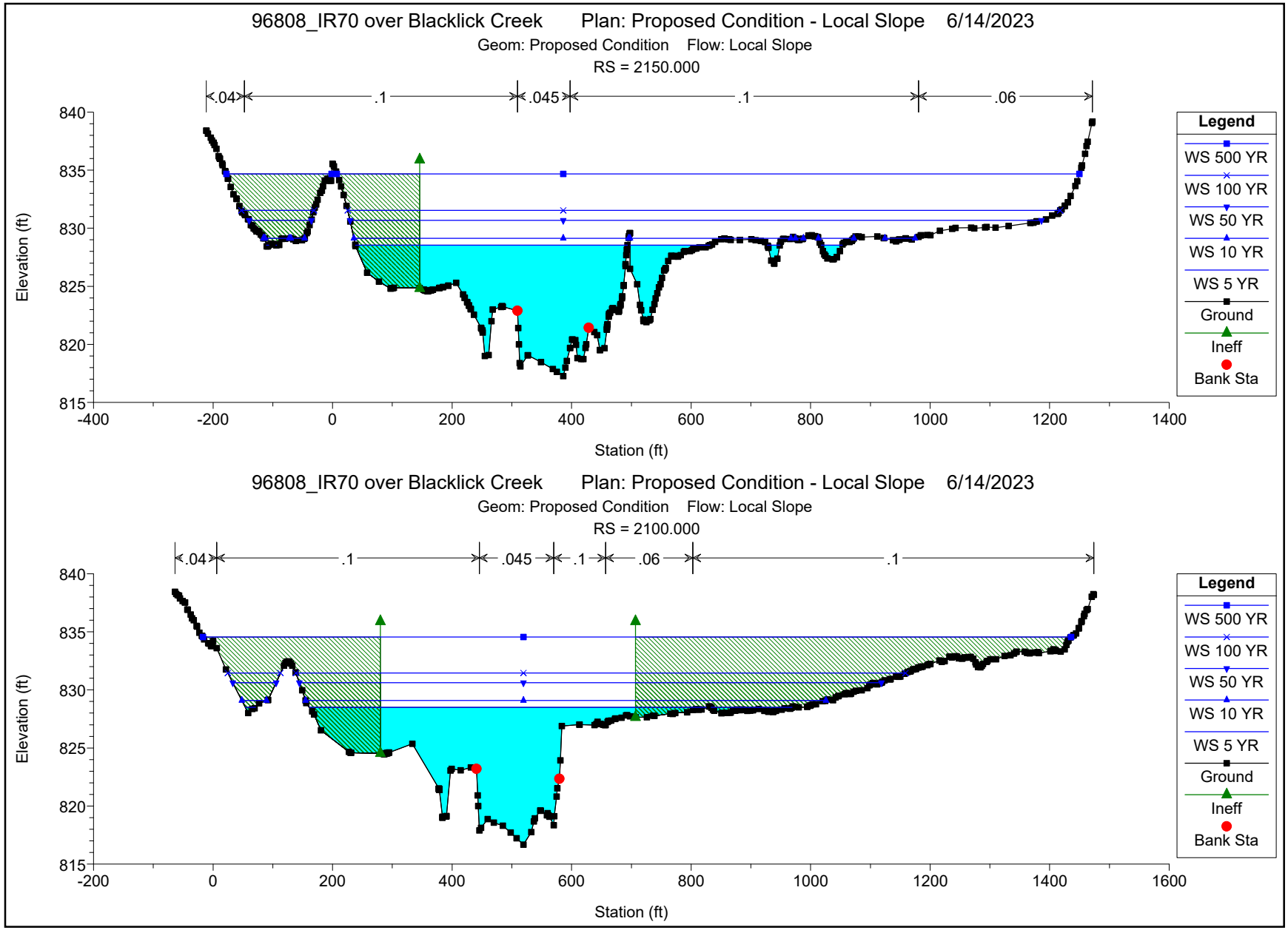
Downstream Tie-In Point

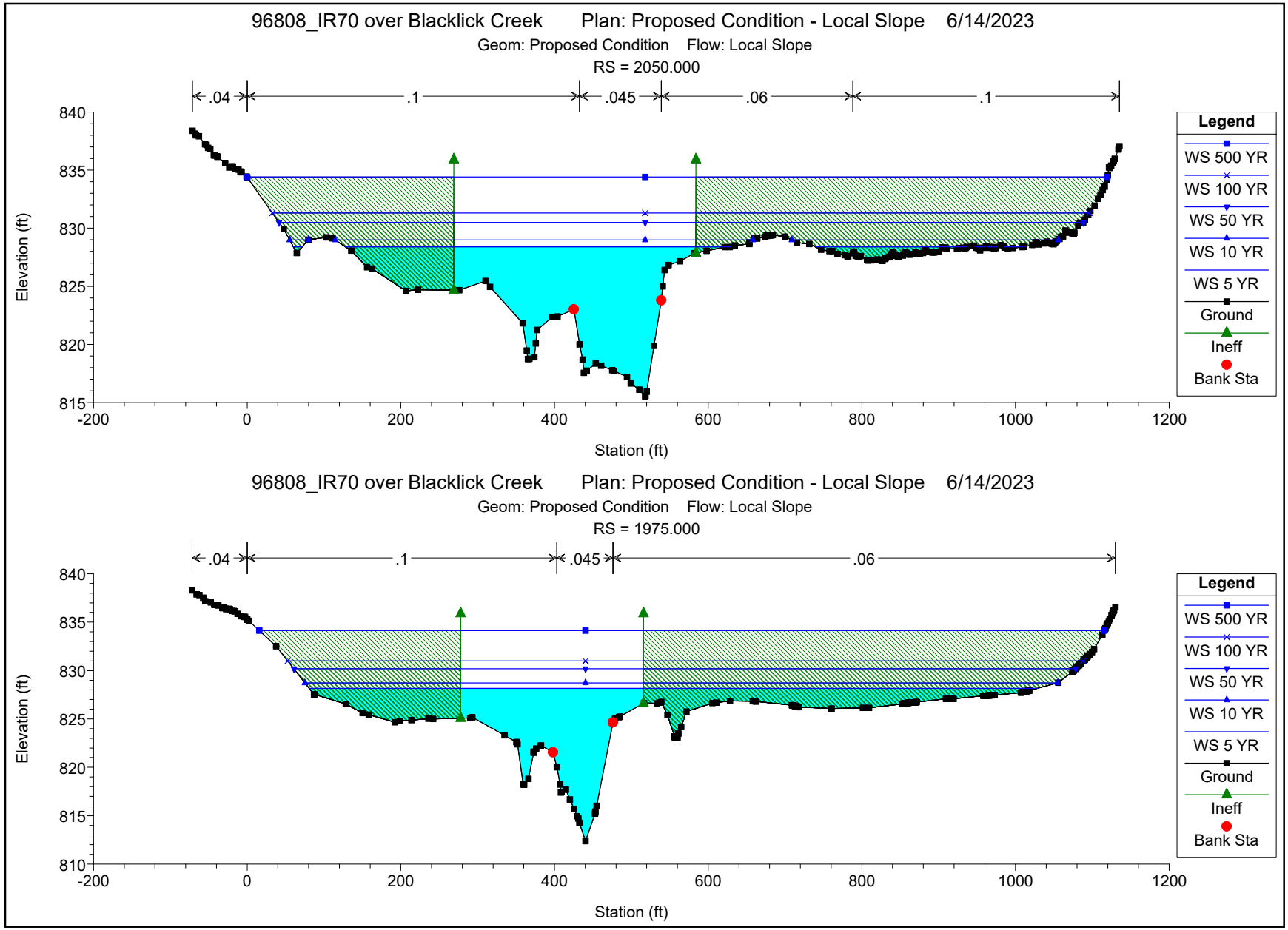

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/19/2023
Geom: Proposed Condition Flow: Local Slope
Blacklick Cre Reach
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Left Levee
Right Levee
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
Main Channel Distance (ft)

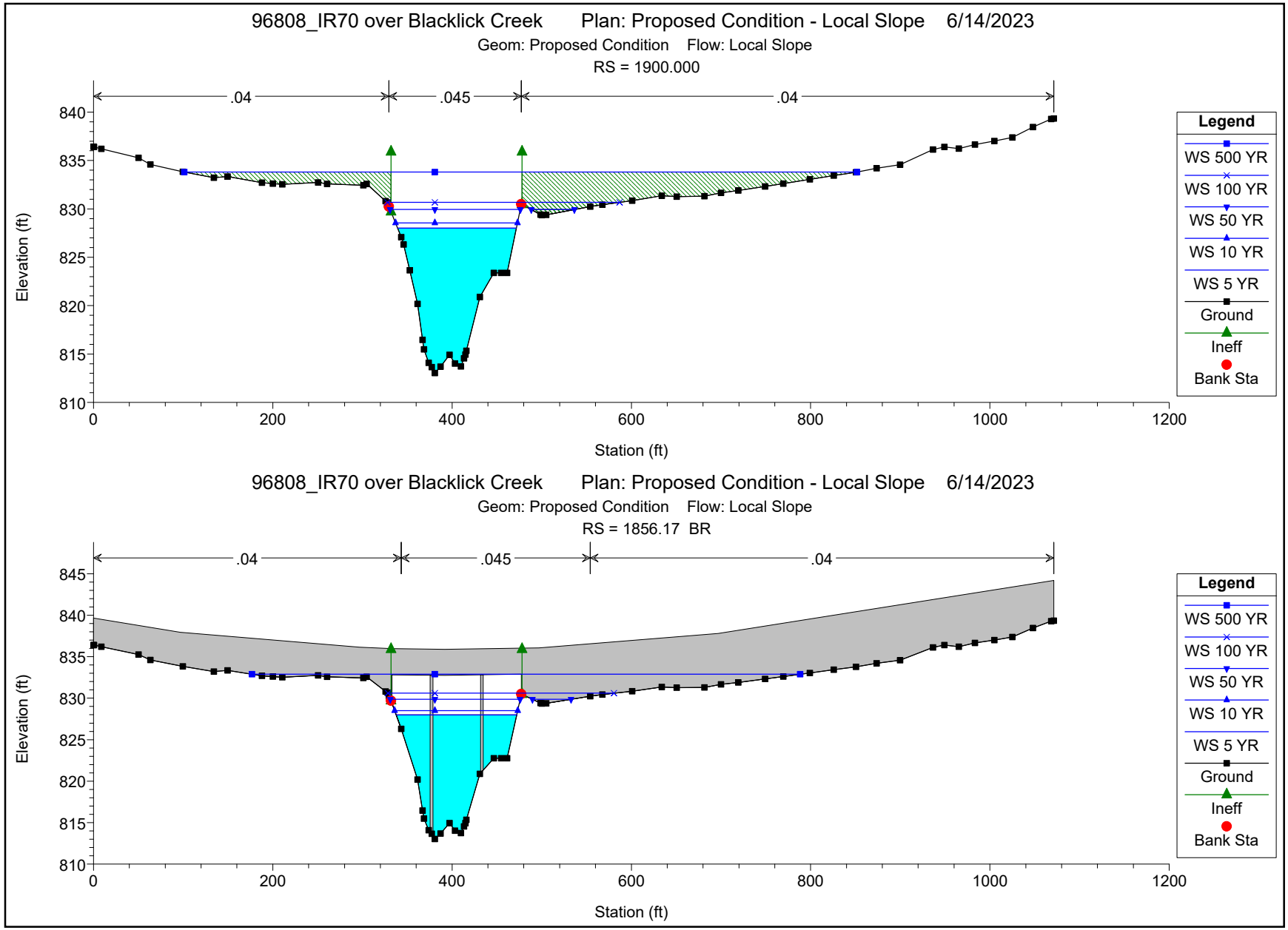

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2450.000
.04
.1
.045
.1
.06
.1
Elevation (ft)
850
845
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2400.000
.04
.1
.045
.1
.06
.1
Elevation (ft)
850
845
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

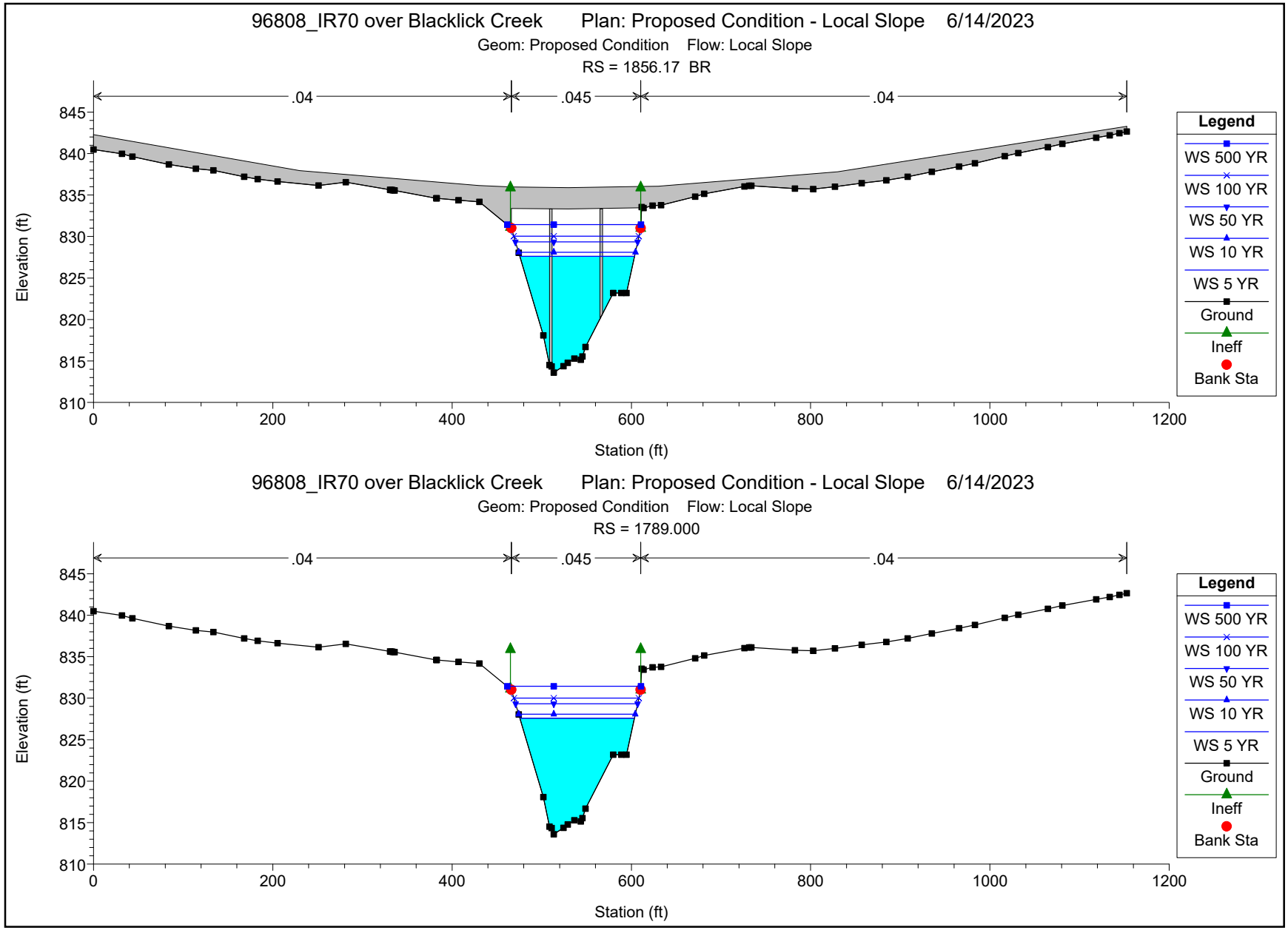

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2350.000
.04
.1
.045
.045
.06
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2300.000
.04
.1
.045
.1
.06
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

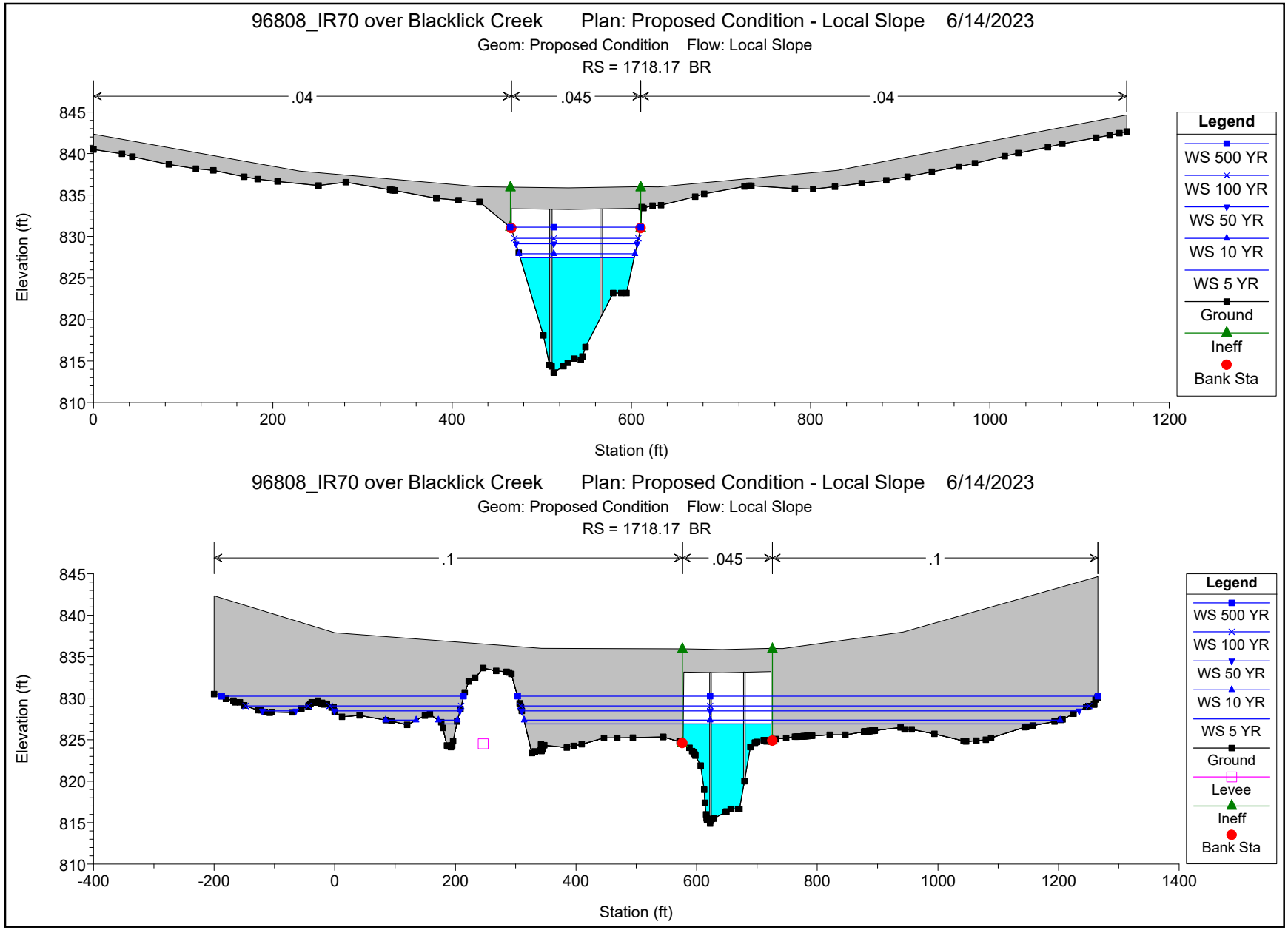

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2250.000
.04
.1
.045
.1
.06
Elevation (ft)
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2200.000
.04
.1
.045
.1
.06
Elevation (ft)
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

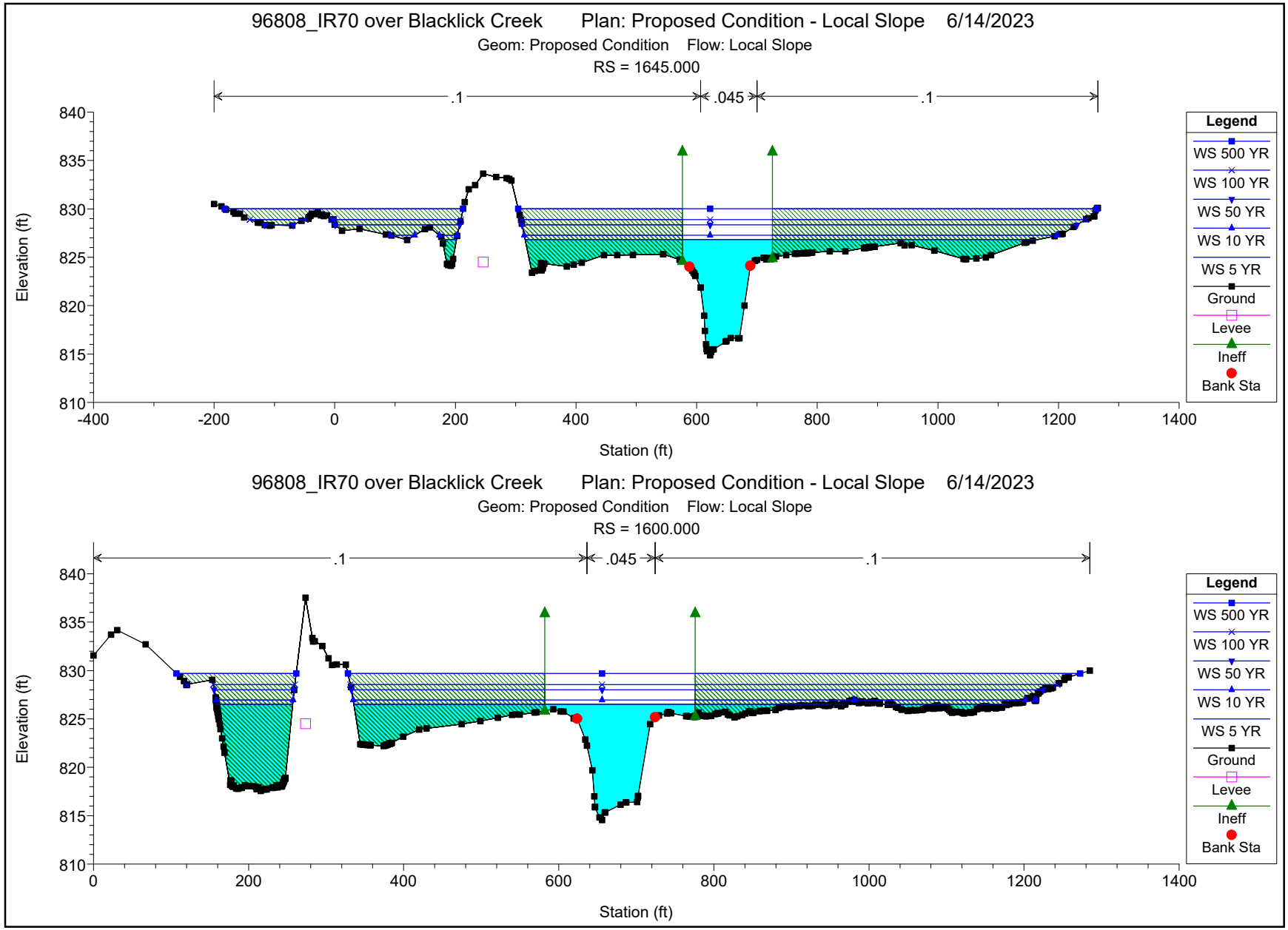

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2150.000
.04
.1
.045
.1
.06
Elevation (ft)
840
835
830
825
820
815
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2100.000
.04
.1
.045
.1
.06
.1
Elevation (ft)
840
835
830
825
820
815
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

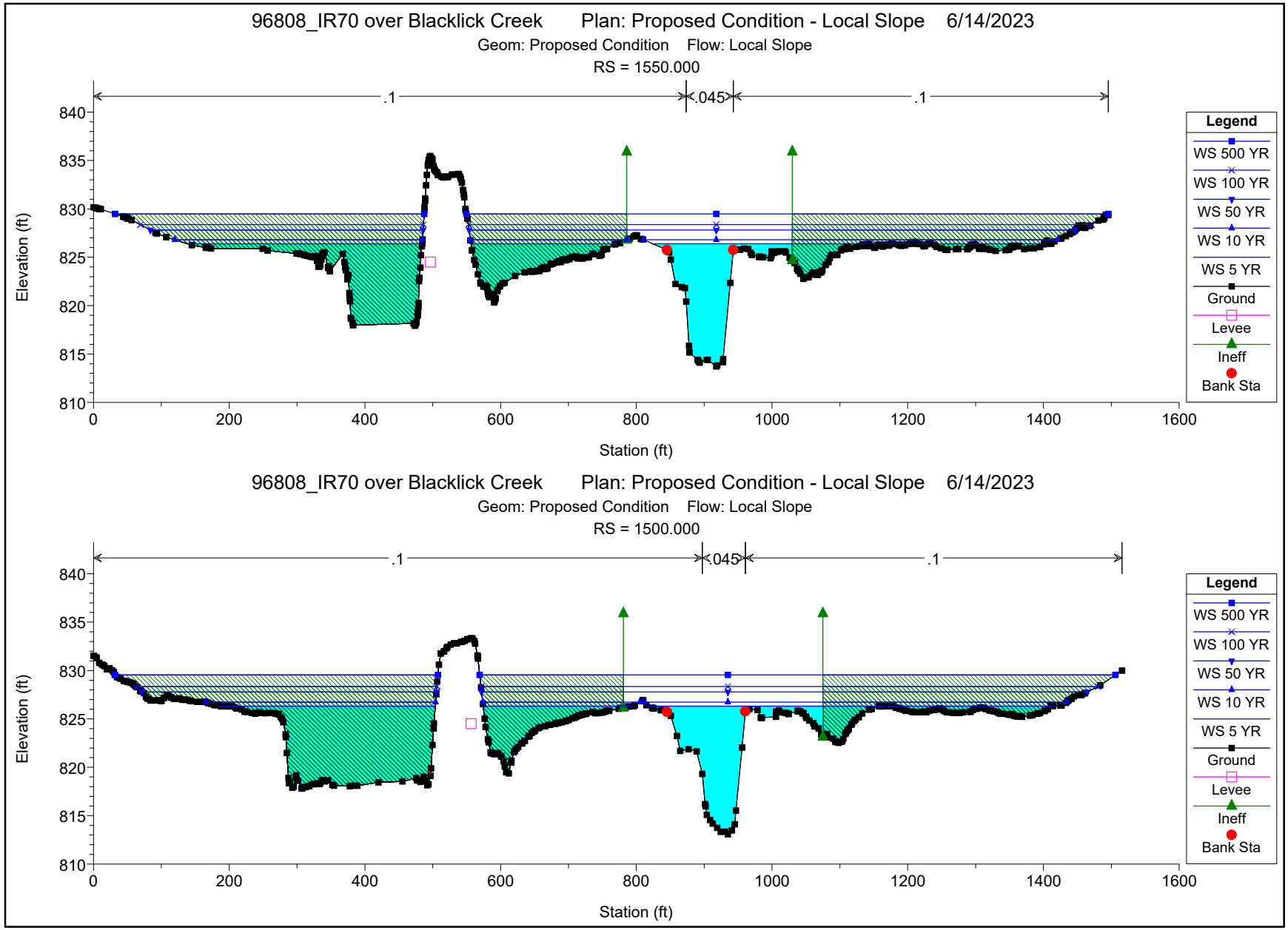

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 2050.000
.04
.1
.045
.06
.1
Elevation (ft)
840
835
830
825
820
815
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1975.000
.04
.1
.045
.06
Elevation (ft)
840
835
830
825
820
815
810
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta

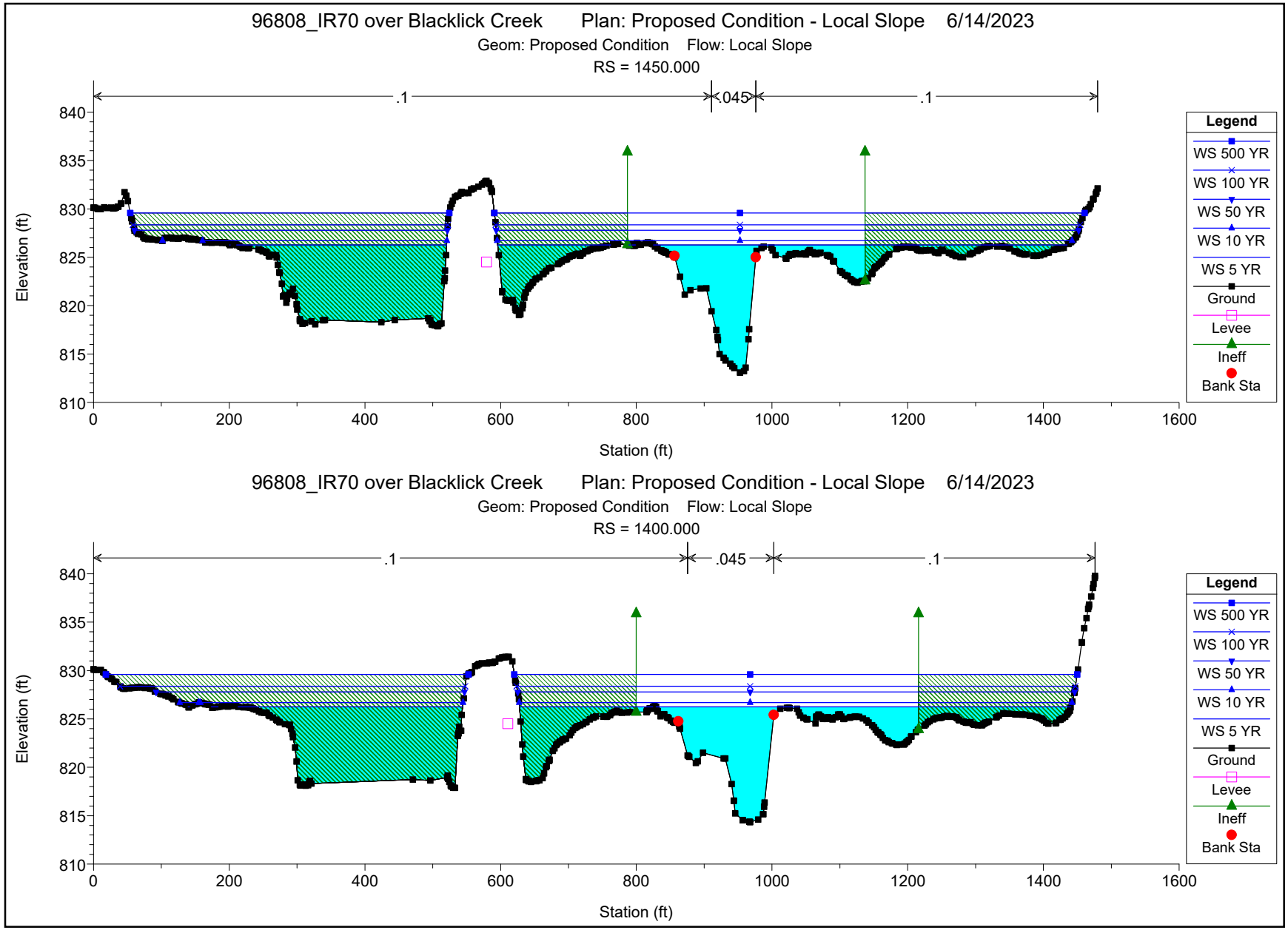

96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1900.000
.04
.045
.04
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1856.17 BR
.04
.045
.04
Elevation (ft)
845
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1856.17 BR
.04
.045
.04
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1789.000
.04
.045
.04
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1718.17 BR
.04
.045
.04
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1718.17 BR
.1
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1645.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
-400
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1600.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta


96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1550.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1500.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta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Geom: Proposed Condition Flow: Local Slope
RS = 1450.000
.1
.045
.1
Elevation (ft)
840
835
830
825
820
815
810
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
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RS = 1400.000
.1
.045
.1
Elevation (ft)
840
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830
825
820
815
810
0
200
400
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800
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1200
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Levee
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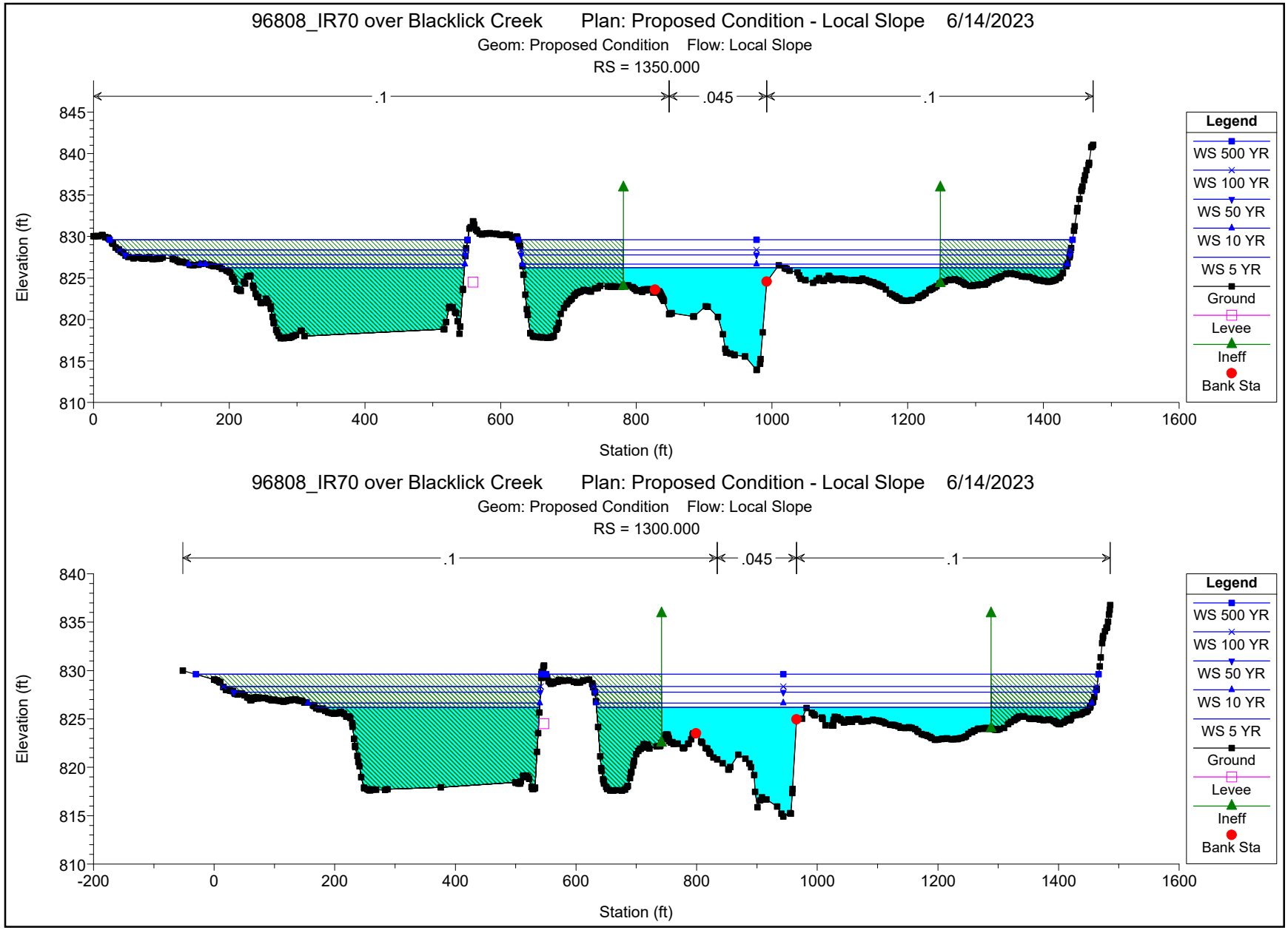
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1300.000
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.045
.1
Elevation (ft)
Station (ft)
Legend
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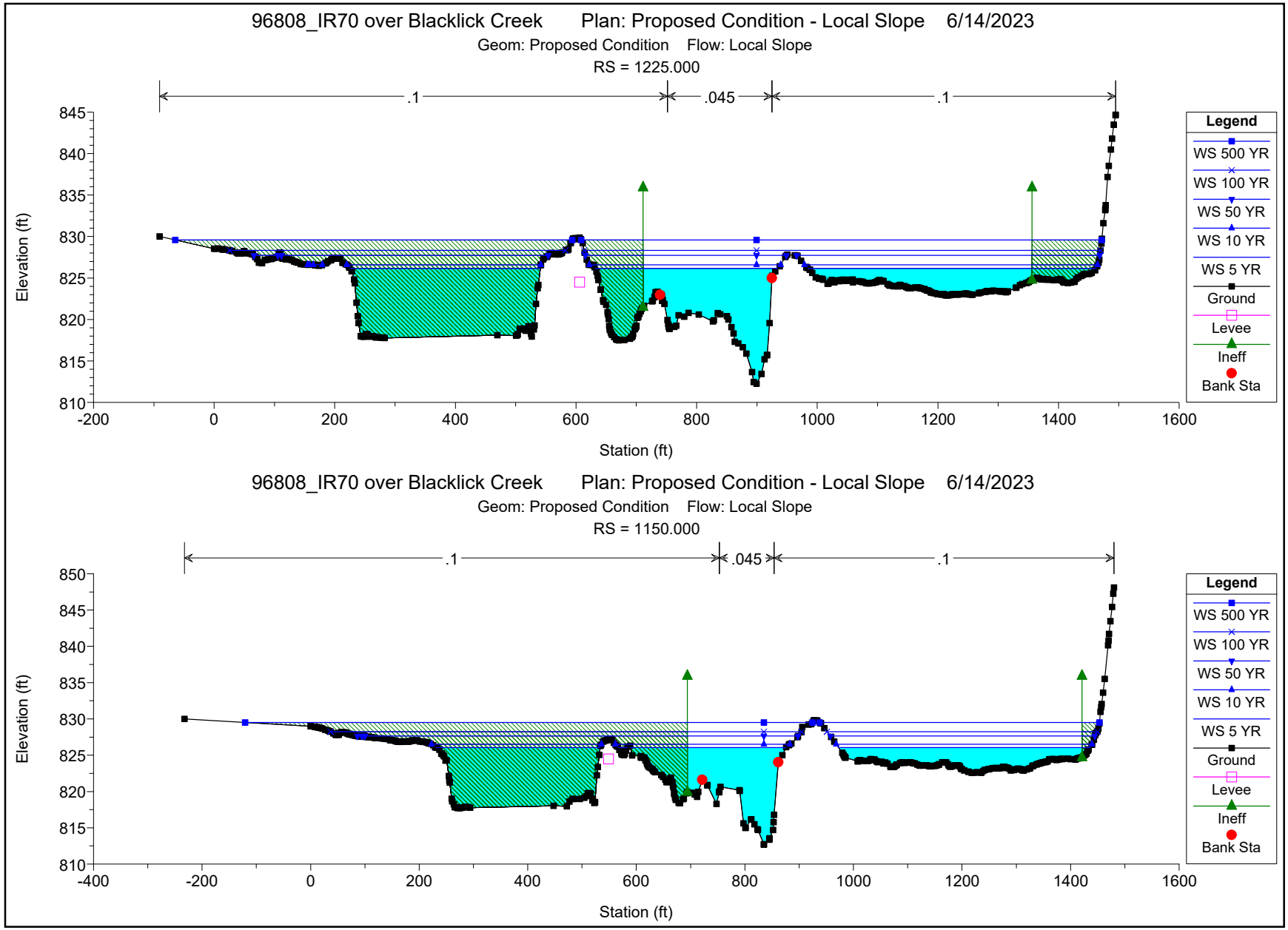
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta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Station (ft)
Legend
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WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
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Geom: Proposed Condition Flow: Local Slope
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.1
.045
.1
Elevation (ft)
Station (ft)
Legend
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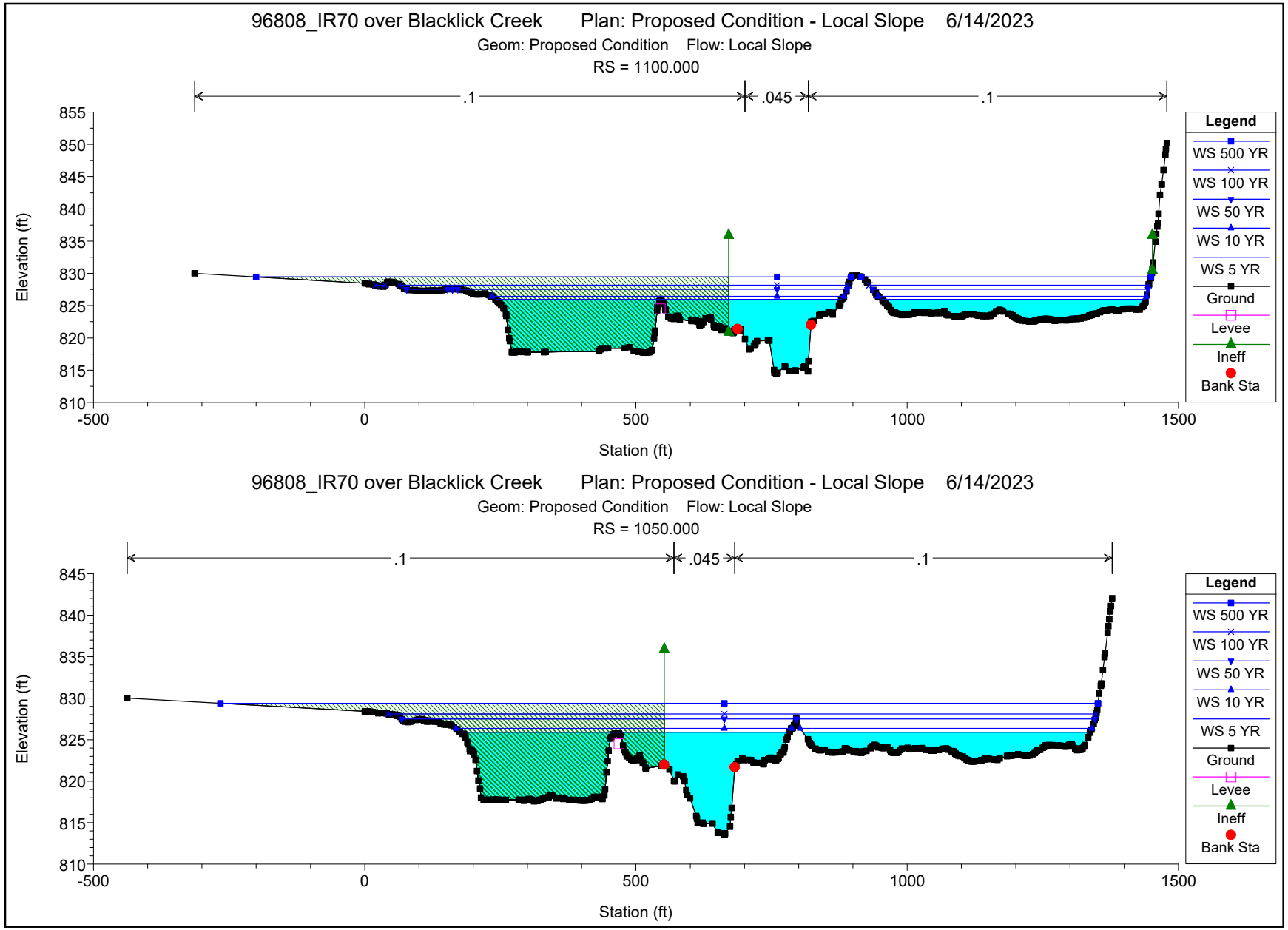
WS 5 YR
Ground
Levee
Ineff
Bank Sta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Geom: Proposed Condition Flow: Local Slope
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.1
.045
.1
Elevation (ft)
855
850
845
840
835
830
825
820
815
810
-500
0
500
1000
1500
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta
96808_IR70 over Blacklick Creek Plan: Proposed Condition - Local Slope 6/14/2023
Geom: Proposed Condition Flow: Local Slope
RS = 1050.000
.1
.045
.1
Elevation (ft)
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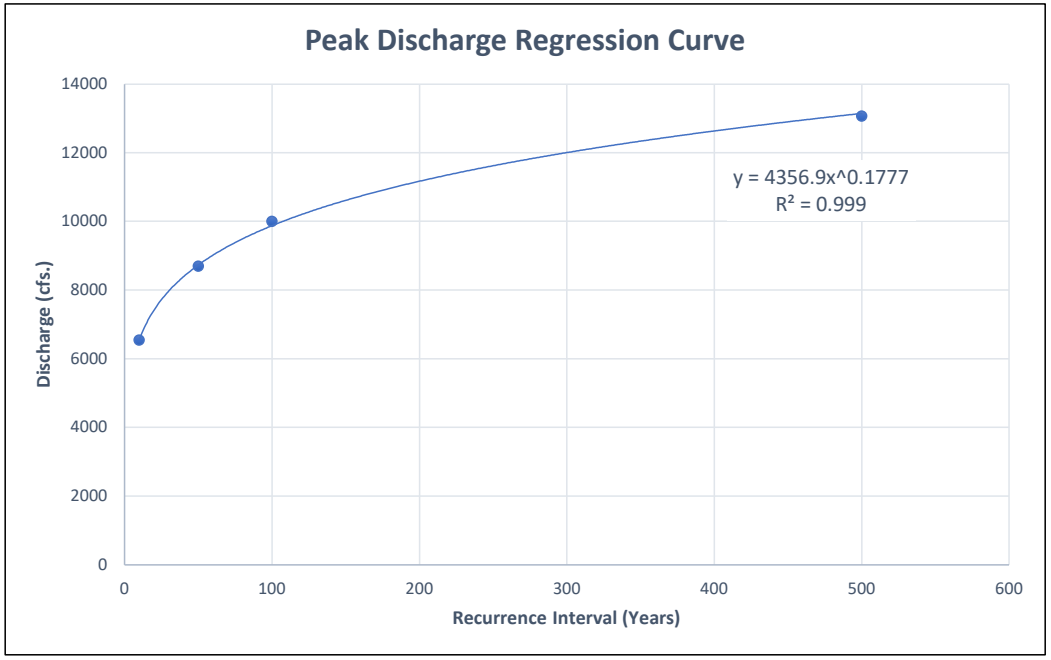
835
830
825
820
815
810
-500
0
500
1000
1500
Station (ft)
Legend
WS 500 YR
WS 100 YR
WS 50 YR
WS 10 YR
WS 5 YR
Ground
Levee
Ineff
Bank Sta

Appendix E – Hydraulic Calculations

CALCULATION OF PEAK DISCHARGE FOR 20% AEP EVENT:

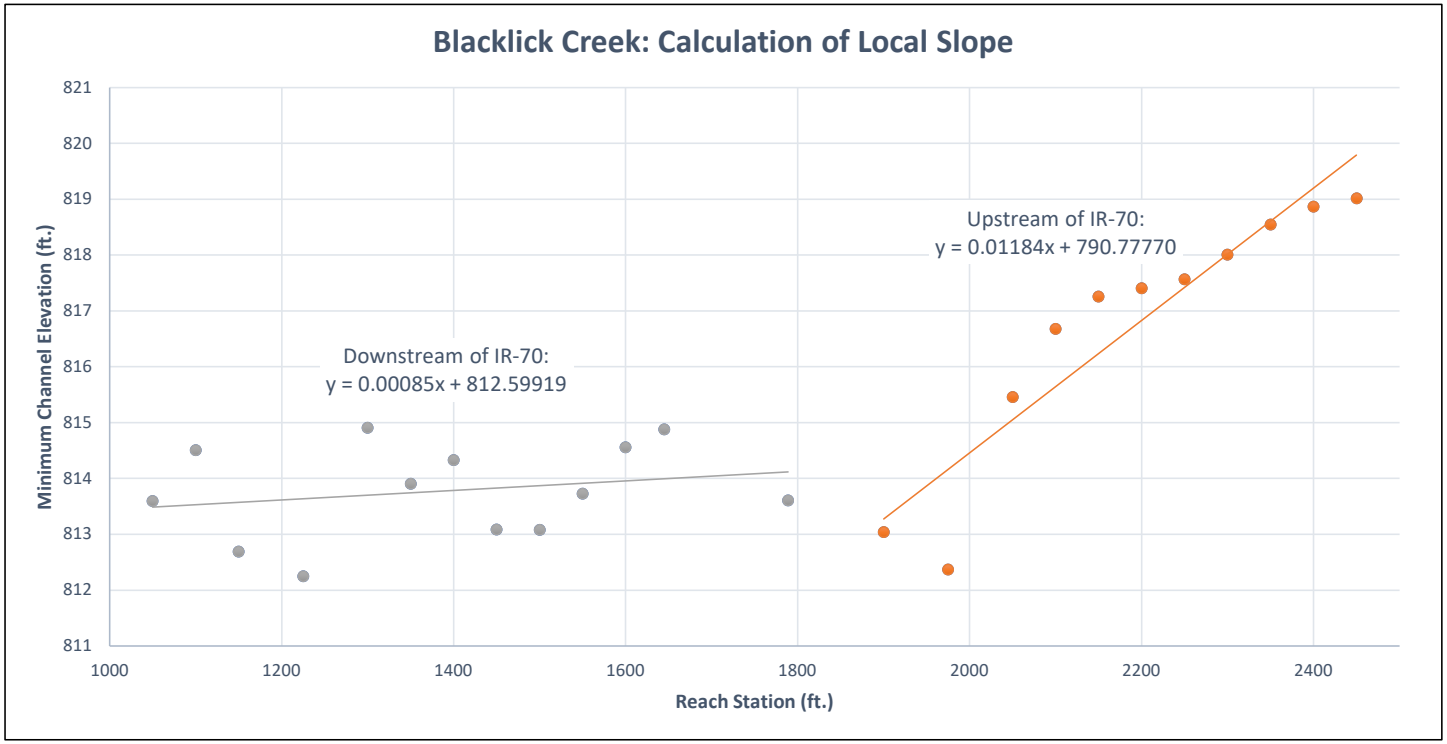
Franklin County FIS Data at Cross Section AI	
Year	Discharge (cfs)
500	13066
100	10000
50	8696
10	6540

Peak Discharge of 5 Year Storm =	5799.42 cfs



CALCULATION OF LOCAL SLOPE:

RS	Thalweg
2450	819.02
2400	818.87
2350	818.55
2300	818.01
2250	817.57
2200	817.41
2150	817.26
2100	816.68
2050	815.46
1975	812.37
1900	813.04
1789	813.61
1645	814.88
1600	814.56
1550	813.73
1500	813.08
1450	813.09
1400	814.33
1350	813.91
1300	814.91
1225	812.25
1150	812.69
1100	814.51
1050	813.6



Appendix F – Site Photos

Left Bridge Upstream Elevation

Upstream Channel

Right Bridge Upstream Elevation

Typical Span 1 Elevation (Left Bridge Looking North Shown)

Downstream Channel

Far East Freeway
FAI-70-01190 L&R
Structure Type Study

Ohio Department of Transportation – District 5
9600 Jacksontown Road
Jacksontown, OH 43030

June 23, 2023

2550 Corporate Exchange Drive, Suite 300
Columbus, Ohio 43231
TEL 614 901 2235
WEB www.structurepoint.com

AMERICAN STRUCTUREPOINT INC.

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Appendix B – Preliminary Bridge Plans, Preferred Alternative

Appendix C – Preliminary Construction Cost and Lifecycle Cost

Appendix D – Existing Bridge Plans

Appendix E – Bridge Inspection Photographs

1.0 Executive Summary

1.1 Overall Summary and Recommendations

This report has been prepared to determine the preferred structure type for the I-70 over SR 256 crossing as part of the FAI/LIC-0.00/0.00 Far East Freeway project (PID 96808). All alternative layouts are based on the pertinent recommendations from the previously submitted and approved "Far East Freeway FAI/LIC-70-0.00/0.00 Feasibility Study" which include:

- Widening IR 70 to the outside, constructing three through lanes in the eastbound and westbound directions
- Construct a two-lane westbound CD road between SR 256 and Taylor Road

The existing FAI-70-01190 Left (SFN 2301628) and Right (SFN 2301652) bridges are both four-span, continuous rolled steel beam structures. The span configurations are slightly different for the two sides, with overall lengths (c/c brg.) of 174'-6" and 178'-6" for the Left and Right Bridges respectively. The substructures consist of reinforced concrete cap and column piers and stub abutments with a 12° skew on spread footing foundations. Originally constructed in 1967, the bridges have had previous rehabilitation work including SDC overlay, parapet replacement, and repairs to strip seal joints performed in 1988. The minimum vertical clearance provided over SR 256 is currently 15'-0", with the point of minimum clearance occurring at the Left Bridge north fascia beam over the southbound inside lane.

The recommended replacement structure for both the Left, Right, and CD Road Bridges is a two-span (67'-0", 75'-0") W30 composite rolled steel beam superstructure on cap and column piers and semi-integral abutments behind MSE walls. This structure type meets all current ODOT design criteria and improves the currently deficient minimum vertical clearance over SR 256.

Although the full replacement alternative (Alternative A) does not have the lowest initial or lifecycle cost, it was selected as the preferred alternative given various other benefits, and less constructability concerns. Widening (Alternative B) presents constructability concerns to gain access to and construct the widened piers, as this will have adverse impacts to SR 256 traffic. With only a marginal increase in lifecycle cost of 5.7%, full replacement is economically competitive compared to the widening alternative. Benefits of the full replacement alternative include: less impacts to SR 256 traffic during construction, flexibility to accommodate future work along SR 256, as well as providing consistency among all structural components in both expected service life and structural design loading.

1.2 Project Location

Defining the built environment.

2.0 Existing Structure Inspection

As part of this Structure Type Study, a routine bridge inspection was performed on 04/12/2023 to assess the substructure condition of both the existing structures. Given that full superstructure replacement is included in all alternatives evaluated, existing superstructure components were not inspected. For bridge inspection photos see Appendix E.

2.1 Left Bridge Substructure Condition Summary

Per the bridge inspection performed on 07/19/2022 by others, the substructure is currently rated as a 6. Based on the inspection findings, American Structurepoint agrees that the substructure is generally in fair condition. Below is the summary of findings:

- Spalls with exposed and corroded reinforcement just above the roadway parapet on Columns 1 and 3 at Pier 1, and on all Pier 3 columns. Worst location is Column 2 at Pier 3.
- Few minor spalls on the east face of Pier 1 cap.
- One location of exposed and corroded steel ties on the bottom of Pier 1 cap.
- Minor areas of spalling, delamination, and/or hairline cracking, primarily at bearing locations, on both R.A. & F.A.
- Large corner spall with exposed and corroded reinforcement at north end of R.A. beam seat.

2.2 Right Bridge Substructure Condition Summary

Per the bridge inspection performed on 07/19/2022 by others, the substructure is currently rated as a 6. Based on the inspection findings, American Structurepoint agrees that the substructure is generally in fair condition. Below is the summary of findings:

- Minor spalls and delamination on Columns 1 & 3 at Pier 1. Spall with exposed and corroded reinforcement just above the roadway parapet on Column 4 at Pier 3.
- Few minor spalls with exposed and corroded stirrups on the west face of Pier 1 cap.
- Exposed and corroded steel ties along the length of Pier 1 & Pier 3 cap.
- Minor areas of spalling, delamination, and/or hairline cracking, primarily at bearing locations, on both R.A. & F.A.

3.0 Structure Type Study

3.1 Design Criteria

Pertinent geometric design criteria was developed in accordance with the current ODOT L&D Vol. 1 and Bridge Design Manuals, and is summarized in Appendix A.

3.2 Proposed Structure Alternatives

The structure types evaluated are based on site constraints, accommodating recommended MOT scheme, project design criteria, and economy. The two proposed alternatives are:

Left Bridge (SFN 2301628)

- Alternative A – Full replacement with two-span (67’-0”, 75’-0”) W30 continuous rolled steel beam superstructure on cap and column piers and semi-integral abutments behind MSE walls with 12 degree skew.
- Alternative B – Full superstructure replacement (34’-6”, 43’-0”, 57’-0”, 40’-0”) with W33 continuous rolled steel beam superstructure on widened cap and column piers and stub abutments converted to semi-integral.

Given that vertical clearance is currently deficient, the IR 70 westbound profile will be raised approximately 1’ to provide the required minimum vertical clearance of 15’-6” over SR 256. This was determined to be a more economical solution than using shallower less efficient beams, considering the increased steel costs for only minimal available reduction in superstructure depth. The Alternative A superstructure is only approximately 1¼” shallower than Alternative B, therefore multiple profile designs were not developed.

Right Bridge (SFN 2301652)

- Alternative A – Full replacement with two-span (67’-0”, 75’-0”) W30 continuous rolled steel beam superstructure on cap and column piers and semi-integral abutments behind MSE walls
- Alternative B – Full superstructure replacement (33’-0”, 47’-0”, 58’-0”, 40’-6”) with W33 continuous rolled steel beam superstructure on widened cap and column piers and stub abutments converted to semi-integral.

For both alternatives the IR 70 eastbound profile will be matched, while the new adjacent CD road to the south will be placed on an independent bridge with a higher profile grade. This allows the minimum required vertical clearance of 15’-6” to be provided over SR 256 along the southern fascia beam, which is the controlling location due to widening and superelevation, while minimizing mainline pavement costs.

CD Road Bridge (SFN 0000002)

- Alternative A – New structure with two-span (67’-0”, 75’-0”) W30 continuous rolled steel beam superstructure on cap and column piers and semi-integral abutments behind MSE walls
- Alternative B – New structure with 4-span (33’-0”, 47’-0”, 58’-0”, 40’-6”) W27 continuous rolled steel beam superstructure on cap and column piers and semi-integral stub abutments.

For both alternatives all new structural components are required and a minimum vertical clearance of 15’-6” will be provided over SR 256. The Alternative B superstructure is only approximately 3” shallower than Alternative A, therefore multiple profile designs were not developed.

Alternative A:

The proposed two-span bridge span lengths were set by maintaining the existing SR 256 median pier location, bridge skew, and placing MSE walls outside the required 19’-0” clear zone on each side of SR 256. By matching the median pier location partial removal of the existing spread footing foundation will be required to construct the proposed pier, though all other existing substructures are avoided. This span arrangement reduces deck area compared to Alternative B, while still providing a large enough bridge

opening to eliminate tunnel like conditions for motorists, and to accommodate future widening and/or pedestrian facilities. Steel costs were balanced with superstructure depth to determine the most efficient beam sections and framing plans. W30 composite rolled steel beams are utilized for all the bridges, with nine beam lines proposed for the Left Bridge, eight beam lines for the Right Bridge, and six beam lines for the CD Road Bridge. On both the Left Bridge and CD Road Bridge the deck, and exterior beam, will be flared to accommodate ramp tapers. Considering the vertical clearance is < 20' over SR 256, and the high IR 70 traffic volumes, a painted coating system will be utilized for the proposed steel superstructures per Section 308.2.2.1.d.1 of the 2020 BDM.

Proposed substructures will consist of semi-integral stub abutments and a cap and column center pier. To facilitate construction of the center pier it is anticipated that the inside lanes of SR 256 will require closure, with temporary shoring needed to minimize the excavation footprint.

The advantages associated with Alternative A include:

- Consistent expected service life for all structural components
- Consistent design loading for all bridge components
- New abutments will be placed outside the SR 256 splash zone
- Future widening of SR 256 can be accommodated
- Future addition of pedestrian facilities can be accommodated
- Fewer utility impacts
- Less impacts to SR 256 traffic during construction

The disadvantages associated with Alternative A include:

- Higher initial and lifecycle cost
- Temporary wire walls likely required at phase construction joints

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $3,813,153 / $6,108,000
Right Bridge = $3,298,931 / $5,258,000
CD Road Bridge = $2,395,170 / $3,849,700

Total = $9,507,254 / $15,216,500

Alternative B:

The proposed four-span superstructure replacement for the widened mainline bridges will utilize W33 composite rolled steel beams, approximately matching existing superstructure weight. Framing plans will match current beam line locations within the existing bridge limits to avoid changing the load configuration to salvaged substructures. The Left Bridge requires four additional beam lines, two on both sides, to accommodate the required IR 70 widening (nine beams total). The Right Bridge requires only one additional beam line on the north side (seven beams total). The CD Road Bridge will require all new structural components, comprised of a five beam line layout utilizing W27 composite rolled steel beams. Similar to Alternative A, the deck and exterior beam will be flared on the Left Bridge and CD Road Bridge and a painted coating system will be utilized for the proposed steel superstructures.

The existing substructures will be rehabilitated and widened as necessary to accommodate the proposed IR 70 roadway section. The Left Bridge requires widening to both sides and the Right Bridge widening only to the north. Portions of existing substructure beyond the proposed mainline bridge to the south will be removed to accommodate the new CD Road bridge. Proposed substructure work will include: the addition of a single column on each side of the existing piers for the Left Bridge and on the north side only for the Right Bridge, removal and reconstruction of portions of the existing pier caps to connect into the new pier caps, patching existing pier columns and composite fiber wrapping (FRP), conversion of existing abutments to semi-integral, removing and rebuilding wingwalls, dowelling in semi-integral diaphragm guides at the abutments, and capping all substructure beam seats to accommodate the raise in profile grade. To facilitate construction of the widened piers, it is anticipated that the inside and outside lanes of SR 256 will require closure, with temporary shoring needed to minimize the excavation footprint at each pier. Considering the current traffic congestion in the area, this will likely result in an unacceptable level of service. To avoid multiple lane closures in each direction, a staggered pier construction approach would likely be required, in which the outside piers are constructed after the center pier is complete.

All bearings will be replaced with expansion elastomeric bearings. By removing the fixed bearing condition at Pier 2, and the addition of semi-integral diaphragm guides at the abutments, all ODOT seismic guidelines will be satisfied, and no additional retrofit work required.

The advantages associated with Alternative B include:

- Lower initial and lifecycle cost

The disadvantages associated with Alternative B include:

- Differing expected service lives for structural components
- Salvaged substructures not designed for current HL-93 loading
- Increased future maintenance costs for columns located within SR 256 splash zone
- Future widening of SR 256 not feasible
- Future addition of pedestrian facilities not feasible
- Will require relocation of existing gas line
- Increased impacts to SR 256 traffic to facilitate pier construction

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,902,822 / $5,800,500
Right Bridge = $2,535,932 / $4,950,100
CD Road Bridge = $1,898,128 / $3,645,000

Total = $7,336,882 / $14,395,600

3.3 Foundation Recommendations

This Structure Type Study does not include soil borings or Foundation Recommendations due to multiple span configurations being evaluated. In an effort to reduce costs, soil borings will be taken at the final approved substructure locations. Although the final required pile/shaft lengths may deviate from the lengths assumed in this report, this difference in length will not significantly affect the relative differences in cost between the studied alternatives.

For the purposes of this report, friction piles have been assumed for the new and widened substructure foundations. The driven length required was estimated to be 50-feet for preliminary costs. Foundation Recommendations, and a more refined length of piling/shafts will be calculated and included with the Stage 1 submission.

3.4 Maintenance of Traffic

The proposed bridge work will be completed utilizing a crossover scheme for both alternatives evaluated. The recommendations from the MOTAA indicate that all three structures can be constructed offline during separate phases. This will greatly simplify existing structure removals and construction of the new bridges. Temporary shoring needs will be minimal under this scenario. For Alternative A the reduction is span length will require the use of temporary wire walls along the phase lines to contain the proposed abutment and MSE wall backfill.

3.5 Roadway Considerations

I-70 roadway costs and impacts will be similar for both alternatives evaluated. Below on SR 256, Alternative A substructures will be placed outside of the required clear zone, allowing for the outside concrete parapet and guardrail to be eliminated. Alternative B will require new parapet in front of the widened substructures, as well as new guardrail transitions on each end.

3.6 Utility Impacts

Electrical conduit is currently mounted to the underside of deck on the southern facia of the Right Bridge over NB SR 256, and on the northern fascia of the Left Bridge over SB SR 256. At both structures this conduit runs to an electric box mounted to the exterior pier before continuing as buried line along SR 256. Relocation will be required to avoid disturbance during construction. Should electric be needed on the proposed bridge, new conduit will be placed in the concrete parapet. Additionally, there is a buried gas line located along the SR 256 SB outside shoulder. Alternative A can be constructed without impacting this line, while Alternative B will require relocation to facilitate excavation and widening of Pier 1.

3.7 Preferred Alternative

Alternative A is recommended as the preferred alternative despite higher initial and lifecycle costs. This recommendation is based on constructability, providing the flexibility to accommodate future work along SR 256, as well providing consistency among all structural components in both expected service life and structural design loading. The minimum vertical clearance over SR will be improved to meet the current design criteria of 15’-6”.

4.0 Conclusion

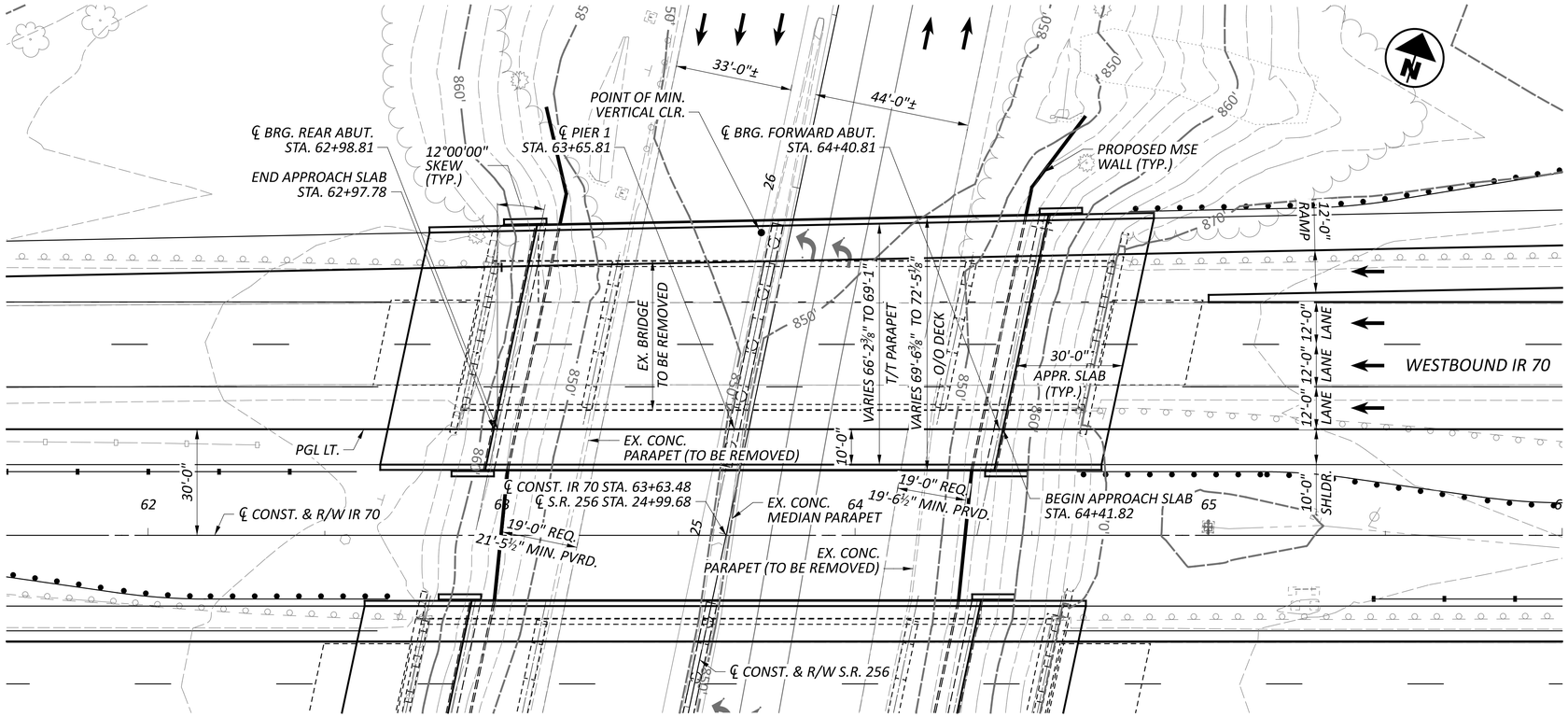
The preferred replacement structure for both the Left, Right and CD Road Bridges is a two-span (67’-0”, 75’-0”) W30 composite rolled steel beam superstructure on cap and column piers and semi-integral abutments behind MSE walls.

This structure meets all current ODOT design criteria, improves the currently deficient minimum vertical clearance over SR 256, and can be constructed with the least amount of impacts to SR 256 traffic.

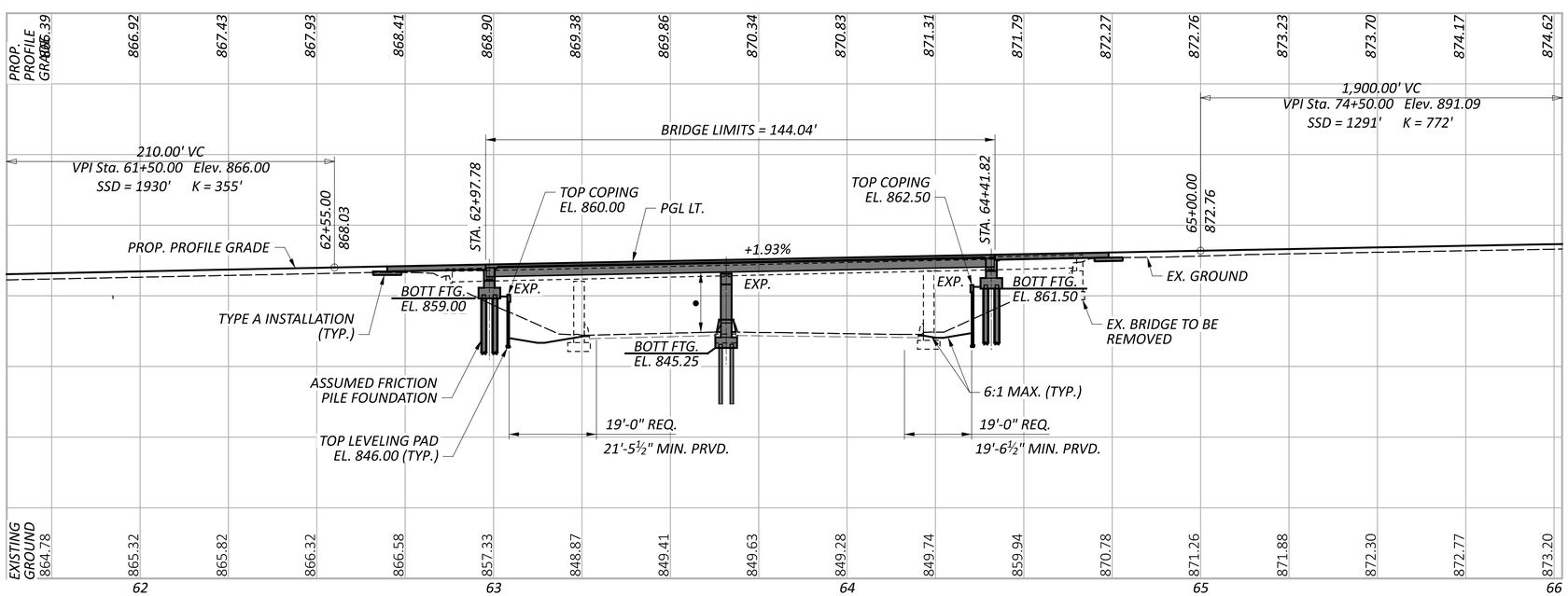
Appendix A – Design Criteria

			Appropriate Design Criteria Guide (Figure 105-1E, Sections 105.1 & 105.5.1)	
Design Feature / Highway Name	**IR 70**	**SR 256**	**Normal Design Criteria**	
			Section	**Figure**
Design Designation				
Location	Urban	Urban		
Functional Classification	Interstate	Arterial		
Traffic Volumes				
Opening Day (2030)				
ADT	56,680	53,910		
DHV	3,937	4,856		
Design Year (2050)				
ADT	76,150	65,060		
DHV	5,290	5,860		
Directional Distribution	50%	55%		
Trucks (D)	12.0%	4.0%		
ADTT (2050)	9,138	2,602		
Terrain	Level	Level		
Design Speed (mph)	70	45		
Posted Speed (mph)	65	40		
NHS Route	Yes	No		
Design Criteria				
TYPICAL SECTION				
Lane Width	12	12	301.1.2 & 303.1	301-2 to 4, 303-1
Curve Widening	N/A	N/A	301.1.3	301-5a, 5b, 5c
Pavement Cross Slopes	0.016 ft/ft Normal Crown	0.016 ft/ft Normal Crown	301.1.5	301-6
Outside Shoulder Width				
Graded Width	15' w/ Barrier 15' w/o Barrier and Foreslope > 6:1 10' w/o Barrier and Foreslope <= 6:1	13' w/ Barrier 12' w/o Barrier and Foreslope > 6:1 8' w/o Barrier and Foreslope <= 6:1	301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	10'	8'	301.2.3 & 303.1	301-3, 4, 303-1
Median Shoulder Width				
Graded Width	9' w/ Barrier 9' w/o Barrier and Foreslope > 6:1 4' w/o Barrier and Foreslope <= 6:1	N/A	301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	4' 10' (6 or more lanes)	N/A	301.2.3 & 303.1	301-3, 4, 303-1
Median Width	60'	N/A	304.1 to 304.3.2	304-1
Clear Zone Width			see below	see below
Foreslopes	≤ 6:1 = 32' (Use 30') > 6:1 to 4:1 = 42' (Use 30')	≤ 6:1 = 19' > 6:1 to 4:1 = 26'	600.2, 600.2.1	600-1, 2
Backslopes	≤ 6:1 = 28' > 6:1 to 4:1 = 28' > 4:1 = 23'	≤ 6:1 = 21' > 6:1 to 4:1 = 19' > 4:1 = 15'	600.2, 600.2.1	600-1, 2
Type of Grading	307-1, 307-2 Safety Grading	307-4 Common/Barrier Grading	307.1 to 307.2	307-1 to 307-6
BRIDGE				
Structural Capacity	HL-93	N/A	302.1	See Bridge Design Manual
New and Reconstructed Bridges				
Lateral Clearance				
On Bridge	10' Rt. / 4' Lt.	N/A	302.1	302-1
Under Bridge		See Clear Zone Width Above	302.1	302-1, 301-3, 301-4, 600-1, & 603-2
Vertical Clearance Over Roadway	N/A	15.5' see Note (l)	302.1	302-1

Appendix B – Preliminary Bridge Plans, Preferred Alternative



PLAN



PROFILE - ALONG PGL LT

BENCHMARK DATA (TO COMPLETED AT STAGE 1)

BM #1 STA.	,	ELEV.	,	OFFSET	,
BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:

2030 ADT = 53,910 2030 ADTT = 2,156
2050 ADT = 65,060 2050 ADTT = 2,602
DIRECTIONAL DISTRIBUTION = 55%

LEGEND

● 15'-6" REQUIRED MINIMUM VERTICAL CLEARANCE
15'-10" ACTUAL MINIMUM VERTICAL CLEARANCE

EXISTING STRUCTURE

TYPE: NON-COMPOSITE CONTINUOUS ROLLED STEEL BEAM WITH REINFORCED CONCRETE DECK ON CAP AND COLUMN PIERS AND STUB ABUTMENTS WITH SPREAD FOOTING FOUNDATIONS

SPANS: 34'-6"±, 43'-0"±, 57'-0"±, 40'-0"±
ROADWAY: 38'-0"± TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: 12°00'00"± L.F.
WEARING SURFACE: 1¾"± SDC OVERLAY
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 2301628
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: COMPOSITE CONTINUOUS ROLLED STEEL BEAM GIRDER WITH REINFORCED CONCRETE DECK ON CAP AND COLUMN PIERS AND SEMI-INTEGRAL ABUTMENTS BEHIND MSE WALLS

SPANS: 67'-0", 75'-0" C/C BRG.
ROADWAY: 66'-2⅜" MIN. TO 69'-1" MAX. TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL93
FUTURE WEARING SURFACE: 60 PSF
SKEW: 12°00'00" L.F.
APPROACH SLABS: 30'-0" LONG (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 10,225 SF

COORDINATES: LATITUDE 39°56'01.46" N
LONGITUDE 82°47'22.72" W

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI-00070-01190 L
IR 70 OVER S.R. 256

SFN	2301628
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	1
TOTAL	4
SHEET	P.0
TOTAL	0

FAI/LIC-70.0.00/0.00

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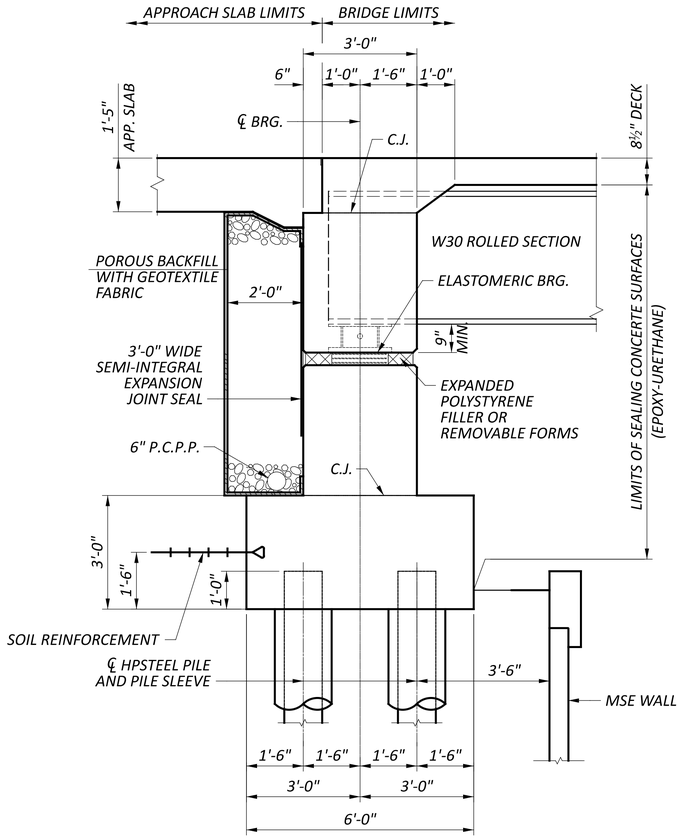

ABUTMENT SECTION

ABUTMENT DETAILS
BRIDGE NO. FAI-00070-01190 L
IR 70 OVER S.R. 256

SFN	2301628
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	2
TOTAL	4
SHEET	P.0
TOTAL	0

FAI/LIC-70.0.00/0.00

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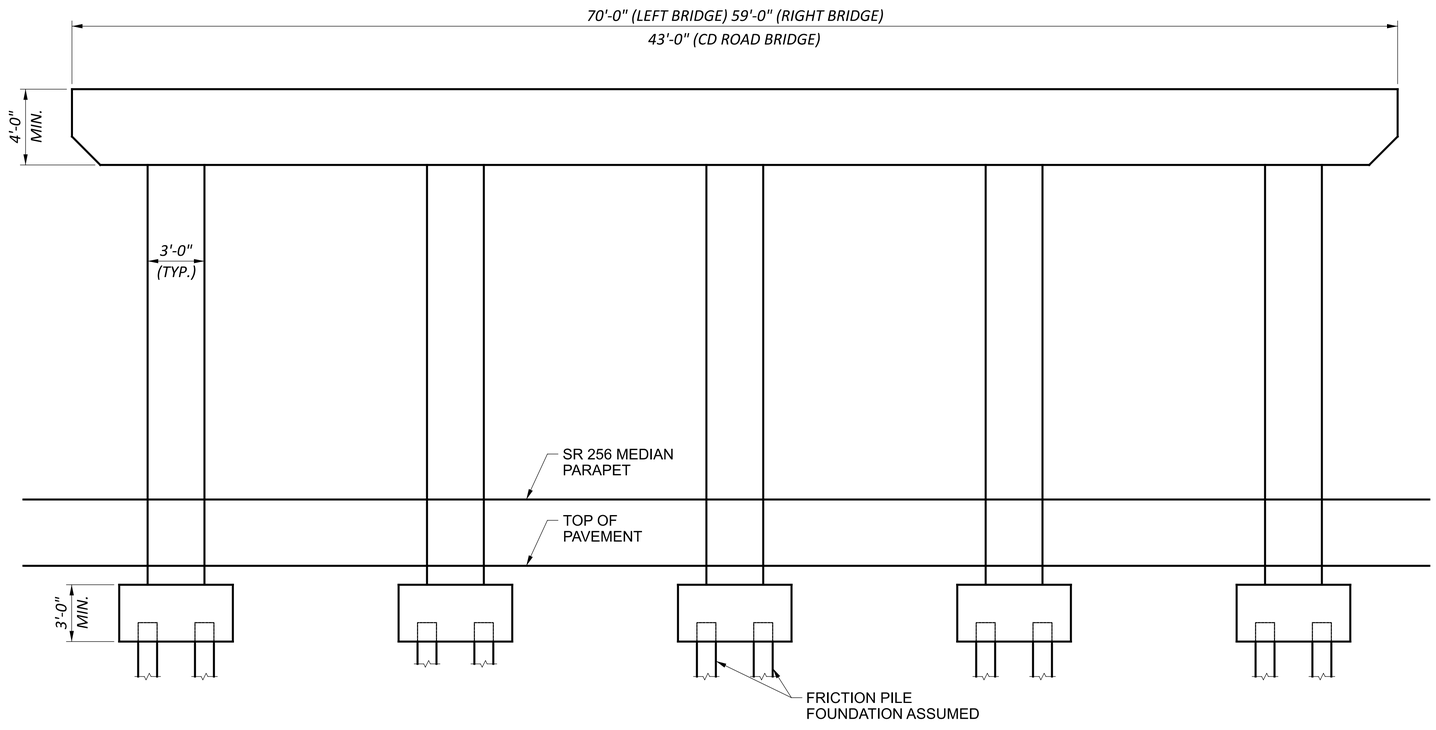

PIER ELEVATION

APPLIES TO LEFT BRIDGE, RIGHT BRIDGE, & CD ROAD BRIDGE

PIER DETAILS
BRIDGE NO. FAI-00070-01190 L
IR 70 OVER S.R. 256

SFN	2301628
DESIGN AGENCY	WEPFER STRUCTUREPOINT INC.
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	3
TOTAL	4
SHEET	P.0
TOTAL	0

FAI/LIC-70.0.00/0.00

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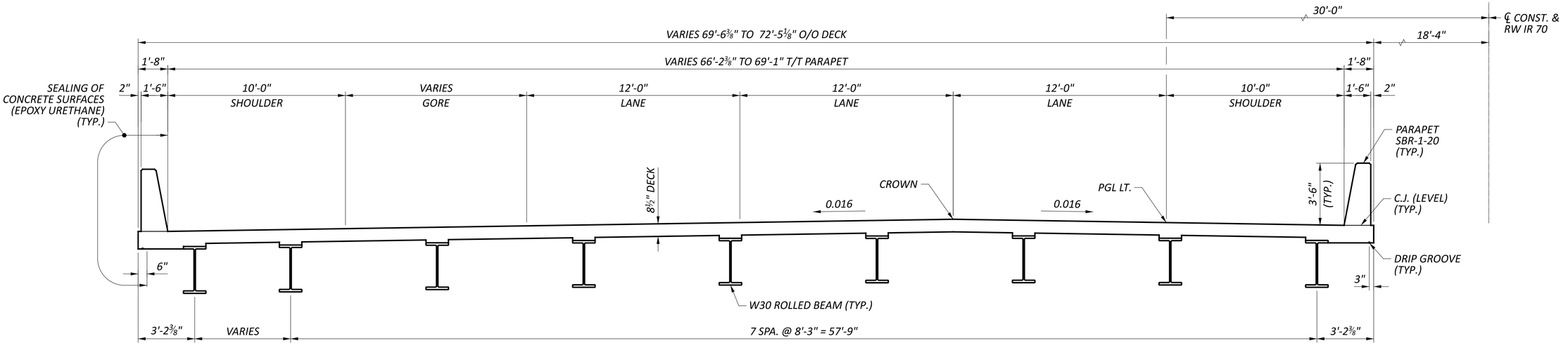

TRANSVERSE SECTION

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TRANSVERSE SECTION
BRIDGE NO. FAI-00070-01190 L
IR 70 OVER S.R. 256

SFN 2301628

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC

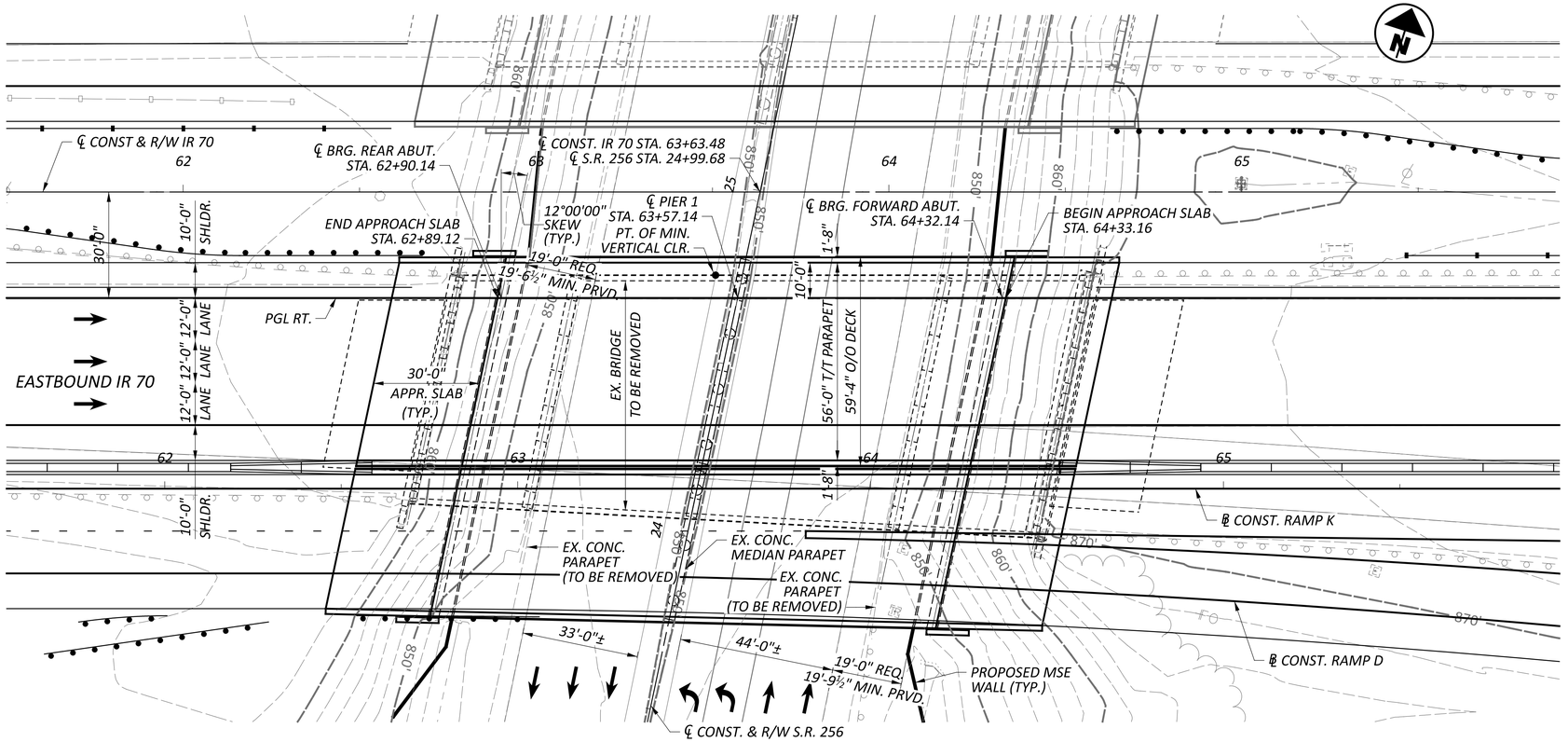
DESIGNER	CHECKER
SJF	MAH

REVIEWER
CLB 06-12-23

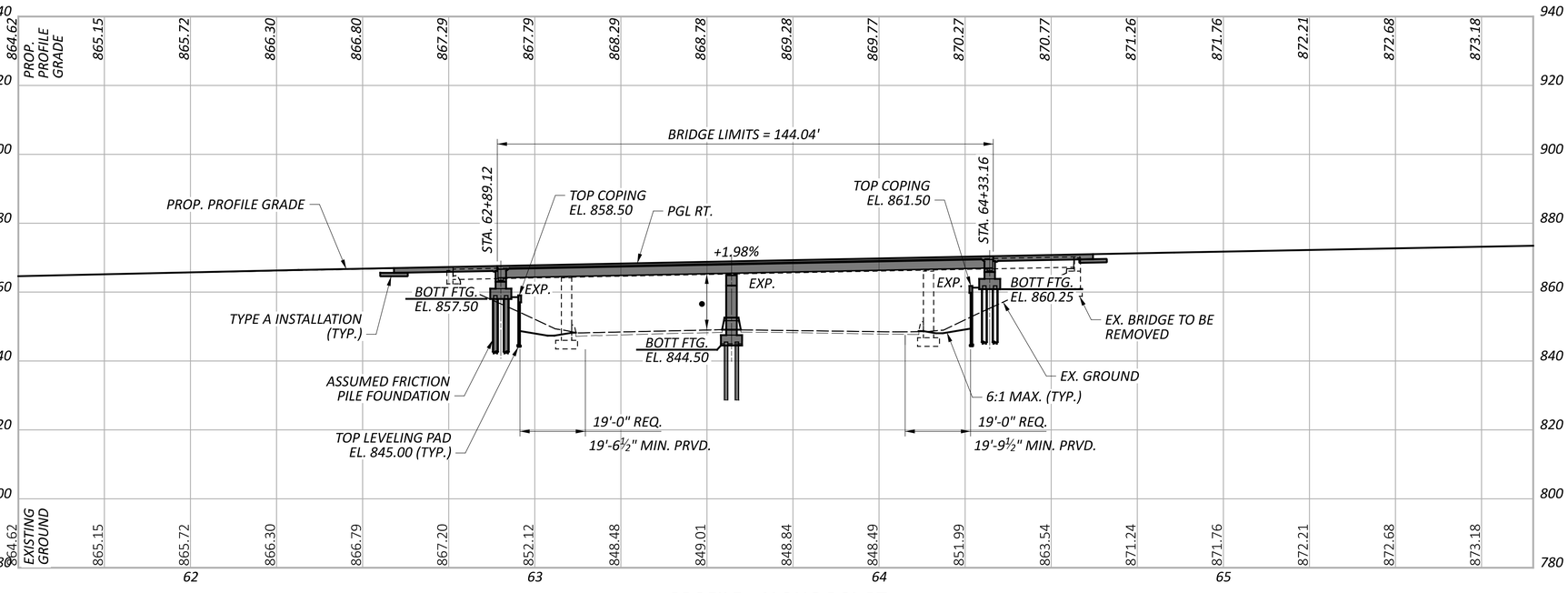
PROJECT ID
96808

SUBSET	TOTAL
4	4

SHEET	TOTAL
P.0	0



PLAN



PROFILE - ALONG PGL RT

BENCHMARK DATA (TO COMPLETED AT STAGE 1)

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:

2030 ADT = 53,910 2030 ADTT = 2,156
2050 ADT = 65,060 2050 ADTT = 2,602
DIRECTIONAL DISTRIBUTION = 55%

LEGEND

● 15'-6" REQUIRED MINIMUM VERTICAL CLEARANCE
16'-0¼" ACTUAL MINIMUM VERTICAL CLEARANCE

EXISTING STRUCTURE

TYPE: NON-COMPOSITE CONTINUOUS ROLLED STEEL BEAM WITH REINFORCED CONCRETE DECK ON CAP AND COLUMN PIERS AND STUB ABUTMENTS WITH SPREAD FOOTING FOUNDATIONS

SPANS: 33'-0"±, 47'-0"±, 58'-0"±, 40'-6"±
ROADWAY: VARIES 62'-7¼" TO 72'-3¼" TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: 12°00'00"± L.F.
WEARING SURFACE: 1¾"± SDC OVERLAY
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 2301652
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: COMPOSITE CONTINUOUS ROLLED STEEL BEAM GIRDER WITH REINFORCED CONCRETE DECK ON CAP AND COLUMN PIERS AND SEMI-INTEGRAL ABUTMENTS BEHIND MSE WALLS

SPANS: 67'-0", 75'-0" C/C BRG.
ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL93
FUTURE WEARING SURFACE: 60 PSF
SKEW: 12°00'00" L.F.
APPROACH SLABS: 30'-0" LONG (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 8,547 SF

COORDINATES: LATITUDE 39°56'01.46" N
LONGITUDE 82°47'22.72" W

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI-00070-01190 R
IR 70 OVER S.R. 256

SFN 2301652
DESIGN AGENCY STRUCTUREPOINT
DESIGNER SJF | CHECKER MAH
REVIEWER CLB 06-12-23
PROJECT ID 96808
SUBSET 1 | TOTAL 3
SHEET P.0 | TOTAL 0

FAI/LIC-70.0.00/0.00

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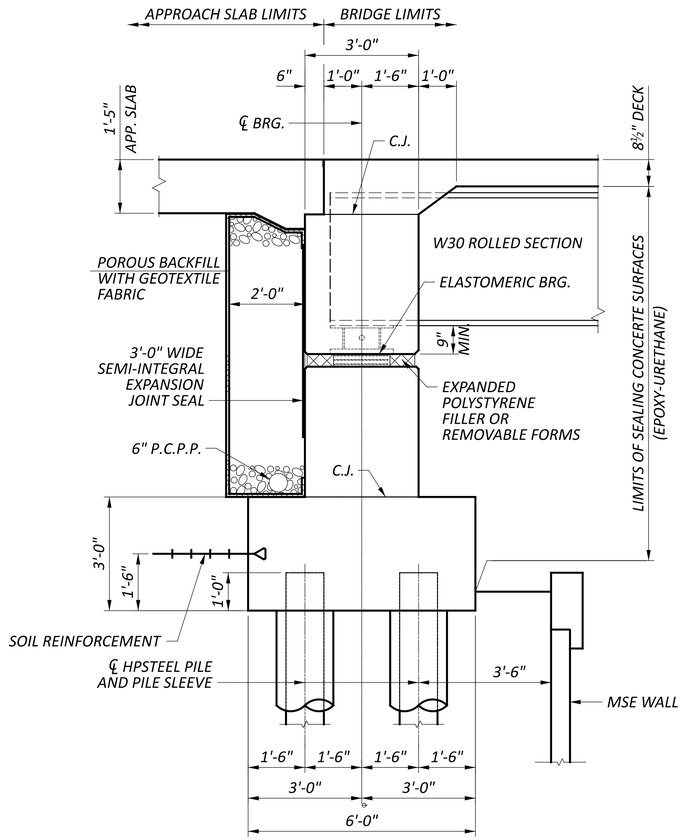

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. FAI-00070-01190 R
IR 70 OVER S.R. 256

SFN	2301652
DESIGN AGENCY	STRUCTUREPOINT LLC (A WEIDLEIN)
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	2
TOTAL	3
SHEET	P.0
TOTAL	0

FAI/LIC-70.0.00/0.00

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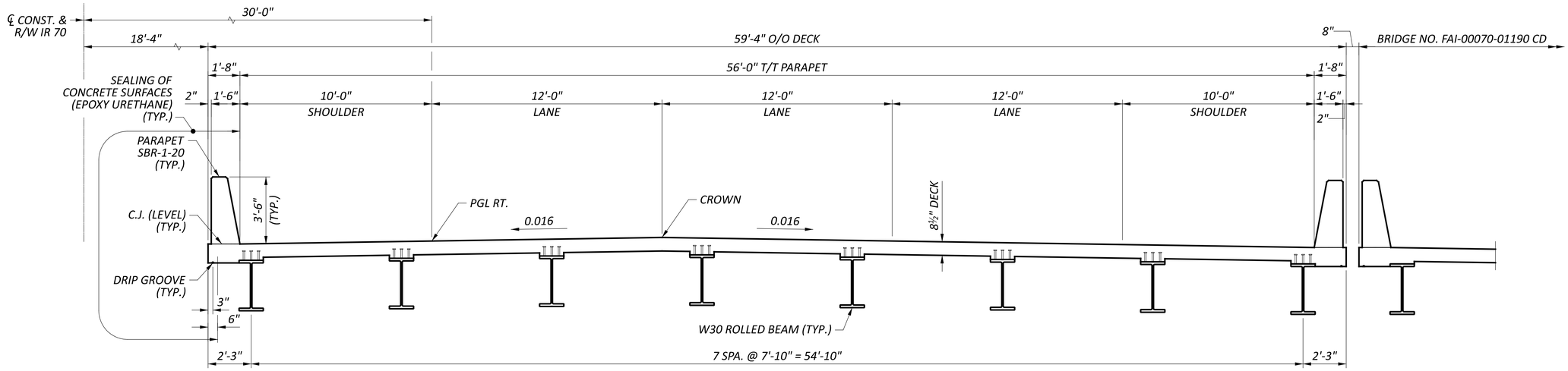

TRANSVERSE SECTION

TRANSVERSE SECTION
BRIDGE NO. FAI-00070-01190 R
IR 70 OVER S.R. 256

FAI/LIC-70.0.00/0.00

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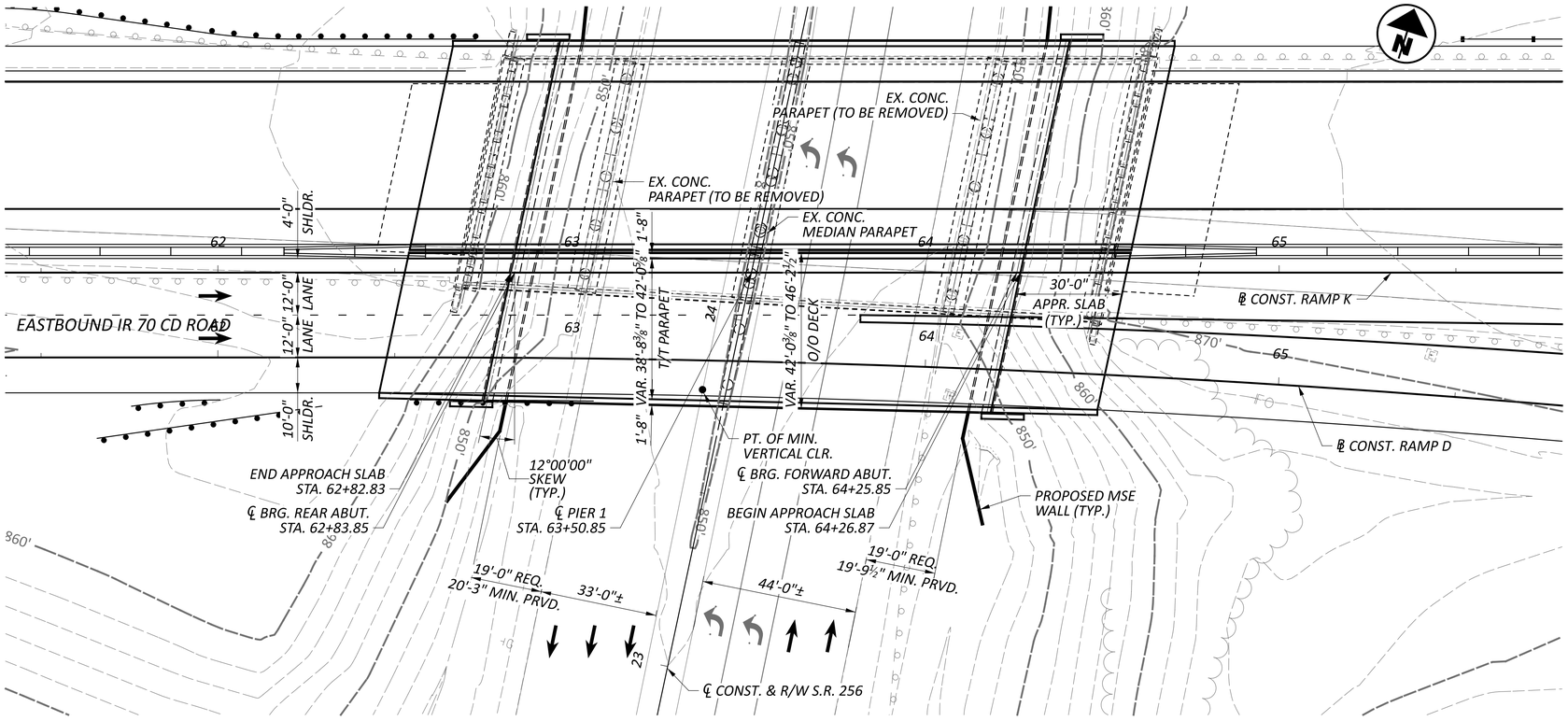
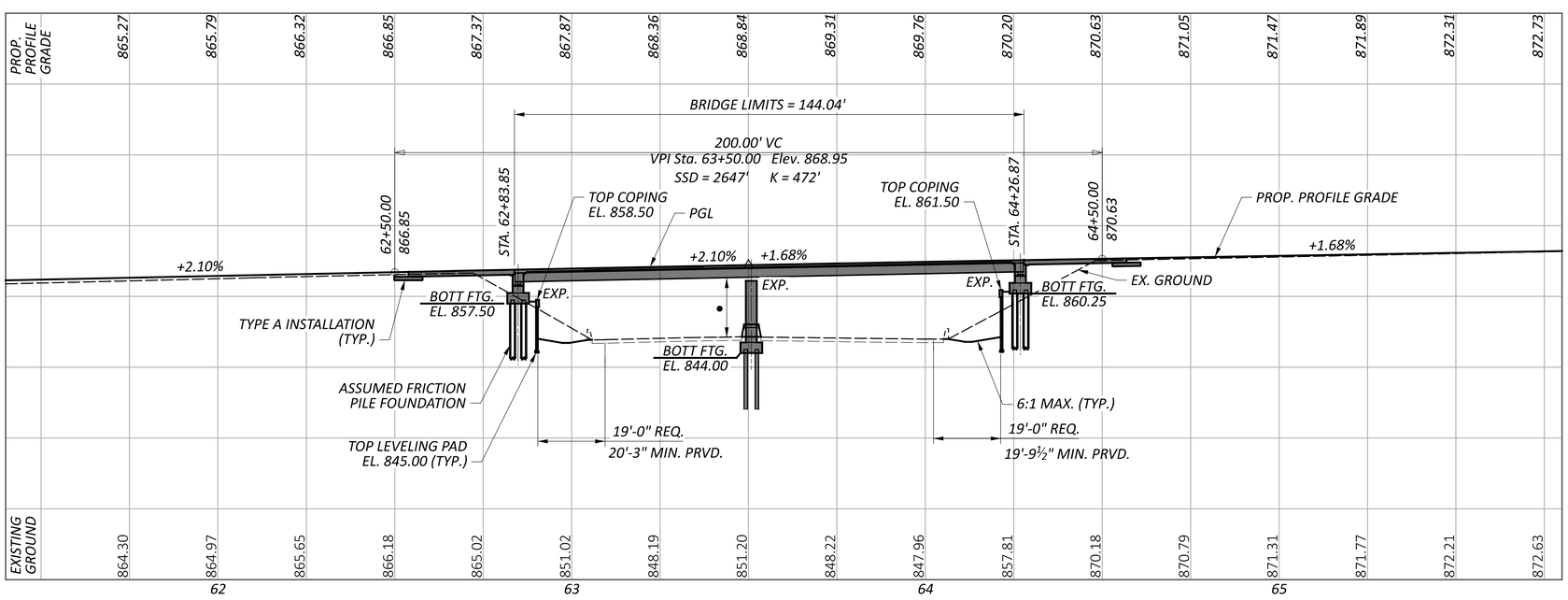
SFN	2301652
DESIGN AGENCY	STRUCTUREPOINT INC.
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	3
TOTAL	3
SHEET	P.0
TOTAL	0



PLAN



PROFILE - ALONG ℄ CONST. RAMP K

BENCHMARK DATA (TO BE COMPLETED AT STAGE 1)

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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC: (TO BE COMPLETED AT STAGE 1)
2030 ADT = 2030 ADTT =
2050 ADT = 2050 ADTT =
DIRECTIONAL DISTRIBUTION =

LEGEND

● 15'-6" REQUIRED MINIMUM VERTICAL CLEARANCE
15'-8½" ACTUAL MINIMUM VERTICAL CLEARANCE

PROPOSED STRUCTURE

TYPE: COMPOSITE CONTINUOUS ROLLED STEEL BEAM GIRDER WITH REINFORCED CONCRETE DECK ON CAP AND COLUMN PIERS AND SEMI-INTEGRAL ABUTMENTS BEHIND MSE WALLS

SPANS: 67'-0", 75'-0" C/C BRG.
ROADWAY: VARIES 38'-8⅜" TO 42'-0⅝" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL-93
FUTURE WEARING SURFACE: 60 PSF
SKEW: 12°00'00" L.F.
APPROACH SLABS: 30'-0" LONG (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 6,295 SF

COORDINATES: LATITUDE 39°56'01.46" N
LONGITUDE 82°47'22.72" W

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI-00070-01190 CD
IR 70 EASTBOUND CD ROAD OVER S.R. 256

SFN	TBD
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	1
TOTAL	3
SHEET	P.0
TOTAL	0

FA\LIC-70-0.00/0.00

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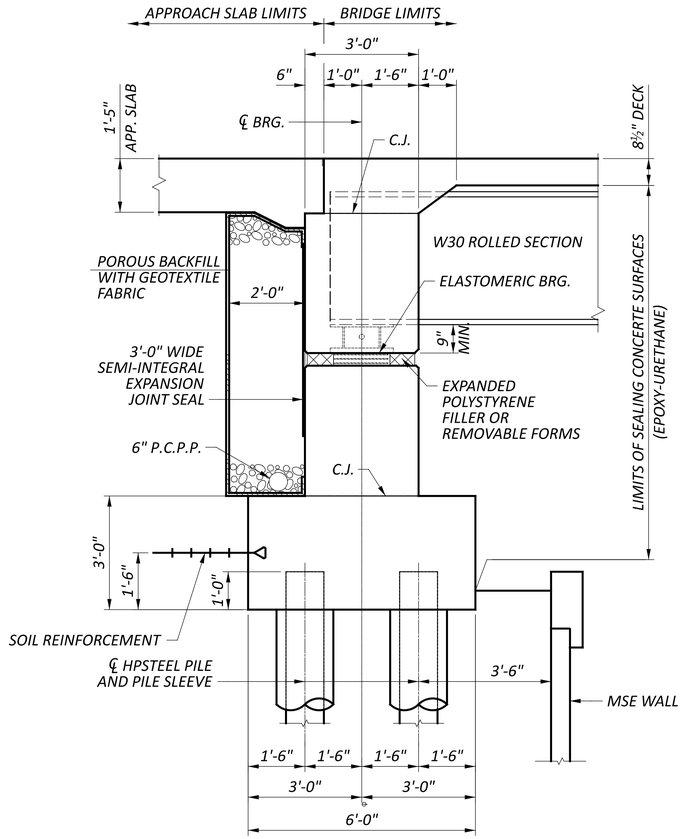

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. FAI-00070-01190 CD
IR 70 EASTBOUND CD ROAD OVER S.R. 256

SFN
TBD

DESIGN AGENCY
STRUCTUREPOINT LLC

DESIGNER	CHECKER
SJF	MAH

REVIEWER
CLB 06-12-23

PROJECT ID
96808

SUBSET	TOTAL
2	3

SHEET	TOTAL
P.0	0

FAI/LIC-70.0.00/0.00

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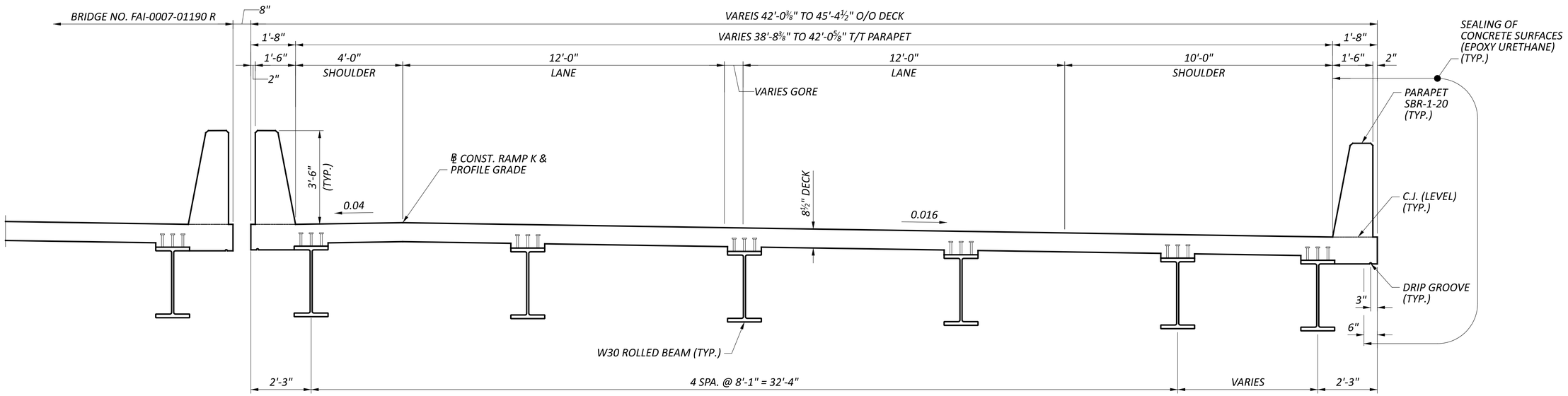

TRANSVERSE SECTION

TRANSVERSE SECTION
BRIDGE NO. FAI-00070-01190 CD
IR 70 EASTBOUND CD ROAD OVER S.R. 256

SFN
TBD

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	CHECKER
SJF	MAH

REVIEWER
CLB 06-12-23

PROJECT ID
96808

SUBSET	TOTAL
3	3

SHEET	TOTAL
P.0	0

FAI/LIC-70.0.00/0.00

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Appendix C – Preliminary Construction Cost and Lifecycle Cost

Estimate 96808

Estimated Cost:$3,177,627.73

Contingency: 20.00%

Estimated Total: $3,813,153.28

I-70 over SR 256 (Left) Alternative A Structure Type Study Cost Estimate
SFN 2301628

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395656

Longitude of Midpoint: 824747

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0053	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$190,000.00000	$190,000.00
0054	202E22900 APPROACH SLAB REMOVED	133.000	SY	$38.03233	$5,058.30
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$75,000.00000	$75,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	3,650.000	FT	$12.46246	$45,487.98
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	4,015.000	FT	$48.00000	$192,720.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	166,625.000	LB	$2.00000	$333,250.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	345.000	CY	$932.64438	$321,762.31
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	60.000	CY	$550.71622	$33,042.97
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	50.000	CY	$1,123.95627	$56,197.81
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	69.000	CY	$851.96970	$58,785.91
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	137.000	CY	$551.24243	$75,520.21
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	278,051.000	LB	$1.80097	$500,761.51
0073	513E20000 WELDED STUD SHEAR CONNECTORS	5,130.000	EACH	$4.60152	$23,605.80
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	24,602.000	SF	$3.41519	$84,020.50
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	24,602.000	SF	$1.61760	$39,796.20
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	27.000	EACH	$1,194.54855	$32,252.81
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	65.000	CY	$82.08565	$5,335.57
0087	526E30010	473.000	SY	$276.91973	$130,983.03

Line #	Item Number Description *Supplemental Description*	Quantity	Units	Unit Price	Extension
	REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")				
0088	526E90010 TYPE A INSTALLATION	146.000	FT	$195.71791	$28,574.81
0092	840E20000 MECHANICALLY STABILIZED EARTH WALL VERTICAL CLEARANCE	5,760.000	SF	$150.00000	$864,000.00

Total for Group 1200:$3,177,627.73

Estimate 96808

Estimated Cost:$2,419,018.47

Contingency: 20.00%

Estimated Total: $2,902,822.16

I-70 over SR 256 (Left) Alternative B Structure Type Study Cost Estimate
SFN 2301628

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395656

Longitude of Midpoint: 824747

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0053	202E11202 PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$225,000.00000	$225,000.00
0054	202E22900 APPROACH SLAB REMOVED	133.000	SY	$38.03233	$5,058.30
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$75,000.00000	$75,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$15,000.00000	$15,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	2,900.000	FT	$12.46246	$36,141.13
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,190.000	FT	$48.00000	$153,120.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	195,250.000	LB	$2.00000	$390,500.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$5,000.00000	$10,000.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	437.000	CY	$900.42510	$393,485.77
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	67.000	CY	$550.71622	$36,897.99
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	71.000	CY	$1,036.87778	$73,618.32
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	74.000	CY	$842.10447	$62,315.73
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	89.000	CY	$585.14579	$52,077.98
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	203,851.000	LB	$1.80097	$367,129.54
0073	513E20000 WELDED STUD SHEAR CONNECTORS	6,264.000	EACH	$4.60152	$28,823.92
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	29,368.000	SF	$3.21277	$94,352.63
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	29,368.000	SF	$1.51345	$44,447.00
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	45.000	EACH	$1,150.00000	$51,750.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	92.000	CY	$79.33333	$7,298.67
0085	519E00100	1,103.000	SF	$50.00000	$55,150.00

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description ***Supplemental Description***				
	SPECIAL - COMPOSITE FIBER WRAP SYSTEM				
0086	519E11101 PATCHING CONCRETE STRUCTURE, AS PER PLAN	221.000	SF	$150.00000	$33,150.00
0087	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	394.000	SY	$330.27077	$130,126.68
0088	526E90010 TYPE A INSTALLATION	146.000	FT	$195.71791	$28,574.81

Total for Group 1200:$2,419,018.47

Estimate 96808

Estimated Cost:$2,749,109.16

Contingency: 20.00%

Estimated Total: $3,298,930.99

I-70 over SR 256 (Right) Alternative A Structure Type Study Cost Estimate
SFN 2301652

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395644

Longitude of Midpoint: 824526

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0053	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$315,000.00000	$315,000.00
0054	202E22900 APPROACH SLAB REMOVED	301.000	SY	$34.54349	$10,397.59
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$75,000.00000	$75,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	3,000.000	FT	$12.46246	$37,387.38
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,300.000	FT	$48.00000	$158,400.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	140,375.000	LB	$2.00000	$280,750.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	290.000	CY	$957.04664	$277,543.53
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	60.000	CY	$550.71622	$33,042.97
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	41.000	CY	$1,176.43978	$48,234.03
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	51.000	CY	$895.94178	$45,693.03
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	108.000	CY	$569.68673	$61,526.17
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	247,157.000	LB	$1.80097	$445,122.34
0073	513E20000 WELDED STUD SHEAR CONNECTORS	4,560.000	EACH	$4.60152	$20,982.93
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	21,868.000	SF	$3.55687	$77,781.63
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	21,868.000	SF	$1.69083	$36,975.07
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	24.000	EACH	$1,216.57024	$29,197.69
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	55.000	CY	$83.44295	$4,589.36
0087	526E30010	396.000	SY	$276.91973	$109,660.21

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
	REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")				
0088	526E90010 TYPE A INSTALLATION	122.000	FT	$199.61655	$24,353.22
0092	840E20000 MECHANICALLY STABILIZED EARTH WALL VERTICAL CLEARANCE	3,840.000	SF	$150.00000	$576,000.00

Total for Group 1200:$2,749,109.16

Estimate 96808

Estimated Cost:$2,113,276.72

Contingency: 20.00%

Estimated Total: $2,535,932.06

I-70 over SR 256 (Right) Alternative B Structure Type Study Cost Estimate
SFN 2301652

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395644

Longitude of Midpoint: 824526

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Kyle Messaros on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0053	202E11202 PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$375,000.00000	$375,000.00
0054	202E22900 APPROACH SLAB REMOVED	301.000	SY	$34.54349	$10,397.59
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$75,000.00000	$75,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$15,000.00000	$15,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	1,150.000	FT	$12.46246	$14,331.83
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	1,265.000	FT	$48.00000	$60,720.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	150,900.000	LB	$2.00000	$301,800.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$5,000.00000	$10,000.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	380.000	CY	$919.33733	$349,348.19
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	68.000	CY	$550.71622	$37,448.70
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	24.000	CY	$1,330.62161	$31,934.92
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	30.000	CY	$978.69079	$29,360.72
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	35.000	CY	$665.80889	$23,303.31
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	162,185.000	LB	$1.80097	$292,090.32
0073	513E20000 WELDED STUD SHEAR CONNECTORS	4,998.000	EACH	$4.60152	$22,998.40
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	23,366.000	SF	$3.47648	$81,231.43
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	23,366.000	SF	$1.64924	$38,536.14
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	35.000	EACH	$1,150.00000	$40,250.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	82.000	CY	$80.23460	$6,579.24
0085	519E00100	1,471.000	SF	$50.00000	$73,550.00

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description ***Supplemental Description***				
	SPECIAL - COMPOSITE FIBER WRAP SYSTEM				
0086	519E11101 PATCHING CONCRETE STRUCTURE, AS PER PLAN	295.000	SF	$150.00000	$44,250.00
0087	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0088	526E90010 TYPE A INSTALLATION	122.000	FT	$199.61655	$24,353.22

Total for Group 1200:$2,113,276.72

Estimate 96808

Estimated Cost:$1,995,975.04

Contingency: 20.00%

Estimated Total: $2,395,170.05

I-70 over SR 256 (CD Road) Alternative A Structure Type Study Cost Estimate
SFN 0000002

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395644

Longitude of Midpoint: 824526

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$25,000.00000	$25,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	2,350.000	FT	$12.46246	$29,286.78
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	2,585.000	FT	$48.00000	$124,080.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	109,250.000	LB	$2.00000	$218,500.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	214.000	CY	$1,001.29604	$214,277.35
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	60.000	CY	$550.71622	$33,042.97
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	31.000	CY	$1,254.56519	$38,891.52
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	40.000	CY	$932.92211	$37,316.88
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	82.000	CY	$591.81620	$48,528.93
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	185,368.000	LB	$1.80097	$333,842.21
0073	513E20000 WELDED STUD SHEAR CONNECTORS	3,420.000	EACH	$4.36075	$14,913.77
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	16,401.000	SF	$3.92807	$64,424.28
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	16,401.000	SF	$1.88389	$30,897.68
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	18.000	EACH	$1,272.07955	$22,897.43
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	40.000	CY	$86.09283	$3,443.71
0087	526E30010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")	291.000	SY	$276.91973	$80,583.64
0088	526E90010 TYPE A INSTALLATION	90.000	FT	$206.39871	$18,575.88
0092	840E20000 MECHANICALLY STABILIZED EARTH WALL	3,840.000	SF	$150.00000	$576,000.00

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description ***Supplemental Description***				
	VERTICAL CLEARANCE				

Total for Group 1200:$1,995,975.04

Estimate 96808

Estimated Cost:$1,581,772.69

Contingency: 20.00%

Estimated Total: $1,898,127.23

I-70 over SR 256 (CD Road) Alternative B Structure Type Study Cost Estimate
SFN 0000002

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395644

Longitude of Midpoint: 824526

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$50,000.00000	$50,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$30,000.00000	$30,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	3,650.000	FT	$12.46246	$45,487.98
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	4,015.000	FT	$48.00000	$192,720.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	131,750.000	LB	$2.00000	$263,500.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	266.000	CY	$969.42170	$257,866.17
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	68.000	CY	$550.71622	$37,448.70
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	49.000	CY	$1,129.19036	$55,330.33
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	40.000	CY	$932.92211	$37,316.88
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	106.000	CY	$571.16212	$60,543.18
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	143,336.000	LB	$1.80097	$258,143.84
0073	513E20000 WELDED STUD SHEAR CONNECTORS	3,570.000	EACH	$4.36075	$15,567.88
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	15,708.000	SF	$3.98702	$62,628.11
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	15,708.000	SF	$1.91470	$30,076.11
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	25.000	EACH	$1,150.00000	$28,750.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	40.000	CY	$86.09283	$3,443.71
0087	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	243.000	SY	$320.58398	$77,901.91
0088	526E90010 TYPE A INSTALLATION	90.000	FT	$206.39871	$18,575.88

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description				
	Supplemental Description				

Total for Group 1200:$1,581,772.69

AMERICAN STRUCTUREPOINT, INC.
FAI-70-01190
LIFE CYCLE COST ANALYSIS

	Alt. A (Left)	Alt. B (Left)	Alt. A (Right)	Alt. B (Right)	Alt. A (CD Road)	Alt. B (CD Road)
Number of Spans	2	4	2	4	2	4
Span Length	67'-0", 75'-0"	34'-6", 43'-0", 57'-0", 40'-0"	67'-0", 75'-0"	33'-0", 47'-0", 58'-0", 40'-6"	67'-0", 75'-0"	33'-0", 47'-0", 58'-0", 40'-6"
Superstructure						
Type	W30 ROLLED STEEL BEAM	W33 ROLLED STEEL BEAM	W30 ROLLED STEEL BEAM	W33 ROLLED STEEL BEAM	W30 ROLLED STEEL BEAM	W27 ROLLED STEEL BEAM
Number of Beam Lines	9	9	8	7	6	5
Spacing	8'-3"	Varies, 9'-6" Max.	7'-10"	Varies, 10'-0" Max.	8'-1"	9'-9"
Deck Thickness	8 1/2" Composite	8 3/4" Composite	8 1/2" Composite	9" Composite	8 1/2" Composite	9" Composite
Deck Area	**10082 SF**	**12390 SF**	**8425 SF**	**10590 SF**	**6206 SF**	**7801 SF**
Patching Area	**150 SF**	**700 SF**	**100 SF**	**600 SF**	**75 SF**	**550 SF**
Painting Area	**24602 SF**	**29368 SF**	**21868 SF**	**23366 SF**	**16401 SF**	**15708 SF**
Substructure						
Abutment Type	Semi-Integral Stub Abutments Behind MSE Walls	Widened Stub Abutments Converted to Semi-Integral	Semi-Integral Stub Abutments Behind MSE Walls	Widened Stub Abutments Converted to Semi-Integral	Semi-Integral Stub Abutments Behind MSE Walls	Semi-Integral Stub Abutments
Pier Type	Cap and Column	Widened Cap and Column	Cap and Column	Widened Cap and Column	Cap and Column	Cap and Column
Cost						
Comparative Initial Construction Cost	**$3,813,153**	**$2,902,822**	**$3,298,931**	**$2,535,932**	**$2,395,170**	**$1,898,128**
Life Cycle Cost	**$6,108,000**	**$5,800,500**	**$5,258,800**	**$4,950,100**	**$3,849,700**	**$3,645,000**

i =	**2.00%**
DECK OVERLAY UNIT COST =	**$ 85 /SF**
DECK REPLACEMENT UNIT COST =	**$ 175 /SF**
PATCHING UNIT COST =	**$ 175 /SF**
PAINTING UNIT COST =	**$ 30 /SF**

Alt. A (Left)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$3,813,153	$3,813,200
Painting of Structural Steel	25 years	0.61	$738,060	$449,900
Deck Overlay	25 years	0.61	$856,970	$522,300
Substructure Patching	25 years	0.61	$26,250	$16,000
Painting of Structural Steel	50 years	0.37	$738,060	$274,200
Deck Replacement	50 years	0.37	$1,764,350	$655,500
Substructure Patching	50 years	0.37	$26,250	$9,800
Painting of Structural Steel	75 years	0.23	$738,060	$167,100
Deck Overlay	75 years	0.23	$856,970	$194,100
Substructure Patching	75 years	0.23	$26,250	$5,900
			LIFE CYCLE COST =	$6,108,000

Alt. B (Left)				
Event	Period	PWF	2021 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,902,822	$2,902,800
Painting of Structural Steel	25 years	0.61	$881,040	$537,000
Deck Overlay	25 years	0.61	$1,053,150	$641,900
Substructure Patching	25 years	0.61	$122,500	$74,700
Painting of Structural Steel	50 years	0.37	$881,040	$327,300
Deck Replacement	50 years	0.37	$2,168,250	$805,600
Substructure Patching	50 years	0.37	$122,500	$45,500
Painting of Structural Steel	75 years	0.23	$881,040	$199,500
Deck Overlay	75 years	0.23	$1,053,150	$238,500
Substructure Patching	75 years	0.23	$122,500	$27,700
			LIFE CYCLE COST =	$5,800,500

Alt. A (Right)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$3,298,931	$3,298,900
Painting of Structural Steel	25 years	0.61	$656,040	$399,900
Deck Overlay	25 years	0.61	$716,125	$436,500
Substructure Patching	25 years	0.61	$17,500	$10,700
Painting of Structural Steel	50 years	0.37	$656,040	$243,700
Deck Replacement	50 years	0.37	$1,474,375	$547,800
Substructure Patching	50 years	0.37	$17,500	$6,500
Painting of Structural Steel	75 years	0.23	$656,040	$148,600
Deck Overlay	75 years	0.23	$716,125	$162,200
Substructure Patching	75 years	0.23	$17,500	$4,000
			LIFE CYCLE COST =	$5,258,800

Alt. B (Right)				
Event	Period	PWF	2021 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,535,932	$2,535,900
Painting of Structural Steel	25 years	0.61	$700,980	$427,300
Deck Overlay	25 years	0.61	$900,150	$548,700
Substructure Patching	25 years	0.61	$105,000	$64,000
Painting of Structural Steel	50 years	0.37	$700,980	$260,400
Deck Replacement	50 years	0.37	$1,853,250	$688,500
Substructure Patching	50 years	0.37	$105,000	$39,000
Painting of Structural Steel	75 years	0.23	$700,980	$158,700
Deck Overlay	75 years	0.23	$900,150	$203,800
Substructure Patching	75 years	0.23	$105,000	$23,800
			LIFE CYCLE COST =	$4,950,100

Alt. A (CD Road)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,395,170	$2,395,200
Painting of Structural Steel	25 years	0.61	$492,030	$299,900
Deck Overlay	25 years	0.61	$527,510	$321,500
Substructure Patching	25 years	0.61	$13,125	$8,000
Painting of Structural Steel	50 years	0.37	$492,030	$182,800
Deck Replacement	50 years	0.37	$1,086,050	$403,500
Substructure Patching	50 years	0.37	$13,125	$4,900
Painting of Structural Steel	75 years	0.23	$492,030	$111,400
Deck Overlay	75 years	0.23	$527,510	$119,500
Substructure Patching	75 years	0.23	$13,125	$3,000
			LIFE CYCLE COST =	$3,849,700

Alt. B (CD Road)				
Event	Period	PWF	2021 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$1,898,128	$1,898,100
Painting of Structural Steel	25 years	0.61	$471,240	$287,200
Deck Overlay	25 years	0.61	$663,085	$404,200
Substructure Patching	25 years	0.61	$96,250	$58,700
Painting of Structural Steel	50 years	0.37	$471,240	$175,100
Deck Replacement	50 years	0.37	$1,365,175	$507,200
Substructure Patching	50 years	0.37	$96,250	$35,800
Painting of Structural Steel	75 years	0.23	$471,240	$106,700
Deck Overlay	75 years	0.23	$663,085	$150,200
Substructure Patching	75 years	0.23	$96,250	$21,800
			LIFE CYCLE COST =	$3,645,000

Appendix D – Existing Bridge Plans

I-70-7(43)110

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

FAIRFIELD - LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

FAI-70-0.00 LIC-70-0.00

VIOLET TOWNSHIP, FAIRFIELD COUNTY
ETNA TOWNSHIP, LICKING COUNTY
TRURO TOWNSHIP, FRANKLIN COUNTY

LIMITED ACCESS

THIS IMPROVEMENT HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR OF HIGHWAYS IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02, REVISED CODE OF OHIO, AND IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC.

CONVENTIONAL SIGNS

RIGHT-OF-WAY WITH LIMITED ACCESS		LARW
RIGHT-OF-WAY WITHOUT LIMITED ACCESS		RW
CENTER LINE		
COUNTY LINE		
TOWNSHIP LINE		
SECTION LINE		
CORPORATION LINE		
PROPERTY LINE		
POLE LINE	TELEPHONE	ELECTRIC
FENCE LINE		
GUARD RAIL	PROPOSED	EXISTING
DRAIN PIPE	PROPOSED	EXISTING
TREE, (EXISTING)		
TREES OR STUMPS TO BE REMOVED		
EXISTING UTILITY POLE	TELEPHONE	ELECTRIC
EXISTING UTILITY POLE (TO BE REMOVED BY OTHERS)	TELEPHONE	ELECTRIC
PROPOSED UTILITY POLE (BY OTHERS)	TELEPHONE	ELECTRIC

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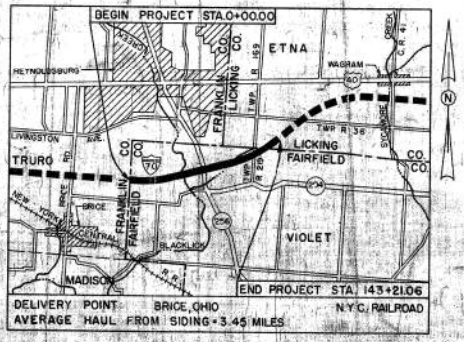


LOCATION MAP

SCALE IN MILES 0 1 2 3 4 5

PORTION TO BE IMPROVED
STATE ROADS
OTHER ROADS
FUTURE CONSTRUCTION

SCALES

PLAN SCALE IN FEET 0 50 100
PROFILE HORIZONTAL SCALE IN FEET 0 50 100
CROSS SECTIONS SCALE IN FEET 0 5 10
VERTICAL SCALE IN FEET 0 5 10

LINE DATA

BEGIN PROJECT	STA. 0+00.00
END PROJECT	STA. 143+21.06
LENGTH OF PROJECT	14,321.06 LIN. FT. OR 2.712 MILES
ADD. FOR APPROACHES (SHEET NO. 12)	3,705.49 LIN. FT.
TOTAL LENGTH OF WORK	18,026.55 LIN. FT. OR 3.414 MILES

1965 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

THE RIGHT OF WAY FOR THIS IMPROVEMENT WILL BE PROVIDED BY THE STATE OF OHIO.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THESE PLANS AND ESTIMATES.

APPROVED DATE 9-13-65	DIVISION DEPUTY DIRECTOR
APPROVED DATE 11-4-65	ENGINEER OF BRIDGES
APPROVED DATE 11-9-65	ENGINEER OF LOCATION AND DESIGN
APPROVED DATE 11-9-65	DEPUTY DIRECTOR OF DESIGN AND CONSTRUCTION
APPROVED DATE 11-16-65	DEPUTY DIRECTOR OF RIGHT OF WAY
APPROVED DATE 11-16-65	DEPUTY DIRECTOR OF PLANNING AND PROGRAMMING
APPROVED DATE	FIRST ASSISTANT DIRECTOR
APPROVED DATE 11/16/65	DIRECTOR OF HIGHWAYS

G-4

PLANS PREPARED BY
DODSON, KINNEY AND LINDBLOM
COLUMBUS, OHIO

FILE NO. 196
CONTRACT NO.

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-1	6-1-65			CB-4	6-1-65	SD-2-64	11-25-64
BP-2	6-1-65	T-2	6-1-65	CB 6	6-1-65	BR-1-65 (sht.)	2-1-65
BP-3	6-1-65	P-3	6-1-65	I-2	6-1-65	RS-1-34	8-10-65
BR-4	6-1-65	FAO-1	6-1-65	GR-1	6-1-65		
BP-5	6-1-65	FAO-2	6-1-65	GR-2A	9-1-65		
BP-6	6-1-65	HW-1	6-1-65				
BP-7	6-1-65	HW-2	6-1-65	GR-5B	6-1-65		
MC-1	6-1-65	HW-3	6-1-65	L-1	6-1-65		
MC-3	6-1-65	HW-6	6-1-65	SP-53	6-30-61		
MC-4	6-1-65	CB-2-2-A&B	6-1-65	SD-1-63 (SH 2,3&4)	11-12-63		
MC-6	6-1-65	CB-3	6-1-65	PSB-1-62	1-15-63		

SUPPLEMENTAL SPECIFICATIONS

808	7-14-65
811	3-29-65
801	9-8-65
806	9-2-65
815	8-6-65
903	5-18-65
906	9-2-65

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED NOV 19 1965
DIVISION ENGINEER

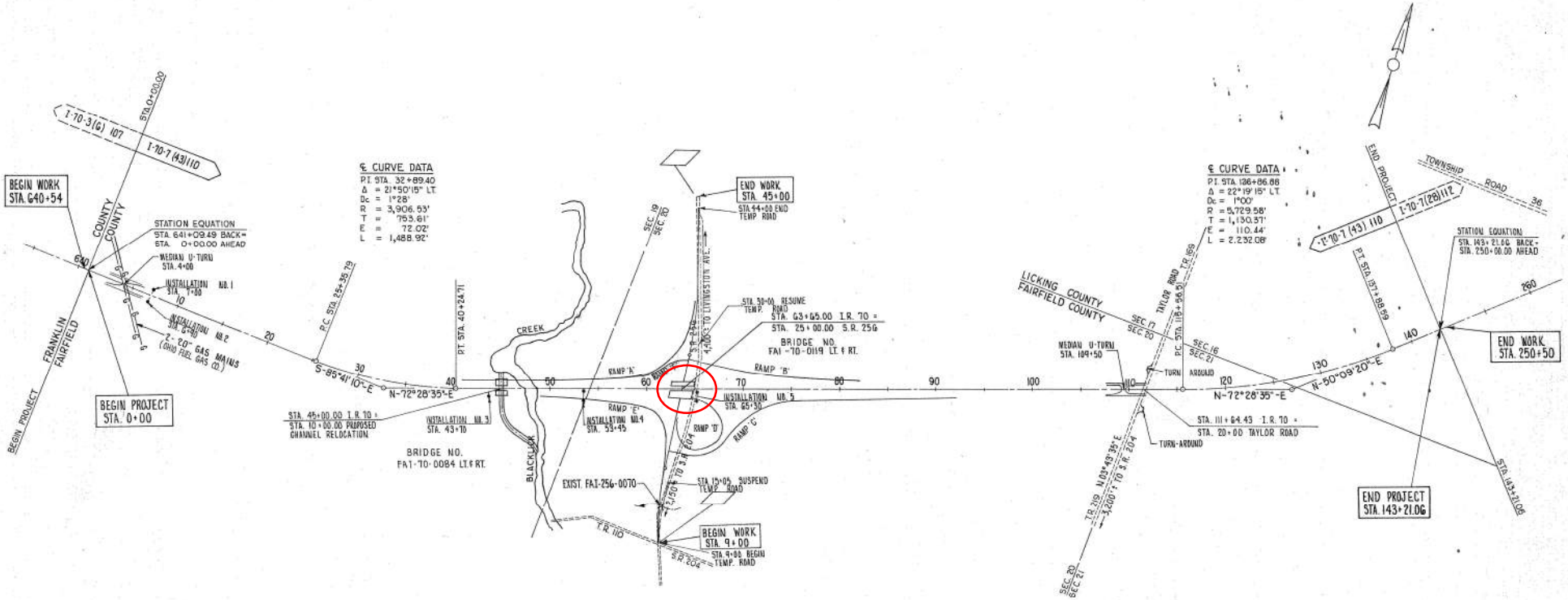
SCHEMATIC LAYOUT PLAN

0 500 1000 1500

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

2/218

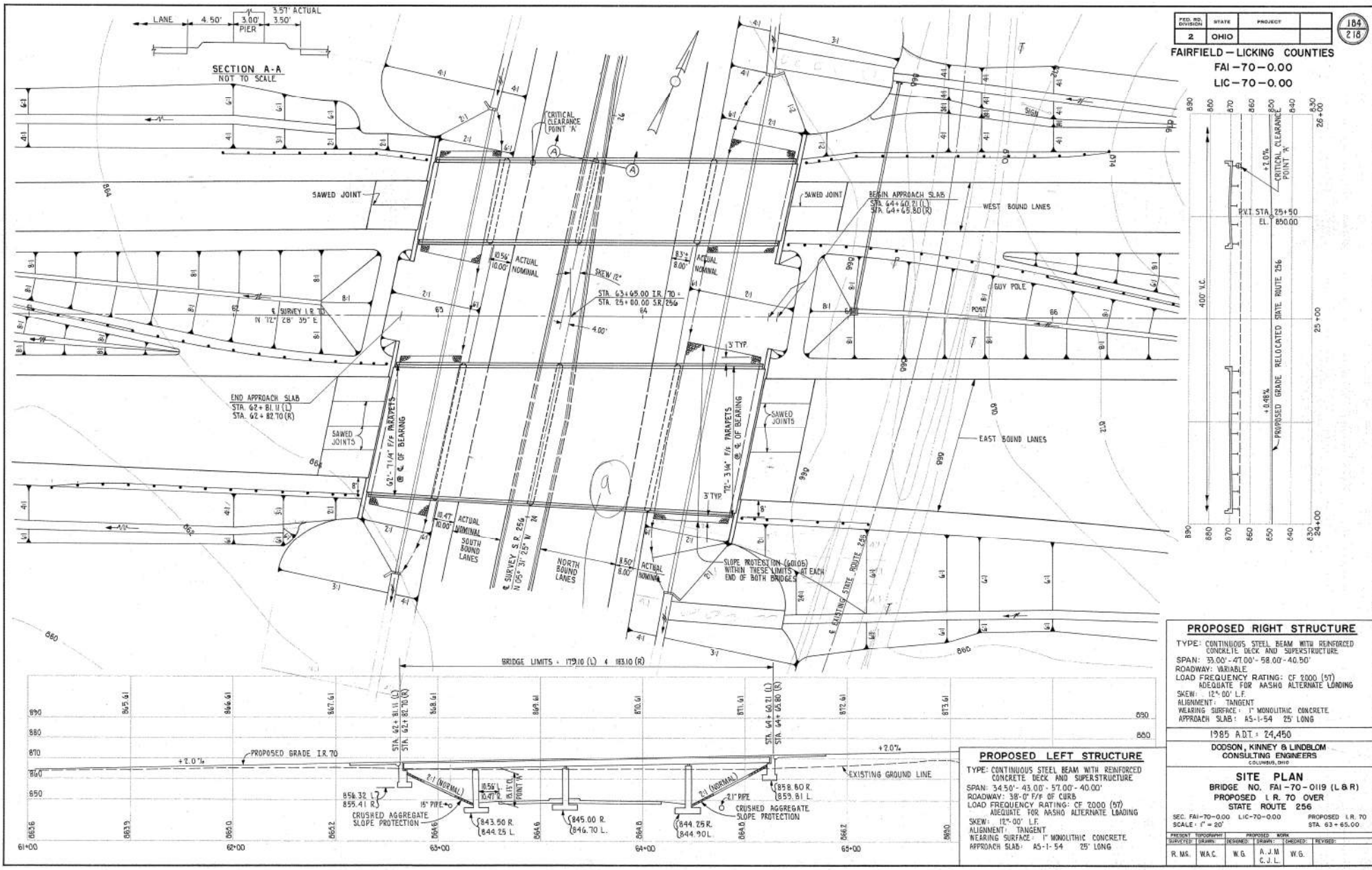
FAIRFIELD – LICKING COUNTIES
FAI – 70 – 0.00
LIC – 70 – 0.00



DESIGN DESIGNATION

CURRENT A.D.T.	=	0 (ON NEW LOCATION)
DESIGN YEAR 1987 A.D.T.	=	{ 47,650 (WEST OF S.R. 256) { 34,080 (EAST OF S.R. 256)
D. H. V.	=	{ 5,240 (WEST OF S.R. 256) { 3,410 (EAST OF S.R. 256)
D (DIRECTIONAL DISTRIBUTION)	=	{ 60% (WEST OF S.R. 256) { 52% (EAST OF S.R. 256)
T (PERCENT B & C TRUCKS)	=	7%
V (DESIGN SPEED)	=	70 M.P.H.

NOTE: THIS SYMBOL INDICATES LOCATION OF FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS. SEE GENERAL NOTE ON SHEET NO. 10.



FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

184
218

FAIRFIELD — LICKING COUNTIES
FAI — 70 — 0.00
LIC — 70 — 0.00

PROPOSED RIGHT STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE.
SPAN: 33.00' - 47.00' - 58.00' - 40.50'
ROADWAY: VARIABLE
LOAD FREQUENCY RATING: CF 2000 (57)
ADEQUATE FOR AASHO ALTERNATE LOADING
SKEW: 12°-00' L.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE
APPROACH SLAB: A5-1-54 25' LONG

1985 A.D.T. = 24,450

PROPOSED LEFT STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPAN: 34.50' - 43.00' - 57.00' - 40.00'
ROADWAY: 38'-0" F/F OF CURB
LOAD FREQUENCY RATING: CF 2000 (57)
ADEQUATE FOR AASHO ALTERNATE LOADING
SKEW: 12°-00' L.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE
APPROACH SLAB: A5-1-54 25' LONG

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SITE PLAN

BRIDGE NO. FAI-70-0119 (L & R)
PROPOSED L.R. 70 OVER
STATE ROUTE 256

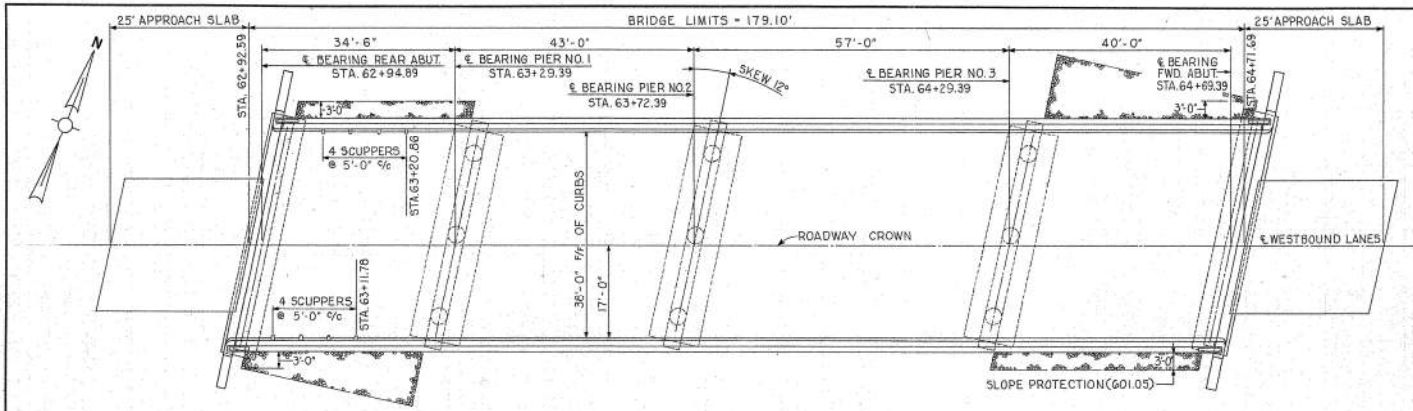
SEC. FAI-70-0.00 LIC-70-0.00 PROPOSED I.R. 70
SCALE: 1" = 20' STA. 63+65.00

PRESENT TOPOGRAPHY SURVEYED	DRAWN	PROPOSED WORK DESIGNED	DRAWN	CHECKED	REVISED:
R. MS.	W.A.C.	W.G.	A. J. M. C. J. L.	W.G.	

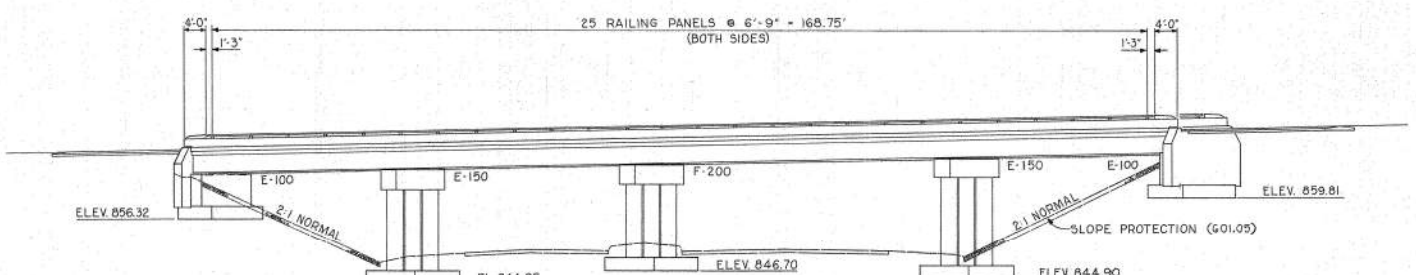
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

185
2.18

FAIRFIELD – LICKING COUNTIES
FAI – 70 – 0.00
LIC – 70 – 0.00



PLAN



ELEVATION

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL		
503	415	CU. YDS.	UNCLASSIFIED EXCAVATION		233	182			
511	231	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	231					
511	89	CU. YDS.	CLASS "C" CONCRETE, PIER CAPS AND COLUMNS			89			
511	158	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS		158				
511	75	CU. YDS.	CLASS "E" CONCRETE, PIER FOOTINGS			75			
509	107,008	LBS.	REINFORCING STEEL	67,444	7,540	32,024			
513	146,497	LBS.	STRUCTURAL STEEL	146,497					
514	146,497	LBS.	FIELD PAINTING OF STRUCTURAL STEEL	146,497					
517	358.50	LIN. FT.	BRIDGE RAILING, TYPE I	358.50					
518	39	CU. YDS.	POROUS BACKFILL		39				
518	8	EACH	SCUPPERS INCLUDING SUPPORTS	8					
601	444	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION		444				
808	231	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	231					
518	88	LIN. FT.	6" PERFORATED HELICAL C.M.P. (SEC. 707.06) INCLUDING SPEC'LS.		88				
518	72	LIN. FT.	6" HELICAL C.M.P. (SECTION 707.06) NON-PERFORATED		72				
512	18	LIN. FT.	PREMOLDED SEALING STRIP		18				

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS BR-1-65 SHEET 1 DATED 2-1-65; SD-1-65 SHEETS 2, 3, & 4 DATED 11-12-63; FSB-1-62 REV. 1-15-63; SD-2-64 DATED 11-25-64 AND SUPPLEMENTAL SPEC. 600 DATED 7-14-65 AND 811 DATED 3-29-65.

DESIGN SPECIFICATIONS: THESE STRUCTURES CONFORM TO THE REQUIREMENTS OF "DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES" OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS DATED 9-1-57, TOGETHER WITH CURRENT REVISIONS THEREOF.

MACHINE FINISH: THE CONCRETE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.

STRUCTURAL STEEL: A.S.T.M. A36 – BASIC UNIT STRESS 20,000 P.S.I.

REINFORCING STEEL: A.S.T.M. A15, A16, A160, DEFORMED, INTERMEDIATE OR HARD GRADE BASIC UNIT STRESS 20,000 P.S.I. EXCEPT SPIRAL REINFORCEMENT MAY BE PLAIN STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 P.S.I.

DESIGN LOADING: C F-2000 (57)

CONCRETE CLASS "C"
BASIC UNIT STRESS 1,333 P.S.I.

CONCRETE CLASS "E"
BASIC UNIT STRESS 1,133 P.S.I.

FOUNDATION BEARING PRESSURE:
ABUTMENT FOOTINGS ARE DESIGNED FOR A MAXIMUM BEARING PRESSURE OF 1.5 TONS PER SQ. FT. PIER FOOTINGS ARE DESIGNED FOR A MAXIMUM BEARING PRESSURE OF 2.0 TONS PER SQ. FT.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

GENERAL PLAN & ESTIMATED QUANTITIES

BRIDGE NO. FAI-70-0119 L.
PROPOSED I. R. 70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I. R. 70 STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W. G.	C. J. L.	C. J. L.	W. G.	C. T. L.	10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

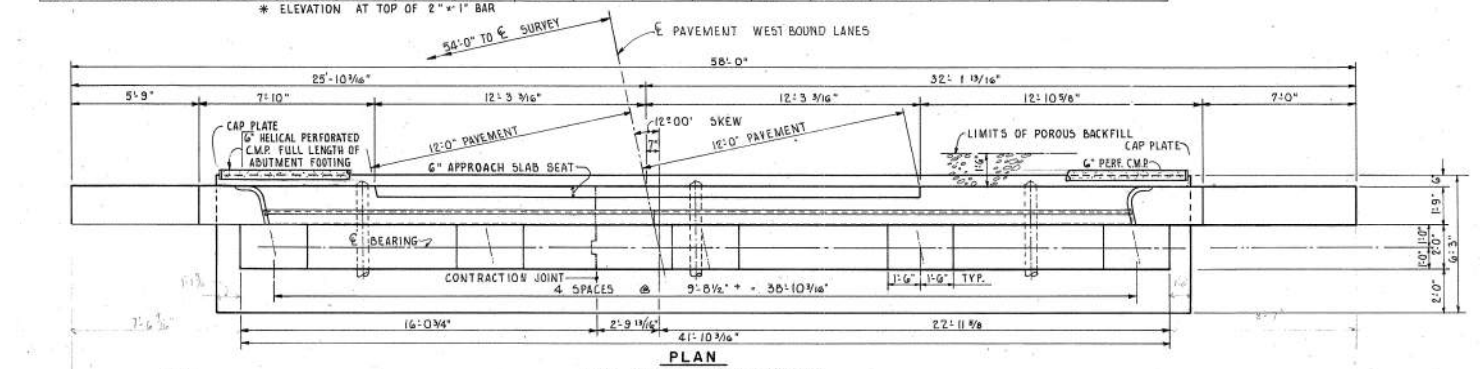
186
218

FAIRFIELD – LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

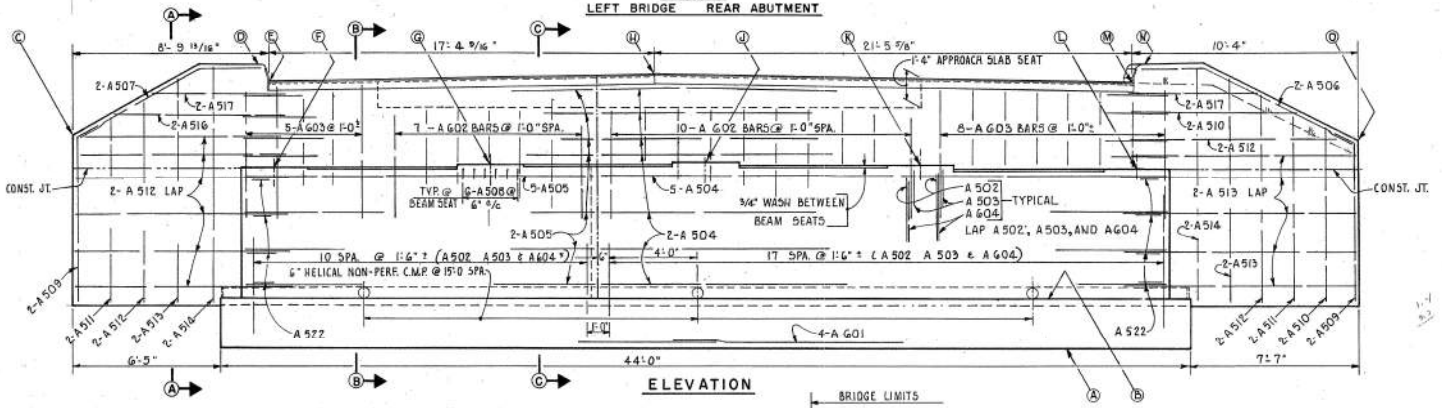
ELEVATIONS

LOCATION	A	B	C	D	E *	F	G	H *	J	K	L	M *	N	O	P	R
REAR ABUTMENT	856.32	858.57	865.85	869.17	868.34	864.47	864.66	868.67	864.78	864.67	864.57	868.44	869.27	865.85		

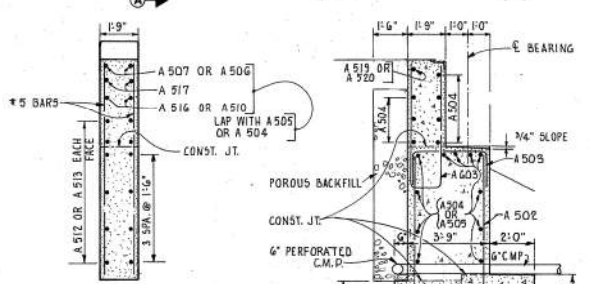
* ELEVATION AT TOP OF 2" x 1" BAR



PLAN
LEFT BRIDGE REAR ABUTMENT

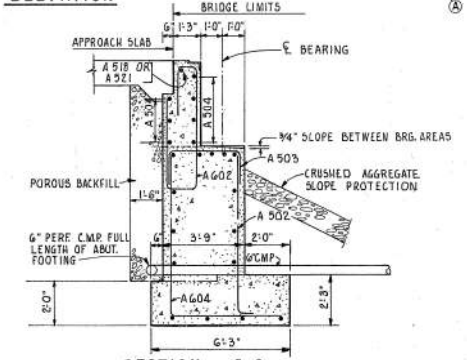


ELEVATION

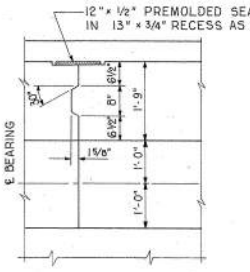


SECTION A-A

SECTION B-B



SECTION C-C



CONTRACTION JOINT DETAIL

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.

2. CONCRETE SHALL BE CLASS "E."

3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.

4. PROCEDURE: - ROADWAY EXCAVATION IN FRONT OF ABUTMENTS SHALL BE MADE BEFORE START OF ABUTMENT CONSTRUCTION. *AT THE REAR ABUTMENT* EXCAVATE TO ELEVATION 852.5 ± TO REMOVE UNSUITABLE SANDY SILT. AREA OF EXCAVATION SHALL BE THE FOOTING WIDTH PLUS 4 FEET OUTWARD ON ALL SIDES.

REPLACEMENT OF OVER-EXCAVATED MATERIAL, UP TO FOOTING LEVEL, SHALL CONSIST OF A SAND AND GRAVEL MIXTURE WITH SOME FINES, COMPARABLE TO ITEM 310 SUBBASE MATERIAL, COMPACTED IN 3 OR 4 INCH LIFTS TO A DENSITY OF AT LEAST 100 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

ABUTMENT DETAILS

BRIDGE NO. FAI-70-0119 L.
PROPOSED I.R. 70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W	G.E.W	W.G	C.T.L.	10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

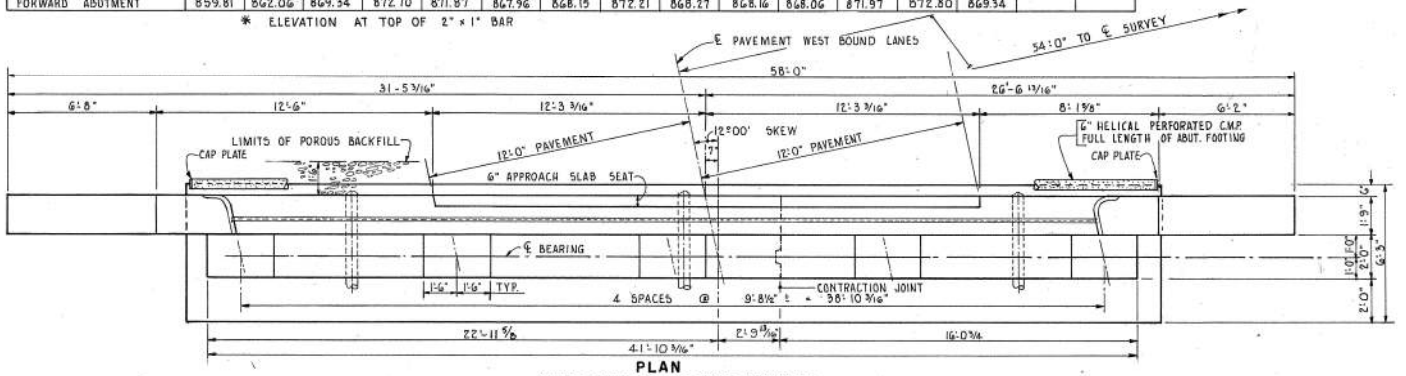
187
218

FAIRFIELD - LICKING COUNTIES
FAI-70 - 0.00
LIC-70 - 0.00

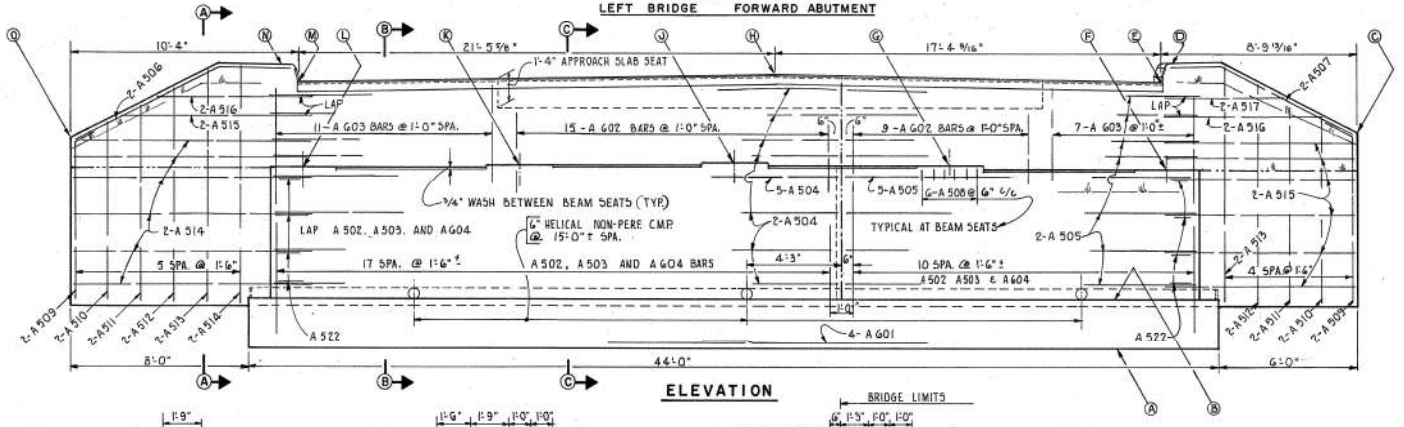
ELEVATIONS

LOCATION	A	B	C	D	E *	F	G	H *	J	K	L	M *	N	O	P	R
FORWARD ABUTMENT	859.81	862.06	869.34	872.70	871.87	867.96	868.15	872.21	868.27	868.16	868.06	871.97	872.80	869.34		

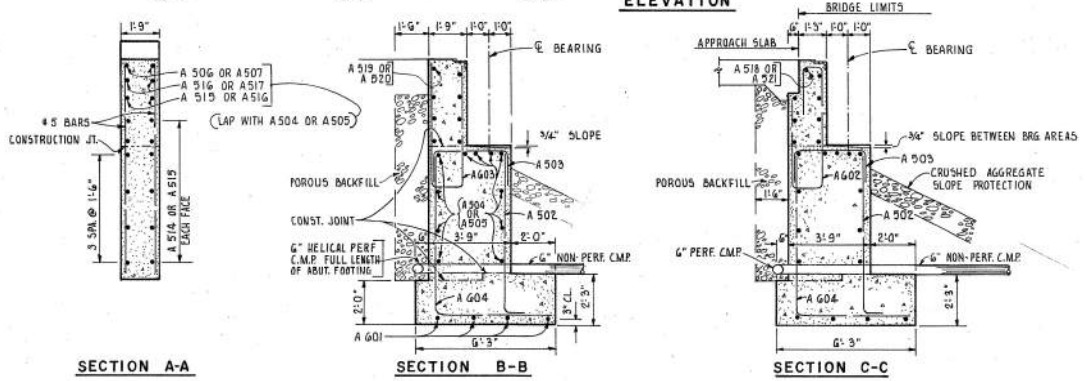
* ELEVATION AT TOP OF 2" x 1" BAR



PLAN
LEFT BRIDGE FORWARD ABUTMENT



ELEVATION



SECTION A-A **SECTION B-B** **SECTION C-C**

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
2. CONCRETE SHALL BE CLASS "E"
3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.
4. FOR CONTRACTION JOINT DETAIL SEE SHEET NO. 186.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

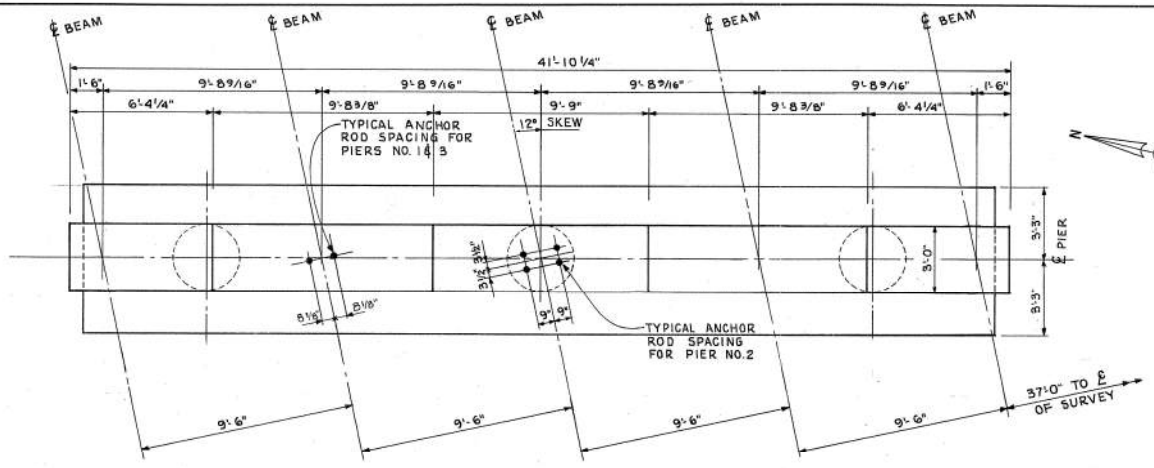
ABUTMENT DETAILS

BRIDGE NO. FAI-70-0119 L.
PROPOSED I.R. 70 OVER
STATE ROUTE 256

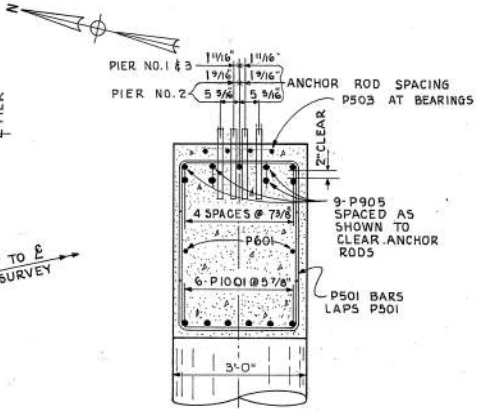
FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L.	10-11-65	

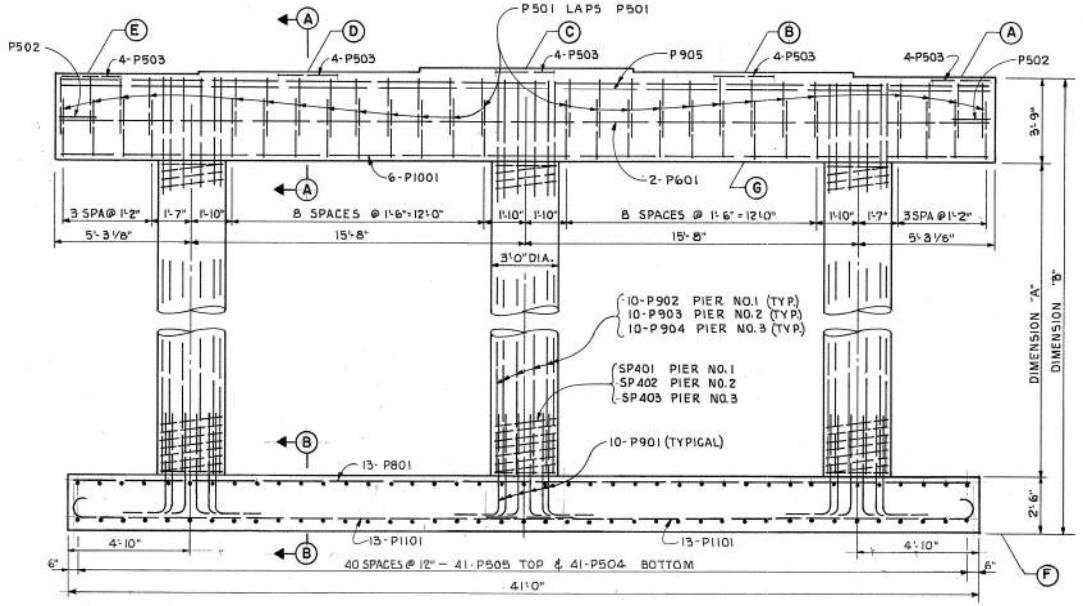
FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC.-70-0.00



PLAN

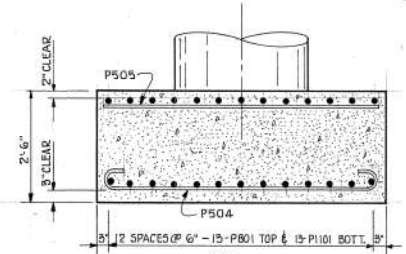


SECTION A-A



ELEVATION

	ELEV. "A"	ELEV. "B"	ELEV. "C"	ELEV. "D"	ELEV. "E"	ELEV. "F"	ELEV. "G"			DIM. "A"	DIM. "B"
PIER NO. 1	865.12	865.30	865.45	865.32	865.21	844.25	861.37			14'-7 1/2"	20'-10 1/2"
PIER NO. 2	865.68	865.87	866.00	865.89	865.78	846.70	861.93			12'-8 3/4"	18'-1 13/16"
PIER NO. 3	867.12	867.30	867.43	867.32	867.21	844.90	863.37			15'-11 5/8"	22'-2 5/8"



SECTION B-B

NOTES

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER CAP SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES

PIER CAPS AND COLUMNS SHALL BE CLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

ALL REINFORCING STEEL SHALL BE PLACED TO PROVIDE A MINIMUM COVER OF 2" UNLESS OTHERWISE SHOWN.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIER DETAILS

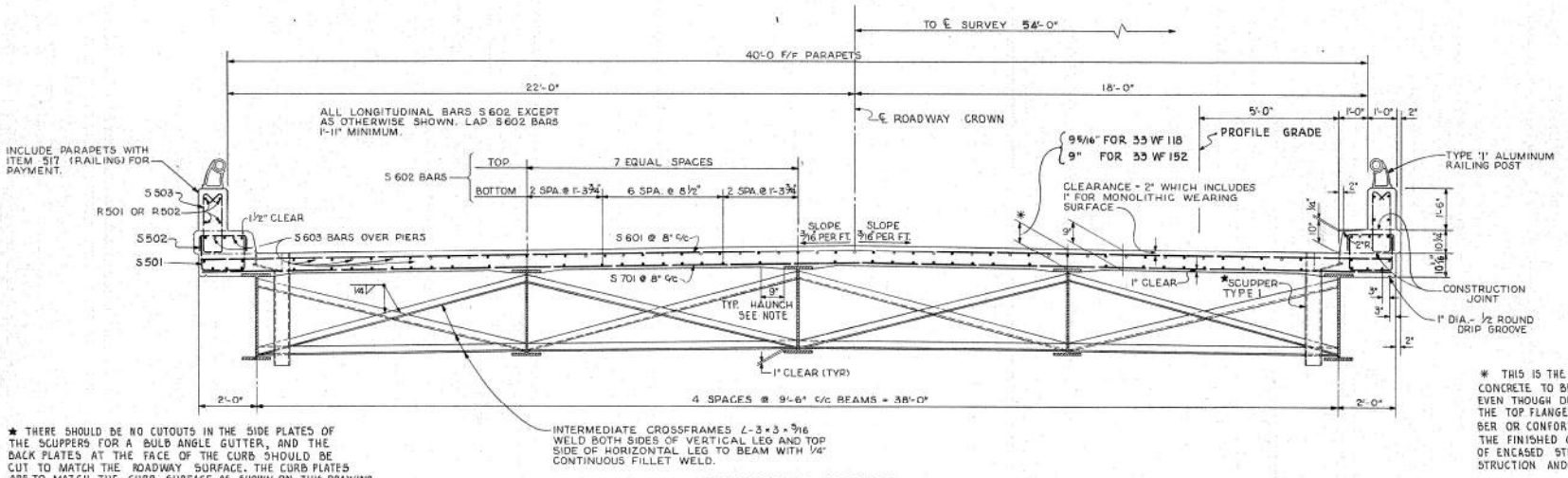
LEFT BRIDGE NO. FAI.-70-0119 L
PROPOSED I.R.70 OVER
STATE ROUTE 256
FAIRFIELD COUNTY — PROPOSED I.R.70 STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
A.C.S.	H.W.S.	H.W.S.	W.G.	C.T.L.	10-11-65	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

189
218

FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC.-70-0.00

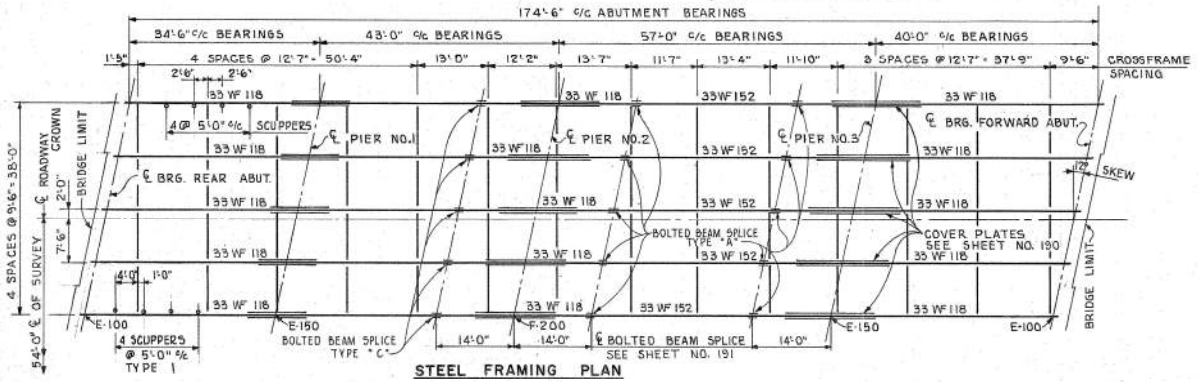


★ THERE SHOULD BE NO CUTOUTS IN THE SIDE PLATES OF THE SCUPPERS FOR A BULB ANGLE GUTTER, AND THE BACK PLATES AT THE FACE OF THE CURB SHOULD BE CUT TO MATCH THE ROADWAY SURFACE. THE CURB PLATES ARE TO MATCH THE CURB SURFACE AS SHOWN ON THIS DRAWING.

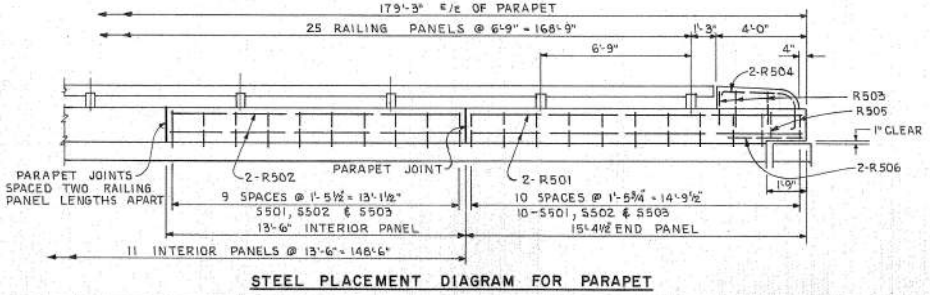
INTERMEDIATE CROSSFRAMES L-3 × 3 × 5/16 WELD BOTH SIDES OF VERTICAL LEG AND TOP SIDE OF HORIZONTAL LEG TO BEAM WITH ¼" CONTINUOUS FILLET WELD.

* THIS IS THE NOMINAL DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE. DEDUCTION SHALL BE MADE FOR VOLUME OF ENCASED STEEL PLATES AS PER ITEM 511.19 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.

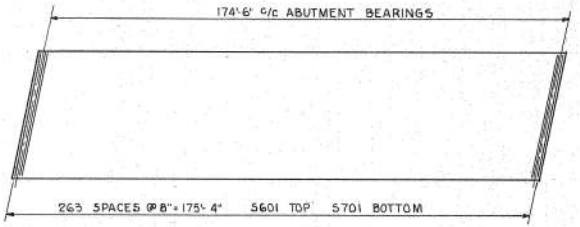
TRANSVERSE SECTION



STEEL FRAMING PLAN



STEEL PLACEMENT DIAGRAM FOR PARAPET



PART PLAN

SHOWING PLACEMENT OF TRANSVERSE REINFORCING STEEL

NOTES

FIXED AND SLIDING BEARINGS SHALL BE E-100 AT THE ABUTMENTS, E-150 AT PIER NO. 1, F-200 AT PIER NO. 2, AND E-150 AT PIER NO. 3. FOR DETAILS SEE STANDARD DRAWING FSB-1-62, REVISED 1-15-63.

FOR DETAIL OF END CROSSFRAME, END FINISH, CURB PLATES, SCUPPERS, BRIDGE RAILING AND WELDED BUTT JOINT IN SUPERSTRUCTURE END FINISH ANGLES CENTERLINE ROADWAY CROWN, SEE STANDARD DRAWINGS SD-1-63, SHEETS 2, 3 AND 4; AND BR-1-65 DATED 2-1-65.

DECK SLAB HAUNCH: A TYPICAL HAUNCH WIDTH OF 9" SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. HOWEVER, THE HAUNCH WIDTH MAY VARY BETWEEN 6" AND 12" PROVIDED THAT THE SLOPE SHALL NOT BE MORE THAN 1:4 FOR A HAUNCH LESS THAN 9" IN WIDTH.

MACHINE FINISH: THE CONCRETE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.

GUTTER ELEVATIONS: SEE SHEET 190.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

LEFT BRIDGE NO. FAI.-70-0119 L
PROPOSED I.R. 70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY PROPOSED I.R. 70 STA. 63+68.00

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
W.G.	H.W.S	H.W.S	W.G.	C.T.L.	10-11-65	

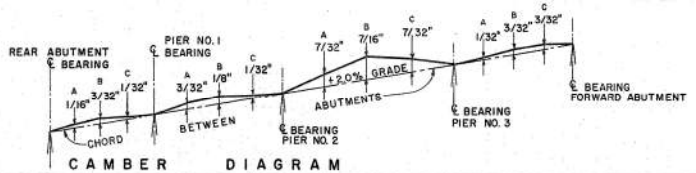
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

190
218

FAIRFIELD - LICKING COUNTIES
FAI - 70 - 0.00
LIC - 70 - 0.00

DEFLECTION AND CAMBER (LEFT BRIDGE)

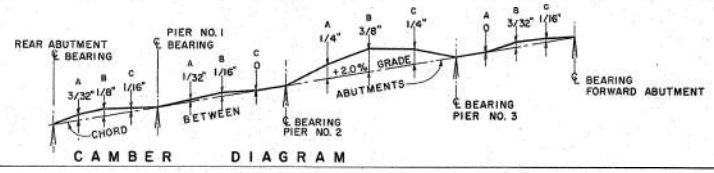
	SPAN NO. 1			SPAN NO. 2			SPAN NO. 3			SPAN NO. 4		
	1/4 POINT A	CENTER POINT B	3/4 POINT C	1/4 POINT A	CENTER POINT B	SPLICE POINT C	SPLICE POINT A	CENTER POINT B	SPLICE POINT C	1/4 POINT A	CENTER POINT B	3/4 POINT C
DEFLECTION DUE TO WEIGHT OF STEEL	0	0	0	0	0	0	0	1/16	0	0	0	0
DEFLECTION DUE TO REMAINING DEAD LOAD	1/16	3/32	1/32	3/32	1/8	1/32	7/32	3/8	7/32	1/32	3/32	3/32
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0
REQUIRED SHOP CAMBER	1/16	3/32	1/32	3/32	1/8	1/32	7/32	7/16	7/32	1/32	3/32	3/32



CAMBER DIAGRAM

DEFLECTION AND CAMBER (RIGHT BRIDGE)

	SPAN NO. 1			SPAN NO. 2			SPAN NO. 3			SPAN NO. 4		
	1/4 POINT A	CENTER POINT B	3/4 POINT C	1/4 POINT A	CENTER POINT B	SPLICE POINT C	SPLICE POINT A	CENTER POINT B	SPLICE POINT C	1/4 POINT A	CENTER POINT B	3/4 POINT C
DEFLECTION DUE TO WEIGHT OF STEEL	0	0	0	0	0	0	0	1/16	0	0	0	0
DEFLECTION DUE TO REMAINING DEAD LOAD	3/32	1/8	1/16	1/32	1/16	0	1/4	3/8	1/4	0	3/32	1/16
ADJUSTMENT REQUIRED FOR VERTICAL CURVE	0	0	0	0	0	0	0	0	0	0	0	0
REQUIRED SHOP CAMBER	3/32	1/8	1/16	1/32	1/16	0	1/4	7/16	1/4	0	3/32	1/16



CAMBER DIAGRAM

GUTTER ELEVATIONS*

LEFT BRIDGE				RIGHT BRIDGE			
LEFT GUTTER		RIGHT GUTTER		LEFT GUTTER		RIGHT GUTTER	
STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
62+99.36	868.46	62+91.28	868.36	62+79.68	868.13	62+66.81	867.45
63+07.99	868.63	62+99.91	868.53	62+87.93	868.30	62+74.96	867.62
63+16.61	868.81	63+08.53	868.71	62+96.18	868.46	62+83.12	867.77
63+25.24	868.98	63+17.16	868.88	63+04.43	868.62	62+91.27	867.92
63+33.86	869.15	63+25.78	869.09	63+12.68	868.79	62+99.42	868.08
63+44.61	869.37	63+36.53	869.27	63+24.43	869.02	63+11.04	868.31
63+55.36	869.59	63+47.28	869.49	63+36.18	869.27	63+22.65	868.53
63+66.11	869.79	63+58.03	869.69	63+47.93	869.49	63+34.27	868.75
63+76.86	870.01	63+68.78	869.91	63+59.68	869.73	63+45.88	868.97
63+91.11	870.31	63+83.03	870.21	63+74.18	870.03	63+60.21	869.26
64+05.36	870.61	63+97.28	870.51	63+88.68	870.33	63+74.55	869.54
64+19.61	870.88	64+11.53	870.78	64+03.18	870.61	63+88.88	869.81
64+33.86	871.15	64+25.78	871.05	64+17.68	870.89	64+03.21	870.06
64+43.86	871.35	64+35.78	871.25	64+27.81	871.09	64+13.22	870.26
64+53.86	871.55	64+45.78	871.55	64+37.93	871.30	64+23.23	870.46
64+63.86	871.75	64+55.78	871.75	64+48.06	871.50	64+33.23	870.65
64+73.86	871.95	64+65.78	871.85	64+58.18	871.70	64+43.24	870.83

*NOTE:
ELEVATIONS INCLUDE AN ALLOWANCE FOR DEAD LOAD DEFLECTION OF CONCRETE SLAB. ELEVATIONS ARE AT THE FACE OF THE CURB.

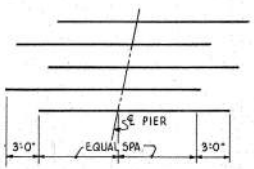
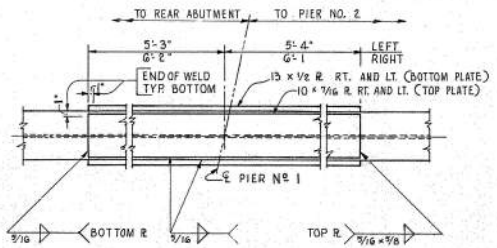
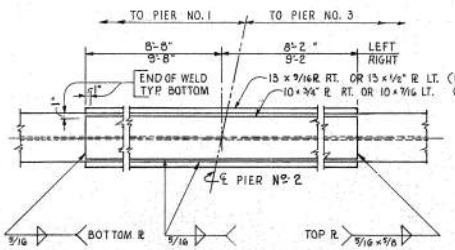


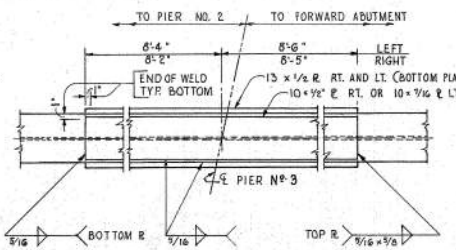
DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS



COVER PLATE DETAIL
PIER Nº 1



COVER PLATE DETAIL
PIER Nº 2



COVER PLATE DETAIL
PIER Nº 3

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COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

BRIDGE NO. FAI. 70-0119 L&R.
PROPOSED I. R. 70 OVER
STATE ROUTE 256

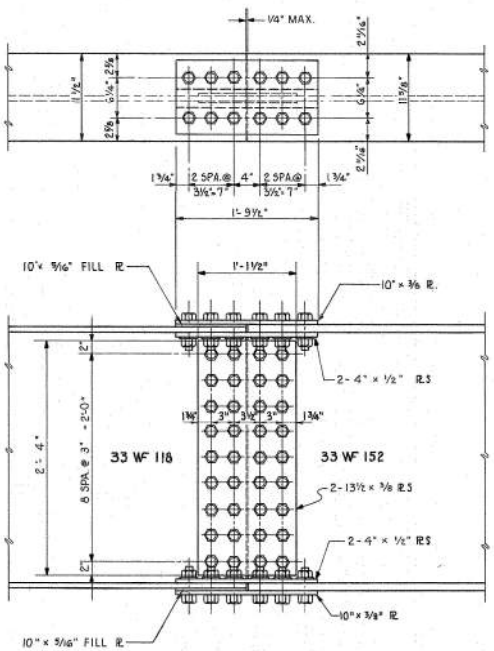
FAIRFIELD COUNTY — PROPOSED I. R. 70 STA. 63+00 & 65+00

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
WG	GEW	GEW	WG	CTL	10-11-63	

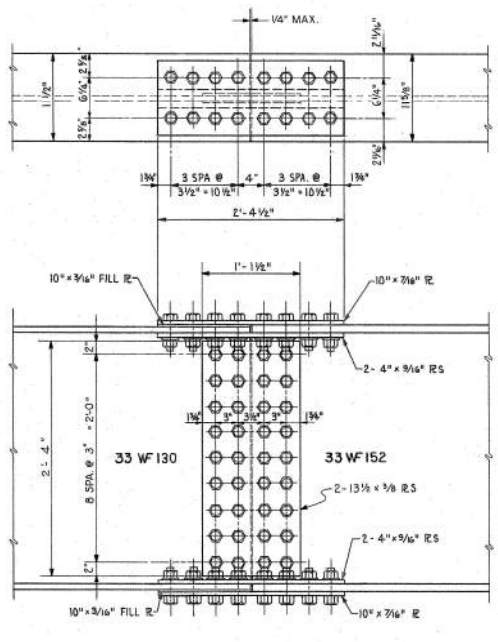
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

191
218

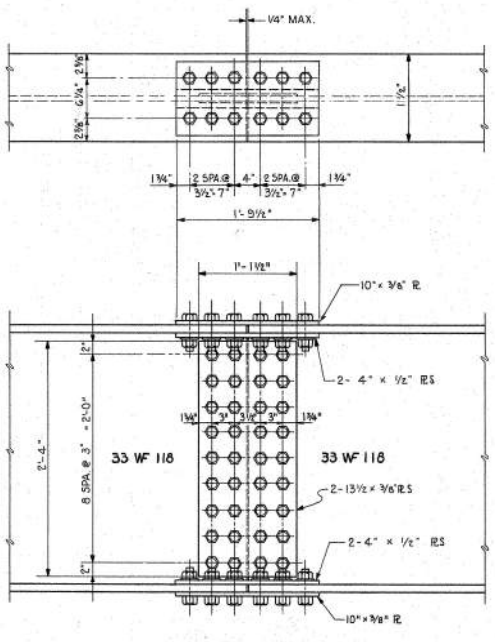
FAIRFIELD – LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00



BOLTED FIELD SPLICE DETAIL
TYPE 'A'



BOLTED FIELD SPLICE DETAIL
TYPE 'B'



BOLTED FIELD SPLICE DETAIL
TYPE 'C'

BOLTED FIELD SPLICE NOTES

MATERIAL: SPLICE PLATES, BOLTS, AND FILLS SHALL BE IN ACCORDANCE WITH THE CONSTRUCTION AND MATERIAL SPECIFICATIONS. BOLTS SHALL BE 1" DIAMETER, HIGH STRENGTH. THE SPLICE WEIGHT, PLUS THE WEIGHT OF FILLS, WHERE REQUIRED, IS INCLUDED WITH THE STRUCTURAL STEEL QUANTITY.

FILLS: IN THE FINAL SHOP ASSEMBLY, FILLS SHALL BE FURNISHED WITH THICKNESSES SUFFICIENT TO COMPENSATE FOR ANY MISALIGNMENT OF ABUTTING FLANGES AND WEBS DUE TO STANDARD ROLLING MILL TOLERANCES. THE CLAMPING TOGETHER OF SPLICE PLATES OVER MATERIAL (INCLUDING FILLS) THAT VARY BY MORE THAN 1/16 INCH IN THICKNESS OR RELATIVE POSITION, AT THE CENTERLINE OF THE SPLICE, WILL NOT BE PERMITTED.

ERECTION: IN THE FIELD ERECTION OF BEAMS WITH BOLTED FIELD SPLICES, THE BEAMS SHALL BE POSITIONED TO FACILITATE THE PLACING OF DRIFT PINS. DRIFTING DONE DURING ERECTION SHALL BE ONLY SUCH AS TO ALIGN THE PARTS TO BE BOLTED AND NOT TO ENLARGE THE HOLES OR DISTORT THE METAL. HEAVY DRIVING OF DRIFT PINS WILL NOT BE PERMITTED.

FIELD ASSEMBLY: IN THE FINAL ASSEMBLY OF THE PARTS TO BE BOLTED, DRIFT PINS SHALL BE PLACED IN A SUFFICIENT NUMBER OF HOLES (NOT LESS THAN 25 PERCENT FOR FIELD ERECTION) TO PROVIDE AND MAINTAIN ACCURATE ALIGNMENT OF HOLES AND PARTS, AND SUFFICIENT BOLTS SHALL BE INSTALLED AND BROUGHT TO A SNUG TIGHT CONDITION TO BRING THE PARTS INTO COMPLETE CONTACT. BOLTS SHALL THEN BE INSTALLED IN ANY REMAINING OPEN HOLES AND TIGHTENED TO A SNUG TIGHT FIT, AFTER WHICH ALL BOLTS SHALL BE TIGHTENED COMPLETELY BY CALIBRATED WRENCHES OR BY THE TURN-OF-NUT METHOD. DRIFT PINS SHALL THEN BE REPLACED WITH BOLTS, TIGHTENED IN THE SAME MANNER.

BOLT HEADS AT FASCIA BEAMS: PLACE BOLT HEADS ON EXPOSED SIDE OF FASCIA BEAMS.

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PROPOSED I.R. 70 OVER
STATE ROUTE 256

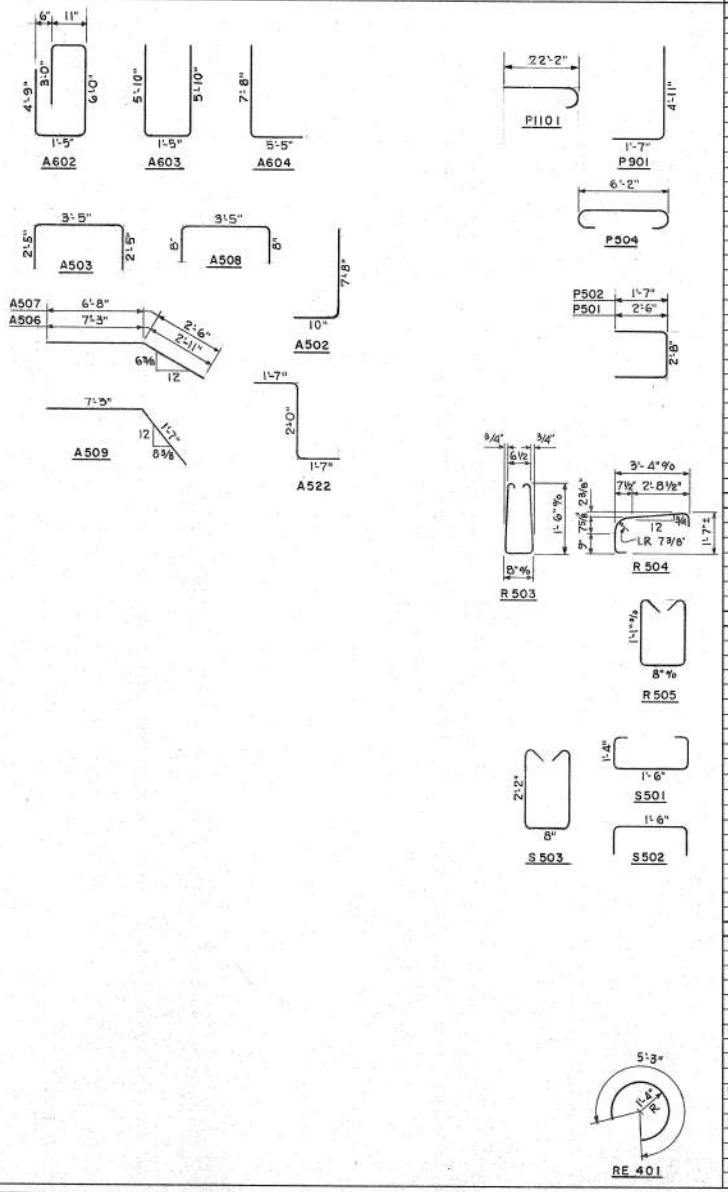
FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63+00 & 65+00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	APPROVED:	DATE:	REVISED:
WG	GEN/WP	GEN/WP	NG	CTL	10-11-03	

STEEL LIST

MARK	NO.	LENGTH	WEIGHT	SHAPE
ABUTMENTS				
A601	16	22'-10"	549	S
A602	48	15'-5"	1111	B
A603	36	12'-9"	689	B
A604	58	12'-11"	1125	B
A502	58	8'-5"	509	B
A503	58	7'-5"	449	B
A504	36	25'-5"	954	S
A505	36	15'-8	588	S
A506	4	10'-2"	42	B
A507	4	9'-2"	38	B
A508	60	4'-6"	282	B
A509	8	8'-10"	74	B
A510	8	8'-0"	67	S
A511	8	8'-9"	73	S
A512	22	9'-6"	218	S
A513	18	10'-1"	189	S
A514	18	10'-7"	199	S
A515	14	8'-10"	129	S
A516	6	7'-1"	44	S
A517	6	5'-6"	34	S
A518	2	17'-2"	36	S
A519	2	10'-0"	21	S
A520	2	7'-0"	15	S
A521	2	10'-5"	22	S
A522	16	5'-0"	88	B

BENDING DIAGRAM



MARK	NO.	LENGTH	WEIGHT	SHAPE
PIERS				
P1101	78	23'-9"	9842	B
P1001	18	41'6"	3214	S
P901	90	6'-3"	1913	B
P902	30	18'-2"	1858	S
P903	30	16'-3"	1658	S
P904	30	19'-6"	1989	S
P905	27	41'-6"	3810	S
P801	39	40'-6	4217	S
P601	6	41'-6"	374	S
P501	156	7'-6"	1220	B
P502	6	5'-8"	35	B
P503	60	2'-8"	167	S
P504	123	7'-4"	941	B
P505	123	6'-2"	791	S
RAILING				
R501	16	15'-0"		S
R502	88	13'-3"	INCLUDE	S
R503	12	4'-2"	WITH	B
R504	8	3'-4"	RAILING	B
R505	8	3'-5"	FOR	B
R506	8	3'-0"	PAYMENT	S
SUPERSTRUCTURE				
S701	264	42'-7"	22979	S
S601	264	42'-7"	16885	S
S602	395	36'-8"	21753	S
S603	90	17'-0	2298	S
S501	260	4'-11"	1334	B
S502	260	2'-6"	679	B
S503	260	5'-7"	1516	B
REPLACEMENT BARS				
RE401	1	5'-3		B
RE501	1	5'-7"		S
RE601	3	5'-11		S
RE701	2	6'-3		S
RE801	1	6'-6"		S
RE901	1	6'-10"		S
RE1001	1	7'-3"		S
RE1101	1	7'-7"		S

SPIRAL REINFORCING LIST

MARK	NO.	CORE DIA. % SPIRAL	LENGTH	PITCH	NO. OF TURNS	WEIGHT
SP401	3	2'-8"	14'-7½"	4½"	42	824
SP402	3	2'-8"	12'-8¾"	4½"	37	725
SP403	3	2'-8"	15'-11⅝"	4½"	46	903

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FAIRFIELD - LICKING COUNTIES
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SPIRAL REINFORCING BARS

THE "LENGTH" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE DISTANCE FROM THE TOP OF THE FOOTING TO THE BOTTOM OF THE PIER CAP.

THE "NUMBER OF TURNS" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE "LENGTH" DIVIDED BY THE PITCH, PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS) EXPRESSED AS THE NEAREST WHOLE NUMBER.

SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM 509.

1-1/2 CLOSED COILS SHALL BE PROVIDED AT THE ENDS OF EACH SPIRAL UNIT.

FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.68 LB. PER LIN. FT. OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS, BASED ON 0.68 LB. PER LIN. FT., WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS.

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE.

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REINFORCING STEEL LIST

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STATE ROUTE 256
FAIRFIELD COUNTY
PROPOSED I.R.70
STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	APPROVED:	DATE:	REVISED:
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.	10-11-65	

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FAI-70-0.00
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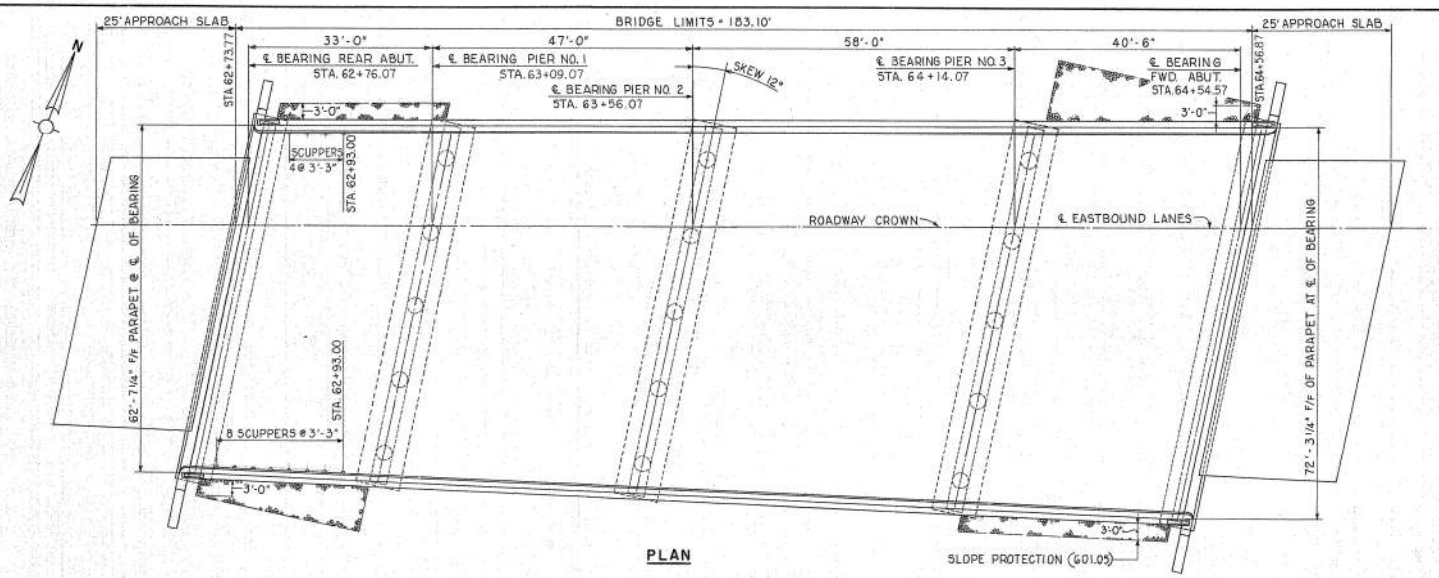
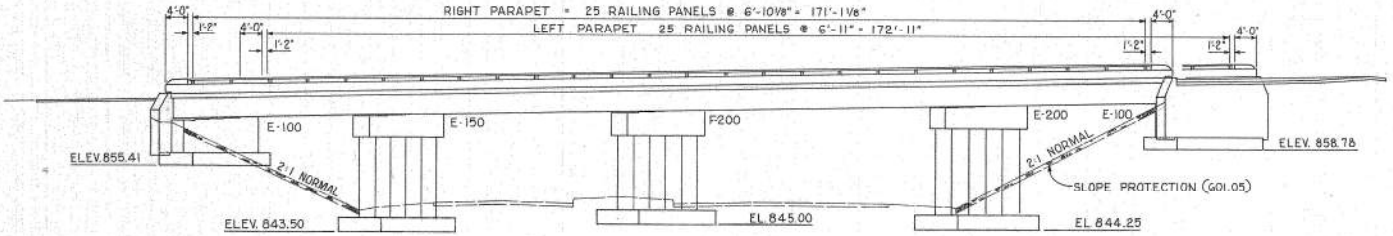


PLAN



ELEVATION

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL		
503	690	CU. YDS.	UNCLASSIFIED EXCAVATION		333	357			
511	382	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	382					
511	157	CU. YDS.	CLASS "C" CONCRETE, PIER CAPS AND COLUMNS			157			
511	235	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS		235				
511	152	CU. YDS.	CLASS "E" CONCRETE, PIER FOOTINGS			152			
509	196,607	LBS.	REINFORCING STEEL	114,479	11,875	70,253			
513	251,514	LBS.	STRUCTURAL STEEL	251,514					
514	251514	LBS.	FIELD PAINTING OF STRUCTURAL STEEL	251,514					
517	364.67	LIN. FT.	BRIDGE RAILING, TYPE 1	364.67					
518	72	CU. YDS.	POROUS BACKFILL		72				
518	12	EACH	SCUPPERS INCLUDING SUPPORTS	12					
601	667	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION		667				
808	382	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	382					
518	144	LIN. FT.	6" PERFORATED HELICAL C.M.P. (SEC. 707.06) INCLUDING SPEC'LS.		144				
518	120	LIN. FT.	6" HELICAL C.M.P. (SEC. 707.06) NON-PERFORATED		120				
512	18	LIN. FT.	PREMOLDED SEALING STRIP		18				

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS BR-1-65 SHEET 1 DATED 2-1-65; SD-1-63 SHEETS 2, 3, & 4 DATED 11-12-63; FSB-1-62 REV. 1-15-63; SD-2-64 DATED 11-25-64, AND SUPPLEMENTAL SPECS. 808 DATED 7-14-63, AND 811 DATED 3-25-65.

DESIGN SPECIFICATIONS: THESE STRUCTURES CONFORM TO THE REQUIREMENTS OF "DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES" OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS DATED 9-1-57, TOGETHER WITH CURRENT REVISIONS THEREOF.

MACHINE FINISH: THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.

STRUCTURAL STEEL: A.S.T.M. A36-BASIC UNIT STRESS 20,000 P.S.I.

REINFORCING STEEL: A.S.T.M. A15, A16, A160, DEFORMED, INTERMEDIATE OR HARD GRADE BASIC UNIT STRESS 20,000 P.S.I. EXCEPT SPIRAL REINFORCEMENT MAY BE PLAIN STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 P.S.I.

DESIGN LOADING: C.F 2000 (57)

CONCRETE CLASS "C": CF-2000 (57)
BASIC UNIT STRESS 1,333 P.S.I.

CONCRETE CLASS "E":
BASIC UNIT STRESS 1,133 P.S.I.

FOUNDATION BEARING PRESSURE:
ABUTMENT FOOTINGS ARE DESIGNED FOR A MAXIMUM BEARING PRESSURE OF 1.5 TONS PER SQ. FT. PIER FOOTINGS ARE DESIGNED FOR A MAXIMUM BEARING PRESSURE OF 2.0 TONS PER SQ. FT.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

GENERAL PLAN & ESTIMATED QUANTITIES

BRIDGE NO. FAI-70-0719 R
PROPOSED I.R. 70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	C.J.L.	C.J.L.	W.G.	C.T.L.	10-11-65	

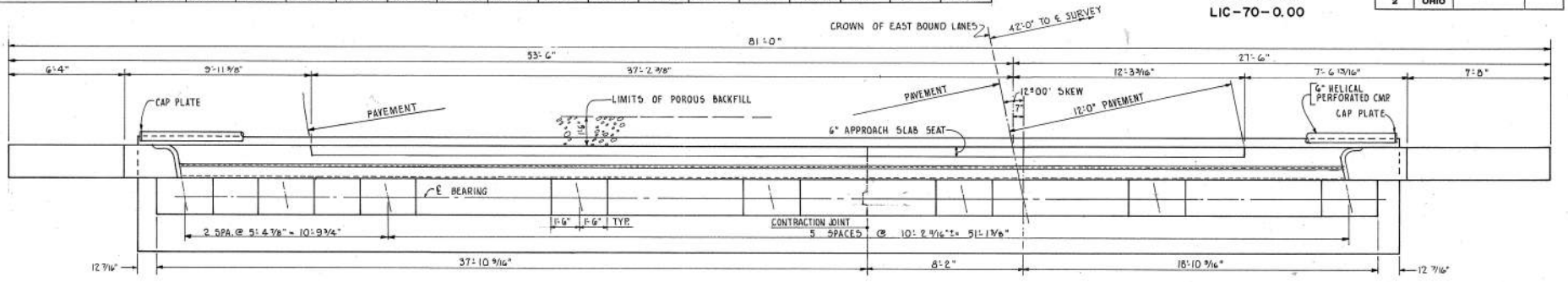
ELEVATIONS

LOCATION	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S
	855.41	857.66	864.35	868.93	868.10	864.24	864.94	868.24	864.37	864.17	863.97	863.77	863.67	863.56	867.42	868.25	864.94

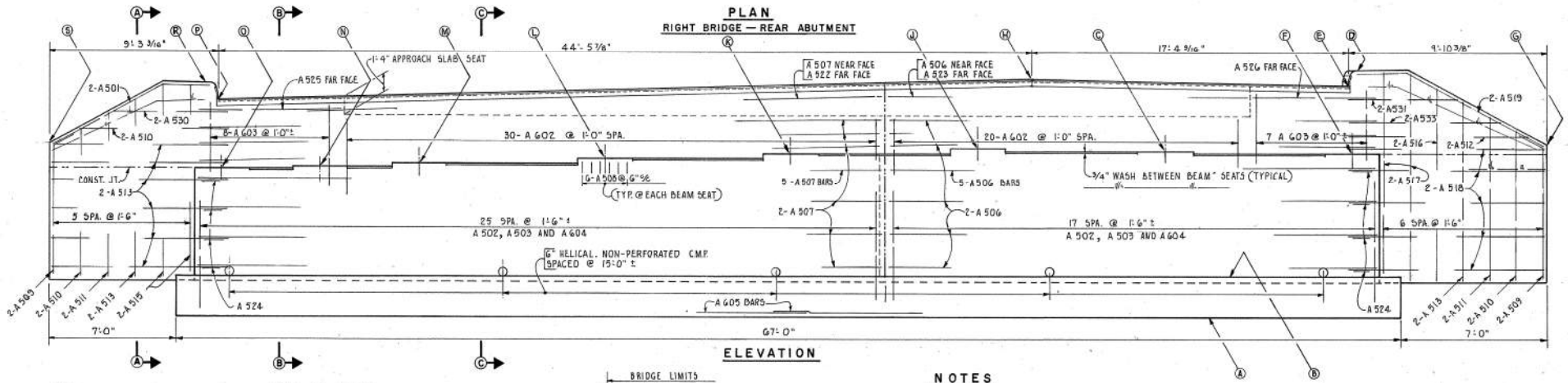
FAIRFIELD–LICKING COUNTIES
FAI–70–0.00
LIC–70–0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

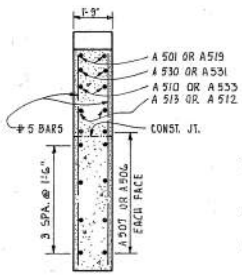
194
218



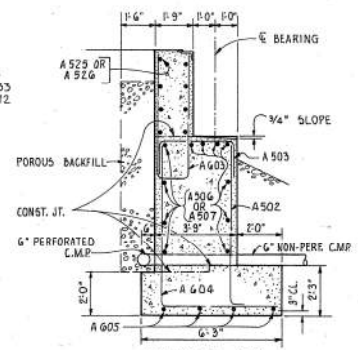
PLAN
RIGHT BRIDGE — REAR ABUTMENT



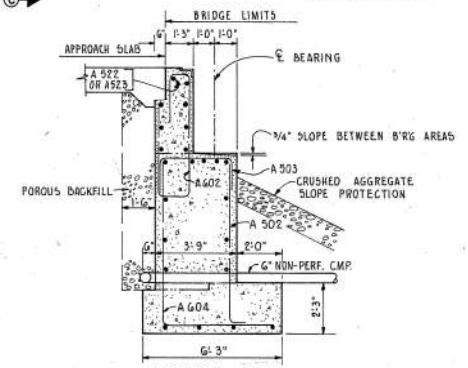
ELEVATION



SECTION AA



SECTION B-B



SECTION C-C

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
2. CONCRETE SHALL BE CLASS "E"
3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.
4. PROCEDURE: SEE NOTE NO. 4, SHEET NO. 18G
5. FOR CONTRACTION JOINT DETAIL SEE SHEET 18G.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

ABUTMENT DETAILS

BRIDGE NO. FAI-70-0119 R.
PROPOSED I.R. 70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63 + 65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	G.E.W.	G.E.W.	W.G.	C.T.L.	10-11-65	

ELEVATIONS

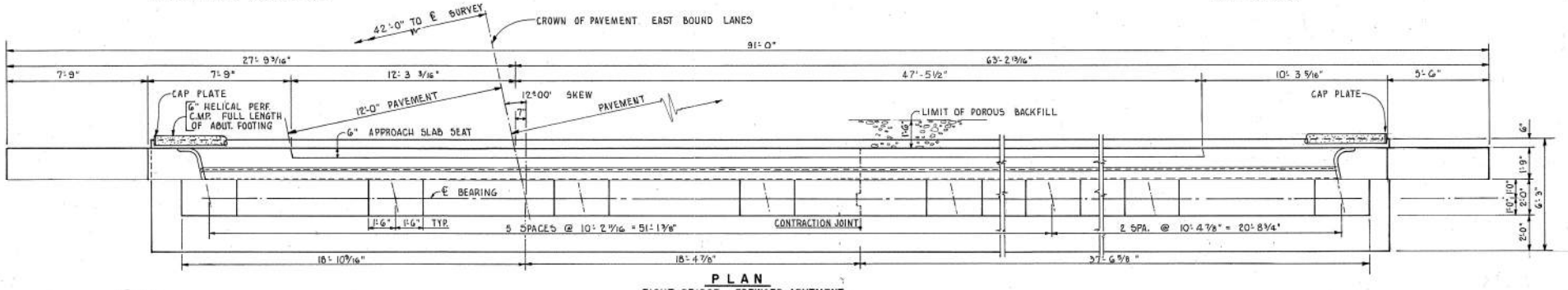
LOCATION	A	B	C	D	E *	F	G	H *	J	K	L	M	N	O	P *	R	S
	858.78	861.03	868.31	872.55	871.72	867.79	867.91	871.92	867.93	867.73	867.53	867.33	867.13	866.93	870.86	871.69	868.31

* ELEVATION AT TOP OF 2" BAR

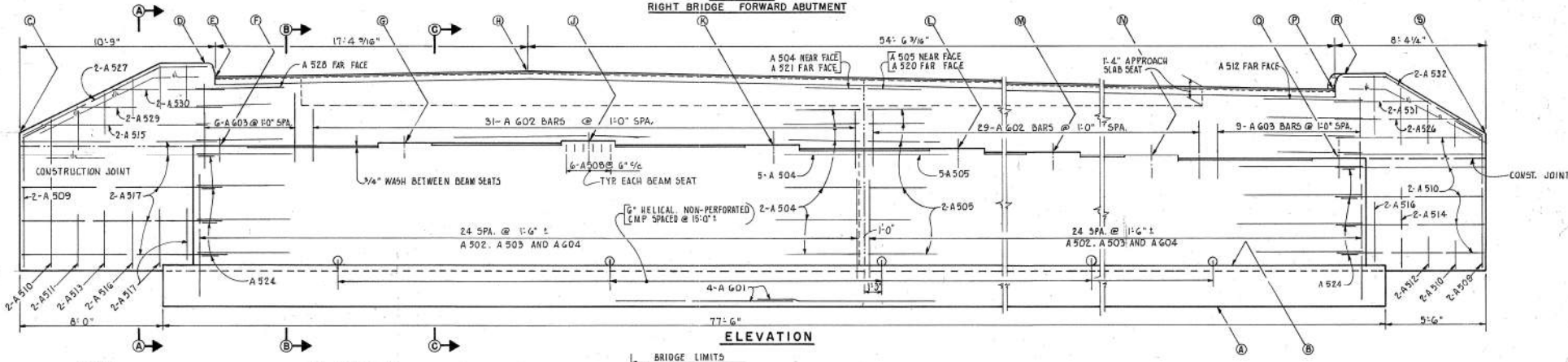
FAIRFIELD - LICKING COUNTIES
FAI-70-0.00
LIC-70-0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

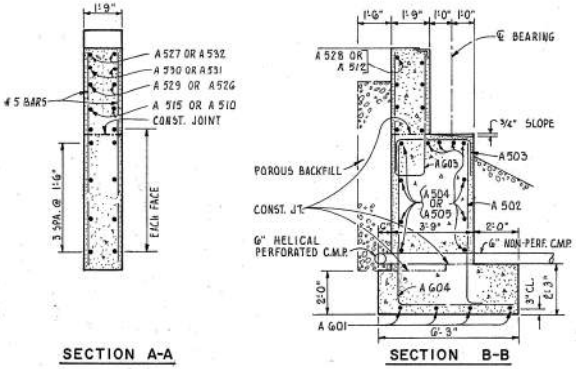
195
218



PLAN
RIGHT BRIDGE FORWARD ABUTMENT

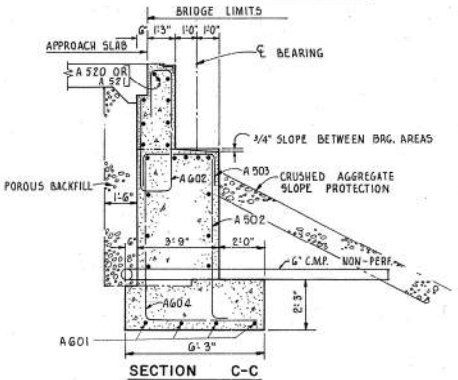


ELEVATION



SECTION A-A

SECTION B-B



SECTION C-C

NOTES

1. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
2. CONCRETE SHALL BE CLASS "E".
3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.
4. FOR CONTRACTION JOINT DETAIL, SEE SHEET NO. 186.

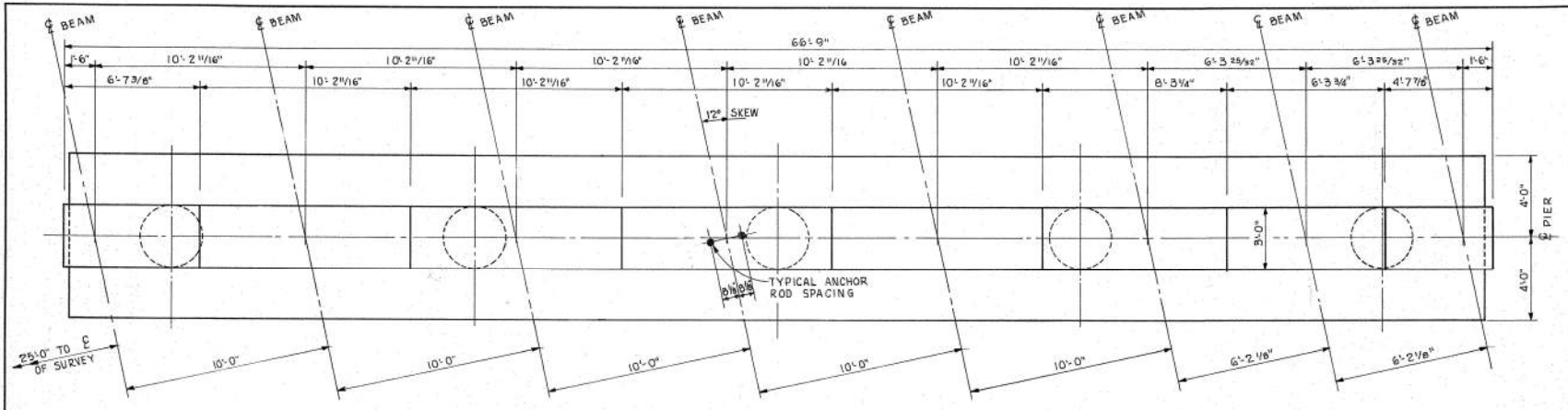
DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

ABUTMENT DETAILS

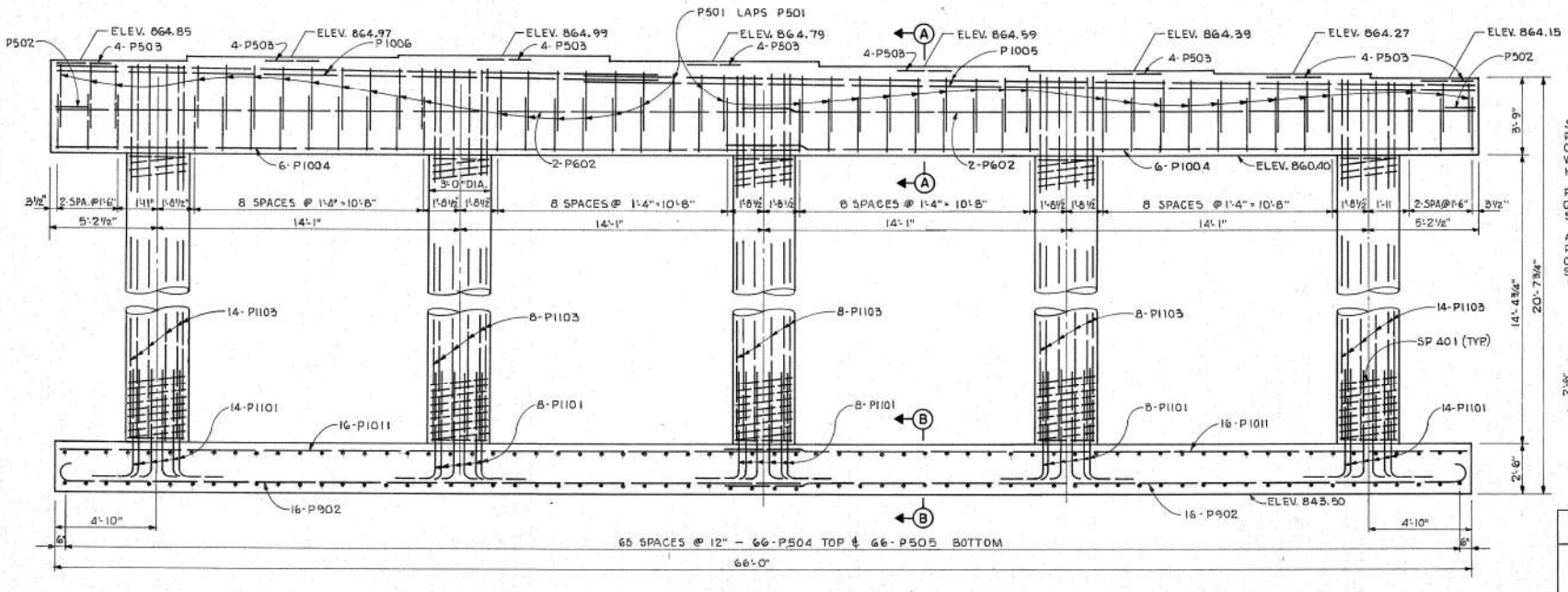
BRIDGE NO. FAI-70-0119 R.
PROPOSED I.R. 70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63 + 65.00

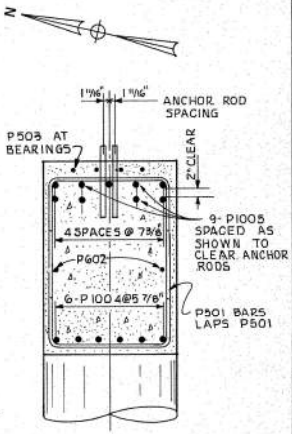
DESIGNED	DRAWN	TRACED	CHECKED	APPROVED	DATE	REVISED
WG.	G.E.W.	G.E.W.	WG.	C.T.L.	10-11-65	



PLAN



ELEVATION



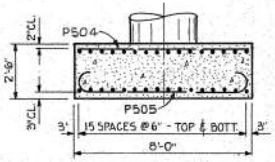
SECTION A-A

NOTES

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER CAP SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER CAPS AND COLUMNS SHALL BE CLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

ALL REINFORCING STEEL SHALL BE PLACED TO PROVIDE A MINIMUM COVER OF 2" UNLESS OTHERWISE SHOWN.



SECTION B-B

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

196
218

FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC.-70-0.00

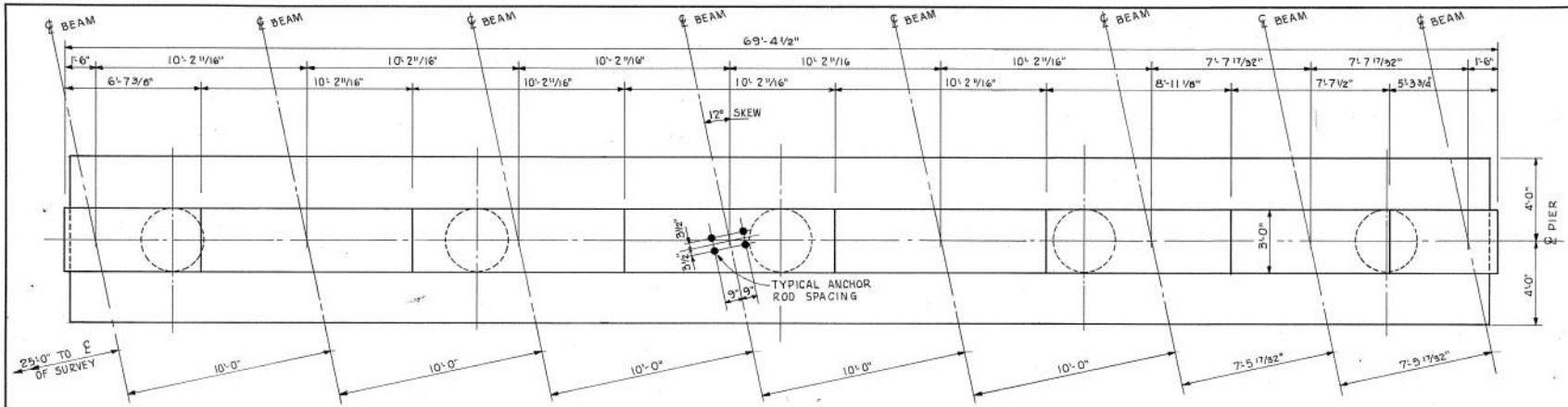
DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIER NO. 1 DETAILS

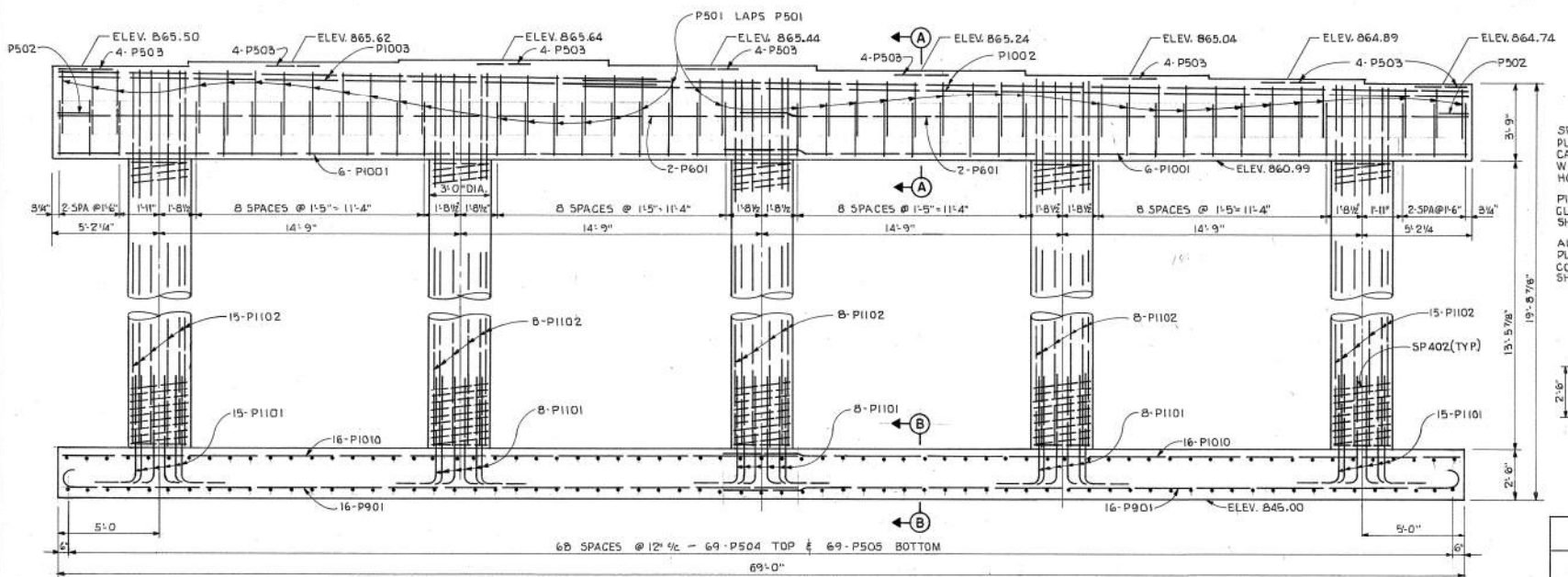
RIGHT BRIDGE NO. FAI.-70-0119 R
PROPOSED I.R.70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R.70 STA 63+65.00

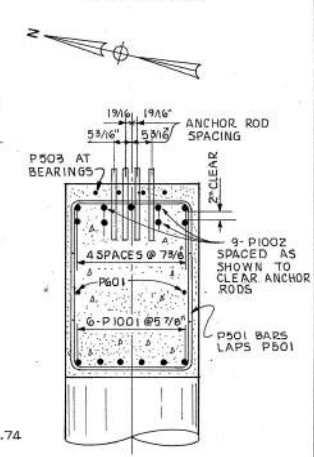
DESIGNED	DRAWN	TRACED	CHECKED	APPROVED	DATE	REVISED
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.	10-11-65	



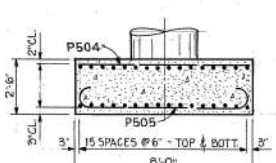
PLAN



ELEVATION



SECTION A-A



SECTION B-B

NOTES

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER CAP SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER CAPS AND COLUMNS SHALL BE GLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

ALL REINFORCING STEEL SHALL BE PLACED TO PROVIDE A MINIMUM COVER OF 2" UNLESS OTHERWISE SHOWN.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

197
218

FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC.-70-0.00

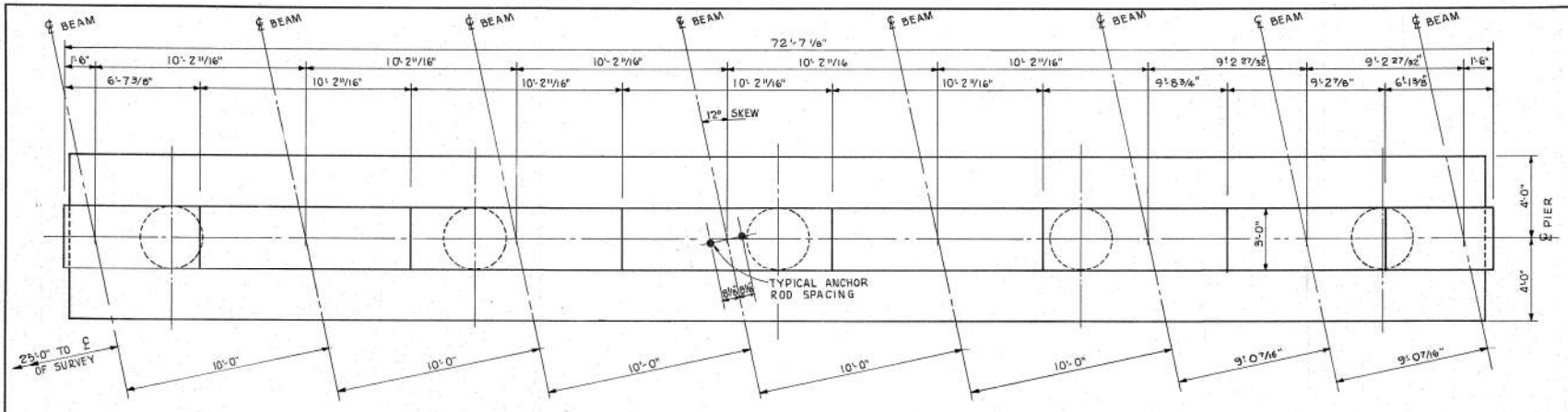
DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIER NO. 2 DETAILS

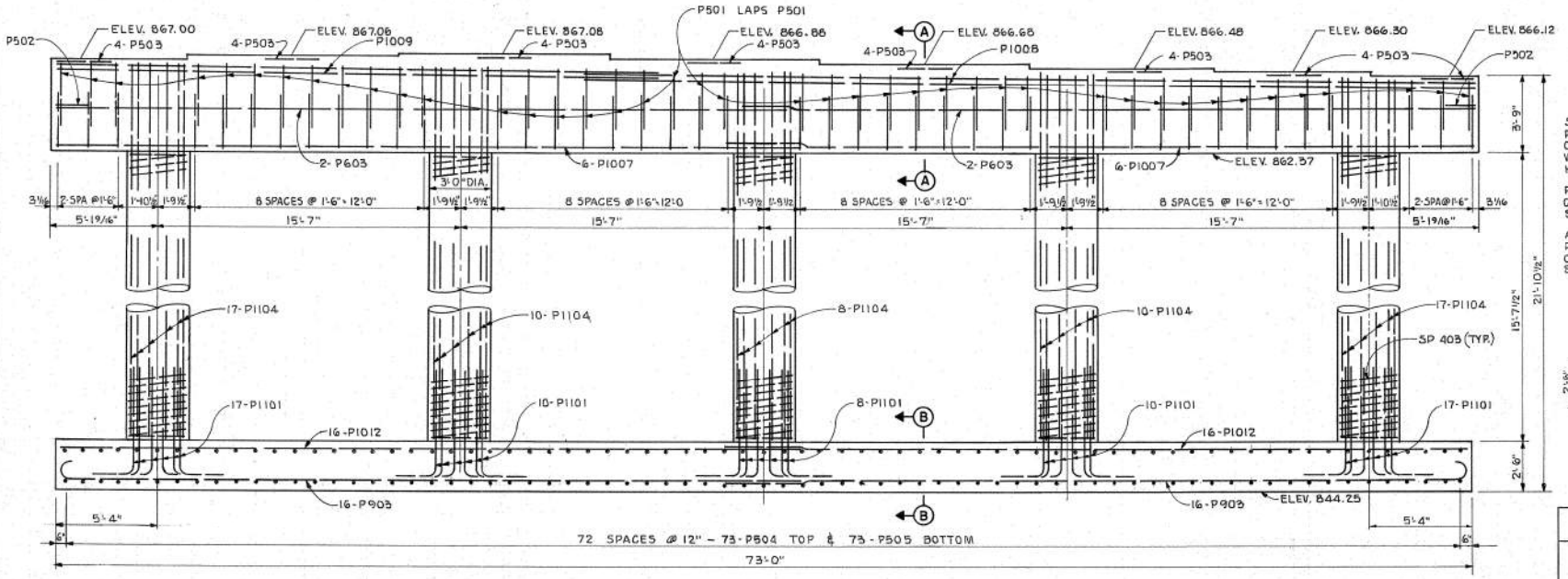
RIGHT BRIDGE NO. FAI.-70-0119 R
PROPOSED I.R.70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R.70 STA 63+65.00

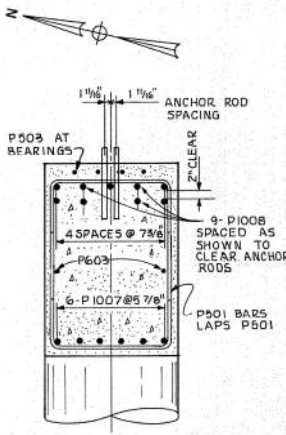
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.	10-11-65	



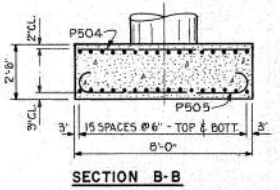
PLAN



ELEVATION



SECTION A-A



SECTION B-B

NOTES

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER CAP SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER CAPS AND COLUMNS SHALL BE CLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

ALL REINFORCING STEEL SHALL BE PLACED TO PROVIDE A MINIMUM COVER OF 2" UNLESS OTHERWISE SHOWN.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

198
218

FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC.-70-0.00

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIER NO. 3 DETAILS

RIGHT BRIDGE NO. FAI.-70-0119 R
PROPOSED I.R.70 OVER
STATE ROUTE 256

FAIRFIELD COUNTY — PROPOSED I.R.70 STA 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	H.K.S.	H.W.S.	W.G.	C.T.L.	10-11-65	

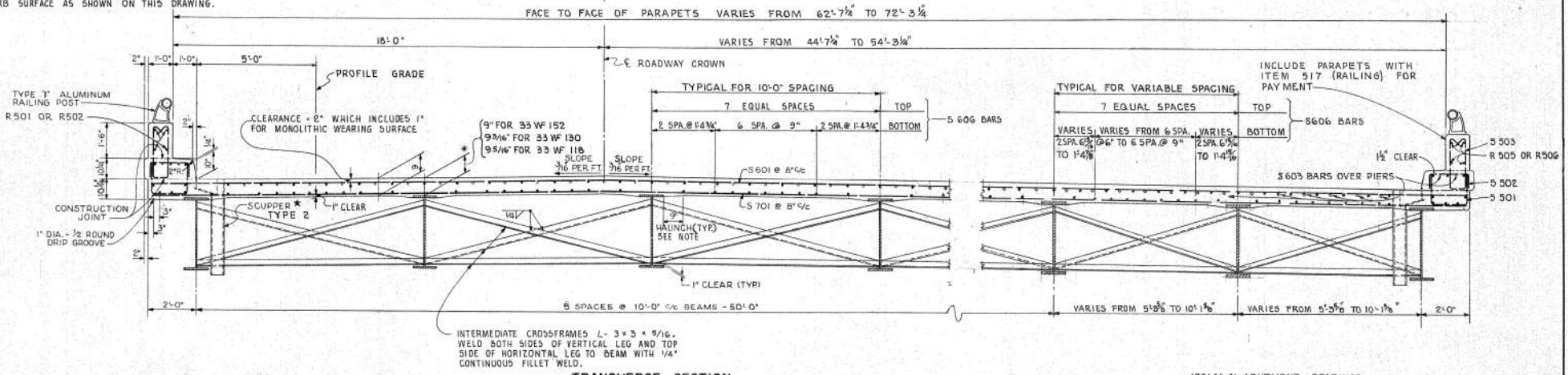
★ THERE SHOULD BE NO CUTOUTS IN THE SIDE PLATES OF THE SCUPPERS FOR A BOLD ANGLE GUTTER. AND THE BACK PLATES AT THE FACE OF THE CURB SHOULD BE CUT TO MATCH THE ROADWAY SURFACE. THE CURB PLATES ARE TO MATCH THE CURB SURFACE AS SHOWN ON THIS DRAWING.

ALL LONGITUDINAL BARS S606 EXCEPT AS OTHERWISE SHOWN. LAP S606 BARS 1' 11" MINIMUM.

FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC.-70-0.00

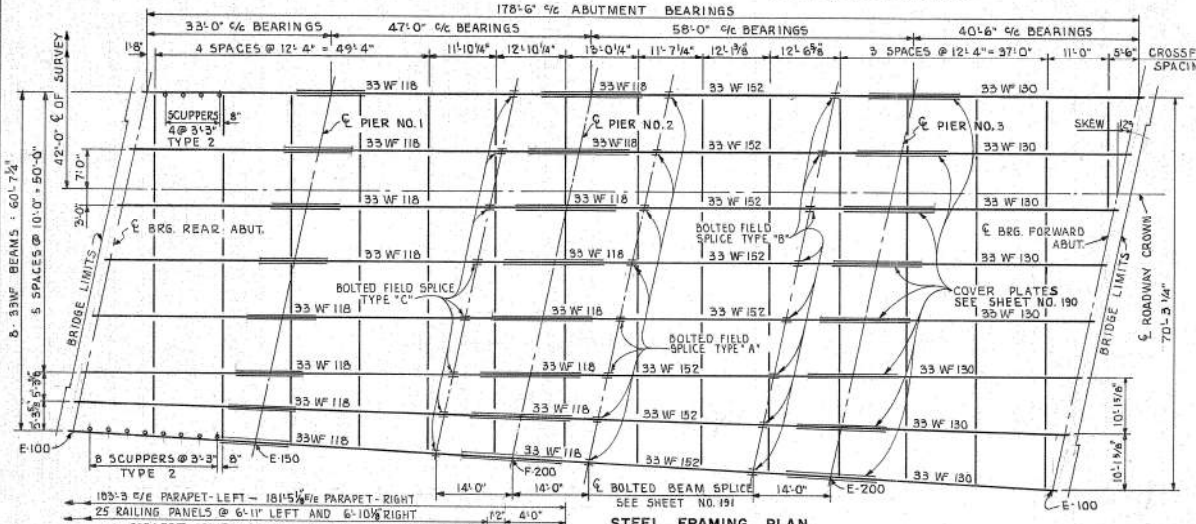
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

199
218

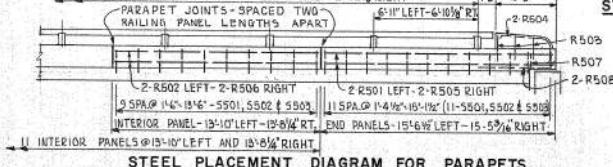


INTERMEDIATE CROSSFRAMES L- 3 x 3 x 5/16. WELD BOTH SIDES OF VERTICAL LEG AND TOP SIDE OF HORIZONTAL LEG TO BEAM WITH ¼" CONTINUOUS FILLET WELD.

TRANSVERSE SECTION

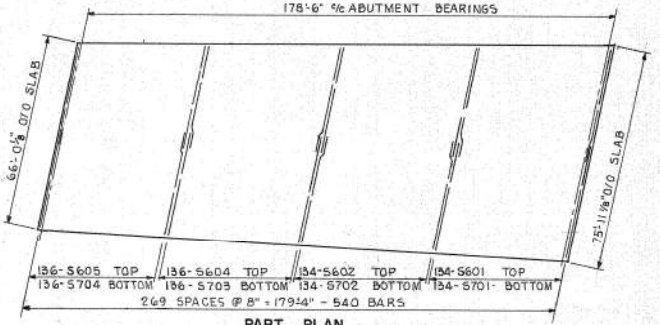


STEEL FRAMING PLAN



STEEL PLACEMENT DIAGRAM FOR PARAPETS

★ THIS IS THE NOMINAL DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE. DEDUCTION SHALL BE MADE FOR VOLUME OF ENCASED STEEL PLATES AS PER ITEM 511.19 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.



PART PLAN

SHOWING PLACEMENT OF TRANSVERSE REINFORCING STEEL.

NOTES

FIXED AND SLIDING BEARINGS SHALL BE E-100 AT THE ABUTMENTS, E-150 AT PIER NO. 1, F-200 AT PIER NO. 2, AND E-200 AT PIER NO. 3. FOR DETAILS SEE STANDARD DRAWING FSB-1-62, REVISED 1-15-62.

FOR DETAIL OF END CROSSFRAME, END FINISH, CURB PLATES, SCUPPERS BRIDGE RAILING AND WELDED BUTT JOINT IN SUPERSTRUCTURE END FINISH ANGLES AT CENTERLINE ROADWAY CROWN, SEE STANDARD DRAWINGS SD-1-63, SHEETS 2, 3 AND 4; AND BR-1-65 DATED 2-1-65.

DECK SLAB HAUNCH. A TYPICAL HAUNCH WIDTH OF 9" SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. HOWEVER, THE THE HAUNCH WIDTH MAY VARY BETWEEN 6" AND 12" PROVIDED THAT THE SLOPE SHALL NOT BE MORE THAN 1:4 FOR A HAUNCH LESS THAN 9" IN WIDTH.

MACHINE FINISH: THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.

GUTTER ELEVATIONS: SEE SHEET 190.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

RIGHT BRIDGE NO. FAI.-70-0119 R
PROPOSED I.R. 70 OVER
STATE ROUTE 256

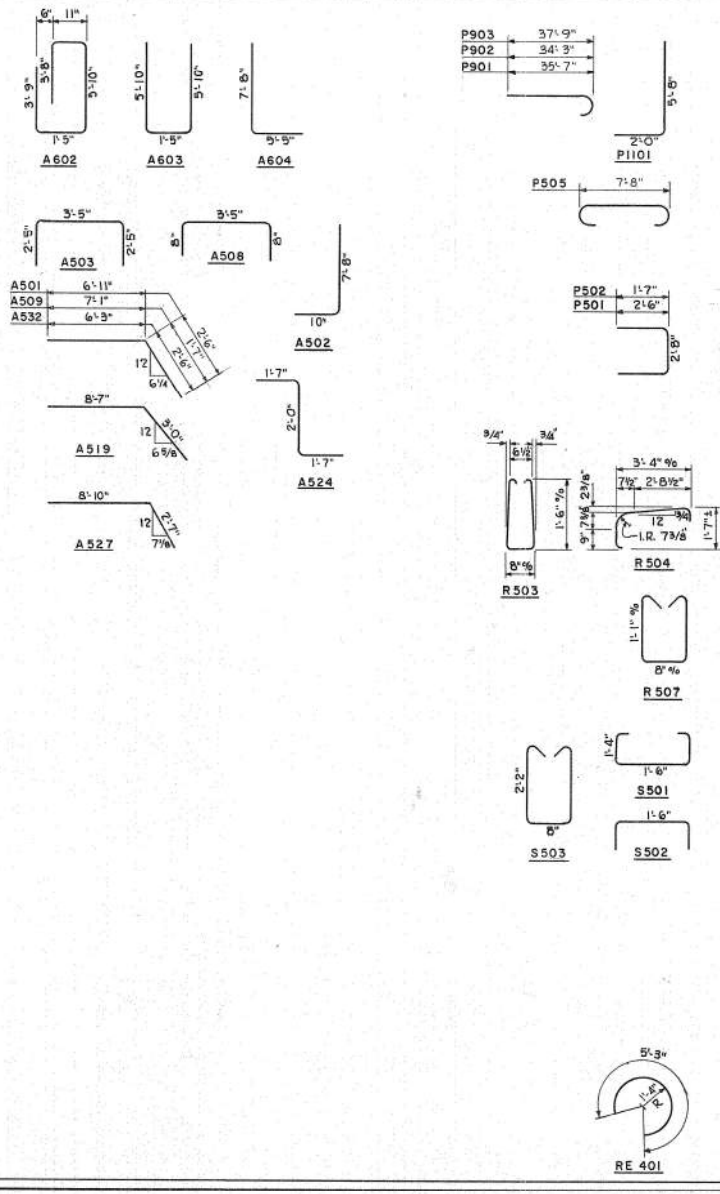
FAIRFIELD COUNTY — PROPOSED I.R. 70 STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	APPROVED:
W.G.	H.W.S	H.W.S	W.G.	C.T.L.	10-11-65	

STEEL LIST

MARK	NO.	LENGTH	WEIGHT	SHAPE
ABUTMENTS				
A601	8	39'-7"	476	S
A602	110	14'-11"	2465	B
A603	30	12'-9"	575	B
A604	94	12'-11"	1824	B
A605	8	34'-4"	413	S
A501	2	9'-5"	20	B
A502	94	8'-5"	825	S
A503	94	8'-1"	792	B
A504	18	36'-11"	693	S
A505	18	37'-2"	707	S
A506	18	26'-8"	501	S
A507	18	37'-6"	704	S
A508	96	4'-7"	459	S
A509	8	8'-8"	72	B
A510	22	8'-0"	184	S
A511	6	6'-7"	55	S
A512	5	8'-11"	47	S
A513	18	9'-7	180	S
A514	4	9'-10"	41	S
A515	6	10'-2"	64	S
A516	6	10'-5"	65	S
A517	18	11'-3"	211	S
A518	10	9'-10"	103	S
A519	2	11'-7"	24	B
A520	1	29'-9"	31	S
A521	1	32'-7"	34	S
A522	1	31'-0"	32	S
A523	1	21'-3"	22	S
A524	16	5'-8"	83	B
A525	1	7'-10"	8	S
A526	3	6'-8"	21	S
A527	2	11'-5"	24	B
A528	1	5'-8"	6	S
A529	4	8'-3"	34	S
A530	4	6'-2"	26	S
A531	4	5'-0"	21	S
A532	2	8'-9"	18	B
A533	2	7'-3"	15	S

BENDING DIAGRAM



MARK	NO.	LENGTH	WEIGHT	SHAPE
PIERS				
P1101	168	7'-4"	6545	B
P1102	54	17'-0"	4877	S
P1103	52	18'-0"	4973	S
P1104	62	19'-2"	6313	S
P1001	12	36'-2"	1868	S
P1002	9	43'-2"	1672	S
P1003	9	29'-2"	1130	S
P1004	12	34'-10"	1799	S
P1005	9	41'-7"	1610	S
P1006	9	28'-0"	1084	S
P1007	12	37'-9"	1949	S
P1008	9	45'-2"	1749	S
P1009	9	30'-4"	1175	S
P1010	32	35'-9"	4923	S
P1011	32	34'-6"	4750	S
P1012	32	38'-0"	5232	S
P901	32	36'-10"	4007	B
P902	32	35'-6"	3862	B
P903	32	39'-0"	4243	B
P601	4	35'-6"	213	S
P602	4	34'-3"	206	S
P603	4	37'-2"	223	S
P501	252	7'-6"	1971	B
P502	6	5'-8"	35	B
P503	96	2'-8"	267	S
P504	208	7'-8"	1661	S
P505	208	8'-10"	1916	B
RAILING				
R501	8	15'-3"		S
R502	44	13'-6"	INCLUDE	S
R503	12	4'-2"	WITH	B
R504	8	5'-4"	RAILING	B
R505	8	15'-1"	FOR	S
R506	44	13'-4"	PAYMENT	S
R507	8	9'-5"		B
R508	8	3'-0"		S
SUPERSTRUCTURE				
S701	134	39'-0"	10683	S
S702	134	37'-9"	10340	S
S703	136	36'-6"	10146	S
S704	136	35'-3"	9799	S
S601	134	38'-10"	7816	S
S602	134	37'-7"	7564	S
S603	153	17'-0"	3907	S
S604	136	36'-4"	7422	S
S605	136	35'-1"	7167	S
S606	762	3'-1 6"	36053	S
S501	264	4'-11"	1354	B
S502	264	2'-6"	689	B
S503	264	5'-7"	1539	B
REPLACEMENT BARS				
RE401	1	5'-3"		B
RE501	1	5'-7"		S
RE601	4	5'-11"		S
RE701	3	6'-3"		S
RE901	1	6'-10"		S
RE1001	2	7'-3"		S
RE1101	2	7'-7"		S

SPIRAL REINFORCING LIST

MARK	NO.	CORE DIA. % SPIRAL	LENGTH	PITCH	NO. OF TURNS	WEIGHT
SP401	5	2'-8"	14'-4 3/4"	4 1/2"	41	1343
SP402	5	2'-8"	13'-5 7/8"	4 1/2"	39	1275
SP403	5	2'-8"	15'-7 5/8"	4 1/2"	45	1472

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

200
218

FAIRFIELD-LICKING COUNTIES
FAI.-70-0.00
LIC-70-0.00

SPIRAL REINFORCING BARS

THE "LENGTH" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE DISTANCE FROM THE TOP OF THE FOOTING TO THE BOTTOM OF THE PIER CAP.

THE "NUMBER OF TURNS" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE "LENGTH" DIVIDED BY THE PITCH, PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS) EXPRESSED AS THE NEAREST WHOLE NUMBER.

SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM 509.

1-1/2 CLOSED COILS SHALL BE PROVIDED AT THE ENDS OF EACH SPIRAL UNIT.

FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.68 LB. PER LIN. FT. OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS, BASED ON 0.68 LB. PER LIN. FT., WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS.

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

REINFORCING STEEL LIST

RIGHT BRIDGE NO. FAI-70-0119 R
PROPOSED I.R.70 OVER
STATE ROUTE 256
FAIRFIELD COUNTY
PROPOSED I.R.70
STA. 63+65.00

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.	10-11-65	

DESIGN DESIGNATION		FAIRFIELD COUNTY	LICKING COUNTY
t Year ADT (1988)	=	56,625	32,400
Year ADT (2008)	=	79,725	45,360
(2008)	=	7,930	4,536
ctional Distribution)	=	Equal	Equal
cent B & C Trucks)	=	14%	23%
ign Speed)	=	70	70
Speed	=	(55 URBAN / 65 RURAL)	65
onal Classification	=	Interstate	Interstate

DESIGN EXCEPTION
Horizontal Clearance (S.R. 158)

APPROVED
2/22/88

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

CALC. BY DPC DATE 2-29-88
CHECK. BY R.M DATE 3-4-88

OHIO	
FHWA REGION	5
IR-70-7(101) 117	FEDERAL PROJECT

FAI-70-0.00
LIC-70-0.00

FAI-70-0.00
LIC-70-0.00

CITY OF COLUMBUS, VILLAGE OF PICKERINGTON, VILLAGE OF KIRKERSVILLE
VIOLET AND ETNA TOWNSHIP
FAIRFIELD AND LICKING COUNTY
(FRANKLIN CO.)

ROFILMED
6 28 1992

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line
Fence Line(existing) (proposed)
Center Line
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA&RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)
Detour

INDEX OF SHEETS

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PICAL DETAILS	7-A, 7-B*, 14, 14A	PAVEMENT MARKINGS	87-88
MPORARY CROSSOVER DETAILS	15-22	DRAINAGE DETAILS	89-105A-C
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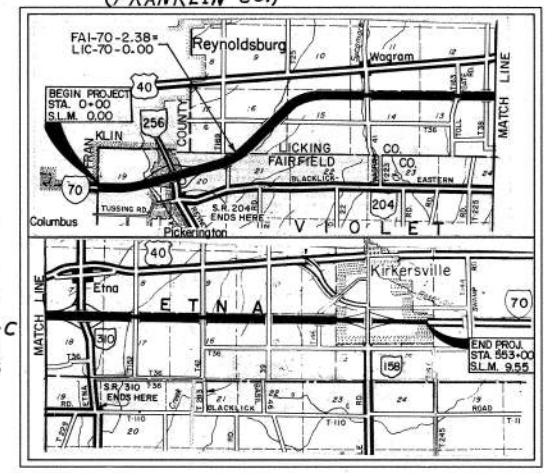


LOCATION MAP

SCALE IN MILES
0 1 2 3 4

Portion to be Improved
State & Federal Routes
Other Roads

SCALES
Plan
0 50' 100'

LINE DATA

BEGIN PROJECT	STA.0+00
STATION EQUATION	STA.641+09.49 BACK = STA.0+00.00 AHEAD
STATION EQUATION	STA.143+21.06 BACK = STA.250+00.00 AHEAD
STATION EQUATION	STA.733+97.69 BACK = STA.550+00.00 AHEAD
END PROJECT	STA.553+00
NET LENGTH OF PROJECT =	63,018.75 LIN.FT. OR 11.935 MILES
BEGIN WORK	STA.586+50
STATION EQUATION	STA.641+09.49 BACK = STA.0+00.00 AHEAD
STATION EQUATION	STA.143+21.06 BACK = STA.250+00.00 AHEAD
STATION EQUATION	STA.733+97.69 BACK = STA.550+00.00 AHEAD
END WORK	STA.600+67.19
NET LENGTH OF WORK =	7324543 LIN.FT. OR 13.872 MILES

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
Call 800-362-2764 (Toll Free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

Plan Prepared By:
DISTRICT NO.5
OHIO DEPARTMENT OF TRANSPORTATION

t FAI-70-0.00
LIC-70-0.00
of Letting 19 Contract No.

SUPPLEMENTAL SPECIFICATIONS

846	11-24-86	849	12-24-85
847	10-17-83	850	2-25-86
947	10-17-83	852	6-10-87
824	10-8-82	853	6-26-78
921	12-4-72	949	9-26-86
		952	6-10-87
		956	6-26-78

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-5	10-1-87	TC-72.20	2-26-82	MC-4	7-26-76	TC-18.24	4-25-79
GR-1	1-11-85	MT-99.10	11-14-86	TC-6L10	4-5-82	TC-31.21	3-6-79
GR-2B	2-5-82	MT-99.20	11-14-86	CB-2-6	5-1-79	TC-32.11	3-21-79
GR-3	1-21-85	BR-1	5-29-79	HW-4A	4-1-80	TC-51.10	1-20-84
GR-4	2-5-82	EXJ-2-81	4-2-84R	MC-11	8-1-78	TC-51.11	1-20-84
GR-4A	1-30-84	SD-1-65	11-8-65	MH-2	6-12-75	TC-65.10	2-26-82
GR-5	2-5-82	CB-2-2B	5-1-79	TC-22.20	3-1-79	TC-65.11	4-5-82
GR-6	2-5-82	CB-4	11-10-83	GR-7	2-5-82		
GR-6A	2-5-82	CB-5	11-10-83				
MC-9	1-30-84	CB-8	11-10-83				
MC-9A	1-11-85	MH-1	12-18-84				
TC-35.10	8-29-84	MH-3	12-18-84				
TC-71.10	4-9-79						

LIMITED ACCESS

This improvement is especially designed for throug traffic and has been declared a limited access high or freeway by action of the Director in accordance the provisions of Section 5511.02 of the Revised Code of Ohio.

1987 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway, except as noted on sheet 22, and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved John W. Hayes
Date 3-3-88 District Deputy Director of Transportation

Approved R. D. Nicholson
Date 3-10-88 Engineer, Bureau of Bridges and Structural Design

Approved George E. Anderson
Date 3-25-88 Chief Engineer, Planning & Desig

Approved Ronald R. Hurst
Date 3-25-88 Director, Department of Transpo

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

DIVISION ADMINISTRATOR DA

BRIDGE NOTES

CALC. BY
DATE
CHK'D BY
DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI -70-0.00
LIC -70-0.00

REFERENCE

DETAILED DRAWINGS OF THE EXISTING STRUCTURE MAY BE INSPECTED IN THE DISTRICT 5 OFFICE OF THE OHIO DEPARTMENT OF TRANSPORTATION, JACKSONTOWN, OHIO.

REMOVED MATERIALS

ALL REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY HIM FROM THE JOB SITE, UNLESS OTHERWISE NOTED.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND/ OR FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK, BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

AREAS OF WORK

THE GENERAL AREAS OF WORK AS INDICATED ON THE PLAN AND PROFILE AND DETAIL SHEETS ARE:

REMOVALS:
1. REMOVE ASPHALT WEARING COURSE,BRIDGE RAILINGS,PARAPETS AND PORTIONS OF EXISTING DECK

CONSTRUCTION:
1. INSTALL EXPANSION JOINTS AND PARAPETS
2. PATCH CONCRETE DECKS
3.OVERLAY BRIDGE DECKS

REPLACEMENT OF EXISTING REINFORCING STEEL

ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT HIS COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. AN ADDITIONAL 3,000 LBS. IS INCLUDED IN ITEM 824 FOR THIS PURPOSE.

ESTIMATED QUANTITIES

AN ESTIMATED AMOUNT OF THE FOLLOWING QUANTITIES HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR BIDDING PURPOSES, BUT FINAL QUANTITIES SHALL BE DETERMINED BY ACTUAL FIELD MEASUREMENTS AT THE COMPLETION OF THE WORK.

BRIDGE NUMBERS	0084L	0084R	0119L	0119R	0074L	0074R	TOTAL
ITEM 850-SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VARIABLE THICKNESS)	30	30	35	75	30	30	230
ITEM 850-FULL DEPTH REPAIR	3	3	3	6	3	3	21

ITEM 202-ALUMINUM BRIDGE RAILING REMOVED FOR STORAGE

CARE SHALL BE TAKEN NOT TO DAMAGE THE ALUMINUM RAIL AND SUPPORTS. IT SHALL BE CAREFULLY REMOVED AND NEATLY STORED ON THE JOB SITE FOR REMOVAL BY STATE FORCES.

PAYMENT SHALL BE PER LINEAR FOOT ITEM 202 ALUMINUM BRIDGE RAILING REMOVED FOR STORAGE.

FAI-70-0084L	212 LIN FT.	FAI-70-0119R	348 LIN FT.
FAI-70-0084R	212 LIN FT.	LIC-70-0074L	321 LIN FT.
FAI-70-0119L	342 LIN FT.	LIC-70-0074R	300 LIN FT.
			1735 LIN.FT.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05 AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

PROTECTION OF TRAFFIC UNDER OVERHEAD STRUCTURES

THE CONTRACTOR SHALL PROVIDE A SAFETY NET OR PLATFORM OF SUITABLE STRENGTH AT THE UNDERSIDE OF THE DECK TO PROTECT PEDESTRAIN AND VEHICULAR TRAFFIC DURING WORK BEING DONE ON THE OVERHEAD STRUCTURE. THE DESIGN OF THE NET OR PLATFORM SHALL CONFORM WITH O.S.H.A. REQUIREMENTS AND THE APPROVAL OF THE ENGINEER AND SHALL REMAIN IN PLACE UNTIL THE WORK HAS BEEN COMPLETED AND ACCEPTED OR AS DIRECTED BY THE ENGINEER.

PAYMENT TO BE INCLUDED UNDER ITEM 614, MAINTAINING TRAFFIC.

REMOVAL OF CONCRETE PARAPETS AND EDGES

CONCRETE REMOVALS ON PARAPETS & EDGES SHALL BE DONE BY THE USE OF 40 - 65 LB. CLASS JACK HAMMERS ONLY. NO OTHER METHOD SHALL BE USED UNLESS APPROVED BY THE DISTRICT 5 CONSTRUCTION ENGINEER.

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

BR-1	DATED	5-29-79
EXJ-2-81	DATED	4-2-84R
SD-1-65	DATED	11-8-65
GR-1	DATED	1-11-85
GR-3	DATED	1-21-85
GR-2B	DATED	2-5-82

AND TO SUPPLEMENTAL SPECIFICATIONS:

824	DATED	10-8-82
850	DATED	2-25-86
849	DATED	12-24-85
949	DATED	9-26-86
852	DATED	6-10-87
853	DATED	6-26-78
952	DATED	6-10-87
956	DATED	6-26-78

Revised 4-6-88

ITEM 516-MODIFICATION OF STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 5-INCH WIDTH, AS PER PLAN

THIS ITEM SHALL INCLUDE ALL THE WORK AND MATERIALS NECESSARY TO MODIFY AND ENCLOSE THE EXPANSION JOINTS. REMOVAL OF EXISTING CONCRETE AND STEEL CURB PLATES SHALL BE IN ACCORDANCE WITH 202.03.
THE PROPOSED SUPERSTRUCTURE EXPANSION JOINT AND BARS SHALL BE FURNISH IN MAXIMUM LENGTHS POSSIBLE TO ALLOW FOR TRAFFIC MAINTENANCE AND SHALL BE BUTT WELDED TOGETHER TO FORM A WATERTIGHT JOINT. THE COMPRESSION S SHALL NOT BE INSTALLED UNTIL ALL OTHER WORK HAS BEEN COMPLETED ON THE MATERIALS: STEEL PLATE BARS AND ANGLES SHALL CONFORM TO ASTM A36 OR A
THE COMPRESSION SEAL SHALL BE AS PER STD. DWG. EXJ-2-81.
SPLICE OR JOINT IN COMPRESSION SEAL: COMPRESSION SEAL FOR BRIDGE DECK JOINTS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS A SHOP FABRICA SPLICE, FIELD SPLICE OR FIELD BUTT JOINT IS APPROVED BY THE DIRECTOR.
FOR OTHER THAN STRAIGHT SEALS WITHOUT INTERMEDIATE SPLICES, SEAL GLANDS SHALL BE SHOP FABRICATED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS.
DRAWING DIMENSIONS FOR EXISTING JOINTS OR FOR JOINTS WHICH ARE BEING MODIFIED SHALL BE BASED ON FIELD MEASUREMENTS PROVIDED BY THE CONTRACT
THE COMPRESSION SEAL SHALL BE AS MANUFACTURED BY THE WATSON-BOWMAN ACME CORPORATION, 95 PINEVIEW DRIVE, AMHERST, NEW YORK 14120; THE D. S. BROWN COMPANY, P.O. BOX 158, NORTH BALTIMORE, OHIO 45872 OR AN APPROVE ALTERNATE.
MEASUREMENT FOR PAY PURPOSES SHALL BE BASED ON THE LINEAR FEET OF SEA JOINT SYSTEM MEASURED HORIZONTALLY ALONG THE BACK OF THE STEEL RETAINE AND BETWEEN THE FACES OF THE DECK.

PAYMENT SHALL BE MADE PER LINEAR FOOT FOR ITEM 516, MODIFICATION OF STRU EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 5-INCH WIDTH, AS PER PLAN, WHICH SHALL INCLUDE ALL REMOVALS, CONCRETE, STEEL BARS, AN COMPRESSION SEAL, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLE THE WORK.

WJ-500
WATSON-BOWMAN & ACME CORP.

CV-5000
D.S. BROWN COMPANY

COMPRESSION SEALS

ITEM 601-ROCK CHANNEL PROTECTION, TYPE B WITH FILTER

THE QUANTITY OF 553 CU. YDS. HAS BEEN INCLUDED IN THE GENERAL SUMMARY ON SHT. 48 FOR EROSION CONTROL TO BE USED AT FAI-70-0084L,R REAR ABUTMENT. PLACEMENT OF THE ROCK SHALL BE AT THE DISCRETION OF THE ENGINEER. FINAL QUANTITY SHALL BE DETERMINED AFTER COMPLETION OF WORK. FOR LOCATION OF ROCK PLACEMENT SEE SHEET 108.

BRIDGE DECK CONDITION SURVEY (GEN. INFORM. ONLY)

	BRIDGE Nº	Deck Area	Sounded		
			Method	Date	Area
	FAI-70-0084 L	710	cored	2-29-88	710
	FAI-70-0084 R	646	cored	2-2-88	646
	FAI-70-0119 L	761	cored	2-29-88	761
	FAI-70-0119 R	1326	cored	3-2-88	1326
*	LIC-70-0074 L	711	visual	3-3-88	711
*	LIC-70-0074 R	696	visual	3-3-88	696

*Bridges to prior to le project.

MICROFILMED
AUG 28 1992

BRIDGE SUMMARY

CALC. BY [illegible] DATE 1-15-88
CHKD. BY AJD DATE 1-21-88

FAI-70-0.00
LIC-70-0.00

OHIO
FHWA REGION
FEDERAL PROJECT

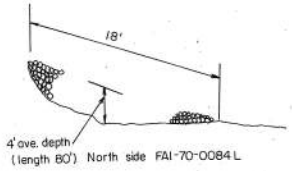
SHEET NUMBER	BRIDGE NUMBER						ITEM	QUANT.	UNIT	DESCRIPTION
	FAI. 70 0084L	FAI. 70 0084R	FAI. 70 0119 L	FAI. 70 0119 R	LIC. 70 0074L	LIC. 70 0074 R				STRUCTURES OVER 20' SPAN
	29	29	45/5	46/6	40/7	38/7	202	252	CU.YD.	PORTIONS OF STRUCTURES REMOVED, SUPERSTRUCTURE
			78	138	110	110	202	436	LIN.FT.	PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN
	697	633	741	1306	693	667	202	4737	SQ.YD.	WEARING COURSE REMOVED
	212	212	342	348	321	300	202	1735	LIN.FT.	ALUMINUM BRIDGE RAIL REMOVED FOR STORAGE
	188	188	292	298	262	246	510	1474	EACH	DOWEL HOLES
	25	25	38/5	39/6	35/7	33/7	511	220	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE
			86	142	121.83	121.83	516	471.66	LIN.FT.	MODIFICATION OF STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION 5-INCH WIDTH, AS PER
106 3000	3655	3655	5563	5669	5094	4877	824	31,513	POUND	EPOXY COATED REINFORCING STEEL, GRADE 60
	710	646	761	1326	711	693	850	4847	SQ.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (1 3/4" THICK) (SEE PROPOSAL NOTE)
	30						850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0084L) (SEE PROPOSA
	3	3	3	6	3	3	850	21	CU.YD.	FULL DEPTH REPAIR (SEE PROPOSAL NOTE)
	—	—	—	—	—	—	850	LUMP		TEST SLAB (SEE PROPOSAL NOTE)
			1391	2395	1391	1391	513	6568	POUND	STRUCTURAL STEEL, AS PER PLAN
	198	198	304	310	281	263	SPEC	1554	SQ.YD.	SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE)
	10	10	8	12	8	8	518	56	EACH	VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN
	10	10	8	12	8	8	518	56	EACH	VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN
		30					850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0084R) (SEE PROP. NO
			35				850	35	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0119L) (SEE PROP. NO
				75			850	75	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0119R) (SEE PROP. NO
					30		850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (LIC-70-0074L) (SEE PROP. NO
						30	850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (LIC-70-0074R) (SEE PROP. NO

MICROFILMED
AUG 28 1992

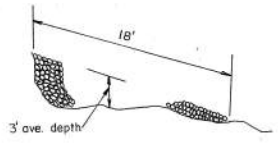
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

CALCULATED BY _____ DATE 1-15-88
CHECKED BY _____ DATE 1-21-88

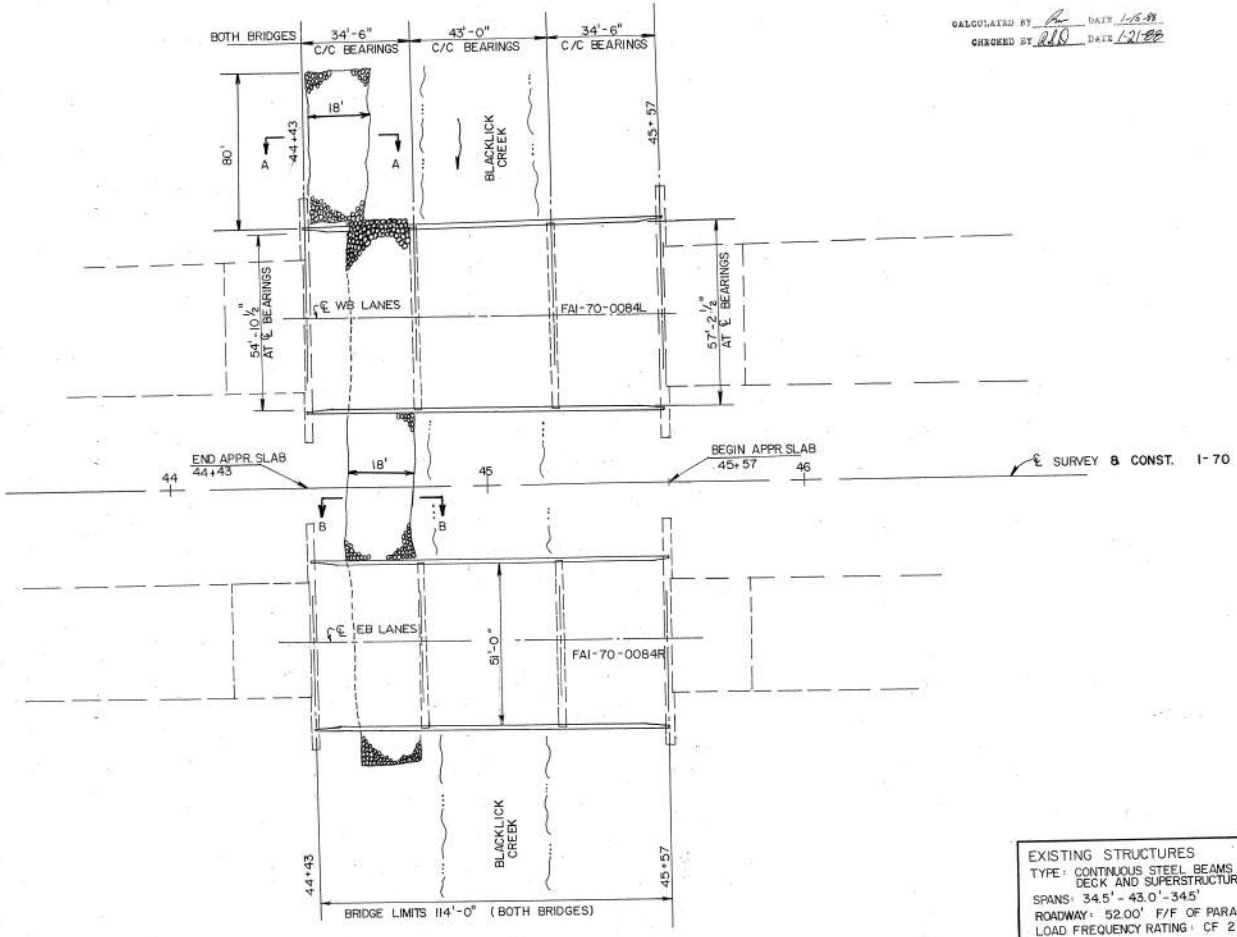


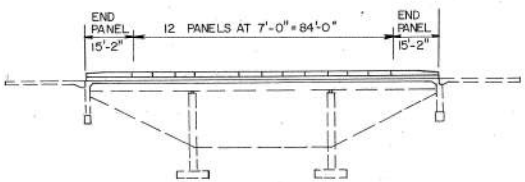
SECTION A-A



SECTION B-B

ROCK CHANNEL PROTECTION TYPE B WITH FILTER





EXISTING STRUCTURES
TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPANS: 34.5' - 43.0' - 34.5'
ROADWAY: 52.00' F/F OF PARAPETS
LOAD FREQUENCY RATING: CF 2000 (57)

SKEW: 0°00
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3 3/4" ASPHALT
APPROACH SLAB: AS-1-54 (25'-0" LONG)

REHABILITATED STRUCTURES
ROADWAY: 51'-0" (0084) — VARIES AS SHOWN (0084L) F/F PARAPET CURBS
BRIDGE RAILING: DEFLECTOR PARAPET TYPE
WEARING SURFACE: 1 3/4" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

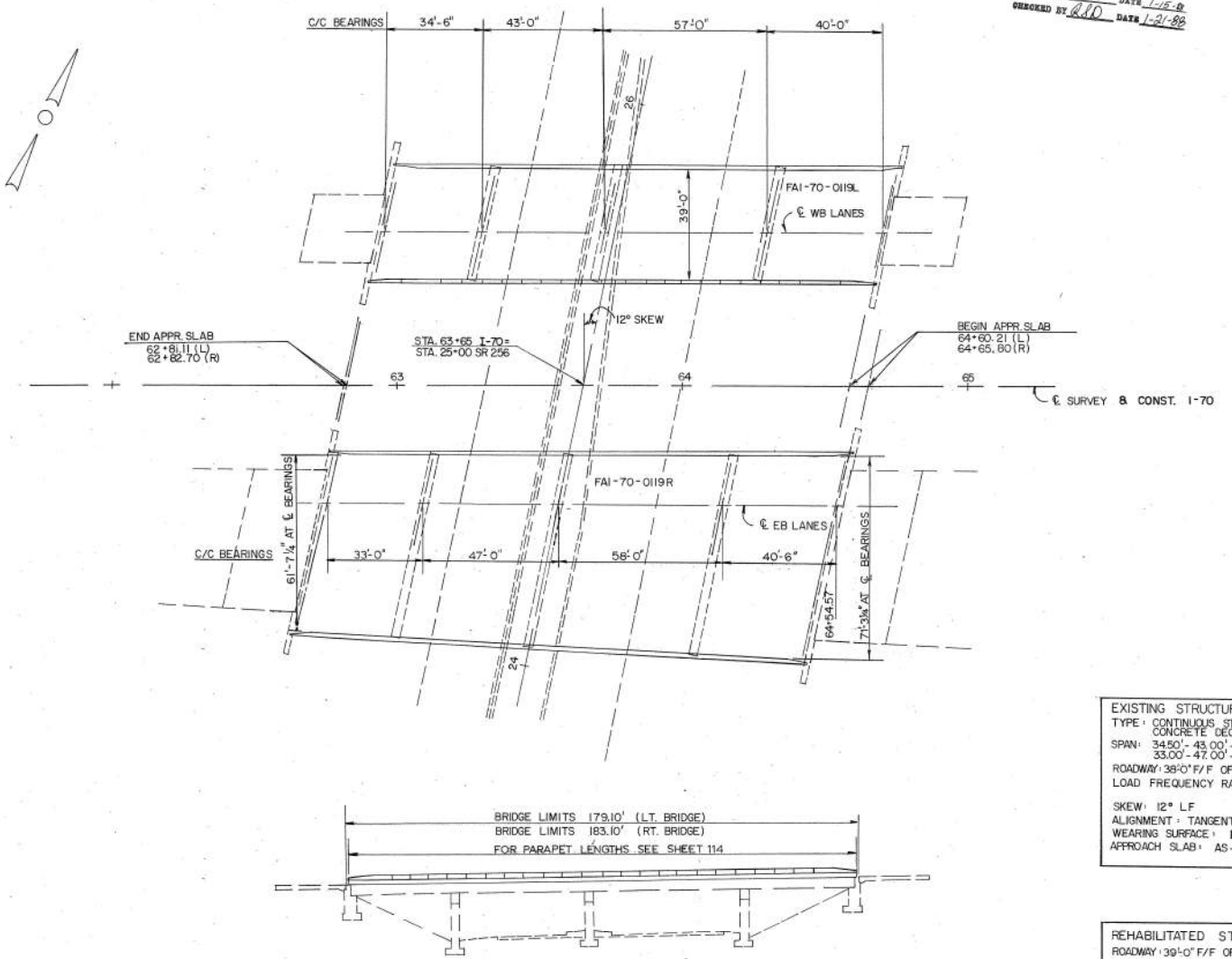
Br. № FAI-70-00

GENERAL PLAN & ELEV

FHWA REGION	STATE	PROJECT	
15	OHIO		

FAI-70-0.00
LIC-70-0.00

CALCULATED BY [illegible] DATE 1-15-86
CHECKED BY RBD DATE 1-21-86



EXISTING STRUCTURES
TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPAN: 34.50' - 43.00' - 57.00' - 40.00' (L)
33.00' - 47.00' - 58.00' - 40.50' (R)
ROADWAY: 38'-0" F/F OF CURB (L) VARIABLE (R)
LOAD FREQUENCY RATING: CF 2000 (57)

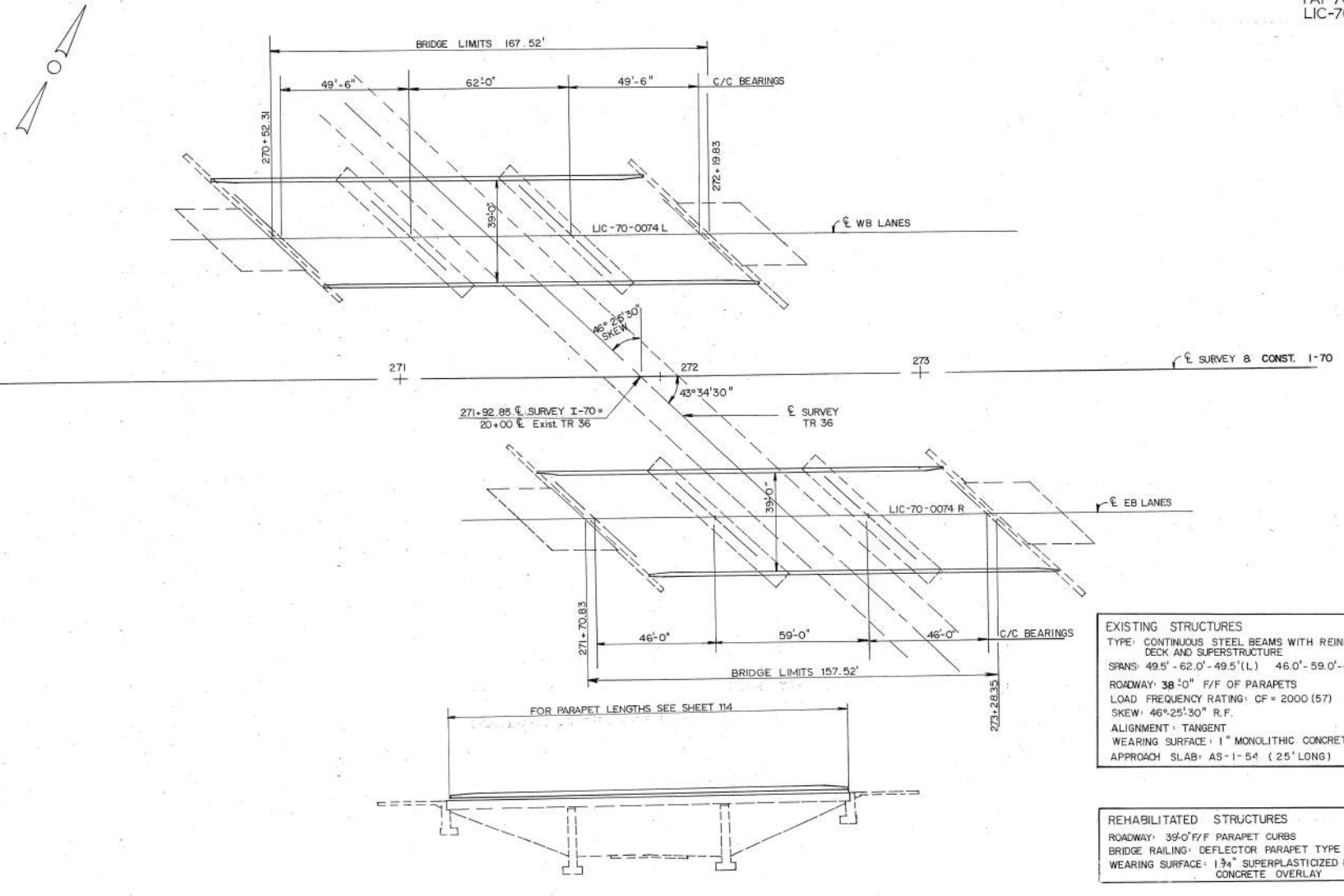
SKEW: 12° L.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3¾" ASPHALT
APPROACH SLAB: AS-1-54 (25' LONG)

REHABILITATED STRUCTURES
ROADWAY: 39'-0" F/F OF PARAPET CURBS (L) VARIABLE AS SHOWN(R)
BRIDGE RAILING: DEFLECTOR PARAPET TYPE
WEARING SURFACE: 1¾" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

CALCULATED BY	DATE
CHECKED BY	DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



EXISTING STRUCTURES

TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE

SPANS: 49.5' - 62.0' - 49.5'(L) 46.0' - 59.0' - 46.0'(R)

ROADWAY: 38'-0" F/F OF PARAPETS

LOAD FREQUENCY RATING: CF = 2000 (57)

SKEW: 46°-25'-30" R.F.

ALIGNMENT: TANGENT

WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3¾" ASPHALT

APPROACH SLAB: AS-1-54 (25' LONG)

REHABILITATED STRUCTURES

ROADWAY: 39'-0" F/F PARAPET CURBS

BRIDGE RAILING: DEFLECTOR PARAPET TYPE

WEARING SURFACE: 1¾" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

Br. № LIC-70-0

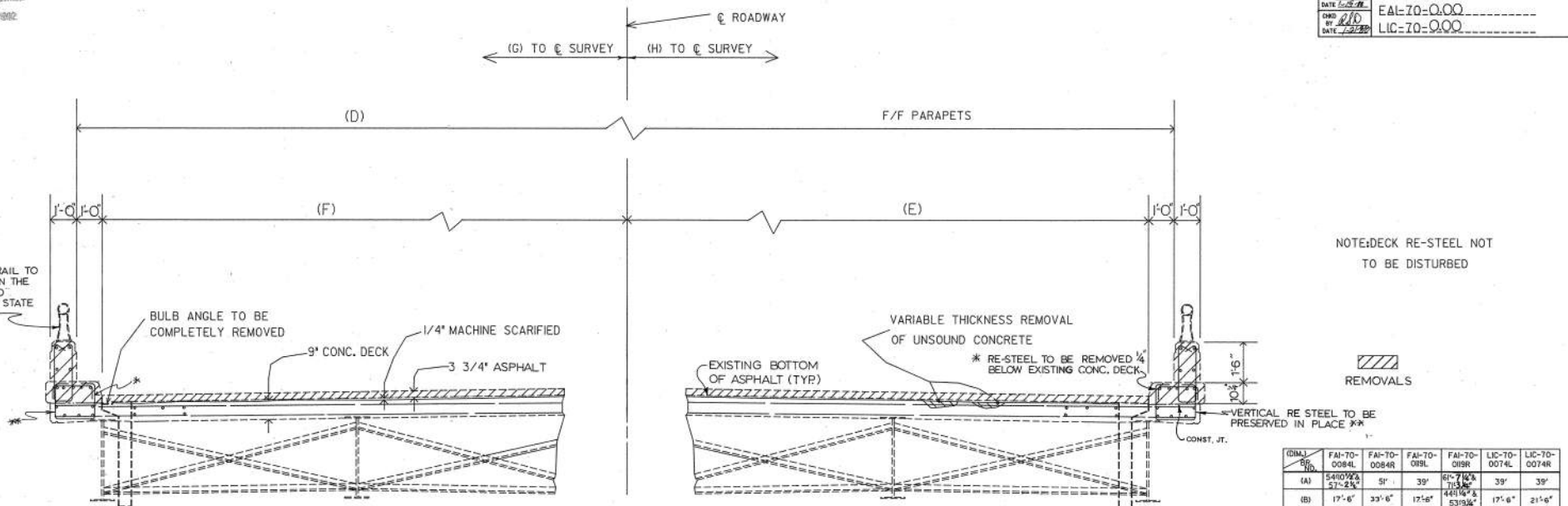
GENERAL PLAN & ELE

AUG 31 1992

CALC BY DATE 6-29-98
CHKD BY DATE 6-29-98

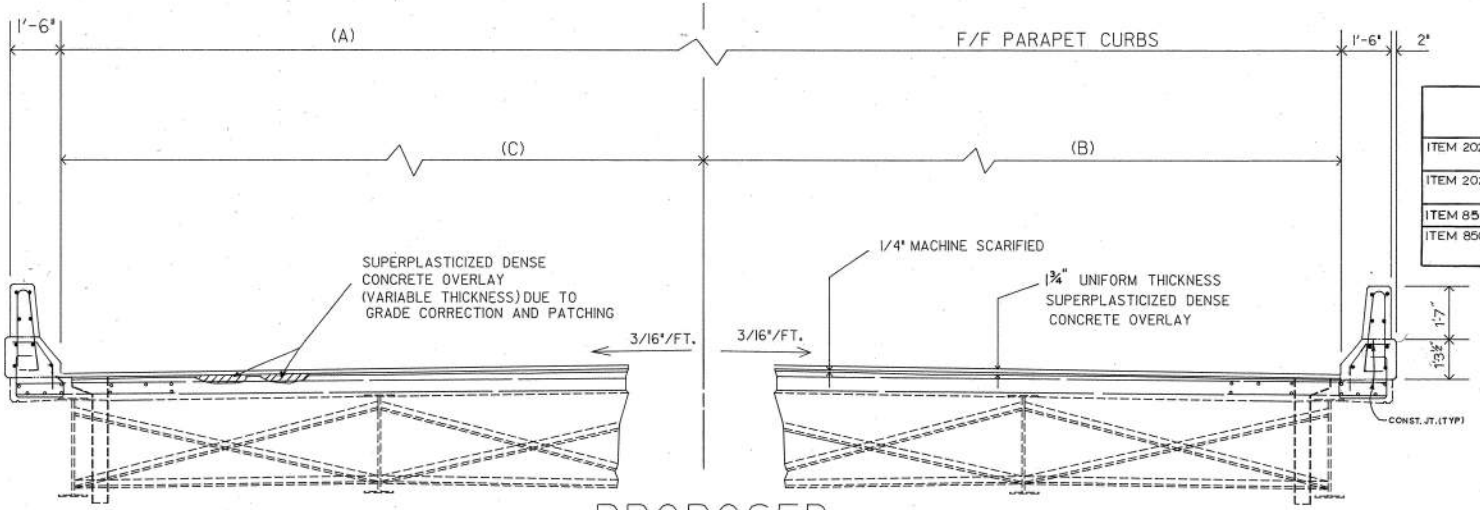
EAL-70-0.00
LIC-70-0.00

OHIO
FHWA REGION 5



EXISTING

(DIM.) / Br. No.	FAI-70-0084L	FAI-70-0084R	FAI-70-0119L	FAI-70-0119R	LIC-70-0074L	LIC-70-0074R
(A)	54°10'52" & 57°-2 1/4"	51'	39'	61°-7 1/4" & 71°13 1/2"	39'	39'
(B)	17'-6"	33'-6"	17'-6"	44°16'9" & 53°33 1/4"	17'-6"	21'-6"
(C)	37°14'52" & 39°8 1/2"	17'-6"	21'-6"	17'-6"	21'-6"	17'-6"
(D)	55°40'52" & 58°2 1/2"	52'	40'	62°7'52" & 72°3 3/4"	40'	40'
(E)	17'	33'	17'	43°7'52" & 53°3 1/8"	17'	21'
(F)	36°40'52" & 39°2 1/2"	17'	21'	17'	21'	17'
(G)	—	42'	—	42'	—	54'
(H)	42'	—	54'	—	54'	—



PROPOSED

DESCRIPTION		Br. No. FAI-70-0084L	Br. No. FAI-70-0084R	Br. No. FAI-70-0119L	Br. No. FAI-70-0119R	Br. No. LIC-70-0074L	Br. No. LIC-70-0074R	Unit
ITEM 202	PORTIONS OF STRUCTURES REMOVED, SUPERSTRUCTURE	29	29	45	46	40	38	Cu.
ITEM 202	WEARING COURSE REMOVED	697	633	741	1306	693	667	Sq.
ITEM 850	TEST SLAB	—	—	—	—	—	—	Lun
ITEM 850	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (1 3/4" THICK)	710	646	761	1326	711	693	Sq.

TRANSVERSE SEC

MICROFILMED
8 31 1982

CALC BY	DATE	CHKD BY	DATE
	1-15-88	RJD	1-21-88

FAI-70-0.00
LIC-70-0.00

OHIO
FHWA REGION 5

FAI-70-0084L/R

MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	168	168	5'-8"	BT.	993	993
ES502	24	24	30'-0"	ST.	751	751
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	96	96	6'-8"	ST.	668	668
ES520	168	168	2'-5"	BT.	423	423
ES521	8	8	29'-0"	ST.	242	242
ES522	16	16	12'-10"	ST.	214	214
TOTALS					3655	3655

LIC-70-0074L/R

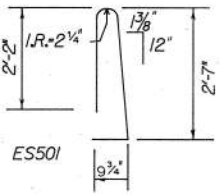
MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	242	226	5'-8"	BT.	1430	1336
ES502	40	40	30'-0"	ST.	1252	1252
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	96	96	6'-8"	ST.	668	668
ES520	242	226	2'-5"	BT.	610	570
ES523	8	8	20'-0"	ST.	167	167
ES524	16		15'-8"	ST.	261	
ES525	24	24	13'-8"	ST.	342	342
ES526		16	10'-8"	ST.		178
TOTALS					5094	4877

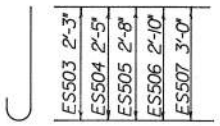
FAI-70-0119L/R

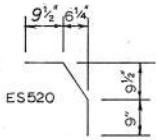
MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	272	278	5'-8"	BT.	1608	1643
ES502	48	48	30'-0"	ST.	1502	1502
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	144	144	6'-8"	ST.	1001	1001
ES520	272	278	2'-5"	BT.	686	701
ES525	16	16	13'-8"	ST.	228	228
ES527	8		5'-5"	ST.	45	
ES528		4	7'-8"	ST.		32
ES529		4	9'-10"	ST.		41
ES530	16		7'-9"	ST.	129	
ES531		8	8'-10"	ST.		74
ES532		8	9'-11"	ST.		83
TOTALS					5563	5669

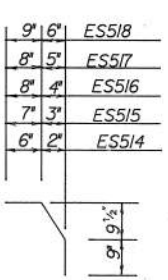
DESCRIPTION	Br. N° FAI-70 0084L	Br. N° FAI-70 0084R	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 0074R
Item 510 Dowel holes	188	188	292	298	262	24
Item 511 Class 'S' conc. superstructure	25	25	38	39	35	3
Item special Sealing of conc. surfaces (epoxy)	198	198	304	310	281	28

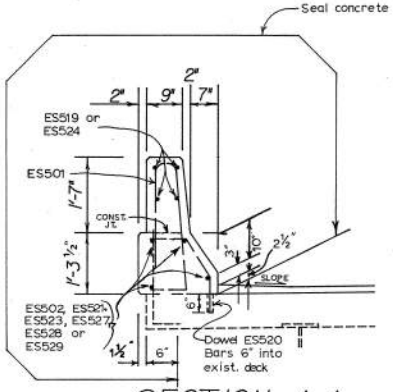
BENDING DIAGRAMS





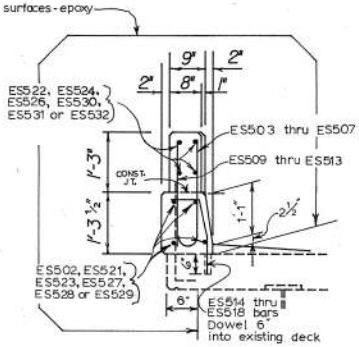






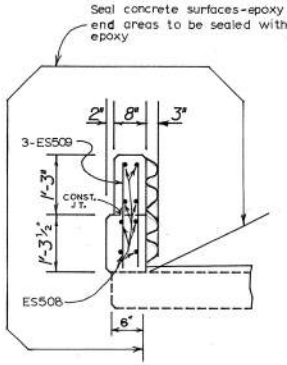
SECTION A-A

(SHEET //3)



SECTION B-B

(SHEET //3)



SECTION C

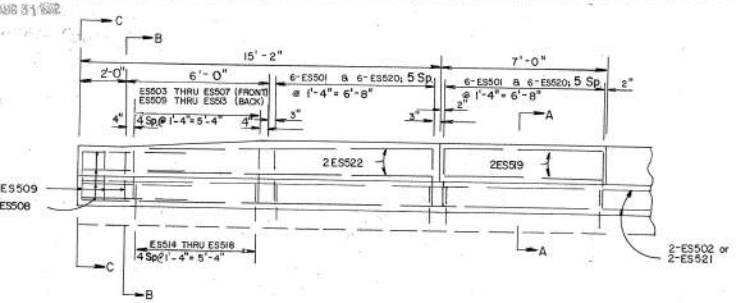
(SHEET //3)

ELEVATION TYPICAL PARAPET REINFORCING

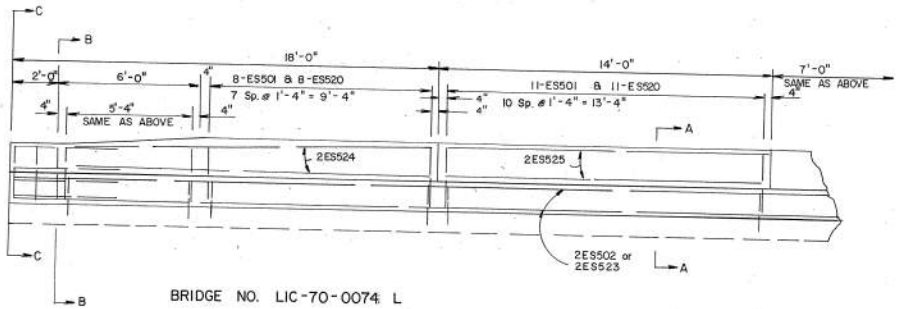
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

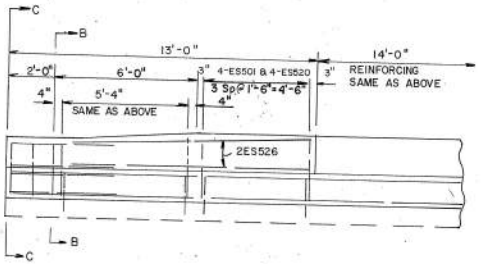
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RBD DATE 1-21-88



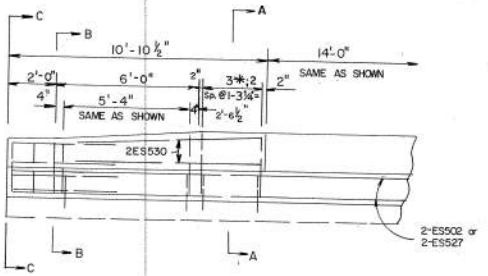
BRIDGE NO. FAI-70-0084 L/R



BRIDGE NO. LIC-70-0074 L



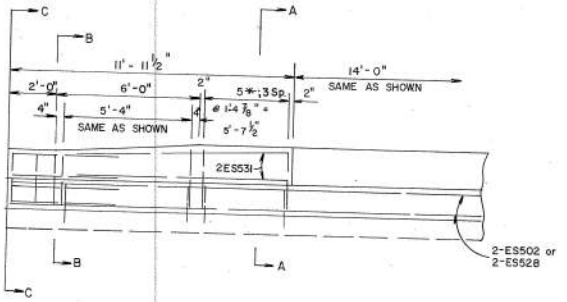
BRIDGE NO. LIC-70-0074 R



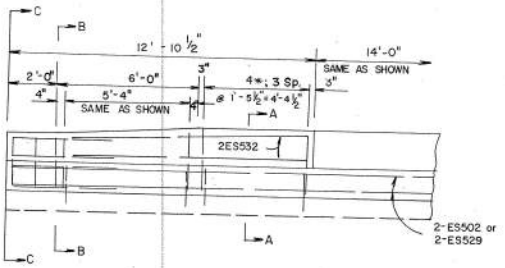
BRIDGE NO. FAI-70-0119L

* ES501 & ES520

SEE SHEET 112 FOR SEC. A-A, B-B, C-C AND BENDING DIAGRAMS AND REINFORCING STEEL TABLES.



BRIDGE NO. FAI-70-0119R
(NORTH PARAPET)



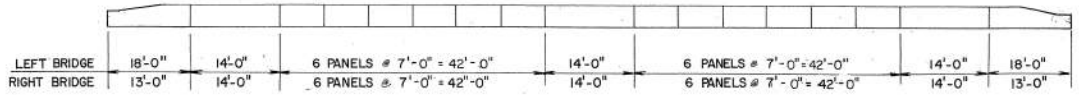
BRIDGE NO. FAI-70-0119R
(SOUTH PARAPET)

JOINT SPACING FOR BRIDGE RAILING, DEFLECTOR PARAPET TYPE

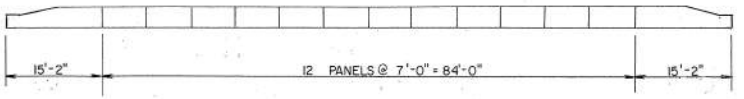
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RJD DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



BRIDGE NO. LIC-70-0074 L/R



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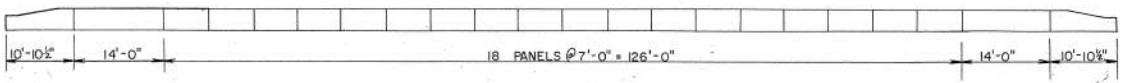
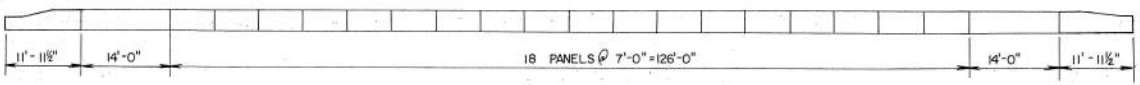
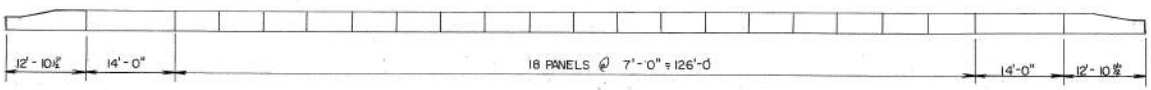


BRIDGE NO. FAI-70-0119L



BRIDGE NO. FAI-70-0119 R
(NORTH PARAPET)



BRIDGE NO. FAI-70-0119 R
(SOUTH PARAPET)

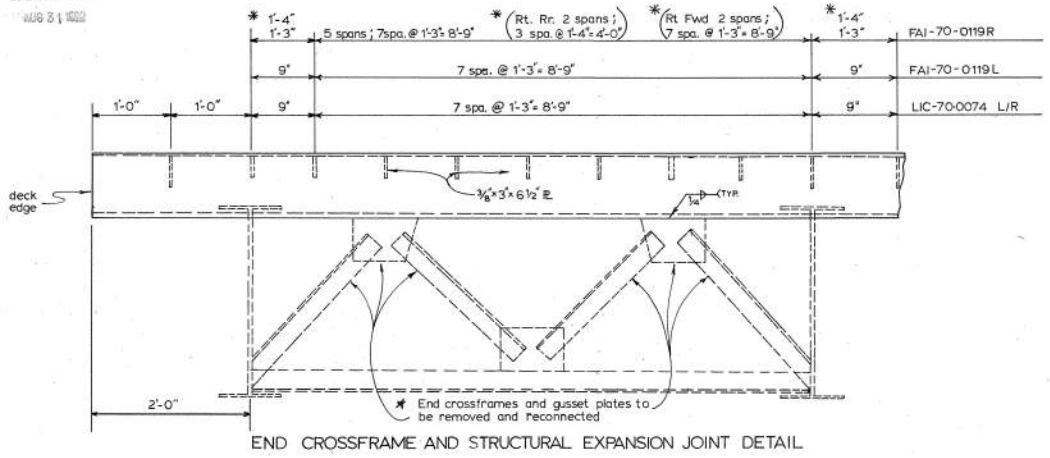
Existing end crossframes and gusset plates shall be removed and reconnected to allow new expansion joint armor to be installed. Any cutting of the crossframes or gusset plates shall be as directed by the Engineer to ensure proper installation of the expansion joint armor. An estimated amount of 6568 pounds of Item 513-Structural Steel as Per Plan has been included in the Bridge Summary for removal, replacement and reconnection of any crossframes or gusset plates deemed necessary by the Engineer.

MICROFILMED
AUG 31 1988

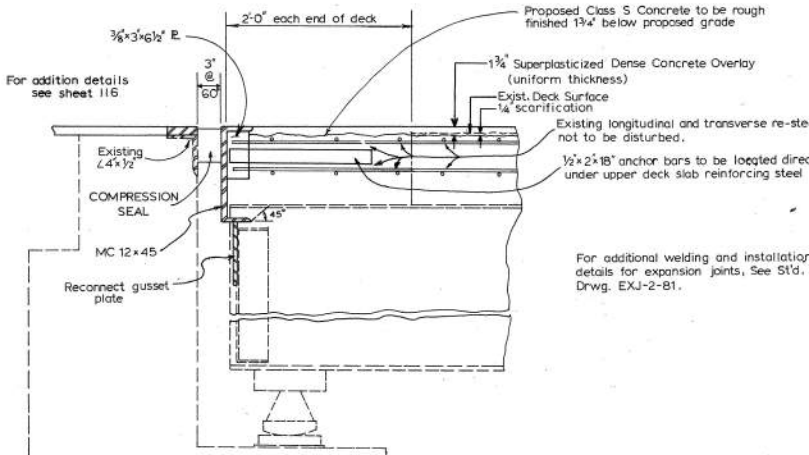
CALCULATED BY RM DATE 1-15-88
CHECKED BY RBD DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

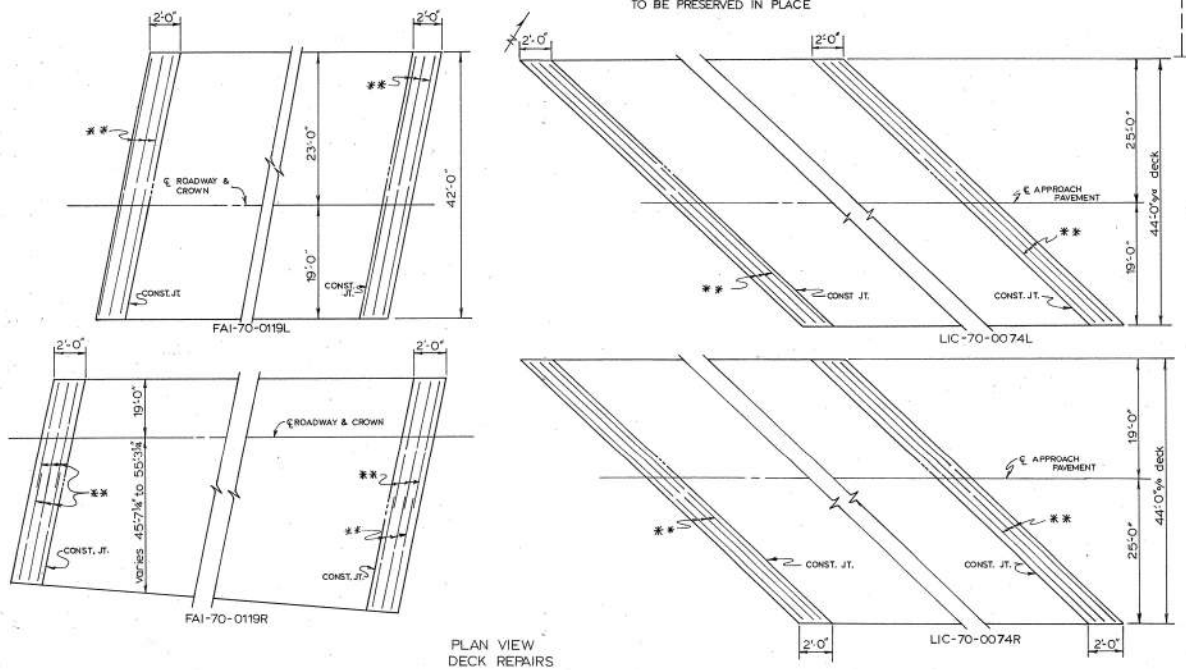


END CROSSFRAME AND STRUCTURAL EXPANSION JOINT DETAIL



FAI-70-0119 L/R
LIC-70-0074 L/R
SECTION ON ℄

** EXISTING TRANSVERSE RESTEEL (TOP AND BOTTOM) TO BE PRESERVED IN PLACE



PLAN VIEW
DECK REPAIRS

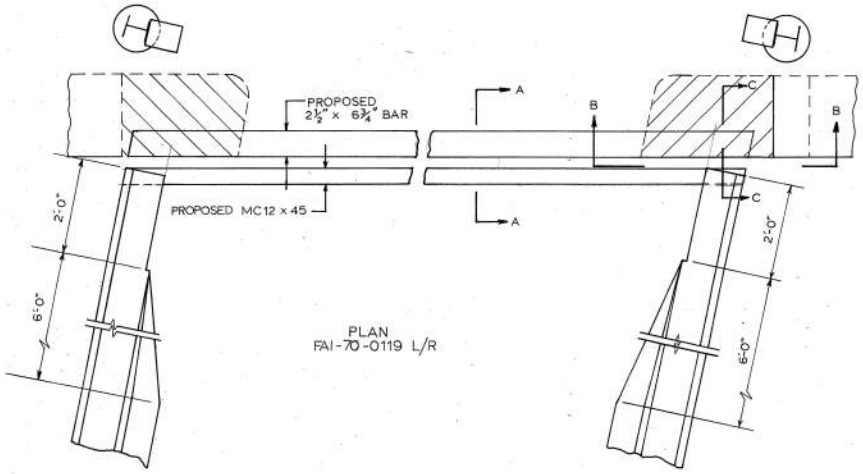
DESCRIPTION	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 0074R	U
ITEM 202 Portions of structures removed, superstructure	5	6	7	7	C
ITEM 511 Class S concrete, superstructure	5	6	7	7	C
ITEM 513 Structural steel	1391	2395	1391	1391	Po

MICROFILMED
AUG 3 1 2010

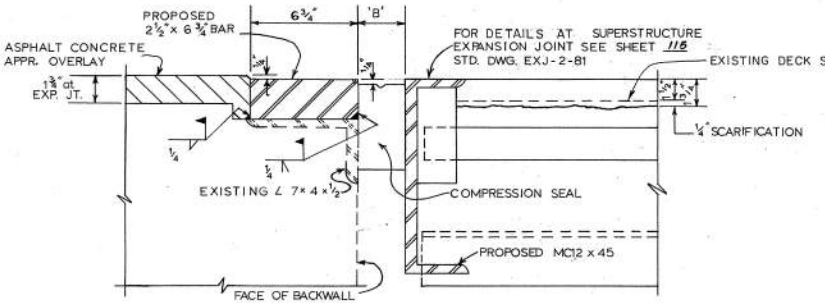
CALCULATED BY Rm DATE 1-15-88
CHECKED BY RJO DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

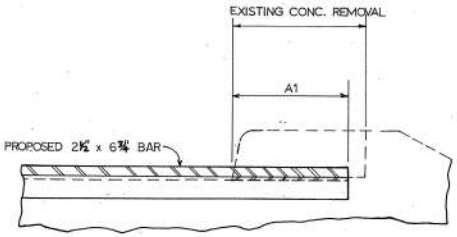
FAI-70-0.00
LIC-70-0.00



PLAN
FAI-70-0119 L/R

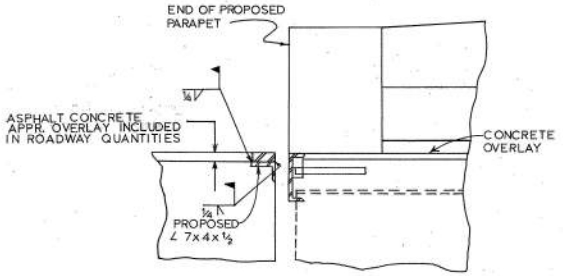


SECTION A-A

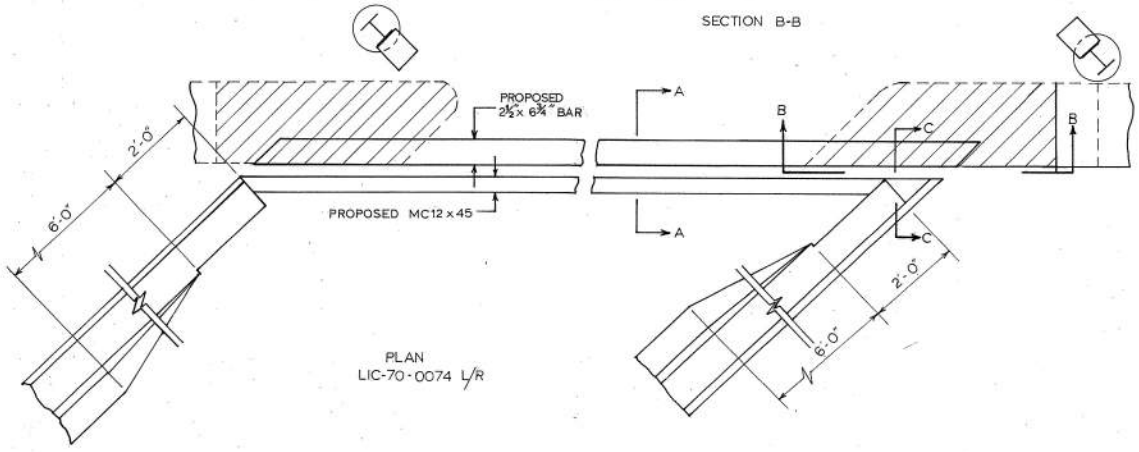


SECTION B-B

AMBIENT TEMP F°	DIMENSION 'B'			
	FAI-70-0119 L/R		LIC-70-0074 L/R	
	REAR	FWD	REAR	FWD
90	3¼"	3¼"	3¼"	3¼"
80	3⅛"	3⅛"	3⅛"	3⅛"
70	3⅛"	3⅛"	3⅛"	3⅛"
60	3"	3"	3"	3"
50	2⅞"	2⅞"	2⅞"	2⅞"
40	2¹³⁄₁₆"	2¹³⁄₁₆"	2¹³⁄₁₆"	2¾"
30	2¾"	2¾"	2¾"	2⅝"



SECTION C-C



PLAN
LIC-70-0074 L/R

BRIDGE NUMBER	ANGLE LT. RR. ABUT.	ANGLE RT. RR. ABUT.	ANGLE LT. FWD. ABUT.	ANGLE RT. FWD. ABUT.	DIM A-1	CONCRETE REMOVALS				EXPANSION JOINT PAY LENGTH	
						LT. RR.	RT. RR.	LT. FWD.	RT. FWD.	RR.	FWD.
FAI-70-0119 L	12°	12°	12°	12°	2'-2"	2'-9"	3'-0"	3'-0"	2'-7"	43'-0"	43'-0"
FAI-70-0119 R	12°	12°	12°	12°	2'-2"	2'-7"	2'-9"	2'-9"	2'-10"	66'-1"	75'-11"
LIC-70-0074 L	46°25'30"	46°25'30"	46°25'30"	46°25'30"	3'-1"	6'-6"	2'-6"	3'-11"	5'-2"	60'-11"	60'-11"
LIC-70-0074 R	46°25'30"	46°25'30"	46°25'30"	46°25'30"	3'-1"	5'-2"	3'-11"	2'-6"	6'-6"	60'-11"	60'-11"

ESTIMATED LENGTH: CONTRACTOR SHALL VERIFY ACTUAL LENGTH NEEDED
LEGEND RR - REAR
FWD - FORWARD

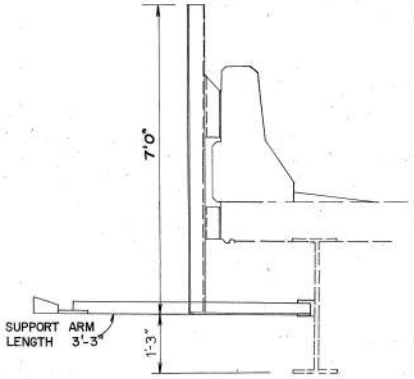
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RJD DATE 1-21-88

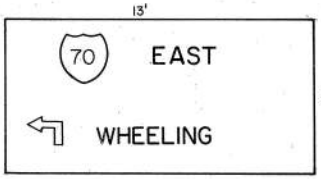
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

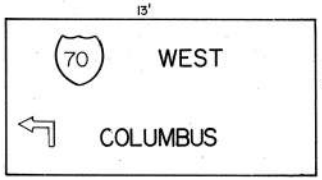
BRIDGE NO. FAI-70 0119 L	BRIDGE NO. FAI-70 0119 R			ITEM	QUANT.	UNIT	DESCRIPTION
845	845			630	169	SQFT.	SIGNS, EXTRUSHEET, TYPE G
1	1			630	2	EACH	OVERPASS STRUCTURE MOUNTED SIGN SUPPORT, TYPE TC-18.24
1	1			630	2	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND STORAGE
1	1			630	2	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND STORAGE, TYPE TC-1824
1	1			631	2	EACH	SIGNS WIRED, OVERPASS STRUCTURE MOUNTED
2	2			631	4	EACH	MERCURY VAPOR LUMINAIRE, TYPE TC-31.21, WITH 175-WATT LAMP
2	2			631	4	EACH	REMOVAL OF LUMINAIRE AND STORAGE

QUANTITIES CARRIED TO SHEET 49





6.5' (INCLUDES 6" GLARE SHIELD)
LEVEL II



6.5' (INCLUDES 6" GLARE SHIELD)
LEVEL II

FAI-70-0119 L

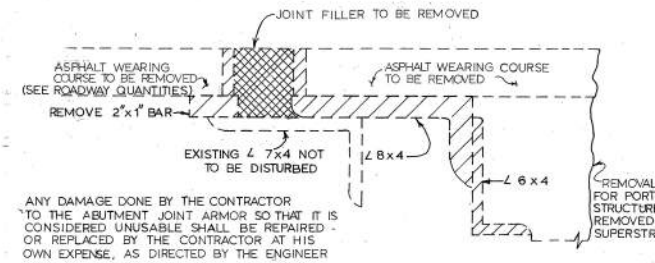
FAI-70-0119 R

TC-18.24

SIGN BRACKET SPACING

6", 72", 72", 6",

MOUNT SIGNS HORIZONTALLY IN THE APPROXIMATE LOCATION OF THE EXISTING SIGNS. THEY MAY BE MOVED SLIGHTLY TO ALLOW FOR THE INSERTION OF THE EXPANSION ANCHOR BOLTS.



ANY DAMAGE DONE BY THE CONTRACTOR TO THE ABUTMENT JOINT ARMOR SO THAT IT IS CONSIDERED UNUSABLE SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE, AS DIRECTED BY THE ENGINEER

ITEM 202 - PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN.

CARE SHALL BE TAKEN IN THE REMOVAL OF THE EXISTING 2"x1" EDGE BARS, VERTICAL EXTENSIO ∠ 8x4; ∠6x4 & JOINT FILLER SO AS NOT TO DAMAGE THE EXPANSION JOINT ARMOR ANGLE AT THE ABUTMENT.

THE BARS SHALL BE REMOVED BY FLAME CUTTING FROM THE END FINISH AND DISPOSED OF BY THE CONTRACTOR. THE SURFACE OF THE END FINISH SHALL BE LEFT FREE OF ANY ROUGH AREAS. THE ENGINEER SHALL DETERMINE IF THE END FINISH IS SMOOTH ENOUGH TO ENSURE PROPER INSTALLATION OF THE NEW 2½"x 6¾" BARS. SEE DETAIL ON SHEET 116.

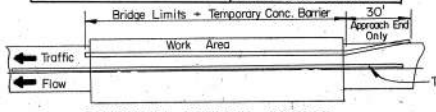
PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR 436 LIN. FT. OF ITEM 202-PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN WHICH SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO REMOVE THE LISTED PARTS.

DESCRIPTION	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 007AR	UN
ITEM 202 PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN	78	138	110	110	LI

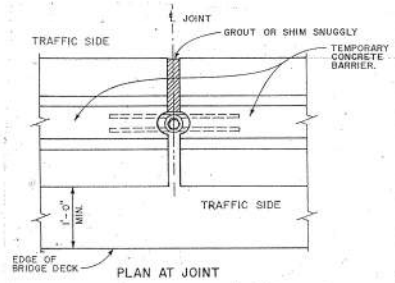
ITEM 622 - TEMPORARY CONCRETE BARRIER *BRIDGE MOUNTED*

THE CONTRACTOR SHALL INSTALL THE BARRIER AS PER STD. DRAWING MC-9A. THE QUANTITY SHALL ALSO INCLUDE REMOVING AND REUSING THE BARRIER AS SHOWN IN PHASES 1A & 2A. AFTER THE PROJECT HAS BEEN COMPLETED THE BARRIER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED BY HIM. ANCHORING OF ALL TEMPORARY CONCRETE BARRIER A.P.P. 2, LOCATED ON THE BRIDGES SHALL NOT BE REQUIRED. CONNECTIONS OF THE PARAPETS SHALL BE DONE BY USING 1¼" x 27" DIA. HIGH STENGTH BOLTS THREADED 8" ON EACH END. PAYMENT FOR BOLTS, NUTS, WASHERS, LABOR, MATERIALS AND INCIDENTALS SHALL BE INCLUDED IN ITEM 622. TEMPORARY CONCRETE BARRIER *BRIDGE MOUNTED* QUANTITIES SHOWN ARE CARRIED IN THE GENERAL SUMMARY ON SHT. 48

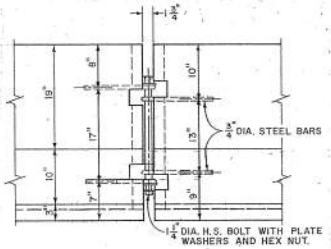
FAI-70-0084 L/R	150	LIN. FT.
FAI-70-0119 L/R	210	LIN. FT.
TOTAL	360	LIN. FT.



CONCRETE BARRIER DETAIL

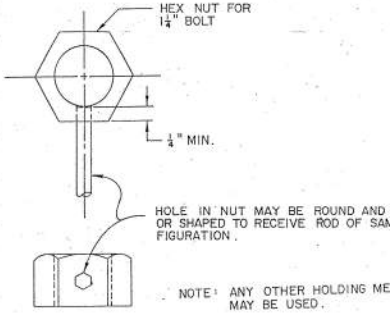


PLAN AT JOINT



ELEVATION AT JOINT

MODIFIED BARRIER



EXAMPLE OF METHOD FOR HOLDING NUT DURING THREADED ROD INSTALLATION

Br. № FAI-70-0

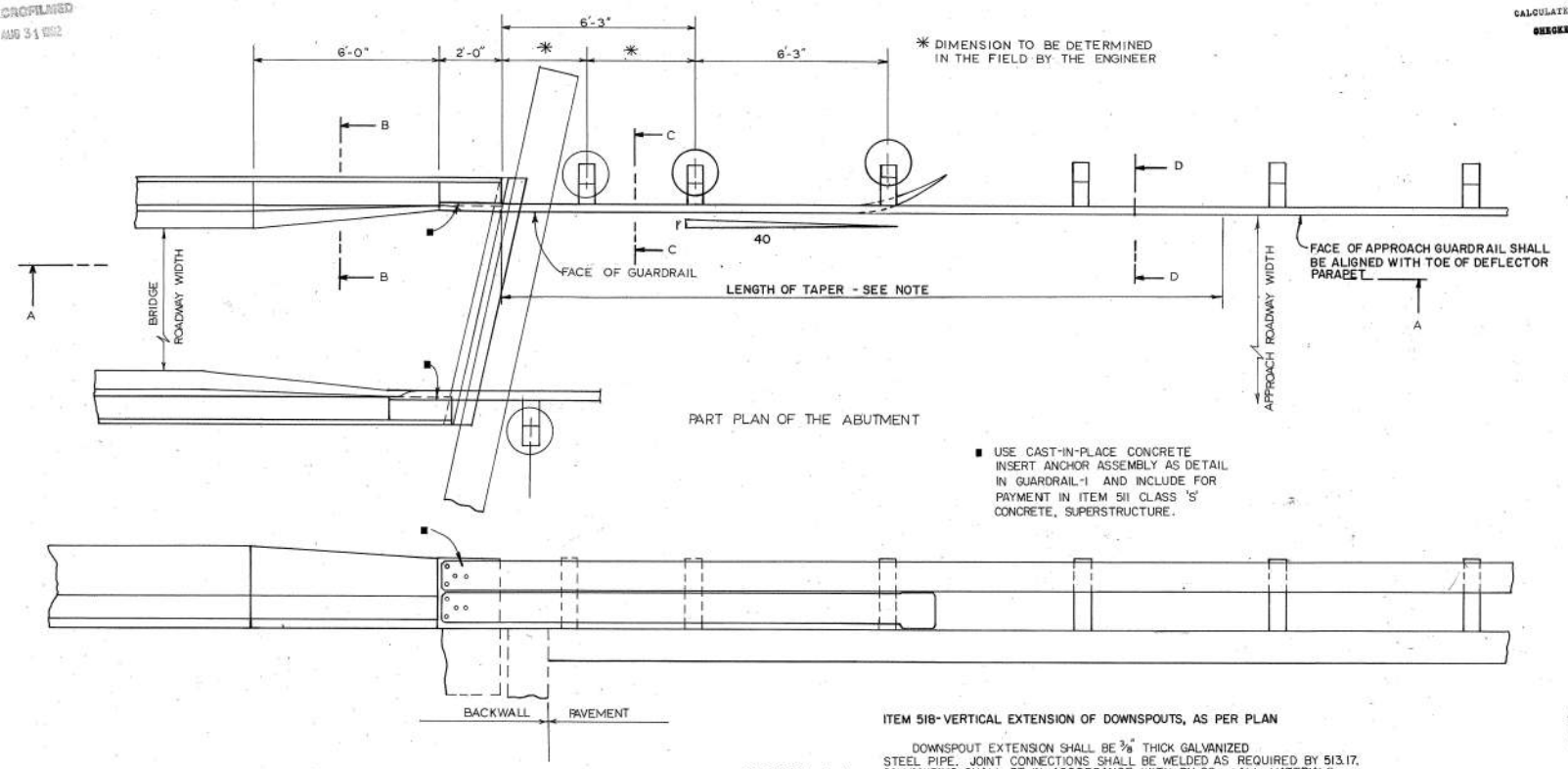
EXPANSION JOINT & SIGN DE

MICROFILMED
AUG 31 1992

CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY [illegible] DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



SECTION A-A

REFERENCE FOR ADDITIONAL DETAILS AND DETAILS NOT SHOWN, SEE STANDARD DRAWINGS BR-1, GR-1, GR-2B, GR-3, & GR-7.

NOTE: ALL HOLES IN THE FIRST APPROACH GUARDRAIL PANEL ADJACENT TO THE BRIDGE SHALL BE SLOTTED ¾" x 2½" AND BOLTS SHALL BE TIGHTENED AS SPECIFIED FOR EXPANSION JOINTS AS PER 606.05.

TAPER: The 40:1 taper shown is de able. However, any taper 25:1 or flatter is acceptable. The length of taper will vary depending o the rate of taper and the alignm of the approach guardrail with respect to the toe of the parapet

SECTION A-A

ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN

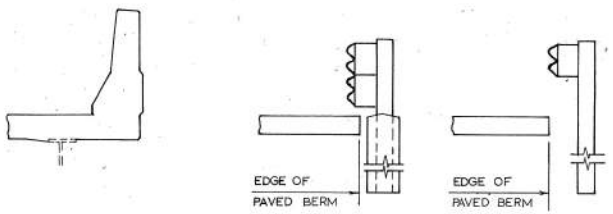
DOWNSPOUT EXTENSION SHALL BE ⅜" THICK GALVANIZED STEEL PIPE. JOINT CONNECTIONS SHALL BE WELDED AS REQUIRED BY 513.17. GALVANIZING SHALL BE IN ACCORDANCE WITH 711.02. ALL MATERIALS, LABOR, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK SHALL BE PAID FOR UNDER ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN. PAINTING OF THE VERTICAL EXTENSION AND DAMAGED AREAS SHALL BE INCLUDED IN ITEM 518 AT THE CONTRACTORS EXPENSE. PAINTING SHALL BE ACCORDING TO 514 SYSTEM B. FINISH PAINT SHALL BE 708.08. PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN.

ITEM 518-VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN

WORK PERFORMED UNDER THIS ITEM SHALL CONSIST OF THE FURNISHINGS AND INSTALLATION OF VERTICAL EXTENSIONS TO EXISTING SCUPPERS IN THE BRIDGE DECKS AS DETAILED ABOVE AND IN ACCORDANCE WITH SECTION 518.06 OF THE SPECIFICATIONS AND REPLACING ANY CONCRETE REMOVED FOR INSTALLATION OF THE VERTICAL EXTENSION OF SCUPPERS. ACTUAL DIMENSION OF THE EXTENSIONS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE EXTENSIONS SHALL BE WELDED TO THE EXISTING SCUPPERS BEFORE THE DECK IS OVERLAYED.

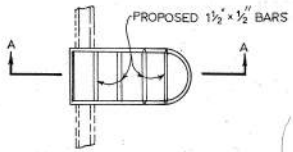
THE MATERIAL UTILIZED FOR THE EXTENSIONS MAY BE WELDABLE GRADE OF LOW OR MILD CARBON STEEL AVAILABLE COMMERCIALLY. THIS MATERIAL IS TO BE EXCLUDED FROM THE REQUIREMENTS OF GALVANIZING ACCORDING TO 711.02 AND FROM THE MILL TEST REPORTS ACCORDING TO 501.07.

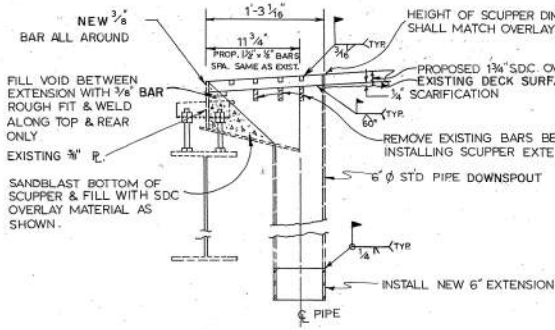
PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 518-VERTICAL EXTENSIONS OF SCUPPERS, AS PER PLAN.



SECTION B-B SECTION C-C SECTION D-D

DESCRIPTION	Br. N° FAI-70 0084 L	Br. N° FAI-70 0084 R	Br. N° FAI-70 0119 L	Br. N° FAI-70 0119 R	Br. N° LIC-70 0074 L	Br. N° LIC-70 0074 R	TOTAL
ITEM 518 VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN	10	10	8	12	8	8	56
ITEM 518 VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN	10	10	8	12	8	8	56





SECTION A-A

VERTICAL EXTENSION OF SCUPPER & DOWNSPOUT

GUARDRAIL TRANS

Appendix E – Bridge Inspection Photographs

Photograph 1: Left Bridge / F.A., Minor Spalling at Beam 3 Bearing

Photograph 2: Left Bridge / F.A. Typical Condition at Bearing Locations

Photograph 3: Left Bridge / Pier 3, Column 1

Photograph 4: Left Bridge / Pier 3, Column 2

Photograph 5: Left Bridge / Pier 3, Column 3

Photograph 6: Left Bridge / Pier 2 Typical Condition

Photograph 7: Left Bridge / Pier 1, Column 1

Photograph 8: Left Bridge / Pier 1, Column 3

Photograph 9: Left Bridge / Pier 1 Minor Spalls & Corroded Ties on Cap

Photograph 10: Left Bridge / R.A., Large Corner Spall at North Edge of Beam Seat

Photograph 11: Left Bridge / R.A. Typical Condition at Bearing Locations

Photograph 12: Right Bridge / F.A., Spall and Cracking at Beam 5 Bearing

Photograph 13: Right Bridge / F.A., Minor Cracking Typical at Bearing Locations

Photograph 14: Right Bridge / Pier 3, Column 4

Photograph 15: Right Bridge / Pier 3, Corroded Ties on Cap (Along Entire Length)

Photograph 16: Right Bridge / Pier 2 Typical Condition

Photograph 17: Right Bridge / Pier 1, Column 3 Delamination w/ Minor Spalling

Photograph 18: Right Bridge / Pier 1, Column 1 Delamination Above Parapet

Photograph 19: Right Bridge / Pier 1, Corroded Ties on Cap (Along Entire Length)

Photograph 20: Right Bridge / Pier 1, Minor Spalls West Face of Cap

Photograph 21: Right Bridge / R.A., Minor Spall at Beam 7 Bearing

Photograph 22: Right Bridge / R.A., Minor Spall at Beam 1 Bearing

Photograph 23: Electric Conduit Mounted on Right Bridge South Overhang & Pier 3 (Similar on Left Bridge North Overhang & Pier 1)

Photograph 24: Buried Gas Line Along West Side SB SR 256

Far East Freeway
LIC-70-00740 L&R
Structure Type Study

Ohio Department of Transportation – District 5
9600 Jacksontown Road
Jacksontown, OH 43030

June 23, 2023

2550 Corporate Exchange Drive, Suite 300
Columbus, Ohio 43231
TEL 614 901 2235
WEB www.structurepoint.com

AMERICAN STRUCTUREPOINT INC.

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1.0 Executive Summary 1

1.1 Overall Summary and Recommendations 1

1.2 Project Location 1

2.0 Existing Structure Inspection 2

2.1 Left Bridge Substructure Condition Summary 2

2.2 Right Bridge Substructure Condition Summary 2

3.0 Structure Type Study 2

3.1 Design Criteria 2

3.2 Proposed Structure Alternatives 2

3.3 Foundation Recommendations 3

3.4 Maintenance of Traffic 3

3.5 Roadway Considerations 3

3.6 Utility Impacts 4

3.7 Preferred Alternative 4

4.0 Conclusion 4

Appendix A – Design Criteria

Appendix B – Preliminary Bridge Plans, Preferred Alternative

Appendix C – Preliminary Construction Cost Estimate and Lifecycle Cost

Appendix D – Existing Bridge Plans

Appendix E – Bridge Inspection Photographs

1.0 Executive Summary

1.1 Overall Summary and Recommendations

This report has been prepared to determine the preferred structure type for the IR 70 over Palmer Rd. crossing as part of the FAI/LIC-0.00/0.00 Far East Freeway project (PID 96808). All alternative layouts are based on the pertinent recommendations from the previously submitted and approved "Far East Freeway FAI/LIC-70-0.00/0.00 Feasibility Study". Per the recommendations in that study, mainline IR 70 work limits will not extend to the Palmer Rd. crossing in either direction.

The existing LIC-70-00740 Left (SFN 4502884) and Right (SFN 4502914) bridges are both three-span, continuous rolled steel beam structures. The span configurations are slightly different for the two sides, with overall lengths (c/c brg.) of 161'-0" and 151'-0" for the Left and Right Bridges respectively. The substructures consist of free-standing column piers and stub abutments with a 46°25'30" skew on pile foundations. Originally constructed in 1967, the bridges have had previous rehabilitation work including SDC overlay, parapet replacement, and repairs to strip seal joints performed in 1988. The minimum vertical clearance provided over Palmer Rd. is currently 14'-2", with the point of minimum clearance occurring at the Right Bridge southern fascia beam. There is evidence of vehicular impact at this location, with damage to the fascia beam noted during the existing structure inspection.

The recommended replacement structure for both the Left and Right bridges is a single span (104'-0"), 42" web composite welded steel plate girder superstructure on semi-integral abutments behind MSE walls with 46 degree skew. To achieve the required minimum vertical clearance of 15'-6", Palmer Rd. will be lowered approximately 2.4' with reconstruction limits of 750 feet.

The full replacement alternative was selected as the preferred alternative given a lower life cycle cost, as well as various other benefits compared to the widening alternative. These benefits include: the flexibility to accommodate future work along Palmer Rd. and providing consistency among all structural components in both expected service life and structural design loading.

1.2 Project Location

Defining the built environment.

2.0 Existing Structure Inspection

As part of this Structure Type Study, a routine bridge inspection was performed on 04/12/2023 to assess the substructure condition of both the existing structures. Given that full superstructure replacement is included in all alternatives evaluated, existing superstructure components were not inspected. For bridge inspection photos see Appendix E.

2.1 Left Bridge Substructure Condition Summary

Per the bridge inspection performed on 06/16/2021 by others, the substructure is currently rated as a 7. Based on the inspection findings, American Structurepoint agrees that the substructure is generally in good condition. Below is the summary of findings:

- Large corner spall (8” x 9” x 8’ long) located in Bay 1 of R.A. beam seat with exposed and corroded reinforcement.
- Minor areas of delamination and cracking at the R.A. Beam 5 bearing location.
- No deficiencies noted at Pier 1
- Spall with exposed reinforcement on top 4” of Pier 2 / Column 5, extending approximately 1/3 of perimeter
- Minor areas of spalling, delamination, and horizontal cracking at F.A. Beam 2 bearing location.
- Erosion beginning to occur along east edge of pavement

2.2 Right Bridge Substructure Condition Summary

Per the bridge inspection performed on 06/21/2022 by others, the substructure is currently rated as a 6. Based on the inspection findings, American Structurepoint would classify the substructure condition as similar to the left bridge, and generally in good condition. Below is the summary of findings:

- Hairline cracking at all R.A. bearing locations, minor spall at Beam 1 bearing location.
- Minor cracking at top of Pier 1 / Column 4.
- Minor cracking at top of Pier 2 / Columns 2 & 4.
- Large corner spall (9” x 9” x 8’ long) located in Bay 1 of F.A. beam seat with exposed and corroded reinforcement.
- Minor areas of spalling, delamination, and/or hairline cracking, primarily at bearing locations, on F.A.
- Vehicular impact damage on south fascia beam.
- Dumped rock repair on eroded area at end of the east curbline

3.0 Structure Type Study

3.1 Design Criteria

Pertinent geometric design criteria was developed in accordance with the current ODOT L&D Vol. 1 and Bridge Design Manuals, and is summarized in Appendix A

3.2 Proposed Structure Alternatives

The structure types evaluated are based on site constraints, constructability, project design criteria, and economy. The two proposed alternatives are:

Left & Right Bridge (SFN 4502884 / 4502914)

- Alternative A – Full replacement with single span (104’-0”), 42” web composite welded steel plate girder superstructure on semi-integral abutments behind MSE walls with 46 degree skew.
- Alternative B – Full superstructure replacement (Left Bridge = 49’-6”, 62’-0”, 49’-6” / Right Bridge = 46’-0”, 52’-0”, 46’-0”) with W36 continuous rolled steel beam superstructure on widened cap and column piers and stub abutments converted to semi-integral.

For both alternatives the IR 70 eastbound and westbound profile will be maintained to minimize mainline impacts and cost. The required minimum vertical clearance of 15’-6” will be achieved by lowering Palmer Rd. approximately 2.4’ and 1.4’ for Alternatives A and B respectively. The impacts associated with this work are discussed in Section 3.5.

Alternative A:

For the full replacement alternative, the Left and Right Bridges will be twin structures. The proposed single span arrangement places the abutments behind MSE walls located outside the required 17’-0” clear zone on each side of Palmer Rd. In this configuration all existing substructures are avoided. A reduction in skew to 30 degrees was evaluated, though this was ultimately determined to be uneconomical given a 30’ increase in span length, and subsequent costs associated with a deeper superstructure and extended Palmer Rd. reconstruction limits. The proposed span arrangement reduces deck area compared to Alternative B, while still providing a large enough bridge opening to eliminate tunnel like conditions for motorists, and to accommodate future widening and/or pedestrian facilities. Steel costs were balanced with superstructure depth to determine the most efficient girder design and framing plans. Nine, 42” web composite welded steel plate girders are utilized for both the Left and Right Bridge. Considering the vertical clearance is < 20’ over Palmer Rd., and the high IR 70 traffic volumes, a painted coating system will be utilized for the proposed steel superstructures per Section 308.2.2.1.d.1 of the 2020 BDM.

Proposed substructures will consist of semi-integral stub abutments behind MSE walls. Given their location beyond the clear zone limits, the MSE walls can be constructed using open cuts and there are no constructability issues anticipated.

The advantages associated with Alternative A include:

- Lower lifecycle cost
- Consistent expected service life for all structural components
- Consistent design loading for all bridge components
- Less impacts to Palmer Rd. traffic during construction
- Substructures removed from the Palmer Rd. splash zone
- Future widening of Palmer Rd. can be accommodated
- Future addition of pedestrian facilities can be accommodated
- Future lengthening of Palmer Rd. left turn lane to Georgian Dr. can be accommodated

The disadvantages associated with Alternative A include:

- Higher initial construction cost
- Increased Palmer Rd. reconstruction limits

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,774,095 / $3,960,200
Right Bridge = $2,774,095 / $3,960,200

Total = $5,598,190 (includes additional roadway costs from Section 3.5) / $8,467,200

Alternative B:

The proposed three-span superstructures will utilize W36 composite rolled steel beams, approximately matching existing superstructure weight. Framing plans will match current beam line locations within the existing bridge limits to avoid changing the load configuration to salvaged substructures. Two additional beam lines will be added to accommodate the required IR 70 widening, for a total of seven beam lines, on both the Left and Right Bridges. Similar to Alternative A, a painted coating system will be utilized for the proposed steel superstructures.

The existing substructures will be rehabilitated and widened as necessary to accommodate the proposed IR 70 roadway section. For both the Right and Left Bridges this requires widening to the inside only. It is recommended to add a pier cap to the existing free standing columns, providing added safety in the case of vehicular collision, as well as tying in new pier columns. Proposed substructure work will include: the addition of two columns and full length pier cap at both Pier 1 & 2, removal of the top 4' of existing pier columns to facilitate construction of proposed pier cap, patching existing pier columns, conversion of existing abutments to semi-integral, removing and rebuilding wingwalls, and dowelling in semi-integral diaphragm guides at the abutments. To facilitate widened pier construction, it is anticipated that temporary shoring will be needed to minimize the excavation footprint and avoid the need for Palmer Rd. lane closures.

All bearings will be replaced with expansion elastomeric bearings. By removing the fixed bearing condition at Pier 2, and the addition of semi-integral diaphragm guides at the abutments, all ODOT seismic guidelines will be satisfied, and no additional retrofit work required.

The advantages associated with Alternative B include:

- Lower initial construction cost
- Shorter Palmer Rd. reconstruction limits

The disadvantages associated with Alternative B include:

- Higher lifecycle cost
- Differing expected service lives for structural components
- Salvaged substructures not designed for current HL-93 loading
- Increased Palmer Rd. traffic impacts during construction
- Increased future maintenance costs for columns located within Palmer Rd. splash zone
- Future widening of Palmer Rd. cannot be accommodated
- Future addition of pedestrian facilities cannot be accommodated
- Future lengthening of Palmer Rd. left turn lane to Georgian Dr. cannot be accommodated

Estimated preliminary structure initial cost / life cycle cost

Left Bridge = $2,401,553 / $4,166,200
Right Bridge = $2,319,105 / $3,977,200

Total = $4,720,658 / $8,933,200

3.3 Foundation Recommendations

This Structure Type Study does not include soil borings or Foundation Recommendations due to multiple span configurations being evaluated. In an effort to reduce costs, soil borings will be taken at the final approved substructure locations. Although the final required pile/shaft lengths may deviate from the lengths assumed in this report, this difference in length will not significantly affect the relative differences in cost between the studied alternatives.

For the purposes of this report, friction piles have been assumed for the new and widened substructure foundations. The driven length required was estimated to be 50-feet for preliminary costs. Foundation Recommendations, and a more refined length of piling/shafts will be calculated and included with the Stage 1 submission.

3.4 Maintenance of Traffic

With IR 70 reconstruction limits ending before the Palmer Rd. crossing, the MOTAA does not include this location in the recommended MOT scheme, therefore MOT considerations were not evaluated. Should replacement of these bridges be included with this project, the recommended MOT scheme will be updated as necessary. For purposes of this study the same MOT scheme will be used for both alternatives evaluated, therefore this will not be a cost differentiator.

3.5 Roadway Considerations

I-70 roadway costs and impacts will be similar for both alternatives evaluated, considering the existing profile grade will be maintained.

For Alternative A, Palmer Rd. will be lowered approximately 2.4' at the point of minimum vertical clearance and reconstructed for a length of 750 feet. The reconstructed roadway will be curbed with 10 foot lanes and utilize clear zone grading (< 6:1 backslopes) through the bridges. For Alternative B Palmer Rd. will be lowered approximately 1.4' at the point of minimum vertical clearance and reconstructed for a length of 650 feet. To avoid reducing cover to less than 1 foot over the existing pier footings, Type D parapet will be utilized through the bridges to serve as a small retaining wall. Like Alternative A, beyond the bridges a curbed section will be utilized. Reconstruction limits for Georgian Dr., which intersects Palmer Rd. immediately East of the Right Bridge, will be approximately 150 feet for both Alternatives. There will be no impacts to French Lake Dr. as Palmer Rd. reconstruction limits will not extend into this intersection for either Alternative.

The additional roadway costs estimated for Alternative A are $50,000. This cost has been carried to the total cost in Section 3.2, though not applied to the lifecycle cost.

3.6 Utility Impacts

Lowering the Palmer Rd. grade will result in only minor utility impacts for both alternatives and will not affect the relative cost differences between the two. Impacts will include: reconstruction of approximately 350 of storm sewer and reconstructing 2 sanitary manholes to the lowered grade.

3.7 Preferred Alternative

Alternative A is recommended as the preferred alternative. This recommendation is based on a lower lifecycle cost, providing the flexibility to accommodate future work along Palmer Rd., as well providing consistency among all structural components in both expected service life and structural design loading. The minimum vertical clearance over Palmer Rd. will be improved to meet the current design criteria of 15’-6”.

4.0 Conclusion

The preferred replacement structure for both the Left and Right Bridges is a single span (104’-0”), 42” web composite welded steel plate girder superstructure on semi-integral abutments behind MSE walls with 46 degree skew.

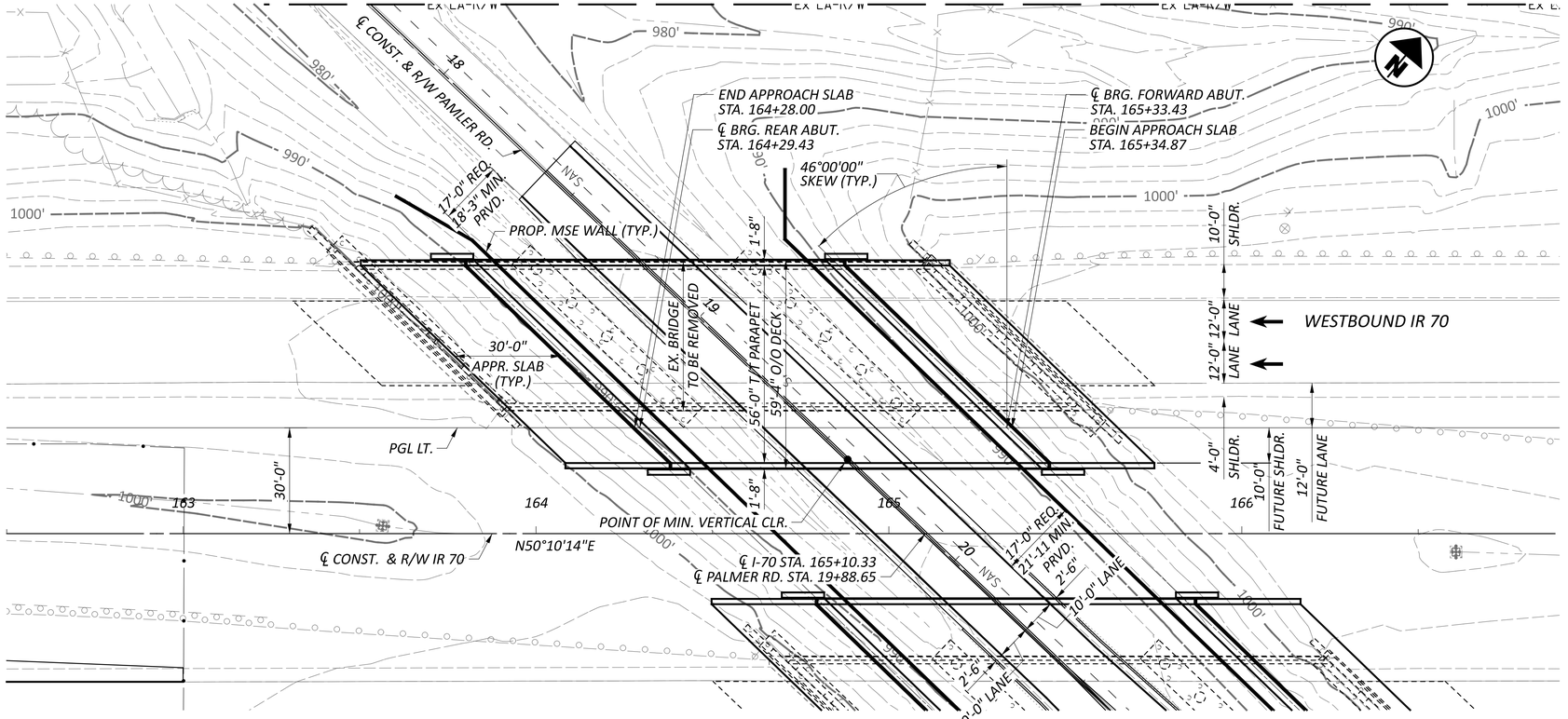
This structure meets all current ODOT design criteria, improves the currently deficient minimum vertical clearance over Palmer Rd., and provides flexibility to accommodate the future needs of Palmer Rd. with a lower lifecycle cost than Alternative B.

Appendix A – Design Criteria

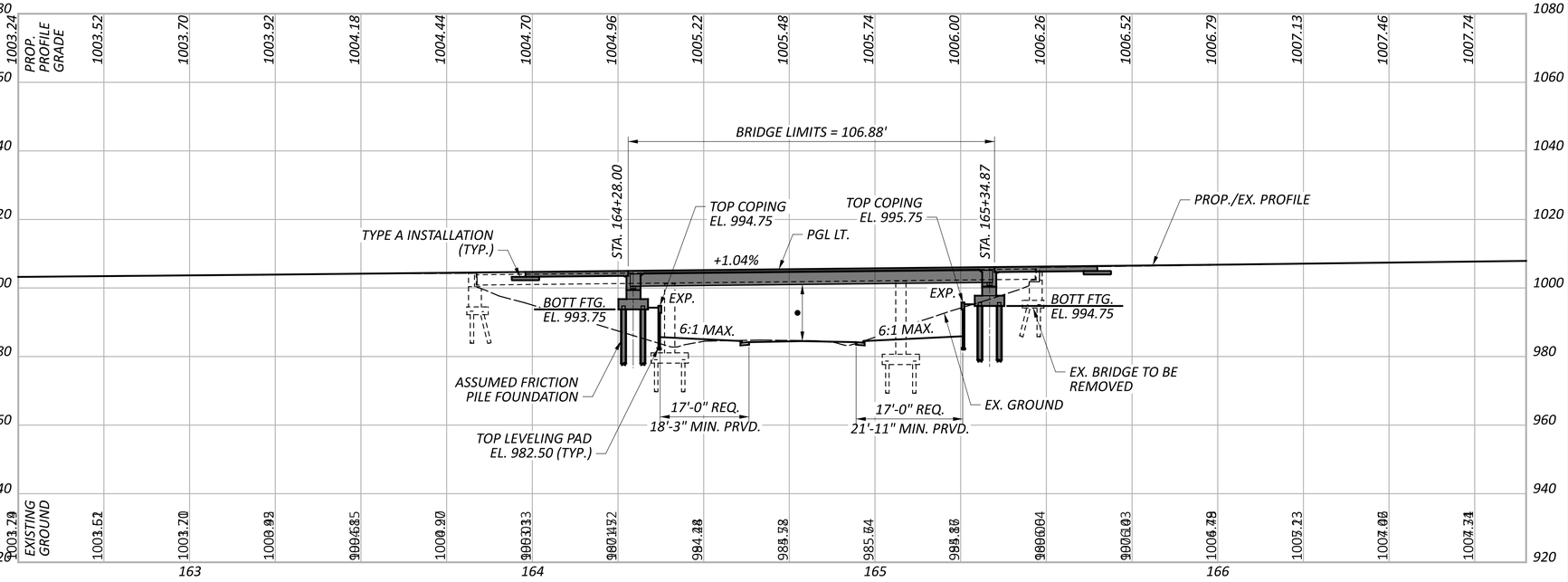
Defining the built environment.

			Appropriate Design Criteria Guide (Figure 105-1E, Sections 105.1 & 105.5.1)	
Design Feature / Highway Name	**IR 70**	**Palmer Rd.**	**Normal Design Criteria**	
			Section	**Figure**
Design Designation				
Location	Urban	Urban		
Functional Classification	Interstate	Collector		
Traffic Volumes				
Opening Day (2030)				
ADT	56,680	3,550		
DHV	3,937	445		
Design Year (2050)				
ADT	76,150	4,190		
DHV	5,290	525		
Directional Distribution	50%	54%		
Trucks (D)	12.0%	3.0%		
ADTT (2050)	9,138	135		
Terrain	Level	Level		
Design Speed (mph)	70	45		
Posted Speed (mph)	65	45		
NHS Route	Yes	No		
Design Criteria				
VERTICAL ALIGNMENT			203	see below
Maximum Grades	3%	8%	203.2, 503.3	203-1
Minimum Grades	0.50% Preferred, 0.30% Minimum for uncurbed highways.		203.2.2	-
Maximum Grade Break	0.25%	0.55%	203.3.2	203-2
Vertical Curves				
Crest Curve				
$K_{CREST\ MIN}$	247	61	203.3.3	203-3
L_{MIN} = 3 x Design Speed	210	135	203.3.3	-
Sag Curve				
$K_{SAG\ MIN}$	181	79	201.2.2, 203.3.4	203-6
Stopping Sight Distance	730	360	201.2	201-1, 203-3 to 4, 203-6 to 7
TYPICAL SECTION				
Lane Width	12	10	301.1.2 & 303.1	301-2 to 4, 303-1
Curve Widening	N/A	N/A	301.1.3	301-5a, 5b, 5c
Pavement Cross Slopes	0.016 ft/ft Normal Crown	0.016 ft/ft Normal Crown	301.1.5	301-6
Outside Shoulder Width				
Graded Width	15' w/ Barrier 15' w/o Barrier and Foreslope > 6:1 10' w/o Barrier and Foreslope <= 6:1	11' w/ Barrier 10' w/o Barrier and Foreslope > 6:1 8' w/o Barrier and Foreslope <= 6:1	301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	10'	4'	301.2.3 & 303.1	301-3, 4, 303-1
Median Shoulder Width				
Graded Width	9' w/ Barrier 9' w/o Barrier and Foreslope > 6:1 4' w/o Barrier and Foreslope <= 6:1	N/A	301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	4' 10' (6 or more lanes)	N/A	301.2.3 & 303.1	301-3, 4, 303-1
Median Width	60'	N/A	304.1 to 304.3.2	304-1
Clear Zone Width			see below	see below
Foreslopes	≤ 6:1 = 32' (Use 30') > 6:1 to 4:1 = 42' (Use 30')	≤ 6:1 = 17' > 6:1 to 4:1 = 23'	600.2, 600.2.1	600-1, 2
Backslopes	≤ 6:1 = 28' > 6:1 to 4:1 = 28' > 4:1 = 23'	< 6:1 = 17' > 6:1 to 4:1 = 15' > 4:1 = 13'	600.2, 600.2.1	600-1, 2
Type of Grading	307-1, 307-2 Safety Grading	307-4 Common/Barrier Grading	307.1 to 307.2	307-1 to 307-6
BRIDGE				
Structural Capacity	HL-93	N/A	302.1	See Bridge Design Manual
New and Reconstructed Bridges				
Lateral Clearance				
On Bridge	10' Rt. / 4' Lt.	N/A	302.1	302-1
Under Bridge		See Clear Zone Width Above	302.1	302-1, 301-3, 301-4, 600-1, & 603-2
Vertical Clearance Over Roadway	N/A	15.5' see Note (l)	302.1	302-1

Appendix B – Preliminary Bridge Plans, Preferred Alternative



PLAN



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BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:

2030 ADT = 3,550 2030 ADTT = 107
2050 ADT = 4,190 2050 ADTT = 126
DIRECTIONAL DISTRIBUTION = 55%

LEGEND

● *15'-6" REQUIRED MINIMUM VERTICAL CLEARANCE*
15'-10¼" ACTUAL MINIMUM VERTICAL CLEARANCE

EXISTING STRUCTURE

TYPE: NON-COMPOSITE CONTINUOUS ROLLED STEEL BEAM WITH REINFORCED CONCRETE DECK ON CAP AND COLUMN PIERS AND STUB ABUTMENTS WITH PILE FOUNDATIONS

SPANS: 49'-6"±, 62'-0"±, 49'-6"±
ROADWAY: 40'-0"± TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: 46°25'30"± R.F.
WEARING SURFACE: 1¾"± SDC OVERLAY
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 4502884
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: COMPOSITE STEEL BEAM GIRDER WITH REINFORCED CONCRETE DECK ON SEMI-INTEGRAL ABUTMENTS BEHIND MSE WALLS

SPANS: 104'-0" C/C BRG.
ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL93
FUTURE WEARING SURFACE: 60 PSF
SKEW: 46°00'00" R.F.
APPROACH SLABS: 30'-0" LONG (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 6,342 SF

COORDINATES: LATITUDE 39°56'44.07"N
LONGITUDE 82°45'26.16"W

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. LIC-00070-00740 L
IR 70 OVER PALMER RD.

SFN	4502884
DESIGN AGENCY	AMERICAN STRUCTUREPOINT INC.
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	1
TOTAL	3
SHEET	P.0
TOTAL	0

FAI/LIC-70-0.00/0.00

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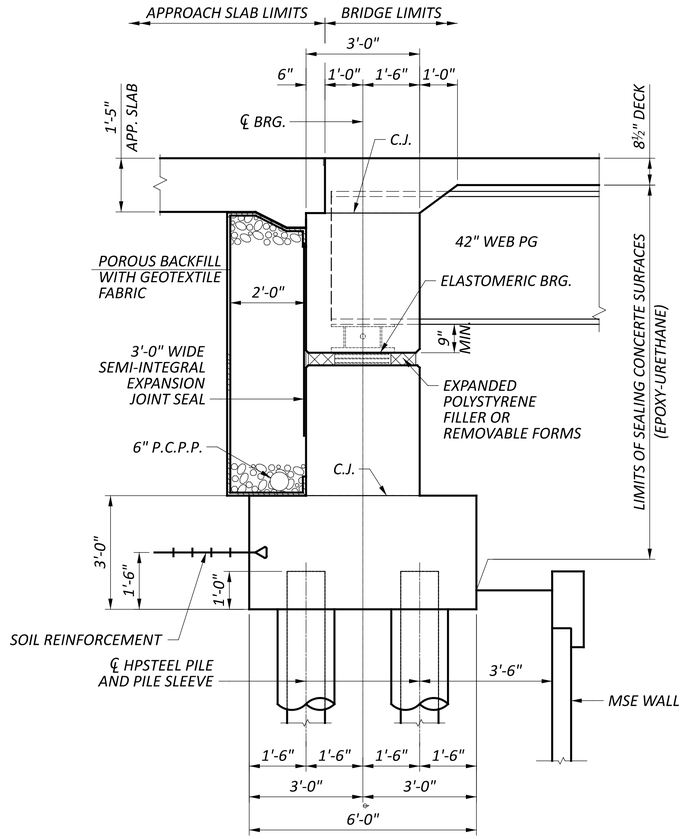

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. LIC-00070-00740 L
IR 70 OVER PALMER RD.

SFN	4502884
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
SUBSET	2
TOTAL	3
SHEET	P.0
TOTAL	0

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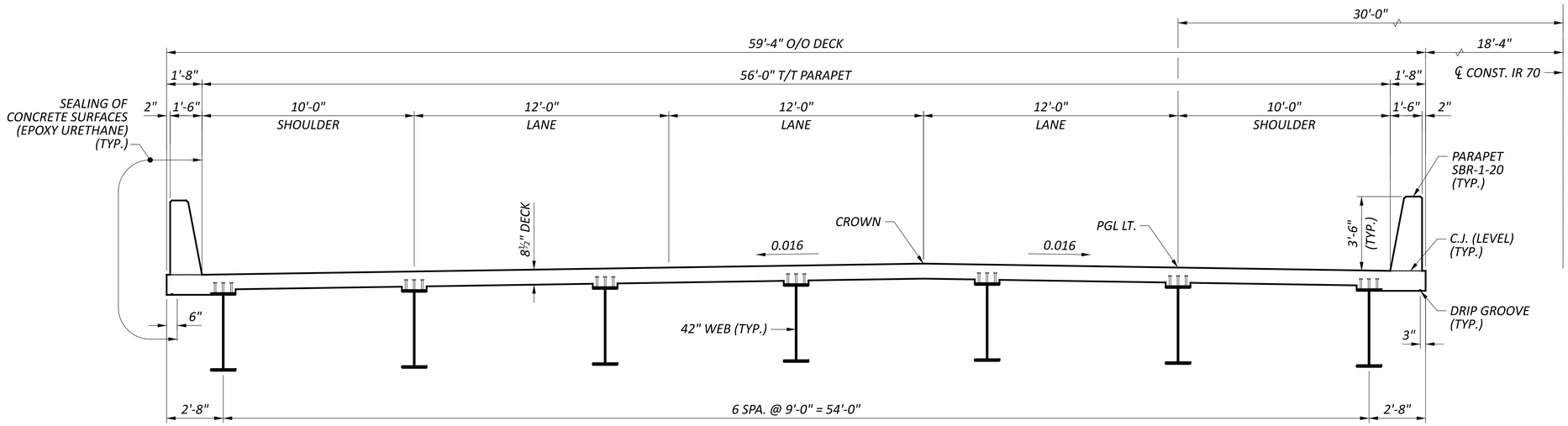

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IR 70 OVER PALMER RD.

SFN	4502884
DESIGN AGENCY	STRUCTUREPOINT LLC (A WSP FIRM)
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
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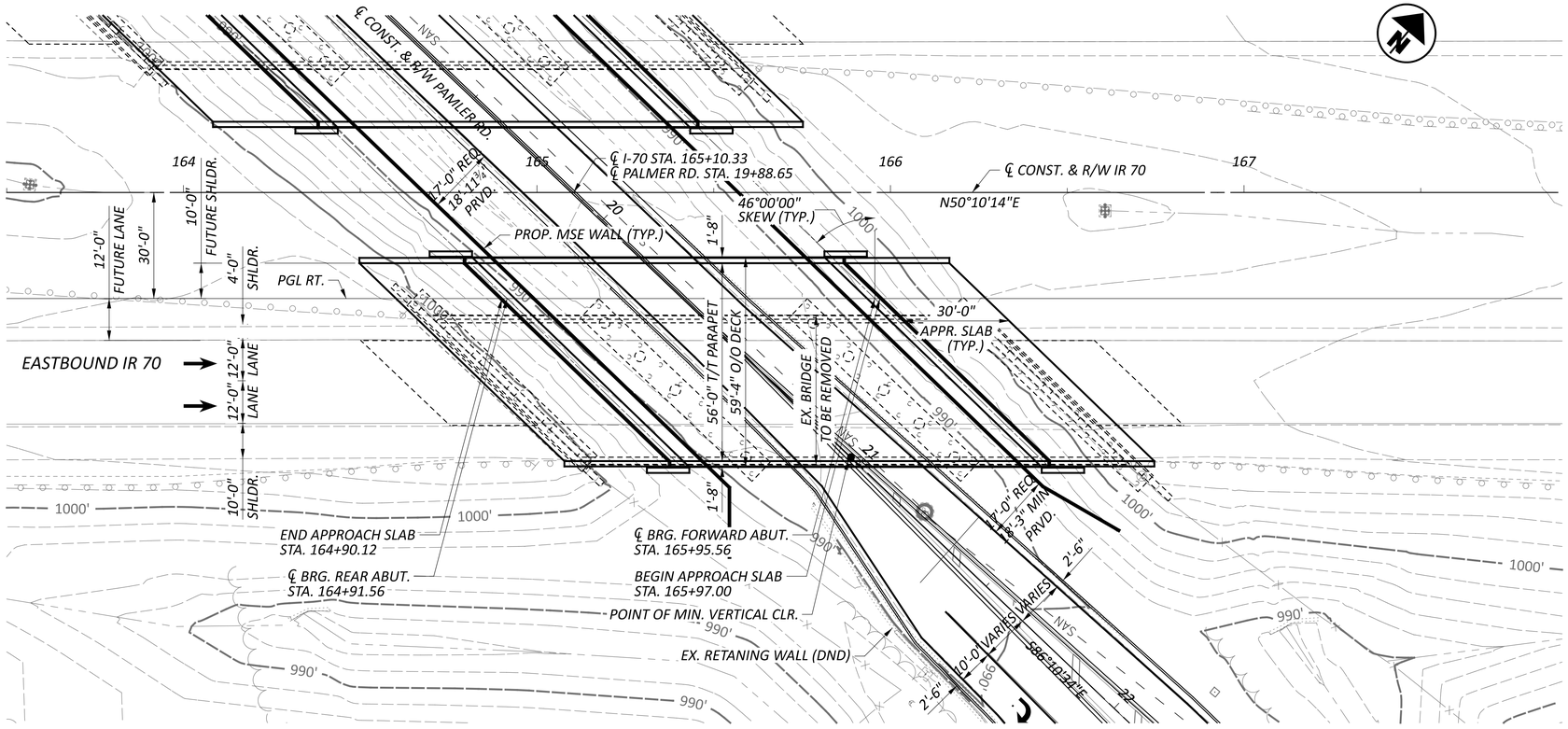
TOTAL	0



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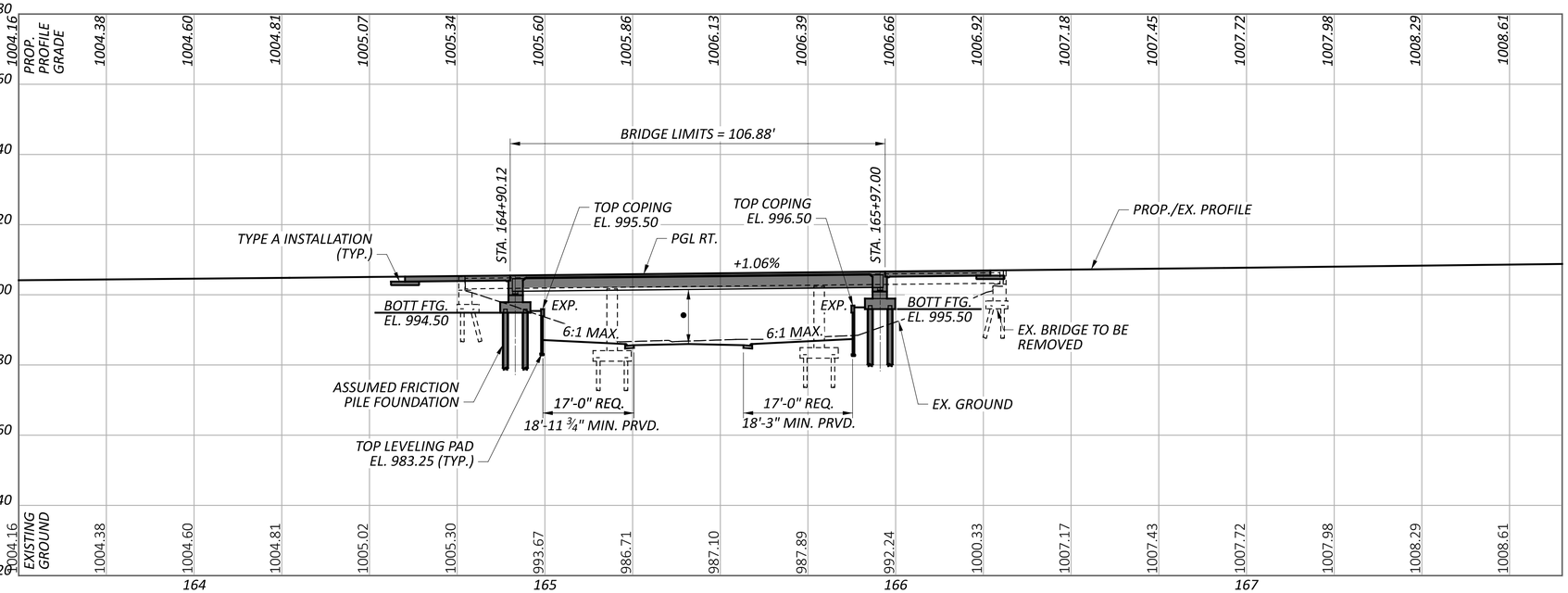

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BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET

HORIZONTAL SCALE IN FEET: 0, 5, 10, 20

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:

2030 ADT = 3,550 2030 ADTT = 107
2050 ADT = 4,190 2050 ADTT = 126
DIRECTIONAL DISTRIBUTION = 55%

LEGEND

● 15'-6" REQUIRED MINIMUM VERTICAL CLEARANCE
15'-9½" ACTUAL MINIMUM VERTICAL CLEARANCE

EXISTING STRUCTURE

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SPANS: 46'-0"±, 59'-0"±, 46'-0"±
ROADWAY: 40'-0"± TOE/TOE PARAPET
LOADING: CF 2000 (57)
SKEW: 46°25'30"± R.F.
WEARING SURFACE: 1¾"± SDC OVERLAY
APPROACH SLABS: 25'-0"± (AS-1-54)
ALIGNMENT: TANGENT
CROWN: 0.016± FT/FT
STRUCTURE FILE NUMBER: 4502884
DATE BUILT: 1967
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: COMPOSITE STEEL BEAM GIRDER WITH REINFORCED CONCRETE DECK ON SEMI-INTEGRAL ABUTMENTS BEHIND MSE WALLS

SPANS: 104'-0" C/C BRG.
ROADWAY: 56'-0" TOE/TOE PARAPET
VEHICULAR LIVE LOAD: HL93
FUTURE WEARING SURFACE: 60 PSF
SKEW: 46°00'00" R.F.
APPROACH SLABS: 30'-0" LONG (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 6,342 SF

COORDINATES: LATITUDE 39°56'44.07"N
LONGITUDE 82°45'26.16"W

SITE PLAN
BRIDGE NO. LIC-00070-00740 R
IR70 OVER PALMER RD.

SFN	4502914
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	SJF
CHECKER	MAH
REVIEWER	CLB 06-12-23
PROJECT ID	96808
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SHEET	P.0
TOTAL	0

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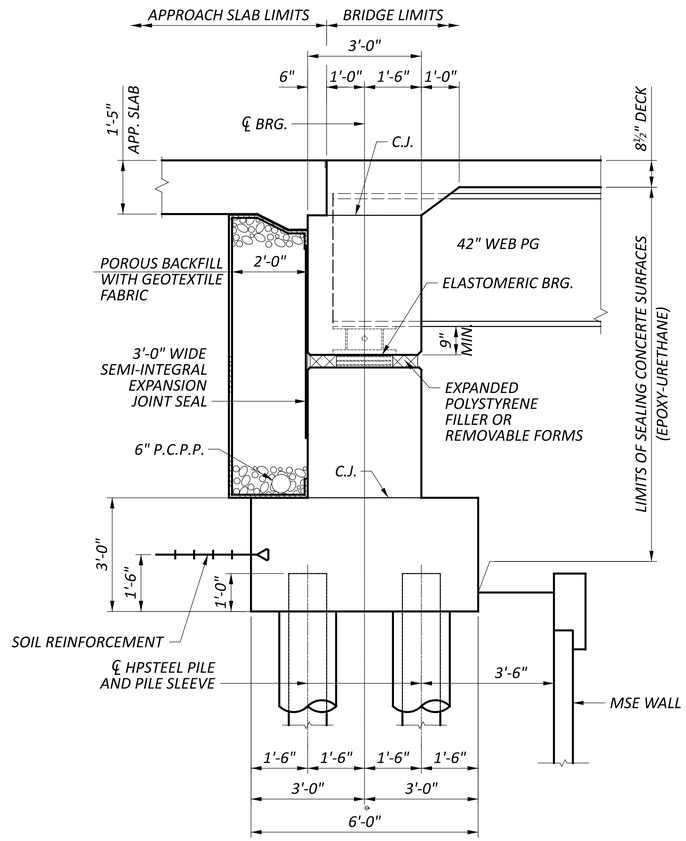

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. LIC-00070-00740 R
IR 70 OVER PALMER RD.

SFN 4502914

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	CHECKER
SJF	MAH

REVIEWER
CLB 06-12-23

PROJECT ID
96808

SUBSET	TOTAL
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SHEET	TOTAL
P.0	0

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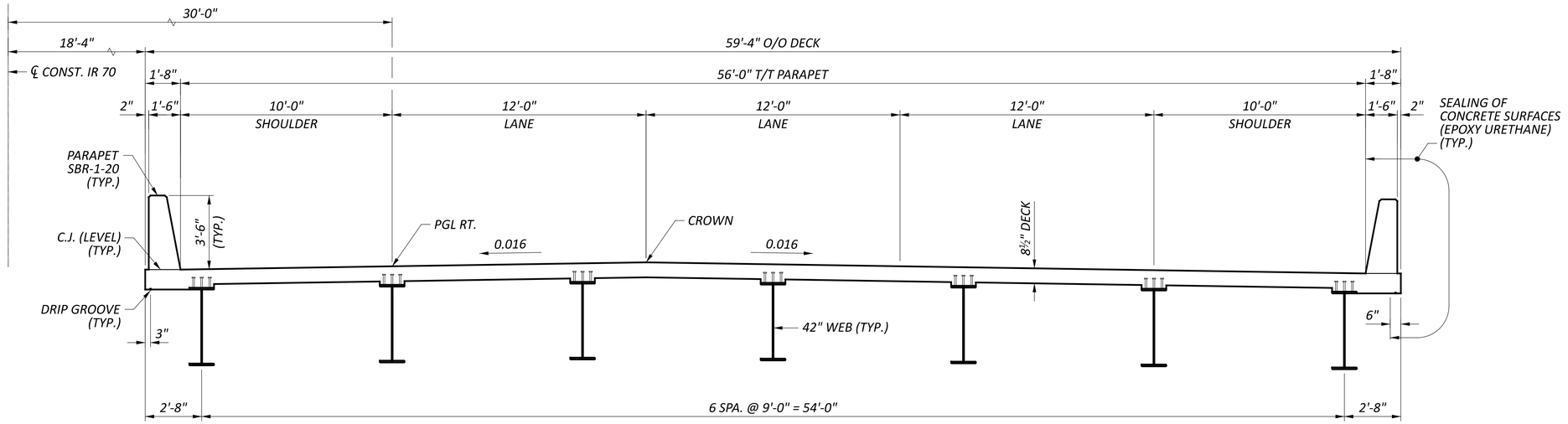

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BRIDGE NO. LIC-00070-00740 R
IR 70 OVER PALMER RD.

SFN 4502914

DESIGN AGENCY
WEPFER STRUCTUREPOINT INC

DESIGNER	CHECKER
SJF	MAH

REVIEWER: CLB 06-12-23

PROJECT ID: 96808

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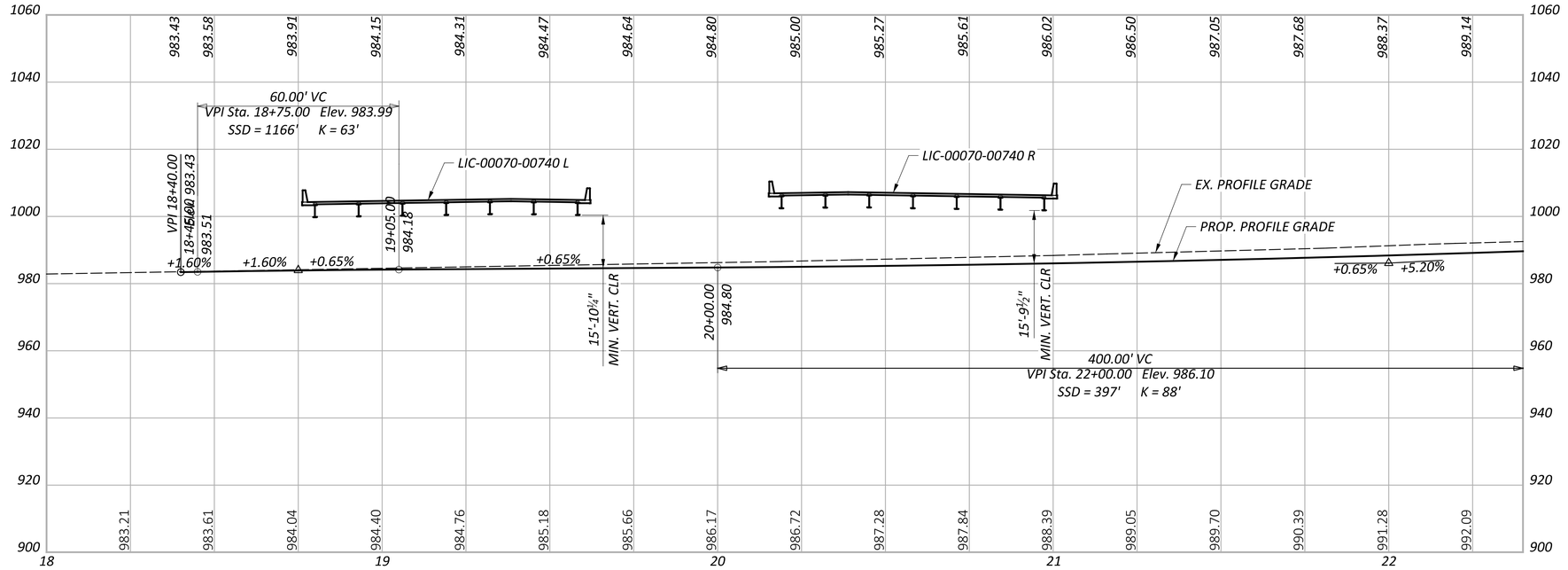

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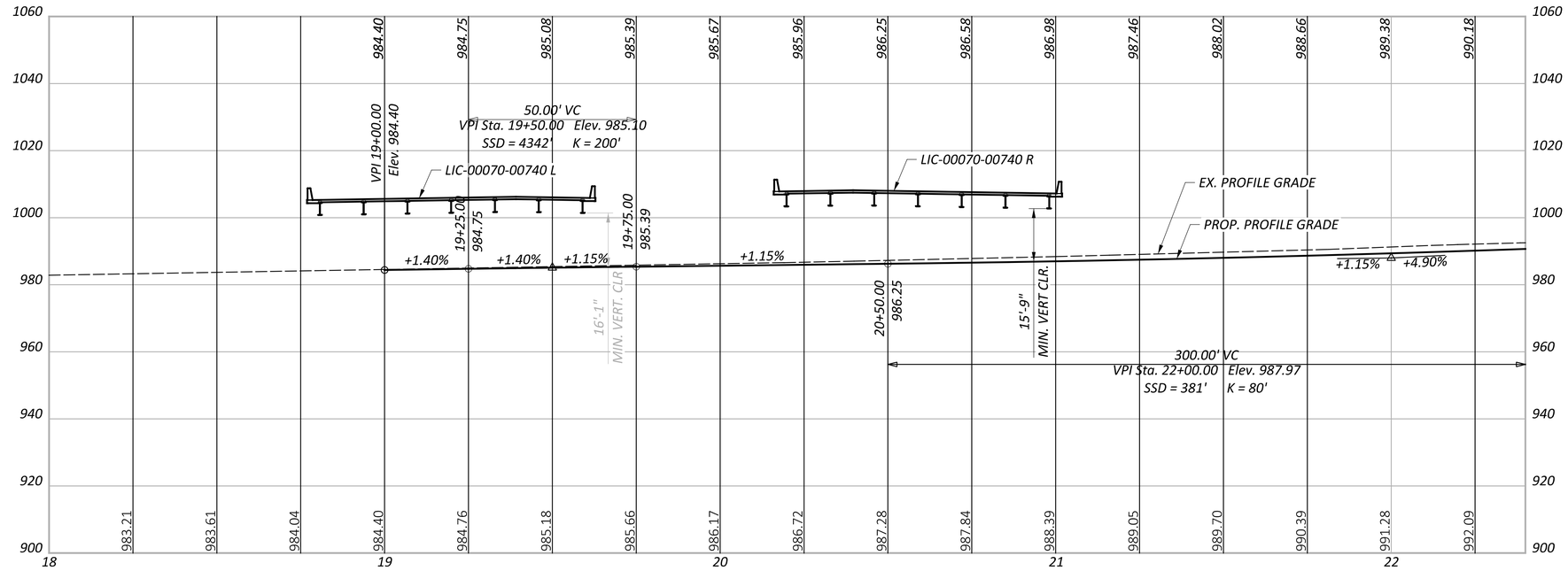

ALTERNATIVE B PROFILE - ℄ CONST. PALMER RD.

ALTERNATIVE PALMER RD. PROFILE
BRIDGE NO. LIC-00070-00740 L & R
IR 70 OVER PALMER RD.

SFN
4502884/4502914

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	CHECKER
SJF	MAH

REVIEWER
CLB 06-12-23

PROJECT ID
96808

SUBSET	TOTAL
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SHEET	TOTAL
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Appendix C – Preliminary Construction Cost Estimate and Lifecycle Cost

Estimate 96808

Estimated Cost:$2,311,745.83

Contingency: 20.00%

Estimated Total: $2,774,095.00

I-70 over Palmer Rd. (Left / Right) Alternative A Structure Type Study Cost Estimate
SFN 4502884 L / 4502914 R

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395656

Longitude of Midpoint: 824747

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 06/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 1200: Structures Over 20' Span					
0053	202E11002 STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$180,000.00000	$180,000.00
0054	202E22900 APPROACH SLAB REMOVED	133.000	SY	$38.03233	$5,058.30
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$50,000.00000	$50,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$25,000.00000	$25,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$25,000.00000	$25,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	3,000.000	FT	$12.46246	$37,387.38
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	3,300.000	FT	$48.00000	$158,400.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	128,725.000	LB	$2.00000	$257,450.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	268.000	CY	$968.34231	$259,515.74
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	48.000	CY	$550.71622	$26,434.38
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	79.000	CY	$832.98780	$65,806.04
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	134.000	CY	$552.93388	$74,093.14
0071	513E10280 STRUCTURAL STEEL MEMBERS, LEVEL 4	158,400.000	LB	$2.17726	$344,877.98
0073	513E20000 WELDED STUD SHEAR CONNECTORS	3,759.000	EACH	$4.60152	$17,297.11
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	16,817.000	SF	$3.89426	$65,489.77
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	16,817.000	SF	$1.86624	$31,384.56
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	14.000	EACH	$1,322.64038	$18,516.97
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	102.000	CY	$78.53376	$8,010.44
0087	526E30010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")	396.000	SY	$276.91973	$109,660.21
0088	526E90010	171.000	FT	$192.34969	$32,891.80

Line #	Item Number Description *Supplemental Description*	Quantity	Units	Unit Price	Extension
	TYPE A INSTALLATION				
0092	840E20000 MECHANICALLY STABILIZED EARTH WALL	3,420.000	SF	$150.00000	$513,000.00

Total for Group 1200:$2,311,745.83

Estimate 96808

Estimated Cost:$2,001,293.89

Contingency: 20.00%

Estimated Total: $2,401,552.67

I-70 over Palmer Rd. (Left) Alternative B Structure Type Study Cost Estimate
SFN 4502884 L

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395656

Longitude of Midpoint: 824747

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 03/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0053	202E11202 PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$215,000.00000	$215,000.00
0054	202E22900 APPROACH SLAB REMOVED	133.000	SY	$38.03233	$5,058.30
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$25,000.00000	$25,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$25,000.00000	$25,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$15,000.00000	$15,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	1,800.000	FT	$12.46246	$22,432.43
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	1,980.000	FT	$48.00000	$95,040.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	171,650.000	LB	$2.00000	$343,300.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$5,000.00000	$10,000.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	392.000	CY	$915.09617	$358,717.70
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	65.000	CY	$550.71622	$35,796.55
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	55.000	CY	$1,099.58881	$60,477.38
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	52.000	CY	$893.05008	$46,438.60
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	78.000	CY	$595.92582	$46,482.21
0071	513E20000 WELDED STUD SHEAR CONNECTORS	4,515.000	EACH	$4.60152	$20,775.86
0072	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	185,955.000	LB	$1.80097	$334,899.38
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	22,315.000	SF	$3.53213	$78,819.48
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	22,315.000	SF	$1.67802	$37,445.02
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	28.000	EACH	$1,150.00000	$32,200.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	96.000	CY	$79.00256	$7,584.25
0086	519E11101	312.000	SF	$150.00000	$46,800.00

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description ***Supplemental Description***				
	PATCHING CONCRETE STRUCTURE, AS PER PLAN				
0087	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0088	526E90010 TYPE A INSTALLATION	173.000	FT	$192.10419	$33,234.02

Total for Group 1200:$2,001,293.89

Estimate 96808

Estimated Cost:$1,932,587.09

Contingency: 20.00%

Estimated Total: $2,319,104.51

I-70 over Palmer Rd. (Right) Alternative B Structure Type Study Cost Estimate
SFN 4502914 R

Base Date: 04/03/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395656

Longitude of Midpoint: 824747

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Structure Type Study

Prepared by Sage Flannagan on 03/08/23
Checked by Chris Bettinger on 06/12/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0053	202E11202 PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.000	LS	$200,000.00000	$200,000.00
0054	202E22900 APPROACH SLAB REMOVED	133.000	SY	$38.03233	$5,058.30
0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$25,000.00000	$25,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$25,000.00000	$25,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$15,000.00000	$15,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	1,800.000	FT	$12.46246	$22,432.43
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	1,980.000	FT	$48.00000	$95,040.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	165,650.000	LB	$2.00000	$331,300.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$5,000.00000	$10,000.00
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	375.000	CY	$921.15012	$345,431.30
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	62.000	CY	$550.71622	$34,144.41
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	55.000	CY	$1,099.58881	$60,477.38
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	52.000	CY	$893.05008	$46,438.60
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	78.000	CY	$595.92582	$46,482.21
0071	513E10260 STRUCTURAL STEEL MEMBERS, LEVEL 3	174,405.000	LB	$1.80097	$314,098.17
0073	513E20000 WELDED STUD SHEAR CONNECTORS	4,242.000	EACH	$4.60152	$19,519.65
0074	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT COATING OF BEAM ENDS	20,929.000	SF	$3.61115	$75,577.76
0075	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	20,929.000	SF	$1.71895	$35,975.90
0079	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (16" X 18" X 3 1/4")	28.000	EACH	$1,150.00000	$32,200.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	96.000	CY	$79.00256	$7,584.25
0086	519E11101	312.000	SF	$150.00000	$46,800.00

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
	PATCHING CONCRETE STRUCTURE, AS PER PLAN				
0087	526E25010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")	330.000	SY	$320.58398	$105,792.71
0088	526E90010 TYPE A INSTALLATION	173.000	FT	$192.10419	$33,234.02

Total for Group 1200:$1,932,587.09

AMERICAN STRUCTUREPOINT, INC.
LIC-70-00740 L
LIFE CYCLE COST ANALYSIS

	Alt. A (Left)	Alt. B (Left)	Alt. A (Right)	Alt. B (Right)
Number of Spans	1	3	1	3
Span Length	104'-0"	49'-6", 62'-0", 49'-6"	104'-0"	46'-0", 59'-0", 46'-0"
Superstructure				
Type	42" WELDED STEEL PLATE GIRDER	W36 ROLLED STEEL BEAM	42" WELDED STEEL PLATE GIRDER	W36 ROLLED STEEL BEAM
Number of Beam Lines	7	7	7	7
Spacing	9'-0"	Varies, 9'-6" Max.	9'-0"	Varies, 9'-6" Max.
Deck Thickness	8 1/2" Composite	8 3/4" Composite	8 1/2" Composite	8 3/4" Composite
Deck Area	**6171 SF**	**9553 SF**	**6171 SF**	**8959 SF**
Patching Area	**50 SF**	**300 SF**	**50 SF**	**300 SF**
Painting Area	**16817 SF**	**22315 SF**	**16817 SF**	**20929 SF**
Substructure				
Abutment Type	Semi-Integral Stub Abutments Behind MSE Walls	Widened Stub Abutments Converted to Semi-Integral	Semi-Integral Stub Abutments Behind MSE Walls	Widened Stub Abutments Converted to Semi-Integral
Pier Type	N/A	Widened Cap and Column	N/A	Widened Cap and Column
Cost				
Comparative Initial Construction Cost	**$2,774,095**	**$2,401,553**	**$2,774,095**	**$2,319,105**
Life Cycle Cost	**$3,960,200**	**$4,166,200**	**$3,960,200**	**$3,977,200**

i =	**2.50%**
DECK OVERLAY UNIT COST =	**$ 85 /SF**
DECK REPLACEMENT UNIT COST =	**$ 175 /SF**
PATCHING UNIT COST =	**$ 175 /SF**
PAINTING UNIT COST =	**$ 30 /SF**

AMERICAN STRUCTUREPOINT, INC.
LIC-70-00740 L
LIFE CYCLE COST ANALYSIS

Alt. A (Left & Right)				
n	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,774,095	$2,774,100
Painting of Structural Steel	25 years	0.54	$504,510	$272,100
Deck Overlay	25 years	0.54	$524,535	$282,900
Substructure Patching	25 years	0.54	$8,750	$4,700
Painting of Structural Steel	50 years	0.29	$504,510	$146,800
Deck Replacement	50 years	0.29	$1,079,925	$314,200
Substructure Patching	50 years	0.29	$8,750	$2,500
Painting of Structural Steel	75 years	0.16	$504,510	$79,200
Deck Overlay	75 years	0.16	$524,535	$82,300
Substructure Patching	75 years	0.16	$8,750	$1,400
			LIFE CYCLE COST =	$3,960,200

Alt. B (Left)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,401,553	$2,401,600
Painting of Structural Steel	25 years	0.54	$669,450	$361,100
Deck Overlay	25 years	0.54	$812,005	$438,000
Substructure Patching	25 years	0.54	$52,500	$28,300
Painting of Structural Steel	50 years	0.29	$669,450	$194,800
Deck Replacement	50 years	0.29	$1,671,775	$486,400
Substructure Patching	50 years	0.29	$52,500	$15,300
Painting of Structural Steel	75 years	0.16	$669,450	$105,100
Deck Overlay	75 years	0.16	$812,005	$127,400
Substructure Patching	75 years	0.16	$52,500	$8,200
			LIFE CYCLE COST =	$4,166,200

Alt. B (Right)				
Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$2,319,105	$2,319,100
Painting of Structural Steel	25 years	0.54	$627,870	$338,700
Deck Overlay	25 years	0.54	$761,515	$410,800
Substructure Patching	25 years	0.54	$52,500	$28,300
Painting of Structural Steel	50 years	0.29	$627,870	$182,700
Deck Replacement	50 years	0.29	$1,567,825	$456,100
Substructure Patching	50 years	0.29	$52,500	$15,300
Painting of Structural Steel	75 years	0.16	$627,870	$98,500
Deck Overlay	75 years	0.16	$761,515	$119,500
Substructure Patching	75 years	0.16	$52,500	$8,200
			LIFE CYCLE COST =	$3,977,200

Appendix D – Existing Bridge Plans

9374
Sharon

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

LIC-70-0.33

ETNA TOWNSHIP
LICKING COUNTY

I-70-7 (28) I

LICKING CO. 1
LIC - 70 - 0.33

LFD

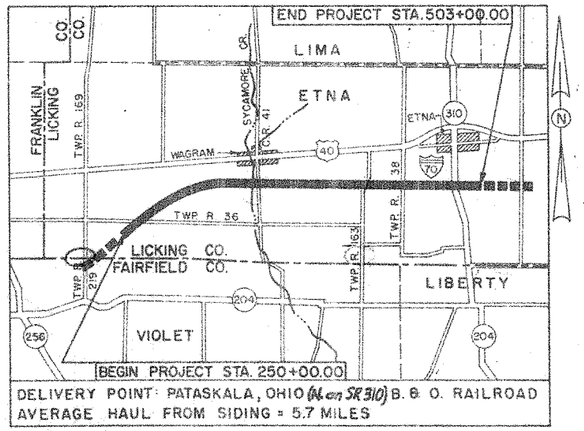
LIMITED ACCESS

THIS IMPROVEMENT HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR OF HIGHWAYS IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02, REVISED CODE OF OHIO, AND IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC.

G-7

CONVENTIONAL SIGNS

RIGHT-OF-WAY WITH LIMITED ACCESS		LARW
RIGHT-OF-WAY WITHOUT LIMITED ACCESS		RW
CENTER LINE		
COUNTY LINE		
TOWNSHIP LINE		
SECTION LINE		
CORPORATION LINE		
PROPERTY LINE		
POLE LINE	TELEPHONE	ELECTRIC
FENCE LINE		
GUARD RAIL	PROPOSED	EXISTING
DRAIN PIPE	PROPOSED	EXISTING
TREE (EXISTING)		
TREES OR STUMPS TO BE REMOVED		
EXISTING UTILITY POLE	TELEPHONE	ELECTRIC
EXISTING UTILITY POLE (TO BE REMOVED BY OTHERS)	TELEPHONE	ELECTRIC
PROPOSED UTILITY POLE (BY OTHERS)	TELEPHONE	ELECTRIC



DELIVERY POINT: PATASKALA, OHIO (N. on SR 310) B. & O. RAILROAD
AVERAGE HAUL FROM SIDING = 5.7 MILES

LOCATION MAP

0 1 2 3 4 5
SCALE IN MILES

PORTION TO BE IMPROVED
STATE ROADS (23)
OTHER ROADS
FUTURE CONSTRUCTION

SCALES

PLAN 0 50 100 SCALE IN FEET
PROFILE: HORIZONTAL 0 50 100 SCALE IN FEET
CROSS SECTIONS 0 5 10 SCALE IN FEET
VERTICAL 0 5 10 SCALE IN FEET

LINE DATA

BEGIN PROJECT	STATION 250+00.00
END PROJECT	STATION 503+00.00
LENGTH OF PROJECT (ALL RURAL)	25,300.00 LIN. FT. OR 4.791 MILES
ADD FOR APPROACHES (SEE SHEET NO. 12)	11,622.06 LIN. FT.
TOTAL LENGTH OF WORK	36,922.06 LIN. FT. OR 6.992 MILES

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Sheet No. 185 & 185A revised 10-7-65
Sheet No. 202 revised 11-29-65

1963 SPCIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

THE RIGHT OF WAY FOR THIS IMPROVEMENT WILL BE PROVIDED BY THE STATE OF OHIO.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY.

AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED DATE 11-5-64 — DIVISION DEPUTY DIRECTOR

APPROVED DATE 6-2-65 — ENGINEER OF BRIDGES

APPROVED DATE 6-3-65 — ENGINEER OF LOCATION AND DESIGN

APPROVED DATE 6-3-65 — DEPUTY DIRECTOR OF DESIGN AND CONSTRUCTION

APPROVED DATE 6-8-65 — DEPUTY DIRECTOR OF RIGHT OF WAY

APPROVED DATE 6-8-65 — DEPUTY DIRECTOR OF PLANNING AND PROGRAMMING

APPROVED DATE _____ — FIRST ASSISTANT DIRECTOR

APPROVED DATE 6/9/65 — DIRECTOR OF HIGHWAYS

PLANS PREPARED BY
DODSON, KINNEY AND LINDBLOM
COLUMBUS, OHIO

FILE NO.	
	DATE OF LETTING 196
	LIC-70-0.33
	CONTRACT NO.

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

B-T-70-71	11-15-60	HW. NO. 2	8-1-63	I-15 NO. 5-B	2-1-63	SD-1-63 (SH. 2, 3 & 4)	11-12-63
B-T-71R	3-2-53	HW. NO. 3	8-1-63	I-15 NO. 6	2-1-63	FSB-1-62 R	1-15-63
DR-1	1-3-58	I-1	11-15-60	I-21-23	3-10-64	AS-1-54 R	7-5-62
F-1	2-1-63	I-8 C.B. 2-2-A & B	2-1-63	L-1	4-1-50		
F-2	2-1-63	I-8 C.B. 2-3 & 2-4	2-1-63	L-3	4-1-50		
F-3	2-1-63	I-8 C.B. NO. 4	2-1-63	L-3-A	4-1-50		
FAGI-1	2-25-64	I-8 C.B. NO. 6	2-1-63	L.J. NO. 1	7-1-55		
FAGI-2	2-25-64	I-8 C.B. NO. 8	2-1-63	RI-1	9-1-64		
G-7.07	4-1-64	I-12	2-1-63	T-35	1-2-56		
HW-6	2-1-63	I-15 NO. 1	11-15-60	T.J.	9-12-60		
HW NO. 1	8-1-63	I-15 NO. 2-A	8-17-60	AR-1-57 R	4-2-62		

SUPPLEMENTAL SPECIFICATIONS

CE-101.04	5-22-56	M-206.1	9-28-62
J-125	R 6-26-61		
T-127	R 1-15-62		
L-120	R 1-2-62		
S-101	7-12-62		
M-107.18	R 4-3-61		
S-307	R 10-1-64		
T-935	10-28-63		

Rev. 6-9-65

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:

DIVISION ENGINEER — DATE

FED. HIGHWAY DIVISION	STATE	PROJECT		SHEET NO.	TOTAL SHEETS
2	OHIO			2	291

LICKING COUNTY
LIC - 70 - 0.33

SCHEMATIC LAYOUT PLAN

SCALE IN FEET 0 500 1000 1500

BEGIN WORK STA. 12+76
STA. 271+92.83 ℄ SURVEY I.R.-70
STA. 20+00.00 ℄ PROP. T.R. 36
BEGIN WORK STA. 69+92.91
BEGIN PROJECT STATION EQUATION
P.I. STA. 127+80.69
BEGIN WORK STA. 139+59
P.I. STA. 126+86.88
N-12°-28'-35"-E
N-50°-09'-20"-E
T-10-7 (27)
T-10-7 (28)-11.2
STA. 249+00.00 BK. = STA. 250+00.00 AHD.
SERVICE ROAD "A"
TOWNSHIP
BRIDGE LIC-70-0035
DRIVE
210'
ROAD
GEORGIAN
BEGIN WORK STA. 37+30
STA. 22+50 ℄ PROP. T.R. 36 = STA. 45+00 GEORGIAN DRIVE
END WORK STA. 27+00
36 7,650'± TO G.R. 41
STA. 284+91.75
END WORK STA. 94+70
P.I. STA. 308+01.36
S-85°-36'-10"-E
P.T. STA. 326+82.68
MEDIAN CROSS-OVER STA. 338+10
SEC. 16 SEC. 15
SEC. 10 SEC. 15
SEC. 10 SEC. 11
SEC. 15 SEC. 14
SEC. 11 SEC. 14
CREEK
ROAD 41
2,000'± TO U.S.R. 40
END WORK STA. 28+50
STA. 20+00.00 ℄ PROP. G.R. - 41 = STA. 354+61.04 ℄ SURVEY I.R.-70
BRIDGE NO. LIC-70-0231
END WORK STA. 3+50
BLUEVIEW DR.
COUNTY
BEGIN WORK STA. 9+75
SYCAMORE
2,500'± TO T.R. 36
MATCH LINE
STA. 375+00

℄ CURVE DATA
P.I. STA. 308+01.36
Δ = 43°-24'-30" RT
Dc = 1°-00'
R = 5,729.58'
T = 2,309.97'
L = 4,390.83'
E = 447.38'

℄ CURVE DATA
P.I. STA. 458+48.92
Δ = 0°-22'-00" LT
Dc = 0°-10'
R = 34,377.47'
T = 110.00'
L = 220.00'
E = 0.18'

T.16 N. R.20 W. | R.19 W. T.17 N.

STA. 375+00
SEC. 11 SEC. 12
SEC. 14 SEC. 13
MATCH LINE
2,600'± TO U.S.R. 40
END WORK STA. 30+00
END WORK STA. 10+00.00
BEGIN WORK STA. 5+25
SERVICE ROAD "B"
SEC. 12 SEC. 13
380 390 400 410 420 430 440 450
S-85°-36'-10"-E
STA. 423+76.63 ℄ SURVEY I.R.70
BRIDGE NO. LIC-70-0367
STA. 20+00.00 ℄ PROP. T.R. 163 = STA. 425+96.00 ℄ SURVEY I.R.70
ROAD
TOWNSHIP
T.R. 36
2,500'± TO I-70
BEGIN WORK STA. 7+00
END WORK STA. 22+61
STA. 20+00.00 ℄ G.R. 38 = STA. 450+44.14 ℄ SURVEY I.R.70
P.C. STA. 457+38.92
P.I. STA. 458+48.92
P.T. STA. 459+56.92
SEC. 12 SEC. 7
SEC. 13 SEC. 18
460 470 480 490 500 520
S-86°-18'-10"-E
MEDIAN CROSS-OVER STA. 450+2.5
BEGIN WORK STA. 10+39
STA. 487+65.25 ℄ SURVEY I.R.70
SERVICE ROAD "C"
END WORK STA. 24+92
BEGIN WORK STA. 0+00
END WORK STA. 43+00
2,750'± TO U.S.R. 40
RAMP E
RAMP
RAMP D
RAMP C
ROUTE 3
STATE
STA. 503+00
I-70-7(28)-11.2
I-70-7(29)-11.7
BRIDGE NO. LIC-70-0484
STA. 25+00.00 ℄ PROP. S.R. 310 = STA. 488+08.01 ℄ SURVEY I.R.70
END PROJECT
END WORK STA. 52.6+60
BEGIN WORK STA. 10+00

S.R. 310 DETOUR
CINA
U.S. 40
℄ SURVEY I.R.70
LICKING COUNTY
FAIRFIELD COUNTY
S.R. 310 DETOUR
SCALE IN MILES 0 1 2 3

STATE ROUTE 310 DETOUR ROUTE
(VIA U.S.R. 40 AND S.R. 158)

NOTE: THIS SYMBOL INDICATES LOCATION OF FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS. SEE GENERAL NOTE ON SHEET NO. 10

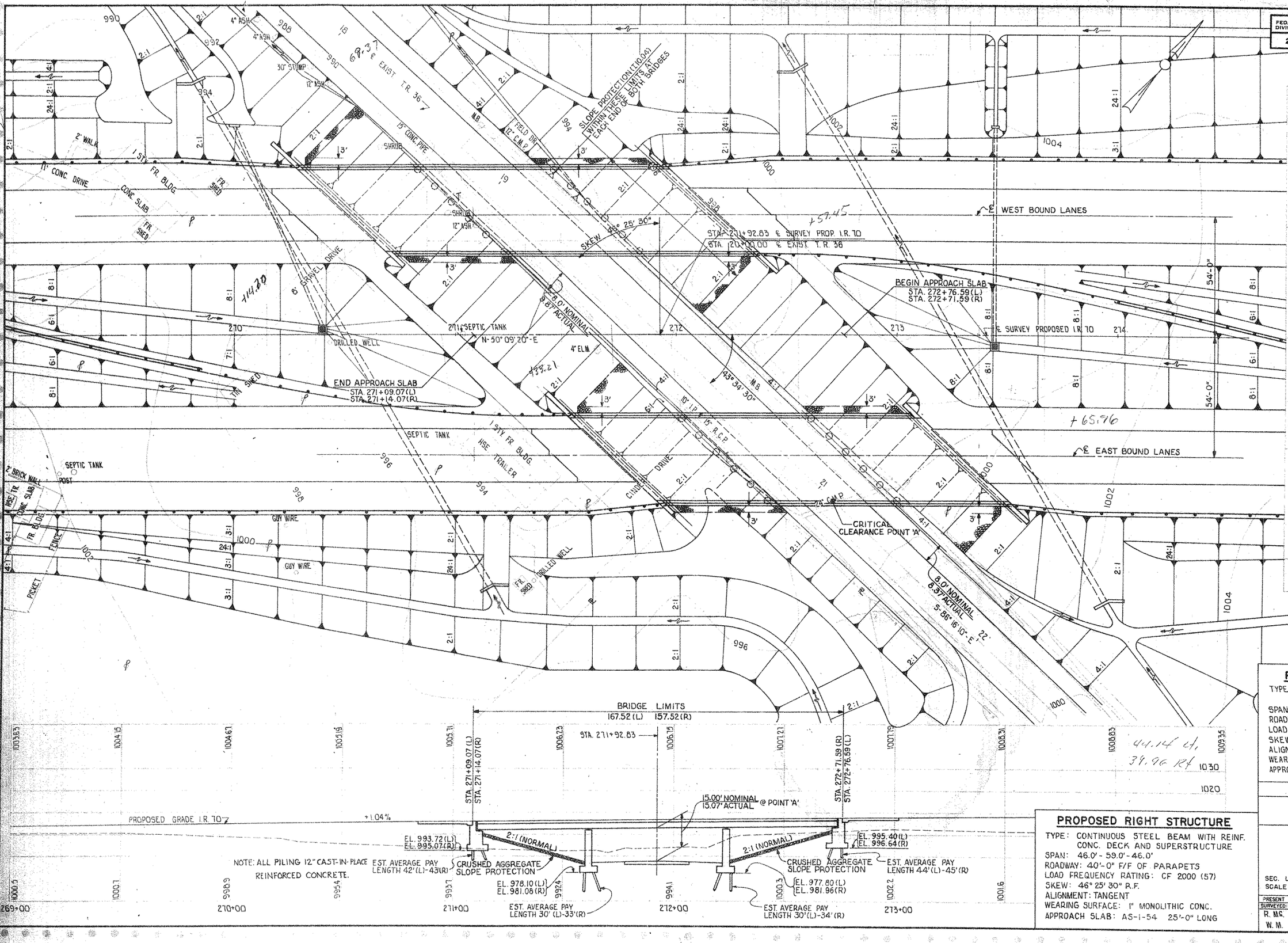
Rev. 6-9-65

SCHEMATIC LAYOUT

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

227
291

LICKING COUNTY
LIC-70-0.33



NOTE: ALL PILING 12" CAST-IN-PLACE REINFORCED CONCRETE.

PROPOSED LEFT STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINF. CONC. DECK AND SUPERSTRUCTURE
SPAN: 49.5'-62.0'-49.5'
ROADWAY: 40'-0" F/F OF PARAPETS
LOAD FREQUENCY RATING: CF 2000 (57)
SKEW: 46° 25' 30" R.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONC.
APPROACH SLAB: AS-1-54 25'-0" LONG

PROPOSED RIGHT STRUCTURE

TYPE: CONTINUOUS STEEL BEAM WITH REINF. CONC. DECK AND SUPERSTRUCTURE
SPAN: 46.0'-59.0'-46.0'
ROADWAY: 40'-0" F/F OF PARAPETS
LOAD FREQUENCY RATING: CF 2000 (57)
SKEW: 46° 25' 30" R.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONC.
APPROACH SLAB: AS-1-54 25'-0" LONG

1975 A.D.T. = P-23,120
C-4,070

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SITE PLAN

BRIDGE NO. LIC-70-0073L&R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

SEC. LIC-70-0.33
SCALE: 1" = 20'

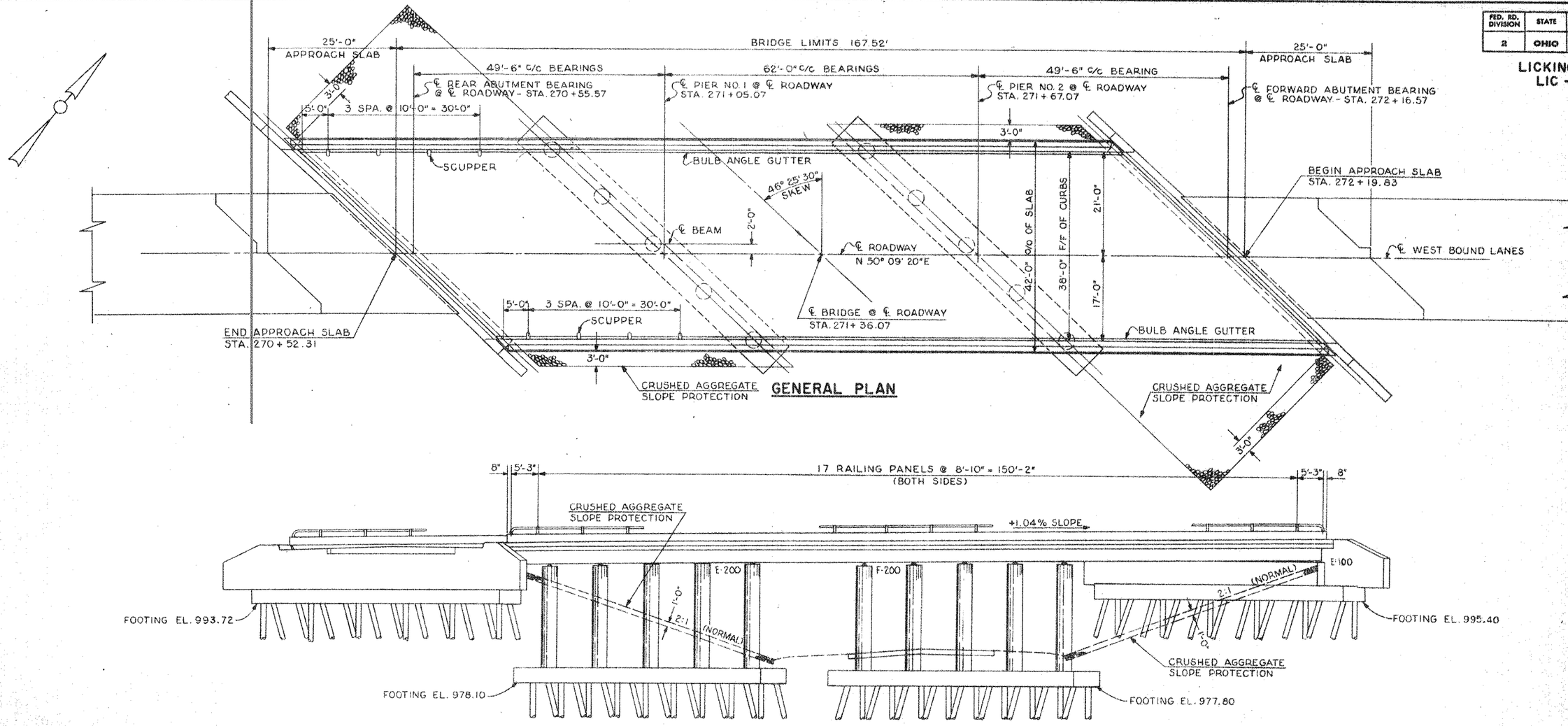
PROPOSED I.R. 70
STA. 271+92.83

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED:	DRAWN:	DESIGNED:	DRAWN:	CHECKED:	REVISED:
R. M.S. W. M.	W.A.C.	W.G.	A.J.M		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

228
291

LICKING COUNTY
LIC-70-0.33



GENERAL PLAN

ELEVATION

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL		
E-2	587	CU. YDS.	UNCLASSIFIED EXCAVATION		306	281			
S-1	213	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	213					
S-1	55	CU. YDS.	CLASS "C" CONCRETE, PIER COLUMNS			55			
S-1	220	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS		220				
S-1	134	CU. YDS.	CLASS "E" CONCRETE, PIER FOOTINGS			134			
S-4	113,612	LBS.	REINFORCING STEEL	61,840	12,657	39,115			
S-7	174,771	LBS.	STRUCTURAL STEEL	174,771					
S-8	174,771	LBS.	FIELD PAINTING OF STRUCTURAL STEEL	174,771					
S-14	320.84	LIN. FT.	RAILING(TYPE 'A' ALUMINUM RAIL & SUPPORTS, & CONC. PARAPET)	320.84					
S-18	2,542	LIN. FT.	12" CAST IN PLACE REINF CONCRETE PILES		1,462	1,080			
S-29	49	CU. YDS.	POROUS BACKFILL		49				
S-29	8	EACH	SCUPPERS INCLUDING SUPPORTS	8					
I-10	762	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION		762				
S-101	213	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	213					
S-29	137	LIN. FT.	6" PERFORATED HELICAL C.M.P M-6.4(h) INCLUDING SPECIALS		137				
S-29	80	LIN. FT.	6" HELICAL C.M.P M-6.4(h) NON-PERFORATED		80				
S-3	17	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		17				

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS AR-1-57 REV. 4-2-62, SD-1-63 SHEETS 2, 3 & 4 DATED 11-12-63, FSB-1-62 REV. 1-15-63, AND SUPPLEMENTAL SPEC. S-101 DATED 7-12-62 & S-307 REV. 10-1-64.

DESIGN SPECIFICATIONS: THESE STRUCTURES CONFORM TO THE REQUIREMENTS OF "DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES" OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS DATED 9-1-57. TOGETHER WITH CURRENT REVISIONS THEREOF.

WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" EXCEPT AS OTHERWISE SHOWN. CLASS "B" WELDS SHOWN THUS B. WELDS SHOWN AS FIELD WELDS MAY, AT THE OPTION OF THE CONTRACTOR, BE MADE IN THE SHOP

HIGH-STRENGTH STEEL BOLTS, NUTS AND WASHERS: UNDER ITEM S-7.10, PARAGRAPH TWO (2), SHALL BE COMPLETELY REVISED AND THE LAST SENTENCE OF PARAGRAPH FOUR (4). REVISED TO READ AS FOLLOWS:

"IN THE FINAL ASSEMBLY OF THE PARTS TO BE BOLTED, DRIFT PINS SHALL BE PLACED IN A SUFFICIENT NUMBER OF HOLES (NOT LESS THEN 25 PERCENT FOR FIELD ERECTION) TO PROVIDE AND MAINTAIN ACCURATE ALIGNMENT OF HOLES AND PARTS, AND SUFFICIENT BOLTS SHALL BE INSTALLED AND BROUGHT TO A SNUG TIGHT CONDITION TO BRING THE PARTS INTO COMPLETE CONTACT. BOLTS SHALL THEN BE INSTALLED IN ANY REMAINING OPEN HOLES AND TIGHTENED TO A SNUG TIGHT FIT, AFTER WHICH ALL BOLTS SHALL BE TIGHTENED COMPLETELY BY CALIBRATED WRENCHES OR BY THE TURN-OF-NUT METHOD. DRIFT PINS SHALL THEN BE REPLACED WITH BOLTS, TIGHTENED IN THE SAME MANNER."

"BOLT LENGTHS DETERMINED BY THE USE OF TABLE NO. 1 SHALL BE ADJUSTED TO THE NEXT 1/4-INCH LENGTH INCREMENT."

PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 36 TONS PER PILE FOR THE ABUTMENTS AND 39 TONS PER PILE FOR THE PIERS.

FIRST TEST PILE: ITEM S-16 IN THE ESTIMATED QUANTITIES FOR LIC-70-0073R MAY BE DRIVEN AT EITHER LIC-70-0073R OR LIC-70-0073L.

STRUCTURAL STEEL: A.S.T.M. A36-BASIC UNIT STRESS 20,000 P.S.I. (A.S.T.M. A7 AND A373 STEEL NOT PERMITTED)

REINFORCING STEEL: A.S.T.M. A15, A16, A160, DEFORMED, INTERMEDIATE OR HARD GRADE BASIC UNIT STRESS 20,000 P.S.I. EXCEPT, SPIRAL REINFORCEMENT MAY BE PLAIN, STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 P.S.I.

DESIGN LOADING: CF 2000 (57)

CONCRETE CLASS "C" - BASIC UNIT STRESS 1,333 P.S.I.

CONCRETE CLASS "E" - BASIC UNIT STRESS 1,133 P.S.I.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

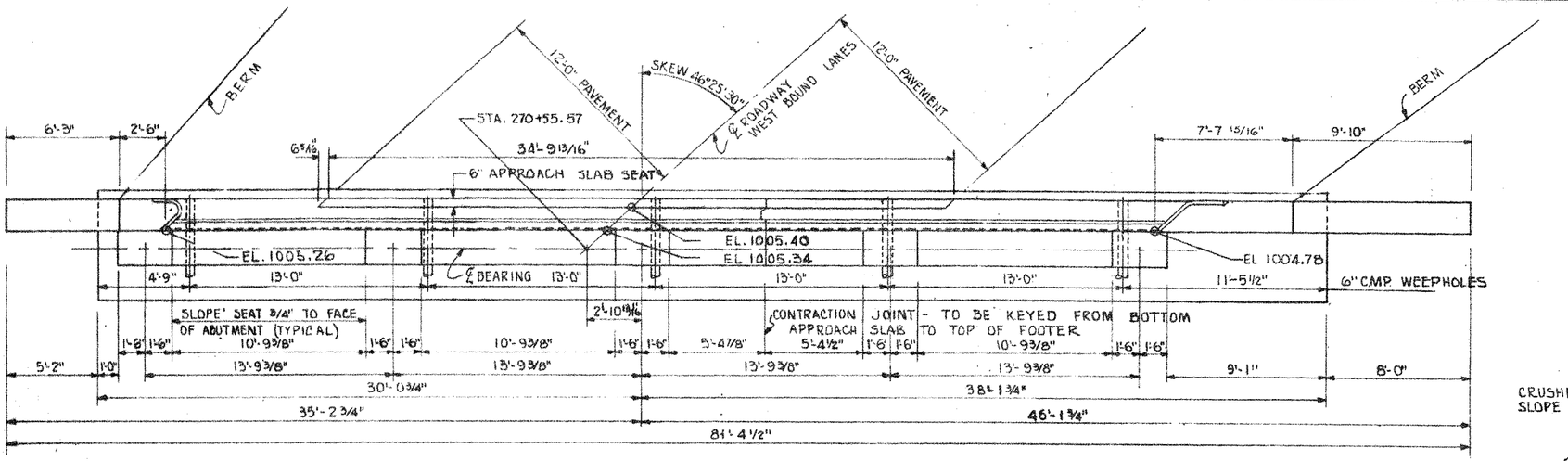
GENERAL PLAN & ESTIMATED QUANTITIES
BRIDGE NO. LIC-70-0073L
PROPOSED I.R. 70 OVER TOWNSHIP ROAD 36
LICKING COUNTY
PROPOSED I.R. 70 STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
	A.J.M.	A.J.M.	W.G.	C.T.L.		

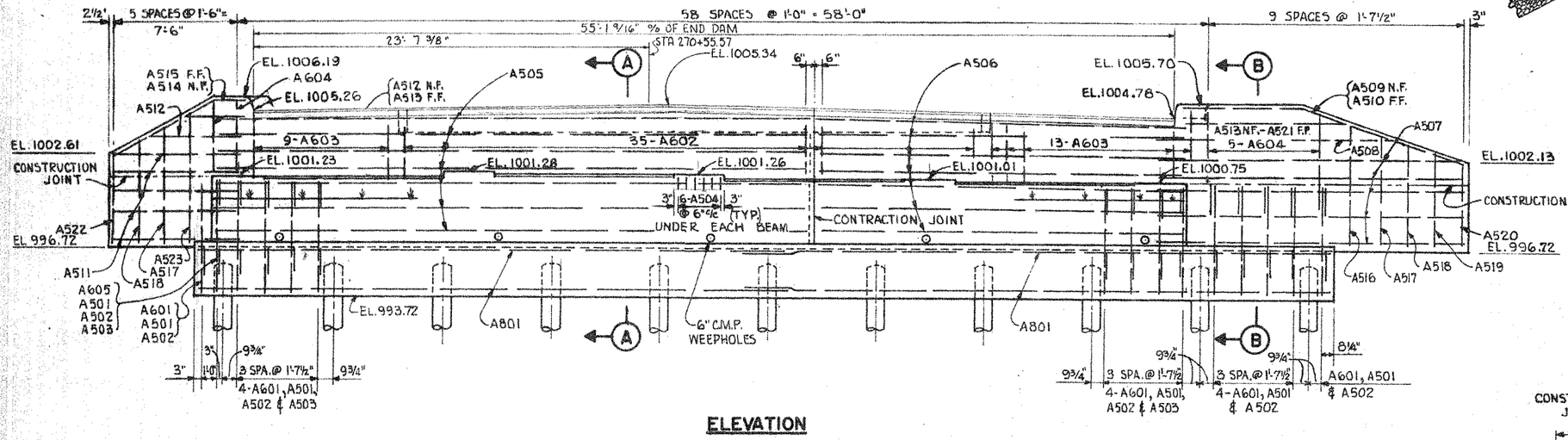
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

229
291

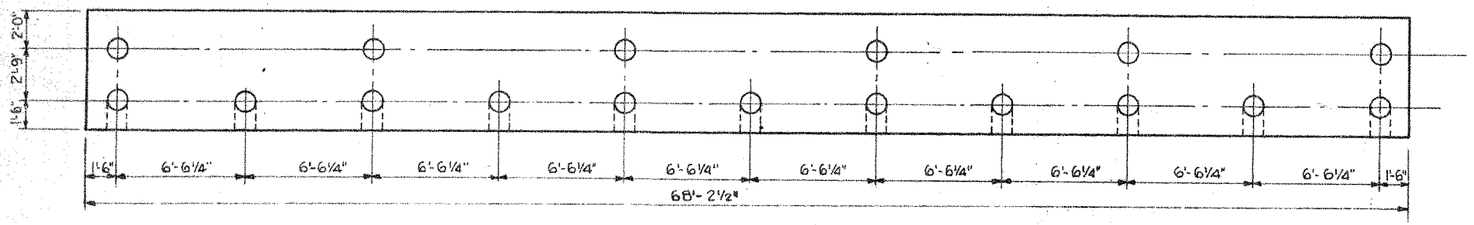
LICKING COUNTY
LIC-70-0.33



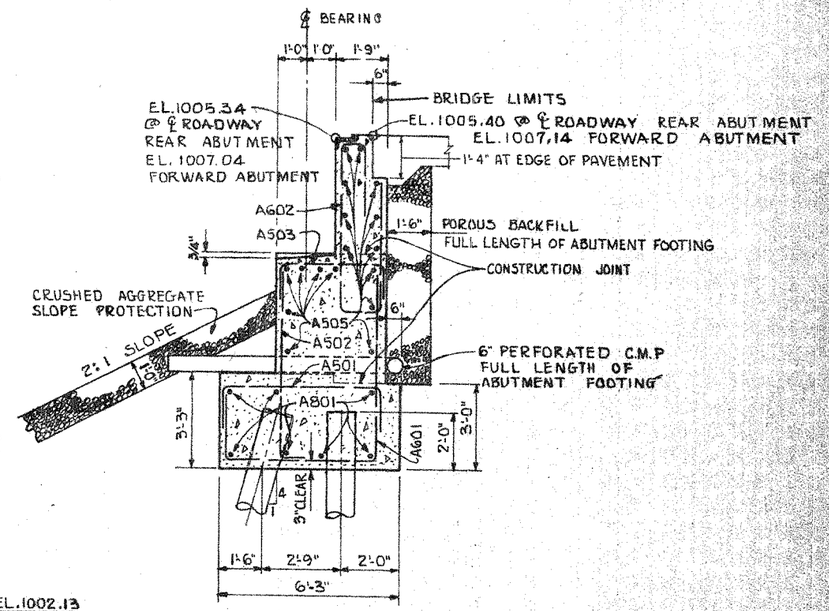
PLAN



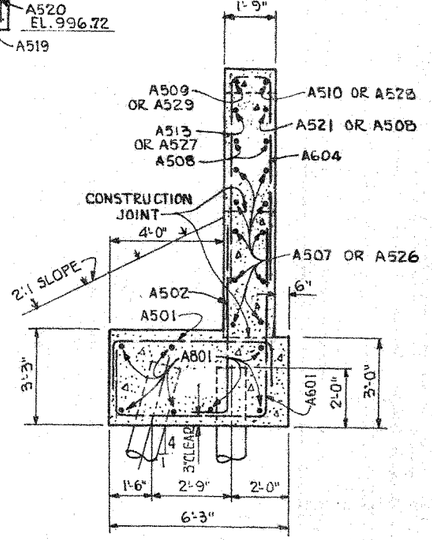
ELEVATION



PILING LAYOUT



SECTION A-A



SECTION B-B

NOTE: SEE SHEET NO. 230 FOR NOTES.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

REAR ABUTMENT DETAILS

LEFT BRIDGE NO. LIC 70-0073L
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36.

LICKING COUNTY

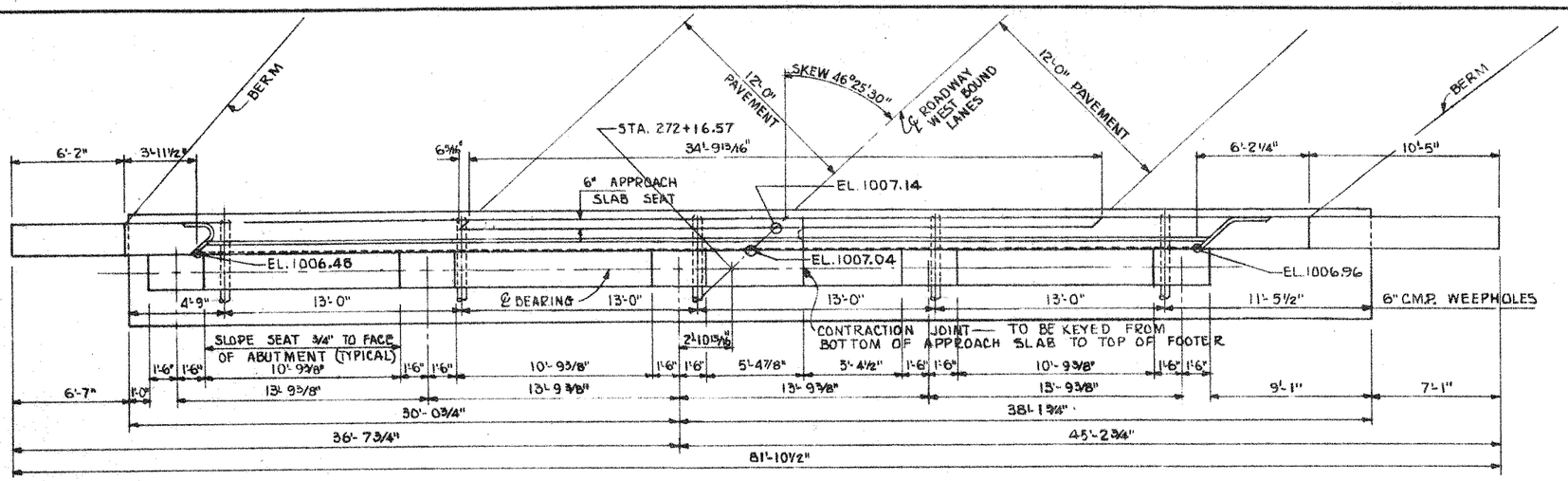
PROPOSED I.R. 70
STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.		

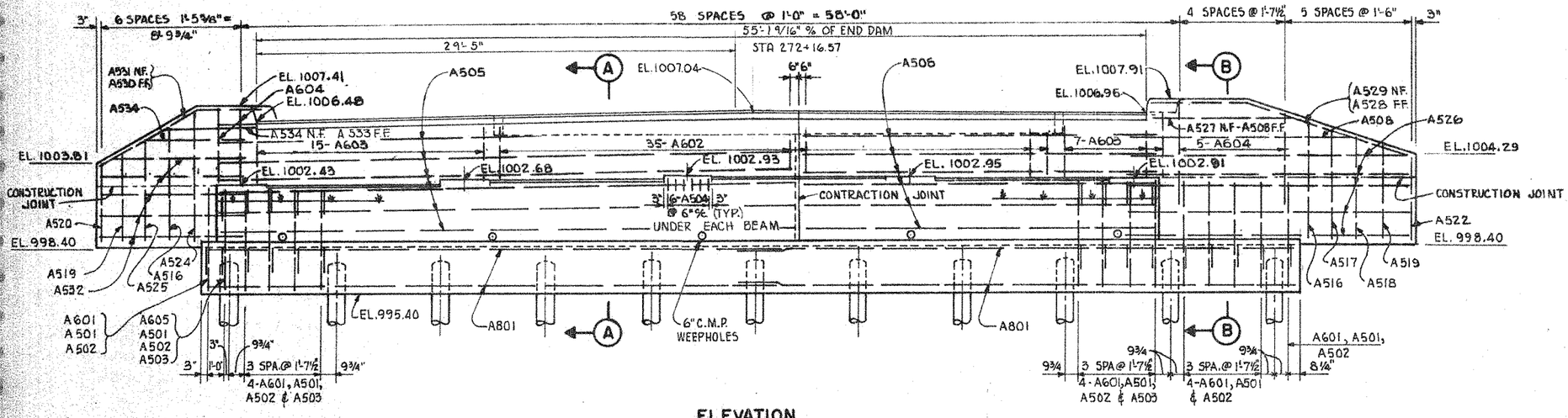
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

230
291

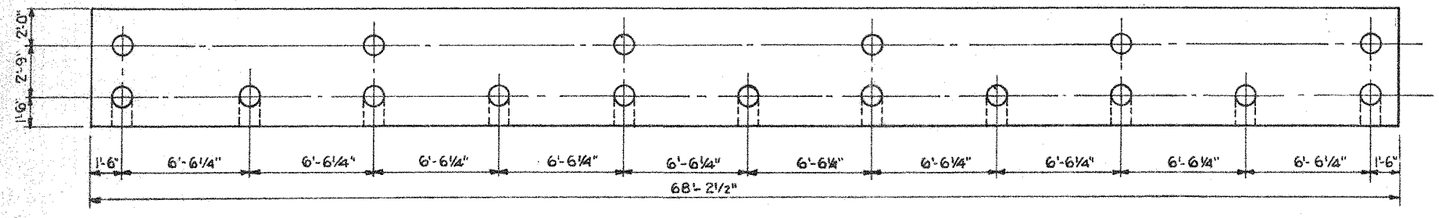
LICKING COUNTY
LIC-70-0.33



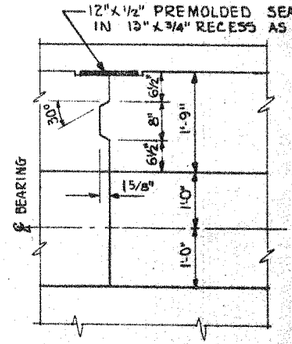
PLAN



ELEVATION



PILING LAYOUT



CONTRACTION JOINT DETAIL

ABUTMENT BEARING PLATE DETAIL

NOTES

1. FOR SECTIONS A-A & B-B SEE SHEET NO. 229.
2. PROCEDURE: EMBANKMENT SHALL BE PLACED AND COMPACTED UP TO THE FINISHED SPILL-THRU SLOPE AND TO THE LEVEL OF THE SUBGRADE AFTER WHICH EXCAVATION FOR THE ABUTMENT SHALL BE MADE.
3. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT
4. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
5. CONCRETE SHALL BE CLASS "E".

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

FORWARD ABUTMENT DETAILS

LEFT BRIDGE NO. LIC 70-0073L
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY

PROPOSED I.R. 70
STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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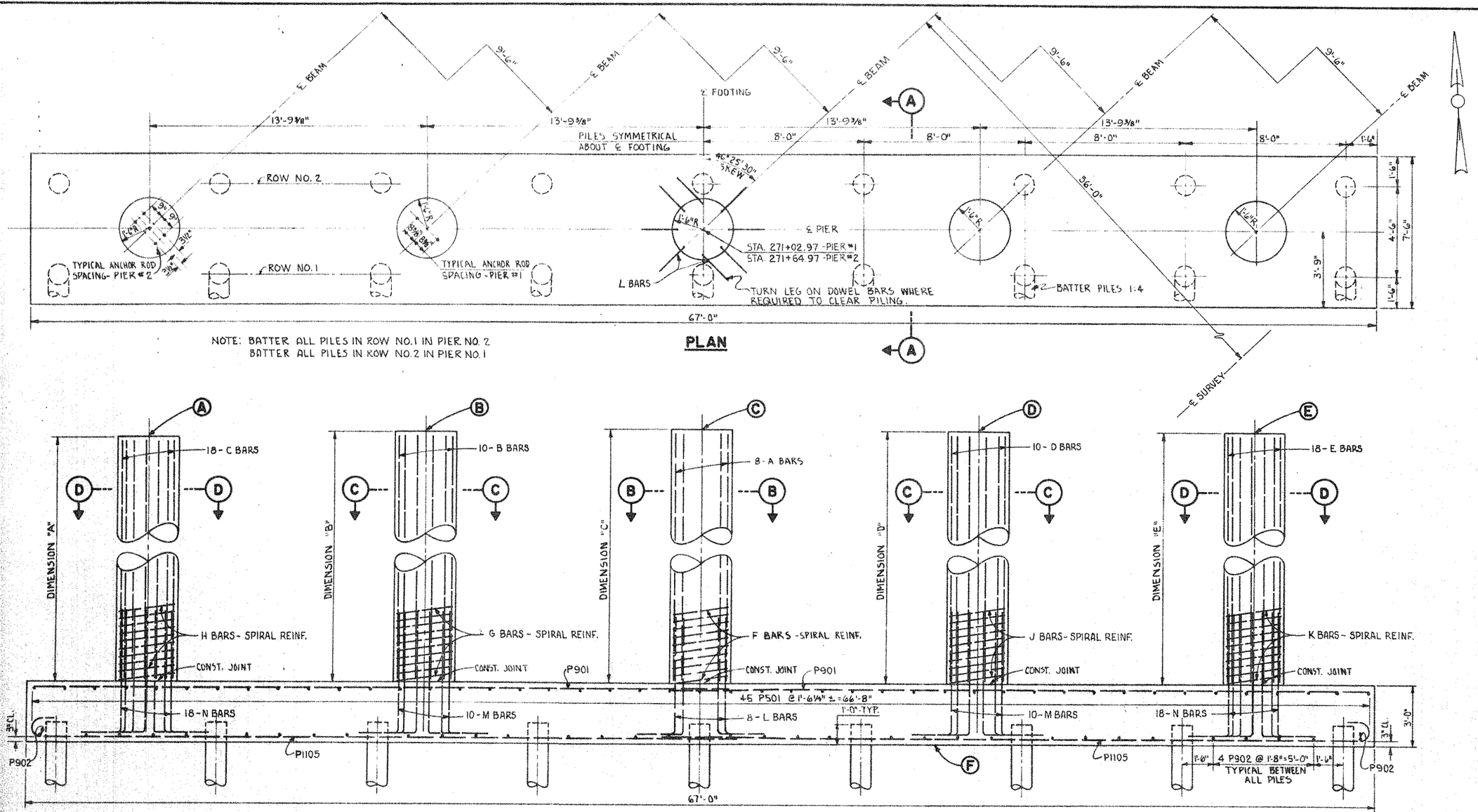
291

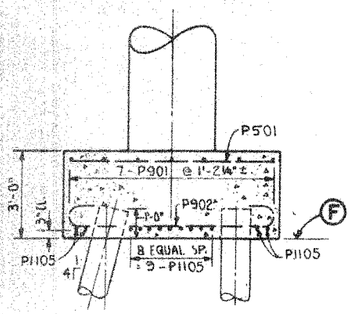
LICKING COUNTY
LIC - 70 - 0.33



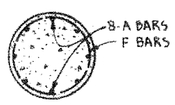
NOTE: BATTER ALL PILES IN ROW NO.1 IN PIER NO. 2
BATTER ALL PILES IN ROW NO.2 IN PIER NO.1

PLAN

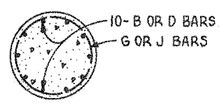
ELEVATION



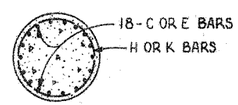
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

	PIER #1	PIER #2
ELEV. Ⓐ	1001.23	1001.58
ELEV. Ⓑ	1001.48	1001.83
ELEV. Ⓒ	1001.73	1002.08
ELEV. Ⓓ	1001.75	1002.10
ELEV. Ⓔ	1001.70	1002.06
ELEV. Ⓕ	978.10	977.80
DIM. "A"	20'-1 9/16"	20'-9 3/8"
DIM. "B"	20'-4 9/16"	21'-0 3/8"
DIM. "C"	20'-7 9/16"	21'-3 3/8"
DIM. "D"	20'-7 13/16"	21'-4 5/8"
DIM. "E"	20'-7 3/16"	21'-3 1/8"
A BARS	P1001	P1003
B BARS	P1101	P1106
C BARS	P1102	P1107
D BARS	P1103	P1108
E BARS	P1103	P1109
F BARS	SP401	SP404
G BARS	SP402	SP405
H BARS	SP403	SP406
J BARS	SP401	SP407
K BARS	SP401	SP404
L BARS	P1002	P1002
M BARS	P1104	P1104
N BARS	P1104	P1104

NOTES

ALL REINFORCING STEEL SHALL BE 2" CLEAR EXCEPT WHERE OTHERWISE SHOWN.

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER COLUMNS SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER COLUMNS SHALL BE CLASS "C" CONCRETE.
PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIER DETAILS

LEFT BRIDGE NO. LIC - 70 - 0073 L
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY — PROPOSED I.R. 70 STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	APPROVED:
W.G.	W.E.P.	W.E.P.	W.G.	C.T.L.		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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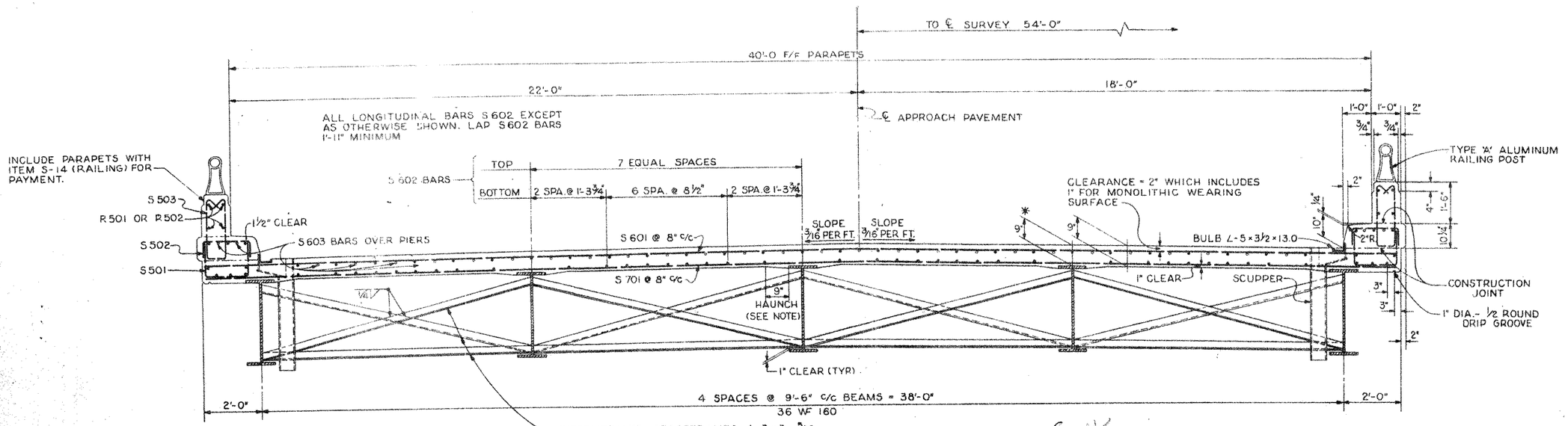
291

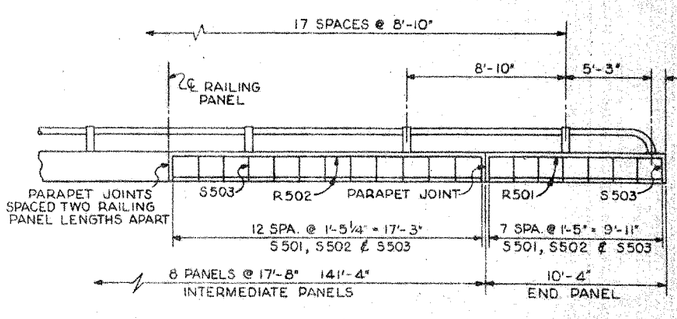
LICKING COUNTY
LIC-70-0.33



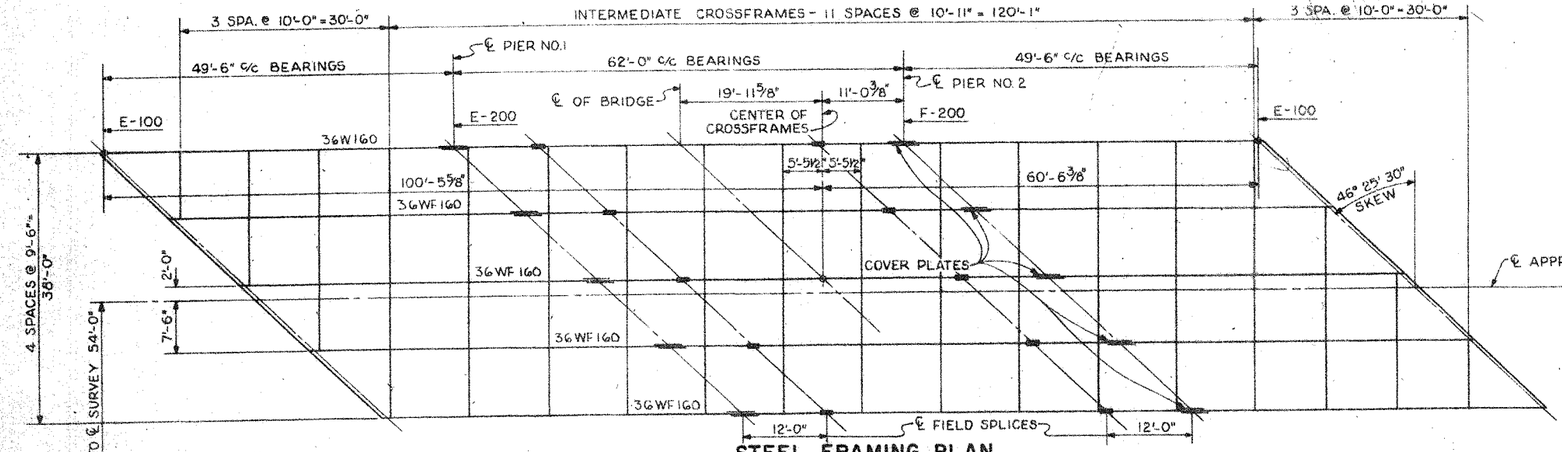
* THIS IS THE NOMINAL DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.

TRANSVERSE SECTION

Saves as 61124
TAM-70



STEEL PLACEMENT DIAGRAM FOR PARAPET



STEEL FRAMING PLAN

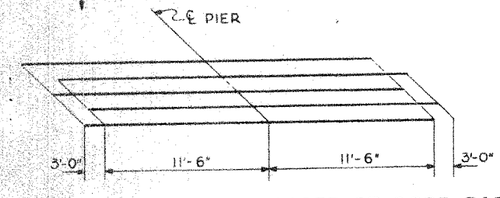
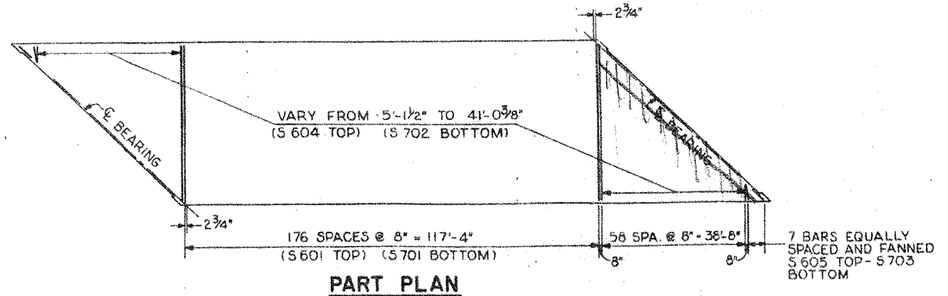


DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS



PART PLAN

SHOWING PLACEMENT OF TRANSVERSE REINFORCING STEEL

NOTES

FIXED AND SLIDING BEARINGS SHALL BE E-100 AT THE ABUTMENTS, E-200 AT PIER NO.1 AND F-200 AT PIER NO. 2.
FOR DETAILS SEE STANDARD DRAWING FSB-1-62, REVISED 1-15-63.

FOR DETAIL OF END CROSSFRAME, END FINISH, CURB PLATES, SCUPPERS, ALUMINUM RAILING, BEAM CUT OFF AT BACK WALL AND WELDED BUTT JOINT IN SUPERSTRUCTURE END FINISH ANGLES AT CENTERLINE ROADWAY, SEE STANDARD DRAWINGS SD-1-63 AND AR-1-57, REVISED 4-2-62.

CONCRETE DECK PLACING: IN ORDER TO FAGILITATE WATER CURING OF THE CONCRETE OF THE DECK SLAB, THE PLACING OF THE CONCRETE SHALL PROGRESS UPGRADE. THE SLAB MAY BE PLACED IN SECTIONS BETWEEN TRANSVERSE CONSTRUCTION JOINTS WHICH ARE PARALLEL TO TRANSVERSE REINFORCING STEEL AND ARE LOCATED NEAR THE CENTER OF ANY SPAN.

MACHINE FINISH: THE CONCRETE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.

DECK SLAB HAUNCH: THE HAUNCH IN THE DECK SLAB ADJACENT TO THE TOP OF STEEL BEAMS, WHICH IS SHOWN AS 9" WIDE, MAY VARY FROM THIS DIMENSION BETWEEN THE LIMITS OF 6" AND 12" EXCEPT THAT THE MAXIMUM SLOPE SHALL NOT EXCEED 3" PER FOOT. PAYMENT FOR DECK SLAB CONCRETE SHALL BE BASED ON THE 9" WIDTH.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

LEFT BRIDGE NO. LIC-70-0073L
PROPOSED I.R.70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY

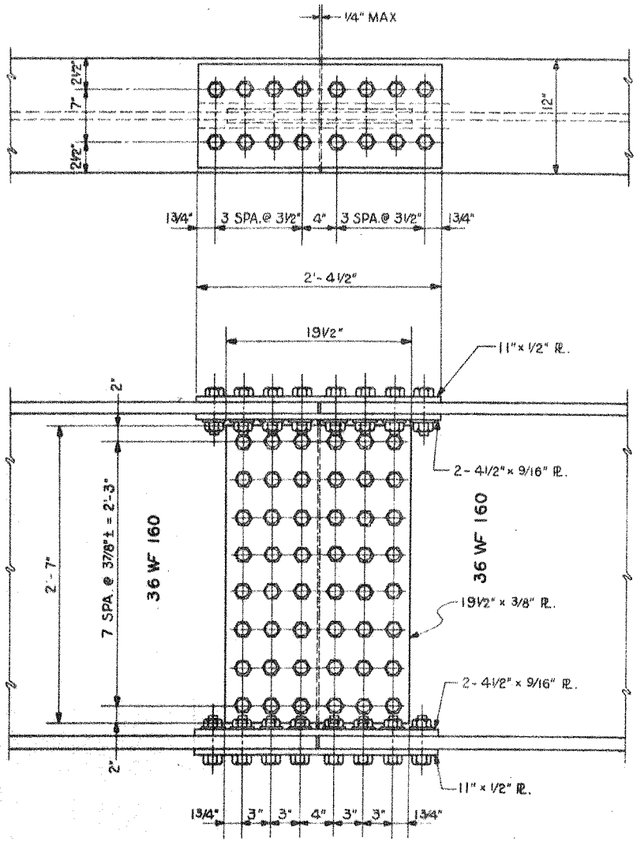
PROPOSED I.R.70
STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	A.J.M.	A.J.M.	W.G.	C.T.L.		

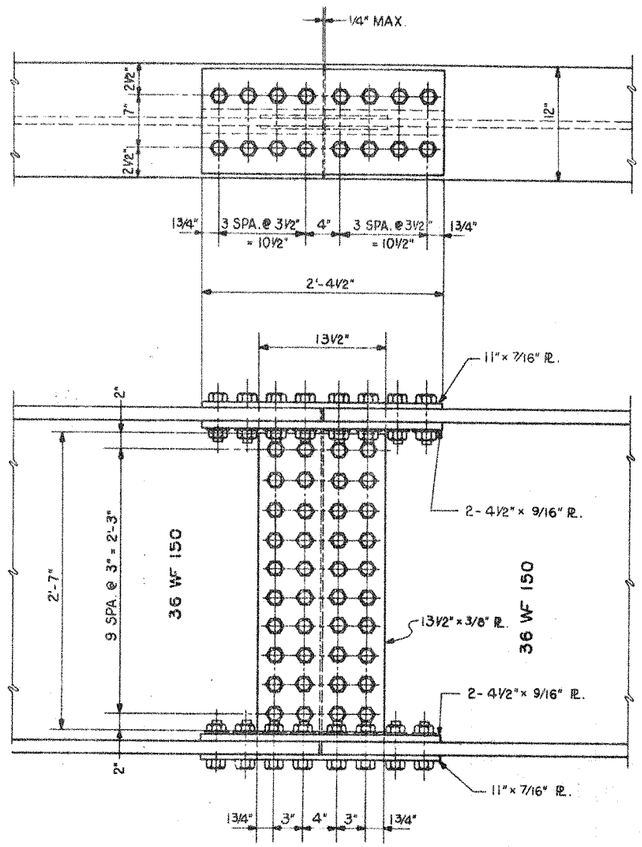
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

235
291

LICKING COUNTY
LIC-70-0.33



BOLTED FIELD SPLICE DETAIL
LEFT BRIDGE

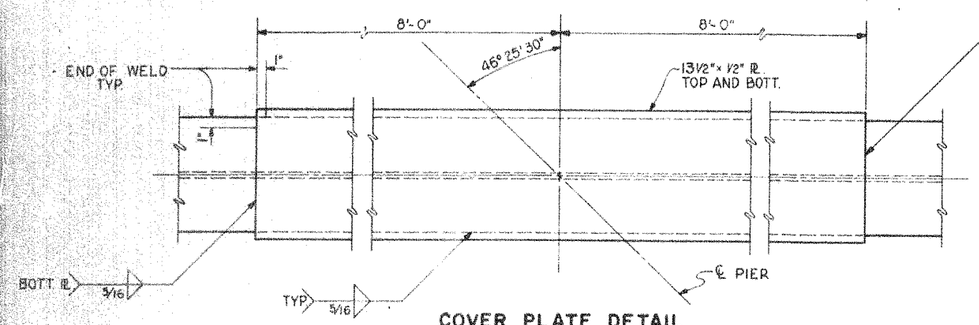


BOLTED FIELD SPLICE DETAIL
RIGHT BRIDGE

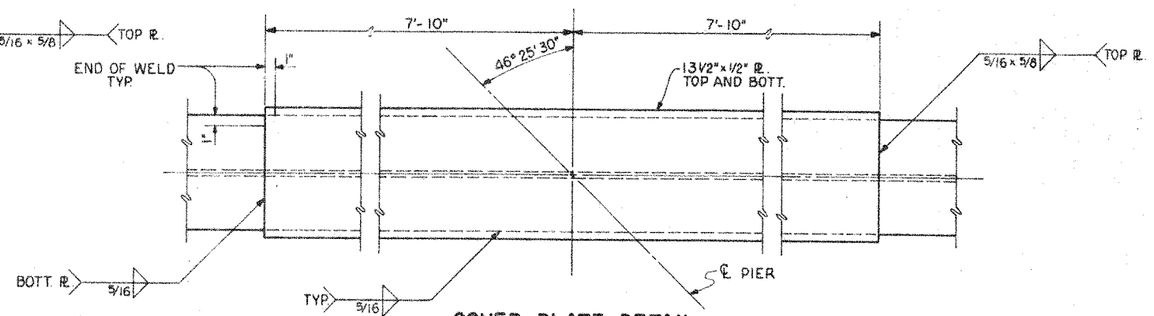
DEFLECTION & CAMBER		
LOCATION	ALL BEAMS	
	MIDDLE SPANS	END SPANS
DEFLECTION DUE TO WEIGHT OF STEEL	1/32"	1/32"
DEFLECTION DUE TO REMAINING DEAD LOAD	9/32"	9/32"
CONVEXITY REQUIRED FOR VERTICAL CURVE	0	0
SUM OF DEFLECTION AND CONVEXITY	5/16"	5/16"
REQUIRED CAMBER	0	0

NOTES

BOLTS SHALL BE 1 INCH DIAMETER, HIGH STRENGTH.
PLACE BOLT HEAD ON EXPOSED SIDE OF FASCIA BEAMS.
PLACE NUTS ON TOP SURFACE OF LOWER FLANGE SPLICE.



COVER PLATE DETAIL
LEFT BRIDGE



COVER PLATE DETAIL
RIGHT BRIDGE

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. LIC-70-0073 L&R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

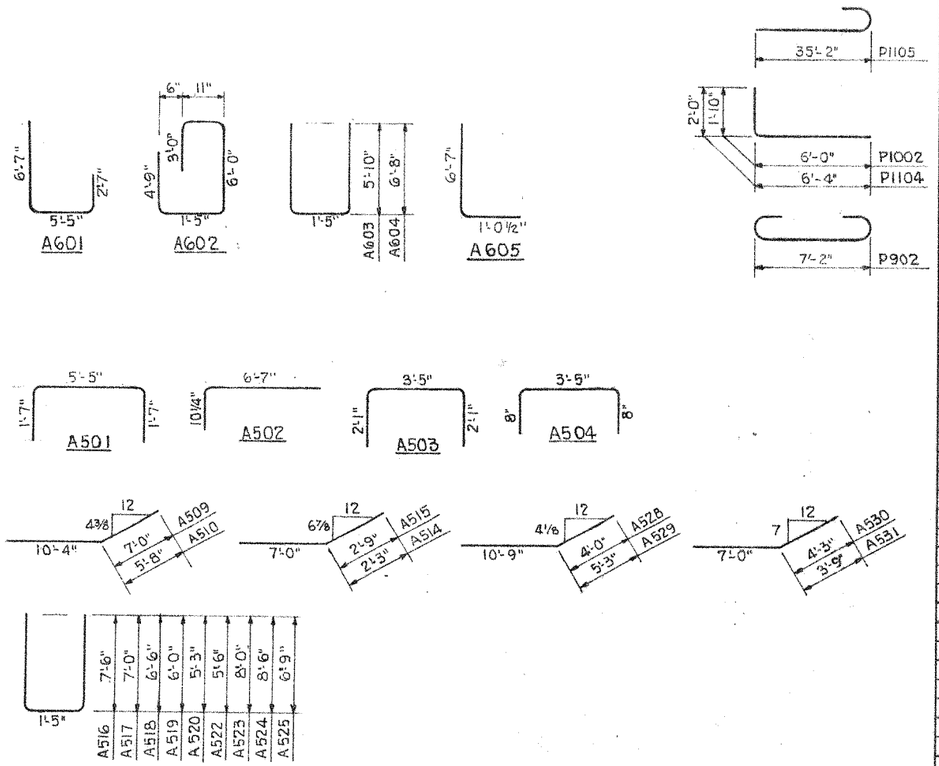
LICKING COUNTY
PROPOSED I.R. 70
STA. 271+92.83

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
W.G.	A.J.M.	A.J.M.	W.G.	C.T.L.		

STEEL LIST

MARK	NO.	LENGTH	WEIGHT	SHAPE
ABUTMENTS				
A801	28	35'-2"	2629	S
A601	84	14'-3"	1798	B
A602	70	15'-5"	1621	B
A603	44	12'-9"	843	B
A604	14	14'-5"	303	B
A605	2	7'-6"	23	B
A501	86	8'-5"	755	B
A502	86	7'-4	658	B
A503	74	7'-5"	572	B
A504	60	4'-6"	282	B
A505	34	35'-8"	1265	S
A506	34	21'-10"	774	S
A507	10	18'-8"	195	S
A508	5	14'-1"	73	S
A509	1	17'-4"	18	B
A510	1	16'-0"	17	B
A511	10	7'-9"	81	S
A512	3	5'-6"	17	S
A513	2	12'-6"	26	S
A514	1	9'-3"	10	B
A515	1	9'-9"	10	B
A516	3	16'-3"	51	B
A517	3	15'-3"	48	B
A518	3	14'-3"	45	B
A519	3	13'-3"	42	B
A520	2	11'-9"	25	B
A521	1	21'-0"	22	S
A522	2	12'-3"	26	B
A523	1	17'-3"	18	B
A524	1	18'-3"	19	B
A525	1	14'-9"	15	B
A526	10	17'-7"	183	S
A527	1	10'-0"	10	S
A528	1	14'-9"	15	B
A529	1	16'-0"	17	B
A530	1	11'-3"	12	B
A531	1	10'-9"	11	B
A532	10	9'-0"	94	S
A533	1	20'-0"	21	S
A534	3	6'-0"	19	S

BENDING DIAGRAM



✳ - 2 SERIES OF 59

✳ ✳ VARIES FROM 5'-11½" TO 41'-03⅜"

MARK	NO.	LENGTH	WEIGHT	SHAPE
PIERS				
P1101	10	20'-2"	1071	S
P1102	18	19'-11"	1905	S
P1103	28	20'-5"	3037	S
P1104	112	8'-0"	4760	B
P1105	52	36'-9"	10153	B
P1106	10	20'-10"	1107	S
P1107	18	20'-7"	1968	S
P1108	10	21'-2"	1125	S
P1109	18	21'-1"	2016	S
P1001	8	20'-5"	703	S
P1002	16	7'-7"	520	B
P1003	8	21'-1"	729	S
P901	28	34'-9"	3308	S
P902	68	9'-8"	2235	B
P501	90	7'-2"	672	S
RAILING				
R501	16	10'-0"	INCLUDE WITH RAILING FOR PAYMENT	S
R502	64	17'-4"		S
SUPERSTRUCTURE				
S701	177	41'-8"	15075	S
S702	✳	✳✳	5567	S
S703	14	5'-3"	150	S
S601	177	41'-8"	11077	S
S602	395	34'-0"	20172	S
S603	60	26'-0"	2343	S
S604	✳	✳✳	4090	S
S605	14	5'-3"	111	S
S501	240	4'-11"	1231	B
S502	240	2'-6"	626	B
S503	240	5'-7"	1398	B
REPLACEMENT BARS				
RE1101	2	7'-7"		S
RE1001	1	7'-3"		S
RE901	1	6'-10"		S
RE801	1	6'-6"		S
RE701	1	6'-3"		S
RE601	3	5'-11"		S
RE501	1	5'-7"		S
RE401	1	5'-3"		B

SPIRAL REINFORCING LIST

MARK	NO.	CORE DIA. % SPIRAL	LENGTH	PITCH	NO. OF TURNS	WEIGHT
SP401	3	32"	20'-5"	4½"	57	1125
SP402	1	32"	20'-2"	4½"	57	375
SP403	1	32"	19'-11"	4½"	56	368
SP404	2	32"	21'-1"	4½"	59	776
SP405	1	32"	20'-10"	4½"	59	387
SP406	1	32"	20'-7"	4½"	58	381
SP407	1	32"	21'-2"	4½	59	388

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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291

LICKING COUNTY
LIC-70-0.33

SPIRAL REINFORCING BARS

THE "LENGTH" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE DISTANCE FROM THE TOP OF THE FOOTING TO THE TOP OF THE COLUMN, LESS 2".

THE "NUMBER OF TURNS" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE "LENGTH" DIVIDED BY THE PITCH, PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS) EXPRESSED AS THE NEAREST WHOLE NUMBER.

SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM S-4.

1-1/2 CLOSED COILS SHALL BE PROVIDED AT THE ENDS OF EACH SPIRAL UNIT.

FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.68 LB. PER LIN. FT. OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS, BASED ON 0.68 LB. PER LIN. FT. WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS.

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

REINFORCING STEEL LIST
LEFT BRIDGE NO. LIC 70-0073 L
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY

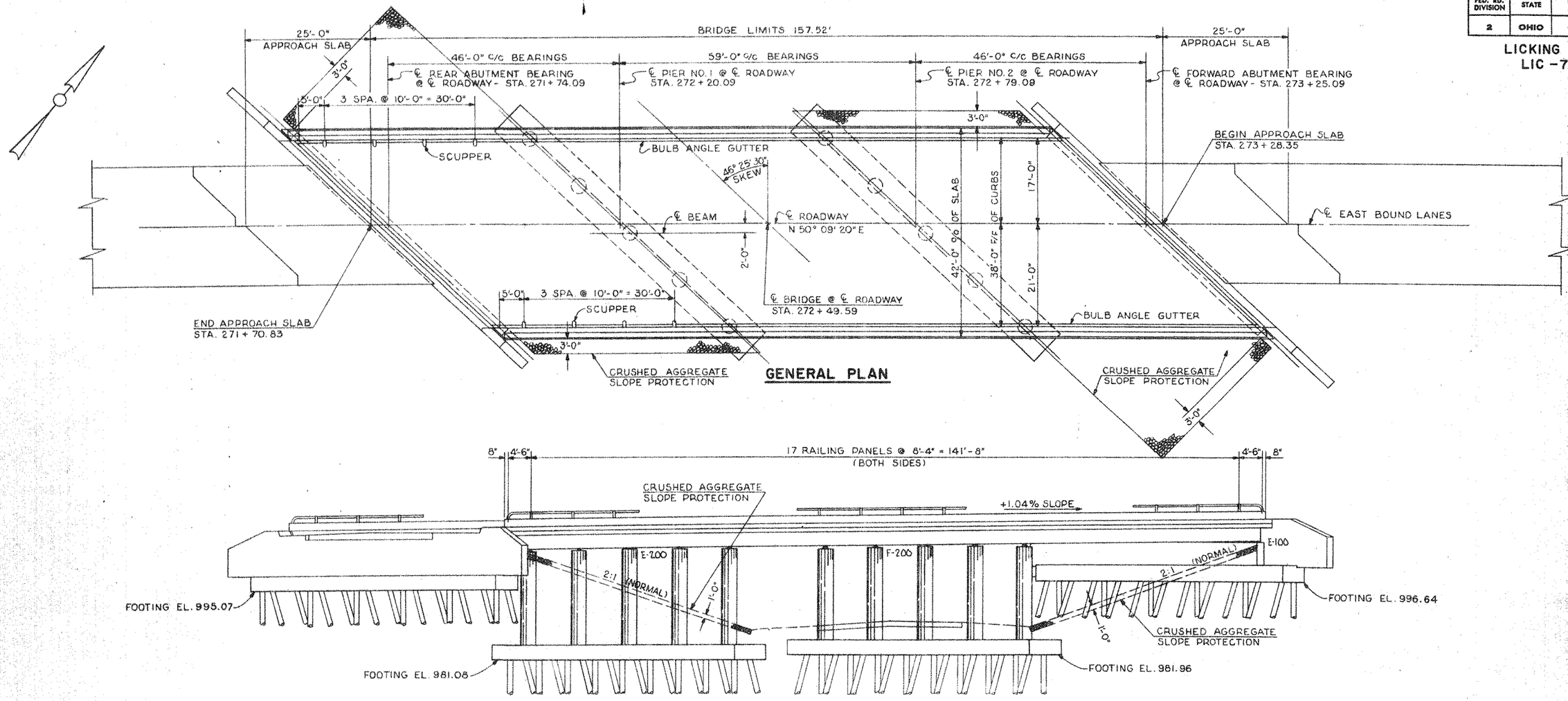
PROPOSED I.R. 70
STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
	H.W.S.	H.W.S.	W.G.	C.T.L.		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

235/291

LICKING COUNTY
LIC-70-0.33



ELEVATION

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS AR-1-57 REV. 4-2-62, SD-1-63 SHEETS 2,3 & 4 DATED 11-12-63, FSB-1-62 REV. 1-15-63, AND SUPPLEMENTAL SPEC. S-101 DATED 7-12-62 & S-307 REV. 10-1-64.

DESIGN SPECIFICATIONS: THESE STRUCTURES CONFORM TO THE REQUIREMENTS OF "DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES" OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS DATED 9-1-57. TOGETHER WITH CURRENT REVISIONS THEREOF.

WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" EXCEPT AS OTHERWISE SHOWN. CLASS "B" WELDS SHOWN THUS B. WELDS SHOWN AS FIELD WELDS MAY, AT THE OPTION OF THE CONTRACTOR, BE MADE IN THE SHOP.

HIGH-STRENGTH STEEL BOLTS, NUTS AND WASHERS: UNDER ITEM S-7.10, PARAGRAPH TWO (2), SHALL BE COMPLETELY REVISED AND THE LAST SENTENCE OF PARAGRAPH FOUR (4). REVISED TO READ AS FOLLOWS:

"IN THE FINAL ASSEMBLY OF THE PARTS TO BE BOLTED, DRIFT PINS SHALL BE PLACED IN A SUFFICIENT NUMBER OF HOLES (NOT LESS THEN 25 PERCENT FOR FIELD ERECTION) TO PROVIDE AND MAINTAIN ACCURATE ALIGNMENT OF HOLES AND PARTS, AND SUFFICIENT BOLTS SHALL BE INSTALLED AND BROUGHT TO A SNUG TIGHT CONDITION TO BRING THE PARTS INTO COMPLETE CONTACT. BOLTS SHALL THEN BE INSTALLED IN ANY REMAINING OPEN HOLES AND TIGHTENED TO A SNUG TIGHT FIT, AFTER WHICH ALL BOLTS SHALL BE TIGHTENED COMPLETELY BY CALIBRATED WRENCHES OR BY THE TURN-OF-NUT METHOD. DRIFT PINS SHALL THEN BE REPLACED WITH BOLTS, TIGHTENED IN THE SAME MANNER."

"BOLT LENGTHS DETERMINED BY THE USE OF TABLE NO. I SHALL BE ADJUSTED TO THE NEXT 1/4-INCH LENGTH INCREMENT."

PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 36 TONS PER PILE FOR THE ABUTMENTS AND 35 TONS PER PILE FOR THE PIERS.

FIRST TEST PILE: PAYMENT WILL BE MADE FOR ONLY ONE FIRST TEST PILE, ITEM S-16. IT MAY BE DRIVEN AT EITHER LIC-70-0073R OR LIC-70-0073L.

STRUCTURAL STEEL: A.S.T.M. A36-BASIC UNIT STRESS 20,000 P.S.I. (A.S.T.M. A7 AND A373 STEEL NOT PERMITTED.)

REINFORCING STEEL: A.S.T.M. A15, A16, A160, DEFORMED, INTERMEDIATE OR HARD GRADE BASIC UNIT STRESS 20,000 P.S.I. EXCEPT. SPIRAL REINFORCEMENT MAY BE PLAIN, STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 P.S.I.

DESIGN LOADING: CF 2000 (57)

CONCRETE CLASS "C" - BASIC UNIT STRESS 1,333 P.S.I.

CONCRETE CLASS "E" - BASIC UNIT STRESS 1,133 P.S.I.

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL		
E-2	587	CU. YDS.	UNCLASSIFIED EXCAVATION		306	281			
S-1	200	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	200					
S-1	48	CU. YDS.	CLASS "C" CONCRETE, PIER COLUMNS			48			
S-1	221	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS		221				
S-1	134	CU. YDS.	CLASS "E" CONCRETE, PIER FOOTINGS			134			
S-4	107,309	LBS.	REINFORCING STEEL	57,984	12,715	36,610			
S-7	157,356	LBS.	STRUCTURAL STEEL	157,356					
S-8	157,356	LBS.	FIELD PAINTING OF STRUCTURAL STEEL	157,356					
S-14	301.34	LIN. FT.	RAILING (TYPE 'A' ALUMINUM RAIL & SUPPORTS, & CONC. PARAPET)	301.34					
S-16	LUMP	SUM	FIRST TEST PILE				LUMP		
S-18	2,702	LIN. FT.	12" CAST-IN-PLACE REINF. CONCRETE PILES		1,496	1,206			
S-29	49	CU. YDS.	POROUS BACKFILL		49				
S-29	8	EACH	SCUPPERS INCLUDING SUPPORTS	8					
I-10	681	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION		681				
S-101	200	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	200					
S-29	137	LIN. FT.	6" PERFORATED HELICAL C.M.P. M-6.4(h) INCLUDING SPECIALS		137				
S-29	80	LIN. FT.	6" HELICAL C.M.P. M-6.4(h) NON-PERFORATED		80				
S-3	17	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		17				

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

GENERAL PLAN & ESTIMATED QUANTITIES

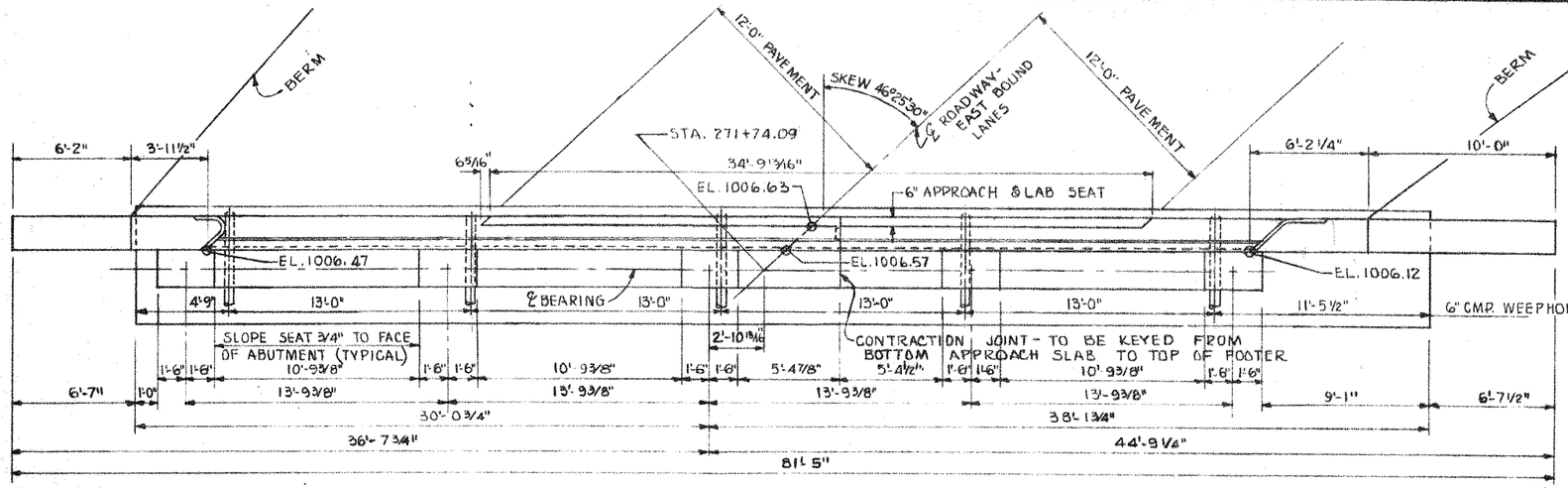
BRIDGE NO. LIC-70-0073R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36
LICKING COUNTY
PROPOSED I.R. 70 STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
	A.J.M.	A.J.M.	W.G.	C.T.L.		

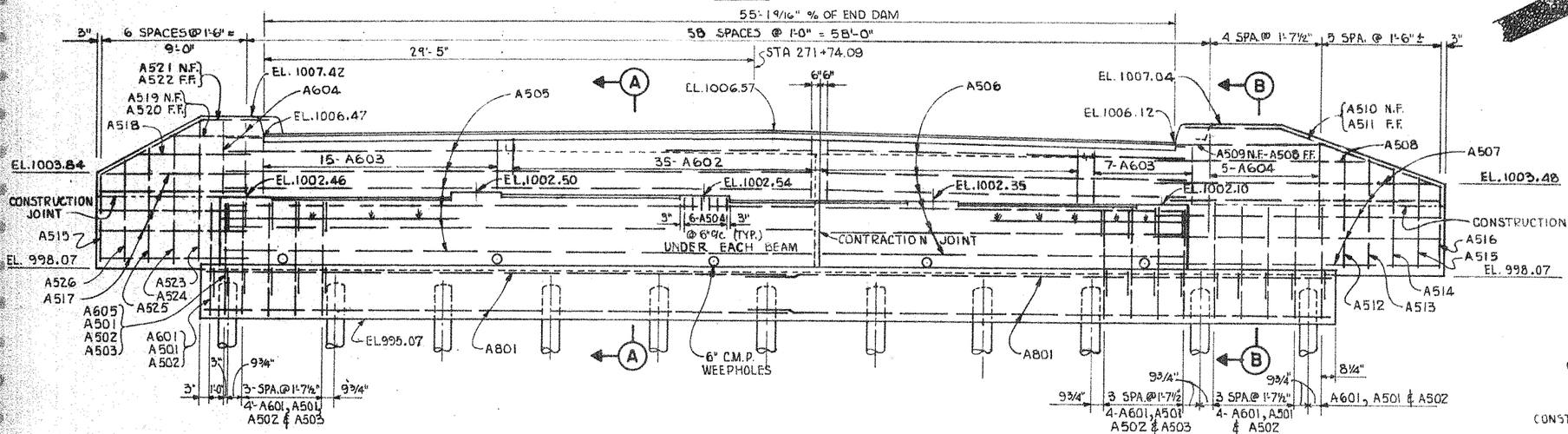
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

236
291

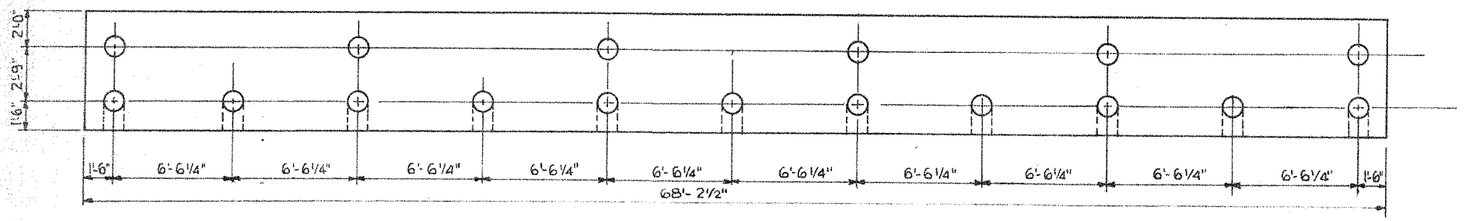
LICKING COUNTY
LIC - 70 - 0.33



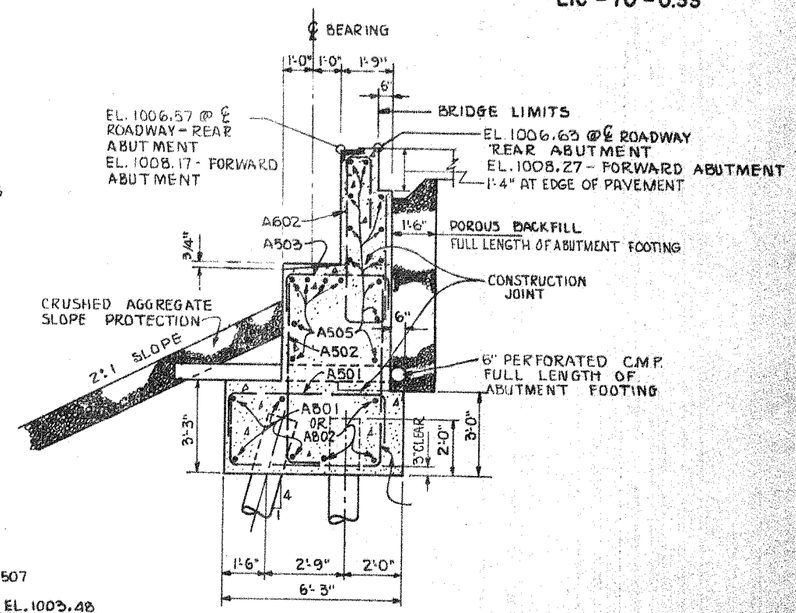
PLAN



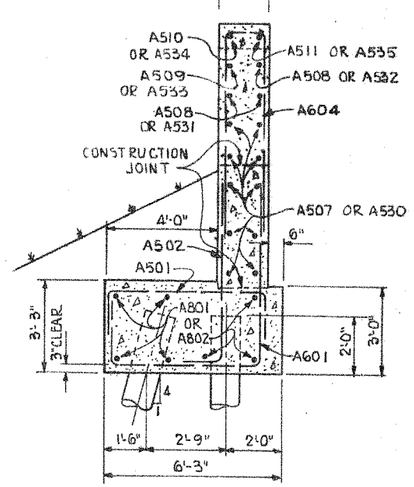
ELEVATION



PILING LAYOUT



SECTION A-A



SECTION B-B

NOTE : SEE SHEET NO. 237 FOR NOTES.

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CONSULTING ENGINEERS
COLUMBUS, OHIO

REAR ABUTMENT DETAILS

RIGHT BRIDGE NO. LIC 70-0073 R
PROPOSED I. R. 70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY

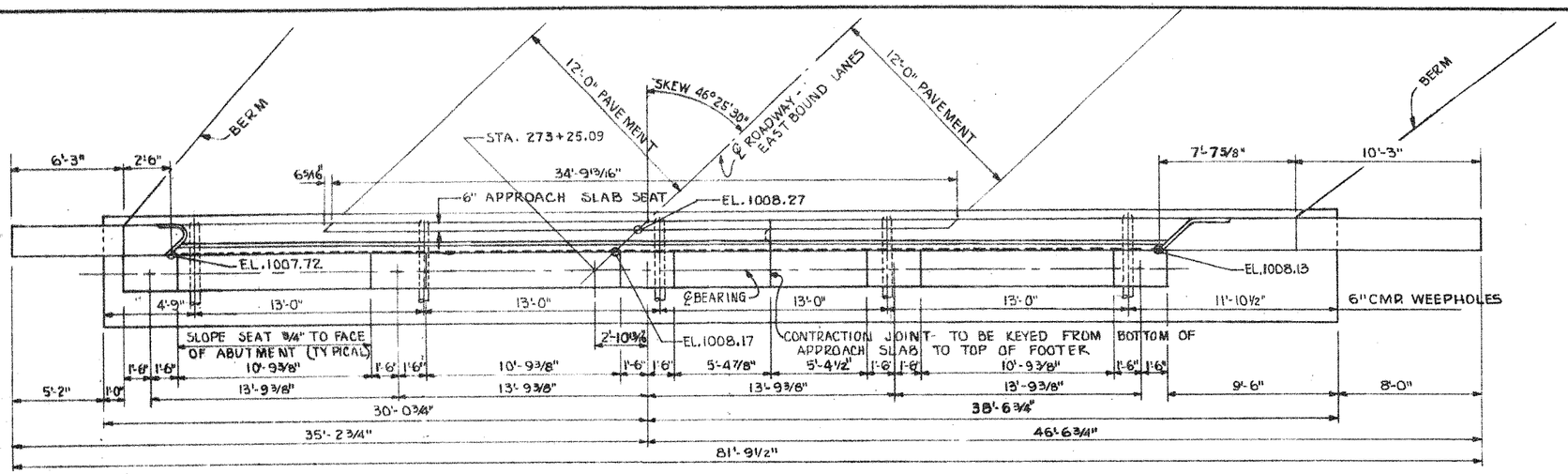
PROPOSED I.R. 70
STA. 271+92.63

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE	REVISED
W.G.	H.W.S.	H.W.S.	W.G.	C.T.L.		

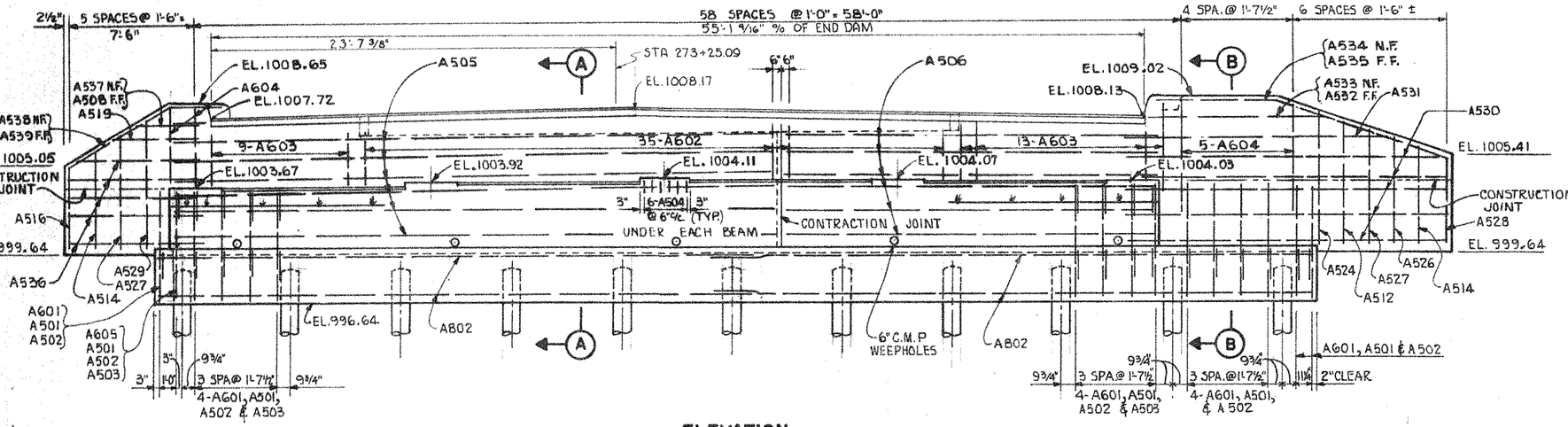
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

237
291

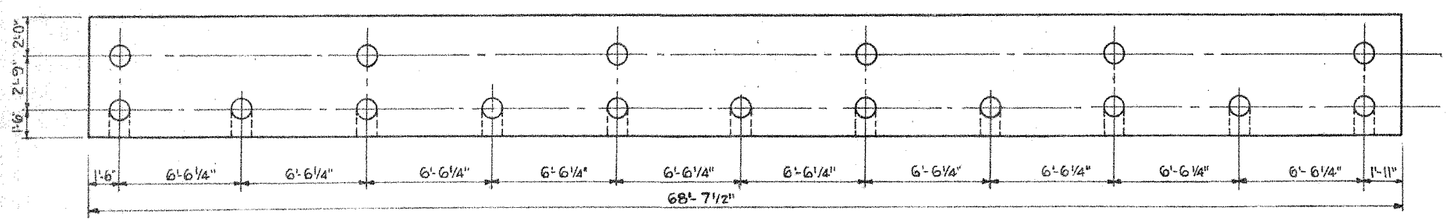
LICKING COUNTY
LIC -70 -0.33



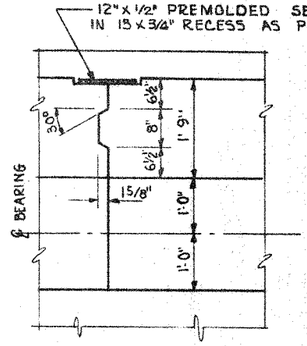
PLAN



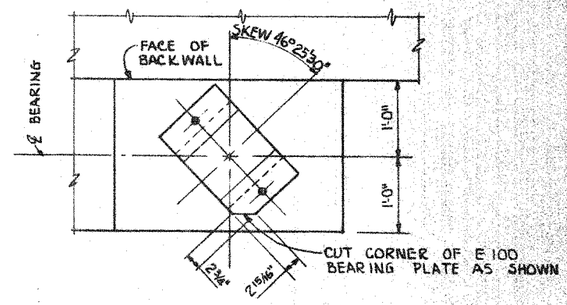
ELEVATION



PILING LAYOUT



CONTRACTION JOINT DETAIL



ABUTMENT BEARING PLATE DETAIL

NOTES

1. FOR SECTIONS A-A & B-B SEE SHEET NO. 236.
2. ALL REINFORCING STEEL SHALL HAVE 2" MIN. COVER EXCEPT WHERE OTHERWISE SHOWN.
3. PROCEDURE: EMBANKMENT SHALL BE PLACED AND COMPACTED UP TO THE FINISHED SPILL-THRU SLOPE AND TO THE LEVEL OF THE SUBGRADE AFTER WHICH EXCAVATION SHALL BE MADE FOR THE ABUTMENT.
4. EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR CONSTRUCTION OF THE ABUTMENT.
5. ALL CONCRETE SHALL BE CLASS "E".

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

FORWARD ABUTMENT DETAILS
RIGHT BRIDGE NO. LIC 70-0073R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

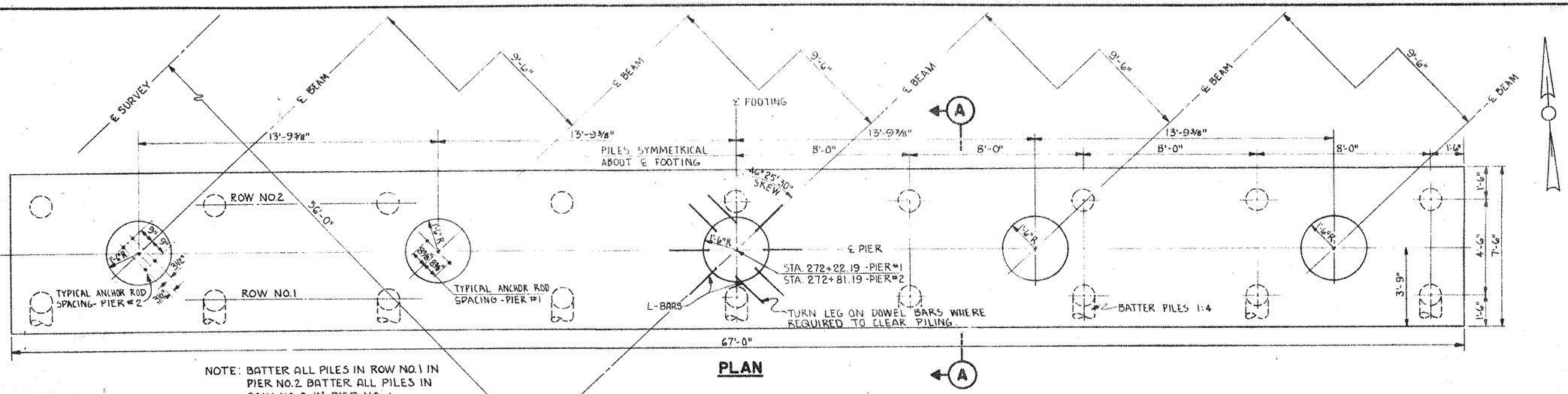
LICKING COUNTY — PROPOSED I.R.70 STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	H.W.S	H.W.S.	W.G.	C.T.L.		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

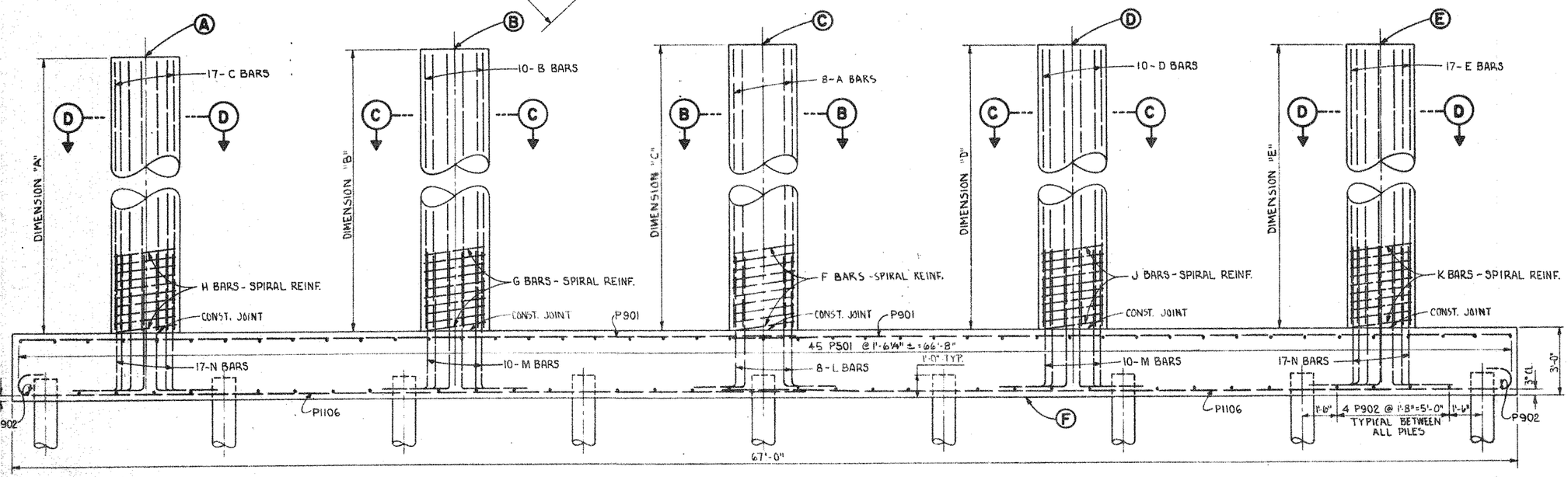
236
291

LICKING COUNTY
LIC - 70 - 0.33

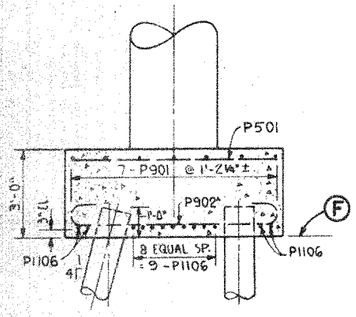


PLAN

NOTE: BATTER ALL PILES IN ROW NO.1 IN PIER NO.2. BATTER ALL PILES IN ROW NO.2 IN PIER NO.1.

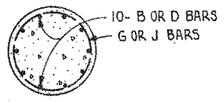


ELEVATION

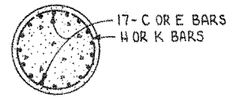


SECTION A-A

SECTION B-B



SECTION C-C



SECTION D-D

	PIER #1	PIER #2
ELEV. Ⓐ	1002.54	1002.86
ELEV. Ⓑ	1002.79	1003.11
ELEV. Ⓒ	1002.98	1003.30
ELEV. Ⓓ	1002.94	1003.26
ELEV. Ⓔ	1002.89	1003.21
ELEV. Ⓕ	981.08	981.96
DIM. "A"	18'-5½"	17'-10¹³⁄₁₆"
DIM. "B"	18'-8½"	18'-1¹³⁄₁₆"
DIM. "C"	18'-10¹⁵⁄₁₆"	18'-4¹⁄₁₆"
DIM. "D"	18'-10⅝"	18'-3⅝"
DIM. "E"	18'-9¾"	18'-3"
A BARS	P1001	P1003
B BARS	P1101	P1107
C BARS	P1102	P1108
D BARS	P1103	P1109
E BARS	P1104	P1110
F BARS	SP401	SP405
G BARS	SP402	SP406
H BARS	SP403	SP407
J BARS	SP401	SP405
K BARS	SP404	SP408
L BARS	P1002	P1002
M BARS	P1105	P1105
N BARS	P1105	P1105

NOTES

ALL REINFORCING STEEL SHALL BE 2" CLEAR EXCEPT WHERE OTHERWISE SHOWN.

SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN PIER COLUMNS SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES.

PIER COLUMNS SHALL BE CLASS "C" CONCRETE. PIER FOOTINGS SHALL BE CLASS "E" CONCRETE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

PIER DETAILS

RIGHT BRIDGE NO. LIC - 70-0073 R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

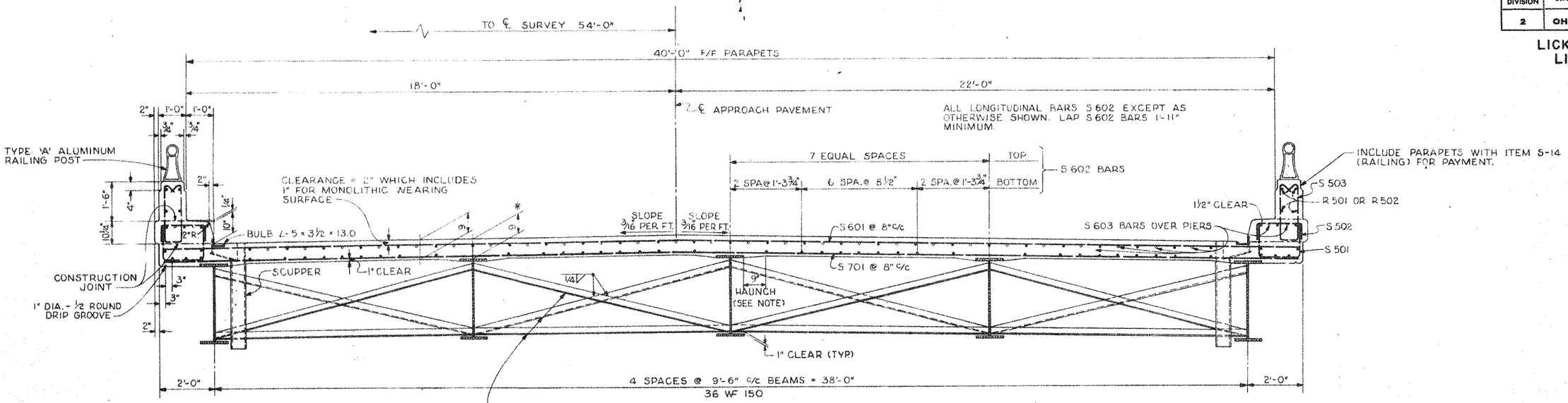
LICKING COUNTY — PROPOSED I.R. 70 STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	W.E.P.	W.E.P.	W.G.	C.T.L.		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

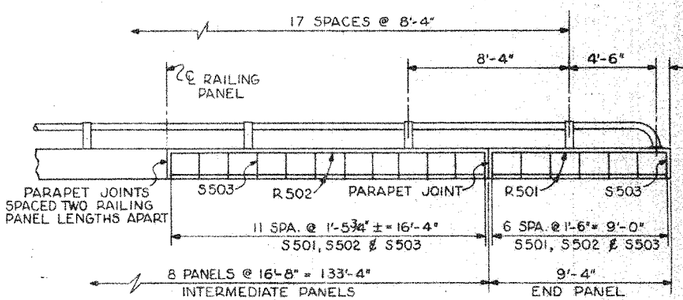
239/291

LICKING COUNTY
LIC-70-0.33

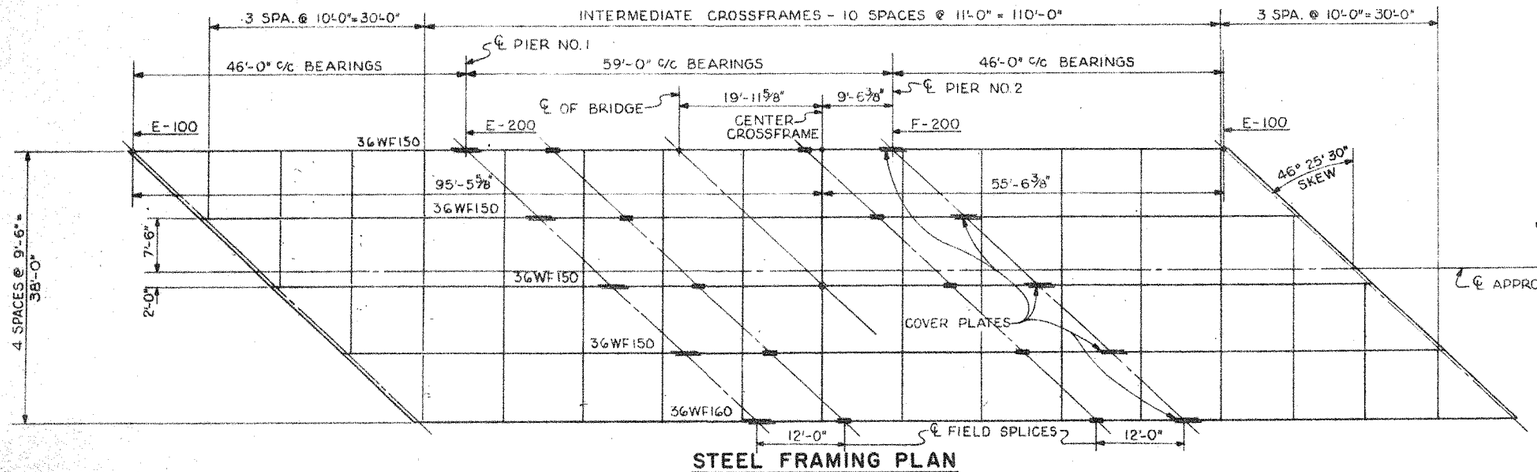


* THIS IS THE NOMINAL DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.

TRANSVERSE SECTION



STEEL PLACEMENT DIAGRAM FOR PARAPET



STEEL FRAMING PLAN

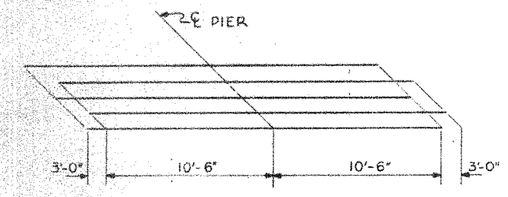
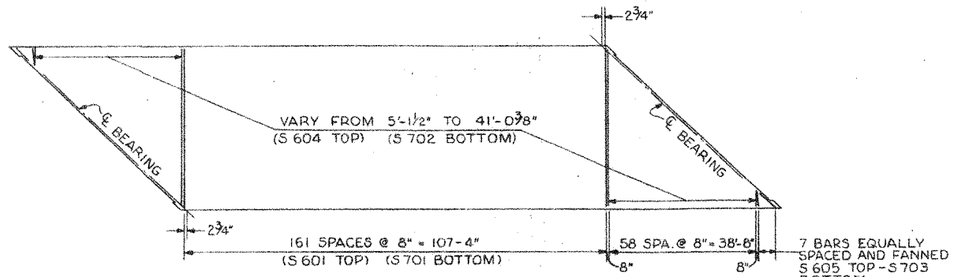


DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS



PART PLAN

SHOWING PLACEMENT OF TRANSVERSE REINFORCING STEEL

NOTES

FIXED AND SLIDING BEARINGS SHALL BE E-100 AT THE ABUTMENTS, E-200 AT PIER NO.1 AND F-200 AT PIER NO.2. FOR DETAILS SEE STANDARD DRAWING FSB-1-62, REVISED 1-15-62.

FOR DETAIL OF END CROSSFRAME, END FINISH, CURB PLATES, SCUPPERS, ALUMINUM RAILING, BEAM CUT OFF AT BACK WALL AND WELDED BUTT JOINT IN SUPERSTRUCTURE END FINISH ANGLES AT CENTERLINE ROADWAY, SEE STANDARD DRAWINGS SD-1-63 AND AR-1-57, REVISED 4-2-62.

CONCRETE DECK PLACING: IN ORDER TO FACILITATE WATER CURING OF THE CONCRETE OF THE DECK SLAB, THE PLACING OF THE CONCRETE SHALL PROGRESS UPGRADE. THE SLAB MAY BE PLACED IN SECTIONS BETWEEN TRANSVERSE CONSTRUCTION JOINTS WHICH ARE PARALLEL TO TRANSVERSE REINFORCING STEEL AND ARE LOCATED NEAR THE CENTER OF ANY SPAN.

MACHINE FINISH: THE CONCRETE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.

DECK SLAB HAUNCH: THE HAUNCH IN THE DECK SLAB ADJACENT TO THE TOP OF STEEL BEAMS, WHICH IS SHOWN AS 9" WIDE, MAY VARY FROM THIS DIMENSION BETWEEN THE LIMITS OF 6" AND 12" EXCEPT THAT THE MAXIMUM SLOPE SHALL NOT EXCEED 3" PER FOOT. PAYMENT FOR DECK SLAB CONCRETE SHALL BE BASED ON THE 9" WIDTH.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

RIGHT BRIDGE NO. LIC-70-0073R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY

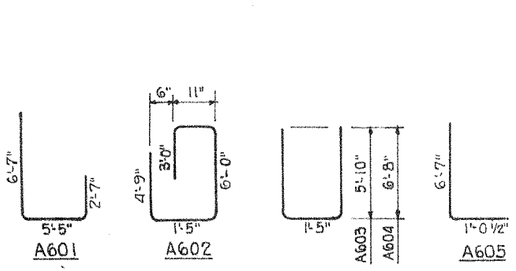
PROPOSED I.R. 70
STA. 271+92.83

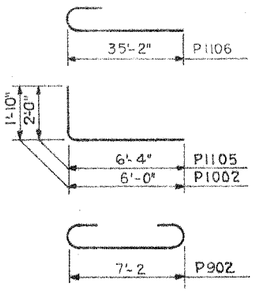
DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
W.G.	A.J.M.	A.J.M.	W.G.	C.T.L.		

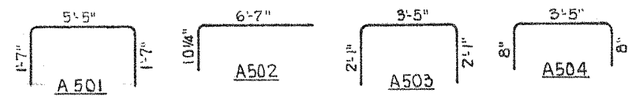
STEEL LIST

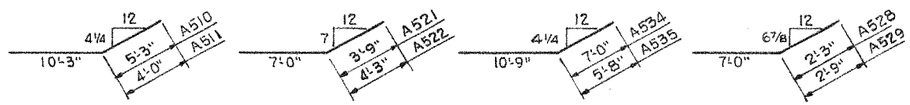
MARK	NO.	LENGTH	WEIGHT	SHAPE
ABUTMENTS				
A801	14	35'-2"	1315	S
A802	14	35'-5"	1324	S
A601	85	14'-3"	1819	B
A602	70	15'-5"	1621	B
A603	44	12'-9"	843	B
A604	14	14'-5"	303	B
A605	2	7'-6"	23	B
A501	87	8'-5"	764	B
A502	87	7'-4"	665	B
A503	74	7'-5"	572	B
A504	60	4'-6"	282	B
A505	34	35'-8"	1265	S
A506	34	21'-10"	774	S
A507	10	17'-2"	179	S
A508	4	13'-3"	55	S
A509	1	10'-0"	10	S
A510	1	15'-6"	16	B
A511	1	14'-3"	15	B
A512	2	15'-7"	33	B
A513	1	14'-5"	15	B
A514	3	13'-3"	41	B
A515	2	12'-3"	26	B
A516	2	11'-3"	23	B
A517	10	9'-2"	96	S
A518	2	7'-0"	15	S
A519	3	5'-0"	16	S
A520	1	20'-0"	21	S
A521	1	10'-9"	11	B
A522	1	11'-3"	12	B
A523	1	18'-9"	20	B
A524	2	16'-11"	35	B
A525	1	15'-3"	16	B
A526	2	13'-7"	28	S
A527	2	14'-9"	31	B
A528	1	11'-9"	12	B
A529	1	16'-7"	17	B
A530	10	19'-11"	198	S
A531	2	15'-9"	33	S
A532	1	21'-6"	22	S
A533	1	12'-0"	13	S
A534	1	17'-9"	19	B
A535	1	16'-5"	17	B
A536	10	7'-9"	81	S
A537	1	3'-9"	4	S
A538	1	9'-3"	10	B
A539	1	9'-9"	10	B

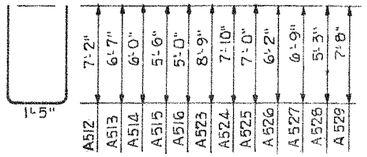
BENDING DIAGRAM

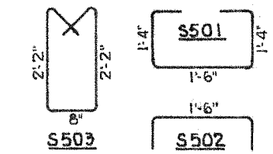


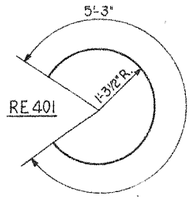












MARK	NO.	LENGTH	WEIGHT	SHAPE
PIERS				
P1101	10	18'-6"	983	S
P1102	17	18'-3"	1648	S
P1103	10	18'-8"	992	S
P1104	17	18'-7"	1678	S
P1105	108	8'-0"	4590	B
P1106	52	36'-9"	10153	S
P1107	10	18'-0"	956	S
P1108	17	17'-9"	1603	S
P1109	10	18'-2	965	S
P1110	17	18'-1"	1633	S
P1001	8	18'-8"	648	S
P1002	16	7'-7"	522	B
P1003	8	18'-2"	625	S
P901	28	34'-9"	3308	S
P902	68	9'-8"	2235	B
P501	90	7'-2"	673	S
RAILING				
R501	16	9'-0"	INCLUDE WITH RAILING FOR PAYMENT	S
R502	64	16'-4"		S
SUPERSTRUCTURE				
S701	162	41'-8"	13797	S
S702	*	**	5566	S
S703	14	5'-3"	150	S
S601	162	41'-8"	10139	S
S602	395	32'-0"	18985	S
S603	60	24'-0"	2163	S
S604	*	**	4090	S
S605	14	5'-3"	111	S
S501	220	4'-11"	1128	B
S502	220	2'-6"	574	B
S503	220	5'-7"	1281	B
REPLACEMENT BARS				
RE1101	2	7'-7"		S
RE1001	1	7'-3"		S
RE901	1	6'-10"		S
RE801	1	6'-6"		S
RE701	1	6'-3"		S
RE601	3	5'-11"		S
RE501	1	5'-7"		S
RE401	1	5'-3"		B

* — 2 SERIES OF 59

** - VARIES FROM 5'-1½" TO 41'-03/8".

SPIRAL REINFORCING LIST

MARK	NO.	CORE DIA. % SPIRAL	LENGTH	PITCH	NO. OF TURNS	WEIGHT
SP401	2	32"	18'-8"	4½"	53	696
SP402	1	32"	18'-6"	4½"	52	342
SP403	1	32"	18'-3"	4½"	52	341
SP404	1	32"	18'-7"	4½"	53	348
SP405	2	32"	18'-2"	4½"	51	671
SP406	1	32"	18'-0"	4½"	51	335
SP407	1	32"	17'-9"	4½"	50	329
SP408	1	32"	18'-1"	4½	51	335

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

240
291

LICKING COUNTY
LIC -70 -0.33

SPIRAL REINFORCING BARS

THE "LENGTH" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE DISTANCE FROM THE TOP OF THE FOOTING TO THE TOP OF COLUMN, LESS 2".

THE "NUMBER OF TURNS" SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE "LENGTH" DIVIDED BY THE PITCH, PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS) EXPRESSED AS THE NEAREST WHOLE NUMBER.

SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM S-4.

1-1/2 CLOSED COILS SHALL BE PROVIDED AT THE ENDS OF EACH SPIRAL UNIT.

FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.68 LB. PER LIN. FT. OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS, BASED ON 0.68 LB. PER LIN. FT., WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS.

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE.

DODSON, KINNEY & LINDBLOM
CONSULTING ENGINEERS
COLUMBUS, OHIO

REINFORCING STEEL LIST
RIGHT BRIDGE NO. LIC 70-0073R
PROPOSED I.R. 70 OVER
TOWNSHIP ROAD 36

LICKING COUNTY

PROPOSED I.R.70
STA. 271+92.83

DESIGNED:	DRAWN:	TRACED:	CHECKED:	REVIEWED:	DATE:	REVISED:
	H.W.S.	H.W.S.	W.G.	C.T.L.		

DESIGN DESIGNATION		FAIRFIELD COUNTY	LICKING COUNTY
t Year ADT (1988)	=	56,625	32,400
Year ADT (2008)	=	79,725	45,360
(2008)	=	7,930	4,536
ctional Distribution)	=	Equal	Equal
cent B & C Trucks)	=	14%	23%
ign Speed)	=	70	70
Speed	=	(55 URBAN / 65 RURAL)	65
onal Classification	=	Interstate	Interstate

DESIGN EXCEPTION
Horizontal Clearance (S.R. 158)

APPROVED
2/22/88

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

CALC. BY DPC DATE 2-29-88
CHECK. BY R.M DATE 3-4-88

OHIO	
FHWA REGION	5
IR-70-7(101) 117	FEDERAL PROJECT

FAI-70-0.00
LIC-70-0.00

FAI-70-0.00
LIC-70-0.00

CITY OF COLUMBUS, VILLAGE OF PICKERINGTON, VILLAGE OF KIRKERSVILLE
VIOLET AND ETNA TOWNSHIP
FAIRFIELD AND LICKING COUNTY
(FRANKLIN CO.)

ROFILMED
6 28 1992

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line
Fence Line(existing) (proposed)
Center Line
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA&RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)
Detour

INDEX OF SHEETS

LE SHEET	1	LINE SHEETS	50-67
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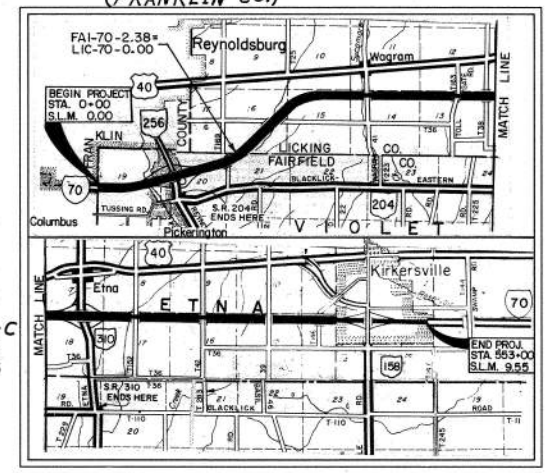
PICAL DETAILS	7-A, 7-B*, 14, 14A	PAVEMENT MARKINGS	87-88
MPORARY CROSSOVER DETAILS	15-22	DRAINAGE DETAILS	89-105A-C
NERAL NOTES	23-30A-B	STRUCTURES, OVER 20'	106-118
VEMENT ELEVATIONS	31-47	MAINTAINING TRAFFIC	119-126
NERAL SUMMARY	48-49		



LOCATION MAP

SCALE IN MILES
0 1 2 3 4

Portion to be Improved
State & Federal Routes
Other Roads

SCALES
Plan
0 50' 100'

LINE DATA

BEGIN PROJECT	STA.0+00
STATION EQUATION	STA.641+09.49 BACK = STA.0+00.00 AHEAD
STATION EQUATION	STA.143+21.06 BACK = STA.250+00.00 AHEAD
STATION EQUATION	STA.733+97.69 BACK = STA.550+00.00 AHEAD
END PROJECT	STA.553+00
NET LENGTH OF PROJECT =	63,018.75 LIN.FT. OR 11.935 MILES
BEGIN WORK	STA.586+50
STATION EQUATION	STA.641+09.49 BACK = STA.0+00.00 AHEAD
STATION EQUATION	STA.143+21.06 BACK = STA.250+00.00 AHEAD
STATION EQUATION	STA.733+97.69 BACK = STA.550+00.00 AHEAD
END WORK	STA.600+67.19
NET LENGTH OF WORK =	7324543 LIN.FT. OR 13.872 MILES

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
Call 800-362-2764 (Toll Free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

Plan Prepared By:
DISTRICT NO.5
OHIO DEPARTMENT OF TRANSPORTATION

t FAI-70-0.00
LIC-70-0.00
of Letting 19 Contract No.

SUPPLEMENTAL SPECIFICATIONS

846	11-24-86	849	12-24-85
847	10-17-83	850	2-25-86
947	10-17-83	852	6-10-87
824	10-8-82	853	6-26-78
921	12-4-72	949	9-26-86
		952	6-10-87
		956	6-26-78

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-5	10-1-87	TC-72.20	2-26-82	MC-4	7-26-76	TC-18.24	4-25-79
GR-1	1-11-85	MT-99.10	11-14-86	TC-6L10	4-5-82	TC-31.21	3-6-79
GR-2B	2-5-82	MT-99.20	11-14-86	CB-2-6	5-1-79	TC-32.11	3-21-79
GR-3	1-21-85	BR-1	5-29-79	HW-4A	4-1-80	TC-51.10	1-20-84
GR-4	2-5-82	EXJ-2-81	4-2-84R	MC-11	8-1-78	TC-51.11	1-20-84
GR-4A	1-30-84	SD-1-65	11-8-65	MH-2	6-12-75	TC-65.10	2-26-82
GR-5	2-5-82	CB-2-2B	5-1-79	TC-22.20	3-1-79	TC-65.11	4-5-82
GR-6	2-5-82	CB-4	11-10-83	GR-7	2-5-82		
GR-6A	2-5-82	CB-5	11-10-83				
MC-9	1-30-84	CB-8	11-10-83				
MC-9A	1-11-85	MH-1	12-18-84				
TC-35.10	8-29-84	MH-3	12-18-84				
TC-71.10	4-9-79						

LIMITED ACCESS

This improvement is especially designed for throug traffic and has been declared a limited access high or freeway by action of the Director in accordance the provisions of Section 5511.02 of the Revised Code of Ohio.

1987 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway, except as noted on sheet 22, and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved John W. Hayes
Date 3-3-88 District Deputy Director of Transportation

Approved R. D. Nicholson
Date 3-10-88 Engineer, Bureau of Bridges and Structural Design

Approved George E. Anderson
Date 3-25-88 Chief Engineer, Planning & Desig

Approved Ronald R. Hurst
Date 3-25-88 Director, Department of Transpo

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

DIVISION ADMINISTRATOR DA

BRIDGE NOTES

CALC. BY
DATE
CHK'D BY
DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI -70-0.00
LIC -70-0.00

REFERENCE

DETAILED DRAWINGS OF THE EXISTING STRUCTURE MAY BE INSPECTED IN THE DISTRICT 5 OFFICE OF THE OHIO DEPARTMENT OF TRANSPORTATION, JACKSONTOWN, OHIO.

REMOVED MATERIALS

ALL REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY HIM FROM THE JOB SITE, UNLESS OTHERWISE NOTED.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND/ OR FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK, BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

AREAS OF WORK

THE GENERAL AREAS OF WORK AS INDICATED ON THE PLAN AND PROFILE AND DETAIL SHEETS ARE:

REMOVALS:
1. REMOVE ASPHALT WEARING COURSE,BRIDGE RAILINGS,PARAPETS AND PORTIONS OF EXISTING DECK

CONSTRUCTION:
1. INSTALL EXPANSION JOINTS AND PARAPETS
2. PATCH CONCRETE DECKS
3.OVERLAY BRIDGE DECKS

REPLACEMENT OF EXISTING REINFORCING STEEL

ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT HIS COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. AN ADDITIONAL 3,000 LBS. IS INCLUDED IN ITEM 824 FOR THIS PURPOSE.

ESTIMATED QUANTITIES

AN ESTIMATED AMOUNT OF THE FOLLOWING QUANTITIES HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR BIDDING PURPOSES, BUT FINAL QUANTITIES SHALL BE DETERMINED BY ACTUAL FIELD MEASUREMENTS AT THE COMPLETION OF THE WORK.

BRIDGE NUMBERS	0084L	0084R	0119L	0119R	0074L	0074R	TOTAL
ITEM 850-SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VARIABLE THICKNESS)	30	30	35	75	30	30	230
ITEM 850-FULL DEPTH REPAIR	3	3	3	6	3	3	21

ITEM 202-ALUMINUM BRIDGE RAILING REMOVED FOR STORAGE

CARE SHALL BE TAKEN NOT TO DAMAGE THE ALUMINUM RAIL AND SUPPORTS. IT SHALL BE CAREFULLY REMOVED AND NEATLY STORED ON THE JOB SITE FOR REMOVAL BY STATE FORCES.

PAYMENT SHALL BE PER LINEAR FOOT ITEM 202 ALUMINUM BRIDGE RAILING REMOVED FOR STORAGE.

FAI-70-0084L	212 LIN FT.	FAI-70-0119R	348 LIN FT.
FAI-70-0084R	212 LIN FT.	LIC-70-0074L	321 LIN FT.
FAI-70-0119L	342 LIN FT.	LIC-70-0074R	300 LIN FT.
			1735 LIN.FT.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05 AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

PROTECTION OF TRAFFIC UNDER OVERHEAD STRUCTURES

THE CONTRACTOR SHALL PROVIDE A SAFETY NET OR PLATFORM OF SUITABLE STRENGTH AT THE UNDERSIDE OF THE DECK TO PROTECT PEDESTRAIN AND VEHICULAR TRAFFIC DURING WORK BEING DONE ON THE OVERHEAD STRUCTURE. THE DESIGN OF THE NET OR PLATFORM SHALL CONFORM WITH O.S.H.A. REQUIREMENTS AND THE APPROVAL OF THE ENGINEER AND SHALL REMAIN IN PLACE UNTIL THE WORK HAS BEEN COMPLETED AND ACCEPTED OR AS DIRECTED BY THE ENGINEER.

PAYMENT TO BE INCLUDED UNDER ITEM 614, MAINTAINING TRAFFIC.

REMOVAL OF CONCRETE PARAPETS AND EDGES

CONCRETE REMOVALS ON PARAPETS & EDGES SHALL BE DONE BY THE USE OF 40 - 65 LB. CLASS JACK HAMMERS ONLY. NO OTHER METHOD SHALL BE USED UNLESS APPROVED BY THE DISTRICT 5 CONSTRUCTION ENGINEER.

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

BR-1	DATED	5-29-79
EXJ-2-81	DATED	4-2-84R
SD-1-65	DATED	11-8-65
GR-1	DATED	1-11-85
GR-3	DATED	1-21-85
GR-2B	DATED	2-5-82

AND TO SUPPLEMENTAL SPECIFICATIONS:

824	DATED	10-8-82
850	DATED	2-25-86
849	DATED	12-24-85
949	DATED	9-26-86
852	DATED	6-10-87
853	DATED	6-26-78
952	DATED	6-10-87
956	DATED	6-26-78

Revised 4-6-88

ITEM 516-MODIFICATION OF STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 5-INCH WIDTH, AS PER PLAN

THIS ITEM SHALL INCLUDE ALL THE WORK AND MATERIALS NECESSARY TO MODIFY AND ENCLOSE THE EXPANSION JOINTS. REMOVAL OF EXISTING CONCRETE AND STEEL CURB PLATES SHALL BE IN ACCORDANCE WITH 202.03.
THE PROPOSED SUPERSTRUCTURE EXPANSION JOINT AND BARS SHALL BE FURNISH IN MAXIMUM LENGTHS POSSIBLE TO ALLOW FOR TRAFFIC MAINTENANCE AND SHALL BE BUTT WELDED TOGETHER TO FORM A WATERTIGHT JOINT. THE COMPRESSION S SHALL NOT BE INSTALLED UNTIL ALL OTHER WORK HAS BEEN COMPLETED ON THE MATERIALS: STEEL PLATE BARS AND ANGLES SHALL CONFORM TO ASTM A36 OR A
THE COMPRESSION SEAL SHALL BE AS PER STD. DWG. EXJ-2-81.
SPLICE OR JOINT IN COMPRESSION SEAL: COMPRESSION SEAL FOR BRIDGE DECK JOINTS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS A SHOP FABRICA SPLICE, FIELD SPLICE OR FIELD BUTT JOINT IS APPROVED BY THE DIRECTOR.
FOR OTHER THAN STRAIGHT SEALS WITHOUT INTERMEDIATE SPLICES, SEAL GLANDS SHALL BE SHOP FABRICATED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS.
DRAWING DIMENSIONS FOR EXISTING JOINTS OR FOR JOINTS WHICH ARE BEING MODIFIED SHALL BE BASED ON FIELD MEASUREMENTS PROVIDED BY THE CONTRACT
THE COMPRESSION SEAL SHALL BE AS MANUFACTURED BY THE WATSON-BOWMAN ACME CORPORATION, 95 PINEVIEW DRIVE, AMHERST, NEW YORK 14120; THE D. S. BROWN COMPANY, P.O. BOX 158, NORTH BALTIMORE, OHIO 45872 OR AN APPROVE ALTERNATE.
MEASUREMENT FOR PAY PURPOSES SHALL BE BASED ON THE LINEAR FEET OF SEA JOINT SYSTEM MEASURED HORIZONTALLY ALONG THE BACK OF THE STEEL RETAINE AND BETWEEN THE FACES OF THE DECK.

PAYMENT SHALL BE MADE PER LINEAR FOOT FOR ITEM 516, MODIFICATION OF STRU EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 5-INCH WIDTH, AS PER PLAN, WHICH SHALL INCLUDE ALL REMOVALS, CONCRETE, STEEL BARS, AN COMPRESSION SEAL, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLE THE WORK.

WJ-500
WATSON-BOWMAN & ACME CORP.

CV-5000
D.S. BROWN COMPANY

COMPRESSION SEALS

ITEM 601-ROCK CHANNEL PROTECTION, TYPE B WITH FILTER

THE QUANTITY OF 553 CU. YDS. HAS BEEN INCLUDED IN THE GENERAL SUMMARY ON SHT. 48 FOR EROSION CONTROL TO BE USED AT FAI-70-0084L,R REAR ABUTMENT. PLACEMENT OF THE ROCK SHALL BE AT THE DISCRETION OF THE ENGINEER. FINAL QUANTITY SHALL BE DETERMINED AFTER COMPLETION OF WORK. FOR LOCATION OF ROCK PLACEMENT SEE SHEET 108.

BRIDGE DECK CONDITION SURVEY (GEN. INFORM. ONLY)

	BRIDGE Nº	Deck Area	Sounded		
			Method	Date	Area
	FAI-70-0084 L	710	cored	2-29-88	710
	FAI-70-0084 R	646	cored	2-2-88	646
	FAI-70-0119 L	761	cored	2-29-88	761
	FAI-70-0119 R	1326	cored	3-2-88	1326
*	LIC-70-0074 L	711	visual	3-3-88	711
*	LIC-70-0074 R	696	visual	3-3-88	696

*Bridges to prior to le project.

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AUG 28 1992

BRIDGE SUMMARY

CALC. BY [illegible] DATE 1-15-88
CHKD. BY AJD DATE 1-21-88

FAI-70-0.00
LIC-70-0.00

OHIO
FHWA REGION
FEDERAL PROJECT

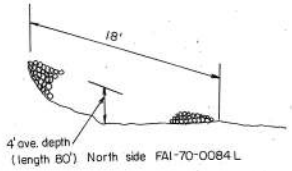
SHEET NUMBER	BRIDGE NUMBER						ITEM	QUANT.	UNIT	DESCRIPTION
	FAI. 70 0084L	FAI. 70 0084R	FAI. 70 0119 L	FAI. 70 0119 R	LIC. 70 0074L	LIC. 70 0074 R				STRUCTURES OVER 20' SPAN
	29	29	45/5	46/6	40/7	38/7	202	252	CU.YD.	PORTIONS OF STRUCTURES REMOVED, SUPERSTRUCTURE
			78	138	110	110	202	436	LIN.FT.	PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN
	697	633	741	1306	693	667	202	4737	SQ.YD.	WEARING COURSE REMOVED
	212	212	342	348	321	300	202	1735	LIN.FT.	ALUMINUM BRIDGE RAIL REMOVED FOR STORAGE
	188	188	292	298	262	246	510	1474	EACH	DOWEL HOLES
	25	25	38/5	39/6	35/7	33/7	511	220	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE
			86	142	121.83	121.83	516	471.66	LIN.FT.	MODIFICATION OF STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION 5-INCH WIDTH, AS PER
106 3000	3655	3655	5563	5669	5094	4877	824	31,513	POUND	EPOXY COATED REINFORCING STEEL, GRADE 60
	710	646	761	1326	711	693	850	4847	SQ.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (1 3/4" THICK) (SEE PROPOSAL NOTE)
	30						850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0084L) (SEE PROPOSA
	3	3	3	6	3	3	850	21	CU.YD.	FULL DEPTH REPAIR (SEE PROPOSAL NOTE)
	—	—	—	—	—	—	850	LUMP		TEST SLAB (SEE PROPOSAL NOTE)
			1391	2395	1391	1391	513	6568	POUND	STRUCTURAL STEEL, AS PER PLAN
	198	198	304	310	281	263	SPEC	1554	SQ.YD.	SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE)
	10	10	8	12	8	8	518	56	EACH	VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN
	10	10	8	12	8	8	518	56	EACH	VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN
		30					850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0084R) (SEE PROP. NO
			35				850	35	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0119L) (SEE PROP. NO
				75			850	75	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (FAI-70-0119R) (SEE PROP. NO
					30		850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (LIC-70-0074L) (SEE PROP. NO
						30	850	30	CU.YD.	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (VAR. THICKNESS) (LIC-70-0074R) (SEE PROP. NO

MICROFILMED
AUG 28 1992

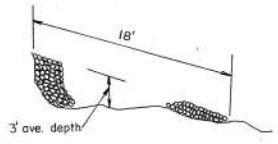
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

CALCULATED BY _____ DATE 1-15-88
CHECKED BY _____ DATE 1-21-88

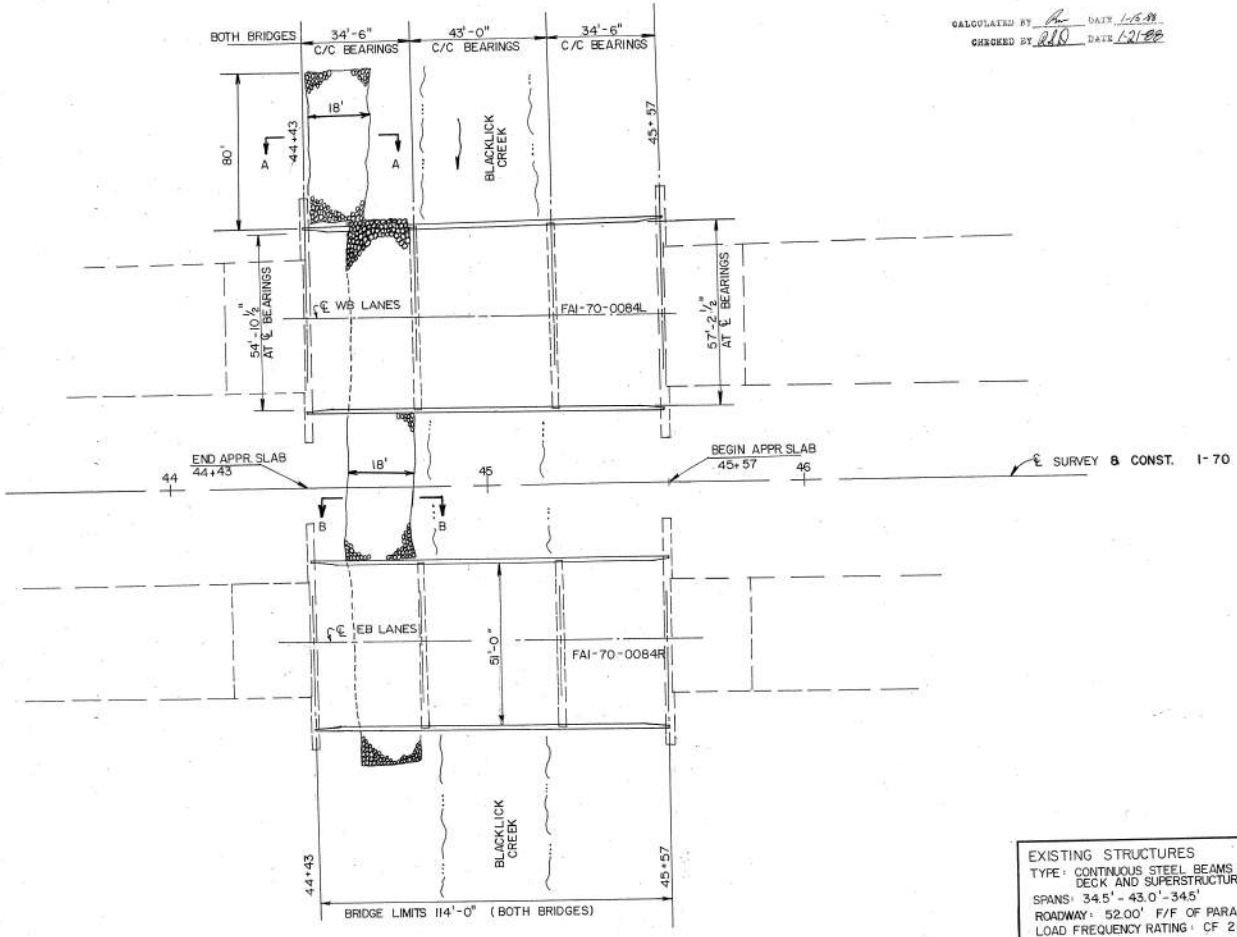


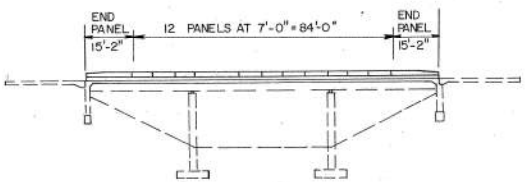
SECTION A-A



SECTION B-B

ROCK CHANNEL PROTECTION TYPE B WITH FILTER





EXISTING STRUCTURES
TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPANS: 34.5' - 43.0' - 34.5'
ROADWAY: 52.00' F/F OF PARAPETS
LOAD FREQUENCY RATING: CF 2000 (57)

SKEW: 0°00
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3 3/4" ASPHALT
APPROACH SLAB: AS-1-54 (25'-0" LONG)

REHABILITATED STRUCTURES
ROADWAY: 51'-0" (0084) — VARIES AS SHOWN (0084L) F/F PARAPET CURBS
BRIDGE RAILING: DEFLECTOR PARAPET TYPE
WEARING SURFACE: 1 3/4" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

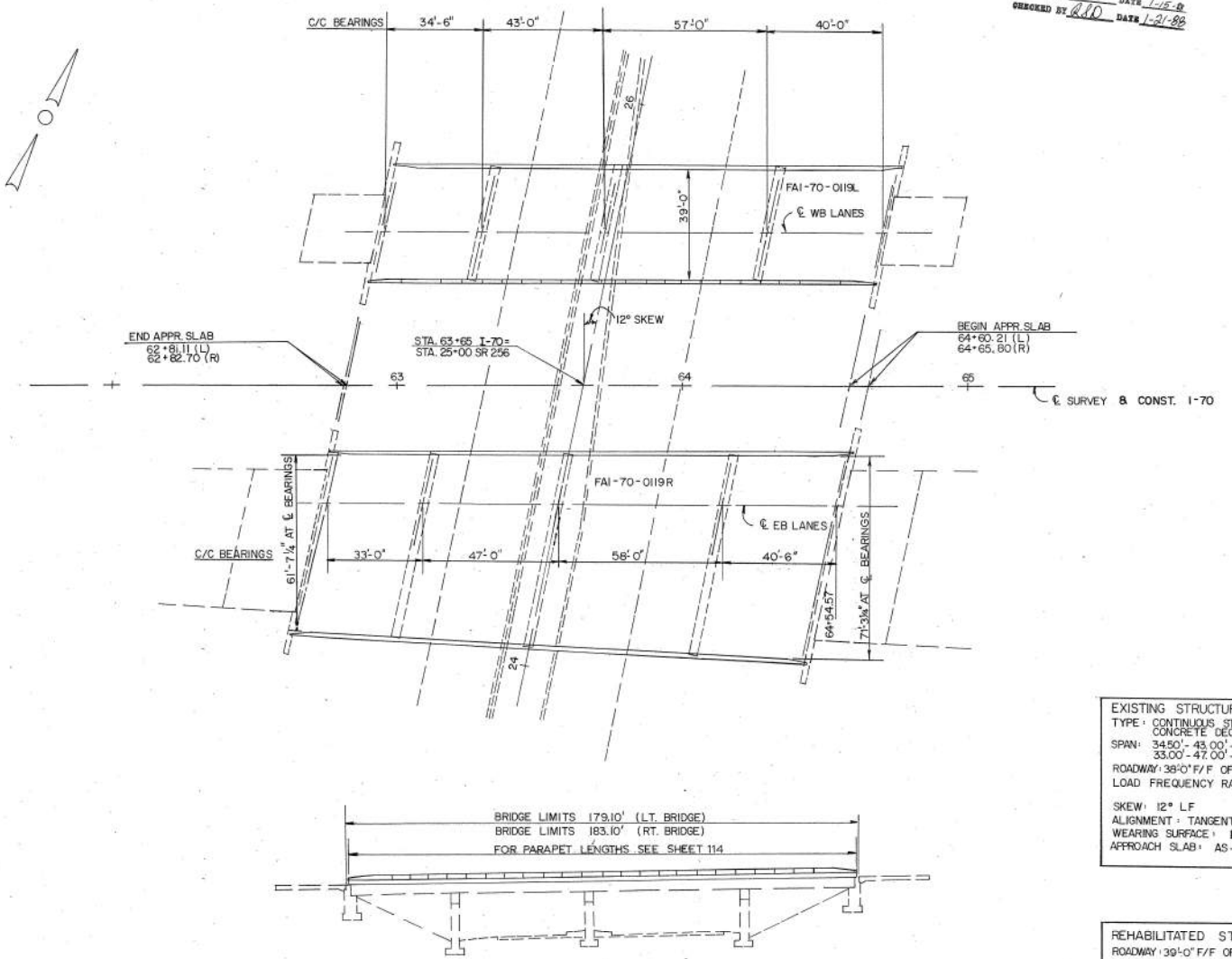
Br. № FAI-70-00

GENERAL PLAN & ELEV

FHWA REGION	STATE	PROJECT	
15	OHIO		

FAI-70-0.00
LIC-70-0.00

CALCULATED BY [illegible] DATE 1-15-86
CHECKED BY RBD DATE 1-21-86



EXISTING STRUCTURES
TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE
SPAN: 34.50' - 43.00' - 57.00' - 40.00' (L)
33.00' - 47.00' - 58.00' - 40.50' (R)
ROADWAY: 38'-0" F/F OF CURB (L) VARIABLE (R)
LOAD FREQUENCY RATING: CF 2000 (57)

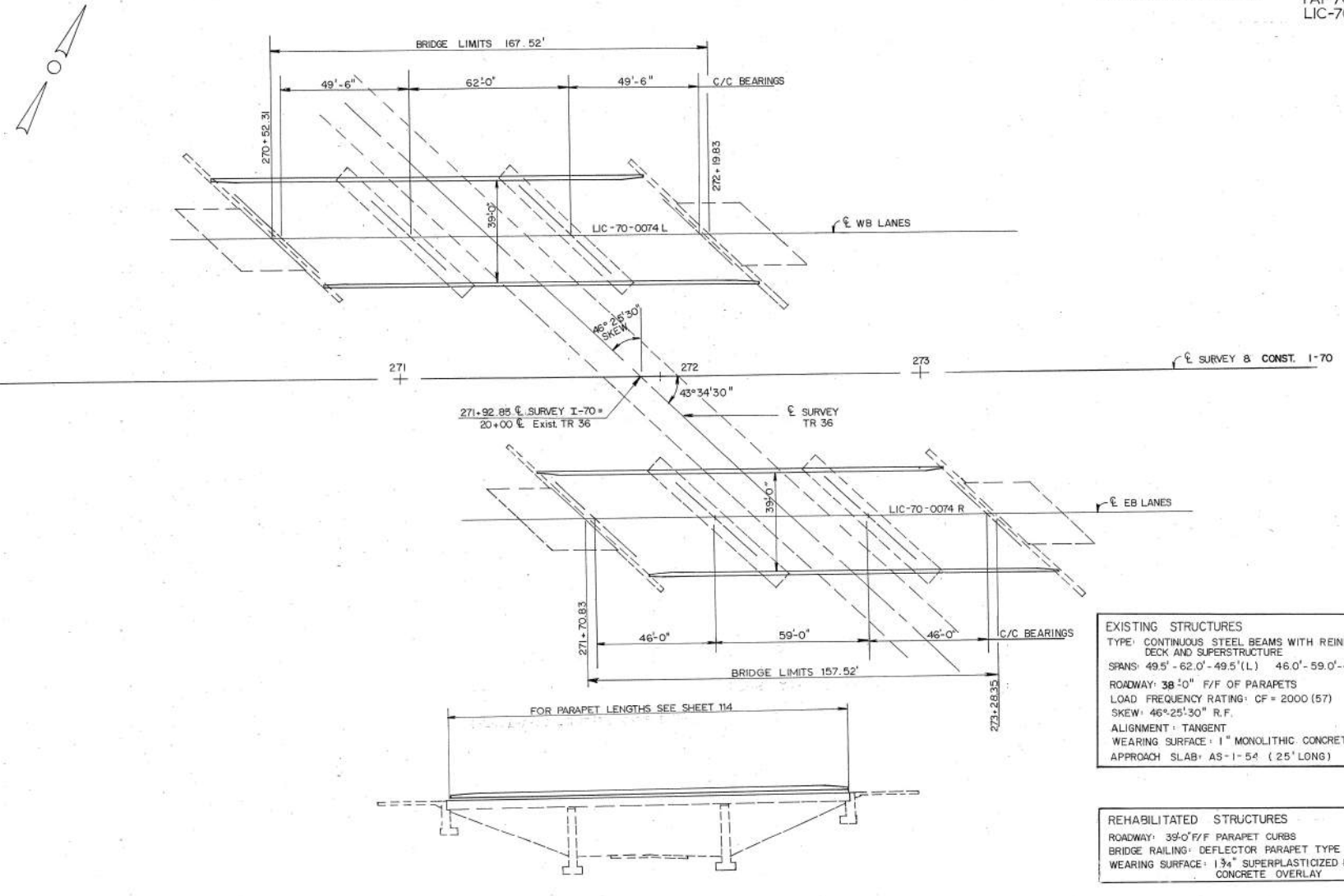
SKEW: 12° L.F.
ALIGNMENT: TANGENT
WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3¾" ASPHALT
APPROACH SLAB: AS-1-54 (25' LONG)

REHABILITATED STRUCTURES
ROADWAY: 39'-0" F/F OF PARAPET CURBS (L) VARIABLE AS SHOWN(R)
BRIDGE RAILING: DEFLECTOR PARAPET TYPE
WEARING SURFACE: 1¾" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

CALCULATED BY	DATE
CHECKED BY	DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



EXISTING STRUCTURES

TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUPERSTRUCTURE

SPANS: 49.5' - 62.0' - 49.5'(L) 46.0' - 59.0' - 46.0'(R)

ROADWAY: 38'-0" F/F OF PARAPETS

LOAD FREQUENCY RATING: CF = 2000 (57)

SKEW: 46°-25'-30" R.F.

ALIGNMENT: TANGENT

WEARING SURFACE: 1" MONOLITHIC CONCRETE, 3¾" ASPHALT

APPROACH SLAB: AS-1-54 (25' LONG)

REHABILITATED STRUCTURES

ROADWAY: 39'-0" F/F PARAPET CURBS

BRIDGE RAILING: DEFLECTOR PARAPET TYPE

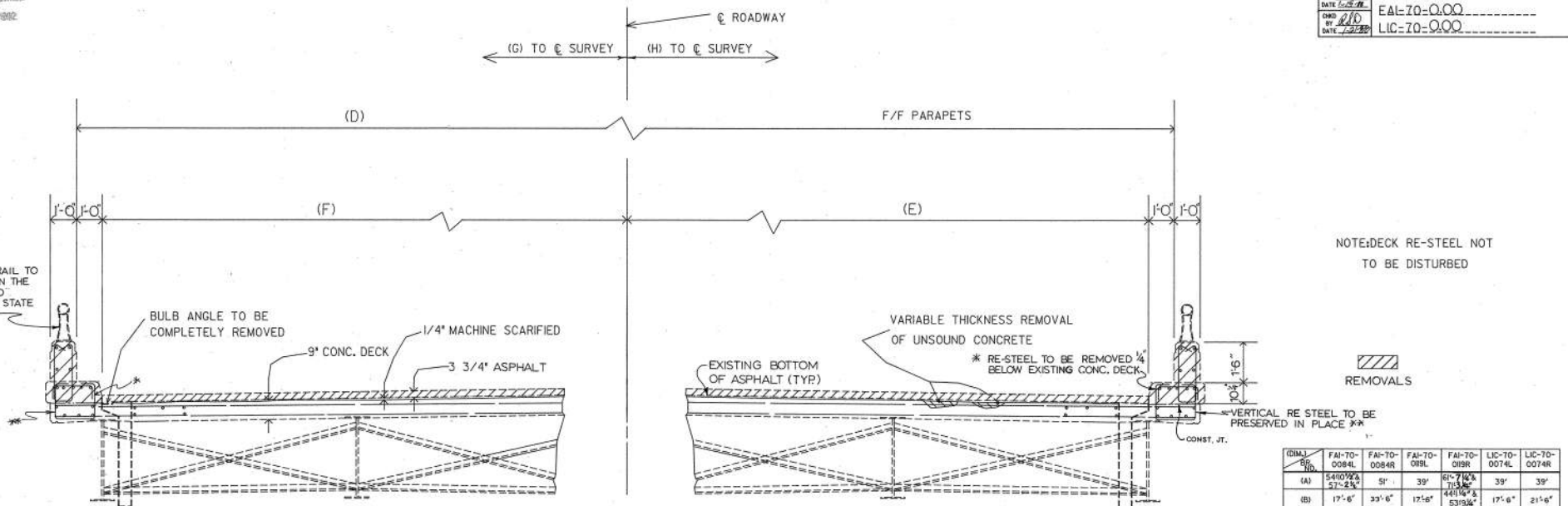
WEARING SURFACE: 1¾" SUPERPLASTICIZED DENSE CONCRETE OVERLAY

AUG 31 1992

CALC BY DATE 6-29-98
CHKD BY DATE 6-29-98

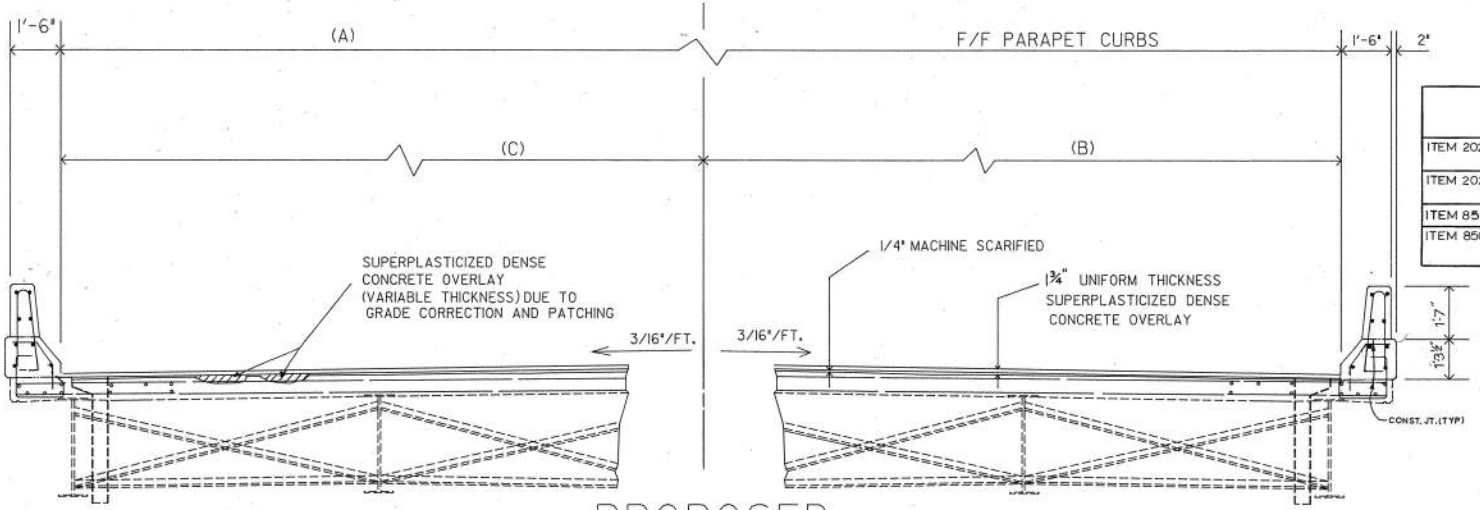
EAL-70-0.00
LIC-70-0.00

OHIO
FHWA REGION 5



EXISTING

(DIM.) / Br. No.	FAI-70-0084L	FAI-70-0084R	FAI-70-0119L	FAI-70-0119R	LIC-70-0074L	LIC-70-0074R
(A)	54°10'52" & 57°-2 1/4"	51'	39'	61°-7 1/4" & 71°13 1/2"	39'	39'
(B)	17'-6"	33'-6"	17'-6"	44°16'9" & 53°33 1/4"	17'-6"	21'-6"
(C)	37°14'52" & 39°8 1/2"	17'-6"	21'-6"	17'-6"	21'-6"	17'-6"
(D)	55°40'52" & 58°2 1/2"	52'	40'	62°7'52" & 72°3 3/4"	40'	40'
(E)	17'	33'	17'	43°7'52" & 53°3 1/8"	17'	21'
(F)	36°40'52" & 39°2 1/2"	17'	21'	17'	21'	17'
(G)	—	42'	—	42'	—	54'
(H)	42'	—	54'	—	54'	—



PROPOSED

DESCRIPTION		Br. No. FAI-70-0084L	Br. No. FAI-70-0084R	Br. No. FAI-70-0119L	Br. No. FAI-70-0119R	Br. No. LIC-70-0074L	Br. No. LIC-70-0074R	Unit
ITEM 202	PORTIONS OF STRUCTURES REMOVED, SUPERSTRUCTURE	29	29	45	46	40	38	Cu.
ITEM 202	WEARING COURSE REMOVED	697	633	741	1306	693	667	Sq.
ITEM 850	TEST SLAB	—	—	—	—	—	—	Lun
ITEM 850	SUPERPLASTICIZED DENSE CONCRETE OVERLAY (1 3/4" THICK)	710	646	761	1326	711	693	Sq.

TRANSVERSE SEC

MICROFILMED
8 31 1982

CALC BY	DATE	CHKD BY	DATE
	1-15-88	RJD	1-21-88

FAI-70-0.00
LIC-70-0.00

OHIO
FHWA REGION 5

FAI-70-0084L/R

MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	168	168	5'-8"	BT.	993	993
ES502	24	24	30'-0"	ST.	751	751
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	96	96	6'-8"	ST.	668	668
ES520	168	168	2'-5"	BT.	423	423
ES521	8	8	29'-0"	ST.	242	242
ES522	16	16	12'-10"	ST.	214	214
TOTALS					3655	3655

LIC-70-0074L/R

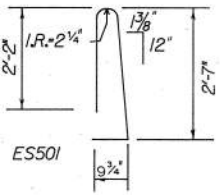
MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	242	226	5'-8"	BT.	1430	1336
ES502	40	40	30'-0"	ST.	1252	1252
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	96	96	6'-8"	ST.	668	668
ES520	242	226	2'-5"	BT.	610	570
ES523	8	8	20'-0"	ST.	167	167
ES524	16		15'-8"	ST.	261	
ES525	24	24	13'-8"	ST.	342	342
ES526		16	10'-8"	ST.		178
TOTALS					5094	4877

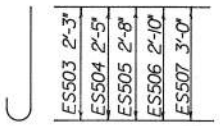
FAI-70-0119L/R

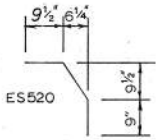
MARK	NO. REQ'D L	NO. REQ'D R	LENGTH	SHAPE	WEIGHT L	WEIGHT R
ES501	272	278	5'-8"	BT.	1608	1643
ES502	48	48	30'-0"	ST.	1502	1502
ES503	4	4	2'-10"	BT.	12	12
ES504	4	4	3'-0"	BT.	13	13
ES505	4	4	3'-3"	BT.	14	14
ES506	4	4	3'-5"	BT.	14	14
ES507	4	4	3'-8"	BT.	15	15
ES508	32	32	4'-4"	ST.	145	145
ES509	28	28	2'-2"	ST.	63	63
ES510	4	4	2'-5"	ST.	10	10
ES511	4	4	2'-7"	ST.	11	11
ES512	4	4	2'-9"	ST.	11	11
ES513	4	4	3'-0"	ST.	13	13
ES514	4	4	1'-11"	BT.	8	8
ES515	4	4	2'-0"	BT.	8	8
ES516	4	4	2'-1"	BT.	9	9
ES517	4	4	2'-1"	BT.	9	9
ES518	4	4	2'-2"	BT.	9	9
ES519	144	144	6'-8"	ST.	1001	1001
ES520	272	278	2'-5"	BT.	686	701
ES525	16	16	13'-8"	ST.	228	228
ES527	8		5'-5"	ST.	45	
ES528		4	7'-8"	ST.		32
ES529		4	9'-10"	ST.		41
ES530	16		7'-9"	ST.	129	
ES531		8	8'-10"	ST.		74
ES532		8	9'-11"	ST.		83
TOTALS					5563	5669

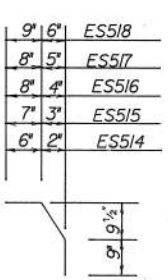
DESCRIPTION	Br. N° FAI-70 0084L	Br. N° FAI-70 0084R	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 0074R
Item 510 Dowel holes	188	188	292	298	262	24
Item 511 Class 'S' conc. superstructure	25	25	38	39	35	3
Item special Sealing of conc. surfaces (epoxy)	198	198	304	310	281	28

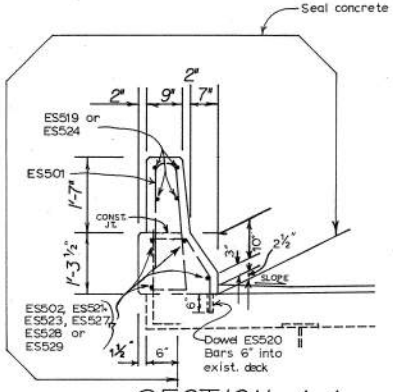
BENDING DIAGRAMS





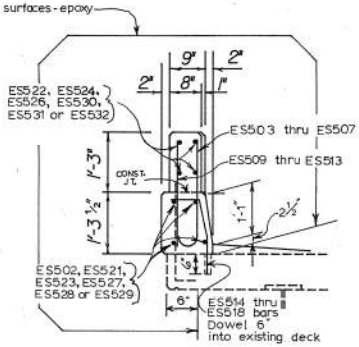






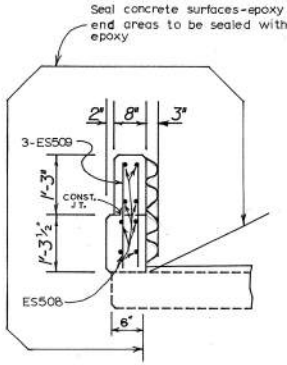
SECTION A-A

(SHEET //3)



SECTION B-B

(SHEET //3)



SECTION C

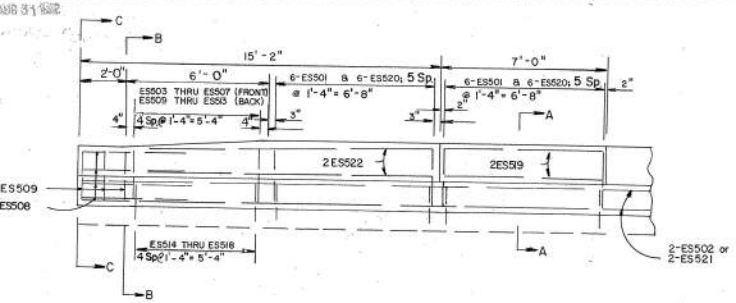
(SHEET //3)

ELEVATION TYPICAL PARAPET REINFORCING

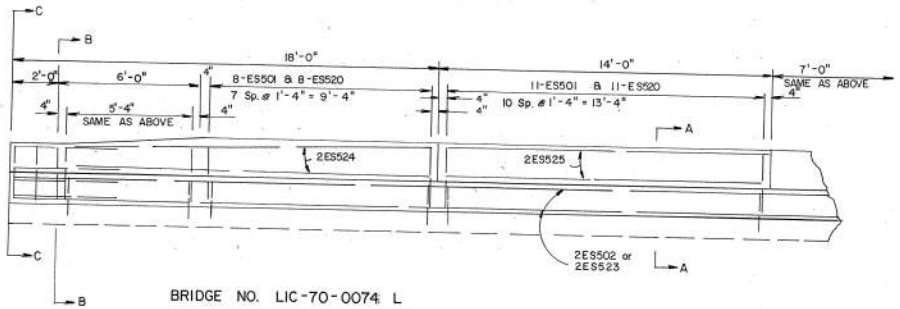
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

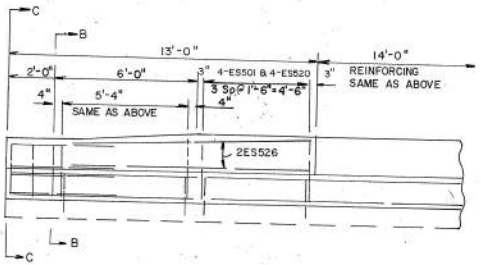
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RBD DATE 1-21-88



BRIDGE NO. FAI-70-0084 L/R



BRIDGE NO. LIC-70-0074 L



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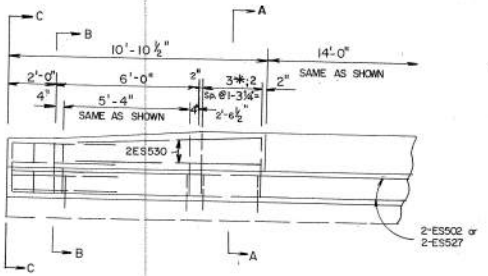
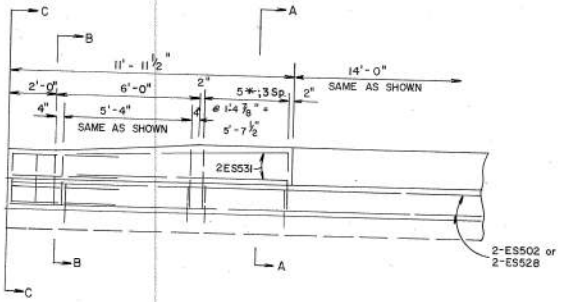


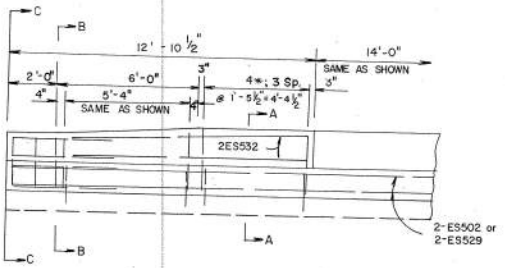
* ES501 & ES520

SEE SHEET 112 FOR SEC. A-A, B-B, C-C AND BENDING DIAGRAMS AND REINFORCING STEEL TABLES.

BRIDGE NO. FAI-70-0119L



BRIDGE NO. FAI-70-0119R
(NORTH PARAPET)



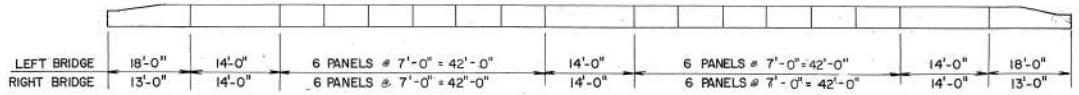
BRIDGE NO. FAI-70-0119R
(SOUTH PARAPET)

JOINT SPACING FOR BRIDGE RAILING, DEFLECTOR PARAPET TYPE

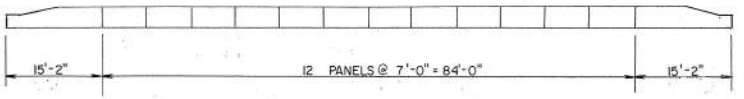
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RJD DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



BRIDGE NO. LIC-70-0074 L/R



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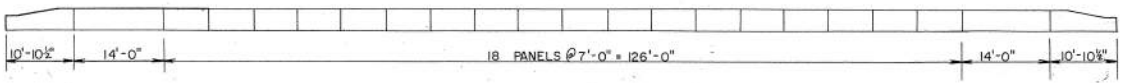
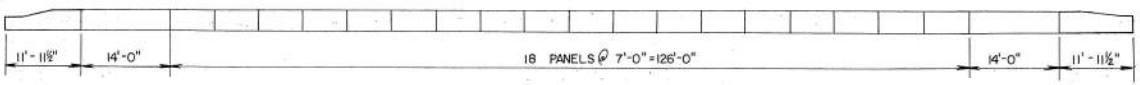
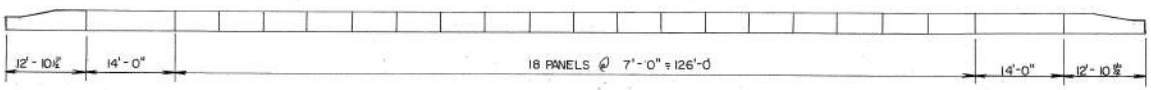


BRIDGE NO. FAI-70-0119L



BRIDGE NO. FAI-70-0119 R
(NORTH PARAPET)



BRIDGE NO. FAI-70-0119 R
(SOUTH PARAPET)

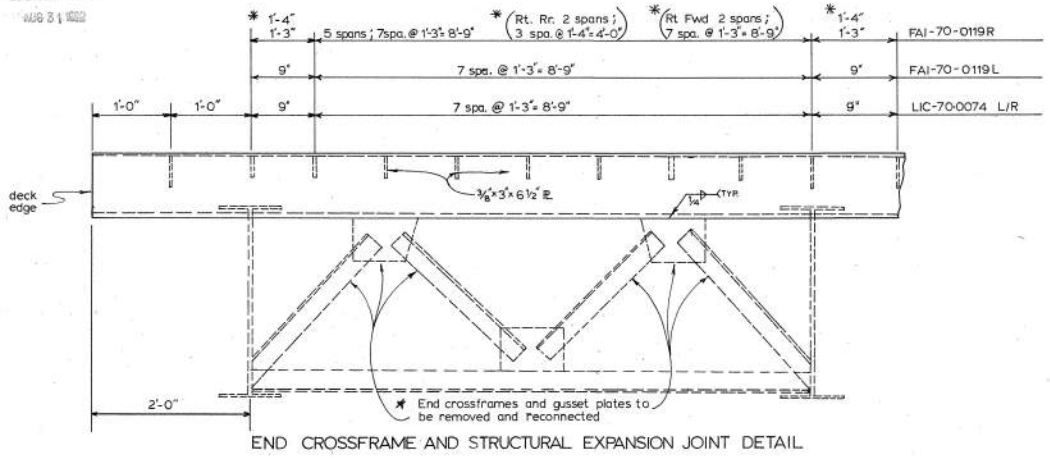
Existing end crossframes and gusset plates shall be removed and reconnected to allow new expansion joint armor to be installed. Any cutting of the crossframes or gusset plates shall be as directed by the Engineer to ensure proper installation of the expansion joint armor. An estimated amount of 6568 pounds of Item 513-Structural Steel as Per Plan has been included in the Bridge Summary for removal, replacement and reconnection of any crossframes or gusset plates deemed necessary by the Engineer.

MICROFILMED
AUG 31 1988

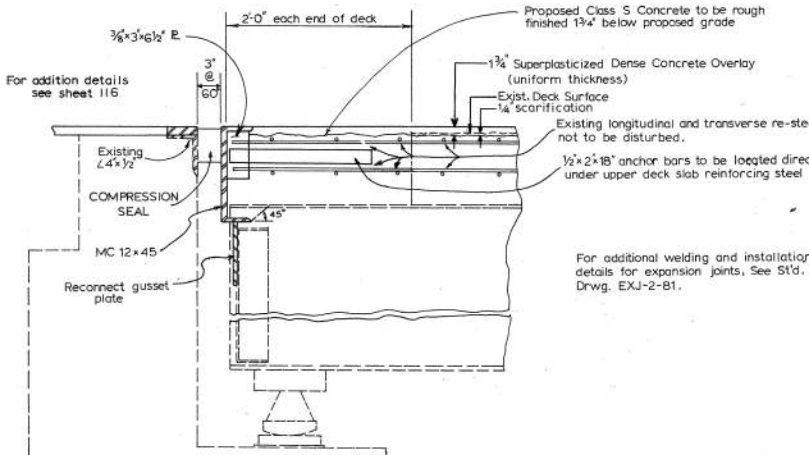
CALCULATED BY RM DATE 1-15-88
CHECKED BY RBD DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

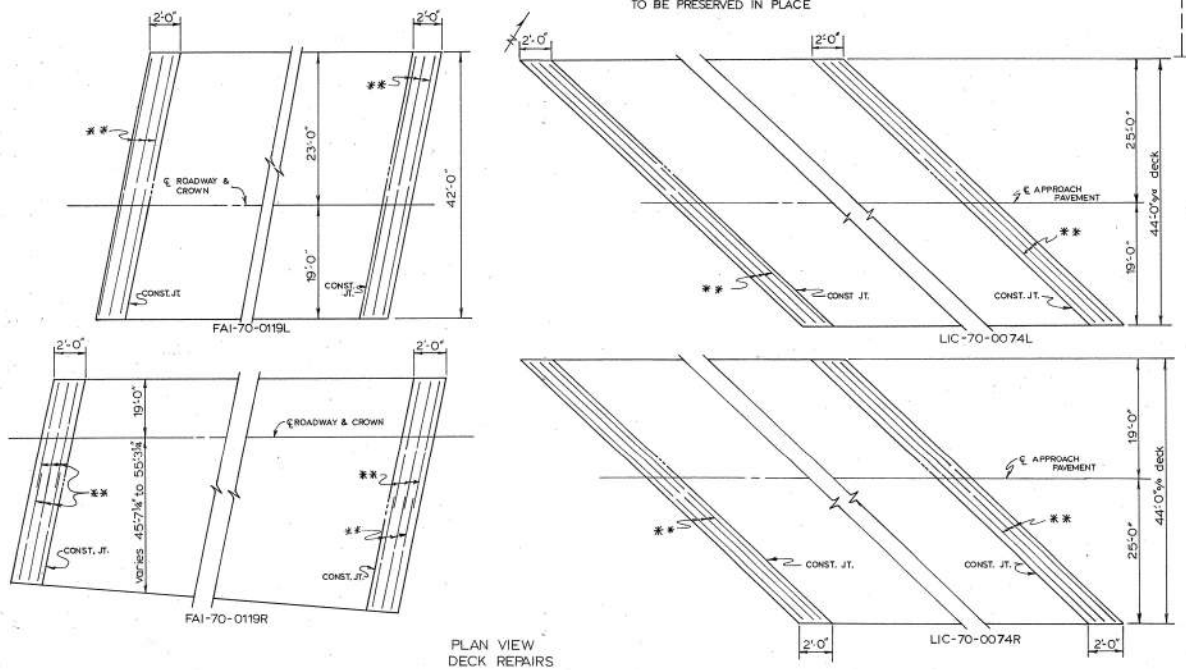


END CROSSFRAME AND STRUCTURAL EXPANSION JOINT DETAIL



FAI-70-0119 L/R
LIC-70-0074 L/R
SECTION ON ℄

** EXISTING TRANSVERSE RESTEEL (TOP AND BOTTOM) TO BE PRESERVED IN PLACE



PLAN VIEW
DECK REPAIRS

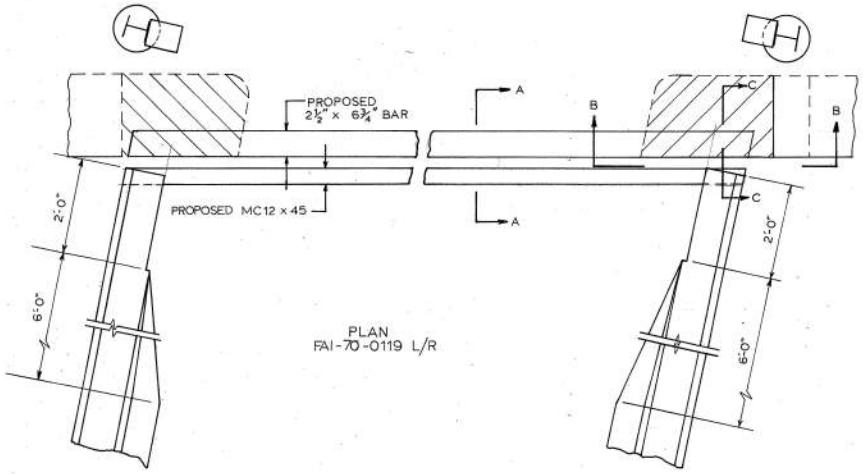
DESCRIPTION	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 0074R	U
ITEM 202 Portions of structures removed, superstructure	5	6	7	7	C
ITEM 511 Class S concrete, superstructure	5	6	7	7	C
ITEM 513 Structural steel	1391	2395	1391	1391	Po

MICROFILMED
AUG 3 1 2010

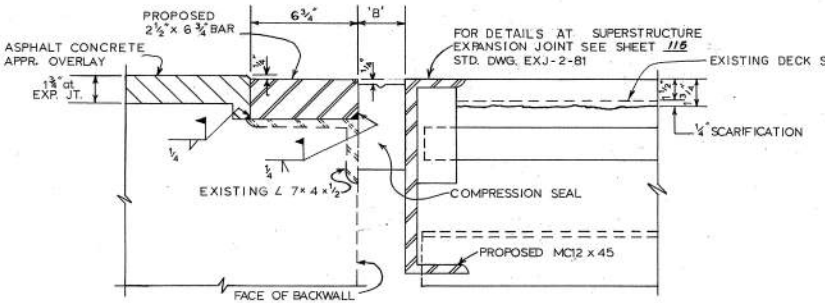
CALCULATED BY Rm DATE 1-15-88
CHECKED BY RJO DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

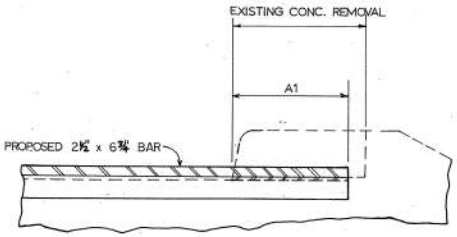
FAI-70-0.00
LIC-70-0.00



PLAN
FAI-70-0119 L/R

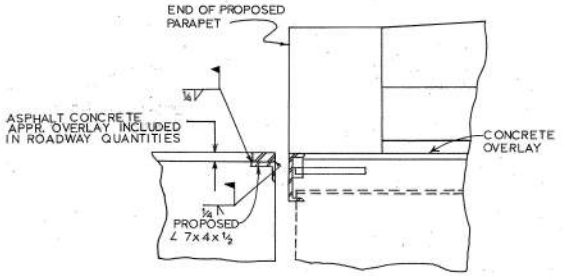


SECTION A-A

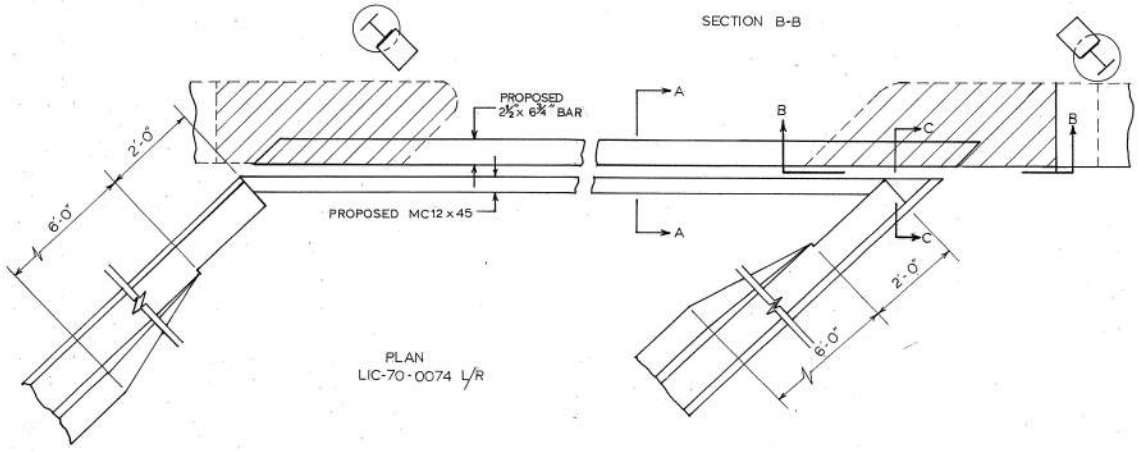


SECTION B-B

AMBIENT TEMP F°	DIMENSION 'B'			
	FAI-70-0119 L/R		LIC-70-0074 L/R	
	REAR	FWD	REAR	FWD
90	3¼"	3¼"	3¼"	3¼"
80	3⅛"	3⅛"	3⅛"	3⅛"
70	3⅛"	3⅛"	3⅛"	3⅛"
60	3"	3"	3"	3"
50	2⅞"	2⅞"	2⅞"	2⅞"
40	2¹³⁄₁₆"	2¹³⁄₁₆"	2¹³⁄₁₆"	2¾"
30	2¾"	2¾"	2¾"	2⅝"



SECTION C-C



PLAN
LIC-70-0074 L/R

BRIDGE NUMBER	ANGLE LT. RR. ABUT.	ANGLE RT. RR. ABUT.	ANGLE LT. FWD. ABUT.	ANGLE RT. FWD. ABUT.	DIM A-1	CONCRETE REMOVALS				EXPANSION JOINT PAY LENGTH	
						LT. RR.	RT. RR.	LT. FWD.	RT. FWD.	RR.	FWD.
FAI-70-0119 L	12°	12°	12°	12°	2'-2"	2'-9"	3'-0"	3'-0"	2'-7"	43'-0"	43'-0"
FAI-70-0119 R	12°	12°	12°	12°	2'-2"	2'-7"	2'-9"	2'-9"	2'-10"	66'-1"	75'-11"
LIC-70-0074 L	46°25'30"	46°25'30"	46°25'30"	46°25'30"	3'-1"	6'-6"	2'-6"	3'-11"	5'-2"	60'-11"	60'-11"
LIC-70-0074 R	46°25'30"	46°25'30"	46°25'30"	46°25'30"	3'-1"	5'-2"	3'-11"	2'-6"	6'-6"	60'-11"	60'-11"

ESTIMATED LENGTH: CONTRACTOR SHALL VERIFY ACTUAL LENGTH NEEDED
LEGEND RR - REAR
FWD - FORWARD

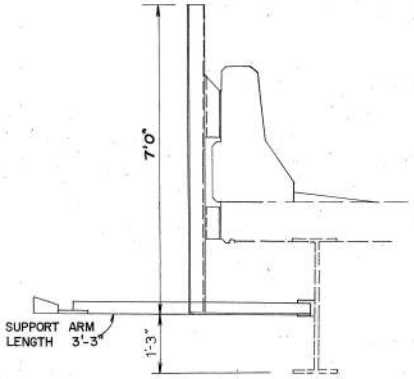
CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY RJD DATE 1-21-88

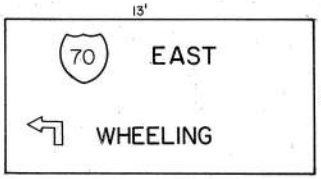
FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00

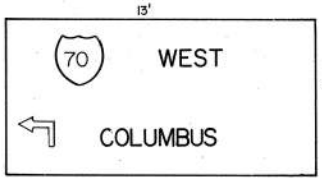
BRIDGE NO. FAI-70 0119 L	BRIDGE NO. FAI-70 0119 R			ITEM	QUANT.	UNIT	DESCRIPTION
845	845			630	169	SQFT.	SIGNS, EXTRUSHEET, TYPE G
1	1			630	2	EACH	OVERPASS STRUCTURE MOUNTED SIGN SUPPORT, TYPE TC-18.24
1	1			630	2	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND STORAGE
1	1			630	2	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND STORAGE, TYPE TC-1824
1	1			631	2	EACH	SIGNS WIRED, OVERPASS STRUCTURE MOUNTED
2	2			631	4	EACH	MERCURY VAPOR LUMINAIRE, TYPE TC-31.21, WITH 175-WATT LAMP
2	2			631	4	EACH	REMOVAL OF LUMINAIRE AND STORAGE

QUANTITIES CARRIED TO SHEET 49





6.5' (INCLUDES 6" GLARE SHIELD)
LEVEL II



6.5' (INCLUDES 6" GLARE SHIELD)
LEVEL II

FAI-70-0119 L

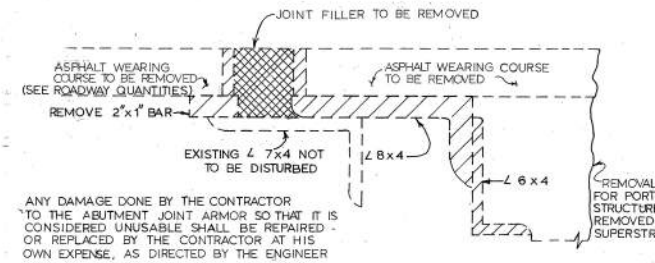
FAI-70-0119 R

TC-18.24

SIGN BRACKET SPACING

6", 72", 72", 6",

MOUNT SIGNS HORIZONTALLY IN THE APPROXIMATE LOCATION OF THE EXISTING SIGNS. THEY MAY BE MOVED SLIGHTLY TO ALLOW FOR THE INSERTION OF THE EXPANSION ANCHOR BOLTS.



ANY DAMAGE DONE BY THE CONTRACTOR TO THE ABUTMENT JOINT ARMOR SO THAT IT IS CONSIDERED UNUSABLE SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE, AS DIRECTED BY THE ENGINEER

ITEM 202 - PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN.

CARE SHALL BE TAKEN IN THE REMOVAL OF THE EXISTING 2"x1" EDGE BARS, VERTICAL EXTENSIO ∠ 8x4; ∠6x4 & JOINT FILLER SO AS NOT TO DAMAGE THE EXPANSION JOINT ARMOR ANGLE AT THE ABUTMENT.

THE BARS SHALL BE REMOVED BY FLAME CUTTING FROM THE END FINISH AND DISPOSED OF BY THE CONTRACTOR. THE SURFACE OF THE END FINISH SHALL BE LEFT FREE OF ANY ROUGH AREAS. THE ENGINEER SHALL DETERMINE IF THE END FINISH IS SMOOTH ENOUGH TO ENSURE PROPER INSTALLATION OF THE NEW 2½"x 6¾" BARS. SEE DETAIL ON SHEET 116.

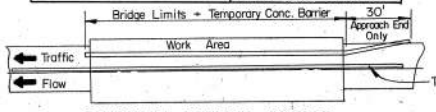
PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR 436 LIN. FT. OF ITEM 202-PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN WHICH SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO REMOVE THE LISTED PARTS.

DESCRIPTION	Br. N° FAI-70 0119L	Br. N° FAI-70 0119R	Br. N° LIC-70 0074L	Br. N° LIC-70 007AR	UN
ITEM 202 PORTIONS OF EXPANSION JOINTS REMOVED, AS PER PLAN	78	138	110	110	LI

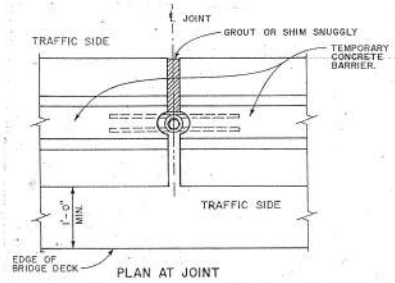
ITEM 622 - TEMPORARY CONCRETE BARRIER *BRIDGE MOUNTED*

THE CONTRACTOR SHALL INSTALL THE BARRIER AS PER STD. DRAWING MC-9A. THE QUANTITY SHALL ALSO INCLUDE REMOVING AND REUSING THE BARRIER AS SHOWN IN PHASES 1A & 2A. AFTER THE PROJECT HAS BEEN COMPLETED THE BARRIER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED BY HIM. ANCHORING OF ALL TEMPORARY CONCRETE BARRIER A.P.P. 2, LOCATED ON THE BRIDGES SHALL NOT BE REQUIRED. CONNECTIONS OF THE PARAPETS SHALL BE DONE BY USING 1¼" x 27" DIA. HIGH STENGTH BOLTS THREADED 8" ON EACH END. PAYMENT FOR BOLTS, NUTS, WASHERS, LABOR, MATERIALS AND INCIDENTALS SHALL BE INCLUDED IN ITEM 622. TEMPORARY CONCRETE BARRIER *BRIDGE MOUNTED* QUANTITIES SHOWN ARE CARRIED IN THE GENERAL SUMMARY ON SHT. 48

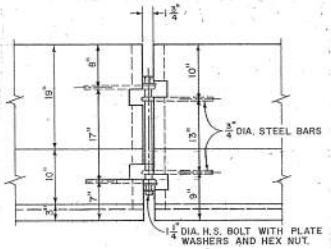
FAI-70-0084 L/R	150	LIN. FT.
FAI-70-0119 L/R	210	LIN. FT.
TOTAL	360	LIN. FT.



CONCRETE BARRIER DETAIL

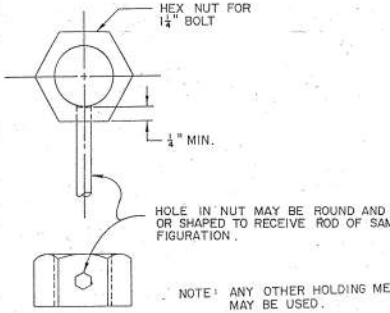


PLAN AT JOINT



ELEVATION AT JOINT

MODIFIED BARRIER



EXAMPLE OF METHOD FOR HOLDING NUT DURING THREADED ROD INSTALLATION

Br. № FAI-70-0

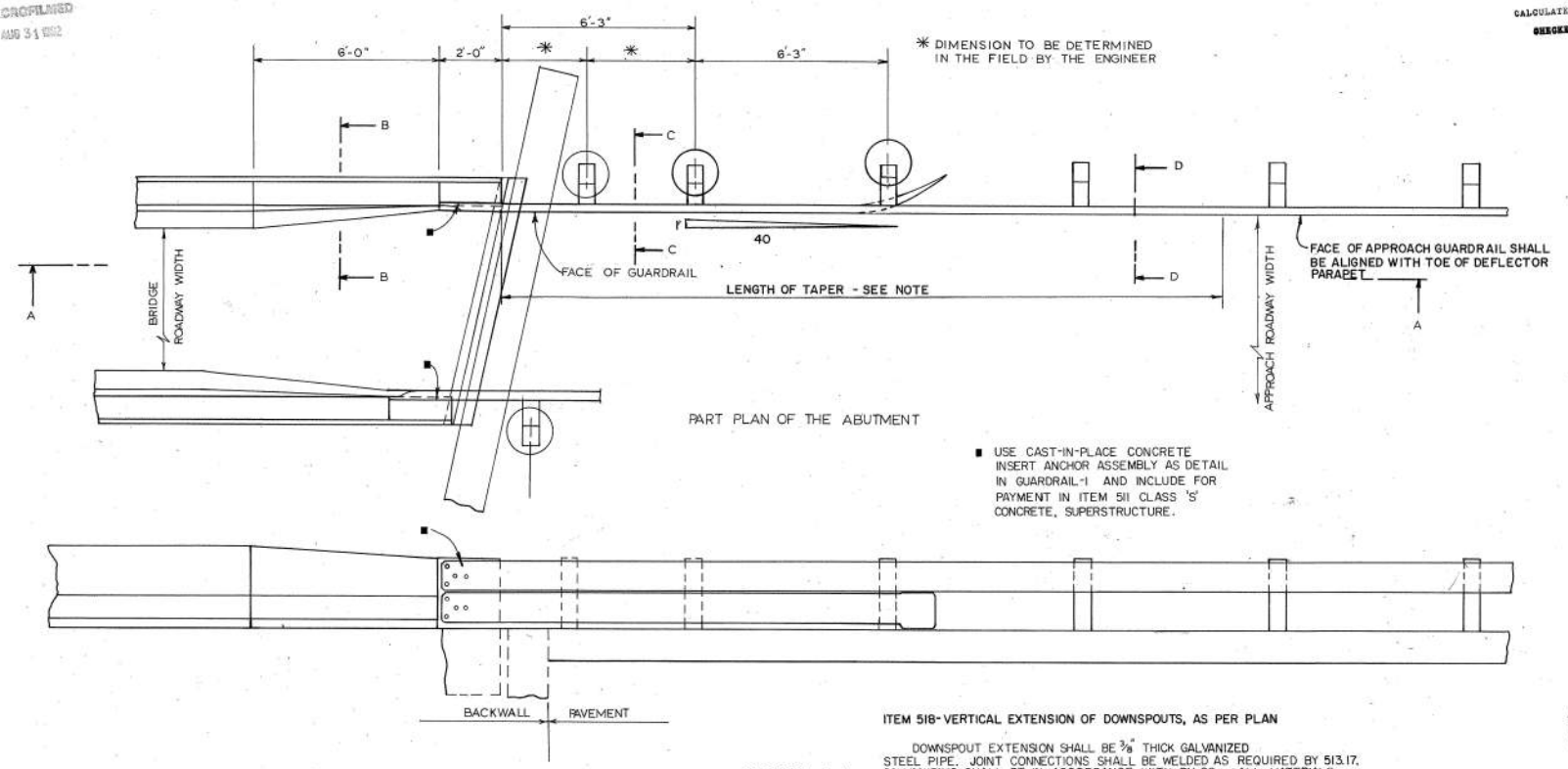
EXPANSION JOINT & SIGN DE

MICROFILMED
AUG 31 1992

CALCULATED BY [illegible] DATE 1-15-88
CHECKED BY [illegible] DATE 1-21-88

FHWA REGION	STATE	PROJECT	
5	OHIO		

FAI-70-0.00
LIC-70-0.00



SECTION A-A

REFERENCE FOR ADDITIONAL DETAILS AND DETAILS NOT SHOWN, SEE STANDARD DRAWINGS BR-1, GR-1, GR-2B, GR-3, & GR-7.

NOTE: ALL HOLES IN THE FIRST APPROACH GUARDRAIL PANEL ADJACENT TO THE BRIDGE SHALL BE SLOTTED ¾" x 2½" AND BOLTS SHALL BE TIGHTENED AS SPECIFIED FOR EXPANSION JOINTS AS PER 606.05.

TAPER: The 40:1 taper shown is de able. However, any taper 25:1 or flatter is acceptable. The length of taper will vary depending o the rate of taper and the alignm of the approach guardrail with respect to the toe of the parapet

SECTION A-A

ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN

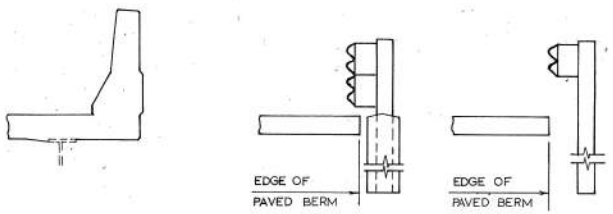
DOWNSPOUT EXTENSION SHALL BE ⅜" THICK GALVANIZED STEEL PIPE. JOINT CONNECTIONS SHALL BE WELDED AS REQUIRED BY 513.17. GALVANIZING SHALL BE IN ACCORDANCE WITH 711.02. ALL MATERIALS, LABOR, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK SHALL BE PAID FOR UNDER ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN. PAINTING OF THE VERTICAL EXTENSION AND DAMAGED AREAS SHALL BE INCLUDED IN ITEM 518 AT THE CONTRACTORS EXPENSE. PAINTING SHALL BE ACCORDING TO 514 SYSTEM B. FINISH PAINT SHALL BE 708.08. PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 518-VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN.

ITEM 518-VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN

WORK PERFORMED UNDER THIS ITEM SHALL CONSIST OF THE FURNISHINGS AND INSTALLATION OF VERTICAL EXTENSIONS TO EXISTING SCUPPERS IN THE BRIDGE DECKS AS DETAILED ABOVE AND IN ACCORDANCE WITH SECTION 518.06 OF THE SPECIFICATIONS AND REPLACING ANY CONCRETE REMOVED FOR INSTALLATION OF THE VERTICAL EXTENSION OF SCUPPERS. ACTUAL DIMENSION OF THE EXTENSIONS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE EXTENSIONS SHALL BE WELDED TO THE EXISTING SCUPPERS BEFORE THE DECK IS OVERLAYED.

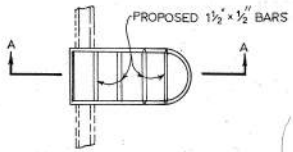
THE MATERIAL UTILIZED FOR THE EXTENSIONS MAY BE WELDABLE GRADE OF LOW OR MILD CARBON STEEL AVAILABLE COMMERCIALLY. THIS MATERIAL IS TO BE EXCLUDED FROM THE REQUIREMENTS OF GALVANIZING ACCORDING TO 711.02 AND FROM THE MILL TEST REPORTS ACCORDING TO 501.07.

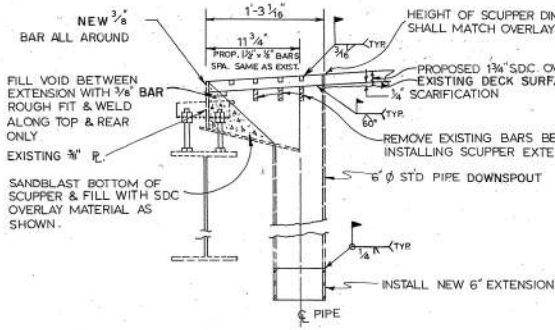
PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 518-VERTICAL EXTENSIONS OF SCUPPERS, AS PER PLAN.



SECTION B-B SECTION C-C SECTION D-D

DESCRIPTION	Br. N° FAI-70 0084 L	Br. N° FAI-70 0084 R	Br. N° FAI-70 0119 L	Br. N° FAI-70 0119 R	Br. N° LIC-70 0074 L	Br. N° LIC-70 0074 R	TOTAL
ITEM 518 VERTICAL EXTENSION OF DOWNSPOUTS, AS PER PLAN	10	10	8	12	8	8	56
ITEM 518 VERTICAL EXTENSION OF SCUPPERS, AS PER PLAN	10	10	8	12	8	8	56





SECTION A-A

VERTICAL EXTENSION OF SCUPPER & DOWNSPOUT

GUARDRAIL TRANS

Appendix E – Bridge Inspection Photographs

Photograph 1: Left Bridge / R.A., Bay 1 Large Corner Spall

Photograph 2: Left Bridge / R.A., Cracking w/ Delamination @ Beam 5 Bearing

Photograph 3: Left Bridge / Pier 1, Typical Condition (No Issues Noted)

Photograph 4: Left Bridge / Pier 2, Column 5 Spall

Photograph 5: Left Bridge / F.A., Long. Cracking w/ Minor Spalls @ Beam 2 Bearing

Photograph 6: Left Bridge / Erosion Along Eastern Edge of Pavt.

Photograph 7: Right Bridge / Impact Damage @ Southern Fascia Beam

Photograph 8: Right Bridge / R.A., Hairline Cracking @ Bearing Location Typical

Photograph 9: Right Bridge / R.A., Cracking w/ Minor Spalls @ Beam 1 Bearing

Photograph 10: Right Bridge / Pier 1, Minor Cracking @ Top of Column 4

Photograph 11: Right Bridge / Pier 2, Minor Cracking @ Top of Column 2

Photograph 12: Right Bridge / Pier 2, Minor Cracking @ Top of Column 4

Photograph 13: Right Bridge / F.A., Bay 1 Large Corner Spall

Photograph 14: Right Bridge / F.A., Cracking w/ Minor Spalls @ Beam 3 Bearing

Photograph 15: Right Bridge / F.A., Bay 2 Horizontal Cracking

Photograph 16: Right Bridge / Dumped Rock @ End of East Curb

Far East Freeway
FAI-T0219-00000
Structure Type Study

Ohio Department of Transportation – District 5
9600 Jacksontown Road
Jacksontown, OH 43030

June 23, 2023

2550 Corporate Exchange Drive, Suite 300
Columbus, Ohio 43231
TEL 614 901 2235
WEB www.structurepoint.com

AMERICAN STRUCTUREPOINT INC.

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1.2 Project Location 1

2.0 Structure Type Study 1

2.1 Design Criteria 1

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Appendix A – Design Criteria

Appendix B – Preliminary Bridge Plans, Preferred Alternative

Appendix C – Estimate of Probable Construction Cost and Lifecycle Cost

1.0 Executive Summary

1.1 Overall Summary and Recommendations

This report has been prepared to determine the preferred structure type for a new crossing carrying Taylor Road over IR 70 as part of the FAI/LIC-0.00/0.00 Far East Freeway project (PID 96808). The alternatives studied herein are based on the pertinent recommendations from the previously submitted and approved 2023 "Far East Freeway FAI/LIC-70-0.00/0.00 Feasibility Study". Bridge layout and span configuration for the two proposed alternatives are identical and based on site constraints, economy, and satisfying the requirements of the ODOT Location and Design Manual (L&D) Volume 1 and ODOT Bridge Design Manual (BDM). Both alternatives consider a two-span bridge (126' – 110') on semi-integral abutments behind MSE walls. The two proposed options are:

- Alternative A (concrete) – composite prestressed wide-flange beam superstructure comprised of eleven (11) WF72-49 beams.
- Alternative B (steel) – plate girder superstructure comprised of ten (10) steel plate girders with 58" web depth.

For an evaluation of the economic impacts associated with each alternative specific to approach roadway costs and considerations, please refer to the Alternatives Evaluation Report (AER).

The recommended structure for this site is Alternative A (concrete) based on providing similar initial construction costs (+5%) but lower lifecycle costs (-10%).

1.2 Project Location

2.0 Structure Type Study

2.1 Design Criteria

Pertinent geometric design criteria were developed in accordance with the current ODOT L&D Vol. 1 and Bridge Design Manuals and summarized in Appendix A of this report.

Defining the built environment.

2.2 Proposed Structure Alternatives

The structure types evaluated herein are based site constraints, project design criteria, and economy. The proposed two span arrangement for each alternative studied was determined by placing MSE walls outside the required 30'-0" clear zone on each side of IR 70 and locating a single pier at the center of the existing IR 70 median. A 21º10'15.2" R.F. skew is proposed for both alternatives based on aligning substructures with the center of the IR 70 median. Although locating substructures within the clear-zone and protecting with barrier is feasible, it was concluded to be less desirable based on future maintenance costs as well as eliminating the flexibility of future widening along IR 70.

For both alternatives the IR 70 profile will be maintained to minimize mainline impacts and cost. The 16'-6" required minimum vertical clearance over IR 70 will be achieved by adjusting the proposed Taylor Road commensurate with structure depth for Alternatives A and B, respectively.

The two proposed alternatives are detailed below:

Alternative A:

Alternative A consists of a two span (126' – 110') composite prestressed wide-flange beam superstructure on semi-integral abutments behind MSE walls. The superstructure is comprised of eleven (11) WF72-49 beams.

The advantages associated with Alternative A include:

- Lower lifecycle cost (-10%)

The disadvantages associated with Alternative A include:

- Higher initial construction cost (+6%)
- Increased Taylor Road profile and associated approach roadway fills

Estimated preliminary structure and earthwork initial cost / life cycle cost = $7,630872* / $10,747,600

*Includes additional earthwork costs relative to Alternative B

Alternative B:

Alternative B is a two span (126' – 110') plate girder superstructure on semi-integral abutments behind MSE walls and a cap and column center pier. The superstructure is comprised of ten (10) painted steel plate girders with 58" web depth.

The advantages associated with Alternative B include:

- Lower initial construction cost (-6%)
- Fewer beam lines
- Reduced superstructure depth yields a lower proposed Taylor Road profile and reduced approach roadway fills

The disadvantages associated with Alternative B include:

- Higher lifecycle cost (+10%)

Estimated preliminary structure initial cost / life cycle cost = $7,180,217 / $11,922,800

Table 2-1 and Appendix C provide a comparison of the probable construction and lifecycle costs between the alternatives considered in this report. Refer to the AER for a cost comparison of anticipated roadway costs.

	Alternative A	**Alternative B**
Number of Spans	2	2
Span Lengths	126'-0", 110'-0"	126'-0", 110'-0"
Superstructure		
Type	PRESTRESSED I-BEAM WF72-49	PAINTED STEEL PLATE GIRDER 58" WEB
Number of Beam Lines	11	10
Spacing	9'-3"	10'-1"
Deck Thickness	8½ " Composite	8 ¾" Composite
Bridge Width	98'-4"	98'-4"
Substructure		
Abutment Type	Semi-Integral Abutment Behind MSE Wall	Semi-Integral Abutment Behind MSE Wall
Pier Type	Cap and Column	Cap and Column
Cost		
***Comparative Initial Construction Cost (bridge only)**	**$7,560,872**	**$7,180,217**
***Life Cycle Cost**	**$10,747,600**	**$11,922,800**

*Detailed cost breakdown provided in Appendix C

Table 2-1: Alternatives Comparison

2.3 Foundation Recommendations

This Structure Type Study does not include soil borings or Foundation Recommendations due to multiple span configurations being evaluated throughout the entire project. To reduce costs, soil borings will be taken at the final approved substructure locations. Although the final required pile/shaft lengths may deviate from the lengths assumed in this report, this difference in length will not significantly affect the relative differences in cost between the studied alternatives.

For the purposes of this report, friction piles have been assumed for substructure foundations at both the concrete and steel alternatives. For preliminary costs, the driven length was estimated to be 60-feet for Alternative A (concrete) and 50-feet for Alternative B (steel). Foundation Recommendations, and a more refined length of piling/shafts will be calculated and included with the Stage 1 submission.

2.4 Maintenance of Traffic

The proposed extension of Taylor Road over IR 70 necessitates a new bridge so there is no need to maintain existing traffic. Both proposed alternatives were evaluated assuming no traffic impacts or part-width construction.

2.5 Roadway Considerations

A higher roadway profile is required for Alternative A compared to Alternative B as a result of increased superstructure depth of concrete relative to steel. However, longitudinal roadway reconstruction limits are identical for both alternatives. IR 70 roadway impacts will be equal for both alternatives evaluated since the existing profile grade will be maintained. To facilitate the use of a deeper superstructure to carry Taylor Road over IR 70, Alternative A requires approximately 5,900 CY of additional embankment along the limits of the proposed Taylor Road improvements, or approximately $70,000 in initial construction cost. At less than 1% of the cost of initial bridge construction, the cost for additional embankment is considered negligible and does not overcome the benefits of reduced lifecycle costs for Alternative A.

2.6 Utility Impacts

Overhead power and communication lines are present within the vicinity of the proposed bridge alignment. It is anticipated these lines will require temporary or permanent relocation to facilitate construction of the proposed bridge. Should utilities be needed on the proposed bridge, new conduit will be placed in the concrete parapet.

2.7 Preferred Alternative

Alternative A is recommended as the preferred alternative. This recommendation is based on similar initial cost to Alternative B and lower lifecycle costs.

3.0 Conclusion

The preferred structure for the new Taylor Road alignment over IR 70 is a two span (126’-0”, 110’-0), composite prestressed wide-flange beam superstructure on semi-integral abutments behind MSE walls. with A 21°10’15.2” R.F. skew. The structure will be 98’-4” wide and consist of two through lanes in each direction, northbound and southbound turn lanes, and a shared use path.

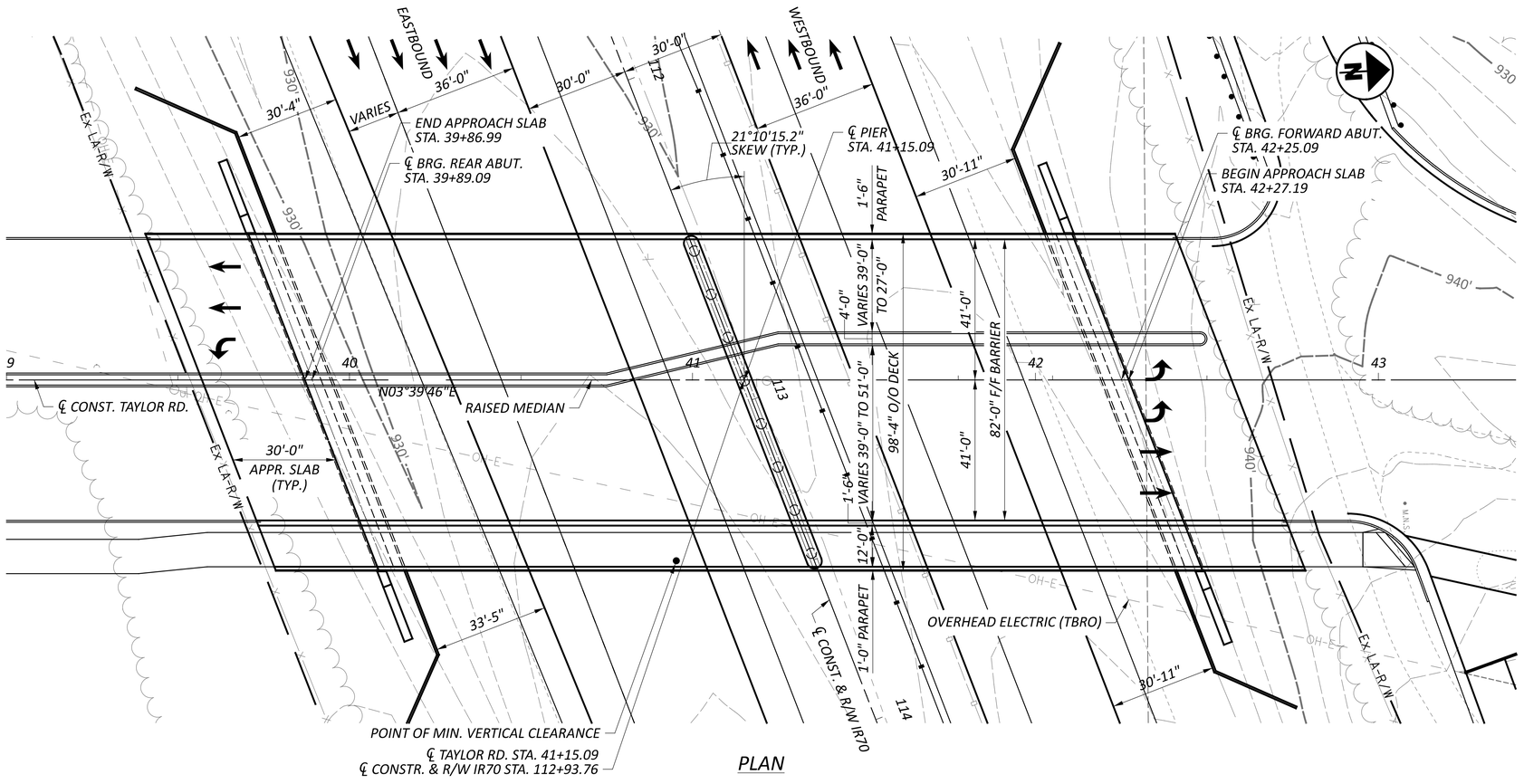
This structure meets all current ODOT design criteria and provides flexibility to accommodate the future needs of IR 70.

Appendix A – Design Criteria

Roadway Design Criteria

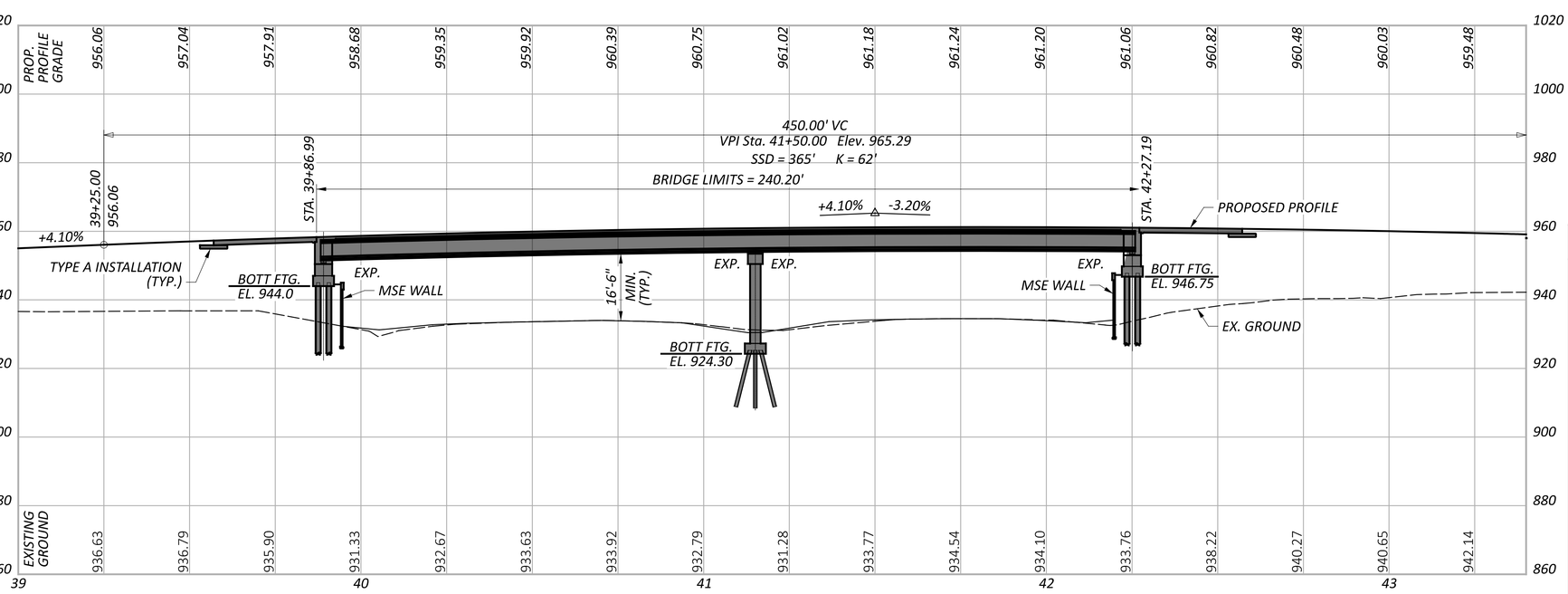
Design Feature / Highway Name	IR 70	TAYLOR ROAD	Appropriate Design Criteria Guide (Figure 105-1E, Sections 105.1 & 105.5.1) Normal Design Criteria Section	Figure
Design Designation				
Location	Urban	Urban		
Functional Classification	Interstate	Arterial		
Traffic Volumes				
Opening Day (2030)				
ADT	56,680	18,460		
DHV	3,937	2,194		
Design Year (2050)				
ADT	76,150	24,650		
DHV	5,290	2,930		
Directional Distribution	50%	53%		
Trucks (D)	12.0%	3.0%		
ADTT (2050)	9,138	740		
Terrain	Level	Level		
Design Speed (mph)	70	45		
Posted Speed (mph)	65	45		
NHS Route	Yes	No		
Design Criteria				
TYPICAL SECTION				
Lane Width	12	12	301.1.2 & 303.1	301-2 to 4, 303-1
Curve Widening	N/A	N/A	301.1.3	301-5a, 5b, 5c
Pavement Cross Slopes	0.016 ft/ft Normal Crown	0.016 ft/ft Normal Crown	301.1.5	301-6
Outside Shoulder Width				
Graded Width	15' w/ Barrier 15' w/o Barrier and Foreslope > 6:1 10' w/o Barrier and Foreslope <= 6:1	13' w/ Barrier 12' w/o Barrier and Foreslope > 6:1 8' w/o Barrier and Foreslope <= 6:1	301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	10'	8'	301.2.3 & 303.1	301-3, 4, 303-1
Median Shoulder Width				
Graded Width	9' w/ Barrier 9' w/o Barrier and Foreslope > 6:1 4' w/o Barrier and Foreslope <= 6:1	N/A	301.2.3 & 303.1	301-3, 4, 303-1
Treated Width	4' 10' (6 or more lanes)	N/A	301.2.3 & 303.1	301-3, 4, 303-1
Median Width	60'	N/A	304.1 to 304.3.2	304-1
Clear Zone Width			600.2	600-1
Foreslopes	≤ 6:1 = 32' (Use 30') > 6:1 to 4:1 = 42' (Use 30')	≤ 6:1 = 19' > 6:1 to 4:1 = 26'	600.2, 600.2.1	600-1, 2
Backslopes	≤ 6:1 = 28' > 6:1 to 4:1 = 28' > 4:1 = 23'	≤ 6:1 = 21' > 6:1 to 4:1 = 19' > 4:1 = 15'	600.2, 600.2.1	600-1, 2
Type of Grading	307-1, 307-2 Safety Grading	307-4 Common/Barrier Grading	307.1 to 307.2	307-1 to 307-6
Shared Use Path Width	N/A	10 ft		
Concrete Walk Width	N/A	Varies		
Walk/Bike Path Cross Slopes	N/A	0.0156 ft/ft		307-6
BRIDGE				
Structural Capacity	N/A	HL-93	302.1	see Bridge Design Manual
New and Reconstructed Bridges				
Lateral Clearance				
On Bridge	N/A	1-2 Paved	302.1	302-1
Under Bridge	10' Rt. / 4' Lt.	N/A	302.1	302-1, 301-3, 301-4, 600-1, & 603-2
Vertical Clearance Over Roadway	16.5'	N/A	302.1	302-1

Appendix B – Preliminary Bridge Plans, Preferred Alternative



POINT OF MIN. VERTICAL CLEARANCE
℄ TAYLOR RD. STA. 41+15.09
℄ CONSTR. & R/W IR70 STA. 112+93.76

PLAN



PROFILE ALONG ℄ CONST. TAYLOR RD.

BENCHMARK DATA (TO BE COMPLETED AT STAGE 1)

BM #1 STA.	,	ELEV.	,	OFFSET	,
BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET XX.

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:

2030 ADT = 18,460 2030 ADTT = 554
2050 ADT = 24,650 2050 ADTT = 740
DIRECTIONAL DISTRIBUTION = 53%

LEGEND

● 16'-6" REQUIRED & PROPOSED MINIMUM VERTICAL CLEARANCE
TBRO = TO BE RELOCATED BY OTHERS

PROPOSED STRUCTURE

TYPE: TWO-SPAN PRESTRESSED CONCRETE I-BEAM WITH COMPOSITE REINFORCED CONCRETE DECK ON SEMI-INTEGRAL ABUTMENT BEHIND MSE WALLS AND CAP AND COLUMN PIER

SPANS: 126'-0", 110'-0" (℄ BRG./℄ PIER, ℄ PIER/℄ BRG.)
ROADWAY: 82'-0" F/F BARRIER W/12'-0" SHARED USE PATH
VEHICULAR LIVE LOAD: HL93
FUTURE WEARING SURFACE: 0.06 KSF
SKEW: 21°10'15.2" R.F.
WEARING SURFACE: MONOLITHIC CONCRETE
APPROACH SLABS: 30'-0" LONG, 17" THICK (AS-1-15, AS-2-15)
ALIGNMENT: TANGENT
CROWN: 0.016 FT/FT
DECK AREA: 23,418 SF

COORDINATES: LATITUDE 39°56'15.09"
LONGITUDE -82°46'20.02"

HORIZONTAL SCALE IN FEET
0 5 10 20

SITE PLAN
BRIDGE NO. FAI T0219 00000
TAYLOR ROAD OVER IR 70

SFN	TBD
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	JCS
CHECKER	MAH
REVIEWER	CLB 06-14-23
PROJECT ID	96808
SUBSET	1
TOTAL	4
SHEET	P.0
TOTAL	0

FAI/LIC-70.0.00/0.00

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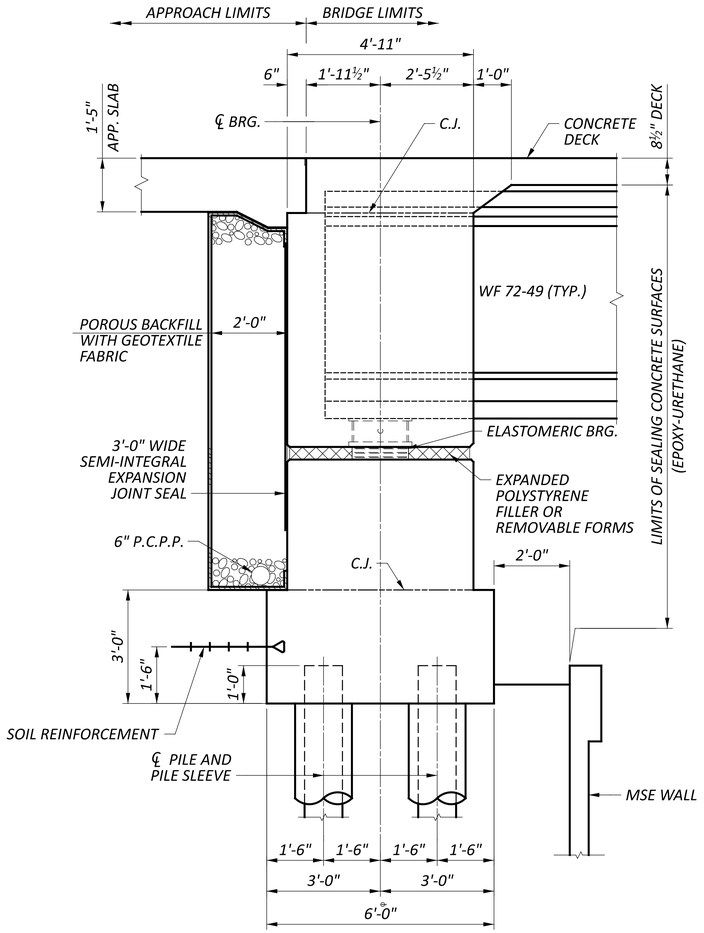

ABUTMENT SECTION

ABUTMENT SECTION
BRIDGE NO. FAI T0219 00000
TAYLOR ROAD OVER IR 70

SFN
TBD

DESIGN AGENCY
AMERICAN STRUCTUREPOINT INC.

DESIGNER	CHECKER
JCS	MAH

REVIEWER
CLB 06-14-23

PROJECT ID
96808

SUBSET	TOTAL
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SHEET	TOTAL
P.0	0

FAI/LIC-70.0.00/0.00

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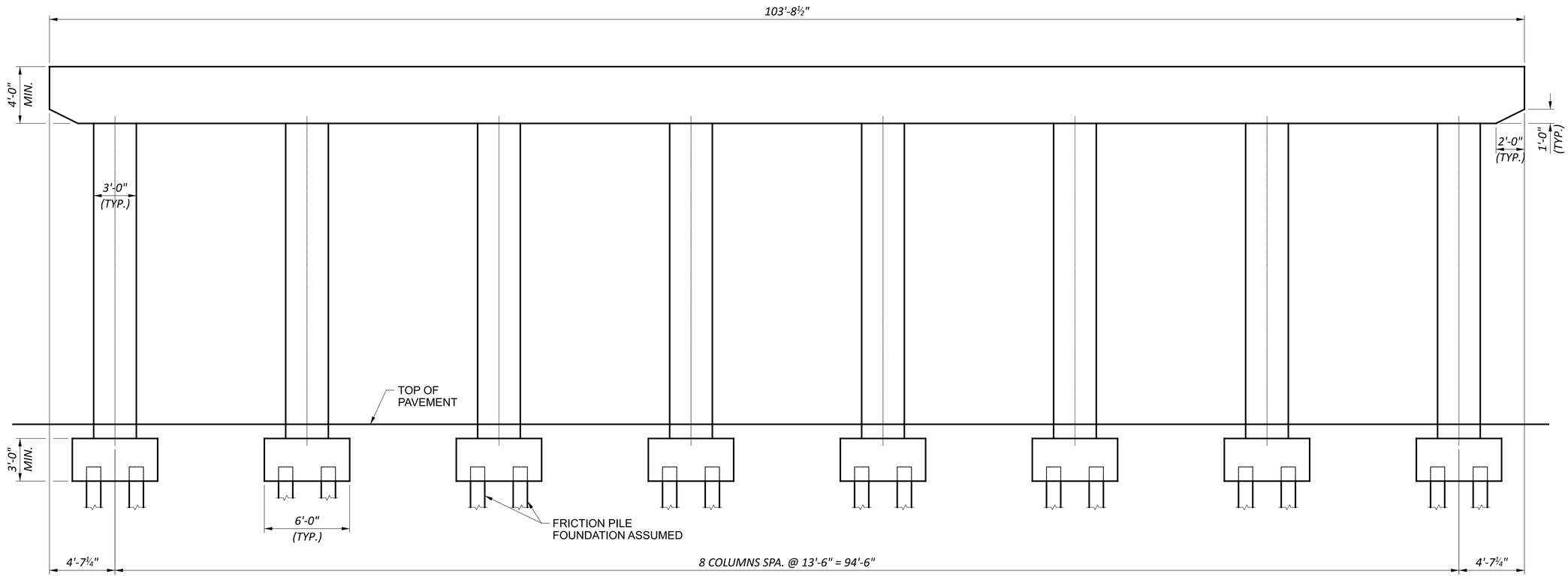

PIER ELEVATION

PIER DETAILS
BRIDGE NO. FAI T0219 00000
TAYLOR ROAD OVER IR 70

SFN TBD

DESIGN AGENCY
STRUCTUREPOINT INC.

DESIGNER	CHECKER
JCS	MAH

REVIEWER: CLB 06-14-23

PROJECT ID: 96808

SUBSET	TOTAL
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SHEET	TOTAL
P.0	0

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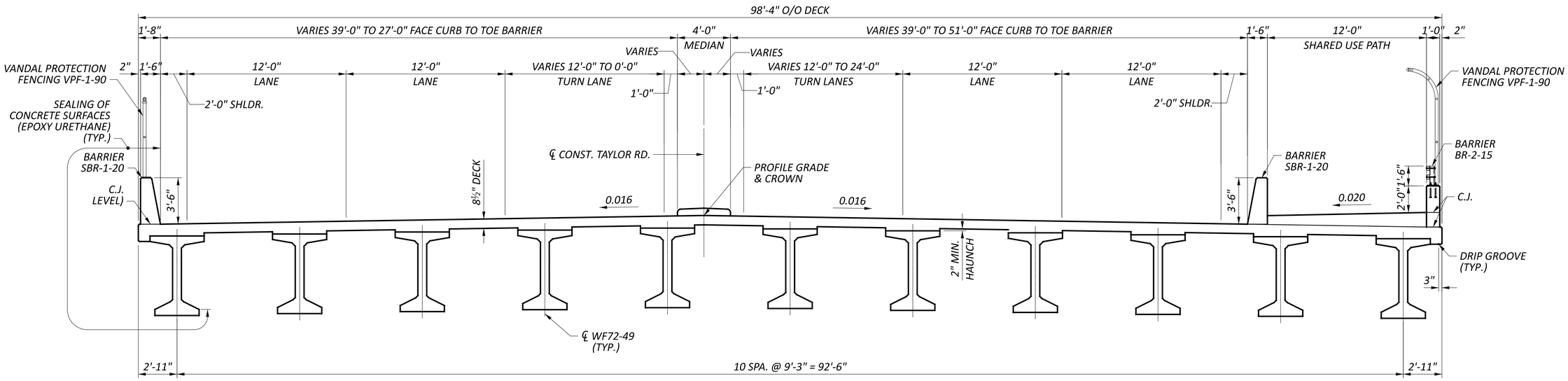

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TRANSVERSE SECTION
BRIDGE NO. FAI T0219 00000
TAYLOR ROAD OVER IR 70

SFN	TBD
DESIGN AGENCY	STRUCTUREPOINT LLC
DESIGNER	JCS
CHECKER	MAH
REVIEWER	CLB 06-14-23
PROJECT ID	96808
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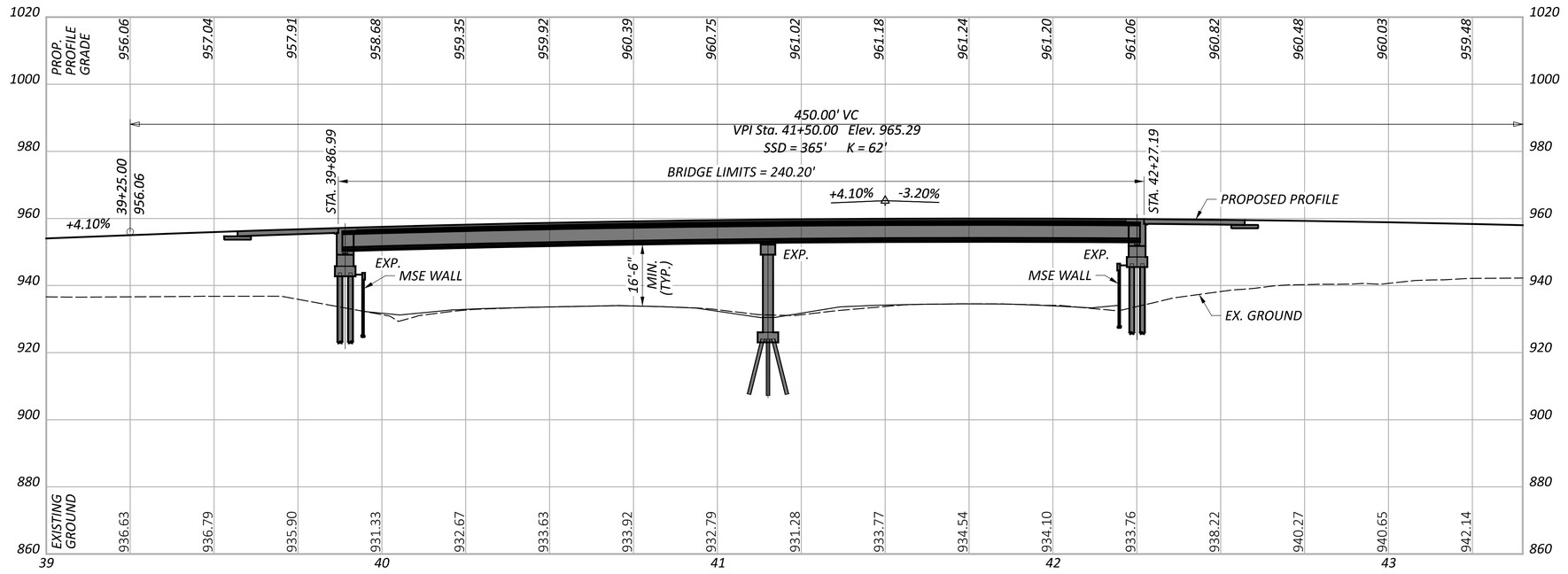
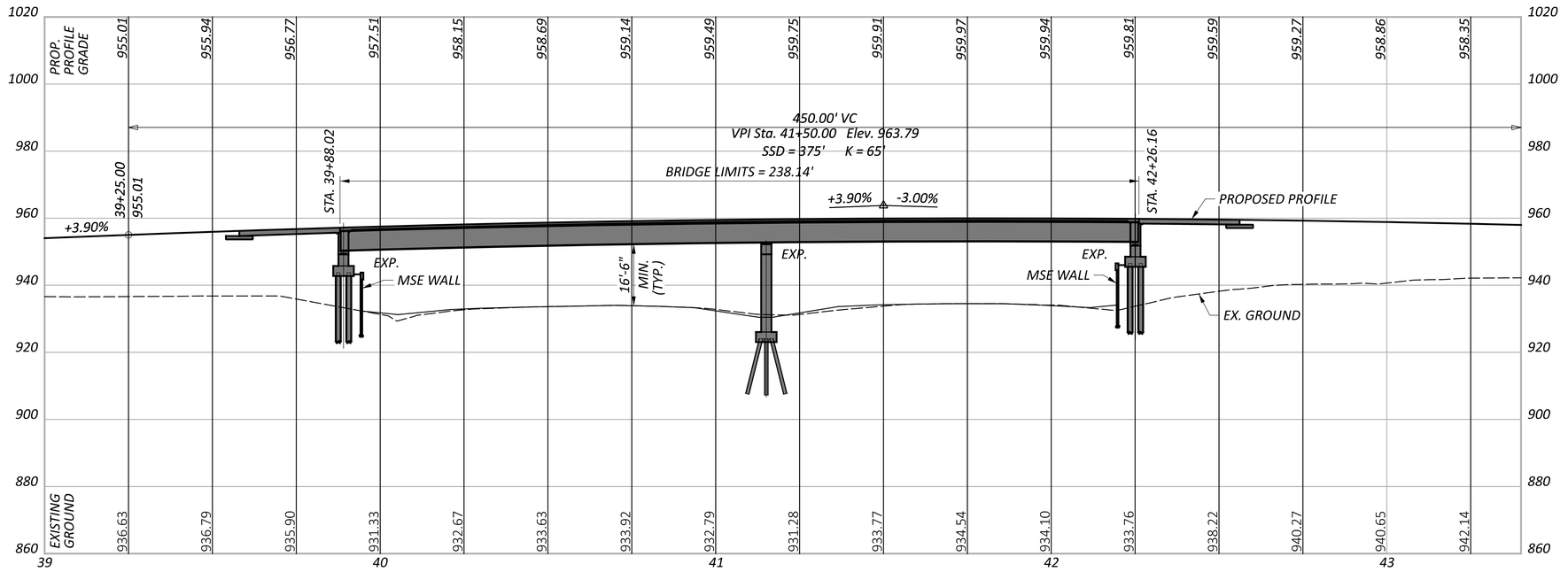
TOTAL	4
SHEET	P.0
TOTAL	0



ALTERNATIVE A PROFILE ALONG ℄ CONST. TAYLOR ROAD



ALTERNATIVE B PROFILE ALONG ℄ CONST. TAYLOR ROAD

ALTERNATIVE PROFILES
BRIDGE NO. FAI T0219 00000
TAYLOR ROAD OVER IR 70

SFN TBD

DESIGN AGENCY STRUCTUREPOINT LLC

DESIGNER	CHECKER
JCS	MAH

REVIEWER CLB 06-14-23

PROJECT ID 96808

SUBSET	TOTAL
0	0

SHEET	TOTAL
P.0	0

FAI/LIC-70.0.00/00

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Appendix C – Estimate of Probable Construction Cost and Lifecycle Cost

Estimate 96808

Estimated Cost:$6,300,651.76

Contingency: 20.00%

Estimated Total: $7,560,782.11

Taylor Road over IR70 Alternative A (Concrete) Structure Type Study Cost Estimate

Base Date: 06/13/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395616

Longitude of Midpoint: -824622

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Preliminary: Structure Type Study (Alt. A)

Prepared by Joe Schmitz on 06/13/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$20,000.00000	$20,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$20,000.00000	$20,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$15,000.00000	$15,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	8,400.000	FT	$12.46246	$104,684.66
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	9,100.000	FT	$48.00000	$436,800.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	454,808.000	LB	$2.00000	$909,616.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	1,013.000	CY	$825.00000	$835,725.00
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	90.000	CY	$550.71622	$49,564.46
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	124.000	CY	$912.08877	$113,099.01
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	165.000	CY	$736.86525	$121,582.77
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	289.000	CY	$497.14759	$143,675.65
0073	511E51512 CLASS QC2 CONCRETE WITH QC/QA, SIDEWALK	69.000	CY	$442.98751	$30,566.14
0076	515E15130 DRAPED STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LE VEL 3, TYPE WF72-49	22.000	EACH	$80,000.00000	$1,760,000.00
0079	515E20000 INTERMEDIATE DIAPHRAGMS	60.000	EACH	$2,017.92963	$121,075.78
0081	516E44200 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	44.000	EACH	$1,800.00000	$79,200.00
0082	517E75122 RAILING (CONCRETE PARAPET WITH TWIN STEEL TUBE RAILING AND V ANDAL PROTECTION FENCE)	240.000	FT	$350.00000	$84,000.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	200.000	CY	$73.51030	$14,702.06
0097	526E30010 REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")	656.000	SY	$280.19873	$183,810.37
0098	526E90010 TYPE A INSTALLATION	211.000	FT	$187.96003	$39,659.57

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description				
	Supplemental Description				
0099	607E39900	239.000	FT	$121.20621	$28,968.28
	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC				
0100	840E20000	7,883.000	SF	$150.00000	$1,182,450.00
	MECHANICALLY STABILIZED EARTH WALL				

Total for Group 1200:$6,300,651.76

Estimate 96808

Estimated Cost:$5,983,514.36

Contingency: 20.00%

Estimated Total: $7,180,217.23

Taylor Road over IR70 Alternative B (Steel) Structure Type Study Cost Estimate

Base Date: 06/13/23

Spec Year: 23

Unit System: E

Work Type: BRIDGE REPLACEMENT

Highway Type:

Urban/Rural Type: URBAN CLASS

Season: SUMMER

County: FAIRFIELD

Latitude of Midpoint: 395616

Longitude of Midpoint: -824622

District: 05

Federal/State Project Number: E220(032)

Estimate Type: Preliminary: Structure Type Study (Alt. B)

Prepared by Joe Schmitz on 06/13/23

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension

Group 1200: Structures Over 20' Span

0055	503E11100 COFFERDAMS AND EXCAVATION BRACING	1.000	LS	$20,000.00000	$20,000.00
0056	503E21300 UNCLASSIFIED EXCAVATION	1.000	LS	$20,000.00000	$20,000.00
0057	505E11100 PILE DRIVING EQUIPMENT MOBILIZATION	1.000	LS	$15,000.00000	$15,000.00
0058	507E00500 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	7,000.000	FT	$12.46246	$87,237.22
0059	507E00550 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	7,700.000	FT	$48.00000	$369,600.00
0060	509E10000 EPOXY COATED REINFORCING STEEL	382,683.000	LB	$2.00000	$765,366.00
0065	511E33500 SEMI-INTEGRAL DIAPHRAGM GUIDE	2.000	EACH	$3,236.00504	$6,472.01
0066	511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	824.000	CY	$825.00000	$679,800.00
0067	511E34450 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	86.000	CY	$550.71622	$47,361.59
0068	511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	101.000	CY	$956.15338	$96,571.49
0069	511E44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTIN G	120.000	CY	$776.98575	$93,238.29
0070	511E46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING	287.000	CY	$497.62555	$142,818.53
0076	511E51512 CLASS QC2 CONCRETE WITH QC/QA, SIDEWALK	69.000	CY	$442.98751	$30,566.14
0077	513E10280 STRUCTURAL STEEL MEMBERS, LEVEL 4	741,312.000	LB	$2.50000	$1,853,280.00
0078	513E20000 WELDED STUD SHEAR CONNECTORS	9,450.000	EACH	$5.50000	$51,975.00
0079	514E00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT	42,952.000	SF	$2.81778	$121,029.29
0080	514E00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	42,952.000	SF	$1.31195	$56,350.88
0081	516E44100 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	30.000	EACH	$1,175.18748	$35,255.62
0082	517E75122 RAILING (CONCRETE PARAPET WITH TWIN STEEL TUBE RAILING AND V ANDAL PROTECTION FENCE)	240.000	FT	$350.00000	$84,000.00
0083	518E21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC	191.000	CY	$73.84333	$14,104.08

Line #	Item Number	Quantity	Units	Unit Price	Extension
	Description				
	Supplemental Description				
0087	526E30010	656.000	SY	$280.19873	$183,810.37
	REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")				
0088	526E90010	211.000	FT	$187.96003	$39,659.57
	TYPE A INSTALLATION				
0099	607E39900	239.000	FT	$121.20621	$28,968.28
	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC				
0100	840E20000	7,607.000	SF	$150.00000	$1,141,050.00
	MECHANICALLY STABILIZED EARTH WALL				

Total for Group 1200:$5,983,514.36

	Alt. A	Alt. B
Number of Spans	2	2
Span Length	126'-0", 110'-0"	126'-0", 110'-0"
Superstructure		
Type	WF72-49	Plate Grider: 58" Web
Number of Beam Lines	11	10
Spacing	9'-3"	10'-1"
Deck Thickness	8 1/2" Composite	8 3/4" Composite
Deck Area	**23418 SF**	**23418 SF**
Painting Area	**N/A**	**42952 SF**
Substructure		
Abutment Type	Semi-Integral Stub Abutments Behind MSE Walls	Semi-Integral Stub Abutments Behind MSE Walls
Pier Type	Cap and Column	Cap and Column
Cost		
Comparative Initial Construction Cost	**$7,560,872**	**$7,180,217**
Life Cycle Cost	**$10,747,600**	**$11,922,800**

i =	**2.00%**
DECK OVERLAY UNIT COST =	**$ 85 /SF**
DECK REPLACEMENT UNIT COST =	**$ 175 /SF**
PAINTING UNIT COST =	**$ 30 /SF**

Alt. A: Prestressed Concrete Girder

Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$7,560,872	$7,560,900
Deck Overlay	25 years	0.61	$1,990,530	$1,213,300
Deck Replacement	50 years	0.37	$4,098,150	$1,522,600
Deck Overlay	75 years	0.23	$1,990,530	$450,800
			LIFE CYCLE COST =	$10,747,600

Alt. B: Steel Plate Girder

Event	Period	PWF	2023 Cost	PWF*Cost
Initial Construction Cost	0 years	1.00	$7,180,217	$7,180,200
Painting of Structural Steel	25 years	0.61	$1,288,560	$785,400
Deck Overlay	25 years	0.61	$1,990,530	$1,213,300
Painting of Structural Steel	50 years	0.37	$1,288,560	$478,700
Deck Replacement	50 years	0.37	$4,098,150	$1,522,600
Painting of Structural Steel	75 years	0.23	$1,288,560	$291,800
Deck Overlay	75 years	0.23	$1,990,530	$450,800
			LIFE CYCLE COST =	$11,922,800

COMPASS
INFRASTRUCTURE GROUP

Structure Type Study

Far East Freeway

FAI/LIC-70-0.00/0.00

PID 96808

Rehabilitation/Replacement of FAI-TR219-00.044 Bridge

June 2023

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APPENDIX A – Bridge Plan Sheets

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Executive Summary

This report has been prepared by Compass Infrastructure Group for ODOT District 5 for the purpose of recommending the preferred structure type to be designed for the rehabilitation/replacement FAI-TR219-00.044 Taylor Road over Tributary to Blacklick Creek in Violet Township and the City of Reynoldsburg in Fairfield County, Ohio.

The existing structure is a 20’ span x 10’ rise box culvert, 60’ long with precast wingwalls and cast in place headwalls. Cover over the existing structure varies over the length of the culvert between 1’ and 7’. The structure is programmed for extension or replacement due to the widening and realignment of Taylor Road for the proposed interchange with IR-70.

This study compared the following options:

1. Option 1 – Culvert Replacement
2. Option 2 – Proposed Bridge
3. Option 3 – Culvert Extension

A preliminary site plan is presented in Appendix A for Option 1. Cost estimates have been prepared for each alternate and are presented in Appendix C. Details concerning constructability, cost and schedule can be found in the report sections herein.

A Hydrology and Hydraulics Report has also been prepared and submitted with this study; investigative information in the H&H Report has been incorporated into this report. The report is located in Appendix D.

Option 1 is preferred. This option consists of replacing the existing culvert under the proposed alignment of Taylor Road. The balance of this report will provide justification for this conclusion.

Project Location

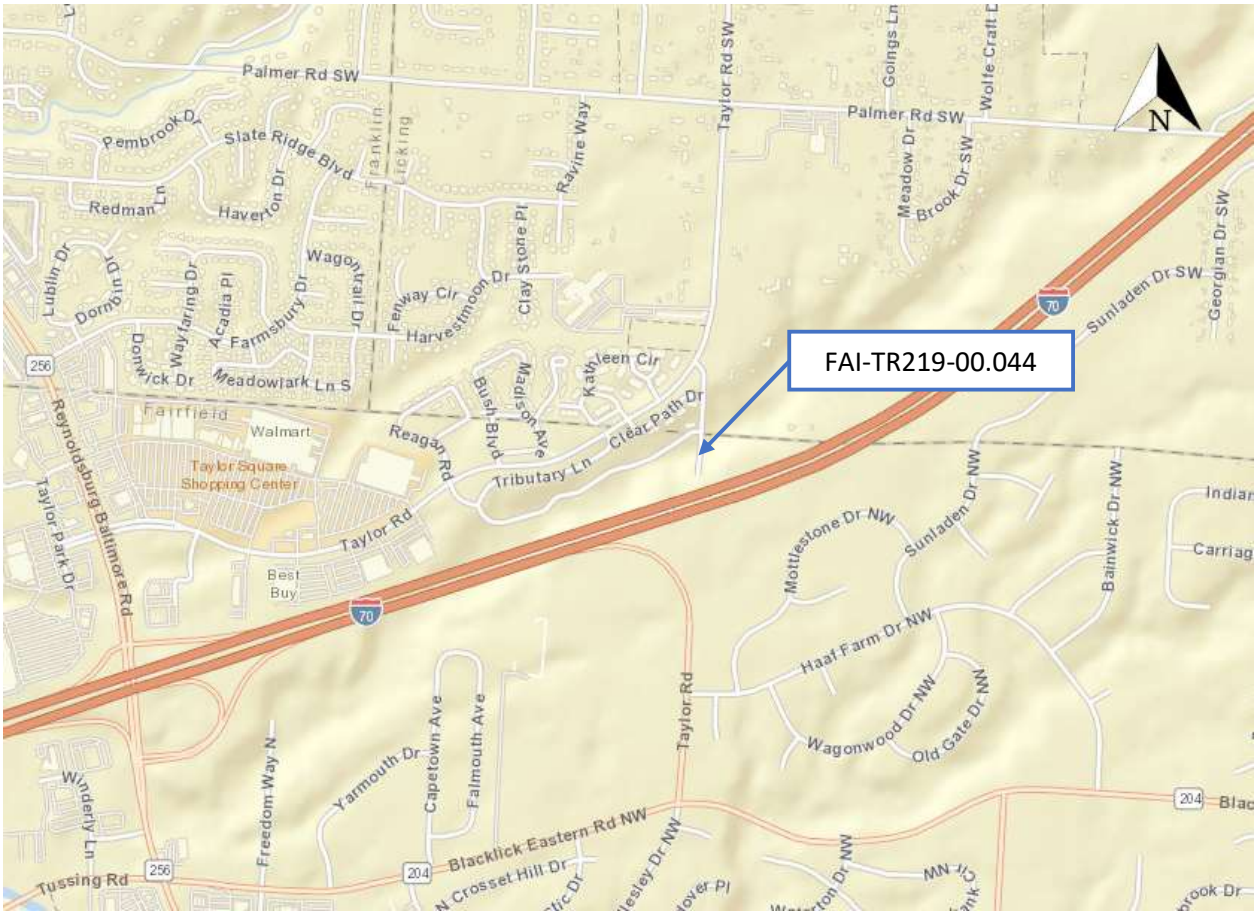
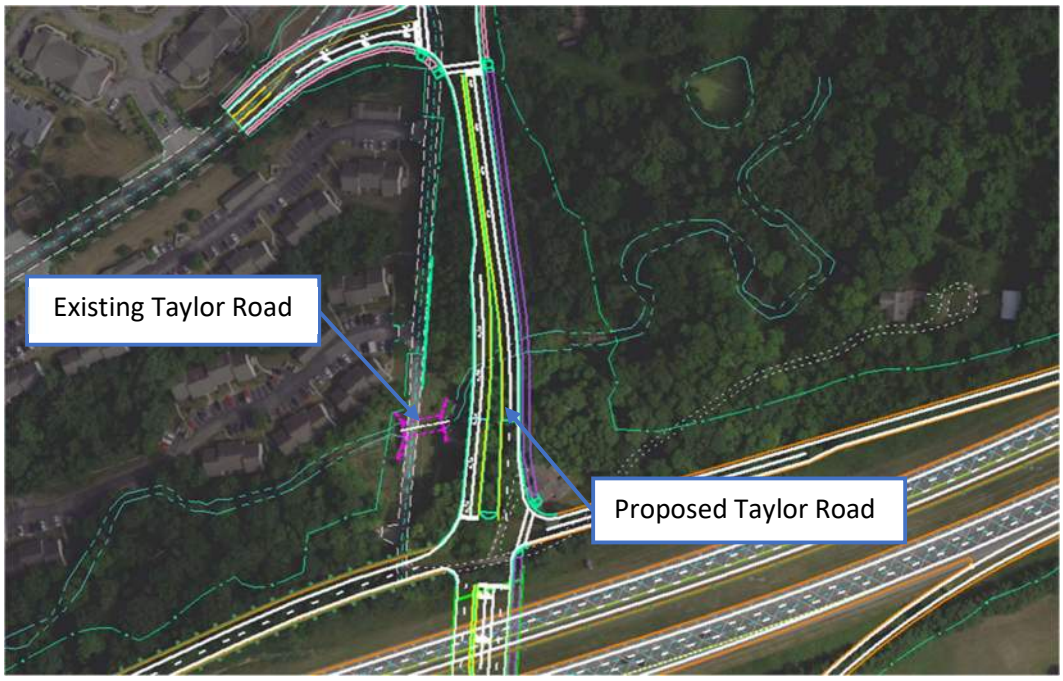


Figure 1: Project Location Map



Project Description

Existing Conditions

The existing FAI-TR219-00.044 bridge carries two lanes of Taylor Road traffic over a Tributary to Blacklick Creek, just north of IR70 in Reynoldsburg and Violet Township in Fairfield County, Ohio. The bridge is a four sided box culvert (20' span x 10' rise) with precast wingwalls and cast in place headwalls on spread footings. There are 12 – 5' long precast sections resulting in a total length of 60'. The culvert has 13°± left forward skew with respect to the existing centerline of Taylor Road. The existing culvert was built in 2014.

The culvert is located on a tangent alignment. The profile is a 100' sag curve with PVI located over the culvert.

The structure currently has a general appraisal rating and operation status of 9A indicating the structure is in excellent condition and may remain open without restrictions. The existing plans and BM191 can be found in Appendix B.

Proposed Conditions

The proposed project will replace the existing culvert with a culvert or a bridge. The horizontal alignment of Taylor Road will be shifted to the east compared to the existing alignment and the proposed structure will be located within a horizontal curve. The vertical alignment will be raised so that Taylor Road can pass over IR 70 to the south. The proposed profile grade is approximately 50 feet above the thalweg of the Tributary to Blacklick Creek.

Taylor Road will consist of two 12'-0" lanes in each direction with 2' outside and 1' inside shoulders with variable width raised median between northbound and southbound lanes. A 10'-0" shared use path will be located on the east side of the road. The overall width including shared use path is 79'-6". For the culvert alternatives, MGS guardrail will be used; for the bridge alternative, BR-2-15 railing will be used.

Structure Type Study Alternatives

Per the scope of services, three alternates were considered for carrying the flow of the Tributary to Blacklick Creek under the proposed alignment of Taylor Road:

1. Culvert Replacement
2. Bridge Replacement
3. Culvert Extension

For this report, each option will be referred to using the numbers above.

Option 1 – Culvert Replacement

Option 1 is replacing the existing 60' long, 20' x 10' box culvert with a longer 20' x 10' box culvert under the proposed alignment of Taylor Road. The culvert is anticipated to consist of 60 – 5' long normal precast sections resulting in a total length of 300'-0" with cast in place wingwalls and headwalls on spread footings. The outlet of the proposed culvert will be located at the same location as the existing culvert outlet. The inlet of the proposed culvert will be placed 300' linearly upstream to match the existing channel resulting in a skew of approximately 28.4° with respect to the proposed centerline of Taylor Road. The existing box culvert including the wingwalls and the spread footing foundations will be removed to avoid a potential conflict with the proposed foundations. The invert of the proposed culvert will be depressed 1' to allow it to fill in to a natural bottom, similar to the existing culvert. The proposed culvert is oversize per LDv2 Section 1002.3.1 as It provides 5.40' of freeboard above the 1% AEP storm.

A box culvert was used for estimating this Option, however other alternatives including 3-sided flat top or precast arch sections will be considered during detailed design should this Option be selected. The feasibility of other types of precast concrete structures will be dependent on the foundation type required which was unable to be determined without geotechnical information. Corrugated metal pipes or arches were not considered for this alternative due to their limited service life compared to concrete culvert alternatives. Replacing the culvert will not be possible without complete closure of Taylor Road.

Close to 40' of type 1 structural fill will be required over the culvert. This may require the box culvert to be cambered to ensure that there is not a sag in the middle due to any settlement that may occur. This will be further evaluated during detailed design after geotechnical analysis has been completed. Lindsay Precast has confirmed that a box culvert with this much fill is feasible.

Advantages of this option include the following:

- Box culverts typically have low maintenance costs.
- Numerous precast manufacturers can produce the non-skewed design sections.
- Faster construction compared to a bridge alternative.
- The cost of this option is significantly lower than option 2.

Disadvantages of this option include the following:

- There will be close to 40' of type 1 structural fill over the culvert.
- The structure will require reconfiguration of the existing channel alignment. Over 300' of disturbance to the existing channel will require an individual permit instead of a nationwide permit.
- Future replacement of the culvert would require the full closure of Taylor Road.

The preliminary construction cost of major items for this alternate including additional roadway and embankment when compared to Option 2 and a 20% contingency is $2,341,000.

Option 2 – Bridge Replacement

Option 2 is a three span (104'-0", 124'-0", 84'-0"), prestressed I-girder structure on semi-integral abutments and hammerhead type piers. The deck width will vary from approximately 85.5' to 128.1' due to the variable width raised median across the bridge. The proposed superstructure will utilize 13 beam lines of AASHTO wide flange type beams with variable spacing and overhangs. Due to the 50' difference between the proposed profile grade and the thalweg of the channel, there will be adequate freeboard from both the 4% and 1% AEP storm events. The proposed approach slabs will be 30'-0" long.

The proposed stub abutments were placed based on 2H:1V grading from elevation 905 to avoid impacts the existing channel. The placement of the forward abutment will cut off an existing channel meander. However, based on field observations and survey data, the channel meander has already naturally begun to be cut off. To avoid cutting off the meander, an additional 100' span would need to be added to the bridge. The proposed hammerhead piers will be very tall due to the 50' difference in elevation between the proposed profile grade and thalweg of the channel. The piers were placed outside of the existing channel. Based on historic borings, it is anticipated that the piers and abutments will be founded on either spread foundations or friction type piles.

Advantages of this option include the following:

- Abutment construction is not near the waterway, so dewatering or temporary shoring would not be needed.
- The stream flow line alignment would remain the same.
- This options will require a realignment of the channel upstream of the bridge, but will only require a nationwide permit instead of an individual permit.

Disadvantages of this option include the following:

- This option is significantly more expensive than option 1.
- Relatively large structure for a small stream due to the difference in profile grade elevation compared to the stream thalweg elevation.
- Placement of the forward abutment will cut off an existing channel meander.
- Life-cycle costs of this option would be significantly more than the culvert option

The preliminary construction cost for this alternate, is $10,458,000. The cost was estimated using a unit cost of $370 per square foot of bridge deck.

Option 3 – Culvert Extension

Option 3 is extending the existing box culvert an additional 243' upstream under the proposed alignment of Taylor Road. This would require 47-5' long precast sections and one cast in place skewed end section to connect the proposed culvert to the existing culvert. The skewed end section will be required to ensure the upstream end of the culvert is aligned with the existing channel. The skewed end section could cause future maintenance issues due to the bend in the culvert. There could be settlement

issues between the existing and proposed culvert sections which could cause long term erosion and scour issues. Additionally, the existing culvert was only designed for 7' to 10' of fill and will not be structurally sufficient to support the 40'+ of new fill making this option not viable. The advantage to this alternative would be less excavation and cost to remove the existing culvert as well as lower cost to build the proposed culvert as it will be shorter than Option 1. However, the cost savings over Option 1 is expected to be minimal. Due to future maintenance concerns, Option 3 was eliminated from consideration and a cost estimate was not calculated.

Cost Comparison

The following table provides a summary of the costs for all options and provides a comparison with the lowest cost alternative.

Table 1 - Summary of Cost Estimates

Option	Initial Cost	Difference	% Difference
1	$2,341,000	-	-
2	$10,458,000	$8,117,000	347%

Refer to Appendix C for detailed bridge construction cost estimates.

Estimated construction costs for the proposed bridge alternatives were based on various sources including ODOT's Office of Estimating Historical Bid Data and Estimator software. The cost estimates include a 20% contingency. Inflation has not been included in these estimates; however, unit prices are based on the most current available bid data from 2023.

Design Criteria

Roadway

Taylor Road

Functional Classification: Urban Arterial

Design Speed: 45 MPH

Legal Speed (Posted): 45 MPH

Traffic Volume: ADT (2030) – 26,320 ADT (2050) – 36,680

ADTT (2030) – 790 ADTT (2050) – 1,100

Clear Roadway Section: Varies (4 - 12'-0" Lanes, 2 - 2' Shoulders, 2 - 1' Shoulders, 2 - 6" curbs, 10' shared use path with 5' offset from curb, variable median)

Bridge

References: *AASHTO LRFD Bridge Design Specifications, 9th Edition*

ODOT Bridge Design Manual (2020)

Live Load: HL-93

Future Wearing Surface: 60 psf

Operational Importance Factor = 1.0
No additional Utility or Stay-In-Place Form Loading
Barrier: Not applicable (culvert alternatives)
BR-2-15 (bridge alternative)
Required Vertical Clearance: Above 4% AEP flood elevation
Required Horizontal Clearance: Not applicable

Design Considerations

Roadway

Taylor Road will have a new horizontal and vertical alignment. The horizontal alignment will be shifted to the east and the proposed structure will be located on a horizontal curve. The vertical alignment will be raised for Taylor Road to pass over IR 70. The proposed profile grade elevation will be approximately 50' above the thalweg elevation. For the bridge alternative, the high profile will ensure there are no concerns that the flow will be clearing the 1% AEP storm event elevation.

Right of Way Requirements

New permanent right-of-way is anticipated based on the preliminary profile and grading for shifting the alignment of Taylor Road to the east.

Preliminary Geotechnical

No geotechnical work has been performed at this time. If Option 1 is selected, it is assumed that the proposed culvert will be placed on Type 1 structural backfill in accordance with ODOT Construction and Material Specifications. If Option 2 is selected, it is assumed that the proposed abutments and piers will be founded on friction piles or spread footings based on historical borings in the area. Geotechnical Investigations will be performed in Part 2 of the Contract. The anticipated work will include borings for bridge substructures as determined from the bridge type.

Maintenance of Traffic

Traffic will not need to be maintained during construction of the proposed structure as the two properties to the southeast of the existing culvert will be vacated prior to construction.

Utilities Issues & Coordination

Utilities identified in the area include overhead electric and telephone and natural gas.

Gas

A gas line is located along the east side of the existing Taylor Road. It is unknown whether this line is located above or below the existing culvert. If the line is located above the existing culvert, it will be impacted by bridge construction.

Overhead Electric and Telephone

Overhead lines are present over the outlet of the existing culvert. Theses lines are not expected to be impacted by bridge construction.

Bridge Hydraulics

The existing structure conveys the Tributary to Blacklick Creek under Taylor Road via 20' span x 10' rise box culvert with 13° left forward skew. The structure is in FEMA Zone X, Area of Minimal Flood Hazard, as shown on Flood Insurance Rate Map Number 3949C0359K.

A 1D HEC-RAS analysis was performed to analyze the existing and proposed conditions at the structure. The analysis indicates that both the design (4% AEP) storm and the 1% AEP storm have adequate freeboard for the existing and proposed bottom of culvert and bridge. Due to the 50' difference between the profile grade and channel thalweg, there is no danger of water surface elevations over topping the roadway for either the design or check storm.

The new structure was designed to achieve a less than 1' rise and to clear the 4% AEP storm event for the proposed alternatives. Option 1 has no more than 0.01' water surface elevation rises for the 4% AEP storm and 1% AEP storm. Options 2 has no more than 0.29' water surface elevation rise for the 4% AEP storm and 0.06' water surface elevation rise for the 1% AEP storm. The rise resolves itself in 534 ft for the 4% AEP and in 170 ft for the 1% AEP storm event. Table 2 gives the freeboard for the existing culvert and each proposed option for the 4% AEP storm, and 1% AEP storm.

Table 2 – Freeboard Comparison

Model	Low Chord	4% AEP storm clearance (ft)	1% AEP storm clearance (ft)
Existing	907.28	3.62	2.39
Option 1	907.48	2.29	1.10
Option 2	943.00	39.08	38.36

All options provide freeboard over the 4% AEP and 1% AEP storms meeting the hydraulic design criteria.

Temporary Access Fill should not be necessary for Option 1 but may be necessary for Option 2 and will be analyzed in the final design phase.

See Appendix D – Hydrology and Hydraulics Report for additional information.

Drainage

The profile features a 3% longitudinal grade, with water flowing towards the north end of the bridge. Option 1 is an underground structure, so no deck drainage will be required. Roadway runoff is collected at nearby catch basins. For Option 2, drainage will be placed as necessary to prevent flow onto the structure from the roadway approaches. Scuppers will be placed as necessary along the shoulder to

prevent spread from encroaching on a 10’ clear travel lane as required by Table 1103-1 of LDv2. Scuppers will free fall into the Tributary to Blacklick Creek.

Temporary Shoring

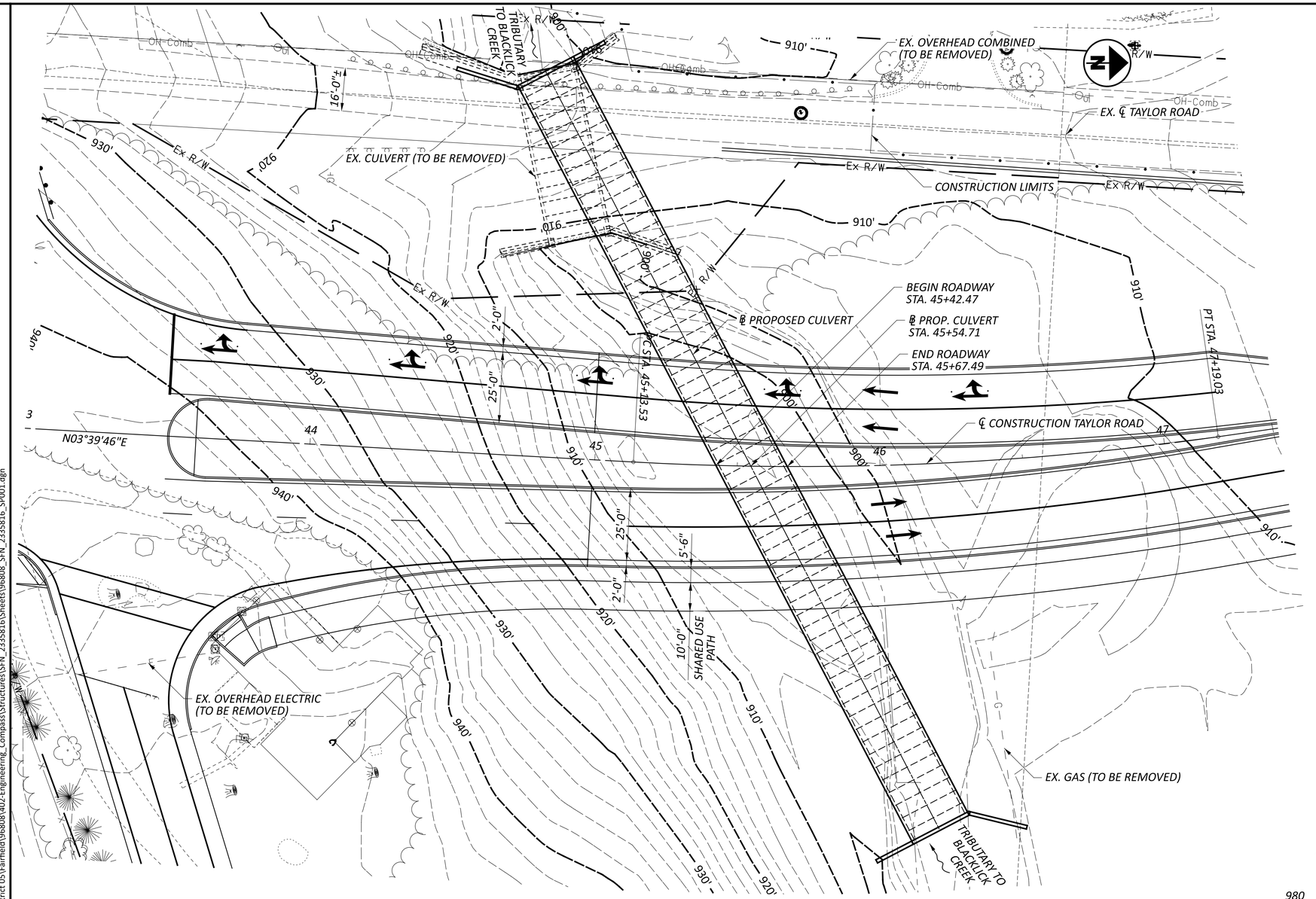
Because the road will be closed, temporary shoring is not required.

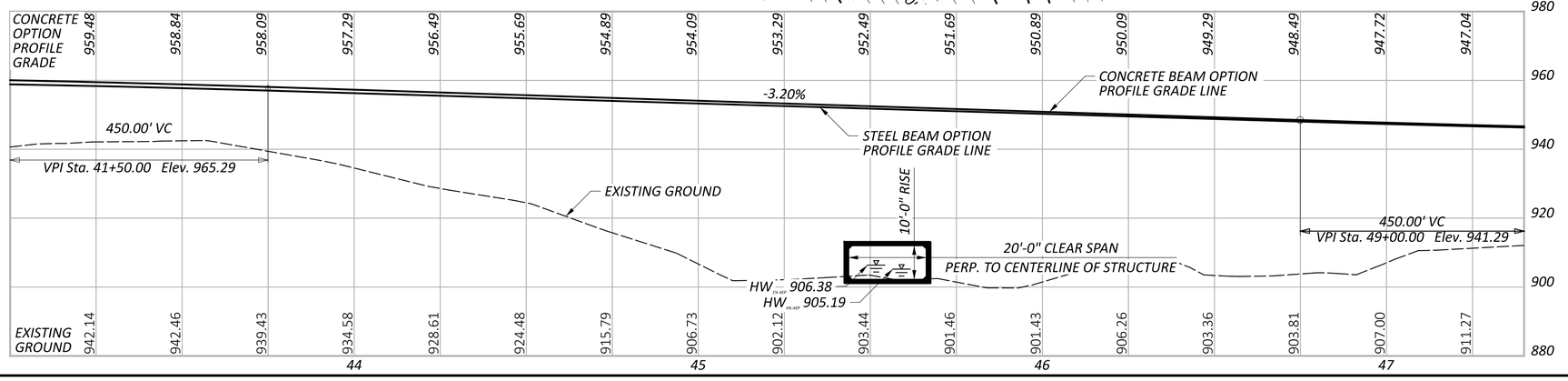
Conclusions & Recommendations

Options 1 and 2 have been evaluated for the replacement structure. Each of these structure types were investigated to meet the design criteria, and to similar levels of detail, to allow them to be compared. Option 3 was eliminated due to structural insufficiency of the existing culvert to accommodate additional fill and concerns about long-term performance of the structure.

The recommended structure type is Option 1: Culvert Replacement. Option 1 is the lowest cost alternative and meets the hydraulic requirements for the storm events analyzed. Option 2 meets hydraulic requirements, however the cost is several times higher than Option 1. Additionally, Option 1 will have a shorter construction duration than Option 2.

APPENDIX A – Bridge Plan Sheets





BENCHMARK DATA

BM #1 STA.	,	ELEV.	,	OFFSET	,
BM #2 STA.	,	ELEV.	,	OFFSET	,
BM #3 STA.	,	ELEV.	,	OFFSET	,
BM #4 STA.	,	ELEV.	,	OFFSET	,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLANS

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
2030 ADT = 26,320 2030 ADTT = 790
2050 ADT = 36,680 2050 ADTT = 1100
DIRECTIONAL DISTRIBUTION =

HYDRAULIC DATA

DRAINAGE AREA = 1.88 SQ. MILES
Q (4% AEP) = 539 CFS V (4% AEP) = 5.60 FT/S
Q (1% AEP) = 787 CFS V (1% AEP) = 6.30 FT/S
STRUCTURE CLEARS THE 4% AEP
DESIGN HW BY 2.29 FEET.

EXISTING STRUCTURE

TYPE: 20'± X 10'± PRECAST CONCRETE BOX CULVERT

SPANS: 20'-0"± (NORMAL TO ℄ CULVERT)
ROADWAY: 16'-0"±
LOADING: HL-93
SKEW: 13° ± RF
WEARING SURFACE: ASPHALT
APPROACH SLABS: NONE
ALIGNMENT: TANGENT
CROWN: 3/16"±/FOOT
STRUCTURE FILE NUMBER: 2335816
DATE BUILT: 2014
DISPOSITION: TO BE REPLACED

PROPOSED STRUCTURE

TYPE: 20' X 10' PRECAST CONCRETE BOX CULVERT

SPANS: 20'-0" (NORMAL TO ℄ CULVERT)
ROADWAY: VARIES TOE/TOE CURB
LOADING: HL93 AND 60 PSF FUTURE WEARING SURFACE
SKEW: 28°24'30.17" RF
WEARING SURFACE: ASPHALT
APPROACH SLABS: NONE
ALIGNMENT: 11°18'09" CURVE LEFT
CROWN: 0.016 FT/FT
DECK AREA: 6600 SF

COORDINATES: LATITUDE 39°56'19.64" N
LONGITUDE 82°46'22.59" W

SITE PLAN
BRIDGE NO. FAI-TR219-00.044
TAYLOR ROAD OVER TRIBUTARY TO BLACKLICK CREEK

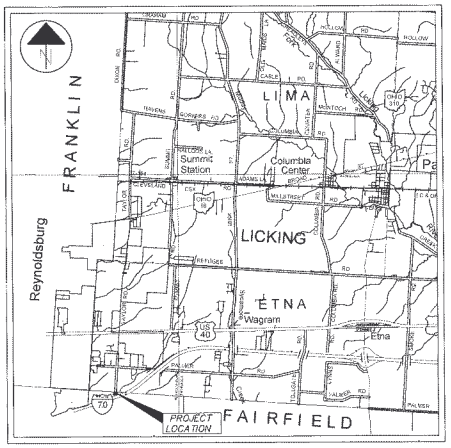
SFN 2335816
DESIGN AGENCY
COMPASS INFRASTRUCTURE GROUP
DESIGNER JFK | CHECKER ERK
REVIEWER XXX MM-DD-YY
PROJECT ID 96808
SUBSET 0 | TOTAL 0
SHEET P.0 | TOTAL 0

FAI/LIC-70-0.00/0.00

MODEL: CLP_TAYLOR - Taylor Road [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/8/2023 TIME: 11:37:51 AM USER: jkoesel
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\402-Engineering_Compass\Structures\SFN_2335816\Sheets\96808_SFN_2335816_SP001.dgn

APPENDIX B – Existing Plans & BM191

FAIRFIELD COUNTY, OHIO
BRIDGE REPLACEMENT
FOR
TAYLOR ROAD BRIDGE
VIO-43



LOCATION MAP
NOT TO SCALE

INDEX OF SHEETS:

TITLE SHEET	1
TYPICAL SECTIONS – TAYLOR ROAD	2
TYPICAL SECTIONS – TEMPORARY ROAD	3
GENERAL NOTES	4
GENERAL SUMMARY	5
PLAN AND PROFILE – TAYLOR ROAD	6
CROSS SECTIONS – TAYLOR ROAD	7–11
PLAN AND PROFILE – TEMPORARY ROAD	12
CROSS SECTIONS – TEMPORARY ROAD	13–17
BRIDGE REPLACEMENT PLAN	18–25

VERTICAL DATUM

The Vertical Datum is based on the elevations established by the National Geodetic Survey, at monument "45WSMIT", being 840.842 feet in elevation, and at monument "F191", being 840.21 feet in elevation. The said elevations were transferred from said National Geodetic Survey monuments using static GPS procedures to the site. The said monuments being source bench marks with elevations that are based on the North American Vertical Datum of 1988.

HORIZONTAL DATUM

The coordinates shown on this map are based on the Ohio State Plane Coordinate System, South Zone, NAD 83 (1986). Said coordinates originated from a field traverse which was tied (referenced) to said coordinate system by GPS observations of Franklin County Engineering Department monuments "FCGS9938", and "FCGS5034". The grid to ground scale factor (1.0000569514) was applied at the location of paint #205.

SOURCE BENCH MARK

Brass plug in the concrete curb of a railroad station platform located in Pickerington, 0.05 miles north of East Columbus Street (S.R. 256), 30 feet southeast of a railroad crossing, 22 feet northwest of the northwest corner of the station, 3 feet southwest of the south roll. Elev. = 840.842

BM #1

Pony spike in the east side of a utility pole, 20± feet west of the centerline of Taylor Road, in front of drive for residence #13920. Elev. = 933.66

BM #2

Pony spike in the southeast side of a utility pole, 20± feet west of the centerline of Taylor Road, 70± feet south of the centerline of Cedar Path Drive. Elev. = 937.95

PLAN PREPARED BY:

EMH&T
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 866.775.3648
emht.com

UNDERGROUND UTILITIES
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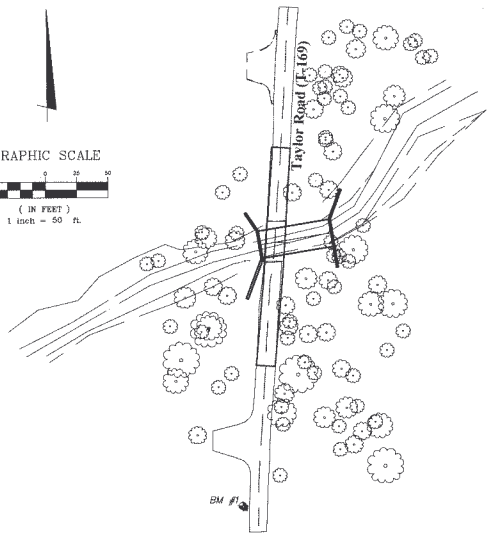
CALL TWO WORKING DAYS
BEFORE YOU DIG
OHIO Utilities Protection SERVICE
811 or 1-800-362-2764
OIL & GAS PRODUCERS PROTECTIVE SERVICE CALL: 1-800-925-0988

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 inch = 50 ft.



INDEX MAP
SCALE: 1"=50'

STANDARD DRAWINGS

THE STANDARD CONSTRUCTION DRAWINGS LISTED ON THESE PLANS SHALL BE CONSIDERED A PART THEREOF.

ODOT		FAIRFIELD COUNTY	SUPPLEMENTAL SPECIFICATIONS	
GR-1.1	7/16/2004		ODOT	
GR-2.1	1/15/2004		SS-800	10/21/2011
GR-2.2	1/20/2006			
GR-4.1	1/21/2011			
RM-4.2	10/15/2010			
BP-3.1	10/19/2007			
TC-61.30	07/15/2011			
MT-101.60	04/17/2009			
MT-101.70	04/15/2011			
MT-101.90	10/21/2011			

PROJECT DESCRIPTION

This project consists of replacing the existing bridge with a 4–sided box culvert and replacing the approach roadway including pavement, guardrail, and traffic control devices.

2010 SPECIFICATIONS

The Standard Specifications of the State of Ohio, Department of Transportation, including changes and Supplemental Specifications listed in the proposal shall govern this improvement, unless specifically noted otherwise.

NOI INFORMATION

Project Earth Disturbed Area = 0.54 Ac.
Estimated Contractor Earth Disturbed Area = 0.1 Ac.
Notice of Intent Earth Disturbed Area = N/A

PLAN PREPARED BY:

EMH&T
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 866.775.3648
emht.com

ENGINEER'S SEAL
STATE OF OHIO
MICHAEL ROBERT BRAHM
E-72756
REGISTERED
PROFESSIONAL ENGINEER
Signed: Michael R. Brahm
Date: 6-11-2012

ENGINEER'S SEAL
STATE OF OHIO
LINDA M. GRIDER
69288
REGISTERED
PROFESSIONAL ENGINEER
Signed: Linda M. Grider
Date: 6-11-12

APPROVAL:

Signatures below signify only concurrence with the general purpose and general location of the project. All technical details remain the responsibility of the design engineer preparing the plans.

FOR FAIRFIELD COUNTY:

I hereby approve these plans and declare that this improvement will require closing to traffic of the highway.

County Engineer — Date: 7/24/12

We the Commissioners of Fairfield County in formal session, hereby approve these plans.

Commissioner — Date: 7/31/12

Commissioner — Date: 7/31/12

Commissioner — Date: 7/31/2012

SHEET 1
25

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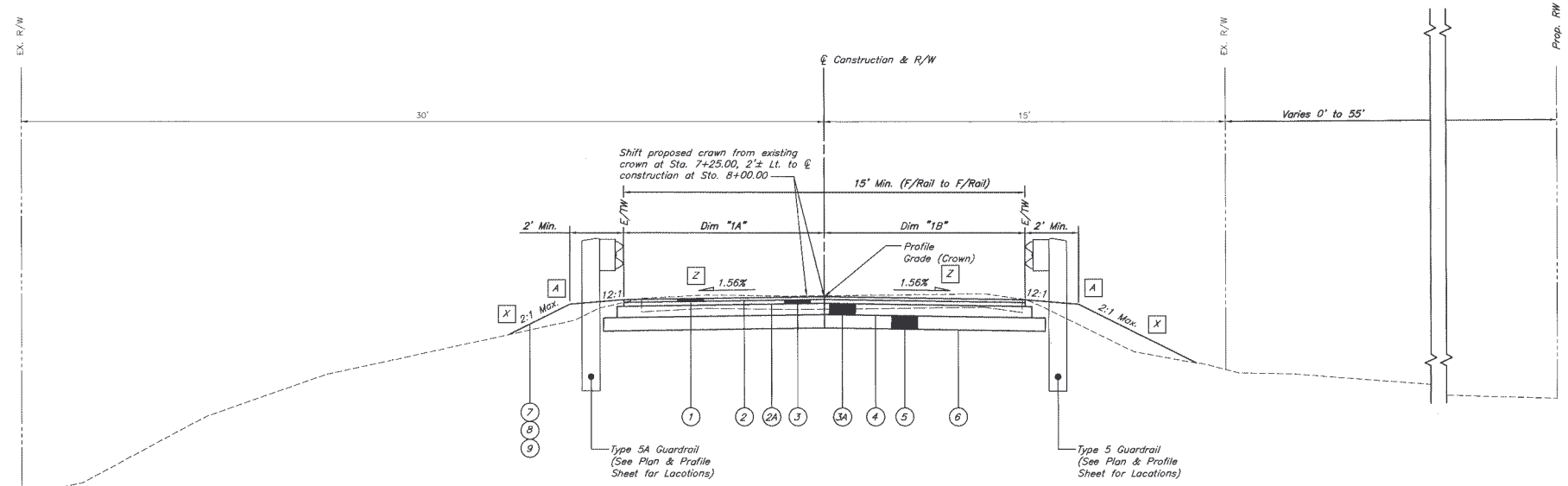


Taylor Road Typical Section (Permanent Construction)

Applies Sta. 7+25.00 to Sta. 9+00.00 = 175.00 Ft.

LEGEND

(1) ODOT ITEM 448 – 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1 PG64–22

(2) ODOT ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE (@ 0.04 GAL/SY)

(2A) ODOT ITEM 407 – TACK COAT (@ 0.075 GAL/SY)

(3) ODOT ITEM 448 – 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64–22

(3A) ODOT ITEM 301 – 5" ASPHALT CONCRETE BASE, PG64–22

(4) ODOT ITEM 408 – PRIME COAT (@ 0.4 GAL/SY)

(5) ODOT ITEM 304 – 6" AGGREGATE BASE

(6) ODOT ITEM 204 – SUBGRADE COMPACTION & PROOF ROLLING

(7) ODOT ITEM 659 – SEEDING AND MULCHING

(8) ODOT ITEM 653 – TOPSOIL, FURNISHED AND PLACED (T=4")

(9) ODOT ITEM 670 – SLOPE EROSION PROTECTION (FOR SLOPES 3:1 AND STEEPER)

(10) ODOT ITEM 304 – 8" AGGREGATE BASE

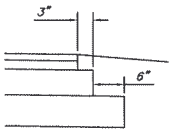
ODOT ITEM 606 – GUARDRAIL, TYPE 5 OR 5A WITH ITEM 626 BARRIER REFLECTOR, TYPE A2 PLACED AT BEGINNING, END, AND MIDPOINT.

[X] See Cross Sections and Culvert Plans for detailed grading.

[A] All Breaks In Grade Shall Be Constructed With a 2' Rounding.

[Z] Vary cross slope from 1.56% to match existing over 25 feet at beginning and end of canstruction

ME = Match Existing
E/TW = Edge of Traveled Way
E/S = Edge of Graded Shoulder



Edge Course Detail

Applies Left and Right Side

Dim "1A":
Varies From 9.50' @ Sta. 7+25.00 To 7.50' @ Sta. 8+00.00
7.50' From Sta. 8+00.00 to Sta. 9+00.00

Dim "1B":
Varies From 5.50' @ Sta. 7+25.00 To 7.50' @ Sta. 8+00.00
7.50' From Sta. 8+00.00 to Sta. 9+00.00

CALCULATED CJB
CHECKED MRB

TYPICAL SECTIONS – TAYLOR ROAD

TAYLOR ROAD BRIDGE

2
25

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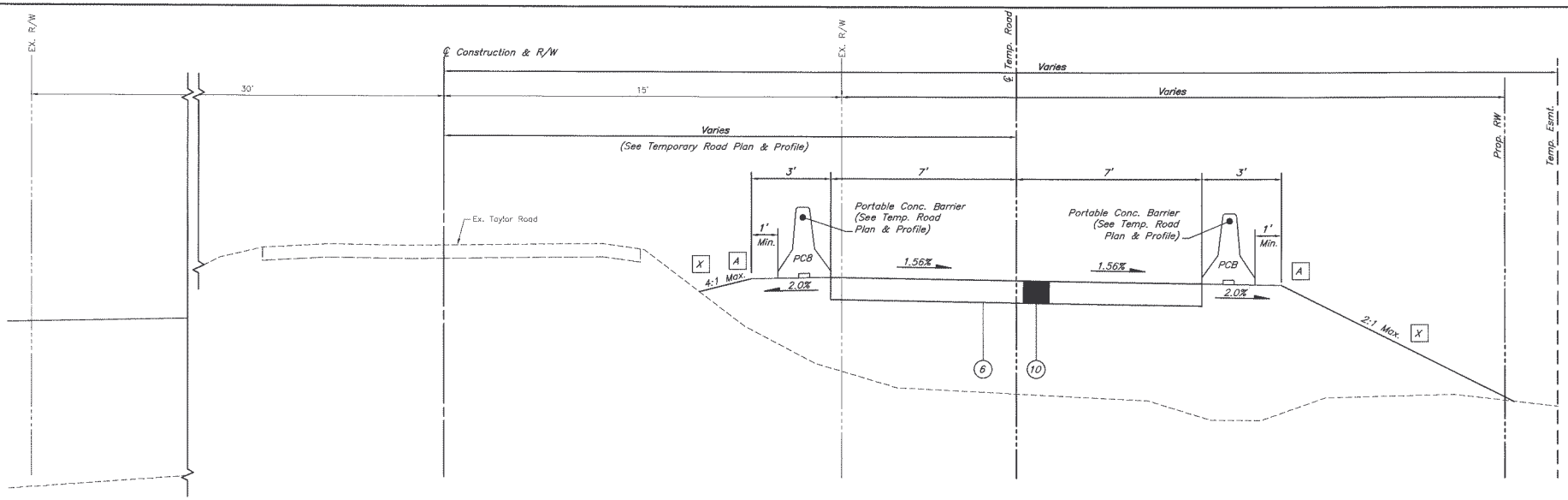


Typical 2

Taylor Road Temporary Typical Section

Applies Sta. 26+87.01 to Sta. 29+80.03 (293.02 Ft.)

LEGEND

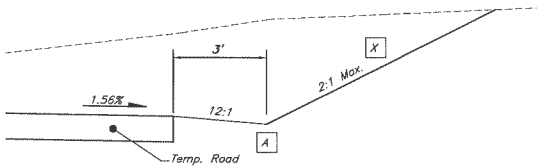
1. ODOT ITEM 448 – 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1 PG64-22
2. ODOT ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE (@ 0.04 GAL/SY)
2A. ODOT ITEM 407 – TACK COAT (@ 0.075 GAL/SY)
3. ODOT ITEM 448 – 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22
3A. ODOT ITEM 301 – 5" ASPHALT CONCRETE BASE, PG64-22
4. ODOT ITEM 408 – PRIME COAT (@ 0.4 GAL/SY)
5. ODOT ITEM 304 – 6" AGGREGATE BASE
6. ODOT ITEM 204 – SUBGRADE COMPACTION & PROOF ROLLING
7. ODOT ITEM 659 – SEEDING AND MULCHING
8. ODOT ITEM 653 – TOPSOIL, FURNISHED AND PLACED (T=4")
9. ODOT ITEM 670 – SLOPE EROSION PROTECTION (FOR SLOPES 3:1 AND STEEPER)
10. ODOT ITEM 304 – 8" AGGREGATE BASE

ODOT ITEM 606 – GUARDRAIL, TYPE 5 OR 5A WITH ITEM 626 BARRIER REFLECTOR, TYPE A2 PLACED AT BEGINNING, END, AND MIDPOINT.

[X] See Cross Sections and Culvert Plans for detailed grading.

[A] All Breaks In Grade Shall Be Constructed With a 2' Raunding.

ME = Match Existing
E/TW = Edge of Traveled Way
E/S = Edge of Graded Shoulder



Supplement to Typical #2

Applies Sta. 26+87.01 to Sta. 27+80.40 (100.39 Ft.)

CALCULATED CJB
CHECKED MRB

TYPICAL SECTIONS – TEMPORARY ROAD

TAYLOR ROAD BRIDGE

3
25

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GENERAL NOTES

ENGINEER DEFINED
DULY AUTHORIZED AGENT OF THE FAIRFIELD COUNTY ENGINEER ACTING WITHIN THE SCOPE OF HIS/HER AUTHORITY FOR PURPOSES OF ENGINEERING AND ADMINISTRATION OF THE CONTRACT.

CONTRACTOR DEFINED
THE INDIVIDUAL, FIRM OR CORPORATION CONTRACTING WITH THE FAIRFIELD COUNTY ENGINEER FOR PERFORMANCE OF PRESCRIBED WORK, ACTING DIRECTLY OR THROUGH A DULY AUTHORIZED REPRESENTATIVE AND QUALIFIED UNDER THE PROVISIONS OF 5525.02 TO 5525.09, ORC, AND ANY AMENDMENTS THERETO.

ELEVATION DATUM
ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OR 1988.

WORK LIMITS
THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL OEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIOE OR OUTSIDE THESE WORK LIMITS.

MATERIAL TESTING
THE COUNTY ENGINEER RESERVES THE RIGHT TO ORDER TESTING OF ALL MATERIALS USED.

ROUNDING
THE 2' ROUNDING AT ALL SLOPE BREAK POINTS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN.

ITEM 201 – CLEARING AND GRUBBING, AS PER PLAN
ALL TREES AND STUMPS WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED UNDER THE LUMP SUM BID FOR ITEM 201, CLEARING AND GRUBBING, AS PER PLAN EXCEPT THOSE OTHERWISE DESIGNATED BY THE ENGINEER.

LANDOWNERS SHALL BE ALLOWED TO SALVAGE THE WOOD FROM TREES BEING REMOVED FROM THEIR PROPERTY. TREES DESIGNATED AS BEING SALVAGED FOR WOOD, SHALL BE CUT ABOVE THE BASE AND PLACED OUTSIDE OF THE RIGH-OF-WAY.

ITEM 204 UNSUITABLE FOUNDATION SOILS
IF UNSUITABLE FOUNDATION SOILS ARE ENCOUNTERED IN THE AREAS OF THE PROPOSED ROADBED OR FOUNDATIONS, THEY SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL. THE LOCATIONS ANO DIMENSIONS WILL BE AS DETERMINED BY THE ENGINEER.

THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN INCLUOED IN THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER.

ITEM 204, EXCAVATION OF SUBGRADE	50 CY
ITEM 204, GRANULAR MATERIAL, TYPE F	50 CY
ITEM 204, GEOTEXTILE FABRIC	100 SY

ITEM 204 – PROOF ROLLING
AN ESTIMATED QUANTITY FOR THIS ITEM HAS BEEN PROVIDED IN THE GENERAL SUMMARY TO BE USED AS OIRECTED BY THE ENGINEER.

ITEM 204, PROOF ROLLING	2 HOURS

ITEM 407 – TACK COAT AND ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE
THE RATE OF APPLICATION OF THE 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. FOR ESTIMATING PURPOSES ONLY, THE PLAN QUANTITIES INDICATE AN AVERAGE ARPLICATION RATE OF:

407 TACK COAT FOR INTERMEDIATE COURSE	0.04 GAL/SQ.YD.
407 TACK COAT	0.075 GAL/SQ.YO.

ITEM 448 – ASPHALT CONCRETE
THE HOT MIX ASPHALT MIXTURE SHALL BE COMPOSED OF AGGRECATE, ASPHALT BINDER, AND MOOIFIERS (WHERE SPECIFIED) MEETING OHIO DEPARTMENT OF TRANSPORTATION (ODOT) REQUIREMENTS. PRIOR TO PRODUCING HOT MIX ASPHALT FOR THIS CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, A JOB MIX FORMULA (JMF) OR BITUMINOUS CONCRETE DATA SHEET 48 HOURS PRIOR TO PLACEMENT OF ANY ASPHALT.

THE JMF SHALL INCLUDE THE MIX TYPE PROPOSED FOR USE, AGGRECATE TYPE AND GRADUATION, PERCENTAGE OF ASPHALT BY WEIGHT OF MIXTURE, GRADE OF ASPHALT BINDER, DESCRIPTION AND SOURCE OF MOOIFIER (IF APPLICABLE), AND UNIT WEIGHT OF THE MIXTURE. THE JMF, OR DATA SHEET, SHALL HAVE PREVIOUSLY BEEN APPROVED FOR USE ON ODOT WORK.

SEEDING AND MULCHING
THE FOLLOWING QUANTITIES SHALL BE USED AS DIRECTED BY THE ENGINEER AND ARE CARRIED TO THE GENERAL SUMMARY TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

653 TOPSOIL FURNISHED AND PLACED	260 CU. YDS.
659 SOIL ANALYSIS TEST	2 EACH
659 REPAIR SEEDING AND MULCHING	120 SQ. YDS.
659 COMMERCIAL FERTILIZER	0.31 TON
659 AGRICULTURAL LIME	0.06 TON
659 WATER	13 M GAL.
659 SEEDING & MULCHING, CLASS 2	2,3DD SQ. YDS.
671 EROSION PROTECTION MAT (TO BE APPLIED TO ALL SLOPES 3:1 AND STEEPER)	1,000 SQ. YDS.

EXISTING UNDERDRAINS
PROVIDE UNOBSTRUCTEO OUTLETS FOR ALL EXISTING UNDERDRAINS ENCOUNTERED DURING CONSTRUCTION.

CONTINGENCY QUANTITIES
THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS OESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE COUNTY" UNLESS AUTHORIZED BY THE COUNTY. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

FARM DRAINS
ALL FARM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION WILL EITHER BE REPAIRED OR PROVIDED WITH UNOBSTRUCTED OUTLETS.

EXISTING FARM DRAINS WHICH ARE LOCATED BELOW THE ROADWAY DITCH ELEVATIONS AND WHICH CROSS THE ROADWAY SHALL BE REPLACED WITHIN THE CONSTRUCTION LIMITS BY ITEM 603 CONDUIT, TYPE B, ONE COMMERCIAL SIZE LARGER THAN THE EXISTING CONDUIT.

EXISTING COLLECTORS AND ISOLATED FARM DRAINS WHICH ARE ENCOUNTEREO ABOVE THE ELEVATION OF ROADWAY DITCHES SHALL BE OUTLETTED INTO THE ROADWAY DITCH BY ITEM 603 CONDUIT, TYPE F. THE OPTIMUM OUTLET, INVERT ELEVATION SHALL BE ONE FOOT ABOVE THE FLOWLINE ELEVATION OF THE DITCH. LATERAL FIELD TILES WHICH CROSS INTO THE LIMITS OF CONSTRUCTION SHALL BE INTERCEPTED BY ITEM 603 CONDUIT, TYPE F AND CARRIED IN A LONGITUDINAL DIRECTION TO AN ADEQUATE OUTLET OR ROADWAY CROSSING.

THE LOCATION, TYPE, SIZE AND GRADE OF REPLACEMENTS SHALL BE DETERMINED BY THE ENGINEER AND PAYMENT SHALL BE MADE ON FINAL MEASUREMENT.

EROSION CONTROL PADS AND ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET END OF ALL FARM ORAINS PER STANDARD CONSTRUCTION DRAWING DM-1.1 EXCEPT WHEN THEY OUTLET INTO A DRAINAGE STRUCTURE. PAYMENT FOR THE EROSION CONTROL PADS AND ANIMAL GUARDS AND ANY NECESSARY BENDS, TEES OR OTHER FITTINGS SHALL BE INCLUDED FOR PAYMENT IN THE PERTINENT CONDUIT ITEMS.

THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE TO BE USED AS DIRECTED BY THE ENGINEER:

ITEM 603 – 6" CONDUIT, TYPE F	50 FEET
ITEM 6D3 – 8" CONDUIT, TYPE F	50 FEET
ITEM 603 – 12" CONDUIT, TYPE B	50 FEET
ITEM 603 – 12" CONDUIT, TYPE F	50 FEET

ITEM 207 – TEMPORARY SOIL EROSION AND SEDIMENT CONTROL
THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE PLACED BY THE CONTRACTOR WITH THE ENGINEERS CONCURRENCE FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

ITEM 207 TEMPORARY SEEDING & MULCHING	2,300 SQ YD
ITEM 207 PERIMETER, DITCH CHECK OR INLET PROTECTION FILTER FABRIC FENCE	200 FOOT

ITEM 411– STABILIZED CRUSHED AGGREGATE, AS PER PLAN
THE CRUSHED MATERIAL PROVIDED FOR THIS ITEM SHALL BE CRUSHED LIMESTONE.

ITEM 604 – MONUMENT RESET, AS PER PLAN
ALL PROPERTY MONUMENTS DISTURBED WITHIN THE CONSTRUCTION LIMITS SHALL BE RESET BY A REGISTERED PROFESSIONAL SURVEYOR IN THE STATE OF OHIO. THE RESET MONUMENT SHALL BE LOCATED AT THE SAME LOCATION WITH THE SAME MATERIAL AND SIZE AS THAT WHICH WAS DISTURBED. ALL RESET MONUMENTS SHALL HAVE A CAP BEARING THE SURVEYOR'S OHIO REGISTRATION NUMBER AND/OR NAME OR COMPANY NAME AND THE WORD "RESET". COST TO PERFORM SAIO WORK SHALL BE INCLUDED IN THE UNIT COST FOR ITEM SPECIAL, MONUMENT RESET.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

ITEM SPECIAL – MONUMENT RESET	4 EACH

SUPPLEMENTAL SPECIFICATIONS AND STANDARD CONSTRUCTION DRAWINGS
THE SUPPLEMENTAL SPECIFICATIONS AND STANDARD CONSTRUCTION DRAWINGS LISTED ON THE TITLE SHEET SHALL BE CONSIDERED A PART OF THIS PLAN.

ITEM 614, MAINTAINING TRAFFIC, AS PER PLAN

GENERAL

UNLESS OTHERWISE INDICATEO ON THE PLANS, ALL TRAFFIC CONTROL OEVICES SHALL BE DESIGNED, PLANNED, FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (CURRENT EDITION), COPIES OF WHICH ARE AVAILABLE FROM THE OHIO DEPARTMENT OF TRANSPORTATION, OFFICE OF TRAFFIC ENGINEERING, 1980 WEST BROAD STREET, COLUMBUS, OHIO 43223.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE AND SUBMIT A PLAN FOR MAINTAINING TRAFFIC TO THE COUNTY ENGINEER FOR REVIEW AND APPROVAL.

THE ROADWAY SHALL NOT BE OPENED TO TRAFFIC UNTIL PERMANENT TRAFFIC CONTROLS ARE IN PLACE, OR UNTIL TEMPORARY TRAFFIC CONTROLS, APPROVED BY THE ENGINEER, ARE INSTALLED. THE CONTRACTOR ASSUMES ALL LIABILITY FOR THE PREMATURE REMOVAL OF TEMPORARY TRAFFIC CONTROLS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REINSTALLATION AND/OR REPLACEMENT OF ALL PERMANENT TRAFFIC CONTROL DEVICES DAMAGED OR REMOVED DURING THE CONSTRUCTION. PERMANENT TRAFFIC CONTROL THAT IS NO LONGER IN CONFLICT WITH TEMPORARY TRAFFIC CONTROL SHALL BE REPLACED IMMEDIATELY. THE CONTRACTOR SHALL ASSUME ALL LIABILITY FOR MISSING, DAMAGED AND IMPROPERLY PLACED TRAFFIC CONTROL DEVICES.

THE CONTRACTOR SHALL PROVIDE A 24 HOUR CONTACT WHO WILL BE RESPONSIBLE FOR MAINTENANCE OF TRAFFIC FOR THE DURATION OF THE PROJECT.

ITEM 614, MAINTAINING TRAFFIC, AS PER PLAN (CONT.)

CONSTRUCTION OPERATIONS SHALL NOT BEGIN UNTIL ALL TEMPORARY TRAFFIC CONTROL DEVICES ARE IN PLACE AND ARPROVED BY THE ENGINEER AND THE COUNTY.

ACCESS TO ALL ADJOINING PROPERTIES SHALL BE MAINTAINED AT ALL TIMES. ACCESS FOR MAIL DELIVERY, EMERGENCY AND SERVICE VEHICLES SHALL NOT BE DISRUPTED. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE ENGINEER AND THE OWNERS OF THE ABUTTING PROPERTIES IN ADVANCE (10 DAYS) OF ANY OPERATIONS WHICH AFFECT ACCESS.

MAINTENANCE OF ALL TRAFFIC GONTROL DEVIGES INCLUDING DRUMS, SIGNS, BARRICADES, PCB, ETC., SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

STEADY-BURNING TYPE "C" LIGHTS SHALL BE REQUIRED ON ALL BARRICADES IN USE AT NIGHT. ALL ADVANCE SIGNING SHALL BE EQUIPPED WITH TYPE "A" FLASHING LIGHTS AND (2) ORANGE FLAGS (24"X24"). CONES ARE NOT ARPROVED FOR USE AT NIGHT. LIGHTS ARE NOT REQUIRED ON SIGNS IN PLACE DURING DAYLIGHT HOURS.

THE SAFETY OF PEOESTRIAN TRAFFIC SHALL BE CONSIDERED AT ALL TIMES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE LIGHTS, SIGNS, BARRICADES, AND OTHER WARNINGS TO PHYSICALLY SEPARATE THE PEDESTRIAN FROM HAZARDS INCIOENTAL TO THE CONSTRUCTION OPERATIONS SUCH AS ANCHOR BOLTS, OPEN EXCAVATIONS, ETC.

FOR AREAS ADJACENT TO VEHICULAR TRAFFIC, OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED ANO PROTECTED WITH THE PROPER TRAFFIC CONTROL DEVICES AT ALL TIMES. DROP OFFS WITHIN THE WORK ZONE SHALL CONFORM TO THE REQUIREMENTS SET FORTH ON ODOT STANDAPO CONSTRUCTION DRAWING MT-101.90

NOTICE OF CLOSURE SIGNS, SHALL BE ERECTED BY THE ENGINEER IN ADVANCE OF THE SCHEDULED ROAD CLOSURE. THE CONTRAGTOR SHALL GIVE AT LEAST TWO WEEK NOTICE TO THE ENGINEER IN ORDER TO ERECT THE SIGNS.

THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN STANDARO 48"X30" "ROAD CLOSED" SIGNS, SIGN SUPPORTS, BARRICADES, GATES, AND LIGHTS, AS DETAILED IN STANDARD CONSTRUCTION DRAWINGS MT-101.60 DURING PERIODS IN WHICH THE AFFECTED ROAOS ARE CLOSED TO TRAFFIC.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVIGES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, AS PER PLAN UNLESS SEPARATELY ITEMIZED IN THE PLAN.

ITEM 614, BARRIER REFLECTORS AND OBJECT MARKERS
BARRIER REFLECTORS AND OBJECT MARKERS SHALL BE INSTALLED ON ALL PORTABLE CONCRETE BARRIER USED FOR TRAFFIC CONTROL. BARRIER REFLECTORS, OBJECT MARKERS AND THEIR INSTALLATION SHALL CONFORM TO CMS626, EXCEPT THAT THE SPACING SHALL BE 50 FEET. AN ESTIMATED QUANTITY OF 10 EACH OF ITEM 614 BARRIER REFLECTOR, TYPE B AND 10 EACH OF ITEM 614 OBJECT MARKER, ONE-WAY HAVE BEEN PROVIDED AND CARRIED TO THE GENERAL SUMMARY.

ITEM 615, ROADS FOR MAINTAINING TRAFFIC, AS PER PLAN
PER CMS 615, ALL EXCAVATION AND EMBANKMENT QUANTITIES NECESSARY TO CONSTRUCT TEMPORARY ROAOS INCLUDING REQUIRED GRADING ACTIVITIES SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 615, ROADS FOR MAINTAINING TRAFFIC, AS PER PLAN. VOLUMETRIC QUANTITIES FOR EXCAVATION AND EMBANKMENT ARE SHOWN ON THE TEMPORARY ROAD CROSS SECTIONS FOR INFORMATION ONLY.

ITEM 615, PAVEMENT FOR MAINTAINING TRAFFIC, AS PER PLAN
THIS ITEM SHALL CONFORM TO CMS ITEM 615 EXCEPT THAT THE PAVEMENT SECTION SHALL BE PER THE PLAN TYPICAL SECTIONS. SUBGRADE COMPACTION, ANO PROOF ROLLING SHALL BE INCLUDED FOR PAYMENT IN THE SQUARE YARD CONTRACT PRICE FOR ITEM 615, TEMPORARY PAVEMENT, AS PER PLAN

OHIO UTILITIES PROTECTION SERVICE (OUPS)
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT OUPS (800-362-2764) FOR EACH LOCATION WHERE DIGGING IS REQUIRED ON IN LOCATIONS WHERE POSTS ARE TO BE DRIVEN. NON-MEMBER UTILITY COMPANIES MUST BE CALLED DIRECTLY BY THE CONTRACTOR. THE FOLLOWING LIST OF UTILITY OWNERS HAVE FACILITIES WITHIN THE PROJECT LIMITS:

PHONE
AT&T
111 N. FOURTH STREET ROOM 802
COLUMBUS, OHIO 43215
ATTN: TOM ZIOMEK
MGR OSP ENG DESIGN
(614)-223-7162

CABLE
INSIGHT COMMUNICATIONS
ANTHONY ADAMS
3770 EAST LIVINGSTON AVE.
COLUMBUS, OHIO 43227
(614)-338-7069

CENTURY LINK
DEE REED
441 WEST BROAD STREET
P.O. BOX 1031
PATASKALA, OHIO 43062
(740)-927-8282

ELECTRIC
SOUTH CENTRAL POWER
JOE EVERHART
10229 BUSEY ROAD
CANAL WINCHESTER, OHIO 43110
1-800-282-5064 EXT 2225

GAS
COLUMBIA GAS
BRYAN KOPACHY
3550 JOHNNY APPLESEED COURT
COLUMBUS, OHIO 43231
(614)-818-2133

KNOX ENERGY
TOM MOORE
11872 WORTHINGTON RD. NW
PATASKALA, OHIO 43062
(740)-927-6731

CITY OF REYNOLDSBURG

7232 E. MAIN STREET
REYNOLDSBURG, OHIO 43068
(614)-322-6884

AEP COLUMBUS SOUTHERN POWER
PAUL PAXTON
850 TECH CENTER DRIVE
CAHANNA, OHIO 43230
(614)-888-6831

LEGEND

EXISTING CONDITIONS

- CENTERLINE SURVEY
- CENTERLINE EXIST. DRIVE
- EDGE OF PAVEMENT
- CURB
- SHOULDER
- BERM
- ASPH. OR CONC. DRIVE
- ASPH. OR CONC. PARKING LOT
- GRAVEL DRIVE/PARKING LOT
- CONC. WALK
- FENCE
- GUARDRAIL
- EX. R/W — RIGHT OF WAY
- PROPERTY LINE
- PROPERTY LINE EXTENDED
- LOT LINE (SAME OWNER BOTH SIDES)
- EX. 12" STM — STORM
- EX. 12" SAN — SANITARY
- EX. 12"W — WATER
- EX. 12"G — GAS
- TELEPHONE (UNDERGROUND)
- TRAFFIC INTERCONNECT WIRING
- CATV
- BUILDING
- CONC. WALL
- STONE WALL
- ROCK
- TREELINE
- TREES
- BUSHES
- HEDGE/SHRUB
- MULCH/LANDSCAPE
- STUMP
- CONC. PAD
- WOOD POST
- POST/BOLLARD
- MB — MAILBOX
- FLAGPOLE
- PARKING BLOCK
- SIGNS
- BIRDBATH
- HANDRAIL
- STEPS

SURVEY SYMBOLS

- IRON PIN FND./METAL BAR FND.
- IRON ROD FND./RR SPIKE FND.
- PK NAIL FND.
- BENCHMARK
- M — RIGHT OF WAY MON. FND.

ABBREVIATIONS

1"WS	1" WATER SERVICE
1"SS	1" SANITARY SERVICE
1"GS	1" GAS SERVICE
1"RD	1" ROOF DRAIN
OHE	OVERHEAD ELECTRIC
OHT	OVERHEAD TELEPHONE
UGT	UNDERGROUND TELEPHONE
CATV	CABLE TELEVISION
Ty	TYPE
EP	EDGE OF PVMT.
ES	EDGE OF SHLDR.
TC	TOP OF CURB
(PA)	PREVIOUSLY ABANDONED
(DND)	DO NOT DISTURB
(TBA)	TO BE ABANDONED
(TBR)	TO BE REMOVED
(TBRL)	TO BE RELOCATED BY THIS PROJECT
(TBRLO)	TO BE RELOCATED BY THIS PROJECT
(TBRBO)	TO BE RELOCATED (BY UTILITY OWNER)
(TBRO)	TO BE REMOVED (BY OTHERS)
(APP)	AS PER PLAN
(ATG)	ADJUST TO GRADE
(ATGBO)	ADJUST TO GRADE (BY UTILITY OWNER)
(RTG)	RECONSTRUCT TO GRADE
(RTGBO)	RECONSTRUCT TO GRADE (BY UTILITY OWNER)

PROPOSED LAYOUT

- CENTERLINE CONSTRUCTION
- CENTERLINE PROP. DRIVE
- EDGE OF PAVEMENT
- BACK OF CURB
- FACE OF CURB
- CONC. WALK/ASPH. BIKEPATH
- R/W — RIGHT-OF-WAY
- Const. Limit — CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- Utility Esmt. — UTILITY & DRAINAGE EASEMENT
- Walk/General Esmt. — SIDEWALK (MULIT-USE WALKWAY) & GENERAL UTILITY EASEMENT
- Slope Esmt. — SLOPE EASEMENT
- Strm. Esmt. — STORM EASEMENT
- 12"-B — STORM
- (2) STM. MH
- (2) CATCH BASIN
- (2) CURB INLET

UTILITY SYMBOLS

- STM. MH
- STM. MH (OPEN GRATE)
- CURB & GUTTER INLET
- CURB INLET
- SAN. MH
- WATER VALVE
- TELEPHONE POLE
- TELEPHONE LIGHT POLE
- TELEPHONE ELECTRIC LIGHT POLE
- DECORATIVE LIGHT POLE
- TELEPHONE ELECTRIC POLE
- ELECTRIC POLE
- LIGHT POLE
- TB — TEL. BOOTH
- PB — ELEC. PULLBOX
- GROUND LIGHT
- GUY ANCHOR
- LIGHTING CONTROLLER
- FIRE HYDRANT
- GAS VALVE
- CATCH BASIN
- G — GAS METER
- TEL. MH
- T — TEL. PEDESTAL

CALCULATED CJB
CHECKED MRB

GENERAL NOTES

TAYLOR ROAD BRIDGE

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION		SHEET NO.
			Roadway		
201	1	LSum	Clearing and Grubbing, As Per Plan	See Sheet 4	4
202	20	Ft	Pipe Removed, 24" and Under		6
203	226	Cu Yd	Excavation		7-11
203	466	Cu Yd	Embankment		7-11
204*	50	Cu Yd	Excavation at Subgrade		4
204*	50	Cu Yd	Granular Material, Type F		4
204*	100	Sq Yd	Geotextile Fabric		4
204	321	Sq Yd	Subgrade Compaction		
204	2	Hour	Proof Rolling		4
604	4	Each	Monument Reset, As Per Plan	See Sheet 4	6
606	100	Ft	Guardrail, Type 5		6
606	125	Ft	Guardrail, Type 5A		6
606	4	Each	Anchor Assembly, Type A		6
			Erasian Cantrol		
207*	200	Ft	Perimeter Filter Fabric Fence		4
207*	2,300	Sq Yd	Temporary Seeding and Mulching		4
653	260	Cu Yd	Topsoil Furnished and Placed (T=4")		4
659	2,300	Sq Yd	Seeding and Mulching, Class 2		4
659	2	Each	Soil Analysis Tests		4
659	120	Sq Yd	Repair Seeding and Mulching		4
659	0.06	Ton	Lime		4
659	0.31	Ton	Commercial Fertilizer		4
659	13	M Gal	Water		4
671	1,000	Sq Yd	Erosion Control Mat (for Slopes 3:1 and Steeper)		4
			Drainage		
601	31	Cu Yd	Rock Channel Protection, Type C with Filter Fabric		6
603*	50	Ft	6" Conduit, Type F		4
603*	50	Ft	8" Conduit, Type F		4
603*	50	Ft	12" Conduit, Type B		4
603*	50	Ft	12" Conduit, Type F		4
			Pavement		
301	42	Cu Yd	Asphalt Concrete Base, PG64-22 (T=5")		
304	54	Cu Yd	Aggregate Base (T=6")		
407	12	Gal	Tack Coat for Intermediate Course		
407	23	Gal	Tack Coat		
408	117	Gal	Prime Coat		
448	11	Cu Yd	Asphalt Concrete Surface Course, Type 1 PG64-22		
448	15	Cu Yd	Asphalt Concrete Intermediate Course, Type 2 PG64-22		
			Maintenance of Traffic		
614	10	Each	Barrier Reflector, Type B		4
614	10	Each	Object Marker, One Way		4
615	1	L Sum	Roads for Maintaining Traffic, As Per Plan	See Sheet 4	4
615	460	Sq Yd	Pavement for Maintaining Traffic, As Per Plan	See Sheet 4	4
622	457	Ft	Portable Concrete Barrier, 32"		12
			Traffic Cantrol		
626	6	Each	Barrier Reflector, Type A2		
630	5	Each	Removal of Ground Mounted Sign and Disposal		6
630	1	Each	Removal of Ground Mounted Sign and Reerection		6
630	5	Each	Removal of Ground Mounted Support and Disposal		6
630	14	Ft	Ground Mounted Support, No. 3 Post		6
			Structures		
			See Sheet 20		
			Miscellaneous		
614	1	LSum	Maintaining Traffic, As Per Plan		4
623	1	LSum	Construction Layout Stakes		
624	1	LSum	Mobilization		

CALCULATED CJB
CHECKED MRB

GENERAL SUMMARY

TAYLOR ROAD BRIDGE

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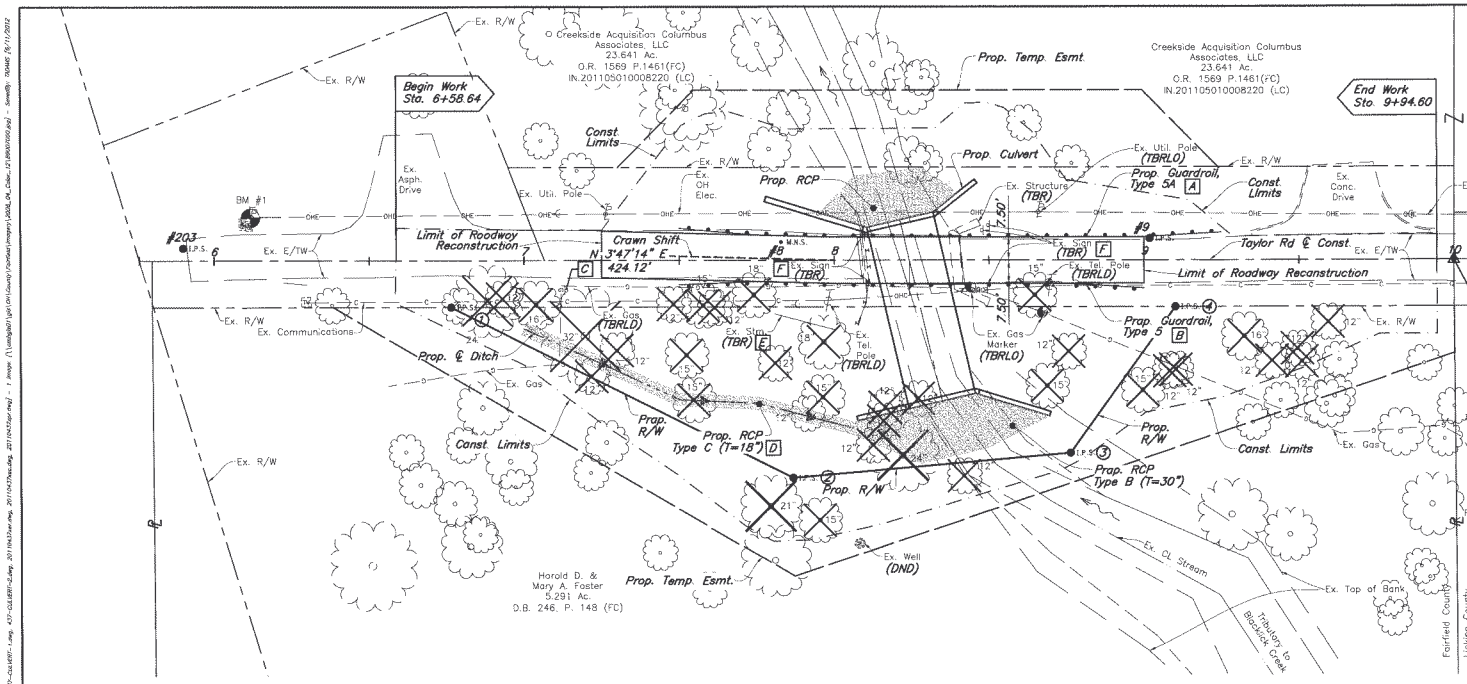


Control reference points (Graund Coordinates):

#8 – Sta. 7+82.81, 5.90' Lt. (Mag Nail Set)
N – 706226.4013 E – 1891954.7408

#9 – Sta. 9+01.86, 7.05' Lt. (1/2" Rebar w/EMHT Trav Cap Set)
N – 706345.2595 E – 1891961.4617

#203 – Sta. 5+90.01, 4.05' Lt. (3/4" Iron Pipe w/EMHT Trav Cap Set)
N – 706033.8978 E – 1891943.8555

Right of Way Monuments to be Reset During Construction.

(1) – Sta. 6+76.46, 15.00' Rt.
N – 706118.9049 E – 1891968.5740

(2) – Sta. 7+86.48, 70.00' Rt.
N – 706225.0501 E – 1892030.7206

(3) – Sta. 8+76.13, 62.00' Rt.
N – 706315.0265 E – 1892028.6589

(4) – Sta. 9+10.11, 15.00' Rt.
N – 706352.0419 E – 1891984.0063

Note: See Typical Sections for edge of pavement deflection points and variable dimensions.

[A]

Guardrail Schedule:

Sta. 7+50.00, 10.33' Lt. to Sta. 7+75.00, 8.17' Lt.
1 Each: Anchor Assembly, Type A

Sta. 7+75.00, 8.17' Lt. to Sta. 9+00.00, 7.50' Lt.
125 Feet: Guardrail, Type 5A (Face of Rail to match E/P)

Sta. 9+00.00, 7.50' Lt. to Sta. 9+25.00, 9.00 Lt.
1 Each: Anchor Assembly, Type A

[B]

Guardrail Schedule:

Sta. 7+50.00, 7.80' Rt. to Sta. 7+75.00, 6.83' Rt.
1 Each: Anchor Assembly, Type A

Sta. 7+75.00, 6.83' Rt. to Sta. 8+75.00, 7.50' Rt.
100 Feet: Guardrail, Type 5 (Face of Rail to match E/P)

Sta. 8+75.00, 7.50' Rt. to Sta. 9+00.00, 9.00' Rt.
1 Each: Anchor Assembly, Type A

[C] Item 630, "One Lane Bridge" Sign (Remove & Reset)

[D] Item 601, 31 Cu Yd Rock Channel Protection, Type C with Filter Fabric

[E] Item 202, 20 Feet Pipe Removed

[F] Item 630, Removal of Ground Mounted Sign and Disposal
Item 630, Removal of Ground Mounted Support and Disposal

LEGEND

OHC	OVERHEAD COMMUNICATION
OHE	OVERHEAD ELECTRIC
E/TW	EDGE OF TRAVELED WAY
E/S	EDGE OF SHLDR.
M.E.	MATCH EXISTING
(DND)	DO NOT DISTURB
(TBR)	TO BE REMOVED
(TBRLO)	TO BE RELOCATED BY OTHERS

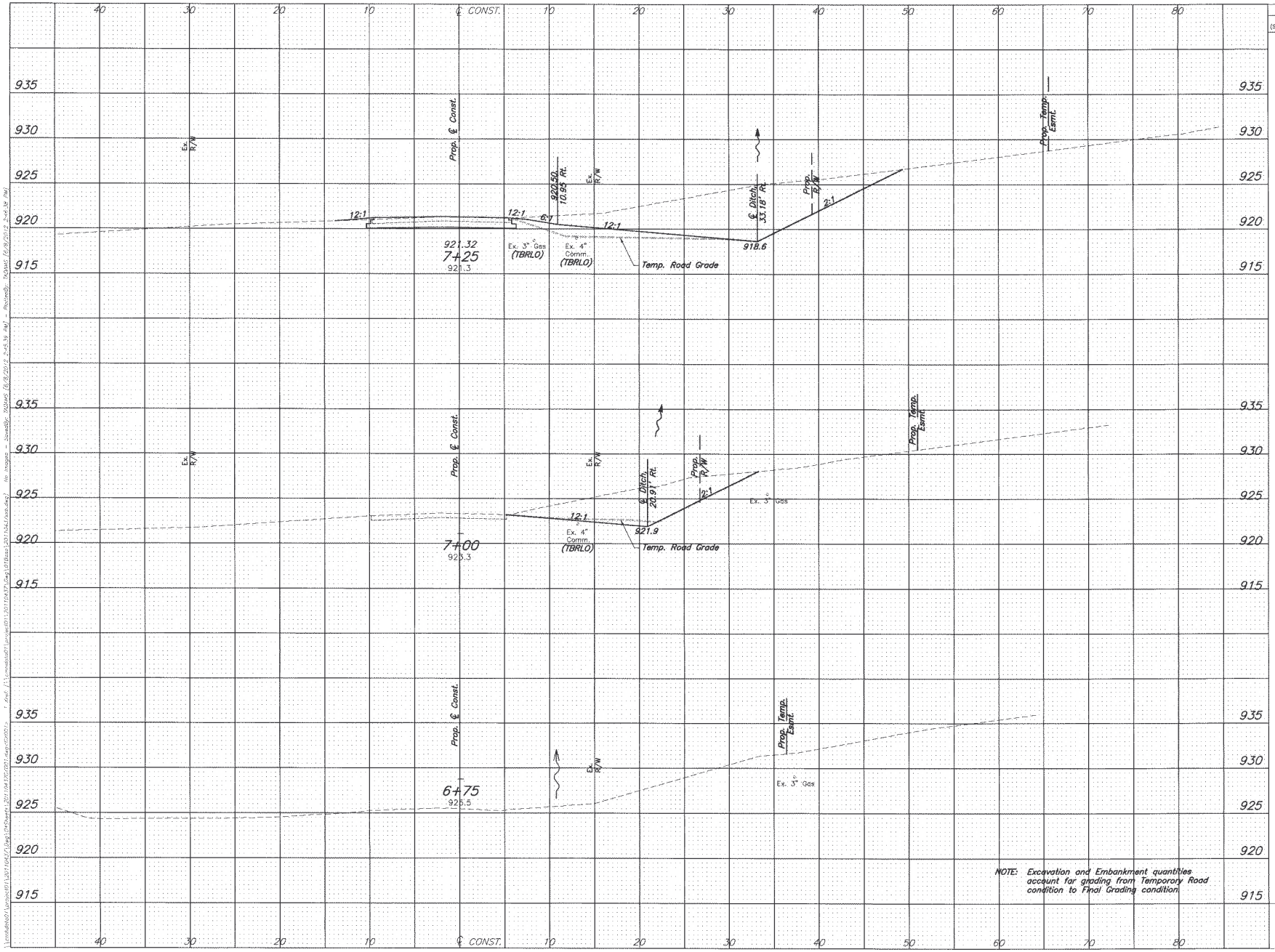
HORIZ. SCALE: 20 0 20

CALCULATED CJB CHECKED MRB

PLAN AND PROFILE – TAYLOR ROAD

TAYLOR ROAD BRIDGE

6 / 25



	END AREA		VOLUME	
	CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
	18	16		
			10	7
	4	0		
			3	0
	0	0		
Sheet Total			13	7

NOTE: Excavation and Embankment quantities account for grading from Temporary Road condition to Final Grading condition.

HORIZ. SCALE 5 0 5

VERT. SCALE 5 0 5 2.5

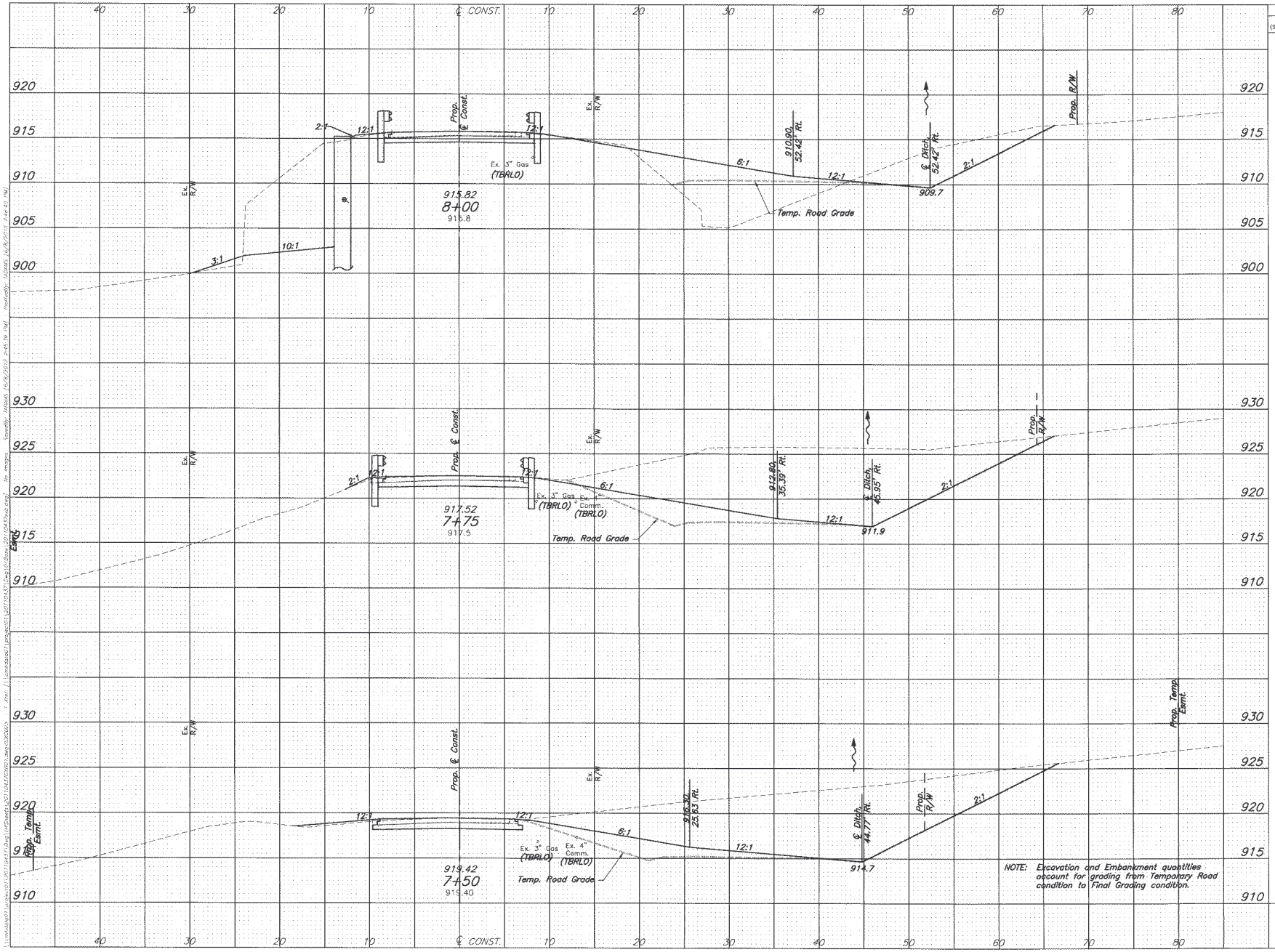
CALCULATED CJB

CHECKED MRB

CROSS SECTIONS – TAYLOR ROAD STA. 6+75 TO STA. 7+25

TAYLOR ROAD BRIDGE

7/25



END AREA		VOLUME	
CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
111	37		
		61	33
20	35		
		18	32
19	34		
		17	23
Sheet Total		96	88

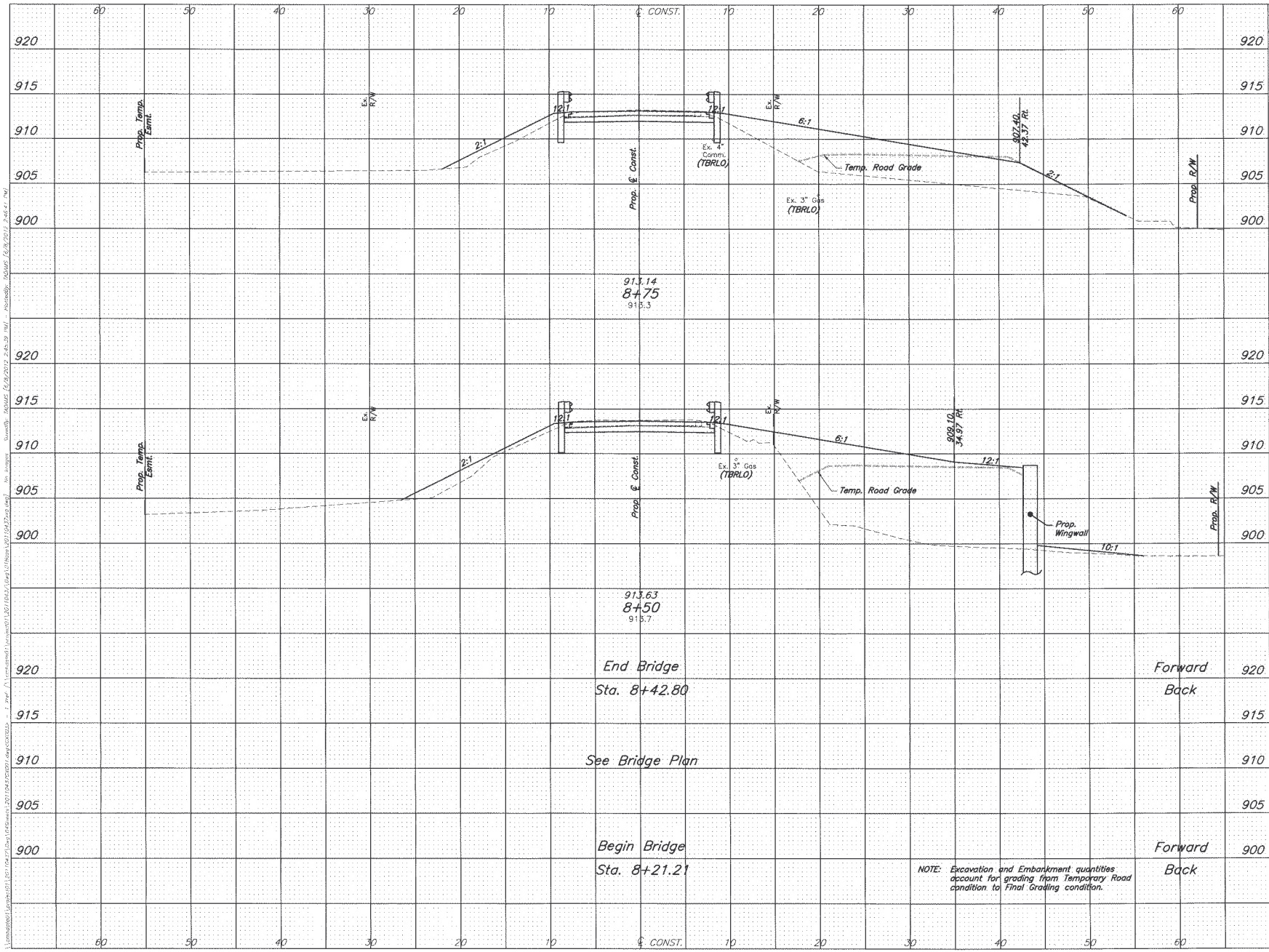
HORIZ. SCALE 5 0 5 10
VERT. SCALE 5 0 2.5 5

DESIGNED CJB
CHECKED MRB

CROSS SECTIONS – TAYLOR ROAD
STA. 7+50 TO STA. 8+00

TAYLOR ROAD BRIDGE

8
25

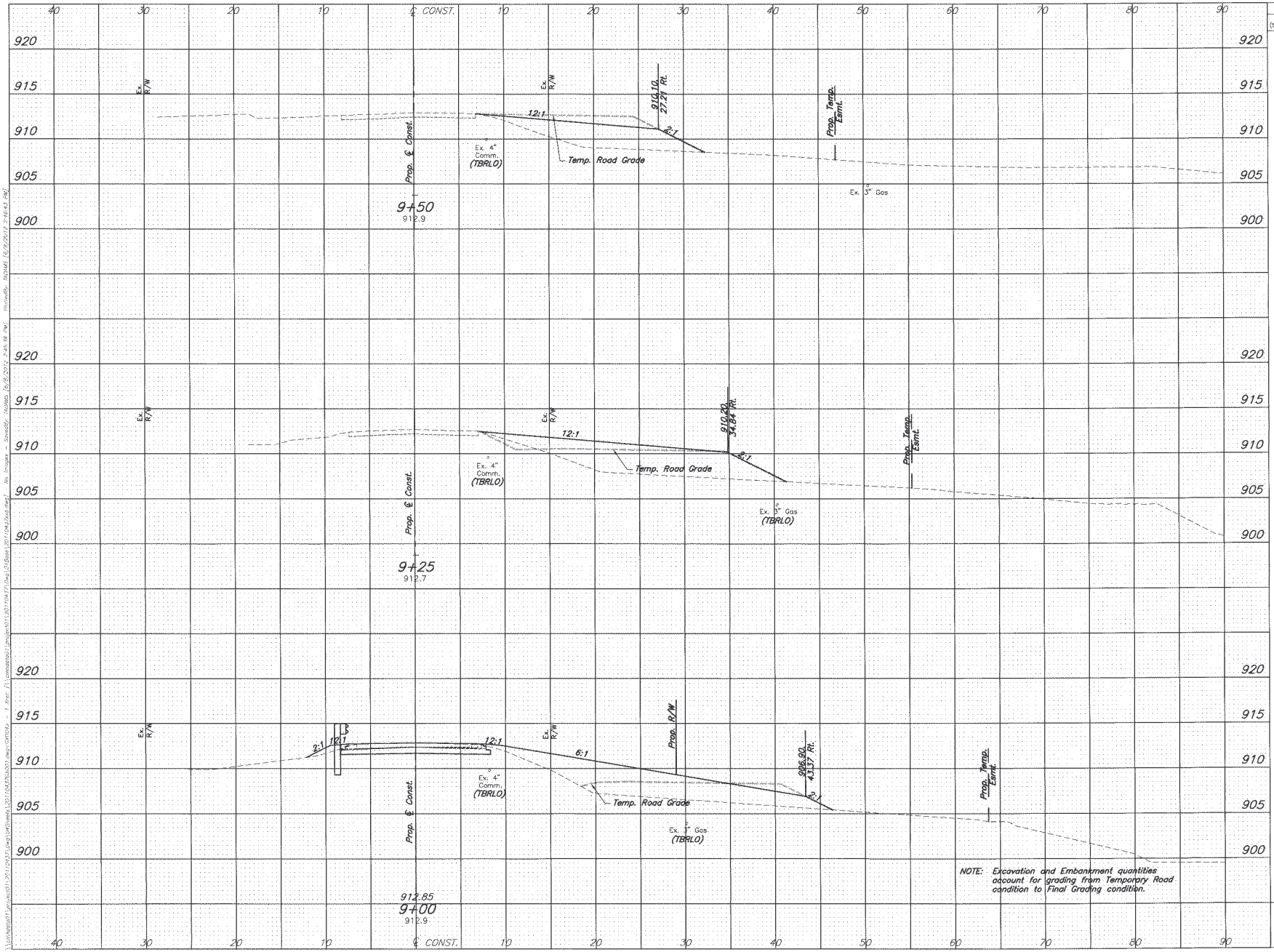


	END AREA CUT (Sq. Ft.)	END AREA FILL (Sq. Ft.)	VOLUME CUT (Cu. Yd.)	VOLUME FILL (Cu. Yd.)
	21	65		
			19	64
	21	73		
			6	19
	21	70		
	0	219		
			0	175
	0	219		
	5	37		
			46	29
Sheet Total			71	287

HORIZ. SCALE 1" = 5
VERT. SCALE 1" = 2.5
CALCULATED CJB
CHECKED MRB

CROSS SECTIONS – TAYLOR ROAD
STA. 8+50 TO STA. 8+75

TAYLOR ROAD BRIDGE



NOTE: Excavation and Embankment quantities account for grading from Temporary Road condition to Final Grading condition.

	END AREA		VOLUME	
	CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
	12	0		
	0	20		
			6	9
			10	27
	22	38		
			20	48
Sheet Total			36	84

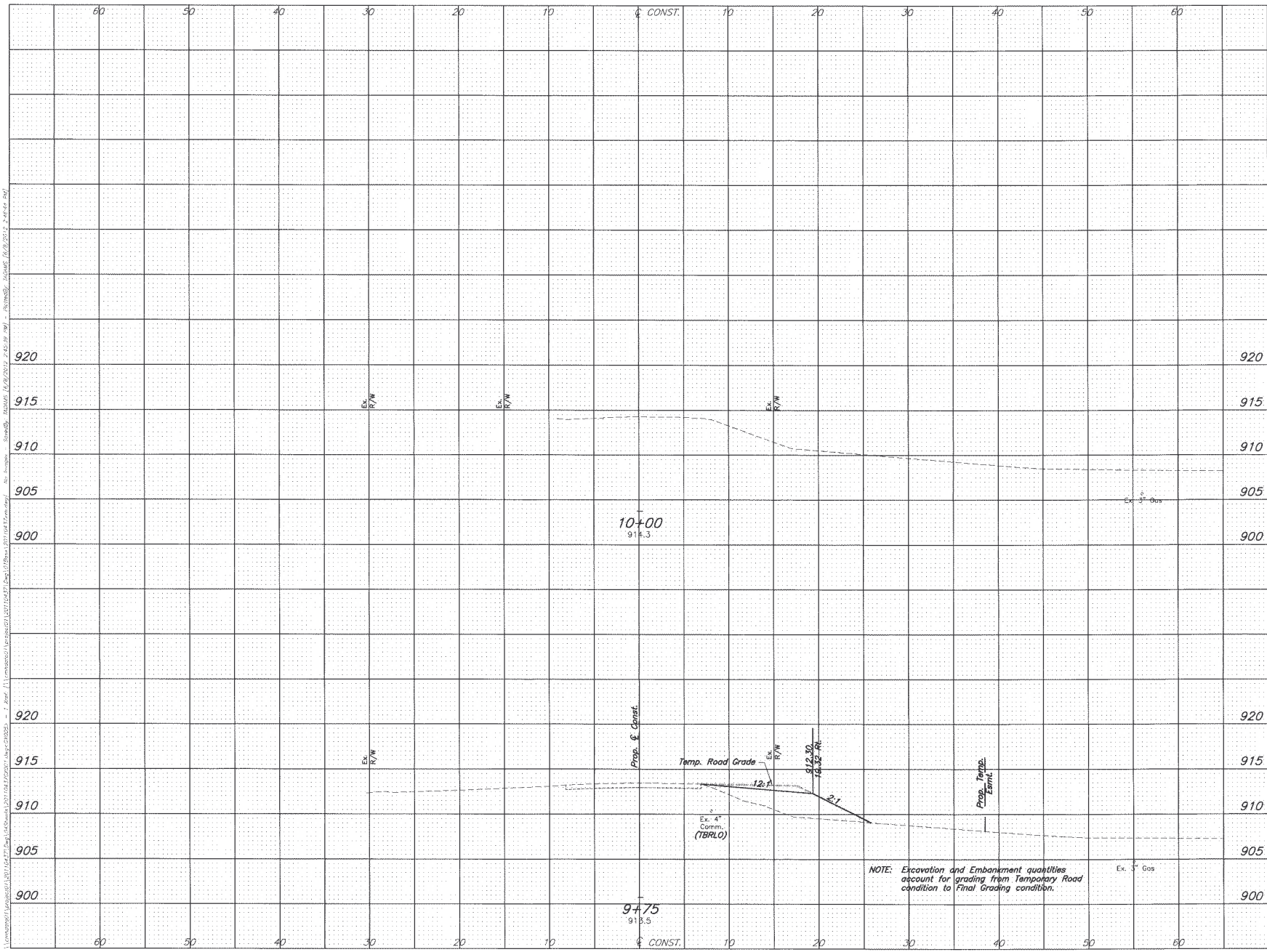
HORIZ. SCALE 1" = 5'
VERT. SCALE 1" = 5'

CALCULATED CJB
CHECKED MRB

CROSS SECTIONS – TAYLOR ROAD STA. 9+00 TO STA. 9+50

TAYLOR ROAD BRIDGE

10/25



END AREA		VOLUME	
CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
0	0		
		2	0
5	0		
		8	0
Sheet Total		10	0

HORIZ. SCALE 1" = 5'
VERT. SCALE 1" = 5'

CALCULATED CJB
CHECKED MRB

CROSS SECTIONS – TAYLOR ROAD
STA. 9+75 TO STA. 10+00

TAYLOR ROAD BRIDGE

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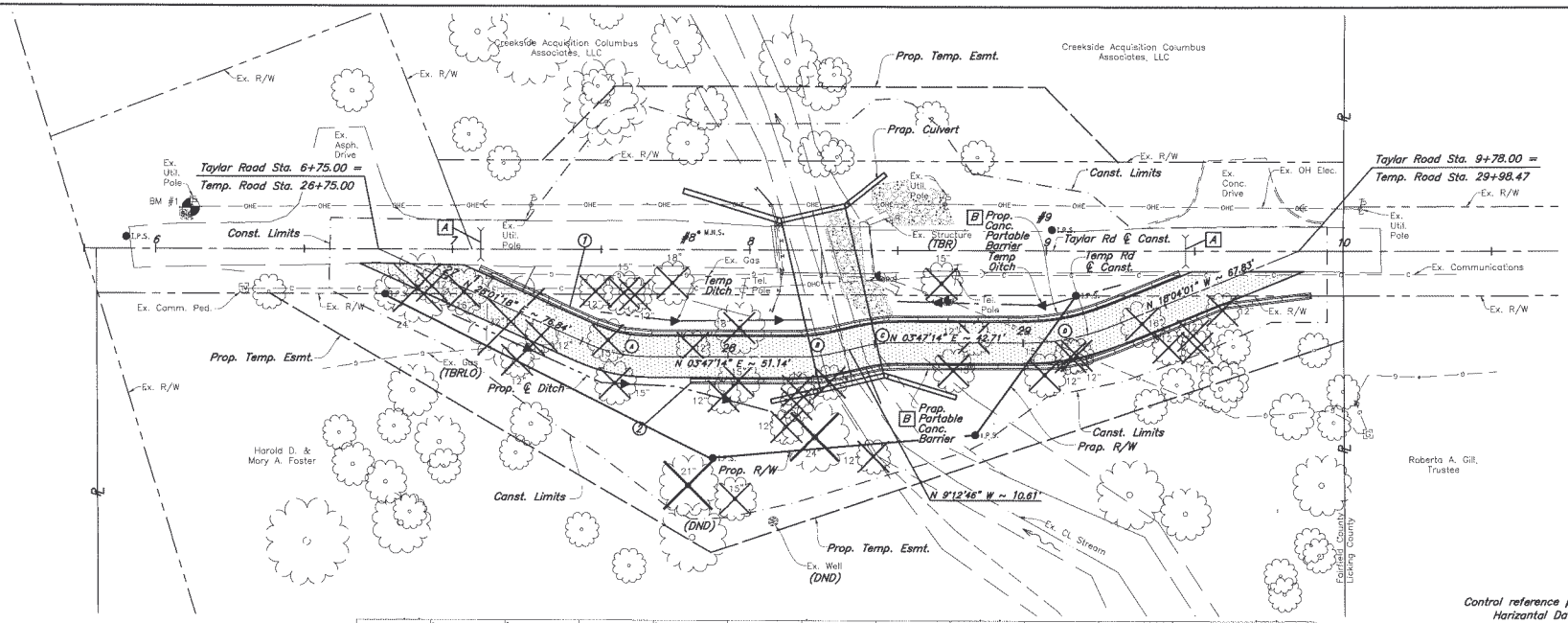
25

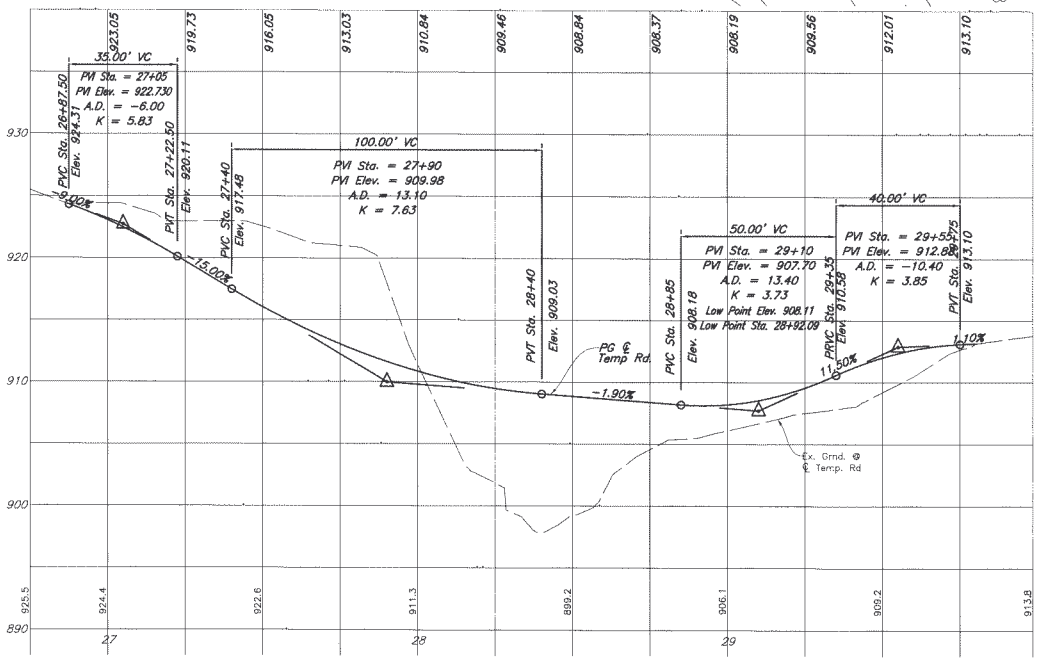


A Curve Data
Δ = 24°14'05"
R = 50.00'
T = 10.73'
L = 21.15'
PC = 27+51.84
PT = 27+72.99

B Curve Data
Δ = 13°00'00"
R = 50.00'
T = 5.70'
L = 11.34'
PC = 28+24.13
PT = 28+35.47

C Curve Data
Δ = 13°00'00"
R = 50.00'
T = 5.70'
L = 11.34'
PC = 28+46.08
PT = 28+57.42

D Curve Data
Δ = 21°51'15"
R = 80.00'
T = 15.44'
L = 30.51'
PC = 29+00.13
PT = 29+30.64



Control reference points (Ground Coordinates – See Horizontal Datum Note on Title Sheet):

#8 – Sta. 27+90.21, 41.85' Lt.
N – 706226.4013 E – 1891954.7408

#9 – Sta. 29+18.11, 36.96' Lt.
N – 706345.2595 E – 1891961.4617

A Type 3 Barricade (See Maintenance of Traffic notes, sheet 4.)

B PCB Shall be delineated as described in General Notes.

① 243 Feet PCB
Temp. Rood Sta. 27+8.80 to Sta. 29+58.41

② 214 Feet PCB
Temp. Rood Sta. 27+87.40 to Sta. 29+97.13

LEGEND

OHE ... OVERHEAD ELECTRIC
E/TW ... EDGE OF TRAVELED WAY
E/S ... EDGE OF SHLDR.
M.E. ... MATCH EXISTING

(DND) ... DO NOT DISTURB
(TBR) ... TO BE REMOVED
(TBRLO) ... TO BE RELOCATED BY OTHERS

... TREES REMOVED

Temporary Roadway (Aggregate)

GRAPHIC SCALE
20 0 10 20
(IN FEET)
1 inch = 20 ft.

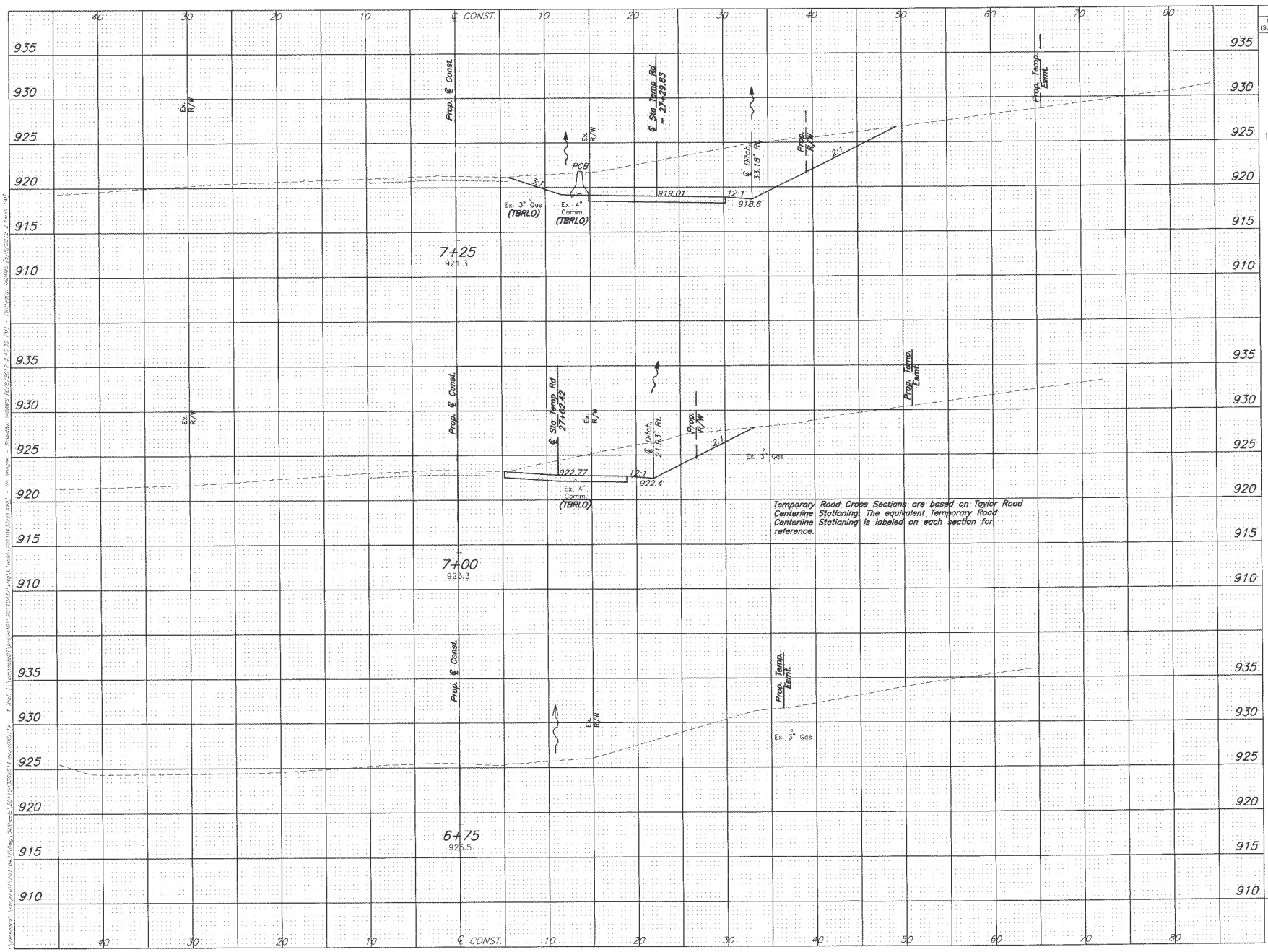
HORIZ. SCALE
20 0 20

CALCULATED CJB
CHECKED MRB

PLAN AND PROFILE – TEMPORARY ROAD

TAYLOR ROAD BRIDGE

12/25



	END AREA		VOLUME	
	CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
	153	0		
			103	0
	69	0		
			53	0
	0	0		
Sheet Total (For Information Only)			156	0

HORIZ. SCALE 1" = 30'
VERT. SCALE 1" = 12'

CALCULATED CJB
CHECKED MRB

CROSS SECTIONS – TEMPORARY ROAD STA. 6+75 TO STA. 7+25

TAYLOR ROAD BRIDGE

13/25

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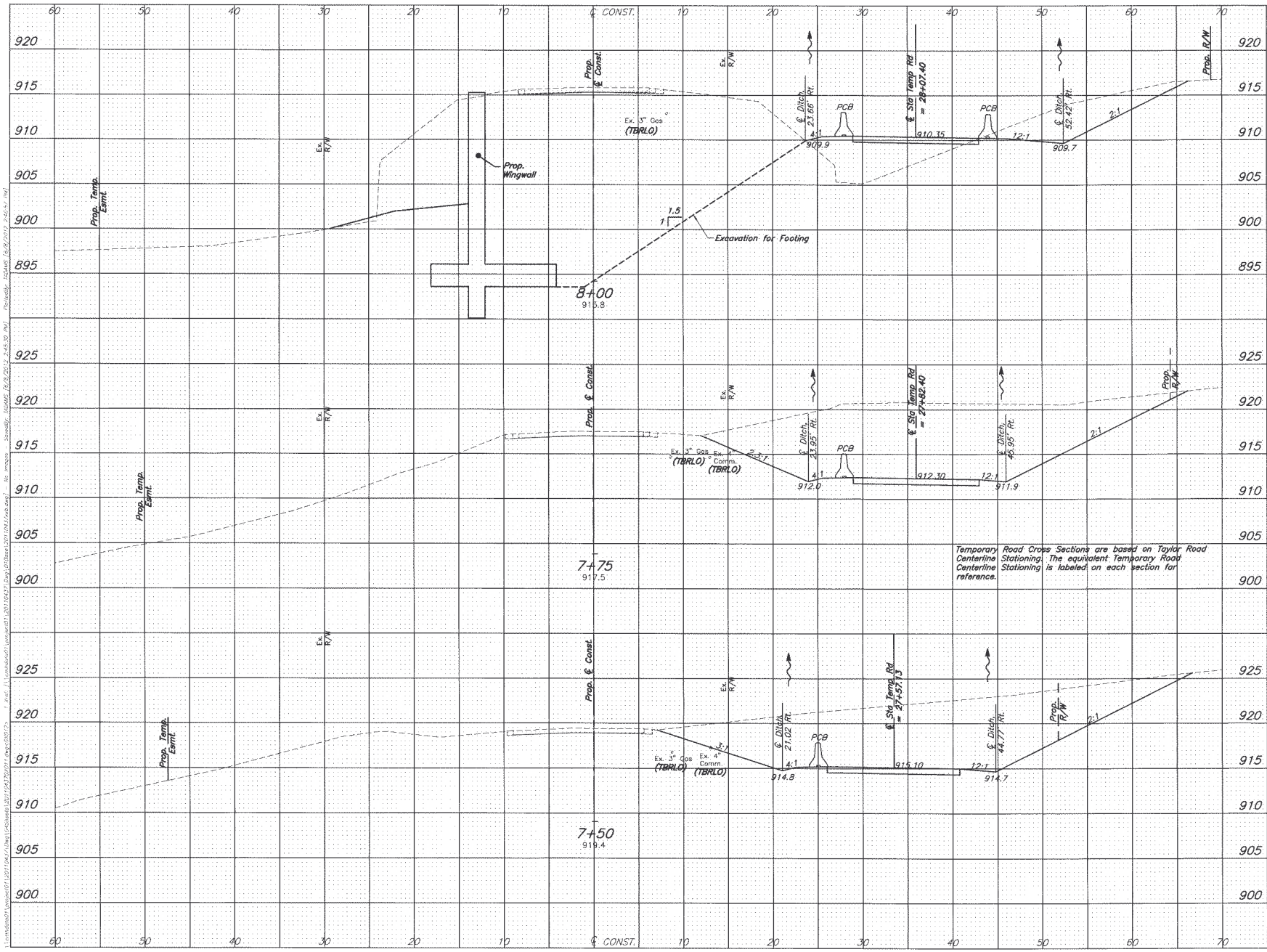


Temporary Road Cross Sections are based on Taylor Road Centerline Stationing. The equivalent Temporary Road Centerline Stationing is labeled on each section for reference.

	END AREA CUT (Sq. Ft.)	END AREA FILL (Sq. Ft.)	VOLUME CUT (Cu. Yd.)	VOLUME FILL (Cu. Yd.)
	51	47		
			172	22
	321	0		
			291	0
	308	0		
			213	0
Sheet Total (For Information Only)			676	22

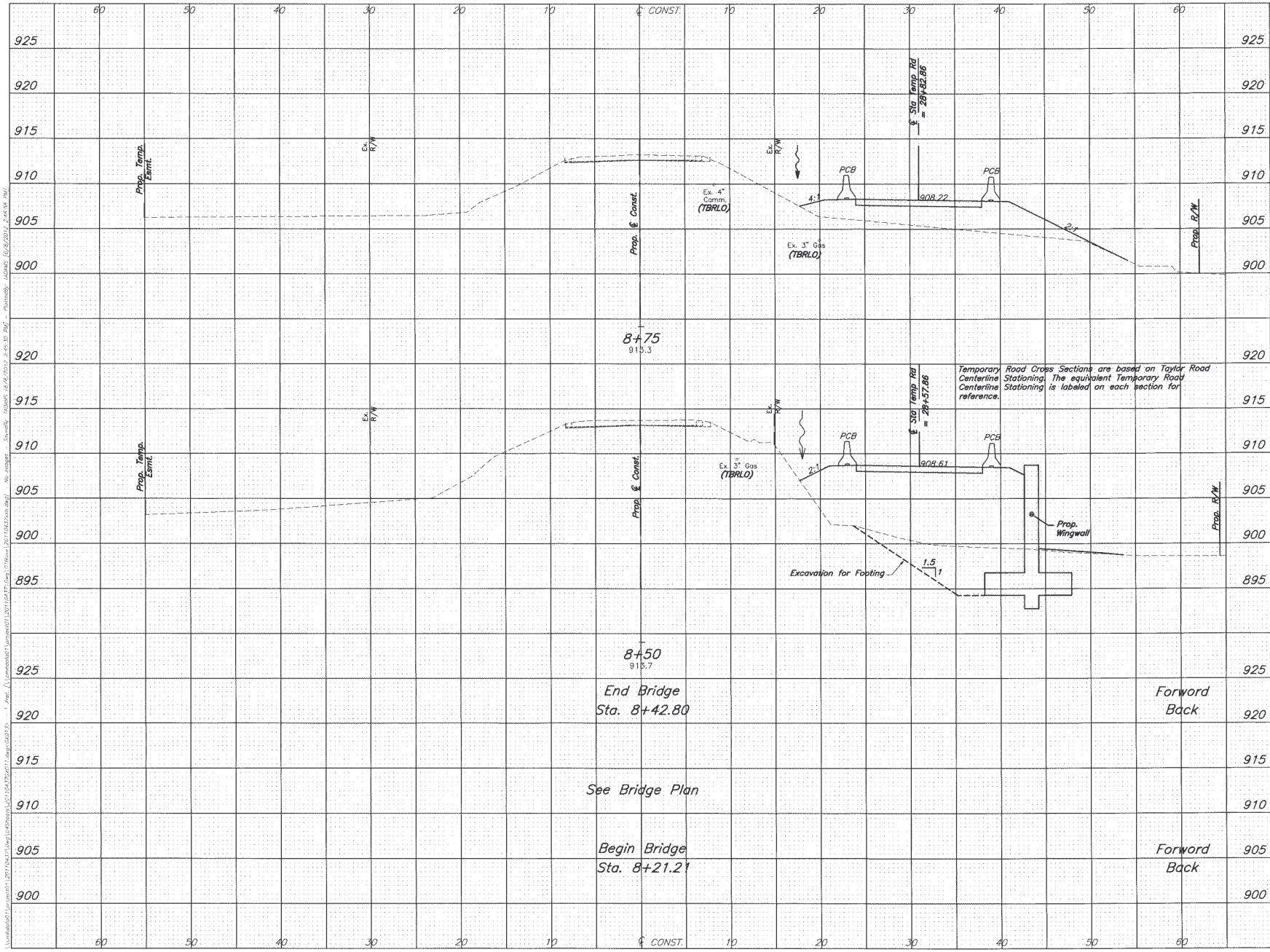
HORIZ. SCALE 5 0 5
VERT. SCALE 5 0 5

CALCULATED CJB
CHECKED MRB

CROSS SECTIONS – TEMPORARY ROAD
STA. 7+50 TO STA. 8+00

TAYLOR ROAD BRIDGE

14
25



	END AREA		VOLUME	
	CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
	0	68		
			0	113
	0	177		
			0	57
	0	250		
Forword	0	22		
Back			0	18
Forword	0	22		
Back	0	250		
			20	117
Sheet Total (For Information Only)			20	305

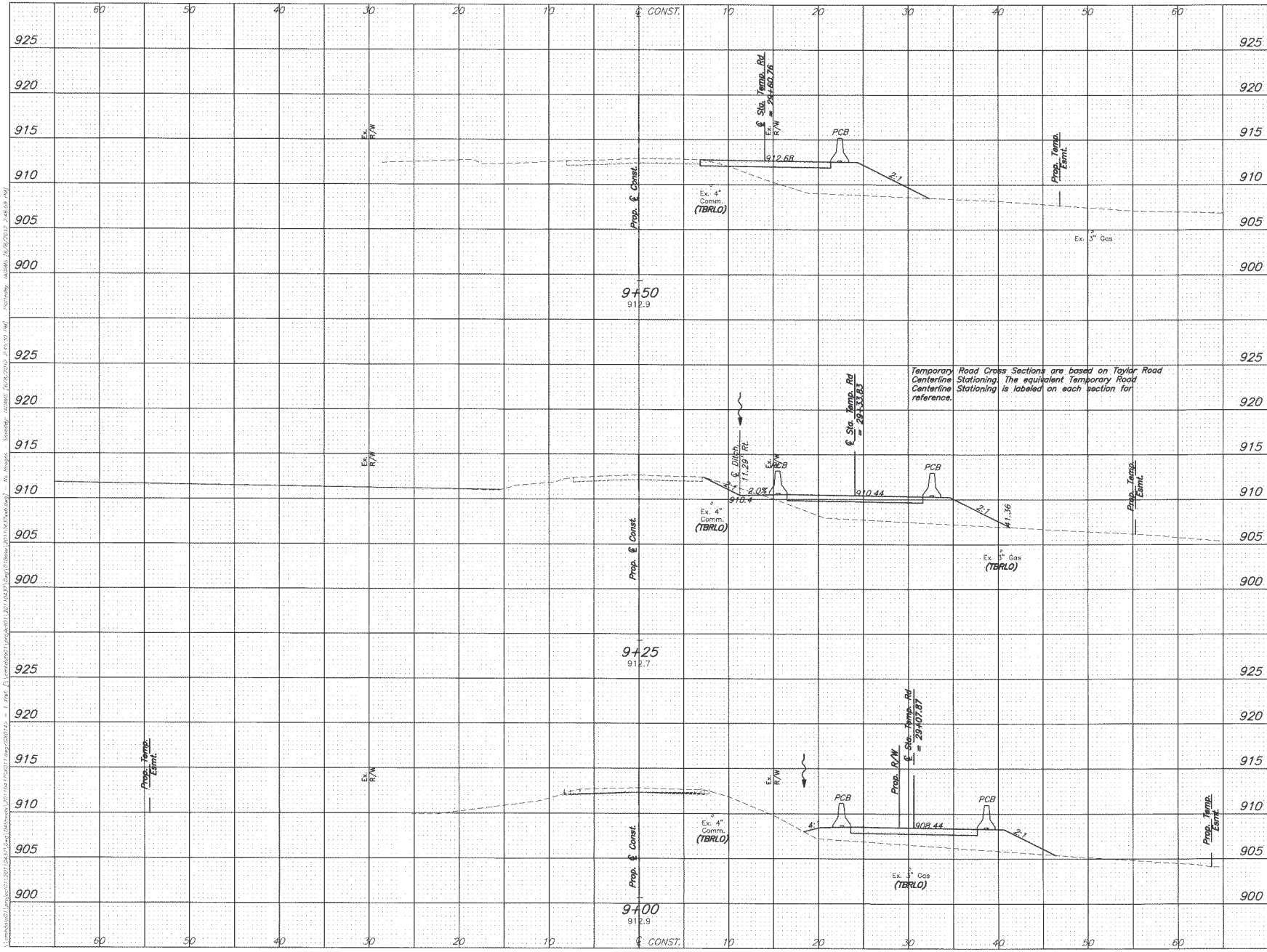
HORIZ. SCALE 1" = 5'
VERT. SCALE 1" = 5'

CALCULATED CJB
CHECKED MRB

CROSS SECTIONS – TEMPORARY ROAD STA. 8+25 TO STA. 8+75

TAYLOR ROAD BRIDGE

15/25



END AREA		VOLUME	
CUT (Sq. Ft.)	FILL (Sq. Ft.)	CUT (Cu. Yd.)	FILL (Cu. Yd.)
1	46		
		2	44
3	48		
		1	40
0	38		
		0	49
Sheet Total (For Information Only)		3	133

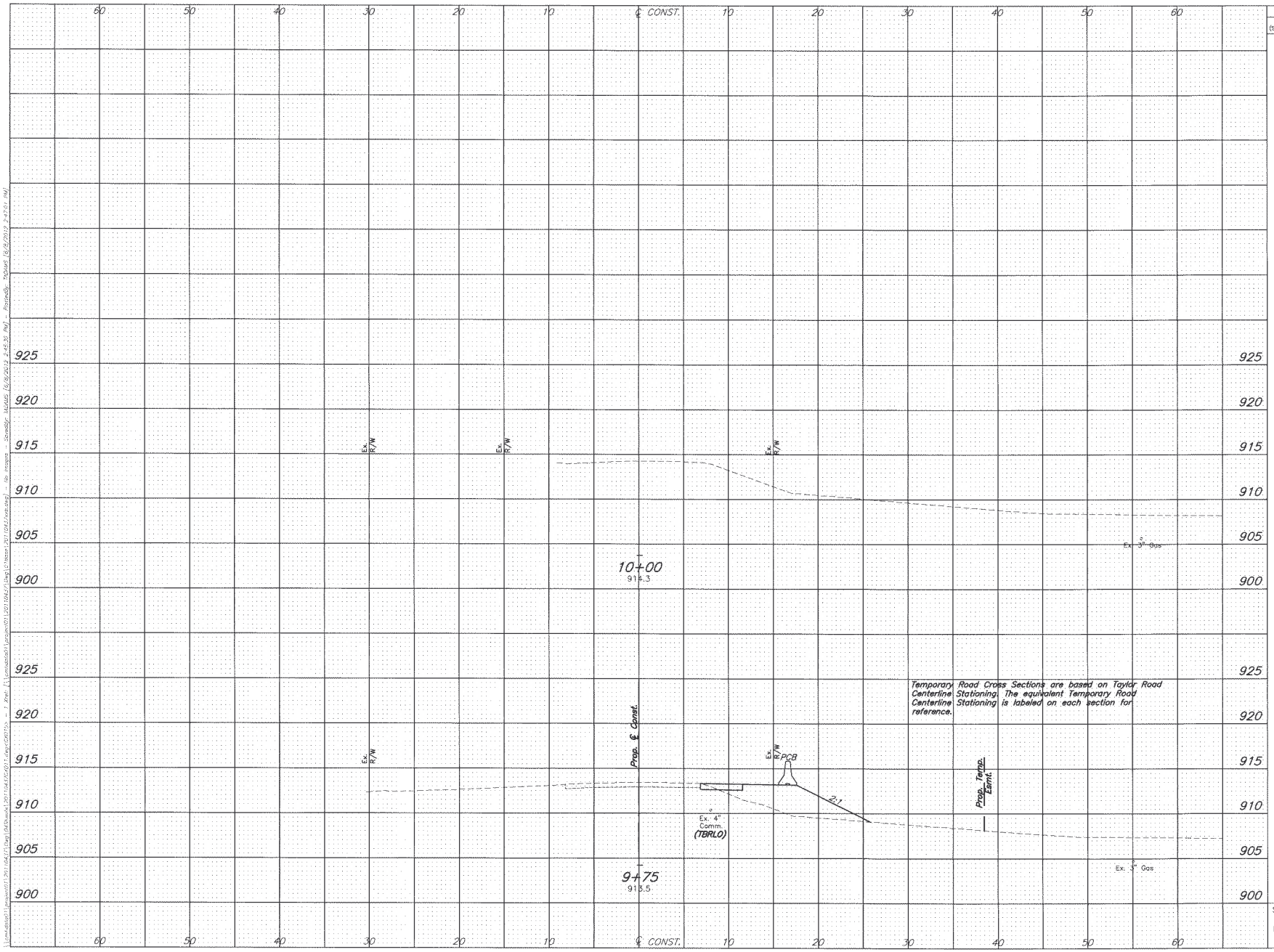
HORIZ. SCALE 1" = 5'
VERT. SCALE 1" = 5'

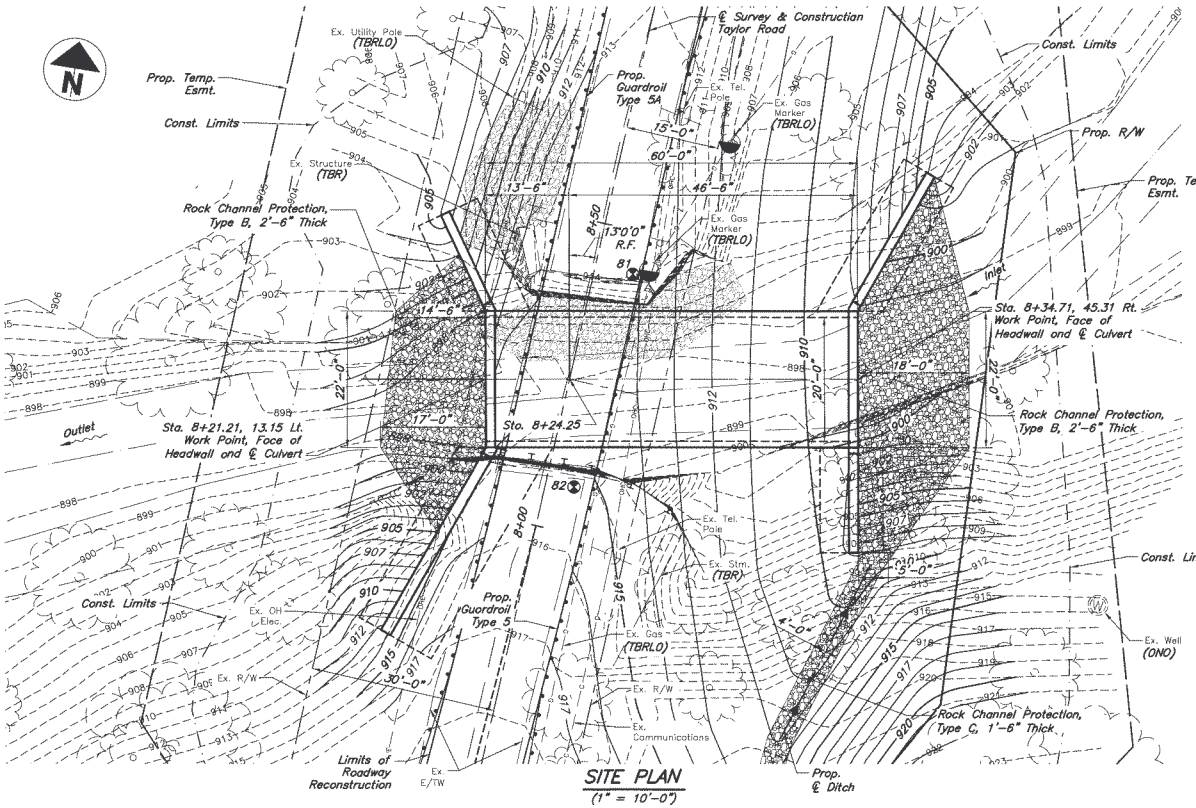
CALCULATED CJB
CHECKED MRB

CROSS SECTIONS - TEMPORARY ROAD STA. 9+00 TO STA. 9+50

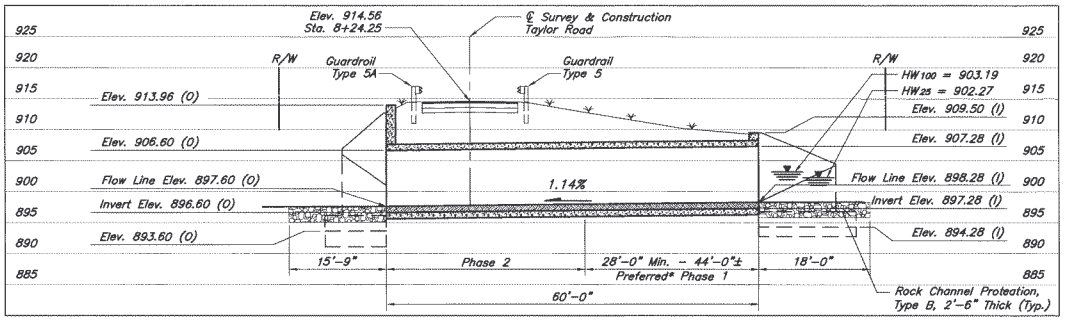
TAYLOR ROAD BRIDGE

16/25


60
50
40
30
20
10
℄ CONST.
10
20
30
40
50
60
925
920
915
910
905
900
Ex. R/W
Ex. R/W
Ex. R/W
10+00
913.3
Ex. 3" Gas
Temporary Road Cross Sections are based on Taylor Road Centerline Stationing. The equivalent Temporary Road Centerline Stationing is labeled on each section for reference.
Prop. ℄ Const.
Ex. R/W
Ex. R/PCB
2:1
Prop. Temp. Esmt.
Ex. 4" Comm. (TBRLO)
9+75
913.5
Ex. 3" Gas
END AREA
CUT (Sq. Ft.)
FILL (Sq. Ft.)
VOLUME
CUT (Cu. Yd.)
FILL (Cu. Yd.)
0 0
0 11
1 31
1 37
Sheet Total (For Information Only)
1 48
HORIZ. SCALE
VERT. SCALE
5 0 2.5 5
5 0 2.5 5
CALCULATED CJB
CHECKED MRB
CROSS SECTIONS – TEMPORARY ROAD
STA. 9+75 TO STA. 10+00
TAYLOR ROAD BRIDGE
17
25



SITE PLAN
(1" = 10'-0")



PROFILE ALONG ℄ CULVERT
(1" = 10'-0")

* See Item 503, Cofferdams and Excavation Bracing, As Per Plan Sheet 20/25.

BENCH MARKS

All Bench Marks and elevations shown upon this plan are based on the North American Vertical Datum (NAVD) of 1988.

SOURCE BENCH MARK
Brass plug in the concrete curb of a railroad station platform located in Pickerington, 0.05 miles north of East Columbus Street (S.R. 256), 30 feet southeast of a railroad crossing, 22 feet northwest of the northwest corner of the station, 3 feet southwest of the south rail.
Elev. = 840.842

BM #1
Pony spike in the east side of a utility pole, 20± feet west of the centerline of Taylor Road, in front of drive for residence #13920.
Elev. = 933.66

BM #2
Pony spike in the southeast side of a utility pole, 20± feet west of the centerline of Taylor Road, 70± feet south of the centerline of Cedar Path Drive.
Elev. = 937.95

HYDRAULIC DATA

Drainage Area = 1.88 sq. mi.
Q25 = 478 cfs, V25 = 8.11 fps,
HW25 = 902.27
Q100 = 646 cfs, V100 = 9.33 fps,
HW100 = 903.19

NOTES

1. Earthwork Limits shown are approximate and are for final condition. Actual Slopes shall canform to Plan Cross Sections.
2. Footing size based on soil bearing capacity of 5000 psf.
3. Design earth caver – 7 Ft. to 10 Ft.

LEGEND

(I) = At Inlet
(O) = At Outlet
Elev. = Elevation
HW = High Water
PEJF = Prefarmed Exponsion Jaint Filler
⊗ = Soil Boring Location
R/W = Right of Way
TBR = To Be Removed
TBRLO = To Be Relocated by Others
ONO = Do Not Disturb
E.F. = Eoch Face
F.F = Far Face
N.F. = Near Face

EXISTING STRUCTURE DATA

TYPE: Single Span Steel Two–Girder Bridge with Steel Stringers and Timber Deck
SPAN: 30'–0" c/c Bearings
ROADWAY: 16'–0"
SKEW: None
DESIGN LOADING: Posted 26 Tons
SUBSTRUCTURE: One Stone Abutments and One Capped Pile Abutment
DATE BUILT: 1978
STRUCTURE FILE NUMBER: 2341433
APPROACH SLABS: None
WEARING SURFACE: Asphalt Concrete

PROPOSED STRUCTURE DATA

TYPE: 20' x 10' Precast Concrete Box Culvert
SPAN: 20'–0"
ROADWAY: 16'–0"
DESIGN LOADING: HL–93
SKEW: 13° R.F.
WEARING SURFACE: Asphalt Concrete
APPROACH SLABS: None
STRUCTURE FILE NUMBER: 2335816
ALIGNMENT: Tangent
CROWN: 3/16"/Foot
LATITUDE: N 39°56'24"
LONGITUDE: W 82°46'24"

GRAPHIC SCALE
10 0 5 10
(IN FEET)
1 inch = 10 ft.

EMHT
Environmental Management & Technology, Inc.
Pickerington, Ohio 43147 Phone: (614) 861-3636 Fax: (614) 861-3648

DESIGNED	DRAWN	REVIEWED	DATE
TDA	TDA	CJS	3–6–12
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LMG		2335816	

BRIDGE REPLACEMENT PLAN
CULVERT
OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

1 / 8

18 / 25

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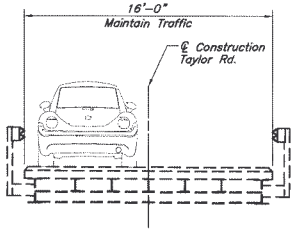
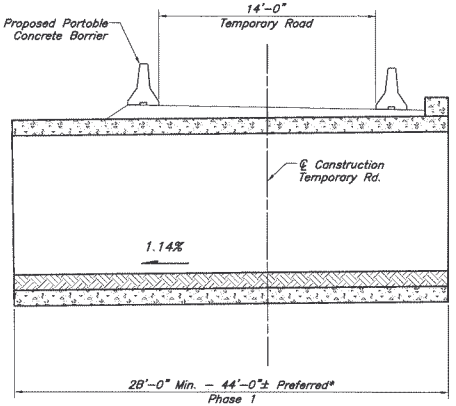
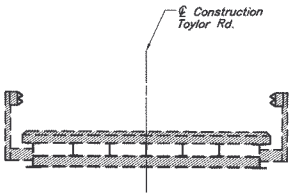
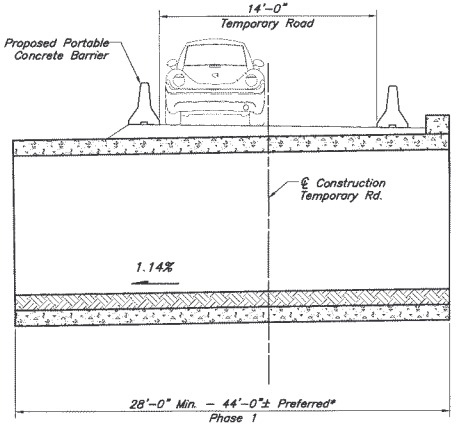




PHASE 1 CONSTRUCTION

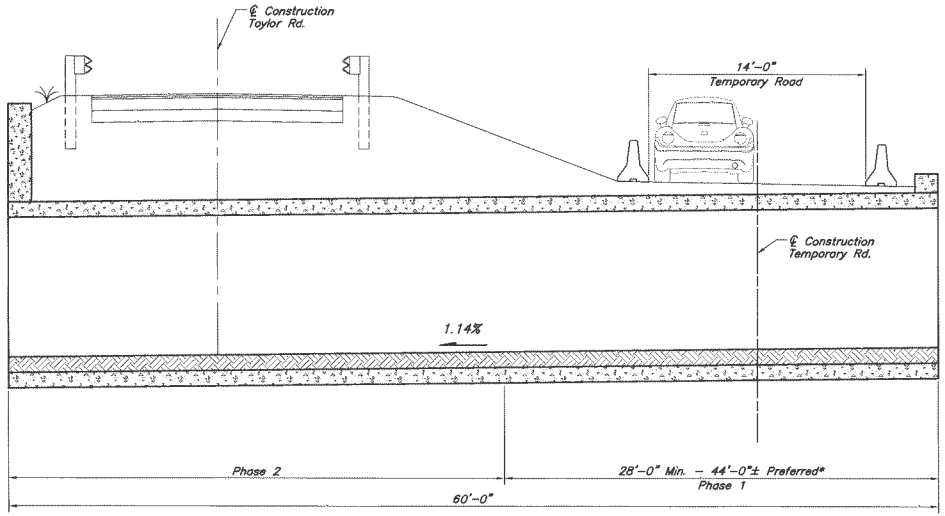
(1/4" = 1'-0")





PHASE 2 REMOVAL

(1/4" = 1'-0")



PHASE 2 CONSTRUCTION

(1/4" = 1'-0")

LEGEND

– Item 202 – Structure Removed, Over 20' Span

* See Item 503, Cofferdams and Excavation Bracing, As Per Plan on Sheet 20/25.

PHASE CONSTRUCTION DETAILS

CULVERT

OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

EMHT

DESIGNED TDA
DRAWN TDA
CHECKED LMG
REVIEWED CJS
REVISED
DATE 3-6-12
STRUCTURE FILE NUMBER 2335816

2 / 8

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25

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GENERAL NOTES

The following specification sections among others shall be adhered to while constructing this structure.

ODOT CMS 202	ODOT CMS 516
ODOT CMS 518	ODOT CMS 501
ODOT CMS 601	ODOT CMS 503
ODOT CMS 603	ODOT CMS 508
ODOT CMS 703	ODOT CMS 509
ODOT CMS 712	ODOT CMS 511

PROPOSED STRUCTURE

The proposed structure shall be a 20' span x 10' rise precast reinforced concrete four-sided box culvert with reinforced concrete footings, wingwalls, and headwalls.

DESIGN SPECIFICATIONS

This structure conforms to the "LRFD Bridge Design Specifications" adopted by the American Association of State Highway and Transportation Officials, 2007, including the Interim Specifications and the O.D.O.T. Bridge Design Manual, 2007.

DESIGN LOADING

HL-93
Future Wearing Surface (FWS) of 0.060 Kips/SQ FT.

DESIGN DATA

Earth Cover - 7'-0"± to 10'-0" ±

Concrete Class C- Compressive Strength 4000 p.s.i.

Reinforcing Steel - ASTM A615, A616 or A617. Grade 60 - minimum Yield Strength 60,000 p.s.i.

ITEM 603 20' SPAN X 10' RISE CONDUIT TYPE A, 706.05, AS PER PLAN

The four-sided box culvert shall be designed per the AASHTO LRFD Bridge Design Specifications, Current Edition, for the HL-93 loading with 7 feet to 10 feet of cover. Dimensions of box shall conform to details shown in these plans. Shop drawings and a load rating signed and sealed by a professional engineer registered in the state of Ohio shall be submitted to the Fairfield County Engineer's Office for approval, prior to casting of concrete box. The load rating shall be per ODOT and county standards on a form approved by the county.

Wingwall concrete above bottom of box shall not be cast until box culvert units are placed.

WINGWALLS

The Contractor may propose Precast Wingwalls and Headwalls as an alternate to cast-in place. This will be allowed upon approval by the Fairfield County Engineers Office and done at no additional cost to the agency. Precast footings will not be allowed at any time. If the precast option is exercised, the complete design, review and detailing of the alternate design shall be the responsibility of the contractor and/ or the contractor's fabricator. This includes any cast-in-place foundation that may be required for the precast wingwall alternate.

Precast walls shall be designed for the following minimum requirements:
Design loading as shown in the plan notes.
Allowable foundation bearing pressure as shown in the plan notes.
Factor of safety of at least 1.5 for sliding and 2.0 for overturning.
Additionally, precast walls that are not rigidly connected to a spread footing with a moment connection shall be mechanically anchored to the adjacent box culvert section.

As there are many different precast wingwall systems available, detailed plans for the selected system shall be signed and sealed by a Professional Engineer, licensed in the State of Ohio. The plans shall be complete with foundation requirements and detail any necessary mechanical connections at the box interface.

EMH&T does not warrant that its plans and specifications describe an improvement that is suitable for the use of precast wingwalls. The conractor shall verify subsurface conditions, including utility locations, prior to fabricating precast wingwalls. No additional payment will be made for adjustments to pipes, grades, utilities, or any other item resulting from the use of precast wingwalls. Payment will be made at the unit price bid for the wingwalls, in place and accepted, as if cast-in-place. Full compensation for the precast wingwall or headwall is the number of cubic yards of item 511, and pounds of item 509 for the corresponding cast-in-place structure.

UTILITY LINES

All expense involved in relocating (installing) the affected Utility Lines shall be borne by the Utility(ies). The Contractor and Utility(ies) are to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

REMOVAL OF THE EXISTING STRUCTURE

When no longer needed to maintain traffic the existing structure shall be removed upon receiving permission from the engineer. Payment for removal shall be included within Item 202 - Structure Removed, Over 20' Span. Payment shall be per Lump Sum.

INSTALLATION

The structure shall be installed in accordance with Item 603.

REINFORCING STEEL

Domestic steel use requirements as specified in section 153.011 of the revised code apply to this project. Copies of section 153.011 of the revised code can be obtained from any of the office's of the Ohio Department of Administrative Services.

Spacing of bars is from center of bars. Minimum lap lengths, No. 5 bar - 2'-5".

The clearance of reinforcing steel from the face of the concrete shall be 2" minimum unless otherwise shown.

MEMBRANE WATERPROOFING

Membrane Waterproofing, Sheet Type 2, shall be applied to the top surface and extend vertically down all sides of the culvert. The exterior joint gap on the top and sides between the precast culvert sections shall be filled with Portland Cement Mortar prior to installing the membrane waterproofing. Joint wrap as specified in 603.06 is not required under the limits of the Membrane Waterproofing.

POROUS BACKFILL WITH FILTER FABRIC

2'-0" Thick, shall be placed behind the wingwalls, and shall extend from 1'-0" below the embankment surface to 6" below the weephole locations.

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN:

The length of box culvert that can be installed during Phase 1 will dictate the amount and extent of the excavation bracing that will be required. If the Contractor is able to install greater than 28 L.F. of box culvert during Phase 1, a plan must be approved by the Engineer.

ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE):

Concrete surfaces shall be sealed using an epoxy urethane concrete sealer. The urethane shall be federal color standard No. 17778 (off-white).

STREAM CHANNEL EXCAVATION

The Contractor shall take all precautions necessary to prevent any incidental discharges associated with the excavation and hauling of material from the stream channel. This pertains to an excavation operations such as foundation excavation, channel cleanout, excavation for rock channel protection and removal of any temporary fill associated with construction operations.

INSTREAM WORK

Instream work will be limited to where practicable and only clean, non-erodible material will be used for fords, cofferdams or other equipment access pads. This temporarily placed material will be removed and the stream bottom restored to near natural conditions when the work is completed.

BEVELED EDGES

All exposed edges shall be beveled as per ODOT CMS 508 unless otherwise shown.

PREFORMED EXPANSION JOINT FILLER

1" P.E.J.F. (Preformed Expansion Joint Filler) shall be placed between the cast-in-place Wingwalls and the Box Culvert.

RAILING

Attachment of the railing posts over the top of the culvert shall be in accordance with ODOT Standard Drawing GR2.2.

ESTIMATED QUANTITIES

ITEM	QUANTITY	UNIT	DESCRIPTION
202	Lump	Sum	Structure Removed, Over 20' Span
503	Lump	Sum	Unclassified Excavation
503	Lump	Sum	Cofferdams and Excavation Bracing, As Per Plan
509	18243	Pounds	Reinforcing Steel
511	114	C.Y.	Class C Concrete, Footing
511	91	C.Y.	Class C Concrete, Headwall and Wingwall
512	320	S.Y.	Type 2 Waterproofing (See Sheet 22)
512	140	S.Y.	Sealing of Concrete Surfaces (Epoxy - Urethane)
516	97	S.F.	1" Preformed Expansion Joint Filler
518	73	C.Y.	Porous Backfill with Filter Fabric
601	110	C.Y.	Rock Channel Protection, Type B with Filter Fabric
603	60	FT.	20' x 10' Conduit, Type A, 706.05, As Per Plan

EMH&T
5500 New Albany Road, Columbus, Ohio 43054
Phone: (614) 775-4500 Fax: (614) 775-4800
www.emht.com

REVIEWED CJS DATE 3-6-12
DRAWN TDA REVISED ——
DESIGNED TDA CHECKED LMG
STRUCTURE FILE NUMBER 2335816

CULVERT GENERAL NOTES AND QUANTITIES
CULVERT
OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

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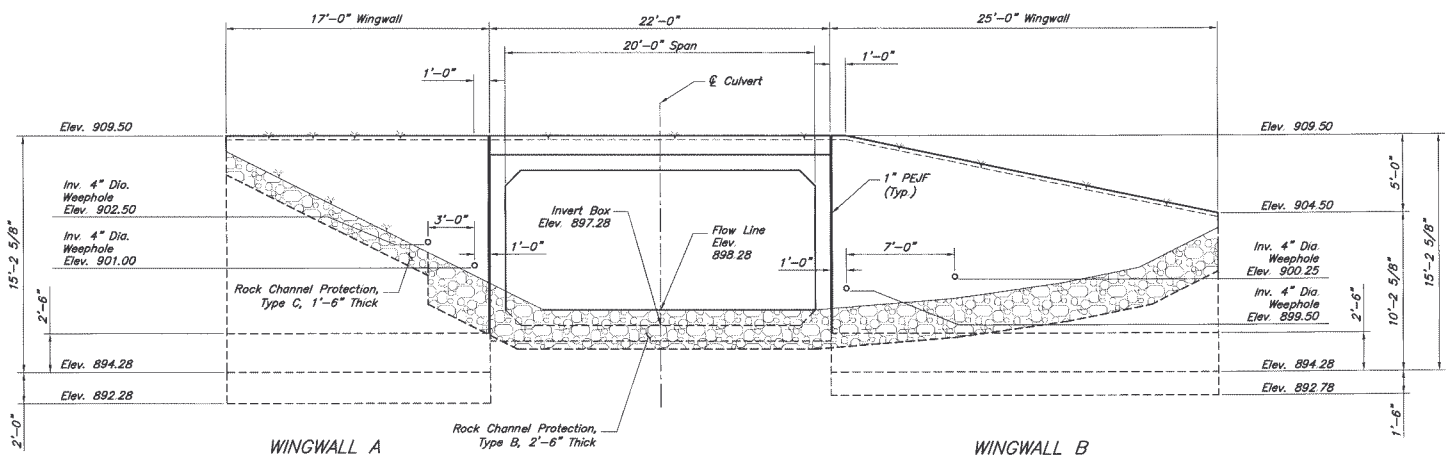
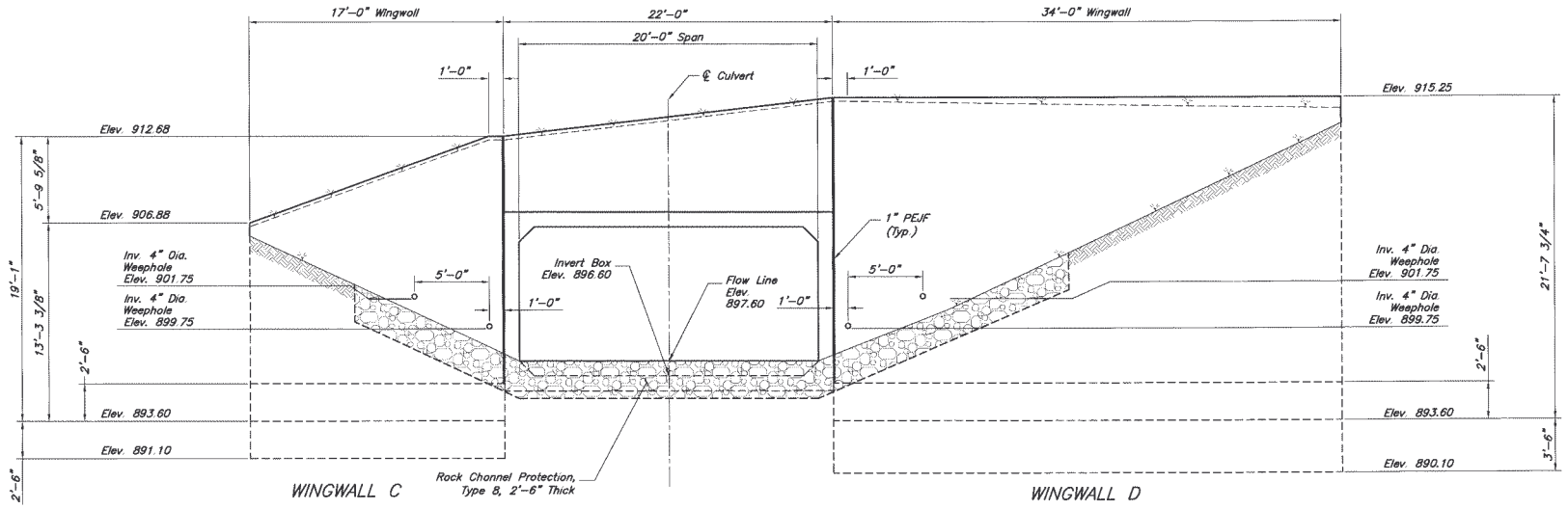


INLET WINGWALL ELEVATION

Dimensions Measured along Outside Face of Concrete
(1/4" = 1'-0")



OUTLET WINGWALL ELEVATION

Dimensions Measured along Outside Face of Concrete
(1/4" = 1'-0")

CULVERT WINGWALL ELEVATIONS

CULVERT
OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

EMHT

DESIGNED TDA
DRAWN TDA
CHECKED LMG
REVISED
REVIEWED CJS
DATE 3-6-12
STRUCTURE FILE NUMBER 2335816

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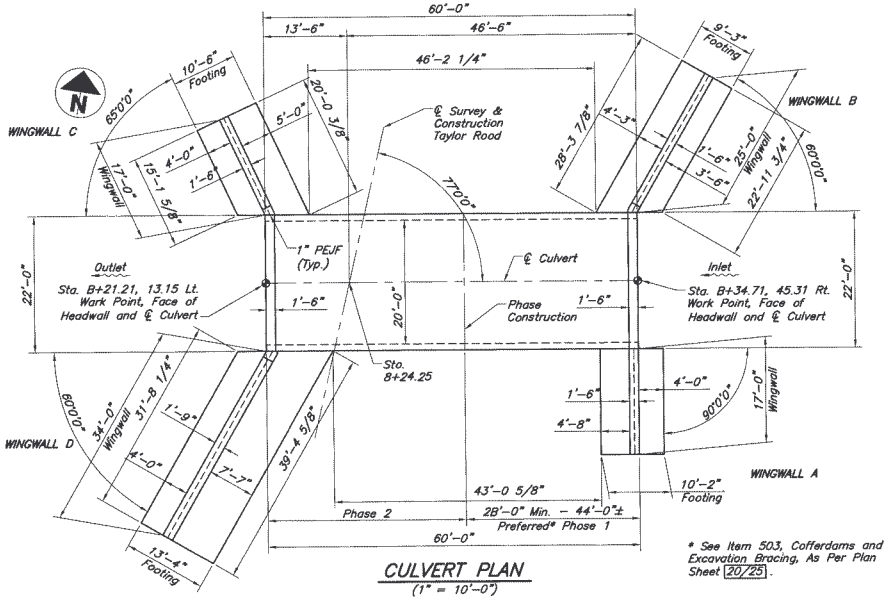
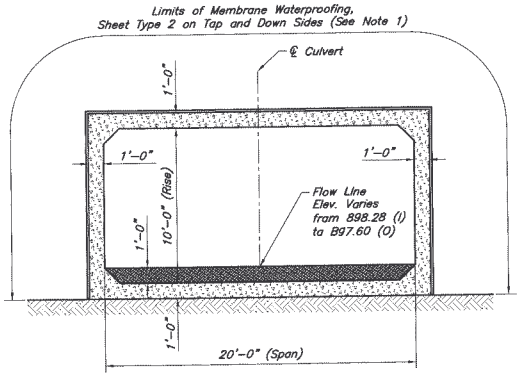
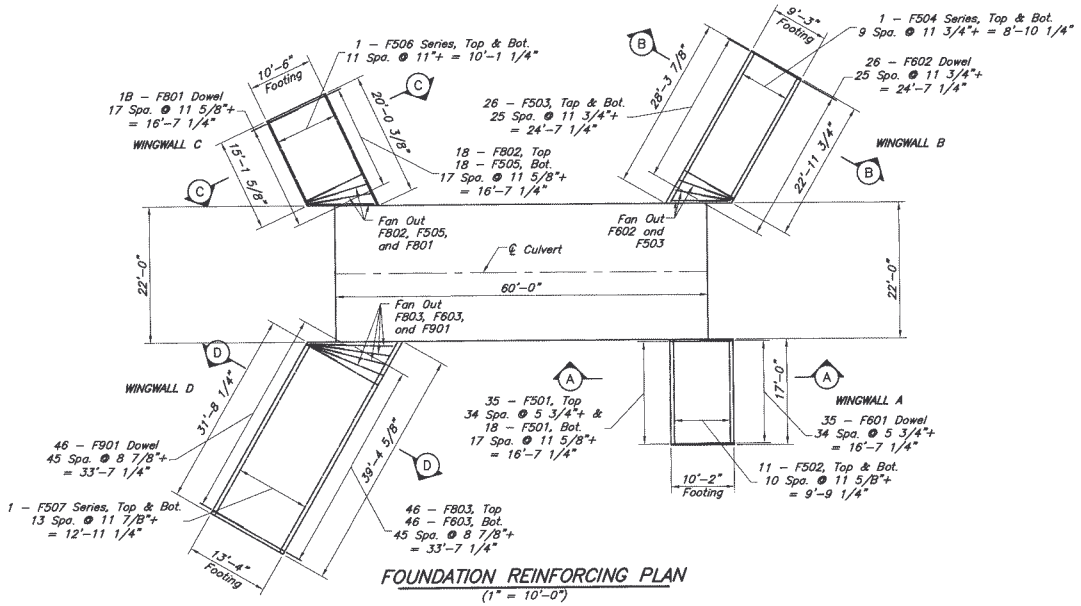


CULVERT PLAN
(1" = 10'-0")

* See Item 503, Cofferdams and Excavation Bracing, As Per Plan Sheet 20/25.



TYPICAL SECTION
(1/4" = 1'-0")



FOUNDATION REINFORCING PLAN
(1" = 10'-0")

NOTE

1. Continue Waterproofing past the end of the Precast Unit to Lap 9" (Min.) onto Backside of Wingwall, covering the Wingwall Vertical Joint.

EMHT

DESIGNED TDA
DRAWN TDA
CHECKED LMG
REVIEWED CJS
REVISED ____
DATE 3-6-12
STRUCTURE FILE NUMBER XXXXXXX

CULVERT DETAILS
CULVERT
OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

5 / 8

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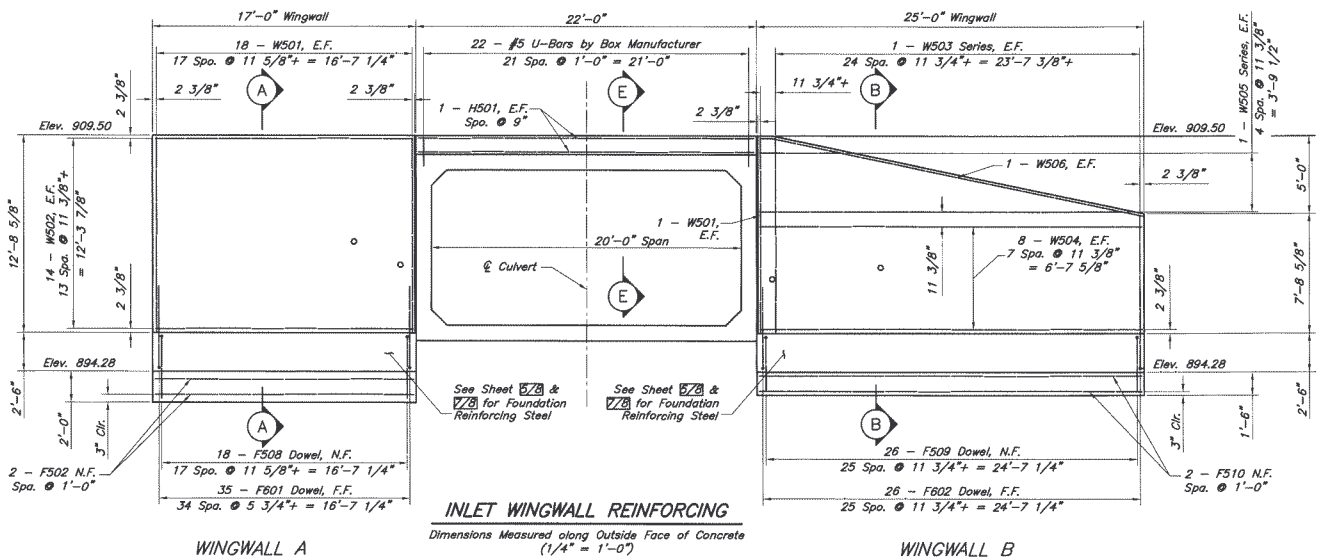

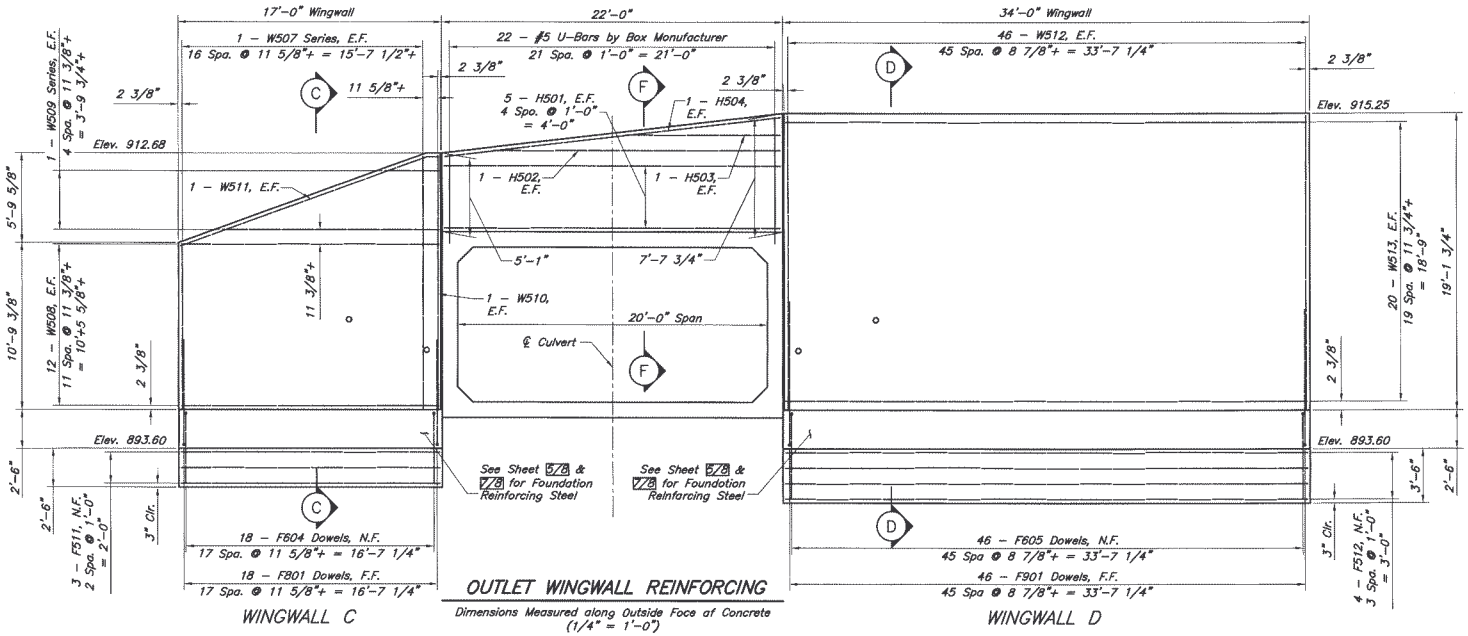

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EMHT
ENGINEERING, PLANNING & SURVEYING
1500 N. MAIN, SUITE 200 • SPRINGFIELD, OHIO 45504
PHONE 937.325.9991 • FAX 937.325.1821
WWW.EMHT.COM

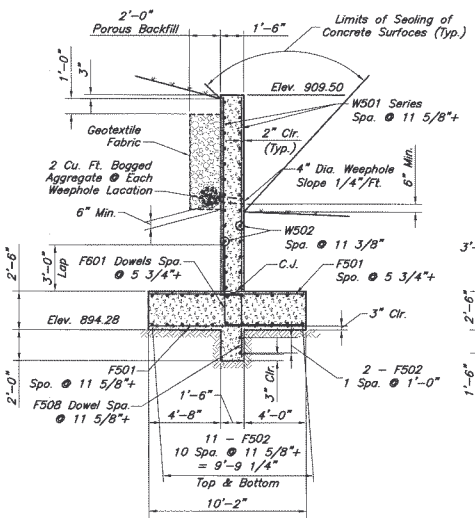
DESIGNED	DRAWN	REVIEWED	DATE
TDA	TDA	CJS	3-6-12
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LMG		XXXXXXX	

CULVERT WINGWALL REINFORCING DETAILS
CULVERT
OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

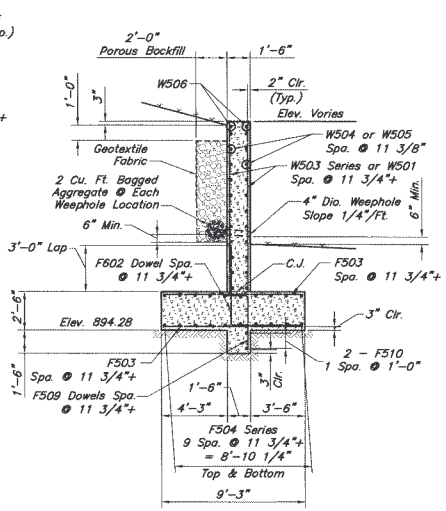
6 / 8

23 / 25



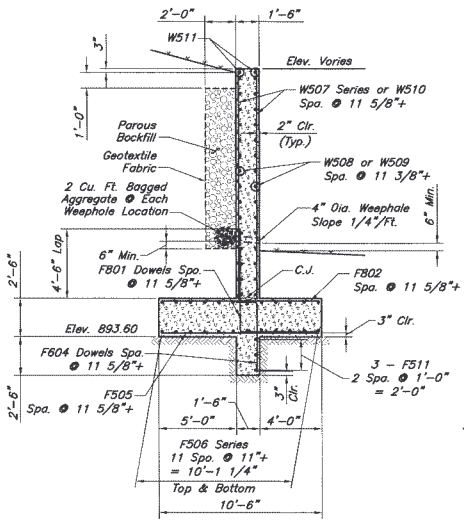
SECTION A–A

(1/4" = 1'-0")



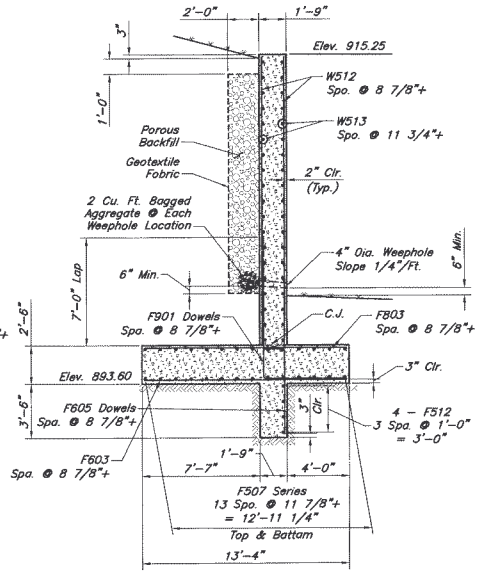
SECTION B–B

(1/4" = 1'-0")



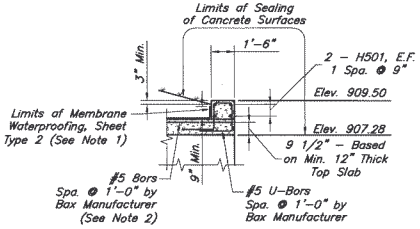
SECTION C–C

(1/4" = 1'-0")



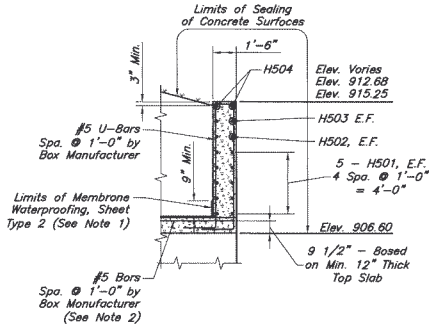
SECTION D–D

(1/4" = 1'-0")



SECTION E–E

(1/4" = 1'-0")



SECTION F–F

(1/4" = 1'-0")

NOTE

1. Continue Waterproofing past the end of the Precast Unit to Lap 9" (Min.) onto Backside of Wingwall, covering the Wingwall Vertical Joint.

2. Reinforcing not shawn in box section to be designed and fabricated by the box monufacturer.

EMHT

DESIGNED TDA
DRAWN TDA
CHECKED LMG
REVIEWED CJS
DATE 3-6-12
REVISED ——
STRUCTURE FILE NUMBER XXXXXXX

CULVERT DETAILS
CULVERT
OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

7 / 8

24 / 25

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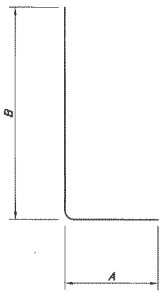
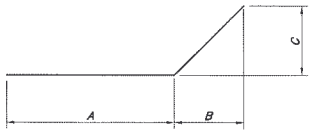


TYPE 3



TYPE 4

REINFORCING BARS

MARK	NUMBER REQUIRED	LENGTH	WEIGHT POUNDS	TYPE	DIMENSION A	DIMENSION B	DIMENSION C	INCR.
W501	38	12'-6"	496	STR				
W502	28	16'-8"	487	STR				
W503	2 Series of 25	7'-7" to 12'-7"	526	STR				2 1/2"
W504	16	24'-8"	412	STR				
W505	2 Series of 5	5'-5" to 23'-6"	151	STR				4'-6 1/4"
W506	2	25'-3"	53	4	24'-6"	8 5/8"	1 3/4"	
W507	2 Series of 17	10'-8" to 16'-4"	479	STR				4 1/4"
W508	24	16'-8"	418	STR				
W509	2 Series of 5	3'-5" to 13'-11"	91	STR				2'-7 1/2"
W510	2	16'-3"	34	STR				
W511	2	17'-6"	37	4	16'-11"	8 3/8"	3"	
W512	92	18'-11"	1816	STR				
W513	40	33'-8"	1405	STR				
H501	14	21'-8"	317	STR				
H502	2	18'-6"	39	STR				
H503	2	10'-0"	21	STR				
H504	2	21'-9"	46	STR				
F501	53	9'-10"	544	STR				
F502	26	16'-8"	452	STR				
F503	52	8'-11"	484	STR				
F504	2 Series of 10	22'-8" to 27'-6 1/2"	524	STR				6 1/2"
F505	18	10'-2"	191	STR				
F506	2 Series of 12	15'-0" to 19'-7"	433	STR				5"
F507	2 Series of 14	31'-6" to 38'-6 1/2"	1023	STR				6 1/2"
F508	18	4'-9"	90	3	10 1/2"	4'-0"		
F509	26	4'-5"	120	3	10 1/2"	3'-6"		
F510	2	24'-8"	52	STR				
F511	3	16'-8"	53	STR				
F512	4	33'-8"	141	STR				
F601	35	10'-3"	539	3	5'-2"	5'-3"		
F602	26	9'-9"	381	3	4'-8"	5'-3"		
F603	46	13'-0"	899	STR				
F604	18	5'-4"	145	3	1'-0"	4'-6"		
F605	46	6'-4"	438	3	1'-0"	5'-6"		
F801	18	11'-9"	565	3	5'-2"	6'-9 1/2"		
F802	18	10'-2"	489	STR				
F803	46	13'-0"	1597	STR				
F901	46	14'-5"	2255	3	5'-5"	9'-3 1/2"		
		TOTAL	18243					

EMHT

DESIGNED TDA | DRAWN TDA | REVIEWED CJS | DATE 3-6-12

CHECKED LMG | REVISED —— | STRUCTURE FILE NUMBER XXXXXXX

CULVERT REINFORCING DETAILS

CULVERT

OVER TRIBUTARY TO BLACKLICK CREEK

TAYLOR ROAD BRIDGE

8 / 8

25 / 25

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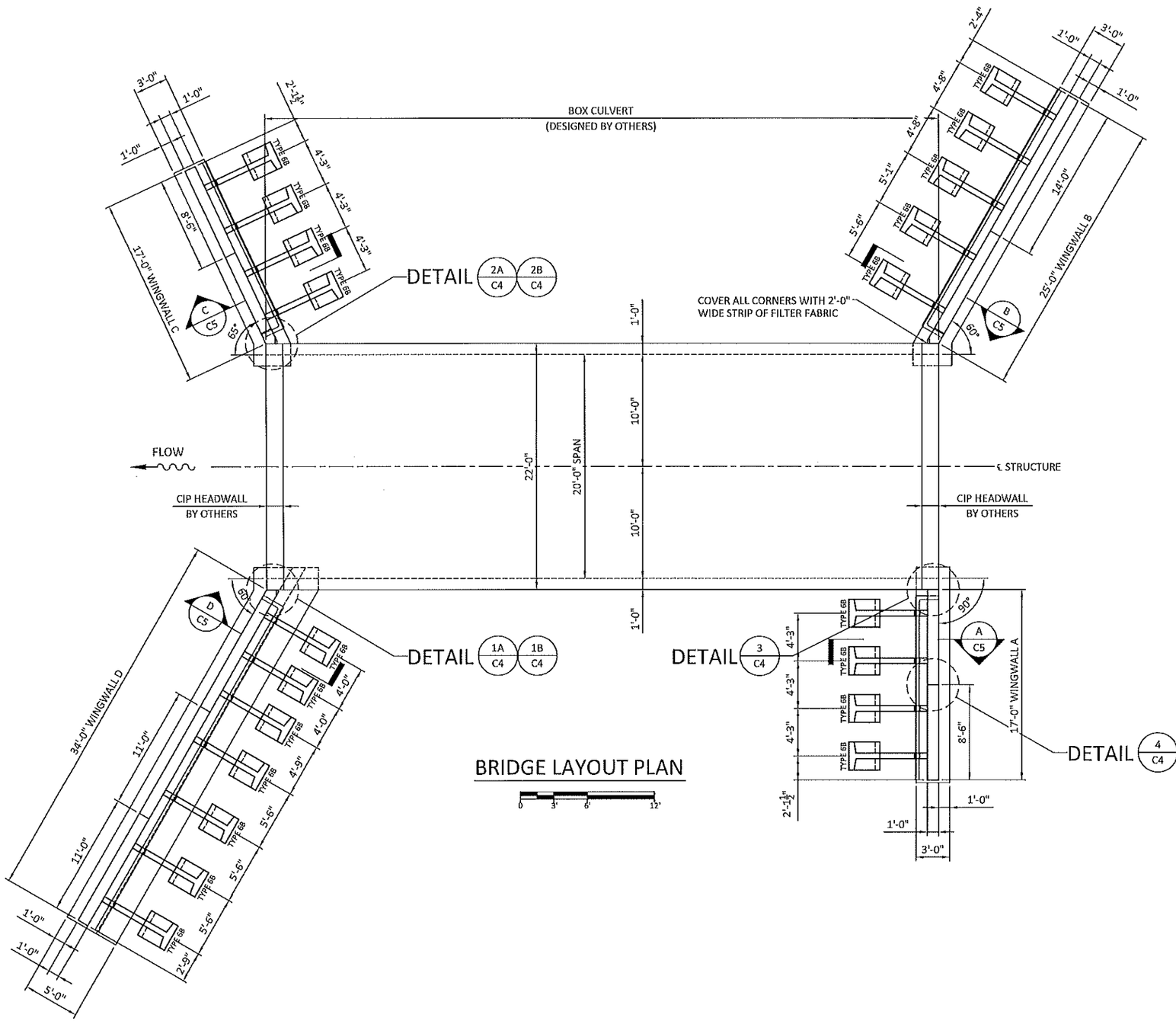


DESIGN NOTES:

1. THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "LRFD BRIDGE DESIGN SPECIFICATIONS" 4TH EDITION INCLUDING 2008 INTERIM SPECIFICATIONS TO DATE AND THE ODOT BRIDGE DESIGN MANUAL 2007. DESIGN LOADS ARE AS FOLLOWS:

   BRIDGE: BY OTHERS
   HEADWALLS: BY OTHERS

   WINGWALLS: EARTH PRESSURE AND LIVE LOAD SURCHARGE

2. FOUNDATION DESIGN BASED ON SOIL BEARING CAPACITY:
   5,000 PSF (FACTORED LOADS)

3. CONFORMANCE TO THESE DRAWINGS, SPECIFICATIONS, AND EXISTING CONDITIONS, INCLUDING HYDRAULIC CAPACITY, SCOUR, GRADING AND SOIL CONDITIONS SHALL BE VERIFIED BY OTHERS.

STATE OF OHIO
JEFFREY J. VonHANDORF
E-65631
REGISTERED PROFESSIONAL ENGINEER

APRIL 2, 2014

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
6			
5			
4			
3			
2			
1	4-2-2014	BACKFILL SPECIFICATION REVISIONS	JJC

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY

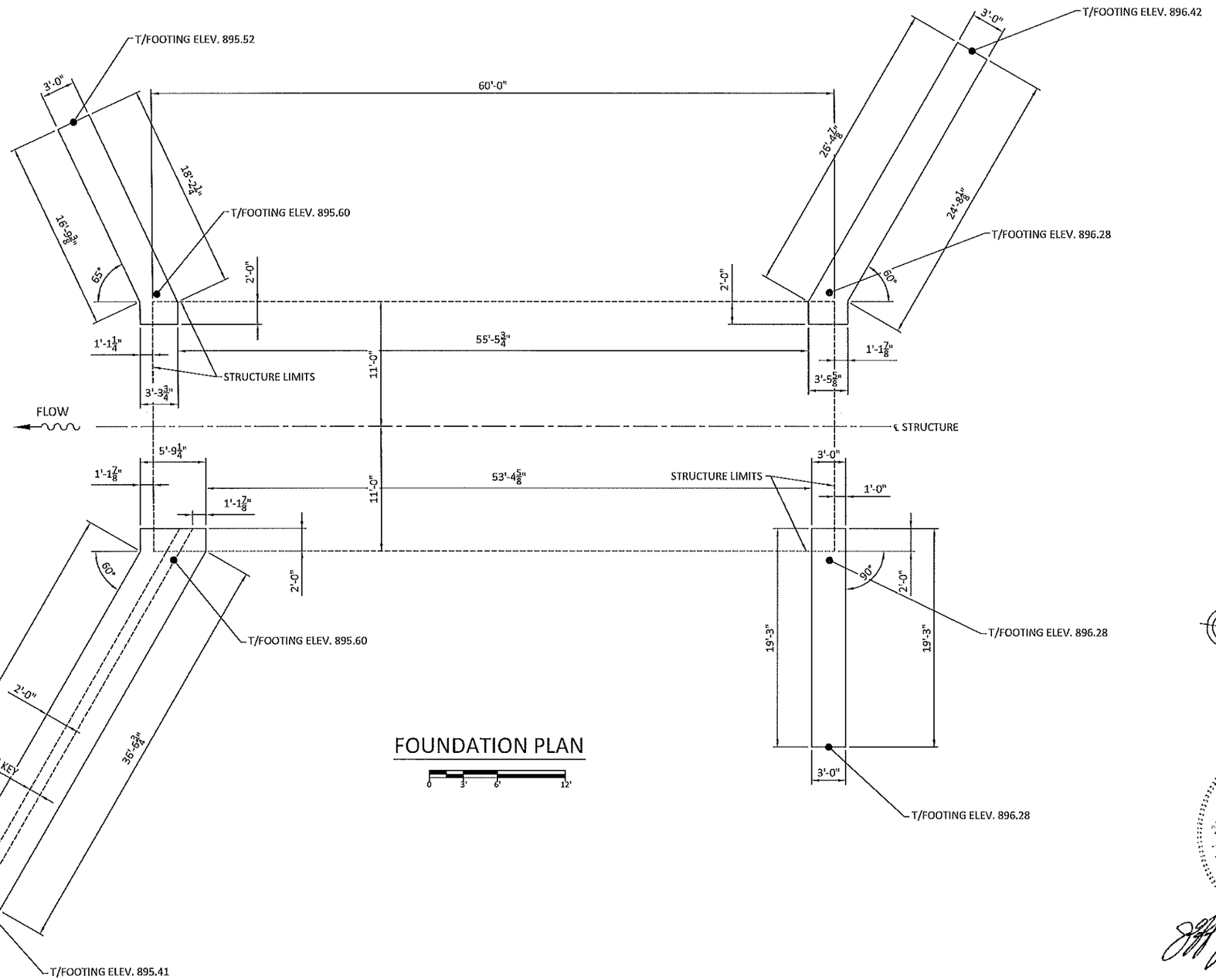
STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER: 14-029
DATE: 3/14/2014
DESIGNED BY: RPZ
DRAWN BY: JJC
CHECKED BY: TEN

C1



FOUNDATION PLAN

0 3' 6' 12'

STATE OF OHIO
JEFFREY J. VonHANDORF
E-65631
REGISTERED PROFESSIONAL ENGINEER

APRIL 2, 2014

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	DATE	DESCRIPTION	ENG
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TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY

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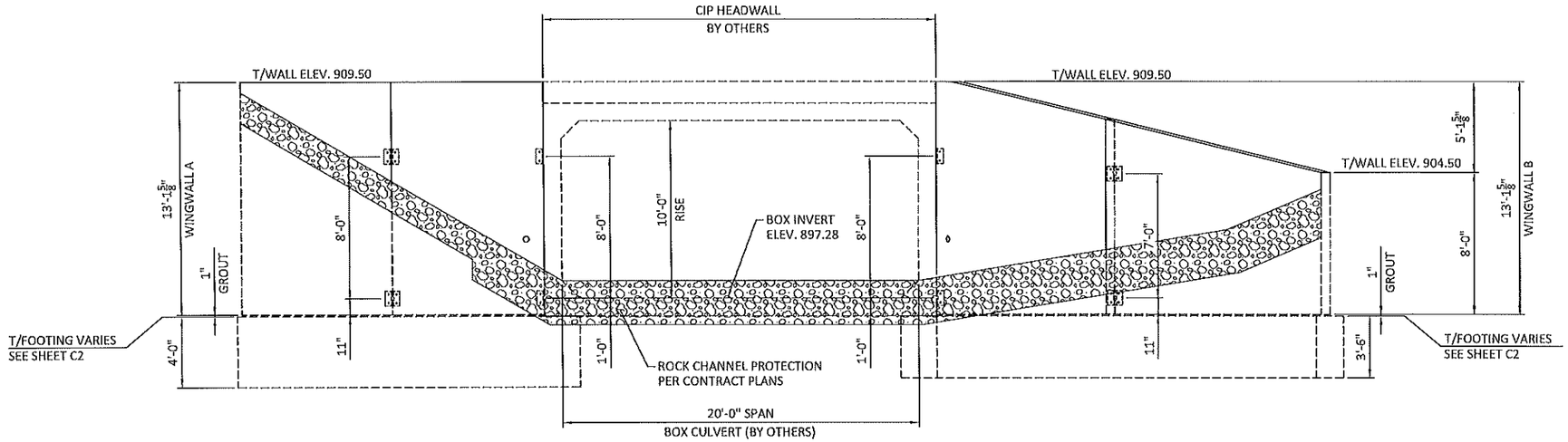
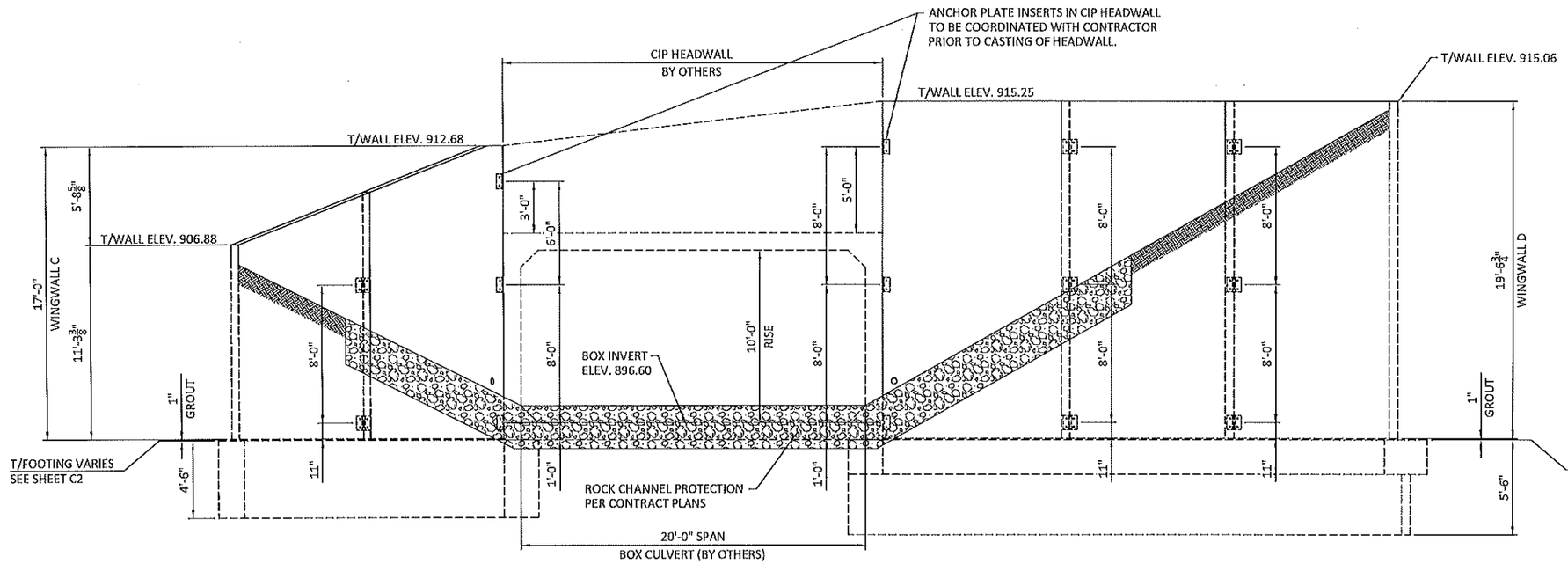
C2



INLET END ELEVATION

0 2' 4' 8'



OUTLET END ELEVATION

0 2' 4' 8'

STATE OF OHIO
JEFFREY J. VonHANDORF
E-65631
REGISTERED PROFESSIONAL ENGINEER

APRIL 2, 2014

FOR APPROVAL

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TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY

STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
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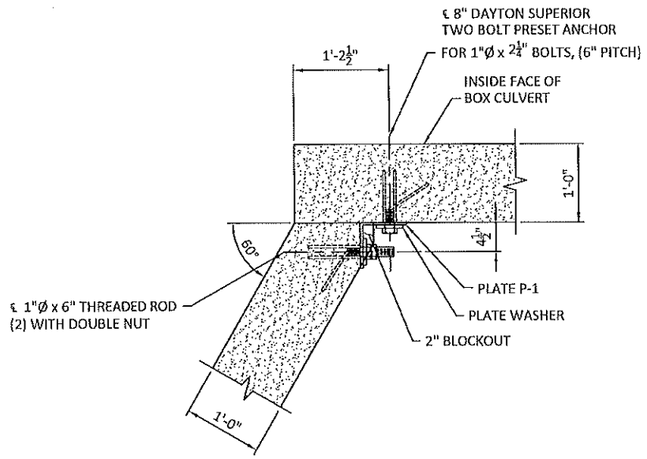
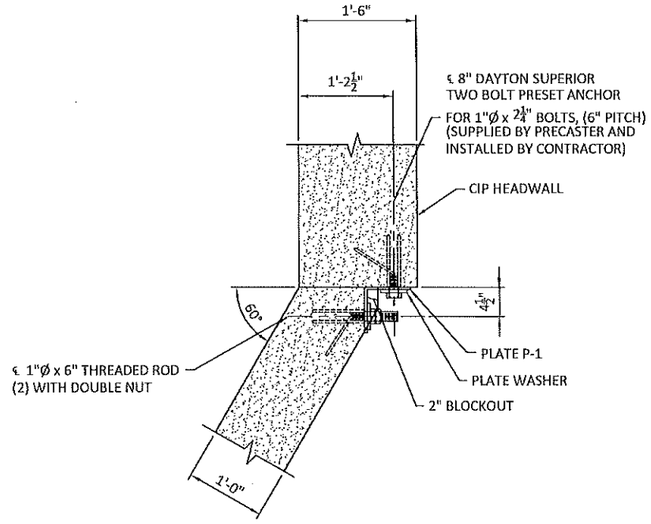
C3



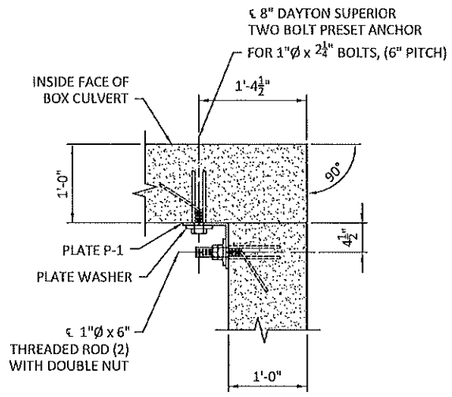
DETAIL (WWB,WWD) 1A / C1

0 1' 2'



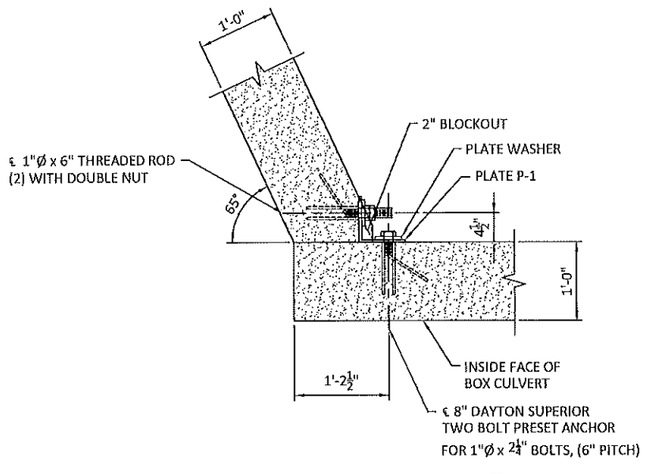
DETAIL (WWD) 1B / C1

0 1' 2'



DETAIL (WWA) 3 / C1

0 1' 2'



DETAIL (WWC) 2A / C1

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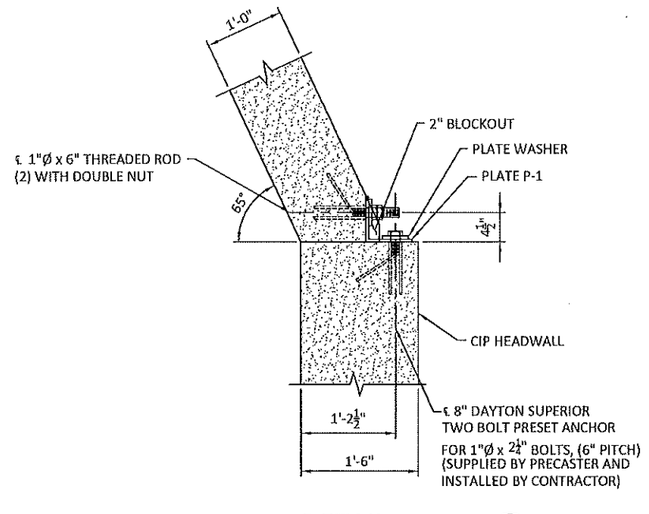

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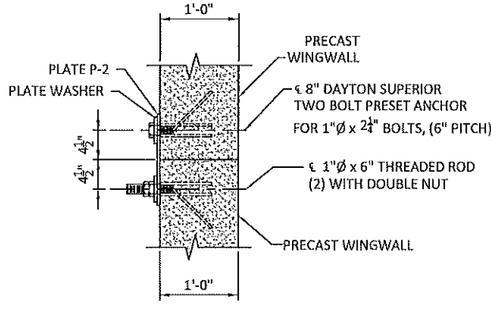
0 1' 2'



DETAIL (@ WINGWALL) 4 / C1

0 1' 2'

APRIL 2, 2014

FOR APPROVAL

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7			
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TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY

STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
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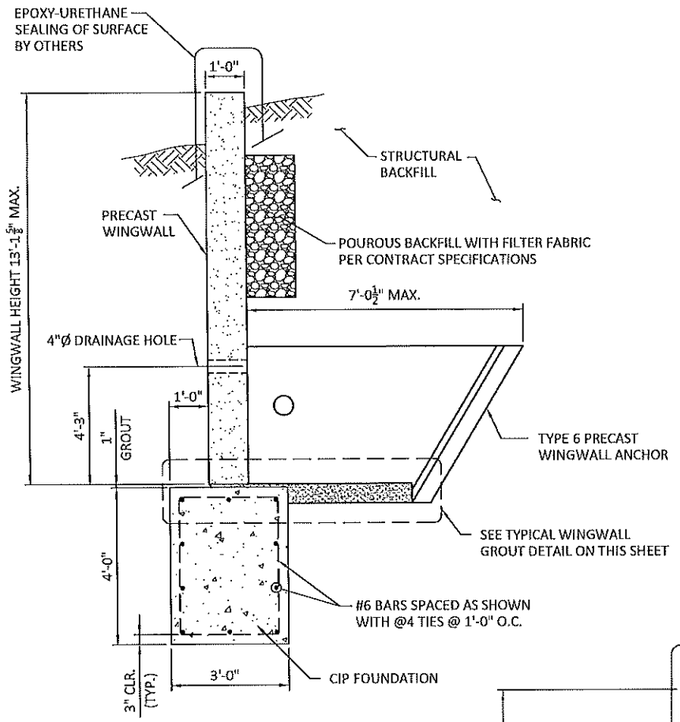
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER:	14-029
DATE:	3/14/2014
DESIGNED BY:	RPZ
DRAWN BY:	JJC
CHECKED BY:	TEN

C4



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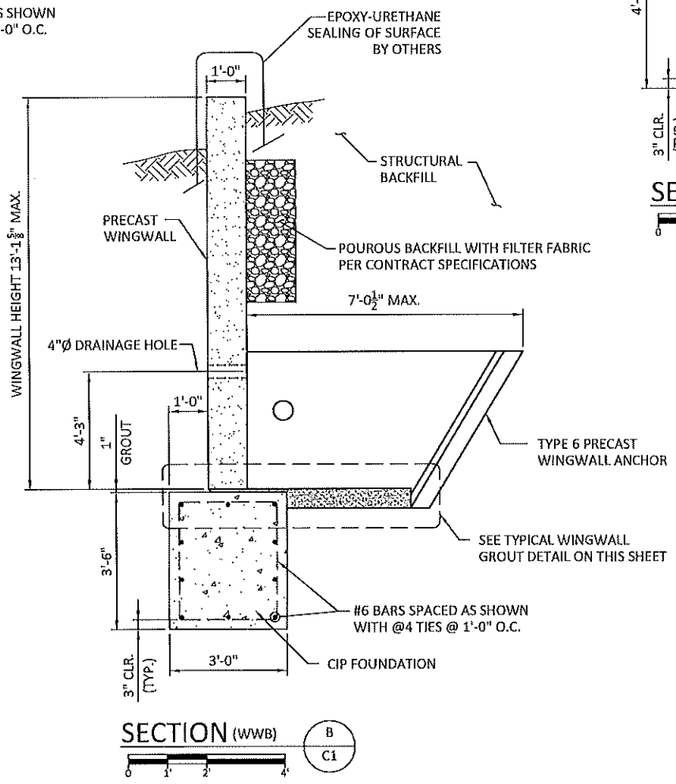

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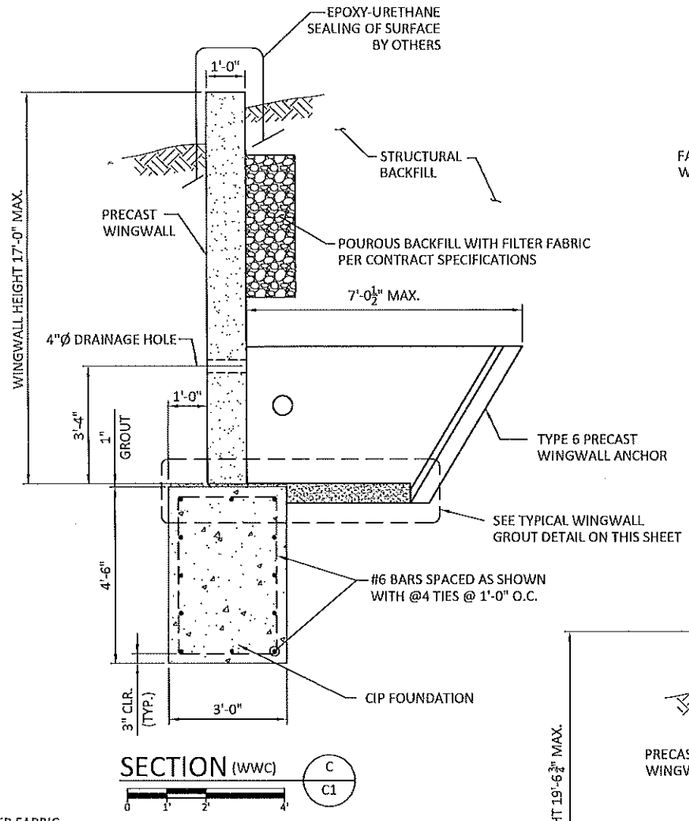
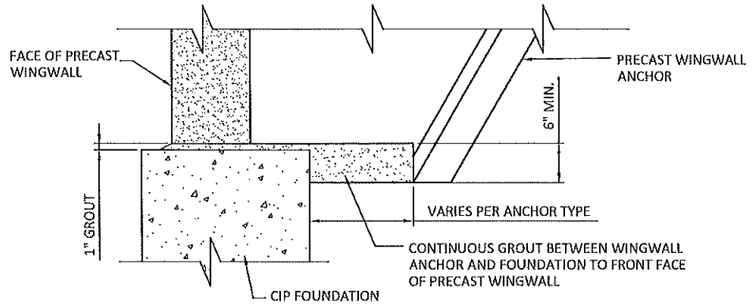
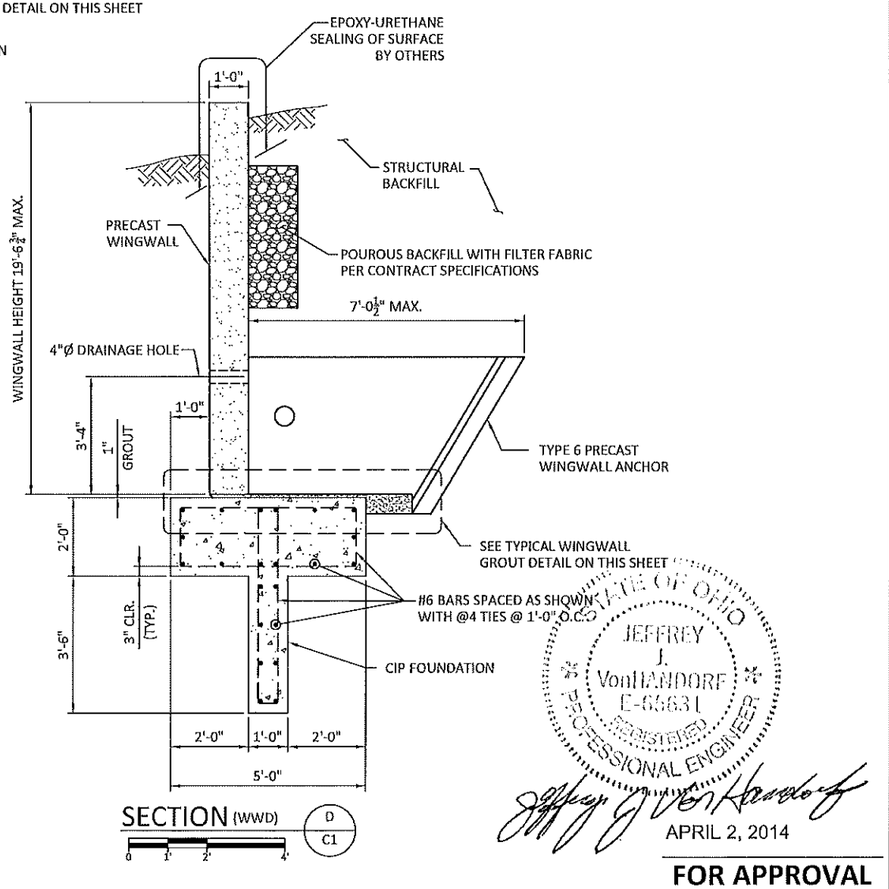


SECTION (WWC) C C1



WINGWALL GROUT DETAIL

NOT TO SCALE



SECTION (WWD) D C1

STATE OF OHIO
JEFFREY J. VonHANDORF
E-66631
REGISTERED
PROFESSIONAL ENGINEER

APRIL 2, 2014

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
6			
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TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER: 14-029
DATE: 3/14/2014
DESIGNED BY: RPZ
DRAWN BY: JJC
CHECKED BY: TEN

C5

SPECIFICATIONS FOR THE MANUFACTURE AND DESIGN OF PRECAST WINGWALLS AND HEADWALLS

1. DESCRIPTION

THESE SPECIFICATIONS ARE FOR PRECAST WINGWALLS AND HEADWALLS. PRECAST PIECES SHALL CONFORM TO THE MORE STRINGENT OF THESE SPECIFICATIONS OR CONTRACT DOCUMENTS.

2. DESIGN

THE PRECAST UNITS ARE DESIGNED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND DESIGN NOTES IN THIS PLAN SET .

3. MATERIAL - CONCRETE

ALL PRECAST ELEMENTS THAT ARE EXPOSED TO FREEZE - THAW SHALL BE AIR ENTRAINED AND COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGRAGATES, AND AN AIR ENTRAINED ADMIXTURE THAT CONFORMS TO AASHTO M154.

- CONCRETE SHALL HAVE 6±2 PERCENT AIR
- PORTLAND CEMENT SHALL CONFORM TO ASTM C150 TYPE I, TYPE II, OR TYPE III CEMENT
- COARSE AGGREGATE SHALL MEET ASTM C33 SPECIFICATION AND HAVE A MAXIMUM SIZE OF 1 INCH
- WATER REDUCING ADMIXTURES FOR THE PURPOSE OF INCREASING THE WORKABILITY OF THE CONCRETE, MAY BE SUBMITTED BY THE MANUFACTURE TO THE ENGINEER FOR APPROVAL.
- CALCIUM CHLORIDE OR ADMIXTURES CONTAINING IT ARE NOT ALLOWED TO BE ADDED TO THE CONCRETE
- CEMENT CONTENT MUST BE IN EXCESS OF 564 POUNDS PER CUBIC YARD
- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE SPECIFIED ON SHOP DRAWINGS OF STRUCTURE

4. MATERIALS - STEEL REINFORCEMENT AND HARDWARE

ALL REINFORCEMENT USED IN THE PRECAST ELEMENTS SHALL CONFORM TO ASTM SPECIFICATION A 185 OR A 497. DEFORMED BILLET STEEL SHALL CONFORM TO ASTM A 615, GRADE 60. STEEL REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI. STEEL REINFORCING SHALL BE PLACED ACCORDING TO THE DETAILS AND PLANS SHOWN ON THE SHOP DRAWINGS. STEEL HARDWARE AND INSERTS USED BY MANUFACTURER SHALL BE SUBMITTED TO THE ENG INEER FOR APPROVAL.

5. FABRICATION OF PRECAST ELEMENTS

- STORAGE OF PRECAST UNITS SHOULD BE IN A MANNER THAT PREVENTS ANY DAMAGE OR CRACKING AND IN A FASHION APPROVED BY THE ENGINEER
- HARDWARE OR HOLES SHALL BE CAST INTO PRECAST ELEMENTS TO FACILITATE HANDLING
- CONCRETE SHALL MEET MINIMUM DESIGN STRENGTH BEFORE 28 DAYS AFTER IT WAS CAST AND BEFORE THE ELEMENT IS SHIPPED

6. QUALITY ASSURANCE

THE PRECAST PLANT SHALL BE CERTIFIED BY THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM OR PRECAST/PRESTRESSED CONCRETE INSTITUE PLANT CERTIFICATION DURING PRODUCTION OF ALL PRECAST ELEMENTS.

THE PRECAST PLANT SHALL PERFORM TESTS FOR AIR ENTRAINMENT AND COMPRESSIVE STRENGTH. THESE TESTS ARE TO COMPLY WITH ASTM C231 OR C173 FOR AIR ENTRAINMENT AND ASTM C39. THESE TESTS ARE TO BE DONE AT INTERVALS STATED IN SECTION 7 OF THIS SPECIFICATION.

THE PRECAST PLANT SHALL PROVIDE PROOF OF COMPLIANCE OF THIS SECTION UPON REQUEST.

7. TESTING AND INSPECTION

COMPRESSION TESTING SHALL BE DONE ON CONCRETE CYLINDERS. A MINIMUM OF 3 CYLINDERS ARE TO BE MADE FOR EACH GROUP OF CONCRETE ELEMENTS CAST FROM THE SAME CONCRETE MIX ON THE SAME DAY. CYLINDERS ARE TO BE TESTED IN ACCORDANCE WITH ASTM C39.

IF THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TAKEN FROM GIVEN CONCRETE MIX ON THE SAME DAY IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, THE CYLINDERS ARE ACCEPTED. IF THE CYLINDERS DO NOT MEET THIS CRITERIA, A MINIMUM OF THREE CORES SHALL BE OBTAINED FROM THE PRECAST ELEMENTS MADE WITH THE SAME CONCRETE MIX FROM THE FAILED CYLINDERS.

CORES SHALL BE BE OBTAINED AND TESTED IN ACCORDANCE WITH ASTM C4 2. IF THE AVERAGE COMPRESSIVE STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, THE CORES ARE ACCEPTABLE.

WHEN THE COMPRESSIVE STRENGTH OF ANY CORE IS LESS THAN THE DESIGN COMPRESSIVE STRENGTH, THE PRECAST ELEMENT THE CORE WAS TAKE FROM SHALL BE REJECTED. THE REMAINING PRECAST ELEMENTS MADE FROM THE SAME CONCRETE MIX ON THE SAME DAY ARE TO BE REJECTED, UNLESS AT THE OPTION OF THE PRECAST PLANT, EACH ELEMENT CAN BE CORED AND ACCEPTED INDIVIDUALLY.
CORE HOLES SHALL BE PLUGGED AND SEALED BY THE PRECAST PLANT IN A MANNER TO MEET THIS SPECIFICATION.
THE OWNER OR OWNER'S AGENT MAY INSPECT THE MATERIAL, MANUFACTURE AND FINISHED PRECAST ELEMENTS AT THEIR DISCRETION.

8. PERMISSIBLE VARIATIONS

WINGWALL AND HEADWALL ARE TO BE MANUFACTURED SO THAT THE LENGTH, HEIGHT AND THICKNESS DOES NOT VARY MORE THAN 1/2" FROM WHAT IS SHOWN ON THE SHOP DRAWINGS.

REINFORCEMENT PLACING SHALL NOT VARY MORE THAN $\frac{1}{4}$" FROM THAT WHICH IS SHOWN ON THE SHOP DRAWINGS. REINFORCING CONCRETE COVER SHALL NEVER BE LESS THAN 1-1/2"

9. WORKMANSHIP AND FINISH

PRECAST ELEMENTS ARE TO HAVE A SMOOTH STEEL FORM OR TROW ELED SURFACE. THE PRECAST ELEMENTS SHALL BE FREE OF ANY SUBSTANTIAL FRACTURE OR BLEMISH.

REPAIRS TO A PRECAST ELEMENT BECAUSE OF FRACTURES OR BLEMISHES CAUSED BY HANDLING OR INSTALLING, MAY BE APPROVED, IN THE OPINION OF THE OWNER, IF THE REPAIRS ARE PROPERLY FINISHED AND CURED TO MEET THIS SPECIFICATION.

10. REJECTION

PRECAST ELEMENTS MAY BE REJECTED FOR EXCESSIVE HONEYCOMBING, DAMAGED ENDS OR FRACTURES AND CRACKS PASSING THROUGH THE WALL

11. MARKING

EACH PRECAST ELEMENT IS TO BE MARKED BY PERMANENT PAINT. THE MINIMUM MARKING SHALL INCLUDE THE DATE OF MANUFACTURE, TRADEMARK OR NAME OF PRECAST PLANT, AND PIECE MARK FROM SHOP DRAWINGS.

12. CONSTRUCTION

THE WINGWALLS SHALL BE INSTALLED ON CAST IN PLACE OR PRECAST FOUNDATIONS PER THE PLANS. THE PROJECT ENGINEER SHALL VERIFY THAT THE FOUNDATION SUBGRADE IS IN COMPLIANCE WITH THE GEOTECHNICAL REPORT FOR THE PROJECT.

THE FOOTINGS SHALL HAVE A SMOOTH FLOAT FINISH WITH A MINIMUM COMPRESSIVE STRENGTH AS SPECIFIED IN THE DESIGN NOTESI. THE SURFACE OF THE FOUNDATION SHALL NOT V ARY BY MORE THAN $\frac{1}{4}$" WHEN MEASURED WITH A 10 FOOT STRAIGHT EDGE. THE FOOTINGS SHALL HAVE REACHED A MINIMUM OF 2000 PSI BEFORE INSTALLATION OF ANY PRECAST ELEMENTS. FOUNDATION DIMENSION SHALL MATCH THOSE THAT ARE SHOWN ON THE PLANS.

PRECAST ELEMENTS SHALL BE INSTALLED AS SHOWN ON THE PLANS. WINGWALLS ARE TO BE PLACED ON MASONITE SHIMS TO ALLOW A MINIMUM OF $\frac{1}{2}$" CLEARANCE BETWEEN BOTTOM OF PRECAST ELEMENT AND TOP OF FOOTING. GAP TO BE FILLED WITH NON-SHRINK,NON-METALLIC GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI. 1

JOINTS BETWEEN WINGWALL SECTIONS AND JOINTS BETWEEN A WINGWALL AND BRIDGE UNIT SHALL BE SEALED WITH A 2' WIDE STRIP OF FILTER FABRIC.

BACKFILL IS DEFINED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT MATERIAL THAT IS ADJACENT TO THE WINGWALLS. BACKFILL MATERIAL WITHIN ZONE A, AS SHOWN ON FIGURE 1 OF THIS PAGE, SHALL BE AGGREGATE MEETING ODOT 703.02A 1

ALL BACKFILL IN ZONE A IS TO BE COMPACTED TO A MINIMUM DENSITY OF 95% STANDARD PROCTOR PER AASHTO T-99.

MECHANICAL TAMPERS OR APPROVED COMPACTING EQUIPMENT SHALL BE USED ON ALL BACKFILL MATERIAL THAT IS DIRECTLY ADJACENT TO THE STRUCTURAL ELEMENTS. BACKFILL MATERIAL IN ZONE A SHALL BE PLACED IN 8" LIFTS (MAXIMUM) BEFORE BEING COMPACTED. AT NO TIME SHALL HEAVY CONSTRUCTION OR BACKFILLING EQUIPMENT IN EXCESS OF 12 TON BE PERMITTED WITHIN 3' OF ANY STRUCTURAL ELEMENT .

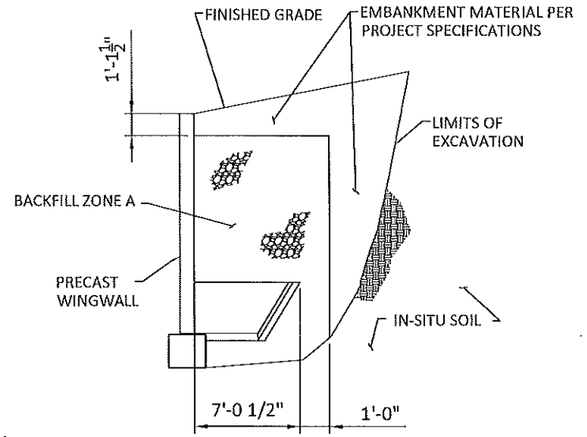


FIGURE 1 - BACKFILL LIMITS

STATE OF OHIO
JEFFREY J. VonHANDORF
E-65631
REGISTERED PROFESSIONAL ENGINEER

APRIL 2, 2014

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
6			
5			
4			
3			
2			
1	4-2-2014	BACKFILL SPECIFICATION REVISIONS	JJC

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY STATE: OH

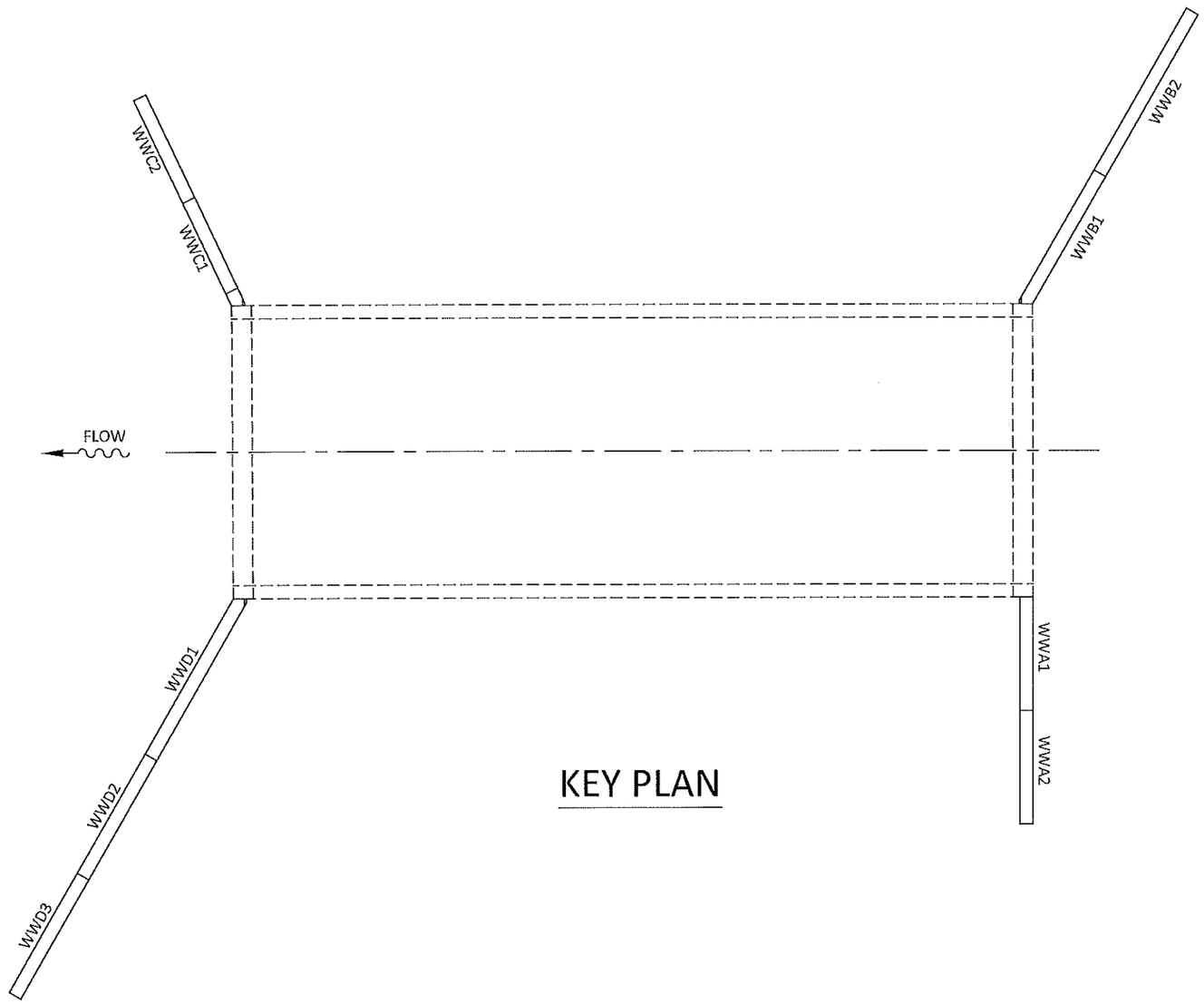
PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER:	14-029
DATE:	3/14/2014
DESIGNED BY:	RPZ
DRAWN BY:	JJC
CHECKED BY:	TEN

C6

TAYLOR ROAD BRIDGE
OVER TRIBUTARY OF BLACKLICK CREEK



KEY PLAN

STATE OF OHIO
JEFFREY J. VonHANDORF
E-65631
REGISTERED PROFESSIONAL ENGINEER

APRIL 2, 2014

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
6			
5			
4			
3			
2			
1			

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY

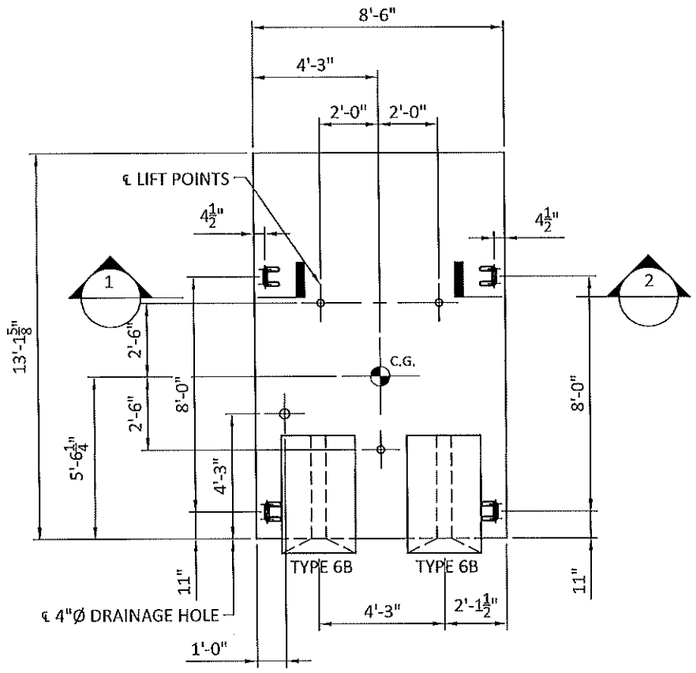
STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

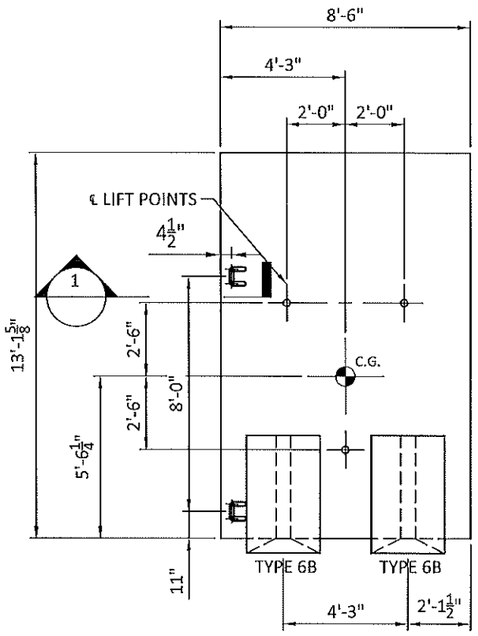
PROJECT NUMBER: 14-029
DATE: 3/14/2014
DESIGNED BY: RPZ
DRAWN BY: JJC
CHECKED BY: TEN

P1

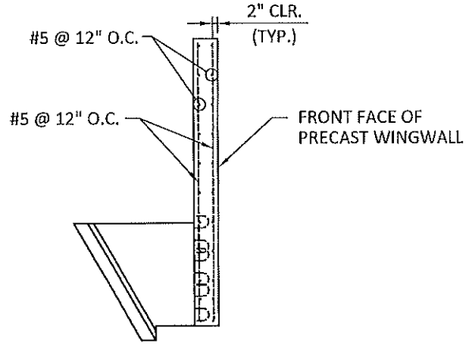


ELEVATION - WINGWALL WWA1
TOTAL WEIGHT = 10.7 TONS

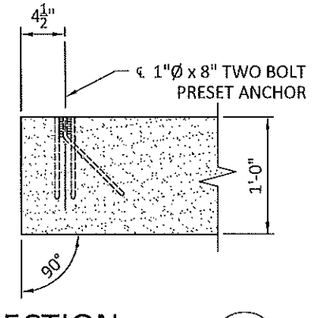
PROVIDE 4"Ø x 17' PERFORATED DRAIN
W/ELBOW, END CAP AND FILTER FABRIC SOCK
PROVIDE (2) 14' LONG x 2' WIDE STRIPS OF FILTER FABRIC



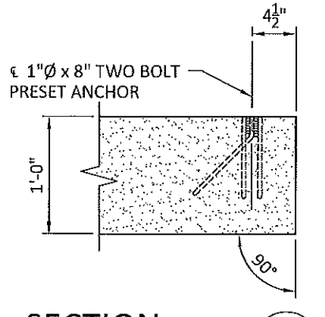
ELEVATION - WINGWALL WWA2
TOTAL WEIGHT = 10.7 TONS



REINFORCING SECTION



SECTION 1



SECTION 2

DESIGN NOTES

1. ALL EDGES TO HAVE ¾" CHAMFER
2. F'c = 5,000 PSI
3. WALL PANEL WILL NOT HANG LEVEL, ADJUST CABLE TIES AS REQUIRED
4. ELEVATION LOOKING AT BACK FACE OF WINGWALL
5. CONSTRUCT WINGWALL USING EPOXY COATED REINFORCEMENT.

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
6			
5			
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TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

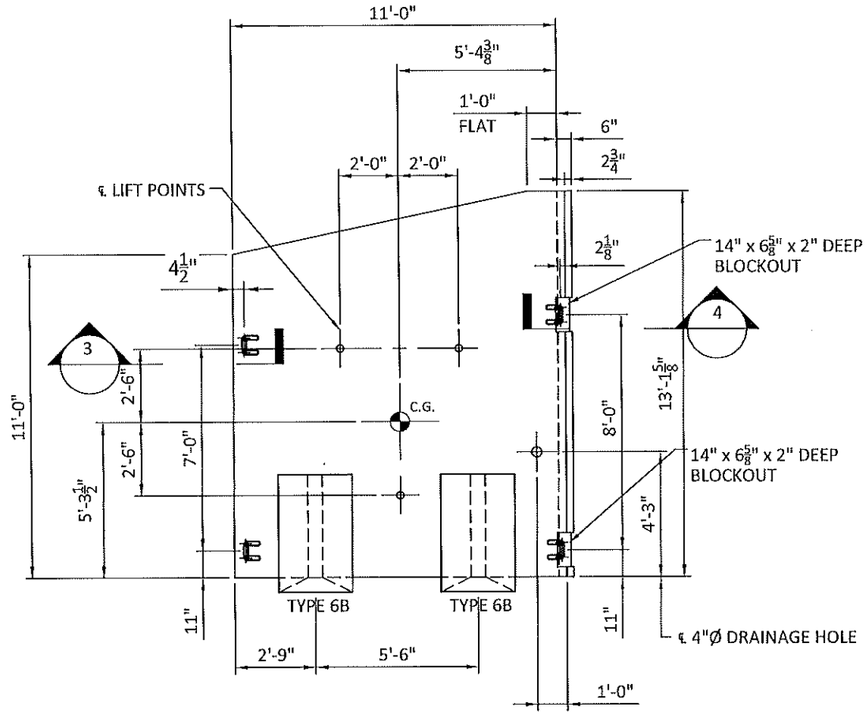
LOCALE: FAIRFIELD COUNTY
STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

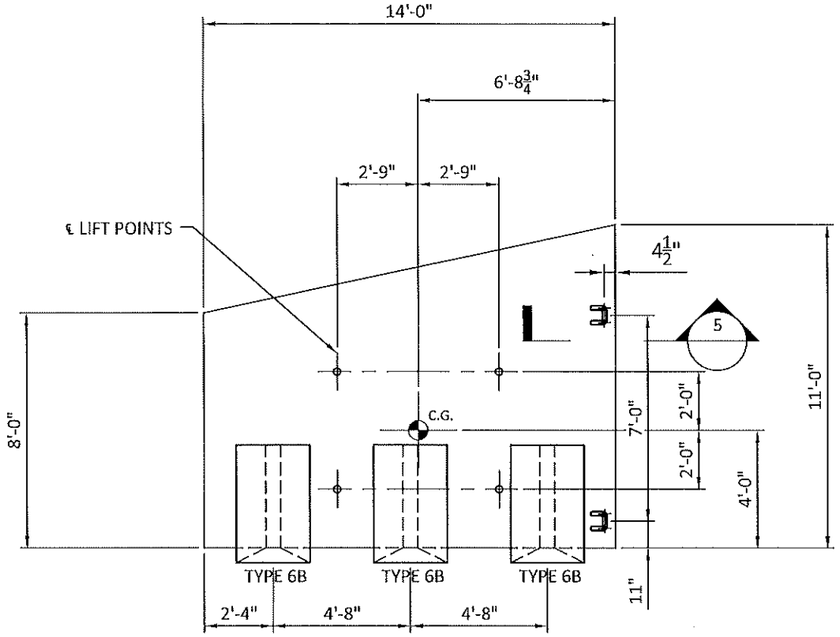
PROJECT NUMBER: 14-029
DATE: 3/14/2014
DESIGNED BY: RPZ
DRAWN BY: JJC
CHECKED BY: TEN

P2



ELEVATION - WINGWALL WWB1
TOTAL WEIGHT = 12.4 TONS

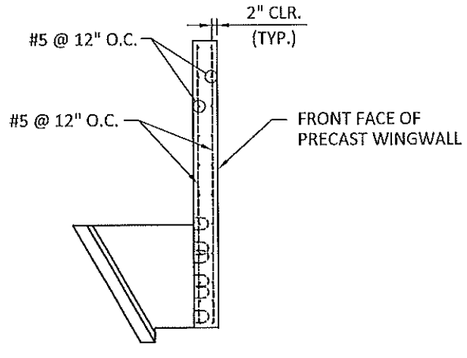
PROVIDE 4"Ø x 25' PERFORATED DRAIN
W/ELBOW, END CAP AND FILTER FABRIC SOCK
PROVIDE (2) 14' LONG x 2' WIDE STRIPS OF FILTER FABRIC



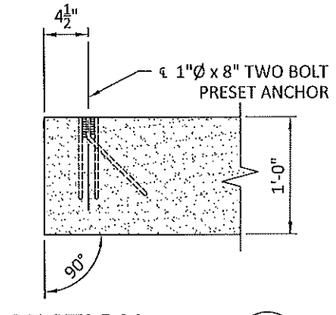
ELEVATION - WINGWALL WWB2
TOTAL WEIGHT = 13.5 TONS

DESIGN NOTES

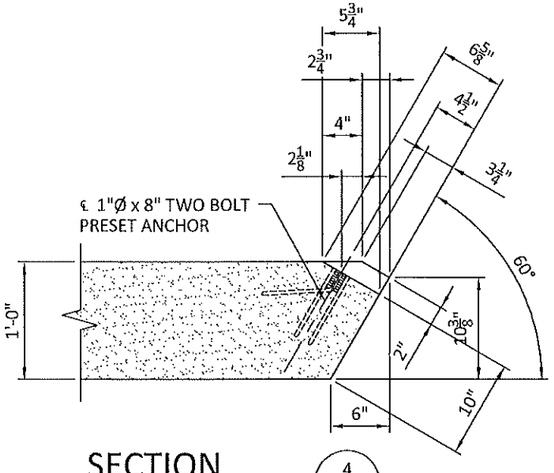
1. ALL EDGES TO HAVE 3/4" CHAMFER
2. F'c = 5,000 PSI
3. WALL PANEL WILL NOT HANG LEVEL, ADJUST CABLE TIES AS REQUIRED
4. ELEVATION LOOKING AT BACK FACE OF WINGWALL
5. CONSTRUCT WINGWALL USING EPOXY COATED REINFORCEMENT.



REINFORCING SECTION



SECTION 3



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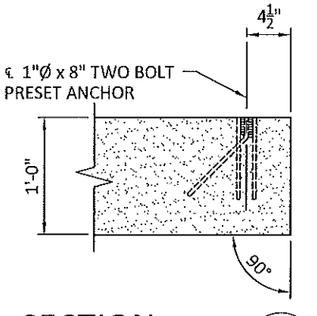

SECTION 5

APRIL 2, 2014

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
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3			
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1			

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

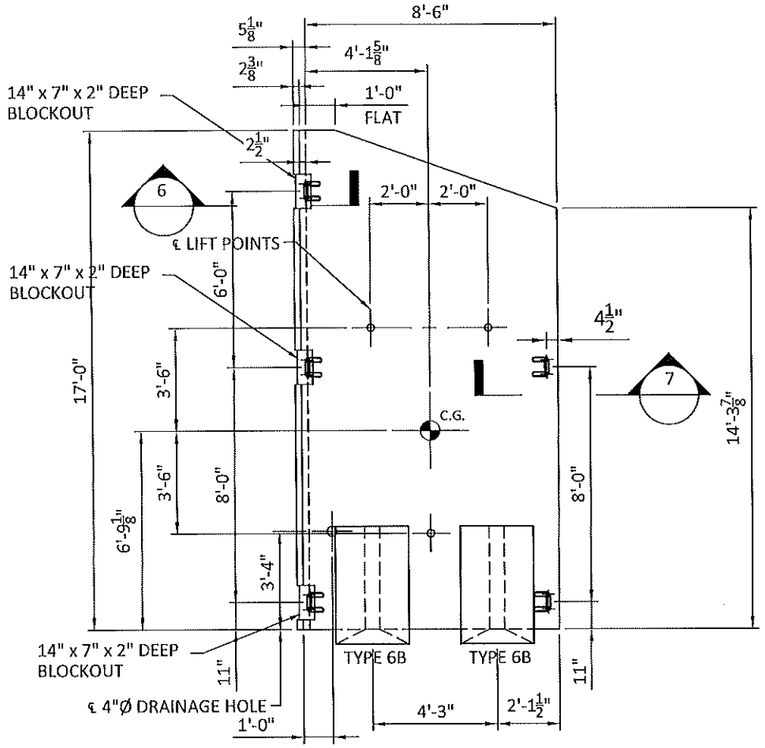
LOCALE: FAIRFIELD COUNTY
STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER: 14-029
DATE: 3/14/2014
DESIGNED BY: RPZ
DRAWN BY: JJC
CHECKED BY: TEN

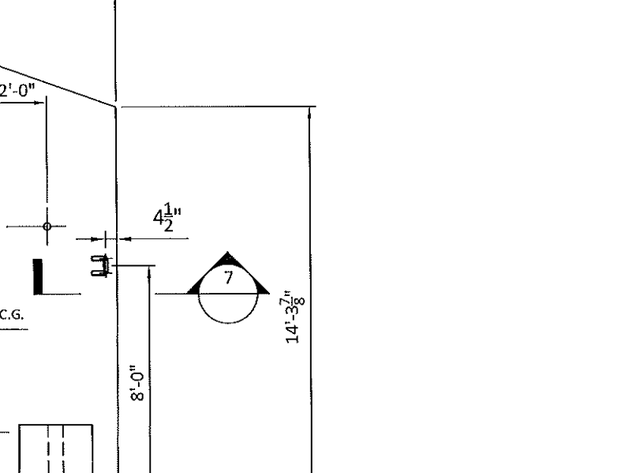
P3



ELEVATION - WINGWALL WWC1
TOTAL WEIGHT = 12.4 TONS

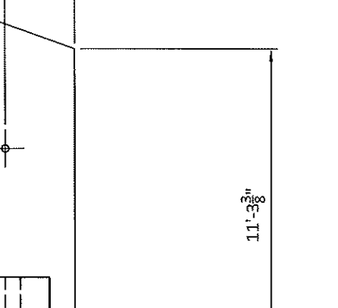
PROVIDE 4"Ø x 17' PERFORATED DRAIN
W/ELBOW, END CAP AND FILTER FABRIC SOCK
PROVIDE (2) 17' LONG x 2' WIDE STRIPS OF FILTER FABRIC

REINFORCING SECTION



SECTION 6

SECTION 7



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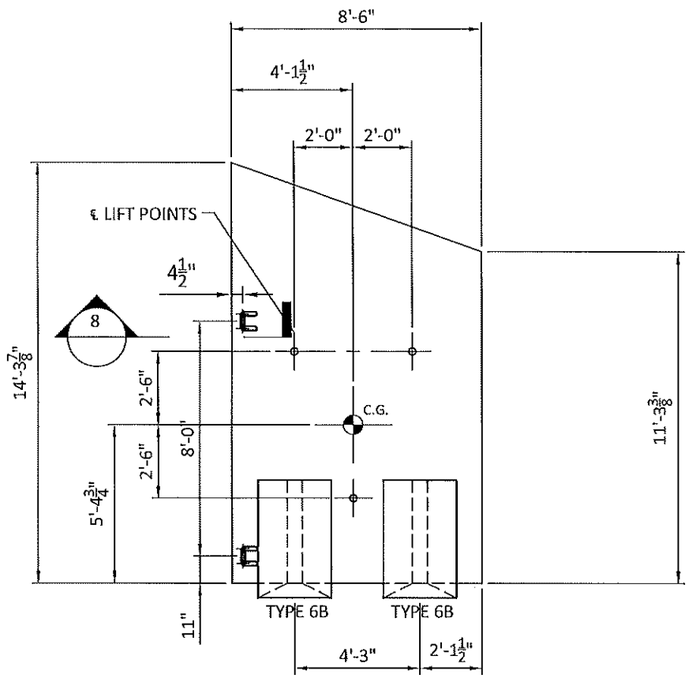
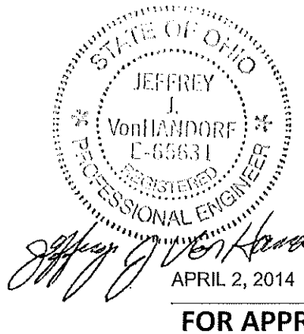


ELEVATION - WINGWALL WWC2
TOTAL WEIGHT = 10.5 TONS

DESIGN NOTES

1. ALL EDGES TO HAVE ¾" CHAMFER
2. F'c = 5,000 PSI
3. WALL PANEL WILL NOT HANG LEVEL, ADJUST CABLE TIES AS REQUIRED
4. ELEVATION LOOKING AT BACK FACE OF WINGWALL
5. CONSTRUCT WINGWALL USING EPOXY COATED REINFORCEMENT.



FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
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1			

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER: 14-029
DATE: 3/14/2014
DESIGNED BY: RPZ
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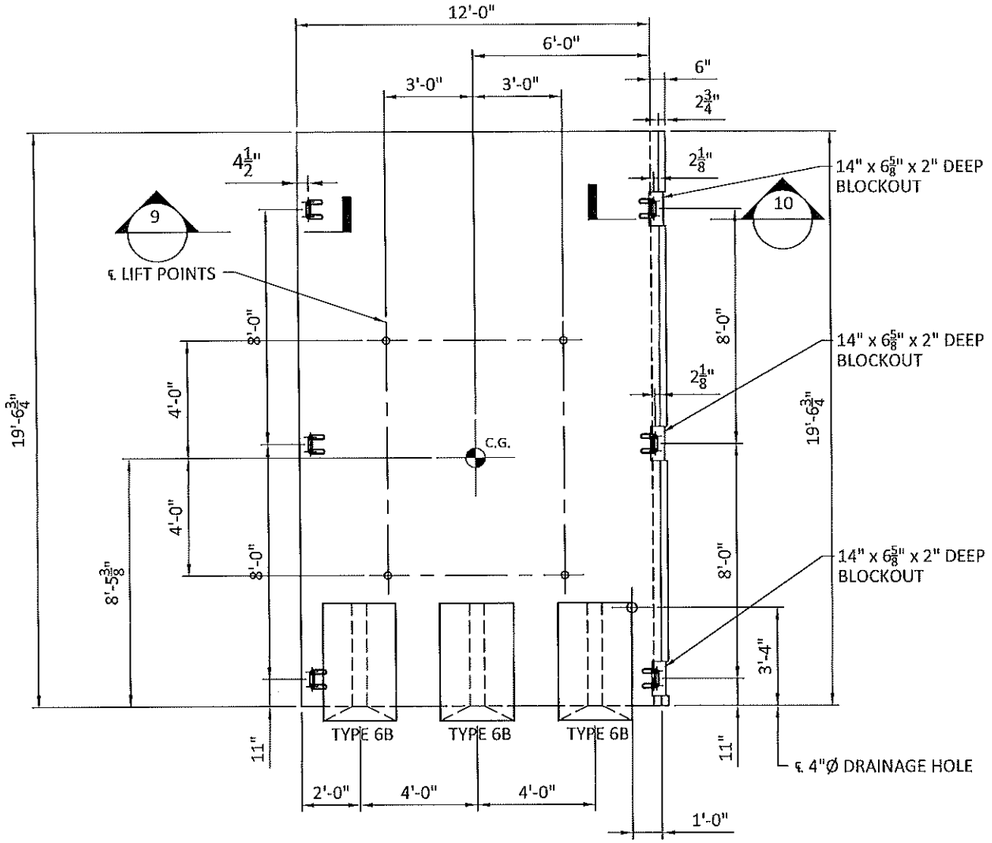
CHECKED BY: TEN

P4

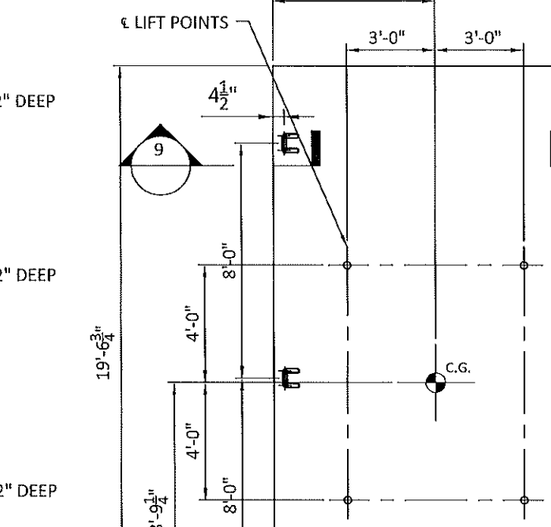


ELEVATION - WINGWALL WWD1
TOTAL WEIGHT = 21.1 TONS

PROVIDE 4"Ø x 34' PERFORATED DRAIN
W/ELBOW, END CAP AND FILTER FABRIC SOCK
PROVIDE (3) 20' LONG x 2' WIDE STRIPS OF FILTER FABRIC

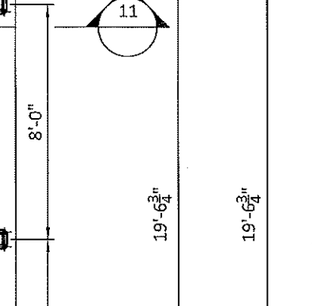
REINFORCING SECTION

SECTION 9

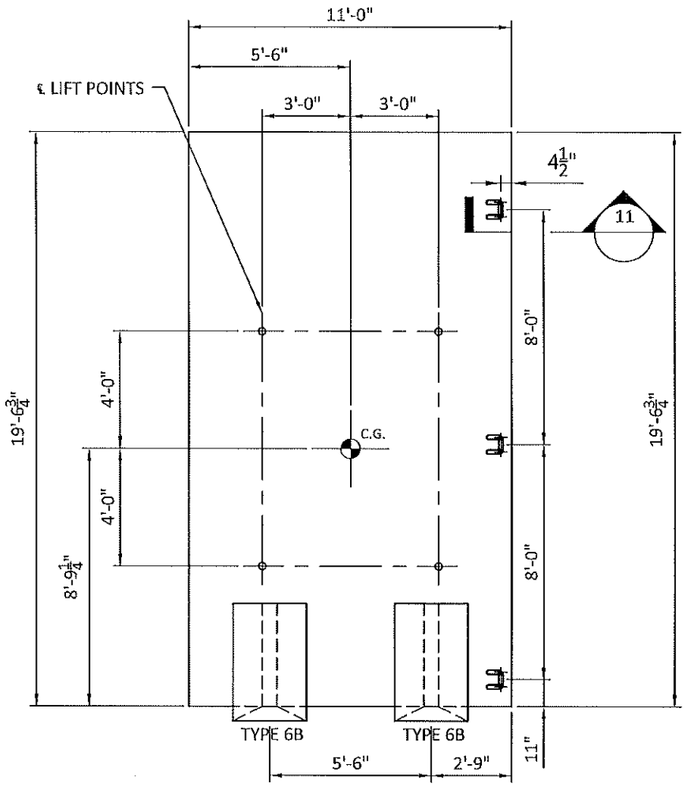


ELEVATION - WINGWALL WWD2
TOTAL WEIGHT = 18.5 TONS

SECTION 10



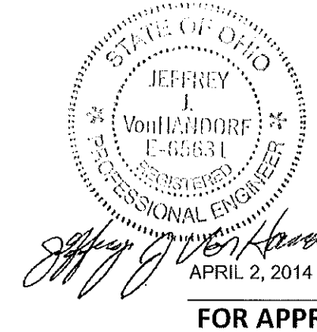
SECTION 11



ELEVATION - WINGWALL WWD3
TOTAL WEIGHT = 18.5 TONS

DESIGN NOTES

1. ALL EDGES TO HAVE ¾" CHAMFER
2. F'c = 5,000 PSI
3. WALL PANEL WILL NOT HANG LEVEL, ADJUST CABLE TIES AS REQUIRED
4. ELEVATION LOOKING AT BACK FACE OF WINGWALL
5. CONSTRUCT WINGWALL USING EPOXY COATED REINFORCEMENT.



FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
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1			

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY
STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
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800.241.0925

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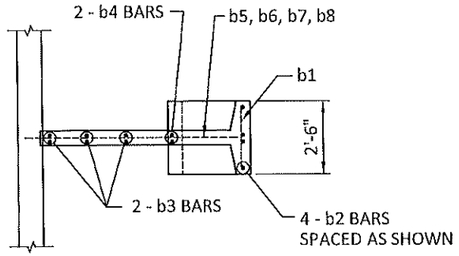
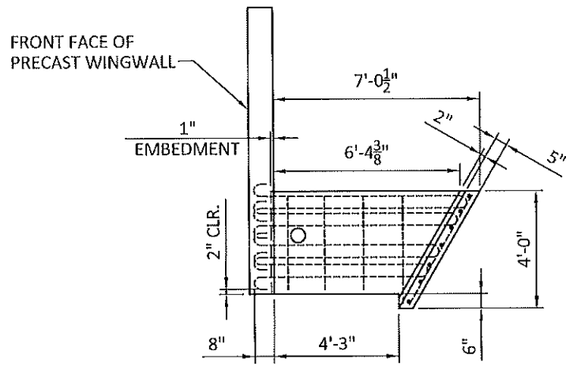
DRAWN BY:	JJC
CHECKED BY:	TEN

P5

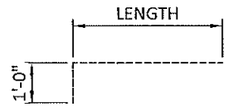


PLAN - TYPE 6B

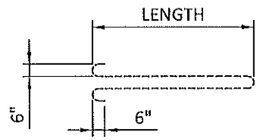
BAR LIST - TYPE 6B					
MARK	SIZE	QNTY.	TYPE	LENGTH	EPOXY COATED
b1	#5	7	STRAIGHT	2'-2"	N
b2	#5	4	STRAIGHT	4'-2"	N
b3	#5	6	STRAIGHT	3'-2"	N
b4	#5	2	TYPE A	3'-8"	N
b5	#6	1	TYPE B	7'-3"	Y
b6	#6	1	TYPE B	6'-11"	Y
b7	#6	1	TYPE B	6'-3"	Y
b8	#6	1	TYPE B	5'-11"	Y



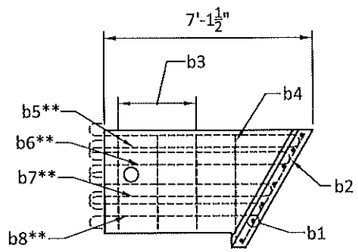
SECTION - TYPE 6B



TYPE A

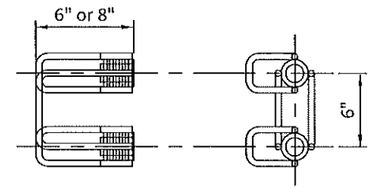


TYPE B



**NOTE: 3" MAX SPACING BETWEEN BOTTOM AND TOP OF SUCCESSIVE BARS

ANCHOR TYPE 6B



SIDE VIEW FRONT VIEW

DAYTON SUPERIOR
TWO BOLT PRESET ANCHOR

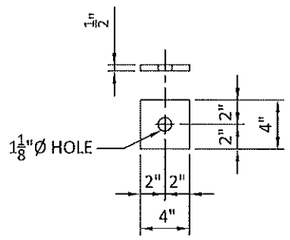
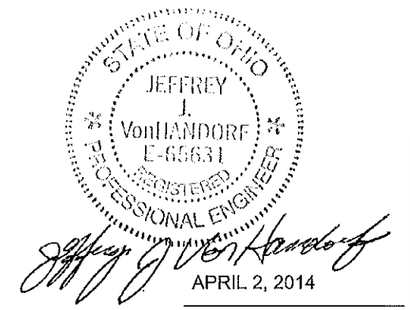


PLATE WASHER



APRIL 2, 2014

FOR APPROVAL

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TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
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PROJECT NUMBER: 14-029
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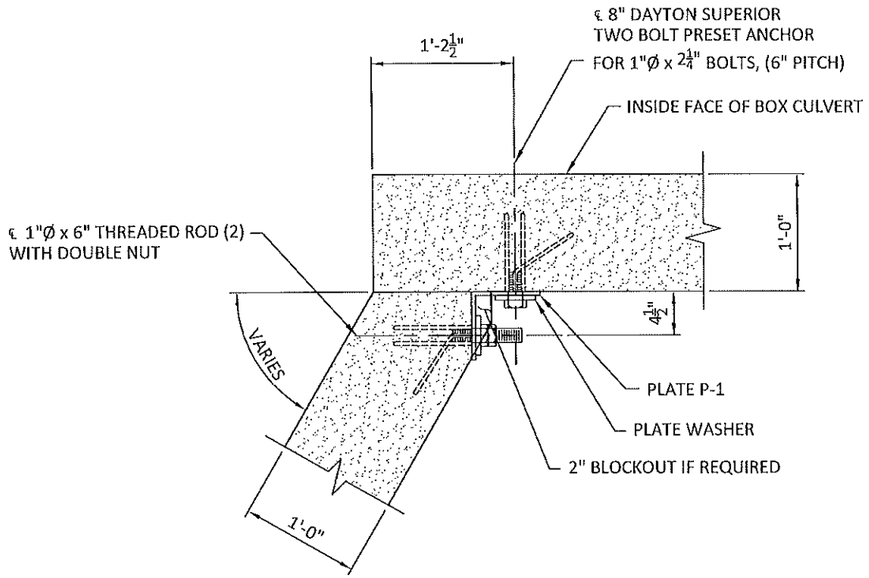
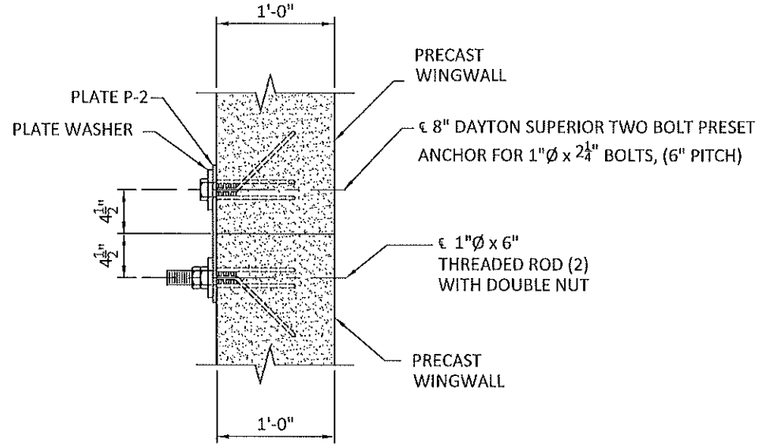
P6



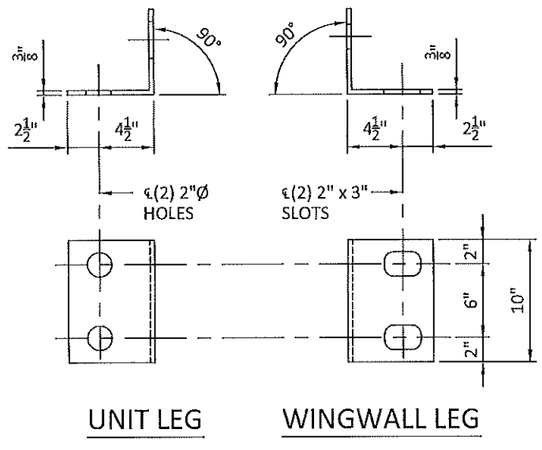
PLAN VIEW

TYPICAL CONNECTION DETAIL - P-1



PLAN VIEW

TYPICAL CONNECTION DETAIL - P-2



UNIT LEG WINGWALL LEG

PLATE - P-1

(PLATE - 3/8" x 14" x 10")
(GALVANIZED AS PER ASTM A153)
TOTAL P-1 PLATES REQUIRED (10)

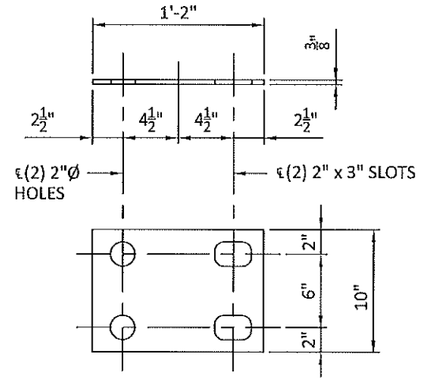


PLATE - P2

(PLATE - 3/8" x 14" x 10")
(GALVANIZED AS PER ASTM A153)
TOTAL P-2 PLATES REQUIRED (12)

APRIL 2, 2014

FOR APPROVAL

	DATE	DESCRIPTION	ENG
7			
6			
5			
4			
3			
2			
1			

TAYLOR ROAD BRIDGE
OVER TRIBUTARY TO BLACKLICK CREEK
WINGWALLS

LOCALE: FAIRFIELD COUNTY STATE: OH

PROVIDED BY:
Lindsay PRECAST
6845 ERIE AVENUE
CANAL FULTON, OH 44614
330.854.4511

DESIGNED BY:
PRETEK GROUP
P.O. BOX 751471
DAYTON, OH 45475
800.241.0925

PROJECT NUMBER:	14-029
DATE:	3/14/2014
DESIGNED BY:	RPZ
DRAWN BY:	JJC
CHECKED BY:	TEN

P7

(203) Bridge (Dedicated) Name: | **BRIDGE INVENTORY AND APPRAISAL** | **Report Date: 7/15/2022**

Structure File Number: 2335816 | **Inventory Bridge Number: FAI T0219 00044**

Sufficiency Rating: 085.8 Deficiency Rating: | **T BLACKLICK CR (TAYLOR R** | **Bridge Status: Active**

(2) District: 05 | (3) County: 23-FAIRFIELD | (9) Location: 0.1Mi N Of Ir 70 | (7) Facility Carried: Vio-43 Taylor Rd.

(4) FIPS Code: None | Owner: | (208) Route On Bridge: Township | (207) Route Under Bridge: Other

(102) Direction of Traffic: 3 - One Lane Bridge For 2-Way Traffic | (103) Temporary Structure: | (110) Designated National Network: Not National Network | (101) Parallel: N

(42A) Type Serv: (On): Highway | (42B) Type Serv (Under): Waterway

INVENTORY ROUTE DATA

(5A) Route On/Under: 1 - 1: Route Carried "On" The Structure

(5B) Hwy Sys: 4 - County Highway

(5D) Route No: T0219 (5E) Dir: Not Applic (5C) Des: Mainline

(6) Feature Int: T Blacklick Cr (Taylor R

(200) CL: 00044 (201)Spec Des: (209) Interstate Mile:

(29) Avg. Daily Traffic(ADT): 983 (30) ADT Year: 2015

(235) Truck Traf: 0 (210) Corridor: (104) NHS: structure/route is not on nhs

(26) Functional Class: rural - local (100) Strahnt: Not A Strahnet Route

INTERSECTED ROUTE DATA

(370A) Record Type: (370B) Hwy Sys:

(370D) Route No: (370E) Dir: (370C) Des:

(373) Feature Int:

(382) CL: 0000 (371) Interstate Mile: (387) Special Desig:

(379) Avg. Daily Traffic(ADT): 0 (380) ADT Year: 0

(381) Truck Traf: 0 (384) Corridor: (378) NHS: -

(375) Functional Class: (386) Strahnt:

CLEARANCE ON THE BRIDGE

Min. Hriz on Bridge: (335) NC: Ft (47) Card: 25.0 Ft

(53) Prac Max Vert On Brg: 99.0 Ft

Min Vrt Clr On Brg: (336) NC: 0.0 Ft (10) Card: 99.0 Ft

Min Latl Clr: (338) Right NC: Ft (337) Right Card: Ft

(340) Left NC: Ft (339) Left Card: Ft

(45) Main Spans Number: 1 | (43) Type: Concrete | /Culvert (Includes Frame Culverts) | /Not Applicable

(46) Approach Spans Nbr: 0 | (44) Type: Other | /Other | /Not Applicable

(307) Total Spans: 1 | (48) Max Span: 22.0 Ft | (49) Overall Leng: 24.0 Ft

SUBSTRUCTURE

Abut-Rear (532) Matl: None | (531) Type: None | (533) Fnd: None (Such As Most Culverts)

Abut-Fwd (527) Matl: None | (526) Type: None | (528) Fnd: None (Such As Most Culverts)

Pier-Pred (535) Matl: None | (534) Type: None | (536) Fnd: None (Such As Most Culverts)

(663) Stream Velocity: 009.3 fps | (113) Scour: Stable For Scour Conditions

(92B) Underwater Inspection: N Freq: 0 | (655) Chan Prot: Rip Rap (Dumped Rock Or Rock Channel Pro

(93B) Date of last Underwater Insp: | (657) Drainage Area: Sq Mi

CLEARANCE UNDER THE BRIDGE

Min. Horiz Under Clear: | (326) NC: Ft | (325) Card: Ft

(328) Prac Max Vrt Under Clear: Ft

Min Vert Under Clear: | (327) NC: Ft | (54) Card: 0.0 Ft

Min Lat Under Clear: | (329) Right NC: Ft | (55) Right Card: 0.0 Ft

(330) Left NC: Ft | (56) Left Card: 0.0 Ft

STRUCTURE INFORMATION

(19) Bypass Length: 19.0 Miles

(16) Latitude: 39 Deg 56 Min 19.64 Sec (17) Longitude: 82 Deg 46 Min 22.59 Sec

(20) Toll: On Free Road

(263) Date Built: 10/30/2014 (264) Major Reconstruction Date:

(28A) No. Lanes On: 1 (28B)No. Lanes Under: 0

(301) Horiz Curve: (34) Skew: 13 Deg

(32) App. Rdw Width: 15 Ft (51) Brg. Rdw Width: 0.0 Ft

(52) Deck Width: 0.0 Ft (424) Deck Area: 360 Sq. Ft

(406) Median Type: None /Non Barrier /No Joint

(33) Bridge Median: No Median

Sidewalks: (50A) Left 0.0 Ft (50B) Right 0.0 Ft

Type Curb or Sidewalk:

(427) Left Matl: None (428) Type: None

(429) Right Matl: None (430) Type: None

(35) Flared: 0 (408) Composite: X - Not Applicable

LOAD RATING INFORMATION

(31) Design Load: HL 93

(64) Opr Rat Fact/Ton: 1.400

(66) Inv Rat Fact/Ton: 1.000

(734) Ohio Percent of Legal Load: 150

(704) Year of Rating: 2014 (708) Rate Soft: Brass

(63) Opr Rat Method: Load And Resistance Factor Rating (Lrfr)

(65) Inv Rat Method: Load And Resistance Factor Rating (Lrfr)

Load Rater: (705) Tommy (706) Nicholson (707) PE#: 70735

APPRAISAL

(71) Waterway Adequacy: 7 Better than present minimum criteria

(72) Approach Alignment: 8 Equal to present desirable criteria

(67) Calc Str Appraisal: 8 - Equal to present desirable criteria

(68) Calc Deck Geometry: N - Not Applicable

(69) Calc Underclearance: N - Not Applicable

APPROACH INFORMATION

(401) Approach Guardrail:

(403) Approach Pavement: (402) Grade:

CULVERT INFORMATION

(575) Culvert Type: 4-Sided Box (Concrete Precast), Structur (578) Length: 60.0 Ft

(580) Depth of Fill: 7.0 Ft (582) Headwalls:

GENERAL INFORMATION

(475) Main Member: Not Applicable (Culverts, Trusses, Arche (477) Moment Plate:

(414) Expansion Joint: None

(453) Bearing Devices: None

(407) Railing: None
(409) Deck Drainage: None
(107) Deck Type: Not Applicable
Deck Protection: (108B) External: Na
(108C) Internal: Na
(108A) Wearing Surface: Na
(423) Thickness: 8.0 in (422) Date of Wearing Surface: 10/30/2014
(547) Slope Protection: None

(38) Navigation: 0 (39) Nav Vert Clr: 0.0 Ft (40) Nav Horiz Clear: 0.0 Ft
(92C) Spec Insp: N Freq: 0 (93C) Special Inspection Date:
(92A) Fracture Critical Insp: N Freq: 0 (93A) Fracture Critical Feature Inspection Date:
(474) Main Structure System: Not Applicable (I.E. Culvert, Beam, Slab (468) Hinges: Not Applicable (Structures With No Hinge
(487) Structural Steel Memb: None - No Structural Steel On Bridge (465) Framing: None Or Not Applicable
(482) Paint: None Or Not Applicable (426) Bridge Railing Steel:
(483) PCS Date:

GENERAL INFORMATION (CONTINUED)

(37) Hist Significance: Not Eligible
(112) NBIS: Y
(842) Hist/Designer:
(827) Hist Build Year:
(828) Hist Type: None N/A
(98A) Border Bridge State:
(98B) Border Bridge Resp:
(99) Border Bridge SFN:

PROPOSED IMPROVEMENTS

(114) Future ADT (On Bridge): 1364 (115) Year of Future ADT: 2035

ORIGINAL PLANS INFORMATION

(250) Fabricator:
(249) Contractor:
(248) Ohio Original Construction Project No:
(252) Microfilm Reel:
(251) Standard Drawing:
Aperture Cards:
(246) Orig: 2
(247) Repair: 2
(245) Fabr: 2
(709) Rating Source: 1 PLAN INFORMATION AVAILABLE FOR LOAD RATI

INSPECTION SUMMARY

(58) Deck: N
(59) Superstructure: N
(60) Substructure: N
(62) Culvert: 9
(61) Channel: 7
(C6) Approaches:
General Appraisal: 9
(41) Operational Status: A
(90) Inspection date: 11/3/2020
(91) Desig Insp Freq: 24 Mos

SURVEY ITEMS

(36A) Railings: Na/Safety Feature Not Required
(36B) Transitions: Na/Safety Feature Not Required
(36C) Guardrail: Meets Acceptable Standards
(36D) Guardrail Ends: Meets Acceptable Standards
(219) Temporary Barrier:
(223) Temporary Shoring:
(224) Temporary Sub Decking: N

(253) SFNs Replacing this retired bridge: 2341433
(255) SFNs That were replaced by this bridge:

UTILITIES

(265) Electric Line: N
(266) Gas Line: N
(269) Sanitary Sewer: N
(267) Telephone Line:
(268) TV Cable:
(270) Water Line:
(271) Other Utilities:

SPECIAL FEATURES

(283) Lighting:
(431) Fence: N
(433) Glare-Screen: N
(436) Splash-Guard:
(459) Catwalks: N
(271) Other-Feat:
(279) Signs-On:
(281) Signs-Under
(432) Fence-Ht on Bridge 0.0 FT
(434) Noise Barrier Walls

Insp 1st: 02 - County Highway Agency
2nd:
3rd:
(21) Major Maint 1st: 02 - County Highway Agency
2nd:
3rd:
(225) Routine Maint 1st: 02 - County Highway Agency
2nd:
3rd:

APPENDIX C – Bridge Cost Estimates

Option 1 - Culvert Replacement					
Item No.	**Unit**	**Description**	**Part Total**	**Cost/Unit**	**Total Cost**
202E11000	LS	STRUCTURE REMOVED	1	$60,000.00	$60,000
203E20000	CY	EMBANKMENT	41227	$15.00	$618,405
301E56000	CY	ASPHALT CONCRETE BASE, PG64-22, (449)	533	$400.00	$213,200
304E20000	CY	AGGREGATE BASE	423	$100.00	$42,300
407E20000	GAL	NON-TRACKING TACK COAT	96	$4.00	$384
441E50000	CY	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	67	$330.00	$22,110
441E50300	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)	94	$300.00	$28,200
503E21300	LS	UNCLASSIFIED EXCAVATION	1	$82,000.00	$82,000
509E10000	LB	EPOXY COATED REINFORCING STEEL	30727	$2.10	$64,527
511E46010	CY	CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING	45	$1,100.00	$49,500
511E46510	CY	CLASS QC1 CONCRETE, FOOTING	107	$750.00	$80,250
512E10100	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	212	$40.00	$8,480
512E33000	SY	TYPE 2 WATERPROOFING	1611	$25.00	$40,275
516E13600	SF	1" PREFORMED EXPANSION JOINT FILLER.	73	$10.00	$730
518E21200	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC	65	$160.00	$10,400
601E32200	CY	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	119	$250.00	$29,750
611E96461	FT	20' X 10' CONDUIT, TYPE A, 706.05, AS PER PLAN	300	$2,000.00	$600,000
TOTAL					**$1,950,511**
TOTAL +20% Contingency					**$2,341,000**

Option 2 - Bridge Replacement			
Proposed Deck Area	**Unit**	**Cost per SF**	**Total Cost**
28264	SF	370	$10,457,680
TOTAL			**$10,458,000**

APPENDIX D – Hydrology and Hydraulics Report

COMPASS
INFRASTRUCTURE GROUP

Hydrology and Hydraulics Report

FAI/LIC-70-0.00/0.00

PID 96808

Rehabilitation/Replacement of FAI-TR219-00.044 Bridge

June 2023

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APPENDIX B – Flood Insurance Rate Map .....
APPENDIX C – Taylor Road StreamStats .....
APPENDIX D – Hydraulic Cross Section Locations .....
APPENDIX E – HEC-RAS Output for Existing Model .....
APPENDIX F – HEC-RAS Output for Box Culvert Replacement .....
APPENDIX G – HEC-RAS Output for Proposed Bridge .....

Executive Summary

This study was conducted to determine the potential impacts of rehabilitating or replacing the existing box culvert on Taylor Road over Tributary to Blacklick Creek in Fairfield County, OH located within the City of Reynoldsburg and Violet Township corporation limits. The existing structure is programmed to be replaced as part of the construction of a new interchange of Taylor Road at IR 70. Taylor Road will be shifted to the east and will cross over IR 70. This report has been prepared to provide the required hydrologic and hydraulic data for review of the data and analysis.

The intent of this project is to rehabilitate or replace the bridge while causing no adverse effects on existing flooding conditions or surrounding properties and to provide a bridge with a low chord that clears the water surface profile of the design year (4% AEP) event and confirm the structure will carry the 1% AEP discharge without causing property damage.

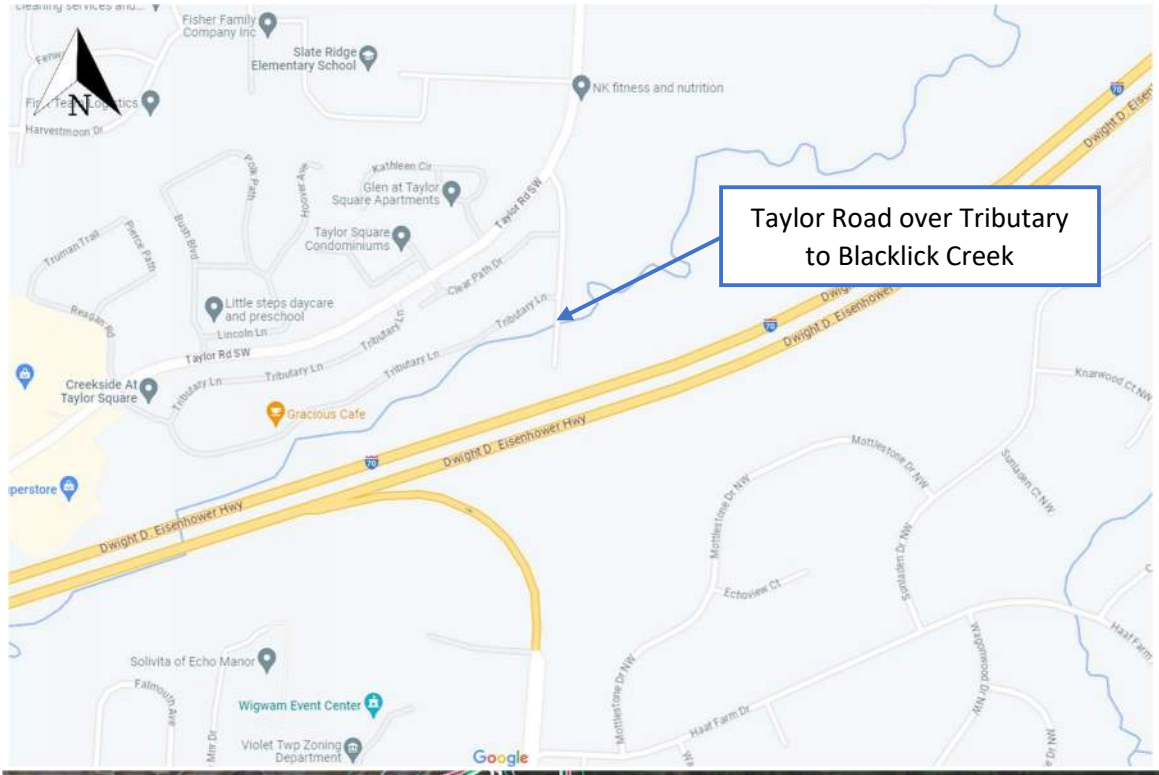
Two options were considered. Herein those options are referred to as:

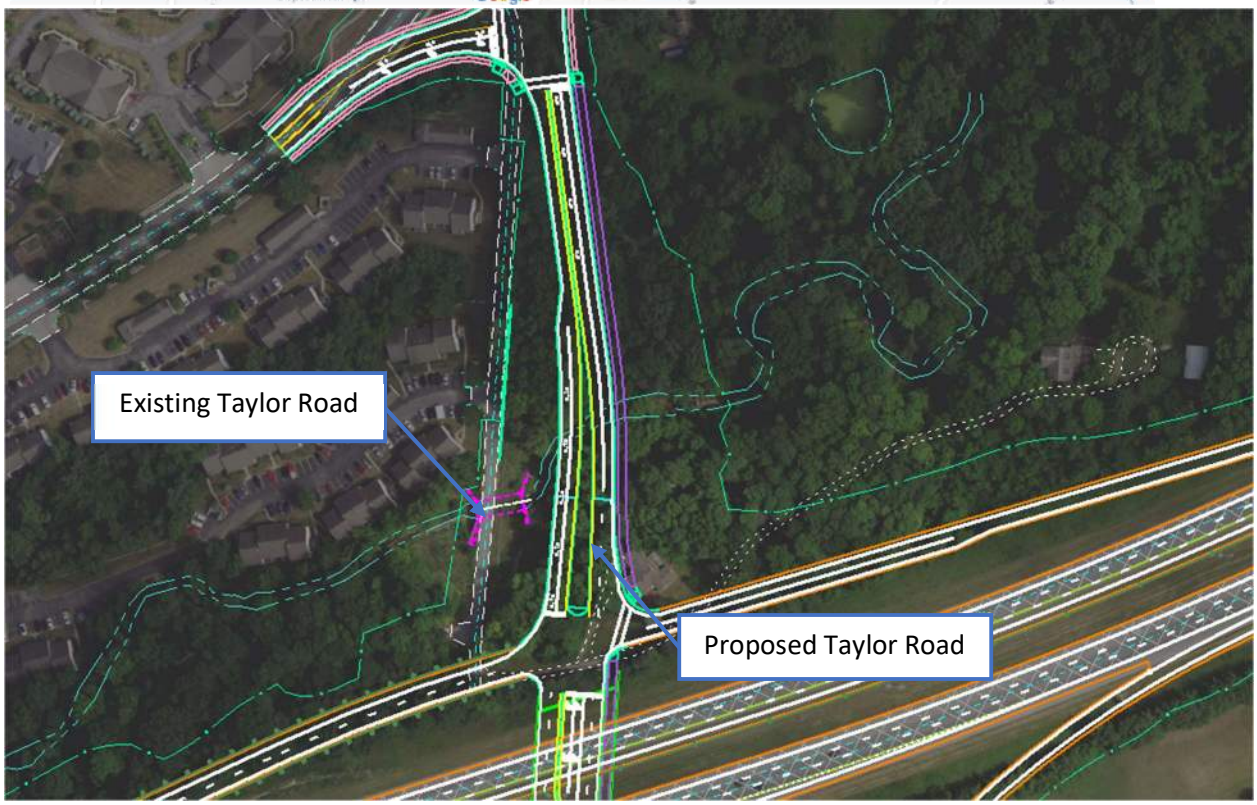
1. Box Culvert Replacement
2. Proposed Bridge

A 1-D analysis approach was implemented using HEC-RAS. The hydraulic analysis for all proposed options indicates no significant change to the downstream or upstream section water surface elevations.

Scour and Temporary Access Fill calculations were not performed as a part of this analysis and will be performed in subsequent design tasks after a preferred option is selected.

Location Map





Project Background

This project involves the hydraulic analysis for the replacement of the Taylor Road Culvert over Tributary to Blacklick Creek as a part of the proposed project to add an interchange to Taylor Road at IR 70. The horizontal alignment of Taylor Road will be moved to the east and the roadway profile grade will be raised to pass over IR 70. The existing structure is a 60' long, 20' span x 10' rise precast four-sided box culvert carrying a 16'± roadway on 6.0' minimum embankment. Taylor Road has a tangent alignment, and the existing culvert has a 13˚ right forward skew. Two proposed options were analyzed as a part of this study:

- Option 1: New 300' Culvert
- Option 2: Removing the existing culvert and constructing a new 3-span bridge under the proposed alignment of Taylor Road

The proposed bridge site plan and photos of existing site conditions are located in Appendix A.

The Project is located within the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) Zone X, Area of Minimal Flood Hazard as shown on Flood Insurance Rate Map 3949C0359K, included in Appendix B.

Hydrologic Analysis

Per LDv2 Section 1004.2, the 4% Annual Exceedance Probability (AEP) storm event was used as the design storm based on the 2050 design year ADT of 36,680 vehicles per day. The analysis was also performed using the 1% AEP storm event. There are no buildings located within the 1% AEP storm floodplain. The design storm for scour will be the 4% AEP storm and the check storm for scour is the 2% AEP storm. Scour calculations will be performed in subsequent design tasks after the preferred option has been selected and geotechnical borings have been performed. The drainage area of the Tributary to Blacklick Creek at the bridge is approximately 1.88 square miles. Flows for Tributary to Blacklick Creek were taken from a hydrologic analysis completed using StreamStats, a service provided by USGS. The peak discharges for Tributary to Blacklick Creek can be found in Table 1. The full StreamStats report can be found in Appendix C.

Table 1 – Tributary to Blacklick Creek Peak Discharge Rates

Storm	Peak Discharge (cfs)
4% AEP	539
2% AEP	659
1% AEP	787

The Manning's roughness coefficients were set based on the aerial photography, site photographs, and the information from the HEC-RAS Hydraulic Reference tables defining roughness coefficients. Table 2 shows the Manning's roughness coefficients selected for this study along with channel and overbank descriptions per Table 3-1 of the HEC-RAS Hydraulic Reference Manual.

Table 2 – Manning's roughness coefficients		
Location	Manning's Roughness Coefficient	Land Cover
Main Channel	0.033	Clean, straight, full, no rifts or deep pools, minimal sandbars and grass
	0.040	Clean, straight, full, no rifts or deep pools, moderate sandbars and grass
Overbanks	0.03	Cleared land with tree stumps, no sprouts
	0.033	Dry rubble or riprap
	0.04	Cleared land with tree stumps, no sprouts
	0.05	Cleared land with stumps, minimum heavy sprouts
	0.06	Cleared land with stumps, moderate heavy sprouts

Hydraulic Analysis

Hydraulic analysis was performed using HEC-RAS Version 6.3.1. The existing model was created using survey data supplemented by ground elevations from LIDAR, obtained from The Ohio Geographically Referenced Information Program (OGRIP) to further define the overbanks. The analysis included 1200' upstream and 500' downstream from existing the culvert with cross sections cut approximately every 100'. The extra distance upstream was to accommodate comparative cross sections between this model and the proposed options. A total of 15 cross sections were used for the existing model. The flow line and bank stations were set based on survey data and aerial photography. An aerial plan showing the cross-section locations can be found in Appendix D.

The existing box culvert geometry was added into the model based on record plans and confirmed by ground survey. The reach boundary condition for the Tributary to Blacklick Creek was set to use a normal depth boundary condition for both upstream and downstream, with the slope set to 0.0088 ft/ft for both. This was determined from calculations using information from the ground survey.

Two Proposed Conditions models were developed:

1. Box Culvert Replacement: Downstream bridge cross section location remains the same. Three existing cross sections were removed where they conflicted with the proposed extended length, and one cross section was added at the upstream face of the proposed culvert. The culvert length was increased from 60' to 300' to account for the fill beneath the proposed Taylor Road alignment. The proposed four-sided box culvert has a span of 20' and a rise of 10', and the bottom elevation is set to accommodate the thalweg at the proposed inlet. The inlet was depressed 1' below the thalweg to allow the channel to fill in naturally. The inlet section was modified from the existing surveyed channel to accommodate for construction area and regrading in front of wingwalls. Additionally, the roadway high chord elevation for the upstream and downstream bridge sections was adjusted to match the proposed raised profile of Taylor Road.

2. Proposed Bridge: The existing box culvert was removed from the model. Two existing cross sections were removed where they conflicted with the proposed bridge and a cross section was added at the upstream and downstream face of the proposed bridge. The proposed 3-span (104', 124', 84' with respect to the reference chord), variable width bridge with stub abutments and 2:1 spill through slopes was then added to the model. The roadway high chord elevations were entered based on the proposed profile of Taylor Road. An estimated superstructure depth of 4.5' was used to calculate the proposed low chord elevations. For further discussion of the bridge alternative, please refer to the Structure Type Study report.

HEC-RAS Results

A total of three HEC-RAS models were analyzed for the purpose of this study: Existing Conditions Model, Culvert Replacement Model (Option 1), and Proposed Bridge Model (Option 2). Table 3 compares headwater elevations for the Existing and Post Project Conditions models for the 4% AEP storm. Table 4 compares headwater elevations for the Existing and Post Project Conditions models for the 1% AEP storm. Detailed results can be found in Appendixes E, F, and G.

Table 3 – Existing and Post Project Conditions 4% AEP Storm Headwater Elevation

Section	Existing	Culvert Replacement		Proposed Bridge	
	Elevation	Elevation	Variance (ft)	Elevation	Elevation
1884.237	914.95	914.95	0.00	914.95	0.00
1779.593	913.45	913.45	0.00	913.45	0.00
1600.512	912.60	912.60	0.00	912.60	0.00
1461.160	911.59	911.59	0.00	911.59	0.00
1258.927	908.33	908.34	0.01	908.34	0.01
1182.848	907.63	907.62	-0.01	907.62	-0.01
1092.190	906.67	906.68	0.01	906.68	0.01
895.4649	-	905.19	N/A	-	N/A
873.8912	904.02	Bridge	N/A	904.31	0.29
814.2176	-		N/A	903.92	N/A
762.3889	903.66		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	902.19	N/A
626.3436	902.96		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	901.72	901.70	-0.02	901.61	-0.11
388.8611	900.28	900.28	0.00	900.28	0.00
283.1181	898.88	898.88	0.00	898.88	0.00
176.6302	896.80	896.80	0.00	896.80	0.00
62.28806	895.81	895.81	0.00	895.81	0.00

Table 4 – Existing and Post Project Conditions 1% AEP Storm Headwater Elevation					
Section	Existing	Culvert Replacement		Proposed Bridge	
	Elevation	Elevation	Variance (ft)	Elevation	Variance (ft)
1884.237	915.63	915.63	0.00	915.63	0.00
1779.593	914.79	914.79	0.00	914.79	0.00
1600.512	913.12	913.12	0.00	913.12	0.00
1461.160	912.03	912.03	0.00	912.03	0.00
1258.927	909.00	909.00	0.00	909.00	0.00
1182.848	908.02	908.02	0.00	908.02	0.00
1092.190	907.13	907.13	0.00	907.13	0.00
895.4649	-	906.38	N/A	-	N/A
873.8912	904.91	Bridge	N/A	904.97	0.06
814.2176	-		N/A	904.64	N/A
762.3889	904.89		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	903.11	N/A
626.3436	904.06		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	902.47	902.48	0.01	902.38	-0.09
388.8611	900.88	900.88	0.00	900.88	0.00
283.1181	899.56	899.56	0.00	899.56	0.00
176.6302	897.44	897.44	0.00	897.44	0.00
62.28806	896.40	896.40	0.00	896.40	0.00

For Option 1, water surface elevations are within a couple hundredths of the existing model for both the 4% AEP and 1% AEP storm events. For Option 2, there is a 0.29’ and 0.06’ rise upstream of the proposed bridge for the 4% AEP storm event and 1% AEP storm events, respectively. If the bridge model is chosen, the proposed stream realignment beneath the structure can be updated to accommodate this localized rise. Water surface elevations downstream of the bridge are lowered by approximately 0.1’ for both storm events.

Tables 5 and 6 compare the velocities for the Existing and Post Project Conditions models for the 4% AEP and 1% AEP storms, respectively.

Table 5 – Existing and Post Project Conditions 4% AEP Storm Velocity

Section	Existing	Culvert Replacement		Proposed Bridge	
	Velocity (ft/s)	Velocity (ft/s)	Variance (ft/s)	Velocity (ft/s)	Variance (ft/s)
1884.237	3.83	3.83	0.00	3.83	0.00
1779.593	8.68	8.68	0.00	8.68	0.00
1600.512	3.66	3.66	0.00	3.66	0.00
1461.160	7.65	7.65	0.00	7.65	0.00
1258.927	6.62	6.61	-0.01	6.61	-0.01
1182.848	6.89	6.93	0.04	6.93	0.04
1092.190	7.07	7.01	-0.06	7.00	-0.07
895.4649	-	5.60	N/A	-	N/A
873.8912	7.01	Bridge	N/A	6.09	-0.92
814.2176	-		N/A	5.97	N/A
762.3889	5.30		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	2.80	N/A
626.3436	5.99		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	6.02	5.58	-0.44	5.28	-0.74
388.8611	7.38	7.38	0.00	7.38	0.00
283.1181	8.27	8.27	0.00	8.27	0.00
176.6302	6.99	6.99	0.00	6.99	0.00
62.28806	7.26	7.26	0.00	7.26	0.00

Table 6 – Existing and Post Project Conditions 1% AEP Storm Velocity					
Section	Existing	Culvert Replacement		Proposed Bridge	
	Velocity (ft/s)	Velocity (ft/s)	Variance (ft/s)	Velocity (ft/s)	Variance (ft/s)
1884.237	4.12	4.12	0.00	4.12	0.00
1779.593	7.12	7.12	0.00	7.12	0.00
1600.512	4.31	4.31	0.00	4.31	0.00
1461.160	8.56	8.56	0.00	8.56	0.00
1258.927	7.38	7.38	0.00	7.38	0.00
1182.848	8.44	8.44	0.00	8.44	0.00
1092.190	7.85	7.85	0.00	7.85	0.00
895.4649	-	6.30	N/A	-	N/A
873.8912	6.90	Bridge	N/A	6.73	-0.17
814.2176	-		N/A	6.44	N/A
762.3889	4.72		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	3.12	N/A
626.3436	6.86		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	7.34	6.83	-0.51	6.11	-1.23
388.8611	8.50	8.50	0.00	8.50	0.00
283.1181	8.98	8.98	0.00	8.98	0.00
176.6302	8.04	8.04	0.00	8.04	0.00
62.28806	8.36	8.36	0.00	8.36	0.00

Velocities decrease or remain the same at all cross sections for the 4% AEP storm event except for cross section 1182.848 which has an increase of 0.04 ft/s for both options. Velocities decrease or remain the same at all cross sections for both options for the 1% AEP storm event.

Table 7 compares the existing and post project waterway opening along with the structure low chord elevations and the design (4% AEP) and check (1% AEP) storm flood clearances.

Table 7 – Waterway Opening Comparison				
Model	Waterway Opening (ft^2)	Upstream Low Chord	4% AEP Storm clearance (ft)	1% AEP Storm clearance (ft)
Existing	165.41	907.28	5.42	4.60
Box Culvert Replacement	180.00	910.19	6.20	5.40
Proposed Bridge	9007.78	943	39.08	38.36

The waterway opening is slightly increased for the proposed culvert compared to the existing model due to some clearing of the channel. The waterway opening significantly increased for bridge replacement compared to the existing model. The new culvert provides adequate freeboard to the 4% AEP and 1% AEP storms.

Conclusion and Recommendations

The two proposed bridge options meet the requirements of the scope document and ODOT LDv2. The proposed conditions for both bridge options allow conveyance of both the design storm (4% AEP) and 1% AEP storm discharge below the proposed low chord. Though there is a localized rise of less than 1 inch in water surface elevations for both storm events, this rise will not negatively impact any residential structures near the site as all structures are outside the 1% AEP floodplain. This rise resolves itself in 534 ft for the 4% AEP and within 170 ft in the 1% AEP storm event. The elevation of the proposed profile grade of Taylor Road (around 951.50) is well above the 1% AEP storm event water surface elevation (906.38) so there is no danger of roadway overtopping.

Option 1 is recommended to be selected for detailed design as it is the most cost effective option which meets hydraulic criteria.

For further discussion of the Options, please see the Structure Type Study Report.

Appendices

APPENDIX A – Proposed Site Plans & Photos

Figure 1: Upstream channel

Figure 2: Downstream channel

Figure 3: Upstream bridge face

Figure 4: Downstream bridge face

APPENDIX B – Flood Insurance Rate Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane South Zone 5001 (FIPSZONE 3402). The **horizontal datum** was NAD83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Franklin County and the Fairfield County, Ohio GIS Department. This information was produced at scales of 1:1,200 and 1:12,000 respectively from aerial photography dated 2000 or later, and from USGS digital orthophoto quadrangles dated 1998 or later.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

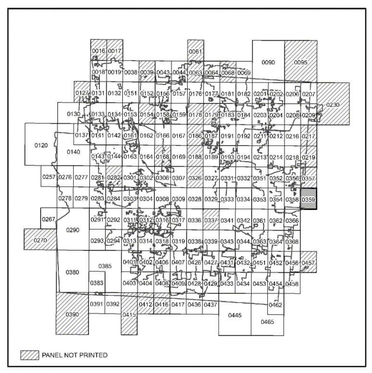
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

PANEL INDEX



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100 year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently deaertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside of the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 10)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
85°03'45.0", 41°24'22.5"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4587000 M	1000-meter Universal Transverse Mercator grid values, zone 17
2250000 FT	5000-foot grid ticks: Ohio State Plane South Coordinate System, 5001 Zone (FIPSZONE 3402) Lambert Conformal Conic
KA0015 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
AUGUST 2, 1995
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
7/16/1997
4/21/1999
3/16/2004
9/19/2007

June 17, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0359K

FIRM
FLOOD INSURANCE RATE MAP
FRANKLIN COUNTY, OHIO
AND INCORPORATED AREAS

PANEL 359 OF 465

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FRANKLIN COUNTY	390167	0359	K
REYNOLDSBURG, CITY OF	390177	0359	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
39049C0359K

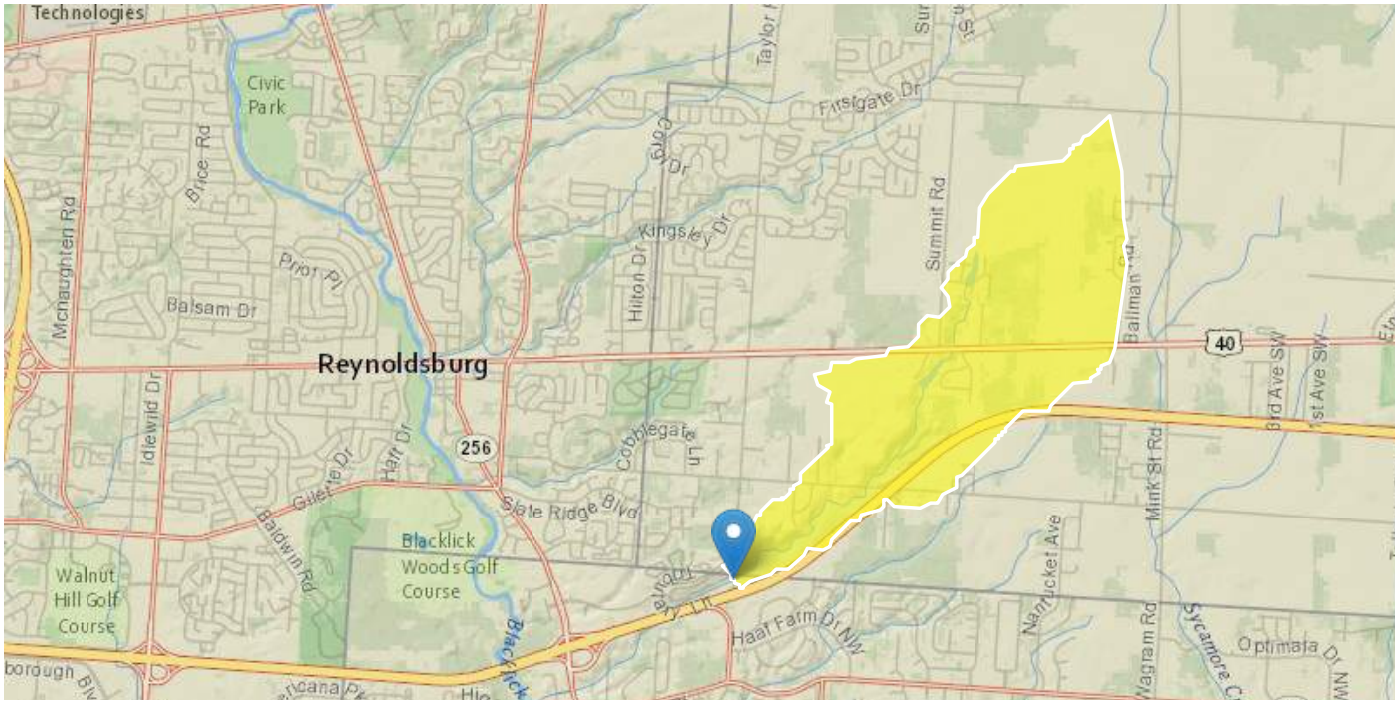
MAP REVISED
JUNE 17, 2008

Federal Emergency Management Agency

APPENDIX C – Taylor Road StreamStats

Taylor Road Report Stream Stats

Region ID: OH
Workspace ID: OH20230405195718403000
Clicked Point (Latitude, Longitude): 39.93881, -82.77293
Time: 2023-04-05 15:57:39 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	350536.8	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4424313.2	meters
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	46.5	feet per mi
DRNAREA	Area that drains to a point on a stream	1.88	square miles
FOREST	Percentage of area covered by forest	25.5	percent
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	35.7	percent

Parameter Code	Parameter Description	Value	Unit
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	8.45	percent
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	1.47	percent
LFPLENGTH	Length of longest flow path	3.77	miles
LONG_CENT	Longitude Basin Centroid	82.7498	decimal degrees
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.54	dimensionless

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	46.5	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	25.35

Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	169	ft^3/s	89.4	319	40.1
20-percent AEP flood	295	ft^3/s	163	534	37.2
10-percent AEP flood	395	ft^3/s	217	719	37.6
4-percent AEP flood	539	ft^3/s	294	988	38.1
2-percent AEP flood	659	ft^3/s	356	1220	37.8
1-percent AEP flood	787	ft^3/s	420	1470	39.6
0.2-percent AEP flood	1120	ft^3/s	592	2120	40.3

Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
1 Day 10 Year Low Flow	0.0312	ft^3/s	53.1
7 Day 10 Year Low Flow	0.0393	ft^3/s	40
30 Day 10 Year Low Flow	0.06	ft^3/s	35.7
90 Day 10 Year Low Flow	0.0908	ft^3/s	29.8

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
80 Percent Duration	0.184	ft^3/s	29.1

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2

Annual Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	1.86	ft^3/s	11.4	11.4

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Monthly Flow Statistics

Monthly Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2
FOREST	Percent Forest	25.5	percent	0	99.1

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Monthly Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
January Mean Flow	2.76	ft^3/s	16.6	16.6
February Mean Flow	3.41	ft^3/s	11.9	11.9
March Mean Flow	3.79	ft^3/s	14	14
April Mean Flow	3.52	ft^3/s	11.2	11.2
May Mean Flow	2.35	ft^3/s	19.5	19.5
June Mean Flow	1.46	ft^3/s	27	27
July Mean Flow	0.828	ft^3/s	28.2	28.2
August Mean Flow	0.606	ft^3/s	36.8	36.8
September Mean Flow	0.39	ft^3/s	43.6	43.6
October Mean Flow	0.386	ft^3/s	50.8	50.8
November Mean Flow	0.884	ft^3/s	37.5	37.5
December Mean Flow	1.92	ft^3/s	21.8	21.8

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

General Flow Statistics

General Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2

General Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.31	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Flow Percentile Statistics

Flow Percentile Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
LONG_CENT	Longitude of Basin Centroid	82.7498	decimal degrees	80.53	84.6

Flow Percentile Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
25th Percentile Flow	0.512	ft^3/s	29.2	29.2
50th Percentile Flow Median	1.06	ft^3/s	40.3	40.3
75th Percentile Flow	2.26	ft^3/s	47.9	47.9

Flow Percentile Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources

Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Bankfull Statistics

Bankfull Statistics Parameters [Interior Plains D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.19305	59927.7393

Bankfull Statistics Parameters [Central Lowland P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.200772	59927.66594

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Interior Plains D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	14.6	ft
Bieger_D_channel_depth	1.69	ft
Bieger_D_channel_cross_sectional_area	29.1	ft^2

Bankfull Statistics Flow Report [Central Lowland P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	16.7	ft
Bieger_P_channel_depth	2.06	ft
Bieger_P_channel_cross_sectional_area	27.9	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	15.5	ft
Bieger_USA_channel_depth	1.38	ft
Bieger_USA_channel_cross_sectional_area	24	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	14.6	ft
Bieger_D_channel_depth	1.69	ft
Bieger_D_channel_cross_sectional_area	29.1	ft^2
Bieger_P_channel_width	16.7	ft
Bieger_P_channel_depth	2.06	ft
Bieger_P_channel_cross_sectional_area	27.9	ft^2
Bieger_USA_channel_width	15.5	ft
Bieger_USA_channel_depth	1.38	ft
Bieger_USA_channel_cross_sectional_area	24	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDF

Probability Statistics

Probability Statistics Parameters [P zero Flow 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Probability Statistics Flow Report [P zero Flow 2012 5138]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PC
Probability zero flow 1Day	0.0288	dim	91
Probability zero flow 7Day	0.0122	dim	94
Probability zero flow 30Day	0.000505	dim	97

Probability Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 6]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	11500	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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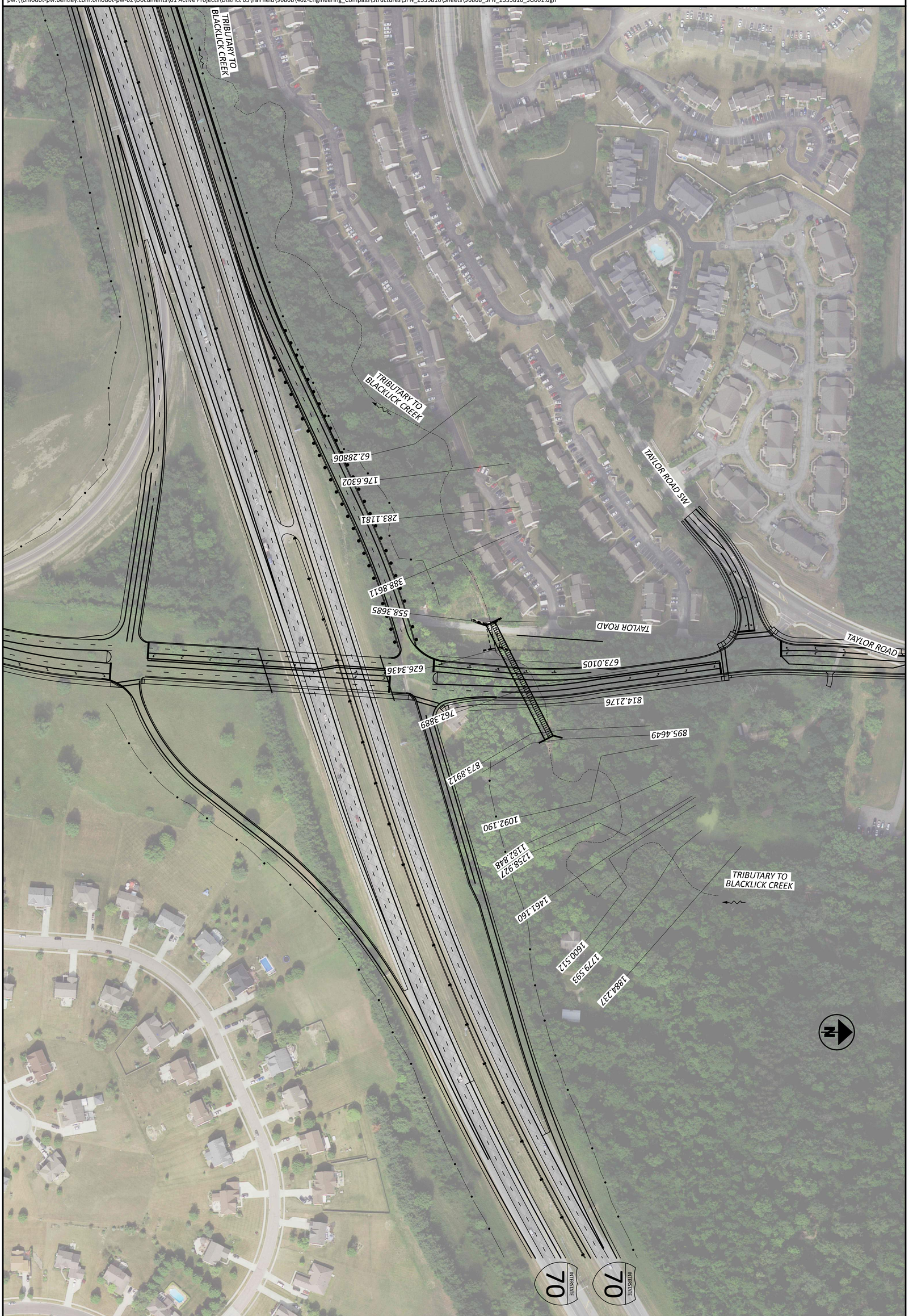
Application Version: 4.14.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

APPENDIX D – Hydraulic Cross Section Locations

FAR/LIC-70-0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/8/2023 TIME: 1:44:54 PM USER: jkoesel
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\402-Engineering_Compass\Structures\SFN_2335816\Sheets\96808_SFN_2335816_SG001.dgn



SHEET 1 TOTAL 1	SUBSET 1 TOTAL 1	PROJECT ID 96808	REVIEWER XXX MM-DD-YY	DESIGNER JFK/JAF CHECKER ERK	COMPASS MANUFACTURING GROUP	DESIGN AGENCY	SFN 2335816

HYDRAULIC CROSS SECTION LOCATIONS
BRIDGE NO. FAI-TR219-00.044
TAYLOR ROAD OVER TRIBUTARY TO BLACKLICK CREEK

APPENDIX E – HEC-RAS Output for Existing Model

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Trib Blacklick
Project File : TribBlacklick.prj
Run Date and Time: 6/14/2023 10:18:34 AM

Project in English units

PLAN DATA

Plan Title: Existing Plan
Plan File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.p01

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

Flow Title : TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Plan Summary Information:
Number of: Cross Sections = 15 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
    Water surface calculation tolerance = 0.01
    Critical depth calculation tolerance = 0.01
    Maximum number of iterations   = 20
    Maximum difference tolerance   = 0.3
    Flow tolerance factor   = 0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method: Average Conveyance
    Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Flow Data (cfs)

River	Reach	RS	50% AEP	20% AEP	10% AEP	4% AEP	2% AEP	1% AEP
Stream	Reach	1884.237	169	295	395	539	659	787

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Stream	Reach	50% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	20% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	10% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	4% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	2% AEP	Normal S = 0.0088	Normal S = 0.0088

GEOMETRY DATA

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1884.237

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	954.51	6.41	954.48	17.41	954.73	18.99	954.45	27.9	952.39
36.66	945.28	52.98	937.21	76.89	926.06	99.4	915.71	102.77	914.92
117.69	914.8	136.02	914.71	142.43	914.82	183.72	915.41	193.3	915.34
227.53	915.53	231.92	915.56	234.91	915.58	236.64	915.61	238.43	913.74
240.12	912.72	246.48	911.81	247.32	911.71	249.73	911.42	262.99	910.26
268.87	912.33	274.02	913.52	274.06	913.53	278.11	913.51	280.36	913.5
283.43	913.49	288.14	913.89	288.86	914.04	291.79	914.65	293.23	914.88
301.84	915.07	309.5	915.16	328.02	915.36	336.06	915.69	347.49	917.8
358.9	919.32	367.24	920.36	371.88	920.96	390.48	923.58	390.55	923.58
402.92	926								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	236.64	.033	293.23	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
236.64	293.23	87.263	104.64	99.362	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1779.593

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.76	12.71	953.07	15.1	952.62	28.18	947.8	46.85	937.41

```
   56.01  933.08   76.47   919.3   82.95  917.36   94.52  914.82  109.53  914.84
  124.72  914.62  130.42  914.46  167.75  914.29  176.28  913.96   180.3  914.21
  206.69  914.43   213.1  914.45  228.82   914.6  246.52  914.15  261.09  913.77
  261.34  913.77  261.55  913.65  263.01  912.64  264.49  911.62  273.26  910.72
  279.37  909.95  281.59  909.61  285.86  912.21  295.21  916.53  296.28  917.02
  297.43   917.7  298.19  918.14  298.72  918.13   302.9   918.3  305.46  918.39
   306.4  918.43  308.56  919.07  321.57  922.79  326.12  924.08  326.71  924.09
  333.97  924.23  334.08  924.22  334.18  924.21  334.84  924.16  335.45  924.13
  335.98  924.09  336.76  924.06  337.45  924.02  338.37     924  339.17  923.97
  340.22  923.97  341.57  924.02  342.67     924  344.16  924.07  345.61  924.14
  347.09  924.15  375.25  924.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  261.09    .033  295.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        261.09  295.21           46.246  179.08  62.301             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1600.512

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.31    4.83  955.12    10.3  954.82   10.49  954.79   12.44  954.27
   27.28  950.49   32.66  948.56   50.57  939.06    76.9  920.79   76.97  920.73
   77.04  920.69   77.23  920.58   77.33  920.55   92.86  915.08    97.3  914.54
   98.04  914.32  100.41  913.13   103.5  912.95  125.46  912.09   135.3  912.54
  143.89  913.16  147.52  913.04  149.13   912.9  153.15   912.3  157.42  911.67
  159.22  911.63  162.96  911.35  166.09  911.12  166.58  910.96  171.56  911.22
  172.86   911.3  178.65  911.65  181.26  910.34  183.78  909.49   187.7  907.58
  195.36  908.98  198.32  909.31  200.52  909.52  203.12  909.67  214.83  910.38
  222.44  910.84   223.1  910.89  224.64  911.17   229.5  912.52  236.98   912.6
  240.38  912.97  252.23  913.23  256.85  913.24  284.12  913.52  292.99  913.53
  300.66  913.33  304.23  913.24  330.58  913.88  330.81  913.94  332.76  914.23
  333.95  914.46   337.1     915  341.58  915.77  363.46  920.07  366.71  920.38
  376.25  921.08   383.7   920.8  389.19   920.8  390.64  920.84  413.78  920.82
  417.16  920.44  420.58  920.54  433.23  922.75  437.09  923.28  442.48     924
  447.71  924.96  458.58  925.64  468.93  926.02  474.21     926
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  178.65    .033   229.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.65   229.5          107.579  139.35  11.829             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1461.160

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.81    3.57  953.64   11.36  953.09   14.36  952.71   48.21  927.92
   53.89  923.77    63.8   917.2   79.26  906.95   89.12   909.8   92.93  910.98
   94.97  910.96  104.28   910.9  105.14  910.87  120.27  910.31  132.24  910.05
  165.25   912.7  168.09  913.02  173.83  913.14  185.32  913.16  199.92   913.3
  219.67  913.29   224.9  913.15  227.29  913.08  229.73  913.01  232.19  912.95
  245.18  913.13  246.82  913.08  248.56  913.06   250.4  913.09  252.32  913.17
  254.24  913.32  255.82  913.49  257.27  913.68  258.54  913.87  270.59  916.21
  272.67  916.56   275.6  917.07   289.3  919.77  296.03  920.42   299.8  920.55
  305.56   920.9  317.24  920.91  326.67  921.16  338.59  921.17   347.9  920.14
  356.73  920.37  357.38   920.4  357.67  920.47  358.83  920.61     383  924.95
  394.25  925.64  409.27  926.83  411.95  926.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    63.8    .033   94.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          63.8   94.97          92.336  202.23  11.941             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1258.927

INPUT
```

Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.43	6.46	950.96	9.86	950.6	19.08	949.85	35.36	943.09
38.43	941.82	47.71	936.33	58.08	930.28	59.67	929.41	62.77	927.72
78.09	919.53	84.28	916.93	93.45	913.65	95.23	913.44	96.27	913.36
102.11	915.37	102.86	915.62	111.76	912.69	113.67	911.86	113.88	911.91
118.56	911.86	140.14	911.87	142.65	911.86	155.9	911.5	159.62	910.77
163.94	909.84	171.83	909.49	185.25	909.12	188.34	908.93	188.82	908.78
191.94	907.8	196.59	906.47	204.94	906.3	208.68	906.22	208.69	906.22
210.23	906.06	220.83	904.86	222.08	904.54	223.81	905.38	236.17	912.6
237.18	912.66	240.2	912.84	254.22	913.03	268.3	913.23	268.94	913.27
276.16	914.75	297.12	918.82	297.43	918.87	297.87	918.95	300.06	919.38
301.22	919.49	313.34	919.95	330.21	921.02	330.82	921.02	347.58	921.46
349.42	921.46	352.67	921.1	362.31	919.95	369.02	920.19	375.42	921.76
396.95	924.31	400.4	924.94	402.38	925.07	420.78	926.55		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	191.94	.033	236.17	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
191.94	236.17	24.845	76.08	70.24	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1182.848

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951	8.98	950.41	15.92	949.84	24.27	949.24	46.86	938.8
50.02	937.49	51.87	936.4	61.11	931.15	73.73	923.85	83.68	918.39
96.32	912.61	97.83	912.54	98.27	912.52	98.84	912.49	99.51	912.44
100.25	912.37	101.02	912.29	101.77	912.2	102.44	912.11	112.95	911.91
114.01	911.79	115.03	911.68	115.96	911.57	133.21	911.73	140.29	911.7
149.68	911.36	165.78	910.93	169.21	910.45	174.14	909.47	188.43	909.2
203.9	908.82	206.99	907.98	211.6	906.73	212.03	906.68	214.83	906.65
214.84	906.65	214.85	906.64	218.19	905.47	222.65	905.08	223.3	905.03
238.83	904.36	246.38	908.19	252.44	911.3	253.18	911.32	263.22	911.58
270.91	911.77	272.78	911.84	282.34	913.4	309.28	919.56	314.28	919.84

```
  314.38  919.85  314.48  919.83  316.88   919.5   327.6  918.06   350.7  922.45
  356.72  923.68  372.54  924.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   203.9    .033  246.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         203.9  246.38           54.037  90.657  97.318             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1092.190

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  949.51   11.05   948.8   22.84  947.98   28.64  946.25   40.02  942.95
   49.69  937.97    51.8  936.92    53.8  935.87   57.25  933.56    75.1  924.63
   98.61  911.15  112.56  911.04  120.78   910.8  124.41  911.09  134.91  911.28
  140.61  910.99  146.23  910.74  154.12  909.75  156.92  909.38  168.82  908.93
  170.03   908.9  170.59  908.87  182.01  908.55  187.74  908.52  192.38  906.93
   195.1  906.24  213.03  906.07  224.64  905.96  227.72  905.82   228.3  905.72
  240.95  903.51  245.07  902.72  245.65  902.81  245.78  902.85     246  902.91
  246.43  903.06     248  903.63  258.68  907.61  262.55  909.05  268.81  908.95
  274.59  908.85  277.34  908.75  277.84  908.77  279.85  908.64  281.67  908.51
  287.15  908.86  288.52  909.19  291.79  909.02  298.71  908.93  302.57   908.4
  307.08  907.64  310.52  908.31  314.31  908.99  321.29  908.94  323.42  908.95
  326.02  909.02  328.86  909.15  340.44  909.35  347.49  909.77  350.35  909.99
  353.42  910.28  356.33  910.61  365.51  914.43  388.89  923.25     406  923.94
  412.35  924.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  213.03    .033  258.68     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.03  258.68          168.653   218.3  59.293             .1       .3

CROSS SECTION
```

RIVER: Stream
REACH: Reach RS: 873.8912

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.75	11.69	946.94	16.34	946.55	40.21	944.49	52.11	942.38
58.6	940.75	74.35	935.46	80.37	932.87	110.86	915.36	114.13	914.16
131.74	908.3	133.8	908.62	137.24	909.15	140.66	909.84	145.23	909.74
151.89	909.58	155.6	909.24	157.51	905.28	159.3	902.36	160.31	902.27
161.4	902.17	177.06	901.28	178.94	901.57	188.29	902.34	190.45	902.54
197	903.16	197.95	903.43	200.5	904.71	201.74	905.33	202.99	906.04
211.04	906.16	212.15	906.18	227.44	906.39	258.28	907.2	261.08	907.17
264.44	906.73	271.49	906.03	277.25	906.52	280.22	906.85	281.32	906.87
282.53	906.88	301.15	907.11	312.09	906.95	324	906.43	342.97	906.46
345.71	906.42	350.63	907.56	353.67	909.01	362.8	913.18	377.32	919.08
385.89	922.29	408.72	923.6	410.78	923.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	155.6	.033	202.99	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.6	202.99	117.307	111.5 132.136	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 762.3889

INPUT
Description:
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944	1.77	943.67	2.1	943.62	5.79	943.28	8.99	943.2
12.08	943.43	12.26	942.86	14.76	942.99	17.5	942.16	29.67	942.4
33.95	941.3	36.07	941.38	38.49	941.3	40.57	941.25	44.87	938.77
64.37	929.42	68.98	928.32	78.36	926.43	90.04	922.19	99.58	918.5
107.89	915.2	121.71	909.45	133.15	904.31	136.08	902.93	142.78	902.76
153.29	902.35	166.69	903.4	169.31	903.43	169.86	903.44	172.57	903.46
175.93	902.91	178.47	902.33	180.19	902.47	184.46	902.57	185.29	902.39

```
  201.88  898.82  202.91  898.84  203.55     899  216.17  903.05  222.03  904.93
  226.46  905.41  227.42  905.51  245.48  907.41  246.79  907.45  247.96  907.53
  248.11  907.53   249.8  906.93  251.22  906.48  253.86  905.18   254.8  904.84
  255.43  904.64   255.9   904.5   256.3   904.4  257.43  903.56  259.91  903.44
  262.59  903.33  264.54  903.26  266.23  903.22  267.87  903.19  286.65  903.59
  286.73  903.59  286.93   903.6  287.98  903.66  289.11   903.7   290.2  903.72
  290.81  903.72  291.49  903.71  292.67  903.67  293.36  903.63  293.76   903.6
  295.22  903.49  297.84  904.42  298.39  904.61  299.27  904.93  303.74   906.7
  306.15  907.62  310.97  909.53  311.93  909.93  313.49  910.54  316.98  910.62
  320.57   910.7  323.16  910.76  325.11  910.82  348.01  912.07  374.58  913.73
   403.6  918.88  415.27  920.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  185.29    .033  216.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        185.29  216.17          119.463  136.05  84.365             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  246.79  415.27  907.53       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 626.3436

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.05  195.12          101.327   67.98  66.819             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

BRIDGE


RIVER: Stream
REACH: Reach              RS: 592

INPUT
Description:
Distance from Upstream XS =     4.3
Deck/Roadway Width        =      60
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   24.08   940.5     892 159.353  914.56     892 159.353  914.56  907.28
 179.421  914.56  907.28 179.421  914.56     892   280.2     908     892

Upstream Bridge Cross Section Data
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        152.05  195.12             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   13.71   928.4     892 178.068  914.56     892 178.068  914.56   906.6
 198.077  914.56   906.6 198.077  914.56     892  300.26     911     892

Downstream Bridge Cross Section Data
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        168.33   202.7             .3       .5
Ineffective Flow     num=       2
```

```
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 558.3685

INPUT
Description:
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
```

```
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        168.33   202.7          120.462  169.51  196.87             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 388.8611

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   943.8    4.02  943.62     5.7     943   30.84  927.41   38.05  922.87
   52.32  920.72   74.08  919.14   76.64  919.08   82.24  918.89   88.44  916.64
  110.11  908.75  110.65  908.56  115.45  906.81  117.27   906.3  124.08  900.14
   126.1  898.63  127.03  897.94  127.96  897.85  141.55  896.55  157.01   900.8
   164.7  902.92  167.31  903.76  168.38  904.11  171.28  904.64  172.13  904.75
  172.65  905.02  173.65  905.33  175.31  905.54  175.94  905.69  176.75  905.68
   180.6  905.74  183.33  906.02  185.06  905.87  188.36  905.68  203.19  906.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.27    .033  168.38     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.27  168.38          125.202  105.74  77.406             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 283.1181

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  925.17   10.77  920.52   31.24  917.18   33.66  916.97   49.82  914.67
   50.23  914.58   56.65  912.39   60.44  913.12   61.23  913.27   68.73  913.95
   73.06   913.9   75.63  913.89   78.56  914.02   79.91  914.08   81.13  914.14
   81.76  913.55   93.64   900.8   95.26  899.06   97.43  897.93  108.72     895
  109.66  895.02   123.8  898.19  134.02  900.47   134.3  900.54   137.8  901.24
  140.43  901.63  142.02   901.8   147.3   902.5   149.9  903.01  150.58  903.09
  151.16  903.18  152.01  903.22  152.32  903.36  153.29  903.61   153.7  903.63
  154.16  903.81  155.51  903.85  155.53  903.85  156.98  903.84  157.41  903.82
  158.42  903.71  158.75  903.38  160.28  903.17  161.03  903.24  184.01  903.91
  184.85  903.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   93.64    .033  134.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.64  134.02           96.688  106.49 101.506             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 176.6302

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  922.99     .21  922.97      45  917.07   68.19  913.98   81.65  912.14
   96.19   911.1   98.98  911.01   105.2  910.82  106.83  910.83  108.26  910.84
```

```
  109.53  910.84   110.7  910.85  112.82  910.85  113.82  910.86   114.7  910.86
  125.03  905.43  125.23  905.32  128.08  903.85  131.61  902.02  132.72  901.71
   146.3  897.65  147.36  897.62  151.72   897.5  151.99  897.47  152.85   897.3
  161.72  893.75  166.99  892.29  177.54  894.32  177.63  894.35   177.8  894.41
  177.93  894.45  178.27  894.57  178.55  894.67  178.97  894.81  179.07  894.85
  179.51     895  180.47  895.33   180.6  895.38  182.25  895.95  182.28  895.96
  182.35  895.98  183.96  896.54  184.96  896.89  185.79  897.17  186.15   897.3
   187.2  897.66  187.75  897.98  188.49   898.4   188.6  898.47  189.68  898.51
  191.15  898.55  194.59   898.5  197.45  898.68  198.32  898.75  198.85  898.68
  198.92  898.67  203.55  898.32  204.02  898.31  205.07  898.31   205.4   898.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  152.85    .033  186.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.85  186.15           68.689  114.34 141.027             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 62.28806

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  921.53     .09  921.52   34.63   916.7   46.19  915.11    57.1   910.9
   66.87  910.11   68.28  910.13   74.18  907.81   80.39  905.46   81.17  905.24
   92.09  903.24   99.03  901.96  104.87  900.28  106.69  899.71  112.03  897.71
  115.34  897.07  117.23  896.71  124.61  895.28  126.55  895.15  127.87  894.63
  134.17  893.83  143.28  892.68  149.02  891.93  149.79  891.81  150.83  892.42
  150.95  892.48  151.03  892.51  151.07  892.53  151.32  892.65  151.98  892.95
  158.69  896.03  163.65  898.32   163.9  898.49     165   899.2  166.05  899.13
  166.62  899.18  168.04  898.94  168.53  898.86  169.44  898.79  174.88  898.72
  176.05  898.71  177.64  898.72  179.33  898.68  185.77  898.68   186.7  898.67
  188.46  898.67  190.67  898.48     191  898.43  191.67  898.31  193.15  898.06
  196.08  898.08  197.09  898.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  126.55    .033  158.69     .06
```

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.55	158.69	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Stream

Reach	River Sta.	n1	n2	n3
Reach	1884.237	.06	.033	.06
Reach	1779.593	.06	.033	.06
Reach	1600.512	.06	.033	.06
Reach	1461.160	.06	.033	.06
Reach	1258.927	.06	.033	.06
Reach	1182.848	.06	.033	.06
Reach	1092.190	.06	.033	.06
Reach	873.8912	.06	.033	.06
Reach	762.3889	.06	.033	.06
Reach	626.3436	.03	.04	.03
Reach	592	Bridge		
Reach	558.3685	.03	.04	.03
Reach	388.8611	.06	.033	.06
Reach	283.1181	.06	.033	.06
Reach	176.6302	.06	.033	.06
Reach	62.28806	.06	.033	.06

SUMMARY OF REACH LENGTHS

River: Stream

Reach	River Sta.	Left	Channel	Right
Reach	1884.237	87.263	104.64	99.362
Reach	1779.593	46.246	179.08	62.301
Reach	1600.512	107.579	139.35	11.829
Reach	1461.160	92.336	202.23	11.941
Reach	1258.927	24.845	76.08	70.24
Reach	1182.848	54.037	90.657	97.318
Reach	1092.190	168.653	218.3	59.293

Reach	873.8912	117.307	111.5	132.136
Reach	762.3889	119.463	136.05	84.365
Reach	626.3436	101.327	67.98	66.819
Reach	592	Bridge		
Reach	558.3685	120.462	169.51	196.87
Reach	388.8611	125.202	105.74	77.406
Reach	283.1181	96.688	106.49	101.506
Reach	176.6302	68.689	114.34	141.027
Reach	62.28806	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Stream

Reach	River Sta.	Contr.	Expan.
Reach	1884.237	.1	.3
Reach	1779.593	.1	.3
Reach	1600.512	.1	.3
Reach	1461.160	.1	.3
Reach	1258.927	.1	.3
Reach	1182.848	.1	.3
Reach	1092.190	.1	.3
Reach	873.8912	.1	.3
Reach	762.3889	.1	.3
Reach	626.3436	.3	.5
Reach	592	Bridge	
Reach	558.3685	.3	.5
Reach	388.8611	.1	.3
Reach	283.1181	.1	.3
Reach	176.6302	.1	.3
Reach	62.28806	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl

Reach	1884.237	4% AEP	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	1% AEP	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1779.593	4% AEP	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	1% AEP	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1600.512	4% AEP	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	1% AEP	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42
Reach	1461.160	4% AEP	539.00	906.95	911.59	911.59	912.30	0.010237	7.65	106.98	79.10	0.88
Reach	1461.160	1% AEP	787.00	906.95	912.03	912.03	912.87	0.010595	8.56	143.59	85.32	0.91
Reach	1258.927	4% AEP	539.00	904.54	908.33		909.02	0.007901	6.62	81.79	38.63	0.79
Reach	1258.927	1% AEP	787.00	904.54	909.00		909.84	0.007181	7.38	108.61	42.80	0.78
Reach	1182.848	4% AEP	539.00	904.36	907.63		908.37	0.008984	6.89	78.24	37.01	0.84
Reach	1182.848	1% AEP	787.00	904.36	908.02	907.96	909.13	0.011579	8.44	93.21	39.23	0.97
Reach	1092.190	4% AEP	539.00	902.72	906.67	906.67	907.42	0.012378	7.07	83.51	62.75	0.95
Reach	1092.190	1% AEP	787.00	902.72	907.13	907.13	908.04	0.011464	7.85	113.44	65.62	0.95

Reach	873.8912	4% AEP	539.00	901.28	904.02	903.89	904.79	0.010849	7.01	76.90
40.85	0.90									
Reach	873.8912	1% AEP	787.00	901.28	904.91		905.65	0.006805	6.90	114.11
43.16	0.75									
Reach	762.3889	4% AEP	539.00	898.82	903.66		904.05	0.003388	5.30	133.85
116.86	0.54									
Reach	762.3889	1% AEP	787.00	898.82	904.89		905.17	0.001685	4.72	241.35
134.59	0.41									
Reach	626.3436	4% AEP	539.00	897.94	902.96	901.57	903.52	0.004274	5.99	89.93
45.86	0.53									
Reach	626.3436	1% AEP	787.00	897.94	904.06	902.32	904.79	0.004051	6.86	114.69
52.01	0.54									
Reach	592		Bridge							
Reach	558.3685	4% AEP	539.00	897.48	901.72		902.28	0.004635	6.02	89.47
33.90	0.55									
Reach	558.3685	1% AEP	787.00	897.48	902.47		903.31	0.005404	7.34	107.22
34.42	0.61									
Reach	388.8611	4% AEP	539.00	896.55	900.28	899.99	901.13	0.009153	7.38	73.01
31.19	0.85									
Reach	388.8611	1% AEP	787.00	896.55	900.88	900.67	902.00	0.010015	8.50	92.54
34.03	0.91									
Reach	283.1181	4% AEP	539.00	895.00	898.88	898.88	899.95	0.013275	8.27	65.15
31.32	1.01									
Reach	283.1181	1% AEP	787.00	895.00	899.56	899.56	900.81	0.012377	8.98	87.64
35.15	1.00									
Reach	176.6302	4% AEP	539.00	892.29	896.80	896.32	897.55	0.007435	6.99	77.16
30.58	0.78									
Reach	176.6302	1% AEP	787.00	892.29	897.44	897.03	898.44	0.008048	8.04	97.98
34.41	0.83									

Reach	62.28806	4% AEP	539.00	891.81	895.81	895.55	896.63	0.008806	7.26	75.82
36.34	0.84									
Reach	62.28806	1% AEP	787.00	891.81	896.40	896.19	897.47	0.008813	8.36	98.56
40.67	0.87									

APPENDIX F – HEC-RAS Output for Box Culvert Replacement

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Trib Blacklick
Project File : TribBlacklick.prj
Run Date and Time: 6/14/2023 10:31:01 AM

Project in English units

PLAN DATA

Plan Title: Proposed Culvert
Plan File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.p02

Geometry Title: Proposed Culvert
Geometry File :
z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g02

Flow Title : TribBlacklick
Flow File :
z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Plan Summary Information:
Number of: Cross Sections = 13 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information

```
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow



FLOW DATA

Flow Title: TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Flow Data (cfs)


  River           Reach           RS                50% AEP         20% AEP         10% AEP          4% AEP          2% AEP
 1% AEP
  Stream          Reach           1884.237              169             295             395             539             659
    787



Boundary Conditions

  River           Reach           Profile                      Upstream                Downstream

  Stream          Reach           50% AEP                Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           20% AEP                Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           10% AEP                Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           4% AEP                 Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           2% AEP                 Normal S = 0.0088       Normal S = 0.0088



GEOMETRY DATA

Geometry Title: Proposed Culvert
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g02
```

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1884.237

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	954.51	6.41	954.48	17.41	954.73	18.99	954.45	27.9	952.39
36.66	945.28	52.98	937.21	76.89	926.06	99.4	915.71	102.77	914.92
117.69	914.8	136.02	914.71	142.43	914.82	183.72	915.41	193.3	915.34
227.53	915.53	231.92	915.56	234.91	915.58	236.64	915.61	238.43	913.74
240.12	912.72	246.48	911.81	247.32	911.71	249.73	911.42	262.99	910.26
268.87	912.33	274.02	913.52	274.06	913.53	278.11	913.51	280.36	913.5
283.43	913.49	288.14	913.89	288.86	914.04	291.79	914.65	293.23	914.88
301.84	915.07	309.5	915.16	328.02	915.36	336.06	915.69	347.49	917.8
358.9	919.32	367.24	920.36	371.88	920.96	390.48	923.58	390.55	923.58
402.92	926								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	236.64	.033	293.23	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
236.64	293.23	87.263	104.64	99.362	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1779.593

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.76	12.71	953.07	15.1	952.62	28.18	947.8	46.85	937.41
56.01	933.08	76.47	919.3	82.95	917.36	94.52	914.82	109.53	914.84
124.72	914.62	130.42	914.46	167.75	914.29	176.28	913.96	180.3	914.21
206.69	914.43	213.1	914.45	228.82	914.6	246.52	914.15	261.09	913.77
261.34	913.77	261.55	913.65	263.01	912.64	264.49	911.62	273.26	910.72
279.37	909.95	281.59	909.61	285.86	912.21	295.21	916.53	296.28	917.02
297.43	917.7	298.19	918.14	298.72	918.13	302.9	918.3	305.46	918.39
306.4	918.43	308.56	919.07	321.57	922.79	326.12	924.08	326.71	924.09

```
  333.97  924.23  334.08  924.22  334.18  924.21  334.84  924.16  335.45  924.13
  335.98  924.09  336.76  924.06  337.45  924.02  338.37     924  339.17  923.97
  340.22  923.97  341.57  924.02  342.67     924  344.16  924.07  345.61  924.14
  347.09  924.15  375.25  924.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  261.09    .033  295.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        261.09  295.21           46.246  179.08  62.301             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1600.512

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.31    4.83  955.12    10.3  954.82   10.49  954.79   12.44  954.27
   27.28  950.49   32.66  948.56   50.57  939.06    76.9  920.79   76.97  920.73
   77.04  920.69   77.23  920.58   77.33  920.55   92.86  915.08    97.3  914.54
   98.04  914.32  100.41  913.13   103.5  912.95  125.46  912.09   135.3  912.54
  143.89  913.16  147.52  913.04  149.13   912.9  153.15   912.3  157.42  911.67
  159.22  911.63  162.96  911.35  166.09  911.12  166.58  910.96  171.56  911.22
  172.86   911.3  178.65  911.65  181.26  910.34  183.78  909.49   187.7  907.58
  195.36  908.98  198.32  909.31  200.52  909.52  203.12  909.67  214.83  910.38
  222.44  910.84   223.1  910.89  224.64  911.17   229.5  912.52  236.98   912.6
  240.38  912.97  252.23  913.23  256.85  913.24  284.12  913.52  292.99  913.53
  300.66  913.33  304.23  913.24  330.58  913.88  330.81  913.94  332.76  914.23
  333.95  914.46   337.1     915  341.58  915.77  363.46  920.07  366.71  920.38
  376.25  921.08   383.7   920.8  389.19   920.8  390.64  920.84  413.78  920.82
  417.16  920.44  420.58  920.54  433.23  922.75  437.09  923.28  442.48     924
  447.71  924.96  458.58  925.64  468.93  926.02  474.21     926

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  178.65    .033   229.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.65   229.5          107.579  139.35  11.829             .1       .3

CROSS SECTION
```

RIVER: Stream
REACH: Reach RS: 1461.160

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.81	3.57	953.64	11.36	953.09	14.36	952.71	48.21	927.92
53.89	923.77	63.8	917.2	79.26	906.95	89.12	909.8	92.93	910.98
94.97	910.96	104.28	910.9	105.14	910.87	120.27	910.31	132.24	910.05
165.25	912.7	168.09	913.02	173.83	913.14	185.32	913.16	199.92	913.3
219.67	913.29	224.9	913.15	227.29	913.08	229.73	913.01	232.19	912.95
245.18	913.13	246.82	913.08	248.56	913.06	250.4	913.09	252.32	913.17
254.24	913.32	255.82	913.49	257.27	913.68	258.54	913.87	270.59	916.21
272.67	916.56	275.6	917.07	289.3	919.77	296.03	920.42	299.8	920.55
305.56	920.9	317.24	920.91	326.67	921.16	338.59	921.17	347.9	920.14
356.73	920.37	357.38	920.4	357.67	920.47	358.83	920.61	383	924.95
394.25	925.64	409.27	926.83	411.95	926.95				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	63.8	.033	94.97	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63.8	94.97	92.236	202.23	11.941	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1258.927

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.43	6.46	950.96	9.86	950.6	19.08	949.85	35.36	943.09
38.43	941.82	47.71	936.33	58.08	930.28	59.67	929.41	62.77	927.72
78.09	919.53	84.28	916.93	93.45	913.65	95.23	913.44	96.27	913.36
102.11	915.37	102.86	915.62	111.76	912.69	113.67	911.86	113.88	911.91
118.56	911.86	140.14	911.87	142.65	911.86	155.9	911.5	159.62	910.77
163.94	909.84	171.83	909.49	185.25	909.12	188.34	908.93	188.82	908.78
191.94	907.8	196.59	906.47	204.94	906.3	208.68	906.22	208.69	906.22
210.23	906.06	220.83	904.86	222.08	904.54	223.81	905.38	236.17	912.6
237.18	912.66	240.2	912.84	254.22	913.03	268.3	913.23	268.94	913.27
276.16	914.75	297.12	918.82	297.43	918.87	297.87	918.95	300.06	919.38

```
  301.22  919.49  313.34  919.95  330.21  921.02  330.82  921.02  347.58  921.46
  349.42  921.46  352.67   921.1  362.31  919.95  369.02  920.19  375.42  921.76
  396.95  924.31   400.4  924.94  402.38  925.07  420.78  926.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  191.94    .033  236.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        191.94  236.17           24.845   76.08   70.24             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1182.848

INPUT
Description:
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     951    8.98  950.41   15.92  949.84   24.27  949.24   46.86   938.8
   50.02  937.49   51.87   936.4   61.11  931.15   73.73  923.85   83.68  918.39
   96.32  912.61   97.83  912.54   98.27  912.52   98.84  912.49   99.51  912.44
  100.25  912.37  101.02  912.29  101.77   912.2  102.44  912.11  112.95  911.91
  114.01  911.79  115.03  911.68  115.96  911.57  133.21  911.73  140.29   911.7
  149.68  911.36  165.78  910.93  169.21  910.45  174.14  909.47  188.43   909.2
   203.9  908.82  206.99  907.98   211.6  906.73  212.03  906.68  214.83  906.65
  214.84  906.65  214.85  906.64  218.19  905.47  222.65  905.08   223.3  905.03
  238.83  904.36  246.38  908.19  252.44   911.3  253.18  911.32  263.22  911.58
  270.91  911.77  272.78  911.84  282.34   913.4  309.28  919.56  314.28  919.84
  314.38  919.85  314.48  919.83  316.88   919.5   327.6  918.06   350.7  922.45
  356.72  923.68  372.54  924.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   203.9    .033  246.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         203.9  246.38           54.037  90.657  97.318             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1092.190
```

```
INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  949.51   11.05   948.8   22.84  947.98   28.64  946.25   40.02  942.95
   49.69  937.97    51.8  936.92    53.8  935.87   57.25  933.56    75.1  924.63
   98.61  911.15  112.56  911.04  120.78   910.8  124.41  911.09  134.91  911.28
  140.61  910.99  146.23  910.74  154.12  909.75  156.92  909.38  168.82  908.93
  170.03   908.9  170.59  908.87  182.01  908.55  187.74  908.52  192.38  906.93
   195.1  906.24  213.03  906.07  224.64  905.96  227.72  905.82   228.3  905.72
  240.95  903.51  245.07  902.72  245.65  902.81  245.78  902.85     246  902.91
  246.43  903.06     248  903.63  258.68  907.61  262.55  909.05  268.81  908.95
  274.59  908.85  277.34  908.75  277.84  908.77  279.85  908.64  281.67  908.51
  287.15  908.86  288.52  909.19  291.79  909.02  298.71  908.93  302.57   908.4
  307.08  907.64  310.52  908.31  314.31  908.99  321.29  908.94  323.42  908.95
  326.02  909.02  328.86  909.15  340.44  909.35  347.49  909.77  350.35  909.99
  353.42  910.28  356.33  910.61  365.51  914.43  388.89  923.25     406  923.94
  412.35  924.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  213.03    .033  258.68     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.03  258.68          149.522 196.726  36.742             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 895.4649

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  948.62   18.14  947.28   29.51  946.46   55.15  944.54   59.18  944.02
   66.65  941.48   88.92  933.88  105.49  924.34  120.71  915.34  126.17  912.92
   133.8  910.42  139.01  908.79  141.25   909.1  144.65  909.75  146.85  910.17
  148.85  910.09   154.2  909.98  159.72  903.99  160.57  903.06  161.39  901.19
  186.21  901.19  189.86  902.86  190.19  902.87  199.91   903.6  202.64   903.8
  204.28  904.64   207.7  906.38  211.04  906.46  228.04   906.9  234.74     907
  241.67  907.18  251.72  907.07  274.82   907.1  281.52  907.24  289.52  907.24
  295.89  907.14  304.05  907.11  312.71  906.95  323.25  906.91  330.68  906.84
  331.22  906.85  331.36  906.85  332.43  906.95  345.78   908.5  362.97  909.67
  371.66  913.21  398.03  923.07  400.51  923.21  410.78  923.62
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  159.72    .033  204.28     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        159.72  204.28          354.101 310.149 354.181             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 162.756   951.5       T
 186.829  410.78   951.5       T

BRIDGE


RIVER: Stream
REACH: Reach              RS: 592

INPUT
Description:
Distance from Upstream XS =     6.8
Deck/Roadway Width        =     300
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   24.08     959     892   165.2   951.5     892   165.2   951.5  910.19
   185.4   951.5  910.19   185.4   951.5     892  410.78   946.5     892

Upstream Bridge Cross Section Data
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  948.62   18.14  947.28   29.51  946.46   55.15  944.54   59.18  944.02
   66.65  941.48   88.92  933.88  105.49  924.34  120.71  915.34  126.17  912.92
   133.8  910.42  139.01  908.79  141.25   909.1  144.65  909.75  146.85  910.17
  148.85  910.09   154.2  909.98  159.72  903.99  160.57  903.06  161.39  901.19
  186.21  901.19  189.86  902.86  190.19  902.87  199.91   903.6  202.64   903.8
  204.28  904.64   207.7  906.38  211.04  906.46  228.04   906.9  234.74     907
  241.67  907.18  251.72  907.07  274.82   907.1  281.52  907.24  289.52  907.24
  295.89  907.14  304.05  907.11  312.71  906.95  323.25  906.91  330.68  906.84
  331.22  906.85  331.36  906.85  332.43  906.95  345.78   908.5  362.97  909.67
  371.66  913.21  398.03  923.07  400.51  923.21  410.78  923.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  159.72     .04  204.28     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
```

```
        159.72  204.28             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 162.756   951.5       T
 186.829  410.78   951.5       T

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   13.71     959     892   177.8   951.5     892   177.8   951.5   906.6
   198.3   951.5   906.6   198.3   951.5     892  300.26   946.5     892

Downstream Bridge Cross Section Data
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  897.48  198.86  897.48  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        168.33   202.7             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223   951.5       T
 199.931  300.26   951.5       T

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
```

```
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 558.3685

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.48  180.21  897.48  198.86  897.48  199.12  899.03     201  899.47
   202.7  900.17  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911
  204.22  910.92  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07
  215.91     909  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3
  250.47  907.33  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51
  286.53  909.64  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78
  300.26     911
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        168.33   202.7          120.462  169.51  196.87             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223   951.5       T
 199.931  300.26   951.5       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 388.8611

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   943.8    4.02  943.62     5.7     943   30.84  927.41   38.05  922.87
   52.32  920.72   74.08  919.14   76.64  919.08    77.6  919.05   82.24  918.89
  110.11  908.75  110.65  908.56  115.45  906.81  117.27   906.3  124.08  900.14
   126.1  898.63  127.03  897.94  127.96  897.85  141.55  896.55  157.01   900.8
   164.7  902.92  167.31  903.76  168.38  904.11  171.28  904.64  172.13  904.75
  172.65  905.02  173.65  905.33  175.31  905.54  175.94  905.69  176.75  905.68
   180.6  905.74  183.33  906.02  185.06  905.87  188.36  905.68  203.19  906.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.27    .033  168.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.27  168.38          125.202  105.74  77.406             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 283.1181

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
       0  925.17   10.77  920.52   31.24  917.18   33.66  916.97   49.82  914.67
   50.23  914.58   50.71  914.42   56.65  912.39   61.23  913.27   68.73  913.95
   73.06   913.9   75.63  913.89   78.56  914.02   79.91  914.08   81.13  914.14
   81.76  913.55   93.64   900.8   95.26  899.06   97.43  897.93  108.72     895
  109.66  895.02   123.8  898.19  134.02  900.47   134.3  900.54   137.8  901.24
  140.43  901.63  142.02   901.8   147.3   902.5   149.9  903.01  150.58  903.09
  151.16  903.18  152.01  903.22  152.32  903.36  153.29  903.61   153.7  903.63
  154.16  903.81  155.51  903.85  155.53  903.85  156.98  903.84  157.41  903.82
  158.42  903.71  158.75  903.38  160.28  903.17  161.03  903.24  184.01  903.91
  184.85  903.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   93.64    .033  134.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.64  134.02           96.688  106.49 101.506             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 176.6302

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  922.99     .21  922.97      45  917.07   68.19  913.98   81.65  912.14
   86.03  911.83   96.19   911.1   105.2  910.82  106.83  910.83  108.26  910.84
  109.53  910.84   110.7  910.85  112.82  910.85  113.82  910.86   114.7  910.86
  125.03  905.43  125.23  905.32  128.08  903.85  131.61  902.02  132.72  901.71
   146.3  897.65  147.36  897.62  151.72   897.5  151.99  897.47  152.85   897.3
  161.72  893.75  166.99  892.29  177.54  894.32  177.63  894.35   177.8  894.41
  177.93  894.45  178.27  894.57  178.55  894.67  178.97  894.81  179.07  894.85
  179.51     895  180.47  895.33   180.6  895.38  182.25  895.95  182.28  895.96
  182.35  895.98  183.96  896.54  184.96  896.89  185.79  897.17  186.15   897.3
   187.2  897.66  187.75  897.98  188.49   898.4   188.6  898.47  189.68  898.51
  191.15  898.55  194.59   898.5  197.45  898.68  198.32  898.75  198.85  898.68
  198.92  898.67  203.55  898.32  204.02  898.31  205.07  898.31   205.4   898.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  152.85    .033  186.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.85  186.15           68.689  114.34 141.027             .1       .3
```

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 62.28806

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	921.53	.09	921.52	34.63	916.7	46.19	915.11	57.1	910.9
66.87	910.11	68.28	910.13	74.18	907.81	80.39	905.46	80.46	905.44
81.17	905.24	99.03	901.96	104.87	900.28	106.69	899.71	112.03	897.71
115.34	897.07	117.23	896.71	124.61	895.28	126.55	895.15	127.87	894.63
134.17	893.83	143.28	892.68	149.02	891.93	149.79	891.81	150.83	892.42
150.95	892.48	151.03	892.51	151.07	892.53	151.32	892.65	151.98	892.95
158.69	896.03	163.65	898.32	163.9	898.49	165	899.2	166.05	899.13
166.62	899.18	168.04	898.94	168.53	898.86	169.44	898.79	174.88	898.72
176.05	898.71	177.64	898.72	179.33	898.68	185.77	898.68	186.7	898.67
188.46	898.67	190.67	898.48	191	898.43	191.67	898.31	193.15	898.06
196.08	898.08	197.09	898.09						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	126.55	.033	158.69	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.55	158.69	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Stream

Reach	River Sta.	n1	n2	n3
Reach	1884.237	.06	.033	.06
Reach	1779.593	.06	.033	.06
Reach	1600.512	.06	.033	.06
Reach	1461.160	.06	.033	.06
Reach	1258.927	.06	.033	.06
Reach	1182.848	.06	.033	.06
Reach	1092.190	.06	.033	.06
Reach	895.4649	.04	.033	.05
Reach	592	Bridge		

Reach	558.3685	.03	.04	.03
Reach	388.8611	.06	.033	.06
Reach	283.1181	.06	.033	.06
Reach	176.6302	.06	.033	.06
Reach	62.28806	.06	.033	.06

SUMMARY OF REACH LENGTHS

River: Stream

Reach	River Sta.	Left	Channel	Right
Reach	1884.237	87.263	104.64	99.362
Reach	1779.593	46.246	179.08	62.301
Reach	1600.512	107.579	139.35	11.829
Reach	1461.160	92.236	202.23	11.941
Reach	1258.927	24.845	76.08	70.24
Reach	1182.848	54.037	90.657	97.318
Reach	1092.190	149.522	196.726	36.742
Reach	895.4649	354.101	310.149	354.181
Reach	592	Bridge		
Reach	558.3685	120.462	169.51	196.87
Reach	388.8611	125.202	105.74	77.406
Reach	283.1181	96.688	106.49	101.506
Reach	176.6302	68.689	114.34	141.027
Reach	62.28806	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Stream

Reach	River Sta.	Contr.	Expan.
Reach	1884.237	.1	.3
Reach	1779.593	.1	.3
Reach	1600.512	.1	.3
Reach	1461.160	.1	.3
Reach	1258.927	.1	.3
Reach	1182.848	.1	.3
Reach	1092.190	.1	.3
Reach	895.4649	.3	.5

Reach	592	Bridge	
Reach	558.3685	.3	.5
Reach	388.8611	.1	.3
Reach	283.1181	.1	.3
Reach	176.6302	.1	.3
Reach	62.28806	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	1884.237	4% AEP	prop	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	4% AEP	ex	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	1% AEP	prop	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1884.237	1% AEP	ex	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1779.593	4% AEP	prop	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	4% AEP	ex	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	1% AEP	prop	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1779.593	1% AEP	ex	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1600.512	4% AEP	prop	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	4% AEP	ex	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	1% AEP	prop	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42
Reach	1600.512	1% AEP	ex	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42

Reach	1461.160	4% AEP	prop	539.00	906.95	911.59	911.59	912.30	0.010237	7.65
106.98	79.10	0.88								
Reach	1461.160	4% AEP	ex	539.00	906.95	911.59	911.59	912.30	0.010237	7.65
106.98	79.10	0.88								
Reach	1461.160	1% AEP	prop	787.00	906.95	912.03	912.03	912.87	0.010595	8.56
143.59	85.32	0.91								
Reach	1461.160	1% AEP	ex	787.00	906.95	912.03	912.03	912.87	0.010595	8.56
143.59	85.32	0.91								
Reach	1258.927	4% AEP	prop	539.00	904.54	908.34		909.02	0.007869	6.61
81.90	38.64	0.79								
Reach	1258.927	4% AEP	ex	539.00	904.54	908.33		909.02	0.007901	6.62
81.79	38.63	0.79								
Reach	1258.927	1% AEP	prop	787.00	904.54	909.00		909.84	0.007181	7.38
108.61	42.80	0.78								
Reach	1258.927	1% AEP	ex	787.00	904.54	909.00		909.84	0.007181	7.38
108.61	42.80	0.78								
Reach	1182.848	4% AEP	prop	539.00	904.36	907.62		908.37	0.009129	6.93
77.81	36.94	0.84								
Reach	1182.848	4% AEP	ex	539.00	904.36	907.63		908.37	0.008984	6.89
78.24	37.01	0.84								
Reach	1182.848	1% AEP	prop	787.00	904.36	908.02	907.96	909.13	0.011579	8.44
93.21	39.23	0.97								
Reach	1182.848	1% AEP	ex	787.00	904.36	908.02	907.96	909.13	0.011579	8.44
93.21	39.23	0.97								
Reach	1092.190	4% AEP	prop	539.00	902.72	906.68	906.68	907.42	0.012074	7.01
84.29	62.83	0.94								
Reach	1092.190	4% AEP	ex	539.00	902.72	906.67	906.67	907.42	0.012378	7.07
83.51	62.75	0.95								
Reach	1092.190	1% AEP	prop	787.00	902.72	907.13	907.13	908.04	0.011464	7.85
113.44	65.62	0.95								
Reach	1092.190	1% AEP	ex	787.00	902.72	907.13	907.13	908.04	0.011464	7.85
113.44	65.62	0.95								
Reach	895.4649	4% AEP	prop	539.00	901.19	905.19	903.69	905.68	0.002448	5.60
96.23	46.75	0.49								
Reach	895.4649	1% AEP	prop	787.00	901.19	906.38	904.40	906.99	0.002197	6.31
124.74	50.17	0.49								
Reach	873.8912	4% AEP	ex	539.00	901.28	904.02	903.89	904.79	0.010849	7.01

76.90	40.85	0.90								
Reach	873.8912	1% AEP	ex	787.00	901.28	904.91		905.65	0.006805	6.90
114.11	43.16	0.75								
Reach	762.3889	4% AEP	ex	539.00	898.82	903.66		904.05	0.003388	5.30
133.85	116.86	0.54								
Reach	762.3889	1% AEP	ex	787.00	898.82	904.89		905.17	0.001685	4.72
241.35	134.59	0.41								
Reach	626.3436	4% AEP	ex	539.00	897.94	902.96	901.57	903.52	0.004274	5.99
89.93	45.86	0.53								
Reach	626.3436	1% AEP	ex	787.00	897.94	904.06	902.32	904.79	0.004051	6.86
114.69	52.01	0.54								
Reach	592			Bridge						
Reach	558.3685	4% AEP	prop	539.00	897.48	901.70		902.18	0.003758	5.58
96.54	33.84	0.49								
Reach	558.3685	4% AEP	ex	539.00	897.48	901.72		902.28	0.004635	6.02
89.47	33.90	0.55								
Reach	558.3685	1% AEP	prop	787.00	897.48	902.48		903.21	0.004452	6.83
115.16	34.42	0.55								
Reach	558.3685	1% AEP	ex	787.00	897.48	902.47		903.31	0.005404	7.34
107.22	34.42	0.61								
Reach	388.8611	4% AEP	prop	539.00	896.55	900.28	899.99	901.13	0.009153	7.38
73.01	31.19	0.85								
Reach	388.8611	4% AEP	ex	539.00	896.55	900.28	899.99	901.13	0.009153	7.38
73.01	31.19	0.85								
Reach	388.8611	1% AEP	prop	787.00	896.55	900.88	900.67	902.00	0.010015	8.50
92.54	34.03	0.91								
Reach	388.8611	1% AEP	ex	787.00	896.55	900.88	900.67	902.00	0.010015	8.50
92.54	34.03	0.91								
Reach	283.1181	4% AEP	prop	539.00	895.00	898.88	898.88	899.95	0.013275	8.27
65.15	31.32	1.01								
Reach	283.1181	4% AEP	ex	539.00	895.00	898.88	898.88	899.95	0.013275	8.27
65.15	31.32	1.01								
Reach	283.1181	1% AEP	prop	787.00	895.00	899.56	899.56	900.81	0.012377	8.98
87.64	35.15	1.00								

Reach	283.1181	1% AEP	ex	787.00	895.00	899.56	899.56	900.81	0.012377	8.98
87.64	35.15	1.00								
Reach	176.6302	4% AEP	prop	539.00	892.29	896.80	896.32	897.55	0.007435	6.99
77.16	30.58	0.78								
Reach	176.6302	4% AEP	ex	539.00	892.29	896.80	896.32	897.55	0.007435	6.99
77.16	30.58	0.78								
Reach	176.6302	1% AEP	prop	787.00	892.29	897.44	897.03	898.44	0.008048	8.04
97.98	34.41	0.83								
Reach	176.6302	1% AEP	ex	787.00	892.29	897.44	897.03	898.44	0.008048	8.04
97.98	34.41	0.83								
Reach	62.28806	4% AEP	prop	539.00	891.81	895.81	895.55	896.63	0.008806	7.26
75.82	36.34	0.84								
Reach	62.28806	4% AEP	ex	539.00	891.81	895.81	895.55	896.63	0.008806	7.26
75.82	36.34	0.84								
Reach	62.28806	1% AEP	prop	787.00	891.81	896.40	896.19	897.47	0.008813	8.36
98.56	40.67	0.87								
Reach	62.28806	1% AEP	ex	787.00	891.81	896.40	896.19	897.47	0.008813	8.36
98.56	40.67	0.87								

APPENDIX G – HEC-RAS Output for Proposed Bridge

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Trib Blacklick
Project File : TribBlacklick.prj
Run Date and Time: 6/14/2023 10:18:34 AM

Project in English units

PLAN DATA

Plan Title: Existing Plan
Plan File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.p01

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

Flow Title : TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Plan Summary Information:
Number of: Cross Sections = 15 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
    Water surface calculation tolerance = 0.01
    Critical depth calculation tolerance = 0.01
    Maximum number of iterations   = 20
    Maximum difference tolerance   = 0.3
    Flow tolerance factor   = 0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method: Average Conveyance
    Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Flow Data (cfs)

River	Reach	RS	50% AEP	20% AEP	10% AEP	4% AEP	2% AEP	1% AEP
Stream	Reach	1884.237	169	295	395	539	659	787

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Stream	Reach	50% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	20% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	10% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	4% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	2% AEP	Normal S = 0.0088	Normal S = 0.0088

GEOMETRY DATA

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1884.237

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	954.51	6.41	954.48	17.41	954.73	18.99	954.45	27.9	952.39
36.66	945.28	52.98	937.21	76.89	926.06	99.4	915.71	102.77	914.92
117.69	914.8	136.02	914.71	142.43	914.82	183.72	915.41	193.3	915.34
227.53	915.53	231.92	915.56	234.91	915.58	236.64	915.61	238.43	913.74
240.12	912.72	246.48	911.81	247.32	911.71	249.73	911.42	262.99	910.26
268.87	912.33	274.02	913.52	274.06	913.53	278.11	913.51	280.36	913.5
283.43	913.49	288.14	913.89	288.86	914.04	291.79	914.65	293.23	914.88
301.84	915.07	309.5	915.16	328.02	915.36	336.06	915.69	347.49	917.8
358.9	919.32	367.24	920.36	371.88	920.96	390.48	923.58	390.55	923.58
402.92	926								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	236.64	.033	293.23	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
236.64	293.23	87.263	104.64	99.362	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1779.593

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.76	12.71	953.07	15.1	952.62	28.18	947.8	46.85	937.41

```
   56.01  933.08   76.47   919.3   82.95  917.36   94.52  914.82  109.53  914.84
  124.72  914.62  130.42  914.46  167.75  914.29  176.28  913.96   180.3  914.21
  206.69  914.43   213.1  914.45  228.82   914.6  246.52  914.15  261.09  913.77
  261.34  913.77  261.55  913.65  263.01  912.64  264.49  911.62  273.26  910.72
  279.37  909.95  281.59  909.61  285.86  912.21  295.21  916.53  296.28  917.02
  297.43   917.7  298.19  918.14  298.72  918.13   302.9   918.3  305.46  918.39
   306.4  918.43  308.56  919.07  321.57  922.79  326.12  924.08  326.71  924.09
  333.97  924.23  334.08  924.22  334.18  924.21  334.84  924.16  335.45  924.13
  335.98  924.09  336.76  924.06  337.45  924.02  338.37     924  339.17  923.97
  340.22  923.97  341.57  924.02  342.67     924  344.16  924.07  345.61  924.14
  347.09  924.15  375.25  924.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  261.09    .033  295.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        261.09  295.21           46.246  179.08  62.301             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1600.512

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.31    4.83  955.12    10.3  954.82   10.49  954.79   12.44  954.27
   27.28  950.49   32.66  948.56   50.57  939.06    76.9  920.79   76.97  920.73
   77.04  920.69   77.23  920.58   77.33  920.55   92.86  915.08    97.3  914.54
   98.04  914.32  100.41  913.13   103.5  912.95  125.46  912.09   135.3  912.54
  143.89  913.16  147.52  913.04  149.13   912.9  153.15   912.3  157.42  911.67
  159.22  911.63  162.96  911.35  166.09  911.12  166.58  910.96  171.56  911.22
  172.86   911.3  178.65  911.65  181.26  910.34  183.78  909.49   187.7  907.58
  195.36  908.98  198.32  909.31  200.52  909.52  203.12  909.67  214.83  910.38
  222.44  910.84   223.1  910.89  224.64  911.17   229.5  912.52  236.98   912.6
  240.38  912.97  252.23  913.23  256.85  913.24  284.12  913.52  292.99  913.53
  300.66  913.33  304.23  913.24  330.58  913.88  330.81  913.94  332.76  914.23
  333.95  914.46   337.1     915  341.58  915.77  363.46  920.07  366.71  920.38
  376.25  921.08   383.7   920.8  389.19   920.8  390.64  920.84  413.78  920.82
  417.16  920.44  420.58  920.54  433.23  922.75  437.09  923.28  442.48     924
  447.71  924.96  458.58  925.64  468.93  926.02  474.21     926
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  178.65    .033   229.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.65   229.5          107.579  139.35  11.829             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1461.160

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.81    3.57  953.64   11.36  953.09   14.36  952.71   48.21  927.92
   53.89  923.77    63.8   917.2   79.26  906.95   89.12   909.8   92.93  910.98
   94.97  910.96  104.28   910.9  105.14  910.87  120.27  910.31  132.24  910.05
  165.25   912.7  168.09  913.02  173.83  913.14  185.32  913.16  199.92   913.3
  219.67  913.29   224.9  913.15  227.29  913.08  229.73  913.01  232.19  912.95
  245.18  913.13  246.82  913.08  248.56  913.06   250.4  913.09  252.32  913.17
  254.24  913.32  255.82  913.49  257.27  913.68  258.54  913.87  270.59  916.21
  272.67  916.56   275.6  917.07   289.3  919.77  296.03  920.42   299.8  920.55
  305.56   920.9  317.24  920.91  326.67  921.16  338.59  921.17   347.9  920.14
  356.73  920.37  357.38   920.4  357.67  920.47  358.83  920.61     383  924.95
  394.25  925.64  409.27  926.83  411.95  926.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    63.8    .033   94.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          63.8   94.97          92.336  202.23  11.941             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1258.927

INPUT
```

Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.43	6.46	950.96	9.86	950.6	19.08	949.85	35.36	943.09
38.43	941.82	47.71	936.33	58.08	930.28	59.67	929.41	62.77	927.72
78.09	919.53	84.28	916.93	93.45	913.65	95.23	913.44	96.27	913.36
102.11	915.37	102.86	915.62	111.76	912.69	113.67	911.86	113.88	911.91
118.56	911.86	140.14	911.87	142.65	911.86	155.9	911.5	159.62	910.77
163.94	909.84	171.83	909.49	185.25	909.12	188.34	908.93	188.82	908.78
191.94	907.8	196.59	906.47	204.94	906.3	208.68	906.22	208.69	906.22
210.23	906.06	220.83	904.86	222.08	904.54	223.81	905.38	236.17	912.6
237.18	912.66	240.2	912.84	254.22	913.03	268.3	913.23	268.94	913.27
276.16	914.75	297.12	918.82	297.43	918.87	297.87	918.95	300.06	919.38
301.22	919.49	313.34	919.95	330.21	921.02	330.82	921.02	347.58	921.46
349.42	921.46	352.67	921.1	362.31	919.95	369.02	920.19	375.42	921.76
396.95	924.31	400.4	924.94	402.38	925.07	420.78	926.55		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	191.94	.033	236.17	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
191.94	236.17	24.845	76.08	70.24	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1182.848

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951	8.98	950.41	15.92	949.84	24.27	949.24	46.86	938.8
50.02	937.49	51.87	936.4	61.11	931.15	73.73	923.85	83.68	918.39
96.32	912.61	97.83	912.54	98.27	912.52	98.84	912.49	99.51	912.44
100.25	912.37	101.02	912.29	101.77	912.2	102.44	912.11	112.95	911.91
114.01	911.79	115.03	911.68	115.96	911.57	133.21	911.73	140.29	911.7
149.68	911.36	165.78	910.93	169.21	910.45	174.14	909.47	188.43	909.2
203.9	908.82	206.99	907.98	211.6	906.73	212.03	906.68	214.83	906.65
214.84	906.65	214.85	906.64	218.19	905.47	222.65	905.08	223.3	905.03
238.83	904.36	246.38	908.19	252.44	911.3	253.18	911.32	263.22	911.58
270.91	911.77	272.78	911.84	282.34	913.4	309.28	919.56	314.28	919.84

```
  314.38  919.85  314.48  919.83  316.88   919.5   327.6  918.06   350.7  922.45
  356.72  923.68  372.54  924.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   203.9    .033  246.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         203.9  246.38           54.037  90.657  97.318             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1092.190

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  949.51   11.05   948.8   22.84  947.98   28.64  946.25   40.02  942.95
   49.69  937.97    51.8  936.92    53.8  935.87   57.25  933.56    75.1  924.63
   98.61  911.15  112.56  911.04  120.78   910.8  124.41  911.09  134.91  911.28
  140.61  910.99  146.23  910.74  154.12  909.75  156.92  909.38  168.82  908.93
  170.03   908.9  170.59  908.87  182.01  908.55  187.74  908.52  192.38  906.93
   195.1  906.24  213.03  906.07  224.64  905.96  227.72  905.82   228.3  905.72
  240.95  903.51  245.07  902.72  245.65  902.81  245.78  902.85     246  902.91
  246.43  903.06     248  903.63  258.68  907.61  262.55  909.05  268.81  908.95
  274.59  908.85  277.34  908.75  277.84  908.77  279.85  908.64  281.67  908.51
  287.15  908.86  288.52  909.19  291.79  909.02  298.71  908.93  302.57   908.4
  307.08  907.64  310.52  908.31  314.31  908.99  321.29  908.94  323.42  908.95
  326.02  909.02  328.86  909.15  340.44  909.35  347.49  909.77  350.35  909.99
  353.42  910.28  356.33  910.61  365.51  914.43  388.89  923.25     406  923.94
  412.35  924.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  213.03    .033  258.68     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.03  258.68          168.653   218.3  59.293             .1       .3

CROSS SECTION
```

RIVER: Stream
REACH: Reach RS: 873.8912

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.75	11.69	946.94	16.34	946.55	40.21	944.49	52.11	942.38
58.6	940.75	74.35	935.46	80.37	932.87	110.86	915.36	114.13	914.16
131.74	908.3	133.8	908.62	137.24	909.15	140.66	909.84	145.23	909.74
151.89	909.58	155.6	909.24	157.51	905.28	159.3	902.36	160.31	902.27
161.4	902.17	177.06	901.28	178.94	901.57	188.29	902.34	190.45	902.54
197	903.16	197.95	903.43	200.5	904.71	201.74	905.33	202.99	906.04
211.04	906.16	212.15	906.18	227.44	906.39	258.28	907.2	261.08	907.17
264.44	906.73	271.49	906.03	277.25	906.52	280.22	906.85	281.32	906.87
282.53	906.88	301.15	907.11	312.09	906.95	324	906.43	342.97	906.46
345.71	906.42	350.63	907.56	353.67	909.01	362.8	913.18	377.32	919.08
385.89	922.29	408.72	923.6	410.78	923.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	155.6	.033	202.99	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.6	202.99	117.307	111.5 132.136	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 762.3889

INPUT
Description:
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944	1.77	943.67	2.1	943.62	5.79	943.28	8.99	943.2
12.08	943.43	12.26	942.86	14.76	942.99	17.5	942.16	29.67	942.4
33.95	941.3	36.07	941.38	38.49	941.3	40.57	941.25	44.87	938.77
64.37	929.42	68.98	928.32	78.36	926.43	90.04	922.19	99.58	918.5
107.89	915.2	121.71	909.45	133.15	904.31	136.08	902.93	142.78	902.76
153.29	902.35	166.69	903.4	169.31	903.43	169.86	903.44	172.57	903.46
175.93	902.91	178.47	902.33	180.19	902.47	184.46	902.57	185.29	902.39

```
  201.88  898.82  202.91  898.84  203.55     899  216.17  903.05  222.03  904.93
  226.46  905.41  227.42  905.51  245.48  907.41  246.79  907.45  247.96  907.53
  248.11  907.53   249.8  906.93  251.22  906.48  253.86  905.18   254.8  904.84
  255.43  904.64   255.9   904.5   256.3   904.4  257.43  903.56  259.91  903.44
  262.59  903.33  264.54  903.26  266.23  903.22  267.87  903.19  286.65  903.59
  286.73  903.59  286.93   903.6  287.98  903.66  289.11   903.7   290.2  903.72
  290.81  903.72  291.49  903.71  292.67  903.67  293.36  903.63  293.76   903.6
  295.22  903.49  297.84  904.42  298.39  904.61  299.27  904.93  303.74   906.7
  306.15  907.62  310.97  909.53  311.93  909.93  313.49  910.54  316.98  910.62
  320.57   910.7  323.16  910.76  325.11  910.82  348.01  912.07  374.58  913.73
   403.6  918.88  415.27  920.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  185.29    .033  216.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        185.29  216.17          119.463  136.05  84.365             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  246.79  415.27  907.53       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 626.3436

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.05  195.12          101.327   67.98  66.819             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

BRIDGE


RIVER: Stream
REACH: Reach              RS: 592

INPUT
Description:
Distance from Upstream XS =     4.3
Deck/Roadway Width        =      60
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   24.08   940.5     892 159.353  914.56     892 159.353  914.56  907.28
 179.421  914.56  907.28 179.421  914.56     892   280.2     908     892

Upstream Bridge Cross Section Data
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        152.05  195.12             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   13.71   928.4     892 178.068  914.56     892 178.068  914.56   906.6
 198.077  914.56   906.6 198.077  914.56     892  300.26     911     892

Downstream Bridge Cross Section Data
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        168.33   202.7             .3       .5
Ineffective Flow     num=       2
```

```
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 558.3685

INPUT
Description:
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
```

```
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        168.33   202.7          120.462  169.51  196.87             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 388.8611

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   943.8    4.02  943.62     5.7     943   30.84  927.41   38.05  922.87
   52.32  920.72   74.08  919.14   76.64  919.08   82.24  918.89   88.44  916.64
  110.11  908.75  110.65  908.56  115.45  906.81  117.27   906.3  124.08  900.14
   126.1  898.63  127.03  897.94  127.96  897.85  141.55  896.55  157.01   900.8
   164.7  902.92  167.31  903.76  168.38  904.11  171.28  904.64  172.13  904.75
  172.65  905.02  173.65  905.33  175.31  905.54  175.94  905.69  176.75  905.68
   180.6  905.74  183.33  906.02  185.06  905.87  188.36  905.68  203.19  906.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.27    .033  168.38     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.27  168.38          125.202  105.74  77.406             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 283.1181

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  925.17   10.77  920.52   31.24  917.18   33.66  916.97   49.82  914.67
   50.23  914.58   56.65  912.39   60.44  913.12   61.23  913.27   68.73  913.95
   73.06   913.9   75.63  913.89   78.56  914.02   79.91  914.08   81.13  914.14
   81.76  913.55   93.64   900.8   95.26  899.06   97.43  897.93  108.72     895
  109.66  895.02   123.8  898.19  134.02  900.47   134.3  900.54   137.8  901.24
  140.43  901.63  142.02   901.8   147.3   902.5   149.9  903.01  150.58  903.09
  151.16  903.18  152.01  903.22  152.32  903.36  153.29  903.61   153.7  903.63
  154.16  903.81  155.51  903.85  155.53  903.85  156.98  903.84  157.41  903.82
  158.42  903.71  158.75  903.38  160.28  903.17  161.03  903.24  184.01  903.91
  184.85  903.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   93.64    .033  134.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.64  134.02           96.688  106.49 101.506             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 176.6302

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  922.99     .21  922.97      45  917.07   68.19  913.98   81.65  912.14
   96.19   911.1   98.98  911.01   105.2  910.82  106.83  910.83  108.26  910.84
```

```
  109.53  910.84   110.7  910.85  112.82  910.85  113.82  910.86   114.7  910.86
  125.03  905.43  125.23  905.32  128.08  903.85  131.61  902.02  132.72  901.71
   146.3  897.65  147.36  897.62  151.72   897.5  151.99  897.47  152.85   897.3
  161.72  893.75  166.99  892.29  177.54  894.32  177.63  894.35   177.8  894.41
  177.93  894.45  178.27  894.57  178.55  894.67  178.97  894.81  179.07  894.85
  179.51     895  180.47  895.33   180.6  895.38  182.25  895.95  182.28  895.96
  182.35  895.98  183.96  896.54  184.96  896.89  185.79  897.17  186.15   897.3
   187.2  897.66  187.75  897.98  188.49   898.4   188.6  898.47  189.68  898.51
  191.15  898.55  194.59   898.5  197.45  898.68  198.32  898.75  198.85  898.68
  198.92  898.67  203.55  898.32  204.02  898.31  205.07  898.31   205.4   898.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  152.85    .033  186.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.85  186.15           68.689  114.34 141.027             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 62.28806

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  921.53     .09  921.52   34.63   916.7   46.19  915.11    57.1   910.9
   66.87  910.11   68.28  910.13   74.18  907.81   80.39  905.46   81.17  905.24
   92.09  903.24   99.03  901.96  104.87  900.28  106.69  899.71  112.03  897.71
  115.34  897.07  117.23  896.71  124.61  895.28  126.55  895.15  127.87  894.63
  134.17  893.83  143.28  892.68  149.02  891.93  149.79  891.81  150.83  892.42
  150.95  892.48  151.03  892.51  151.07  892.53  151.32  892.65  151.98  892.95
  158.69  896.03  163.65  898.32   163.9  898.49     165   899.2  166.05  899.13
  166.62  899.18  168.04  898.94  168.53  898.86  169.44  898.79  174.88  898.72
  176.05  898.71  177.64  898.72  179.33  898.68  185.77  898.68   186.7  898.67
  188.46  898.67  190.67  898.48     191  898.43  191.67  898.31  193.15  898.06
  196.08  898.08  197.09  898.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  126.55    .033  158.69     .06
```

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.55	158.69	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Stream

Reach	River Sta.	n1	n2	n3
Reach	1884.237	.06	.033	.06
Reach	1779.593	.06	.033	.06
Reach	1600.512	.06	.033	.06
Reach	1461.160	.06	.033	.06
Reach	1258.927	.06	.033	.06
Reach	1182.848	.06	.033	.06
Reach	1092.190	.06	.033	.06
Reach	873.8912	.06	.033	.06
Reach	762.3889	.06	.033	.06
Reach	626.3436	.03	.04	.03
Reach	592	Bridge		
Reach	558.3685	.03	.04	.03
Reach	388.8611	.06	.033	.06
Reach	283.1181	.06	.033	.06
Reach	176.6302	.06	.033	.06
Reach	62.28806	.06	.033	.06

SUMMARY OF REACH LENGTHS

River: Stream

Reach	River Sta.	Left	Channel	Right
Reach	1884.237	87.263	104.64	99.362
Reach	1779.593	46.246	179.08	62.301
Reach	1600.512	107.579	139.35	11.829
Reach	1461.160	92.336	202.23	11.941
Reach	1258.927	24.845	76.08	70.24
Reach	1182.848	54.037	90.657	97.318
Reach	1092.190	168.653	218.3	59.293

Reach	873.8912	117.307	111.5	132.136
Reach	762.3889	119.463	136.05	84.365
Reach	626.3436	101.327	67.98	66.819
Reach	592	Bridge		
Reach	558.3685	120.462	169.51	196.87
Reach	388.8611	125.202	105.74	77.406
Reach	283.1181	96.688	106.49	101.506
Reach	176.6302	68.689	114.34	141.027
Reach	62.28806	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Stream

Reach	River Sta.	Contr.	Expan.
Reach	1884.237	.1	.3
Reach	1779.593	.1	.3
Reach	1600.512	.1	.3
Reach	1461.160	.1	.3
Reach	1258.927	.1	.3
Reach	1182.848	.1	.3
Reach	1092.190	.1	.3
Reach	873.8912	.1	.3
Reach	762.3889	.1	.3
Reach	626.3436	.3	.5
Reach	592	Bridge	
Reach	558.3685	.3	.5
Reach	388.8611	.1	.3
Reach	283.1181	.1	.3
Reach	176.6302	.1	.3
Reach	62.28806	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl

Reach	1884.237	4% AEP	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	1% AEP	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1779.593	4% AEP	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	1% AEP	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1600.512	4% AEP	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	1% AEP	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42
Reach	1461.160	4% AEP	539.00	906.95	911.59	911.59	912.30	0.010237	7.65	106.98	79.10	0.88
Reach	1461.160	1% AEP	787.00	906.95	912.03	912.03	912.87	0.010595	8.56	143.59	85.32	0.91
Reach	1258.927	4% AEP	539.00	904.54	908.33		909.02	0.007901	6.62	81.79	38.63	0.79
Reach	1258.927	1% AEP	787.00	904.54	909.00		909.84	0.007181	7.38	108.61	42.80	0.78
Reach	1182.848	4% AEP	539.00	904.36	907.63		908.37	0.008984	6.89	78.24	37.01	0.84
Reach	1182.848	1% AEP	787.00	904.36	908.02	907.96	909.13	0.011579	8.44	93.21	39.23	0.97
Reach	1092.190	4% AEP	539.00	902.72	906.67	906.67	907.42	0.012378	7.07	83.51	62.75	0.95
Reach	1092.190	1% AEP	787.00	902.72	907.13	907.13	908.04	0.011464	7.85	113.44	65.62	0.95

Reach	873.8912	4% AEP	539.00	901.28	904.02	903.89	904.79	0.010849	7.01	76.90
40.85	0.90									
Reach	873.8912	1% AEP	787.00	901.28	904.91		905.65	0.006805	6.90	114.11
43.16	0.75									
Reach	762.3889	4% AEP	539.00	898.82	903.66		904.05	0.003388	5.30	133.85
116.86	0.54									
Reach	762.3889	1% AEP	787.00	898.82	904.89		905.17	0.001685	4.72	241.35
134.59	0.41									
Reach	626.3436	4% AEP	539.00	897.94	902.96	901.57	903.52	0.004274	5.99	89.93
45.86	0.53									
Reach	626.3436	1% AEP	787.00	897.94	904.06	902.32	904.79	0.004051	6.86	114.69
52.01	0.54									
Reach	592		Bridge							
Reach	558.3685	4% AEP	539.00	897.48	901.72		902.28	0.004635	6.02	89.47
33.90	0.55									
Reach	558.3685	1% AEP	787.00	897.48	902.47		903.31	0.005404	7.34	107.22
34.42	0.61									
Reach	388.8611	4% AEP	539.00	896.55	900.28	899.99	901.13	0.009153	7.38	73.01
31.19	0.85									
Reach	388.8611	1% AEP	787.00	896.55	900.88	900.67	902.00	0.010015	8.50	92.54
34.03	0.91									
Reach	283.1181	4% AEP	539.00	895.00	898.88	898.88	899.95	0.013275	8.27	65.15
31.32	1.01									
Reach	283.1181	1% AEP	787.00	895.00	899.56	899.56	900.81	0.012377	8.98	87.64
35.15	1.00									
Reach	176.6302	4% AEP	539.00	892.29	896.80	896.32	897.55	0.007435	6.99	77.16
30.58	0.78									
Reach	176.6302	1% AEP	787.00	892.29	897.44	897.03	898.44	0.008048	8.04	97.98
34.41	0.83									

Reach	62.28806	4% AEP	539.00	891.81	895.81	895.55	896.63	0.008806	7.26	75.82
36.34	0.84									
Reach	62.28806	1% AEP	787.00	891.81	896.40	896.19	897.47	0.008813	8.36	98.56
40.67	0.87									

COMPASS
INFRASTRUCTURE GROUP

Hydrology and Hydraulics Report

FAI/LIC-70-0.00/0.00

PID 96808

Rehabilitation/Replacement of FAI-TR219-00.044 Bridge

June 2023

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Executive Summary

This study was conducted to determine the potential impacts of rehabilitating or replacing the existing box culvert on Taylor Road over Tributary to Blacklick Creek in Fairfield County, OH located within the City of Reynoldsburg and Violet Township corporation limits. The existing structure is programmed to be replaced as part of the construction of a new interchange of Taylor Road at IR 70. Taylor Road will be shifted to the east and will cross over IR 70. This report has been prepared to provide the required hydrologic and hydraulic data for review of the data and analysis.

The intent of this project is to rehabilitate or replace the bridge while causing no adverse effects on existing flooding conditions or surrounding properties and to provide a bridge with a low chord that clears the water surface profile of the design year (4% AEP) event and confirm the structure will carry the 1% AEP discharge without causing property damage.

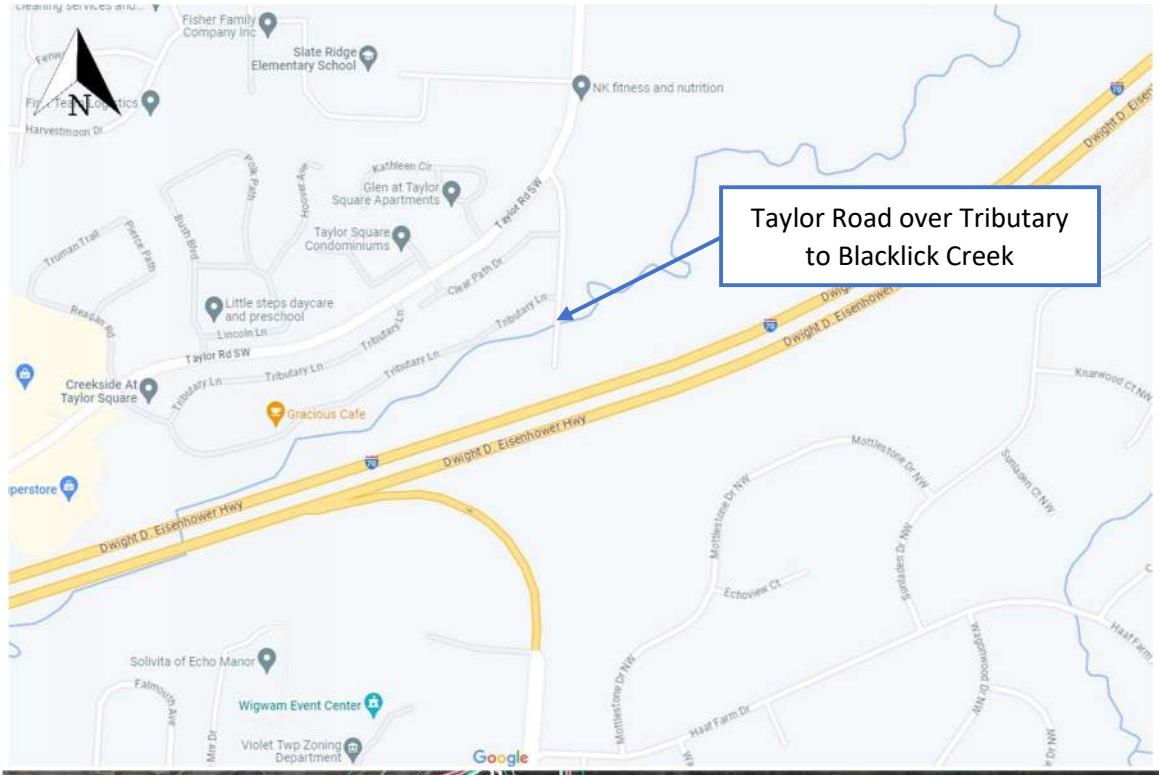
Two options were considered. Herein those options are referred to as:

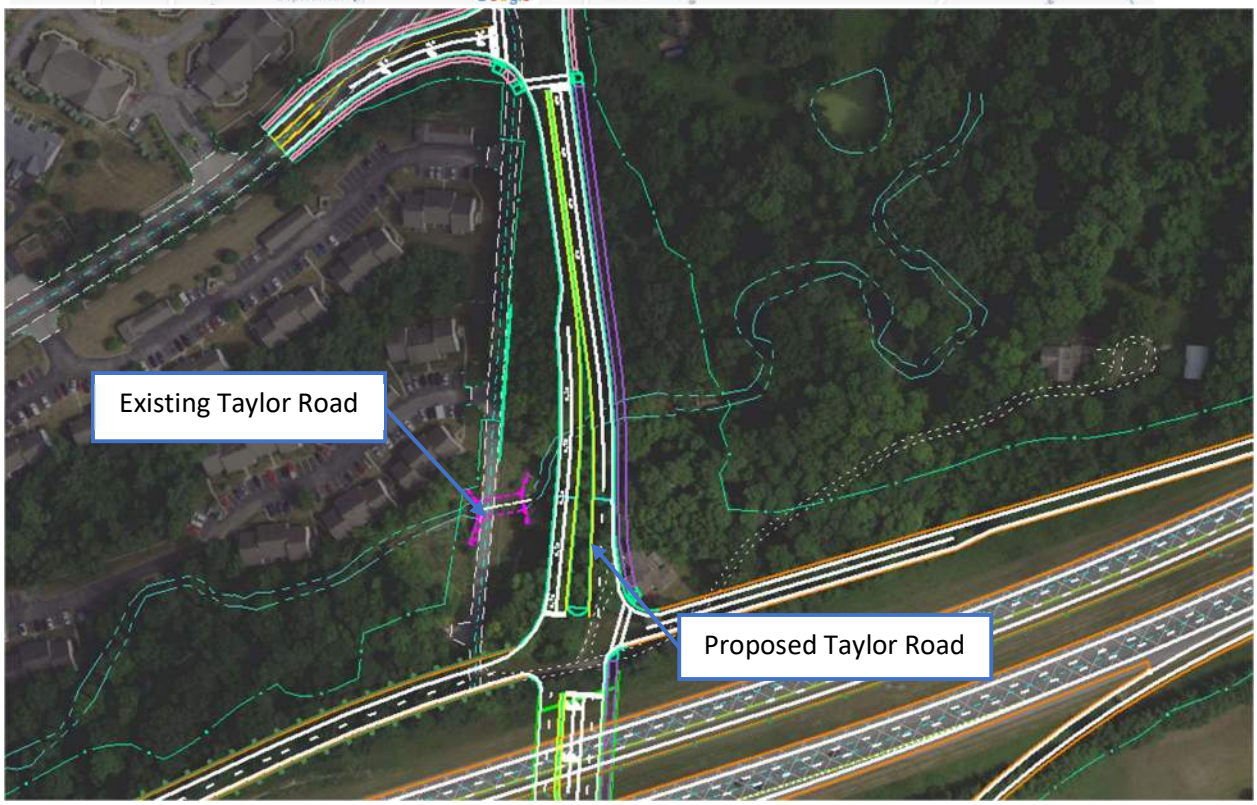
1. Box Culvert Replacement
2. Proposed Bridge

A 1-D analysis approach was implemented using HEC-RAS. The hydraulic analysis for all proposed options indicates no significant change to the downstream or upstream section water surface elevations.

Scour and Temporary Access Fill calculations were not performed as a part of this analysis and will be performed in subsequent design tasks after a preferred option is selected.

Location Map





Project Background

This project involves the hydraulic analysis for the replacement of the Taylor Road Culvert over Tributary to Blacklick Creek as a part of the proposed project to add an interchange to Taylor Road at IR 70. The horizontal alignment of Taylor Road will be moved to the east and the roadway profile grade will be raised to pass over IR 70. The existing structure is a 60' long, 20' span x 10' rise precast four-sided box culvert carrying a 16'± roadway on 6.0' minimum embankment. Taylor Road has a tangent alignment, and the existing culvert has a 13˚ right forward skew. Two proposed options were analyzed as a part of this study:

- Option 1: New 300' Culvert
- Option 2: Removing the existing culvert and constructing a new 3-span bridge under the proposed alignment of Taylor Road

The proposed bridge site plan and photos of existing site conditions are located in Appendix A.

The Project is located within the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) Zone X, Area of Minimal Flood Hazard as shown on Flood Insurance Rate Map 3949C0359K, included in Appendix B.

Hydrologic Analysis

Per LDv2 Section 1004.2, the 4% Annual Exceedance Probability (AEP) storm event was used as the design storm based on the 2050 design year ADT of 36,680 vehicles per day. The analysis was also performed using the 1% AEP storm event. There are no buildings located within the 1% AEP storm floodplain. The design storm for scour will be the 4% AEP storm and the check storm for scour is the 2% AEP storm. Scour calculations will be performed in subsequent design tasks after the preferred option has been selected and geotechnical borings have been performed. The drainage area of the Tributary to Blacklick Creek at the bridge is approximately 1.88 square miles. Flows for Tributary to Blacklick Creek were taken from a hydrologic analysis completed using StreamStats, a service provided by USGS. The peak discharges for Tributary to Blacklick Creek can be found in Table 1. The full StreamStats report can be found in Appendix C.

Table 1 – Tributary to Blacklick Creek Peak Discharge Rates

Storm	Peak Discharge (cfs)
4% AEP	539
2% AEP	659
1% AEP	787

The Manning's roughness coefficients were set based on the aerial photography, site photographs, and the information from the HEC-RAS Hydraulic Reference tables defining roughness coefficients. Table 2 shows the Manning's roughness coefficients selected for this study along with channel and overbank descriptions per Table 3-1 of the HEC-RAS Hydraulic Reference Manual.

Table 2 – Manning's roughness coefficients		
Location	Manning's Roughness Coefficient	Land Cover
Main Channel	0.033	Clean, straight, full, no rifts or deep pools, minimal sandbars and grass
	0.040	Clean, straight, full, no rifts or deep pools, moderate sandbars and grass
Overbanks	0.03	Cleared land with tree stumps, no sprouts
	0.033	Dry rubble or riprap
	0.04	Cleared land with tree stumps, no sprouts
	0.05	Cleared land with stumps, minimum heavy sprouts
	0.06	Cleared land with stumps, moderate heavy sprouts

Hydraulic Analysis

Hydraulic analysis was performed using HEC-RAS Version 6.3.1. The existing model was created using survey data supplemented by ground elevations from LIDAR, obtained from The Ohio Geographically Referenced Information Program (OGRIP) to further define the overbanks. The analysis included 1200' upstream and 500' downstream from existing the culvert with cross sections cut approximately every 100'. The extra distance upstream was to accommodate comparative cross sections between this model and the proposed options. A total of 15 cross sections were used for the existing model. The flow line and bank stations were set based on survey data and aerial photography. An aerial plan showing the cross-section locations can be found in Appendix D.

The existing box culvert geometry was added into the model based on record plans and confirmed by ground survey. The reach boundary condition for the Tributary to Blacklick Creek was set to use a normal depth boundary condition for both upstream and downstream, with the slope set to 0.0088 ft/ft for both. This was determined from calculations using information from the ground survey.

Two Proposed Conditions models were developed:

1. Box Culvert Replacement: Downstream bridge cross section location remains the same. Three existing cross sections were removed where they conflicted with the proposed extended length, and one cross section was added at the upstream face of the proposed culvert. The culvert length was increased from 60' to 300' to account for the fill beneath the proposed Taylor Road alignment. The proposed four-sided box culvert has a span of 20' and a rise of 10', and the bottom elevation is set to accommodate the thalweg at the proposed inlet. The inlet was depressed 1' below the thalweg to allow the channel to fill in naturally. The inlet section was modified from the existing surveyed channel to accommodate for construction area and regrading in front of wingwalls. Additionally, the roadway high chord elevation for the upstream and downstream bridge sections was adjusted to match the proposed raised profile of Taylor Road.

2. Proposed Bridge: The existing box culvert was removed from the model. Two existing cross sections were removed where they conflicted with the proposed bridge and a cross section was added at the upstream and downstream face of the proposed bridge. The proposed 3-span (104', 124', 84' with respect to the reference chord), variable width bridge with stub abutments and 2:1 spill through slopes was then added to the model. The roadway high chord elevations were entered based on the proposed profile of Taylor Road. An estimated superstructure depth of 4.5' was used to calculate the proposed low chord elevations. For further discussion of the bridge alternative, please refer to the Structure Type Study report.

HEC-RAS Results

A total of three HEC-RAS models were analyzed for the purpose of this study: Existing Conditions Model, Culvert Replacement Model (Option 1), and Proposed Bridge Model (Option 2). Table 3 compares headwater elevations for the Existing and Post Project Conditions models for the 4% AEP storm. Table 4 compares headwater elevations for the Existing and Post Project Conditions models for the 1% AEP storm. Detailed results can be found in Appendixes E, F, and G.

Table 3 – Existing and Post Project Conditions 4% AEP Storm Headwater Elevation

Section	Existing	Culvert Replacement		Proposed Bridge	
	Elevation	Elevation	Variance (ft)	Elevation	Elevation
1884.237	914.95	914.95	0.00	914.95	0.00
1779.593	913.45	913.45	0.00	913.45	0.00
1600.512	912.60	912.60	0.00	912.60	0.00
1461.160	911.59	911.59	0.00	911.59	0.00
1258.927	908.33	908.34	0.01	908.34	0.01
1182.848	907.63	907.62	-0.01	907.62	-0.01
1092.190	906.67	906.68	0.01	906.68	0.01
895.4649	-	905.19	N/A	-	N/A
873.8912	904.02	Bridge	N/A	904.31	0.29
814.2176	-		N/A	903.92	N/A
762.3889	903.66		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	902.19	N/A
626.3436	902.96		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	901.72	901.70	-0.02	901.61	-0.11
388.8611	900.28	900.28	0.00	900.28	0.00
283.1181	898.88	898.88	0.00	898.88	0.00
176.6302	896.80	896.80	0.00	896.80	0.00
62.28806	895.81	895.81	0.00	895.81	0.00

Table 4 – Existing and Post Project Conditions 1% AEP Storm Headwater Elevation					
Section	Existing	Culvert Replacement		Proposed Bridge	
	Elevation	Elevation	Variance (ft)	Elevation	Variance (ft)
1884.237	915.63	915.63	0.00	915.63	0.00
1779.593	914.79	914.79	0.00	914.79	0.00
1600.512	913.12	913.12	0.00	913.12	0.00
1461.160	912.03	912.03	0.00	912.03	0.00
1258.927	909.00	909.00	0.00	909.00	0.00
1182.848	908.02	908.02	0.00	908.02	0.00
1092.190	907.13	907.13	0.00	907.13	0.00
895.4649	-	906.38	N/A	-	N/A
873.8912	904.91	Bridge	N/A	904.97	0.06
814.2176	-		N/A	904.64	N/A
762.3889	904.89		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	903.11	N/A
626.3436	904.06		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	902.47	902.48	0.01	902.38	-0.09
388.8611	900.88	900.88	0.00	900.88	0.00
283.1181	899.56	899.56	0.00	899.56	0.00
176.6302	897.44	897.44	0.00	897.44	0.00
62.28806	896.40	896.40	0.00	896.40	0.00

For Option 1, water surface elevations are within a couple hundredths of the existing model for both the 4% AEP and 1% AEP storm events. For Option 2, there is a 0.29’ and 0.06’ rise upstream of the proposed bridge for the 4% AEP storm event and 1% AEP storm events, respectively. If the bridge model is chosen, the proposed stream realignment beneath the structure can be updated to accommodate this localized rise. Water surface elevations downstream of the bridge are lowered by approximately 0.1’ for both storm events.

Tables 5 and 6 compare the velocities for the Existing and Post Project Conditions models for the 4% AEP and 1% AEP storms, respectively.

Table 5 – Existing and Post Project Conditions 4% AEP Storm Velocity

Section	Existing	Culvert Replacement		Proposed Bridge	
	Velocity (ft/s)	Velocity (ft/s)	Variance (ft/s)	Velocity (ft/s)	Variance (ft/s)
1884.237	3.83	3.83	0.00	3.83	0.00
1779.593	8.68	8.68	0.00	8.68	0.00
1600.512	3.66	3.66	0.00	3.66	0.00
1461.160	7.65	7.65	0.00	7.65	0.00
1258.927	6.62	6.61	-0.01	6.61	-0.01
1182.848	6.89	6.93	0.04	6.93	0.04
1092.190	7.07	7.01	-0.06	7.00	-0.07
895.4649	-	5.60	N/A	-	N/A
873.8912	7.01	Bridge	N/A	6.09	-0.92
814.2176	-		N/A	5.97	N/A
762.3889	5.30		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	2.80	N/A
626.3436	5.99		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	6.02	5.58	-0.44	5.28	-0.74
388.8611	7.38	7.38	0.00	7.38	0.00
283.1181	8.27	8.27	0.00	8.27	0.00
176.6302	6.99	6.99	0.00	6.99	0.00
62.28806	7.26	7.26	0.00	7.26	0.00

Table 6 – Existing and Post Project Conditions 1% AEP Storm Velocity					
Section	Existing	Culvert Replacement		Proposed Bridge	
	Velocity (ft/s)	Velocity (ft/s)	Variance (ft/s)	Velocity (ft/s)	Variance (ft/s)
1884.237	4.12	4.12	0.00	4.12	0.00
1779.593	7.12	7.12	0.00	7.12	0.00
1600.512	4.31	4.31	0.00	4.31	0.00
1461.160	8.56	8.56	0.00	8.56	0.00
1258.927	7.38	7.38	0.00	7.38	0.00
1182.848	8.44	8.44	0.00	8.44	0.00
1092.190	7.85	7.85	0.00	7.85	0.00
895.4649	-	6.30	N/A	-	N/A
873.8912	6.90	Bridge	N/A	6.73	-0.17
814.2176	-		N/A	6.44	N/A
762.3889	4.72		N/A	-	N/A
744	-		N/A	Bridge	N/A
673.0105	-		N/A	3.12	N/A
626.3436	6.86		N/A	-	N/A
592	Bridge		N/A	-	N/A
558.3685	7.34	6.83	-0.51	6.11	-1.23
388.8611	8.50	8.50	0.00	8.50	0.00
283.1181	8.98	8.98	0.00	8.98	0.00
176.6302	8.04	8.04	0.00	8.04	0.00
62.28806	8.36	8.36	0.00	8.36	0.00

Velocities decrease or remain the same at all cross sections for the 4% AEP storm event except for cross section 1182.848 which has an increase of 0.04 ft/s for both options. Velocities decrease or remain the same at all cross sections for both options for the 1% AEP storm event.

Table 7 compares the existing and post project waterway opening along with the structure low chord elevations and the design (4% AEP) and check (1% AEP) storm flood clearances.

Table 7 – Waterway Opening Comparison				
Model	Waterway Opening (ft^2)	Upstream Low Chord	4% AEP Storm clearance (ft)	1% AEP Storm clearance (ft)
Existing	165.41	907.28	5.42	4.60
Box Culvert Replacement	180.00	910.19	6.20	5.40
Proposed Bridge	9007.78	943	39.08	38.36

The waterway opening is slightly increased for the proposed culvert compared to the existing model due to some clearing of the channel. The waterway opening significantly increased for bridge replacement compared to the existing model. The new culvert provides adequate freeboard to the 4% AEP and 1% AEP storms.

Conclusion and Recommendations

The two proposed bridge options meet the requirements of the scope document and ODOT LDv2. The proposed conditions for both bridge options allow conveyance of both the design storm (4% AEP) and 1% AEP storm discharge below the proposed low chord. Though there is a localized rise of less than 1 inch in water surface elevations for both storm events, this rise will not negatively impact any residential structures near the site as all structures are outside the 1% AEP floodplain. This rise resolves itself in 534 ft for the 4% AEP and within 170 ft in the 1% AEP storm event. The elevation of the proposed profile grade of Taylor Road (around 951.50) is well above the 1% AEP storm event water surface elevation (906.38) so there is no danger of roadway overtopping.

Option 1 is recommended to be selected for detailed design as it is the most cost effective option which meets hydraulic criteria.

For further discussion of the Options, please see the Structure Type Study Report.

Appendices

APPENDIX A – Proposed Site Plans & Photos

Figure 1: Upstream channel

Figure 2: Downstream channel

Figure 3: Upstream bridge face

Figure 4: Downstream bridge face

APPENDIX B – Flood Insurance Rate Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane South Zone 5001 (FIPSZONE 3402). The **horizontal datum** was NAD83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Franklin County and the Fairfield County, Ohio GIS Department. This information was produced at scales of 1:1,200 and 1:12,000 respectively from aerial photography dated 2000 or later, and from USGS digital orthophoto quadrangles dated 1998 or later.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

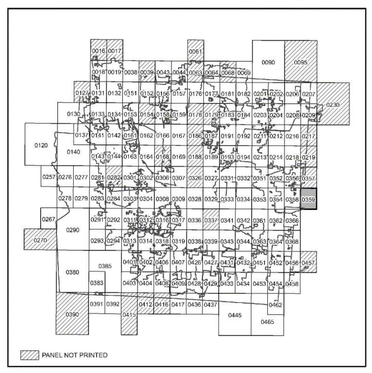
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

PANEL INDEX



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100 year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently deaertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside of the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 10)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
85° 03' 45.0", 41° 24' 22.5"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4587000 M	1000-meter Universal Transverse Mercator grid values, zone 17
2250000 FT	5000-foot grid ticks: Ohio State Plane South Coordinate System, 5001 Zone (FIPSZONE 3402) Lambert Conformal Conic
KA0015	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
AUGUST 2, 1995
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
7/16/1997
4/21/1999
3/16/2004
9/19/2007

June 17, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0359K

FIRM
FLOOD INSURANCE RATE MAP
FRANKLIN COUNTY, OHIO
AND INCORPORATED AREAS

PANEL 359 OF 465

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FRANKLIN COUNTY	390167	0359	K
REYNOLDSBURG, CITY OF	390177	0359	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
39049C0359K

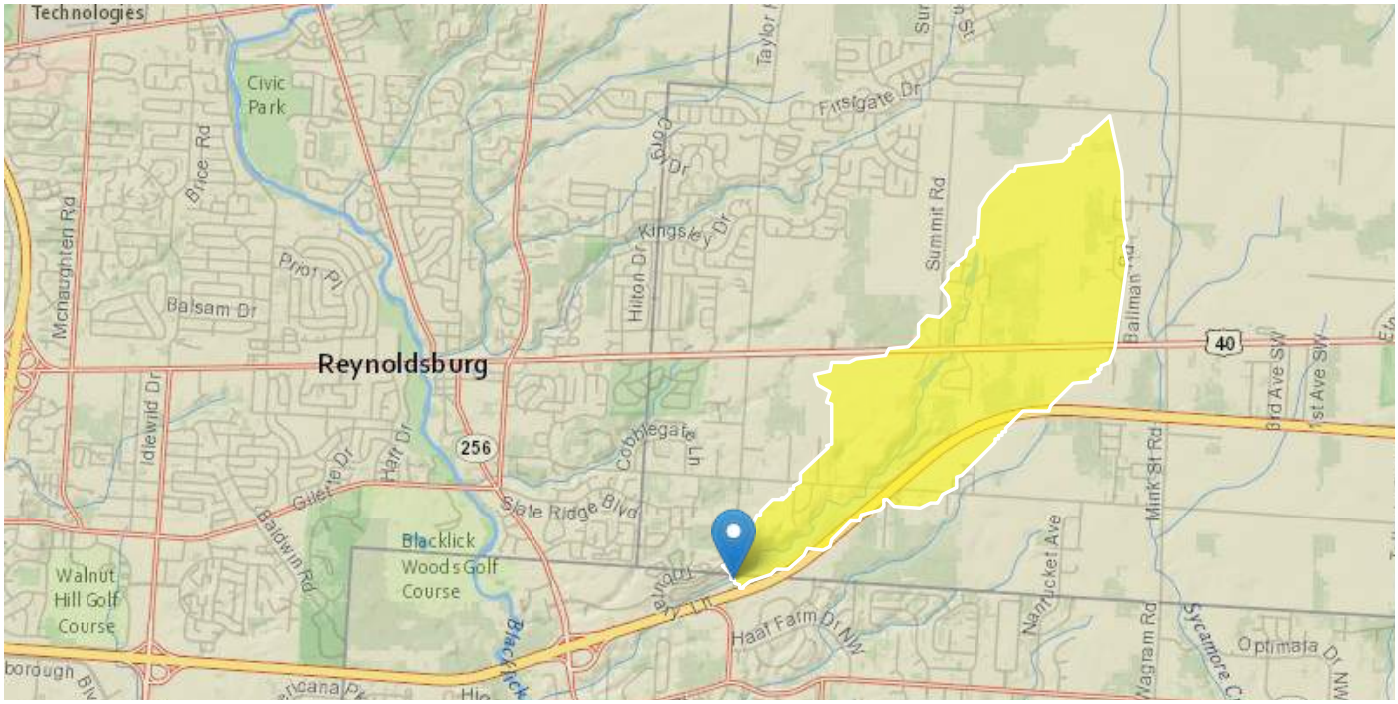
MAP REVISED
JUNE 17, 2008

Federal Emergency Management Agency

APPENDIX C – Taylor Road StreamStats

Taylor Road Report Stream Stats

Region ID: OH
Workspace ID: OH20230405195718403000
Clicked Point (Latitude, Longitude): 39.93881, -82.77293
Time: 2023-04-05 15:57:39 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	350536.8	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	4424313.2	meters
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	46.5	feet per mi
DRNAREA	Area that drains to a point on a stream	1.88	square miles
FOREST	Percentage of area covered by forest	25.5	percent
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	35.7	percent

Parameter Code	Parameter Description	Value	Unit
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	8.45	percent
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	1.47	percent
LFPLENGTH	Length of longest flow path	3.77	miles
LONG_CENT	Longitude Basin Centroid	82.7498	decimal degrees
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.54	dimensionless

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	46.5	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	25.35

Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	169	ft^3/s	89.4	319	40.1
20-percent AEP flood	295	ft^3/s	163	534	37.2
10-percent AEP flood	395	ft^3/s	217	719	37.6
4-percent AEP flood	539	ft^3/s	294	988	38.1
2-percent AEP flood	659	ft^3/s	356	1220	37.8
1-percent AEP flood	787	ft^3/s	420	1470	39.6
0.2-percent AEP flood	1120	ft^3/s	592	2120	40.3

Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
1 Day 10 Year Low Flow	0.0312	ft^3/s	53.1
7 Day 10 Year Low Flow	0.0393	ft^3/s	40
30 Day 10 Year Low Flow	0.06	ft^3/s	35.7
90 Day 10 Year Low Flow	0.0908	ft^3/s	29.8

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
80 Percent Duration	0.184	ft^3/s	29.1

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2

Annual Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	1.86	ft^3/s	11.4	11.4

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Monthly Flow Statistics

Monthly Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2
FOREST	Percent Forest	25.5	percent	0	99.1

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Monthly Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
January Mean Flow	2.76	ft^3/s	16.6	16.6
February Mean Flow	3.41	ft^3/s	11.9	11.9
March Mean Flow	3.79	ft^3/s	14	14
April Mean Flow	3.52	ft^3/s	11.2	11.2
May Mean Flow	2.35	ft^3/s	19.5	19.5
June Mean Flow	1.46	ft^3/s	27	27
July Mean Flow	0.828	ft^3/s	28.2	28.2
August Mean Flow	0.606	ft^3/s	36.8	36.8
September Mean Flow	0.39	ft^3/s	43.6	43.6
October Mean Flow	0.386	ft^3/s	50.8	50.8
November Mean Flow	0.884	ft^3/s	37.5	37.5
December Mean Flow	1.92	ft^3/s	21.8	21.8

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

General Flow Statistics

General Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2

General Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.31	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Flow Percentile Statistics

Flow Percentile Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
LONG_CENT	Longitude of Basin Centroid	82.7498	decimal degrees	80.53	84.6

Flow Percentile Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
25th Percentile Flow	0.512	ft^3/s	29.2	29.2
50th Percentile Flow Median	1.06	ft^3/s	40.3	40.3
75th Percentile Flow	2.26	ft^3/s	47.9	47.9

Flow Percentile Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources

Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Bankfull Statistics

Bankfull Statistics Parameters [Interior Plains D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.19305	59927.7393

Bankfull Statistics Parameters [Central Lowland P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.200772	59927.66594

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Interior Plains D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	14.6	ft
Bieger_D_channel_depth	1.69	ft
Bieger_D_channel_cross_sectional_area	29.1	ft^2

Bankfull Statistics Flow Report [Central Lowland P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	16.7	ft
Bieger_P_channel_depth	2.06	ft
Bieger_P_channel_cross_sectional_area	27.9	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	15.5	ft
Bieger_USA_channel_depth	1.38	ft
Bieger_USA_channel_cross_sectional_area	24	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	14.6	ft
Bieger_D_channel_depth	1.69	ft
Bieger_D_channel_cross_sectional_area	29.1	ft^2
Bieger_P_channel_width	16.7	ft
Bieger_P_channel_depth	2.06	ft
Bieger_P_channel_cross_sectional_area	27.9	ft^2
Bieger_USA_channel_width	15.5	ft
Bieger_USA_channel_depth	1.38	ft
Bieger_USA_channel_cross_sectional_area	24	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDF

Probability Statistics

Probability Statistics Parameters [P zero Flow 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Probability Statistics Flow Report [P zero Flow 2012 5138]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PC
Probability zero flow 1Day	0.0288	dim	91
Probability zero flow 7Day	0.0122	dim	94
Probability zero flow 30Day	0.000505	dim	97

Probability Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 6]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	11500	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

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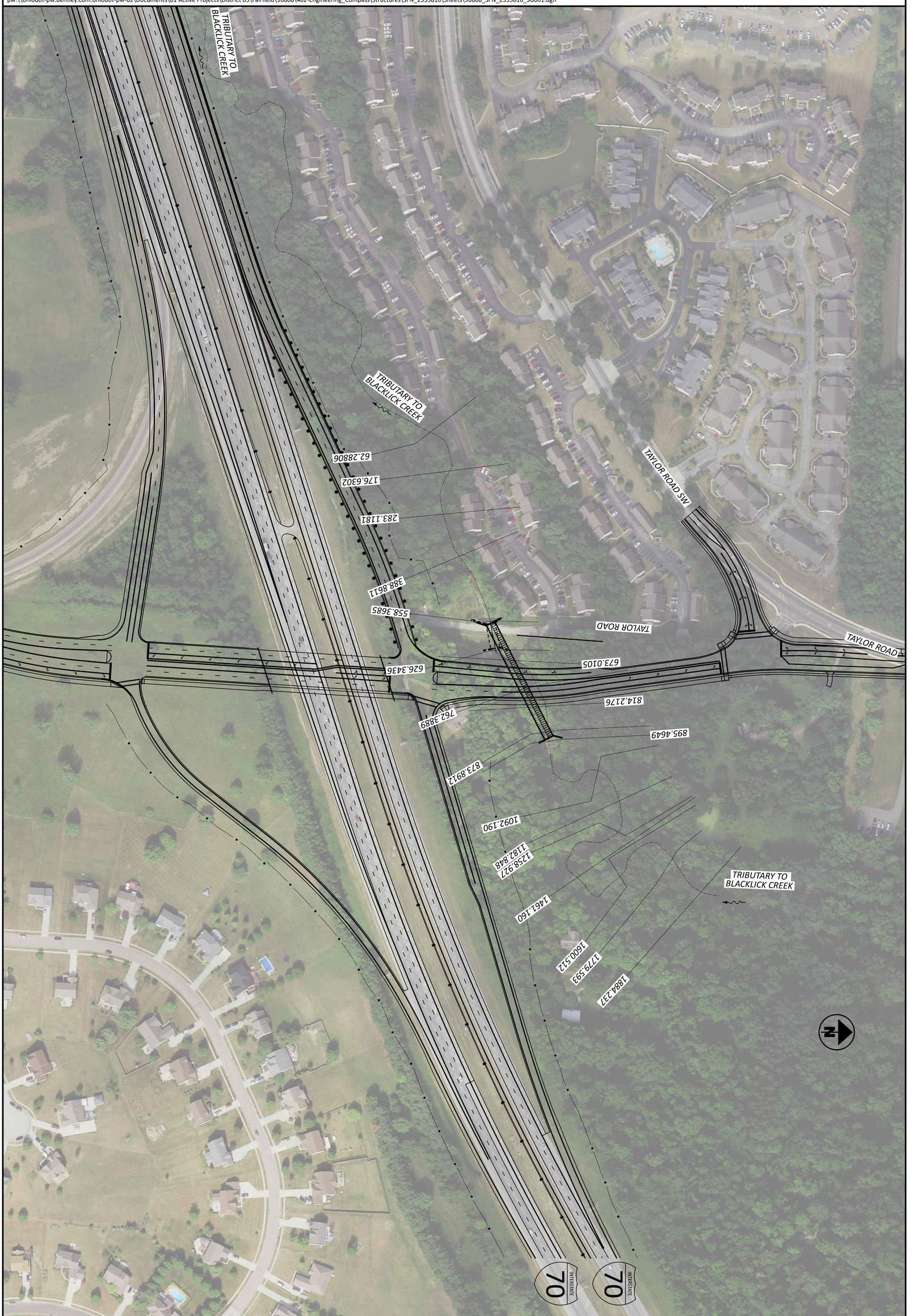
USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.14.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

APPENDIX D – Hydraulic Cross Section Locations

FAR/LIC-70-0.00/0.00

MODEL: Sheet PAPERSIZE: 34x22 (in.) DATE: 6/8/2023 TIME: 1:44:54 PM USER: jkoesel
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 05\Fairfield\96808\402-Engineering_Compass\Structures\SFN_2335816\Sheets\96808_SFN_2335816_SG001.dgn



SHEET 1 TOTAL 1	SUBSET 1 TOTAL 1	PROJECT ID 96808	REVIEWER XXX MM-DD-YY	DESIGNER JFK/JAF CHECKER ERK	COMPASS MANUFACTURING GROUP	DESIGN AGENCY	SFN 2335816

HYDRAULIC CROSS SECTION LOCATIONS
BRIDGE NO. FAI-TR219-00.044
TAYLOR ROAD OVER TRIBUTARY TO BLACKLICK CREEK

APPENDIX E – HEC-RAS Output for Existing Model

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Trib Blacklick
Project File : TribBlacklick.prj
Run Date and Time: 6/14/2023 10:18:34 AM

Project in English units

PLAN DATA

Plan Title: Existing Plan
Plan File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.p01

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

Flow Title : TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Plan Summary Information:
Number of: Cross Sections = 15 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
    Water surface calculation tolerance = 0.01
    Critical depth calculation tolerance = 0.01
    Maximum number of iterations   = 20
    Maximum difference tolerance   = 0.3
    Flow tolerance factor   = 0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method: Average Conveyance
    Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Flow Data (cfs)

River	Reach	RS	50% AEP	20% AEP	10% AEP	4% AEP	2% AEP	1% AEP
Stream	Reach	1884.237	169	295	395	539	659	787

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Stream	Reach	50% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	20% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	10% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	4% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	2% AEP	Normal S = 0.0088	Normal S = 0.0088

GEOMETRY DATA

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1884.237

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	954.51	6.41	954.48	17.41	954.73	18.99	954.45	27.9	952.39
36.66	945.28	52.98	937.21	76.89	926.06	99.4	915.71	102.77	914.92
117.69	914.8	136.02	914.71	142.43	914.82	183.72	915.41	193.3	915.34
227.53	915.53	231.92	915.56	234.91	915.58	236.64	915.61	238.43	913.74
240.12	912.72	246.48	911.81	247.32	911.71	249.73	911.42	262.99	910.26
268.87	912.33	274.02	913.52	274.06	913.53	278.11	913.51	280.36	913.5
283.43	913.49	288.14	913.89	288.86	914.04	291.79	914.65	293.23	914.88
301.84	915.07	309.5	915.16	328.02	915.36	336.06	915.69	347.49	917.8
358.9	919.32	367.24	920.36	371.88	920.96	390.48	923.58	390.55	923.58
402.92	926								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	236.64	.033	293.23	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
236.64	293.23	87.263	104.64	99.362	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1779.593

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.76	12.71	953.07	15.1	952.62	28.18	947.8	46.85	937.41

```
   56.01  933.08   76.47   919.3   82.95  917.36   94.52  914.82  109.53  914.84
  124.72  914.62  130.42  914.46  167.75  914.29  176.28  913.96   180.3  914.21
  206.69  914.43   213.1  914.45  228.82   914.6  246.52  914.15  261.09  913.77
  261.34  913.77  261.55  913.65  263.01  912.64  264.49  911.62  273.26  910.72
  279.37  909.95  281.59  909.61  285.86  912.21  295.21  916.53  296.28  917.02
  297.43   917.7  298.19  918.14  298.72  918.13   302.9   918.3  305.46  918.39
   306.4  918.43  308.56  919.07  321.57  922.79  326.12  924.08  326.71  924.09
  333.97  924.23  334.08  924.22  334.18  924.21  334.84  924.16  335.45  924.13
  335.98  924.09  336.76  924.06  337.45  924.02  338.37     924  339.17  923.97
  340.22  923.97  341.57  924.02  342.67     924  344.16  924.07  345.61  924.14
  347.09  924.15  375.25  924.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  261.09    .033  295.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        261.09  295.21           46.246  179.08  62.301             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1600.512

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.31    4.83  955.12    10.3  954.82   10.49  954.79   12.44  954.27
   27.28  950.49   32.66  948.56   50.57  939.06    76.9  920.79   76.97  920.73
   77.04  920.69   77.23  920.58   77.33  920.55   92.86  915.08    97.3  914.54
   98.04  914.32  100.41  913.13   103.5  912.95  125.46  912.09   135.3  912.54
  143.89  913.16  147.52  913.04  149.13   912.9  153.15   912.3  157.42  911.67
  159.22  911.63  162.96  911.35  166.09  911.12  166.58  910.96  171.56  911.22
  172.86   911.3  178.65  911.65  181.26  910.34  183.78  909.49   187.7  907.58
  195.36  908.98  198.32  909.31  200.52  909.52  203.12  909.67  214.83  910.38
  222.44  910.84   223.1  910.89  224.64  911.17   229.5  912.52  236.98   912.6
  240.38  912.97  252.23  913.23  256.85  913.24  284.12  913.52  292.99  913.53
  300.66  913.33  304.23  913.24  330.58  913.88  330.81  913.94  332.76  914.23
  333.95  914.46   337.1     915  341.58  915.77  363.46  920.07  366.71  920.38
  376.25  921.08   383.7   920.8  389.19   920.8  390.64  920.84  413.78  920.82
  417.16  920.44  420.58  920.54  433.23  922.75  437.09  923.28  442.48     924
  447.71  924.96  458.58  925.64  468.93  926.02  474.21     926
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  178.65    .033   229.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.65   229.5          107.579  139.35  11.829             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1461.160

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.81    3.57  953.64   11.36  953.09   14.36  952.71   48.21  927.92
   53.89  923.77    63.8   917.2   79.26  906.95   89.12   909.8   92.93  910.98
   94.97  910.96  104.28   910.9  105.14  910.87  120.27  910.31  132.24  910.05
  165.25   912.7  168.09  913.02  173.83  913.14  185.32  913.16  199.92   913.3
  219.67  913.29   224.9  913.15  227.29  913.08  229.73  913.01  232.19  912.95
  245.18  913.13  246.82  913.08  248.56  913.06   250.4  913.09  252.32  913.17
  254.24  913.32  255.82  913.49  257.27  913.68  258.54  913.87  270.59  916.21
  272.67  916.56   275.6  917.07   289.3  919.77  296.03  920.42   299.8  920.55
  305.56   920.9  317.24  920.91  326.67  921.16  338.59  921.17   347.9  920.14
  356.73  920.37  357.38   920.4  357.67  920.47  358.83  920.61     383  924.95
  394.25  925.64  409.27  926.83  411.95  926.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    63.8    .033   94.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          63.8   94.97          92.336  202.23  11.941             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1258.927

INPUT
```

Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.43	6.46	950.96	9.86	950.6	19.08	949.85	35.36	943.09
38.43	941.82	47.71	936.33	58.08	930.28	59.67	929.41	62.77	927.72
78.09	919.53	84.28	916.93	93.45	913.65	95.23	913.44	96.27	913.36
102.11	915.37	102.86	915.62	111.76	912.69	113.67	911.86	113.88	911.91
118.56	911.86	140.14	911.87	142.65	911.86	155.9	911.5	159.62	910.77
163.94	909.84	171.83	909.49	185.25	909.12	188.34	908.93	188.82	908.78
191.94	907.8	196.59	906.47	204.94	906.3	208.68	906.22	208.69	906.22
210.23	906.06	220.83	904.86	222.08	904.54	223.81	905.38	236.17	912.6
237.18	912.66	240.2	912.84	254.22	913.03	268.3	913.23	268.94	913.27
276.16	914.75	297.12	918.82	297.43	918.87	297.87	918.95	300.06	919.38
301.22	919.49	313.34	919.95	330.21	921.02	330.82	921.02	347.58	921.46
349.42	921.46	352.67	921.1	362.31	919.95	369.02	920.19	375.42	921.76
396.95	924.31	400.4	924.94	402.38	925.07	420.78	926.55		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	191.94	.033	236.17	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
191.94	236.17	24.845	76.08	70.24	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1182.848

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951	8.98	950.41	15.92	949.84	24.27	949.24	46.86	938.8
50.02	937.49	51.87	936.4	61.11	931.15	73.73	923.85	83.68	918.39
96.32	912.61	97.83	912.54	98.27	912.52	98.84	912.49	99.51	912.44
100.25	912.37	101.02	912.29	101.77	912.2	102.44	912.11	112.95	911.91
114.01	911.79	115.03	911.68	115.96	911.57	133.21	911.73	140.29	911.7
149.68	911.36	165.78	910.93	169.21	910.45	174.14	909.47	188.43	909.2
203.9	908.82	206.99	907.98	211.6	906.73	212.03	906.68	214.83	906.65
214.84	906.65	214.85	906.64	218.19	905.47	222.65	905.08	223.3	905.03
238.83	904.36	246.38	908.19	252.44	911.3	253.18	911.32	263.22	911.58
270.91	911.77	272.78	911.84	282.34	913.4	309.28	919.56	314.28	919.84

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  314.38  919.85  314.48  919.83  316.88   919.5   327.6  918.06   350.7  922.45
  356.72  923.68  372.54  924.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   203.9    .033  246.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         203.9  246.38           54.037  90.657  97.318             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1092.190

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  949.51   11.05   948.8   22.84  947.98   28.64  946.25   40.02  942.95
   49.69  937.97    51.8  936.92    53.8  935.87   57.25  933.56    75.1  924.63
   98.61  911.15  112.56  911.04  120.78   910.8  124.41  911.09  134.91  911.28
  140.61  910.99  146.23  910.74  154.12  909.75  156.92  909.38  168.82  908.93
  170.03   908.9  170.59  908.87  182.01  908.55  187.74  908.52  192.38  906.93
   195.1  906.24  213.03  906.07  224.64  905.96  227.72  905.82   228.3  905.72
  240.95  903.51  245.07  902.72  245.65  902.81  245.78  902.85     246  902.91
  246.43  903.06     248  903.63  258.68  907.61  262.55  909.05  268.81  908.95
  274.59  908.85  277.34  908.75  277.84  908.77  279.85  908.64  281.67  908.51
  287.15  908.86  288.52  909.19  291.79  909.02  298.71  908.93  302.57   908.4
  307.08  907.64  310.52  908.31  314.31  908.99  321.29  908.94  323.42  908.95
  326.02  909.02  328.86  909.15  340.44  909.35  347.49  909.77  350.35  909.99
  353.42  910.28  356.33  910.61  365.51  914.43  388.89  923.25     406  923.94
  412.35  924.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  213.03    .033  258.68     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.03  258.68          168.653   218.3  59.293             .1       .3

CROSS SECTION
```

RIVER: Stream
REACH: Reach RS: 873.8912

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.75	11.69	946.94	16.34	946.55	40.21	944.49	52.11	942.38
58.6	940.75	74.35	935.46	80.37	932.87	110.86	915.36	114.13	914.16
131.74	908.3	133.8	908.62	137.24	909.15	140.66	909.84	145.23	909.74
151.89	909.58	155.6	909.24	157.51	905.28	159.3	902.36	160.31	902.27
161.4	902.17	177.06	901.28	178.94	901.57	188.29	902.34	190.45	902.54
197	903.16	197.95	903.43	200.5	904.71	201.74	905.33	202.99	906.04
211.04	906.16	212.15	906.18	227.44	906.39	258.28	907.2	261.08	907.17
264.44	906.73	271.49	906.03	277.25	906.52	280.22	906.85	281.32	906.87
282.53	906.88	301.15	907.11	312.09	906.95	324	906.43	342.97	906.46
345.71	906.42	350.63	907.56	353.67	909.01	362.8	913.18	377.32	919.08
385.89	922.29	408.72	923.6	410.78	923.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	155.6	.033	202.99	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.6	202.99	117.307	111.5 132.136	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 762.3889

INPUT
Description:
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944	1.77	943.67	2.1	943.62	5.79	943.28	8.99	943.2
12.08	943.43	12.26	942.86	14.76	942.99	17.5	942.16	29.67	942.4
33.95	941.3	36.07	941.38	38.49	941.3	40.57	941.25	44.87	938.77
64.37	929.42	68.98	928.32	78.36	926.43	90.04	922.19	99.58	918.5
107.89	915.2	121.71	909.45	133.15	904.31	136.08	902.93	142.78	902.76
153.29	902.35	166.69	903.4	169.31	903.43	169.86	903.44	172.57	903.46
175.93	902.91	178.47	902.33	180.19	902.47	184.46	902.57	185.29	902.39

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  201.88  898.82  202.91  898.84  203.55     899  216.17  903.05  222.03  904.93
  226.46  905.41  227.42  905.51  245.48  907.41  246.79  907.45  247.96  907.53
  248.11  907.53   249.8  906.93  251.22  906.48  253.86  905.18   254.8  904.84
  255.43  904.64   255.9   904.5   256.3   904.4  257.43  903.56  259.91  903.44
  262.59  903.33  264.54  903.26  266.23  903.22  267.87  903.19  286.65  903.59
  286.73  903.59  286.93   903.6  287.98  903.66  289.11   903.7   290.2  903.72
  290.81  903.72  291.49  903.71  292.67  903.67  293.36  903.63  293.76   903.6
  295.22  903.49  297.84  904.42  298.39  904.61  299.27  904.93  303.74   906.7
  306.15  907.62  310.97  909.53  311.93  909.93  313.49  910.54  316.98  910.62
  320.57   910.7  323.16  910.76  325.11  910.82  348.01  912.07  374.58  913.73
   403.6  918.88  415.27  920.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  185.29    .033  216.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        185.29  216.17          119.463  136.05  84.365             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  246.79  415.27  907.53       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 626.3436

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68
```

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Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.05  195.12          101.327   67.98  66.819             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

BRIDGE


RIVER: Stream
REACH: Reach              RS: 592

INPUT
Description:
Distance from Upstream XS =     4.3
Deck/Roadway Width        =      60
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   24.08   940.5     892 159.353  914.56     892 159.353  914.56  907.28
 179.421  914.56  907.28 179.421  914.56     892   280.2     908     892

Upstream Bridge Cross Section Data
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68

Manning's n Values        num=       3
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     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        152.05  195.12             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   13.71   928.4     892 178.068  914.56     892 178.068  914.56   906.6
 198.077  914.56   906.6 198.077  914.56     892  300.26     911     892

Downstream Bridge Cross Section Data
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        168.33   202.7             .3       .5
Ineffective Flow     num=       2
```

```
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 558.3685

INPUT
Description:
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
```

```
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        168.33   202.7          120.462  169.51  196.87             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 388.8611

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   943.8    4.02  943.62     5.7     943   30.84  927.41   38.05  922.87
   52.32  920.72   74.08  919.14   76.64  919.08   82.24  918.89   88.44  916.64
  110.11  908.75  110.65  908.56  115.45  906.81  117.27   906.3  124.08  900.14
   126.1  898.63  127.03  897.94  127.96  897.85  141.55  896.55  157.01   900.8
   164.7  902.92  167.31  903.76  168.38  904.11  171.28  904.64  172.13  904.75
  172.65  905.02  173.65  905.33  175.31  905.54  175.94  905.69  176.75  905.68
   180.6  905.74  183.33  906.02  185.06  905.87  188.36  905.68  203.19  906.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.27    .033  168.38     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.27  168.38          125.202  105.74  77.406             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 283.1181

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  925.17   10.77  920.52   31.24  917.18   33.66  916.97   49.82  914.67
   50.23  914.58   56.65  912.39   60.44  913.12   61.23  913.27   68.73  913.95
   73.06   913.9   75.63  913.89   78.56  914.02   79.91  914.08   81.13  914.14
   81.76  913.55   93.64   900.8   95.26  899.06   97.43  897.93  108.72     895
  109.66  895.02   123.8  898.19  134.02  900.47   134.3  900.54   137.8  901.24
  140.43  901.63  142.02   901.8   147.3   902.5   149.9  903.01  150.58  903.09
  151.16  903.18  152.01  903.22  152.32  903.36  153.29  903.61   153.7  903.63
  154.16  903.81  155.51  903.85  155.53  903.85  156.98  903.84  157.41  903.82
  158.42  903.71  158.75  903.38  160.28  903.17  161.03  903.24  184.01  903.91
  184.85  903.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   93.64    .033  134.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.64  134.02           96.688  106.49 101.506             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 176.6302

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  922.99     .21  922.97      45  917.07   68.19  913.98   81.65  912.14
   96.19   911.1   98.98  911.01   105.2  910.82  106.83  910.83  108.26  910.84
```

```
  109.53  910.84   110.7  910.85  112.82  910.85  113.82  910.86   114.7  910.86
  125.03  905.43  125.23  905.32  128.08  903.85  131.61  902.02  132.72  901.71
   146.3  897.65  147.36  897.62  151.72   897.5  151.99  897.47  152.85   897.3
  161.72  893.75  166.99  892.29  177.54  894.32  177.63  894.35   177.8  894.41
  177.93  894.45  178.27  894.57  178.55  894.67  178.97  894.81  179.07  894.85
  179.51     895  180.47  895.33   180.6  895.38  182.25  895.95  182.28  895.96
  182.35  895.98  183.96  896.54  184.96  896.89  185.79  897.17  186.15   897.3
   187.2  897.66  187.75  897.98  188.49   898.4   188.6  898.47  189.68  898.51
  191.15  898.55  194.59   898.5  197.45  898.68  198.32  898.75  198.85  898.68
  198.92  898.67  203.55  898.32  204.02  898.31  205.07  898.31   205.4   898.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  152.85    .033  186.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.85  186.15           68.689  114.34 141.027             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 62.28806

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  921.53     .09  921.52   34.63   916.7   46.19  915.11    57.1   910.9
   66.87  910.11   68.28  910.13   74.18  907.81   80.39  905.46   81.17  905.24
   92.09  903.24   99.03  901.96  104.87  900.28  106.69  899.71  112.03  897.71
  115.34  897.07  117.23  896.71  124.61  895.28  126.55  895.15  127.87  894.63
  134.17  893.83  143.28  892.68  149.02  891.93  149.79  891.81  150.83  892.42
  150.95  892.48  151.03  892.51  151.07  892.53  151.32  892.65  151.98  892.95
  158.69  896.03  163.65  898.32   163.9  898.49     165   899.2  166.05  899.13
  166.62  899.18  168.04  898.94  168.53  898.86  169.44  898.79  174.88  898.72
  176.05  898.71  177.64  898.72  179.33  898.68  185.77  898.68   186.7  898.67
  188.46  898.67  190.67  898.48     191  898.43  191.67  898.31  193.15  898.06
  196.08  898.08  197.09  898.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  126.55    .033  158.69     .06
```

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.55	158.69	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Stream

Reach	River Sta.	n1	n2	n3
Reach	1884.237	.06	.033	.06
Reach	1779.593	.06	.033	.06
Reach	1600.512	.06	.033	.06
Reach	1461.160	.06	.033	.06
Reach	1258.927	.06	.033	.06
Reach	1182.848	.06	.033	.06
Reach	1092.190	.06	.033	.06
Reach	873.8912	.06	.033	.06
Reach	762.3889	.06	.033	.06
Reach	626.3436	.03	.04	.03
Reach	592	Bridge		
Reach	558.3685	.03	.04	.03
Reach	388.8611	.06	.033	.06
Reach	283.1181	.06	.033	.06
Reach	176.6302	.06	.033	.06
Reach	62.28806	.06	.033	.06

SUMMARY OF REACH LENGTHS

River: Stream

Reach	River Sta.	Left	Channel	Right
Reach	1884.237	87.263	104.64	99.362
Reach	1779.593	46.246	179.08	62.301
Reach	1600.512	107.579	139.35	11.829
Reach	1461.160	92.336	202.23	11.941
Reach	1258.927	24.845	76.08	70.24
Reach	1182.848	54.037	90.657	97.318
Reach	1092.190	168.653	218.3	59.293

Reach	873.8912	117.307	111.5	132.136
Reach	762.3889	119.463	136.05	84.365
Reach	626.3436	101.327	67.98	66.819
Reach	592	Bridge		
Reach	558.3685	120.462	169.51	196.87
Reach	388.8611	125.202	105.74	77.406
Reach	283.1181	96.688	106.49	101.506
Reach	176.6302	68.689	114.34	141.027
Reach	62.28806	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Stream

Reach	River Sta.	Contr.	Expan.
Reach	1884.237	.1	.3
Reach	1779.593	.1	.3
Reach	1600.512	.1	.3
Reach	1461.160	.1	.3
Reach	1258.927	.1	.3
Reach	1182.848	.1	.3
Reach	1092.190	.1	.3
Reach	873.8912	.1	.3
Reach	762.3889	.1	.3
Reach	626.3436	.3	.5
Reach	592	Bridge	
Reach	558.3685	.3	.5
Reach	388.8611	.1	.3
Reach	283.1181	.1	.3
Reach	176.6302	.1	.3
Reach	62.28806	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl

Reach	1884.237	4% AEP	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	1% AEP	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1779.593	4% AEP	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	1% AEP	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1600.512	4% AEP	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	1% AEP	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42
Reach	1461.160	4% AEP	539.00	906.95	911.59	911.59	912.30	0.010237	7.65	106.98	79.10	0.88
Reach	1461.160	1% AEP	787.00	906.95	912.03	912.03	912.87	0.010595	8.56	143.59	85.32	0.91
Reach	1258.927	4% AEP	539.00	904.54	908.33		909.02	0.007901	6.62	81.79	38.63	0.79
Reach	1258.927	1% AEP	787.00	904.54	909.00		909.84	0.007181	7.38	108.61	42.80	0.78
Reach	1182.848	4% AEP	539.00	904.36	907.63		908.37	0.008984	6.89	78.24	37.01	0.84
Reach	1182.848	1% AEP	787.00	904.36	908.02	907.96	909.13	0.011579	8.44	93.21	39.23	0.97
Reach	1092.190	4% AEP	539.00	902.72	906.67	906.67	907.42	0.012378	7.07	83.51	62.75	0.95
Reach	1092.190	1% AEP	787.00	902.72	907.13	907.13	908.04	0.011464	7.85	113.44	65.62	0.95

Reach	873.8912	4% AEP	539.00	901.28	904.02	903.89	904.79	0.010849	7.01	76.90
40.85	0.90									
Reach	873.8912	1% AEP	787.00	901.28	904.91		905.65	0.006805	6.90	114.11
43.16	0.75									
Reach	762.3889	4% AEP	539.00	898.82	903.66		904.05	0.003388	5.30	133.85
116.86	0.54									
Reach	762.3889	1% AEP	787.00	898.82	904.89		905.17	0.001685	4.72	241.35
134.59	0.41									
Reach	626.3436	4% AEP	539.00	897.94	902.96	901.57	903.52	0.004274	5.99	89.93
45.86	0.53									
Reach	626.3436	1% AEP	787.00	897.94	904.06	902.32	904.79	0.004051	6.86	114.69
52.01	0.54									
Reach	592		Bridge							
Reach	558.3685	4% AEP	539.00	897.48	901.72		902.28	0.004635	6.02	89.47
33.90	0.55									
Reach	558.3685	1% AEP	787.00	897.48	902.47		903.31	0.005404	7.34	107.22
34.42	0.61									
Reach	388.8611	4% AEP	539.00	896.55	900.28	899.99	901.13	0.009153	7.38	73.01
31.19	0.85									
Reach	388.8611	1% AEP	787.00	896.55	900.88	900.67	902.00	0.010015	8.50	92.54
34.03	0.91									
Reach	283.1181	4% AEP	539.00	895.00	898.88	898.88	899.95	0.013275	8.27	65.15
31.32	1.01									
Reach	283.1181	1% AEP	787.00	895.00	899.56	899.56	900.81	0.012377	8.98	87.64
35.15	1.00									
Reach	176.6302	4% AEP	539.00	892.29	896.80	896.32	897.55	0.007435	6.99	77.16
30.58	0.78									
Reach	176.6302	1% AEP	787.00	892.29	897.44	897.03	898.44	0.008048	8.04	97.98
34.41	0.83									

Reach	62.28806	4% AEP	539.00	891.81	895.81	895.55	896.63	0.008806	7.26	75.82
36.34	0.84									
Reach	62.28806	1% AEP	787.00	891.81	896.40	896.19	897.47	0.008813	8.36	98.56
40.67	0.87									

APPENDIX F – HEC-RAS Output for Box Culvert Replacement

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Trib Blacklick
Project File : TribBlacklick.prj
Run Date and Time: 6/14/2023 10:31:01 AM

Project in English units

PLAN DATA

Plan Title: Proposed Culvert
Plan File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.p02

Geometry Title: Proposed Culvert
Geometry File :
z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g02

Flow Title : TribBlacklick
Flow File :
z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Plan Summary Information:
Number of: Cross Sections = 13 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information

```
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow



FLOW DATA

Flow Title: TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Flow Data (cfs)


  River           Reach           RS                50% AEP         20% AEP         10% AEP          4% AEP          2% AEP
 1% AEP
  Stream          Reach           1884.237              169             295             395             539             659
    787



Boundary Conditions

  River           Reach           Profile                      Upstream                Downstream

  Stream          Reach           50% AEP                Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           20% AEP                Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           10% AEP                Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           4% AEP                 Normal S = 0.0088       Normal S = 0.0088
  Stream          Reach           2% AEP                 Normal S = 0.0088       Normal S = 0.0088



GEOMETRY DATA

Geometry Title: Proposed Culvert
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g02
```

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1884.237

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	954.51	6.41	954.48	17.41	954.73	18.99	954.45	27.9	952.39
36.66	945.28	52.98	937.21	76.89	926.06	99.4	915.71	102.77	914.92
117.69	914.8	136.02	914.71	142.43	914.82	183.72	915.41	193.3	915.34
227.53	915.53	231.92	915.56	234.91	915.58	236.64	915.61	238.43	913.74
240.12	912.72	246.48	911.81	247.32	911.71	249.73	911.42	262.99	910.26
268.87	912.33	274.02	913.52	274.06	913.53	278.11	913.51	280.36	913.5
283.43	913.49	288.14	913.89	288.86	914.04	291.79	914.65	293.23	914.88
301.84	915.07	309.5	915.16	328.02	915.36	336.06	915.69	347.49	917.8
358.9	919.32	367.24	920.36	371.88	920.96	390.48	923.58	390.55	923.58
402.92	926								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	236.64	.033	293.23	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
236.64	293.23	87.263	104.64	99.362	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1779.593

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.76	12.71	953.07	15.1	952.62	28.18	947.8	46.85	937.41
56.01	933.08	76.47	919.3	82.95	917.36	94.52	914.82	109.53	914.84
124.72	914.62	130.42	914.46	167.75	914.29	176.28	913.96	180.3	914.21
206.69	914.43	213.1	914.45	228.82	914.6	246.52	914.15	261.09	913.77
261.34	913.77	261.55	913.65	263.01	912.64	264.49	911.62	273.26	910.72
279.37	909.95	281.59	909.61	285.86	912.21	295.21	916.53	296.28	917.02
297.43	917.7	298.19	918.14	298.72	918.13	302.9	918.3	305.46	918.39
306.4	918.43	308.56	919.07	321.57	922.79	326.12	924.08	326.71	924.09

```
  333.97  924.23  334.08  924.22  334.18  924.21  334.84  924.16  335.45  924.13
  335.98  924.09  336.76  924.06  337.45  924.02  338.37     924  339.17  923.97
  340.22  923.97  341.57  924.02  342.67     924  344.16  924.07  345.61  924.14
  347.09  924.15  375.25  924.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  261.09    .033  295.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        261.09  295.21           46.246  179.08  62.301             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1600.512

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.31    4.83  955.12    10.3  954.82   10.49  954.79   12.44  954.27
   27.28  950.49   32.66  948.56   50.57  939.06    76.9  920.79   76.97  920.73
   77.04  920.69   77.23  920.58   77.33  920.55   92.86  915.08    97.3  914.54
   98.04  914.32  100.41  913.13   103.5  912.95  125.46  912.09   135.3  912.54
  143.89  913.16  147.52  913.04  149.13   912.9  153.15   912.3  157.42  911.67
  159.22  911.63  162.96  911.35  166.09  911.12  166.58  910.96  171.56  911.22
  172.86   911.3  178.65  911.65  181.26  910.34  183.78  909.49   187.7  907.58
  195.36  908.98  198.32  909.31  200.52  909.52  203.12  909.67  214.83  910.38
  222.44  910.84   223.1  910.89  224.64  911.17   229.5  912.52  236.98   912.6
  240.38  912.97  252.23  913.23  256.85  913.24  284.12  913.52  292.99  913.53
  300.66  913.33  304.23  913.24  330.58  913.88  330.81  913.94  332.76  914.23
  333.95  914.46   337.1     915  341.58  915.77  363.46  920.07  366.71  920.38
  376.25  921.08   383.7   920.8  389.19   920.8  390.64  920.84  413.78  920.82
  417.16  920.44  420.58  920.54  433.23  922.75  437.09  923.28  442.48     924
  447.71  924.96  458.58  925.64  468.93  926.02  474.21     926

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  178.65    .033   229.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.65   229.5          107.579  139.35  11.829             .1       .3

CROSS SECTION
```

RIVER: Stream
REACH: Reach RS: 1461.160

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.81	3.57	953.64	11.36	953.09	14.36	952.71	48.21	927.92
53.89	923.77	63.8	917.2	79.26	906.95	89.12	909.8	92.93	910.98
94.97	910.96	104.28	910.9	105.14	910.87	120.27	910.31	132.24	910.05
165.25	912.7	168.09	913.02	173.83	913.14	185.32	913.16	199.92	913.3
219.67	913.29	224.9	913.15	227.29	913.08	229.73	913.01	232.19	912.95
245.18	913.13	246.82	913.08	248.56	913.06	250.4	913.09	252.32	913.17
254.24	913.32	255.82	913.49	257.27	913.68	258.54	913.87	270.59	916.21
272.67	916.56	275.6	917.07	289.3	919.77	296.03	920.42	299.8	920.55
305.56	920.9	317.24	920.91	326.67	921.16	338.59	921.17	347.9	920.14
356.73	920.37	357.38	920.4	357.67	920.47	358.83	920.61	383	924.95
394.25	925.64	409.27	926.83	411.95	926.95				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	63.8	.033	94.97	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63.8	94.97	92.236	202.23	11.941	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1258.927

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.43	6.46	950.96	9.86	950.6	19.08	949.85	35.36	943.09
38.43	941.82	47.71	936.33	58.08	930.28	59.67	929.41	62.77	927.72
78.09	919.53	84.28	916.93	93.45	913.65	95.23	913.44	96.27	913.36
102.11	915.37	102.86	915.62	111.76	912.69	113.67	911.86	113.88	911.91
118.56	911.86	140.14	911.87	142.65	911.86	155.9	911.5	159.62	910.77
163.94	909.84	171.83	909.49	185.25	909.12	188.34	908.93	188.82	908.78
191.94	907.8	196.59	906.47	204.94	906.3	208.68	906.22	208.69	906.22
210.23	906.06	220.83	904.86	222.08	904.54	223.81	905.38	236.17	912.6
237.18	912.66	240.2	912.84	254.22	913.03	268.3	913.23	268.94	913.27
276.16	914.75	297.12	918.82	297.43	918.87	297.87	918.95	300.06	919.38

```
  301.22  919.49  313.34  919.95  330.21  921.02  330.82  921.02  347.58  921.46
  349.42  921.46  352.67   921.1  362.31  919.95  369.02  920.19  375.42  921.76
  396.95  924.31   400.4  924.94  402.38  925.07  420.78  926.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  191.94    .033  236.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        191.94  236.17           24.845   76.08   70.24             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1182.848

INPUT
Description:
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     951    8.98  950.41   15.92  949.84   24.27  949.24   46.86   938.8
   50.02  937.49   51.87   936.4   61.11  931.15   73.73  923.85   83.68  918.39
   96.32  912.61   97.83  912.54   98.27  912.52   98.84  912.49   99.51  912.44
  100.25  912.37  101.02  912.29  101.77   912.2  102.44  912.11  112.95  911.91
  114.01  911.79  115.03  911.68  115.96  911.57  133.21  911.73  140.29   911.7
  149.68  911.36  165.78  910.93  169.21  910.45  174.14  909.47  188.43   909.2
   203.9  908.82  206.99  907.98   211.6  906.73  212.03  906.68  214.83  906.65
  214.84  906.65  214.85  906.64  218.19  905.47  222.65  905.08   223.3  905.03
  238.83  904.36  246.38  908.19  252.44   911.3  253.18  911.32  263.22  911.58
  270.91  911.77  272.78  911.84  282.34   913.4  309.28  919.56  314.28  919.84
  314.38  919.85  314.48  919.83  316.88   919.5   327.6  918.06   350.7  922.45
  356.72  923.68  372.54  924.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   203.9    .033  246.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         203.9  246.38           54.037  90.657  97.318             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1092.190
```

```
INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  949.51   11.05   948.8   22.84  947.98   28.64  946.25   40.02  942.95
   49.69  937.97    51.8  936.92    53.8  935.87   57.25  933.56    75.1  924.63
   98.61  911.15  112.56  911.04  120.78   910.8  124.41  911.09  134.91  911.28
  140.61  910.99  146.23  910.74  154.12  909.75  156.92  909.38  168.82  908.93
  170.03   908.9  170.59  908.87  182.01  908.55  187.74  908.52  192.38  906.93
   195.1  906.24  213.03  906.07  224.64  905.96  227.72  905.82   228.3  905.72
  240.95  903.51  245.07  902.72  245.65  902.81  245.78  902.85     246  902.91
  246.43  903.06     248  903.63  258.68  907.61  262.55  909.05  268.81  908.95
  274.59  908.85  277.34  908.75  277.84  908.77  279.85  908.64  281.67  908.51
  287.15  908.86  288.52  909.19  291.79  909.02  298.71  908.93  302.57   908.4
  307.08  907.64  310.52  908.31  314.31  908.99  321.29  908.94  323.42  908.95
  326.02  909.02  328.86  909.15  340.44  909.35  347.49  909.77  350.35  909.99
  353.42  910.28  356.33  910.61  365.51  914.43  388.89  923.25     406  923.94
  412.35  924.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  213.03    .033  258.68     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.03  258.68          149.522 196.726  36.742             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 895.4649

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  948.62   18.14  947.28   29.51  946.46   55.15  944.54   59.18  944.02
   66.65  941.48   88.92  933.88  105.49  924.34  120.71  915.34  126.17  912.92
   133.8  910.42  139.01  908.79  141.25   909.1  144.65  909.75  146.85  910.17
  148.85  910.09   154.2  909.98  159.72  903.99  160.57  903.06  161.39  901.19
  186.21  901.19  189.86  902.86  190.19  902.87  199.91   903.6  202.64   903.8
  204.28  904.64   207.7  906.38  211.04  906.46  228.04   906.9  234.74     907
  241.67  907.18  251.72  907.07  274.82   907.1  281.52  907.24  289.52  907.24
  295.89  907.14  304.05  907.11  312.71  906.95  323.25  906.91  330.68  906.84
  331.22  906.85  331.36  906.85  332.43  906.95  345.78   908.5  362.97  909.67
  371.66  913.21  398.03  923.07  400.51  923.21  410.78  923.62
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  159.72    .033  204.28     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        159.72  204.28          354.101 310.149 354.181             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 162.756   951.5       T
 186.829  410.78   951.5       T

BRIDGE


RIVER: Stream
REACH: Reach              RS: 592

INPUT
Description:
Distance from Upstream XS =     6.8
Deck/Roadway Width        =     300
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   24.08     959     892   165.2   951.5     892   165.2   951.5  910.19
   185.4   951.5  910.19   185.4   951.5     892  410.78   946.5     892

Upstream Bridge Cross Section Data
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  948.62   18.14  947.28   29.51  946.46   55.15  944.54   59.18  944.02
   66.65  941.48   88.92  933.88  105.49  924.34  120.71  915.34  126.17  912.92
   133.8  910.42  139.01  908.79  141.25   909.1  144.65  909.75  146.85  910.17
  148.85  910.09   154.2  909.98  159.72  903.99  160.57  903.06  161.39  901.19
  186.21  901.19  189.86  902.86  190.19  902.87  199.91   903.6  202.64   903.8
  204.28  904.64   207.7  906.38  211.04  906.46  228.04   906.9  234.74     907
  241.67  907.18  251.72  907.07  274.82   907.1  281.52  907.24  289.52  907.24
  295.89  907.14  304.05  907.11  312.71  906.95  323.25  906.91  330.68  906.84
  331.22  906.85  331.36  906.85  332.43  906.95  345.78   908.5  362.97  909.67
  371.66  913.21  398.03  923.07  400.51  923.21  410.78  923.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  159.72     .04  204.28     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
```

```
        159.72  204.28             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 162.756   951.5       T
 186.829  410.78   951.5       T

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   13.71     959     892   177.8   951.5     892   177.8   951.5   906.6
   198.3   951.5   906.6   198.3   951.5     892  300.26   946.5     892

Downstream Bridge Cross Section Data
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  897.48  198.86  897.48  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        168.33   202.7             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223   951.5       T
 199.931  300.26   951.5       T

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
```

```
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 558.3685

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.48  180.21  897.48  198.86  897.48  199.12  899.03     201  899.47
   202.7  900.17  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911
  204.22  910.92  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07
  215.91     909  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3
  250.47  907.33  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51
  286.53  909.64  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78
  300.26     911
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        168.33   202.7          120.462  169.51  196.87             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223   951.5       T
 199.931  300.26   951.5       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 388.8611

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   943.8    4.02  943.62     5.7     943   30.84  927.41   38.05  922.87
   52.32  920.72   74.08  919.14   76.64  919.08    77.6  919.05   82.24  918.89
  110.11  908.75  110.65  908.56  115.45  906.81  117.27   906.3  124.08  900.14
   126.1  898.63  127.03  897.94  127.96  897.85  141.55  896.55  157.01   900.8
   164.7  902.92  167.31  903.76  168.38  904.11  171.28  904.64  172.13  904.75
  172.65  905.02  173.65  905.33  175.31  905.54  175.94  905.69  176.75  905.68
   180.6  905.74  183.33  906.02  185.06  905.87  188.36  905.68  203.19  906.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.27    .033  168.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.27  168.38          125.202  105.74  77.406             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 283.1181

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
       0  925.17   10.77  920.52   31.24  917.18   33.66  916.97   49.82  914.67
   50.23  914.58   50.71  914.42   56.65  912.39   61.23  913.27   68.73  913.95
   73.06   913.9   75.63  913.89   78.56  914.02   79.91  914.08   81.13  914.14
   81.76  913.55   93.64   900.8   95.26  899.06   97.43  897.93  108.72     895
  109.66  895.02   123.8  898.19  134.02  900.47   134.3  900.54   137.8  901.24
  140.43  901.63  142.02   901.8   147.3   902.5   149.9  903.01  150.58  903.09
  151.16  903.18  152.01  903.22  152.32  903.36  153.29  903.61   153.7  903.63
  154.16  903.81  155.51  903.85  155.53  903.85  156.98  903.84  157.41  903.82
  158.42  903.71  158.75  903.38  160.28  903.17  161.03  903.24  184.01  903.91
  184.85  903.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   93.64    .033  134.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.64  134.02           96.688  106.49 101.506             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 176.6302

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  922.99     .21  922.97      45  917.07   68.19  913.98   81.65  912.14
   86.03  911.83   96.19   911.1   105.2  910.82  106.83  910.83  108.26  910.84
  109.53  910.84   110.7  910.85  112.82  910.85  113.82  910.86   114.7  910.86
  125.03  905.43  125.23  905.32  128.08  903.85  131.61  902.02  132.72  901.71
   146.3  897.65  147.36  897.62  151.72   897.5  151.99  897.47  152.85   897.3
  161.72  893.75  166.99  892.29  177.54  894.32  177.63  894.35   177.8  894.41
  177.93  894.45  178.27  894.57  178.55  894.67  178.97  894.81  179.07  894.85
  179.51     895  180.47  895.33   180.6  895.38  182.25  895.95  182.28  895.96
  182.35  895.98  183.96  896.54  184.96  896.89  185.79  897.17  186.15   897.3
   187.2  897.66  187.75  897.98  188.49   898.4   188.6  898.47  189.68  898.51
  191.15  898.55  194.59   898.5  197.45  898.68  198.32  898.75  198.85  898.68
  198.92  898.67  203.55  898.32  204.02  898.31  205.07  898.31   205.4   898.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  152.85    .033  186.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.85  186.15           68.689  114.34 141.027             .1       .3
```

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 62.28806

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	921.53	.09	921.52	34.63	916.7	46.19	915.11	57.1	910.9
66.87	910.11	68.28	910.13	74.18	907.81	80.39	905.46	80.46	905.44
81.17	905.24	99.03	901.96	104.87	900.28	106.69	899.71	112.03	897.71
115.34	897.07	117.23	896.71	124.61	895.28	126.55	895.15	127.87	894.63
134.17	893.83	143.28	892.68	149.02	891.93	149.79	891.81	150.83	892.42
150.95	892.48	151.03	892.51	151.07	892.53	151.32	892.65	151.98	892.95
158.69	896.03	163.65	898.32	163.9	898.49	165	899.2	166.05	899.13
166.62	899.18	168.04	898.94	168.53	898.86	169.44	898.79	174.88	898.72
176.05	898.71	177.64	898.72	179.33	898.68	185.77	898.68	186.7	898.67
188.46	898.67	190.67	898.48	191	898.43	191.67	898.31	193.15	898.06
196.08	898.08	197.09	898.09						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	126.55	.033	158.69	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.55	158.69	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Stream

Reach	River Sta.	n1	n2	n3
Reach	1884.237	.06	.033	.06
Reach	1779.593	.06	.033	.06
Reach	1600.512	.06	.033	.06
Reach	1461.160	.06	.033	.06
Reach	1258.927	.06	.033	.06
Reach	1182.848	.06	.033	.06
Reach	1092.190	.06	.033	.06
Reach	895.4649	.04	.033	.05
Reach	592	Bridge		

Reach	558.3685	.03	.04	.03
Reach	388.8611	.06	.033	.06
Reach	283.1181	.06	.033	.06
Reach	176.6302	.06	.033	.06
Reach	62.28806	.06	.033	.06

SUMMARY OF REACH LENGTHS

River: Stream

Reach	River Sta.	Left	Channel	Right
Reach	1884.237	87.263	104.64	99.362
Reach	1779.593	46.246	179.08	62.301
Reach	1600.512	107.579	139.35	11.829
Reach	1461.160	92.236	202.23	11.941
Reach	1258.927	24.845	76.08	70.24
Reach	1182.848	54.037	90.657	97.318
Reach	1092.190	149.522	196.726	36.742
Reach	895.4649	354.101	310.149	354.181
Reach	592	Bridge		
Reach	558.3685	120.462	169.51	196.87
Reach	388.8611	125.202	105.74	77.406
Reach	283.1181	96.688	106.49	101.506
Reach	176.6302	68.689	114.34	141.027
Reach	62.28806	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Stream

Reach	River Sta.	Contr.	Expan.
Reach	1884.237	.1	.3
Reach	1779.593	.1	.3
Reach	1600.512	.1	.3
Reach	1461.160	.1	.3
Reach	1258.927	.1	.3
Reach	1182.848	.1	.3
Reach	1092.190	.1	.3
Reach	895.4649	.3	.5

Reach	592	Bridge	
Reach	558.3685	.3	.5
Reach	388.8611	.1	.3
Reach	283.1181	.1	.3
Reach	176.6302	.1	.3
Reach	62.28806	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach	1884.237	4% AEP	prop	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	4% AEP	ex	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	1% AEP	prop	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1884.237	1% AEP	ex	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1779.593	4% AEP	prop	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	4% AEP	ex	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	1% AEP	prop	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1779.593	1% AEP	ex	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1600.512	4% AEP	prop	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	4% AEP	ex	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	1% AEP	prop	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42
Reach	1600.512	1% AEP	ex	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42

Reach	1461.160	4% AEP	prop	539.00	906.95	911.59	911.59	912.30	0.010237	7.65
106.98	79.10	0.88								
Reach	1461.160	4% AEP	ex	539.00	906.95	911.59	911.59	912.30	0.010237	7.65
106.98	79.10	0.88								
Reach	1461.160	1% AEP	prop	787.00	906.95	912.03	912.03	912.87	0.010595	8.56
143.59	85.32	0.91								
Reach	1461.160	1% AEP	ex	787.00	906.95	912.03	912.03	912.87	0.010595	8.56
143.59	85.32	0.91								
Reach	1258.927	4% AEP	prop	539.00	904.54	908.34		909.02	0.007869	6.61
81.90	38.64	0.79								
Reach	1258.927	4% AEP	ex	539.00	904.54	908.33		909.02	0.007901	6.62
81.79	38.63	0.79								
Reach	1258.927	1% AEP	prop	787.00	904.54	909.00		909.84	0.007181	7.38
108.61	42.80	0.78								
Reach	1258.927	1% AEP	ex	787.00	904.54	909.00		909.84	0.007181	7.38
108.61	42.80	0.78								
Reach	1182.848	4% AEP	prop	539.00	904.36	907.62		908.37	0.009129	6.93
77.81	36.94	0.84								
Reach	1182.848	4% AEP	ex	539.00	904.36	907.63		908.37	0.008984	6.89
78.24	37.01	0.84								
Reach	1182.848	1% AEP	prop	787.00	904.36	908.02	907.96	909.13	0.011579	8.44
93.21	39.23	0.97								
Reach	1182.848	1% AEP	ex	787.00	904.36	908.02	907.96	909.13	0.011579	8.44
93.21	39.23	0.97								
Reach	1092.190	4% AEP	prop	539.00	902.72	906.68	906.68	907.42	0.012074	7.01
84.29	62.83	0.94								
Reach	1092.190	4% AEP	ex	539.00	902.72	906.67	906.67	907.42	0.012378	7.07
83.51	62.75	0.95								
Reach	1092.190	1% AEP	prop	787.00	902.72	907.13	907.13	908.04	0.011464	7.85
113.44	65.62	0.95								
Reach	1092.190	1% AEP	ex	787.00	902.72	907.13	907.13	908.04	0.011464	7.85
113.44	65.62	0.95								
Reach	895.4649	4% AEP	prop	539.00	901.19	905.19	903.69	905.68	0.002448	5.60
96.23	46.75	0.49								
Reach	895.4649	1% AEP	prop	787.00	901.19	906.38	904.40	906.99	0.002197	6.31
124.74	50.17	0.49								
Reach	873.8912	4% AEP	ex	539.00	901.28	904.02	903.89	904.79	0.010849	7.01

76.90	40.85	0.90								
Reach	873.8912	1% AEP	ex	787.00	901.28	904.91		905.65	0.006805	6.90
114.11	43.16	0.75								
Reach	762.3889	4% AEP	ex	539.00	898.82	903.66		904.05	0.003388	5.30
133.85	116.86	0.54								
Reach	762.3889	1% AEP	ex	787.00	898.82	904.89		905.17	0.001685	4.72
241.35	134.59	0.41								
Reach	626.3436	4% AEP	ex	539.00	897.94	902.96	901.57	903.52	0.004274	5.99
89.93	45.86	0.53								
Reach	626.3436	1% AEP	ex	787.00	897.94	904.06	902.32	904.79	0.004051	6.86
114.69	52.01	0.54								
Reach	592			Bridge						
Reach	558.3685	4% AEP	prop	539.00	897.48	901.70		902.18	0.003758	5.58
96.54	33.84	0.49								
Reach	558.3685	4% AEP	ex	539.00	897.48	901.72		902.28	0.004635	6.02
89.47	33.90	0.55								
Reach	558.3685	1% AEP	prop	787.00	897.48	902.48		903.21	0.004452	6.83
115.16	34.42	0.55								
Reach	558.3685	1% AEP	ex	787.00	897.48	902.47		903.31	0.005404	7.34
107.22	34.42	0.61								
Reach	388.8611	4% AEP	prop	539.00	896.55	900.28	899.99	901.13	0.009153	7.38
73.01	31.19	0.85								
Reach	388.8611	4% AEP	ex	539.00	896.55	900.28	899.99	901.13	0.009153	7.38
73.01	31.19	0.85								
Reach	388.8611	1% AEP	prop	787.00	896.55	900.88	900.67	902.00	0.010015	8.50
92.54	34.03	0.91								
Reach	388.8611	1% AEP	ex	787.00	896.55	900.88	900.67	902.00	0.010015	8.50
92.54	34.03	0.91								
Reach	283.1181	4% AEP	prop	539.00	895.00	898.88	898.88	899.95	0.013275	8.27
65.15	31.32	1.01								
Reach	283.1181	4% AEP	ex	539.00	895.00	898.88	898.88	899.95	0.013275	8.27
65.15	31.32	1.01								
Reach	283.1181	1% AEP	prop	787.00	895.00	899.56	899.56	900.81	0.012377	8.98
87.64	35.15	1.00								

Reach	283.1181	1% AEP	ex	787.00	895.00	899.56	899.56	900.81	0.012377	8.98
87.64	35.15	1.00								
Reach	176.6302	4% AEP	prop	539.00	892.29	896.80	896.32	897.55	0.007435	6.99
77.16	30.58	0.78								
Reach	176.6302	4% AEP	ex	539.00	892.29	896.80	896.32	897.55	0.007435	6.99
77.16	30.58	0.78								
Reach	176.6302	1% AEP	prop	787.00	892.29	897.44	897.03	898.44	0.008048	8.04
97.98	34.41	0.83								
Reach	176.6302	1% AEP	ex	787.00	892.29	897.44	897.03	898.44	0.008048	8.04
97.98	34.41	0.83								
Reach	62.28806	4% AEP	prop	539.00	891.81	895.81	895.55	896.63	0.008806	7.26
75.82	36.34	0.84								
Reach	62.28806	4% AEP	ex	539.00	891.81	895.81	895.55	896.63	0.008806	7.26
75.82	36.34	0.84								
Reach	62.28806	1% AEP	prop	787.00	891.81	896.40	896.19	897.47	0.008813	8.36
98.56	40.67	0.87								
Reach	62.28806	1% AEP	ex	787.00	891.81	896.40	896.19	897.47	0.008813	8.36
98.56	40.67	0.87								

APPENDIX G – HEC-RAS Output for Proposed Bridge

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Trib Blacklick
Project File : TribBlacklick.prj
Run Date and Time: 6/14/2023 10:18:34 AM

Project in English units

PLAN DATA

Plan Title: Existing Plan
Plan File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.p01

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

Flow Title : TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Plan Summary Information:
Number of: Cross Sections = 15 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
    Water surface calculation tolerance = 0.01
    Critical depth calculation tolerance = 0.01
    Maximum number of iterations   = 20
    Maximum difference tolerance   = 0.3
    Flow tolerance factor   = 0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method: Average Conveyance
    Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: TribBlacklick
Flow File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.f01

Flow Data (cfs)

River	Reach	RS	50% AEP	20% AEP	10% AEP	4% AEP	2% AEP	1% AEP
Stream	Reach	1884.237	169	295	395	539	659	787

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Stream	Reach	50% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	20% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	10% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	4% AEP	Normal S = 0.0088	Normal S = 0.0088
Stream	Reach	2% AEP	Normal S = 0.0088	Normal S = 0.0088

GEOMETRY DATA

Geometry Title: Exist Geometry
Geometry File : z:\Projects\10028-FAI-LIC-70\96808\400-Engineering\Structures\SFN_2335816\EngData\Hydraulics\TribBlacklick.g01

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1884.237

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	954.51	6.41	954.48	17.41	954.73	18.99	954.45	27.9	952.39
36.66	945.28	52.98	937.21	76.89	926.06	99.4	915.71	102.77	914.92
117.69	914.8	136.02	914.71	142.43	914.82	183.72	915.41	193.3	915.34
227.53	915.53	231.92	915.56	234.91	915.58	236.64	915.61	238.43	913.74
240.12	912.72	246.48	911.81	247.32	911.71	249.73	911.42	262.99	910.26
268.87	912.33	274.02	913.52	274.06	913.53	278.11	913.51	280.36	913.5
283.43	913.49	288.14	913.89	288.86	914.04	291.79	914.65	293.23	914.88
301.84	915.07	309.5	915.16	328.02	915.36	336.06	915.69	347.49	917.8
358.9	919.32	367.24	920.36	371.88	920.96	390.48	923.58	390.55	923.58
402.92	926								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	236.64	.033	293.23	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
236.64	293.23	87.263	104.64	99.362	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1779.593

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.76	12.71	953.07	15.1	952.62	28.18	947.8	46.85	937.41

```
   56.01  933.08   76.47   919.3   82.95  917.36   94.52  914.82  109.53  914.84
  124.72  914.62  130.42  914.46  167.75  914.29  176.28  913.96   180.3  914.21
  206.69  914.43   213.1  914.45  228.82   914.6  246.52  914.15  261.09  913.77
  261.34  913.77  261.55  913.65  263.01  912.64  264.49  911.62  273.26  910.72
  279.37  909.95  281.59  909.61  285.86  912.21  295.21  916.53  296.28  917.02
  297.43   917.7  298.19  918.14  298.72  918.13   302.9   918.3  305.46  918.39
   306.4  918.43  308.56  919.07  321.57  922.79  326.12  924.08  326.71  924.09
  333.97  924.23  334.08  924.22  334.18  924.21  334.84  924.16  335.45  924.13
  335.98  924.09  336.76  924.06  337.45  924.02  338.37     924  339.17  923.97
  340.22  923.97  341.57  924.02  342.67     924  344.16  924.07  345.61  924.14
  347.09  924.15  375.25  924.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  261.09    .033  295.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        261.09  295.21           46.246  179.08  62.301             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1600.512

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.31    4.83  955.12    10.3  954.82   10.49  954.79   12.44  954.27
   27.28  950.49   32.66  948.56   50.57  939.06    76.9  920.79   76.97  920.73
   77.04  920.69   77.23  920.58   77.33  920.55   92.86  915.08    97.3  914.54
   98.04  914.32  100.41  913.13   103.5  912.95  125.46  912.09   135.3  912.54
  143.89  913.16  147.52  913.04  149.13   912.9  153.15   912.3  157.42  911.67
  159.22  911.63  162.96  911.35  166.09  911.12  166.58  910.96  171.56  911.22
  172.86   911.3  178.65  911.65  181.26  910.34  183.78  909.49   187.7  907.58
  195.36  908.98  198.32  909.31  200.52  909.52  203.12  909.67  214.83  910.38
  222.44  910.84   223.1  910.89  224.64  911.17   229.5  912.52  236.98   912.6
  240.38  912.97  252.23  913.23  256.85  913.24  284.12  913.52  292.99  913.53
  300.66  913.33  304.23  913.24  330.58  913.88  330.81  913.94  332.76  914.23
  333.95  914.46   337.1     915  341.58  915.77  363.46  920.07  366.71  920.38
  376.25  921.08   383.7   920.8  389.19   920.8  390.64  920.84  413.78  920.82
  417.16  920.44  420.58  920.54  433.23  922.75  437.09  923.28  442.48     924
  447.71  924.96  458.58  925.64  468.93  926.02  474.21     926
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  178.65    .033   229.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        178.65   229.5          107.579  139.35  11.829             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1461.160

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.81    3.57  953.64   11.36  953.09   14.36  952.71   48.21  927.92
   53.89  923.77    63.8   917.2   79.26  906.95   89.12   909.8   92.93  910.98
   94.97  910.96  104.28   910.9  105.14  910.87  120.27  910.31  132.24  910.05
  165.25   912.7  168.09  913.02  173.83  913.14  185.32  913.16  199.92   913.3
  219.67  913.29   224.9  913.15  227.29  913.08  229.73  913.01  232.19  912.95
  245.18  913.13  246.82  913.08  248.56  913.06   250.4  913.09  252.32  913.17
  254.24  913.32  255.82  913.49  257.27  913.68  258.54  913.87  270.59  916.21
  272.67  916.56   275.6  917.07   289.3  919.77  296.03  920.42   299.8  920.55
  305.56   920.9  317.24  920.91  326.67  921.16  338.59  921.17   347.9  920.14
  356.73  920.37  357.38   920.4  357.67  920.47  358.83  920.61     383  924.95
  394.25  925.64  409.27  926.83  411.95  926.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    63.8    .033   94.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          63.8   94.97          92.336  202.23  11.941             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1258.927

INPUT
```

Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.43	6.46	950.96	9.86	950.6	19.08	949.85	35.36	943.09
38.43	941.82	47.71	936.33	58.08	930.28	59.67	929.41	62.77	927.72
78.09	919.53	84.28	916.93	93.45	913.65	95.23	913.44	96.27	913.36
102.11	915.37	102.86	915.62	111.76	912.69	113.67	911.86	113.88	911.91
118.56	911.86	140.14	911.87	142.65	911.86	155.9	911.5	159.62	910.77
163.94	909.84	171.83	909.49	185.25	909.12	188.34	908.93	188.82	908.78
191.94	907.8	196.59	906.47	204.94	906.3	208.68	906.22	208.69	906.22
210.23	906.06	220.83	904.86	222.08	904.54	223.81	905.38	236.17	912.6
237.18	912.66	240.2	912.84	254.22	913.03	268.3	913.23	268.94	913.27
276.16	914.75	297.12	918.82	297.43	918.87	297.87	918.95	300.06	919.38
301.22	919.49	313.34	919.95	330.21	921.02	330.82	921.02	347.58	921.46
349.42	921.46	352.67	921.1	362.31	919.95	369.02	920.19	375.42	921.76
396.95	924.31	400.4	924.94	402.38	925.07	420.78	926.55		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	191.94	.033	236.17	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
191.94	236.17	24.845	76.08	70.24	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 1182.848

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951	8.98	950.41	15.92	949.84	24.27	949.24	46.86	938.8
50.02	937.49	51.87	936.4	61.11	931.15	73.73	923.85	83.68	918.39
96.32	912.61	97.83	912.54	98.27	912.52	98.84	912.49	99.51	912.44
100.25	912.37	101.02	912.29	101.77	912.2	102.44	912.11	112.95	911.91
114.01	911.79	115.03	911.68	115.96	911.57	133.21	911.73	140.29	911.7
149.68	911.36	165.78	910.93	169.21	910.45	174.14	909.47	188.43	909.2
203.9	908.82	206.99	907.98	211.6	906.73	212.03	906.68	214.83	906.65
214.84	906.65	214.85	906.64	218.19	905.47	222.65	905.08	223.3	905.03
238.83	904.36	246.38	908.19	252.44	911.3	253.18	911.32	263.22	911.58
270.91	911.77	272.78	911.84	282.34	913.4	309.28	919.56	314.28	919.84

```
  314.38  919.85  314.48  919.83  316.88   919.5   327.6  918.06   350.7  922.45
  356.72  923.68  372.54  924.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   203.9    .033  246.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         203.9  246.38           54.037  90.657  97.318             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 1092.190

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  949.51   11.05   948.8   22.84  947.98   28.64  946.25   40.02  942.95
   49.69  937.97    51.8  936.92    53.8  935.87   57.25  933.56    75.1  924.63
   98.61  911.15  112.56  911.04  120.78   910.8  124.41  911.09  134.91  911.28
  140.61  910.99  146.23  910.74  154.12  909.75  156.92  909.38  168.82  908.93
  170.03   908.9  170.59  908.87  182.01  908.55  187.74  908.52  192.38  906.93
   195.1  906.24  213.03  906.07  224.64  905.96  227.72  905.82   228.3  905.72
  240.95  903.51  245.07  902.72  245.65  902.81  245.78  902.85     246  902.91
  246.43  903.06     248  903.63  258.68  907.61  262.55  909.05  268.81  908.95
  274.59  908.85  277.34  908.75  277.84  908.77  279.85  908.64  281.67  908.51
  287.15  908.86  288.52  909.19  291.79  909.02  298.71  908.93  302.57   908.4
  307.08  907.64  310.52  908.31  314.31  908.99  321.29  908.94  323.42  908.95
  326.02  909.02  328.86  909.15  340.44  909.35  347.49  909.77  350.35  909.99
  353.42  910.28  356.33  910.61  365.51  914.43  388.89  923.25     406  923.94
  412.35  924.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  213.03    .033  258.68     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.03  258.68          168.653   218.3  59.293             .1       .3

CROSS SECTION
```

RIVER: Stream
REACH: Reach RS: 873.8912

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.75	11.69	946.94	16.34	946.55	40.21	944.49	52.11	942.38
58.6	940.75	74.35	935.46	80.37	932.87	110.86	915.36	114.13	914.16
131.74	908.3	133.8	908.62	137.24	909.15	140.66	909.84	145.23	909.74
151.89	909.58	155.6	909.24	157.51	905.28	159.3	902.36	160.31	902.27
161.4	902.17	177.06	901.28	178.94	901.57	188.29	902.34	190.45	902.54
197	903.16	197.95	903.43	200.5	904.71	201.74	905.33	202.99	906.04
211.04	906.16	212.15	906.18	227.44	906.39	258.28	907.2	261.08	907.17
264.44	906.73	271.49	906.03	277.25	906.52	280.22	906.85	281.32	906.87
282.53	906.88	301.15	907.11	312.09	906.95	324	906.43	342.97	906.46
345.71	906.42	350.63	907.56	353.67	909.01	362.8	913.18	377.32	919.08
385.89	922.29	408.72	923.6	410.78	923.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	155.6	.033	202.99	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.6	202.99	117.307	111.5 132.136	.1	.3

CROSS SECTION

RIVER: Stream
REACH: Reach RS: 762.3889

INPUT
Description:
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944	1.77	943.67	2.1	943.62	5.79	943.28	8.99	943.2
12.08	943.43	12.26	942.86	14.76	942.99	17.5	942.16	29.67	942.4
33.95	941.3	36.07	941.38	38.49	941.3	40.57	941.25	44.87	938.77
64.37	929.42	68.98	928.32	78.36	926.43	90.04	922.19	99.58	918.5
107.89	915.2	121.71	909.45	133.15	904.31	136.08	902.93	142.78	902.76
153.29	902.35	166.69	903.4	169.31	903.43	169.86	903.44	172.57	903.46
175.93	902.91	178.47	902.33	180.19	902.47	184.46	902.57	185.29	902.39

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  201.88  898.82  202.91  898.84  203.55     899  216.17  903.05  222.03  904.93
  226.46  905.41  227.42  905.51  245.48  907.41  246.79  907.45  247.96  907.53
  248.11  907.53   249.8  906.93  251.22  906.48  253.86  905.18   254.8  904.84
  255.43  904.64   255.9   904.5   256.3   904.4  257.43  903.56  259.91  903.44
  262.59  903.33  264.54  903.26  266.23  903.22  267.87  903.19  286.65  903.59
  286.73  903.59  286.93   903.6  287.98  903.66  289.11   903.7   290.2  903.72
  290.81  903.72  291.49  903.71  292.67  903.67  293.36  903.63  293.76   903.6
  295.22  903.49  297.84  904.42  298.39  904.61  299.27  904.93  303.74   906.7
  306.15  907.62  310.97  909.53  311.93  909.93  313.49  910.54  316.98  910.62
  320.57   910.7  323.16  910.76  325.11  910.82  348.01  912.07  374.58  913.73
   403.6  918.88  415.27  920.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  185.29    .033  216.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        185.29  216.17          119.463  136.05  84.365             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  246.79  415.27  907.53       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 626.3436

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.05  195.12          101.327   67.98  66.819             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

BRIDGE


RIVER: Stream
REACH: Reach              RS: 592

INPUT
Description:
Distance from Upstream XS =     4.3
Deck/Roadway Width        =      60
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   24.08   940.5     892 159.353  914.56     892 159.353  914.56  907.28
 179.421  914.56  907.28 179.421  914.56     892   280.2     908     892

Upstream Bridge Cross Section Data
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  940.55    4.65  940.42     7.5  940.38   24.08  937.41   43.46  933.39
   51.46  931.56   57.34  930.06   73.94  927.48   81.42  926.15   93.87  923.44
  104.01  920.99   115.6  915.35   116.6  914.64  120.51  914.12  121.28  913.87
  121.88  913.66   139.3  907.56  141.55  906.77  152.05  901.66  154.34  900.93
  155.41  900.58  155.84  900.46  159.41  897.94  164.53  898.85  169.53  899.77
  175.01  898.99  176.44   899.3  179.91  898.66   180.7  898.54  181.26  898.53
  185.96  899.31     188  899.65  189.56  899.71   194.7  900.39  195.12   901.7
  195.49     906  197.31  905.67  197.98  905.53  200.22  904.72   200.3  904.69
  202.35  904.54  205.15  903.57  215.65  905.73  222.69  907.18  231.01  907.22
  241.15  907.44  249.86   908.1  255.83  908.52  263.92  908.44   280.2  908.96
  292.49  907.69  293.62  907.68

Manning's n Values        num=       3
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     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  152.05     .04  195.12     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        152.05  195.12             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 158.097  914.56       T
 180.679  293.62  914.56       T

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   13.71   928.4     892 178.068  914.56     892 178.068  914.56   906.6
 198.077  914.56   906.6 198.077  914.56     892  300.26     911     892

Downstream Bridge Cross Section Data
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        168.33   202.7             .3       .5
Ineffective Flow     num=       2
```

```
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 558.3685

INPUT
Description:
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  929.75    5.71  928.95    8.21  928.62   13.71  927.45   18.82  926.42
   20.01  926.36   30.11  925.65   35.31  925.31   41.01  924.89   44.69  924.55
   53.46  923.74   57.22  923.37   61.83  922.98    68.5  922.49   69.93  922.38
   84.29  920.98   88.13  920.72   92.64  920.42   94.36  920.29   95.16  920.23
  104.94   919.2  108.62  918.91  108.75   918.9  110.66  918.75  114.68  918.44
  126.81  917.29  132.82  916.83   135.8   916.6  141.85  915.74  145.26  915.47
```

```
  147.55   914.9  147.67  914.89  148.52  914.83  148.59  914.82  151.37  914.95
  152.21  914.89  152.77  914.84  152.92  914.84  157.34  914.54  158.56  914.45
  162.45   914.3  162.97  914.61   164.9  915.13  166.86  915.11  167.85  915.11
  167.94  907.54  168.33   901.9  171.21  900.81  172.93  900.11  174.53  899.46
     176  898.91  180.21  897.48  187.35  897.85  192.43  897.98  196.22   897.6
  197.82  898.27  198.86  898.95  199.12  899.03     201  899.47   202.7  900.17
  202.74  911.12   202.9  911.27  203.18   911.2  203.94     911  204.22  910.92
  204.63  909.92  204.81  909.83  213.42  909.08  213.52  909.07  215.91     909
  216.43  908.98  220.86  908.84  248.63  907.34  250.11   907.3  250.47  907.33
  251.24  907.48  263.14  908.81  268.26  909.32  282.18  909.51  286.53  909.64
  296.93  910.63  297.98  910.73  298.33  910.78  298.48  910.78  300.26     911

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  168.33     .04   202.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        168.33   202.7          120.462  169.51  196.87             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 176.223  914.56       T
 199.931  300.26  914.56       T

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 388.8611

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   943.8    4.02  943.62     5.7     943   30.84  927.41   38.05  922.87
   52.32  920.72   74.08  919.14   76.64  919.08   82.24  918.89   88.44  916.64
  110.11  908.75  110.65  908.56  115.45  906.81  117.27   906.3  124.08  900.14
   126.1  898.63  127.03  897.94  127.96  897.85  141.55  896.55  157.01   900.8
   164.7  902.92  167.31  903.76  168.38  904.11  171.28  904.64  172.13  904.75
  172.65  905.02  173.65  905.33  175.31  905.54  175.94  905.69  176.75  905.68
   180.6  905.74  183.33  906.02  185.06  905.87  188.36  905.68  203.19  906.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.27    .033  168.38     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.27  168.38          125.202  105.74  77.406             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 283.1181

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  925.17   10.77  920.52   31.24  917.18   33.66  916.97   49.82  914.67
   50.23  914.58   56.65  912.39   60.44  913.12   61.23  913.27   68.73  913.95
   73.06   913.9   75.63  913.89   78.56  914.02   79.91  914.08   81.13  914.14
   81.76  913.55   93.64   900.8   95.26  899.06   97.43  897.93  108.72     895
  109.66  895.02   123.8  898.19  134.02  900.47   134.3  900.54   137.8  901.24
  140.43  901.63  142.02   901.8   147.3   902.5   149.9  903.01  150.58  903.09
  151.16  903.18  152.01  903.22  152.32  903.36  153.29  903.61   153.7  903.63
  154.16  903.81  155.51  903.85  155.53  903.85  156.98  903.84  157.41  903.82
  158.42  903.71  158.75  903.38  160.28  903.17  161.03  903.24  184.01  903.91
  184.85  903.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   93.64    .033  134.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.64  134.02           96.688  106.49 101.506             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 176.6302

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  922.99     .21  922.97      45  917.07   68.19  913.98   81.65  912.14
   96.19   911.1   98.98  911.01   105.2  910.82  106.83  910.83  108.26  910.84
```

```
  109.53  910.84   110.7  910.85  112.82  910.85  113.82  910.86   114.7  910.86
  125.03  905.43  125.23  905.32  128.08  903.85  131.61  902.02  132.72  901.71
   146.3  897.65  147.36  897.62  151.72   897.5  151.99  897.47  152.85   897.3
  161.72  893.75  166.99  892.29  177.54  894.32  177.63  894.35   177.8  894.41
  177.93  894.45  178.27  894.57  178.55  894.67  178.97  894.81  179.07  894.85
  179.51     895  180.47  895.33   180.6  895.38  182.25  895.95  182.28  895.96
  182.35  895.98  183.96  896.54  184.96  896.89  185.79  897.17  186.15   897.3
   187.2  897.66  187.75  897.98  188.49   898.4   188.6  898.47  189.68  898.51
  191.15  898.55  194.59   898.5  197.45  898.68  198.32  898.75  198.85  898.68
  198.92  898.67  203.55  898.32  204.02  898.31  205.07  898.31   205.4   898.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  152.85    .033  186.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        152.85  186.15           68.689  114.34 141.027             .1       .3

CROSS SECTION


RIVER: Stream
REACH: Reach              RS: 62.28806

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  921.53     .09  921.52   34.63   916.7   46.19  915.11    57.1   910.9
   66.87  910.11   68.28  910.13   74.18  907.81   80.39  905.46   81.17  905.24
   92.09  903.24   99.03  901.96  104.87  900.28  106.69  899.71  112.03  897.71
  115.34  897.07  117.23  896.71  124.61  895.28  126.55  895.15  127.87  894.63
  134.17  893.83  143.28  892.68  149.02  891.93  149.79  891.81  150.83  892.42
  150.95  892.48  151.03  892.51  151.07  892.53  151.32  892.65  151.98  892.95
  158.69  896.03  163.65  898.32   163.9  898.49     165   899.2  166.05  899.13
  166.62  899.18  168.04  898.94  168.53  898.86  169.44  898.79  174.88  898.72
  176.05  898.71  177.64  898.72  179.33  898.68  185.77  898.68   186.7  898.67
  188.46  898.67  190.67  898.48     191  898.43  191.67  898.31  193.15  898.06
  196.08  898.08  197.09  898.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  126.55    .033  158.69     .06
```

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.55	158.69	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Stream

Reach	River Sta.	n1	n2	n3
Reach	1884.237	.06	.033	.06
Reach	1779.593	.06	.033	.06
Reach	1600.512	.06	.033	.06
Reach	1461.160	.06	.033	.06
Reach	1258.927	.06	.033	.06
Reach	1182.848	.06	.033	.06
Reach	1092.190	.06	.033	.06
Reach	873.8912	.06	.033	.06
Reach	762.3889	.06	.033	.06
Reach	626.3436	.03	.04	.03
Reach	592	Bridge		
Reach	558.3685	.03	.04	.03
Reach	388.8611	.06	.033	.06
Reach	283.1181	.06	.033	.06
Reach	176.6302	.06	.033	.06
Reach	62.28806	.06	.033	.06

SUMMARY OF REACH LENGTHS

River: Stream

Reach	River Sta.	Left	Channel	Right
Reach	1884.237	87.263	104.64	99.362
Reach	1779.593	46.246	179.08	62.301
Reach	1600.512	107.579	139.35	11.829
Reach	1461.160	92.336	202.23	11.941
Reach	1258.927	24.845	76.08	70.24
Reach	1182.848	54.037	90.657	97.318
Reach	1092.190	168.653	218.3	59.293

Reach	873.8912	117.307	111.5	132.136
Reach	762.3889	119.463	136.05	84.365
Reach	626.3436	101.327	67.98	66.819
Reach	592	Bridge		
Reach	558.3685	120.462	169.51	196.87
Reach	388.8611	125.202	105.74	77.406
Reach	283.1181	96.688	106.49	101.506
Reach	176.6302	68.689	114.34	141.027
Reach	62.28806	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Stream

Reach	River Sta.	Contr.	Expan.
Reach	1884.237	.1	.3
Reach	1779.593	.1	.3
Reach	1600.512	.1	.3
Reach	1461.160	.1	.3
Reach	1258.927	.1	.3
Reach	1182.848	.1	.3
Reach	1092.190	.1	.3
Reach	873.8912	.1	.3
Reach	762.3889	.1	.3
Reach	626.3436	.3	.5
Reach	592	Bridge	
Reach	558.3685	.3	.5
Reach	388.8611	.1	.3
Reach	283.1181	.1	.3
Reach	176.6302	.1	.3
Reach	62.28806	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl

Reach	1884.237	4% AEP	539.00	910.26	914.95		915.18	0.002202	3.83	147.08	108.11	0.43
Reach	1884.237	1% AEP	787.00	910.26	915.63		915.87	0.001895	4.12	259.83	234.72	0.41
Reach	1779.593	4% AEP	539.00	909.61	913.45	913.45	914.62	0.013072	8.68	62.13	26.71	1.00
Reach	1779.593	1% AEP	787.00	909.61	914.79	914.79	915.51	0.005513	7.12	166.08	178.75	0.69
Reach	1600.512	4% AEP	539.00	907.58	912.60		912.79	0.001817	3.66	173.46	109.35	0.39
Reach	1600.512	1% AEP	787.00	907.58	913.12		913.38	0.001987	4.31	238.36	144.77	0.42
Reach	1461.160	4% AEP	539.00	906.95	911.59	911.59	912.30	0.010237	7.65	106.98	79.10	0.88
Reach	1461.160	1% AEP	787.00	906.95	912.03	912.03	912.87	0.010595	8.56	143.59	85.32	0.91
Reach	1258.927	4% AEP	539.00	904.54	908.33		909.02	0.007901	6.62	81.79	38.63	0.79
Reach	1258.927	1% AEP	787.00	904.54	909.00		909.84	0.007181	7.38	108.61	42.80	0.78
Reach	1182.848	4% AEP	539.00	904.36	907.63		908.37	0.008984	6.89	78.24	37.01	0.84
Reach	1182.848	1% AEP	787.00	904.36	908.02	907.96	909.13	0.011579	8.44	93.21	39.23	0.97
Reach	1092.190	4% AEP	539.00	902.72	906.67	906.67	907.42	0.012378	7.07	83.51	62.75	0.95
Reach	1092.190	1% AEP	787.00	902.72	907.13	907.13	908.04	0.011464	7.85	113.44	65.62	0.95

Reach	873.8912	4% AEP	539.00	901.28	904.02	903.89	904.79	0.010849	7.01	76.90
40.85	0.90									
Reach	873.8912	1% AEP	787.00	901.28	904.91		905.65	0.006805	6.90	114.11
43.16	0.75									
Reach	762.3889	4% AEP	539.00	898.82	903.66		904.05	0.003388	5.30	133.85
116.86	0.54									
Reach	762.3889	1% AEP	787.00	898.82	904.89		905.17	0.001685	4.72	241.35
134.59	0.41									
Reach	626.3436	4% AEP	539.00	897.94	902.96	901.57	903.52	0.004274	5.99	89.93
45.86	0.53									
Reach	626.3436	1% AEP	787.00	897.94	904.06	902.32	904.79	0.004051	6.86	114.69
52.01	0.54									
Reach	592		Bridge							
Reach	558.3685	4% AEP	539.00	897.48	901.72		902.28	0.004635	6.02	89.47
33.90	0.55									
Reach	558.3685	1% AEP	787.00	897.48	902.47		903.31	0.005404	7.34	107.22
34.42	0.61									
Reach	388.8611	4% AEP	539.00	896.55	900.28	899.99	901.13	0.009153	7.38	73.01
31.19	0.85									
Reach	388.8611	1% AEP	787.00	896.55	900.88	900.67	902.00	0.010015	8.50	92.54
34.03	0.91									
Reach	283.1181	4% AEP	539.00	895.00	898.88	898.88	899.95	0.013275	8.27	65.15
31.32	1.01									
Reach	283.1181	1% AEP	787.00	895.00	899.56	899.56	900.81	0.012377	8.98	87.64
35.15	1.00									
Reach	176.6302	4% AEP	539.00	892.29	896.80	896.32	897.55	0.007435	6.99	77.16
30.58	0.78									
Reach	176.6302	1% AEP	787.00	892.29	897.44	897.03	898.44	0.008048	8.04	97.98
34.41	0.83									

Reach	62.28806	4% AEP	539.00	891.81	895.81	895.55	896.63	0.008806	7.26	75.82
36.34	0.84									
Reach	62.28806	1% AEP	787.00	891.81	896.40	896.19	897.47	0.008813	8.36	98.56
40.67	0.87									

Appendix E – Maintenance of Traffic Alternative Analysis (MOTAA)

MAINTENANCE OF TRAFFIC ALTERNATIVE ANALYSIS

FAR EAST FREEWAY
FAI/LIC-70-0.00/0.00

September 2023
PID 96808

Prepared for:
Ohio Department of Transportation – District 5
9600 Jacksontown Road
Jacksontown, Ohio 43030

GANNETT FLEMING

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PROJECT BACKGROUND

The section of IR 70 on the east side of Columbus between Livingston Avenue and SR 310, known as the Far East Freeway, has experienced a high number of crashes and daily traffic backups for years, and the problems through the corridor are numerous. This section of IR 70 currently ranks third in central Ohio in both congestion and accident frequency. High truck volumes, deficient weave lengths and interchange spacing, combined with heavy growth on the east side has led to level of service (LOS) F at several ramp locations during the AM and PM peaks. Built in the 1960's to meet the travel volumes of the era, many of the interchanges along IR 70 are handling volumes significantly higher than what they were originally designed for. Because of this, ODOT developed a transportation operations and construction strategy to identify deficiencies and workable solutions. This included the shortcomings of the IR 70 and SR 256 interchange; by improving traffic flow and level of service by correcting operational deficiencies, including insufficient capacity in the interchange areas; and improve safety, by addressing problematic geometric deficiencies and weave areas. Refer to the 2023 project Feasibility Study for a more in-depth review of the existing deficiencies.

Important considerations for a construction project that will limit capacity are the traffic generators that are located adjacent to the active work zones. There is a very large retail complex northeast of the SR 256 and IR 70 interchange. There are two golf courses: one north and one south of the interchange. Emergency health services are located nearby, such as the Ohio Health Pickerington Emergency Care Center located south of the interchange at the NW corner of SR 256 and Refugee Road, and the Mount Carmel Reynoldsburg Emergency Room located at the NE corner of SR 256 and Taylor Road SW. Nearby emergency fire services are the Truro Township Fire Department located north of the interchange along East Livingston Avenue, Violet Township Fire Department is south of the interchange along Refugee Road, and Columbus Fire Station #32 is located along Gender Road. Additional medical facilities lie along US 40 (E. Main Street) and SR 16 (E Broad Street), and other urgent care locations are close by. Overly high traffic demand within the project area is due to key traffic generators, the critical challenge of this project will be providing a maintenance of traffic concept that will minimize traffic disruption, maintain as much access as possible, and provide adequate space for construction operations. The maintenance of traffic alternatives, detailed below, will provide a successful project by balancing operations, cost and safety while providing an efficient and constructible project.

EXISTING ROADWAY CONDITIONS

This section of IR 70 is an Urban Interstate with a posted speed limit of 70 mph. The project is jointly located in Fairfield County and Licking County and extends eastward to include the construction of a new interchange at Taylor Road. IR 70 is a six-lane divided highway with a grass median in Fairfield County and a four-lane divided highway with a grass median in Licking County. The existing add-lane for westbound occurs at the westbound entrance ramp from SR 256 and the lane merge for eastbound occurs approximately 2,200 feet east of the Taylor Road eastbound exit ramp. Existing twelve-foot lanes are provided in each direction. There is a full interchange at IR 70 / SR 256 with the following ramps:

- SR 256 to IR 70 WB entrance ramp (Ramp A)
- IR 70 WB to SR 256 exit ramp (Ramp B)
- SR 256 to IR 70 EB entrance ramp (Ramp C)
- IR 70 EB to SR 256 NB exit loop ramp (Ramp D)
- IR 70 EB to SR 256 SB exit ramp (Ramp E)

There is also one additional ramp along eastbound IR 70. This is the exit ramp for Taylor Road (Ramp G). This ramp is located east of SR 256 and will be removed and replaced as part of the Taylor Road full access interchange construction.

There are two existing pairs of structures within the project limits. One set of bridges are on the IR 70 mainline over Blacklick Creek and Blacklick Trail. Each of these structures carries three lanes of traffic in each direction. The second set of bridges are also on IR 70 mainline over SR 256. One structure accommodates two westbound lanes and the other accommodates three eastbound lanes with an additional deceleration lane for the exit loop ramp (Ramp D).

SR 256 is a major arterial roadway providing access along the commercial corridor. It is bordered on the south by Tussing Road (SR 204) and on the north by Taylor Park Drive. This section of SR 256 provides three through lanes and the signalized intersections are served with left turn only and right turn only lanes. The intersection with Taylor Park Drive is signalized with left turn lanes on each leg and a right turn lane for northbound SR 256. The next signalized intersection is with Taylor Road SW. Left turns are served by dedicated left turn lanes in each direction with the northbound SR 256 and westbound Taylor Road SW being dual left turn lanes. The next intersection lies south of Taylor Road SW and is the signalized intersection with Ramp A and Ramp B of the interchange. The northbound approach is served with dual left turn lanes. South of IR 70, Ramp C and Ramp D access is controlled by a traffic signal. Southbound SR 256 is not signalized here. The intersection with Tussing Road is signalized. Single left turn lanes are provided along SR 256. Dual left turns are provided along Tussing Road. Dual right turn lanes service westbound Tussing Road.

Taylor Road north of IR 70 is a minor arterial roadway providing access to private residences, apartment complexes, additional east-west routes, and continues approximately 5 miles to the north. Taylor Road south of IR 70 is also a minor arterial used as an extension of Ramp G that dead ends into SR 204 (Blacklick Eastern Road NW). This roadway provides residential access to SR 204 and provides relief from the SR 256 interchange for eastbound local traffic. Taylor Road does not currently cross IR 70.

PROPOSED WORK

Roadway Improvements

The project improvements will tie-in with the improvements made by the FRA-70-22.85 (PID 98323) project at the Franklin County / Fairfield County line. The tie-in will feature four 12-foot lanes with 10-foot shoulders in each direction.

The majority of the mainline pavement widening will be completed to the outside along IR 70, but limited widening will be required to the inside to increase the inside paved shoulder width to 10 feet to avoid the need for a design exception. In the eastbound direction, the inside shoulder widening is estimated to be 7 feet wide. In the westbound direction, the widening is estimated to be 7 feet from the western project limits to the SR 256 overpass, and then increased to 22 feet for the remainder of the project to construct the additional lane and shoulder. A concrete barrier will be installed from the ramp gore at SR 256 easterly through the proposed Taylor Road interchange area to separate the mainline traffic from the proposed collector-distributor road in both the westbound and eastbound directions. Ramp work at the interchange will correct deficiencies and integrate access with the new C-D roads. Ramp A will be rebuilt, mostly offline from the existing ramp, and be widened to accommodate two full-time lanes. Ramp B will be rebuilt as the westernmost end of the WB C-D road and will be a single lane along its current alignment. Ramps C and D will generally be rebuilt along their respective alignments, each serving a single lane of ramp traffic. Ramp E will have two exit lanes that expand to three lanes for the merge with southbound SR 256. Ramp G will be integrated into the new Taylor Road interchange but will be a two lane exit from the eastbound C-D road.

The new Taylor Road interchange will provide full access from eastbound and westbound IR 70 and includes a new overpass structure connecting Taylor Road on a shifted alignment to SR 204 on the south side of the IR 70

mainline. A C-D road will connect this interchange with the SR 256 interchange. Westbound traffic exiting IR 70 for SR 256, will exit at Taylor Road and use the C-D road to continue to Ramp B. Any Taylor Road traffic entering westbound IR 70 would use the C-D road to access the entrance ramp near the widened SR 256 structure.

Local roadway improvements include: ramp tie-in work with SR 256, Taylor Road is widened, realigned, and reconstructed as part of the new interchange work. This work includes the intersection improvement work located south of IR 70 at SR 204 and north of IR 70 to Taylor Road Extension.

Bridge Improvements

Due to the extensive widening of the mainline roadway, the existing mainline structures over Blacklick Creek and SR 256 require superstructure replacement and widening, or full replacement, in both the eastbound and westbound directions to accommodate the C-D road and ramps. A greatly widened structure, or two new structures (one for mainline and one for the eastbound C-D road) is proposed along eastbound IR 70 to accommodate the widened mainline and the new eastbound C-D road with access to SR 256 and Taylor Road interchange ramps. An overpass structure is proposed at the new SR 256 and Taylor Road interchange that will connect Taylor Road north and south of the IR 70 mainline.

Recently added and not currently in the scope of work, the IR 70 mainline bridges over Palmer Road were not included in the preliminary MOT layouts for the alternative analysis. However, some discussion of the MOT impacts of Palmer Road bridges was included to present a more complete picture of the project likely to be scoped for Final Design.

MOTAA GENERAL & WORK ZONE CONSIDERATIONS

Maintenance of Traffic Alternative Analysis (MOTAA) was prepared per guidelines of the Traffic Engineering Manual (TEM) Section 630-5 for three MOT scenarios. Work zone criteria were uniformly applied and considered in comparing the MOT alternatives for their relative strengths and weaknesses. A summary of the work zone criteria and constraints is outlined in the Work Zone Constraints Form (Appendix A).

Work Zone Design Speed

The existing posted speed limit on IR 70 within the project area is 70 mph. All decision sight distances (DSD), merge and diverge lengths, lane shifts, reverse curves, and crossover length requirements were calculated/ evaluated based upon 70 mph. At entrance ramps where the required DSD and merge distances could not be provided for this speed criteria, recommendations were made to either maintain existing distances, provide temporary pavement (where feasible) or close the ramp with traffic diverted. Likewise, the design of crossovers and the selection of crossover locations were also based on the 70 mph speed criteria per TEM Figure 698-4 and Figure 698-12.

Lane Configurations and Typical Sections

Per guidelines of Section 630-5 of the TEM, 11-foot lanes with 2-foot paved shoulders and a minimum 2-foot clearance between the edge of travel lane and toe of barrier were the desired criteria for typical sections in implementing the MOT patterns. Narrower lane widths and barrier clearances are allowed across bridges and noted where applied. The permitted lane closure charts (PLCC) for this project require the project to maintain a minimum of two lanes of mainline traffic in each direction. However, the existing eastbound traffic volumes encourage the use of three lanes approaching the SR 256 Ramp E exit. The use of three lanes for the eastbound direction is the only deviation from the PLCC. These considerations are applied to both roadway and bridge sections. Though not explored in detail, lane reductions outside of PLCC restricted times, short term closures for

beam erection and minor shifting of traffics lanes are required for bridge construction, temporary pavement construction and other ancillary work.

MAINLINE MOT ALTERNATIVES EVALUATED

The following three alternatives were evaluated in this MOTAA, and descriptions are found below. In all three alternatives it is anticipated to maintain two lanes of traffic in each direction east of SR 256 with a third eastbound lane between the western project limits dropping at Ramp E to SR 256 southbound and a third westbound lane will be added from the SR 256 Ramp A. With the anticipated sale date of the project in April of 2027, the first year of construction for each alternative will focus on the construction of the Taylor Road Interchange, off-line work, substructure work, temporary pavement and/or any ancillary work that would not impact mainline or ramp traffic. The intent of constructing the Taylor Road interchange first is to utilize it for maintaining ramp traffic from SR 256 in the later phases of the project. The MOT schematics with transverse sections are in Appendix E.

1. Part-Width
2. Single Lane Contraflow
3. Full Crossover

Part-Width Alternative

Part-width construction will be completed in three phases as described below. The bulk of the mainline roadway work is in the first phase and will be the construction of the outside widening, ramp, and bridge work in both directions. Phase 2 will build the eastbound inside widening and Phase 3 will construct the inside widening of the westbound direction. For additional details, constraints, and costs for this alternative see Appendices A through D.

In summary, the part-width construction would maintain mainline traffic along their respective bounds.

Phase 1 – 2028
Work to be completed:

- Complete work to utilize Taylor Road interchange
- Build outside improvements along eastbound IR 70 through project limits
- Widen existing Blacklick Creek EB bridge to the outside
- Build the Blacklick Creek EB ramp bridge
- Build outside improvements along westbound IR 70 through project limits
- Widen existing Blacklick Creek WB bridge to the outside
- Widen existing SR 256 EB bridge to the outside
- Widen existing SR 256 WB bridge to the outside

Traffic maintained:

- Maintain three shifted EB mainline lanes to SR 256 Ramp dropping one lane for Ramp E
- Close SR 256 Ramp C traffic with a diversion utilizing the new Taylor Road Interchange
- Maintain SR 256 Ramp E traffic through part-width methods
- Close SR 256 Ramp D with traffic directed to the new Taylor Road Interchange
- Maintain SR 256 Ramp A with part-width traffic methods with diversion to new Taylor Road Interchange
- Short-term closure of Ramp G to finalize interchange tie-in
- Maintain two shifted WB mainline lanes through work zone with add lane from Ramp A.
- Close SR 256 Ramp B and utilize traffic diversion to new Taylor Road Interchange

Duration: 6-8 months

Phase 2 - 2029
Work to be completed:

- Build inside improvements along eastbound IR 70 through project limits
- Widen existing Blacklick Creek EB bridge to the inside
- Widen existing SR 256 EB bridge to the inside

Traffic maintained:

- Taylor Road interchange is open
- All SR 256 Ramps are open
- Maintain three shifted EB mainline lanes to SR 256 Ramp D exit, two lanes downstream
- Maintain two shifted WB mainline lanes to SR 256 Ramp A add lane, three lanes downstream

Duration: 6-8 months

Phase 3 - 2030
Work to be completed:

- Build inside improvements along westbound IR 70 through project limits
- Widen existing Blacklick Creek WB bridge to the inside
- Widen existing SR 256 WB bridge to the inside

Traffic maintained:

- All ramps maintained, C-D and Taylor Road interchange are open
- Maintain two shifted WB mainline lanes to SR 256 Ramp A add lane, three lanes downstream
- Eastbound lanes are maintained in their final configuration

Duration: 5-6 months

Construction is paused during the Winter months. The work zones will be returned to traffic to the extent permitted by conditions. This condition will be developed further during final design.

Part-Width Evaluation
Advantages:

- No crossover temporary pavement required

Disadvantages:

- SR 256 bridge requires 1-foot barrier clearances and 10.5 ft lanes to maintain two WB lanes in Phase 1 that maximizes the available bridge width for follow-on phases
- SR 256 bridge requires overbuilding to maintain two WB lanes in Phase 3
- Bridge overbuilding affects vertical clearance to SR 256 below and requires complementary mainline roadway widening near bridge
- Phase 1 requires the improvements to ramps along both sides of the mainline (a very heavy workload for the contractor during the first construction phase)
- Anticipate overbuilding of both EB and WB Palmer Rd bridges. Extra deck width, either inside or outside, is required to maintain part-width method if these bridges are included in the final design
- Ramp A requires narrow offsets and lane widths to maintain the ramp on the Blacklick Creek bridge.

Single Lane Contraflow Alternative

Single lane contraflow construction will be completed in three main phases. Phase 1 work constructs the outside widening, ramp, and bridge work in the eastbound direction. Single lane crossovers are built for use in phase 2. Phase 2 will build the eastbound and westbound inside widening while maintaining the same number of eastbound lanes, a westbound lane along the westbound roadway and a single westbound contraflow lane along the eastbound roadway. The third phase will maintain the phase 2 lane configuration for the eastbound roadway and a single lane along the westbound roadway. The westbound widening, ramp and bridge work are completed in this phase. For additional details, constraints, and costs for this alternative see Appendices A through D.

The first phase of work is widening the eastbound roadway. Follow-on phases would maintain one westbound lane along the westbound roadway while the second westbound lane would use a crossover to access the eastbound roadway.

Phase 1 - 2028
Work to be completed:

- Complete work to utilize Taylor Road interchange
- Build outside improvements along eastbound IR 70 through project limits
- Widen existing Blacklick Creek EB bridge to the outside
- Build the Blacklick Creek EB ramp bridge
- Widen existing SR 256 EB bridge to the outside
- Build single lane crossovers at east and west limits of project

Traffic maintained:

- Maintain three shifted EB mainline lanes to SR 256 Ramp dropping one lane for Ramp E
- Short-term closure of Ramp G to finalize interchange tie-in
- Close SR 256 Ramp C with traffic diverted to Taylor Road interchange
- Maintain SR 256 Ramp E traffic through part-width methods
- Close SR 256 Ramp D with traffic diverted to Taylor Road interchange
- Maintain two WB mainline lanes through work zone
- Close SR 256 Ramp B with traffic diverted through new interchange

Duration: 6-7 months

Phase 2 - 2029
Work to be completed:

- Build inside improvements along eastbound IR 70 through project limits
- Widen existing Blacklick Creek EB bridge to the inside
- Widen existing SR 256 EB bridge to the inside
- Build outside improvements along westbound IR 70 through project limits
- Widen existing Blacklick Creek WB bridge to the outside
- Widen existing SR 256 WB bridge to the outside

Traffic maintained:

- SR 256 Ramp E, Ramp D, Ramp C are open
- Maintain three shifted EB mainline lanes to SR 256 Ramp D exit, two lanes downstream
- Maintain one shifted WB mainline lane through project limits
- Maintain one WB mainline lane with crossovers built in Phase 1

- Maintain SR 256 Ramp A through part-width methods

Duration: 6-7 months

Phase 3 - 2030
Work to be completed:

- Build inside improvements along westbound IR 70 through project limits
- Widen existing Blacklick Creek WB bridge to the inside
- Widen existing SR 256 WB bridge to the inside
- Build SR 256 Ramp B with access provided by open Taylor Road interchange

Traffic maintained:

- Maintain three EB mainline lanes, which opens to two mainline lanes and four lanes for the C-D road
- Maintain one shifted WB mainline lane through project limits
- Maintain one WB mainline lane with crossovers built in Phase 1
- Close SR 256 Ramp B with traffic diverted to new interchange

Duration: 5-6 months

Construction is paused during the Winter months. The work zones will be returned to traffic to the extent permitted by conditions. This condition will be developed further during final design.

Single Lane Contraflow Evaluation
Advantages:

- Temporary pavement only required for single lane crossovers
- No overbuilding of bridges or roadway required, including Palmer Rd bridges
- Planned work in phase 1 is less than the first phase of part-width – reduced construction workload for contractor.

Disadvantages:

- Narrow width of Palmer Rd bridges requires several MOT phases to complete while maintaining a minimum of one traffic lane. Additional crossovers specific to Palmer Rd might be required. Bridges require 1-foot barrier clearances and 10.5 ft lanes

Full Crossover Alternative

Full crossover construction would be completed in three main phases very similar to the single lane contraflow alternative. Phase 1 work constructs the outside widening, ramp, and bridge work in the eastbound direction. Phase 2 will build the inside improvements in the eastbound direction. Two westbound lanes are maintained on the westbound roadway as in phase 1. The two-lane crossovers are built in this phase for use in phase 3. The third phase will use the crossovers to maintain westbound traffic along the eastbound roadway. The westbound widening, ramp and bridge work are completed in this phase. For additional details, constraints, and costs for this alternative see Appendices A through D.

Full crossover would maintain westbound mainline traffic along the eastbound roadway. A single westbound lane would be used to access Taylor Road and Ramp B.

Phase 1 - 2028

Work to be completed:

- Complete work to utilize Taylor Road interchange
- Build outside improvements along eastbound IR 70 through project limits
- Widen existing Blacklick Creek EB bridge to the outside
- Build the Blacklick Creek EB ramp bridge
- Widen existing SR 256 EB bridge to the outside

Traffic maintained:

- Maintain three shifted EB mainline lanes to SR 256 Ramps dropping one lane for Ramp E
- Short-term closure of Ramp G to finalize interchange tie-in
- Close SR 256 Ramp C with traffic directed to Taylor Road interchange
- Maintain SR 256 Ramp E traffic through part-width methods
- Close SR 256 Ramp D with traffic directed to Taylor Road interchange
- Maintain existing lane configuration for WB mainline traffic through project limits

Duration: 6-7 months

Phase 2 -2029
Work to be completed:

- Build inside improvements along eastbound IR 70 through project limits
- Widen existing Blacklick Creek EB bridge to the inside
- Widen existing SR 256 EB bridge to the inside
- Complete tie-in with Taylor Road interchange & local Taylor Road improvements
- Build two-lane crossovers at east and west limits of project

Traffic maintained:

- SR 256 Ramp E, Ramp D, Ramp C are open
- Maintain three shifted EB mainline lanes along C-D road
- Maintain existing lane configuration for WB mainline traffic through project limits

Duration: 6-7 months

Phase 3 - 2030
Work to be completed:

- Build inside improvements along westbound IR 70 through project limits
- Build outside improvements along westbound IR 70 through project limits
- Widen existing Blacklick Creek bridge to inside and outside
- Widen existing SR 256 bridge to inside and outside
- Build SR 256 Ramp A
- Build SR 256 Ramp B

Traffic maintained:

- Maintain three shifted EB mainline lanes along C-D road
- Maintain two WB mainline lanes with two-lane crossovers built in Phase 2
- Maintain one WB lane to Taylor Road interchange exit ramp to access Taylor Road and SR 256 from WB IR 70
- Maintain SR 256 Ramp A using part-width methods

- Close SR 256 Ramp B with traffic directed to Taylor Road interchange
- Build Blacklick Creek bridge improvements using part-width methods to provide a single traffic lane from Ramp A

Duration: 5-6 months

Construction is paused during the Winter months. The work zones will be returned to traffic to the extent permitted by conditions. This condition will be developed further during final design.

Full Crossover Evaluation

Advantages:

- Crossover is only used for one MOT phase
- Westbound IR 70 can be improved with minimal need to maintain traffic
- Westbound Blacklick Creek bridge can be improved while maintaining a single lane of traffic

Disadvantages:

- Defers westbound improvements until the very last phase of construction
- Anticipate two single lane crossovers to accommodate Palmer Rd WB bridge construction
- Palmer Rd WB bridge requires 1-foot barrier clearances and 10.5 ft lanes to maintain one lane of contraflow while EB bridge is widened to accommodate a full crossover section

MAINTENANCE OF RAMP TRAFFIC

For all three mainline maintenance of traffic alternatives, the intent of the overall project is to focus the initial effort to construct the Taylor Road interchange, off-line work, substructure work, temporary pavement and/or any ancillary work that would not impact mainline or ramp traffic during the first year of construction. With the anticipated sale date of the project in April 2027, it is anticipated the first year of construction would not impact any existing traffic as it completes majority of the Taylor Road interchange and offline work. The ramps and C-D road could be connected to the mainline with temporary pavement if needed to maintain access. Construction of the new interchange will lengthen the anticipated construction schedule; however, the bulk of this construction will happen offline with minimal impact to the local traffic network during the first year and provide an overwhelming benefit of utilizing the new interchange for maintaining ramp traffic from SR 256 in the later phases of the project by maintaining access and reducing user delay due to closures.

Gannett Fleming utilized peak hour turn movement traffic counts obtained for the project and provided by American Structurepoint for the following intersections: SR 256 at Taylor Road Extension, SR 256 at IR 70 WB Exit Ramp, SR 256 at IR 70 EB Exit Ramp, SR 256 at SR 204, SR 204 at Freedom Way, and SR 204 at Taylor Road, and utilized the 2020 certified traffic from the FRA-70-16.17 (2014, PID 76997) for the future movements at the Taylor Road Interchange. The traffic was then projected to 2028 for the second year of construction at a provided rate of one percent annual growth. The volumes were then balanced between the certified traffic and traffic count intersections with a fully open interchange at Taylor Road as shown on the projected traffic volume figure located in Appendix F. The analysis can be verified with the new certified traffic anticipated later this year during the maintenance of traffic design to ensure the recommendations operate acceptably.

Capacity analyses for the 2028 projected volumes were conducted in Synchro during the AM and PM peak hours utilizing Highway Capacity Manual methodologies. A capacity analysis is the primary method for evaluating the efficiency of a roadway or intersection as it relates to vehicular traffic. The Highway Capacity Manual (HCM), published by Transportation Research Board (TRB), outlines capacity analysis procedures and criteria for evaluating the operations of unsignalized and signalized intersections. The criteria for evaluating the operation of an intersection are measured in terms of level of service (LOS), a qualitive measure, and control delay per vehicle.

There are six levels of service, designated by the letters A through F. LOS A represents the best operating conditions, and LOS F represents the worst operating conditions. LOS criteria are listed in Table 1.

Table 1 – Level of Service Criteria for Signalized Intersections

Level of Service	Signalized Intersection Delay (Seconds)
A	≤ 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80 or Volume-Capacity Ratio > 1.0

Summary figures of the fully open analyses for the project are located in Appendix F. Detailed analyses are located in Appendix G.

Ramp Closure Evaluations

Capacity analyses were conducted for the 2028 projected traffic volumes for varying ramp construction and were evaluated to ensure minimum operations are kept during construction. They are summarized on figures in Appendix F and detailed analyses are in Appendix G. Optimized signal timing and phasing were utilized for all analyses considering coordination along SR 256 and the new Taylor Road interchange. To improve traffic operations, the Taylor Road interchange can be closed to traffic, however the analysis assumed the interchange to be open as a worst-case scenario. SR 204 at SR 256 and SR 204 at Taylor Road operate with a less than desirable level of service in the PM peak hour, so utilizing those intersections as a diversion route would exacerbate the operational issues at those locations and was avoided. The following traffic analysis goes into further detail, describes the diversion routes, and analyzes the operational benefits and issues of utilizing the open Taylor Road interchange to maintain existing ramp access during construction. The following locations were analyzed:

IR 70 Westbound Entrance Ramp (Ramp A)

It is anticipated that the ramp will be constructed in Phase 1 during the Part-Width alternative, Phase 2 in the Contra-Flow Alternative and Phase 3 for the Crossover Alternative. The ramp and minimum area for decision sight distance will take approximately six to nine months to construct. Portion of the Blacklick Creek bridge could be constructed earlier to minimize the duration of the ramp construction. Due to the heavy traffic volumes that utilize this ramp during the peak hours, removing all volume and diverting traffic from the ramp would have many intersections within the project area operating with less than desirable levels of service. Varying options were evaluated, and it was determined that the ramp would be constructed part-width maintaining only one lane of southbound traffic from SR 256 due to the proposed ramp mostly being constructed off of the existing alignment. Northbound left turn traffic at the existing westbound entrance ramp to IR 70 would be diverted to the new Taylor Road interchange and back westbound via the proposed westbound C-D road or temporary connection to achieve part-width construction. All intersections can operate at a LOS D or better with the exception of Taylor Road and eastbound exit ramp. That intersection would require the addition of a temporary left turn lane to operate at an acceptable LOS. This can be accomplished by temporarily stripping a fourth lane on the proposed ramp without any additional widening. The weave resulting weave on the eastbound C-D road would be LOS F, to eliminate the weave the eastbound entrance ramp would be temporarily directed to utilize the new eastbound exit ramp at Taylor Road to then merge onto IR 70 from the entrance ramp at the Taylor Road interchange.

IR 70 Westbound Exit Ramp (Ramp B)
It is anticipated that the ramp will be constructed in Phase 1 during the Part-Width alternative, Phase 2 in the Contra-Flow Alternative and Phase 3 for the Crossover Alternative. The ramp will take approximately three to eight months to construct. During this time, the traffic volumes to this ramp can be easily accommodated on the diversion route with no intersection operating less than a LOS C. It is recommended to close this ramp with the diversion route utilizing the new Taylor Road westbound exit ramp to Taylor Road to Taylor Road Extension to SR 256. The diversion route can be seen in Figure 1.

IR 70 Eastbound Entrance Ramp (Ramp C)
This ramp will be constructed in Phase 1 for all the alternatives. The ramp and minimum area for decision sight distance will take approximately seven to eight months to construct. The diverted traffic volumes from this ramp can be easily accommodated on the diversion route with no intersection, weave or merge operating less than a LOS D. It is recommended to close this ramp with the diversion route utilizing SR 256 to the Taylor Road Extension to Taylor Road to the new Taylor Road interchange eastbound entrance ramp. The diversion route can be seen in Figure 1.

IR 70 Eastbound Exit Loop Ramp (Ramp D)
This ramp will be constructed in Phase 1 for all the alternatives. The ramp will take approximately seven to eight months to construct. The diverted traffic volumes from this ramp can be accommodated on the diversion route of keeping traffic on IR 70 or on the eastbound C-D road, to the new Taylor Road interchange back westbound to the new C-D road or IR 70 to westbound exit ramp with all intersections and merges operating at a LOS D or

Figure 1 – Traffic Diversion Routes

better with the exception of IR 70 westbound exit ramp to SR 256. That intersection would require the addition of a temporary right turn lane to operate at an acceptable LOS. This can be accomplished by temporarily widening approximately ten feet to the inside of the ramp or the westbound ramp could be constructed prior to Ramp D closure. The weave resulting on the eastbound C-D road would be LOS F. To eliminate the weave the eastbound entrance ramp from SR 256 would be temporarily directed to utilize the new eastbound exit ramp at Taylor Road then merge onto IR 70 from the new Taylor Road eastbound entrance ramp. It is recommended to close this ramp with the stated diversion route of a Texas U-turn as described above. The diversion route can be seen in Figure 1.

IR 70 Eastbound Exit Ramp (Ramp E)

It is anticipated that this ramp will be constructed in Phase 1 for each alternative. The ramp will take approximately six months to construct. Due to the heavy existing traffic volumes that utilize this ramp during the PM peak hour, removing any of the volume and diverting traffic from the ramp would have many intersections within the project area operating with less than desirable levels of service. No option could handle the amount of traffic at this ramp so it was assumed this ramp would be constructed part-width maintaining traffic. The ramp will be widened by multiple lanes, making part-width construction feasible.

Taylor Road Eastbound Exit Ramp (Ramp G)

This ramp will be removed in Phase 1 for each alternative. The removal of this ramp and construction to the tie-in to the new Talyor Road ramp will take approximately two months. Due to the heavy traffic volumes that utilize this ramp during the PM peak hour, and not wanting to further overload Ramp E, it is anticipated that this ramp will be maintained with a short-term closure to tie the new eastbound exit ramp to the new Taylor Road interchange with using a detour similar to the diversion route discussed for the eastbound entrance ramp (Ramp C). Since this diversion route operated with acceptable levels of service, the route can handle the additional traffic from this ramp in the short-term during construction.

SIDE ROAD MAINTENANCE OF TRAFFIC

Though not as extensive as the IR 70 mainline or Taylor Road interchange improvements, the maintenance of traffic along SR 256 addresses important work zone impacts to its users. The majority of the improvements impacting SR 256 are related to the tie-in of the improved interchange ramps and bridge widening requires work under the structures to build the new substructure items. Ramp tie-ins and substructure work require the closing of an outside northbound and/or southbound lane in both directions as well as a northbound and southbound interior lane for the middle pier work. The outside and inside work of SR 256 will not be done concurrently. It is anticipated these lane closures will be approximately four to six weeks in duration. An already congested situation will be made worse with the loss of the third through lane. Deferring initial bridge work until the new Taylor Road interchange is open will help to relieve congestion. For example, northbound left turns onto Ramp A can be diverted to the newly opened interchange prior at the Tussing Road intersection. Conversely, the southbound left turns onto Ramp C can be diverted at Taylor Road SW to the new interchange. Volumes for both of these moves can effectively be removed from SR 256 making the closing of the outside lanes more tolerable. The traffic analysis shows the Tussing Road and SR 256 to be near capacity. Further investigation into possible mitigation is necessary to adequately address the increased demand. It is anticipated that the contractor will use the available ODOT resources; standard construction drawings and OMUTCD figures, to address the majority of work zone conditions.

SR 256 Lane Closure Evaluations

Ramp tie-ins and substructure work for the SR 256 bridges will require the closing of an outside lane in each direction adjacent to the work. In addition, middle pier substructure work will require the closing of an interior lane in both directions. These closures will not happen concurrently. Capacity analyses were conducted for the 2028 projected traffic volumes for varying lane closures to ensure minimum operations are kept during construction. They are summarized on the figures in Appendix F and detailed analyses are in Appendix G.

Optimized signal timing and phasing were utilized for all analyses considering coordination along SR 256. It was determined that all intersections will operate at acceptable levels during the varying lane closures.

CONCLUSION AND RECOMMENDATION

Two of the three MOT alternatives meet the minimum criteria as stated in this report. The part-width does not, it requires reduced lane widths and barrier offsets as well as the overbuilding of the SR 256 WB bridge to accommodate a second mainline lane in phase 3. The ability to leverage the new Taylor Road interchange is important to the overall maintenance of traffic approach for each studied MOT alternative, and the first year of construction is dedicated to its construction. Once this interchange is open to traffic, even if partially to accept diverted traffic, the mainline and local improvements can commence. At this point, the three alternatives are varied and can be compared. The first mainline MOT phase for each of the three alternatives is the widening of IR 70 eastbound to the outside and includes the improvement of Ramps E, D, and C. The single lane contraflow and full crossover alternatives are identical in this phase. However, the part-width alternative adds the westbound outside improvements, including Ramp A improvements, and therefore, increases the amount of required work compared to the other two alternatives for the same phase. More information on the affected bridges and ramps can be found in the Bridge Information Form (Appendix B) and the Ramp Information Form (Appendix C).

As noted above, the construction of the Taylor Road interchange in the initial year can yield roadway access and congestion relief benefits. Construction efficiencies/increased production rates can be realized by reducing the interaction between the contractor and maintained traffic. These efficiencies are minimized with the part-width alternative and are anticipated to increase as the MOT approach changes from single lane contraflow to full crossover alternatives. This is maximized with the full crossover alternative as the SR 256 westbound bridge and several thousand feet of roadway can be built without maintaining a single IR 70 westbound vehicle. The construction durations are estimates only and assume work to be completed during accepted construction seasons. As a side note, the Palmer Road WB bridge can also be constructed without traffic if eventually included in a revised project scope.

With respect to MOT related construction costs. The preliminary cost comparison reveals that the part-width alternative has the greatest impact with preliminary measurable costs at $2 million. This amount is not much more than the single lane contraflow alternative ($1.9 million) but is significantly higher than the full crossover option ($1.4 million). The extra costs combined with the limitations of the part-width alternative do not make this the alternative the first choice for this improvement. Preliminary construction costs are tabulated in the Cost Comparison Form (Appendix D). Anticipated MOT related construction costs for the Palmer Road bridges are not included at this time.

The single lane contra-flow and full crossover both meet the criteria, have a similar project duration, and would provide ample space for the contractor to perform their work. It is recommended to utilize the full cross over alternative to save approximately a half million dollars towards the project costs.

APPENDIX A

Work Zone Constraints Form 696-1a

Work Zone Constraints Form 696-1a

Work Zone Constraints			
Constraint	**Work Zone Alternatives**		
	Part-Width	**Single Lane Contraflow**	**Full Crossover**
Ability to meet Work Zone Policy	**Impact: Low** The policy can be met with a few exceptions. The improvements to the SR 256 WB bridge require the use of 10.5' lanes with 1' barrier offsets. The use of these lane widths and offsets will minimize the overbuilding required in a later construction phase. Refer to bridge table.	**Impact: None** Policy can be met	**Impact: None** Policy can be met
Ability to Maintain All Accesses	**Impact: Medium** When ramps are open or maintained the current ramp configuration is maintained. Impacts occur when the ramps are closed and traffic is detoured. Ramps A and E are built using part-width methods. Ramps B, C, and D are built under full closure. Ramp G is built while maintaining traffic with an anticipated short-term closure for tie-in. The completion of Taylor Rd interchange provides necessary access during IR 70 & SR 256 improvements. Ramp D traffic uses the redundant Ramp G. Ramp G can also use the newly opened Ramps E and D. Ramp closure distribution. Phase 1: 2 closures (B,C,D)/2 part-width (A,E); Phase 2: 1 closure (B); Phase 3: all open. Refer to Ramp Table	**Impact: Medium** When ramps are open or maintained the current ramp configuration is maintained. Impacts occur when the ramps are closed and traffic is detoured. Ramps A & E are built using part-width methods. Ramp B can be built under full closure or part-width. Ramp G is built while maintaining traffic with an anticipated short-term closure for tie-in. Taylor Rd interchange provides necessary access during IR 70 & SR 256 improvements. When Ramp D is closed, Ramp G is readily available. When Ramp G is closed (short-term for tie-in), the improved Ramps E and/or D can be used. Ramp closure distribution. Phase 1: 2 closures (C, D)/2 part-width (E,G); Phase 2: 1 closure (B); Phase 3: all open. Refer to Ramp Table	**Impact: Low** When ramps are open or maintained the current ramp configuration is maintained. Impacts occur when the ramps are closed and traffic is detoured. Ramps A and E are built using part-width methods. Ramps B, C, and D are built under full closure. Ramp G is built while maintaining traffic with an anticipated short-term closure for tie-in. Taylor Rd interchange provides necessary access during IR 70 & SR 256 improvements. Ramp D traffic uses the redundant Ramp G. Ramp G uses the newly opened Ramps E and D. Ramp closure distribution. Phase 1: 2 closures (C, D)/2 part-width (E,G); Phase 2: 1 closure (B); Phase 3: 1 closure (B) or (B part-width). Refer to Ramp Table
Ability to Provide Required On-Ramp Merge Decision Sight Distance	**Impact: Low** When entrance ramps are open, the ramps are provided as an add-lane portion before the merge taper. The lengths provided are in excess of the DSD and Merger Taper required for 70 mph (1445' / 770').	**Impact: Low** When entrance ramps are open, the ramps are provided as an add-lane portion before the merge taper. The lengths provided are in excess of the DSD and Merger Taper required for 70 mph (1445' / 770').	**Impact: Low** When entrance ramps are open, the ramps are provided as an add-lane portion before the merge taper. The lengths provided are in excess of the DSD and Merger Taper required for 70 mph (1445' / 770').
Right-of-Way Impacts	**Impact: None** No impacts anticipated	**Impact: None** No impacts anticipated	**Impact: None** No impacts anticipated
Environmental Impacts	**Impact: Low** The improvements to the Blacklick Creek bridges require closure of Blacklick Trail near work zone Contractor has option to provide protected overhead cover under bridge work zones.	**Impact: Low** The improvements to the Blacklick Creek bridges require closure of Blacklick Trail near work zone Contractor has option to provide protected overhead cover under bridge work zones.	**Impact: Low** The improvements to the Blacklick Creek bridges require closure of Blacklick Trail near work zone Contractor has option to provide protected overhead cover under bridge work zones.
Bridge Widths	**Impact: High** SR 256 Bridge: construction can accommodate part-width construction except in Phase 3. Overbuilding is required (tapered from 6' to 10.5'). Also, for Phases 1 & 2, narrow lane widths (10.5') and 1' barrier offset are required to maintain 2 WB lanes.	**Impact: Low** No impacts anticipated Note: Deferred construction of a portion of the C-D road barrier across Blacklick Creek EB bridge due to need to maintain contraflow lane and 3 EB lanes through work zone in Phase 2.	**Impact: None** No impacts anticipated
Significant Impacts for Construction Duration and/or Construction Costs	**Impact: High** Prioritizing the completion of the Taylor Rd interchange to provide additional access is the same for all 3 alternatives. Construction of the other improvements set each alternative apart. SR 256 Bridge WB: 1) deferred C-D road barrier (WB direction) must be built at end of project (Sta 72+00 to Sta 79+50) 2) overbuilding of bridge adds costs to project (approx. $570K)	**Impact: Medium** Prioritizing the completion of the Taylor Rd interchange to provide additional access is the same for all 3 alternatives. Construction of the other improvements set each alternative apart. Anticipated MOT related costs for this alternative is $500K more than Full Crossover	**Impact: Low** Prioritizing the completion of the Taylor Rd interchange to provide additional access is the same for all 3 alternatives. Construction of the other improvements set each alternative apart.
Significant impacts to earthwork, retaining walls, shoulder buildup, pier clearances, profile differences, etc.	**Impact: None** No MOT related impacts to earthwork, retaining walls, shoulder buildup, etc. are anticipated	**Impact: None** No MOT related impacts to earthwork, retaining walls, shoulder buildup, etc. are anticipated	**Impact: None** No MOT related impacts to earthwork, retaining walls, shoulder buildup, etc. are anticipated
Ability to Maintain Existing Drainage and Lighting Systems	**Impact: Low** Existing median highway lighting can be maintained during MOT. Do not anticipate issues maintaining existing drainage.	**Impact: Low** Existing median highway lighting can be maintained during MOT. Do not anticipate issues maintaining existing drainage. Each crossover requires a WZ Crossover Lighting System and associated drainage	**Impact: Low** Existing median highway lighting can be maintained during MOT. Do not anticipate issues maintaining existing drainage. Each crossover requires a WZ Crossover Lighting System and associated drainage
Constructability; and Construction Equipment Access	**Impact: High** Outside shoulder work will cause the contractor to shift access points while maintaining ramps under part-width. Maintaining 2 WB lanes narrows available work zone over other options. Inside shoulder work zones are long & narrow but manageable. Bridge construction will require access points on either side of bridges that could be shared. Access for the new Taylor Rd interchange is straight forward w/ access from mainline side, north & south approaches during Phases 1 & 2. In conjunction with bridge overbuilding for use in Phase 3, a portion of WB C-D road barrier work must be deferred to a final phase to accommodate the lane shift to align WB lanes to cross the SR 256 bridge. Approximately 750' of C-D barrier affected.	**Impact: Medium** Outside shoulder work will cause the contractor to shift access points while maintaining ramps using part-width methods. Maintaining 1 WB lane through work zone is improvement over part-width option providing wider work areas. Inside shoulder work zones are long & narrow but manageable. During Phase 2 contraflow a 1750' portion of permanent EB C-D road barrier is deferred to Phase 3 (Sta 43+50 to Sta 61+00). Bridge construction will require access points on either side of bridges that could be shared. Access for the new Taylor Rd interchange is straight forward w/ access from mainline side, north & south approaches during Phases 1 & 2.	**Impact: Medium** Outside EB shoulder work (Phase 1) will cause the contractor to shift access points while maintaining ramps using part-width methods. Inside EB shoulder work (Phase 2) will not affect ramp access and can be continuous with breaks at bridges. Phase 3 shifts mainline traffic onto improved EB lanes and opens Taylor Rd interchange. Bridge construction will require access points on either side of bridges that could be shared. Access for the new Taylor Rd interchange is straight forward w/ access from mainline side, north & south approaches during Phases 1 & 2.
Location of Crossovers (e.g., Can crossovers be located near the project?)	**Impact: None** No crossovers in this MOT option	**Impact: Low** Crossovers can be placed near project and can be placed without impacting existing median highway lighting. There is an existing sign truss at west end to avoid. (Note about Palmer Rd bridges: crossover can be located e/o bridges only if EB bridge is widened first)	**Impact: Low** Crossovers can be placed near project (even with larger footprint for 2 lanes) and can be placed without impacting existing median highway lighting. There is an existing sign truss at west end to avoid. (Note about Palmer Rd bridges: 2-lane crossover can be located e/o bridges only if EB bridge is replaced. Proposed Palmer Rd bridges can accommodate 2-12' lanes/PB/2-11' lanes)
What are the Access Impacts to Important Traffic Generators such as Hospitals, Fire Departments, Industries, Sports Arenas, etc.	**Impact: Medium** The SR 256 interchange has an enormous amount of retail & food options, mostly located north of IR 70 along Taylor Rd SW. The interchange also provides access to residential areas beyond the retail areas. All areas can be alternatively accessed from nearby interchanges along IR 70 and IR 270. Closed ramps may cause confusion to non-local traffic or delays following a lengthy or complex detour. By prioritizing the Taylor Rd interchange many issues related to complex detours can be eliminated.	**Impact: Medium** The SR 256 interchange has an enormous amount of retail & food options, mostly located north of IR 70 along Taylor Rd SW. The interchange also provides access to residential areas beyond the retail areas. All areas can be alternatively accessed from nearby interchanges along IR 70 and IR 270. Closed ramps may cause confusion to non-local traffic or delays following a lengthy or complex detour. By prioritizing the Taylor Rd interchange many issues related to complex detours can be eliminated.	**Impact: Medium** The SR 256 interchange has an enormous amount of retail & food options, mostly located north of IR 70 along Taylor Rd SW. The interchange also provides access to residential areas beyond the retail areas. All areas can be alternatively accessed from nearby interchanges along IR 70 and IR 270. Closed ramps may cause confusion to non-local traffic or delays following a lengthy or complex detour. By prioritizing the Taylor Rd interchange many issues related to complex detours can be eliminated.
For Concrete Pavements, the Longitudinal Joints must be Located at the Lane Lines.	**Impact: Low** Shoulder widening matches existing EOP. Outside widening can be accommodated along joint lines.	**Impact: Low** Shoulder widening matches existing EOP. Outside widening can be accommodated along joint lines.	**Impact: Low** Shoulder widening matches existing EOP. Outside widening can be accommodated along joint lines.
Exit Ramps - Can the existing number of ramp lanes be maintained?	**Impact: Medium** Yes, when exit ramps are open or maintained the current ramp configuration is maintained. When exit ramps are closed detours are implemented. Ramp E is maintained with part-width methods. Ramp D closure is easily detoured to Ramp G. Ramps B & C closures are diverted to the new Taylor Rd interchange.	**Impact: Medium** Yes, when exit ramps are open or maintained the current ramp configuration is maintained. When exit ramps are closed detours are implemented. Maintaining Ramps E & G alleviate immediate need for detours when Ramp D is closed, especially with new Taylor Rd interchange. Ramp G is maintained with only a short term closure to tie-in with the Taylor Rd interchange.	**Impact: Medium** Yes, when exit ramps are open or maintained the current ramp configuration is maintained. When exit ramps are closed detours are implemented. The concurrent construction of Ramps A & B in phase 3 can pose some difficulties. The WB exit movement is maintained by the new Taylor Rd interchange.

APPENDIX B

Bridge Information Form 696-2a

Bridge Information Form 696-2a

								Part-Width Construction			Single Lane Contraflow Construction			Full Crossover Construction		
BRIDGE NAME	STATION	EXTENT OF WORK	TYPE OF BRIDGE	LENGTH OF BRIDGE	EXISTING PIER SPACING	EXISTING BRIDGE WIDTH	FUTURE BRIDGE WIDTH	WIDTH NEEDED FOR PART-WIDTH	COST OF 32" PCB BRIDGE MOUNTED	COST OF ADDITIONAL BRIDGE WIDENING	WIDTH NEEDED FOR CONTRA FLOW (crossover lane/contra flow lane)	COST OF 32" PCB BRIDGE MOUNTED	COST OF ADDITIONAL BRIDGE WIDENING	WIDTH NEEDED FOR CROSSOVER	COST OF 32" PCB BRIDGE MOUNTED	COST OF ADDITIONAL BRIDGE WIDENING
FAI-00070-00840 L	44+42.75	WIDEN OR REPLACE	STEEL BEAM	114'	34'-6", 43'-0", 34'-6"	VARIES 57.88' TO 60.21' O/O	83'-4" O/O	72'	$11,220	-	70'	$7,480	-	39' (if maintaining Rmp A traffic)	$7,480	-
FA-00070-00840 R	44+42.75	WIDEN OR REPLACE	STEEL BEAM	114'	34'-6", 43'-0", 34'-6"	54' O/O	119'-4" O/O	100'	$3,740	-	105'	$7,480	-	105'	$3,740	-
FAI-00070-01190 L	62+79.12	WIDEN OR REPLACE	STEEL BEAM	177'	34'-6", 43'-0", 57'-0", 40'-0"	42' O/O	VARIES 69.54' TO 72.43' O/O	80'	$10,710	$570,500 ($350 per SF)	69' to 72'	$7,140	-	No traffic on bridge	$0	-
FAI-00070-01190 R	62+80.72	WIDEN OR REPLACE	STEEL BEAM	181'	33'-0", 47'-0", 58'-0", 40'-6"	VARIES 64.60' TO 74.27' O/O	VARIES 101.91' TO 105.28' O/O	94'	$3,570	-	95'	$7,140	-	90'	$3,570	-

APPENDIX C

Ramp Information Form 696-3a

Ramp Information Form 696-3a

RAMP DESIGNATION	NUMBER OF LANES	RAMP VOLUME (% TRUCKS) *	RAMP CLOSURE																		DETOUR
			PART-WIDTH						SINGLE LANE CONTRAFLOW						FULL CROSSOVER						
			PHASE 1		PHASE 2		PHASE 3		PHASE 1		PHASE 2		PHASE 3		PHASE 1		PHASE 2		PHASE 3		
			DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF THE CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	DURATION OF CLOSURE	DECISION SIGHT DISTANCE (FT)	
IR 70 WB Entrance from SR 256 (Ramp A)	2	20971 (3%)	Open**	N/A	Open	1445	Open	1445	Open	Exist Condition	Open	N/A	Open	1445	Open	Exist Condition	Open	Exist Condition	Open	N/A	N/A - constructed part-width, remains open
IR 70 WB Exit to SR 256 (Ramp B)	2	3422 (4%)	8 mos	N/A	Open	N/A	Open	N/A	Open	N/A	6 mos	N/A	Open	N/A	Open	N/A	Open	N/A	3 mos	N/A	Use new Taylor Rd interchange
IR 70 EB Entrance from SR 256 (Ramp C)	1	3687 (3%)	8 mos	N/A	Open	1445	Open	1445	7 mos	N/A	Open	1445	Open	1445	7 mos	N/A	Open	1445	Open	1445	Use new Taylor Rd interchange
IR 70 EB Exit to SR 256 NB (Ramp D)	2	7642 (4%)	8 mos	N/A	Open	N/A	Open	N/A	7 mos	N/A	Open	N/A	Open	N/A	7 mos	N/A	Open	N/A	Open	N/A	Utilize Ramp G or new Taylor Road Interchange
IR 70 EB Exit to SR 256 SB (Ramp E)	1	10783 (3%)	Open	N/A	Open	N/A	Open	N/A	Open	N/A	Open	N/A	Open	N/A	Open	N/A	Open	N/A	Open	N/A	N/A - constructed part-wdith, remains open
IR 70 EB Exit to Taylor Rd (Ramp G)	1	4508 (3%)	2 mos	N/A					2 mos	N/A					2 mos	N/A					Ramp G will be removed in Phase 1, Phases 2 and 3 will utilize new Taylor Road Interchange Ramp

* TIMS (2022 volumes & truck %)

** During Part-Width Alternative, Phase 1 will require the closure of ramp or construct Blacklick Creek bridge in multiple phases to provide a safe merge meeting DSD requirements.

APPENDIX D

Cost Comparison Form 696-4a

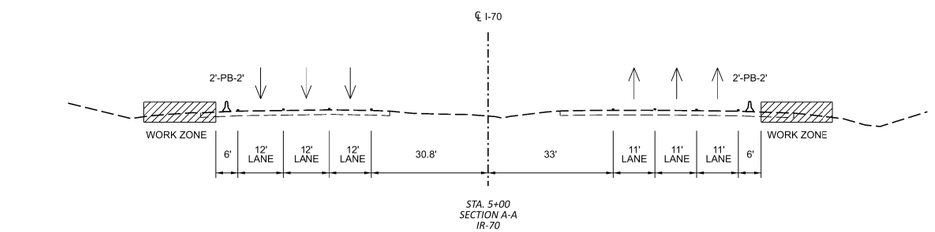
Cost Comparison Form 696-4a

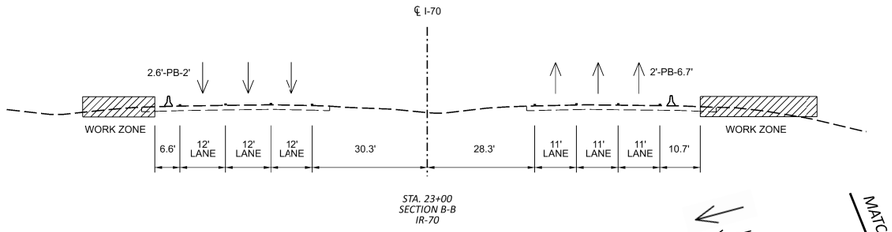
	Part-Width Construction	Single Lane Contraflow Construction	Full Crossover Construction
	Cost	Cost	Cost
Additional Right-of-Way	$0	$0	$0
Additional Retaining Walls	$0	$0	$0
Additional Bridge Structure	$570,500	$0	$0
Cut/Fill/Shoring	$0	$0	$0
Lighting (Crossover)	$0	$70,000	$70,000
Drainage (Crossover related)	$0	$10,000	$15,000
Temporary Pavement	$220,990	$231,560	$361,340
Portable Concrete Barrier	$914,400	$1,302,900	$733,350
Anchored Portable Barrier	$29,240	$29,240	$14,790
Subtotal:	$1,735,130	$1,643,700	$1,194,480
15% Contingency	$260,270	$246,555	$179,172
MOT RELATED COST	**$1,995,400**	**$1,890,255**	**$1,373,652**
Project Duration *	17-22 months	17-20 months	17-20 months

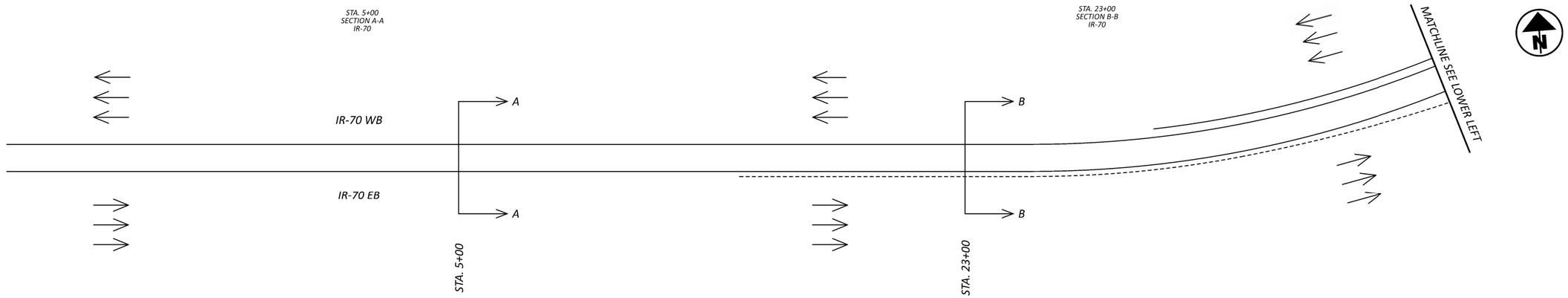
* does not include Taylor Road interchange

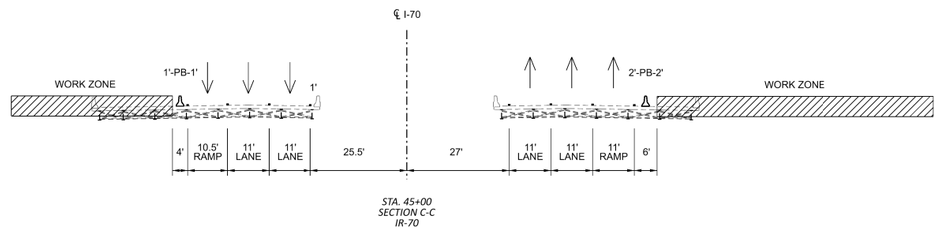
APPENDIX E

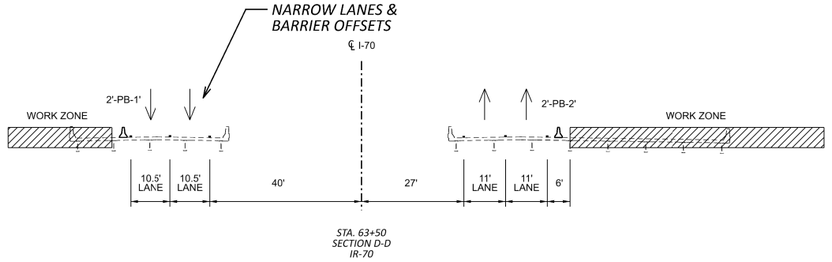
MOT Schematics with Transverse Sections

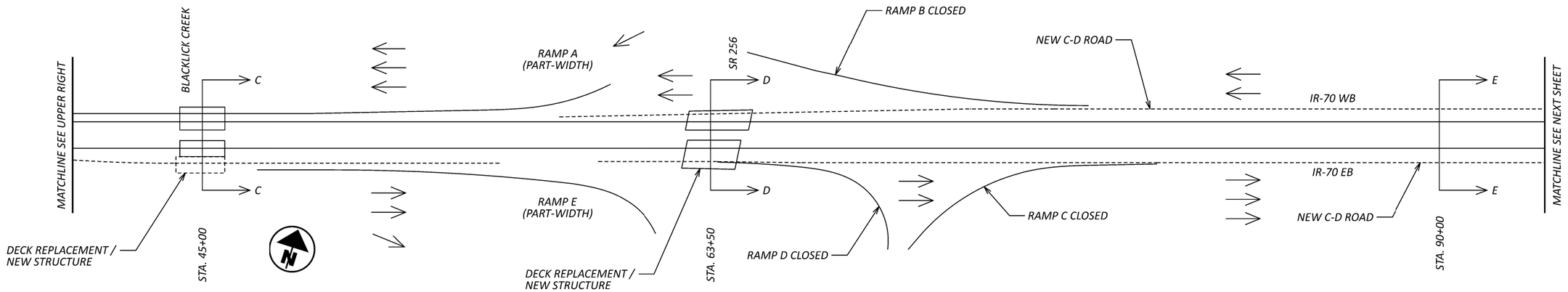


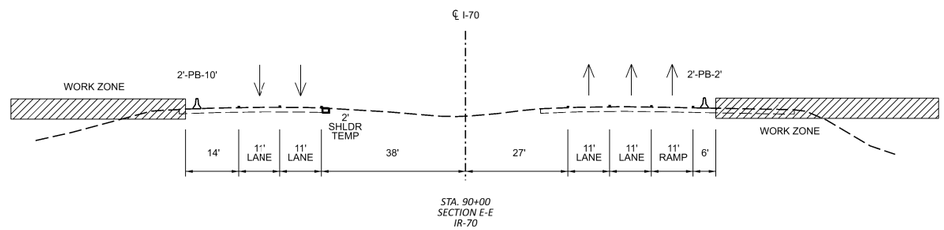












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MOTAA
PART-WIDTH: PHASE 1

DESIGN AGENCY
GANNETT FLEMING

DESIGNER ACW
REVIEWER DRJ 08/29/23
PROJECT ID 96808
SHEET 1 TOTAL 18

FAI/LIC-70-0.00/0.00

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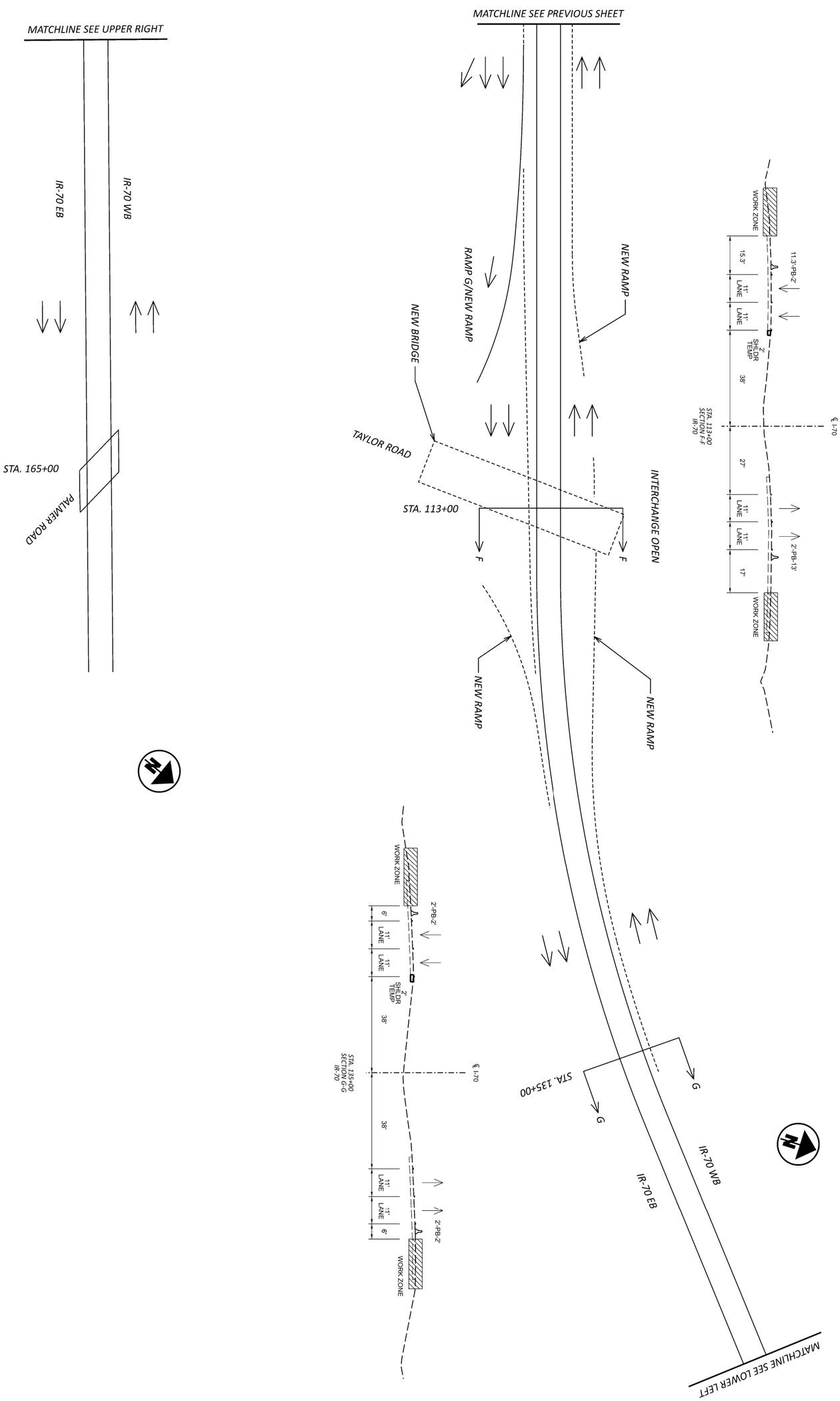

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
2	18	96808	DRJ 08/29/23	ACW	GANNETT FLEMING

MOTAA
PART-WIDTH: PHASE 1

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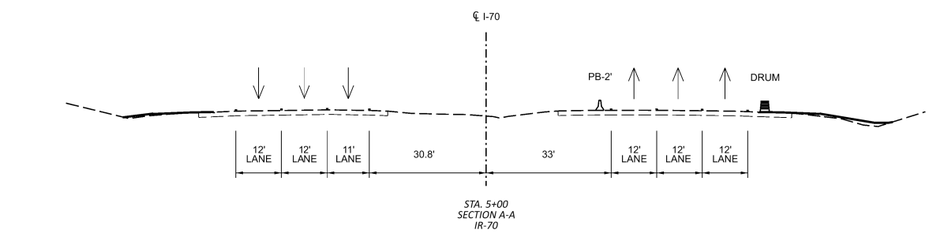

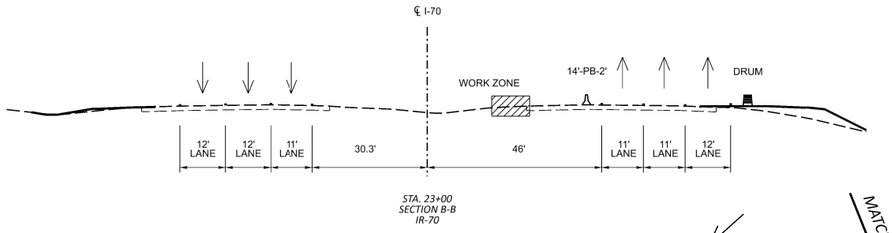

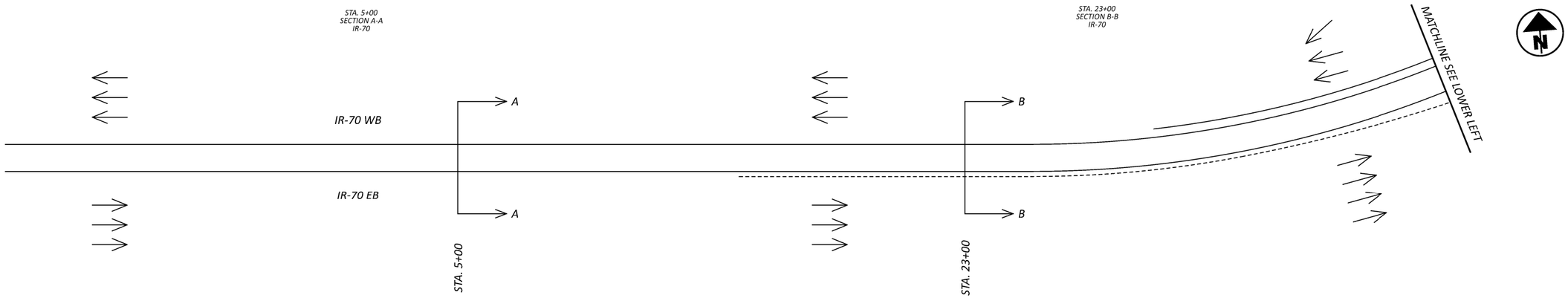

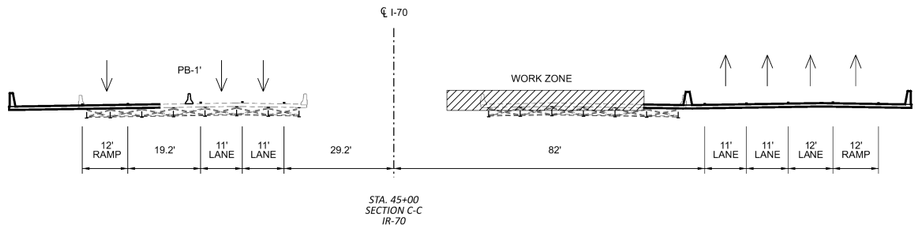

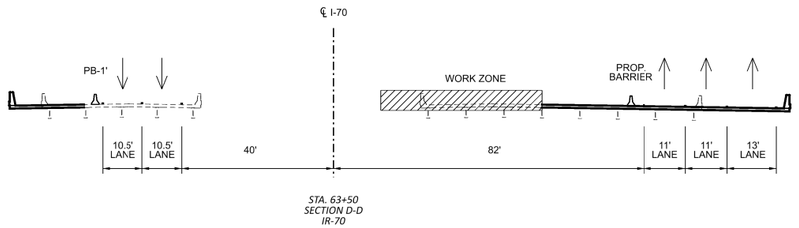

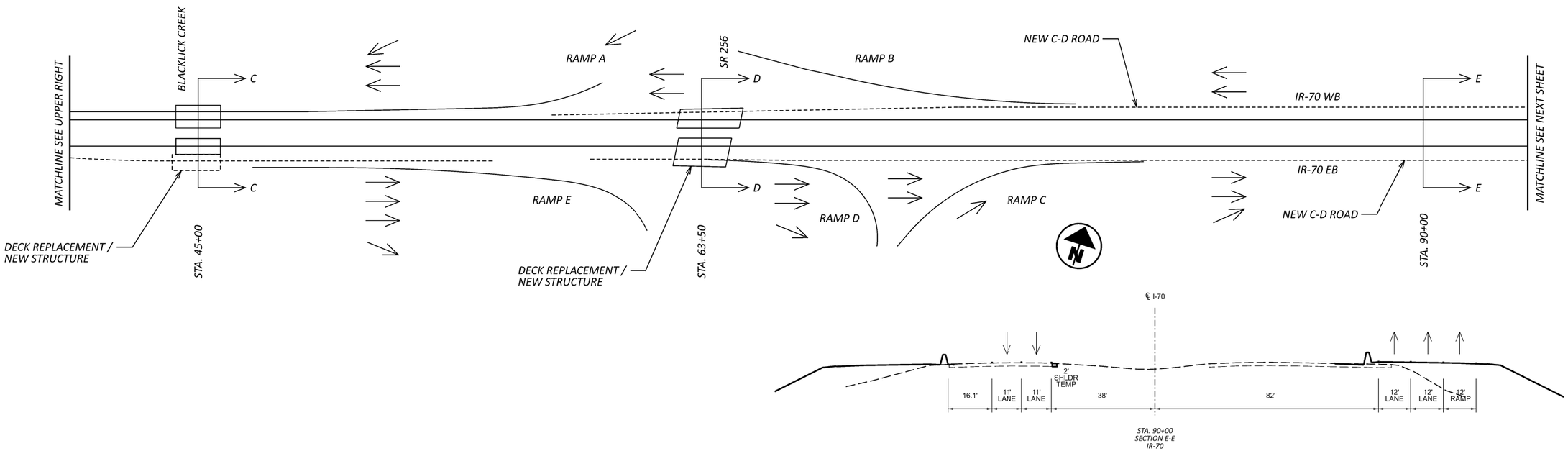

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MOTAA PART-WIDTH: PHASE 2

DESIGN AGENCY
GANNETT FLEMING

DESIGNER ACW
REVIEWER DRJ 08/29/23
PROJECT ID 96808
SHEET 3 TOTAL 18

FAI/LIC-70-0.00/0.00

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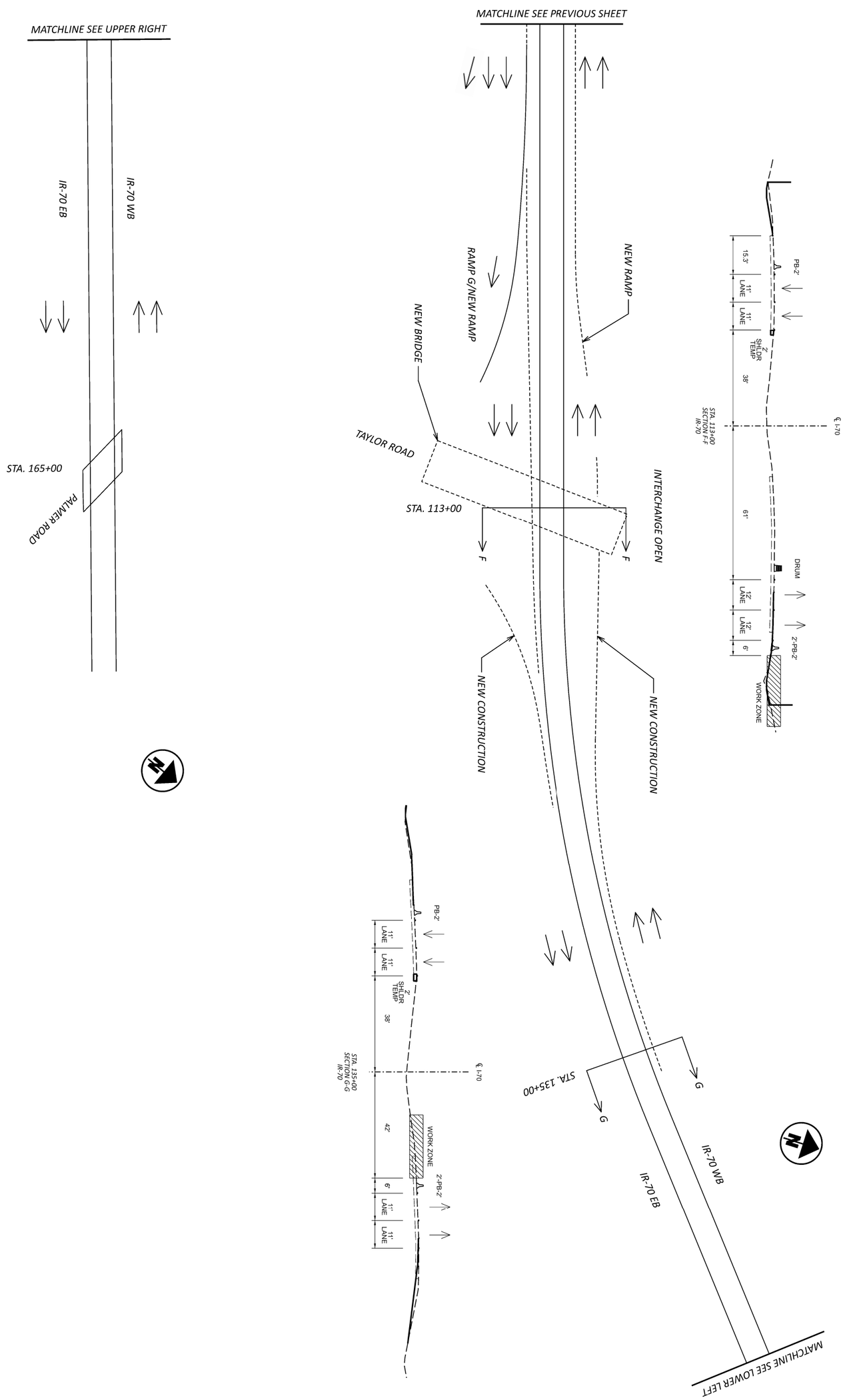

SHEET	TOTAL
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PROJECT ID: 96808

REVIEWER: DRJ 08/29/23

DESIGNER: ACW

DESIGN AGENCY: GANNETT FLEMING

MOTAA
PART-WIDTH: PHASE 2

HORIZONTAL SCALE IN FEET

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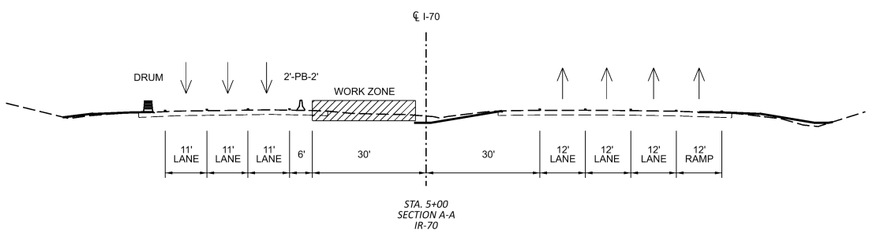

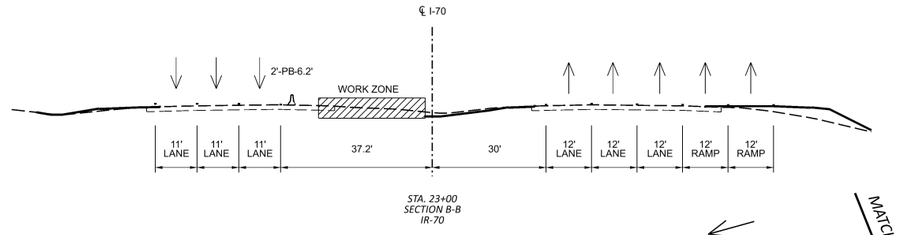

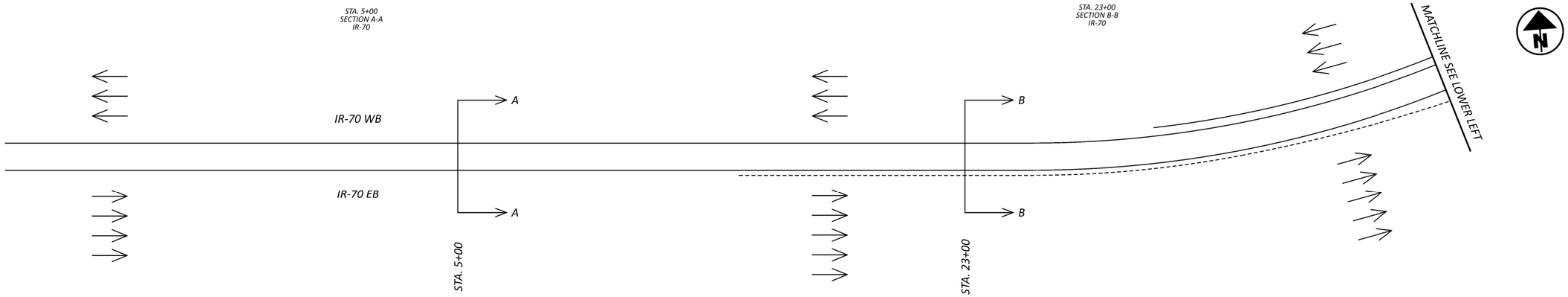

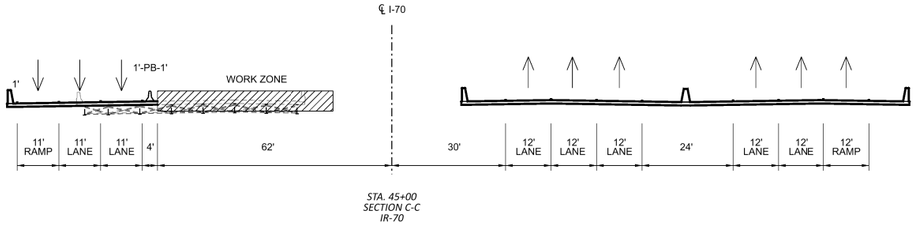

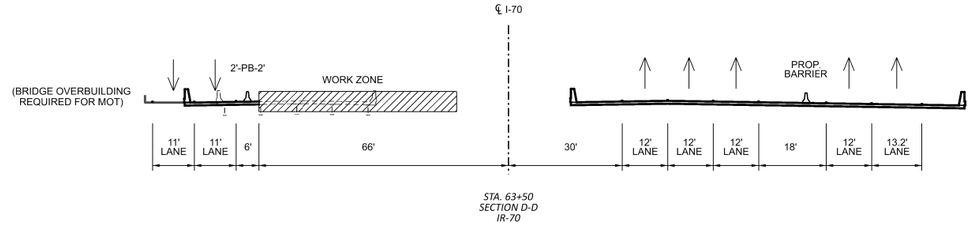

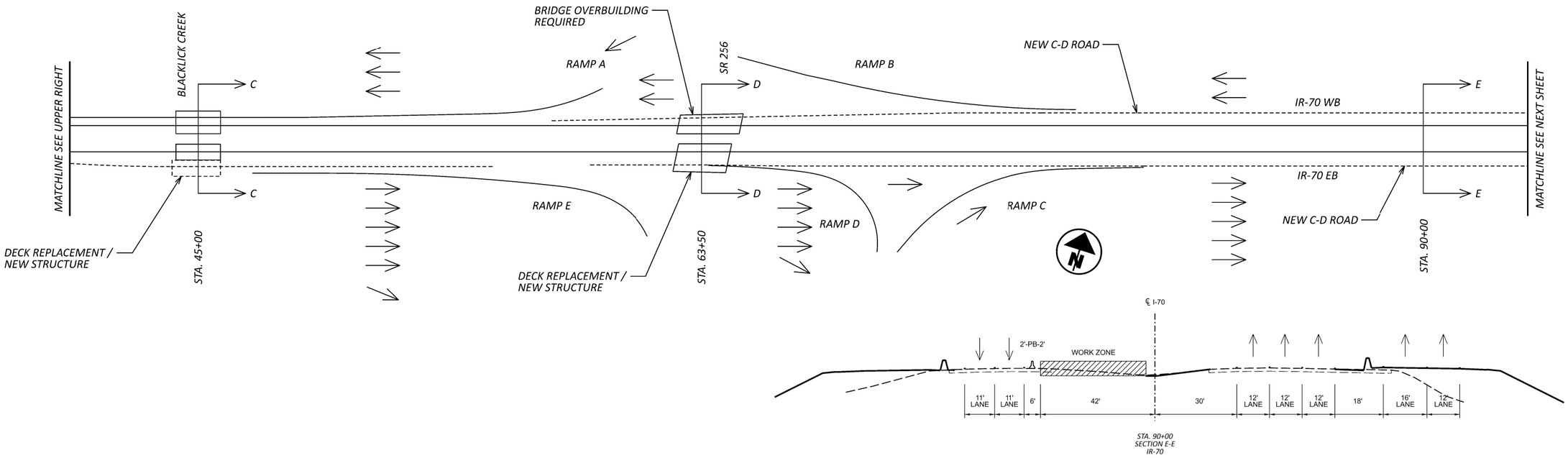

HORIZONTAL SCALE IN FEET
0 100 200 400

MOTAA PART-WIDTH: PHASE 3

DESIGN AGENCY
GANNETT FLEMING

DESIGNER ACW
REVIEWER DRJ 08/29/23
PROJECT ID 96808
SHEET 5 TOTAL 18

FAI/LIC-70-0.00/0.00

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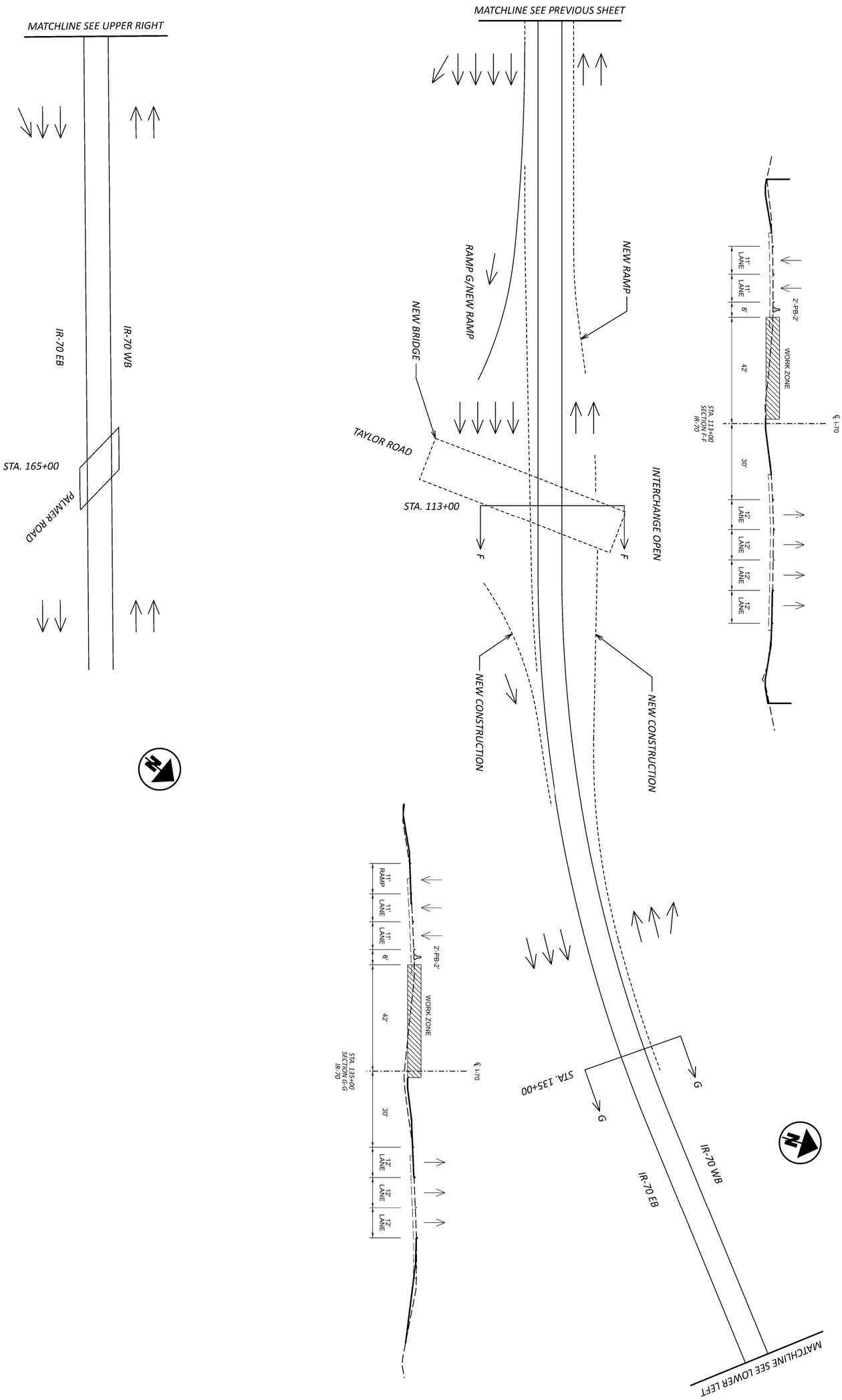

SHEET 6 / TOTAL 18	PROJECT ID 96808	REVIEWER DRJ 08/29/23	DESIGNER ACW	DESIGN AGENCY GANNETT FLEMING

MOTAA
PART-WIDTH: PHASE 3

HORIZONTAL SCALE IN FEET
0 200
100 400

MODEL: Contraflow Ph 1 Sht_1 PAPERSIZE: 17x11 (in.) DATE: 8/30/2023 TIME: 12:14:52 PM USER: awilsbacher
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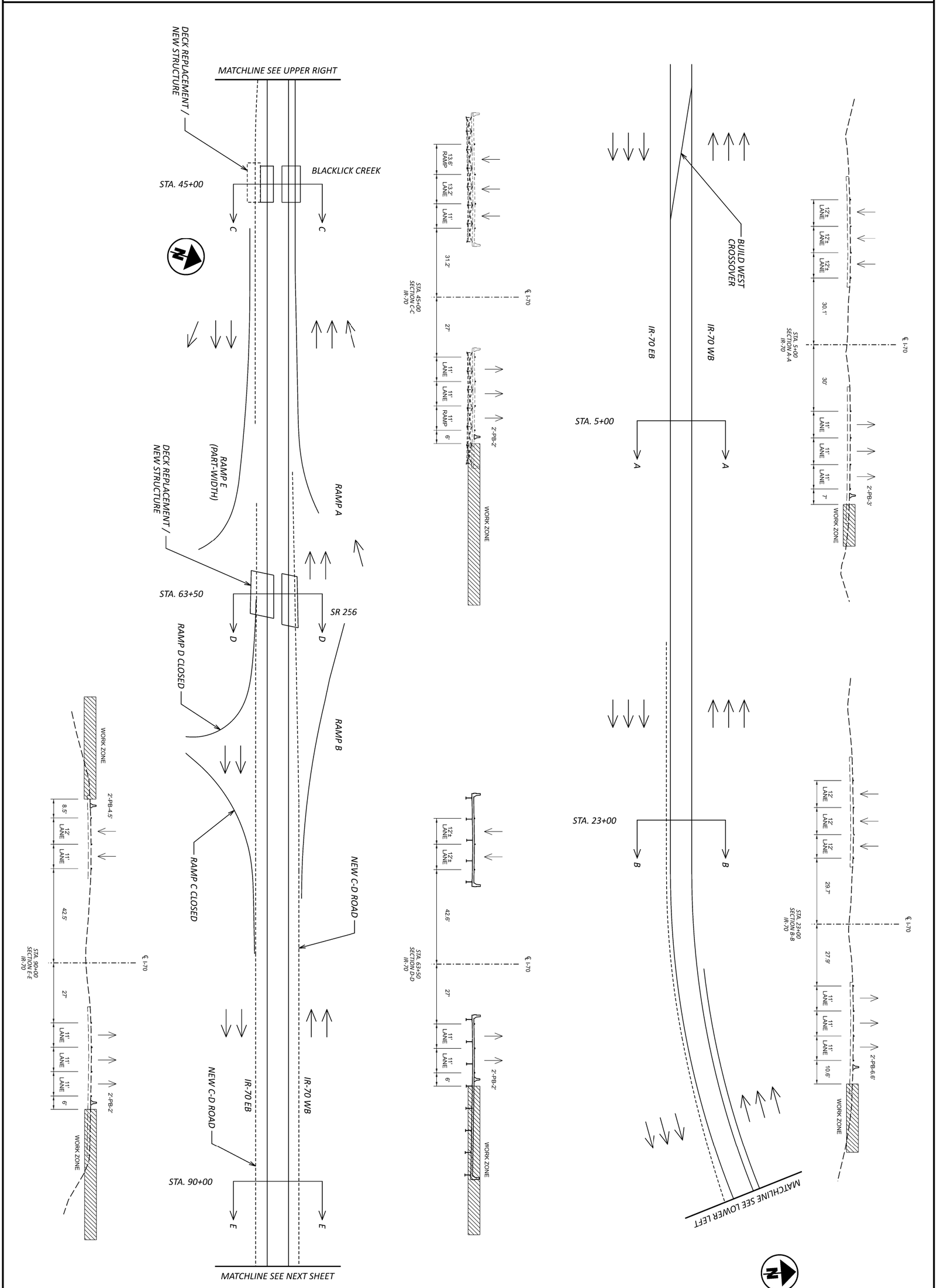

DESIGNER ACW	DESIGN AGENCY GANNETT FLEMING	MOTAA SINGLE CONTRAFLOW LANE: PHASE 1	HORIZONTAL SCALE IN FEET 0 200 100 400
REVIEWER DRJ 08/29/23			
PROJECT ID 96808			
SHEET 7 TOTAL 18			

MODEL: Contraflow Ph 1 Sht_2 PAPERSIZE: 17x11 (in.) DATE: 8/30/2023 TIME: 12:15:08 PM USER: awilsbacher
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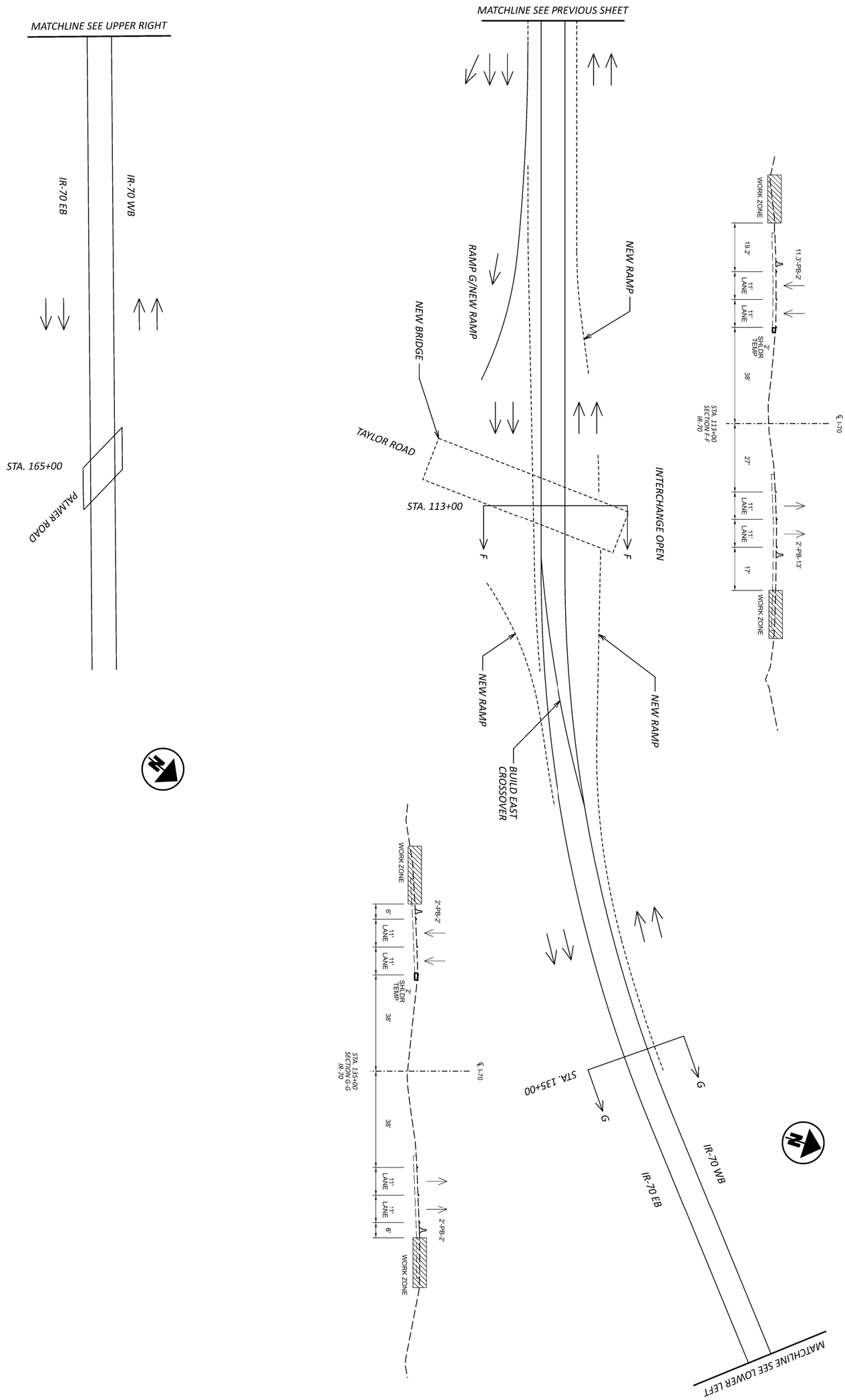
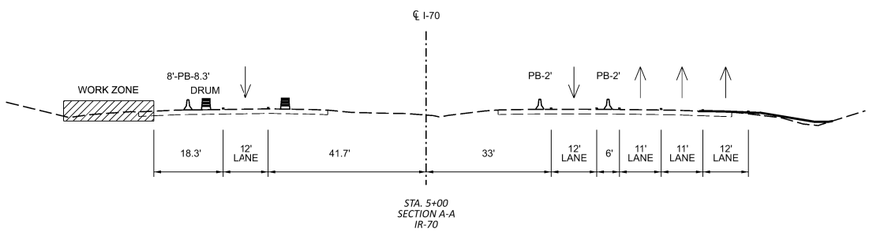
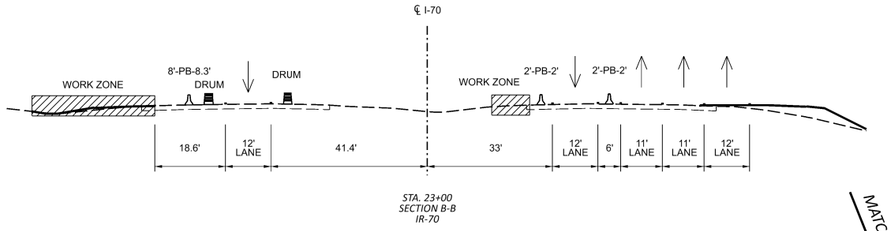


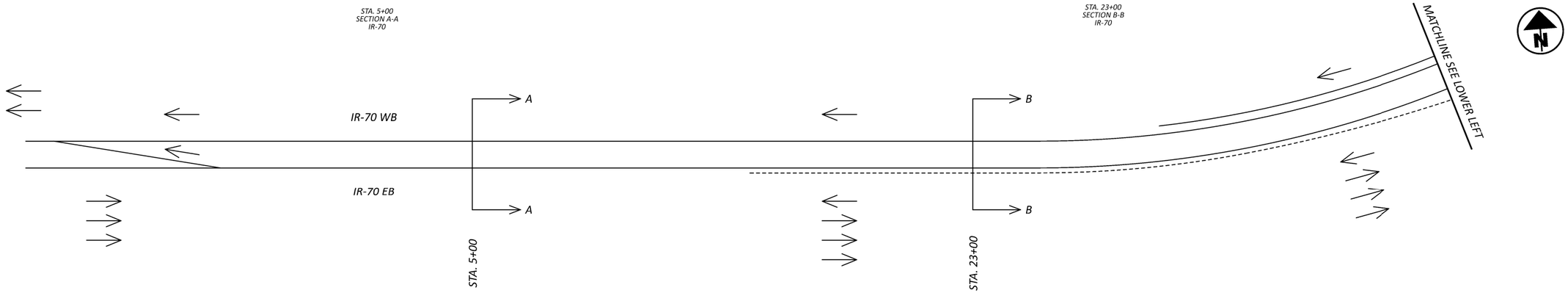
DESIGN AGENCY	DESIGNER	REVIEWER	PROJECT ID	SHEET	TOTAL
GANNETT FLEMING	ACW	DRJ 08/29/23	96808	8	18

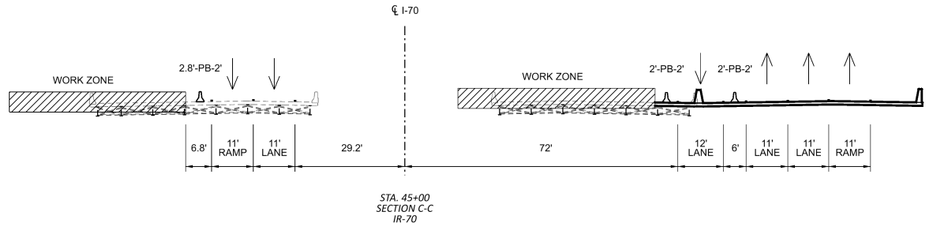
MOTAA
SINGLE CONTRAFLOW LANE: PHASE 1

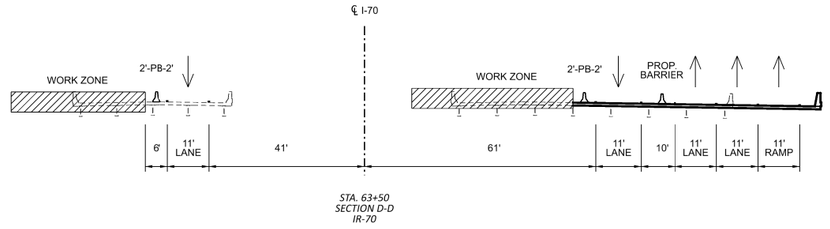
HORIZONTAL SCALE IN FEET
0 200
100 400

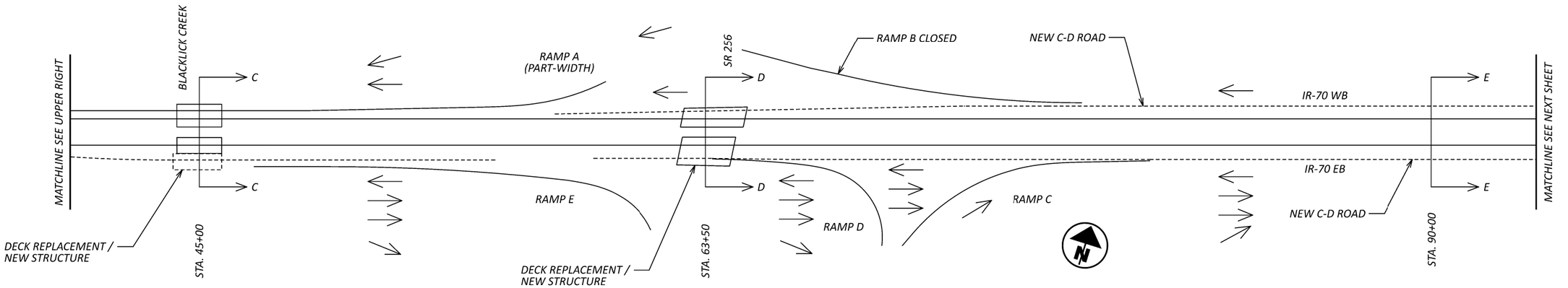


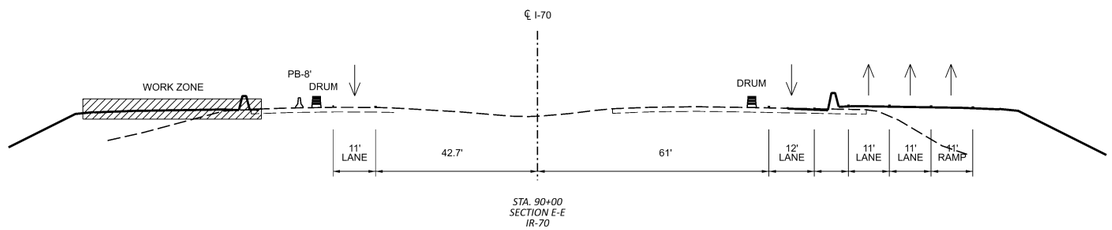












HORIZONTAL SCALE IN FEET
0 100 200 400

MOTAA
SINGLE CONTRAFLOW LANE: PHASE 2

DESIGN AGENCY
GANNETT FLEMING

DESIGNER ACW
REVIEWER DRJ 08/29/23
PROJECT ID 96808
SHEET 9 TOTAL 18

FAI/LIC-70-0.00/0.00

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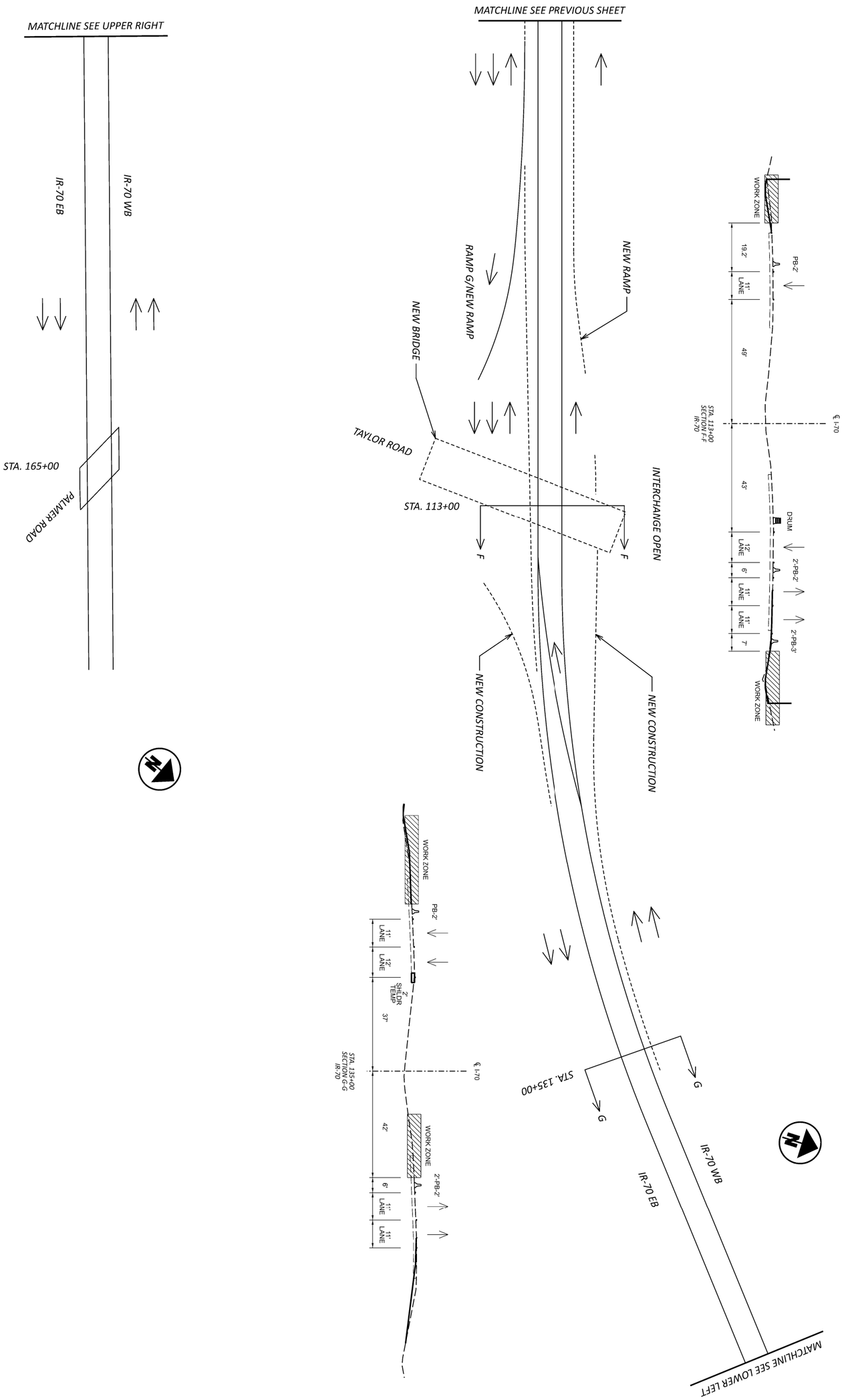

SHEET 10 / TOTAL 18	PROJECT ID 96808	REVIEWER DRJ 08/29/23	DESIGNER ACW	DESIGN AGENCY GANNETT FLEMING

MOTAA
SINGLE CONTRAFLOW LANE: PHASE 2

HORIZONTAL SCALE IN FEET
0 200
100 400

HORIZONTAL SCALE IN FEET
0 100 200 400

MOTAA
SINGLE CONTRAFLOW LANE: PHASE 3

DESIGN AGENCY
GANNETT FLEMING

DESIGNER
ACW

REVIEWER
DRJ 08/29/23

PROJECT ID
96808

SHEET 11 TOTAL 18

FAI/LIC-70-0.00/0.00

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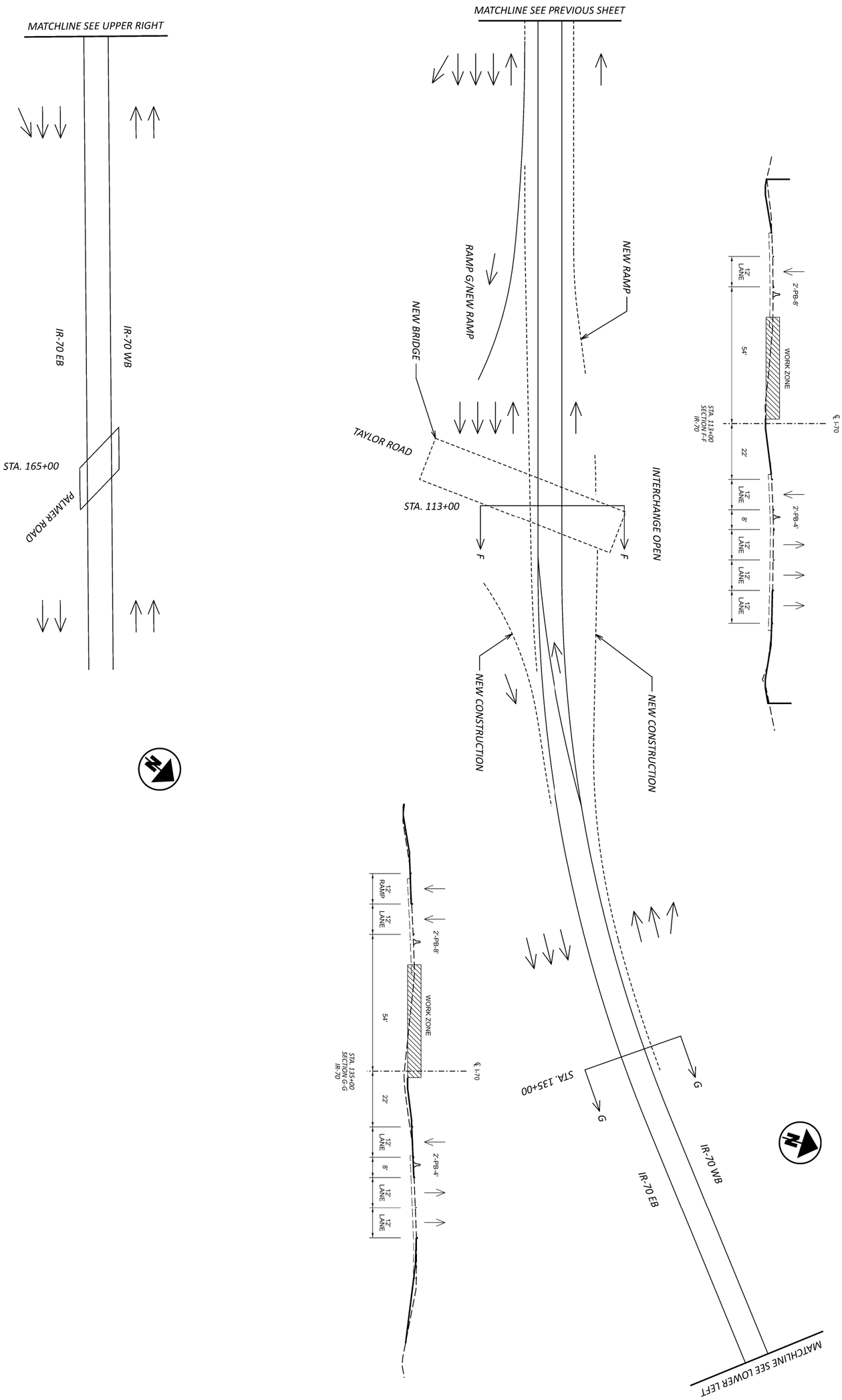

SHEET 12 / TOTAL 18	PROJECT ID 96808	REVIEWER DRJ 08/29/23	DESIGNER ACW	DESIGN AGENCY GANNETT FLEMING	MOTAA SINGLE CONTRAFLOW LANE: PHASE 3

HORIZONTAL SCALE IN FEET
0 200
100 400

MODEL: Crossover Ph 1 Sht_1 PAPERSIZE: 17x11 (in.) DATE: 8/30/2023 TIME: 12:16:51 PM USER: awilsbacher
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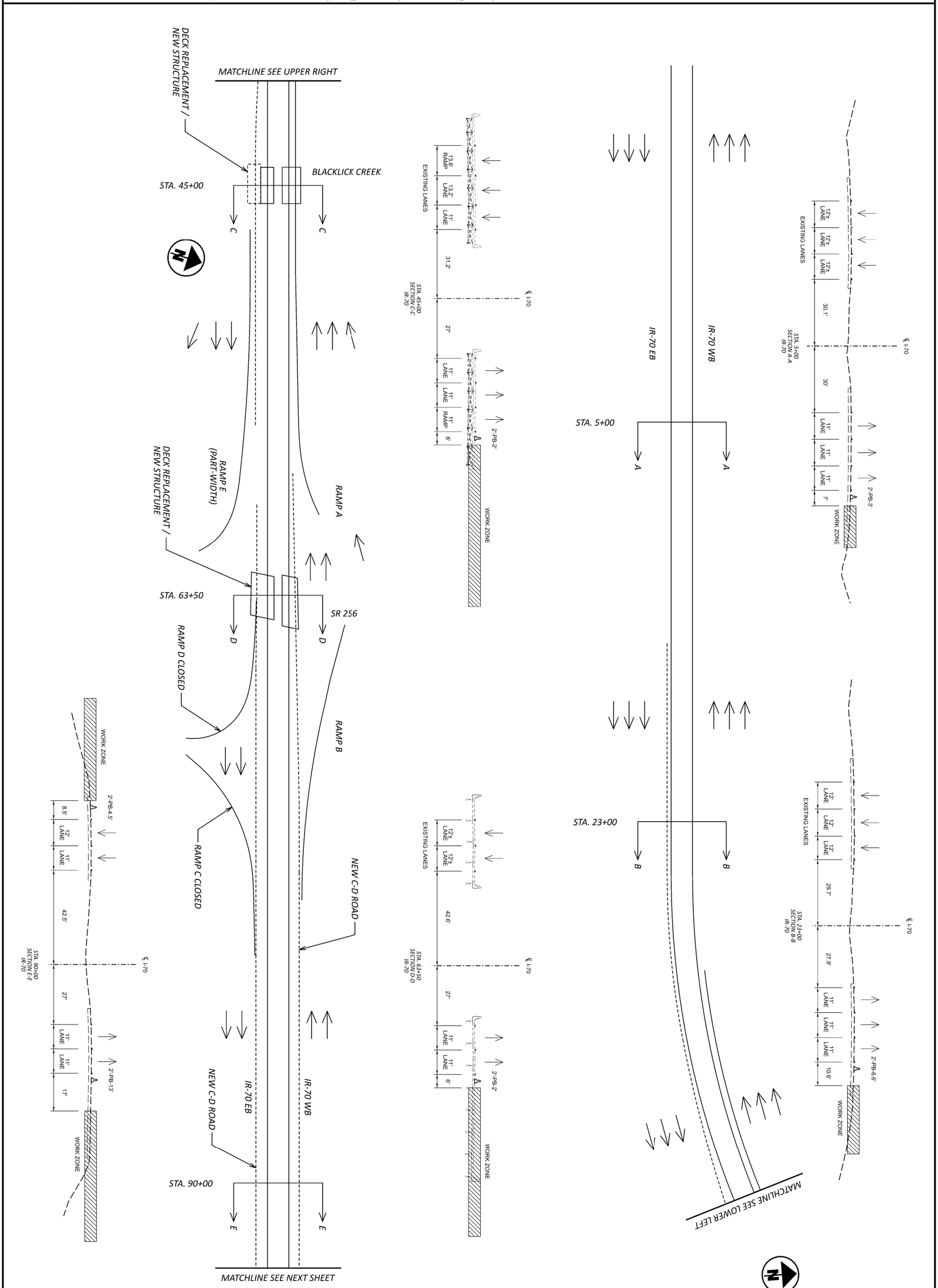

DESIGNER ACW	DESIGN AGENCY GANNETT FLEMING	MOTAA FULL CROSSOVER: PHASE 1	HORIZONTAL SCALE IN FEET 0 200 100 400
REVIEWER DRJ 08/29/23			
PROJECT ID 96808			
SHEET 13 TOTAL 18			

MODEL: Crossover Ph 1 Sht_2 PAPERSIZE: 17x11 (in.) DATE: 8/30/2023 TIME: 12:17:06 PM USER: awilsbacher
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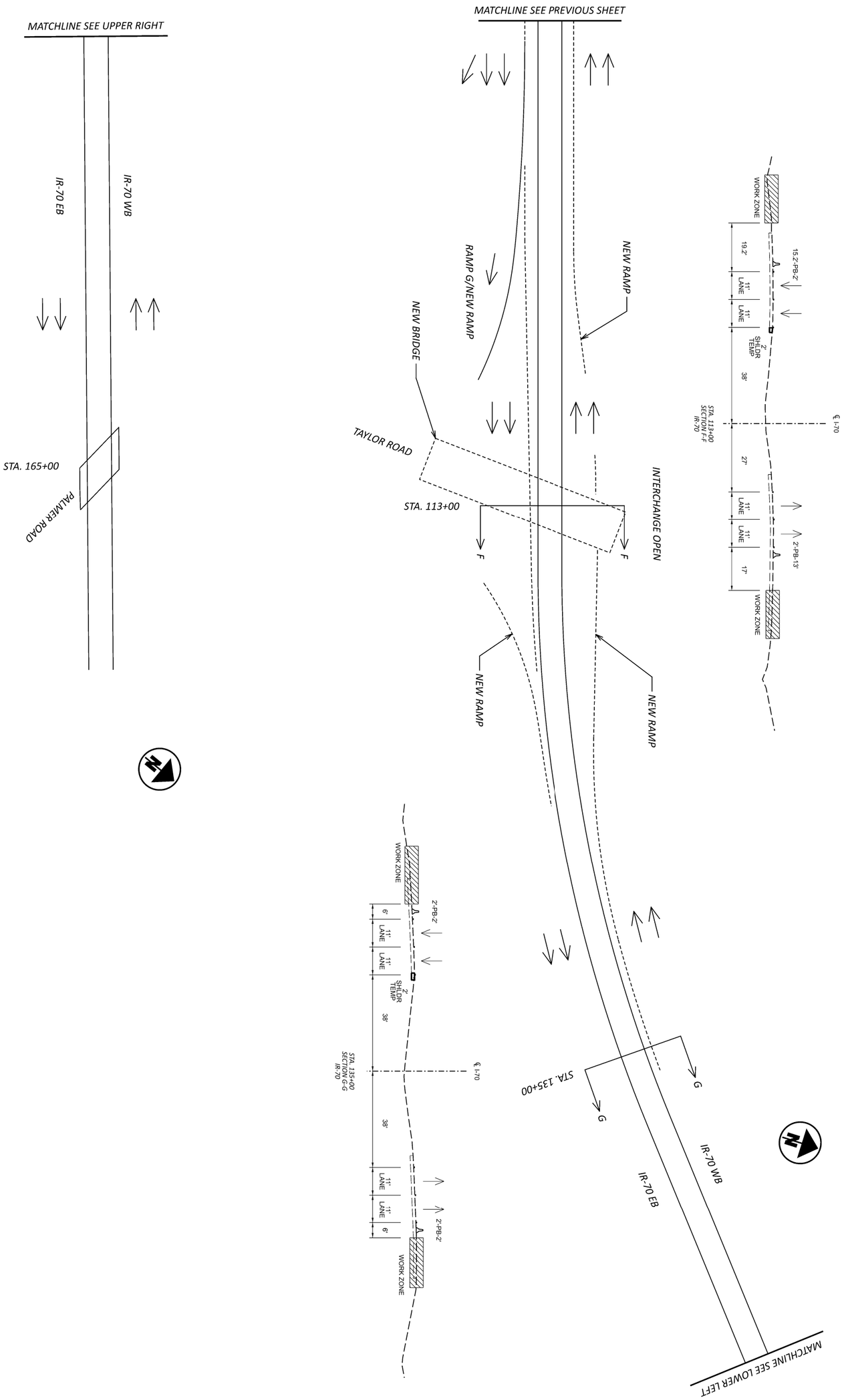

SHEET 14 / TOTAL 18	PROJECT ID 96808	REVIEWER DRJ 08/29/23	DESIGNER ACW

DESIGN AGENCY: GANNETT FLEMING

MOTAA
FULL CROSSOVER: PHASE 1

HORIZONTAL SCALE IN FEET
0 200
100 400

HORIZONTAL SCALE IN FEET
0 100 200 400

MOTAA
FULL CROSSOVER: PHASE 2

DESIGN AGENCY
GANNETT FLEMING

DESIGNER ACW
REVIEWER DRJ 08/29/23
PROJECT ID 96808
SHEET 15 TOTAL 18

FAI/LIC-70-0.00/0.00

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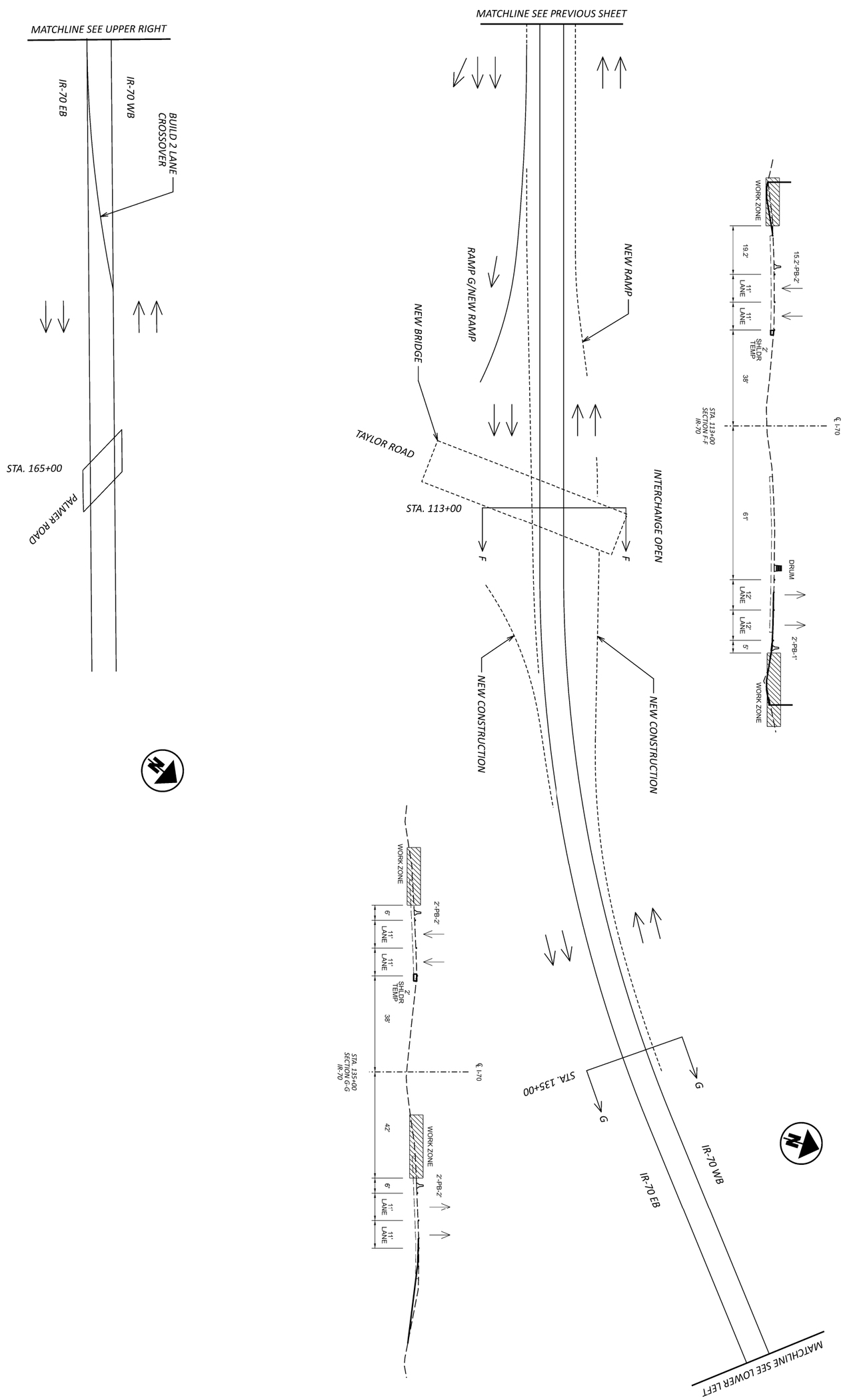
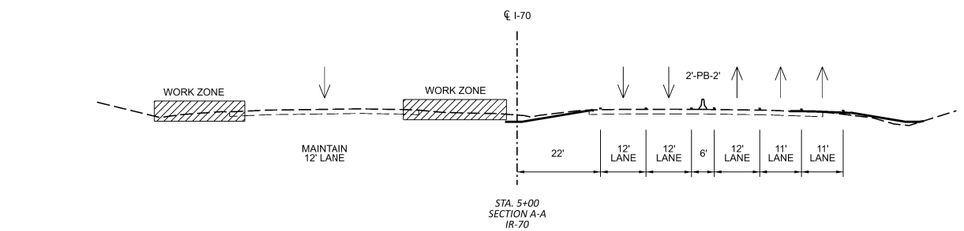


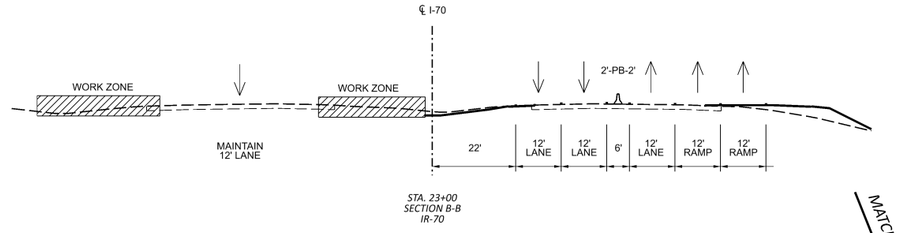
SHEET 16 TOTAL 18	PROJECT ID 96808	REVIEWER DRJ 08/29/23	DESIGNER ACW

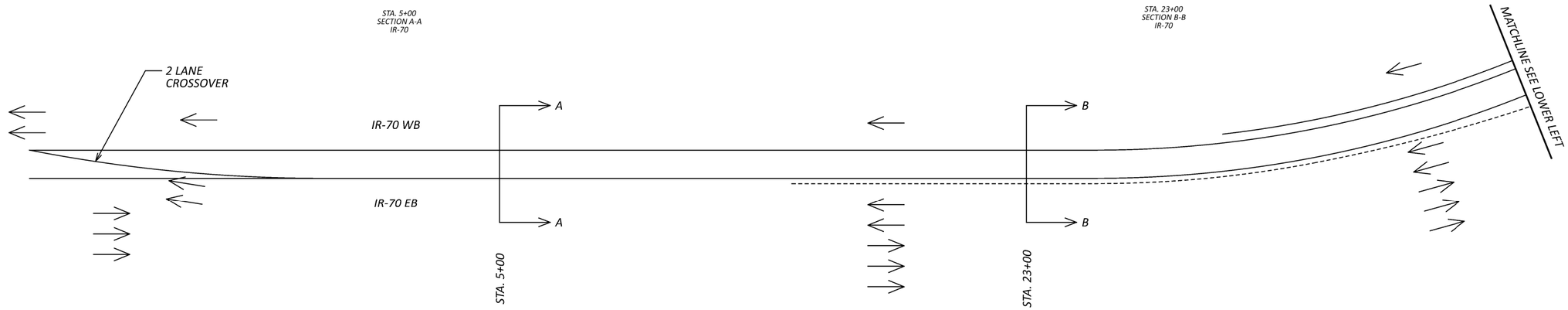
DESIGN AGENCY: GANNETT FLEMING

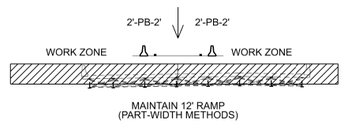
MOTAA
FULL CROSSOVER: PHASE 2

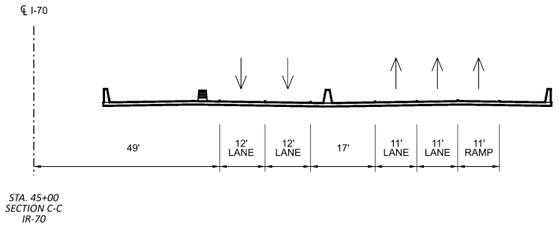
HORIZONTAL SCALE IN FEET
0 200
100 400

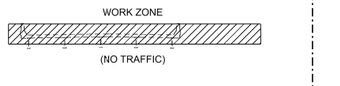


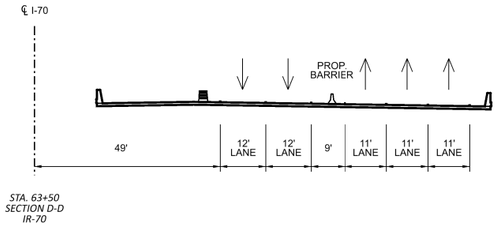


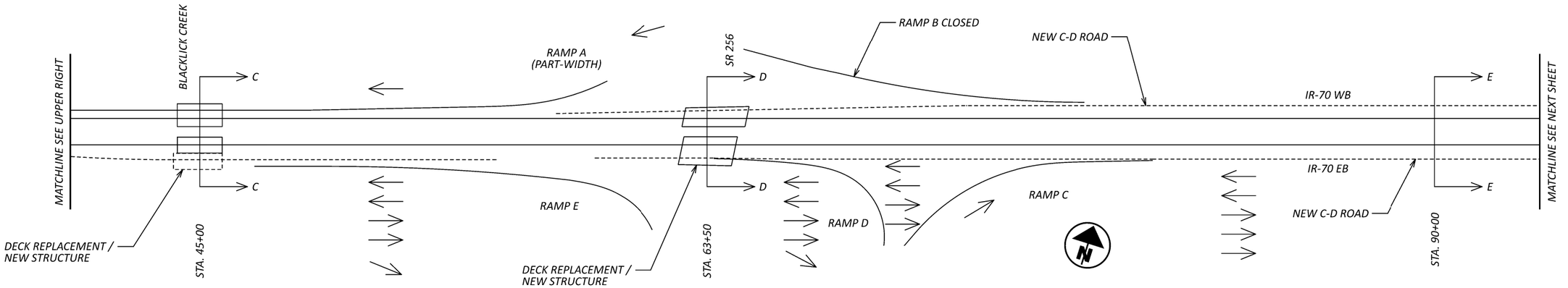


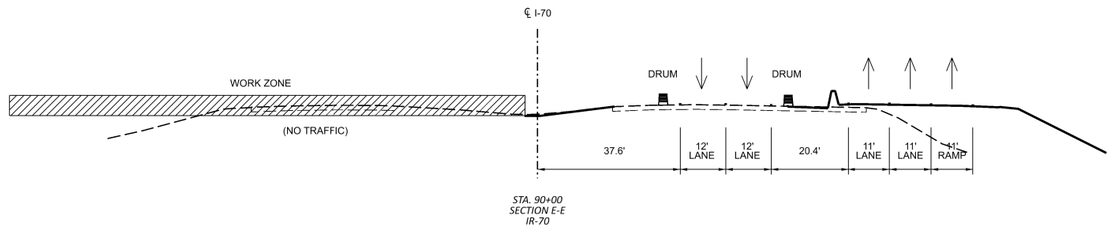












HORIZONTAL SCALE IN FEET
0 100 200 400

MOTAA
FULL CROSSOVER: PHASE 3

DESIGN AGENCY
GANNETT FLEMING

DESIGNER ACW
REVIEWER DRJ 08/29/23
PROJECT ID 96808
SHEET 17 TOTAL 18

FAI/LIC-70-0.00/0.00

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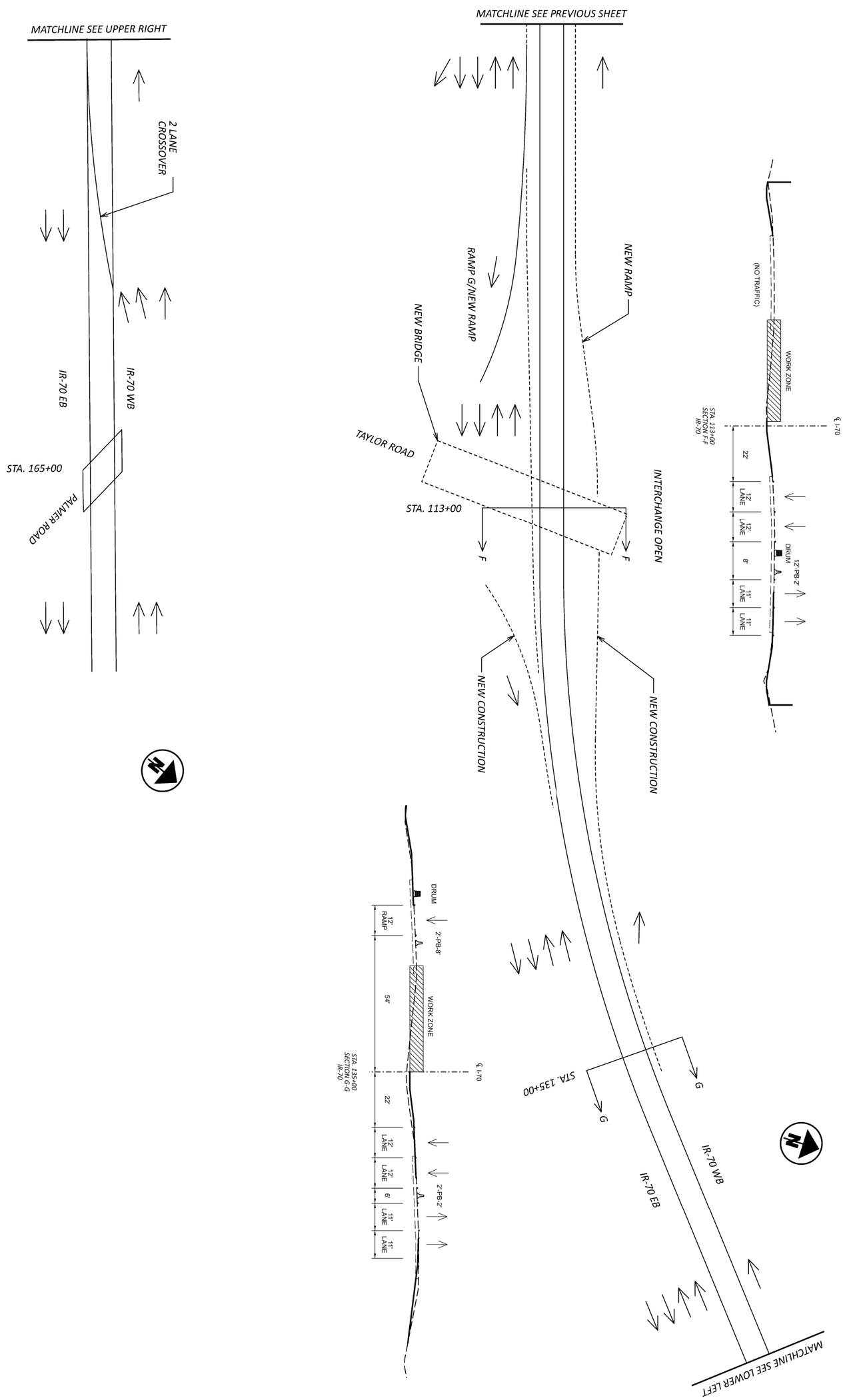
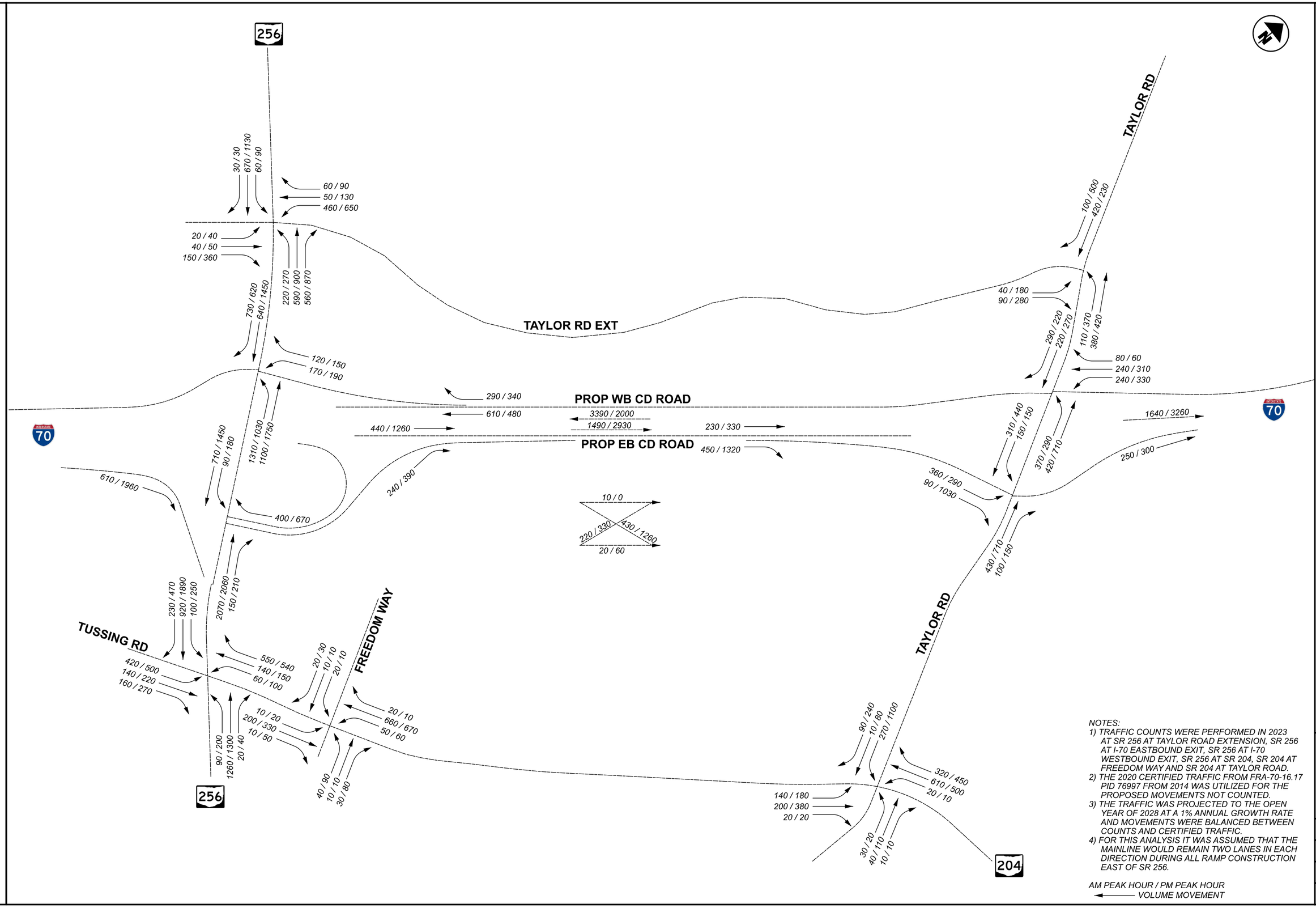


SHEET 18 / TOTAL 18	PROJECT ID 96808	REVIEWER DRJ 08/29/23	DESIGNER ACW	DESIGN AGENCY GANNETT FLEMING	MOTAA FULL CROSSOVER: PHASE 3

HORIZONTAL SCALE IN FEET
0 200
100 400

APPENDIX F

Ramp Access Traffic and Analysis



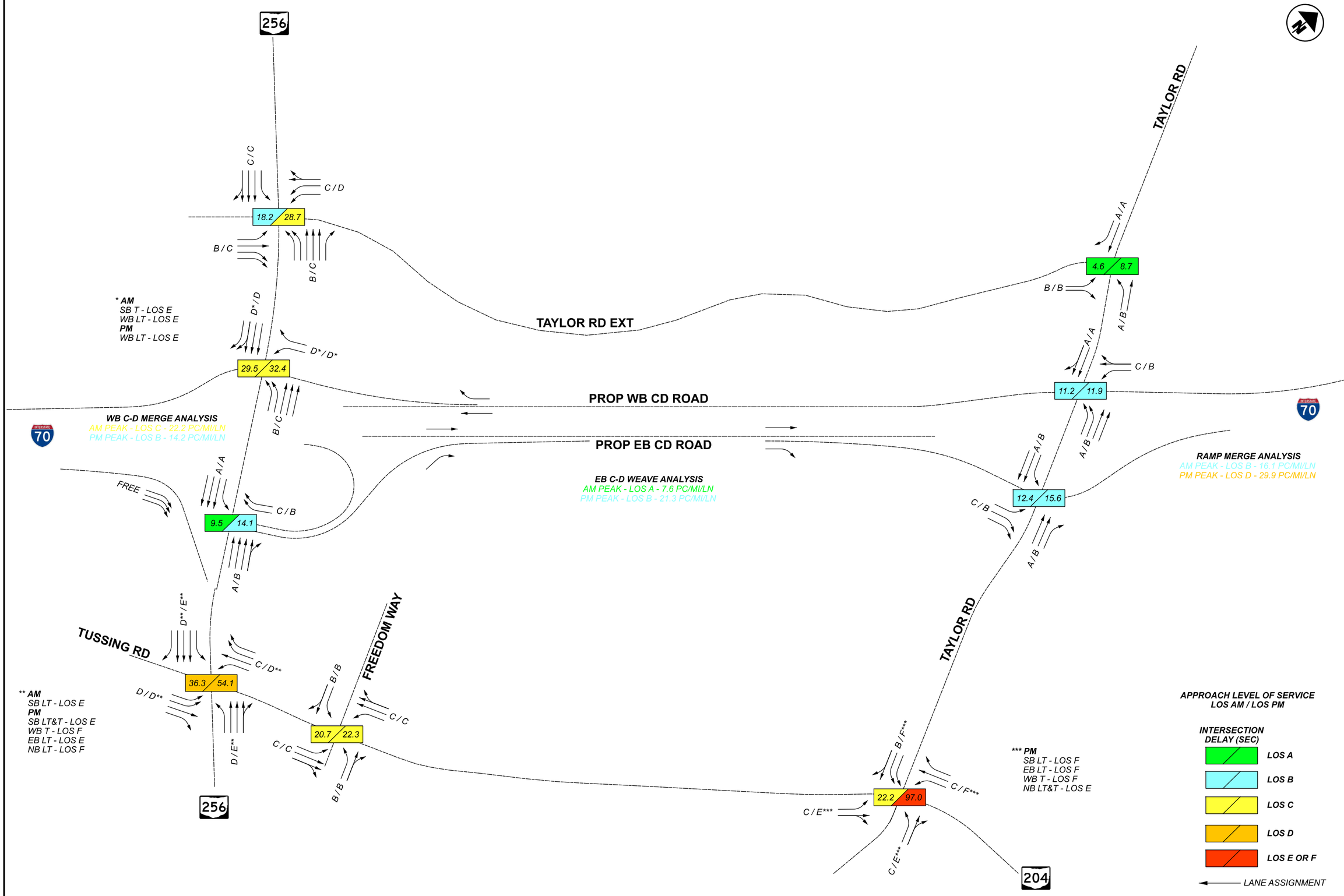
NOTES:
1) TRAFFIC COUNTS WERE PERFORMED IN 2023 AT SR 256 AT TAYLOR ROAD EXTENSION, SR 256 AT I-70 EASTBOUND EXIT, SR 256 AT I-70 WESTBOUND EXIT, SR 256 AT SR 204, SR 204 AT FREEDOM WAY AND SR 204 AT TAYLOR ROAD.
2) THE 2020 CERTIFIED TRAFFIC FROM FRA-70-16.17 PID 76997 FROM 2014 WAS UTILIZED FOR THE PROPOSED MOVEMENTS NOT COUNTED.
3) THE TRAFFIC WAS PROJECTED TO THE OPEN YEAR OF 2028 AT A 1% ANNUAL GROWTH RATE AND MOVEMENTS WERE BALANCED BETWEEN COUNTS AND CERTIFIED TRAFFIC.
4) FOR THIS ANALYSIS IT WAS ASSUMED THAT THE MAINLINE WOULD REMAIN TWO LANES IN EACH DIRECTION DURING ALL RAMP CONSTRUCTION EAST OF SR 256.

AM PEAK HOUR / PM PEAK HOUR
VOLUME MOVEMENT

MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
2028 PROJECTED TRAFFIC VOLUMES

DESIGN AGENCY: GANNETT FLEMING
DESIGNER: DRJ
REVIEWER: BRO 6/9/2023
PROJECT ID: 96808
SHEET: 1 TOTAL: 7

FAI/LIC-70-0.00/0.00



MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
2028 FULL OPEN LEVEL OF SERVICE

DESIGN AGENCY
GANNETT FLEMING

DESIGNER
DRJ

REVIEWER
BRO 6/9/2023

PROJECT ID
96808

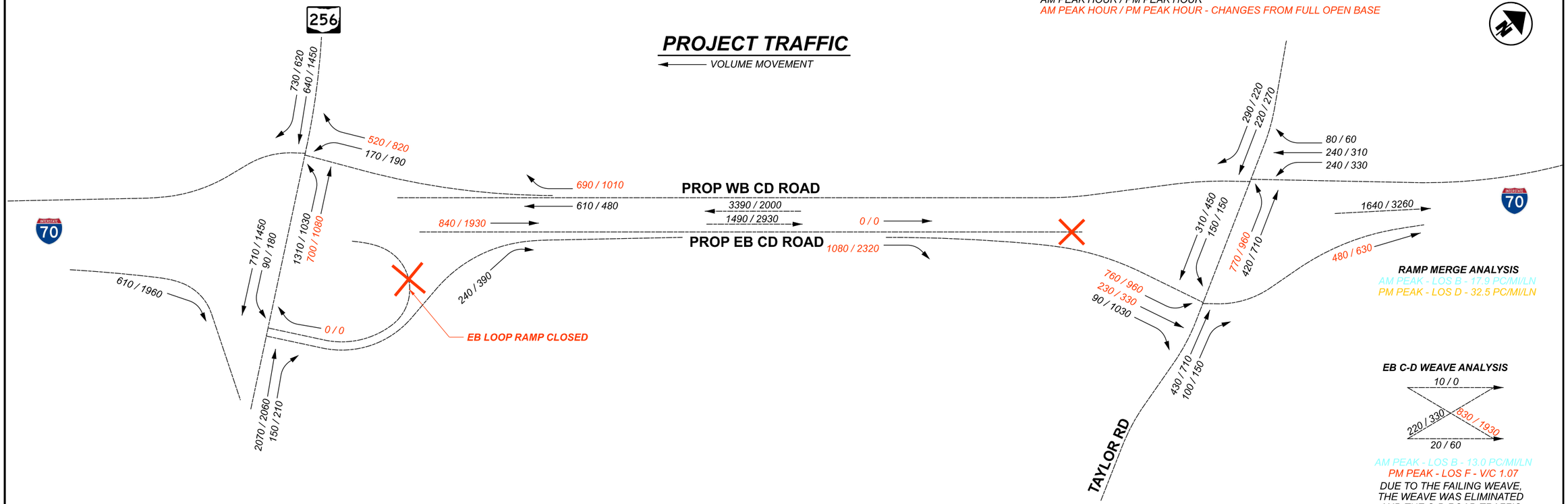
SHEET 2 TOTAL 7

FAI/LIC-70-0.00/0.00

AM PEAK HOUR / PM PEAK HOUR
AM PEAK HOUR / PM PEAK HOUR - CHANGES FROM FULL OPEN BASE

PROJECT TRAFFIC

VOLUME MOVEMENT



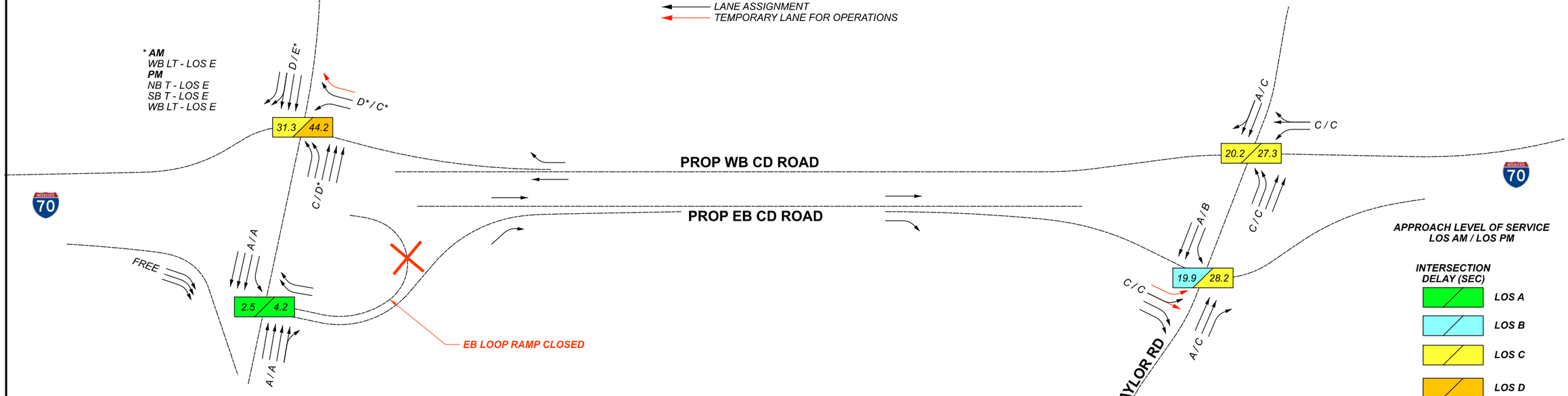
RAMP MERGE ANALYSIS
AM PEAK - LOS B - 17.9 PC/MI/LN
PM PEAK - LOS D - 32.5 PC/MI/LN

EB C-D WEAVE ANALYSIS

AM PEAK - LOS B - 13.0 PC/MI/LN
PM PEAK - LOS F - V/C 1.07
DUE TO THE FAILING WEAVE, THE WEAVE WAS ELIMINATED AND THE C-D ROAD TRAFFIC WILL TEMPORARILY USE THE RAMP INTERSECTION.

LEVEL OF SERVICE

LANE ASSIGNMENT
TEMPORARY LANE FOR OPERATIONS



APPROACH LEVEL OF SERVICE
LOS AM / LOS PM

INTERSECTION DELAY (SEC)

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E OR F

NOTES:
1) SEE NOTES SHEET 1.

MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
EASTBOUND LOOP RAMP CLOSURE TO SR 256 NORTHBOUND

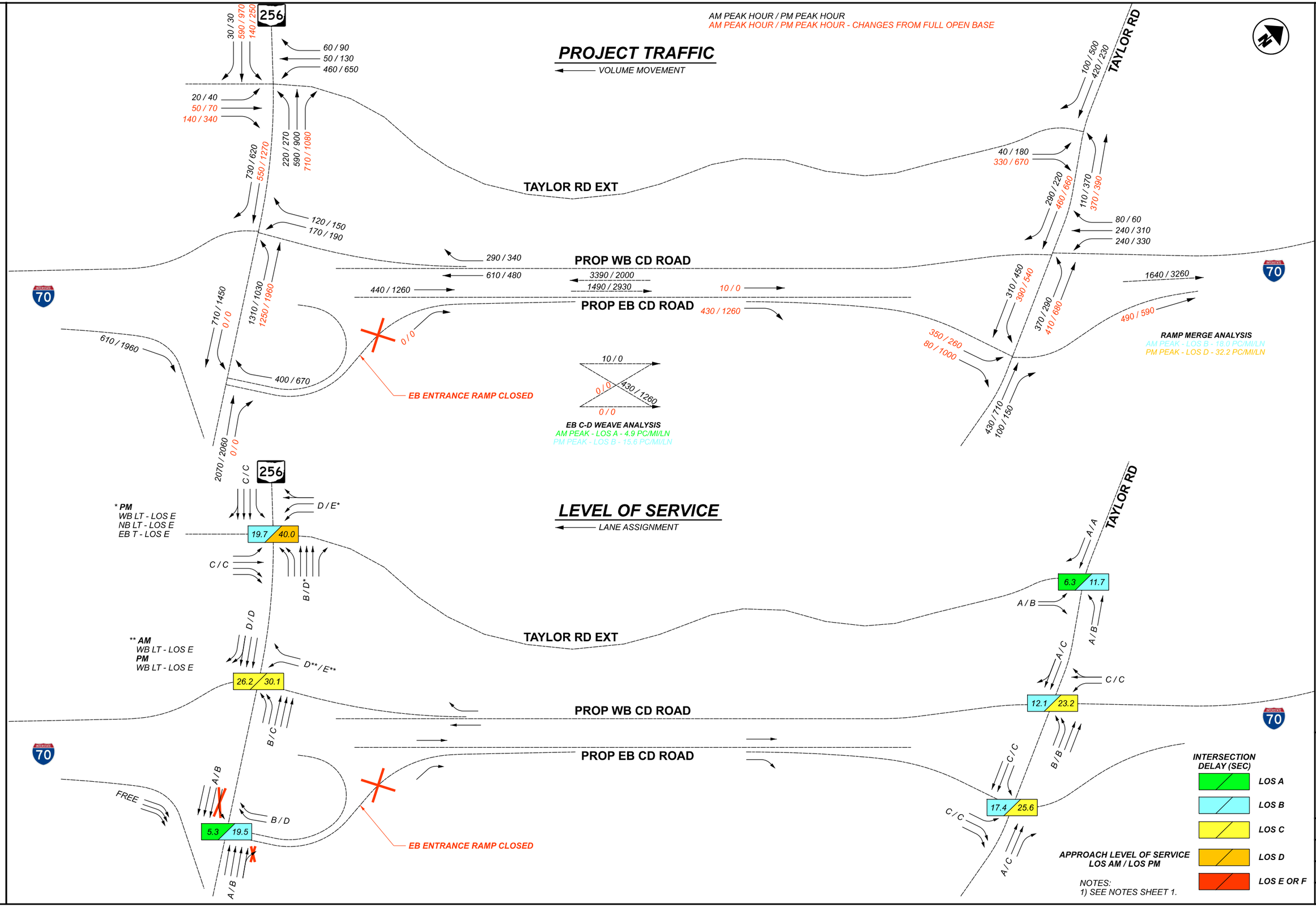
DESIGN AGENCY: GANNETT FLEMING
DESIGNER: DRJ
REVIEWER: BRO 6/9/2023
PROJECT ID: 96808
SHEET: 3 TOTAL: 7

FAI/LIC-70-0.00/0.00

AM PEAK HOUR / PM PEAK HOUR
AM PEAK HOUR / PM PEAK HOUR - CHANGES FROM FULL OPEN BASE

PROJECT TRAFFIC

VOLUME MOVEMENT



LEVEL OF SERVICE

LANE ASSIGNMENT

INTERSECTION DELAY (SEC)

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E OR F

APPROACH LEVEL OF SERVICE
LOS AM / LOS PM

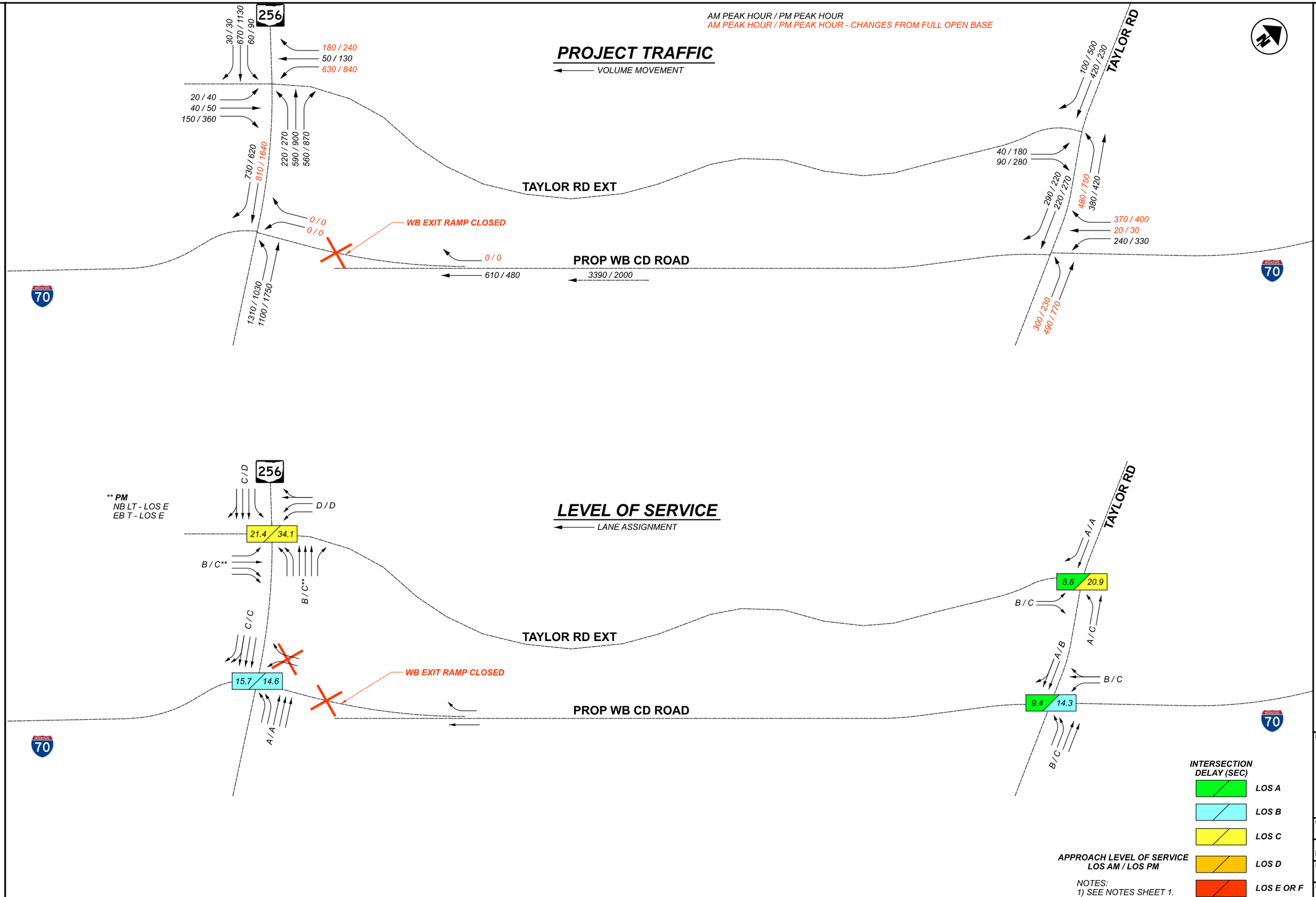
NOTES:
1) SEE NOTES SHEET 1.

MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
EASTBOUND ENTRANCE RAMP FROM SR 256 CLOSURE

DESIGN AGENCY
GANNETT FLEMING

DESIGNER	DRJ
REVIEWER	BRO 6/9/2023
PROJECT ID	96808
SHEET	4
TOTAL	7

FAI/LIC-70-0.00/0.00



MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
WESTBOUND EXIT RAMP TO SR 256 CLOSURE

DESIGN AGENCY
GANNETT FLEMING

DESIGNER
DRJ

REVIEWER
BRO 6/9/2023

PROJECT ID
96808

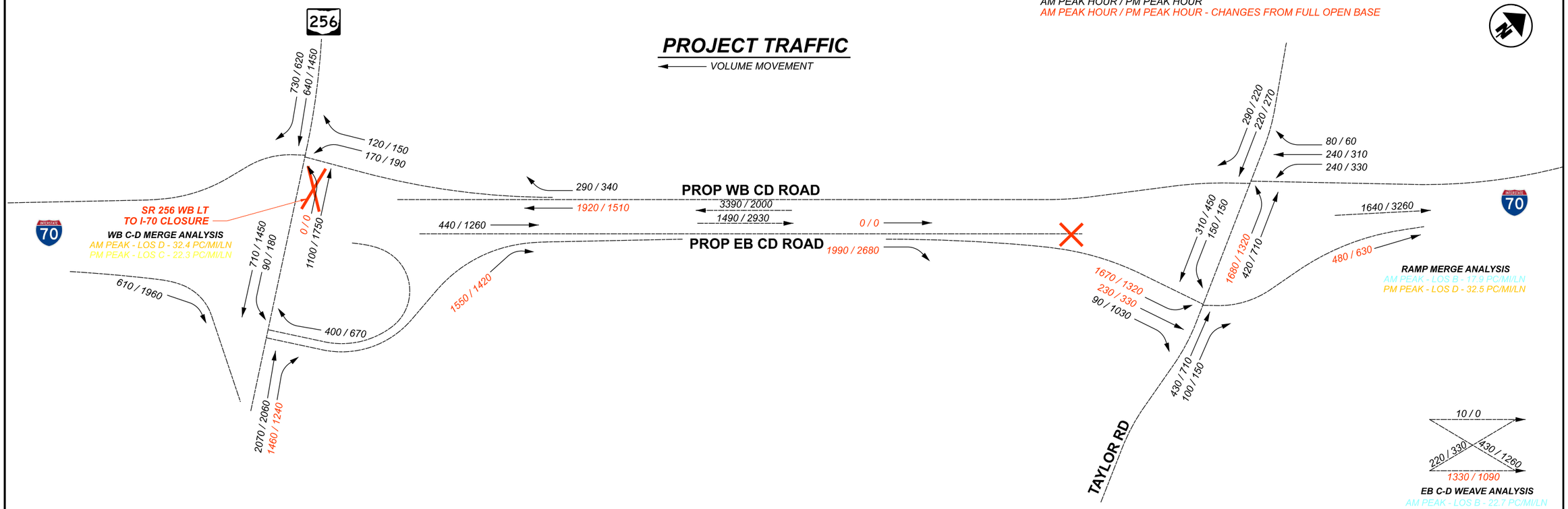
SHEET 5 TOTAL 7

FAI/LIC-70-0.00/0.00

AM PEAK HOUR / PM PEAK HOUR
AM PEAK HOUR / PM PEAK HOUR - CHANGES FROM FULL OPEN BASE

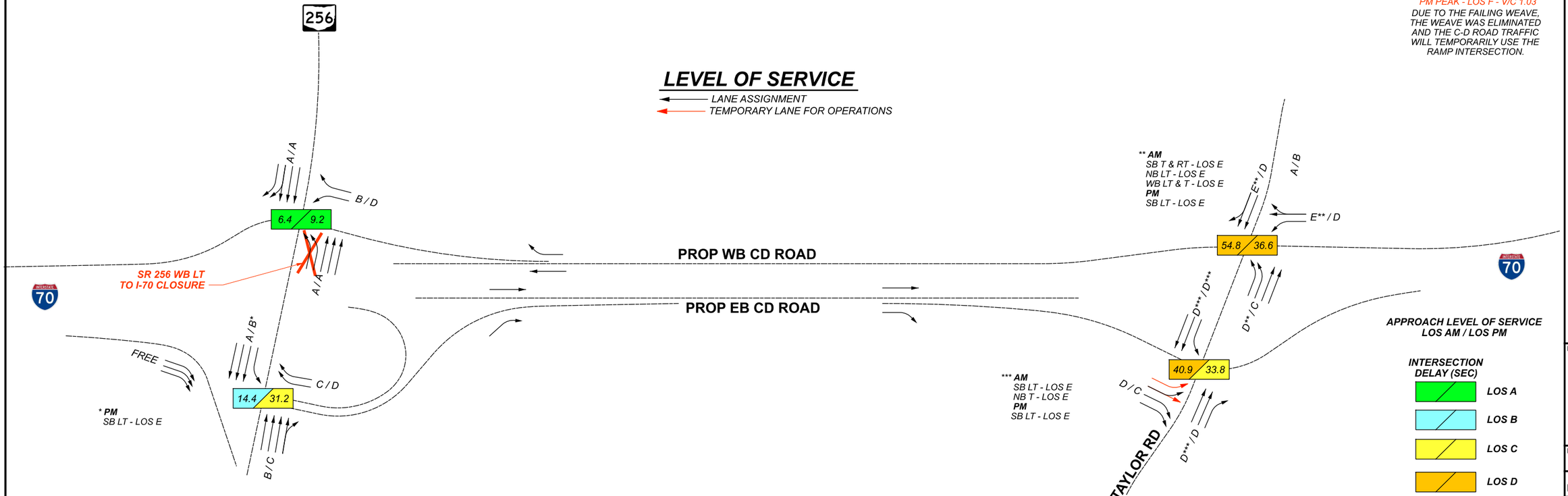
PROJECT TRAFFIC

VOLUME MOVEMENT



LEVEL OF SERVICE

LANE ASSIGNMENT
TEMPORARY LANE FOR OPERATIONS



APPROACH LEVEL OF SERVICE
LOS AM / LOS PM

INTERSECTION DELAY (SEC)

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E OR F

NOTES:
1) SEE NOTES SHEET 1.

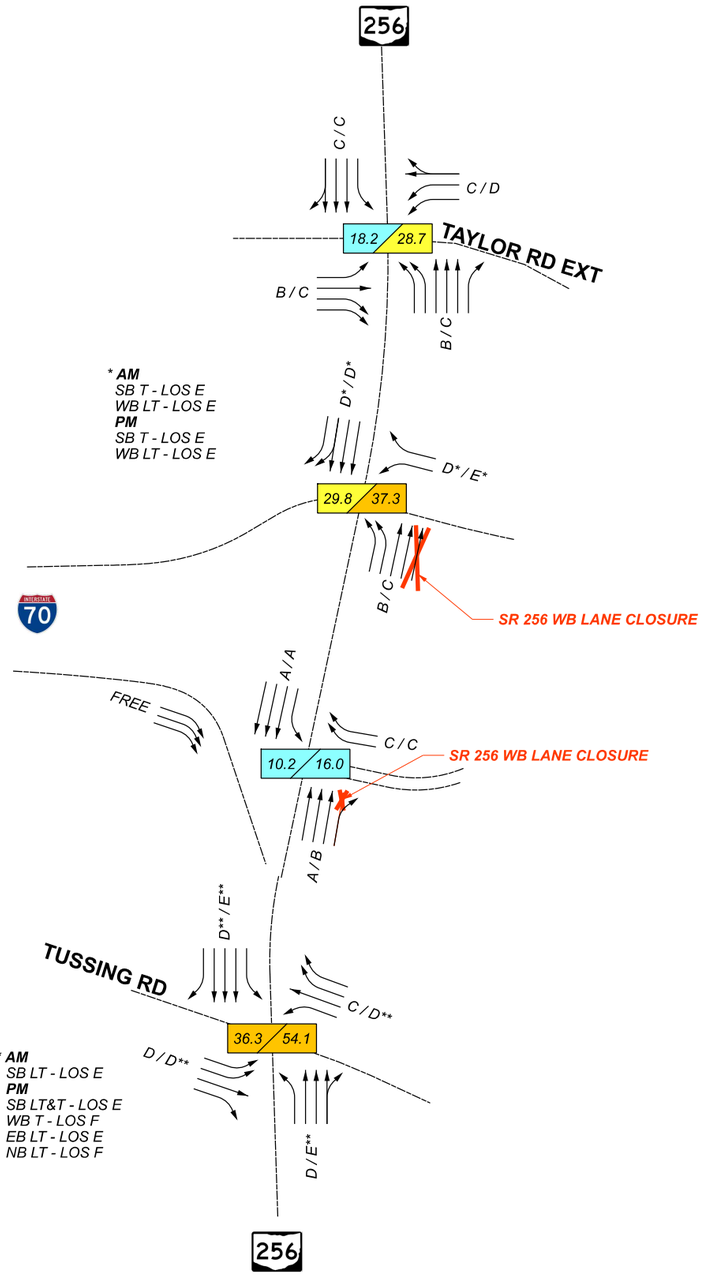
MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
NORTHBOUND LEFT TURN LANE CLOSURES FROM SR 256 TO I-70 WESTBOUND

DESIGN AGENCY: GANNETT FLEMING
DESIGNER: DRJ
REVIEWER: BRO 6/9/2023
PROJECT ID: 96808
SHEET: 6 TOTAL: 7

FAI/LIC-70-0.00/0.00

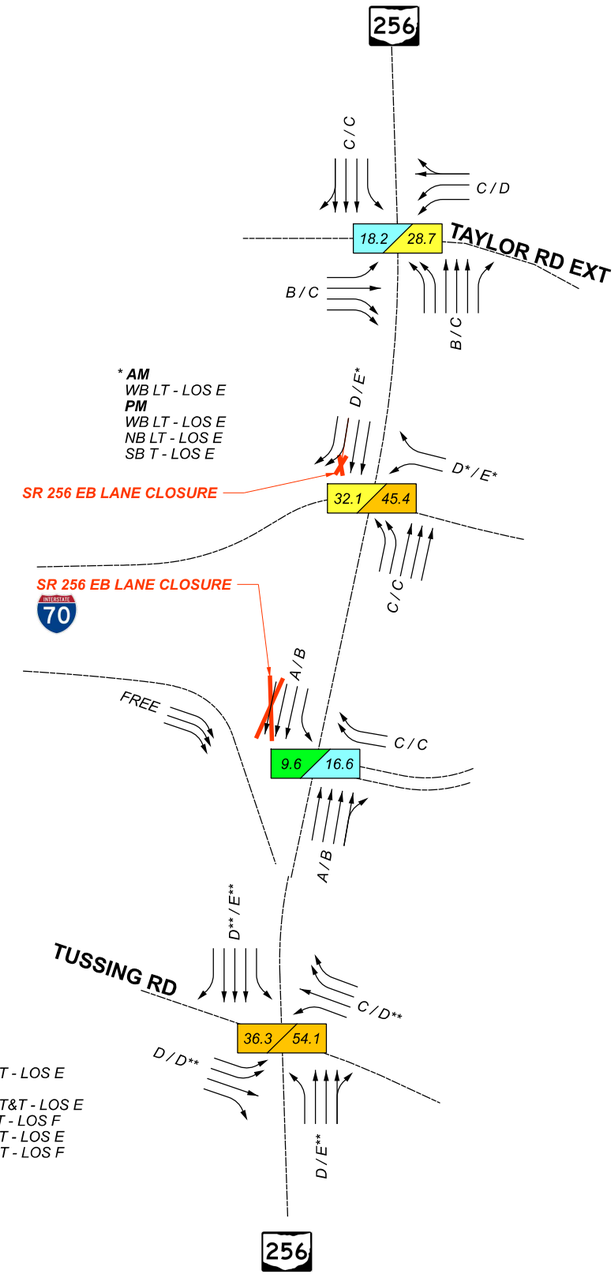
WESTBOUND SR 256 LANE CLOSURE

I-70 BRIDGE OVER 256 SUBSTRUCTURE WORK



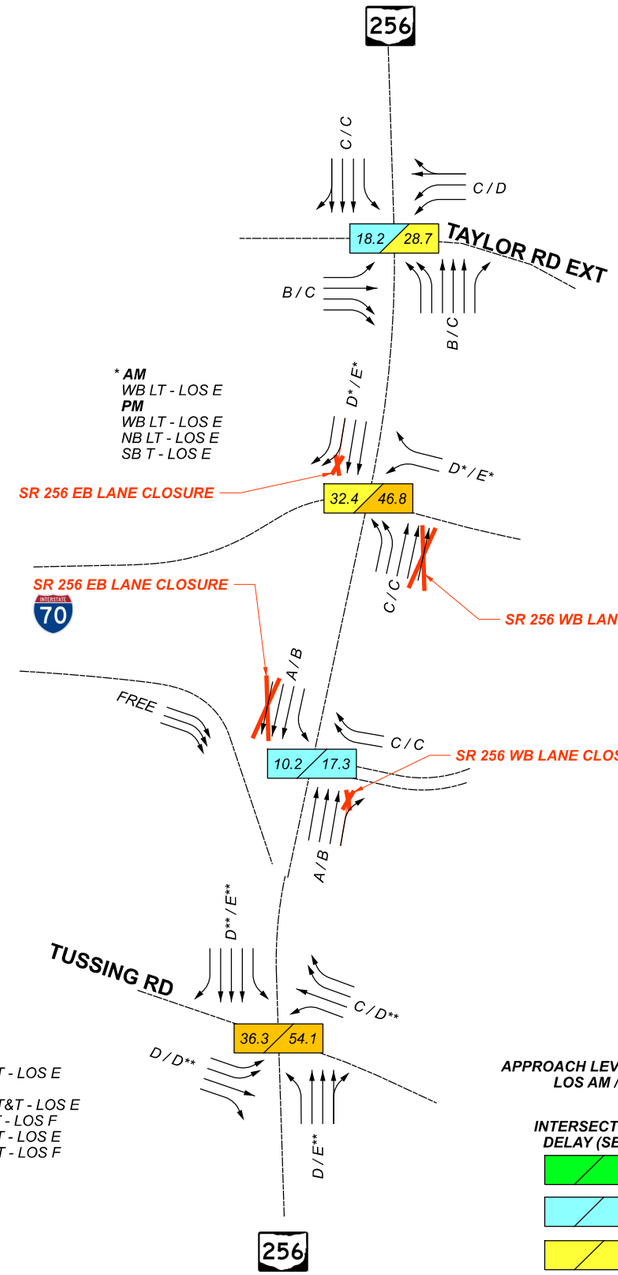
EASTBOUND SR 256 LANE CLOSURE

I-70 BRIDGE OVER 256 SUBSTRUCTURE WORK



EB & WB SR 256 LANE CLOSURE

I-70 BRIDGE OVER 256 SUBSTRUCTURE WORK



APPROACH LEVEL OF SERVICE
LOS AM / LOS PM

INTERSECTION DELAY (SEC)

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E OR F

NOTES:
1) SEE NOTES SHEET 1.

LANE ASSIGNMENT

PROJECTED TRAFFIC MATCHES THE 2028 FULL OPEN FIGURE

MAINTENANCE OF TRAFFIC - TRAFFIC ANALYSIS
SR 256 THRU LANE CLOSURES

DESIGN AGENCY: GANNETT FLEMING

DESIGNER: DRJ

REVIEWER: BRO 6/9/2023

PROJECT ID: 96808

SHEET 7 TOTAL 7

FAI/LIC-70-0.00/0.00

APPENDIX G

Ramp Closure Capacity Analyses

2028 FULL OPEN PROJECTED TRAFFIC

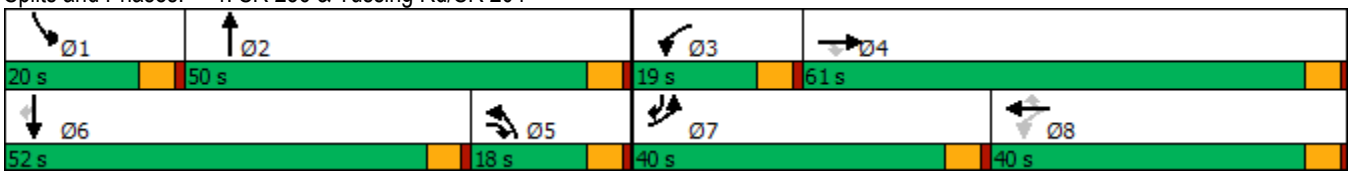
2028 AM PEAK HOUR

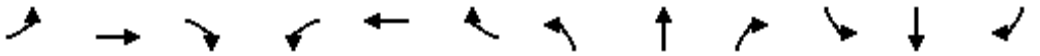
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Future Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5075	0	1770	5085	1583
Flt Permitted	0.950			0.660			0.950			0.950		
Satd. Flow (perm)	3433	1863	1583	1229	1863	2787	1770	5075	0	1770	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			390		2				250
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	152	174	65	152	598	98	1370	22	109	1000	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	152	174	65	152	598	98	1392	0	109	1000	250
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	40.0	61.0	18.0	19.0	40.0	40.0	18.0	50.0		20.0	52.0	40.0
Total Split (%)	26.7%	40.7%	12.0%	12.7%	26.7%	26.7%	12.0%	33.3%		13.3%	34.7%	26.7%
Maximum Green (s)	35.0	56.0	13.0	14.0	35.0	35.0	13.0	45.0		15.0	47.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	21.8	37.4	60.8	32.6	22.4	22.4	22.2	42.2		12.6	32.6	54.4
Actuated g/C Ratio	0.18	0.31	0.51	0.27	0.19	0.19	0.19	0.35		0.11	0.27	0.46
v/c Ratio	0.73	0.26	0.19	0.17	0.44	0.71	0.30	0.77		0.58	0.72	0.29
Control Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
LOS	D	C	A	C	D	C	D	D		E	D	A
Approach Delay		38.7			26.7			39.4			37.2	
Approach LOS		D			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 119.2			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 36.3		Intersection LOS: D	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204



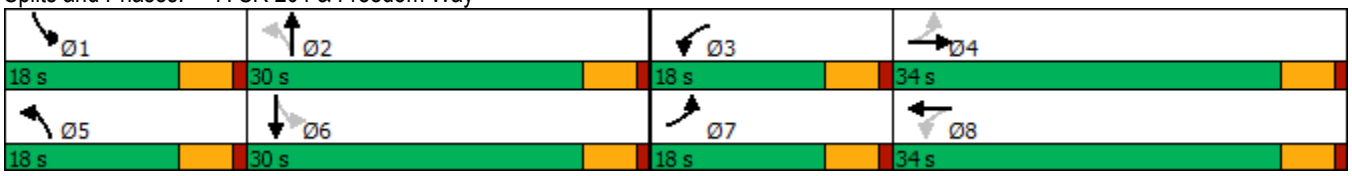


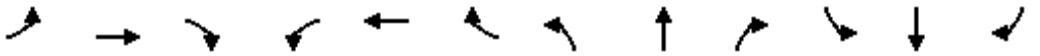
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	200	10	50	660	20	40	10	30	20	10	20
Future Volume (vph)	10	200	10	50	660	20	40	10	30	20	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	80		0	80		0	60		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.996			0.887			0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3514	0	1770	3525	0	1770	1652	0	1770	1676	0
Flt Permitted	0.274			0.533			0.693			0.728		
Satd. Flow (perm)	510	3514	0	993	3525	0	1291	1652	0	1356	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			3			33			22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		833			574			282			721	
Travel Time (s)		18.9			13.0			6.4			16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	217	11	54	717	22	43	11	33	22	11	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	228	0	54	739	0	43	44	0	22	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	20.0		10.0	20.0		10.0	20.0		10.0	20.0	
Minimum Split (s)	18.0	28.0		18.0	28.0		18.0	28.0		18.0	28.0	
Total Split (s)	18.0	34.0		18.0	34.0		18.0	30.0		18.0	30.0	
Total Split (%)	18.0%	34.0%		18.0%	34.0%		18.0%	30.0%		18.0%	30.0%	
Maximum Green (s)	13.0	29.0		13.0	29.0		13.0	25.0		13.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	27.6	22.5		29.4	27.8		32.4	29.0		31.5	26.4	
Actuated g/C Ratio	0.37	0.30		0.39	0.37		0.43	0.39		0.42	0.35	
v/c Ratio	0.03	0.21		0.11	0.56		0.07	0.07		0.03	0.05	
Control Delay	14.5	22.9		15.0	22.0		14.1	11.6		14.2	13.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.5	22.9		15.0	22.0		14.1	11.6		14.2	13.9	
LOS	B	C		B	C		B	B		B	B	
Approach Delay		22.5			21.5			12.8			14.0	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 74.8			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 56.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: SR 204 & Freedom Way



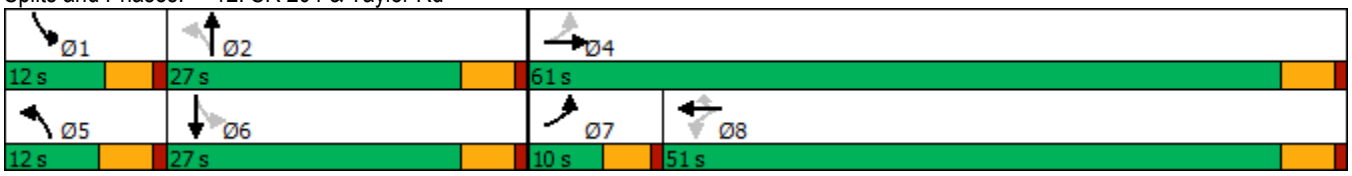


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	200	20	20	610	320	30	40	10	270	10	90
Future Volume (vph)	140	200	20	20	610	320	30	40	10	270	10	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	225		225	100		0	550		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.986				0.850		0.969			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1837	0	1770	1863	1583	1770	1805	0	3433	1611	0
Flt Permitted	0.109			0.610			0.687			0.632		
Satd. Flow (perm)	203	1837	0	1136	1863	1583	1280	1805	0	2284	1611	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				348		11			98	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2082			353			205			1618	
Travel Time (s)		47.3			8.0			4.7			36.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	217	22	22	663	348	33	43	11	293	11	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	239	0	22	663	348	33	54	0	293	109	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		9	15		60	15		9	60		60
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		20.0	20.0	20.0	5.0	20.0		5.0	20.0	
Minimum Split (s)	9.5	28.0		28.0	28.0	28.0	13.0	28.0		9.5	28.0	
Total Split (s)	10.0	61.0		51.0	51.0	51.0	12.0	27.0		12.0	27.0	
Total Split (%)	10.0%	61.0%		51.0%	51.0%	51.0%	12.0%	27.0%		12.0%	27.0%	
Maximum Green (s)	5.5	56.0		46.0	46.0	46.0	7.0	22.0		7.5	22.0	
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	4.0	4.0		3.5	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	5.0		5.0	5.0	5.0	5.0	5.0		4.5	5.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	48.5	48.0		37.9	37.9	37.9	26.5	20.2		30.3	25.6	
Actuated g/C Ratio	0.54	0.53		0.42	0.42	0.42	0.29	0.22		0.34	0.28	
v/c Ratio	0.74	0.24		0.05	0.85	0.40	0.08	0.13		0.34	0.21	
Control Delay	34.6	11.3		14.8	34.7	3.2	22.6	26.9		23.1	9.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	34.6	11.3		14.8	34.7	3.2	22.6	26.9		23.1	9.8	
LOS	C	B		B	C	A	C	C		C	A	
Approach Delay		20.3			23.6			25.3			19.5	
Approach LOS		C			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 90.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 22.2		Intersection LOS: C	
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: SR 204 & Taylor Rd

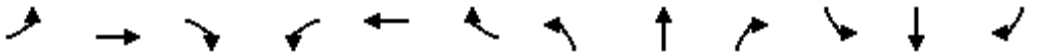


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	400	2070	150	90	710
Future Volume (vph)	0	400	2070	150	90	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt		0.850	0.990			
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	6344	0	1770	5085
Flt Permitted					0.051	
Satd. Flow (perm)	0	2787	6344	0	95	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		330	17			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	435	2250	163	98	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	435	2413	0	98	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		37.0	91.0		22.0	113.0
Total Split (%)		24.7%	60.7%		14.7%	75.3%
Maximum Green (s)		32.5	86.5		17.5	108.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		10.5	73.8		86.7	86.7
Actuated g/C Ratio		0.10	0.69		0.81	0.81
v/c Ratio		0.76	0.55		0.48	0.19
Control Delay		22.4	8.9		21.8	2.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		22.4	8.9		21.8	2.4
LOS		C	A		C	A
Approach Delay	22.4		8.9			4.6
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 106.6			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 54.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

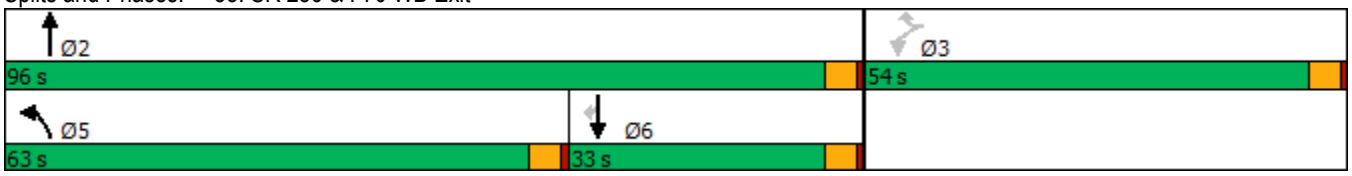


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Future Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.946	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	5085	0	0	4546	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	5085	0	0	4546	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						80					85	396
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	696	793
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	1093	396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	63.0	96.0			33.0	33.0
Total Split (%)				36.0%		36.0%	42.0%	64.0%			22.0%	22.0%
Maximum Green (s)				49.5		49.5	58.5	91.5			28.5	28.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				17.5		17.5	58.6	91.6			28.5	28.5
Actuated g/C Ratio				0.15		0.15	0.50	0.78			0.24	0.24
v/c Ratio				0.71		0.43	0.84	0.30			0.94	0.63
Control Delay				62.7		23.6	31.8	4.4			56.6	8.8
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				62.7		23.6	31.8	4.4			56.6	8.8
LOS				E		C	C	A			E	A
Approach Delay					46.5			19.3			43.9	
Approach LOS					D			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 118.1			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

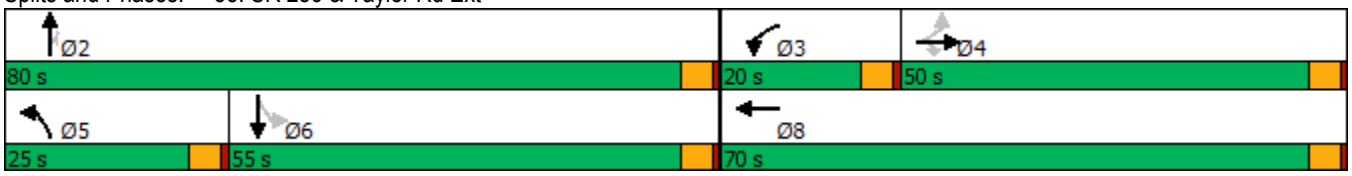


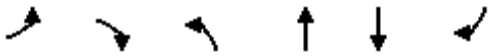
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Future Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.918				0.850		0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1710	0	3433	5085	1583	1770	5050	0
Flt Permitted	0.681			0.950			0.950			0.397		
Satd. Flow (perm)	1269	1863	2787	3433	1710	0	3433	5085	1583	740	5050	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		51				609		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	163	500	54	65	239	641	609	65	728	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	43	163	500	119	0	239	641	609	65	761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	22.5	22.5	
Total Split (s)	50.0	50.0	50.0	20.0	70.0		25.0	80.0	80.0	55.0	55.0	
Total Split (%)	33.3%	33.3%	33.3%	13.3%	46.7%		16.7%	53.3%	53.3%	36.7%	36.7%	
Maximum Green (s)	45.5	45.5	45.5	15.5	65.5		20.5	75.5	75.5	50.5	50.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0			0	0	0	0	
Act Effct Green (s)	7.4	7.4	7.4	15.7	27.6		10.8	34.2	34.2	18.9	18.9	
Actuated g/C Ratio	0.10	0.10	0.10	0.22	0.39		0.15	0.48	0.48	0.27	0.27	
v/c Ratio	0.17	0.22	0.37	0.66	0.17		0.46	0.26	0.56	0.33	0.56	
Control Delay	34.5	34.2	8.8	31.9	10.8		31.5	11.0	3.2	26.8	24.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	34.5	34.2	8.8	31.9	10.8		31.5	11.0	3.2	26.8	24.2	
LOS	C	C	A	C	B		C	B	A	C	C	
Approach Delay		16.1			27.8			11.1			24.4	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 70.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



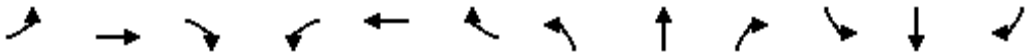


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	90	110	380	420	100
Future Volume (vph)	40	90	110	380	420	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	550			250
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.493			
Satd. Flow (perm)	1770	1583	918	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		98				109
Link Speed (mph)	30			30	30	
Link Distance (ft)	2247			555	2212	
Travel Time (s)	51.1			12.6	50.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	98	120	413	457	109
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	98	120	413	457	109
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60	60			60
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Maximum Green (s)	19.5	19.5	31.5	31.5	31.5	31.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	6.9	6.9	39.4	39.4	39.4	39.4
Actuated g/C Ratio	0.13	0.13	0.75	0.75	0.75	0.75
v/c Ratio	0.19	0.33	0.17	0.29	0.33	0.09
Control Delay	20.6	8.5	3.9	3.8	4.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	8.5	3.9	3.8	4.0	1.1
LOS	C	A	A	A	A	A
Approach Delay	12.2			3.9	3.5	
Approach LOS	B			A	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 52.4			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 4.6		Intersection LOS: A	
Intersection Capacity Utilization 43.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 41: Taylor Rd Ext & Taylor Rd

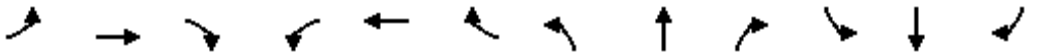


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	240	240	80	370	420	0	0	220	290
Future Volume (vph)	0	0	0	240	240	80	370	420	0	0	220	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.962						0.915	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1792	0	3433	3539	0	0	3238	0
Flt Permitted				0.950			0.442					
Satd. Flow (perm)	0	0	0	1770	1792	0	1597	3539	0	0	3238	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					31						315	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	261	261	87	402	457	0	0	239	315
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	261	348	0	402	457	0	0	554	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				26.0	26.0		34.0	34.0			34.0	
Total Split (%)				43.3%	43.3%		56.7%	56.7%			56.7%	
Maximum Green (s)				21.5	21.5		29.5	29.5			29.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		Max	Max			Max	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		0	0			0	
Act Effct Green (s)				15.1	15.1		29.7	29.7			29.7	
Actuated g/C Ratio				0.28	0.28		0.55	0.55			0.55	
v/c Ratio				0.53	0.66		0.46	0.23			0.29	
Control Delay				20.1	21.8		10.6	7.5			3.7	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				20.1	21.8		10.6	7.5			3.7	
LOS				C	C		B	A			A	
Approach Delay					21.1			9.0			3.7	
Approach LOS					C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.9			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	0	90	0	0	0	0	430	100	150	310	0
Future Volume (vph)	360	0	90	0	0	0	0	430	100	150	310	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	0	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950									0.484		
Satd. Flow (perm)	1770	0	2787	0	0	0	0	3539	1583	902	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98						109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	0	98	0	0	0	0	467	109	163	337	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	391	0	98	0	0	0	0	467	109	163	337	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm					NA	Perm	Perm	NA	
Protected Phases								2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4		4					2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5		22.5					22.5	22.5	22.5	22.5	
Total Split (s)	25.0		25.0					35.0	35.0	35.0	35.0	
Total Split (%)	41.7%		41.7%					58.3%	58.3%	58.3%	58.3%	
Maximum Green (s)	20.5		20.5					30.5	30.5	30.5	30.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					Max	Max	Max	Max	
Walk Time (s)	7.0		7.0					7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		11.0					11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0		0					0	0	0	0	
Act Effct Green (s)	16.5		16.5					30.8	30.8	30.8	30.8	
Actuated g/C Ratio	0.29		0.29					0.55	0.55	0.55	0.55	
v/c Ratio	0.75		0.11					0.24	0.12	0.33	0.17	
Control Delay	27.9		4.0					7.8	2.4	10.6	7.4	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	27.9		4.0					7.8	2.4	10.6	7.4	
LOS	C		A					A	A	B	A	
Approach Delay		23.1						6.7			8.5	
Approach LOS		C						A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 56.3			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor

HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	AM Peak - Taylor EB Entrance
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	1640	250
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	1745	266
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.46	0.14

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.297
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	1745	Ramp Junction Speed (S), mi/h	59.2

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2011	Average Density (D), pc/mi/ln	17.0
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	16.1

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HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	AM Peak - WB CD TO MAIN BASE
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	3390	610
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	3606	649
Capacity (c_{md}), pc/h	7050	2000
Adjusted Capacity (c_{md}), pc/h	6620	1878
Volume-to-Capacity Ratio (v/c)	0.64	0.35

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	1
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.333
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	1442
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	0.600	Outer Lanes Freeway Speed (S_O), mi/h	63.1
Flow in Lanes 1 and 2 (v_{12}), pc/h	2164	Ramp Junction Speed (S), mi/h	59.8

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2813	Average Density (D), pc/mi/ln	23.7
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	22.2

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	AM Peak - Base
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	10	220	20	430
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	11	234	21	457
Weaving Flow Rate (v_w), pc/h	691	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	32	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		2532
Total Flow Rate (v), pc/h	723	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		2510
Volume Ratio (VR)	0.956	Weaving Area Capacity (c_W), veh/h		2510
Minimum Lane Change Rate (LC_{MIN}), lc/h	691	Adjusted Weaving Area Capacity (c_{WA}), veh/h		2357
Maximum Weaving Length (L_{MAX}), ft	13625	Demand-to-Capacity Ratio (v/c)		0.31

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	1	Average Weaving Speed (S_W), mi/h	47.2
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	0	Average Non-Weaving Speed (S_{NW}), mi/h	50.3
Weaving Lane Change Rate (LC_W), lc/h	726	Average Speed (S), mi/h	47.3
Weaving Lane Change Rate (LC_{All}), lc/h	726	Density (D), pc/mi/ln	7.6
Weaving Intensity Factor (W)	0.303	Level of Service (LOS)	A

Design Analysis Table

Number of Lanes, ln	4	5	6	7
Density, pc/mi/ln	3.9	3.1	2.7	2.3
LOS	A	A	A	A

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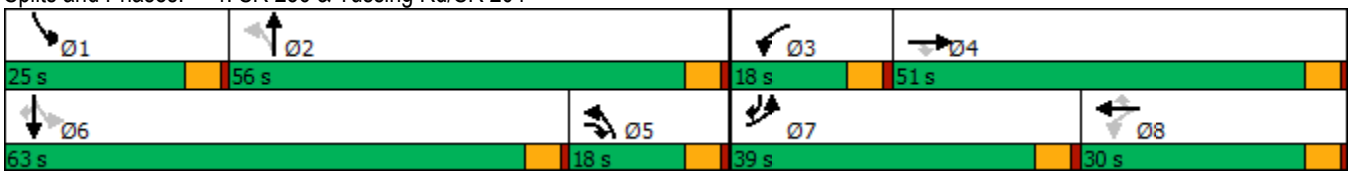
2028 PM PEAK HOUR

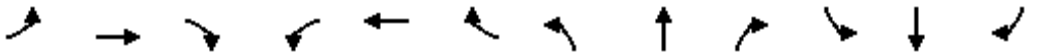
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Future Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5065	0	1770	5085	1583
Flt Permitted	0.950			0.610			0.104			0.104		
Satd. Flow (perm)	3433	1863	1583	1136	1863	2787	194	5065	0	194	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			430		3				83
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	239	293	109	326	587	217	1413	43	272	2054	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	543	239	293	109	326	587	217	1456	0	272	2054	511
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	39.0	51.0	18.0	18.0	30.0	30.0	18.0	56.0		25.0	63.0	39.0
Total Split (%)	26.0%	34.0%	12.0%	12.0%	20.0%	20.0%	12.0%	37.3%		16.7%	42.0%	26.0%
Maximum Green (s)	34.0	46.0	13.0	13.0	25.0	25.0	13.0	51.0		20.0	58.0	34.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	28.7	42.4	55.4	36.3	25.0	25.0	51.3	51.3		58.0	58.0	86.8
Actuated g/C Ratio	0.20	0.29	0.38	0.25	0.17	0.17	0.35	0.35		0.40	0.40	0.60
v/c Ratio	0.80	0.44	0.44	0.33	1.02	0.70	1.03	0.81		0.93	1.01	0.52
Control Delay	64.7	44.5	15.8	32.0	112.3	19.9	128.0	47.2		78.0	64.8	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	64.7	44.5	15.8	32.0	112.3	19.9	128.0	47.2		78.0	64.8	9.2
LOS	E	D	B	C	F	B	F	D		E	E	A
Approach Delay		46.9			50.7			57.7			56.1	
Approach LOS		D			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 144.8			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 54.1		Intersection LOS: D	
Intersection Capacity Utilization 95.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204



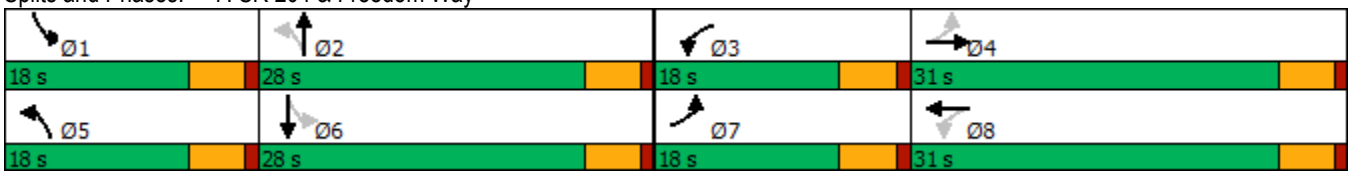


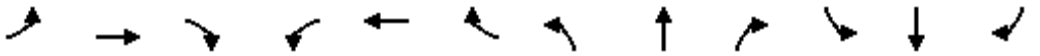
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	330	50	60	670	10	90	10	80	10	10	30
Future Volume (vph)	20	330	50	60	670	10	90	10	80	10	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		0	80		0	80		0	60		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980			0.998			0.867			0.887	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3532	0	1770	1615	0	1770	1652	0
Flt Permitted	0.265			0.378			0.614			0.694		
Satd. Flow (perm)	494	3468	0	704	3532	0	1144	1615	0	1293	1652	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			2			87			33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		833			574			282			721	
Travel Time (s)		18.9			13.0			6.4			16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	359	54	65	728	11	98	11	87	11	11	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	413	0	65	739	0	98	98	0	11	44	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	20.0		10.0	20.0		10.0	20.0		10.0	20.0	
Minimum Split (s)	18.0	28.0		18.0	28.0		18.0	28.0		18.0	28.0	
Total Split (s)	18.0	31.0		18.0	31.0		18.0	28.0		18.0	28.0	
Total Split (%)	18.9%	32.6%		18.9%	32.6%		18.9%	29.5%		18.9%	29.5%	
Maximum Green (s)	13.0	26.0		13.0	26.0		13.0	23.0		13.0	23.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	30.3	22.9		32.3	28.7		34.7	32.7		31.3	23.9	
Actuated g/C Ratio	0.38	0.29		0.40	0.36		0.43	0.41		0.39	0.30	
v/c Ratio	0.06	0.41		0.15	0.58		0.17	0.14		0.02	0.08	
Control Delay	14.3	25.4		15.2	25.0		15.5	7.0		14.6	12.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.3	25.4		15.2	25.0		15.5	7.0		14.6	12.4	
LOS	B	C		B	C		B	A		B	B	
Approach Delay		24.8			24.2			11.3			12.9	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 95			
Actuated Cycle Length: 79.8			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 22.3		Intersection LOS: C	
Intersection Capacity Utilization 56.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: SR 204 & Freedom Way





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	380	20	10	500	450	20	110	10	1100	80	240
Future Volume (vph)	180	380	20	10	500	450	20	110	10	1100	80	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	225		225	100		0	550		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt		0.992				0.850		0.987			0.887	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1848	0	1770	1863	1583	1770	1839	0	3433	1652	0
Flt Permitted	0.104			0.370			0.950			0.673		
Satd. Flow (perm)	194	1848	0	689	1863	1583	1770	1839	0	2432	1652	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				279		3			121	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2082			353			205			1618	
Travel Time (s)		47.3			8.0			4.7			36.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	413	22	11	543	489	22	120	11	1196	87	261
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	435	0	11	543	489	22	131	0	1196	348	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	custom	NA		Perm	NA	
Protected Phases	7	4			8		2	2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0		20.0	20.0	20.0	20.0	20.0		5.0	5.0	
Minimum Split (s)	9.5	28.0		28.0	28.0	28.0	28.0	28.0		22.5	22.5	
Total Split (s)	16.0	55.0		39.0	39.0	39.0	30.0	30.0		65.0	65.0	
Total Split (%)	10.7%	36.7%		26.0%	26.0%	26.0%	20.0%	20.0%		43.3%	43.3%	
Maximum Green (s)	11.5	50.0		34.0	34.0	34.0	25.0	25.0		60.5	60.5	
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	5.0		5.0	5.0	5.0	5.0	5.0		4.5	4.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	None		Min	Min	
Walk Time (s)		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)	50.5	50.0		34.0	34.0	34.0	20.2	20.2		60.5	60.5	
Actuated g/C Ratio	0.35	0.34		0.23	0.23	0.23	0.14	0.14		0.42	0.42	
v/c Ratio	1.02	0.68		0.07	1.25	0.84	0.09	0.51		1.18	0.46	
Control Delay	107.9	47.2		45.1	174.3	36.0	55.6	64.1		129.9	21.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	107.9	47.2		45.1	174.3	36.0	55.6	64.1		129.9	21.4	
LOS	F	D		D	F	D	E	E		F	C	
Approach Delay		66.0			108.1			62.9			105.4	
Approach LOS		E			F			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 145.2			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 97.0		Intersection LOS: F	
Intersection Capacity Utilization 88.0%		ICU Level of Service E	
Analysis Period (min) 15			

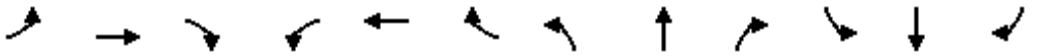
Splits and Phases: 12: SR 204 & Taylor Rd

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	670	2060	210	180	1450
Future Volume (vph)	0	670	2060	210	180	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt		0.850	0.986			
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	6318	0	1770	5085
Flt Permitted					0.074	
Satd. Flow (perm)	0	2787	6318	0	138	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		510	27			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	728	2239	228	196	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	728	2467	0	196	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		35.0	53.0		22.0	75.0
Total Split (%)		31.8%	48.2%		20.0%	68.2%
Maximum Green (s)		30.5	48.5		17.5	70.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		14.3	49.2		64.5	64.5
Actuated g/C Ratio		0.16	0.56		0.73	0.73
v/c Ratio		0.83	0.70		0.65	0.42
Control Delay		19.3	16.9		27.1	5.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		19.3	16.9		27.1	5.6
LOS		B	B		C	A
Approach Delay	19.3		16.9			8.0
Approach LOS	B		B			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 87.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

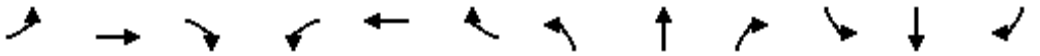


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Future Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.985	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	5085	0	0	4734	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	5085	0	0	4734	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						60					17	399
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1576	674
Shared Lane Traffic (%)												25%
Lane Group Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1745	505
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				25.0		25.0	41.0	85.0			44.0	44.0
Total Split (%)				22.7%		22.7%	37.3%	77.3%			40.0%	40.0%
Maximum Green (s)				20.5		20.5	36.5	80.5			39.5	39.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)				16.8		16.8	36.6	80.6			39.6	39.6
Actuated g/C Ratio				0.16		0.16	0.34	0.76			0.37	0.37
v/c Ratio				0.74		0.54	0.95	0.49			0.99	0.67
Control Delay				59.3		32.6	51.8	5.8			52.0	11.2
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				59.3		32.6	51.8	5.8			52.0	11.2
LOS				E		C	D	A			D	B
Approach Delay					47.5			22.8			42.9	
Approach LOS					D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 106.4			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 32.4		Intersection LOS: C	
Intersection Capacity Utilization 83.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

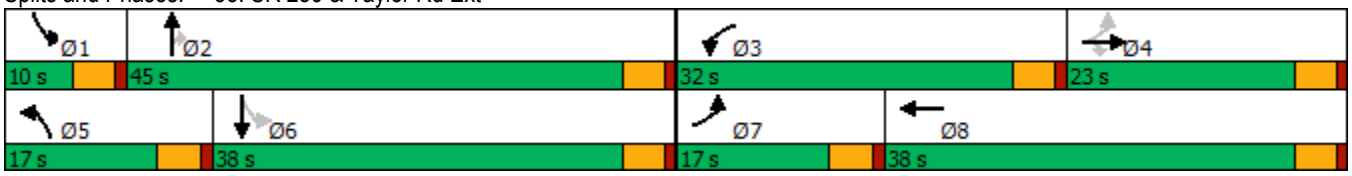


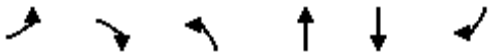
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Future Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.938				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1747	0	3433	5085	1583	1770	5065	0
Flt Permitted	0.610			0.950			0.950			0.242		
Satd. Flow (perm)	1136	1863	2787	3433	1747	0	3433	5085	1583	451	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256		33				866		4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	54	391	707	141	98	293	978	946	98	1228	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	54	391	707	239	0	293	978	946	98	1261	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	17.0	23.0	23.0	32.0	38.0		17.0	45.0	45.0	10.0	38.0	
Total Split (%)	15.5%	20.9%	20.9%	29.1%	34.5%		15.5%	40.9%	40.9%	9.1%	34.5%	
Maximum Green (s)	12.5	18.5	18.5	27.5	33.5		12.5	40.5	40.5	5.5	33.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	18.1	11.1	11.1	24.1	33.0		11.9	37.6	37.6	36.9	31.3	
Actuated g/C Ratio	0.19	0.11	0.11	0.25	0.34		0.12	0.39	0.39	0.38	0.32	
v/c Ratio	0.17	0.25	0.72	0.83	0.39		0.69	0.49	0.83	0.40	0.77	
Control Delay	21.5	43.5	22.9	44.6	24.6		52.1	24.2	10.7	21.2	34.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.5	43.5	22.9	44.6	24.6		52.1	24.2	10.7	21.2	34.1	
LOS	C	D	C	D	C		D	C	B	C	C	
Approach Delay		25.0			39.6			22.1			33.2	
Approach LOS		C			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 96.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 28.7		Intersection LOS: C	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



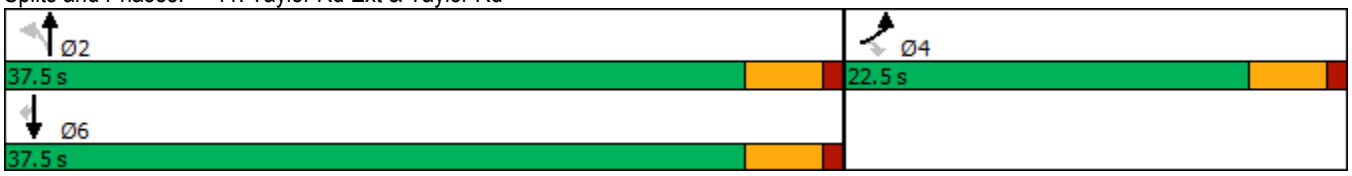


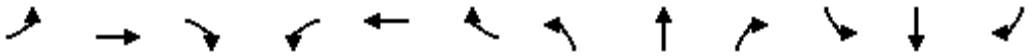
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	180	280	370	420	230	500
Future Volume (vph)	180	280	370	420	230	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	550			250
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.604			
Satd. Flow (perm)	1770	1583	1125	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		304				543
Link Speed (mph)	30			30	30	
Link Distance (ft)	2247			555	2212	
Travel Time (s)	51.1			12.6	50.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	304	402	457	250	543
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	304	402	457	250	543
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Maximum Green (s)	18.0	18.0	33.0	33.0	33.0	33.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	10.6	10.6	20.9	20.9	20.9	20.9
Actuated g/C Ratio	0.26	0.26	0.50	0.50	0.50	0.50
v/c Ratio	0.43	0.48	0.71	0.49	0.27	0.51
Control Delay	18.3	5.5	16.0	8.7	6.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	5.5	16.0	8.7	6.6	2.6
LOS	B	A	B	A	A	A
Approach Delay	10.5			12.1	3.9	
Approach LOS	B			B	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 41.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 41: Taylor Rd Ext & Taylor Rd



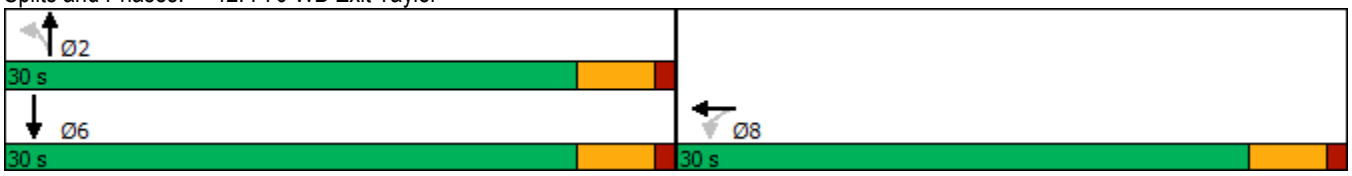


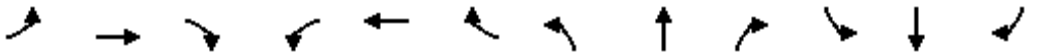
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	330	310	60	290	710	0	0	270	220
Future Volume (vph)	0	0	0	330	310	60	290	710	0	0	270	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.976						0.933	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1818	0	3433	3539	0	0	3302	0
Flt Permitted				0.950			0.450					
Satd. Flow (perm)	0	0	0	1770	1818	0	1626	3539	0	0	3302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					20						239	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	359	337	65	315	772	0	0	293	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	359	402	0	315	772	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				30.0	30.0		30.0	30.0			30.0	
Total Split (%)				50.0%	50.0%		50.0%	50.0%			50.0%	
Maximum Green (s)				25.5	25.5		25.5	25.5			25.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		0	0			0	
Act Effct Green (s)				16.4	16.4		18.9	18.9			18.9	
Actuated g/C Ratio				0.36	0.36		0.42	0.42			0.42	
v/c Ratio				0.56	0.60		0.46	0.52			0.35	
Control Delay				15.6	15.6		13.1	11.8			5.9	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				15.6	15.6		13.1	11.8			5.9	
LOS				B	B		B	B			A	
Approach Delay					15.6			12.2			5.9	
Approach LOS					B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 45			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 55.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	0	1030	0	0	0	0	710	150	150	440	0
Future Volume (vph)	290	0	1030	0	0	0	0	710	150	150	440	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	0	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950									0.189		
Satd. Flow (perm)	1770	0	2787	0	0	0	0	3539	1583	352	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			544						163			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	0	1120	0	0	0	0	772	163	163	478	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	315	0	1120	0	0	0	0	772	163	163	478	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm					NA	Perm	pm+pt	NA	
Protected Phases								2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4		4					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5		22.5					22.5	22.5	9.5	22.5	
Total Split (s)	26.0		26.0					23.0	23.0	11.0	34.0	
Total Split (%)	43.3%		43.3%					38.3%	38.3%	18.3%	56.7%	
Maximum Green (s)	21.5		21.5					18.5	18.5	6.5	29.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					None	None	None	None	
Walk Time (s)	7.0		7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0		11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0		0					0	0		0	
Act Effct Green (s)	18.7		18.7					16.7	16.7	24.7	24.7	
Actuated g/C Ratio	0.35		0.35					0.31	0.31	0.47	0.47	
v/c Ratio	0.50		0.84					0.69	0.27	0.47	0.29	
Control Delay	18.1		15.9					21.1	4.6	13.3	9.3	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	18.1		15.9					21.1	4.6	13.3	9.3	
LOS	B		B					C	A	B	A	
Approach Delay		16.4						18.2			10.3	
Approach LOS		B						B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.1			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 55.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor

HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	PM Peak - Taylor EB Entrance
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	3260	300
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	3468	319
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.86	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.440
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	3468	Ramp Junction Speed (S), mi/h	55.7

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3787	Average Density (D), pc/mi/ln	34.0
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	29.9

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HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	PM Peak - WB CD TO MAIN BASE
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	2000	480
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	2128	511
Capacity (c_{md}), pc/h	7050	2000
Adjusted Capacity (c_{md}), pc/h	6620	1878
Volume-to-Capacity Ratio (v/c)	0.40	0.27

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	1
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.291
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	851
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	0.600	Outer Lanes Freeway Speed (S_O), mi/h	65.2
Flow in Lanes 1 and 2 (v_{12}), pc/h	1277	Ramp Junction Speed (S), mi/h	61.2

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1788	Average Density (D), pc/mi/ln	14.4
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	14.2

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	PM Peak - Base
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	0	330	60	1260
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	0	351	64	1340
Weaving Flow Rate (v_W), pc/h	1691	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	64	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		2516
Total Flow Rate (v), pc/h	1755	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		2490
Volume Ratio (VR)	0.964	Weaving Area Capacity (c_W), veh/h		2490
Minimum Lane Change Rate (LC_{MIN}), lc/h	1691	Adjusted Weaving Area Capacity (c_{WA}), veh/h		2338
Maximum Weaving Length (L_{MAX}), ft	13735	Demand-to-Capacity Ratio (v/c)		0.75

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	3	Average Weaving Speed (S_W), mi/h	41.2
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	0	Average Non-Weaving Speed (S_{NW}), mi/h	40.6
Weaving Lane Change Rate (LC_W), lc/h	1726	Average Speed (S), mi/h	41.2
Weaving Lane Change Rate (LC_{All}), lc/h	1726	Density (D), pc/mi/ln	21.3
Weaving Intensity Factor (W)	0.601	Level of Service (LOS)	B

Design Analysis Table

Number of Lanes, ln	4	5	6	7
Density, pc/mi/ln	10.7	8.7	7.3	6.3
LOS	A	A	A	A

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EASTBOUND EXIT LOOP RAMP CLOSURE

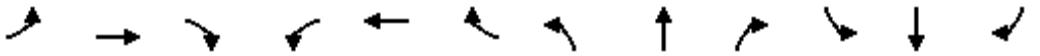
2028 AM PEAK HOUR

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	2070	150	90	710
Future Volume (vph)	0	0	2070	150	90	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt			0.990			
Flt Protected					0.950	
Satd. Flow (prot)	0	3278	6344	0	1770	5085
Flt Permitted					0.047	
Satd. Flow (perm)	0	3278	6344	0	88	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)			17			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2250	163	98	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	2413	0	98	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		37.0	91.0		22.0	113.0
Total Split (%)		24.7%	60.7%		14.7%	75.3%
Maximum Green (s)		32.5	86.5		17.5	108.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)			81.0		92.7	97.3
Actuated g/C Ratio			0.83		0.95	1.00
v/c Ratio			0.46		0.47	0.15
Control Delay			2.5		21.2	0.1
Queue Delay			0.0		0.0	0.0
Total Delay			2.5		21.2	0.1
LOS			A		C	A
Approach Delay			2.5			2.4
Approach LOS			A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 97.3			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 2.5		Intersection LOS: A	
Intersection Capacity Utilization 45.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

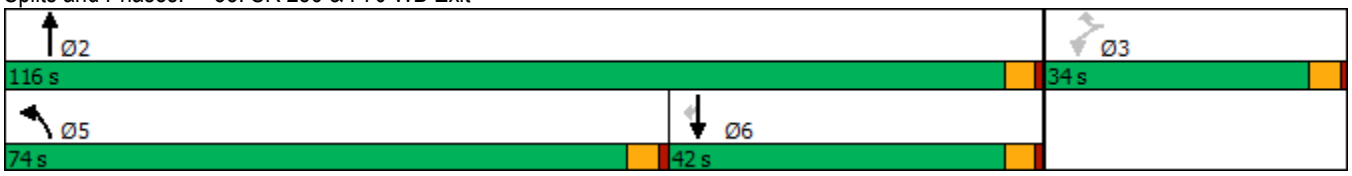


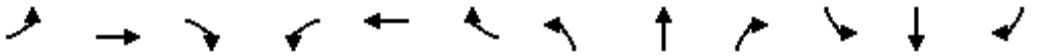
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	520	1310	700	0	0	640	730
Future Volume (vph)	0	0	0	170	0	520	1310	700	0	0	640	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		2	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.946	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	2787	3433	5085	0	0	4546	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	2787	3433	5085	0	0	4546	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						507					91	337
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	565	1424	761	0	0	696	793
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	0	0	0	185	0	565	1424	761	0	0	1093	396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				34.0		34.0	74.0	116.0			42.0	42.0
Total Split (%)				22.7%		22.7%	49.3%	77.3%			28.0%	28.0%
Maximum Green (s)				29.5		29.5	69.5	111.5			37.5	37.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				20.0		20.0	59.8	100.7			36.4	36.4
Actuated g/C Ratio				0.15		0.15	0.46	0.78			0.28	0.28
v/c Ratio				0.68		0.66	0.90	0.19			0.82	0.63
Control Delay				66.8		11.2	41.9	4.3			47.3	13.4
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				66.8		11.2	41.9	4.3			47.3	13.4
LOS				E		B	D	A			D	B
Approach Delay					25.0			28.8			38.3	
Approach LOS					C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 129.9			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 31.3		Intersection LOS: C	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



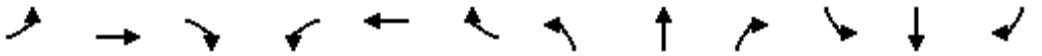


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	240	240	80	770	420	0	0	220	290
Future Volume (vph)	0	0	0	240	240	80	770	420	0	0	220	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.962						0.915	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1792	0	3433	3539	0	0	3238	0
Flt Permitted				0.950			0.442					
Satd. Flow (perm)	0	0	0	1770	1792	0	1597	3539	0	0	3238	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					31						315	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	261	261	87	837	457	0	0	239	315
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	261	348	0	837	457	0	0	554	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				26.0	26.0		34.0	34.0			34.0	
Total Split (%)				43.3%	43.3%		56.7%	56.7%			56.7%	
Maximum Green (s)				21.5	21.5		29.5	29.5			29.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		Min	Min			Min	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		0	0			0	
Act Effct Green (s)				15.1	15.1		29.7	29.7			29.7	
Actuated g/C Ratio				0.28	0.28		0.55	0.55			0.55	
v/c Ratio				0.53	0.66		0.95	0.23			0.29	
Control Delay				20.1	21.8		37.5	7.5			3.7	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				20.1	21.8		37.5	7.5			3.7	
LOS				C	C		D	A			A	
Approach Delay					21.1			26.9			3.7	
Approach LOS					C			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 66.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor

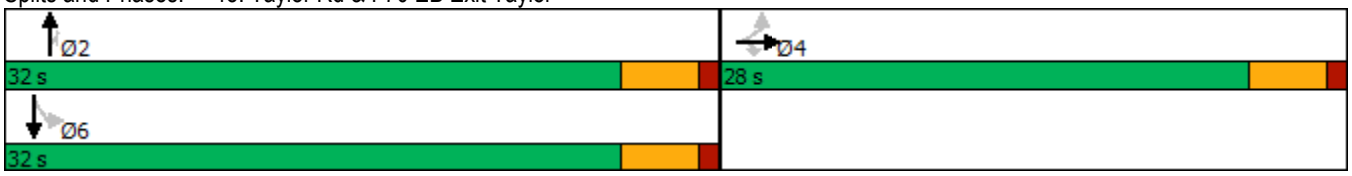


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	760	230	90	0	0	0	0	430	100	150	310	0
Future Volume (vph)	760	230	90	0	0	0	0	430	100	150	310	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.974								0.950		
Satd. Flow (prot)	1681	1724	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.974								0.477		
Satd. Flow (perm)	1681	1724	2787	0	0	0	0	3539	1583	889	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98						109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	826	250	98	0	0	0	0	467	109	163	337	0
Shared Lane Traffic (%)	36%											
Lane Group Flow (vph)	529	547	98	0	0	0	0	467	109	163	337	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5					22.5	22.5	22.5	22.5	
Total Split (s)	28.0	28.0	28.0					32.0	32.0	32.0	32.0	
Total Split (%)	46.7%	46.7%	46.7%					53.3%	53.3%	53.3%	53.3%	
Maximum Green (s)	23.5	23.5	23.5					27.5	27.5	27.5	27.5	
Yellow Time (s)	3.5	3.5	3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5					4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Recall Mode	None	None	None					Max	Max	Max	Max	
Walk Time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0	0	0	
Act Effct Green (s)	22.0	22.0	22.0					27.6	27.6	27.6	27.6	
Actuated g/C Ratio	0.38	0.38	0.38					0.47	0.47	0.47	0.47	
v/c Ratio	0.84	0.85	0.09					0.28	0.14	0.39	0.20	
Control Delay	31.1	31.3	3.4					10.4	2.9	14.3	9.9	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	31.1	31.3	3.4					10.4	2.9	14.3	9.9	
LOS	C	C	A					B	A	B	A	
Approach Delay		28.9						9.0			11.3	
Approach LOS		C						A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.6			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 66.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor



HCS Freeway Merge Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	AM Peak - Taylor EB Entrance (EB Loop Exit Closure)
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity

Demand Volume (V_i), veh/h	1640	480
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	1745	511
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.27

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.305
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	1745	Ramp Junction Speed (S), mi/h	59.0

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2256	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	AM Peak - EB Loop Closure
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	10	220	20	830
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	11	234	21	883
Weaving Flow Rate (v_w), pc/h	1117	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	32	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		2498
Total Flow Rate (v), pc/h	1149	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		2469
Volume Ratio (VR)	0.972	Weaving Area Capacity (c_W), veh/h		2469
Minimum Lane Change Rate (LC_{MIN}), lc/h	1117	Adjusted Weaving Area Capacity (c_{WA}), veh/h		2318
Maximum Weaving Length (L_{MAX}), ft	13845	Demand-to-Capacity Ratio (v/c)		0.50

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	1	Average Weaving Speed (S_W), mi/h	44.2
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	0	Average Non-Weaving Speed (S_{NW}), mi/h	46.2
Weaving Lane Change Rate (LC_W), lc/h	1152	Average Speed (S), mi/h	44.3
Weaving Lane Change Rate (LC_{All}), lc/h	1152	Density (D), pc/mi/ln	13.0
Weaving Intensity Factor (W)	0.437	Level of Service (LOS)	B

Design Analysis Table

Number of Lanes, ln	4	5	6	7
Density, pc/mi/ln	6.6	5.3	4.5	3.9
LOS	A	A	A	A

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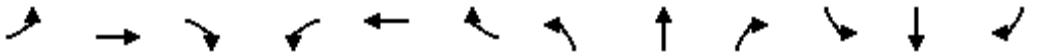
2028 PM PEAK HOUR

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	2060	210	180	1450
Future Volume (vph)	0	0	2060	210	180	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt			0.986			
Flt Protected					0.950	
Satd. Flow (prot)	0	3278	6318	0	1770	5085
Flt Permitted					0.049	
Satd. Flow (perm)	0	3278	6318	0	91	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)			26			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2239	228	196	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	2467	0	196	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		14.0	90.0		46.0	136.0
Total Split (%)		9.3%	60.0%		30.7%	90.7%
Maximum Green (s)		9.5	85.5		41.5	131.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)			77.8		94.8	99.4
Actuated g/C Ratio			0.78		0.95	1.00
v/c Ratio			0.50		0.66	0.31
Control Delay			4.4		34.8	0.2
Queue Delay			0.0		0.0	0.0
Total Delay			4.4		34.8	0.2
LOS			A		C	A
Approach Delay			4.4			4.0
Approach LOS			A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 99.4			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 4.2		Intersection LOS: A	
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

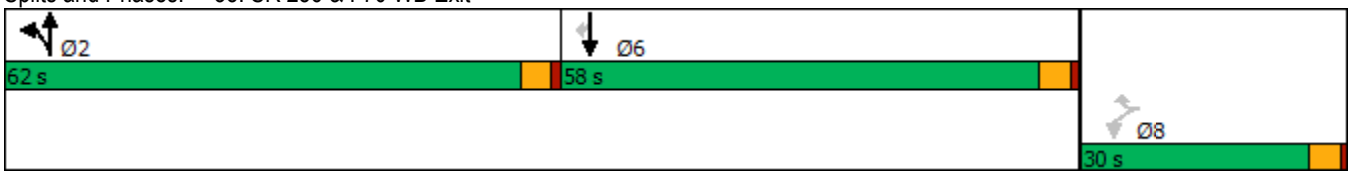


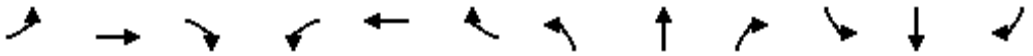
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	820	1030	1080	0	0	1450	620
Future Volume (vph)	0	0	0	190	0	820	1030	1080	0	0	1450	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		2	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.985	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	2787	3433	5085	0	0	4734	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	2787	3433	5085	0	0	4734	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						891					12	349
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	891	1120	1174	0	0	1576	674
Shared Lane Traffic (%)												25%
Lane Group Flow (vph)	0	0	0	207	0	891	1120	1174	0	0	1745	505
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Split	NA			NA	Perm
Protected Phases							2	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	2	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	22.5	22.5			22.5	22.5
Total Split (s)				30.0		30.0	62.0	62.0			58.0	58.0
Total Split (%)				20.0%		20.0%	41.3%	41.3%			38.7%	38.7%
Maximum Green (s)				25.5		25.5	57.5	57.5			53.5	53.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	Min	Min			None	None
Walk Time (s)				7.0		7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0	11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0	0	0			0	0
Act Effct Green (s)				22.2		22.2	57.5	57.5			53.5	53.5
Actuated g/C Ratio				0.15		0.15	0.39	0.39			0.36	0.36
v/c Ratio				0.78		0.76	0.83	0.59			1.01	0.70
Control Delay				79.5		7.9	47.3	37.1			69.0	17.8
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				79.5		7.9	47.3	37.1			69.0	17.8
LOS				E		A	D	D			E	B
Approach Delay					21.4			42.1			57.5	
Approach LOS					C			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 146.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 44.2		Intersection LOS: D	
Intersection Capacity Utilization 83.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



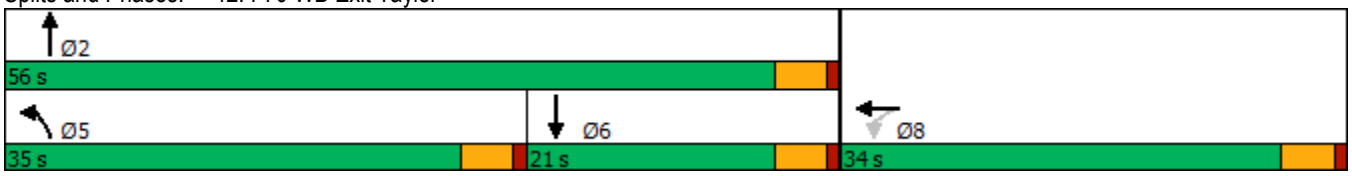


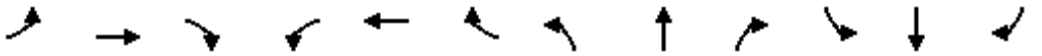
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	330	310	60	960	710	0	0	270	220
Future Volume (vph)	0	0	0	330	310	60	960	710	0	0	270	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.976						0.933	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1818	0	3433	3539	0	0	3302	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	1818	0	3433	3539	0	0	3302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11						149	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	359	337	65	1043	772	0	0	293	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	359	402	0	1043	772	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		9.5	22.5			22.5	
Total Split (s)				34.0	34.0		35.0	56.0			21.0	
Total Split (%)				37.8%	37.8%		38.9%	62.2%			23.3%	
Maximum Green (s)				29.5	29.5		30.5	51.5			16.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)				22.9	22.9		27.8	46.5			14.1	
Actuated g/C Ratio				0.29	0.29		0.35	0.59			0.18	
v/c Ratio				0.70	0.75		0.86	0.37			0.75	
Control Delay				33.5	34.9		33.9	9.6			30.1	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				33.5	34.9		33.9	9.6			30.1	
LOS				C	C		C	A			C	
Approach Delay					34.3			23.6			30.1	
Approach LOS					C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 78.7			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 74.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor



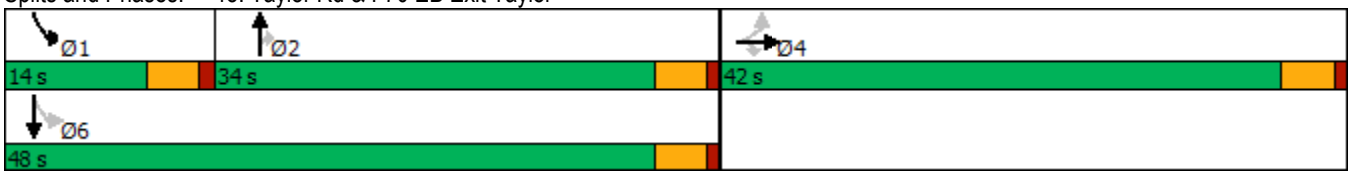


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	960	330	1030	0	0	0	0	710	150	150	440	0
Future Volume (vph)	960	330	1030	0	0	0	0	710	150	150	440	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.976								0.950		
Satd. Flow (prot)	1681	1727	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.976								0.147		
Satd. Flow (perm)	1681	1727	2787	0	0	0	0	3539	1583	274	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			532						163			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1043	359	1120	0	0	0	0	772	163	163	478	0
Shared Lane Traffic (%)	34%											
Lane Group Flow (vph)	688	714	1120	0	0	0	0	772	163	163	478	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5					22.5	22.5	9.5	22.5	
Total Split (s)	42.0	42.0	42.0					34.0	34.0	14.0	48.0	
Total Split (%)	46.7%	46.7%	46.7%					37.8%	37.8%	15.6%	53.3%	
Maximum Green (s)	37.5	37.5	37.5					29.5	29.5	9.5	43.5	
Yellow Time (s)	3.5	3.5	3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Recall Mode	None	None	None					None	None	None	None	
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	
Act Effct Green (s)	37.7	37.7	37.7					25.2	25.2	38.6	38.6	
Actuated g/C Ratio	0.44	0.44	0.44					0.30	0.30	0.45	0.45	
v/c Ratio	0.93	0.94	0.73					0.74	0.28	0.58	0.30	
Control Delay	45.0	46.1	13.7					31.8	5.1	22.5	15.1	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	45.0	46.1	13.7					31.8	5.1	22.5	15.1	
LOS	D	D	B					C	A	C	B	
Approach Delay		31.4						27.1			17.0	
Approach LOS		C						C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 85.3			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 28.2		Intersection LOS: C	
Intersection Capacity Utilization 74.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor



HCS Freeway Merge Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	PM Peak - Taylor EB Entrance (EB Loop Exit Closure)
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity

Demand Volume (V_i), veh/h	3260	630
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	3468	670
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.94	0.36

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.512
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	3468	Ramp Junction Speed (S), mi/h	54.0

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4138	Average Density (D), pc/mi/ln	38.3
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	32.5

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	PM Peak - EB LOOP CLOSURE
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	0	330	60	1930
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	0	351	64	2053
Weaving Flow Rate (v_w), pc/h	2404	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	64	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		2494
Total Flow Rate (v), pc/h	2468	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		2464
Volume Ratio (VR)	0.974	Weaving Area Capacity (c_W), veh/h		2464
Minimum Lane Change Rate (LC_{MIN}), lc/h	0	Adjusted Weaving Area Capacity (c_{WA}), veh/h		2314
Maximum Weaving Length (L_{MAX}), ft	13872	Demand-to-Capacity Ratio (v/c)		1.07

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	-	Average Weaving Speed (S_W), mi/h	-
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	-	Average Non-Weaving Speed (S_{NW}), mi/h	-
Weaving Lane Change Rate (LC_W), lc/h	-	Average Speed (S), mi/h	-
Weaving Lane Change Rate (LC_{All}), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

Design Analysis Table

Number of Lanes, ln	3	4	5	6
Density, pc/mi/ln	-	-	-	-
LOS	F	F	F	F

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EASTBOUND ENTRANCE RAMP CLOSURE

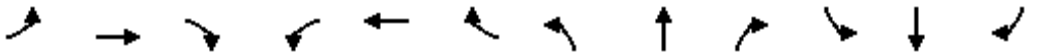
2028 AM PEAK HOUR

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	400	2070	0	0	710
Future Volume (vph)	0	400	2070	0	0	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	6408	0	1863	5085
Flt Permitted						
Satd. Flow (perm)	0	2787	6408	0	1863	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		330				
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	435	2250	0	0	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	435	2250	0	0	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		37.0	91.0		22.0	113.0
Total Split (%)		24.7%	60.7%		14.7%	75.3%
Maximum Green (s)		32.5	86.5		17.5	108.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		9.8	59.9			59.9
Actuated g/C Ratio		0.12	0.76			0.76
v/c Ratio		0.69	0.46			0.20
Control Delay		16.5	4.0			2.9
Queue Delay		0.0	0.0			0.0
Total Delay		16.5	4.0			2.9
LOS		B	A			A
Approach Delay	16.5		4.0			2.9
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 79.3			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 5.3		Intersection LOS: A	
Intersection Capacity Utilization 51.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit



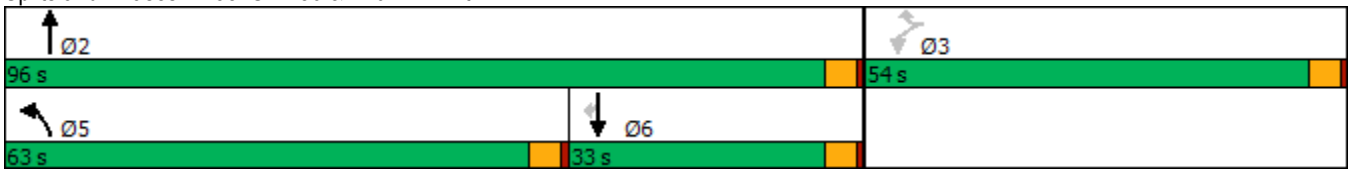
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	120	1310	1250	0	0	550	730
Future Volume (vph)	0	0	0	170	0	120	1310	1250	0	0	550	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.940	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	5085	0	0	4518	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	5085	0	0	4518	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						55					99	396
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	130	1424	1359	0	0	598	793
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	0	0	0	185	0	130	1424	1359	0	0	995	396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

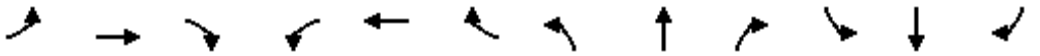
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	63.0	96.0			33.0	33.0
Total Split (%)				36.0%		36.0%	42.0%	64.0%			22.0%	22.0%
Maximum Green (s)				49.5		49.5	58.5	91.5			28.5	28.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				17.5		17.5	58.6	91.6			28.5	28.5
Actuated g/C Ratio				0.15		0.15	0.50	0.78			0.24	0.24
v/c Ratio				0.71		0.46	0.84	0.34			0.91dr	0.63
Control Delay				62.7		31.8	31.8	4.6			47.1	8.8
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				62.7		31.8	31.8	4.6			47.1	8.8
LOS				E		C	C	A			D	A
Approach Delay					50.0			18.6			36.2	
Approach LOS					D			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 118.1			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 35: SR 256 & I-70 WB Exit



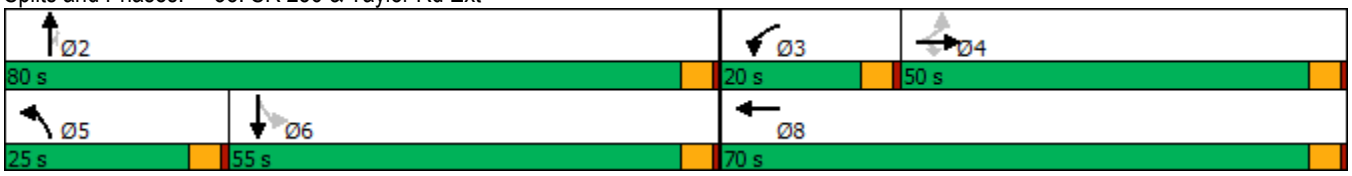


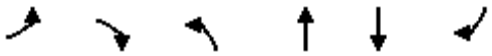
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	50	140	460	50	60	220	590	710	140	670	30
Future Volume (vph)	20	50	140	460	50	60	220	590	710	140	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.918				0.850		0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1710	0	3433	5085	1583	1770	5050	0
Flt Permitted	0.681			0.950			0.950			0.397		
Satd. Flow (perm)	1269	1863	2787	3433	1710	0	3433	5085	1583	740	5050	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152		51				772		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	54	152	500	54	65	239	641	772	152	728	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	54	152	500	119	0	239	641	772	152	761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	22.5	22.5	
Total Split (s)	50.0	50.0	50.0	20.0	70.0		25.0	80.0	80.0	55.0	55.0	
Total Split (%)	33.3%	33.3%	33.3%	13.3%	46.7%		16.7%	53.3%	53.3%	36.7%	36.7%	
Maximum Green (s)	45.5	45.5	45.5	15.5	65.5		20.5	75.5	75.5	50.5	50.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0			0	0	0	0	
Act Effct Green (s)	8.2	8.2	8.2	16.0	28.9		11.7	41.9	41.9	25.5	25.5	
Actuated g/C Ratio	0.10	0.10	0.10	0.20	0.36		0.15	0.52	0.52	0.32	0.32	
v/c Ratio	0.17	0.28	0.36	0.73	0.18		0.48	0.24	0.65	0.65	0.47	
Control Delay	40.9	41.2	9.8	40.3	14.3		36.8	10.2	3.5	37.2	22.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	40.9	41.2	9.8	40.3	14.3		36.8	10.2	3.5	37.2	22.3	
LOS	D	D	A	D	B		D	B	A	D	C	
Approach Delay		20.2			35.3			10.9			24.8	
Approach LOS		C			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 80			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 67.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



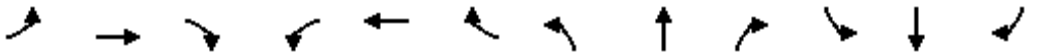


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	330	110	370	420	100
Future Volume (vph)	40	330	110	370	420	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	550			250
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.480			
Satd. Flow (perm)	1770	1583	894	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		353				109
Link Speed (mph)	30			30	30	
Link Distance (ft)	2247			555	2212	
Travel Time (s)	51.1			12.6	50.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	359	120	402	457	109
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	359	120	402	457	109
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60	60			60
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Maximum Green (s)	19.5	19.5	31.5	31.5	31.5	31.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	7.9	7.9	32.1	32.1	32.1	32.1
Actuated g/C Ratio	0.16	0.16	0.66	0.66	0.66	0.66
v/c Ratio	0.15	0.65	0.21	0.33	0.37	0.10
Control Delay	18.1	9.0	5.3	5.2	5.6	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	9.0	5.3	5.2	5.6	1.5
LOS	B	A	A	A	A	A
Approach Delay	10.0			5.2	4.8	
Approach LOS	A			A	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 49			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 50.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 41: Taylor Rd Ext & Taylor Rd

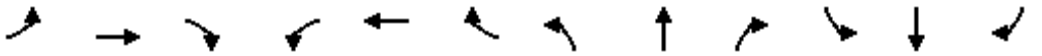


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	240	240	80	370	410	0	0	460	290
Future Volume (vph)	0	0	0	240	240	80	370	410	0	0	460	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.962						0.942	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1792	0	3433	3539	0	0	3334	0
Flt Permitted				0.950			0.309					
Satd. Flow (perm)	0	0	0	1770	1792	0	1117	3539	0	0	3334	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					31						315	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	261	261	87	402	446	0	0	500	315
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	261	348	0	402	446	0	0	815	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				26.0	26.0		34.0	34.0			34.0	
Total Split (%)				43.3%	43.3%		56.7%	56.7%			56.7%	
Maximum Green (s)				21.5	21.5		29.5	29.5			29.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		Max	Max			Max	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		0	0			0	
Act Effct Green (s)				15.1	15.1		29.7	29.7			29.7	
Actuated g/C Ratio				0.28	0.28		0.55	0.55			0.55	
v/c Ratio				0.53	0.66		0.65	0.23			0.41	
Control Delay				20.1	21.8		17.2	7.5			5.4	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				20.1	21.8		17.2	7.5			5.4	
LOS				C	C		B	A			A	
Approach Delay					21.1			12.1			5.4	
Approach LOS					C			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	0	80	0	0	0	0	430	100	390	310	0
Future Volume (vph)	350	0	80	0	0	0	0	430	100	390	310	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	0	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950									0.484		
Satd. Flow (perm)	1770	0	2787	0	0	0	0	3539	1583	902	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87						109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	380	0	87	0	0	0	0	467	109	424	337	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	380	0	87	0	0	0	0	467	109	424	337	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm					NA	Perm	Perm	NA	
Protected Phases								2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4		4					2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5		22.5					22.5	22.5	22.5	22.5	
Total Split (s)	25.0		25.0					35.0	35.0	35.0	35.0	
Total Split (%)	41.7%		41.7%					58.3%	58.3%	58.3%	58.3%	
Maximum Green (s)	20.5		20.5					30.5	30.5	30.5	30.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					Max	Max	Max	Max	
Walk Time (s)	7.0		7.0					7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		11.0					11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0		0					0	0	0	0	
Act Effct Green (s)	16.3		16.3					30.9	30.9	30.9	30.9	
Actuated g/C Ratio	0.29		0.29					0.55	0.55	0.55	0.55	
v/c Ratio	0.74		0.10					0.24	0.12	0.86	0.17	
Control Delay	27.5		4.2					7.7	2.4	33.7	7.3	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	27.5		4.2					7.7	2.4	33.7	7.3	
LOS	C		A					A	A	C	A	
Approach Delay		23.2						6.6			22.0	
Approach LOS		C						A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 56.2			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor

HCS Freeway Merge Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	AM Peak - Taylor EB Entrance (SR 256 EB Ent Closure)
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity

Demand Volume (V_i), veh/h	1640	490
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	1745	521
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.28

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.305
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	1745	Ramp Junction Speed (S), mi/h	59.0

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2266	Average Density (D), pc/mi/ln	19.2
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	18.0

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	AM Peak - EB Ent Closure
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	10	0	20	430
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	11	0	21	457

Weaving Flow Rate (v_w), pc/h	457	Ideal Conditions Capacity (c_{IFL}), pc/h/ln	2270
Non-Weaving Flow Rate (v_{NW}), pc/h	32	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h	2576
Total Flow Rate (v), pc/h	489	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h	2567
Volume Ratio (VR)	0.935	Weaving Area Capacity (c_W), veh/h	2567
Minimum Lane Change Rate (LC_{MIN}), lc/h	457	Adjusted Weaving Area Capacity (c_{WA}), veh/h	2410
Maximum Weaving Length (L_{MAX}), ft	13338	Demand-to-Capacity Ratio (v/c)	0.20

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	1	Average Weaving Speed (S_W), mi/h	49.3
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	0	Average Non-Weaving Speed (S_{NW}), mi/h	52.5
Weaving Lane Change Rate (LC_W), lc/h	492	Average Speed (S), mi/h	49.5
Weaving Lane Change Rate (LC_{All}), lc/h	492	Density (D), pc/mi/ln	4.9
Weaving Intensity Factor (W)	0.223	Level of Service (LOS)	A

Design Analysis Table

Number of Lanes, ln	3	4	5	6
Density, pc/mi/ln	3.3	2.5	2.0	1.7
LOS	A	A	A	A

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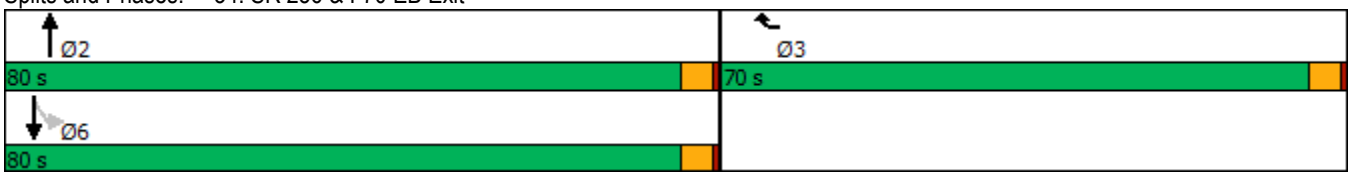
2028 PM PEAK HOUR

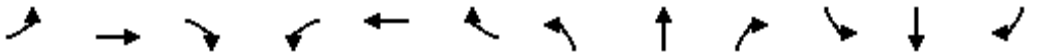
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	670	2060	0	0	1450
Future Volume (vph)	0	670	2060	0	0	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	6408	0	1863	5085
Flt Permitted						
Satd. Flow (perm)	0	2787	6408	0	1863	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		4				
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	728	2239	0	0	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	728	2239	0	0	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		Perm	NA
Protected Phases		3	2			6
Permitted Phases					6	
Detector Phase		3	2		6	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		22.5	22.5
Total Split (s)		70.0	80.0		80.0	80.0
Total Split (%)		46.7%	53.3%		53.3%	53.3%
Maximum Green (s)		65.5	75.5		75.5	75.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			11.0		11.0	11.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		36.1	66.0			66.0
Actuated g/C Ratio		0.32	0.59			0.59
v/c Ratio		0.80	0.59			0.52
Control Delay		42.8	15.4			14.6
Queue Delay		0.0	0.0			0.0
Total Delay		42.8	15.4			14.6
LOS		D	B			B
Approach Delay	42.8		15.4			14.6
Approach LOS	D		B			B

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 111.4			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 19.5		Intersection LOS: B	
Intersection Capacity Utilization 60.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit



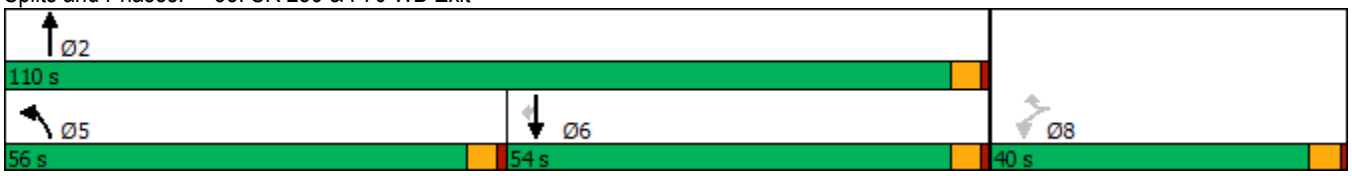


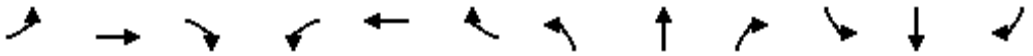
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	150	1030	1960	0	0	1270	620
Future Volume (vph)	0	0	0	190	0	150	1030	1960	0	0	1270	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.980	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	5085	0	0	4710	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	5085	0	0	4710	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44					18	450
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	163	1120	2130	0	0	1380	674
Shared Lane Traffic (%)												31%
Lane Group Flow (vph)	0	0	0	207	0	163	1120	2130	0	0	1589	465
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				40.0		40.0	56.0	110.0			54.0	54.0
Total Split (%)				26.7%		26.7%	37.3%	73.3%			36.0%	36.0%
Maximum Green (s)				35.5		35.5	51.5	105.5			49.5	49.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)				20.8		20.8	47.9	102.3			49.8	49.8
Actuated g/C Ratio				0.16		0.16	0.36	0.77			0.38	0.38
v/c Ratio				0.74		0.57	0.90	0.54			0.89	0.59
Control Delay				70.2		45.6	50.8	6.8			46.5	6.8
Queue Delay				0.0		0.0	0.0	0.1			0.0	0.0
Total Delay				70.2		45.6	50.8	7.0			46.5	6.8
LOS				E		D	D	A			D	A
Approach Delay					59.4			22.1			37.5	
Approach LOS					E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 132.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 30.1		Intersection LOS: C	
Intersection Capacity Utilization 79.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



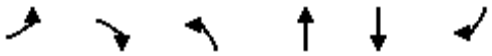


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	70	340	650	130	90	270	900	1080	250	970	30
Future Volume (vph)	40	70	340	650	130	90	270	900	1080	250	970	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.938				0.850		0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1747	0	3433	5085	1583	1770	5060	0
Flt Permitted	0.610			0.950			0.950			0.262		
Satd. Flow (perm)	1136	1863	2787	3433	1747	0	3433	5085	1583	488	5060	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			350		23				735		4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	76	370	707	141	98	293	978	1174	272	1054	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	76	370	707	239	0	293	978	1174	272	1087	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4						2	6		

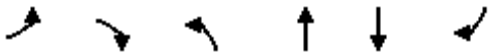
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	12.0	23.0	23.0	36.0	47.0		26.0	78.0	78.0	13.0	65.0	
Total Split (%)	8.0%	15.3%	15.3%	24.0%	31.3%		17.3%	52.0%	52.0%	8.7%	43.3%	
Maximum Green (s)	7.5	18.5	18.5	31.5	42.5		21.5	73.5	73.5	8.5	60.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	None	None	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	18.5	11.5	11.5	31.5	38.2		17.2	73.5	73.5	73.3	64.8	
Actuated g/C Ratio	0.13	0.08	0.08	0.22	0.27		0.12	0.51	0.51	0.51	0.45	
v/c Ratio	0.24	0.51	0.68	0.94	0.50		0.71	0.37	1.00	0.83	0.47	
Control Delay	38.7	74.6	14.4	75.2	44.6		70.6	21.8	40.7	43.5	28.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	38.7	74.6	14.4	75.2	44.6		70.6	21.8	40.7	43.5	28.8	
LOS	D	E	B	E	D		E	C	D	D	C	
Approach Delay		25.9			67.5			36.7			31.7	
Approach LOS		C			E			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 143.1			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 40.0		Intersection LOS: D	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



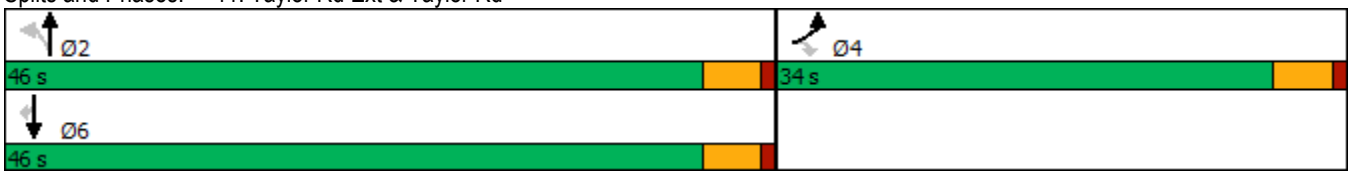
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	180	670	370	390	230	500
Future Volume (vph)	180	670	370	390	230	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	550			250
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.604			
Satd. Flow (perm)	1770	1583	1125	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		588				543
Link Speed (mph)	30			30	30	
Link Distance (ft)	2247			555	2212	
Travel Time (s)	51.1			12.6	50.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	728	402	424	250	543
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	728	402	424	250	543
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

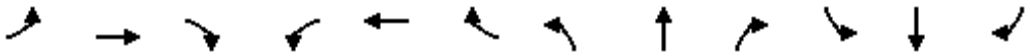


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	57.5%	57.5%	57.5%	57.5%
Maximum Green (s)	29.5	29.5	41.5	41.5	41.5	41.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	15.9	15.9	26.2	26.2	26.2	26.2
Actuated g/C Ratio	0.30	0.30	0.50	0.50	0.50	0.50
v/c Ratio	0.37	0.82	0.72	0.46	0.27	0.51
Control Delay	18.1	13.1	20.0	11.1	9.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	13.1	20.0	11.1	9.3	2.9
LOS	B	B	B	B	A	A
Approach Delay	14.1			15.4	4.9	
Approach LOS	B			B	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 52.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 61.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 41: Taylor Rd Ext & Taylor Rd



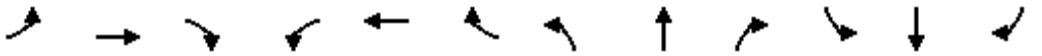


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	330	310	60	290	680	0	0	660	220
Future Volume (vph)	0	0	0	330	310	60	290	680	0	0	660	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.976						0.962	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1818	0	3433	3539	0	0	3405	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	1818	0	3433	3539	0	0	3405	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13						65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	359	337	65	315	739	0	0	717	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	359	402	0	315	739	0	0	956	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		9.5	22.5			22.5	
Total Split (s)				30.0	30.0		16.0	50.0			34.0	
Total Split (%)				37.5%	37.5%		20.0%	62.5%			42.5%	
Maximum Green (s)				25.5	25.5		11.5	45.5			29.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)				20.2	20.2		10.6	40.2			24.9	
Actuated g/C Ratio				0.29	0.29		0.15	0.58			0.36	
v/c Ratio				0.70	0.75		0.60	0.36			0.76	
Control Delay				30.9	32.1		35.2	9.0			23.5	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				30.9	32.1		35.2	9.0			23.5	
LOS				C	C		D	A			C	
Approach Delay					31.6			16.8			23.5	
Approach LOS					C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 69.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 75.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	0	1000	0	0	0	0	710	150	540	450	0
Future Volume (vph)	260	0	1000	0	0	0	0	710	150	540	450	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	0	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950									0.161		
Satd. Flow (perm)	1770	0	2787	0	0	0	0	3539	1583	300	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			706						163			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	0	1087	0	0	0	0	772	163	587	489	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	283	0	1087	0	0	0	0	772	163	587	489	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1					2	1	1	2	
Detector Template	Left		Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20		20					100	20	20	100	
Trailing Detector (ft)	0		0					0	0	0	0	
Detector 1 Position(ft)	0		0					0	0	0	0	
Detector 1 Size(ft)	20		20					6	20	20	6	
Detector 1 Type	Cl+Ex		Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm		Perm					NA	Perm	pm+pt	NA	
Protected Phases								2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4		4					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0		5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5		22.5					22.5	22.5	9.5	22.5	
Total Split (s)	25.0		25.0					26.0	26.0	29.0	55.0	
Total Split (%)	31.3%		31.3%					32.5%	32.5%	36.3%	68.8%	
Maximum Green (s)	20.5		20.5					21.5	21.5	24.5	50.5	
Yellow Time (s)	3.5		3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5		4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Recall Mode	None		None					None	None	None	None	
Walk Time (s)	7.0		7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0		11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0		0					0	0		0	
Act Effct Green (s)	17.9		17.9					20.3	20.3	47.8	47.8	
Actuated g/C Ratio	0.24		0.24					0.27	0.27	0.64	0.64	
v/c Ratio	0.67		0.90					0.81	0.30	0.91	0.22	
Control Delay	35.1		21.6					34.1	5.9	38.8	6.2	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	35.1		21.6					34.1	5.9	38.8	6.2	
LOS	D		C					C	A	D	A	
Approach Delay		24.4						29.2			24.0	
Approach LOS		C						C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 74.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 25.6		Intersection LOS: C	
Intersection Capacity Utilization 75.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor

HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	PM Peak - Taylor EB Entrance (SR 256 EB Ent Closure)
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	3260	590
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	3468	628
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.93	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.502
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	3468	Ramp Junction Speed (S), mi/h	54.2

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4096	Average Density (D), pc/mi/ln	37.8
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	32.2

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	AM Peak - EB Ent Closure
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	0	0	0	1260
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	0	0	0	1340
Weaving Flow Rate (v_w), pc/h	1340	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	0	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		2438
Total Flow Rate (v), pc/h	1340	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		2400
Volume Ratio (VR)	1.000	Weaving Area Capacity (c_W), veh/h		2400
Minimum Lane Change Rate (LC_{MIN}), lc/h	1340	Adjusted Weaving Area Capacity (c_{WA}), veh/h		2254
Maximum Weaving Length (L_{MAX}), ft	14232	Demand-to-Capacity Ratio (v/c)		0.59

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	0	Average Weaving Speed (S_W), mi/h	43.0
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	0	Average Non-Weaving Speed (S_{NW}), mi/h	44.1
Weaving Lane Change Rate (LC_W), lc/h	1375	Average Speed (S), mi/h	43.0
Weaving Lane Change Rate (LC_{All}), lc/h	1375	Density (D), pc/mi/ln	15.6
Weaving Intensity Factor (W)	0.502	Level of Service (LOS)	B

Design Analysis Table

Number of Lanes, ln	3	4	5	6
Density, pc/mi/ln	10.5	7.9	6.4	5.4
LOS	A	A	A	A

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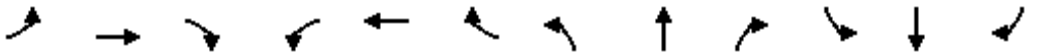
WESTBOUND EXIT RAMP CLOSURE

2028 AM PEAK HOUR

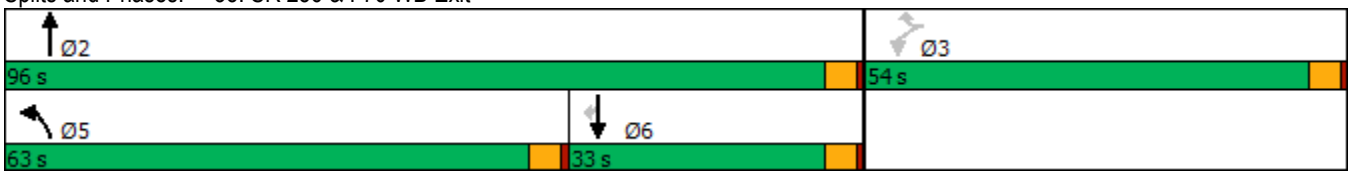


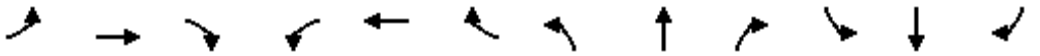
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	1310	1100	0	0	810	730
Future Volume (vph)	0	0	0	0	0	0	1310	1100	0	0	810	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt											0.953	0.850
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	1863	0	1863	3433	5085	0	0	4580	1362
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	1863	0	1863	3433	5085	0	0	4580	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)											67	396
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	1424	1196	0	0	880	793
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	0	0	0	0	0	0	1424	1196	0	0	1277	396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	63.0	96.0			33.0	33.0
Total Split (%)				36.0%		36.0%	42.0%	64.0%			22.0%	22.0%
Maximum Green (s)				49.5		49.5	58.5	91.5			28.5	28.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)							51.7	89.3			28.6	28.6
Actuated g/C Ratio							0.58	1.00			0.32	0.32
v/c Ratio							0.72	0.24			0.85	0.56
Control Delay							16.3	0.1			32.7	5.8
Queue Delay							0.0	0.0			0.0	0.0
Total Delay							16.3	0.1			32.7	5.8
LOS							B	A			C	A
Approach Delay								8.9			26.4	
Approach LOS								A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 89.3			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



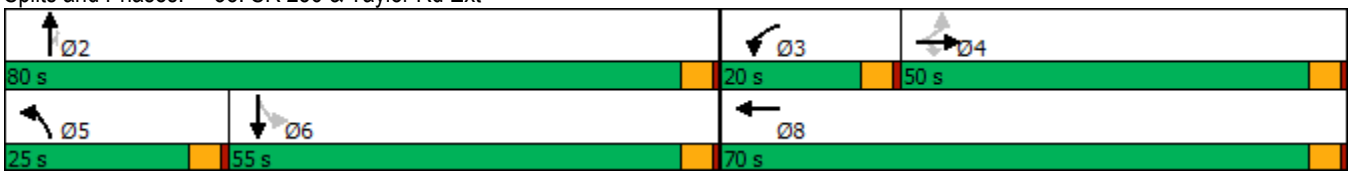


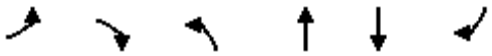
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	40	150	630	50	180	220	590	560	60	670	30
Future Volume (vph)	20	40	150	630	50	180	220	590	560	60	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.882				0.850		0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1643	0	3433	5085	1583	1770	5050	0
Flt Permitted	0.604			0.950			0.950			0.397		
Satd. Flow (perm)	1125	1863	2787	3433	1643	0	3433	5085	1583	740	5050	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		155				609		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	163	685	54	196	239	641	609	65	728	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	43	163	685	250	0	239	641	609	65	761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	22.5	22.5	
Total Split (s)	50.0	50.0	50.0	20.0	70.0		25.0	80.0	80.0	55.0	55.0	
Total Split (%)	33.3%	33.3%	33.3%	13.3%	46.7%		16.7%	53.3%	53.3%	36.7%	36.7%	
Maximum Green (s)	45.5	45.5	45.5	15.5	65.5		20.5	75.5	75.5	50.5	50.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0			0	0	0	0	
Act Effct Green (s)	7.4	7.4	7.4	15.7	27.6		10.8	34.2	34.2	18.9	18.9	
Actuated g/C Ratio	0.10	0.10	0.10	0.22	0.39		0.15	0.48	0.48	0.27	0.27	
v/c Ratio	0.19	0.22	0.37	0.90	0.34		0.46	0.26	0.56	0.33	0.56	
Control Delay	35.5	34.2	8.8	46.6	8.5		31.5	11.0	3.2	26.8	24.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	35.5	34.2	8.8	46.6	8.5		31.5	11.0	3.2	26.8	24.2	
LOS	D	C	A	D	A		C	B	A	C	C	
Approach Delay		16.2			36.4			11.1			24.4	
Approach LOS		B			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 70.9			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 21.4		Intersection LOS: C	
Intersection Capacity Utilization 55.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



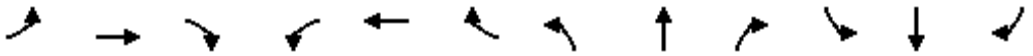


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	90	480	380	420	100
Future Volume (vph)	40	90	480	380	420	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	550			250
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.493			
Satd. Flow (perm)	1770	1583	918	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		98				109
Link Speed (mph)	30			30	30	
Link Distance (ft)	2247			555	2212	
Travel Time (s)	51.1			12.6	50.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	98	522	413	457	109
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	98	522	413	457	109
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60	60	60			60
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Maximum Green (s)	19.5	19.5	31.5	31.5	31.5	31.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	6.9	6.9	39.4	39.4	39.4	39.4
Actuated g/C Ratio	0.13	0.13	0.75	0.75	0.75	0.75
v/c Ratio	0.19	0.33	0.76	0.29	0.33	0.09
Control Delay	20.6	8.5	17.6	3.8	4.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	8.5	17.6	3.8	4.0	1.1
LOS	C	A	B	A	A	A
Approach Delay	12.2			11.6	3.5	
Approach LOS	B			B	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 52.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 8.8		Intersection LOS: A	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 41: Taylor Rd Ext & Taylor Rd

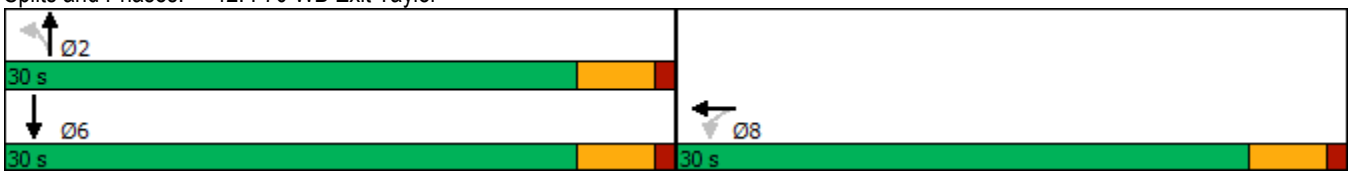


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	240	20	370	300	490	0	0	220	290
Future Volume (vph)	0	0	0	240	20	370	300	490	0	0	220	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.858						0.915	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1598	0	3433	3539	0	0	3238	0
Flt Permitted				0.950			0.445					
Satd. Flow (perm)	0	0	0	1770	1598	0	1608	3539	0	0	3238	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					212						315	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	261	22	402	326	533	0	0	239	315
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	261	424	0	326	533	0	0	554	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					

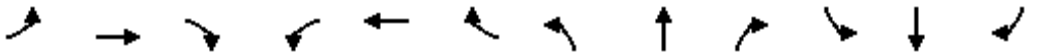
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				30.0	30.0		30.0	30.0			30.0	
Total Split (%)				50.0%	50.0%		50.0%	50.0%			50.0%	
Maximum Green (s)				25.5	25.5		25.5	25.5			25.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		Min	Min			Min	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		0	0			0	
Act Effct Green (s)				14.0	14.0		16.1	16.1			16.1	
Actuated g/C Ratio				0.35	0.35		0.40	0.40			0.40	
v/c Ratio				0.42	0.61		0.51	0.38			0.37	
Control Delay				13.0	10.0		13.1	9.8			4.8	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				13.0	10.0		13.1	9.8			4.8	
LOS				B	B		B	A			A	
Approach Delay					11.2			11.1			4.8	
Approach LOS					B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 40.1			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 59.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor



2028 PM PEAK HOUR

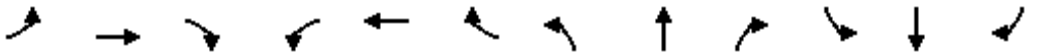


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	1030	1750	0	0	1640	620
Future Volume (vph)	0	0	0	0	0	0	1030	1750	0	0	1640	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt											0.990	0.850
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	1863	0	1863	3433	5085	0	0	4758	1362
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	1863	0	1863	3433	5085	0	0	4758	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)											11	399
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	1120	1902	0	0	1783	674
Shared Lane Traffic (%)												19%
Lane Group Flow (vph)	0	0	0	0	0	0	1120	1902	0	0	1911	546
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				25.0		25.0	41.0	85.0			44.0	44.0
Total Split (%)				22.7%		22.7%	37.3%	77.3%			40.0%	40.0%
Maximum Green (s)				20.5		20.5	36.5	80.5			39.5	39.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)							35.2	83.8			39.5	39.5
Actuated g/C Ratio							0.42	1.00			0.47	0.47
v/c Ratio							0.78	0.37			0.85	0.64
Control Delay							25.3	0.2			24.3	8.5
Queue Delay							0.0	0.0			0.0	0.0
Total Delay							25.3	0.2			24.3	8.5
LOS							C	A			C	A
Approach Delay								9.5			20.8	
Approach LOS								A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 83.8			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

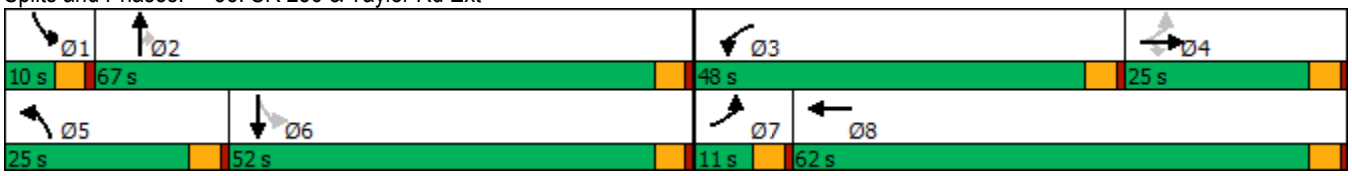


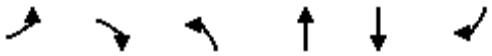
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	50	360	840	130	240	270	900	870	90	1130	30
Future Volume (vph)	40	50	360	840	130	240	270	900	870	90	1130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.903				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1682	0	3433	5085	1583	1770	5065	0
Flt Permitted	0.526			0.950			0.950			0.258		
Satd. Flow (perm)	980	1863	2787	3433	1682	0	3433	5085	1583	481	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			314		72				895		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	54	391	913	141	261	293	978	946	98	1228	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	54	391	913	402	0	293	978	946	98	1261	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	11.0	25.0	25.0	48.0	62.0		25.0	67.0	67.0	10.0	52.0	
Total Split (%)	7.3%	16.7%	16.7%	32.0%	41.3%		16.7%	44.7%	44.7%	6.7%	34.7%	
Maximum Green (s)	6.5	20.5	20.5	43.5	57.5		20.5	62.5	62.5	5.5	47.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	17.0	10.6	10.6	39.2	46.1		16.3	52.1	52.1	47.1	41.5	
Actuated g/C Ratio	0.13	0.08	0.08	0.31	0.37		0.13	0.41	0.41	0.37	0.33	
v/c Ratio	0.25	0.34	0.75	0.86	0.61		0.66	0.47	0.80	0.41	0.76	
Control Delay	32.5	64.5	23.0	51.1	32.6		62.2	28.0	8.9	26.8	42.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	32.5	64.5	23.0	51.1	32.6		62.2	28.0	8.9	26.8	42.1	
LOS	C	E	C	D	C		E	C	A	C	D	
Approach Delay		28.4			45.5			24.4			41.0	
Approach LOS		C			D			C			D	

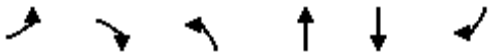
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 126.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 34.1		Intersection LOS: C	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext





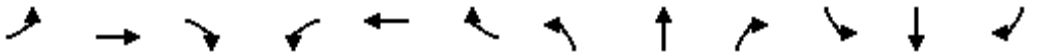
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	180	280	750	420	230	500
Future Volume (vph)	180	280	750	420	230	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250	0	550			250
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.604			
Satd. Flow (perm)	1770	1583	1125	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		304				543
Link Speed (mph)	30			30	30	
Link Distance (ft)	2247			555	2212	
Travel Time (s)	51.1			12.6	50.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	304	815	457	250	543
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	304	815	457	250	543
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes				Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	67.0	67.0	67.0	67.0
Total Split (%)	25.6%	25.6%	74.4%	74.4%	74.4%	74.4%
Maximum Green (s)	18.5	18.5	62.5	62.5	62.5	62.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	14.2	14.2	62.6	62.6	62.6	62.6
Actuated g/C Ratio	0.17	0.17	0.73	0.73	0.73	0.73
v/c Ratio	0.67	0.59	0.99	0.34	0.18	0.42
Control Delay	45.2	9.0	45.1	5.4	4.5	1.5
Queue Delay	0.0	0.0	1.1	0.0	0.0	0.0
Total Delay	45.2	9.0	46.2	5.4	4.5	1.5
LOS	D	A	D	A	A	A
Approach Delay	23.2			31.6	2.4	
Approach LOS	C			C	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 85.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 41: Taylor Rd Ext & Taylor Rd

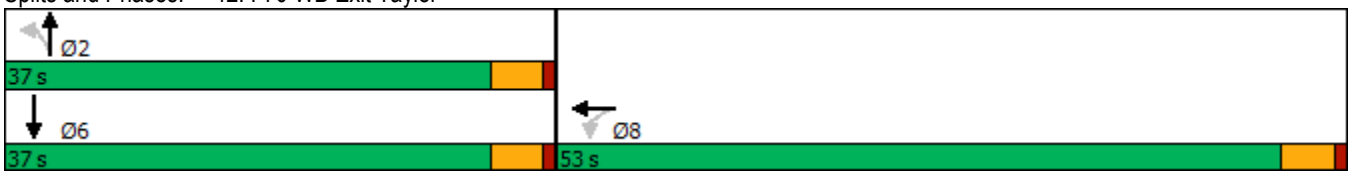


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	330	30	400	230	770	0	0	270	220
Future Volume (vph)	0	0	0	330	30	400	230	770	0	0	270	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.861						0.933	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1604	0	3433	3539	0	0	3302	0
Flt Permitted				0.950			0.423					
Satd. Flow (perm)	0	0	0	1770	1604	0	1529	3539	0	0	3302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					48						239	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	359	33	435	250	837	0	0	293	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	359	468	0	250	837	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		2	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		22.5	22.5			22.5	
Total Split (s)				53.0	53.0		37.0	37.0			37.0	
Total Split (%)				58.9%	58.9%		41.1%	41.1%			41.1%	
Maximum Green (s)				48.5	48.5		32.5	32.5			32.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		0	0			0	
Act Effct Green (s)				23.8	23.8		22.3	22.3			22.3	
Actuated g/C Ratio				0.43	0.43		0.40	0.40			0.40	
v/c Ratio				0.48	0.66		0.41	0.59			0.36	
Control Delay				14.4	17.0		16.2	16.3			7.8	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				14.4	17.0		16.2	16.3			7.8	
LOS				B	B		B	B			A	
Approach Delay					15.9			16.2			7.8	
Approach LOS					B			B			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 55.9	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 58.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 42: I-70 WB Exit Taylor



NORTHBOUND LEFT TURN LANE CLOSURE ON SR 256

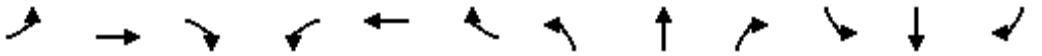
2028 AM PEAK HOUR

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	400	2070	1460	90	710
Future Volume (vph)	0	400	2070	1460	90	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt		0.850	0.938			
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	6011	0	1770	5085
Flt Permitted					0.044	
Satd. Flow (perm)	0	2787	6011	0	82	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		330	200			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	435	2250	1587	98	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	435	3837	0	98	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		37.0	91.0		22.0	113.0
Total Split (%)		24.7%	60.7%		14.7%	75.3%
Maximum Green (s)		32.5	86.5		17.5	108.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		10.8	86.8		99.5	99.5
Actuated g/C Ratio		0.09	0.73		0.83	0.83
v/c Ratio		0.79	1.29dr		0.53	0.18
Control Delay		24.5	15.3		28.5	2.3
Queue Delay		0.0	0.1		0.0	0.0
Total Delay		24.5	15.4		28.5	2.3
LOS		C	B		C	A
Approach Delay	24.5		15.4			5.2
Approach LOS	C		B			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 119.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 76.0%		ICU Level of Service D	
Analysis Period (min) 15			
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			

Splits and Phases: 34: SR 256 & I-70 EB Exit

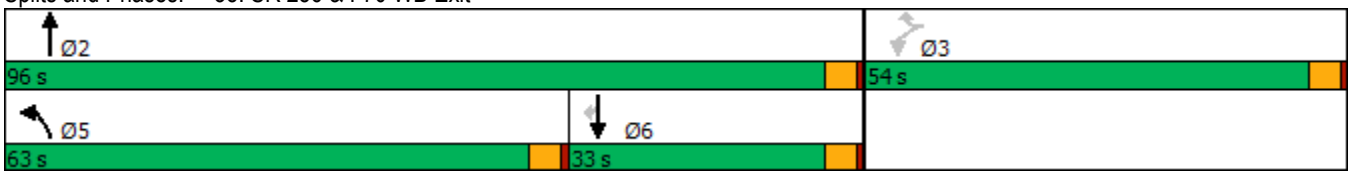


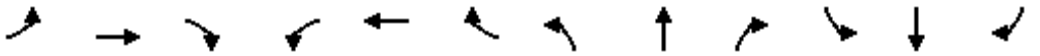
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	120	0	1100	0	0	640	730
Future Volume (vph)	0	0	0	170	0	120	0	1100	0	0	640	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.946	0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1770	0	1583	3614	5085	0	0	4546	1362
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1770	0	1583	3614	5085	0	0	4546	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						80					85	396
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	130	0	1196	0	0	696	793
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	0	0	0	185	0	130	0	1196	0	0	1093	396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	63.0	96.0			33.0	33.0
Total Split (%)				36.0%		36.0%	42.0%	64.0%			22.0%	22.0%
Maximum Green (s)				49.5		49.5	58.5	91.5			28.5	28.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				10.8		10.8		29.8			29.8	29.8
Actuated g/C Ratio				0.22		0.22		0.60			0.60	0.60
v/c Ratio				0.48		0.32		0.39			0.40	0.41
Control Delay				20.9		9.7		6.0			5.6	2.2
Queue Delay				0.0		0.0		0.0			0.0	0.0
Total Delay				20.9		9.7		6.0			5.6	2.2
LOS				C		A		A			A	A
Approach Delay					16.3			6.0			4.7	
Approach LOS					B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 49.6			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 6.4		Intersection LOS: A	
Intersection Capacity Utilization 37.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit





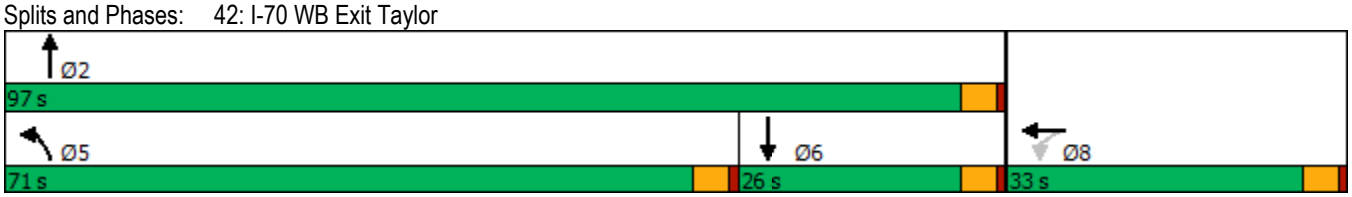
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	240	240	80	1680	420	0	0	220	290
Future Volume (vph)	0	0	0	240	240	80	1680	420	0	0	220	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.962						0.915	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1792	0	3433	3539	0	0	3238	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	1792	0	3433	3539	0	0	3238	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12						75	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	261	261	87	1826	457	0	0	239	315
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	261	348	0	1826	457	0	0	554	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								

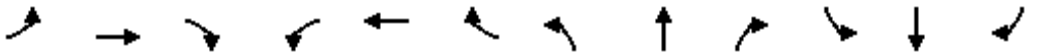
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		9.5	22.5			22.5	
Total Split (s)				33.0	33.0		71.0	97.0			26.0	
Total Split (%)				25.4%	25.4%		54.6%	74.6%			20.0%	
Maximum Green (s)				28.5	28.5		66.5	92.5			21.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Min			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)				26.9	26.9		66.6	92.1			21.0	
Actuated g/C Ratio				0.21	0.21		0.52	0.72			0.16	
v/c Ratio				0.70	0.90		1.02	0.18			0.96dr	
Control Delay				58.0	74.6		58.4	6.2			69.3	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				58.0	74.6		58.4	6.2			69.3	
LOS				E	E		E	A			E	
Approach Delay					67.5			47.9			69.3	
Approach LOS					E			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 128			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 54.8		Intersection LOS: D	
Intersection Capacity Utilization 92.1%		ICU Level of Service F	
Analysis Period (min) 15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 42: I-70 WB Exit Taylor





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1670	230	90	0	0	0	0	430	100	150	310	0
Future Volume (vph)	1670	230	90	0	0	0	0	430	100	150	310	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.964								0.950		
Satd. Flow (prot)	1681	1706	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.964								0.182		
Satd. Flow (perm)	1681	1706	2787	0	0	0	0	3539	1583	339	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98						109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1815	250	98	0	0	0	0	467	109	163	337	0
Shared Lane Traffic (%)	43%											
Lane Group Flow (vph)	1035	1030	98	0	0	0	0	467	109	163	337	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5					22.5	22.5	9.5	22.5	
Total Split (s)	86.0	86.0	86.0					30.0	30.0	14.0	44.0	
Total Split (%)	66.2%	66.2%	66.2%					23.1%	23.1%	10.8%	33.8%	
Maximum Green (s)	81.5	81.5	81.5					25.5	25.5	9.5	39.5	
Yellow Time (s)	3.5	3.5	3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	
Act Effct Green (s)	81.5	81.5	81.5					22.0	22.0	36.0	36.0	
Actuated g/C Ratio	0.64	0.64	0.64					0.17	0.17	0.28	0.28	
v/c Ratio	0.96	0.94	0.05					0.76	0.30	0.80	0.33	
Control Delay	40.9	37.5	1.8					58.4	10.1	64.9	36.7	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	40.9	37.5	1.8					58.4	10.1	64.9	36.7	
LOS	D	D	A					E	B	E	D	
Approach Delay		37.5						49.3			45.9	
Approach LOS		D						D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 126.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 40.9		Intersection LOS: D	
Intersection Capacity Utilization 92.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor

HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	AM Peak - WB CD TO MAIN
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	3390	1920
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	3606	2043
Capacity (c_{md}), pc/h	7050	2000
Adjusted Capacity (c_{md}), pc/h	6620	1878
Volume-to-Capacity Ratio (v/c)	0.85	1.00

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	1
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.530
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	1442
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	53.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	0.600	Outer Lanes Freeway Speed (S_O), mi/h	63.1
Flow in Lanes 1 and 2 (v_{12}), pc/h	2164	Ramp Junction Speed (S), mi/h	55.7

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4207	Average Density (D), pc/mi/ln	33.8
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	32.4

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HCS Freeway Merge Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	AM Peak - Taylor EB Entrance (EB Loop Exit Closure)
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity

Demand Volume (V_i), veh/h	1640	480
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	1745	511
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.27

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.305
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	1745	Ramp Junction Speed (S), mi/h	59.0

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2256	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	AM Peak - WB Ent LT Closure
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	10	220	1330	430
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	11	234	1415	457
Weaving Flow Rate (v_w), pc/h	691	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	1426	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		3720
Total Flow Rate (v), pc/h	2117	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		7362
Volume Ratio (VR)	0.326	Weaving Area Capacity (c_W), veh/h		3720
Minimum Lane Change Rate (LC_{MIN}), lc/h	691	Adjusted Weaving Area Capacity (c_{WA}), veh/h		3493
Maximum Weaving Length (L_{MAX}), ft	5864	Demand-to-Capacity Ratio (v/c)		0.61

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	57	Average Weaving Speed (S_W), mi/h	45.9
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	180	Average Non-Weaving Speed (S_{NW}), mi/h	46.9
Weaving Lane Change Rate (LC_W), lc/h	726	Average Speed (S), mi/h	46.6
Weaving Lane Change Rate (LC_{All}), lc/h	906	Density (D), pc/mi/ln	22.7
Weaving Intensity Factor (W)	0.361	Level of Service (LOS)	B

Design Analysis Table

Number of Lanes, ln	3	4	5	6
Density, pc/mi/ln	14.7	10.9	8.7	7.3
LOS	B	A	A	A

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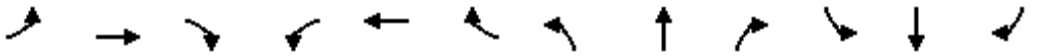
2028 PM PEAK HOUR

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	670	2060	1240	180	1450
Future Volume (vph)	0	670	2060	1240	180	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.91
Frt		0.850	0.944			
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	6049	0	1770	5085
Flt Permitted					0.043	
Satd. Flow (perm)	0	2787	6049	0	80	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		295	177			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	728	2239	1348	196	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	728	3587	0	196	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		37.0	93.0		20.0	113.0
Total Split (%)		24.7%	62.0%		13.3%	75.3%
Maximum Green (s)		32.5	88.5		15.5	108.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		28.8	88.7		107.7	107.7
Actuated g/C Ratio		0.20	0.61		0.74	0.74
v/c Ratio		0.92	1.28dr		0.86	0.42
Control Delay		51.9	33.4		74.0	7.8
Queue Delay		0.0	1.6		0.0	0.0
Total Delay		51.9	35.0		74.0	7.8
LOS		D	C		E	A
Approach Delay	51.9		35.0			15.1
Approach LOS	D		C			B

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 145.5			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 31.2		Intersection LOS: C	
Intersection Capacity Utilization 81.6%		ICU Level of Service D	
Analysis Period (min) 15			
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			

Splits and Phases: 34: SR 256 & I-70 EB Exit

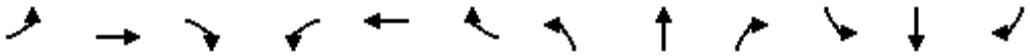


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	150	0	1750	0	0	1450	620
Future Volume (vph)	0	0	0	190	0	150	0	1750	0	0	1450	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.86	0.86
Frt						0.850					0.985	0.850
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1770	0	1583	3614	5085	0	0	4734	1362
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1770	0	1583	3614	5085	0	0	4734	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44					21	505
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	163	0	1902	0	0	1576	674
Shared Lane Traffic (%)												25%
Lane Group Flow (vph)	0	0	0	207	0	163	0	1902	0	0	1745	505
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				44.0		44.0	9.5	106.0			96.5	96.5
Total Split (%)				29.3%		29.3%	6.3%	70.7%			64.3%	64.3%
Maximum Green (s)				39.5		39.5	5.0	101.5			92.0	92.0
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)				17.8		17.8		65.7			65.7	65.7
Actuated g/C Ratio				0.19		0.19		0.71			0.71	0.71
v/c Ratio				0.61		0.48		0.53			0.52	0.46
Control Delay				46.5		32.9		7.1			7.0	1.9
Queue Delay				0.0		0.0		0.0			0.0	0.0
Total Delay				46.5		32.9		7.1			7.0	1.9
LOS				D		C		A			A	A
Approach Delay					40.5			7.1			5.8	
Approach LOS					D			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 93.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 9.2		Intersection LOS: A	
Intersection Capacity Utilization 51.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

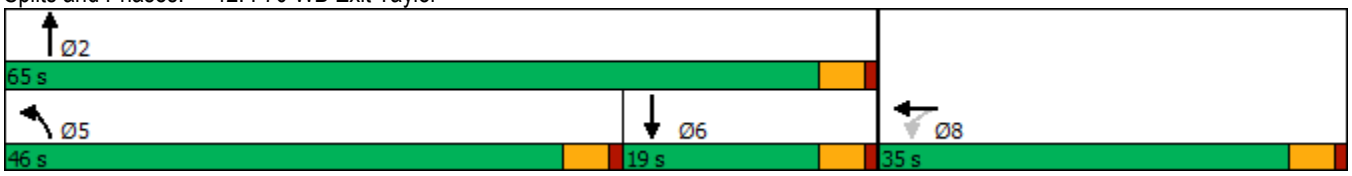


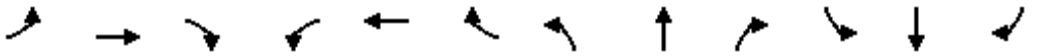
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	330	310	60	1320	710	0	0	270	220
Future Volume (vph)	0	0	0	330	310	60	1320	710	0	0	270	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	450		0	450		0	0		450
Storage Lanes	0		0	1		0	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	0.95
Frt					0.976						0.933	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	1818	0	3433	3539	0	0	3302	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	1818	0	3433	3539	0	0	3302	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					10						115	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1168			1283			555	
Travel Time (s)		31.5			26.5			29.2			12.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	359	337	65	1435	772	0	0	293	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	359	402	0	1435	772	0	0	532	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5		9.5	22.5			22.5	
Total Split (s)				35.0	35.0		46.0	65.0			19.0	
Total Split (%)				35.0%	35.0%		46.0%	65.0%			19.0%	
Maximum Green (s)				30.5	30.5		41.5	60.5			14.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5		4.5	4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)				25.4	25.4		41.6	60.5			14.3	
Actuated g/C Ratio				0.27	0.27		0.44	0.64			0.15	
v/c Ratio				0.76	0.81		0.95	0.34			0.89	
Control Delay				42.9	45.6		41.9	9.1			50.9	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				42.9	45.6		41.9	9.1			50.9	
LOS				D	D		D	A			D	
Approach Delay					44.3			30.5			50.9	
Approach LOS					D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 94.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 36.6		Intersection LOS: D	
Intersection Capacity Utilization 84.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 42: I-70 WB Exit Taylor



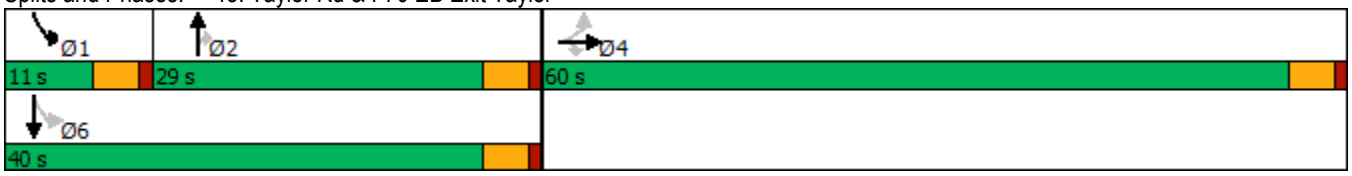


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1320	330	1030	0	0	0	0	710	150	150	440	0
Future Volume (vph)	1320	330	1030	0	0	0	0	710	150	150	440	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		400	0		0	0		650	450		0
Storage Lanes	1		2	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			
Flt Protected	0.950	0.971								0.950		
Satd. Flow (prot)	1681	1718	2787	0	0	0	0	3539	1583	1770	3539	0
Flt Permitted	0.950	0.971								0.140		
Satd. Flow (perm)	1681	1718	2787	0	0	0	0	3539	1583	261	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			329						163			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1287			307			1618			1283	
Travel Time (s)		29.3			7.0			36.8			29.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1435	359	1120	0	0	0	0	772	163	163	478	0
Shared Lane Traffic (%)	38%											
Lane Group Flow (vph)	890	904	1120	0	0	0	0	772	163	163	478	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4					2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5					22.5	22.5	9.5	22.5	
Total Split (s)	60.0	60.0	60.0					29.0	29.0	11.0	40.0	
Total Split (%)	60.0%	60.0%	60.0%					29.0%	29.0%	11.0%	40.0%	
Maximum Green (s)	55.5	55.5	55.5					24.5	24.5	6.5	35.5	
Yellow Time (s)	3.5	3.5	3.5					3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5					4.5	4.5	4.5	4.5	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Recall Mode	None	None	None					None	None	None	None	
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	
Act Effct Green (s)	55.5	55.5	55.5					24.1	24.1	35.1	35.1	
Actuated g/C Ratio	0.56	0.56	0.56					0.24	0.24	0.35	0.35	
v/c Ratio	0.95	0.94	0.66					0.90	0.32	0.86	0.38	
Control Delay	42.0	40.6	12.6					51.9	6.8	64.0	25.2	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	42.0	40.6	12.6					51.9	6.8	64.0	25.2	
LOS	D	D	B					D	A	E	C	
Approach Delay		30.2						44.1			35.1	
Approach LOS		C						D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 99.6			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 33.8		Intersection LOS: C	
Intersection Capacity Utilization 84.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 45: Taylor Rd & I-70 EB Exit Taylor



HCS Freeway Merge Report

Project Information			
Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	PM Peak - WB CD TO MAIN
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity		
Demand Volume (V_i), veh/h	2000	1510
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	2128	1606
Capacity (c_{md}), pc/h	7050	2000
Adjusted Capacity (c_{md}), pc/h	6620	1878
Volume-to-Capacity Ratio (v/c)	0.56	0.86

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	1
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.338
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	851
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	0.600	Outer Lanes Freeway Speed (S_O), mi/h	65.2
Flow in Lanes 1 and 2 (v_{12}), pc/h	1277	Ramp Junction Speed (S), mi/h	59.7

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2883	Average Density (D), pc/mi/ln	20.8
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	22.3

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HCS Freeway Merge Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2023
Jurisdiction	ODOT	Time Analyzed	PM Peak - Taylor EB Entrance (EB Loop Exit Closure)
Project Description	FAI/LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	0.939	0.939

Demand and Capacity

Demand Volume (V_i), veh/h	3260	630
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	0.00	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000
Flow Rate (v_i), pc/h	3468	670
Capacity (c_{md}), pc/h	4700	2000
Adjusted Capacity (c_{md}), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.94	0.36

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O), ln	0
Distance to Upstream Ramp (L_{UP}), ft	10000	Speed Index (M_S)	0.512
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	66.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	3468	Ramp Junction Speed (S), mi/h	54.0

Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4138	Average Density (D), pc/mi/ln	38.3
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	32.5

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HCS Freeway Weaving Report

Project Information

Analyst	Gannett Fleming	Date	6/12/2023
Agency	ODOT	Analysis Year	2028
Jurisdiction	ODOT	Time Analyzed	PM Peak - WB Ent LT Closure
Project Description	FAI-LIC-70-0.00/0.00	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Highway/CD Roadway
Segment Length (L_S), ft	500	Number of Maneuver Lanes (N_{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC_{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC_{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC_{RR}), lc	0
Interchange Density (ID), int/mi	0.80	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAF_{CAV}	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	0.939

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (V_i), veh/h	0	330	1090	1260
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	0.00	0.00	0.00	0.00
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	1.000	1.000	1.000
Flow Rate (v_i), pc/h	0	351	1160	1340
Weaving Flow Rate (v_w), pc/h	1691	Ideal Conditions Capacity (c_{IFL}), pc/h/ln		2270
Non-Weaving Flow Rate (v_{NW}), pc/h	1160	Density-Based Capacity ($c_{IWL} \times N \times f_{HV}$), veh/h		3250
Total Flow Rate (v), pc/h	2851	Demand Flow-Based Capacity ($c_{IW} \times f_{HV}$), veh/h		4047
Volume Ratio (VR)	0.593	Weaving Area Capacity (c_W), veh/h		3250
Minimum Lane Change Rate (LC_{MIN}), lc/h	0	Adjusted Weaving Area Capacity (c_{WA}), veh/h		3052
Maximum Weaving Length (L_{MAX}), ft	8934	Demand-to-Capacity Ratio (v/c)		0.93

Speed and Density

Non-Weaving Vehicle Index (I_{NW})	-	Average Weaving Speed (S_W), mi/h	-
Non-Weaving Lane Change Rate (LC_{NW}), lc/h	-	Average Non-Weaving Speed (S_{NW}), mi/h	-
Weaving Lane Change Rate (LC_W), lc/h	-	Average Speed (S), mi/h	-
Weaving Lane Change Rate (LC_{All}), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

Design Analysis Table

Number of Lanes, ln	3	4	5	6
Density, pc/mi/ln	-	-	-	-
LOS	F	F	F	F

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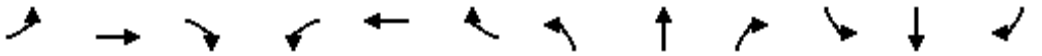
LANE CLOSURE ON SR 256

2028 SR 256 NORTHBOUND LANE CLOSURE AM PEAK HOUR

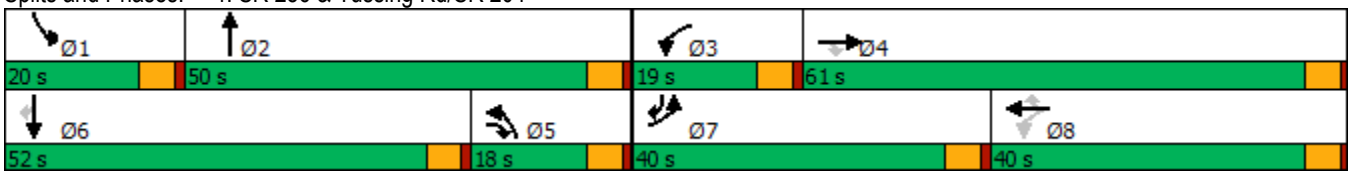


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Future Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5075	0	1770	5085	1583
Flt Permitted	0.950			0.660			0.950			0.950		
Satd. Flow (perm)	3433	1863	1583	1229	1863	2787	1770	5075	0	1770	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			390		2				250
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	152	174	65	152	598	98	1370	22	109	1000	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	152	174	65	152	598	98	1392	0	109	1000	250
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	40.0	61.0	18.0	19.0	40.0	40.0	18.0	50.0		20.0	52.0	40.0
Total Split (%)	26.7%	40.7%	12.0%	12.7%	26.7%	26.7%	12.0%	33.3%		13.3%	34.7%	26.7%
Maximum Green (s)	35.0	56.0	13.0	14.0	35.0	35.0	13.0	45.0		15.0	47.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	21.8	37.4	60.8	32.6	22.4	22.4	22.2	42.2		12.6	32.6	54.4
Actuated g/C Ratio	0.18	0.31	0.51	0.27	0.19	0.19	0.19	0.35		0.11	0.27	0.46
v/c Ratio	0.73	0.26	0.19	0.17	0.44	0.71	0.30	0.77		0.58	0.72	0.29
Control Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
LOS	D	C	A	C	D	C	D	D		E	D	A
Approach Delay		38.7			26.7			39.4			37.2	
Approach LOS		D			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 119.2			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 36.3		Intersection LOS: D	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204

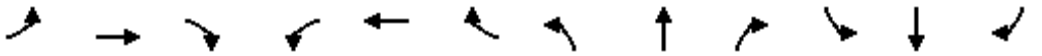


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	400	2070	150	90	710
Future Volume (vph)	0	400	2070	150	90	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.91	1.00	1.00	0.91
Frt		0.850		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	5085	1583	1770	5085
Flt Permitted					0.050	
Satd. Flow (perm)	0	2787	5085	1583	93	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		330		123		
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	435	2250	163	98	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	435	2250	163	98	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2	1	1	2
Detector Template		Right	Thru	Right	Left	Thru
Leading Detector (ft)		20	100	20	20	100
Trailing Detector (ft)		0	0	0	0	0
Detector 1 Position(ft)		0	0	0	0	0
Detector 1 Size(ft)		20	6	20	20	6
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA	Perm	pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases				2	6	
Detector Phase		3	2	2	1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0	5.0	5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5	22.5	9.5	22.5
Total Split (s)		37.0	91.0	91.0	22.0	113.0
Total Split (%)		24.7%	60.7%	60.7%	14.7%	75.3%
Maximum Green (s)		32.5	86.5	86.5	17.5	108.5
Yellow Time (s)		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	Min	Min	None	None
Walk Time (s)			7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0		11.0
Pedestrian Calls (#/hr)			0	0		0
Act Effct Green (s)		10.6	75.9	75.9	88.8	88.8
Actuated g/C Ratio		0.10	0.70	0.70	0.82	0.82
v/c Ratio		0.76	0.63	0.14	0.48	0.19
Control Delay		23.0	10.3	2.3	22.9	2.4
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		23.0	10.3	2.3	22.9	2.4
LOS		C	B	A	C	A
Approach Delay	23.0		9.8			4.7
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 108.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 61.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

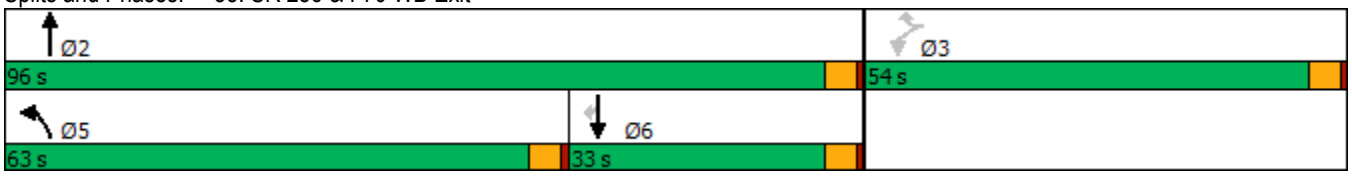


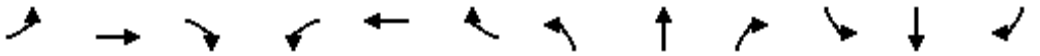
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Future Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.86	0.86
Frt						0.850					0.946	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	3539	0	0	4546	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	3539	0	0	4546	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						80					85	396
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	696	793
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	1093	396
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	63.0	96.0			33.0	33.0
Total Split (%)				36.0%		36.0%	42.0%	64.0%			22.0%	22.0%
Maximum Green (s)				49.5		49.5	58.5	91.5			28.5	28.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				17.5		17.5	58.6	91.6			28.5	28.5
Actuated g/C Ratio				0.15		0.15	0.50	0.78			0.24	0.24
v/c Ratio				0.71		0.43	0.84	0.44			0.94	0.63
Control Delay				62.7		23.6	31.8	5.4			56.6	8.8
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				62.7		23.6	31.8	5.4			56.6	8.8
LOS				E		C	C	A			E	A
Approach Delay					46.5			19.8			43.9	
Approach LOS					D			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 118.1			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 29.8		Intersection LOS: C	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



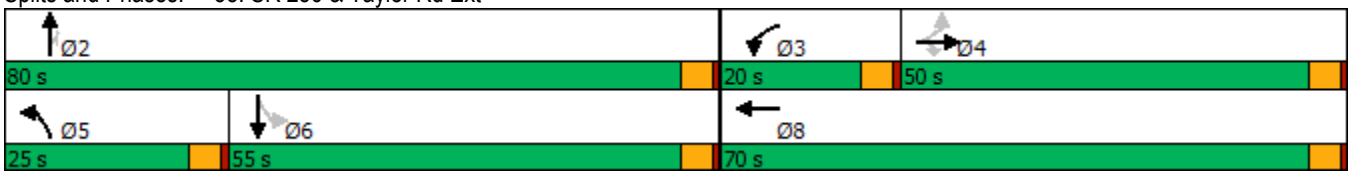


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Future Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.91	0.91
Frt			0.850		0.918				0.850		0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1710	0	3433	3539	1583	1770	5050	0
Flt Permitted	0.681			0.950			0.950			0.408		
Satd. Flow (perm)	1269	1863	2787	3433	1710	0	3433	3539	1583	760	5050	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		51				609		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	163	500	54	65	239	641	609	65	728	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	43	163	500	119	0	239	641	609	65	761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	22.5	22.5	
Total Split (s)	50.0	50.0	50.0	20.0	70.0		25.0	80.0	80.0	55.0	55.0	
Total Split (%)	33.3%	33.3%	33.3%	13.3%	46.7%		16.7%	53.3%	53.3%	36.7%	36.7%	
Maximum Green (s)	45.5	45.5	45.5	15.5	65.5		20.5	75.5	75.5	50.5	50.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0			0	0	0	0	
Act Effct Green (s)	7.4	7.4	7.4	15.7	27.6		10.8	34.2	34.2	18.9	18.9	
Actuated g/C Ratio	0.10	0.10	0.10	0.22	0.39		0.15	0.48	0.48	0.27	0.27	
v/c Ratio	0.17	0.22	0.37	0.66	0.17		0.46	0.38	0.56	0.32	0.56	
Control Delay	34.5	34.2	8.8	31.9	10.8		31.5	12.2	3.2	26.4	24.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	34.5	34.2	8.8	31.9	10.8		31.5	12.2	3.2	26.4	24.2	
LOS	C	C	A	C	B		C	B	A	C	C	
Approach Delay		16.1			27.8			11.6			24.4	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 70.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



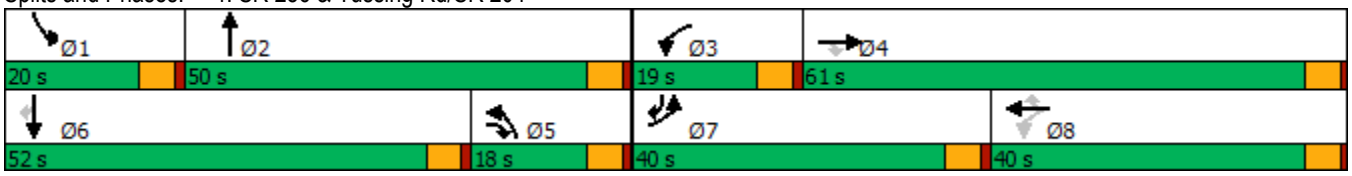
2028 SR 256 SOUTHBOUND LANE CLOSURE AM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Future Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5075	0	1770	5085	1583
Flt Permitted	0.950			0.660			0.950			0.950		
Satd. Flow (perm)	3433	1863	1583	1229	1863	2787	1770	5075	0	1770	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			390		2				250
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	152	174	65	152	598	98	1370	22	109	1000	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	152	174	65	152	598	98	1392	0	109	1000	250
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	40.0	61.0	18.0	19.0	40.0	40.0	18.0	50.0		20.0	52.0	40.0
Total Split (%)	26.7%	40.7%	12.0%	12.7%	26.7%	26.7%	12.0%	33.3%		13.3%	34.7%	26.7%
Maximum Green (s)	35.0	56.0	13.0	14.0	35.0	35.0	13.0	45.0		15.0	47.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	21.8	37.4	60.8	32.6	22.4	22.4	22.2	42.2		12.6	32.6	54.4
Actuated g/C Ratio	0.18	0.31	0.51	0.27	0.19	0.19	0.19	0.35		0.11	0.27	0.46
v/c Ratio	0.73	0.26	0.19	0.17	0.44	0.71	0.30	0.77		0.58	0.72	0.29
Control Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
LOS	D	C	A	C	D	C	D	D		E	D	A
Approach Delay		38.7			26.7			39.4			37.2	
Approach LOS		D			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 119.2			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 36.3		Intersection LOS: D	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204

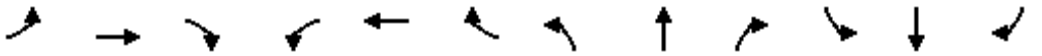


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	400	2070	150	90	710
Future Volume (vph)	0	400	2070	150	90	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.95
Frt		0.850	0.990			
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	6344	0	1770	3539
Flt Permitted					0.051	
Satd. Flow (perm)	0	2787	6344	0	95	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		330	17			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	435	2250	163	98	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	435	2413	0	98	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		37.0	91.0		22.0	113.0
Total Split (%)		24.7%	60.7%		14.7%	75.3%
Maximum Green (s)		32.5	86.5		17.5	108.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		10.5	73.8		86.7	86.7
Actuated g/C Ratio		0.10	0.69		0.81	0.81
v/c Ratio		0.76	0.55		0.48	0.27
Control Delay		22.4	8.9		21.8	2.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		22.4	8.9		21.8	2.8
LOS		C	A		C	A
Approach Delay	22.4		8.9			4.9
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 106.6			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 54.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

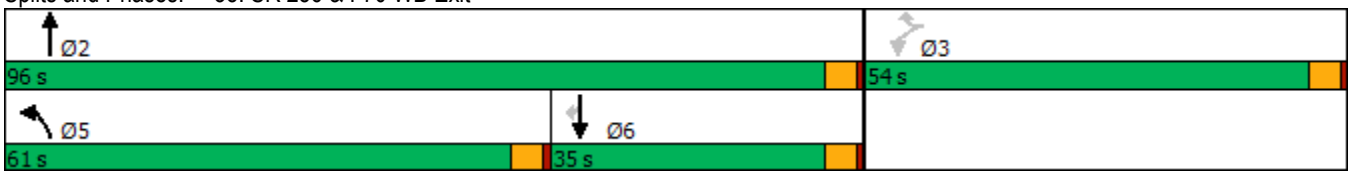


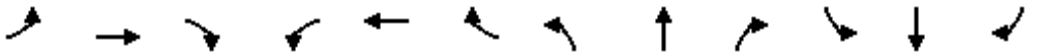
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Future Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	5085	0	0	3539	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	5085	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						80						513
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	696	793
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	696	793
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	61.0	96.0			35.0	35.0
Total Split (%)				36.0%		36.0%	40.7%	64.0%			23.3%	23.3%
Maximum Green (s)				49.5		49.5	56.5	91.5			30.5	30.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				17.5		17.5	56.6	91.6			30.5	30.5
Actuated g/C Ratio				0.15		0.15	0.48	0.78			0.26	0.26
v/c Ratio				0.71		0.43	0.87	0.30			0.76	1.01
Control Delay				62.7		23.6	34.9	4.4			47.4	49.6
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				62.7		23.6	34.9	4.4			47.4	49.6
LOS				E		C	C	A			D	D
Approach Delay					46.5			21.0			48.5	
Approach LOS					D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 118.1			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



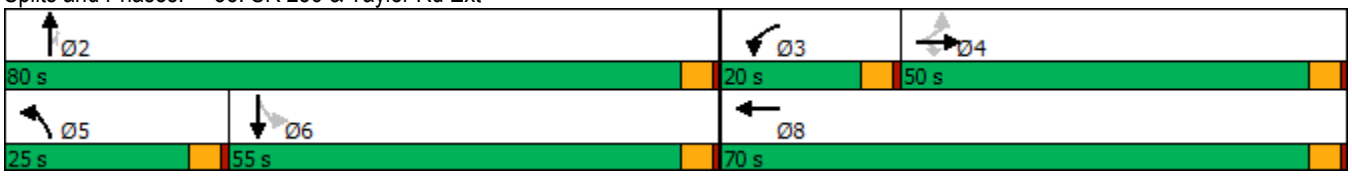


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Future Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.918				0.850		0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1710	0	3433	5085	1583	1770	5050	0
Flt Permitted	0.681			0.950			0.950			0.397		
Satd. Flow (perm)	1269	1863	2787	3433	1710	0	3433	5085	1583	740	5050	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		51				609		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	163	500	54	65	239	641	609	65	728	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	43	163	500	119	0	239	641	609	65	761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4						2	6		

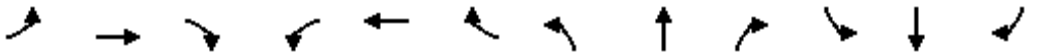
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	22.5	22.5	
Total Split (s)	50.0	50.0	50.0	20.0	70.0		25.0	80.0	80.0	55.0	55.0	
Total Split (%)	33.3%	33.3%	33.3%	13.3%	46.7%		16.7%	53.3%	53.3%	36.7%	36.7%	
Maximum Green (s)	45.5	45.5	45.5	15.5	65.5		20.5	75.5	75.5	50.5	50.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0			0	0	0	0	
Act Effct Green (s)	7.4	7.4	7.4	15.7	27.6		10.8	34.2	34.2	18.9	18.9	
Actuated g/C Ratio	0.10	0.10	0.10	0.22	0.39		0.15	0.48	0.48	0.27	0.27	
v/c Ratio	0.17	0.22	0.37	0.66	0.17		0.46	0.26	0.56	0.33	0.56	
Control Delay	34.5	34.2	8.8	31.9	10.8		31.5	11.0	3.2	26.8	24.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	34.5	34.2	8.8	31.9	10.8		31.5	11.0	3.2	26.8	24.2	
LOS	C	C	A	C	B		C	B	A	C	C	
Approach Delay		16.1			27.8			11.1			24.4	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 70.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



2028 SR 256 NB & SB LANE CLOSURE AM PEAK HOUR

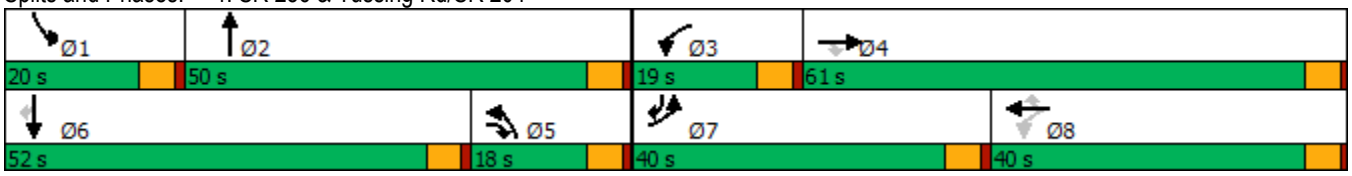


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Future Volume (vph)	420	140	160	60	140	550	90	1260	20	100	920	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5075	0	1770	5085	1583
Flt Permitted	0.950			0.660			0.950			0.950		
Satd. Flow (perm)	3433	1863	1583	1229	1863	2787	1770	5075	0	1770	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			390		2				250
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	152	174	65	152	598	98	1370	22	109	1000	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	152	174	65	152	598	98	1392	0	109	1000	250
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	40.0	61.0	18.0	19.0	40.0	40.0	18.0	50.0		20.0	52.0	40.0
Total Split (%)	26.7%	40.7%	12.0%	12.7%	26.7%	26.7%	12.0%	33.3%		13.3%	34.7%	26.7%
Maximum Green (s)	35.0	56.0	13.0	14.0	35.0	35.0	13.0	45.0		15.0	47.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	21.8	37.4	60.8	32.6	22.4	22.4	22.2	42.2		12.6	32.6	54.4
Actuated g/C Ratio	0.18	0.31	0.51	0.27	0.19	0.19	0.19	0.35		0.11	0.27	0.46
v/c Ratio	0.73	0.26	0.19	0.17	0.44	0.71	0.30	0.77		0.58	0.72	0.29
Control Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.1	34.0	2.2	24.8	49.2	21.2	49.0	38.8		66.6	42.8	1.9
LOS	D	C	A	C	D	C	D	D		E	D	A
Approach Delay		38.7			26.7			39.4			37.2	
Approach LOS		D			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 119.2			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 36.3		Intersection LOS: D	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204

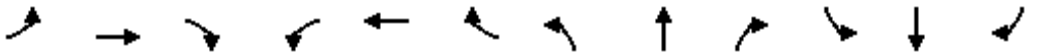


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	400	2070	150	90	710
Future Volume (vph)	0	400	2070	150	90	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.91	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	5085	1583	1770	3539
Flt Permitted					0.050	
Satd. Flow (perm)	0	2787	5085	1583	93	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		330		123		
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	435	2250	163	98	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	435	2250	163	98	772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2	1	1	2
Detector Template		Right	Thru	Right	Left	Thru
Leading Detector (ft)		20	100	20	20	100
Trailing Detector (ft)		0	0	0	0	0
Detector 1 Position(ft)		0	0	0	0	0
Detector 1 Size(ft)		20	6	20	20	6
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA	Perm	pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases				2	6	
Detector Phase		3	2	2	1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0	5.0	5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5	22.5	9.5	22.5
Total Split (s)		37.0	91.0	91.0	22.0	113.0
Total Split (%)		24.7%	60.7%	60.7%	14.7%	75.3%
Maximum Green (s)		32.5	86.5	86.5	17.5	108.5
Yellow Time (s)		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	Min	Min	None	None
Walk Time (s)			7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0		11.0
Pedestrian Calls (#/hr)			0	0		0
Act Effct Green (s)		10.6	75.9	75.9	88.8	88.8
Actuated g/C Ratio		0.10	0.70	0.70	0.82	0.82
v/c Ratio		0.76	0.63	0.14	0.48	0.27
Control Delay		23.0	10.3	2.3	22.9	2.7
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		23.0	10.3	2.3	22.9	2.7
LOS		C	B	A	C	A
Approach Delay	23.0		9.8			5.0
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 108.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 61.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

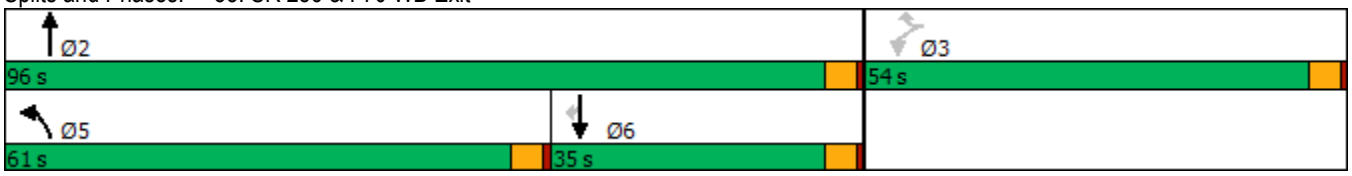


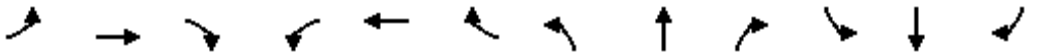
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Future Volume (vph)	0	0	0	170	0	120	1310	1100	0	0	640	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	3539	0	0	3539	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						80						513
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	696	793
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	185	0	130	1424	1196	0	0	696	793
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				3		3						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				3		3	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				9.5		9.5	9.5	22.5			22.5	22.5
Total Split (s)				54.0		54.0	61.0	96.0			35.0	35.0
Total Split (%)				36.0%		36.0%	40.7%	64.0%			23.3%	23.3%
Maximum Green (s)				49.5		49.5	56.5	91.5			30.5	30.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)								7.0			7.0	7.0
Flash Dont Walk (s)								11.0			11.0	11.0
Pedestrian Calls (#/hr)								0			0	0
Act Effct Green (s)				17.5		17.5	56.6	91.6			30.5	30.5
Actuated g/C Ratio				0.15		0.15	0.48	0.78			0.26	0.26
v/c Ratio				0.71		0.43	0.87	0.44			0.76	1.01
Control Delay				62.7		23.6	34.9	5.4			47.4	49.6
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				62.7		23.6	34.9	5.4			47.4	49.6
LOS				E		C	C	A			D	D
Approach Delay					46.5			21.5			48.5	
Approach LOS					D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 118.1			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 32.4		Intersection LOS: C	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit



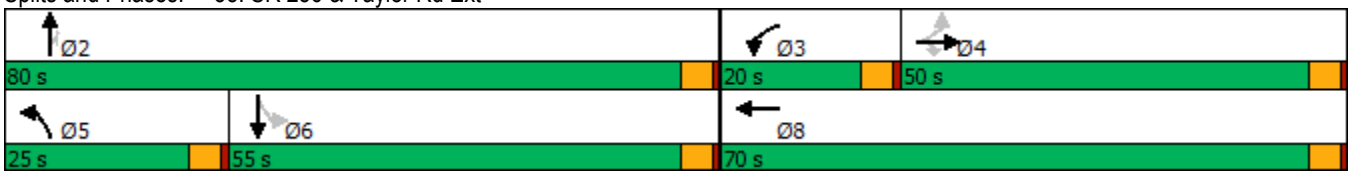


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Future Volume (vph)	20	40	150	460	50	60	220	590	560	60	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.91	0.91
Frt			0.850		0.918				0.850		0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1710	0	3433	3539	1583	1770	5050	0
Flt Permitted	0.681			0.950			0.950			0.408		
Satd. Flow (perm)	1269	1863	2787	3433	1710	0	3433	3539	1583	760	5050	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		51				609		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	163	500	54	65	239	641	609	65	728	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	43	163	500	119	0	239	641	609	65	761	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	22.5	22.5	
Total Split (s)	50.0	50.0	50.0	20.0	70.0		25.0	80.0	80.0	55.0	55.0	
Total Split (%)	33.3%	33.3%	33.3%	13.3%	46.7%		16.7%	53.3%	53.3%	36.7%	36.7%	
Maximum Green (s)	45.5	45.5	45.5	15.5	65.5		20.5	75.5	75.5	50.5	50.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0			11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0			0	0	0	0	
Act Effct Green (s)	7.4	7.4	7.4	15.7	27.6		10.8	34.2	34.2	18.9	18.9	
Actuated g/C Ratio	0.10	0.10	0.10	0.22	0.39		0.15	0.48	0.48	0.27	0.27	
v/c Ratio	0.17	0.22	0.37	0.66	0.17		0.46	0.38	0.56	0.32	0.56	
Control Delay	34.5	34.2	8.8	31.9	10.8		31.5	12.2	3.2	26.4	24.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	34.5	34.2	8.8	31.9	10.8		31.5	12.2	3.2	26.4	24.2	
LOS	C	C	A	C	B		C	B	A	C	C	
Approach Delay		16.1			27.8			11.6			24.4	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 70.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



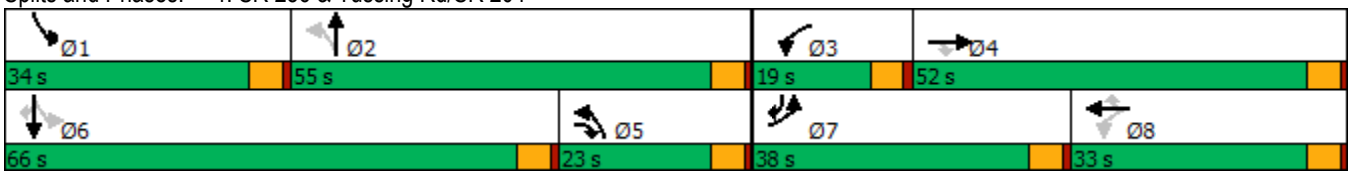
2028 SR 256 NORTHBOUND LANE CLOSURE PM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Future Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5065	0	1770	5085	1583
Flt Permitted	0.950			0.610			0.106			0.106		
Satd. Flow (perm)	3433	1863	1583	1136	1863	2787	197	5065	0	197	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			540		3				107
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	239	293	109	326	587	217	1413	43	272	2054	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	543	239	293	109	326	587	217	1456	0	272	2054	511
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	38.0	52.0	23.0	19.0	33.0	33.0	23.0	55.0		34.0	66.0	38.0
Total Split (%)	23.8%	32.5%	14.4%	11.9%	20.6%	20.6%	14.4%	34.4%		21.3%	41.3%	23.8%
Maximum Green (s)	33.0	47.0	18.0	14.0	28.0	28.0	18.0	50.0		29.0	61.0	33.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	29.6	45.9	62.5	39.8	28.1	28.1	54.5	54.5		61.1	61.1	90.8
Actuated g/C Ratio	0.19	0.30	0.40	0.26	0.18	0.18	0.35	0.35		0.39	0.39	0.58
v/c Ratio	0.83	0.43	0.42	0.32	0.97	0.62	0.92	0.82		0.87	1.03	0.53
Control Delay	72.3	47.6	14.7	34.4	104.6	10.0	102.9	51.5		70.6	73.3	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	72.3	47.6	14.7	34.4	104.6	10.0	102.9	51.5		70.6	73.3	9.8
LOS	E	D	B	C	F	A	F	D		E	E	A
Approach Delay		51.1			42.8			58.1			61.6	
Approach LOS		D			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 155.4			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 56.1		Intersection LOS: E	
Intersection Capacity Utilization 95.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204

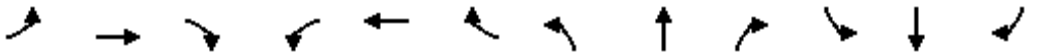


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	670	2060	210	180	1450
Future Volume (vph)	0	670	2060	210	180	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.91	1.00	1.00	0.91
Frt		0.850		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	5085	1583	1770	5085
Flt Permitted					0.049	
Satd. Flow (perm)	0	2787	5085	1583	91	5085
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		515		161		
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	728	2239	228	196	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	728	2239	228	196	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2	1	1	2
Detector Template		Right	Thru	Right	Left	Thru
Leading Detector (ft)		20	100	20	20	100
Trailing Detector (ft)		0	0	0	0	0
Detector 1 Position(ft)		0	0	0	0	0
Detector 1 Size(ft)		20	6	20	20	6
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA	Perm	pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases				2	6	
Detector Phase		3	2	2	1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0	5.0	5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5	22.5	9.5	22.5
Total Split (s)		30.0	86.0	86.0	34.0	120.0
Total Split (%)		20.0%	57.3%	57.3%	22.7%	80.0%
Maximum Green (s)		25.5	81.5	81.5	29.5	115.5
Yellow Time (s)		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	Min	Min	None	None
Walk Time (s)			7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0		11.0
Pedestrian Calls (#/hr)			0	0		0
Act Effct Green (s)		16.7	76.9	76.9	96.4	96.4
Actuated g/C Ratio		0.14	0.63	0.63	0.79	0.79
v/c Ratio		0.88	0.70	0.22	0.71	0.39
Control Delay		28.8	18.3	4.6	46.1	4.7
Queue Delay		0.0	0.1	0.0	0.0	0.0
Total Delay		28.8	18.4	4.6	46.1	4.7
LOS		C	B	A	D	A
Approach Delay	28.8		17.1			9.3
Approach LOS	C		B			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 122.5			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

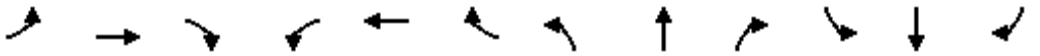


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Future Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.86	0.86
Frt						0.850					0.985	0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	3539	0	0	4734	1362
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	3539	0	0	4734	1362
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44					12	381
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1576	674
Shared Lane Traffic (%)												25%
Lane Group Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1745	505
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				47.0		47.0	52.0	103.0			51.0	51.0
Total Split (%)				31.3%		31.3%	34.7%	68.7%			34.0%	34.0%
Maximum Green (s)				42.5		42.5	47.5	98.5			46.5	46.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)				20.0		20.0	47.6	98.7			46.6	46.6
Actuated g/C Ratio				0.16		0.16	0.37	0.77			0.36	0.36
v/c Ratio				0.75		0.57	0.88	0.70			1.01	0.68
Control Delay				68.1		43.9	46.8	9.5			63.5	14.0
Queue Delay				0.0		0.0	0.0	0.5			0.0	0.0
Total Delay				68.1		43.9	46.8	10.0			63.5	14.0
LOS				E		D	D	B			E	B
Approach Delay					57.5			23.6			52.4	
Approach LOS					E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 127.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 37.3		Intersection LOS: D	
Intersection Capacity Utilization 83.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

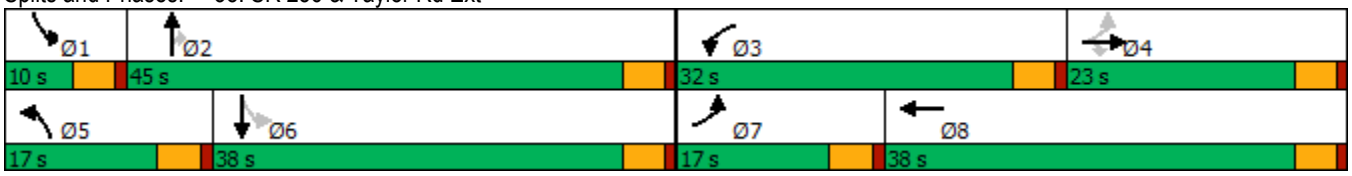


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Future Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.91	0.91
Frt			0.850		0.938				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1747	0	3433	3539	1583	1770	5065	0
Flt Permitted	0.610			0.950			0.950			0.170		
Satd. Flow (perm)	1136	1863	2787	3433	1747	0	3433	3539	1583	317	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256		33				857		4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	54	391	707	141	98	293	978	946	98	1228	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	54	391	707	239	0	293	978	946	98	1261	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	17.0	23.0	23.0	32.0	38.0		17.0	45.0	45.0	10.0	38.0	
Total Split (%)	15.5%	20.9%	20.9%	29.1%	34.5%		15.5%	40.9%	40.9%	9.1%	34.5%	
Maximum Green (s)	12.5	18.5	18.5	27.5	33.5		12.5	40.5	40.5	5.5	33.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	18.1	11.1	11.1	24.1	33.0		11.9	38.6	38.6	37.9	32.3	
Actuated g/C Ratio	0.19	0.11	0.11	0.25	0.34		0.12	0.40	0.40	0.39	0.33	
v/c Ratio	0.17	0.26	0.72	0.83	0.39		0.70	0.70	0.83	0.48	0.75	
Control Delay	21.6	43.7	23.1	45.5	24.8		52.9	29.0	11.0	24.6	33.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.6	43.7	23.1	45.5	24.8		52.9	29.0	11.0	24.6	33.5	
LOS	C	D	C	D	C		D	C	B	C	C	
Approach Delay		25.2			40.3			24.5			32.9	
Approach LOS		C			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 97.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 29.8		Intersection LOS: C	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



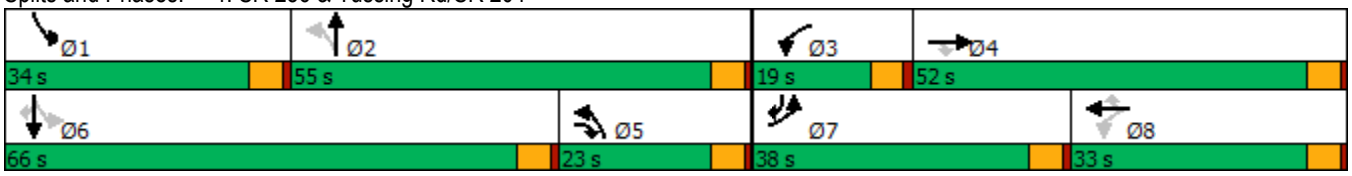
2028 SR 256 SOUTHBOUND LANE CLOSURE PM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Future Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5065	0	1770	5085	1583
Flt Permitted	0.950			0.610			0.106			0.106		
Satd. Flow (perm)	3433	1863	1583	1136	1863	2787	197	5065	0	197	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			540		3				107
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	239	293	109	326	587	217	1413	43	272	2054	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	543	239	293	109	326	587	217	1456	0	272	2054	511
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	38.0	52.0	23.0	19.0	33.0	33.0	23.0	55.0		34.0	66.0	38.0
Total Split (%)	23.8%	32.5%	14.4%	11.9%	20.6%	20.6%	14.4%	34.4%		21.3%	41.3%	23.8%
Maximum Green (s)	33.0	47.0	18.0	14.0	28.0	28.0	18.0	50.0		29.0	61.0	33.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	29.6	45.9	62.5	39.8	28.1	28.1	54.5	54.5		61.1	61.1	90.8
Actuated g/C Ratio	0.19	0.30	0.40	0.26	0.18	0.18	0.35	0.35		0.39	0.39	0.58
v/c Ratio	0.83	0.43	0.42	0.32	0.97	0.62	0.92	0.82		0.87	1.03	0.53
Control Delay	72.3	47.6	14.7	34.4	104.6	10.0	102.9	51.5		70.6	73.3	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	72.3	47.6	14.7	34.4	104.6	10.0	102.9	51.5		70.6	73.3	9.8
LOS	E	D	B	C	F	A	F	D		E	E	A
Approach Delay		51.1			42.8			58.1			61.6	
Approach LOS		D			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 155.4			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 56.1		Intersection LOS: E	
Intersection Capacity Utilization 95.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204

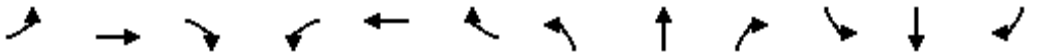


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	670	2060	210	180	1450
Future Volume (vph)	0	670	2060	210	180	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.86	0.86	1.00	0.95
Frt		0.850	0.986			
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	6318	0	1770	3539
Flt Permitted					0.053	
Satd. Flow (perm)	0	2787	6318	0	99	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		497	22			
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	728	2239	228	196	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	728	2467	0	196	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2		1	2
Detector Template		Right	Thru		Left	Thru
Leading Detector (ft)		20	100		20	100
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		20	6		20	6
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA		pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases					6	
Detector Phase		3	2		1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0		5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5		9.5	22.5
Total Split (s)		42.0	78.0		30.0	108.0
Total Split (%)		28.0%	52.0%		20.0%	72.0%
Maximum Green (s)		37.5	73.5		25.5	103.5
Yellow Time (s)		3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		None	Min		None	None
Walk Time (s)			7.0			7.0
Flash Dont Walk (s)			11.0			11.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)		17.9	71.3		90.0	90.0
Actuated g/C Ratio		0.15	0.61		0.77	0.77
v/c Ratio		0.86	0.64		0.71	0.58
Control Delay		26.4	17.4		42.8	7.5
Queue Delay		0.0	0.0		0.0	0.1
Total Delay		26.4	17.4		42.8	7.6
LOS		C	B		D	A
Approach Delay	26.4		17.4			11.5
Approach LOS	C		B			B

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 117.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

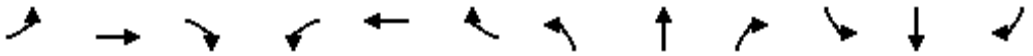


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Future Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	5085	0	0	3539	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	5085	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44						356
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1576	674
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1576	674
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				35.0		35.0	51.0	115.0			64.0	64.0
Total Split (%)				23.3%		23.3%	34.0%	76.7%			42.7%	42.7%
Maximum Green (s)				30.5		30.5	46.5	110.5			59.5	59.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)				21.6		21.6	46.6	110.6			59.6	59.6
Actuated g/C Ratio				0.15		0.15	0.33	0.78			0.42	0.42
v/c Ratio				0.76		0.58	0.99	0.48			1.06	0.77
Control Delay				75.7		48.5	71.7	6.2			79.3	23.2
Queue Delay				0.0		0.0	0.0	0.0			0.0	0.0
Total Delay				75.7		48.5	71.7	6.2			79.3	23.2
LOS				E		D	E	A			E	C
Approach Delay					63.7			30.5			62.5	
Approach LOS					E			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 141.3			
Natural Cycle: 140			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 45.4		Intersection LOS: D	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

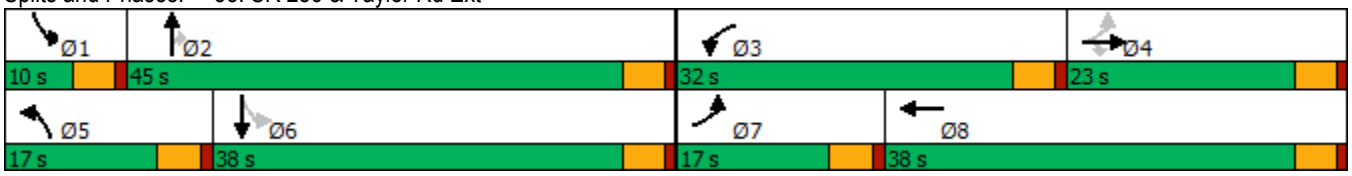


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Future Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.91	1.00	1.00	0.91	0.91
Frt			0.850		0.938				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1747	0	3433	5085	1583	1770	5065	0
Flt Permitted	0.610			0.950			0.950			0.242		
Satd. Flow (perm)	1136	1863	2787	3433	1747	0	3433	5085	1583	451	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256		33				866		4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	54	391	707	141	98	293	978	946	98	1228	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	54	391	707	239	0	293	978	946	98	1261	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	17.0	23.0	23.0	32.0	38.0		17.0	45.0	45.0	10.0	38.0	
Total Split (%)	15.5%	20.9%	20.9%	29.1%	34.5%		15.5%	40.9%	40.9%	9.1%	34.5%	
Maximum Green (s)	12.5	18.5	18.5	27.5	33.5		12.5	40.5	40.5	5.5	33.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	18.1	11.1	11.1	24.1	33.0		11.9	37.6	37.6	36.9	31.3	
Actuated g/C Ratio	0.19	0.11	0.11	0.25	0.34		0.12	0.39	0.39	0.38	0.32	
v/c Ratio	0.17	0.25	0.72	0.83	0.39		0.69	0.49	0.83	0.40	0.77	
Control Delay	21.5	43.5	22.9	44.6	24.6		52.1	24.2	10.7	21.2	34.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.5	43.5	22.9	44.6	24.6		52.1	24.2	10.7	21.2	34.1	
LOS	C	D	C	D	C		D	C	B	C	C	
Approach Delay		25.0			39.6			22.1			33.2	
Approach LOS		C			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 96.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 28.7		Intersection LOS: C	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



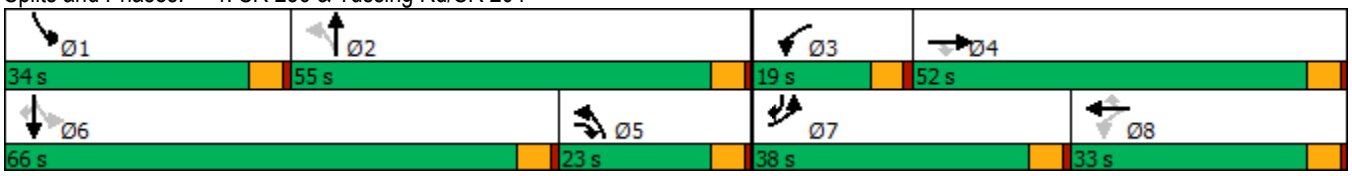
2028 SR 256 NB & SB LANE CLOSURE PM PEAK HOUR

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Future Volume (vph)	500	220	270	100	300	540	200	1300	40	250	1890	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		370	485		310	450		0	0		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	0.91	1.00
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1863	2787	1770	5065	0	1770	5085	1583
Flt Permitted	0.950			0.610			0.106			0.106		
Satd. Flow (perm)	3433	1863	1583	1136	1863	2787	197	5065	0	197	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			540		3				107
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		723			833			2552			974	
Travel Time (s)		16.4			18.9			58.0			22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	239	293	109	326	587	217	1413	43	272	2054	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	543	239	293	109	326	587	217	1456	0	272	2054	511
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	5	3	8	8	5	2		1	6	7
Switch Phase												
Minimum Initial (s)	10.0	20.0	10.0	10.0	20.0	20.0	10.0	35.0		10.0	20.0	10.0
Minimum Split (s)	39.5	28.0	18.0	18.0	28.0	28.0	18.0	43.0		18.0	39.5	39.5
Total Split (s)	38.0	52.0	23.0	19.0	33.0	33.0	23.0	55.0		34.0	66.0	38.0
Total Split (%)	23.8%	32.5%	14.4%	11.9%	20.6%	20.6%	14.4%	34.4%		21.3%	41.3%	23.8%
Maximum Green (s)	33.0	47.0	18.0	14.0	28.0	28.0	18.0	50.0		29.0	61.0	33.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	None
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	29.6	45.9	62.5	39.8	28.1	28.1	54.5	54.5		61.1	61.1	90.8
Actuated g/C Ratio	0.19	0.30	0.40	0.26	0.18	0.18	0.35	0.35		0.39	0.39	0.58
v/c Ratio	0.83	0.43	0.42	0.32	0.97	0.62	0.92	0.82		0.87	1.03	0.53
Control Delay	72.3	47.6	14.7	34.4	104.6	10.0	102.9	51.5		70.6	73.3	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	72.3	47.6	14.7	34.4	104.6	10.0	102.9	51.5		70.6	73.3	9.8
LOS	E	D	B	C	F	A	F	D		E	E	A
Approach Delay		51.1			42.8			58.1			61.6	
Approach LOS		D			D			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 155.4			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 56.1		Intersection LOS: E	
Intersection Capacity Utilization 95.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: SR 256 & Tussing Rd/SR 204

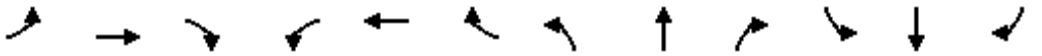


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	670	2060	210	180	1450
Future Volume (vph)	0	670	2060	210	180	1450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.91	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	2787	5085	1583	1770	3539
Flt Permitted					0.053	
Satd. Flow (perm)	0	2787	5085	1583	99	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		497		144		
Link Speed (mph)	30		30			30
Link Distance (ft)	453		974			917
Travel Time (s)	10.3		22.1			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	728	2239	228	196	1576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	728	2239	228	196	1576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors		1	2	1	1	2
Detector Template		Right	Thru	Right	Left	Thru
Leading Detector (ft)		20	100	20	20	100
Trailing Detector (ft)		0	0	0	0	0
Detector 1 Position(ft)		0	0	0	0	0
Detector 1 Size(ft)		20	6	20	20	6
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type		Prot	NA	Perm	pm+pt	NA
Protected Phases		3	2		1	6
Permitted Phases				2	6	
Detector Phase		3	2	2	1	6
Switch Phase						
Minimum Initial (s)		5.0	5.0	5.0	5.0	5.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)		9.5	22.5	22.5	9.5	22.5
Total Split (s)		42.0	78.0	78.0	30.0	108.0
Total Split (%)		28.0%	52.0%	52.0%	20.0%	72.0%
Maximum Green (s)		37.5	73.5	73.5	25.5	103.5
Yellow Time (s)		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	Min	Min	None	None
Walk Time (s)			7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0		11.0
Pedestrian Calls (#/hr)			0	0		0
Act Effct Green (s)		17.9	71.3	71.3	90.1	90.1
Actuated g/C Ratio		0.15	0.61	0.61	0.77	0.77
v/c Ratio		0.86	0.72	0.22	0.71	0.58
Control Delay		26.4	20.0	5.9	42.9	7.5
Queue Delay		0.0	0.0	0.0	0.0	0.1
Total Delay		26.4	20.0	5.9	42.9	7.6
LOS		C	B	A	D	A
Approach Delay	26.4		18.7			11.5
Approach LOS	C		B			B

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 117.2			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 34: SR 256 & I-70 EB Exit

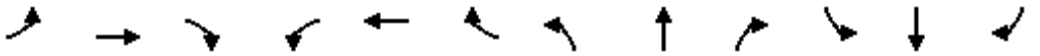


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Future Volume (vph)	0	0	0	190	0	150	1030	1750	0	0	1450	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		350	0		0	0		0
Storage Lanes	0		0	1		1	2		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1770	0	1583	3433	3539	0	0	3539	1583
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	0	0	1770	0	1583	3433	3539	0	0	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						44						356
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			912			917			928	
Travel Time (s)		7.8			20.7			20.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1576	674
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	207	0	163	1120	1902	0	0	1576	674
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1		1	1	2			2	1
Detector Template				Left		Right	Left	Thru			Thru	Right
Leading Detector (ft)				20		20	20	100			100	20
Trailing Detector (ft)				0		0	0	0			0	0
Detector 1 Position(ft)				0		0	0	0			0	0
Detector 1 Size(ft)				20		20	20	6			6	20
Detector 1 Type				Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0		0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type				Perm		Perm	Prot	NA			NA	Perm
Protected Phases							5	2			6	
Permitted Phases				8		8						6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				8		8	5	2			6	6
Switch Phase												
Minimum Initial (s)				5.0		5.0	5.0	5.0			5.0	5.0
Minimum Split (s)				22.5		22.5	9.5	22.5			22.5	22.5
Total Split (s)				35.0		35.0	51.0	115.0			64.0	64.0
Total Split (%)				23.3%		23.3%	34.0%	76.7%			42.7%	42.7%
Maximum Green (s)				30.5		30.5	46.5	110.5			59.5	59.5
Yellow Time (s)				3.5		3.5	3.5	3.5			3.5	3.5
All-Red Time (s)				1.0		1.0	1.0	1.0			1.0	1.0
Lost Time Adjust (s)				0.0		0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.5		4.5	4.5	4.5			4.5	4.5
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				3.0		3.0	3.0	3.0			3.0	3.0
Recall Mode				None		None	None	Min			None	None
Walk Time (s)				7.0		7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0		11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0		0		0			0	0
Act Effct Green (s)				21.6		21.6	46.6	110.6			59.6	59.6
Actuated g/C Ratio				0.15		0.15	0.33	0.78			0.42	0.42
v/c Ratio				0.76		0.58	0.99	0.69			1.06	0.77
Control Delay				75.7		48.5	71.7	9.5			79.3	23.2
Queue Delay				0.0		0.0	0.0	0.7			0.0	0.0
Total Delay				75.7		48.5	71.7	10.2			79.3	23.2
LOS				E		D	E	B			E	C
Approach Delay					63.7			33.0			62.5	
Approach LOS					E			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 141.3			
Natural Cycle: 140			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 46.8		Intersection LOS: D	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 35: SR 256 & I-70 WB Exit

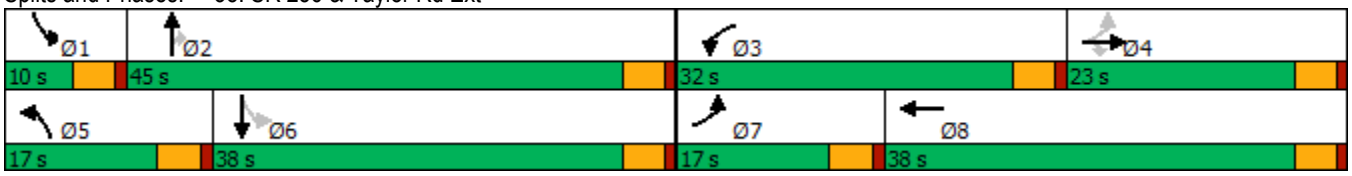


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Future Volume (vph)	40	50	360	650	130	90	270	900	870	90	1130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	400		0	0		0	0		0
Storage Lanes	1		2	1		0	2		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.91	0.91
Frt			0.850		0.938				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1747	0	3433	3539	1583	1770	5065	0
Flt Permitted	0.610			0.950			0.950			0.170		
Satd. Flow (perm)	1136	1863	2787	3433	1747	0	3433	3539	1583	317	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256		33				857		4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			2962			928			728	
Travel Time (s)		9.6			67.3			21.1			16.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	54	391	707	141	98	293	978	946	98	1228	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	54	391	707	239	0	293	978	946	98	1261	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4						2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		9.5	22.5	22.5	9.5	22.5	
Total Split (s)	17.0	23.0	23.0	32.0	38.0		17.0	45.0	45.0	10.0	38.0	
Total Split (%)	15.5%	20.9%	20.9%	29.1%	34.5%		15.5%	40.9%	40.9%	9.1%	34.5%	
Maximum Green (s)	12.5	18.5	18.5	27.5	33.5		12.5	40.5	40.5	5.5	33.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	18.1	11.1	11.1	24.1	33.0		11.9	38.6	38.6	37.9	32.3	
Actuated g/C Ratio	0.19	0.11	0.11	0.25	0.34		0.12	0.40	0.40	0.39	0.33	
v/c Ratio	0.17	0.26	0.72	0.83	0.39		0.70	0.70	0.83	0.48	0.75	
Control Delay	21.6	43.7	23.1	45.5	24.8		52.9	29.0	11.0	24.6	33.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.6	43.7	23.1	45.5	24.8		52.9	29.0	11.0	24.6	33.5	
LOS	C	D	C	D	C		D	C	B	C	C	
Approach Delay		25.2			40.3			24.5			32.9	
Approach LOS		C			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 97.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 29.8		Intersection LOS: C	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 38: SR 256 & Taylor Rd Ext



Appendix F – Preliminary Drainage Calculations

CARPENTER MARTY transportation

FAR EAST FREEWAY
FAI/LIC-70-0.00/0.00

OHIO DEPARTMENT OF TRANSPORTATION – DISTRICT 5

FAIRFIELD COUNTY

FRANKLIN COUNTY

LICKING COUNTY

DRAINAGE REPORT

06/23/2023 – AER Submission

10816 Millington Court
Blue Ash OH, 45242
513.734.8542
www.cmtran.com

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I. Project Narrative

A. Project Description

This project consists of improvements on Interstate-70 and Taylor Road in Franklin, Licking, and Fairfield Counties. The improvements include widening of the pavement to the outside, the addition of collector roads with concrete barriers in both directions between State Route 256 and Taylor Road, mill-and-overlay of existing pavement, mechanically stabilized earth (MSE) walls, bridge replacements, Taylor Road extension and new bridge construction, curb and gutter, new sidewalks along Taylor Road, as well as a new closed system storm sewer, extension or replacement of existing culverts, and two detention basins. Additional items including pavement markings and signing, lighting, grading, and other miscellaneous items are also included in the improvement design.

B. Existing Conditions

The existing conditions of I-70 include six lanes with paved shoulders, median and roadside ditches, culverts, and minimal closed storm sewer used to outlet water from the ditches. The existing conditions of Taylor Road include two sections: one north and one south of I-70. The section north of I-70 has two lanes with graded shoulders and a culvert. The section south of I-70 has two lanes with a concrete median that turns into a left turn lane. The southern portion of Taylor Road has curbs and existing inlets. Currently only eastbound I-70 can exit onto Taylor Road and there is no entrance ramp to I-70 from Taylor Road. The majority of storm runoff drains to Blacklick Creek through the tributaries within the project area.

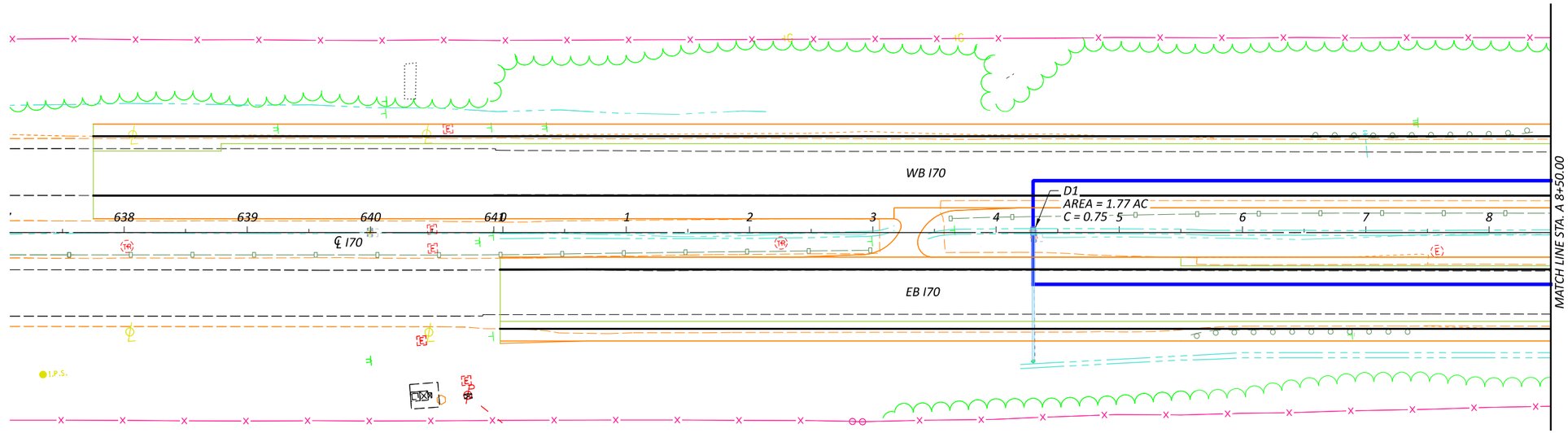
C. Proposed Design

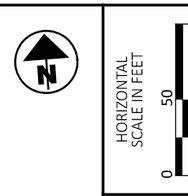
I-70 will be widened to the outside with the addition of collector roads between SR256 and Taylor Road. Taylor Road will be extended over I-70 with the new construction of a bridge, re-alignment, and re-grading of the existing road. The proposed stormwater management system includes closed storm sewer systems, curb inlets, concrete barrier inlets, median and roadside ditches, extension or replacement of existing culverts, and two detention basins. There are 30 runs of proposed storm sewer that outlet to numerous different locations that will ultimately drain to Blacklick Creek.

The project will require 32.18 acres of water quality and quantity treatment. Two proposed detention basins will provide the required water quality and quantity treatment for the project. One will be in the infield of the entrance ramp from SR256 to eastbound I-70 and one will be in the infield of the exit ramp to Taylor Road from eastbound I-70. The detention basins will treat a total of 40.67 acres, 34.73 acres of that is within permanent ODOT right-of-way.

II. Drainage Map

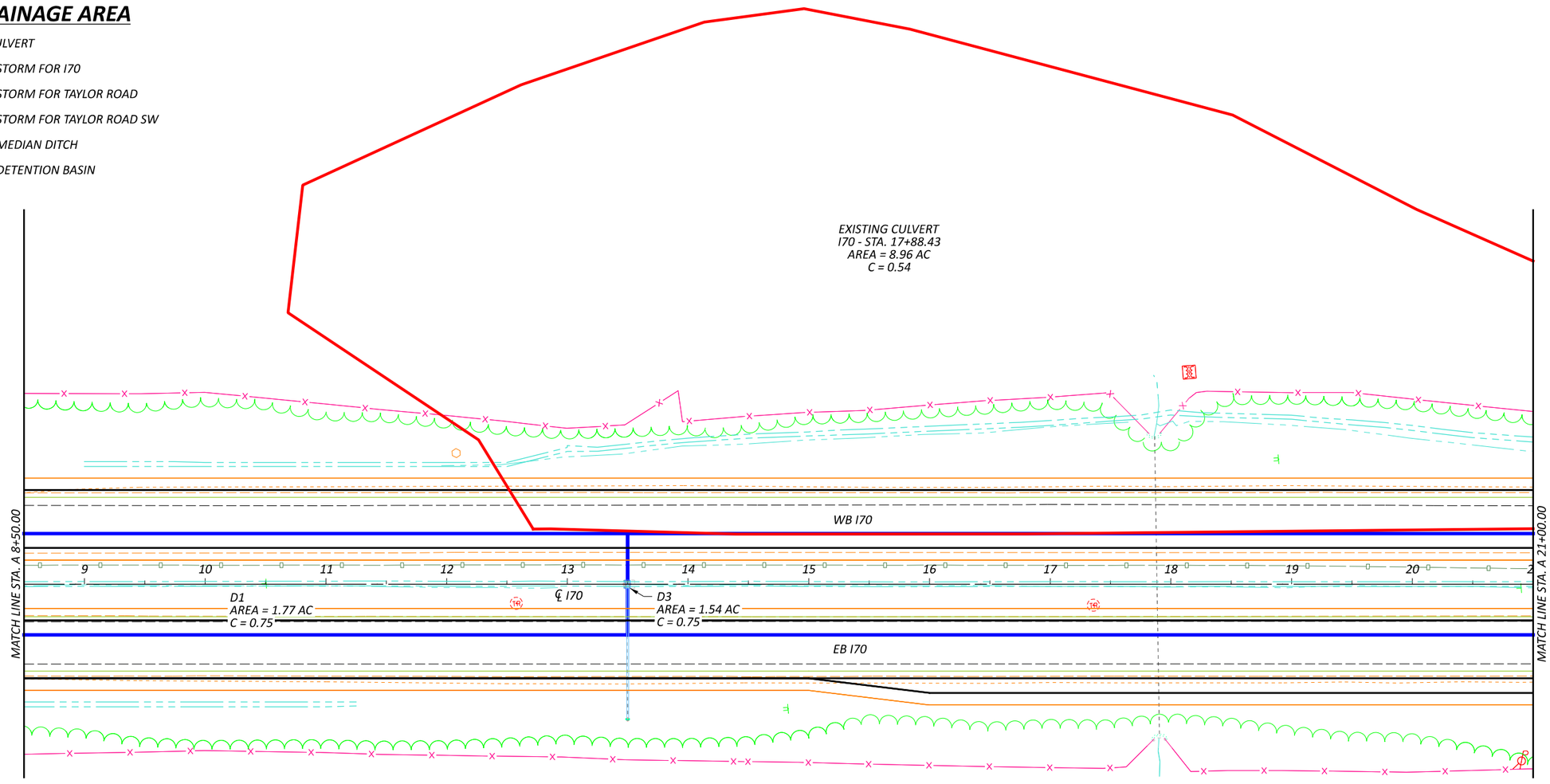
The drainage maps show the existing drainage system including existing culverts and storm sewers, as well as the preliminary layout of the proposed storm sewer system and proposed detention basins. The drainage areas were delineated from a combination of proposed work and existing terrain. Each drainage area has a label with the total acreage, the runoff coefficient, and drainage structure the area drains to in the proposed system. The drainage areas were used in all the drainage calculations including median ditch analysis, inlet spacing, storm sewer design, existing culvert analysis, and BMPs considerations.





LEGEND - DRAINAGE AREA

- EXISTING CULVERT
- PROPOSED STORM FOR I70
- PROPOSED STORM FOR TAYLOR ROAD
- PROPOSED STORM FOR TAYLOR ROAD SW
- PROPOSED MEDIAN DITCH
- PROPOSED DETENTION BASIN



DRAINAGE MAP
I70 - STA. 637+00.00 TO STA. A 21+00.00

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 06/02/23
PROJECT ID	96808
SHEET	1
TOTAL	11

FAI/LIC-70-0.00

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HORIZONTAL SCALE IN FEET
0 25 50 100

DRAINAGE MAP
I70 - STA. A 21+00.00 TO STA. A 46+00.00

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 06/02/23
PROJECT ID	96808
SHEET	2
TOTAL	11

FAI/LIC-70-0.00

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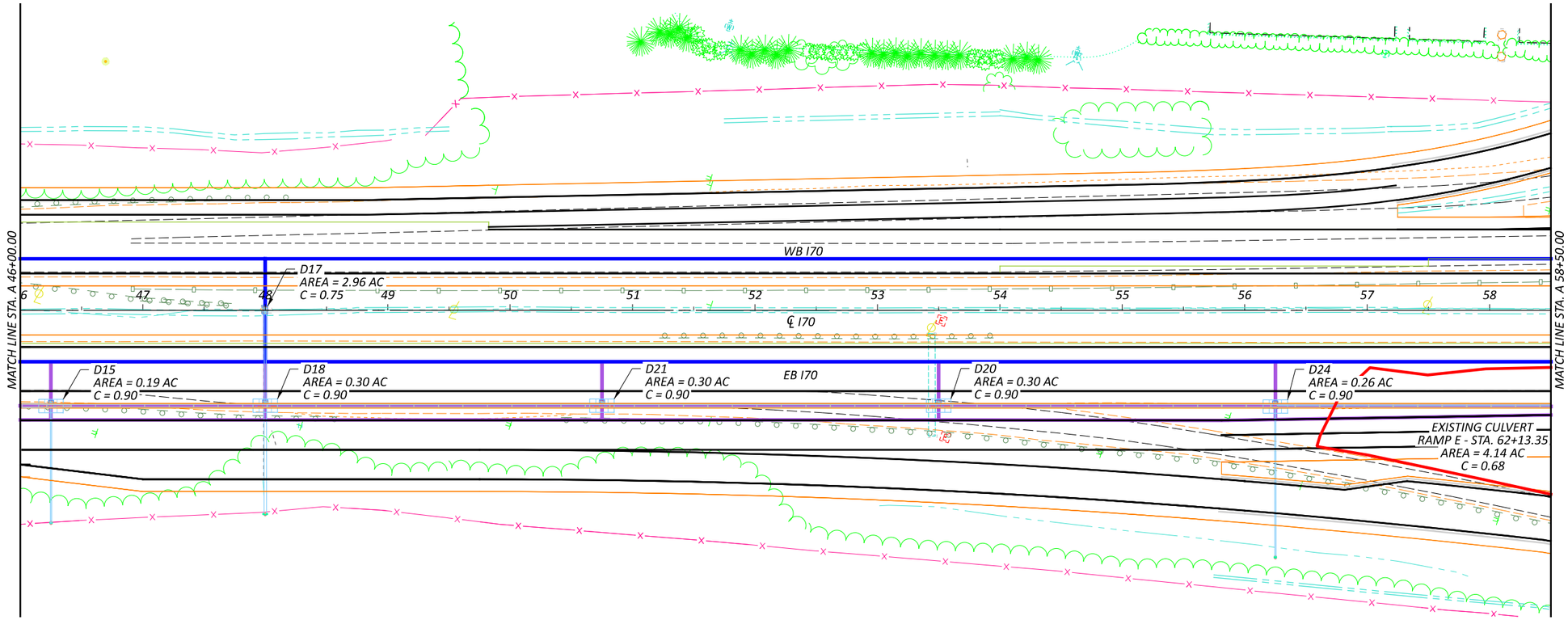

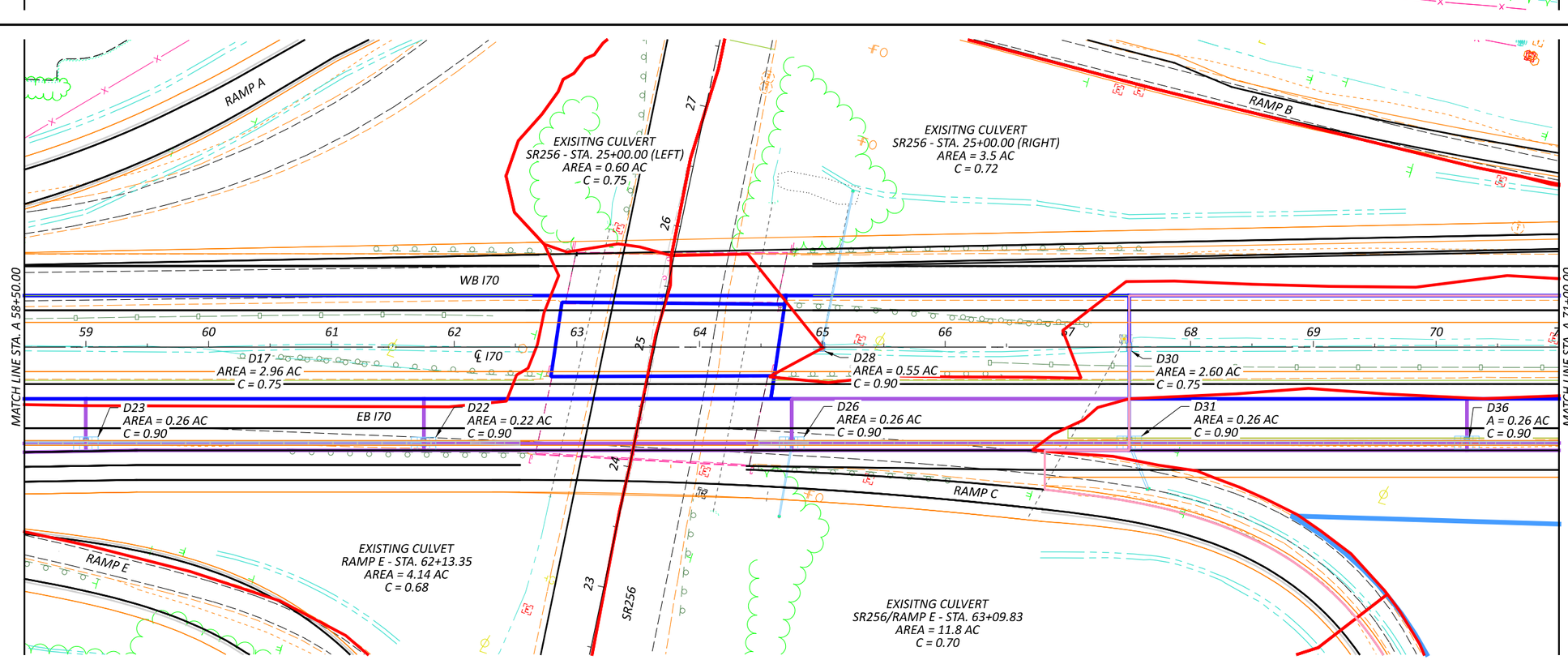

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAINAGE MAP
I70 - STA. A 46+00.00 TO STA. A 71+00.00

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	DMG 06/02/23
PROJECT ID	96808
SHEET	3
TOTAL	11

FAI/LIC-70-0.00

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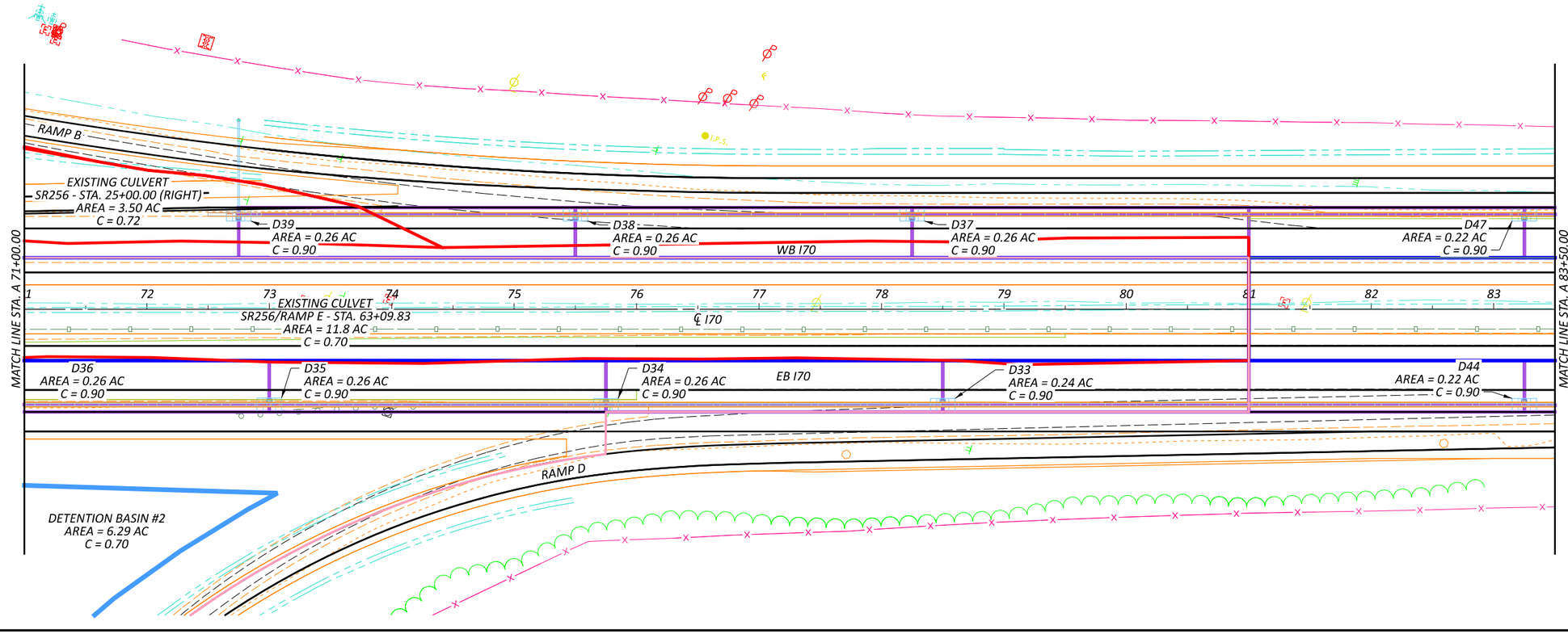

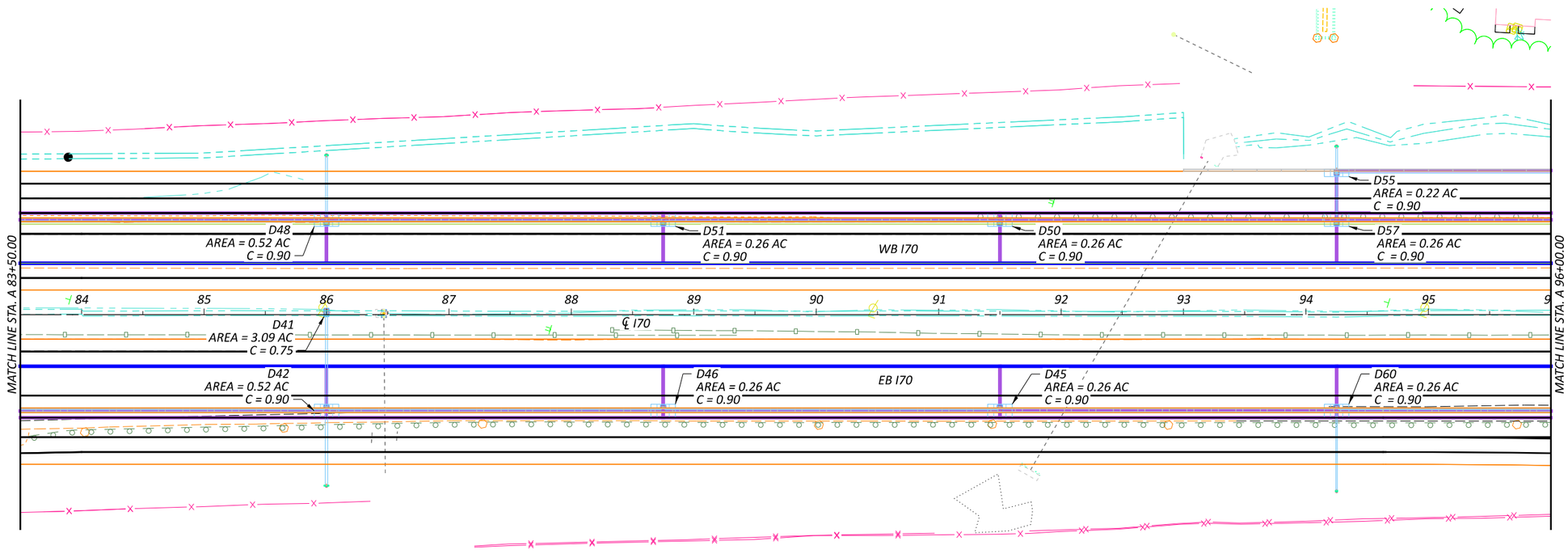

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAINAGE MAP
I70 - STA. A 71+00.00 TO STA. A 96+00.00

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER
CEF

REVIEWER
DMG 06/02/23

PROJECT ID
96808

SHEET 4 TOTAL 11

FAI/LIC-70-0.00

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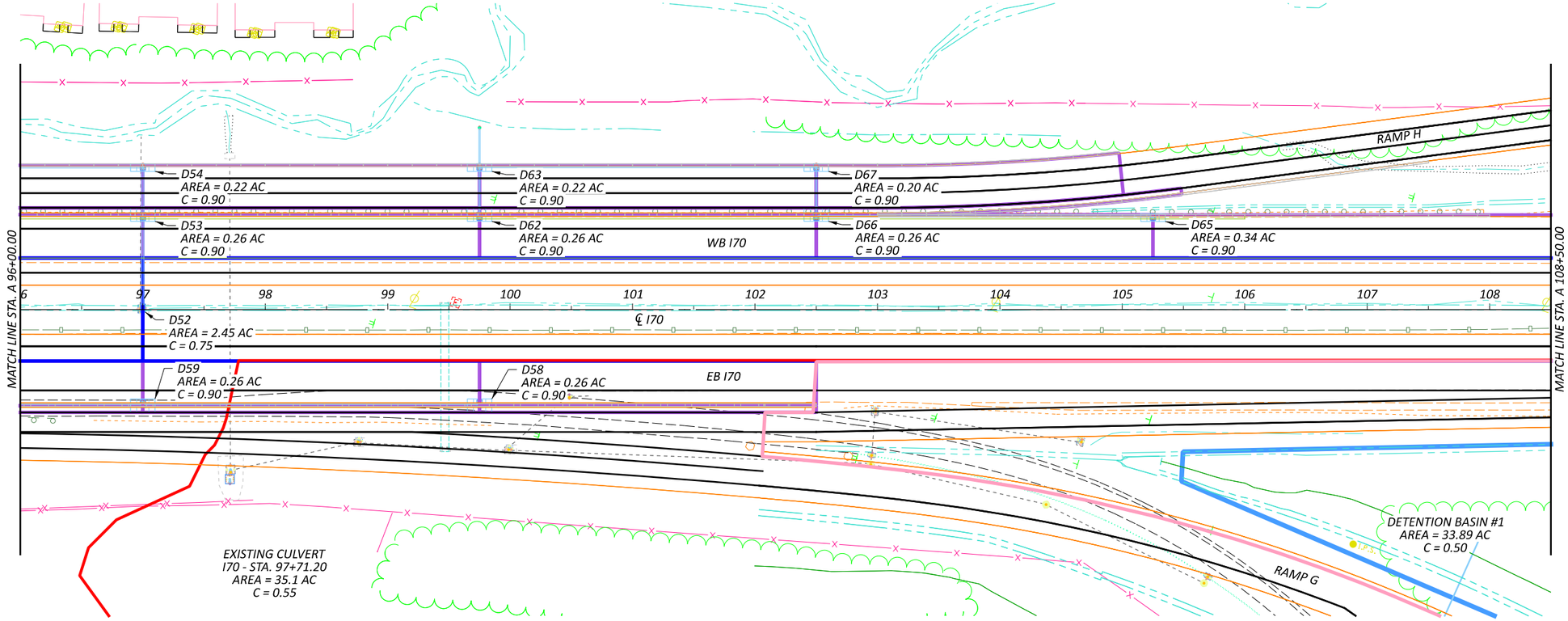

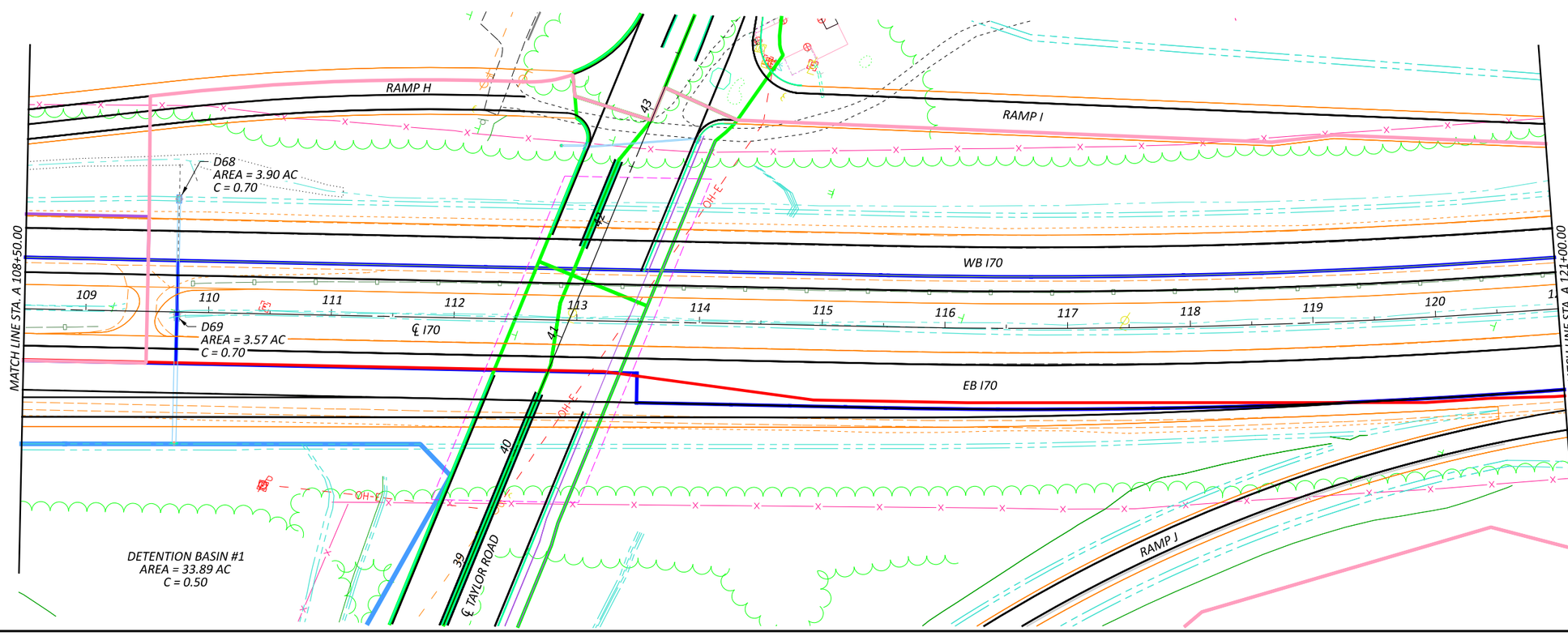

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAINAGE MAP
I70 - STA. A 96+00.00 TO STA. A 121+00.00

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 06/02/23
PROJECT ID	96808
SHEET	5
TOTAL	11

FAI/LIC-70-0.00

MODEL: CLP_I74 - Plan 20 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:18:42 PM USER: dfach
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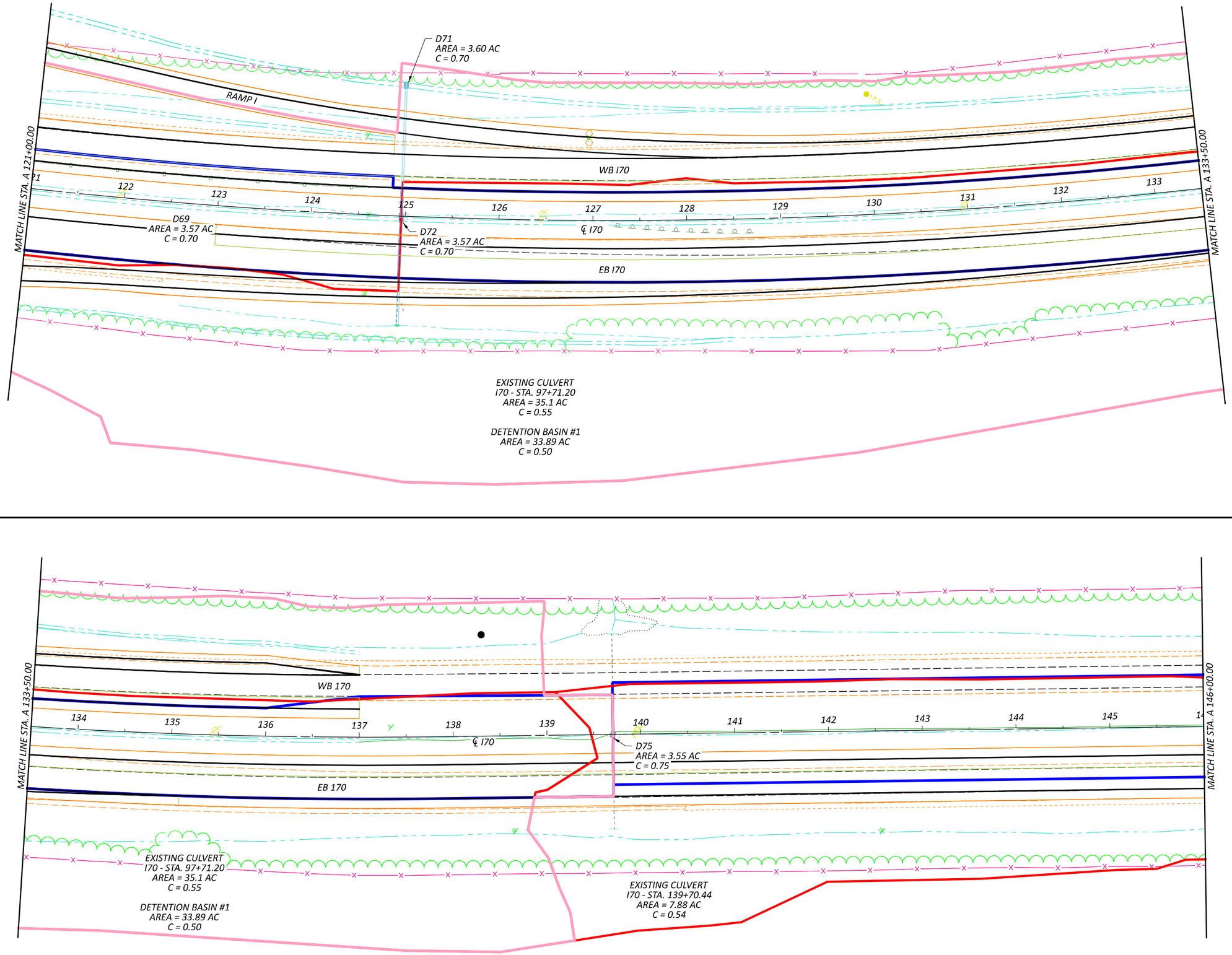

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAINAGE MAP
I70 - STA. A 121+00.00 TO STA. A 146+00.00

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 06/02/23
PROJECT ID	96808
SHEET	6
TOTAL	11

FAI/LIC-70-0.00

MODEL: CLP_I74 - Plan 22 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:18:47 PM USER: cflach
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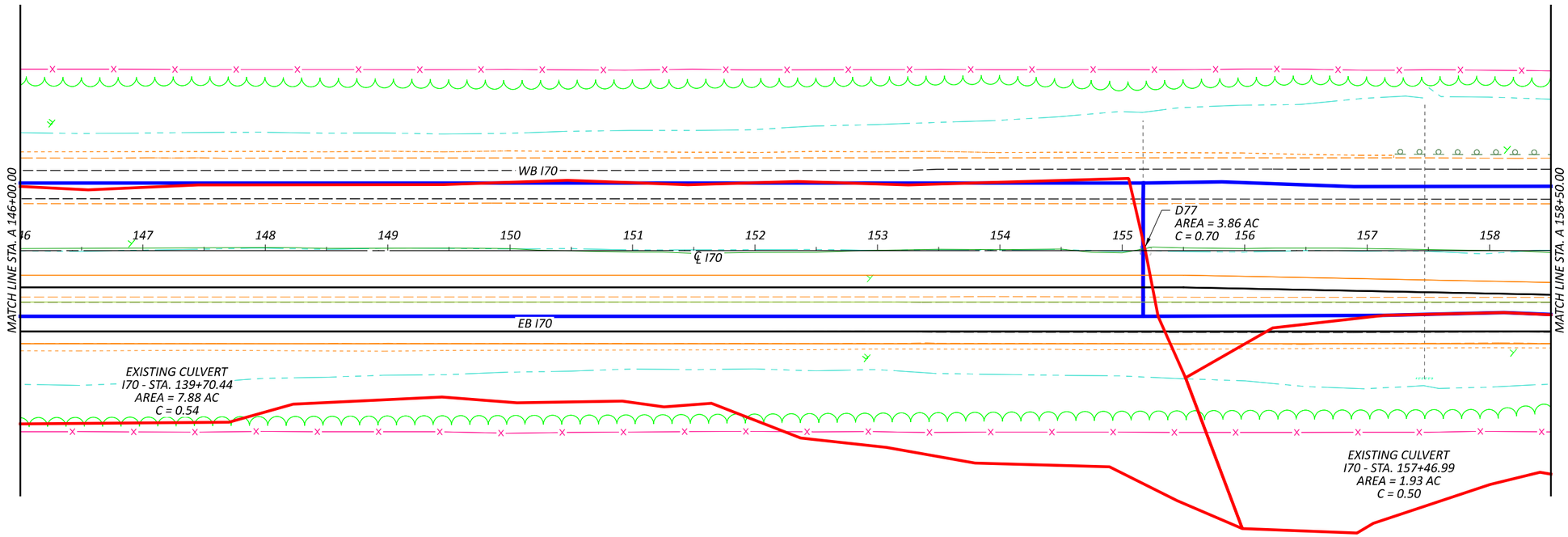

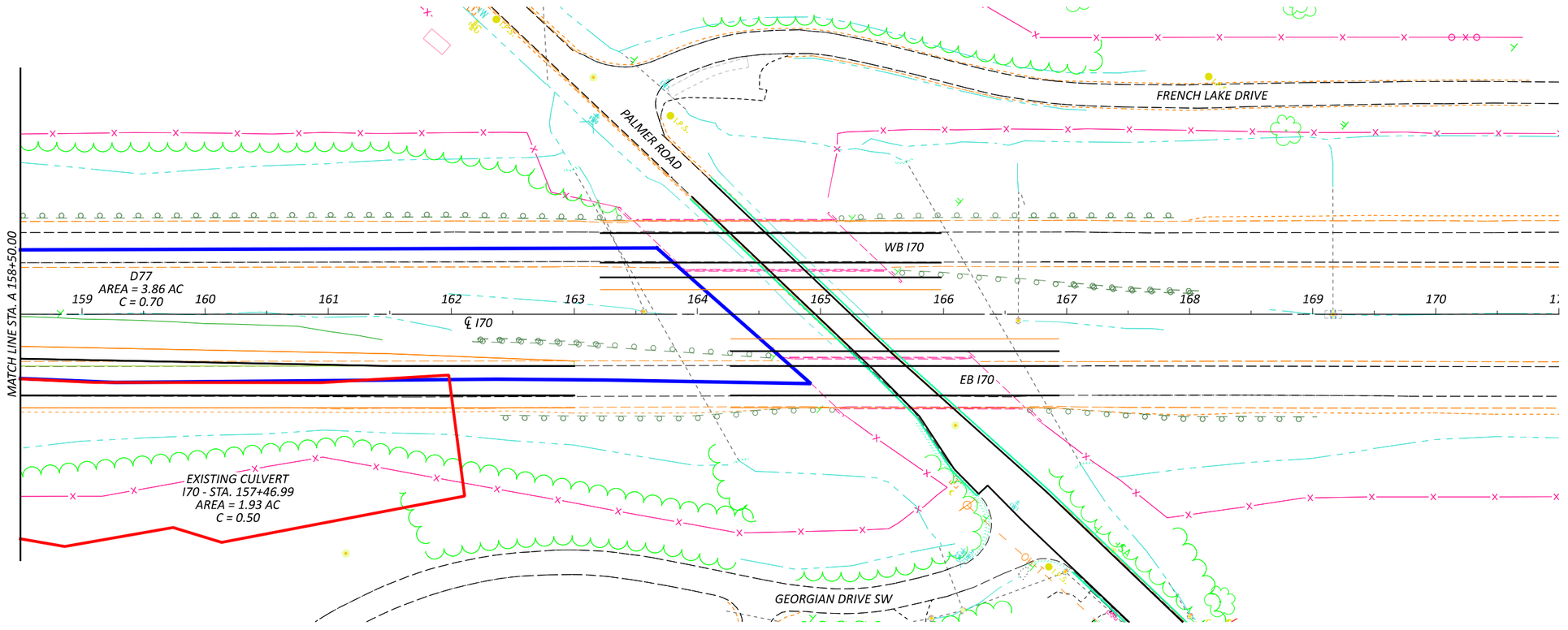

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAINAGE MAP
I70 - STA. A 146+00.00 TO STA. A 171+00.00

FAI/LIC-70-0.00

MODEL: CLP_174 - Plan 24 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:18:52 PM USER: cflach
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DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 06/02/23
PROJECT ID	96808
SHEET	7
TOTAL	11

MODEL: CLP_TAYLOR-2 - Plan 26 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:18:56 PM USER: cflach
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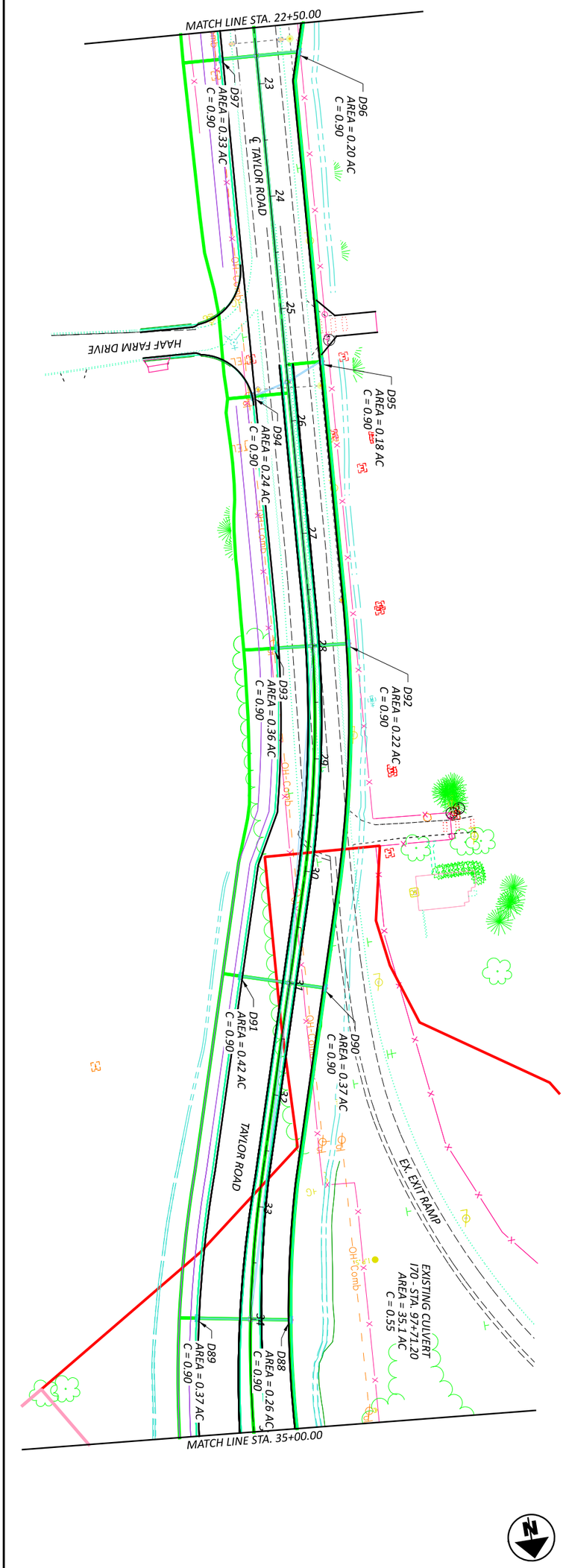

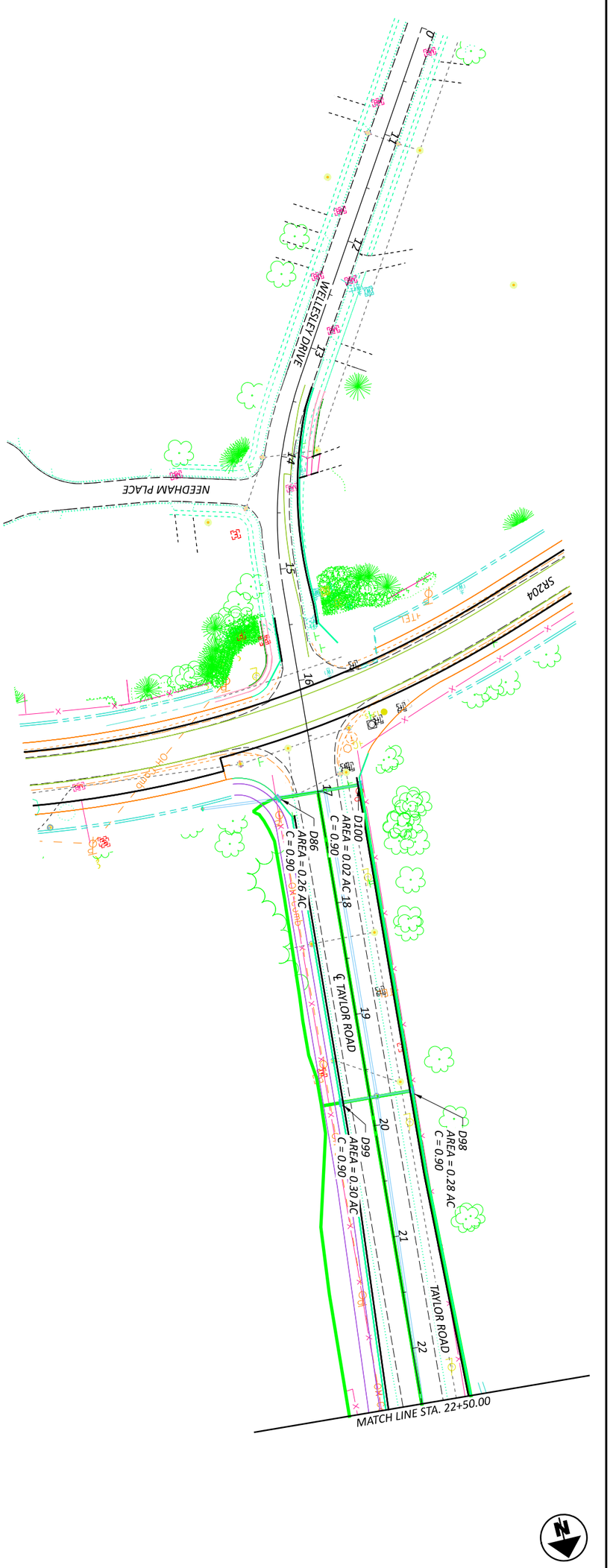

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
8	11	96808	BAA 06/02/23	CEF	CARPENTER MARTY transportation

DRAINAGE MAP
TAYLOR ROAD - STA. 10+00.00 TO STA. 35+00.00

HORIZONTAL SCALE IN FEET
0 50
25 100

FAI/LIC-70-0.00

MODEL: CLP_TAYLOR-2 - Plan 28 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:19:01 PM USER: cflach
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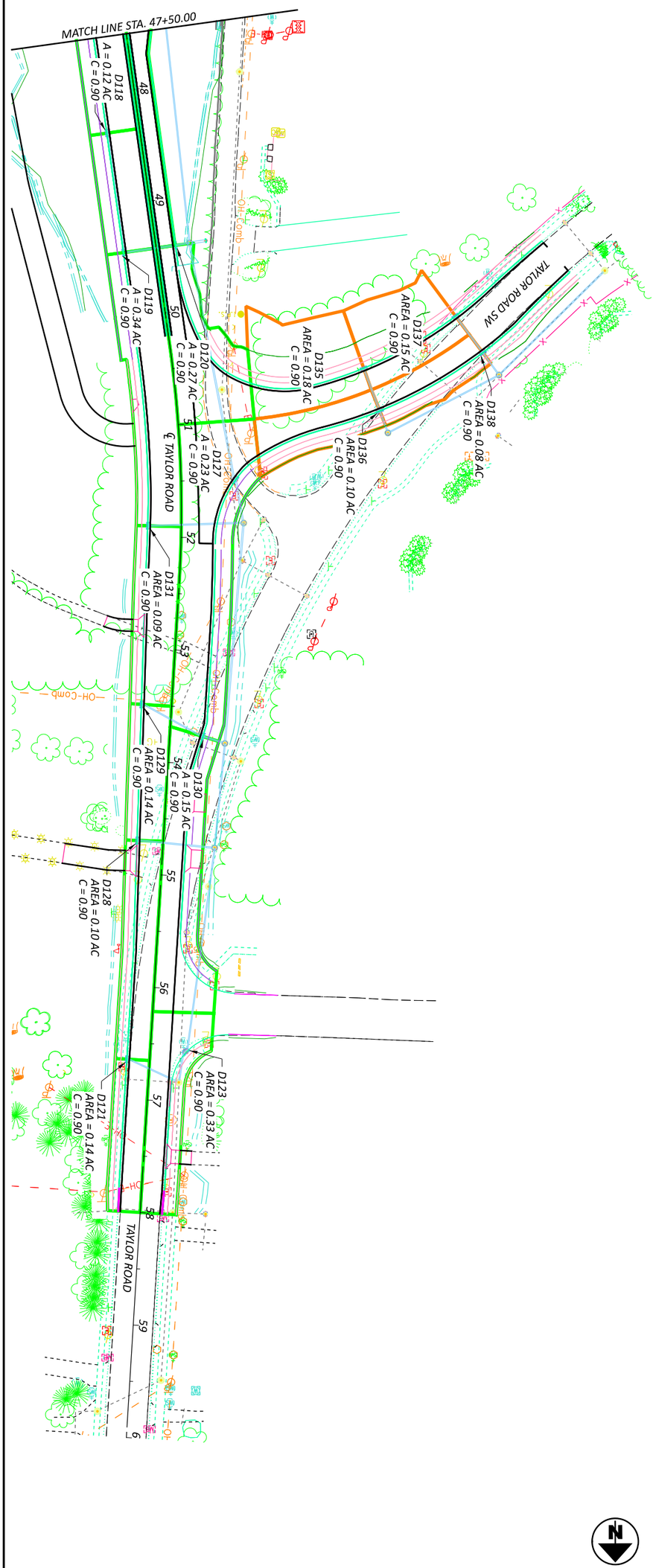

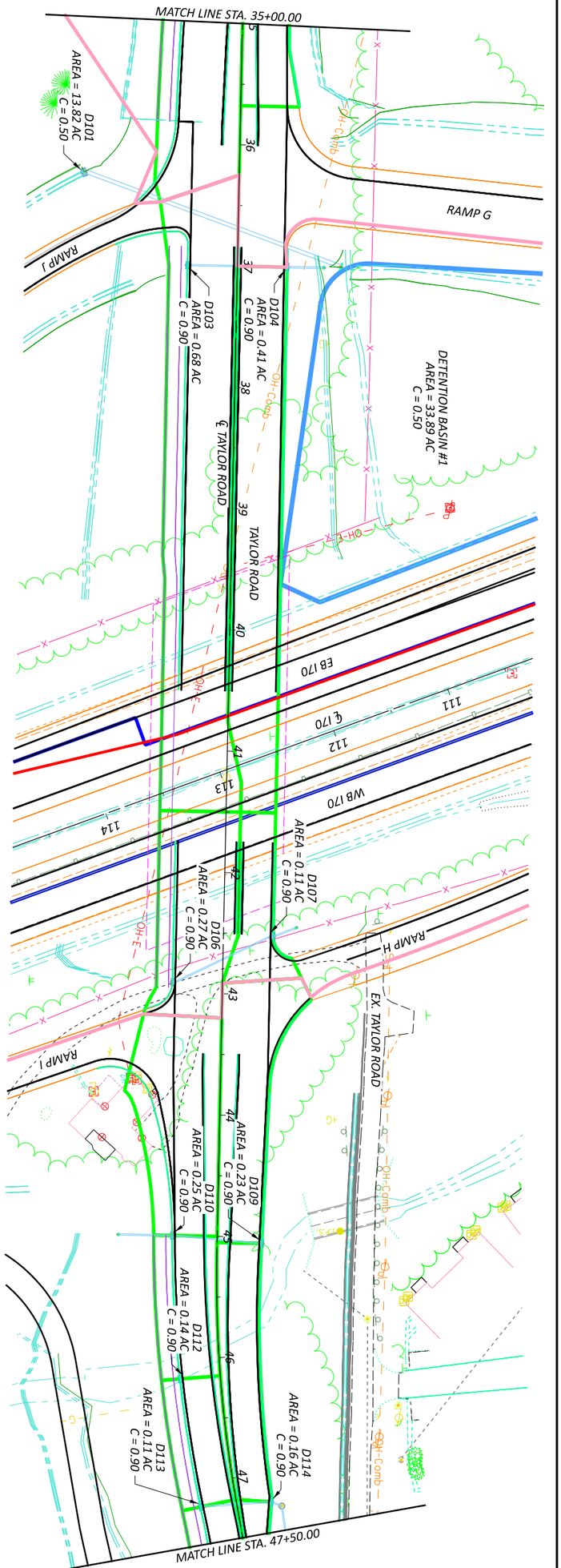

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
9	11	96808	BAA 06/02/23	CEF	CARPENTER MARTY transportation

DRAINAGE MAP
TAYLOR ROAD - STA. 35+00.00 TO STA. 60+00.00

HORIZONTAL SCALE IN FEET
0 50
25 100

MODEL: CLP_I72 - Plan 10 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:19:06 PM USER: cflach
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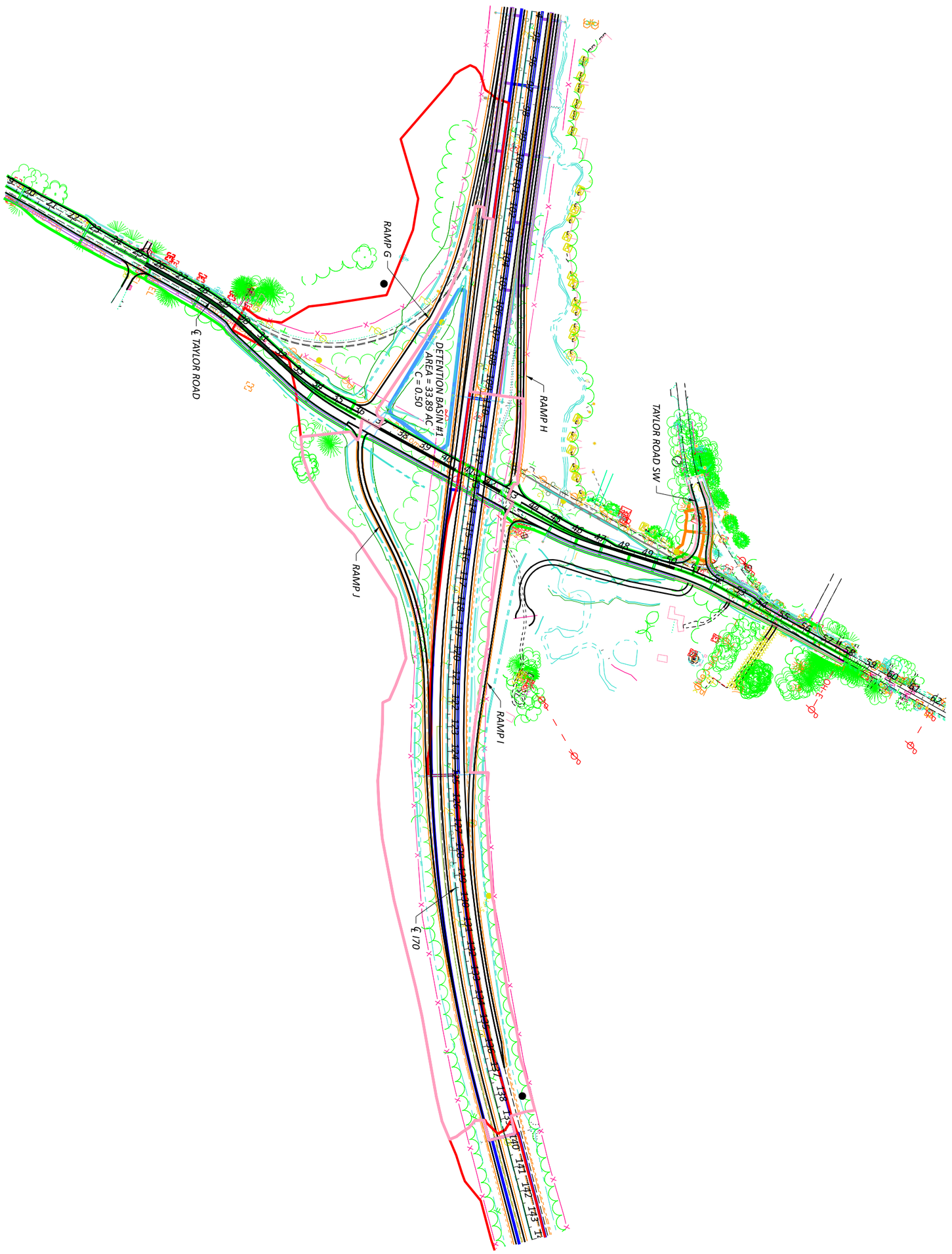


DRAINAGE MAP
DETENTION BASIN - I70 AND TAYLOR ROAD

HORIZONTAL SCALE IN FEET
0 200
100 400

RAMP A

EXISTING CULVERT
SR256 - STA. 25+00.00 (LEFT)
AREA = 0.6 AC
C = 0.75

RAMP B

EXISTING CULVERT
SR256 - STA. 25+00.00 (RIGHT)
AREA = 3.5 AC
C = 0.72

EXISTING CULVERT
RAMP E - STA. 62+13.35
AREA = 4.14 AC
C = 0.68

EXISTING CULVERT
SR25/RAMP E - STA. 63+09.83
AREA = 11.8 AC
C = 0.70

RAMP C

DETENTION BASIN #2
AREA = 6.29 AC
C = 0.70

RAMP E

SR256

EXISTING CULVERT
RAMP C - STA. 70+10.99
AREA = 3.19 AC
C = 0.68

RAMP D

℄ I70

HORIZONTAL
SCALE IN FEET
0 50 100 200

DRAINAGE MAP
DETENTION BASIN - I70 AND SR256

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER
CEF

REVIEWER
BAA 06/02/23

PROJECT ID
96808

SHEET 11 | TOTAL 11

FAI/LIC-70-0.00

MODEL: CLP_I73 - Plan 11 PAPERSIZE: 17x11 (in.) DATE: 6/18/2023 TIME: 6:19:11 PM USER: cflach
P:\ODT\WP\0145_FAI_LIC-70-0.00_0.00\96808\403-Engineering_Carpenter-Marty\Drainage\Sheets\96808_DB102.dgn

III. Median Ditch Analysis

In the existing median of I-70, there are ditches and catch basins to outlet the water to the outside ditches. Preliminary ditch analysis was performed to check that the catch basins were appropriately spaced to avoid flooding on the roadway which might be caused by the additional proposed pavement. From the analysis, the existing median catch basins are adequately spaced to avoid flooding but will need to be replaced to ensure enough cover under the proposed pavement and median ditches.

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 1 - Ditch from sta. 13+50 to sta. 4+30 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
13+50	4+30	C	920.00	4.00	0.13	0.13	0.0156	1.77	1.77	0.75	1.33	Seed	3.37	2	0.030	14.92	2.91	0.37	4.47	0.38	4.10
												Seed	3.93	5	0.040	15.60	2.55	0.49	5.21	0.50	4.13

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 2 - Ditch from sta. 21+50 to sta. 13+50 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
21+50	13+50	C	800.00	4.00	0.13	0.13	0.0060	1.54	1.54	0.75	1.16	Seed	3.23	2	0.030	16.12	2.01	0.17	3.73	0.46	4.11
												Seed	3.75	5	0.040	17.00	1.75	0.23	4.34	0.61	4.15

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 3 - Ditch from sta. 21+50 to sta. 34+35 **Designer :** CEF

Rainfall Area : C

Allowable Shears

	Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
21+50	34+35	C	1285.0	4.00	0.13	0.13	0.0090	3.52	3.52	0.75	2.64	Seed	3.19	2	0.030	16.52	3.03	0.38	8.41	0.68	4.17
												Seed	3.69	5	0.040	17.54	2.61	0.51	9.75	0.91	4.23

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 4 - Ditch from sta. 34+35 to sta. 42+00 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:**	0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:**	3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00				

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
34+35	42+00	C	765.00	4.00	0.13	0.13	0.0206	2.25	2.25	0.75	1.69	Seed	3.55	2	0.030	13.43	3.54	0.54	5.99	0.42	4.10
												Jute Mat	3.46	2	0.040	14.14	2.91	0.64	5.84	0.49	4.12
												Temp. Mat	3.46	2	0.040	14.14	2.91	0.64	5.84	0.49	4.12
												Temp. Mat	4.16	5	0.040	13.91	3.10	0.72	7.01	0.56	4.14

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 5 - Ditch from sta. 42+00 to sta. 44+15 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
42+00	44+15	C	215.00	4.00	0.13	0.13	0.0082	0.57	0.57	0.75	0.43	Seed	3.73	2	0.030	12.14	1.63	0.12	1.60	0.24	4.06
												Seed	4.39	5	0.040	12.40	1.44	0.17	1.88	0.32	4.08

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 6 - Ditch from sta. 48+00 to sta. 45+87 **Designer :** CEF

Rainfall Area : C

Allowable Shears

	Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
48+00	45+87	C	213.00	4.00	0.13	0.13	0.0115	0.46	0.46	0.75	0.35	Seed	3.75	2	0.030	12.06	1.66	0.14	1.29	0.19	4.05
												Seed	4.40	5	0.040	12.31	1.48	0.18	1.52	0.26	4.06

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 7 - Ditch from sta. 62+00 to sta. 48+00 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
62+00	48+00	C	1400.0	4.00	0.13	0.13	0.0209	2.96	2.96	0.75	2.22	Seed	3.28	2	0.030	15.69	3.80	0.61	7.28	0.47	4.12
												Jute Mat	3.15	2	0.040	16.88	3.11	0.72	6.99	0.55	4.14
												Temp. Mat	3.15	2	0.040	16.88	3.11	0.72	6.99	0.55	4.14
												Temp. Mat	3.81	5	0.040	16.51	3.32	0.81	8.46	0.63	4.16

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 8 - Ditch from sta. 67+50 to sta. 65+00 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
67+50	65+00	C	250.00	4.00	0.13	0.13	0.0214	0.55	0.55	0.75	0.41	Seed	3.78	2	0.030	11.86	2.17	0.24	1.56	0.18	4.04
												Seed	4.44	5	0.040	12.09	1.93	0.31	1.83	0.23	4.06

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 9 - Ditch from sta. 81+00 to sta. 67+50 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
81+00	67+50	C	1350.0	4.00	0.13	0.13	0.0079	2.60	2.60	0.75	1.95	Seed	3.05	2	0.030	17.90	2.58	0.28	5.95	0.57	4.14
												Seed	3.53	5	0.040	19.09	2.24	0.37	6.88	0.75	4.19

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 10a - Ditch from sta. 81+00 to sta. 86+00 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
81+00	86+00	C	500.00	4.00	0.13	0.13	0.0029	1.55	1.55	0.75	1.16	Seed	3.37	2	0.030	14.86	1.61	0.11	3.92	0.60	4.15
												Seed	3.93	5	0.040	15.59	1.40	0.14	4.57	0.80	4.20

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 10b - Ditch from sta. 97+00 to sta. 86+00 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
97+00	86+00	C	1100.0	4.00	0.13	0.13	0.0146	1.55	1.55	0.75	1.16	Seed	3.21	2	0.030	16.30	2.66	0.32	3.73	0.35	4.09
												Seed	3.73	5	0.040	17.17	2.34	0.42	4.34	0.46	4.11

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 11 - Ditch from sta. 109+75 to sta. 97+00 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:**	0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:**	3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00				

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
109+75	97+00	C	1275.0	4.00	0.13	0.13	0.0200	2.45	2.45	0.75	1.84	Seed	3.29	2	0.030	15.61	3.51	0.53	6.04	0.42	4.11
												Jute Mat	3.16	2	0.040	16.77	2.87	0.62	5.81	0.50	4.12
												Temp. Mat	3.16	2	0.040	16.77	2.87	0.62	5.81	0.50	4.12
												Temp. Mat	3.82	5	0.040	16.40	3.07	0.70	7.03	0.56	4.14

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 12 - Ditch from sta. 124+95 to sta. 109+75 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:**	0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:**	3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00				

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
124+95	109+75	C	1520.0	4.00	0.13	0.13	0.0193	3.57	3.57	0.75	2.68	Seed	3.25	2	0.030	15.94	3.94	0.65	8.70	0.54	4.14
												Jute Mat	3.12	2	0.040	17.20	3.21	0.77	8.35	0.64	4.16
												Temp. Mat	3.12	2	0.040	17.20	3.21	0.77	8.35	0.64	4.16
												Temp. Mat	3.77	5	0.040	16.82	3.43	0.87	10.11	0.72	4.18

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 13 - Ditch from sta. 139+70 to sta. 124+95 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
139+70	124+95	C	1475.0	4.00	0.13	0.13	0.0143	3.55	3.55	0.75	2.66	Seed	3.20	2	0.030	16.39	3.54	0.53	8.52	0.59	4.15
												Jute Mat	3.06	2	0.040	17.76	2.89	0.61	8.15	0.69	4.17
												Temp. Mat	3.06	2	0.040	17.76	2.89	0.61	8.15	0.69	4.17
												Temp. Mat	3.71	5	0.040	17.36	3.07	0.70	9.89	0.79	4.20

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 14 - Ditch from sta. 155+17 to sta. 139+70 **Designer :** CEF

Rainfall Area : C

Allowable Shears

		Seed:	0.40	**Jute Mat:** 0.45	**Temporary Mat:**	1.00
	Permanent Mat	**Type 1:**	2.00	**Type 2:** 3.00	**Type 3:**	5.00
	RCP	**Type B:**	6.00			

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
155+17	139+70	C	1547.0	4.00	0.13	0.13	0.0103	3.86	3.86	0.75	2.90	Seed	3.11	2	0.030	17.27	3.24	0.44	9.00	0.68	4.17
												Jute Mat	2.96	2	0.040	18.84	2.63	0.51	8.57	0.79	4.20
												Temp. Mat	2.96	2	0.040	18.84	2.63	0.51	8.57	0.79	4.20
												Temp. Mat	3.60	5	0.040	18.41	2.80	0.58	10.41	0.90	4.23

DITCH ANALYSIS

PID : 96808 **Date :** 04/27/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 15 - Ditch from sta. 166+61 to sta. 155+17 **Designer :** CEF

Rainfall Area : C

Allowable Shears

	Seed:	0.40	**Jute Mat:**	0.45	**Temporary Mat:**	1.00
Permanent Mat	**Type 1:**	2.00	**Type 2:**	3.00	**Type 3:**	5.00
RCP	**Type B:**	6.00				

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
166+61	155+17	C	1144.0	2.00	0.13	0.13	0.0107	2.24	2.24	0.75	1.68	Seed	3.27	2	0.030	15.74	3.13	0.56	5.50	0.84	2.21
												Jute Mat	3.13	2	0.040	17.11	2.50	0.66	5.25	0.99	2.25
												Temp. Mat	3.13	2	0.040	17.11	2.50	0.66	5.25	0.99	2.25
												Temp. Mat	3.77	5	0.040	16.84	2.63	0.75	6.34	1.13	2.28

IV. Inlet Spacing Calculations

The project is in rainfall area C. The storm frequency used was 10 years for I-70 and 2 years for Taylor Road. The total maximum spread for I-70 was limited to the paved shoulder which varies throughout the project. For Taylor Road, the total maximum spread was limited to half of the travel lane which varies as well. The maximum water depth was 5” for both I-70 and Taylor Road. The proposed storm sewer system has single-grated catch basins (type 3A), double-grated basins (type 3), manholes (type 3), single slope barrier inlets (I-3), ditch catch basins (type 2-2B, 4, 6), and both half-height and full-height headwalls.

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 1 - Eastbound I-70 concrete barrier from sta. 81+00 to sta. 44+25 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 10.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
81+00	Begin																	
78+50	I-3B	250.00	0.90	0.21	10.00	5.75	15.75	0.0010	0.0400	0.0160	10.00	0.0000	4.37	0.83	0.00	0.83	0.262	6.54
75+75	I-3B	275.00	0.90	0.23	10.00	3.62	13.62	0.0040	0.0400	0.0160	10.00	0.0000	4.68	0.93	0.04	0.97	0.214	5.35
73+00	I-3C	275.00	0.90	0.23	10.00	2.74	12.74	0.0080	0.0400	0.0160	10.00	0.0000	4.82	0.91	0.12	1.04	0.193	4.83
70+25	I-3C	275.00	0.90	0.23	10.00	2.30	12.30	0.0120	0.0400	0.0160	10.00	0.0000	4.89	0.93	0.21	1.14	0.185	4.63
67+50	I-3C	275.00	0.90	0.23	10.00	2.02	12.02	0.0160	0.0400	0.0160	10.00	0.0000	4.94	0.94	0.29	1.23	0.181	4.52
64+75	I-3C	275.00	0.90	0.23	10.00	1.94	11.94	0.0170	0.0400	0.0160	10.00	0.0000	4.95	0.98	0.34	1.32	0.183	4.58
61+75	I-3C	300.00	0.90	0.19	10.00	2.01	12.01	0.0210	0.0400	0.0160	10.00	0.0000	4.94	0.87	0.32	1.19	0.169	4.24
59+00	I-3C	275.00	0.90	0.23	10.00	1.82	11.82	0.0200	0.0400	0.0160	10.00	0.0000	4.98	0.96	0.38	1.35	0.179	4.48
56+25	I-3C	275.00	0.90	0.23	10.00	1.80	11.80	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.00	0.42	1.42	0.183	4.56
53+50	I-3C	275.00	0.90	0.23	10.00	1.79	11.79	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.01	0.44	1.45	0.184	4.61
50+75	I-3C	275.00	0.90	0.23	10.00	2.41	12.41	0.0090	0.0400	0.0160	10.00	0.0000	4.87	1.16	0.28	1.44	0.214	5.34
48+00	I-3C	275.00	0.90	0.23	10.00	1.59	11.59	0.0290	0.0400	0.0160	10.00	0.0000	5.02	0.89	0.44	1.32	0.166	4.15
46+25	I-3C	175.00	0.90	0.17	10.00	1.44	11.44	0.0120	0.0400	0.0160	10.00	0.0000	5.04	0.97	0.24	1.21	0.189	4.73

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 2 - Eastbound I-70 concrete barrier from sta. 81+00 to sta. 102+50 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 10.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
81+00	Begin																		
83+25	I-3C	225.00	0.90	0.19	10.00	4.04	14.04	0.0020	0.0400	0.0160	10.00	0.0000	4.61	0.79	0.00	0.79	0.226	5.65	
86+00	I-3C	275.00	0.90	0.23	10.00	4.04	14.04	0.0030	0.0400	0.0160	10.00	0.0000	4.61	******	******	0.96	0.225	5.62	Sag
86+00	I-3C	275.00	0.90	0.23	10.00	4.02	14.02	0.0030	0.0400	0.0160	10.00	0.0000	4.62	******	******	0.98	0.227	5.67	End
88+75	I-3C	275.00	0.90	0.23	10.00	2.18	12.18	0.0150	0.0400	0.0160	10.00	0.0000	4.91	0.82	0.20	1.02	0.170	4.26	
91+50	I-3C	275.00	0.90	0.23	10.00	1.86	11.86	0.0200	0.0400	0.0160	10.00	0.0000	4.97	0.90	0.33	1.22	0.173	4.32	
94+25	I-3C	275.00	0.90	0.23	10.00	1.82	11.82	0.0200	0.0400	0.0160	10.00	0.0000	4.98	0.97	0.39	1.36	0.180	4.49	
97+00	I-3C	275.00	0.90	0.23	10.00	1.80	11.80	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.00	0.42	1.42	0.183	4.57	
99+75	I-3C	275.00	0.90	0.23	10.00	1.79	11.79	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.02	0.44	1.45	0.184	4.61	
102+50	Begin																		

SUMP DATA

Total Flow (cfs) : 1.93 **Ponded Depth (ft.) :** 0.158 **Spread on Pavement (ft.) :** 3.94

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 3 - Eastbound I-70 concrete barrier from sta. 44+00 to sta. 81+00 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 4.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
81+00	Begin																	
78+50	I-3B	250.00	0.90	0.03	10.00	9.62	19.62	0.0010	0.0400	0.0160	4.00	0.0000	3.91	0.11	0.00	0.11	0.121	3.02
75+75	I-3B	275.00	0.90	0.03	10.00	5.62	15.62	0.0050	0.0400	0.0160	4.00	0.0000	4.39	0.12	0.00	0.12	0.093	2.33
73+00	I-3C	275.00	0.90	0.03	10.00	4.68	14.68	0.0080	0.0400	0.0160	4.00	0.0000	4.52	0.12	0.00	0.12	0.086	2.16
70+25	I-3C	275.00	0.90	0.03	10.00	3.99	13.99	0.0120	0.0400	0.0160	4.00	0.0000	4.62	0.12	0.00	0.12	0.081	2.02
67+50	I-3C	275.00	0.90	0.03	10.00	3.57	13.57	0.0160	0.0400	0.0160	4.00	0.0000	4.69	0.13	0.00	0.13	0.077	1.92
64+75	I-3C	275.00	0.90	0.03	10.00	3.49	13.49	0.0170	0.0400	0.0160	4.00	0.0000	4.70	0.13	0.00	0.13	0.076	1.90
61+75	I-3C	300.00	0.90	0.03	10.00	3.66	13.66	0.0190	0.0400	0.0160	4.00	0.0000	4.67	0.13	0.00	0.13	0.074	1.86
59+00	I-3C	275.00	0.90	0.03	10.00	3.22	13.22	0.0210	0.0400	0.0160	4.00	0.0000	4.74	0.13	0.00	0.13	0.073	1.84
56+25	I-3C	275.00	0.90	0.05	10.00	2.77	12.77	0.0220	0.0400	0.0160	9.50	0.0000	4.81	0.21	0.00	0.22	0.089	2.22
53+50	I-3C	275.00	0.90	0.07	10.00	2.54	12.54	0.0220	0.0400	0.0160	10.00	0.0000	4.85	0.30	0.01	0.31	0.101	2.53
50+75	I-3C	275.00	0.90	0.07	10.00	2.57	12.57	0.0210	0.0400	0.0160	10.00	0.0000	4.85	0.31	0.01	0.32	0.103	2.58
48+00	I-3C	275.00	0.90	0.07	10.00	2.61	12.61	0.0200	0.0400	0.0160	10.00	0.0000	4.84	0.31	0.01	0.32	0.104	2.60
46+25	I-3C	175.00	0.90	0.04	10.00	2.57	12.57	0.0090	0.0400	0.0160	4.00	0.0000	4.85	0.19	0.00	0.19	0.099	2.47

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 4 - Eastbound I-70 concrete barrier from sta. 81+00 to sta. 102+50 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 4.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
81+00	Begin																		
83+25	I-3C	225.00	0.90	0.03	10.00	6.53	16.53	0.0020	0.0400	0.0160	4.00	0.0000	4.27	0.12	0.00	0.12	0.110	2.74	
86+00	I-3C	275.00	0.90	0.03	10.00	6.87	16.87	0.0030	0.0400	0.0160	4.00	0.0000	4.23	******	******	0.11	0.101	2.53	Sag
86+00	I-3C	275.00	0.90	0.03	10.00	5.62	15.62	0.0050	0.0400	0.0160	4.00	0.0000	4.39	******	******	0.12	0.093	2.33	End
88+75	I-3C	275.00	0.90	0.03	10.00	3.57	13.57	0.0160	0.0400	0.0160	4.00	0.0000	4.69	0.13	0.00	0.13	0.077	1.92	
91+50	I-3C	275.00	0.90	0.03	10.00	3.34	13.34	0.0190	0.0400	0.0160	4.00	0.0000	4.72	0.13	0.00	0.13	0.075	1.87	
94+25	I-3C	275.00	0.90	0.03	10.00	3.34	13.34	0.0190	0.0400	0.0160	4.00	0.0000	4.72	0.13	0.00	0.13	0.075	1.87	
97+00	I-3C	275.00	0.90	0.03	10.00	3.34	13.34	0.0190	0.0400	0.0160	4.00	0.0000	4.72	0.13	0.00	0.13	0.075	1.87	
99+75	I-3C	275.00	0.90	0.03	10.00	3.34	13.34	0.0190	0.0400	0.0160	4.00	0.0000	4.72	0.13	0.00	0.13	0.075	1.87	
102+50	Begin																		

SUMP DATA

Total Flow (cfs) : 0.23 **Ponded Depth (ft.) :** 0.038 **Spread on Pavement (ft.) :** 0.96

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 5 - Westbound I-70 concrete barrier from sta. 81+00 sta. 106+00 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 10.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
81+00	Begin																		
83+25	I-3C	225.00	0.90	0.19	10.00	3.45	13.45	0.0030	0.0400	0.0160	10.00	0.0000	4.70	0.80	0.01	0.80	0.211	5.27	
86+00	I-3C	275.00	0.90	0.23	10.00	4.72	14.72	0.0020	0.0400	0.0160	10.00	0.0000	4.51	******	******	0.94	0.241	6.03	Sag
86+00	I-3C	275.00	0.90	0.23	10.00	3.61	13.61	0.0040	0.0400	0.0160	10.00	0.0000	4.68	******	******	0.97	0.215	5.36	End
88+75	I-3C	275.00	0.90	0.23	10.00	2.18	12.18	0.0150	0.0400	0.0160	10.00	0.0000	4.91	0.82	0.20	1.02	0.170	4.26	
91+50	I-3B	275.00	0.90	0.23	10.00	1.86	11.86	0.0200	0.0400	0.0160	10.00	0.0000	4.97	0.90	0.33	1.22	0.173	4.32	
94+25	I-3B	275.00	0.90	0.23	10.00	1.82	11.82	0.0200	0.0400	0.0160	10.00	0.0000	4.98	0.97	0.39	1.36	0.180	4.49	
97+00	I-3B	275.00	0.90	0.23	10.00	1.80	11.80	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.00	0.42	1.42	0.183	4.57	
99+75	I-3B	275.00	0.90	0.23	10.00	1.79	11.79	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.02	0.44	1.45	0.184	4.61	
102+50	I-3C	275.00	0.90	0.23	10.00	1.78	11.78	0.0200	0.0400	0.0160	10.00	0.0000	4.98	1.02	0.45	1.47	0.185	4.63	
105+25	I-3C	75.00	0.90	0.06	10.00	0.58	10.58	0.0200	0.0400	0.0160	10.00	0.0000	5.21	0.61	0.12	0.73	0.142	3.55	
106+00	Begin																		

SUMP DATA

Total Flow (cfs) : 1.92 **Ponded Depth (ft.) :** 0.157 **Spread on Pavement (ft.) :** 3.92

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 6 - Westbound I-70 concrete barrier from sta. 81+00 to sta. 72+75 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 10.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
81+00	Begin																	
78+25	I-3B	275.00	0.90	0.23	10.00	8.92	18.92	0.0004	0.0400	0.0160	10.00	0.0000	3.99	0.82	0.00	0.82	0.310	7.76
75+50	I-3C	275.00	0.90	0.23	10.00	3.62	13.62	0.0040	0.0400	0.0160	10.00	0.0000	4.68	0.93	0.04	0.97	0.214	5.35
72+75	I-3C	275.00	0.90	0.23	10.00	2.74	12.74	0.0080	0.0400	0.0160	10.00	0.0000	4.82	0.91	0.12	1.04	0.193	4.83

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 7 - Westbound I-70 concrete barrier from sta. 81+00 sta. 106+00 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 4.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
81+00	Begin																		
83+25	I-3C	225.00	0.90	0.03	10.00	5.57	15.57	0.0030	0.0400	0.0160	4.00	0.0000	4.40	0.12	0.00	0.12	0.103	2.57	
86+00	I-3C	275.00	0.90	0.03	10.00	6.13	16.13	0.0040	0.0400	0.0160	4.00	0.0000	4.32	******	******	0.12	0.097	2.42	Sag
86+00	I-3C	275.00	0.90	0.03	10.00	6.13	16.13	0.0040	0.0400	0.0160	4.00	0.0000	4.32	******	******	0.12	0.097	2.42	End
88+75	I-3C	275.00	0.90	0.03	10.00	3.66	13.66	0.0150	0.0400	0.0160	4.00	0.0000	4.67	0.13	0.00	0.13	0.078	1.95	
91+50	I-3B	275.00	0.90	0.03	10.00	3.28	13.28	0.0200	0.0400	0.0160	4.00	0.0000	4.73	0.13	0.00	0.13	0.074	1.85	
94+25	I-3B	275.00	0.90	0.03	10.00	3.28	13.28	0.0200	0.0400	0.0160	4.00	0.0000	4.73	0.13	0.00	0.13	0.074	1.85	
97+00	I-3B	275.00	0.90	0.03	10.00	3.28	13.28	0.0200	0.0400	0.0160	4.00	0.0000	4.73	0.13	0.00	0.13	0.074	1.85	
99+75	I-3B	275.00	0.90	0.03	10.00	3.05	13.05	0.0240	0.0400	0.0160	4.00	0.0000	4.77	0.13	0.00	0.13	0.072	1.80	
102+50	I-3C	275.00	0.90	0.03	10.00	2.62	12.62	0.0360	0.0400	0.0160	4.00	0.0000	4.84	0.13	0.00	0.13	0.067	1.67	
104+51	Begin																		

SUMP DATA

Total Flow (cfs) : 0.23 **Ponded Depth (ft.) :** 0.039 **Spread on Pavement (ft.) :** 0.96

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 8 - Westbound I-70 concrete barrier from sta. 81+00 to sta. 72+75 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 4.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
81+00	Begin																	
78+25	I-3B	275.00	0.90	0.03	10.00	10.65	20.65	0.0010	0.0400	0.0160	4.00	0.0000	3.80	0.10	0.00	0.10	0.120	2.99
75+50	I-3C	275.00	0.90	0.03	10.00	5.62	15.62	0.0050	0.0400	0.0160	4.00	0.0000	4.39	0.12	0.00	0.12	0.093	2.33
72+75	I-3C	275.00	0.90	0.03	10.00	4.47	14.47	0.0090	0.0400	0.0160	4.00	0.0000	4.55	0.12	0.00	0.12	0.085	2.12

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 9 -Westbound I-70 and Ramp H concrete barrier from sta. 105+00 to sta. 94+25 **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 10 **Total Allow. Spread (ft.) :** 10.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
105+00	Begin																	
102+50	I-3D	250.00	0.90	0.20	10.00	1.45	11.45	0.0370	0.0400	0.0160	10.00	0.0000	5.04	0.65	0.26	0.91	0.138	3.44
99+75	I-3D	275.00	0.90	0.22	10.00	1.76	11.76	0.0230	0.0400	0.0160	10.00	0.0000	4.99	0.89	0.36	1.25	0.170	4.24
97+00	I-3D	275.00	0.90	0.22	10.00	1.82	11.82	0.0200	0.0400	0.0160	10.00	0.0000	4.98	0.96	0.38	1.34	0.179	4.48
94+25	I-3D	275.00	0.90	0.22	10.00	1.81	11.81	0.0200	0.0400	0.0160	10.00	0.0000	4.98	0.97	0.40	1.37	0.180	4.51

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 10 - Taylor Road (left) Sta. 41+50 to Sta. 42+52 (Ramp H) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 8.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
41+50	Begin																	
42+52	CB-3	101.70	0.90	0.11	10.00	0.93	10.93	0.0360	0.0160	0.0160	2.00	0.0000	3.92	0.32	0.07	0.39	0.071	4.46

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 11 - Taylor Road (left) Sta. 42+52 (Ramp H) to Sta. 50+75 (Taylor SW) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 8.50 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
42+85	Begin																		
45+05	CB-3	220.00	0.90	0.22	10.00	1.84	11.84	0.0290	0.0160	0.0160	2.00	0.0000	3.78	0.53	0.22	0.75	0.095	5.94	
47+25	CB-3	220.00	0.90	0.16	10.00	1.79	11.79	0.0310	0.0160	0.0160	2.00	0.0000	3.79	0.54	0.22	0.76	0.095	5.91	
49+42	CB-3	217.00	0.90	0.09	10.00	2.78	12.78	0.0120	0.0160	0.0160	2.00	0.0000	3.64	******	******	0.52	0.098	6.11	Sag
49+42	CB-3	133.00	0.90	0.18	10.00	1.82	11.82	0.0080	0.0160	0.0160	2.00	0.0000	3.78	******	******	0.73	0.120	7.48	End
50+75	Begin																		

SUMP DATA

Total Flow (cfs) : 1.25 **Ponded Depth (ft.) :** 0.108 **Spread on Pavement (ft.) :** 8.12

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 12 - Taylor Road (left) Sta. 56+21 (school) to Sta. 50+75 (Taylor SW) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 9.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
56+21	Begin																	
53+75	CB-3	246.33	0.90	0.23	10.00	2.57	12.57	0.0160	0.0160	0.0160	2.00	0.0000	3.67	0.54	0.22	0.76	0.107	6.68
51+50	CB-3	225.00	0.90	0.33	10.00	1.78	11.78	0.0230	0.0160	0.0160	2.00	0.0000	3.79	0.81	0.54	1.35	0.124	7.74

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 13 - Taylor Road (left) Sta. 58+00 (end project) to Sta. 56+21 (school) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 7.75 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
58+00	Begin																	
56+55	CB-3	145.30	0.90	0.15	10.00	1.81	11.81	0.0130	0.0160	0.0160	2.00	0.0000	3.78	0.40	0.11	0.51	0.096	5.99

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 14 - Taylor Road (right) Sta. 41+50 to Sta. 43+46 (Ramp I) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 8.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
41+50	Begin																	
42+91	CB-3	141.15	0.90	0.27	10.00	1.10	11.10	0.0300	0.0160	0.0160	2.00	0.0000	3.89	0.63	0.32	0.95	0.103	6.45

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 15 - Taylor Road (right) Sta. 43+46 (Ramp I) to Sta. 58+00 (end project) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 8.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
43+46	Begin																		
45+00	CB-3	154.00	0.90	0.25	10.00	1.21	11.21	0.0310	0.0160	0.0160	2.00	0.0000	3.88	0.59	0.28	0.87	0.099	6.22	
46+15	CB-3	115.00	0.90	0.14	10.00	0.93	10.93	0.0310	0.0160	0.0160	2.00	0.0000	3.92	0.54	0.23	0.77	0.095	5.94	
47+25	CB-3	110.00	0.90	0.11	10.00	0.96	10.96	0.0300	0.0160	0.0160	2.00	0.0000	3.92	0.46	0.16	0.62	0.088	5.49	
48+35	CB-3	110.00	0.90	0.12	10.00	1.15	11.15	0.0190	0.0160	0.0160	2.00	0.0000	3.89	0.44	0.14	0.58	0.093	5.83	
49+42	CB-3	107.00	0.90	0.11	10.00	1.78	11.78	0.0060	0.0160	0.0160	2.00	0.0000	3.79	******	******	0.52	0.111	6.94	Sag
49+42	CB-3	248.00	0.90	0.18	10.00	2.78	12.78	0.0140	0.0160	0.0160	2.00	0.0000	3.64	******	******	0.69	0.106	6.63	End
51+90	CB-3	160.00	0.90	0.15	10.00	1.63	11.63	0.0220	0.0160	0.0160	2.00	0.0000	3.81	0.40	0.11	0.51	0.087	5.44	
53+50	CB-3	120.00	0.90	0.10	10.00	1.28	11.28	0.0210	0.0160	0.0160	2.00	0.0000	3.87	0.37	0.09	0.46	0.084	5.27	
54+70	CB-3	195.00	0.90	0.14	10.00	2.63	12.63	0.0100	0.0160	0.0160	2.00	0.0000	3.66	0.43	0.13	0.56	0.104	6.49	
56+50	CB-3	135.00	0.90	0.09	10.00	2.01	12.01	0.0090	0.0160	0.0160	2.00	0.0000	3.75	0.35	0.08	0.43	0.096	6.02	
58+00	Begin																		

SUMP DATA

Total Flow (cfs) : 1.21 **Ponded Depth (ft.) :** 0.105 **Spread on Pavement (ft.) :** 7.94

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 16 - Taylor Road (right) Sta. 41+50 to Sta. 36+00 (Ramp G) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 14.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
41+50	Begin																	
37+00	CB-3	450.00	0.90	0.68	10.00	2.57	12.57	0.0390	0.0160	0.0160	2.00	0.0000	3.67	1.17	1.08	2.25	0.136	8.49

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 17 - Taylor Road (left) Sta. 36+00 (Ramp G) to Sta. 16+50 (SR204) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 14.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
36+00	Begin																	
34+00	CB-3	200.00	0.90	0.29	10.00	1.47	11.47	0.0340	0.0160	0.0160	2.00	0.0000	3.84	0.66	0.34	1.00	0.103	6.43
31+00	CB-3	300.00	0.90	0.22	10.00	3.59	13.59	0.0090	0.0160	0.0160	2.00	0.0000	3.53	0.68	0.36	1.04	0.134	8.38
28+00	CB-3	300.00	0.90	0.22	10.00	4.48	14.48	0.0050	0.0160	0.0160	2.00	0.0000	3.42	0.69	0.34	1.04	0.150	9.35
25+50	CB-3	250.00	0.90	0.18	10.00	3.39	13.39	0.0070	0.0160	0.0160	2.00	0.0000	3.56	0.63	0.29	0.92	0.134	8.39
22+75	CB-3	275.00	0.90	0.20	10.00	3.03	13.03	0.0120	0.0160	0.0160	2.00	0.0000	3.61	0.63	0.31	0.94	0.122	7.65
19+75	CB-3	300.00	0.90	0.28	10.00	2.65	12.65	0.0180	0.0160	0.0160	2.00	0.0000	3.66	0.76	0.48	1.24	0.125	7.84
17+00	CB-3	275.00	0.90	0.24	10.00	2.16	12.16	0.0240	0.0160	0.0160	2.00	0.0000	3.73	0.78	0.50	1.28	0.121	7.54

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 18 - Taylor Road (right) Sta. 41+50 to Sta. 37+00 (Ramp J) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 14.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
41+50	Begin																	
37+00	CB-3	450.00	0.90	0.41	10.00	2.92	12.92	0.0390	0.0160	0.0160	2.00	0.0000	3.62	0.81	0.52	1.34	0.112	6.99

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 19 - Taylor Road (right) Sta. 36+50 (Ramp J) to Sta. 25+20 (Haaf) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 14.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
36+50	Begin																	
34+00	CB-3	250.00	0.90	0.37	10.00	1.74	11.74	0.0337	0.0160	0.0160	2.00	0.0000	3.79	0.78	0.49	1.26	0.113	7.03
31+00	CB-3	300.00	0.90	0.42	10.00	2.99	12.99	0.0100	0.0160	0.0160	2.00	0.0000	3.61	1.01	0.84	1.85	0.163	10.19
28+00	CB-3	300.00	0.90	0.40	10.00	4.09	14.09	0.0040	0.0160	0.0160	2.00	0.0000	3.47	1.14	0.94	2.09	0.202	12.65
25+75	CB-3	225.00	0.90	0.30	10.00	2.69	12.69	0.0060	0.0160	0.0160	2.00	0.0000	3.65	1.06	0.87	1.93	0.182	11.39

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 20 - Taylor Road (right) Sta. 25+20 (Haaf) to Sta. 16+50 (SR204) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 14.00 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
25+20	Begin																	
22+75	CB-3	245.00	0.90	0.42	10.00	2.45	12.45	0.0120	0.0160	0.0160	2.00	0.0000	3.69	0.83	0.56	1.39	0.142	8.86
19+75	CB-3	300.00	0.90	0.41	10.00	2.43	12.43	0.0170	0.0160	0.0160	2.00	0.0000	3.69	1.04	0.89	1.93	0.150	9.36
17+00	CB-3	275.00	0.90	0.29	10.00	2.00	12.00	0.0230	0.0160	0.0160	2.00	0.0000	3.75	1.02	0.85	1.87	0.140	8.75

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 21 - Taylor SW (right) Sta. 50+75 (Taylor) to Sta. 12+00 (end project) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 7.75 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
15+15	Begin																	
14+00	CB-3	115.00	0.75	0.18	10.00	1.81	11.81	0.0070	0.0160	0.0160	2.00	0.0000	3.78	0.41	0.11	0.51	0.108	6.72
13+00	CB-3	100.00	0.75	0.15	10.00	1.23	11.23	0.0130	0.0160	0.0160	2.00	0.0000	3.87	0.42	0.12	0.54	0.098	6.12
11+71	CB-3	129.00	0.75	0.20	10.00	1.34	11.34	0.0170	0.0160	0.0160	2.00	0.0000	3.86	0.51	0.20	0.70	0.103	6.42

INLET SPACING DESIGN

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, and Fairfield Counties

Description : Run 22 - Taylor SW (left) Sta. 50+75 (Taylor) to Sta. 12+00 (end project) **Designer :** CEF

Rainfall Area: C **Storm Frequency (yr.) :** 2 **Total Allow. Spread (ft.) :** 7.75 **Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	RUNOFF AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
15+15	Begin																	
14+00	CB-3	115.00	0.75	0.10	10.00	1.36	11.36	0.0220	0.0160	0.0160	2.00	0.0000	3.85	0.25	0.04	0.29	0.070	4.38
13+00	CB-3	100.00	0.75	0.08	10.00	1.47	11.47	0.0130	0.0160	0.0160	2.00	0.0000	3.84	0.24	0.03	0.27	0.075	4.68
11+71	CB-3	129.00	0.75	0.10	10.00	1.61	11.61	0.0180	0.0160	0.0160	2.00	0.0000	3.81	0.27	0.04	0.31	0.075	4.69

V. Storm Sewer Calculations

The just-full capacity frequency used was 10 years and the hydraulic grade frequency used was 25 years. The required minimum pipe diameter is 12". Pipe inverts were set based on a minimum cover of 2' for manholes and catch basins. For single-slope barrier inlets, the pipe inverts were controlled by a preferred cover of 5.33' with a required minimum cover of 4'. There are 30 runs for the proposed storm system: runs 1 to 24 are for I-70, runs 25 to 30 are for Taylor Road. The storm sewers along I-70 are concrete barrier inlets along both collector roads and catch basins to drain the water out of the median. The Taylor Road system north of I-70 will connect to the existing storm system in place at the north end of the project limits that will outlet to the tributary of Blacklick Creek. Taylor Road SW proposed storm sewer system will tie into the existing system at an existing manhole. The Taylor Road system south of I-70 will outlet to a ditch that drains to a tributary of Blacklick Creek.

The proposed storm sewer system outlets the water as close as possible to the existing conditions with minor exceptions for the detention basins. The overwhelming majority of the water in the system drains to Blacklick Creek through three well-defined tributaries. One storm system run will drain to an existing detention pond outside of the project limits located south of I-70 at sta. 13+50.

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 1 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D1	D2	4+30	1.77	1.33	10.00	5.32	5.95	7.1	7.9	18	103.5	0.0100	838.69	5.68	9.77	0.0075	839.77	842.19	2.42	2.00	CB 4
begin		4+30	1.77	1.33									837.66				838.95	839.16			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 2 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D3	D4	13+50	1.54	1.16	10.00	5.32	5.94	6.1	6.9	18	109.6	0.0100	852.54	5.54	9.81	0.0057	853.51	856.04	2.53	2.00	CB 4
begin		13+50	1.54	1.16									851.44				852.70	852.94			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 3 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D5	D6	34+35	3.52	2.64	10.00	5.32	5.95	14.0	15.7	21	126.7	0.0150	844.40	7.83	18.09	0.0131	845.76	849.33	3.57	3.18	CB 4
begin		34+35	3.52	2.64									842.50				844.11	844.25			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 4 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D7	D8	42+00	2.25	1.69	10.00	5.32	5.94	9.0	10.0	18	160.0	0.0200	831.25	7.88	13.85	0.0121	832.25	834.75	2.50	2.00	CB 4
begin		42+00	2.25	1.69									828.05				829.41	829.55			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 5 - Eastbound I-70 and ramp A gore **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D9	D10	43+98	0.45	0.41	10.00	5.32	5.95	2.2	2.4	12	86.6	0.0200	832.50	5.53	4.69	0.0061	833.03	835.50	2.47	2.00	CB 2-3
begin		43+98	0.45	0.41									830.77				831.60	831.77			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 6 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D11	D12	44+15	0.57	0.43	10.00	5.32	5.99	2.3	2.6	12	60.4	0.0850	823.98	9.56	9.68	0.0069	824.34	830.98	6.64	6.00	CB 4
begin		44+77	0.57	0.43									818.85				819.69	819.85			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 7 - Median ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D13	D14	45+87		0.46	0.35	10.00	5.32	5.99	1.8	2.1	12	55.7	0.1775	826.49	11.76	13.99	0.0045	826.76	833.53	6.77	6.04	CB 4
begin		45+30		0.46	0.35									816.60				817.41	816.60			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 8 - Eastbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D15	D16	46+25	0.30	0.27	10.00	5.32	5.95	1.4	1.6	12	77.6	0.0200	828.37	4.97	4.69	0.0027	828.79	834.70	5.91	5.33	I 3C
begin		46+25	0.30	0.27									826.82				827.59	827.82			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 9 - Median Ditch and Eastbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D17	D18	48+00	2.96	2.22	10.00	5.32	5.98	11.8	13.3	18	71.3	0.0250	831.20	9.09	15.47	0.0213	832.37	834.71	2.34	2.01	CB 4
begin		48+00	2.96	2.22									829.42				830.85	836.25			0.015
D20	D21	53+50	0.30	0.27	10.00	5.32	5.82	1.4	1.6	12	272.0	0.0200	840.80	4.97	4.70	0.0026	841.22	847.49	6.27	5.69	I 3C
begin		50+75	3.26	2.49									835.36				836.13	841.71			0.015
D21	D18	50+75	0.30	0.27	10.91	5.14	5.67	2.8	3.1	12	272.0	0.0200	835.36	5.89	4.70	0.0098	835.98	841.71	5.73	5.35	I 3C
		48+00	3.56	2.76									829.92				830.79	836.25			0.015
D18	D19	48+00	0.30	0.27	11.68	5.00	5.62	15.2	17.0	24	91.7	0.0100	828.92	6.89	21.12	0.0075	830.44	836.25	5.81	5.33	I 3C
final		48+00	3.86	3.03									828.00				829.74	830.00			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 10 - Eastbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D22	D23	61+75	0.22	0.20	10.00	5.32	5.81	1.1	1.1	12	272.0	0.0210	858.26	4.64	4.81	0.0014	858.61	864.59	5.98	5.33	I 3C
begin		59+00	0.22	0.20									852.55				853.28	859.01			0.015
D23	D24	59+00	0.26	0.23	10.98	5.13	5.65	2.2	2.4	12	272.0	0.0210	852.55	5.69	4.81	0.0062	853.08	859.01	5.93	5.46	I 3C
		56+25	0.48	0.43									846.84				847.67	853.41			0.015
D24	D25	56+25	0.28	0.25	11.77	4.98	5.59	3.4	3.8	12	122.7	0.0200	846.84	6.15	4.70	0.0153	847.56	853.41	5.85	5.57	I 3C
final		56+25	0.76	0.68									844.38				845.30	845.38			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 11 - Eastbound I-70 concrete carrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D26	D27	64+75	0.26	0.23	10.00	5.32	5.96	1.2	1.4	12	59.7	0.0175	864.62	4.58	4.39	0.0020	865.02	870.95	5.93	5.33	I 3C
begin		64+65	0.26	0.23									863.58				864.32	864.58			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 12 - Median ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D28	D29	65+00	0.55	0.41	10.00	5.32	5.90	2.2	2.4	12	127.1	0.0100	865.94	4.26	3.32	0.0062	866.61	868.94	2.33	2.00	CB 4
begin		65+25	0.55	0.41									864.67				865.50	865.67			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 13 - Median ditch and Eastbound I-70 concrete barrier to Detention Basin **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA	ΔCA	BEGIN TIME	RAINFALL INTENSITY		DISCHARGE (cfs.)		PIPE DIAM.	LENGTH	SLOPE	F/L PIPE IN / OUT	MEAN VEL	JUST FULL CAPACITY	FRICT SLOPE	HYGR EL. IN / OUT	COVER IN / OUT	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
				ΣAREA (acres)	ΣCA	(min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)			
D30	D31	67+50		2.60	1.95	10.00	5.32	5.18	10.4	10.1	21	71.2	0.0100	869.16	6.27	14.75	0.0054	870.66	873.41	2.75	2.50	CB 4
begin		67+50		2.60	1.95									868.45				870.27	875.53			0.015
D33	D34	78+50		0.24	0.22	10.00	5.32	5.34	1.1	1.2	12	272.0	0.0075	880.08	3.28	2.88	0.0014	880.54	886.62	6.08	5.54	I 3B
begin		75+75		2.84	2.17									878.04				878.96	885.42			0.015
D34	D35	75+75		0.26	0.23	11.38	5.05	5.34	2.3	2.4	12	272.0	0.0075	878.04	3.83	2.88	0.0061	878.96	885.42	6.46	6.38	I 3B
		73+00		3.10	2.40									876.00				877.31	883.19			0.015
D35	D36	73+00		0.26	0.23	12.57	4.85	5.34	3.3	3.7	12	272.0	0.0125	876.00	5.01	3.71	0.0140	877.31	883.19	5.88	6.19	I 3C
		70+25		3.36	2.63									872.60				873.51	879.84			0.015
D36	D31	70+25		0.26	0.23	13.47	4.70	5.18	4.3	4.8	15	272.0	0.0125	872.35	5.51	6.73	0.0072	873.16	879.84	6.68	6.24	I 3C
		67+50		3.62	2.87									868.95				870.27	870.20			0.015
D31	D32	67+50		0.26	0.23	14.30	4.58	5.18	14.2	16.1	21	56.9	0.0100	868.45	6.50	14.78	0.0137	870.27	875.53	5.26	5.33	I 3C
final		67+00		3.88	3.10									867.88				869.49	869.63			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 14 - Westbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D37	D38	78+25	0.26	0.23	10.00	5.32	5.69	1.2	1.3	12	272.0	0.0050	880.41	2.87	2.35	0.0019	880.97	886.74	5.77	5.33	I 3B
begin		75+50	0.26	0.23									879.05				879.79	885.51			0.015
D38	D39	75+50	0.26	0.23	11.58	5.02	5.49	2.3	2.6	12	272.0	0.0100	879.05	4.32	3.32	0.0069	879.75	885.51	5.76	5.46	I 3C
		72+75	0.52	0.47									876.33				877.17	883.06			0.015
D39	D40	72+75	0.26	0.23	12.63	4.84	5.43	3.4	3.8	15	76.3	0.0050	876.08	3.62	4.25	0.0046	877.07	883.06	5.99	5.73	I 3C
final		72+75	0.78	0.70									875.70				876.72	876.95			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 15 - Median ditch and Eastbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D41	D42	86+00	3.09	2.32	10.00	5.32	5.97	12.3	13.8	21	73.7	0.0100	878.39	6.47	14.80	0.0101	879.96	882.64	2.68	2.50	CB 4
begin		86+00	3.09	2.32									877.65				879.22	885.60			0.015
D44	D42	83+25	0.22	0.20	10.00	5.32	5.54	1.1	1.1	12	272.0	0.0075	880.44	3.20	2.88	0.0013	880.89	886.53	5.64	5.09	I 3C
begin		86+00	3.31	2.52									878.40				879.15	885.60			0.015
D45	D46	91+50	0.26	0.23	10.00	5.32	5.77	1.2	1.4	12	272.0	0.0120	884.25	3.97	3.64	0.0019	884.69	890.55	5.86	5.30	I 3C
begin		88+75	3.57	2.75									880.99				881.74	886.56			0.015
D46	D42	88+75	0.26	0.23	11.14	5.10	5.57	2.4	2.6	12	272.0	0.0095	880.99	4.26	3.24	0.0071	881.71	886.56	4.85	4.57	I 3C
		86+00	3.83	2.98									878.40				879.25	885.60			0.015
D42	D43	86+00	0.52	0.47	12.21	4.91	5.54	16.9	19.1	24	60.7	0.0100	877.40	7.04	21.14	0.0095	879.15	885.60	6.45	6.20	I 3C
final		86+00	4.35	3.45									876.79				878.58	878.79			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 16 - Westbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D47	D48	83+25	0.22	0.20	10.00	5.32	5.58	1.1	1.1	12	272.0	0.0150	879.86	4.13	4.07	0.0013	880.23	886.19	5.96	5.33	I 3C
begin		86+00	0.22	0.20									875.78				876.51	885.47			0.015
D50	D51	91+50	0.26	0.23	10.00	5.32	5.79	1.2	1.4	12	272.0	0.0150	884.21	4.31	4.07	0.0019	884.62	890.65	6.03	5.44	I 3B
begin		88+75	0.48	0.43									880.13				880.88	886.54			0.015
D51	D48	88+75	0.26	0.23	11.05	5.12	5.62	2.4	2.6	12	272.0	0.0160	880.13	5.23	4.20	0.0072	880.73	886.54	5.81	5.41	I 3C
		86+00	0.74	0.67									875.78				876.63	885.47			0.015
D48	D49	86+00	0.52	0.47	11.92	4.96	5.58	5.6	6.3	18	52.2	0.0050	875.28	4.10	6.91	0.0048	876.51	885.47	8.96	8.69	I 3C
final		86+00	1.26	1.13									875.02				876.26	876.52			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 17 - Median ditch and Westbound I-70 concrete barrier and Ramp H MSE wall **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA	ΔCA	BEGIN TIME	RAINFALL INTENSITY		DISCHARGE (cfs.)		PIPE DIAM. (in.)	PIPE LENGTH (ft)	PIPE SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
				ΣAREA (acres)	ΣCA	(min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)												
D52	D53	97+00		2.45	1.84	10.00	5.32	5.83	9.8	10.7	18	69.7	0.0125	895.19	6.56	10.94	0.0138	897.48	898.69	1.21	2.00	CB 4
begin		97+00		2.45	1.84									894.32				896.52	901.67			0.015
D53	D54	97+00		0.26	0.23	10.18	5.29	5.83	11.0	12.1	18	35.9	0.0175	894.32	7.73	12.97	0.0176	896.52	901.67	5.15	5.85	I 3B
		97+00		2.71	2.07									893.69				895.89	901.05			0.015
D54	D55	97+00		0.22	0.20	10.25	5.27	5.83	12.0	13.2	18	272.0	0.0185	893.69	7.98	13.32	0.0211	895.89	901.05	5.16	5.86	I 3D
		94+25		2.93	2.27									888.66				890.16	895.54			0.015
D57	D55	94+25		0.26	0.23	10.00	5.32	5.83	1.2	1.4	12	35.9	0.0175	889.79	4.58	4.40	0.0019	890.23	896.16	5.93	5.37	I 3B
begin		94+25		3.19	2.50									889.16				890.16	895.54			0.015
D55	D56	94+25		0.22	0.20	10.82	5.16	5.83	13.9	15.7	21	19.7	0.0100	888.41	6.51	14.77	0.0131	890.16	895.54	5.38	5.38	I 3D
final		94+25		3.41	2.70									888.21				889.82	889.96			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 18 - Eastbound I-70 concrete barrier **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA	ΔCA	BEGIN TIME	RAINFALL INTENSITY		DISCHARGE (cfs.)		PIPE DIAM.	LENGTH	SLOPE	F/L PIPE IN / OUT	MEAN VEL	JUST FULL CAPACITY	FRICT SLOPE	HYGR EL. IN / OUT	COVER IN / OUT	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S
				ΣAREA (acres)	ΣCA	(min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)			'n'
D58	D59	99+75		0.26	0.23	10.00	5.32	5.82	1.2	1.4	12	272.0	0.0215	900.70	4.92	4.87	0.0019	901.08	907.03	5.95	5.33	I 3C
begin		97+00		0.26	0.23									894.85				895.60	901.56			0.015
D59	D60	97+00		0.26	0.23	10.92	5.14	5.66	2.4	2.6	12	272.0	0.0200	894.85	5.69	4.70	0.0073	895.41	901.56	6.15	5.71	I 3C
		94+25		0.52	0.47									889.41				890.26	896.01			0.015
D60	D61	94+25		0.26	0.23	11.72	4.99	5.63	3.5	4.0	12	65.0	0.0300	889.41	7.26	5.75	0.0164	890.05	896.01	5.96	5.60	I 3C
final		94+25		0.78	0.70									887.46				888.38	888.46			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 19 - Westbound I-70 concrete barrier and Ramp H MSE wall **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA	ΔCA	BEGIN TIME	RAINFALL INTENSITY		DISCHARGE (cfs.)		PIPE DIAM.	LENGTH	SLOPE	F/L PIPE IN / OUT	MEAN VEL	JUST FULL CAPACITY	FRICT SLOPE	HYGR EL. IN / OUT	COVER IN / OUT	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
				ΣAREA (acres)	ΣCA	(min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)			
D62	D63	99+75		0.26	0.23	10.00	5.32	5.66	1.2	1.3	12	35.9	0.0500	900.86	6.65	7.43	0.0018	901.16	907.19	6.03	5.33	I 3B
begin		99+75		0.26	0.23									899.07				899.88	906.56			0.015
D65	D66	105+25		0.34	0.31	10.00	5.32	5.83	1.6	1.8	12	272.0	0.0200	911.85	5.16	4.70	0.0033	912.29	918.19	5.90	5.34	I 3D
begin		102+50		0.60	0.54									906.41				907.19	912.81			0.015
D66	D67	102+50		0.26	0.23	10.88	5.15	5.80	2.8	3.1	12	35.9	0.0150	906.41	5.26	4.07	0.0103	907.12	912.81	5.69	5.40	I 3B
		102+50		0.86	0.77									905.87				906.75	912.86			0.015
D67	D63	102+50		0.20	0.18	10.99	5.13	5.67	3.7	4.1	12	272.0	0.0250	905.87	6.84	5.25	0.0175	906.57	912.86	6.29	5.99	I 3D
		99+75		1.06	0.95									899.07				899.99	906.56			0.015
D63	D64	99+75		0.22	0.20	11.66	5.01	5.66	5.8	6.5	12	30.7	0.0500	899.07	9.85	7.43	0.0446	899.88	906.56	6.68	6.49	I 3D
final		99+75		1.28	1.15									897.53				898.51	898.53			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 20 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D68	D69	109+75		3.90	2.73	10.00	5.32	5.95	14.5	16.2	24	88.6	0.0050	920.73	4.98	14.86	0.0068	922.73	924.73	2.00	2.00	CB 4
begin		109+75		3.90	2.73									920.29				922.02	924.54			0.015
D69	D70	109+75		3.57	2.50	10.30	5.26	5.89	27.5	30.8	36	103.0	0.0050	919.29	6.23	44.18	0.0028	921.46	924.54	3.08	2.25	CB 4
final		109+75		7.47	5.23									918.77				921.17	921.77			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 21 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D71	D72	124+95	3.60	2.52	10.00	5.32	5.85	13.4	14.7	24	138.9	0.0050	944.57	5.01	14.86	0.0056	946.66	949.07	2.41	2.50	CB 4
begin		124+95	3.60	2.52									943.88				945.88	953.85			0.015
D72	D73	124+95	3.57	2.50	10.46	5.23	5.85	26.2	29.3	30	110.7	0.0050	943.38	5.79	26.95	0.0068	945.88	953.85	7.97	7.97	CB 4
final		124+95	7.17	5.02									942.83				945.00	945.33			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 22 - Median Ditch/Culvert (existing conditions) **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA	ΣAREA (acres)	ΔCA	ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D74	D75	139+70		7.88		4.26		10.00	5.32	5.93	22.6	25.2	24	98.8	0.0139	972.79	8.37	24.84	0.0165	974.96	974.79	-0.17	0.00	HW Half He
begin		139+70		7.88		4.26										971.42				973.33	974.79			0.015
D75	D76	139+70		3.55		2.49		10.20	5.28	5.93	35.6	39.9	30	104.8	0.0117	970.92	8.91	41.42	0.0126	973.33	974.79	1.46	1.37	CB 4
final		139+70		11.43		6.74										969.69				972.00	972.19			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 23 - Median Ditch **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D77	D78	155+17	3.86	2.70	10.00	5.32	5.94	14.4	16.0	24	103.0	0.0050	986.77	5.04	14.99	0.0067	988.77	990.77	2.00	2.00	CB 4
begin		155+17	3.86	2.70									986.25				987.97	988.25			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 24 - Taylor Road from I70 ramps to SR204 **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D88	D79	34+00		0.26	0.23	10.00	5.32	5.74	1.2	1.3	12	31.8	0.0120	932.07	3.99	3.64	0.0019	932.96	935.32	2.36	2.25	CB 3
begin		34+00		0.26	0.23									931.69				932.90	936.57			0.015
D89	D79	34+00		0.37	0.33	10.00	5.32	5.74	1.8	1.9	12	43.8	0.0100	932.13	4.08	3.33	0.0038	933.07	935.13	2.06	2.00	CB 3
begin		34+00		0.63	0.57									931.69				932.90	936.57			0.015
D79	D80	34+00		0.00	0.00	10.18	5.29	5.74	3.0	3.3	12	295.9	0.0100	931.69	4.48	3.32	0.0111	932.90	936.57	3.67	3.88	MH 3
		31+00		0.63	0.57									928.73				929.62	933.64			0.015
D90	D80	31+00		0.37	0.33	10.00	5.32	5.99	1.8	2.0	12	28.2	0.0200	929.29	5.26	4.70	0.0042	929.77	932.53	2.76	2.24	CB 3
begin		31+00		1.00	0.90									928.73				929.53	933.64			0.015
D91	D80	31+00		0.42	0.38	10.00	5.32	5.98	2.0	2.3	12	40.2	0.0150	929.33	4.89	4.07	0.0054	929.89	932.33	2.44	2.00	CB 3
begin		31+00		1.42	1.28									928.73				929.55	933.64			0.015
D80	D81	31+00		0.00	0.00	11.28	5.07	5.46	6.5	7.0	18	295.5	0.0100	928.23	5.59	9.78	0.0059	929.21	933.64	4.43	3.91	MH 3
		28+00		1.42	1.28									925.28				927.01	932.14			0.015
D92	D81	28+00		0.22	0.20	10.00	5.32	5.46	1.1	1.1	12	28.2	0.0300	926.63	5.27	5.75	0.0012	927.04	931.03	3.99	3.40	CB 3
begin		28+00		1.64	1.48									925.78				927.01	932.14			0.015
D93	D81	28+00		0.36	0.32	10.00	5.32	5.46	1.7	1.8	12	28.2	0.0300	926.63	6.09	5.75	0.0033	927.10	931.03	3.93	3.40	CB 3
begin		28+00		2.00	1.80									925.78				927.01	932.14			0.015

STORM SEWER SYSTEM

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D81	D82	28+00		0.00	0.00	12.16	4.92	5.46	8.8	9.8	18	231.0	0.0100	925.28	5.87	9.79	0.0116	927.01	932.14	5.13	5.36	MH 3
		25+65		2.00	1.80									922.97				924.32	930.64			0.015
D94	D82	25+75		0.24	0.22	10.00	5.32	5.99	1.1	1.3	12	30.2	0.0300	924.38	5.41	5.75	0.0018	924.71	929.69	4.98	4.32	CB 3
begin		25+65		2.24	2.02									923.47				924.21	930.64			0.015
D95	D82	25+50		0.18	0.16	10.00	5.32	5.99	0.9	1.0	12	31.7	0.0300	924.42	4.98	5.75	0.0010	924.71	929.38	4.67	3.96	CB 3
begin		25+65		2.42	2.18									923.47				924.18	930.64			0.015
D82	D83	25+65		0.00	0.00	12.82	4.81	5.33	10.5	11.6	21	286.2	0.0100	922.72	6.29	14.79	0.0071	923.95	930.64	6.69	6.17	CB 3
		22+75		2.42	2.18									919.85				921.36	926.63			0.015
D96	D83	22+75		0.20	0.18	10.00	5.32	5.99	1.0	1.1	12	34.2	0.0300	921.63	5.16	5.75	0.0012	921.93	926.02	4.09	3.39	CB 3
begin		22+75		2.62	2.36									920.60				921.32	926.63			0.015
D97	D83	22+75		0.33	0.30	10.00	5.32	5.99	1.6	1.8	12	28.2	0.0300	921.45	5.94	5.75	0.0033	921.84	926.12	4.28	3.67	CB 3
begin		22+75		2.95	2.66									920.60				921.38	926.63			0.015
D83	D84	22+75		0.00	0.00	13.57	4.69	5.21	12.4	13.8	21	296.4	0.0125	919.85	7.11	16.52	0.0101	921.15	926.63	5.48	5.03	MH 3
		19+75		2.95	2.66									916.15				917.71	921.38			0.015
D98	D84	19+75		0.28	0.25	10.00	5.32	5.98	1.3	1.5	12	28.0	0.0100	917.18	3.78	3.32	0.0024	917.73	920.77	3.04	2.59	CB 3
begin		19+75		3.23	2.91									916.90				917.66	921.38			0.015
D99	D84	19+75		0.30	0.27	10.00	5.32	5.98	1.4	1.6	12	28.4	0.0100	917.18	3.86	3.32	0.0027	917.75	920.97	3.22	2.79	CB 3
begin		19+75		3.53	3.18									916.90				917.67	921.38			0.015
D84	D85	19+75		0.00	0.00	14.27	4.58	5.10	14.5	16.2	21	270.5	0.0225	916.15	9.29	22.16	0.0139	917.32	921.38	4.06	3.48	MH 3
		17+00		3.53	3.18									910.06				911.82	914.72			0.015
D100	D85	17+00		0.02	0.02	10.00	5.32	5.10	0.1	0.1	12	27.9	0.0100	911.09	1.79	3.33	0.0000	911.82	914.11	2.29	2.02	CB 3
begin		17+00		3.55	3.20									910.81				911.82	914.72			0.015

STORM SEWER SYSTEM

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D85	D86	17+00	0.00	0.00	14.75	4.51	5.10	14.4	16.3	21	38.6	0.0175	910.06	8.38	19.52	0.0141	911.82	914.72	2.90	2.91	MH 3
		17+00	3.55	3.20									909.39				911.28	914.58			0.015
D86	D87	17+00	0.26	0.23	14.83	4.50	5.10	15.4	17.5	21	67.2	0.0125	909.39	7.28	16.52	0.0162	911.28	914.58	3.30	3.44	CB 3
final		17+00	3.81	3.43									908.55				910.19	910.30			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 25 - Taylor Road and I70 Ramp J **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D101	D102	36+25	13.82	6.91	10.00	5.32	5.89	36.8	40.7	36	225.0	0.0050	928.51	6.53	43.87	0.0049	931.04	934.01	2.97	2.50	CB 4
begin		37+00	13.82	6.91									927.39				929.93	930.39			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 26 - Taylor Road from bridge to I70 ramps (south side) **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D103	D104	37+00	0.68	0.61	10.00	5.32	5.95	3.3	3.6	12	78.3	0.0100	943.18	4.43	3.32	0.0139	944.39	946.18	1.79	2.00	CB 3
begin		37+00	0.68	0.61									942.40				943.31	946.18			0.015
D104	D105	37+00	0.41	0.37	10.29	5.26	5.93	5.2	5.8	15	30.0	0.0200	942.15	6.87	8.52	0.0108	942.99	946.18	3.19	2.78	CB 3
final		37+00	1.09	0.98									941.55				942.66	943.64			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 27 - Taylor Road from bridge to I70 ramps (north side) **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D106	D107	42+91		0.27	0.24	10.00	5.32	5.93	1.3	1.4	12	87.7	0.0100	956.58	3.77	3.33	0.0022	957.06	959.58	2.52	2.00	CB 3
begin		42+52		0.27	0.24									955.70				956.45	960.05			0.015
D107	D108	42+52		0.11	0.10	10.39	5.24	5.91	1.8	2.0	12	20.0	0.0100	955.70	4.07	3.32	0.0043	956.39	960.05	3.66	3.35	CB 3
final		42+44		0.38	0.34									955.50				956.30	956.50			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 28 - Taylor Road from I70 ramps (north side) to stream **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D109	D110	45+05	0.23	0.21	10.00	5.32	5.94	1.1	1.2	12	70.3	0.0100	950.34	3.60	3.31	0.0016	950.78	953.34	2.56	2.00	CB 3
begin		45+00	0.23	0.21									949.64				950.37	953.50			0.015
D110	D111	45+00	0.25	0.23	10.33	5.26	5.90	2.3	2.6	12	45.0	0.0100	949.64	4.30	3.32	0.0068	950.34	953.50	3.16	2.86	CB 3
final		43+54	0.48	0.43									949.19				950.03	950.19			0.015

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 29 - Taylor Road from stream to end of project **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D112	D113	46+15		0.14	0.13	10.00	5.32	5.93	0.7	0.7	12	101.8	0.0250	945.88	4.34	5.25	0.0006	946.14	949.88	3.74	3.00	CB 3
begin		47+19		0.14	0.13									943.34				944.02	946.72			0.015
D113	D114	47+19		0.11	0.10	10.39	5.24	5.88	1.2	1.3	12	54.7	0.0150	943.34	4.25	4.07	0.0018	943.75	946.72	2.97	2.38	CB 3
		47+25		0.25	0.23									942.52				943.26	946.59			0.015
D114	D115	47+25		0.16	0.14	10.61	5.20	5.88	1.9	2.2	12	7.3	0.0225	942.52	5.63	4.98	0.0049	943.20	946.59	3.39	3.08	CB 3
		47+30		0.41	0.37									942.35				943.17	945.47			0.015
D115	D116	47+30		0.00	0.00	10.63	5.20	5.72	1.9	2.1	12	207.9	0.0125	942.35	4.51	3.71	0.0047	942.92	945.47	2.55	2.12	MH 3
		49+42		0.41	0.37									939.75				940.56	944.25			0.015
D118	D119	48+35		0.12	0.11	10.00	5.32	5.85	0.6	0.6	12	102.0	0.0100	941.44	3.01	3.32	0.0004	941.75	944.44	2.69	2.00	CB 3
begin		49+45		0.53	0.48									940.42				941.10	943.76			0.015
D119	D120	49+45		0.34	0.31	10.56	5.21	5.85	2.2	2.4	12	42.3	0.0100	940.42	4.25	3.32	0.0061	941.10	943.76	2.66	2.34	CB 3
		49+45		0.87	0.78									940.00				940.84	943.95			0.015
D120	D116	49+45		0.27	0.24	10.73	5.18	5.85	3.4	3.8	12	10.9	0.0225	940.00	6.43	4.98	0.0155	940.84	943.95	3.11	2.95	CB 3
		49+42		1.14	1.03									939.75				940.67	944.25			0.015
D121	D122	56+65		0.14	0.13	10.00	5.32	5.98	0.7	0.8	12	46.1	0.0500	949.31	5.59	7.43	0.0006	949.53	955.45	5.92	5.15	CB 3
begin		56+83		1.28	1.15									947.00				947.68	956.16			0.015

STORM SEWER SYSTEM

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D122	D123	56+83	56+54	0.00 1.28	0.00 1.15	10.14	5.29	5.95	0.7	0.8	12	24.1	0.0100	947.00 946.76	3.14	3.31	0.0006	947.46 947.44	956.16 954.56	8.70	8.16	MH 3 0.015
D123	D124	56+54	54+83	0.33 1.61	0.30 1.45	10.27	5.27	5.81	2.2	2.5	12	177.6	0.0100	946.76 944.98	4.29	3.33	0.0063	947.43 945.82	954.56 953.69	7.13	6.80	CB 3 0.015
D128	D124	54+70	54+73	0.10 1.71	0.09 1.54	10.00	5.32	5.74	0.5	0.5	12	64.6	0.0500	948.21 944.98	5.03	7.43	0.0003	948.39 945.77	953.29 953.69	4.90	4.08	CB 3 0.015
begin																						
D124	D125	54+73	53+80	0.00 1.71	0.00 1.54	10.95	5.13	5.74	2.6	2.9	12	88.3	0.0100	944.98 944.10	4.40	3.32	0.0091	945.77 944.97	953.69 952.10	7.92	7.71	MH 3 0.015
D129	D130	53+50	53+75	0.14 1.85	0.13 1.67	10.00	5.32	5.97	0.7	0.8	12	57.5	0.0300	946.37 944.65	4.65	5.75	0.0006	946.63 945.33	950.76 951.27	4.13	3.39	CB 3 0.015
begin																						
D130	D125	53+75	53+80	0.15 2.00	0.14 1.80	10.21	5.28	5.95	1.4	1.6	12	18.3	0.0300	944.65 944.10	5.70	5.75	0.0025	945.02 944.86	951.27 952.10	6.25	5.62	CB 3 0.015
D125	D126	53+80	51+87	0.00 2.00	0.00 1.80	11.29	5.07	5.47	3.9	4.2	15	191.4	0.0100	943.85 941.94	4.93	6.02	0.0057	944.66 943.13	952.10 947.53	7.44	7.00	MH 3 0.015
D131	D126	51+90	51+87	0.09 2.09	0.08 1.88	10.00	5.32	5.47	0.4	0.4	12	80.6	0.0150	943.44 942.23	3.21	4.07	0.0002	943.67 943.13	947.19 947.53	3.52	2.75	CB 3 0.015
begin																						
D126	D127	51+87	51+50	0.00 2.09	0.00 1.88	11.94	4.96	5.47	4.2	4.7	15	37.0	0.0100	941.98 941.61	5.02	6.02	0.0070	943.13 942.88	947.53 945.99	4.40	4.30	MH 3 0.015
D127	D116	51+50	49+42	0.23 2.32	0.21 2.09	12.06	4.93	5.47	5.2	5.8	15	210.4	0.0100	941.61 939.50	5.19	6.03	0.0108	942.88 940.61	945.99 944.25	3.11	3.13	CB 3 0.015
D116	D117	49+42	49+42	0.00 2.32	0.00 2.09	12.73	4.82	5.47	10.1	11.4	21	13.0	0.0100	939.00 938.87	6.23	14.77	0.0069	940.46 940.37	944.25 940.62	3.79	3.50	MH 3 0.015
final																						

STORM SEWER SYSTEM

PID : 96808 **Date :** 06/01/2023 **Project :** FAI-LIC-70 **Location :** Franklin, Licking, Fairfield Counties

Description : Run 30 - Taylor Road SW (connects to existing system) **Designer :** CEF

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
D135	D136	14+00	0.18	0.16	10.00	5.32	5.97	0.9	1.0	12	36.3	0.0075	939.98	3.04	2.88	0.0010	940.45	943.04	2.59	2.06	CB 3
begin		14+00	0.18	0.16									939.71				940.41	943.04			0.015
D136	D132	14+00	0.10	0.09	10.20	5.28	5.95	1.3	1.5	12	17.8	0.0100	939.71	3.79	3.32	0.0024	940.33	943.04	2.71	2.33	CB 3
		14+00	0.28	0.25									939.53				940.29	944.78			0.015
D132	D133	14+00	0.00	0.00	10.28	5.27	5.88	1.3	1.5	12	106.2	0.0300	939.53	5.66	5.76	0.0023	939.89	944.78	4.89	4.25	MH 3
		13+00	0.28	0.25									936.34				937.10	943.56			0.015
D137	D138	13+00	0.15	0.14	10.00	5.32	5.98	0.7	0.8	12	36.3	0.0300	938.29	4.76	5.75	0.0007	938.56	941.73	3.17	2.44	CB 3
begin		13+00	0.43	0.39									937.21				937.89	941.73			0.015
D138	D133	13+00	0.08	0.07	10.13	5.30	5.97	1.1	1.2	12	21.6	0.0400	937.21	5.91	6.64	0.0016	937.51	941.73	4.22	3.52	CB 3
		13+00	0.51	0.46									936.34				937.08	943.56			0.015
D133	D134	13+00	0.00	0.00	10.59	5.20	5.82	2.4	2.7	12	126.7	0.0300	936.34	6.63	5.75	0.0075	936.84	943.56	6.72	6.22	MH 3
final		11+71	0.51	0.46									932.54				933.39	941.07			0.015

VI. Existing Culvert Analysis Calculations

A preliminary hydraulic analysis was performed for each existing culvert using HY-8. There are twelve culverts within the project limits: five culverts are under I-70, one culvert is under Taylor Road, two culverts are under SR256, two culverts run parallel with SR256 under the bridge of I-70, one culvert is under the eastbound I-70 exit ramp to SR256, and one culvert is under the eastbound I-70 entrance ramp from SR256. The existing culverts' parameters were provided by American Structurepoint. Three of the existing culverts have Stream Stats data, but the remaining nine culverts utilized drainage areas based on existing contours for discharge data. All culverts within the project limits will not need to be resized. The existing culverts, depending on the condition, can be extended rather than fully replaced.

HY-8 Culvert Analysis Report

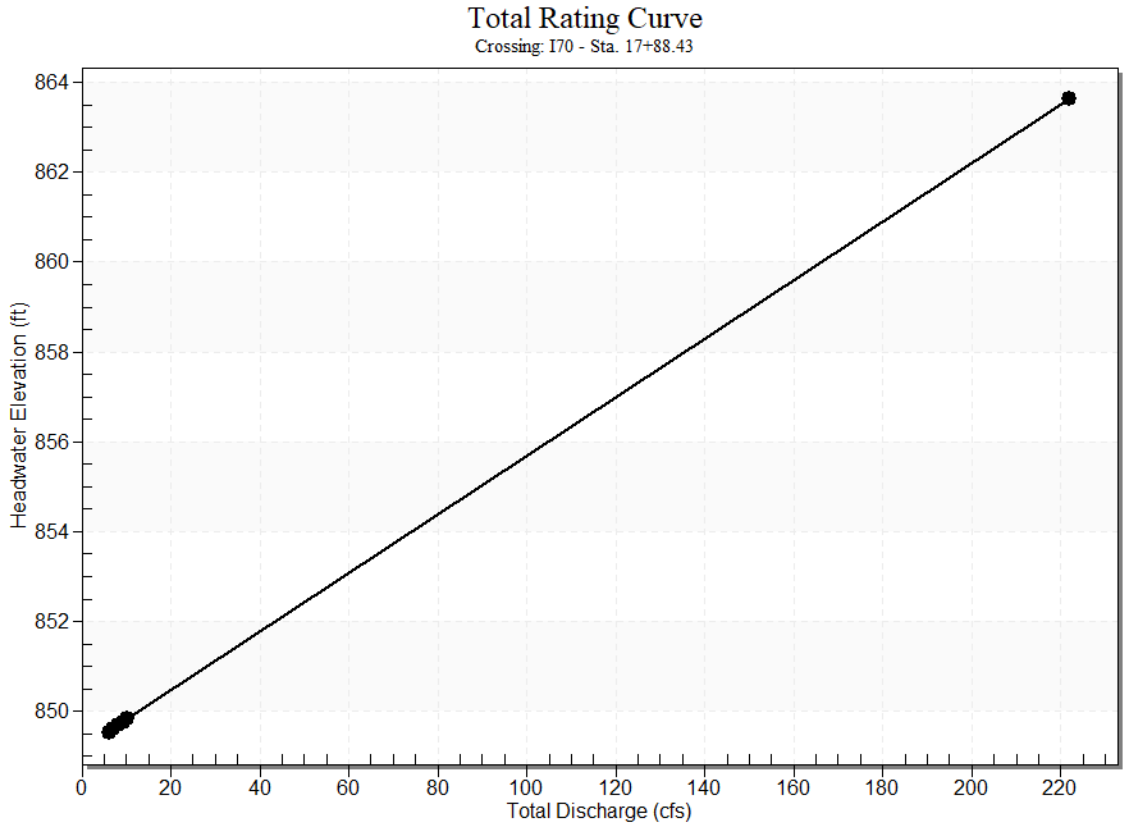
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: I70 - Sta. 17+88.43

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 48" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
849.53	5 year	6.12	6.12	0.00	1
849.60	10 year	7.05	7.05	0.00	1
849.69	25 year	8.33	8.33	0.00	1
849.76	50 year	9.28	9.28	0.00	1
849.82	100 year	10.18	10.18	0.00	1
863.60	Overtopping	219.98	219.98	0.00	Overtopping

Rating Curve Plot for Crossing: I70 - Sta. 17+88.43



Culvert Data: Existing 48" Circular Culvert

Table 1 - Culvert Summary Table: Existing 48" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	6.12 cfs	6.12 cfs	849.53	0.97	0.0*	1-S2n	0.63	0.72	0.63	0.38	4.82	2.27
10 year	7.05 cfs	7.05 cfs	849.60	1.05	0.0*	1-S2n	0.67	0.77	0.67	0.41	5.03	2.38
25 year	8.33 cfs	8.33 cfs	849.69	1.14	0.0*	1-S2n	0.73	0.84	0.73	0.45	5.28	2.51
50 year	9.28 cfs	9.28 cfs	849.76	1.21	0.0*	1-S2n	0.77	0.89	0.77	0.48	5.45	2.60
100 year	10.18 cfs	10.18 cfs	849.82	1.27	0.0*	1-S2n	0.81	0.93	0.81	0.51	5.60	2.68

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

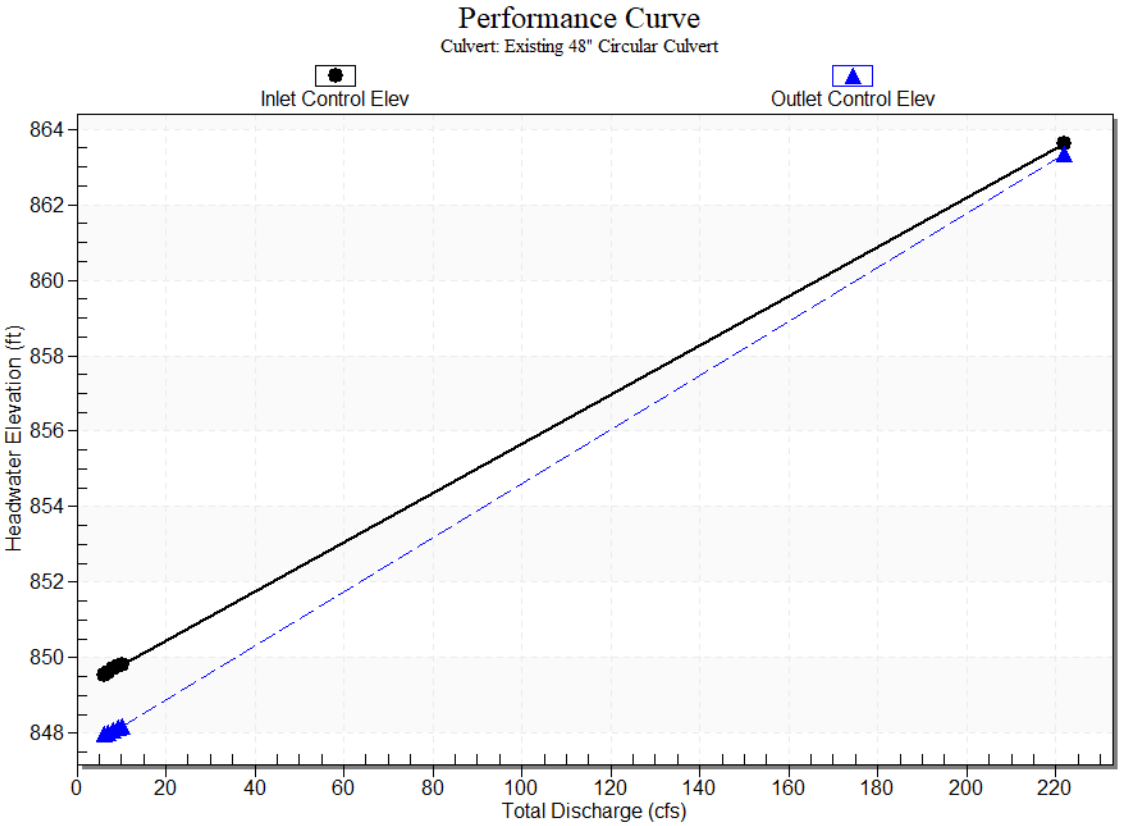
Inlet Elevation (invert): 848.55 ft,

Outlet Elevation (invert): 847.24 ft

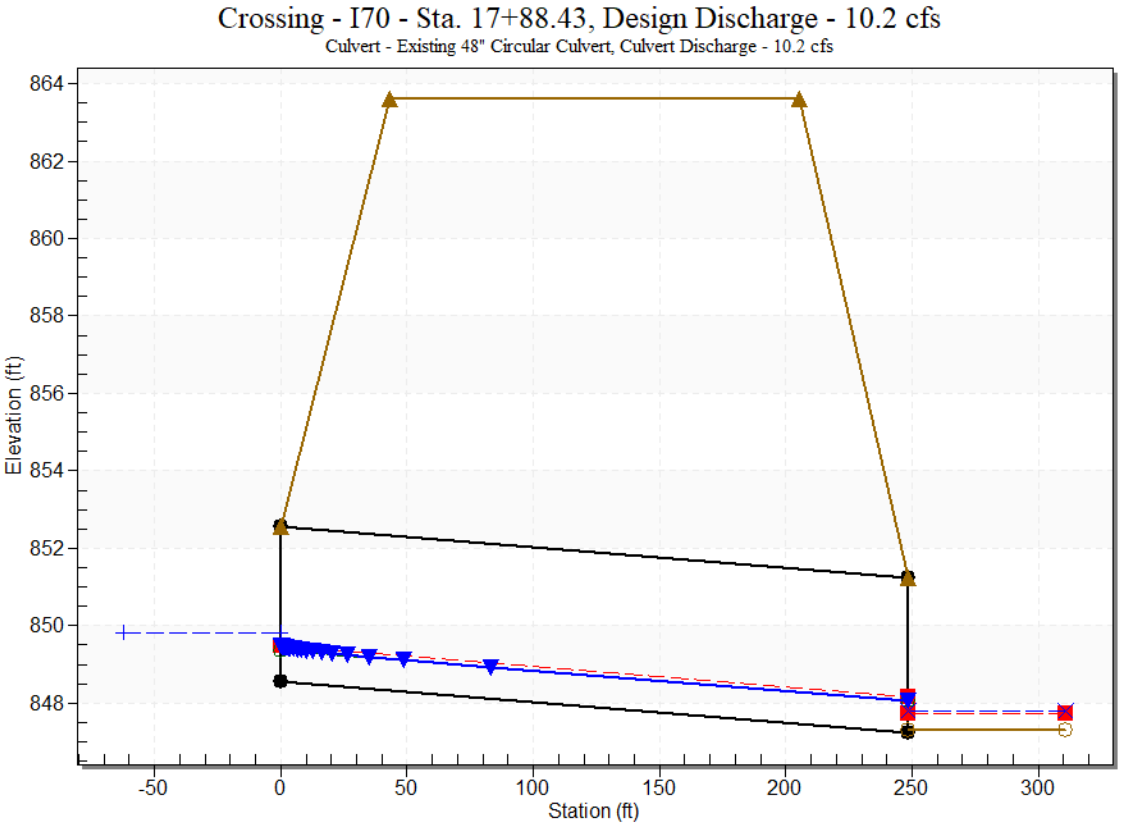
Culvert Length: 248.54 ft,

Culvert Slope: 0.0053

Culvert Performance Curve Plot: Existing 48" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 48" Circular Culvert



Site Data - Existing 48" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 848.55 ft

Outlet Station: 248.53 ft

Outlet Elevation: 847.24 ft

Number of Barrels: 1

Culvert Data Summary - Existing 48" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: I70 - Sta. 17+88.43

Table 2 - Downstream Channel Rating Curve (Crossing: I70 - Sta. 17+88.43)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
6.12	847.68	0.38	2.27	0.40	0.70
7.05	847.71	0.41	2.38	0.43	0.71
8.33	847.75	0.45	2.51	0.48	0.72
9.28	847.78	0.48	2.60	0.51	0.72
10.18	847.81	0.51	2.68	0.53	0.73

Tailwater Channel Data - I70 - Sta. 17+88.43

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 3.00 (_:1)

Channel Slope: 0.0169

Channel Manning's n: 0.0400

Channel Invert Elevation: 847.30 ft

Roadway Data for Crossing: I70 - Sta. 17+88.43

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 115.00 ft

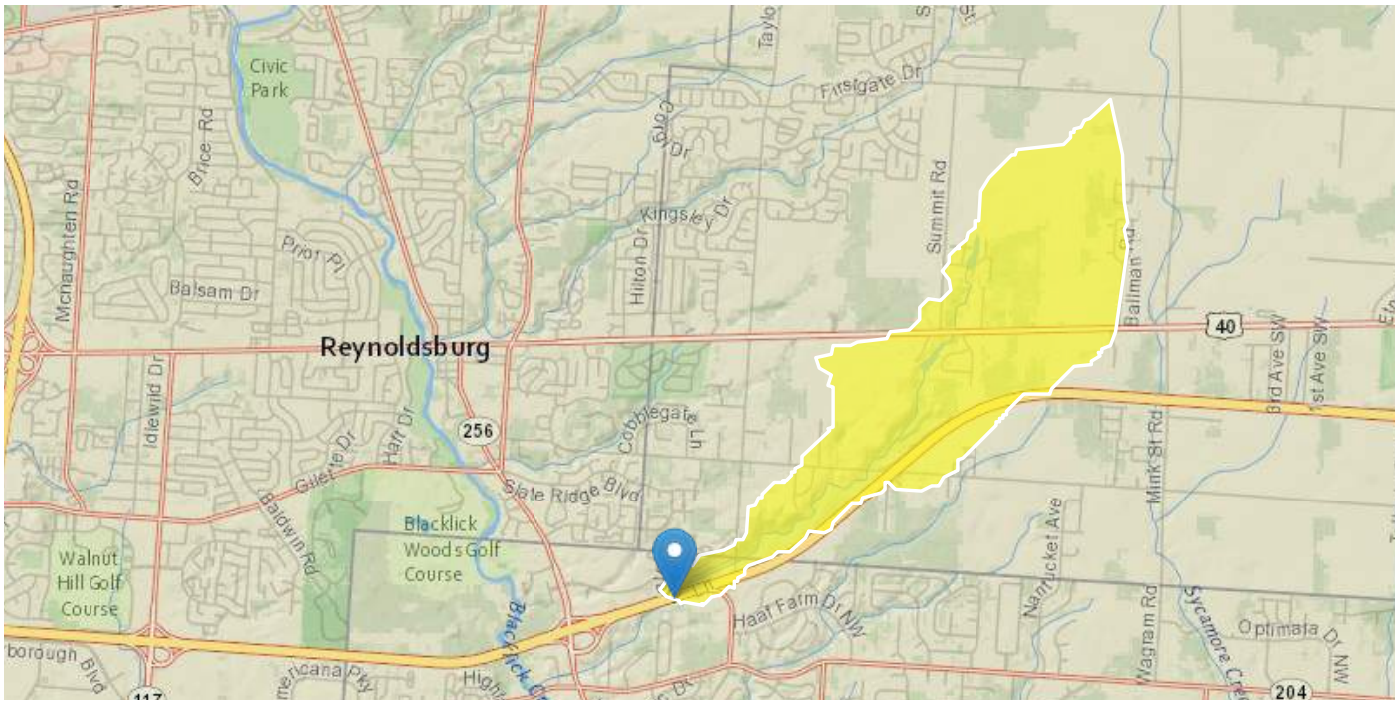
Crest Elevation: 863.60 ft

Roadway Surface: Paved

Roadway Top Width: 162.50 ft

StreamStats Report - Culvert Sta. 92+47.89

Region ID: OH
Workspace ID: OH20230516144616714000
Clicked Point (Latitude, Longitude): 39.93613, -82.77904
Time: 2023-05-16 10:46:42 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	50.9	feet per mi
DRNAREA	Area that drains to a point on a stream	1.96	square miles
FOREST	Percentage of area covered by forest	27	percent
LAT_CENT	Latitude of Basin Centroid	39.955	decimal degrees
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	1.42	percent
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches

Parameter Code	Parameter Description	Value	Unit
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.55	dimensionless

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.96	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	50.9	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	1.42	percent	0	25.35

Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	178	ft^3/s	94.1	337	40.1
20-percent AEP flood	311	ft^3/s	172	563	37.2
10-percent AEP flood	417	ft^3/s	229	759	37.6
4-percent AEP flood	571	ft^3/s	311	1050	38.1
2-percent AEP flood	698	ft^3/s	377	1290	37.8
1-percent AEP flood	835	ft^3/s	446	1560	39.6
0.2-percent AEP flood	1190	ft^3/s	629	2250	40.3

Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.96	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.24	1.12

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
1 Day 10 Year Low Flow	0.0291	ft^3/s	53.1
7 Day 10 Year Low Flow	0.037	ft^3/s	40
30 Day 10 Year Low Flow	0.0573	ft^3/s	35.7
90 Day 10 Year Low Flow	0.0885	ft^3/s	29.8

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.96	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.24	1.12

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
80 Percent Duration	0.183	ft^3/s	29.1

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.96	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	39.955	decimal degrees	38.68	41.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2

Annual Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	1.94	ft^3/s	11.4	11.4

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Monthly Flow Statistics

Monthly Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.96	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.42	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2
FOREST	Percent Forest	27	percent	0	99.1
LAT_CENT	Latitude of Basin Centroid	39.955	decimal degrees	38.68	41.2
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.25	1.13

Monthly Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
January Mean Flow	2.87	ft^3/s	16.6	16.6
February Mean Flow	3.56	ft^3/s	11.9	11.9
March Mean Flow	3.96	ft^3/s	14	14
April Mean Flow	3.67	ft^3/s	11.2	11.2
May Mean Flow	2.46	ft^3/s	19.5	19.5
June Mean Flow	1.51	ft^3/s	27	27
July Mean Flow	0.856	ft^3/s	28.2	28.2
August Mean Flow	0.622	ft^3/s	36.8	36.8
September Mean Flow	0.402	ft^3/s	43.6	43.6
October Mean Flow	0.397	ft^3/s	50.8	50.8
November Mean Flow	0.923	ft^3/s	37.5	37.5
December Mean Flow	2.01	ft^3/s	21.8	21.8

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

General Flow Statistics

General Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.96	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.42	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.955	decimal degrees	38.68	41.2

General Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.304	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

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Application Version: 4.14.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

HY-8 Culvert Analysis Report

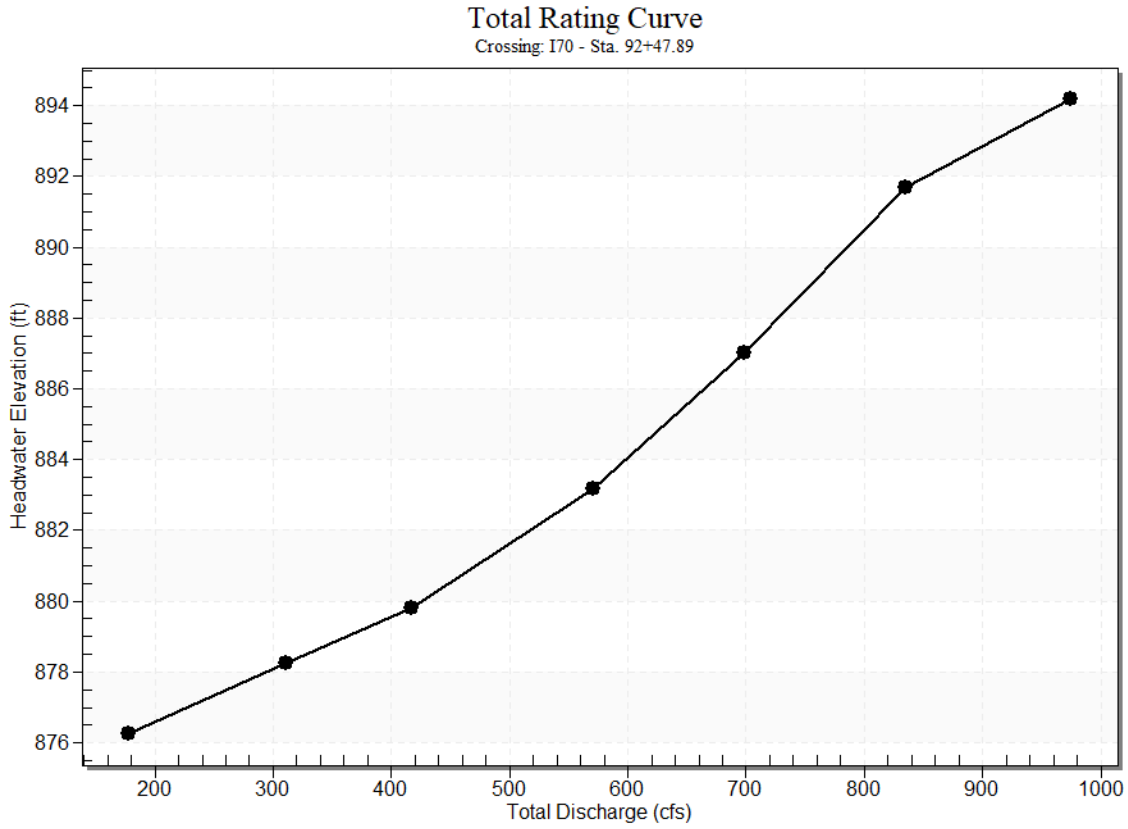
Crossing Discharge Data

Discharge Selection Method: User Defined

Table 1 - Summary of Culvert Flows at Crossing: I70 - Sta. 92+47.89

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 96" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
876.27	50%	178.00	178.00	0.00	1
878.25	20%	311.00	311.00	0.00	1
879.81	10%	417.00	417.00	0.00	1
883.16	4%	571.00	571.00	0.00	1
887.01	2%	698.00	698.00	0.00	1
891.70	1%	835.00	835.00	0.00	1
894.16	Overtopping	900.05	900.05	0.00	Overtopping

Rating Curve Plot for Crossing: I70 - Sta. 92+47.89



Culvert Data: Existing 96" Circular Culvert

Table 1 - Culvert Summary Table: Existing 96" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50%	178.00 cfs	178.00 cfs	876.27	4.67	5.136	2-M2c	3.82	3.33	3.33	1.48	8.99	5.72
20%	311.00 cfs	311.00 cfs	878.25	6.55	7.124	2-M2c	5.45	4.46	4.46	2.05	10.80	6.88
10%	417.00 cfs	417.00 cfs	879.81	8.01	8.677	7-M2c	8.00	5.19	5.19	2.42	12.07	7.55
4%	571.00 cfs	571.00 cfs	883.16	10.41	12.031	7-M2c	8.00	6.09	6.09	2.88	13.91	8.33
2%	698.00 cfs	698.00 cfs	887.01	12.83	15.879	7-M2c	8.00	6.68	6.68	3.22	15.58	8.86
1%	835.00 cfs	835.00 cfs	891.70	15.99	20.565	7-M2c	8.00	7.15	7.15	3.56	17.61	9.34

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

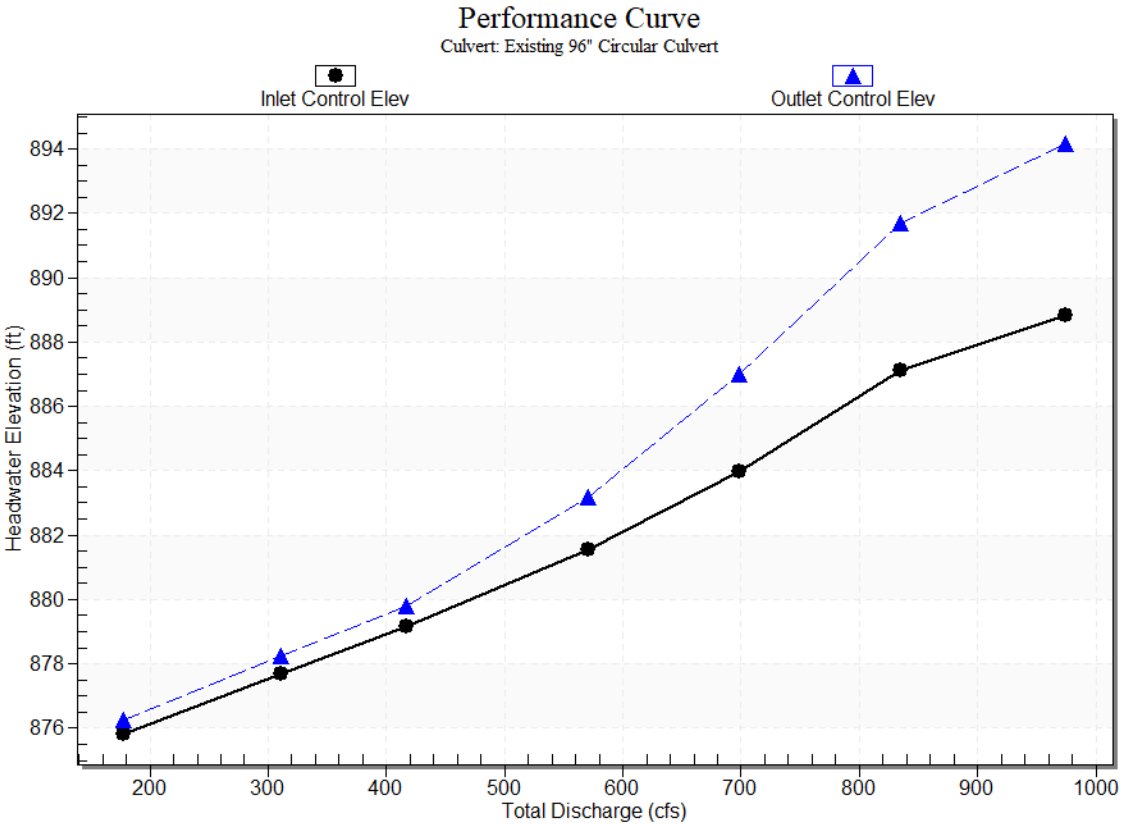
Inlet Elevation (invert): 871.13 ft,

Outlet Elevation (invert): 869.37 ft

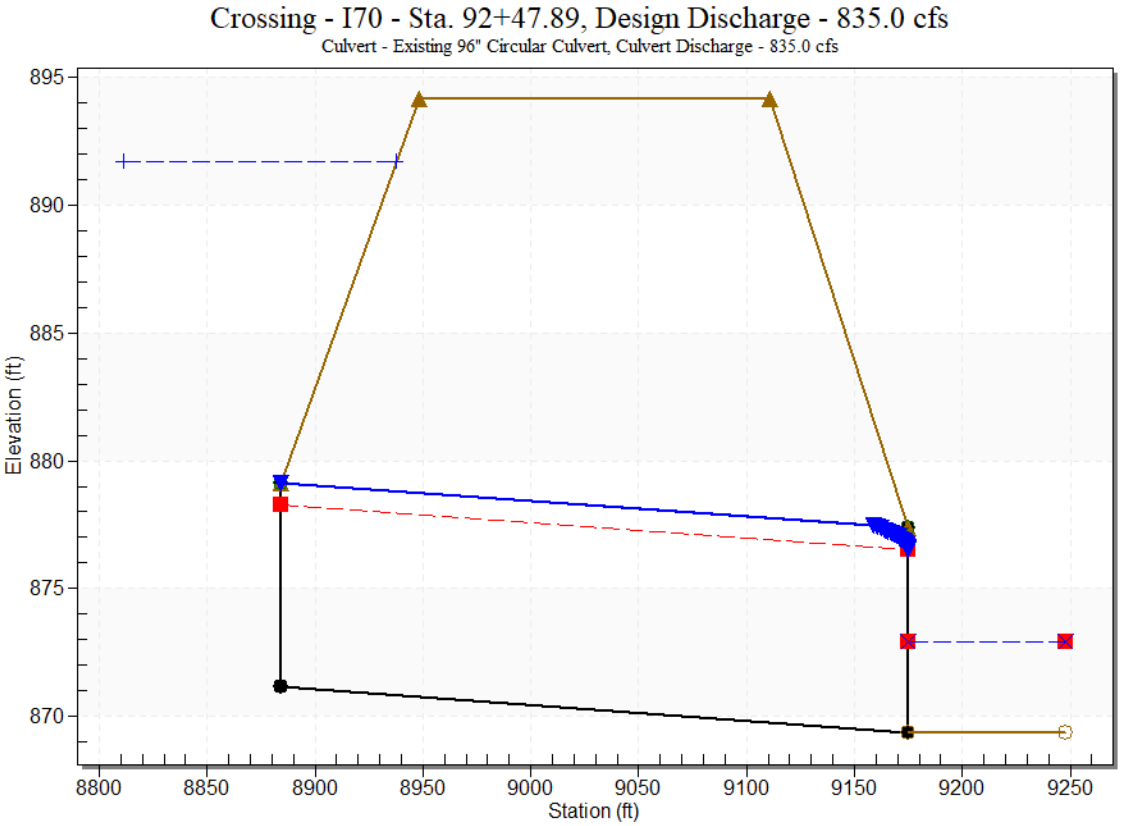
Culvert Length: 290.86 ft,

Culvert Slope: 0.0061

Culvert Performance Curve Plot: Existing 96" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 96" Circular Culvert



Site Data - Existing 96" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 8884.17 ft

Inlet Elevation: 871.13 ft

Outlet Station: 9175.02 ft

Outlet Elevation: 869.37 ft

Number of Barrels: 1

Culvert Data Summary - Existing 96" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 8.00 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0240

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: I70 - Sta. 92+47.89

Table 2 - Downstream Channel Rating Curve (Crossing: I70 - Sta. 92+47.89)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
178.00	870.84	1.48	5.72	2.04	0.88
311.00	871.41	2.05	6.88	2.81	0.92
417.00	871.78	2.42	7.55	3.32	0.94
571.00	872.24	2.88	8.33	3.96	0.96
698.00	872.58	3.22	8.86	4.43	0.98
835.00	872.92	3.56	9.34	4.88	0.99

Tailwater Channel Data - I70 - Sta. 92+47.89

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 18.00 ft

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0220

Channel Manning's n: 0.0450

Channel Invert Elevation: 869.36 ft

Roadway Data for Crossing: I70 - Sta. 92+47.89

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 72.00 ft

Crest Elevation: 894.16 ft

Roadway Surface: Paved

Roadway Top Width: 162.70 ft

HY-8 Culvert Analysis Report

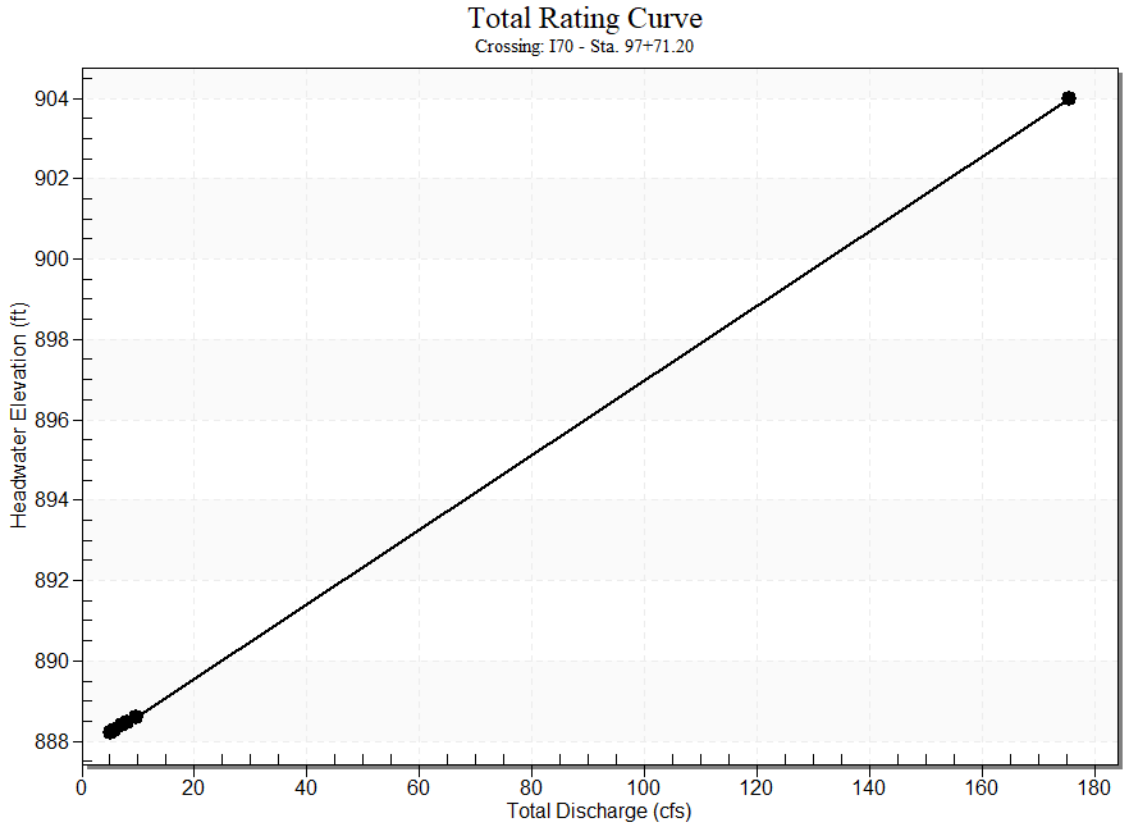
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: I70 - Sta. 97+71.20

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 48" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
888.22	5 year	5.10	5.10	0.00	1
888.29	10 year	5.83	5.83	0.00	1
888.39	25 year	7.07	7.07	0.00	1
888.48	50 year	8.17	8.17	0.00	1
888.60	100 year	9.75	9.75	0.00	1
903.79	Overtopping	171.76	171.76	0.00	Overtopping

Rating Curve Plot for Crossing: I70 - Sta. 97+71.20



Culvert Data: Existing 48" Circular Culvert

Table 1 - Culvert Summary Table: Existing 48" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	5.10 cfs	5.10 cfs	888.22	0.94	0.0*	1-S2n	0.58	0.65	0.58	0.51	4.49	9.66
10 year	5.83 cfs	5.83 cfs	888.29	1.01	0.0*	1-S2n	0.62	0.70	0.62	0.54	4.66	9.99
25 year	7.07 cfs	7.07 cfs	888.39	1.11	0.0*	1-S2n	0.68	0.77	0.68	0.58	4.94	10.48
50 year	8.17 cfs	8.17 cfs	888.48	1.20	0.0*	1-S2n	0.73	0.83	0.73	0.61	5.15	10.86
100 year	9.75 cfs	9.75 cfs	888.60	1.32	0.0*	1-S2n	0.80	0.91	0.80	0.66	5.43	11.35

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

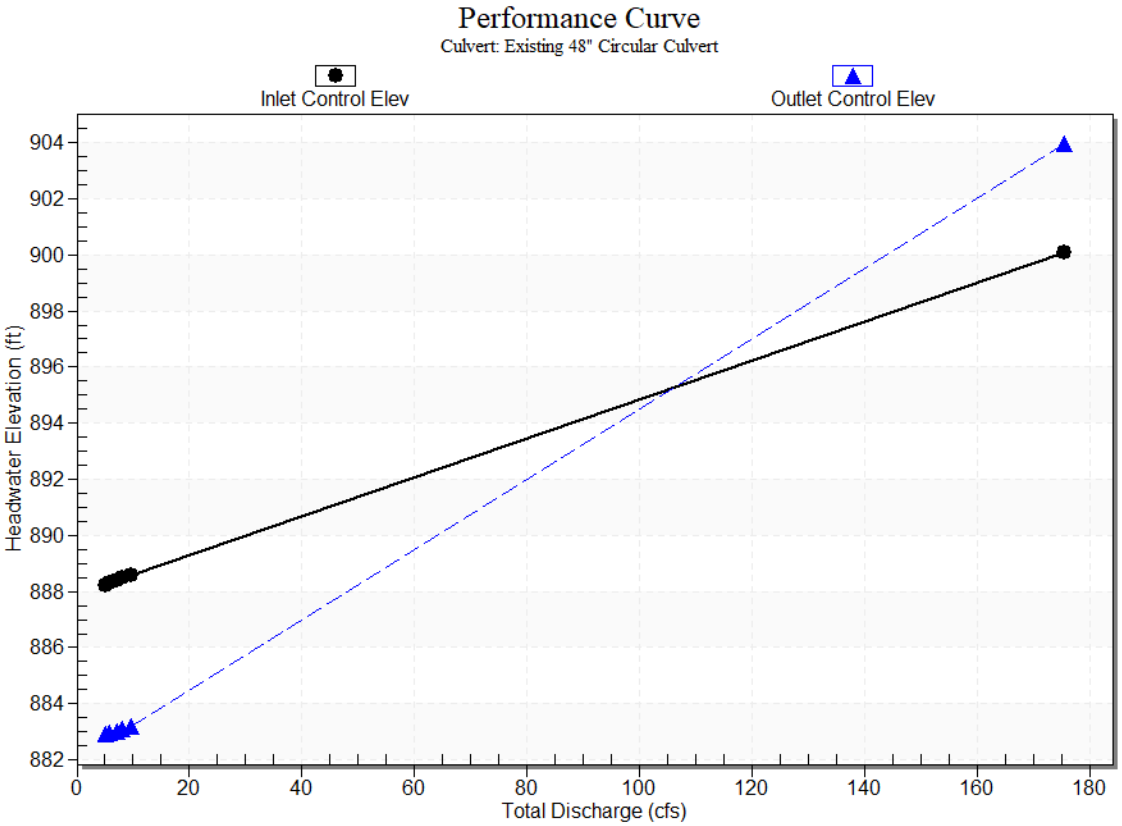
Inlet Elevation (invert): 887.28 ft,

Outlet Elevation (invert): 882.23 ft

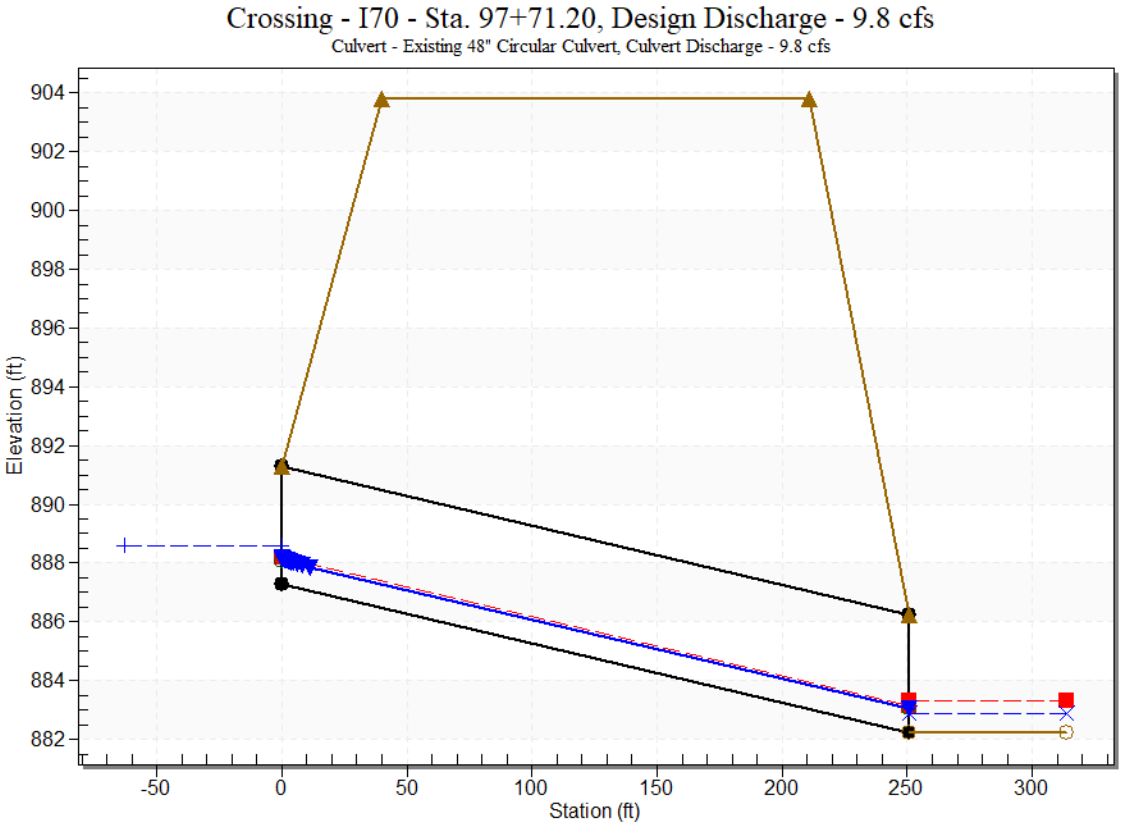
Culvert Length: 250.93 ft,

Culvert Slope: 0.0201

Culvert Performance Curve Plot: Existing 48" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 48" Circular Culvert



Site Data - Existing 48" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 887.28 ft

Outlet Station: 250.88 ft

Outlet Elevation: 882.23 ft

Number of Barrels: 1

Culvert Data Summary - Existing 48" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0240

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting (Ke=0.9)

Inlet Depression: None

Tailwater Data for Crossing: I70 - Sta. 97+71.20

Table 2 - Downstream Channel Rating Curve (Crossing: I70 - Sta. 97+71.20)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
5.10	882.74	0.51	9.66	3.85	3.36
5.83	882.77	0.54	9.99	4.05	3.39
7.07	882.81	0.58	10.48	4.35	3.43
8.17	882.84	0.61	10.86	4.59	3.46
9.75	882.89	0.66	11.35	4.91	3.50

Tailwater Channel Data - I70 - Sta. 97+71.20

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.1200

Channel Manning's n: 0.0200

Channel Invert Elevation: 882.23 ft

Roadway Data for Crossing: I70 - Sta. 97+71.20

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 12.00 ft

Crest Elevation: 903.79 ft

Roadway Surface: Paved

Roadway Top Width: 170.70 ft

HY-8 Culvert Analysis Report

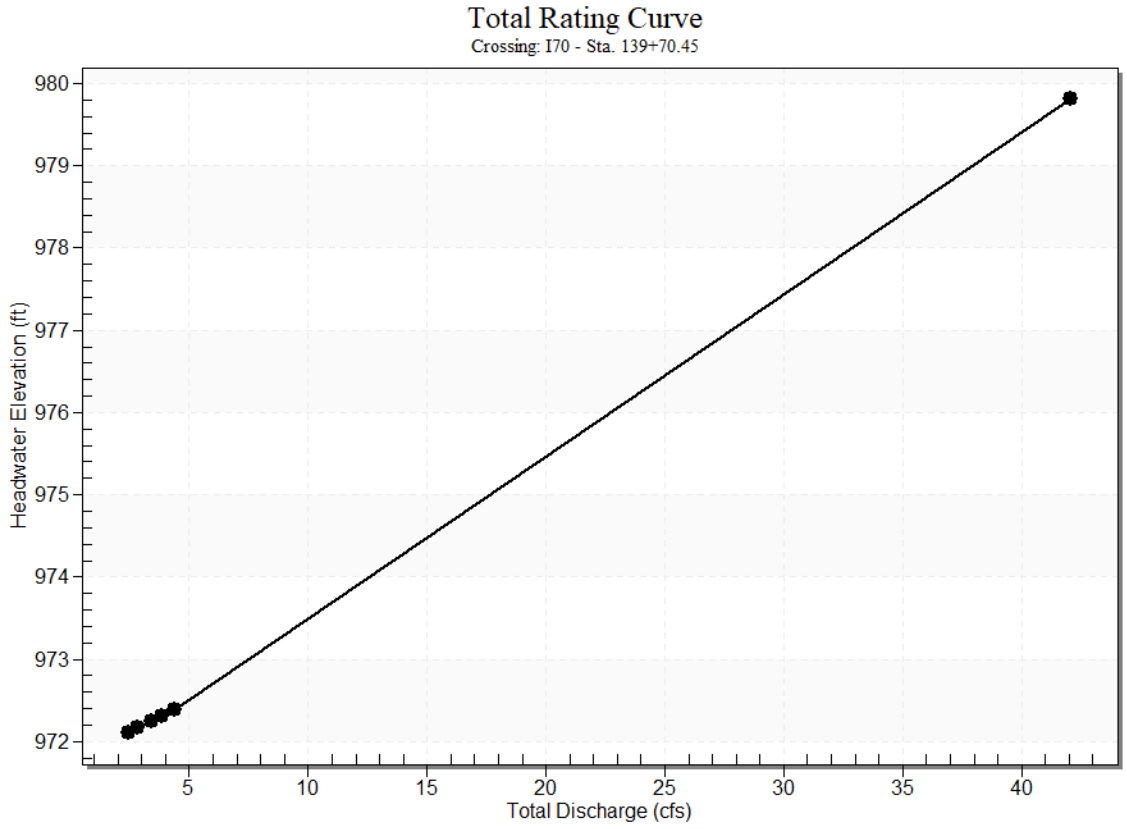
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: I70 - Sta. 139+70.45

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 24" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
972.11	5 year	2.46	2.46	0.00	1
972.17	10 year	2.83	2.83	0.00	1
972.25	25 year	3.39	3.39	0.00	1
972.31	50 year	3.84	3.84	0.00	1
972.38	100 year	4.38	4.38	0.00	1
979.80	Overtopping	41.54	41.54	0.00	Overtopping

Rating Curve Plot for Crossing: I70 - Sta. 139+70.45



Culvert Data: Existing 24" Circular Culvert

Table 1 - Culvert Summary Table: Existing 24" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	2.46 cfs	2.46 cfs	972.11	0.74	0.0*	1-JS 1t	0.42	0.55	0.79	0.79	2.14	1.98
10 year	2.83 cfs	2.83 cfs	972.17	0.80	0.0*	1-JS 1t	0.44	0.59	0.83	0.83	2.30	2.05
25 year	3.39 cfs	3.39 cfs	972.25	0.88	0.0*	1-S2 n	0.49	0.64	0.49	0.89	5.73	2.14
50 year	3.84 cfs	3.84 cfs	972.31	0.94	0.0*	1-S2 n	0.52	0.69	0.52	0.93	5.93	2.21
100 year	4.38 cfs	4.38 cfs	972.38	1.01	0.0*	1-S2 n	0.55	0.74	0.56	0.98	6.10	2.29

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

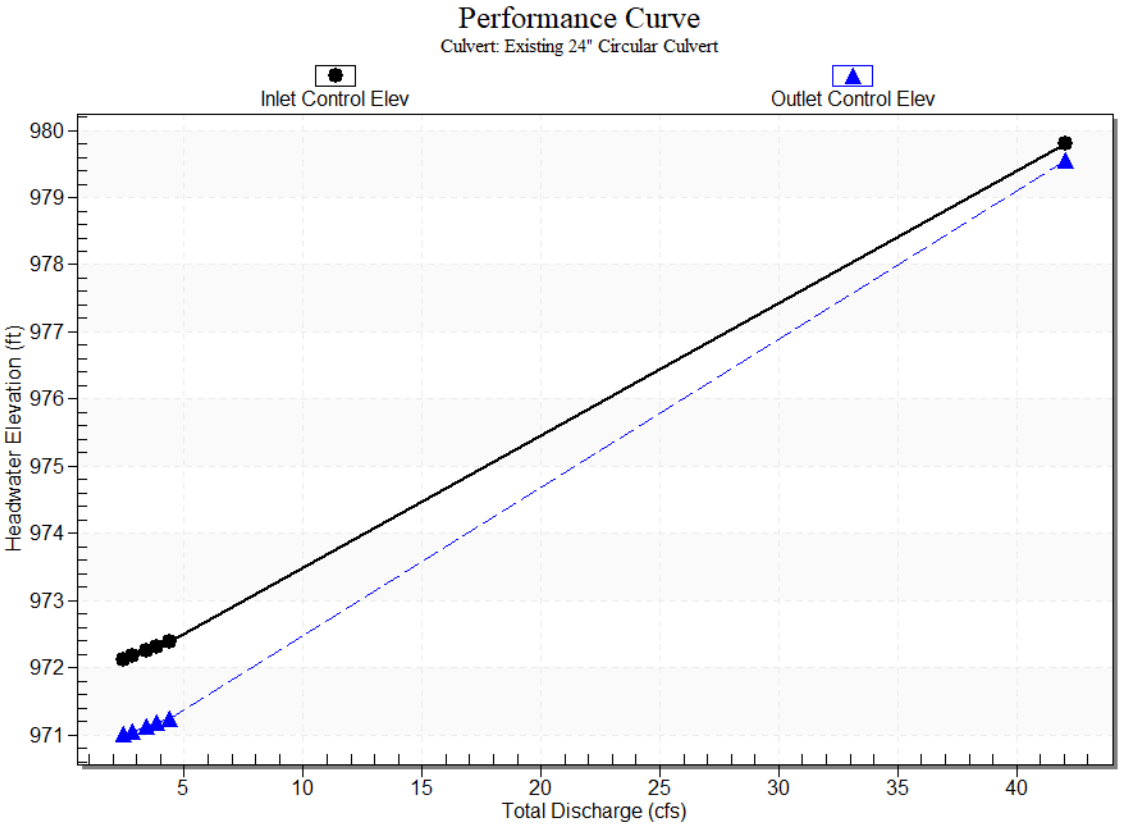
Inlet Elevation (invert): 971.37 ft,

Outlet Elevation (invert): 970.19 ft

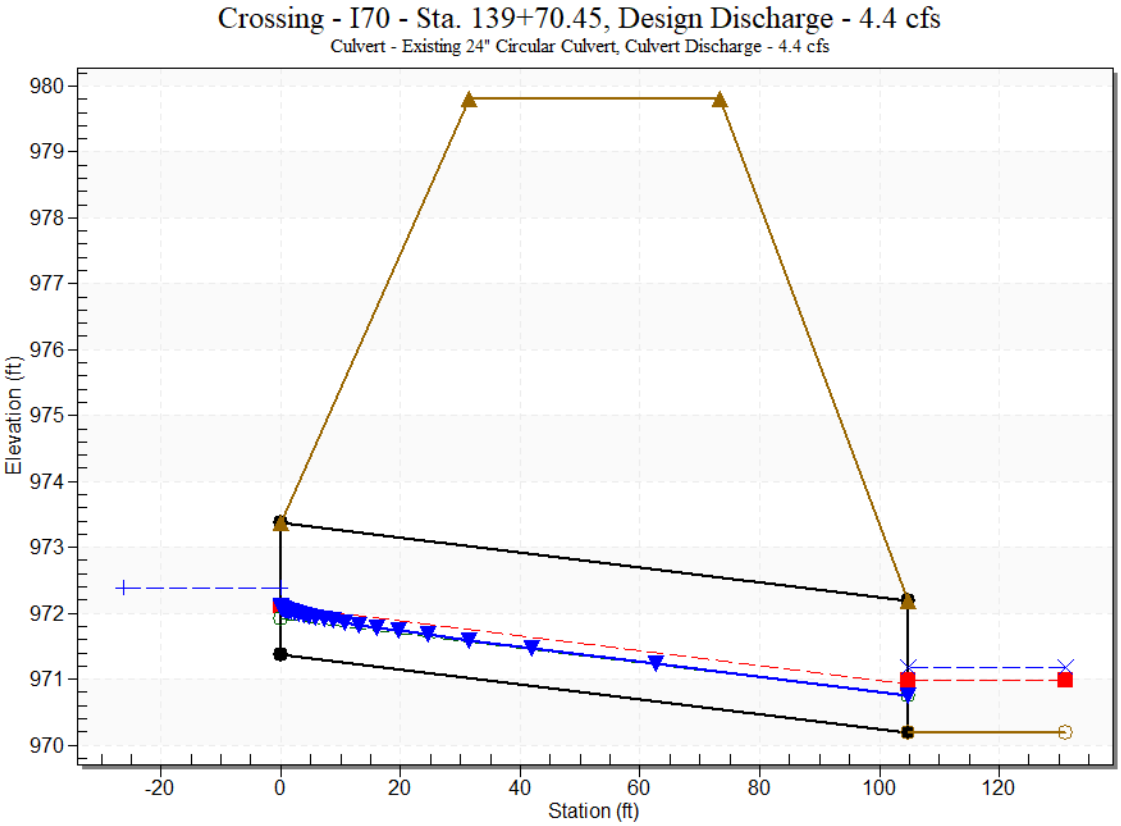
Culvert Length: 104.84 ft,

Culvert Slope: 0.0112

Culvert Performance Curve Plot: Existing 24" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 24" Circular Culvert



Site Data - Existing 24" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 971.37 ft

Outlet Station: 104.83 ft

Outlet Elevation: 970.19 ft

Number of Barrels: 1

Culvert Data Summary - Existing 24" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: I70 - Sta. 139+70.45

Table 2 - Downstream Channel Rating Curve (Crossing: I70 - Sta. 139+70.45)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
2.46	970.98	0.79	1.98	1.48	0.56
2.83	971.02	0.83	2.05	1.56	0.56
3.39	971.08	0.89	2.14	1.67	0.57
3.84	971.12	0.93	2.21	1.75	0.57
4.38	971.17	0.98	2.29	1.84	0.58

Tailwater Channel Data - I70 - Sta. 139+70.45

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0301

Channel Manning's n: 0.0650

Channel Invert Elevation: 970.19 ft

Roadway Data for Crossing: I70 - Sta. 139+70.45

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 148.00 ft

Crest Elevation: 979.80 ft

Roadway Surface: Paved

Roadway Top Width: 42.00 ft

HY-8 Culvert Analysis Report

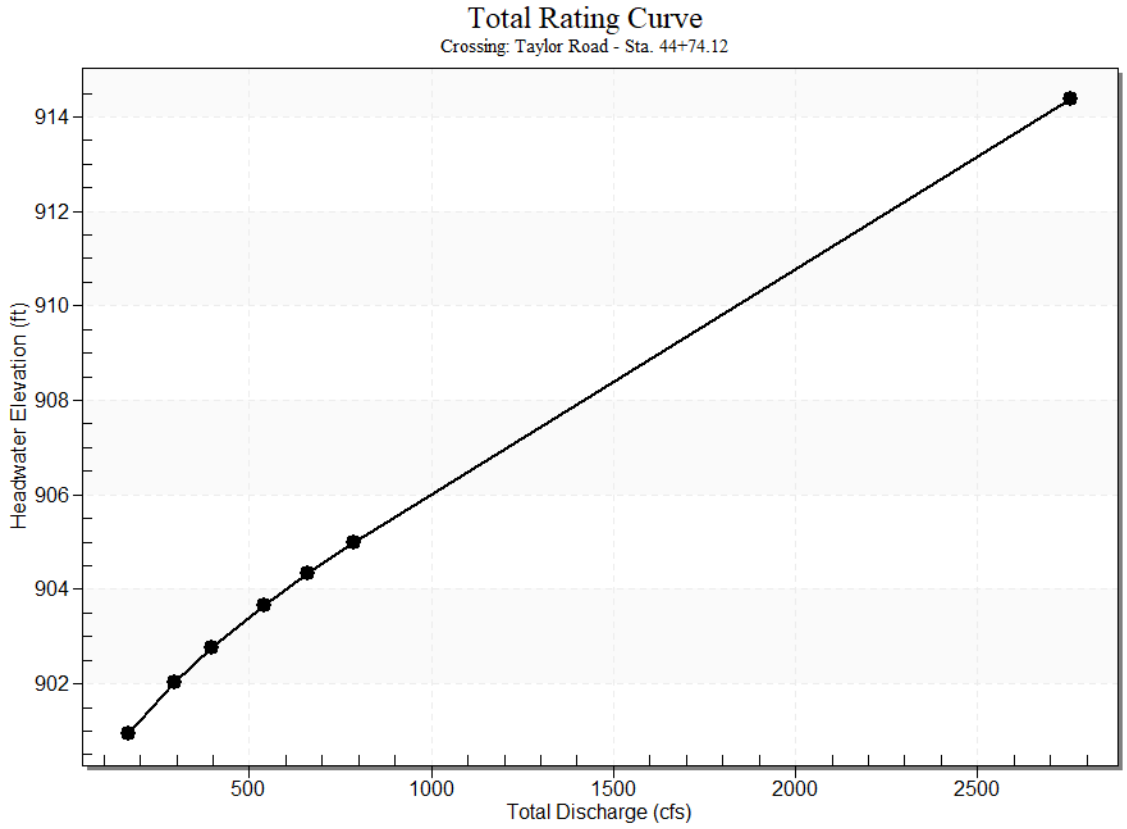
Crossing Discharge Data

Discharge Selection Method: User Defined

Table 1 - Summary of Culvert Flows at Crossing: Taylor Road - Sta. 44+74.12

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 20' x 9' Box Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
900.95	50%	169.00	169.00	0.00	1
902.04	20%	295.00	295.00	0.00	1
902.75	10%	395.00	395.00	0.00	1
903.65	4%	539.00	539.00	0.00	1
904.33	2%	659.00	659.00	0.00	1
904.99	1%	787.00	787.00	0.00	1
914.34	Overtopping	2698.97	2698.97	0.00	Overtopping

Rating Curve Plot for Crossing: Taylor Road - Sta. 44+74.12



Culvert Data: Existing 20' x 9' Box Culvert

Table 1 - Culvert Summary Table: Existing 20' x 9' Box Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50%	169.00 cfs	169.00 cfs	900.95	2.21	2.932	1-S1t	0.75	1.30	3.55	2.77	2.38	3.49
20%	295.00 cfs	295.00 cfs	902.04	3.20	4.018	1-S1t	1.06	1.89	4.50	3.72	3.28	4.09
10%	395.00 cfs	395.00 cfs	902.75	3.89	4.733	1-S1t	1.27	2.30	5.11	4.32	3.87	4.43
4%	539.00 cfs	539.00 cfs	903.65	4.78	5.633	1-S1t	1.55	2.83	5.84	5.06	4.61	4.82
2%	659.00 cfs	659.00 cfs	904.33	5.45	6.305	1-S1t	1.76	3.23	6.38	5.59	5.17	5.08
1%	787.00 cfs	787.00 cfs	904.99	6.12	6.968	1-S1t	1.98	3.64	6.89	6.10	5.71	5.33

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

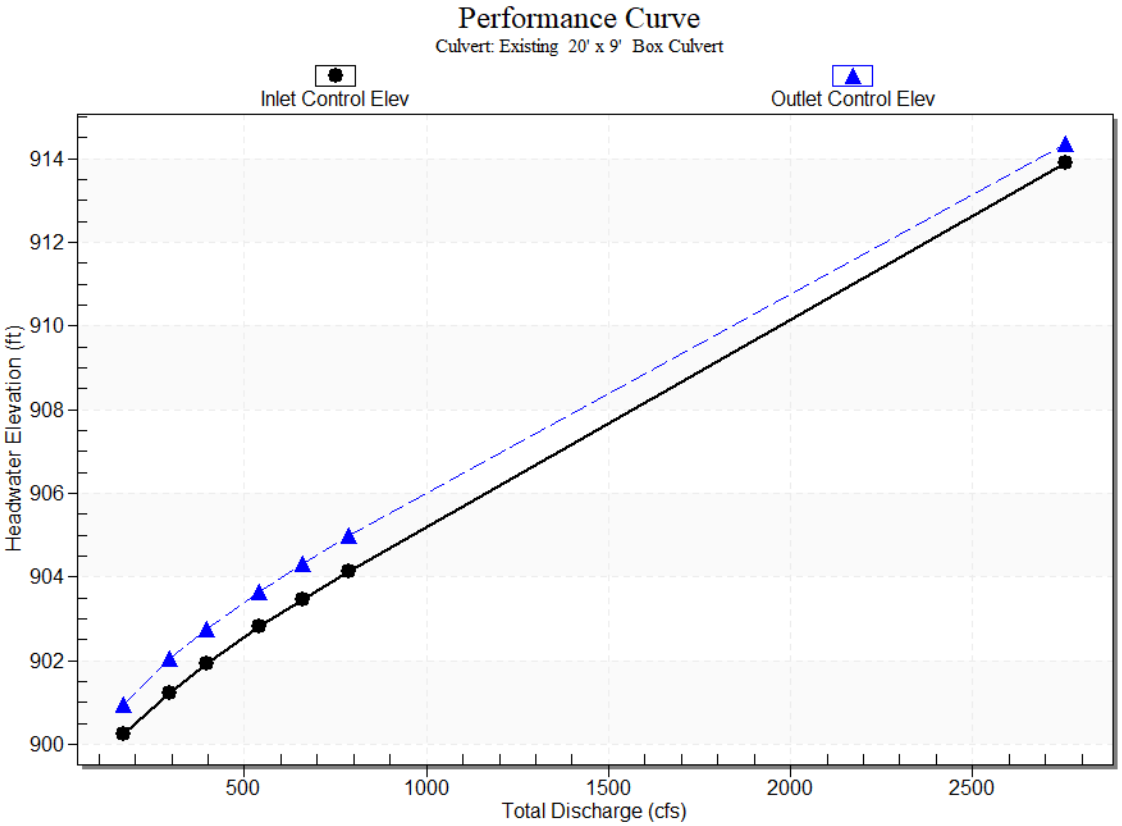
Inlet Elevation (invert): 898.02 ft,

Outlet Elevation (invert): 897.23 ft

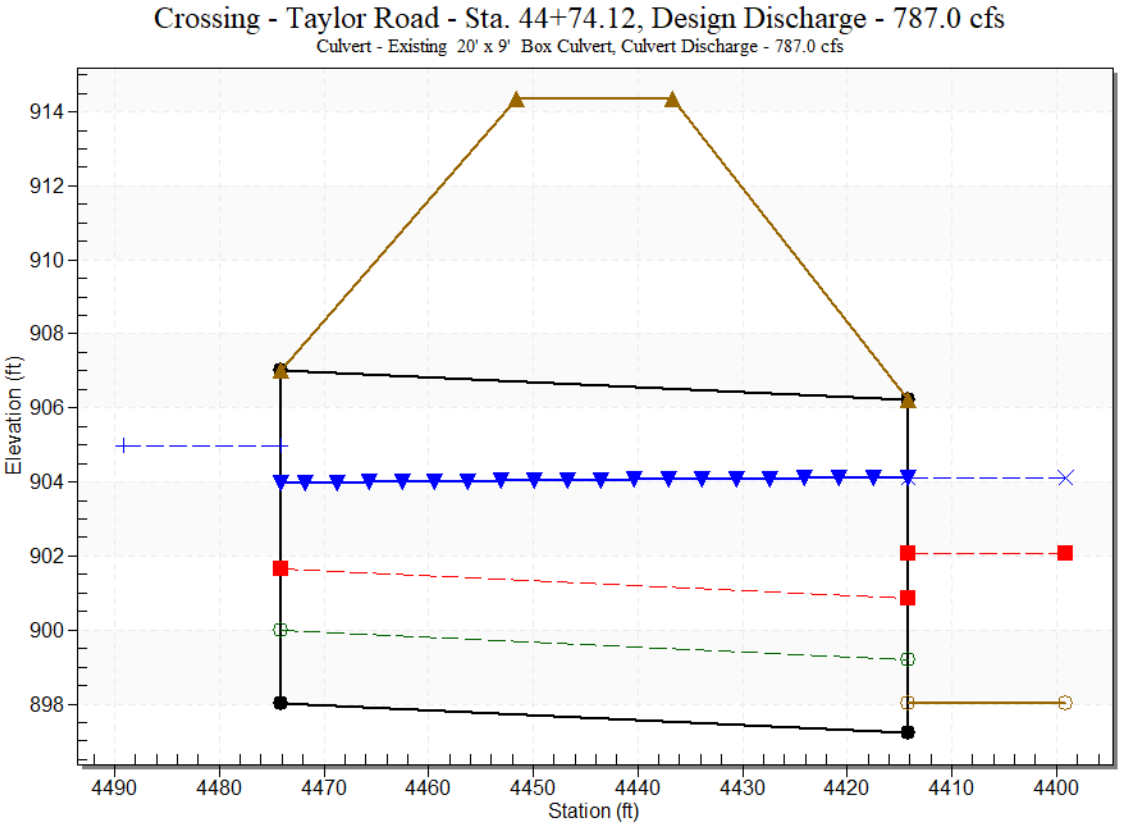
Culvert Length: 59.98 ft,

Culvert Slope: 0.0132

Culvert Performance Curve Plot: Existing 20' x 9' Box Culvert



Water Surface Profile Plot for Culvert: Existing 20' x 9' Box Culvert



Site Data - Existing 20' x 9' Box Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 4474.12 ft

Inlet Elevation: 898.02 ft

Outlet Station: 4414.15 ft

Outlet Elevation: 897.23 ft

Number of Barrels: 1

Culvert Data Summary - Existing 20' x 9' Box Culvert

Barrel Shape: Concrete Box

Barrel Span: 20.00 ft

Barrel Rise: 9.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

Tailwater Data for Crossing: Taylor Road - Sta. 44+74.12

Table 2 - Downstream Channel Rating Curve (Crossing: Taylor Road - Sta. 44+74.12)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
169.00	900.78	2.77	3.49	0.95	0.42
295.00	901.73	3.72	4.09	1.28	0.44
395.00	902.34	4.32	4.43	1.48	0.45
539.00	903.07	5.06	4.82	1.74	0.46
659.00	903.61	5.59	5.08	1.92	0.46
787.00	904.12	6.10	5.33	2.09	0.47

Tailwater Channel Data - Taylor Road - Sta. 44+74.12

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 12.00 ft

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0055

Channel Manning's n: 0.0500

Channel Invert Elevation: 898.01 ft

Roadway Data for Crossing: Taylor Road - Sta. 44+74.12

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 71.50 ft

Crest Elevation: 914.34 ft

Roadway Surface: Paved

Roadway Top Width: 15.00 ft

StreamStats Report - Culvert (Taylor Road) Sta. 44+74.12

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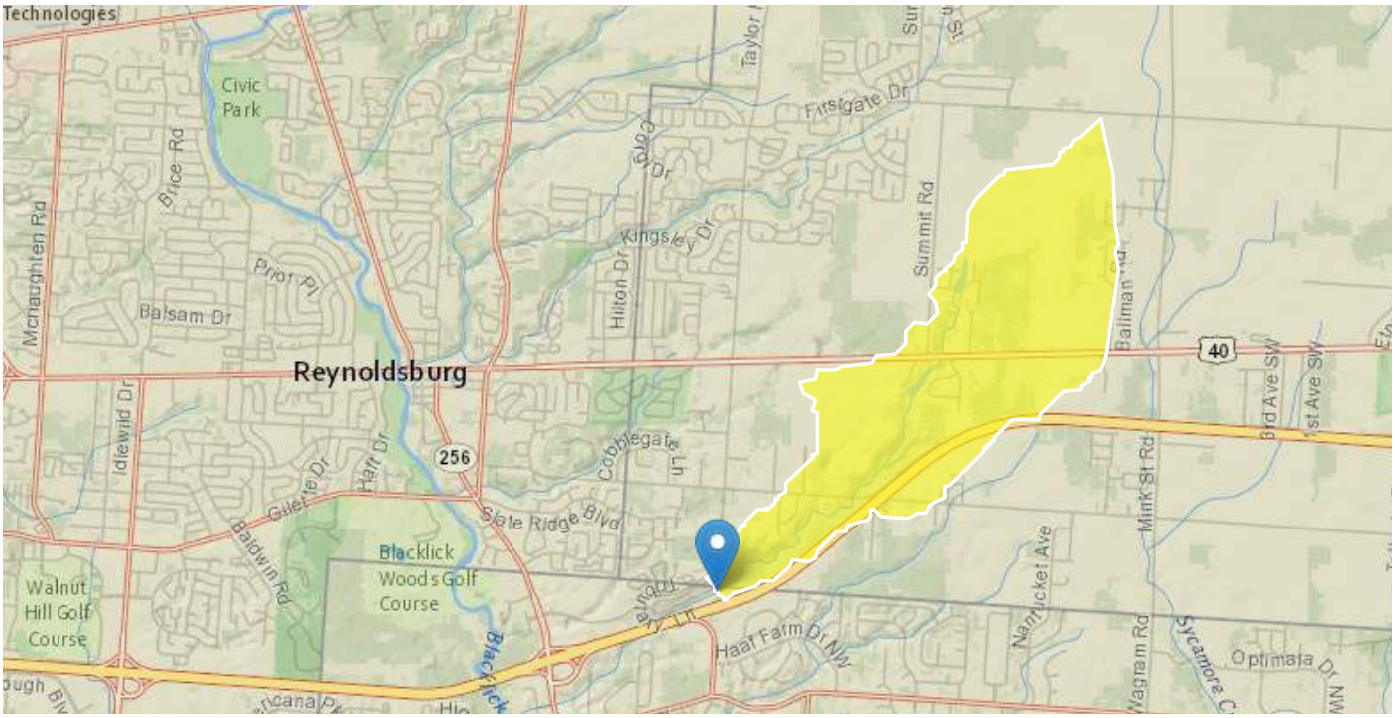
Clicked Point (Latitude, Longitude): 39.93880, -82.77299
Time: 2023-05-16 10:52:31 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	46.5	feet per mi
DRNAREA	Area that drains to a point on a stream	1.88	square miles
FOREST	Percentage of area covered by forest	25.5	percent
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	1.47	percent
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches

Parameter Code	Parameter Description	Value	Unit
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.54	dimensionless

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	46.5	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	25.35

Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	169	ft^3/s	89.4	319	40.1
20-percent AEP flood	295	ft^3/s	163	534	37.2
10-percent AEP flood	395	ft^3/s	217	719	37.6
4-percent AEP flood	539	ft^3/s	294	988	38.1
2-percent AEP flood	659	ft^3/s	356	1220	37.8
1-percent AEP flood	787	ft^3/s	420	1470	39.6
0.2-percent AEP flood	1120	ft^3/s	592	2120	40.3

Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
1 Day 10 Year Low Flow	0.0312	ft^3/s	53.1
7 Day 10 Year Low Flow	0.0393	ft^3/s	40
30 Day 10 Year Low Flow	0.06	ft^3/s	35.7
90 Day 10 Year Low Flow	0.0908	ft^3/s	29.8

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
80 Percent Duration	0.184	ft^3/s	29.1

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2

Annual Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	1.86	ft^3/s	11.4	11.4

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Monthly Flow Statistics

Monthly Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.8	inches	34	43.2
FOREST	Percent Forest	25.5	percent	0	99.1

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Monthly Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
January Mean Flow	2.76	ft^3/s	16.6	16.6
February Mean Flow	3.41	ft^3/s	11.9	11.9
March Mean Flow	3.79	ft^3/s	14	14
April Mean Flow	3.52	ft^3/s	11.2	11.2
May Mean Flow	2.35	ft^3/s	19.5	19.5
June Mean Flow	1.46	ft^3/s	27	27
July Mean Flow	0.828	ft^3/s	28.2	28.2
August Mean Flow	0.606	ft^3/s	36.8	36.8
September Mean Flow	0.39	ft^3/s	43.6	43.6
October Mean Flow	0.386	ft^3/s	50.8	50.8
November Mean Flow	0.884	ft^3/s	37.5	37.5
December Mean Flow	1.92	ft^3/s	21.8	21.8

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

General Flow Statistics

General Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.88	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	1.47	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	39.9558	decimal degrees	38.68	41.2

General Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.31	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

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Application Version: 4.14.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

HY-8 Culvert Analysis Report

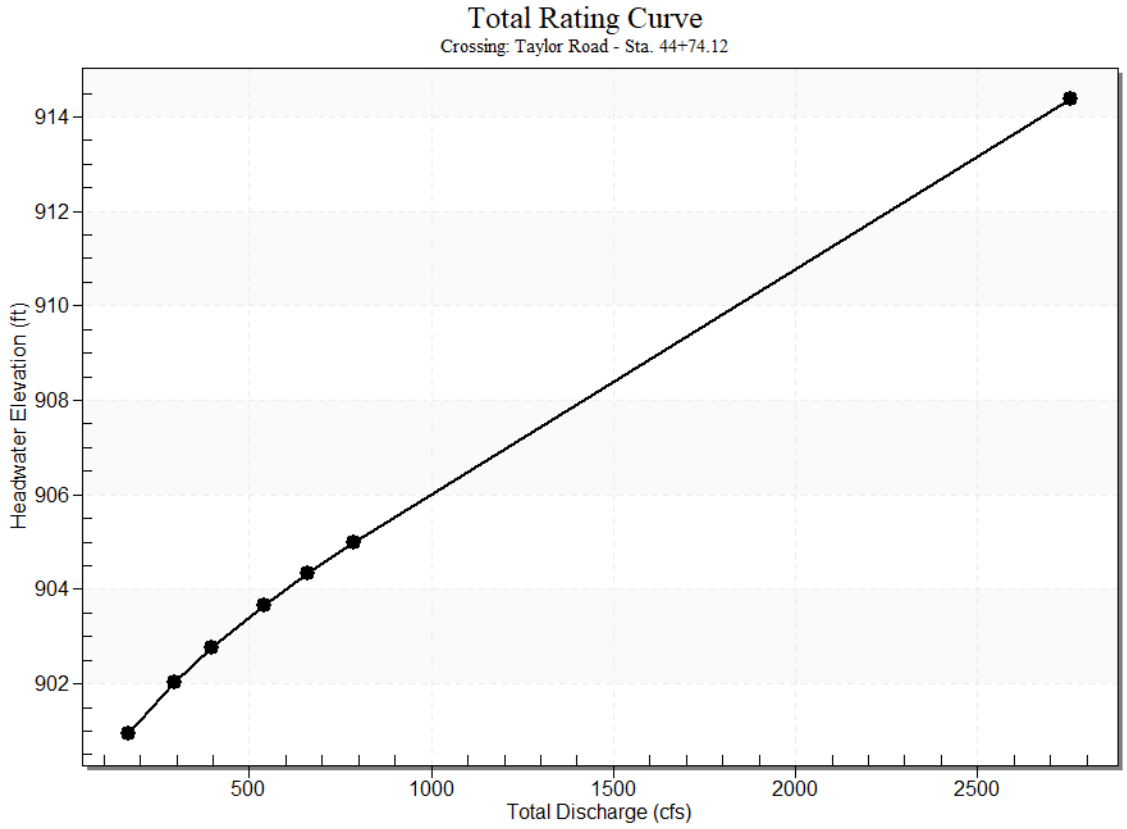
Crossing Discharge Data

Discharge Selection Method: User Defined

Table 1 - Summary of Culvert Flows at Crossing: Taylor Road - Sta. 44+74.12

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 20' x 9' Box Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
900.95	50%	169.00	169.00	0.00	1
902.04	20%	295.00	295.00	0.00	1
902.75	10%	395.00	395.00	0.00	1
903.65	4%	539.00	539.00	0.00	1
904.33	2%	659.00	659.00	0.00	1
904.99	1%	787.00	787.00	0.00	1
914.34	Overtopping	2698.97	2698.97	0.00	Overtopping

Rating Curve Plot for Crossing: Taylor Road - Sta. 44+74.12



Culvert Data: Existing 20' x 9' Box Culvert

Table 1 - Culvert Summary Table: Existing 20' x 9' Box Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50%	169.00 cfs	169.00 cfs	900.95	2.21	2.932	1-S1t	0.75	1.30	3.55	2.77	2.38	3.49
20%	295.00 cfs	295.00 cfs	902.04	3.20	4.018	1-S1t	1.06	1.89	4.50	3.72	3.28	4.09
10%	395.00 cfs	395.00 cfs	902.75	3.89	4.733	1-S1t	1.27	2.30	5.11	4.32	3.87	4.43
4%	539.00 cfs	539.00 cfs	903.65	4.78	5.633	1-S1t	1.55	2.83	5.84	5.06	4.61	4.82
2%	659.00 cfs	659.00 cfs	904.33	5.45	6.305	1-S1t	1.76	3.23	6.38	5.59	5.17	5.08
1%	787.00 cfs	787.00 cfs	904.99	6.12	6.968	1-S1t	1.98	3.64	6.89	6.10	5.71	5.33

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

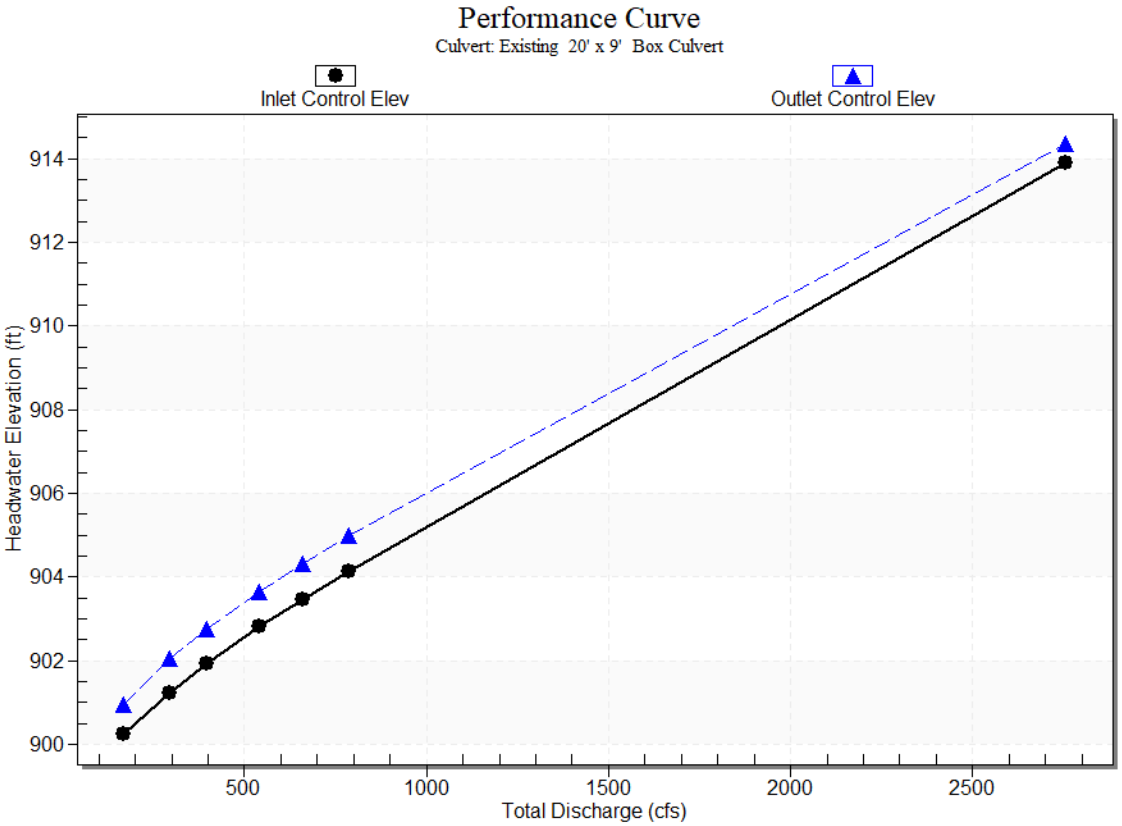
Inlet Elevation (invert): 898.02 ft,

Outlet Elevation (invert): 897.23 ft

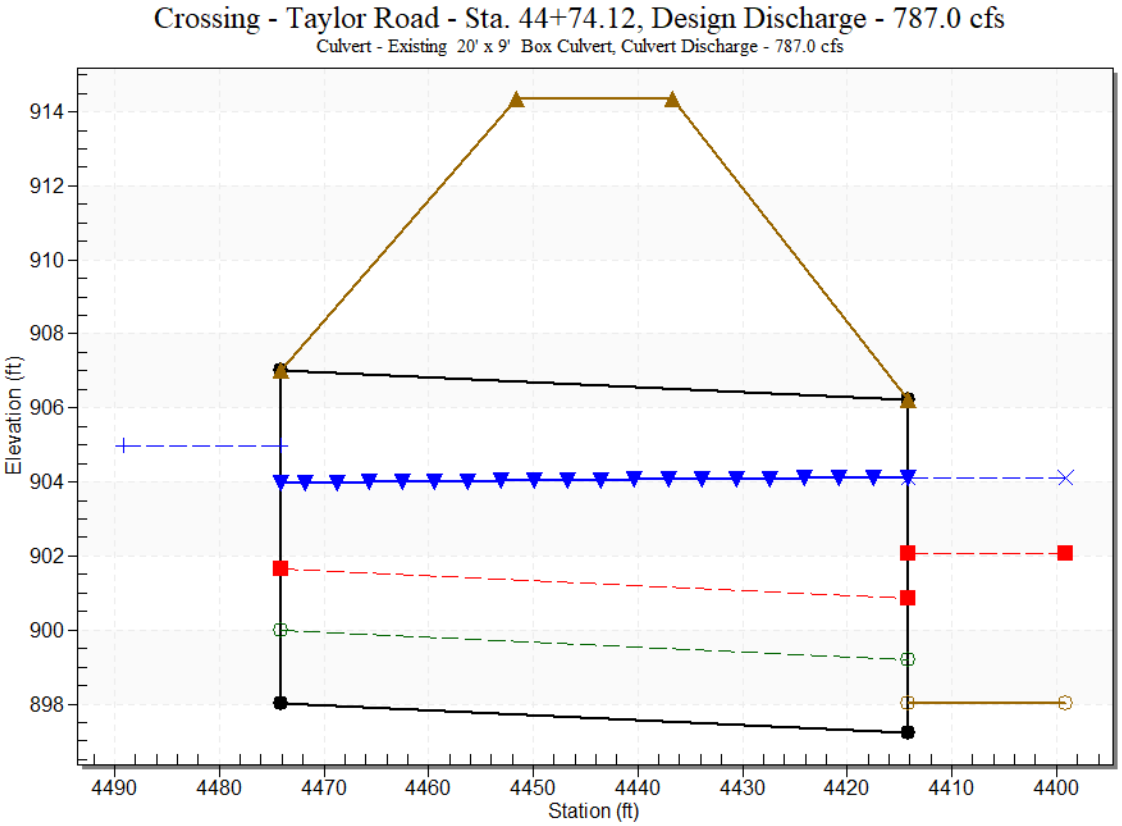
Culvert Length: 59.98 ft,

Culvert Slope: 0.0132

Culvert Performance Curve Plot: Existing 20' x 9' Box Culvert



Water Surface Profile Plot for Culvert: Existing 20' x 9' Box Culvert



Site Data - Existing 20' x 9' Box Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 4474.12 ft

Inlet Elevation: 898.02 ft

Outlet Station: 4414.15 ft

Outlet Elevation: 897.23 ft

Number of Barrels: 1

Culvert Data Summary - Existing 20' x 9' Box Culvert

Barrel Shape: Concrete Box

Barrel Span: 20.00 ft

Barrel Rise: 9.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

Tailwater Data for Crossing: Taylor Road - Sta. 44+74.12

Table 2 - Downstream Channel Rating Curve (Crossing: Taylor Road - Sta. 44+74.12)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
169.00	900.78	2.77	3.49	0.95	0.42
295.00	901.73	3.72	4.09	1.28	0.44
395.00	902.34	4.32	4.43	1.48	0.45
539.00	903.07	5.06	4.82	1.74	0.46
659.00	903.61	5.59	5.08	1.92	0.46
787.00	904.12	6.10	5.33	2.09	0.47

Tailwater Channel Data - Taylor Road - Sta. 44+74.12

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 12.00 ft

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0055

Channel Manning's n: 0.0500

Channel Invert Elevation: 898.01 ft

Roadway Data for Crossing: Taylor Road - Sta. 44+74.12

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 71.50 ft

Crest Elevation: 914.34 ft

Roadway Surface: Paved

Roadway Top Width: 15.00 ft

HY-8 Culvert Analysis Report

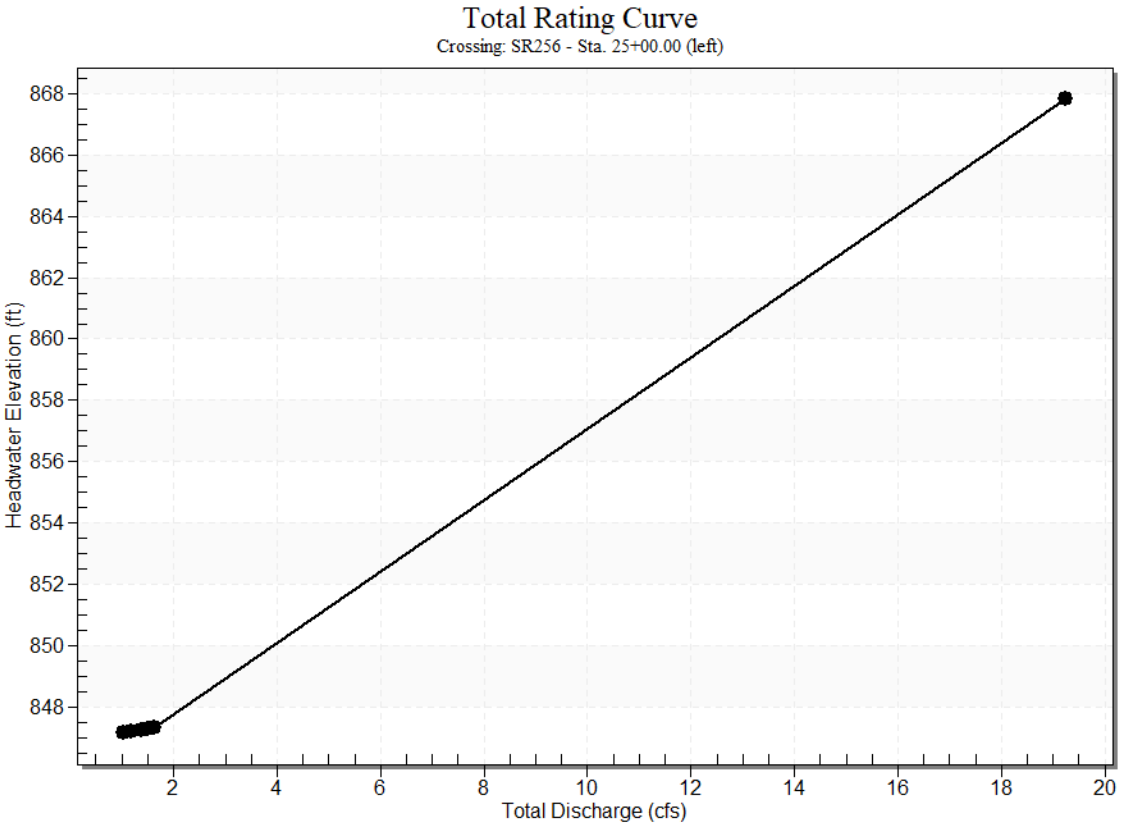
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: SR256 - Sta. 25+00.00 (left)

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 15" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
847.19	5 year	1.04	1.04	0.00	1
847.23	10 year	1.18	1.18	0.00	1
847.28	25 year	1.37	1.37	0.00	1
847.32	50 year	1.51	1.51	0.00	1
847.35	100 year	1.63	1.63	0.00	1
867.80	Overtopping	18.91	18.91	0.00	Overtopping

Rating Curve Plot for Crossing: SR256 - Sta. 25+00.00 (left)



Culvert Data: Existing 15" Circular Culvert

Table 1 - Culvert Summary Table: Existing 15" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	1.04 cfs	1.04 cfs	847.19	0.55	0.0*	1-S2n	0.32	0.40	0.32	0.51	4.21	0.67
10 year	1.18 cfs	1.18 cfs	847.23	0.59	0.0*	1-S2n	0.34	0.43	0.34	0.53	4.37	0.69
25 year	1.37 cfs	1.37 cfs	847.28	0.64	0.0*	1-S2n	0.37	0.46	0.37	0.57	4.56	0.71
50 year	1.51 cfs	1.51 cfs	847.32	0.68	0.0*	1-S2n	0.39	0.49	0.39	0.59	4.68	0.73
100 year	1.63 cfs	1.63 cfs	847.35	0.71	0.0*	1-S2n	0.40	0.51	0.40	0.60	4.78	0.75

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

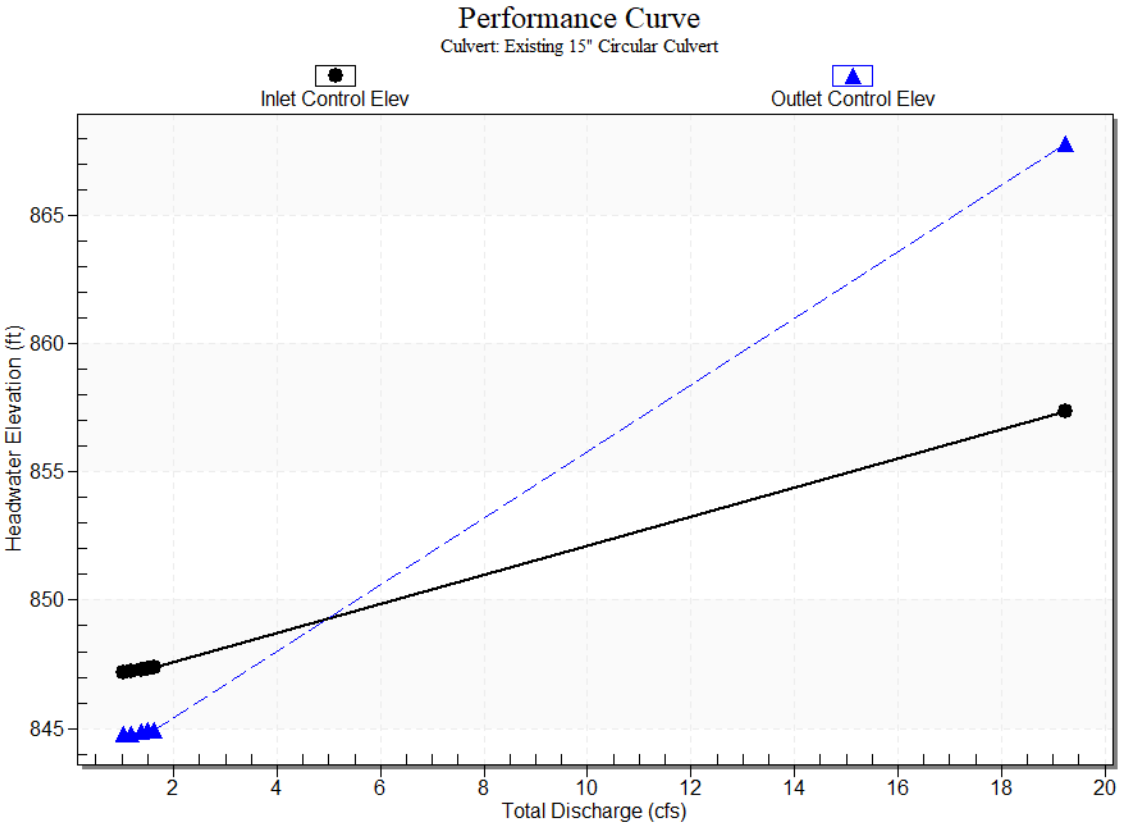
Inlet Elevation (invert): 846.64 ft,

Outlet Elevation (invert): 844.18 ft

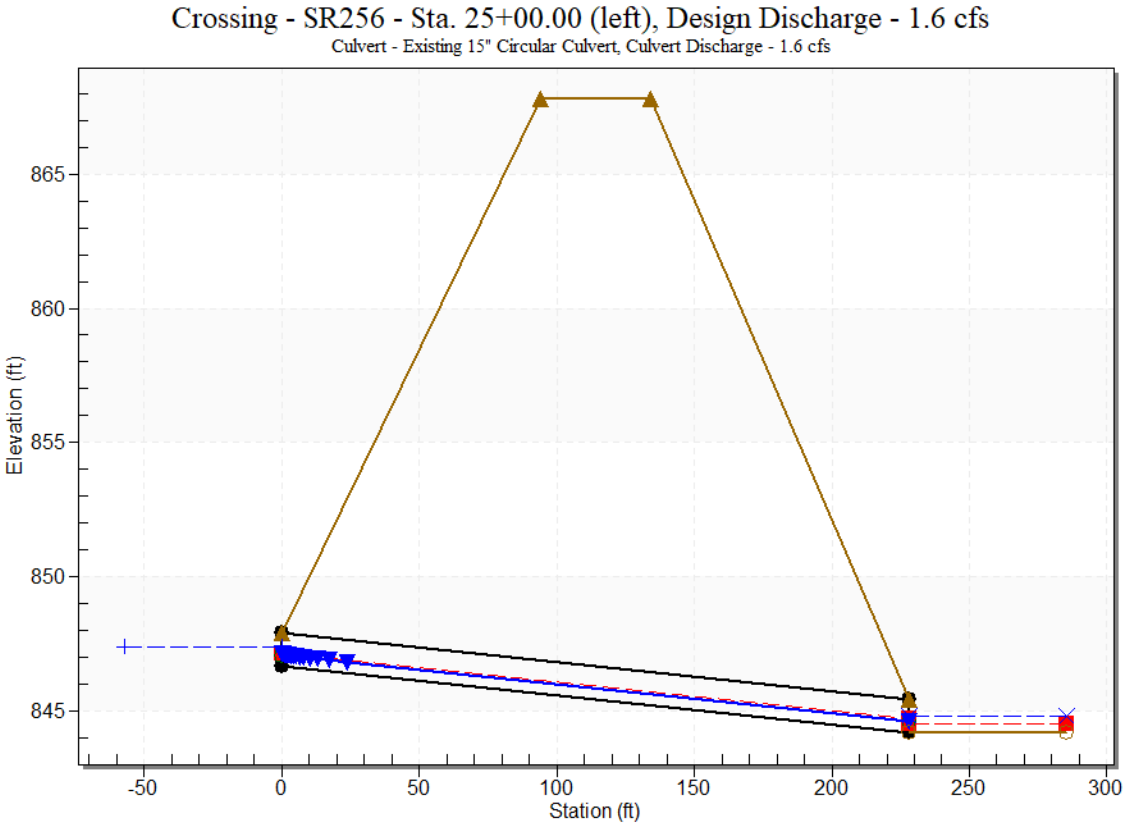
Culvert Length: 228.23 ft,

Culvert Slope: 0.0108

Culvert Performance Curve Plot: Existing 15" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 15" Circular Culvert



Site Data - Existing 15" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 846.64 ft

Outlet Station: 228.22 ft

Outlet Elevation: 844.18 ft

Number of Barrels: 1

Culvert Data Summary - Existing 15" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: SR256 - Sta. 25+00.00 (left)

Table 2 - Downstream Channel Rating Curve (Crossing: SR256 - Sta. 25+00.00 (left))

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
1.04	844.69	0.51	0.67	0.20	0.23
1.18	844.72	0.53	0.69	0.21	0.23
1.37	844.75	0.57	0.71	0.22	0.24
1.51	844.77	0.59	0.73	0.23	0.24
1.63	844.79	0.60	0.75	0.23	0.24

Tailwater Channel Data - SR256 - Sta. 25+00.00 (left)

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 6.00 (_:1)

Channel Slope: 0.0062

Channel Manning's n: 0.0700

Channel Invert Elevation: 844.18 ft

Roadway Data for Crossing: SR256 - Sta. 25+00.00 (left)

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 167.00 ft

Crest Elevation: 867.80 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report

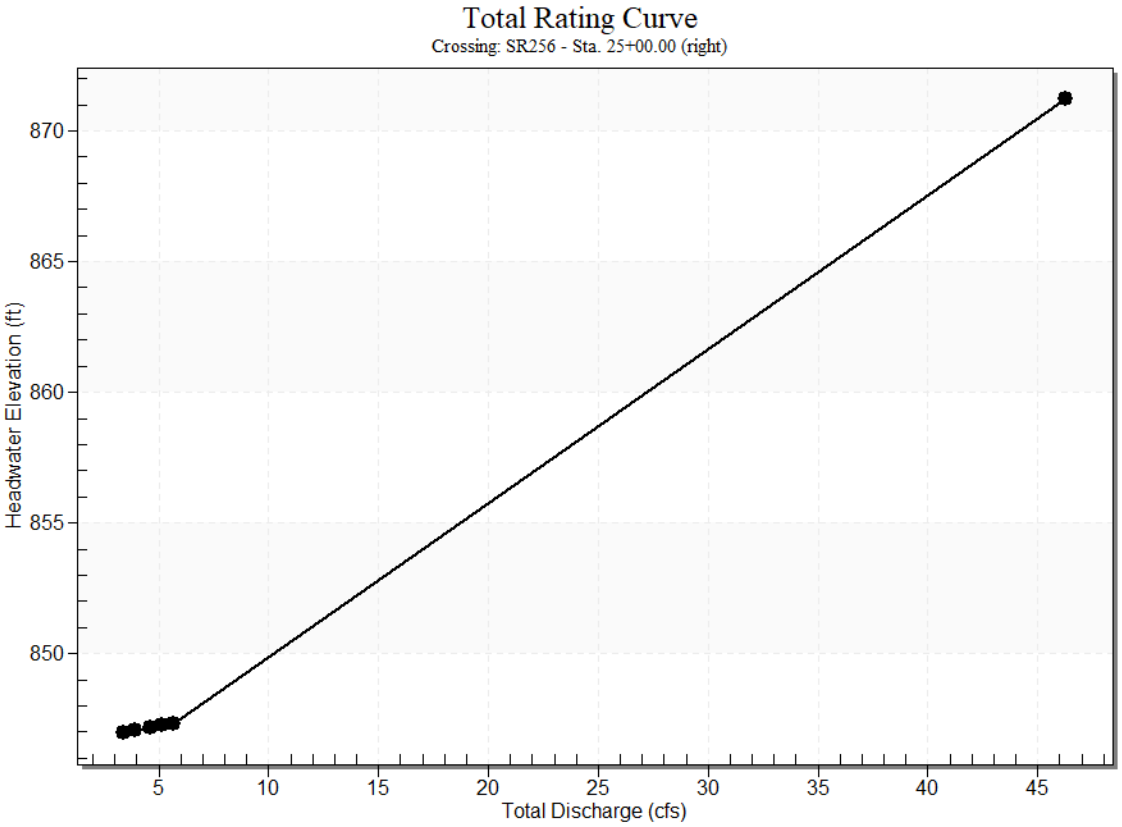
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: SR256 - Sta. 25+00.00 (right)

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 21" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
846.98	5 year	3.41	3.41	0.00	1
847.07	10 year	3.93	3.93	0.00	1
847.18	25 year	4.63	4.63	0.00	1
847.26	50 year	5.15	5.15	0.00	1
847.33	100 year	5.64	5.64	0.00	1
871.20	Overtopping	45.35	45.35	0.00	Overtopping

Rating Curve Plot for Crossing: SR256 - Sta. 25+00.00 (right)



Culvert Data: Existing 21" Circular Culvert

Table 1 - Culvert Summary Table: Existing 21" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	3.41 cfs	3.41 cfs	846.98	0.93	0.0*	1-S2n	0.52	0.67	0.52	0.67	5.68	1.92
10 year	3.93 cfs	3.93 cfs	847.07	1.02	0.0*	1-S2n	0.56	0.72	0.56	0.70	5.92	1.99
25 year	4.63 cfs	4.63 cfs	847.18	1.13	0.0*	1-S2n	0.61	0.79	0.61	0.75	6.19	2.07
50 year	5.15 cfs	5.15 cfs	847.26	1.21	0.0*	1-S2n	0.65	0.83	0.65	0.78	6.38	2.13
100 year	5.64 cfs	5.64 cfs	847.33	1.28	0.0*	1-S2n	0.68	0.87	0.68	0.81	6.53	2.17

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

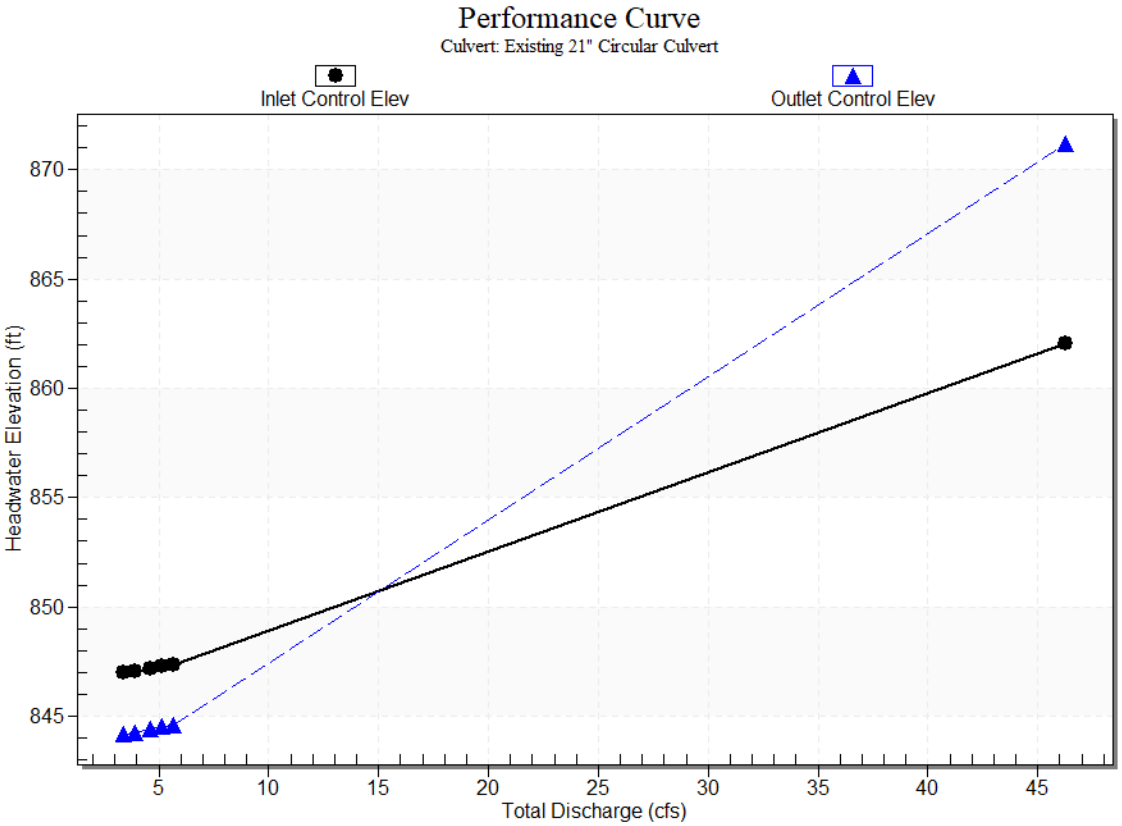
Inlet Elevation (invert): 846.05 ft,

Outlet Elevation (invert): 843.34 ft

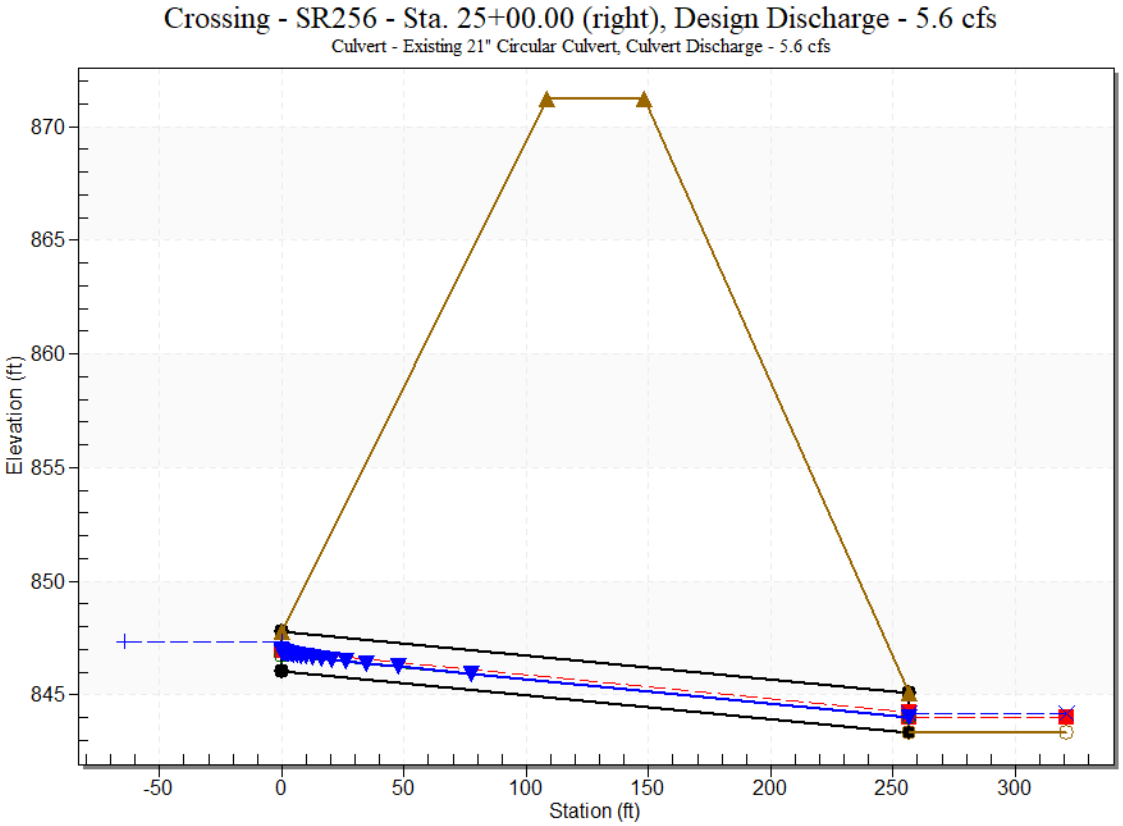
Culvert Length: 256.69 ft,

Culvert Slope: 0.0106

Culvert Performance Curve Plot: Existing 21" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 21" Circular Culvert



Site Data - Existing 21" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 846.05 ft

Outlet Station: 256.68 ft

Outlet Elevation: 843.34 ft

Number of Barrels: 1

Culvert Data Summary - Existing 21" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 1.75 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: SR256 - Sta. 25+00.00 (right)

Table 2 - Downstream Channel Rating Curve (Crossing: SR256 - Sta. 25+00.00 (right))

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
3.41	844.01	0.67	1.92	1.12	0.59
3.93	844.04	0.70	1.99	1.18	0.59
4.63	844.09	0.75	2.07	1.26	0.60
5.15	844.12	0.78	2.13	1.31	0.60
5.64	844.15	0.81	2.17	1.36	0.60

Tailwater Channel Data - SR256 - Sta. 25+00.00 (right)

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0270

Channel Manning's n: 0.0600

Channel Invert Elevation: 843.34 ft

Roadway Data for Crossing: SR256 - Sta. 25+00.00 (right)

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 167.00 ft

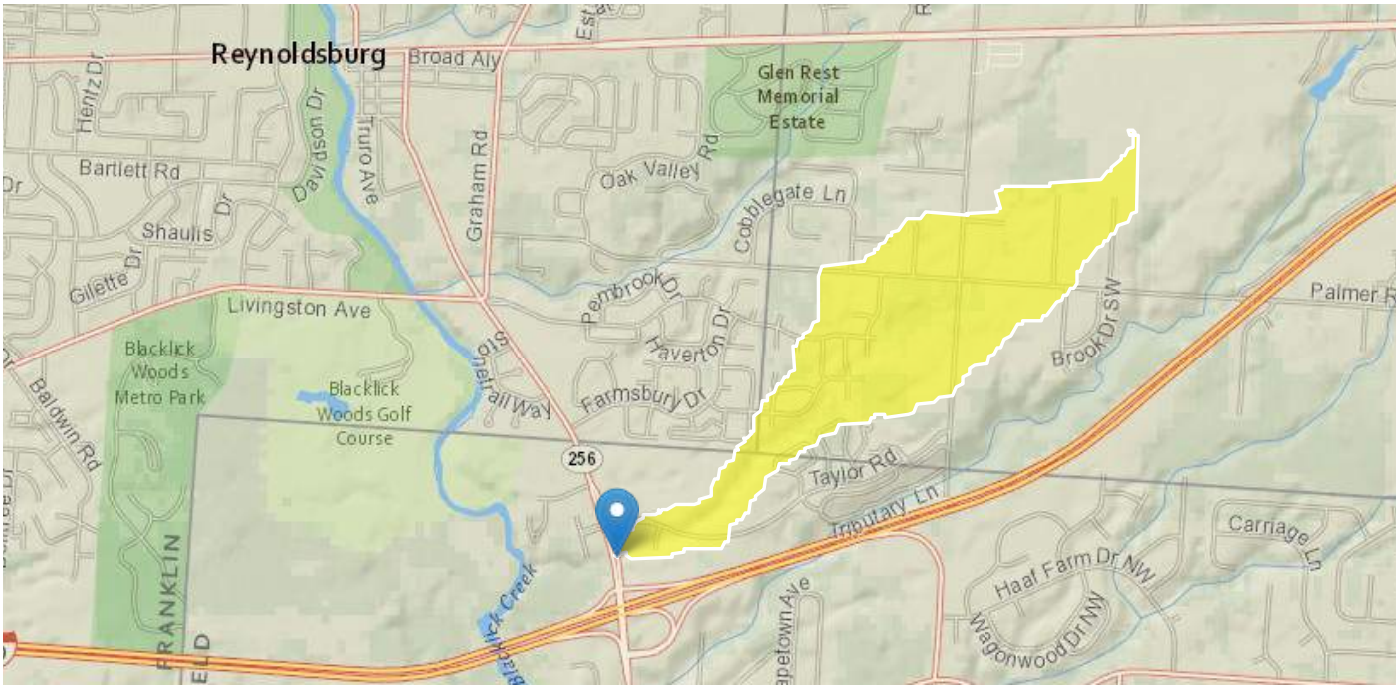
Crest Elevation: 871.20 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

StreamStats Report - Culvert (SR 256) Sta. 32+50

Region ID: OH
Workspace ID: OH20230516150129675000
Clicked Point (Latitude, Longitude): 39.93580, -82.78964
Time: 2023-05-16 11:01:52 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	78	feet per mi
DRNAREA	Area that drains to a point on a stream	0.42	square miles
FOREST	Percentage of area covered by forest	40.1	percent
LAT_CENT	Latitude of Basin Centroid	39.9444	decimal degrees
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	0.37	percent
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.7	inches

Parameter Code	Parameter Description	Value	Unit
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.55	dimensionless

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.42	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	78	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	0.37	percent	0	25.35

Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PIl: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	Plu	ASEp
50-percent AEP flood	61.6	ft^3/s	32.5	117	40.1
20-percent AEP flood	115	ft^3/s	63.4	209	37.2
10-percent AEP flood	159	ft^3/s	87.1	290	37.6
4-percent AEP flood	225	ft^3/s	122	414	38.1
2-percent AEP flood	281	ft^3/s	151	523	37.8
1-percent AEP flood	342	ft^3/s	182	644	39.6
0.2-percent AEP flood	506	ft^3/s	266	962	40.3

Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019–5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.42	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.24	1.12

Low-Flow Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

Statistic	Value	Unit
1 Day 10 Year Low Flow	0.00625	ft^3/s
7 Day 10 Year Low Flow	0.00793	ft^3/s
30 Day 10 Year Low Flow	0.0123	ft^3/s
90 Day 10 Year Low Flow	0.019	ft^3/s

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.42	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.24	1.12

Flow-Duration Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

Statistic	Value	Unit
80 Percent Duration	0.0392	ft^3/s

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.42	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	39.9444	decimal degrees	38.68	41.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.7	inches	34	43.2

Annual Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	0.407	ft^3/s	11.4	11.4

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Monthly Flow Statistics

Monthly Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.42	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	0.37	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	37.7	inches	34	43.2
FOREST	Percent Forest	40.1	percent	0	99.1
LAT_CENT	Latitude of Basin Centroid	39.9444	decimal degrees	38.68	41.2
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.25	1.13

Monthly Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
January Mean Flow	0.57	ft^3/s	16.6	16.6
February Mean Flow	0.795	ft^3/s	11.9	11.9
March Mean Flow	0.861	ft^3/s	14	14
April Mean Flow	0.821	ft^3/s	11.2	11.2
May Mean Flow	0.541	ft^3/s	19.5	19.5
June Mean Flow	0.319	ft^3/s	27	27
July Mean Flow	0.187	ft^3/s	28.2	28.2
August Mean Flow	0.13	ft^3/s	36.8	36.8
September Mean Flow	0.0848	ft^3/s	43.6	43.6
October Mean Flow	0.08	ft^3/s	50.8	50.8
November Mean Flow	0.185	ft^3/s	37.5	37.5
December Mean Flow	0.433	ft^3/s	21.8	21.8

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

General Flow Statistics

General Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.42	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	0.37	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.55	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.9444	decimal degrees	38.68	41.2

General Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.0485	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

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Application Version: 4.14.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

HY-8 Culvert Analysis Report

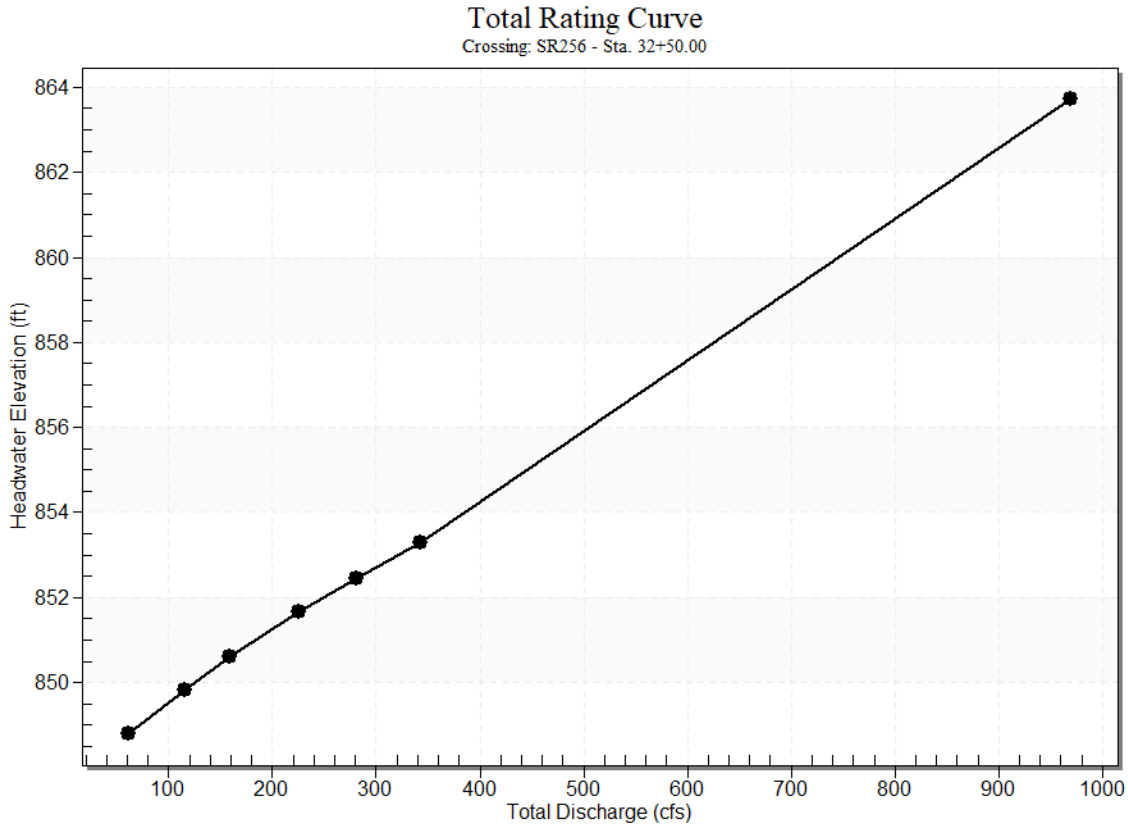
Crossing Discharge Data

Discharge Selection Method: User Defined

Table 1 - Summary of Culvert Flows at Crossing: SR256 - Sta. 32+50.00

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 96" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
848.81	50%	61.60	61.60	0.00	1
849.83	20%	115.00	115.00	0.00	1
850.59	10%	159.00	159.00	0.00	1
851.66	4%	225.00	225.00	0.00	1
852.46	2%	281.00	281.00	0.00	1
853.28	1%	342.00	342.00	0.00	1
863.11	Overtopping	860.93	860.93	0.00	Overtopping

Rating Curve Plot for Crossing: SR256 - Sta. 32+50.00



Culvert Data: Existing 96" Circular Culvert

Table 1 - Culvert Summary Table: Existing 96" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
50%	61.60 cfs	61.60 cfs	848.81	2.62	0.956	1-S2n	1.61	1.92	1.62	1.30	8.45	6.25
20%	115.00 cfs	115.00 cfs	849.83	3.65	1.792	1-S2n	2.20	2.65	2.24	1.80	9.97	7.44
10%	159.00 cfs	159.00 cfs	850.59	4.41	2.415	1-S2n	2.60	3.14	2.66	2.12	10.88	8.13
4%	225.00 cfs	225.00 cfs	851.66	5.48	3.325	1-S2n	3.13	3.76	3.21	2.52	11.92	8.91
2%	281.00 cfs	281.00 cfs	852.46	6.28	4.109	1-S2n	3.54	4.23	3.65	2.80	12.60	9.45
1%	342.00 cfs	342.00 cfs	853.28	7.10	4.997	1-S2n	3.96	4.69	4.08	3.08	13.26	9.95

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

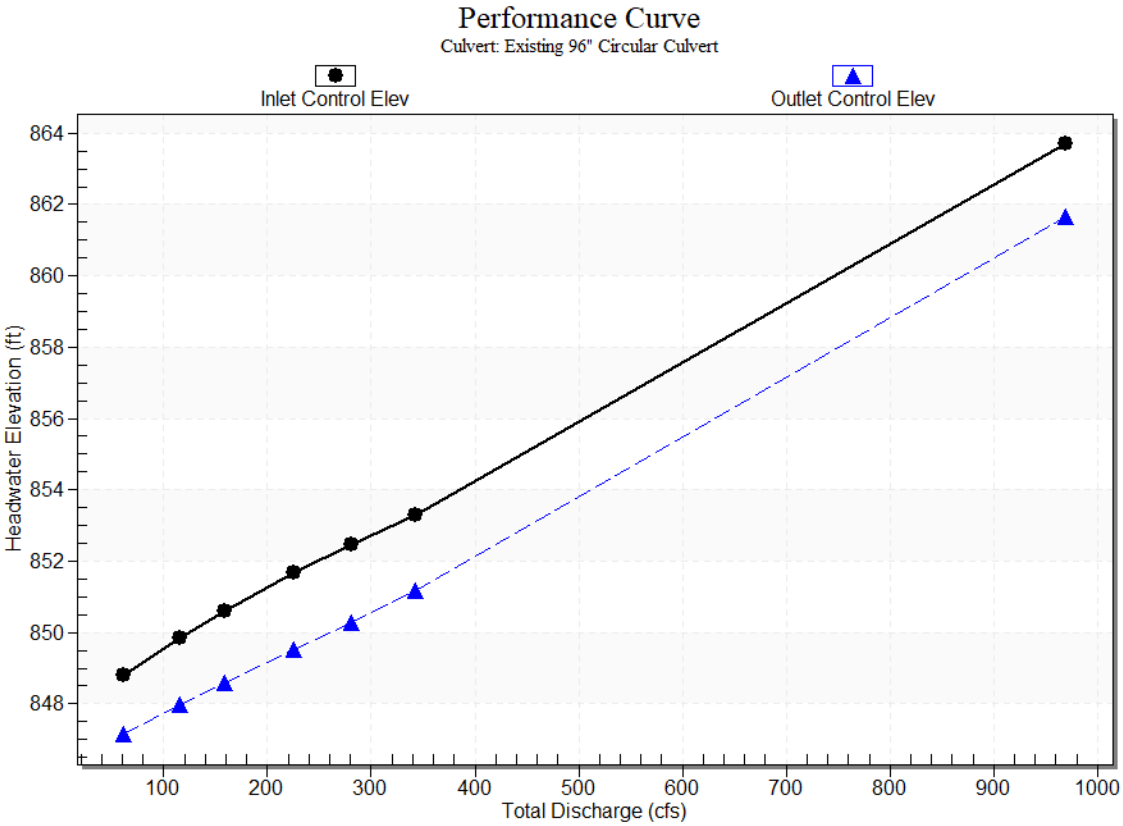
Inlet Elevation (invert): 846.18 ft,

Outlet Elevation (invert): 845.17 ft

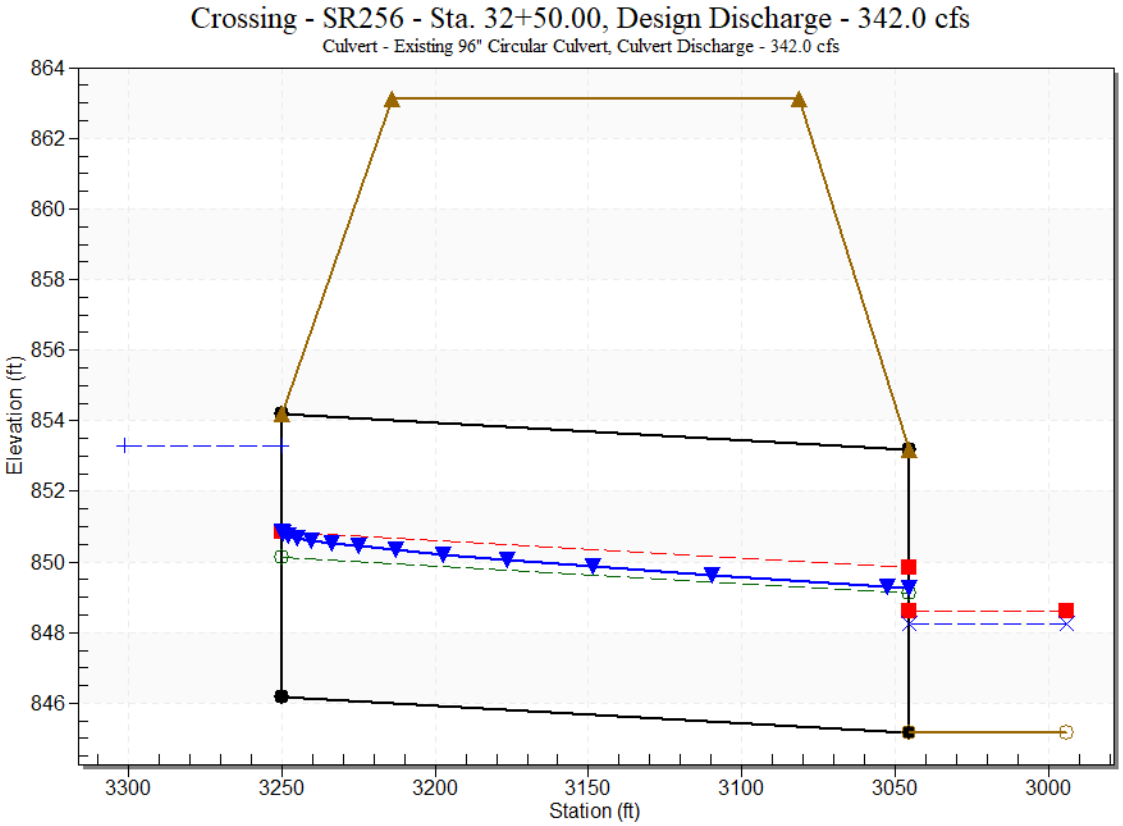
Culvert Length: 204.65 ft,

Culvert Slope: 0.0049

Culvert Performance Curve Plot: Existing 96" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 96" Circular Culvert



Site Data - Existing 96" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 3250.00 ft

Inlet Elevation: 846.18 ft

Outlet Station: 3045.35 ft

Outlet Elevation: 845.17 ft

Number of Barrels: 1

Culvert Data Summary - Existing 96" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 8.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: SR256 - Sta. 32+50.00

Table 2 - Downstream Channel Rating Curve (Crossing: SR256 - Sta. 32+50.00)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
61.60	846.47	1.30	6.25	2.59	1.12
115.00	846.97	1.80	7.44	3.59	1.16
159.00	847.29	2.12	8.13	4.23	1.19
225.00	847.69	2.52	8.91	5.02	1.21
281.00	847.97	2.80	9.45	5.60	1.23
342.00	848.25	3.08	9.95	6.15	1.24

Tailwater Channel Data - SR256 - Sta. 32+50.00

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 5.00 ft

Side Slope (H:V): 2.00 (_:1)

Channel Slope: 0.0320

Channel Manning's n: 0.0400

Channel Invert Elevation: 845.17 ft

Roadway Data for Crossing: SR256 - Sta. 32+50.00

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 60.00 ft

Crest Elevation: 863.11 ft

Roadway Surface: Paved

Roadway Top Width: 132.59 ft

HY-8 Culvert Analysis Report

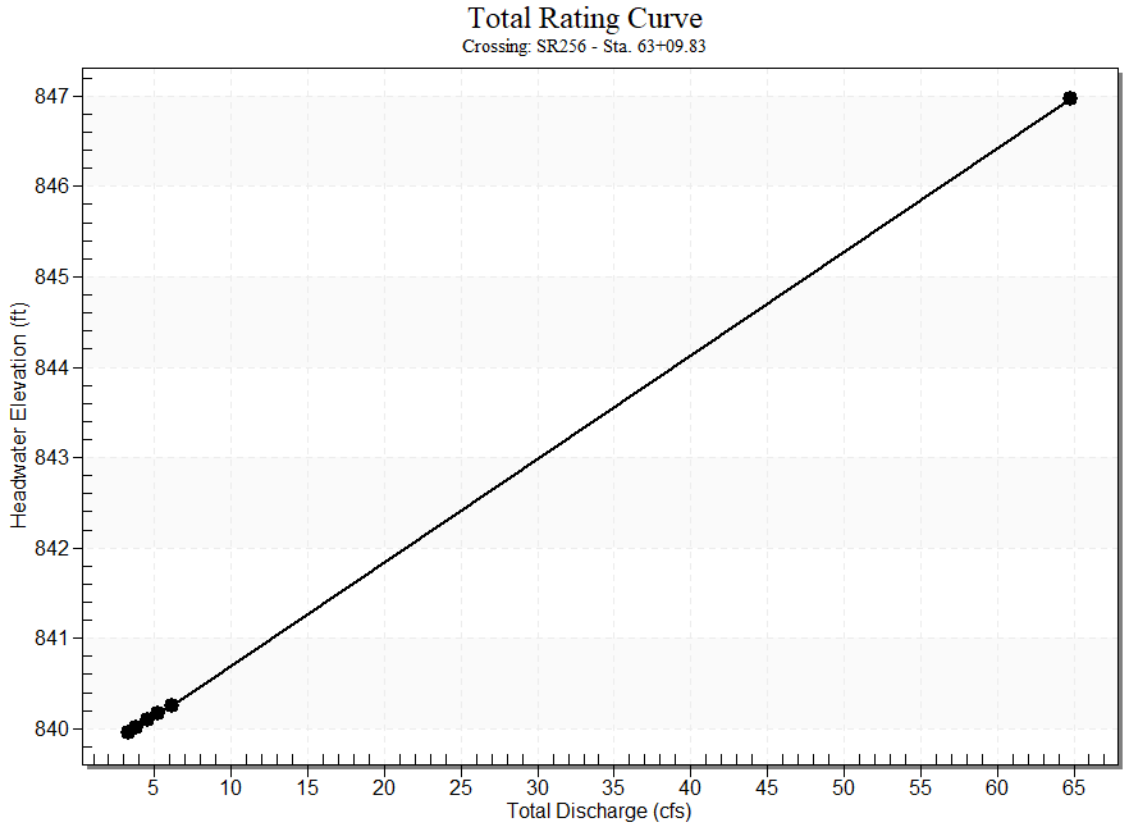
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: SR256 - Sta. 63+09.83

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 36" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
839.96	5 year	3.32	3.32	0.00	1
840.01	10 year	3.81	3.81	0.00	1
840.10	25 year	4.59	4.59	0.00	1
840.16	50 year	5.25	5.25	0.00	1
840.24	100 year	6.11	6.11	0.00	1
846.90	Overtopping	63.12	63.12	0.00	Overtopping

Rating Curve Plot for Crossing: SR256 - Sta. 63+09.83



Culvert Data: Existing 36" Circular Culvert

Table 1 - Culvert Summary Table: Existing 36" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	3.32 cfs	3.32 cfs	839.96	0.77	0.0*	1-S2n	0.43	0.57	0.43	0.64	5.25	1.72
10 year	3.81 cfs	3.81 cfs	840.01	0.83	0.0*	1-S2n	0.47	0.61	0.47	0.71	5.45	1.80
25 year	4.59 cfs	4.59 cfs	840.10	0.91	0.0*	1-S2n	0.51	0.67	0.51	0.80	5.77	1.90
50 year	5.25 cfs	5.25 cfs	840.16	0.97	0.0*	1-S2n	0.54	0.72	0.54	0.88	6.00	1.98
100 year	6.11 cfs	6.11 cfs	840.24	1.06	0.0*	1-S2n	0.59	0.78	0.59	0.98	6.28	2.07

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

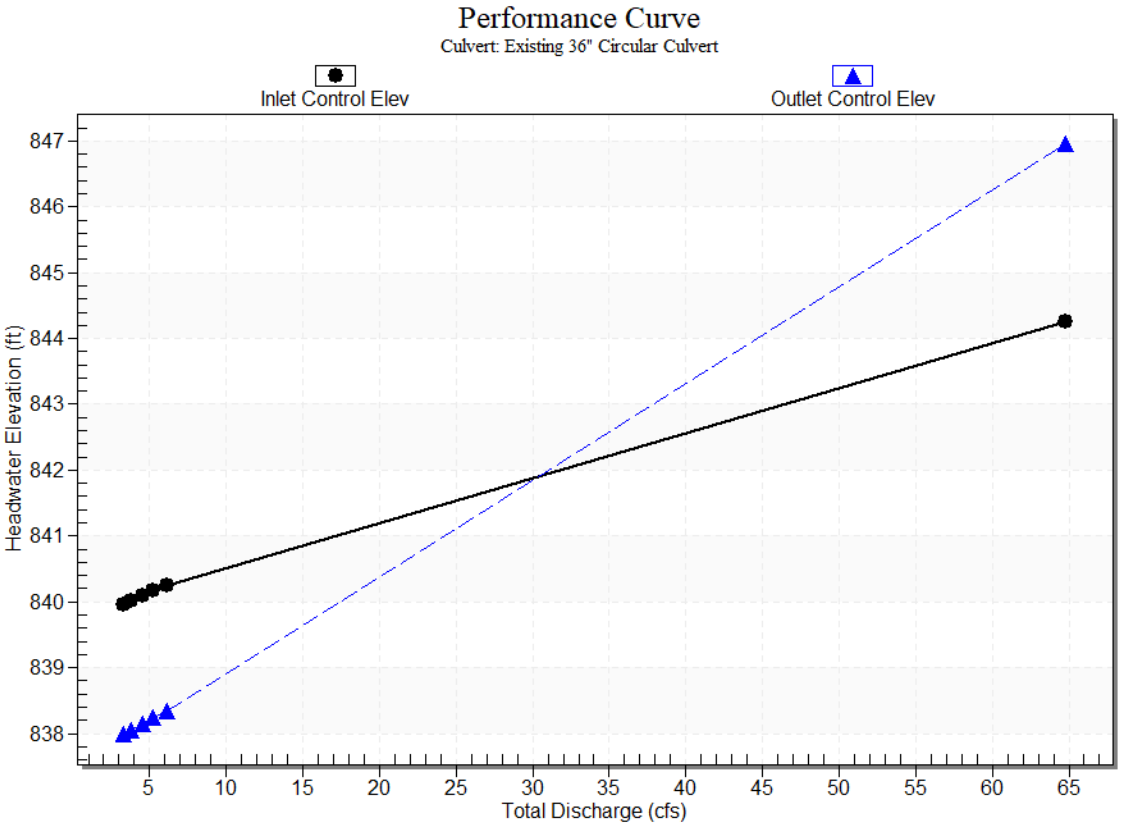
Inlet Elevation (invert): 839.19 ft,

Outlet Elevation (invert): 837.33 ft

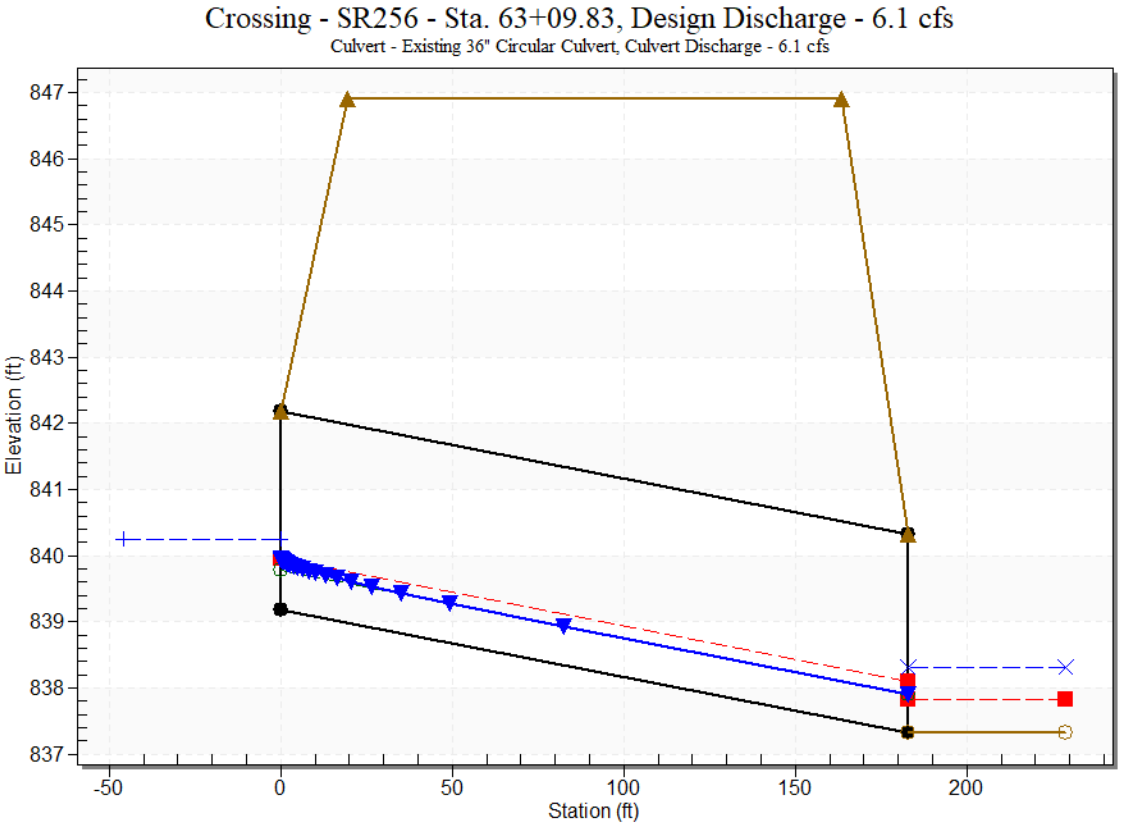
Culvert Length: 182.96 ft,

Culvert Slope: 0.0102

Culvert Performance Curve Plot: Existing 36" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 36" Circular Culvert



Site Data - Existing 36" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 839.19 ft

Outlet Station: 182.95 ft

Outlet Elevation: 837.33 ft

Number of Barrels: 1

Culvert Data Summary - Existing 36" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: SR256 - Sta. 63+09.83

Table 2 - Downstream Channel Rating Curve (Crossing: SR256 - Sta. 63+09.83)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
3.32	837.97	0.64	1.72	0.76	0.38
3.81	838.04	0.71	1.80	0.84	0.38
4.59	838.13	0.80	1.90	0.95	0.37
5.25	838.21	0.88	1.98	1.05	0.37
6.11	838.31	0.98	2.07	1.17	0.37

Tailwater Channel Data - SR256 - Sta. 63+09.83

Tailwater Channel Option: Rectangular Channel

Bottom Width: 3.00 ft

Channel Slope: 0.0190

Channel Manning's n: 0.0700

Channel Invert Elevation: 837.33 ft

Roadway Data for Crossing: SR256 - Sta. 63+09.83

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 846.90 ft

Roadway Surface: Paved

Roadway Top Width: 143.77 ft

HY-8 Culvert Analysis Report

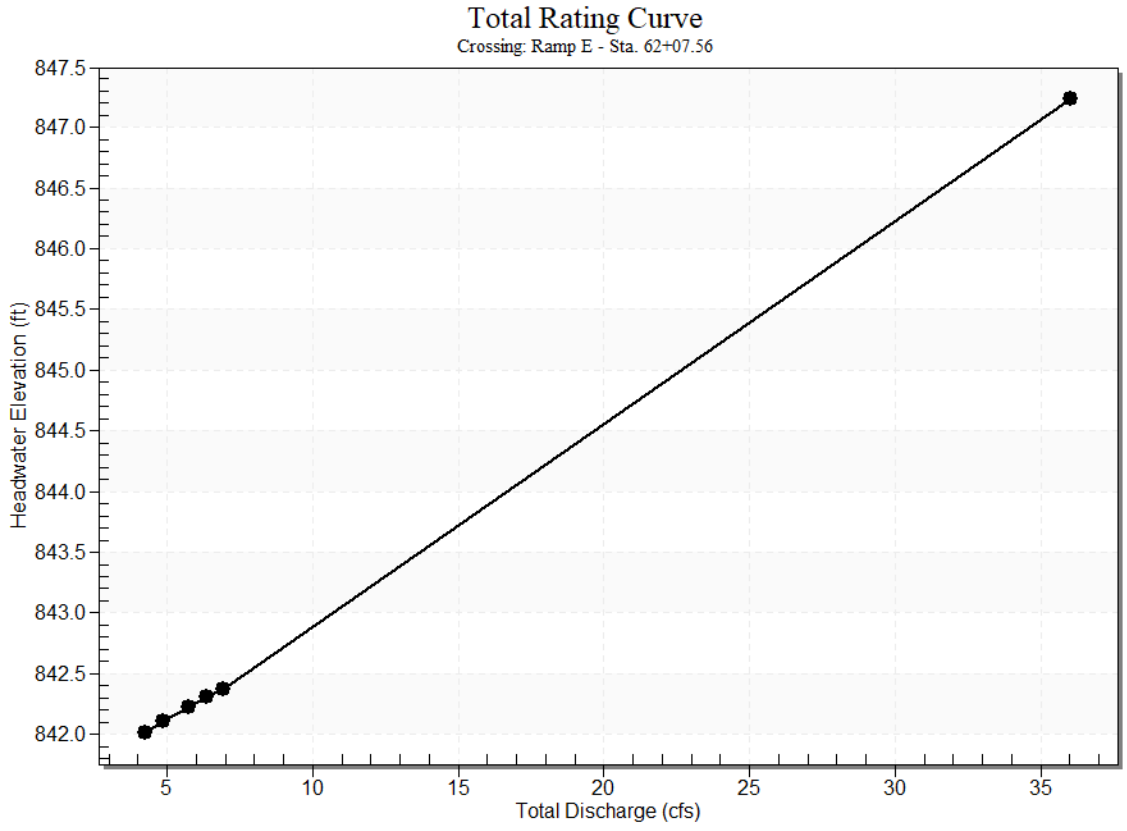
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: Ramp E - Sta. 62+07.56

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 24" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
842.02	5 year	4.23	4.23	0.00	1
842.11	10 year	4.87	4.87	0.00	1
842.23	25 year	5.73	5.73	0.00	1
842.31	50 year	6.35	6.35	0.00	1
842.38	100 year	6.93	6.93	0.00	1
847.20	Overtopping	34.66	34.66	0.00	Overtopping

Rating Curve Plot for Crossing: Ramp E - Sta. 62+07.56



Culvert Data: Existing 24" Circular Culvert

Table 1 - Culvert Summary Table: Existing 24" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	4.23 cfs	4.23 cfs	842.02	0.99	0.254	1-S2n	0.57	0.72	0.57	0.61	5.66	2.81
10 year	4.87 cfs	4.87 cfs	842.11	1.08	0.328	1-S2n	0.61	0.78	0.62	0.65	5.88	2.91
25 year	5.73 cfs	5.73 cfs	842.23	1.20	0.427	1-S2n	0.67	0.85	0.68	0.69	6.14	3.03
50 year	6.35 cfs	6.35 cfs	842.31	1.28	0.498	1-S2n	0.70	0.89	0.71	0.71	6.30	3.11
100 year	6.93 cfs	6.93 cfs	842.38	1.35	0.565	1-S2n	0.74	0.93	0.75	0.74	6.44	3.18

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

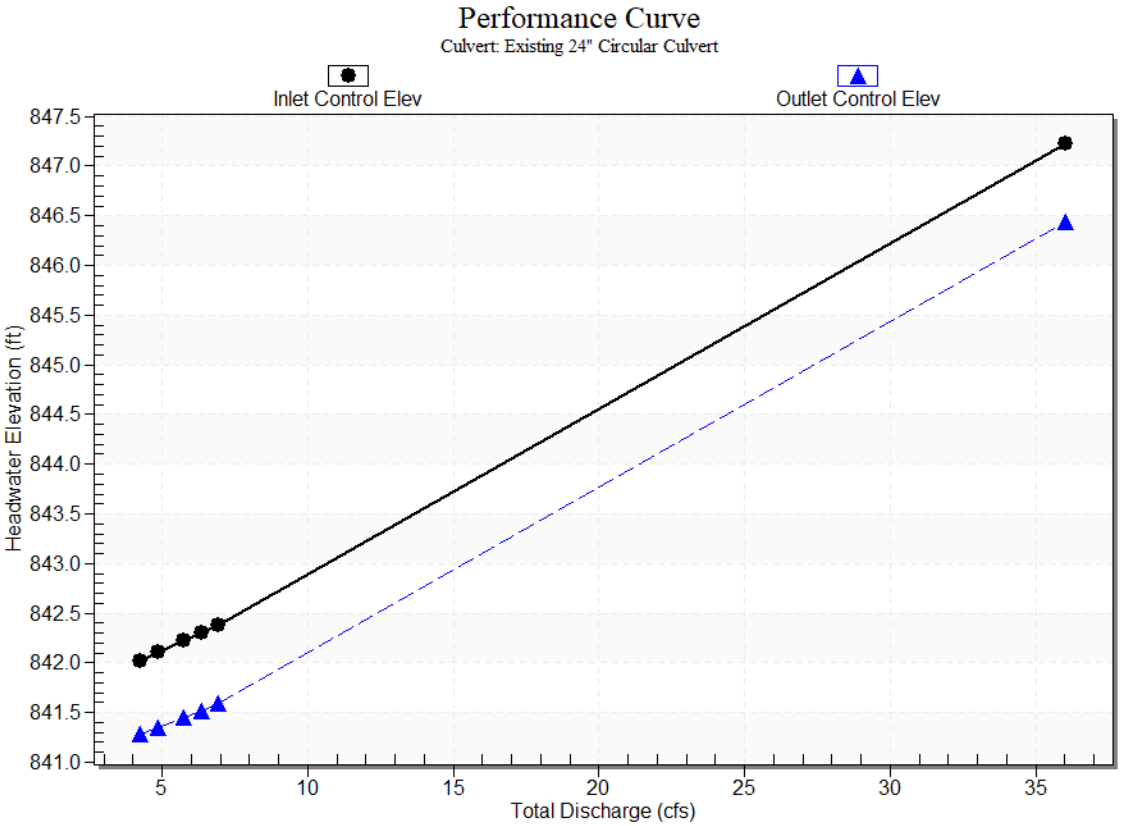
Inlet Elevation (invert): 841.02 ft,

Outlet Elevation (invert): 840.50 ft

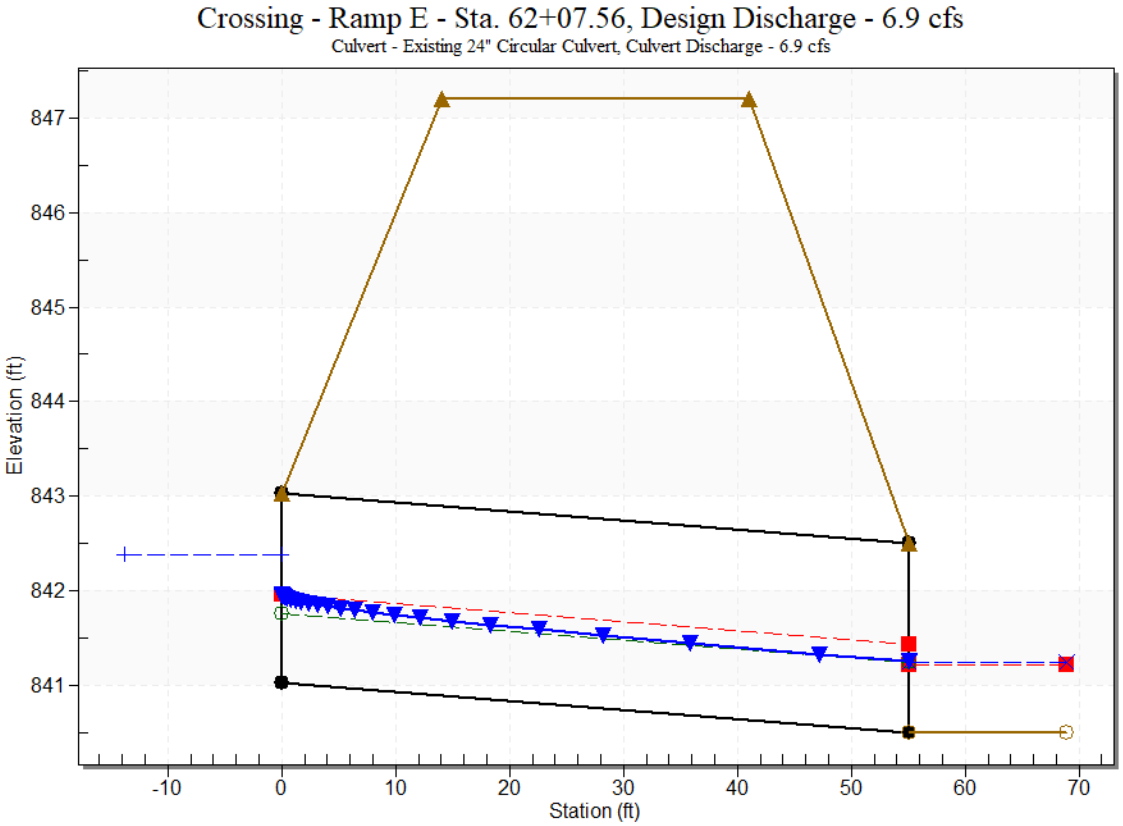
Culvert Length: 55.11 ft,

Culvert Slope: 0.0095

Culvert Performance Curve Plot: Existing 24" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 24" Circular Culvert



Site Data - Existing 24" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 841.02 ft

Outlet Station: 55.10 ft

Outlet Elevation: 840.50 ft

Number of Barrels: 1

Culvert Data Summary - Existing 24" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: Ramp E - Sta. 62+07.56

Table 2 - Downstream Channel Rating Curve (Crossing: Ramp E - Sta. 62+07.56)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
4.23	841.11	0.61	2.81	2.47	0.89
4.87	841.15	0.65	2.91	2.61	0.90
5.73	841.19	0.69	3.03	2.77	0.91
6.35	841.21	0.71	3.11	2.88	0.92
6.93	841.24	0.74	3.18	2.98	0.92

Tailwater Channel Data - Ramp E - Sta. 62+07.56

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0646

Channel Manning's n: 0.0600

Channel Invert Elevation: 840.50 ft

Roadway Data for Crossing: Ramp E - Sta. 62+07.56

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 847.20 ft

Roadway Surface: Paved

Roadway Top Width: 27.00 ft

HY-8 Culvert Analysis Report

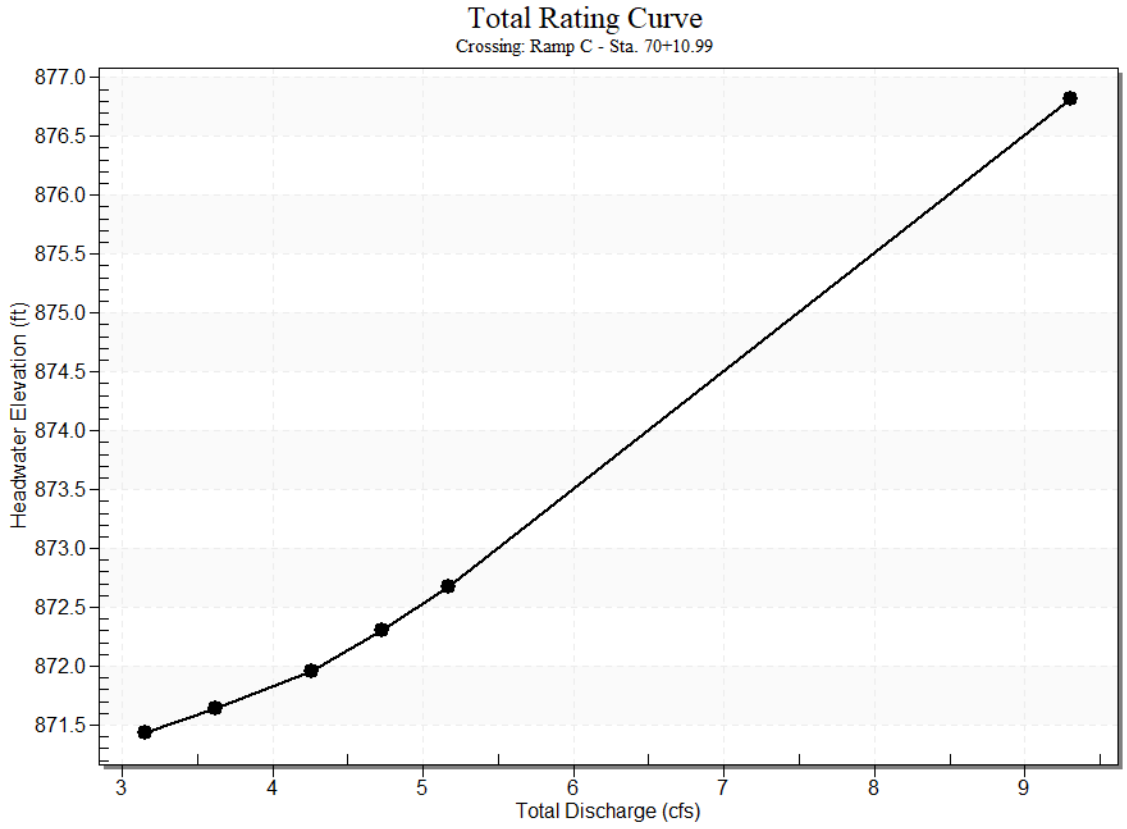
Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: Ramp C - Sta. 70+10.99

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Existing 12" Circular Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
871.44	5 year	3.15	3.15	0.00	1
871.64	10 year	3.62	3.62	0.00	1
871.96	25 year	4.26	4.26	0.00	1
872.30	50 year	4.73	4.73	0.00	1
872.68	100 year	5.17	5.17	0.00	1
876.80	Overtopping	8.74	8.74	0.00	Overtopping

Rating Curve Plot for Crossing: Ramp C - Sta. 70+10.99



Culvert Data: Existing 12" Circular Culvert

Table 1 - Culvert Summary Table: Existing 12" Circular Culvert

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5 year	3.15 cfs	3.15 cfs	871.44	1.31	1.073	5-S2n	0.70	0.76	0.70	0.57	5.33	1.64
10 year	3.62 cfs	3.62 cfs	871.64	1.51	1.361	5-S2n	0.79	0.81	0.79	0.60	5.42	1.69
25 year	4.26 cfs	4.26 cfs	871.96	1.83	1.777	7-M2c	1.00	0.87	0.87	0.63	5.88	1.76
50 year	4.73 cfs	4.73 cfs	872.30	2.10	2.170	7-M2c	1.00	0.90	0.90	0.66	6.35	1.81
100 year	5.17 cfs	5.17 cfs	872.68	2.38	2.546	7-M2c	1.00	0.93	0.93	0.68	6.81	1.85

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

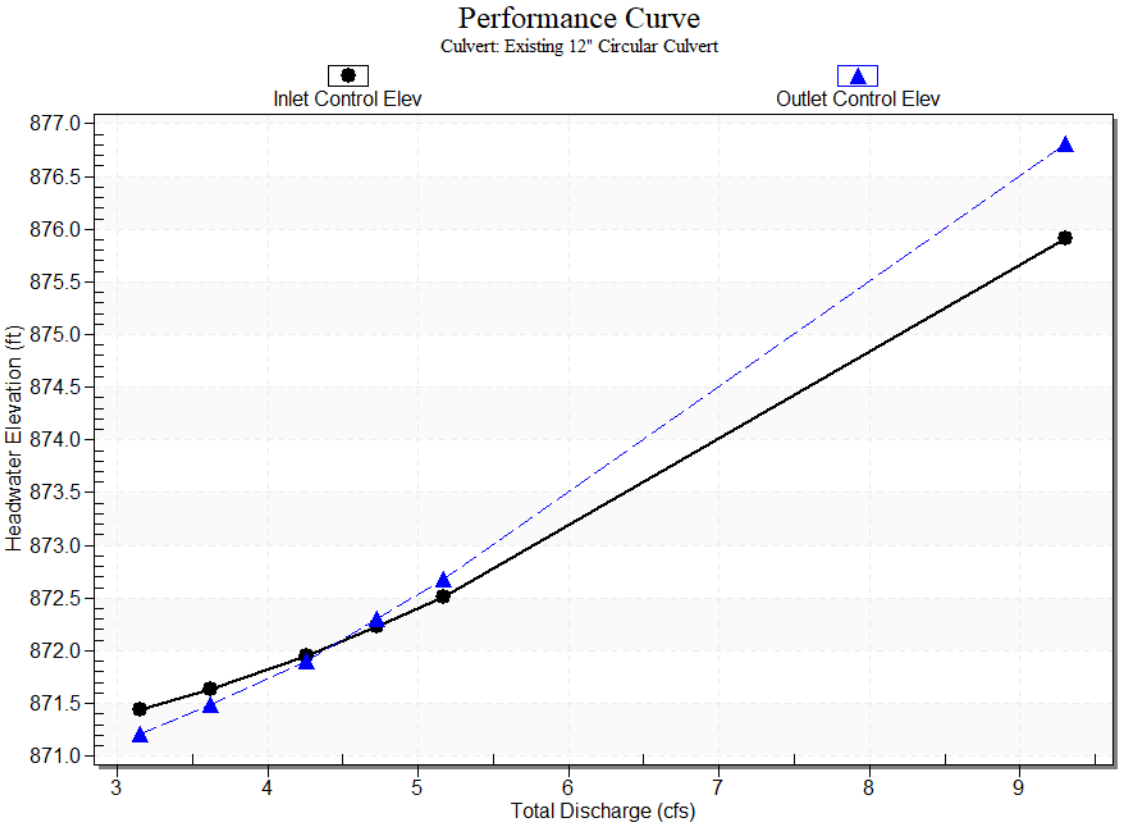
Inlet Elevation (invert): 870.13 ft,

Outlet Elevation (invert): 869.51 ft

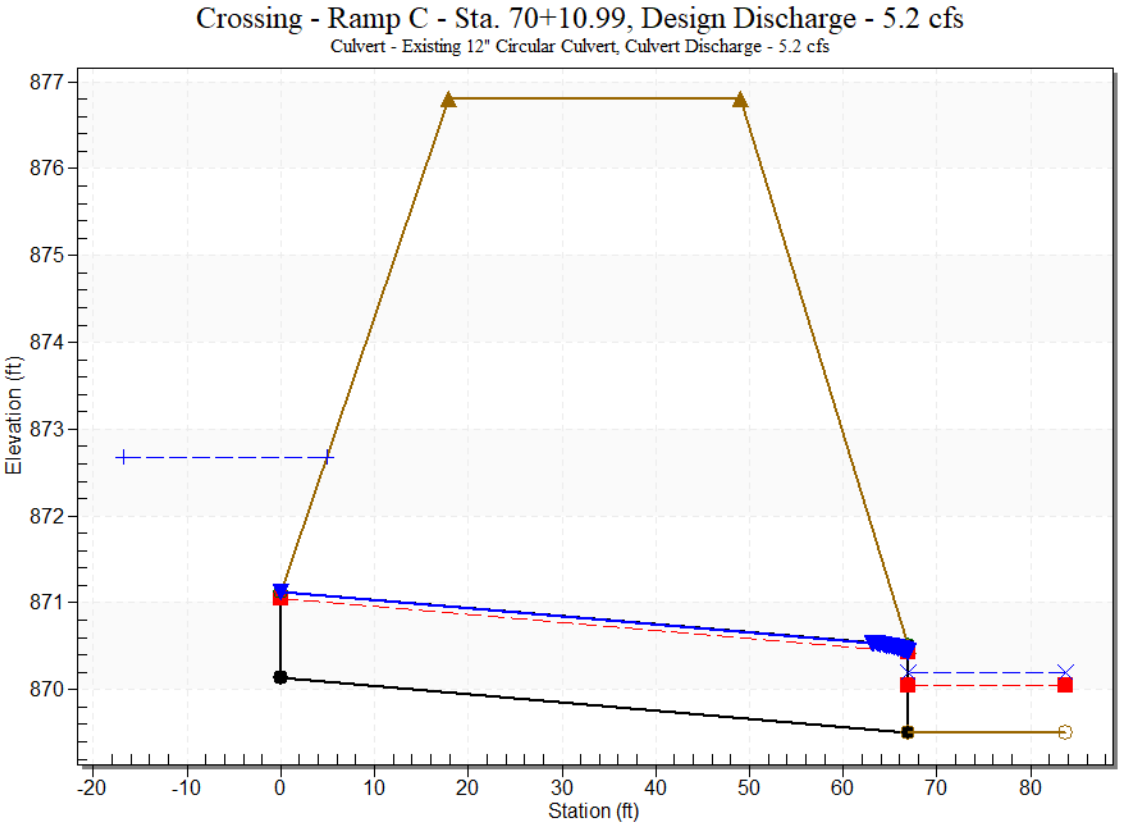
Culvert Length: 66.96 ft,

Culvert Slope: 0.0093

Culvert Performance Curve Plot: Existing 12" Circular Culvert



Water Surface Profile Plot for Culvert: Existing 12" Circular Culvert



Site Data - Existing 12" Circular Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 870.13 ft

Outlet Station: 66.95 ft

Outlet Elevation: 869.51 ft

Number of Barrels: 1

Culvert Data Summary - Existing 12" Circular Culvert

Barrel Shape: Circular

Barrel Diameter: 1.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Tailwater Data for Crossing: Ramp C - Sta. 70+10.99

Table 2 - Downstream Channel Rating Curve (Crossing: Ramp C - Sta. 70+10.99)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
3.15	870.08	0.57	1.64	1.15	0.54
3.62	870.11	0.60	1.69	1.21	0.55
4.26	870.14	0.63	1.76	1.29	0.55
4.73	870.17	0.66	1.81	1.34	0.56
5.17	870.19	0.68	1.85	1.38	0.56

Tailwater Channel Data - Ramp C - Sta. 70+10.99

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 6.00 (_:1)

Channel Slope: 0.0325

Channel Manning's n: 0.0700

Channel Invert Elevation: 869.51 ft

Roadway Data for Crossing: Ramp C - Sta. 70+10.99

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 89.00 ft

Crest Elevation: 876.80 ft

Roadway Surface: Paved

Roadway Top Width: 31.00 ft

VII. Best Management Practice Calculations

The preliminary estimated project earth disturbed area for this project is 126.59 acres. The required BMP treatment percentage (T%) is 25.42% of the area for both water quality and quantity, which is 32.18 acres. For this project, two detention basins will be used to treat the water. The first detention basin will be in the infield of the eastbound I-70 exit ramp to Taylor Road and the second will be in the infield of the eastbound ramps to SR256 and I-70. The first detention basin will treat 27.95 acres of project water; the water will outlet to the outer ditch of I-70 which will eventually drain to Blacklick Creek. The second detention basin will treat 6.78 acres of project water; the water will outlet to the outer ditch of the entrance ramp which will drain to a tributary of Blacklick Creek. The total treated area of 34.73 acres exceeds the required 32.18 acres.

Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Post Construction - Project Summary

Project Data		Units
Project EDA	126.59	acres
Is the Project Routine Maintenance per L&D Vol. 2, Sec. 1112.2	No	
BMPs Required?	**BMPs Required**	NA
Ain (New Impervious Area in New Permanent R/W	7.90	acres
Does Entire Site Drain to Large River (>100 sq. miles)?	No	
Water Quality Treatment Required	**Yes**	
Water Quantity Treatment Required	**Yes**	
Treatment Percent and Treatment Requirement		
Aix (Project EDA that is inside the existing right-of-way)	108.56	acres
Ain (New Impervious Area in New Permanent R/W)	7.90	acres
T% (Treatment Percent)	**25.42**	**%**
Treatment Requirement	**32.18**	**acres**

BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
DB1	Extended Detention Basin	33.89	27.95
DB2	Extended Detention Basin	6.78	6.78

Treatment Provided

Total Area with ODOT R/W Treated (acres)	**34.73**
Treatment Requirements (acres)	**32.18**
Treatment Check	**Good**

BMP Submittal Requirements (Per L&D, Vol. 2, Sec. 1116.2)

1. Estimated Project Earth Disturbed Area	Yes	**Good**
2. Treatment Percent Calculation	Yes	**Good**
3. BMP Selected for use	Yes	**Good**
4. Drainage area mapping for post-construction BMPs that show the total contributing drainage area and the amount of contributing area within ODOT right-of-way	Yes	**Good**
5. Plan sheets showing locations of post-construction BMP	Yes	**Good**
6. Calculations for each BMP	Yes	**Good**
7. Explanation for any area that is not treated	Yes	**Good**

Water Quality Volume (WQ_V)

Drainage Area #1	Values	Units
Tributary Area within Existing R/W	23.54	acres
Impervious Trib. Area Outside Existing R/W	2.37	acres
Pervious Trib. Area Outside Existing R/W	7.98	acres
Total Tributary Area	33.89	acres
Impervious Tributary Area	25.91	acres
Impervious fraction (i)	0.76	fraction
Volumetric Runoff Coefficient (R_V)	0.74	NA
Precipitation (P)	0.90	inches
WQ_V	**1.876**	ac-ft

Drainage Area #2	Values	Units
Tributary Area within Existing R/W	6.78	acres
Impervious Trib. Area Outside Existing R/W	0.00	acres
Pervious Trib. Area Outside Existing R/W	0.00	acres
Total Tributary Area	6.78	acres
Impervious Tributary Area	6.78	acres
Impervious fraction (i)	1.00	fraction
Volumetric Runoff Coefficient (R_V)	0.95	NA
Precipitation (P)	0.90	inches
WQ_V	**0.483**	ac-ft

Yellow: Requires Input (See instructions tab)

Notes:

L&D Volume 2, Section 1115.4: $WQ_V = (R_V * P * A)/12$; Results in ac-ft

L&D Volume 2, Section 1115.4: P = 0.90 inches

L&D Volume 2, Section 1115.4: $R_V = 0.05 + 0.9*i$

L&D Volume 2, Section 1115.4: "Treat all areas within existing ODOT right-of-way a

Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Extended Detention Basin / Retention Basin

Drainage Area #	Total Tributary Area (acres)	Tributary Area within the R/W (acres)	WQ_V (ac-ft)
1	33.89	27.95	1.876

Yellow: Requires Input (See instructions tab)

Total Treatment Credit Earned from Extended Detention (within R/W):[1]

27.95	acres

(Treatment is for quality and quantity)

	Extended Detention #1	
	Values	Notes / Checks
WQ_V (ac-ft)	1.876	Calculation
Detention or Retention	Detention	Drop Down List
Minimum WQ_V (ac-ft)	2.251	Calculation
Design WQ_V (ac-ft)[2]	2.300	GOOD
Min. Time to Drain WQ_V (hrs)[3]	48	By Rule
Design Time to Drain WQ_V	48	GOOD
50% WQ_V (ac-ft)	1.126	Calculation
Min. Time to Drain 50% WQ_V (hrs)[4]	16	Calculation
Design Time to Drain 50% WQ_V	16.00	GOOD
Min. Forebay and Micropool Vol. (ac-ft)[5]	0.188	Calculation
Design Forebay Volume (ac-ft)	0.200	GOOD
Design Micropool Volume (ac-ft)	0.200	GOOD
Minimum Permanent Pond Vol. (ac-ft)[6]	0.000	Calculation
Design Permanent Pond Vol. (ac-ft)	0.000	Not required

BMP Design Considerations	Answer	Design Check
1. Is the stage/storage table and graph provided?	No	CHECK DESIGN
2. Are all detention basin outlets shown in detail?	No	CHECK DESIGN
3. Is a drawdown hydrograph provided?	No	CHECK DESIGN
4. Has a summary of all input and output into a basin routing software been provided?	No	CHECK DESIGN
5. Is scour protection provided at inlets and outlets?	No	CHECK DESIGN
6. Have detention basin overflow structures (catch basin and overflow weir) been sized appropriately?	No	CHECK DESIGN
7. Has tailwater been considered?	No	CHECK DESIGN
8. Is the detention basin located outside of any FEMA designated floodplains?	Yes	Good
9. Are the limits of Item 670, Slope Erosion Protection, shown on the plans?	No	CHECK DESIGN
10. Are anti-seep collars included in the plans?	No	CHECK DESIGN
11. Has maintenance access been considered?	No	CHECK DESIGN
12. Have safety concerns been considered and addressed?	No	CHECK DESIGN

Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Extended Detention Basin / Retention Basin

Drainage Area #	Total Tributary Area (acres)	Tributary Area within the R/W (acres)	WQ_V (ac-ft)
2	6.78	6.78	0.483

Yellow: Requires Input (See instructions tab)

Total Treatment Credit Earned from Extended Detention (within R/W):[1]

6.78	acres

(Treatment is for quality and quantity)

	Extended Detention #1	
	Values	Notes / Checks
WQ_V (ac-ft)	0.483	Calculation
Detention or Retention	Detention	Drop Down List
Minimum WQ_V (ac-ft)	0.580	Calculation
Design WQ_V (ac-ft)[2]	0.600	GOOD
Min. Time to Drain WQ_V (hrs)[3]	48	By Rule
Design Time to Drain WQ_V	48	GOOD
50% WQ_V (ac-ft)	0.290	Calculation
Min. Time to Drain 50% WQ_V (hrs)[4]	16	Calculation
Design Time to Drain 50% WQ_V	16.00	GOOD
Min. Forebay and Micropool Vol. (ac-ft)[5]	0.048	Calculation
Design Forebay Volume (ac-ft)	0.050	GOOD
Design Micropool Volume (ac-ft)	0.050	GOOD
Minimum Permanent Pond Vol. (ac-ft)[6]	0.000	Calculation
Design Permanent Pond Vol. (ac-ft)	0.000	Not required

BMP Design Considerations	Answer	Design Check
1. Is the stage/storage table and graph provided?	No	CHECK DESIGN
2. Are all detention basin outlets shown in detail?	No	CHECK DESIGN
3. Is a drawdown hydrograph provided?	No	CHECK DESIGN
4. Has a summary of all input and output into a basin routing software been provided?	No	CHECK DESIGN
5. Is scour protection provided at inlets and outlets?	No	CHECK DESIGN
6. Have detention basin overflow structures (catch basin and overflow weir) been sized appropriately?	No	CHECK DESIGN
7. Has tailwater been considered?	No	CHECK DESIGN
8. Is the detention basin located outside of any FEMA designated floodplains?	Yes	Good
9. Are the limits of Item 670, Slope Erosion Protection, shown on the plans?	No	CHECK DESIGN
10. Are anti-seep collars included in the plans?	No	CHECK DESIGN
11. Has maintenance access been considered?	No	CHECK DESIGN
12. Have safety concerns been considered and addressed?	No	CHECK DESIGN