

**GAL-850-0.21 IMPROVEMENTS
GALLIA COUNTY, OHIO
ODOT PID NO. 117244**

ROADWAY EXPLORATION REPORT

Prepared For:
**Korda/Nemeth Engineering, Inc.
1650 Watermark Drive
Columbus, Ohio 43215**

Prepared By:
**Resource International, Inc.
6350 Presidential Gateway
Columbus, OH 43231**

Rii Project No. W-22-198

December 2025

**Planning, Engineering, Construction Management, Technology
6350 Presidential Gateway, Columbus, OH 43231
P 614.823.4949**





RESOURCE INTERNATIONAL, INC.

6350 Presidential Gateway
Columbus, Ohio 43231
T: 614.823.4949

Planning

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December 15, 2025

Mr. Brooks Vogel, P.E., LEED AP
Partner
Korda/Nemeth Engineering, Inc.
1650 Watermark Drive
Columbus, Ohio 43215

**Re: Roadway Exploration Report
GAL-850-0.21 Improvements
ODOT PID No. 117244
Gallia County, Ohio
Rii Project No. W-22-198**

Mr. Vogel:

Resource International, Inc. (Rii) is pleased to submit this roadway exploration report for the above referenced project. Engineering logs have been prepared and are attached to this report along with the results of laboratory testing. This report includes geotechnical recommendations for the proposed improvements to SR 850 in Gallia County, Ohio.

We sincerely appreciate the opportunity to be of service to you on this project. If you have any questions regarding the Geotechnical Exploration or this report, please contact us.

Sincerely,

RESOURCE INTERNATIONAL, INC.

A handwritten signature in blue ink that reads 'Johnnatan Garcia-Ruiz'.

Johnnatan Garcia-Ruiz, Ph.D.
Staff Engineer

A handwritten signature in blue ink that reads 'Daniel E. Karch'.

Daniel E. Karch, P.E.
Director – Geotechnical Services (Ohio)

Enclosure: Roadway Exploration Report

ISO 9001:2015 QMS

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EXECUTIVE SUMMARY

Resource International, Inc. (Rii) has completed the roadway exploration report for the proposed improvements to SR 850 in Gallia County, Ohio. Based on the information provided the improvements are understood to include the following:

- Widening of SR 850 from Jackson Pike (SLM 0.21) to approximately 570 feet south of the US 35 eastbound ramps (SLM 1.80) from an existing pavement width ranging from approximately 20 to 26 feet to a widened 30.0 feet, which includes two (2) 11.0-foot lanes with 4.0-foot shoulders.
- Minor grade profile improvements of the areas with deficient vertical curves, such as at SLM 0.59 and SLM 0.92. Based on available plans, no significant changes to the slopes of the existing roadway embankment and/or right-of-way, associated to the widening or the grade improvements are planned.
- Minor grade correction in the area of the intersections of SR 850 and Watson Road and SRO 850 and Harrisburg Road.
- Extension of the small culvert structure located at approximately SLM 1.76.
- Widening of SR 850 from approximately 700 feet north of Denney Cemetery Road (SLM 3.53) to approximately 300 feet south of Flem Road (SLM 4.62) from an existing pavement width ranging from approximately 20 to 24 feet to a widened 26.0 feet, which includes two 11.0-foot lanes with 2.0-foot shoulders.
- Minor grade profile correction of areas subjected to frequent flooding, such as a road section parallel to Barren Creek, approximately from SLM 3.72 to SLM 4.10; as well as the sag curve near SLM 4.50.

Exploration and Findings

On February 6 through 10, 2023, a total of forty-one (41) roadway borings, designated as B-001-0-23 through B-041-0-23, were advanced for this project along the proposed alignment of SR 850. The borings were advanced to depths ranging from 3.2 to 9.5 feet below the existing pavement surface.

Prior to drilling the borings, pavement cores were obtained from all borings, except B-006-0-23, B-024-02-23 and B-027-0-23, to determine the existing pavement composition and condition of the paved section. All borings were performed within the pavement limits of SR 850 and encountered 4.25 to 19.5 inches of hot mix asphalt (HMA) pavement over 0.0 to 8.25 inches of aggregate base.

Beneath the surficial materials, boring B-002-0-23, B-011-0-23, B-012-0-23, B-021-0-23, B-033-0-23, B-040-0-23 and B-041-0-23 encountered existing fill material identified as

sandy silt, silty clay, clay (ODOT A-4a, A-6b, A-7-6) and gravel with sand (ODOT A-1-b), extending to a depth of 3.0 feet below existing grade. Asphalt fragments were observed within these fill materials.

Beneath the surficial and fill materials, natural cohesive and/or granular soils were encountered extending to top of bedrock or to the boring termination depths. The natural cohesive soils were described as sandy silt, silt, silt and clay, silty clay, clay soils (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6) with varying amounts of sand and gravel. The natural granular soils were described as brown gravel, gravel with sand, gravel with sand and silt, gravel with sand, silt, and clay, and coarse and fine sand (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a).

Bedrock was encountered in borings B-031-0-23, B-032-0-23, B-038-0-23, and B-039-0-23 performed for this investigation. The bedrock was identified as highly weathered shale or siltstone

Groundwater was encountered during drilling activities in boring B-009-0-023 and B-029-0-23 at depths of or 3.0 and 4.5 feet below the existing ground surface, respectively. Groundwater was encountered in B-009-0-23 and B-029-0-23 upon completion of drilling at depths of 5.0 feet each below the existing ground surface.

Analysis and Recommendations

With exception of boring B-002-0-23, B-011-0-23, B-012-0-23, B-012-0-23, B-021-0-23, B-033-0-23, B-040-0-23, and B-041-0-23, where existing fill material were encountered, the soils at the anticipated subgrade elevation along SR 850, within the project limits, consists predominantly of natural cohesive and granular soils. Along the southern portion of the alignment the subgrade soils generally consist of soft to hard cohesive soils (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6) with intermittent layer(s) of loose to dense granular soils (A-1-a, A-1-b, A-2-4, A-3a) in some borings. Along the northern portion of the alignment subgrade soils generally consist of very soft to hard cohesive soils (ODOT A-4a, A-4b, A-6a, A-6b) and medium dense to very dense granular soils (A-1-a, A-1-b, A-2-4, A-2-6, A-3a). Bedrock was also encountered in the borings performed within the north portion of the proposed improvements.

Unsuitable natural soils of silt (ODOT A-4b) were encountered in borings B-003-0-23, B-034-0-23, and B-035-0-23, while clay (ODOT A-7-6) soils with a high liquid limit (LL > 65) were encountered in borings B-002-0-23 and B-009-0-23. **Rii recommends the removal of any silt (ODOT A-4b) and with high liquid limit (LL > 65) soils to a depth of 36 inches below the anticipated subgrade elevation.**

In addition, highly weathered siltstone, was encountered in boring B-038-0-23 within the anticipated subgrade elevation. **Rii recommends the removal of bedrock to a depth of 24 inches below the anticipated subgrade elevation.**

Per Section 600 of the ODOT GDM, global stabilization recommendations are based upon the overall average site parameters, as noted in the following table for each section of the project alignment.

Average Site Parameters

Alignment	Average N _{60L}	Average PI	Average Moisture	Average Optimum Moisture	Average Group Index	Average CBR
SR 850 (south)	13	24	19	15	11	6
SR 850 (north)	16	11	16	11	5	8

After applying the averages in the above table and considering the conditions and type of soils encountered at the anticipated subgrade elevations, Rii recommends the following global stabilization option within the project limits:

Option 1. Undercut 12-inch of subgrade and replace with Item 204 Granular Material Type B, Type C or Type D. It is recommended that Item 204 Geotextile be placed at the bottom of the undercut.

Option 2. Chemically stabilize the upper 12-inches of subgrade soils along the entire alignment section with the stabilizing agent recommended for each section in the following table and as per ODOT Construction and Materials Specification (CMS) Item 206. For estimating purposes, utilize a cement/lime content of 5.0 percent by weight of soil. Actual application rates shall be verified by the contractor under Item 206.06 Mixture Design for Chemically Stabilized Soils.

Global Stabilization Recommendations (Option 2)

Project Section	Representative Borings	Begin Station	End Station	Recommended Subgrade Stabilization (Option 2)
SR 850 (South Section)	B-001-0-22 through B-025-0-22	11+59	96+83	12" Item 206 Chemical Stabilization with Lime
SR 850 (North Section)	B-026-0-22 through B-041-0-22	185+90	243+50	12" Item 206 Chemical Stabilization with Cement

It should be noted that due to the limited width of roadway widening within the project limits, it may not be practical to perform chemical stabilization.

It should also be noted that the global stabilization options recommended above considers that removal of any silt soils (ODOT A-4b) and soils with high liquid limit (LL>65) to 36.0 inches below the anticipated subgrade elevation, as well as the removal of

bedrock to 24.0 inches below the anticipated subgrade elevation, has been completed previous to proceed with the global stabilization.

Based on the conditions encountered across the subject site, **it is recommended that pavement design be based on the design CBR values provided in the following table**. The corresponding modulus of subgrade reaction (K) and soil support value (SSV) obtained through correlation charts are also provided in this table.

Design CBR Values Recommended

Project Section	Design CBR	Mr (psi)	K (pci)	SSV
SR 850 – South Section	6	7,200	150	4.4
SR 850 – North Section	8	9,600	175	5.3

Please note that this executive summary does not contain all the information presented in the report. The unabridged roadway exploration report should be read in its entirety to obtain a more complete understanding of the information presented.

1.0 INTRODUCTION

This report is a presentation of the roadway exploration performed for the proposed improvements to State Route 850 in Gallia County, Ohio.

Based on the information provided by Korda/Nemeth Engineering, Inc. (Korda), the project is understood to consist of improvements to two (2) sections of the SR 850 corridor. The south section includes improvements to SR 850 from Jackson Pike to US 35. The improvements to the south section are understood to include the following:

- Widening of SR 850 from Jackson Pike (SLM 0.21) to approximately 570 feet south of the US 35 eastbound ramps (SLM 1.80) from an existing pavement width ranging from approximately 20 to 26 feet to a widened 30.0 feet, which includes two (2) 11.0-foot lanes with 4.0-foot shoulders.
- Minor grade profile improvements of the areas with deficient vertical curves, such as at SLM 0.59 and SLM 0.92. Based on available plans, no significant changes to the slopes of the existing roadway embankment and/or right-of-way, associated to the widening or the grade improvements are planned.
- Minor grade correction in the area of the intersections of SR 850 and Watson Road and SRO 850 and Harrisburg Road.
- Extension of the small culvert structure located at approximately SLM 1.76.

The north section includes improvements from 700 feet north of Denney Cemetery Road to 300 feet south of Flem Road in Gallia County, Ohio. The improvements to the north section are understood to include the following:

- Widening of SR 850 from approximately 700 feet north of Denney Cemetery Road (SLM 3.53) to approximately 300 feet south of Flem Road (SLM 4.62), from an existing pavement width ranging from approximately 20 to 24 feet to a widened 26.0 feet, which includes two 11.0-foot lanes with 2.0-foot shoulders.
- Minor grade profile correction of areas subjected to frequent flooding, such as a road section parallel to Barren Creek, approximately from SLM 3.72 to SLM 4.10; as well as the sag curve near SLM 4.50.

This exploration was performed in general accordance with the Ohio Department of Transportation (ODOT) Specification for Geotechnical Explorations (SGE), dated July 2022. The project site is shown on the vicinity map and boring plan presented in Appendix I.

2.0 GEOLOGY AND OBSERVATIONS OF THE PROJECT

2.1 Site Geology

Physiographically the site lies within the Marietta Plateau Region of the Allegheny Plateau Section. The region is within the unglaciated area of Ohio and is generally a high plateau dissected by broad and steep river valleys.

Based on the bedrock geology and topography maps obtained from the Ohio Department of Natural Resources (ODNR), the underlying bedrock across the project site consists of Pennsylvanian-aged Conemaugh Group. This formation is comprised of non-bedded to massively bedded shale, siltstone, mudstone and sandstone with lesser amounts of coal and limestone. The entire bedrock unit ranges from 350 to 490 feet thick and is characterized by rapid horizontal and vertical changes in rock type. Typically, the formation contains shades of gray, green, and infrequent reds. Surficial deposits include colluvium derived from local bedrock, including weathered material, landslides, and bedrock outcroppings. The project alignment contains some lacustrine deposits from pre-Illinoian ice-dammed lakes, consisting of laminated clays and silts covered with thin colluvial sand, silt, or gravel.

2.2 Existing Site Conditions

The project site is located along SR 850 in Gallia County, Ohio. The project site extends from Jackson Pike to approximately 570 feet south of the US 35 eastbound entrance ramp, and from approximately 700 feet north of Denney Cemetery Road to 300 feet south of Flem Road. At the time of this report, SR 850 within the project limits is a bidirectional, two lane asphalt paved roadway. Along the project alignment, the land use surrounding SR 850 is residential and agricultural.

Overhead electric lines and cable lines were noted along the majority of the alignment of SR 850 within the project limits. Surface drainage appears to be collected in the drainage ditches along the majority of the roadway alignment.

3.0 EXPLORATION

On February 6 through 10, 2023, a total of forty-one (41) roadway borings, designated as B-001-0-23 through B-041-0-23, were advanced for this project along the proposed alignment of SR 850. The borings were advanced to depths ranging from 3.2 to 9.5 feet below the existing pavement surface. The locations of the borings are illustrated on the boring plans presented in Appendix I of this report, and a summary of boring information is presented in Appendix II.

Prior to drilling the borings, pavement cores, designated as PC-1 through PC-41, were obtained at each boring location, B-001-0-23 through B-041-0-23, respectively, to determine the existing pavement composition and condition of the paved section. Even though no pavement core was retained from borings B-006-0-23, B-024-0-23 and B-027-0-23, the type and thickness of the pavement at these locations was measured and registered prior to the drilling operations. The pavement cores were obtained with a 4.0-inch diameter thin-walled pavement core bit. Data sheets, including photographs of the retained pavement cores and base samples are presented in Appendix V.

Boring locations were determined and field located by Rii personnel prior to drilling operations. Coordinates and ground surface elevations of the as drilled boring locations were interpolated from basemapping provided by Korda.

The borings were drilled and sampled with CME 55 truck mounted drill rig utilizing 4.5-inch continuous flight augers to advance the holes. Standard penetration testing (SPT) and split spoon sampling were performed continuously in all borings, except B-024-0-23, to the boring termination depths. In boring B-024.0-23, SPT and split spoon sampling were performed at 2.5-foot intervals to the boring termination depth. The SPT, per the American Society for Testing and Materials (ASTM) designation D1586, was conducted using a 140-pound hammer free falling 30 inches to drive a 2.0-inch outside diameter (O.D.) split spoon sampler for 18.0 inches. Rii utilized a calibrated automatic drop hammer to generate consistent energy transfer to the sampler. Driving resistance is recorded on the boring logs in terms of blows per 6.0-inch interval of the driving distance. The second and third intervals were added to obtain the number of blows per foot (N). SPT blow counts aid in estimating soil characteristics used to calculate bearing/subgrade capacities and settlement potential. Measured blow count (N_m) values are corrected to an equivalent (60%) energy ratio, N_{60} , by the following equation. Both values are represented on boring logs presented in Appendix III.

$$N_{60} = N_m * (ER/60)$$

Where:

N_{60} = energy corrected number of blows required to drive split spoon sampler final 12 inches in 1.5-foot sampling intervals

N_m = measured N value

ER = drill rod energy ratio, expressed as a percent, for the system used

The hammer utilized in CEM 55 truck rig was calibrated on March 21, 2022 and had an energy ratio of 87.0 percent. Upon completion of drilling, the borings were backfilled with a mixture of soil cuttings and bentonite chips. The pavement surface at the boring and core locations was patched with an equivalent thickness of asphalt cold patch.

Hand penetrometer readings, which provide a rough estimate of the unconfined compressive strength of the soil, were reported on the boring logs in units of tons per square foot (tsf) and were utilized to classify the consistency of the cohesive soil in each



layer. An indirect estimate of the unconfined compressive strength of the cohesive split spoon samples can also be made from a correlation with the blow counts (N_{60}). Please note that split spoon samples are considered to be disturbed and the laboratory determination of their shear strengths may vary from undisturbed conditions.

During drilling, Rii personnel prepared field logs showing the encountered subsurface conditions. Soil samples obtained from the drilling operation were preserved and sealed in glass jars and delivered to the soil laboratory. In the laboratory, the soil samples were visually classified and select samples were tested, as noted in Table 1.

Table 1. Laboratory Test Schedule

Laboratory Test	Test Designation	Number of Tests Performed
Natural Moisture Content	ASTM D 2216	120
Plastic and Liquid Limits	AASHTO T89, T90	66
Gradation – Sieve/Hydrometer	AASHTO T88	72
Sulfate Content – Colorimetric Method	ODOT S1122	41

The tests performed are necessary to classify existing soil according to the ODOT classification system and to estimate engineering properties of importance for pavement design and construction recommendations. A description of the soil terms used throughout this report is presented in Appendix III. Results of the laboratory testing are presented on the boring logs in Appendix IV.

4.0 FINDINGS

Interpreted engineering logs have been prepared based on the field logs, visual examination of samples and laboratory test results. Classification follows the current version of the ODOT SGE. The following is a summary of what was found in the test borings and what is represented on the boring logs.

4.1 Surface Materials

All borings were performed within the pavement limits of SR 850 and encountered 4.25 to 19.5 inches of hot mix asphalt (HMA) pavement over 0.0 to 8.25 inches of aggregate base. A more detailed information regarding the type of pavement, thickness and condition encountered at each boring location is presented in Appendix V.

4.2 Subsurface Soils

Beneath the surficial materials, boring B-002-0-23, B-011-0-23, B-012-0-23, B-021-0-23, B-033-0-23, B-040-0-23, and B-041-0-23 encountered existing fill material identified as sandy silt, silty clay, clay (ODOT A-4a, A-6b, A-7-6), gravel with sand and gravel with sand and silt (ODOT A-1-b, A-2-4), extending to a depth of 3.0 feet below existing grade. Presence of asphalt fragments were observed within these fill materials.

Beneath the surficial and fill materials, natural cohesive and/or granular soils were encountered extending to top of bedrock or to the boring termination depths. The natural cohesive soils were described as sandy silt, silt, silt and clay, silty clay, clay soils (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6) with varying amounts of sand and gravel. The shear strength and consistency of the cohesive soils are primarily derived from the hand penetrometer values (HP). The consistency of the encountered cohesive soils ranged from very soft ($0.0 \leq HP \leq 0.5$ tsf) to hard ($HP > 4.0$ tsf). The unconfined compressive strength of the cohesive soil samples tested, obtained from the hand penetrometer, ranged from 0.25 tsf to 4.5 tsf.

The natural granular soils were described as brown gravel, gravel with sand, gravel with sand and silt, gravel with sand, silt, and clay, and coarse and fine sand (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a). The N_{60} values obtained within these granular soils ranged from 6 to 59 blows per foot (bpf), corresponding to relative densities ranging from loose to very dense. The overall N_{60} values obtained within the soil borings ranged from 4 to over one hundred (100+) bpf.

Moisture contents of the cohesive soil samples tested ranged from 6 to 32 percent, and the moisture contents of the granular soil samples tested ranged from 1 to 12 percent. The natural moisture contents of the cohesive soil samples tested for plasticity index ranged from 14 percent below to 14 percent above their corresponding plastic limits. In general, the cohesive soils exhibited natural moisture contents estimated to be significantly below to significantly above the estimated optimum moisture levels.

Sulfate testing was performed in the upper soil samples obtained from all borings in accordance with the ODOT Supplement 1122 along the proposed alignments, as outlined in the current ODOT SGE and ODOT Geotechnical Design Manual (GDM). Based on the results of the testing, the sulfate contents of the subgrade soils ranged from less than 100 to 930 parts per million (ppm or mg/kg of material). Results of the sulfate testing at each boring location tested are provided on the respective boring log in Appendix IV.

4.3 Bedrock

Bedrock was encountered in borings B-031-0-23, B-032-0-23, B-038-0-23, and B-039-0-23 performed for this investigation, at depths ranging from 3.0 to 4.5 feet below

the existing surface grade. The bedrock was identified as highly weathered shale or siltstone.

4.4 Groundwater

Groundwater was encountered during drilling activities in boring B-009-0-023 and B-029-0-23 at depths of or 3.0 and 4.5 feet below the existing ground surface, respectively. Groundwater was encountered in B-009-0-23 and B-029-0-23 upon completion of drilling at depths of 5.0 feet each below the existing ground surface.

Please note that short-term water level readings, especially in cohesive soils, are not necessarily an accurate indication of the actual groundwater level. In addition, groundwater levels or the presence of groundwater are considered to be dependent on seasonal fluctuations in precipitation.

5.0 ANALYSES AND RECOMMENDATIONS

Data obtained from the drilling and testing program have been used to determine pavement support capabilities for the soils encountered at the site. These parameters have been used to provide guidelines for the design of the pavement foundation systems, as well as the construction specifications related to the placement of the pavement and general earthwork recommendations, which are discussed in the following paragraphs. This report and the recommendations contained herein, has been written under the consideration that the construction will be performed in accordance with the latest version of the ODOT Construction and Materials Specifications (CMS).

5.1 Pavement Subgrade Recommendations

With exception of boring B-002-0-23, B-011-0-23, B-012-0-23, B-021-0-23, B-033-0-23, B-040-0-23, and B-041-0-23 where existing fill materials were encountered extending to a depth of 3.0 feet below existing grade, the soils at the proposed subgrade elevation along the south and north section of the alignment of SR 850, within the project limits, consisted of natural cohesive soils with intermittent layers of natural granular soils.

The subgrade soils along the southern portion of the alignment, generally consisted of cohesive soils (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6) with intermittent layer(s) of granular soils (A-1-a, A-1-b, A-2-4, A-3a) in some borings. These soils exhibited moisture content values ranging from 1 to 32 percent, averaging 19 percent. Based on ODOT subgrade analysis, the estimated optimum moisture content (OMC) values of these soils range from 6 to 21 percent with an average OMC value of 15 percent. The lowest SPT N_{60} values determined within the subgrade soils ranged from 4 to 30 bpf averaging 13 bpf and, HP values determined within encountered cohesive soils ranged from 0.5 tsf to 4.5 tsf averaging 2.7 tsf.

The encountered subgrade soils along the northern portion of the alignment, generally consisted of both cohesive soils (ODOT A-4a, A-4b, A-6a, A-6b) and granular soils (A-1-a, A-1-b, A-2-4, A-2-6, A-3a). These soils exhibited moisture content values ranging from 4 to 29 percent, averaging 16 percent. Based on ODOT subgrade analysis, the estimated optimum moisture content (OMC) values of these soils range from 0 to 17 percent with an average OMC value of 11 percent. The lowest SPT N_{60} values determined within the subgrade soils ranged from 6 to 30 bpf averaging 16 bpf and, HP values determined within encountered cohesive soils ranged from 0.25 tsf to 4.5 tsf averaging 2.7 tsf. Bedrock was also encountered in the borings performed within the north portion of the proposed improvements.

Unsuitable natural soils of silt (ODOT A-4b) were encountered in borings B-003-0-23, B-034-0-23, and B-035-0-23, while clay (ODOT A-7-6) soils with a high liquid limit (LL > 65) were encountered in borings B-002-0-23 and B-009-0-23. Silt soils are prone to frost heave, while clay soil with high liquid limits are known to be susceptible to instability due their shrink/swell potential. Therefore, **Rii recommends the removal of any silt (ODOT A-4b) and any soil with high liquid limit (LL>65) to a depth of 36 inches below the anticipated subgrade elevation.**

In addition, bedrock described as highly weathered siltstone, was encountered in boring B-038-0-23 within the anticipated subgrade elevation. Per Section 610.5 of the ODOT GDM, **Rii recommends the removal of bedrock to a depth of 24 inches below the anticipated subgrade elevation.**

In general, based on the soil conditions encountered during the drilling phase, it is estimated that the subgrade soils within the upper portions of the proposed subgrade will require some level of stabilization per Section 600 of the ODOT GDM. The depth and type of subgrade stabilization/modification is determined by subgrade analysis following ODOT GDM guidelines, utilizing SPT N_{60} values, HP values, moisture content values (relative to OMC values) and the type of subgrade soils encountered.

Based on the existing and proposed grades estimated from the plan and profile information provided by Korda, and the assumption that the thickness of the existing and proposed pavement buildup along the widened and improved pavement sections will be similar (approximately 18.0 inches), an approximate amount of cut and/or fill depths required to achieve proposed subgrade elevation at the boring locations have been estimated and is summarized below in Table 2.

Table 2. Summary of Proposed Cut/Fill Depths

Boring No.	Station	Offset	Existing Ground Surface Elevation, feet ¹	Proposed Subgrade Elevation, feet ²	Cut (C), Fill (F) Depth, feet
B-001-0-23	12+14	10' RT	682.5	679.6	2.9 C
B-002-0-23	15+39	6' LT	681.6	680.3	1.3 C
B-003-0-23	18+91	7' RT	666.1	664.7	1.4 C
B-004-0-23	22+45	6' LT	672.3	671.3	1.0 C
B-005-0-23	26+34	5' RT	688.7	687.5	1.2 C
B-006-0-23	30+52	11' LT	737.5	732.3	5.2 C
B-007-0-23	34+43	8' RT	716.4	721.6	5.2 F
B-008-0-23	38+42	7' LT	694.0	693.0	1.0 C
B-009-0-23	42+50	7' LT	690.2	688.6	1.6 C
B-010-0-23	46+38	7' LT	687.2	686.0	1.2 C
B-011-0-23	50+26	6' LT	693.5	691.9	1.6 C
B-012-0-23	54+16	5' RT	685.5	684.2	1.3 C
B-013-0-23	57+83	6' LT	674.4	673.0	1.4 C
B-014-0-23	61+98	6' LT	688.7	686.5	2.2 C
B-015-0-23	63+86	7' LT	687.7	686.3	1.4 C
B-016-0-23	65+79	8' RT	673.1	676.1	3.0 F
B-017-0-23	69+81	8' LT	671.1	669.8	1.3 C
B-018-0-23	73+75	8' RT	678.0	676.8	1.2 C
B-019-0-23	77+90	8' LT	665.1	663.8	1.3 C
B-020-0-23	80+80	9' RT	677.4	676.1	1.3 C
B-021-0-23	84+76	8' LT	694.2	692.7	1.5 C
B-022-0-23	88+83	9' RT	692.4	689.8	2.6 C
B-023-0-23	92+76	6' LT	667.6	666.7	0.9 C
B-024-0-23	94+26	8' RT	664.8	663.7	1.1 C
B-025-0-23	96+72	8' RT	667.3	663.9	3.4 C
B-026-0-23	185+85	13' RT	659.1	657.6	1.5 C
B-027-0-23	189+63	7' LT	656.1	655.4	0.7 C

Boring No.	Station	Offset	Existing Ground Surface Elevation, feet ¹	Proposed Subgrade Elevation, feet ²	Cut (C), Fill (F) Depth, feet
B-028-0-23	193+59	12' RT	649.7	648.7	1.0 C
B-029-0-23	197+57	8' LT	645.6	644.6	1.0 C
B-030-0-23	201+52	7' RT	645.9	644.7	1.2 C
B-031-0-23	205+55	9' LT	648.1	647.4	0.7 C
B-032-0-23	209+51	9' RT	648.4	647.8	0.6 C
B-033-0-23	213+50	10' LT	649.7	648.9	0.8 C
B-034-0-23	217+45	7' RT	652.7	651.5	1.2 C
B-035-0-23	221+43	5' LT	659.4	658.2	1.2 C
B-036-0-23	225+44	7' RT	663.4	662.2	1.2 C
B-037-0-23	229+39	5' LT	667.8	666.4	1.4 C
B-038-0-23	233+36	5' RT	674.1	672.6	1.5 C
B-039-0-23	237+30	5' LT	676.4	675.4	1.0 C
B-040-0-23	240+76	7' RT	665.4	664.2	1.2 C
B-041-0-23	243+80	6' LT	672.7	671.3	1.4 C

1. Existing ground surface elevations were interpolated from topographic basemapping provided by Korda
2. Estimated from proposed roadway grade elevation minus 18-inches for estimated pavement build-up thickness

5.1.1 Subgrade Stabilization

Based on the Section 605 of the ODOT GDM guidelines, when approximately 30 percent or more of the subgrade area requires stabilization, consideration should be given to utilizing a global stabilization option. For this project, 56 and 53 percent of the subgrade areas along the southern and northern project alignment, respectively, are anticipated to require stabilization based on the soil borings performed. Per ODOT GDM Subgrade Analysis, global stabilization recommendations are based upon the overall average site parameters, as noted in Table 3. The Subgrade Analysis spreadsheet outputs for each section of the project alignment evaluated are provided in Appendix VI.

Table 3. Average Site Parameters

Alignment	Average N _{60L}	Average PI	Average Moisture	Average Optimum Moisture	Average Group Index	Average CBR
SR 850 (South Section)	13	24	19	15	11	6
SR 850 (North Section)	16	11	16	11	5	8

Applying the averages from Table 3 and based on the results of the Subgrade Analysis spreadsheet prepared in accordance with Section 605 of the ODOT GDM, Rii recommends the following global stabilization option within the project limits:

Option 1. Undercut 12-inch of subgrade and replace with Item 204 Granular Material Type B, Type C or Type D. It is recommended that Item 204 Geotextile be placed at the bottom of the undercut.

Option 2. Chemically stabilize the upper 12-inches of subgrade soils along the entire alignment section with the stabilizing agent recommended for each section in Table 4 and as per ODOT Construction and Materials Specification (CMS) Item 206. For estimating purposes, utilize a cement/lime content of 5.0 percent by weight of soil. Actual application rates shall be verified by the contractor under Item 206.06 Mixture Design for Chemically Stabilized Soils.

Table 4. Global Stabilization Recommendations (Option 2)

Project Section	Representative Borings	Begin Station	End Station	Recommended Subgrade Stabilization (Option 2)
SR 850 (South Section)	B-001-0-22 through B-025-0-22	11+59	96+83	12" Item 206 Chemical Stabilization with Lime
SR 850 (North Section)	B-026-0-22 through B-041-0-22	185+90	243+50	12" Item 206 Chemical Stabilization with Cement

Per Section 600 of the ODOT GDM requirements the entire subgrade should be stabilized using one of the global stabilization options provided above. However, due to the limited width of roadway widening within the project limits, it may not be practical to perform chemical stabilization. In accordance with Section 608 of the ODOT GDM, plan note G121 should be included in the project plan set. The actual depths and limits of excavation and replacement (ODOT Item 204) should be determined by the Project Engineer in the field based on the results of proof rolling and subgrade observations in accordance with ODOT Item 204 and guidance provided under the ODOT Construction Administration Manual of

Procedures (MOP) for ODOT Item 204. Upon completion of the stabilization, the entire subgrade should be proof rolled to verify that stability has been achieved.

It should be noted that the global stabilization options recommended above considers that removal of any silt soils (ODOT A-4b) and soils with high liquid limit (LL>65) to 36.0 inches below the anticipated subgrade elevation, as well as the removal of bedrock to 24.0 inches below the anticipated subgrade elevation, has been completed previous to proceed with the global stabilization.

5.1.2 Subgrade Design Considerations

California Bearing Ratio (CBR) values obtained from subgrade analysis for the project ranged from 3 to 12. Based on the conditions encountered across the subject site, **it is recommended that pavement design be based on the design CBR values provided in Table 5**. The corresponding modulus of subgrade reaction (K) and soil support value (SSV) obtained through correlation charts are also provided in Table 5.

Table 5. Design CBR Values Recommended

Project Section	Design CBR	Mr (psi)	K (pci)	SSV
SR 850 – South Section	6	7,200	150	4.4
SR 850 – North Section	8	9,600	175	5.3

Per Sections 605 and 609 of the ODOT GDM, soils with sulfate content in excess of 5,000 ppm cannot be chemically stabilized due to the potential for sulfate heave in the soil. Based on the results of the testing, the sulfate contents of the subgrade soils range from less than 100 to 840 ppm. Therefore, soils with sulfate content greater than 5,000 ppm was not encountered in any boring. However, due to the limited width of roadway widening within the project limits, it is likely not practical to perform chemical stabilization.

Please note that the recommended CBR values assume that the materials utilized for the subgrade in fill areas are equivalent to, or better than materials at the existing subgrade elevation. Sources of borrow material should be designated in advance of construction. The material should be tested in the laboratory to verify the soil exhibits a minimum design **CBR values of 6 and 8 for the southern and northern portions of the alignment, respectively.**

Pavement design is dependent on the inclusion of adequate surface and subsurface drainage in order to maintain the compacted subgrade near optimum moisture conditions throughout the lifetime of the pavement. Based on the elevated natural moisture contents compared to the optimum values, as shown in the boring logs and subgrade analysis, it is recommended that underdrains be considered for the proposed improvements. Under

drained should be installed in accordance with the specifications in Item 605 of the ODOT CMS.

5.2 Construction Considerations

All site work shall conform to local codes and to the latest ODOT CMS, including that all excavation and embankment preparation and construction should follow ODOT Item 200 (Earthwork).

5.3 Excavation Considerations

All excavations should be shored / braced or laid back at a safe angle in accordance to Occupational Safety and Health Administration (OSHA) guidelines. During excavation, if slopes cannot be laid back to OSHA Standards due to adjacent structures or other obstructions, temporary shoring may be required. Actual excavation back slopes must be field verified by qualified personnel at the time of excavation in strict accordance with OSHA guidelines.

5.4 Lateral Earth Pressure Parameters

For the soil types encountered in the borings, the “in-situ” unit weight (γ), cohesion (c), effective angle of friction (φ'), and lateral earth pressure coefficients for at-rest conditions (k_o), active conditions (k_a), and passive conditions (k_p) have been estimated and are provided in Table 6 and Table 7.

Table 6. Estimated Undrained (Short-term) Soil Parameters for Design

Soil Type	γ^1 (pcf)	c (psf)	φ	k_a	k_o	k_p
Natural Very Soft to Soft Cohesive Soil	110	500	0°	N/A	N/A	N/A
Natural Medium Stiff Cohesive Soil	115	1,000	0°	N/A	N/A	N/A
Natural Stiff to Very Stiff Cohesive Soil	120	1,500	0°	N/A	N/A	N/A
Natural Hard Cohesive Soil	125	3,000	0°	N/A	N/A	N/A
Natural Very Loose to Loose Granular Soil	120	0	28°	0.36	0.53	2.77
Natural Medium Dense Granular Soil	125	0	30°	0.33	0.50	3.54
Natural Dense to Very Dense Granular Soil	130	0	34°	0.28	0.44	3.54
Compacted Cohesive Engineered Fill	120	1,500	0°	N/A	N/A	N/A
Compacted Granular Engineered Fill	130	0	33°	0.29	0.46	3.39

1. When below groundwater table, use effective unit weight, $\gamma' = \gamma - 62.4$ pcf and add hydrostatic water pressure.

Table 7. Estimated Drained (Long-term) Soil Parameters for Design

Soil Type	γ^1 (pcf)	c' (psf)	ϕ'	k_a	k_o	k_p
Natural Very Soft to Soft Cohesive Soil	110	0	24°	0.42	0.59	2.37
Natural Medium Stiff Cohesive Soil	115	0	25°	0.41	0.58	2.46
Natural Stiff to Very Stiff Cohesive Soil	120	0	26°	0.39	0.56	2.56
Natural Hard Cohesive Soil	125	0	27°	0.38	0.55	2.66
Natural Very Loose to Loose Granular Soil	120	0	28°	0.36	0.53	2.77
Natural Medium Dense Granular Soil	125	0	30°	0.33	0.50	3.54
Natural Dense to Very Dense Granular Soil	130	0	34°	0.28	0.44	3.54
Compacted Cohesive Engineered Fill	120	0	28°	0.36	0.53	2.77
Compacted Granular Engineered Fill	130	0	33°	0.29	0.46	3.39

1. When below the groundwater table, use effective unit weight, $\gamma' = \gamma - 62.4$ pcf and add hydrostatic water pressure.

These parameters are considered appropriate for the design of all subsurface structures, and any excavation support systems. Subsurface structures (where the top of the structure is restrained from movement) should be designed based on at-rest conditions (k_o). For any temporary retaining structures (where the top of the structure is allowed to move), earth pressure distributions should be based on active conditions (k_a) and passive pressure (k_p). These values in the above tables have been estimated from correlation charts based on minimum standards specified for compacted engineered fill materials. These recommendations do not take into consideration the effect of any surcharge loading or a sloped ground surface (a flat surface is considered). Earth pressures on excavation support systems will be dependent on the type of sheeting and method of bracing or anchorage.

5.5 Groundwater Considerations

Groundwater was not encountered during or upon the completion of drilling operations. However, based on our experience with the geology at this site, groundwater conditions affecting construction may be encountered within the trapped/perched zones. These trapped/perched zones are generally the layer(s) of granular soils that are isolated within fine-grained soil layers and may not have been encountered in the borings. If excavations encounter such layers, temporary dewatering may be accomplished by placing localized sumps and pumps within and beyond the excavation. Seepage rates from these layers are difficult to predict and flow rate could be significant.

If encountered, proper groundwater control measures should be implemented to prevent disturbance to excavation bottoms consisting of cohesive soil, and to prevent the possible

development of a quick or “boiling” condition if soft/loose silts and/or fine sands are encountered. It is preferable that the groundwater level, if encountered, be maintained at least 36.0 inches below the deepest excavation. Note that determining and maintaining actual groundwater levels during construction is the responsibility of the contractor.

6.0 LIMITATIONS OF STUDY

The above recommendations are predicated upon construction inspection by a qualified soil technician under the direct supervision of a professional geotechnical engineer. Adequate testing and inspection during construction are considered necessary to assure an adequate foundation system and are part of these recommendations.

The recommendations for this project were developed utilizing soil and bedrock information obtained from the test borings that were made at the proposed site for the current investigation. Resource International is not responsible for the data, conclusions, opinions or recommendations made by others during previous investigations at this site. At this time we would like to point out that soil borings only depict the soil and bedrock conditions at the specific locations and time at which they were made. The conditions at other locations on the site may differ from those occurring at the boring locations.

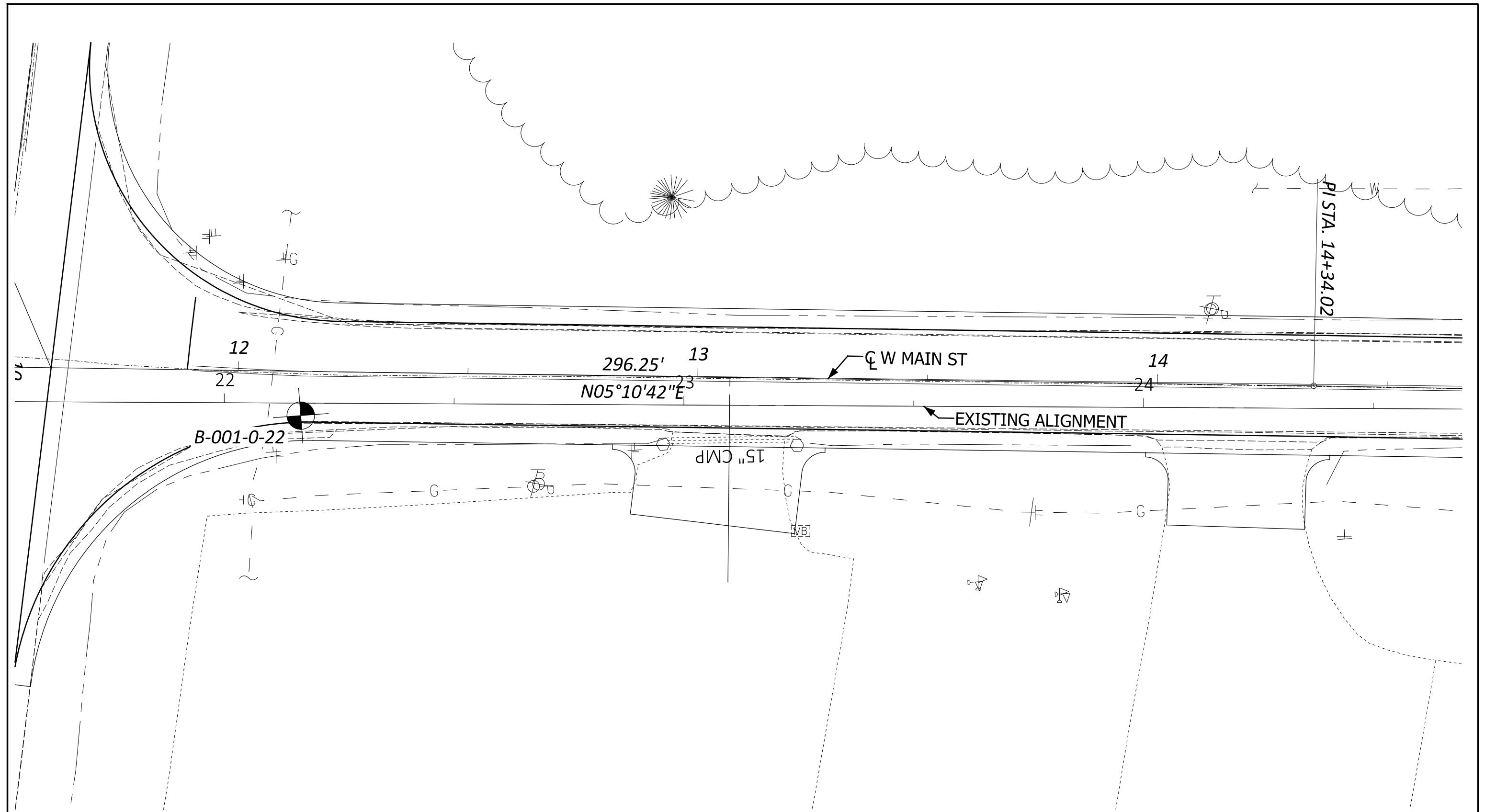
The conclusions and recommendations herein have been based upon the available soil and bedrock information and the design details furnished by a representative of the owner of the proposed project. Any revision in the plans for the proposed construction from those anticipated in this report should be brought to the attention of the geotechnical engineer to determine whether any changes in the foundation or earthwork recommendations are necessary. If deviations from the noted subsurface conditions are encountered during construction, they should also be brought to the attention of the geotechnical engineer.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater or surface water within or beyond the site studied. Any statements in this report or on the test boring logs regarding odors, staining of soils or other unusual conditions observed are strictly for the information of our client.

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted Subgrade engineering principles and practices. Resource International is not responsible for the conclusions, opinions or recommendations made by others based upon the data included.



APPENDIX I
VICINITY MAP AND BORING PLANS



BORING PLAN
ODOT GAL-850-0.21 PID 117244
GALLIA, OHIO

RII PROJECT NO.
W-22-198

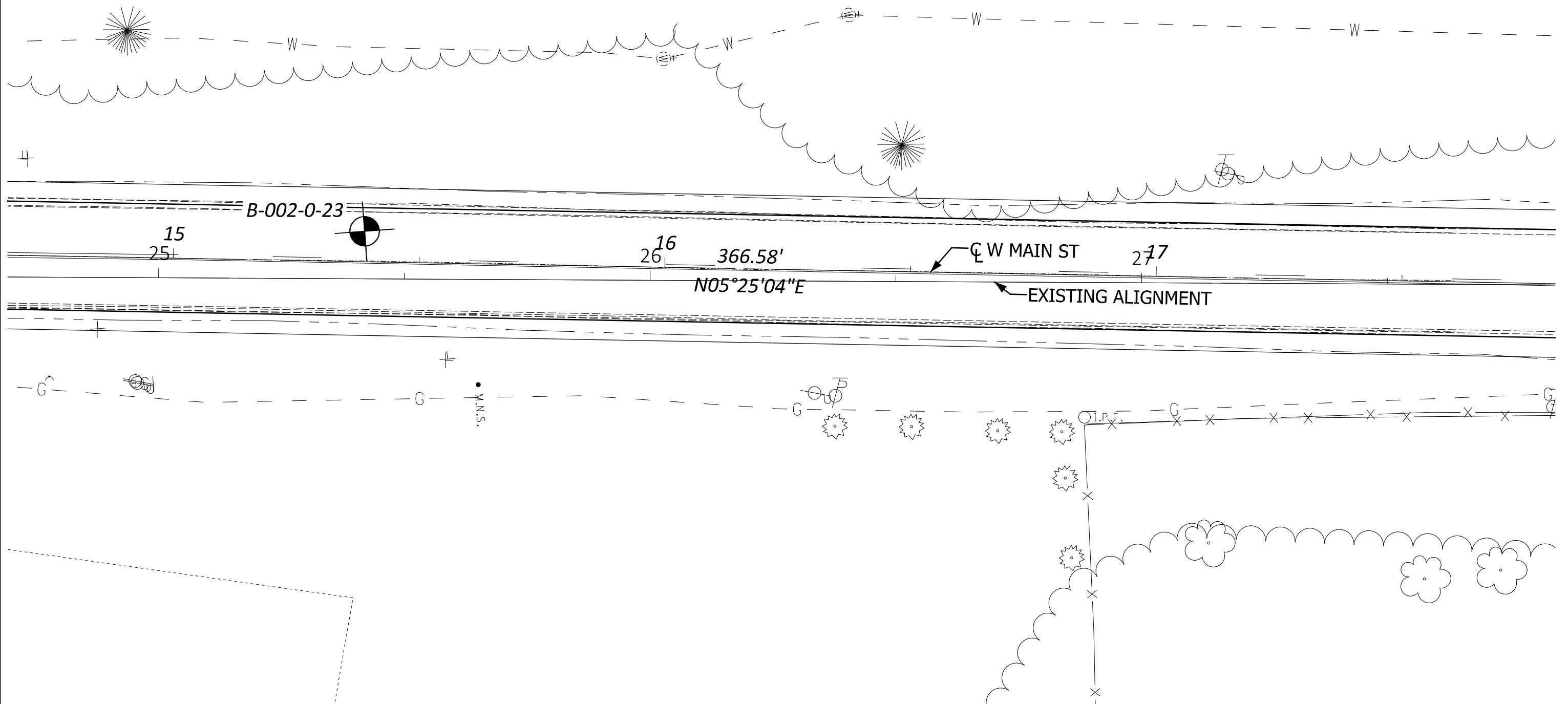
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The logo for Resource International. It features a circular design with the word "RESOURCE" at the top and "INTERNATIONAL" at the bottom, both in a curved, bold, black font. The center of the circle contains the letters "Rii" in a large, bold, black font.



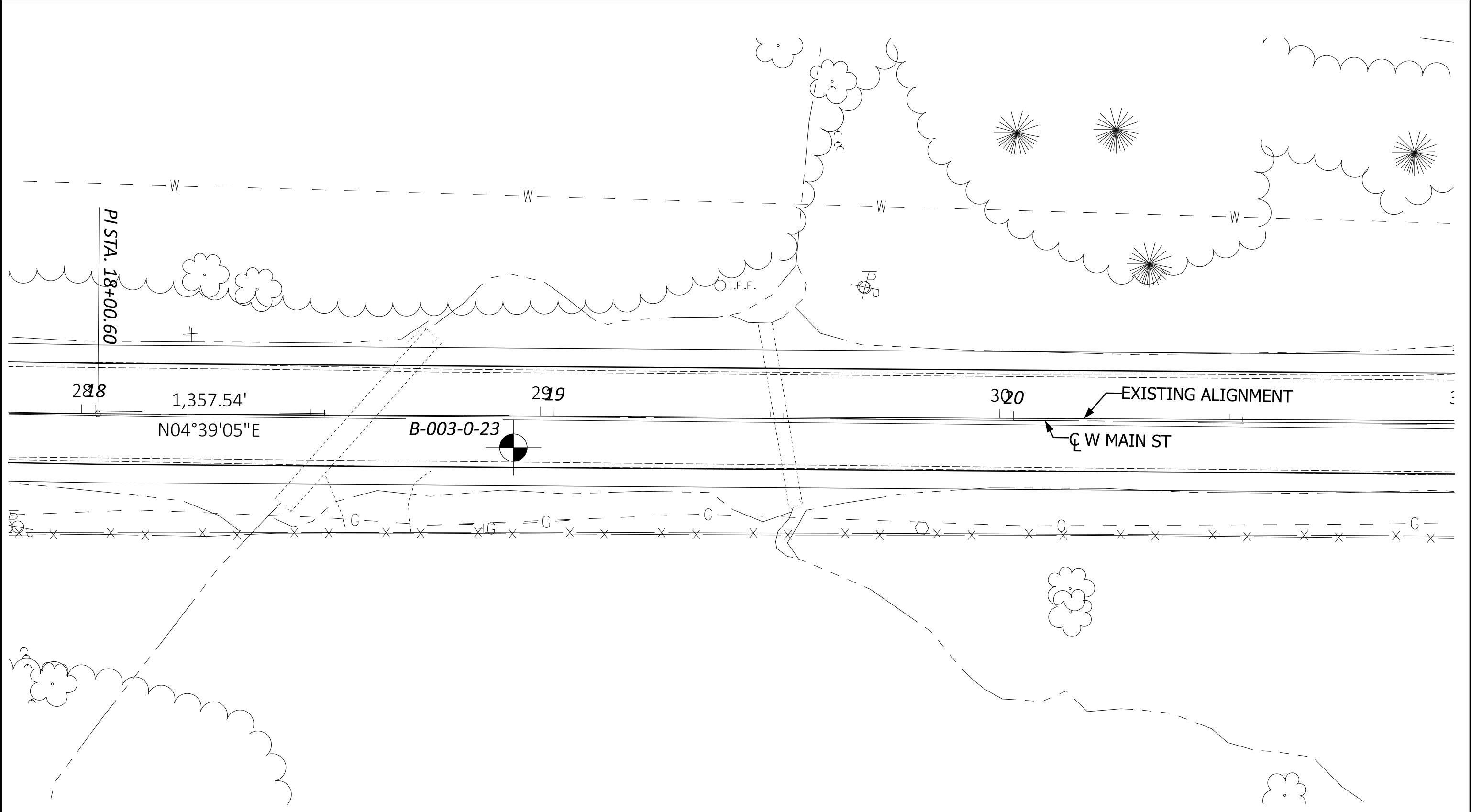
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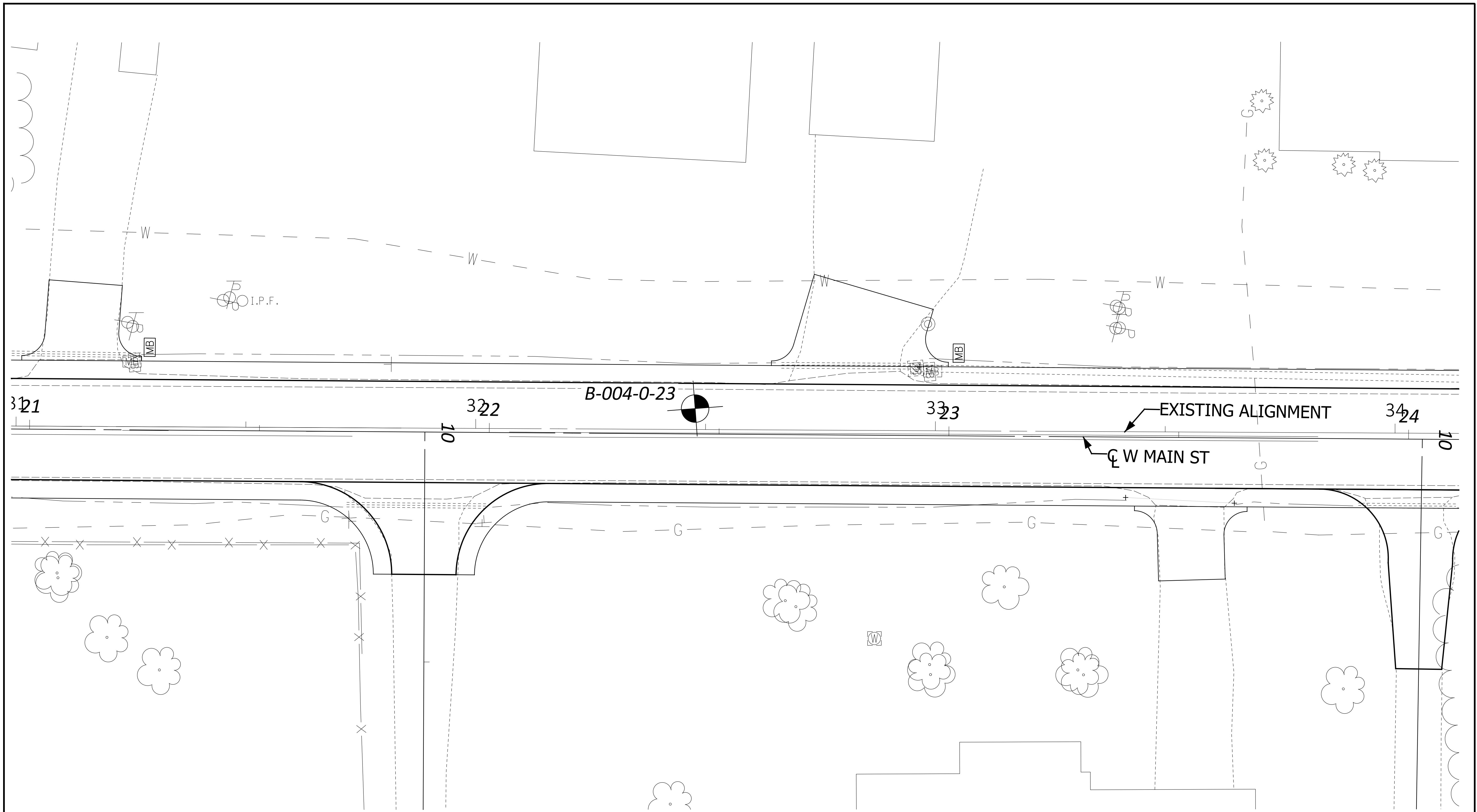
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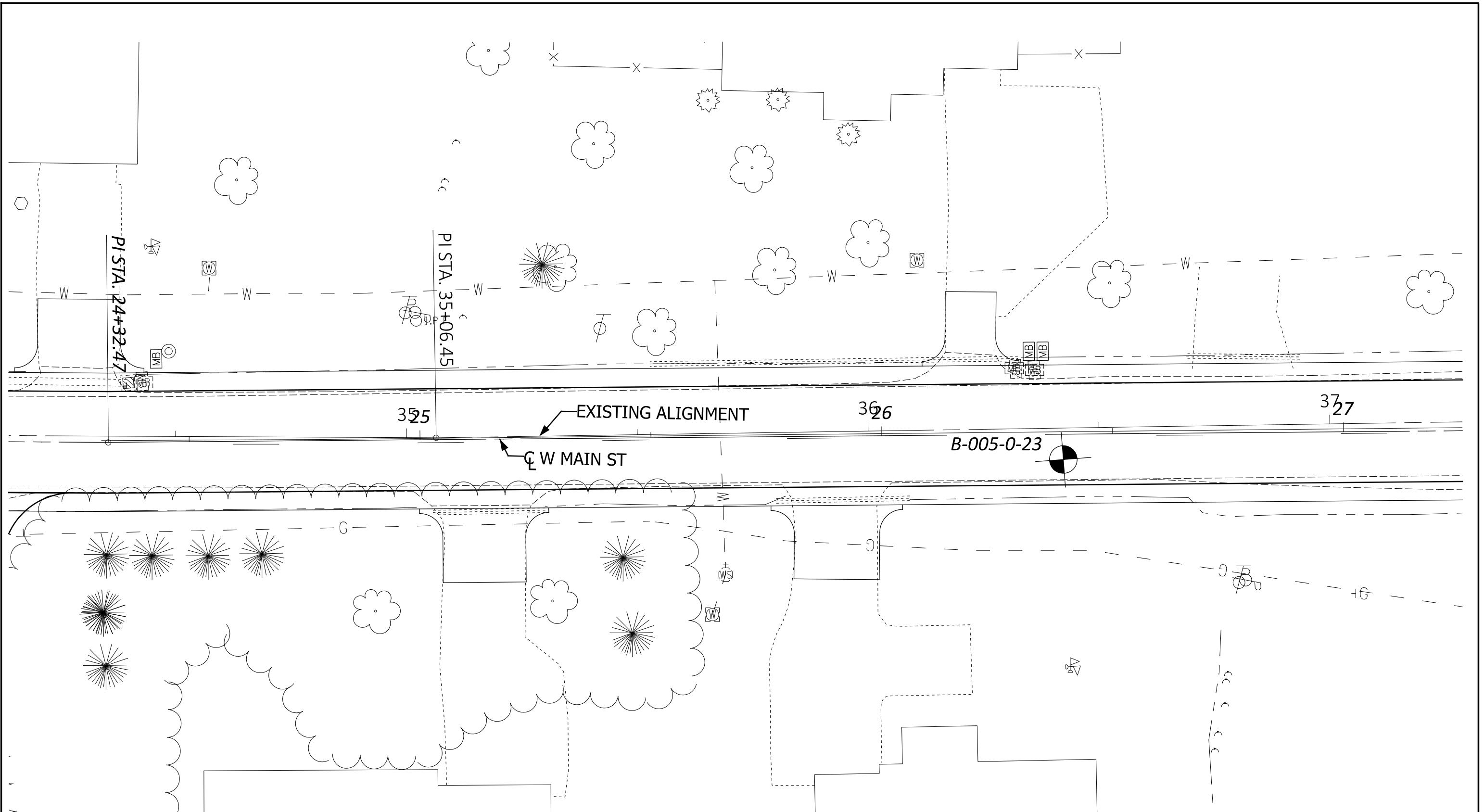
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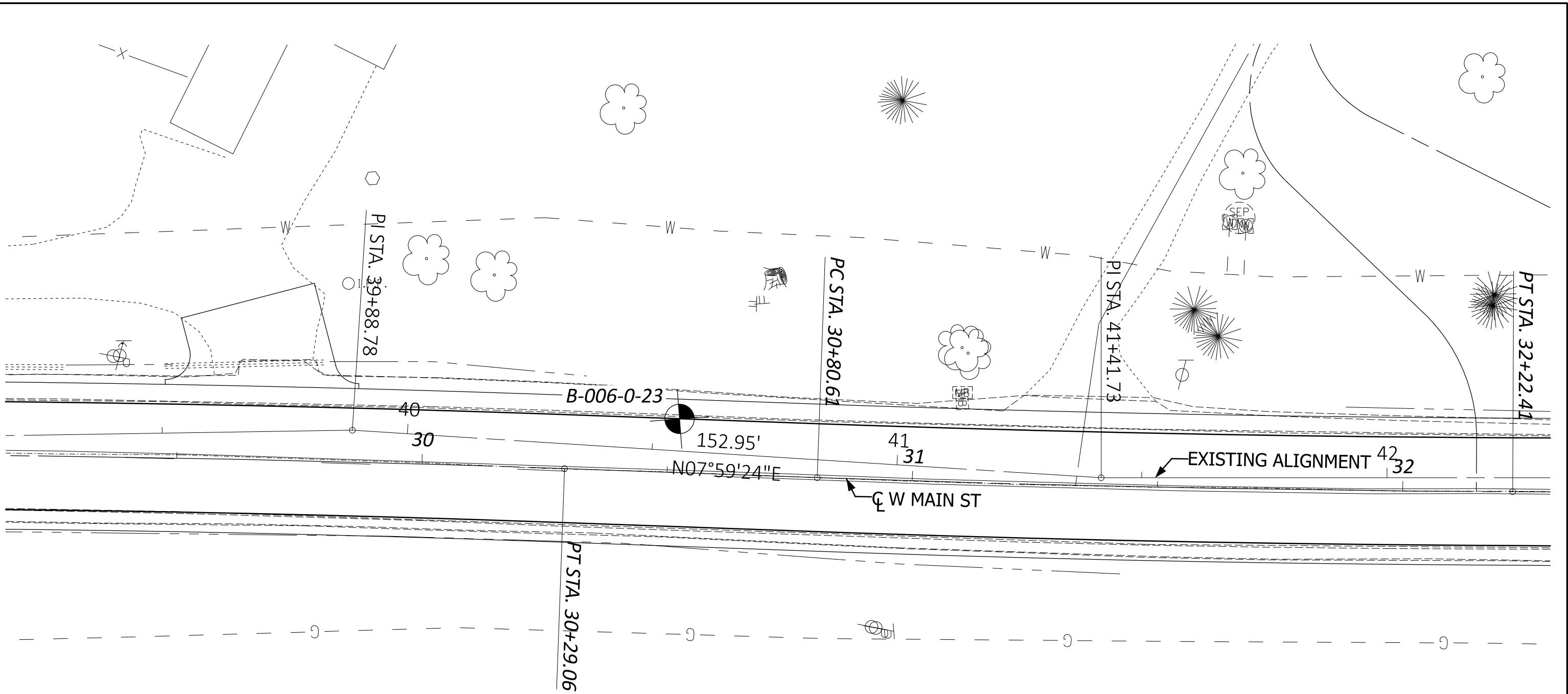
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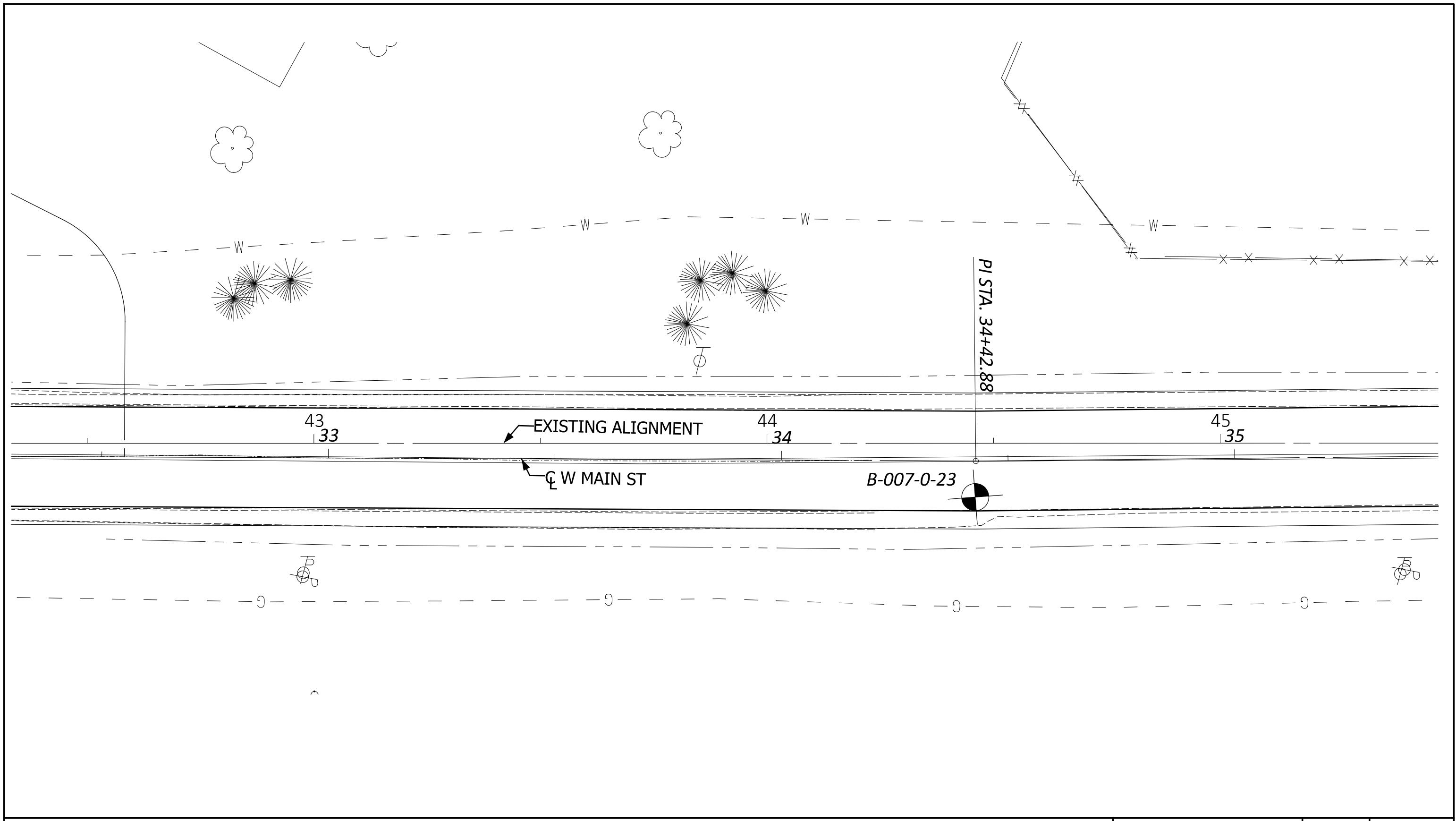
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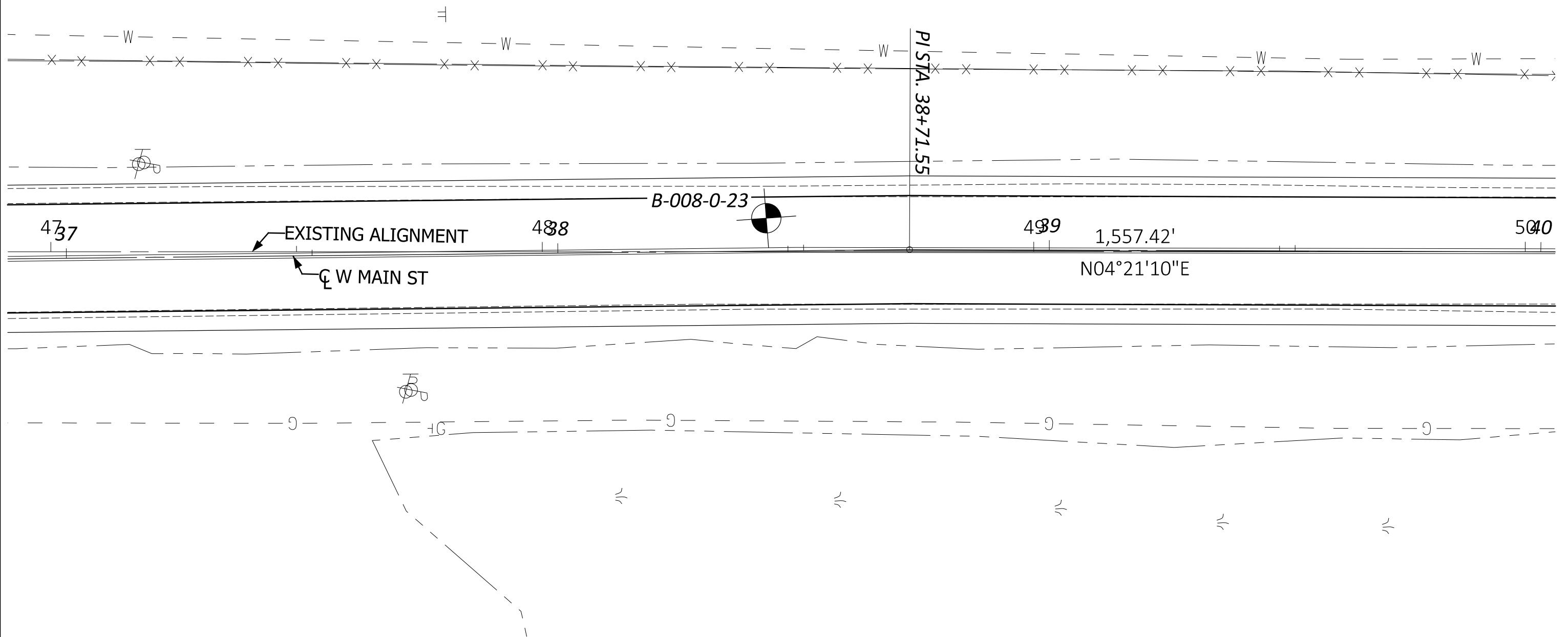
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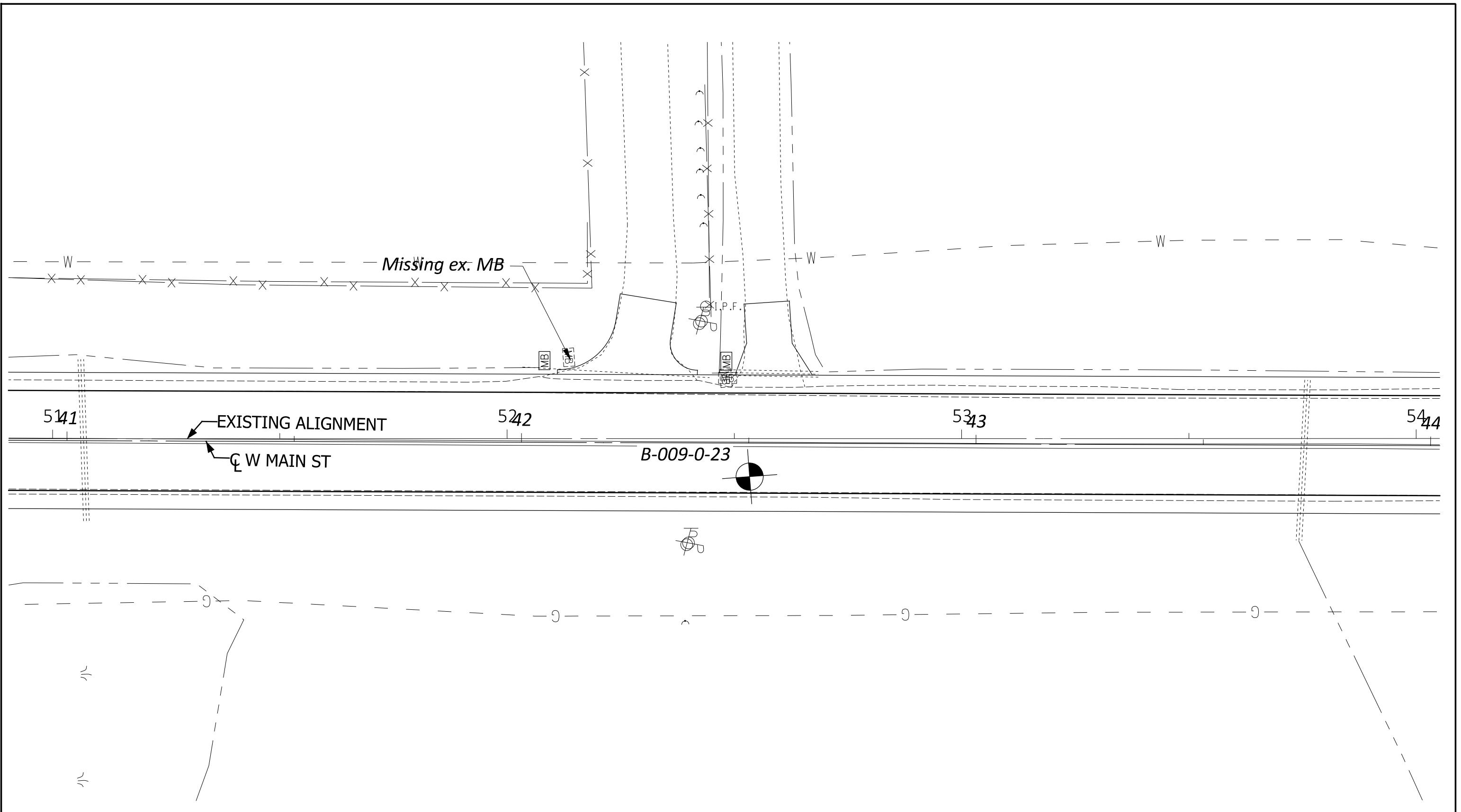
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A scale bar and a north arrow are located in the bottom right corner of the map. The scale bar is a horizontal line with tick marks at 10 and 20. The north arrow is a triangle pointing upwards with the letter 'N' inside.

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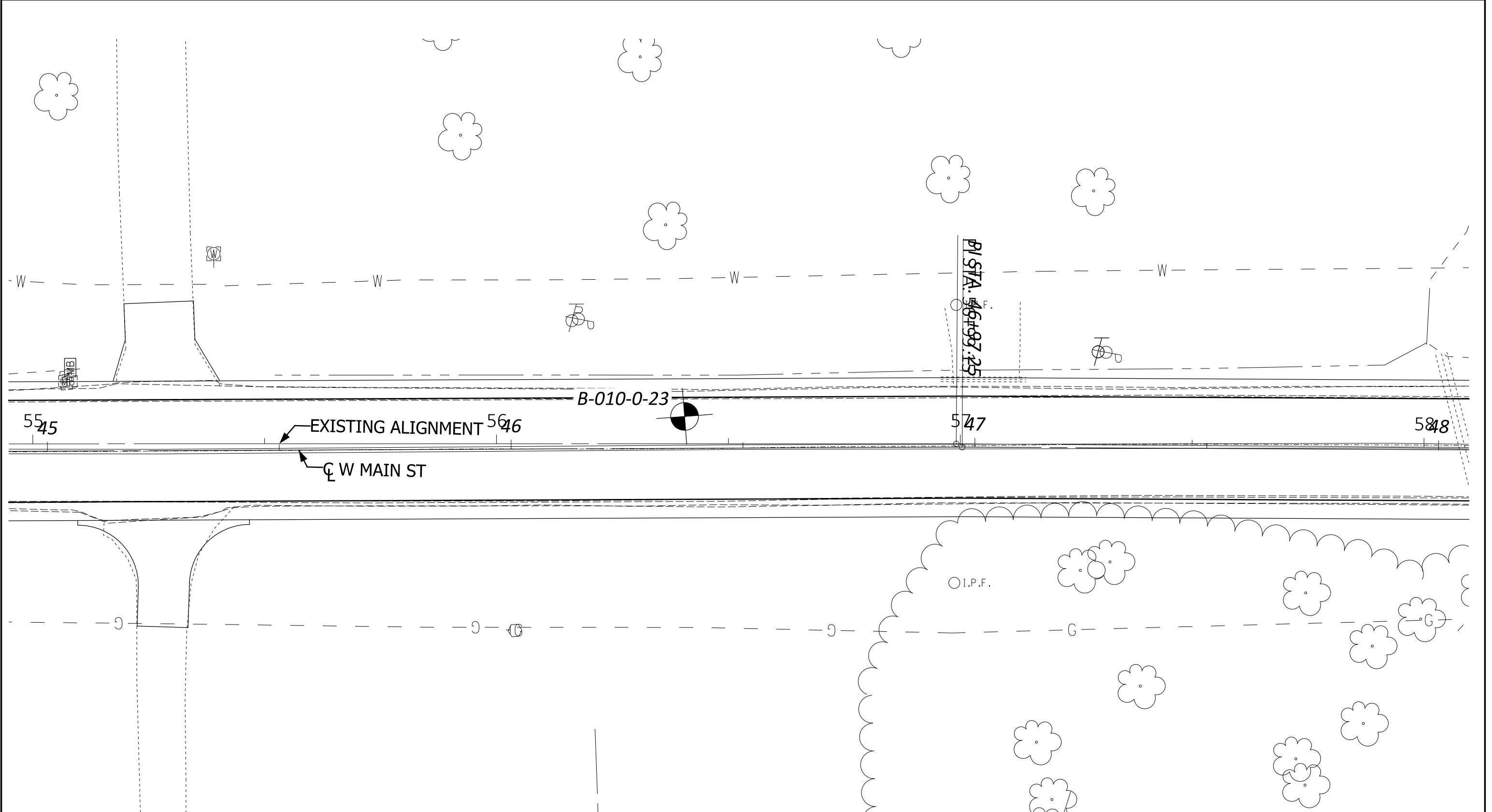
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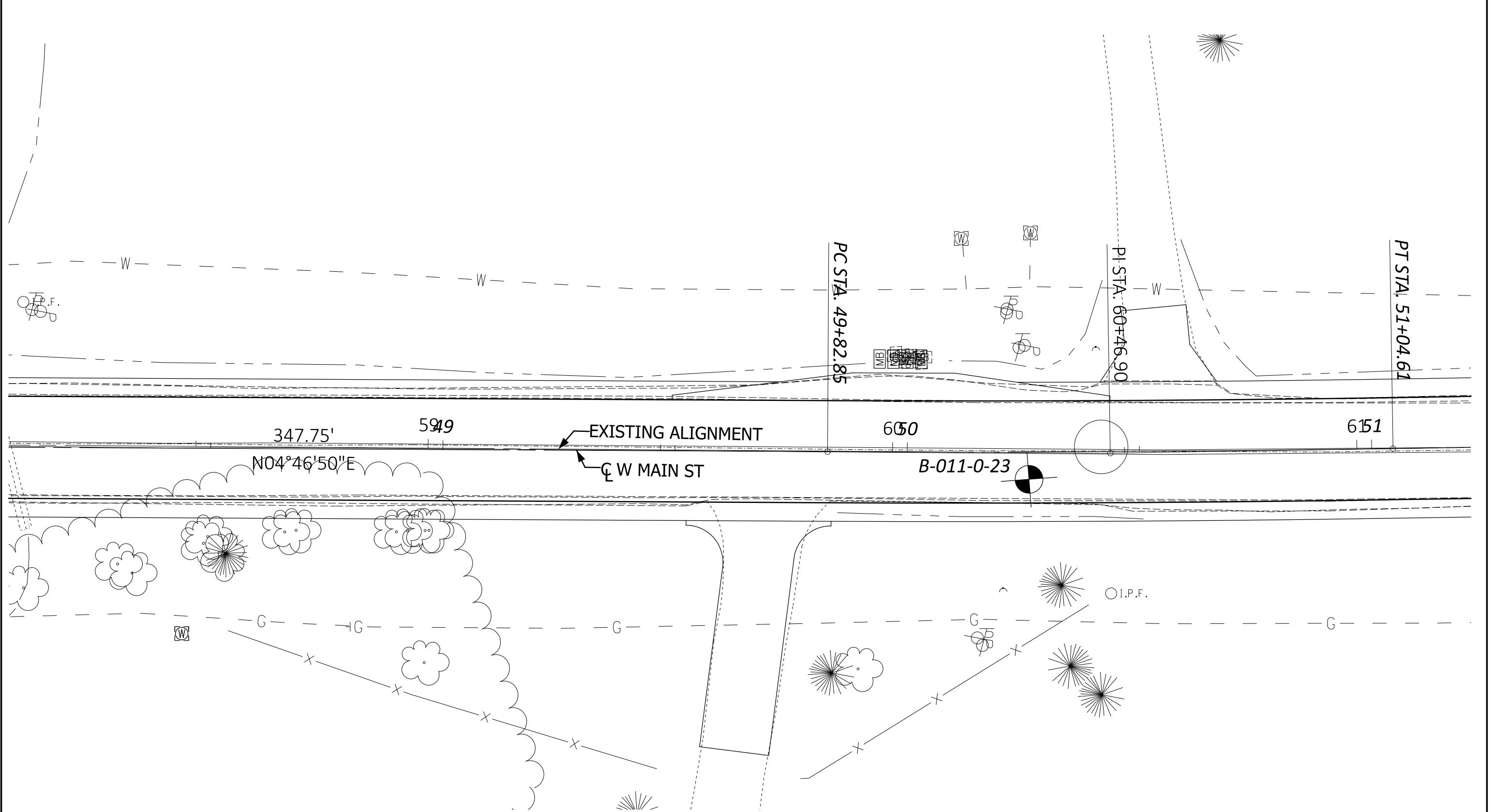
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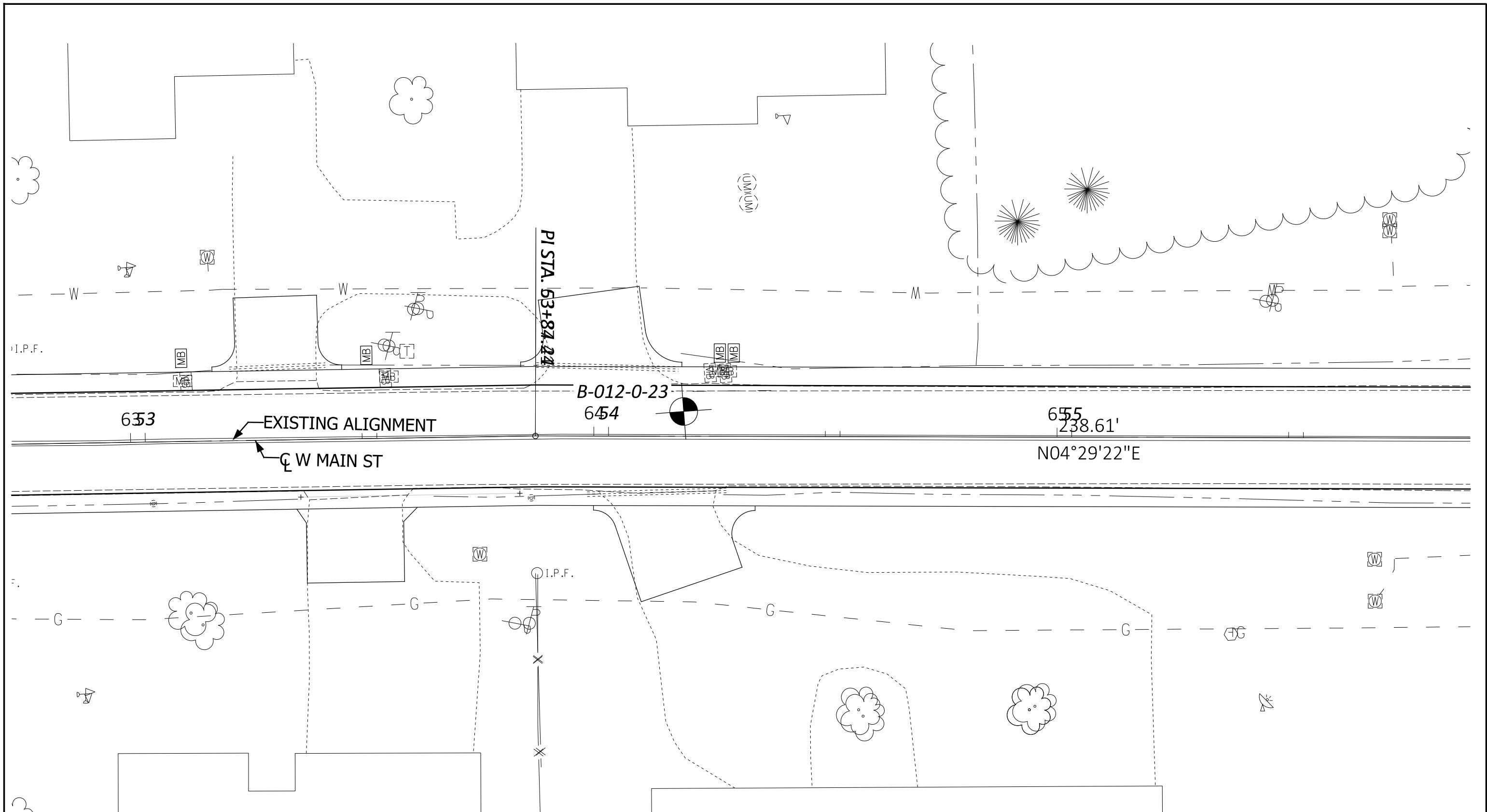
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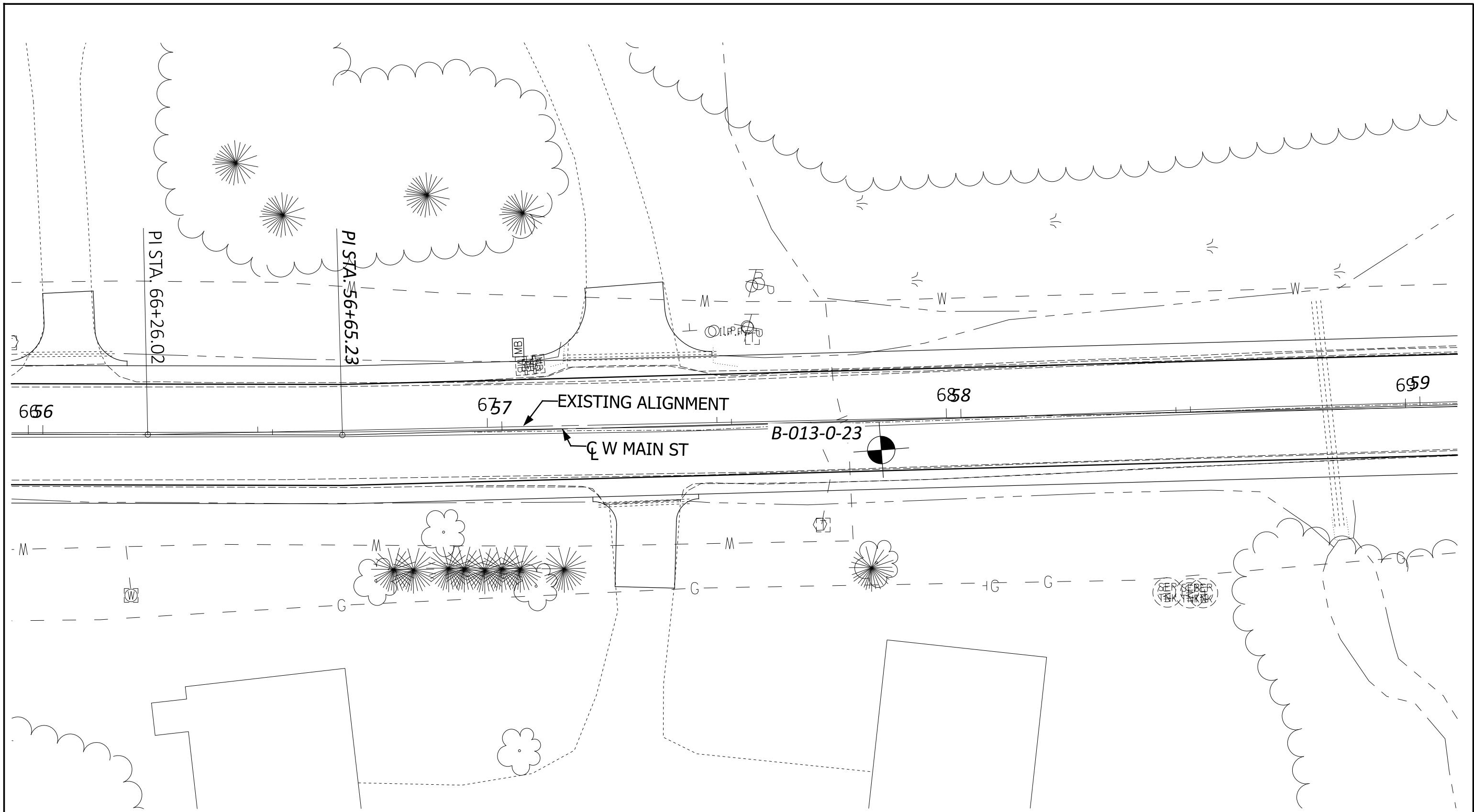
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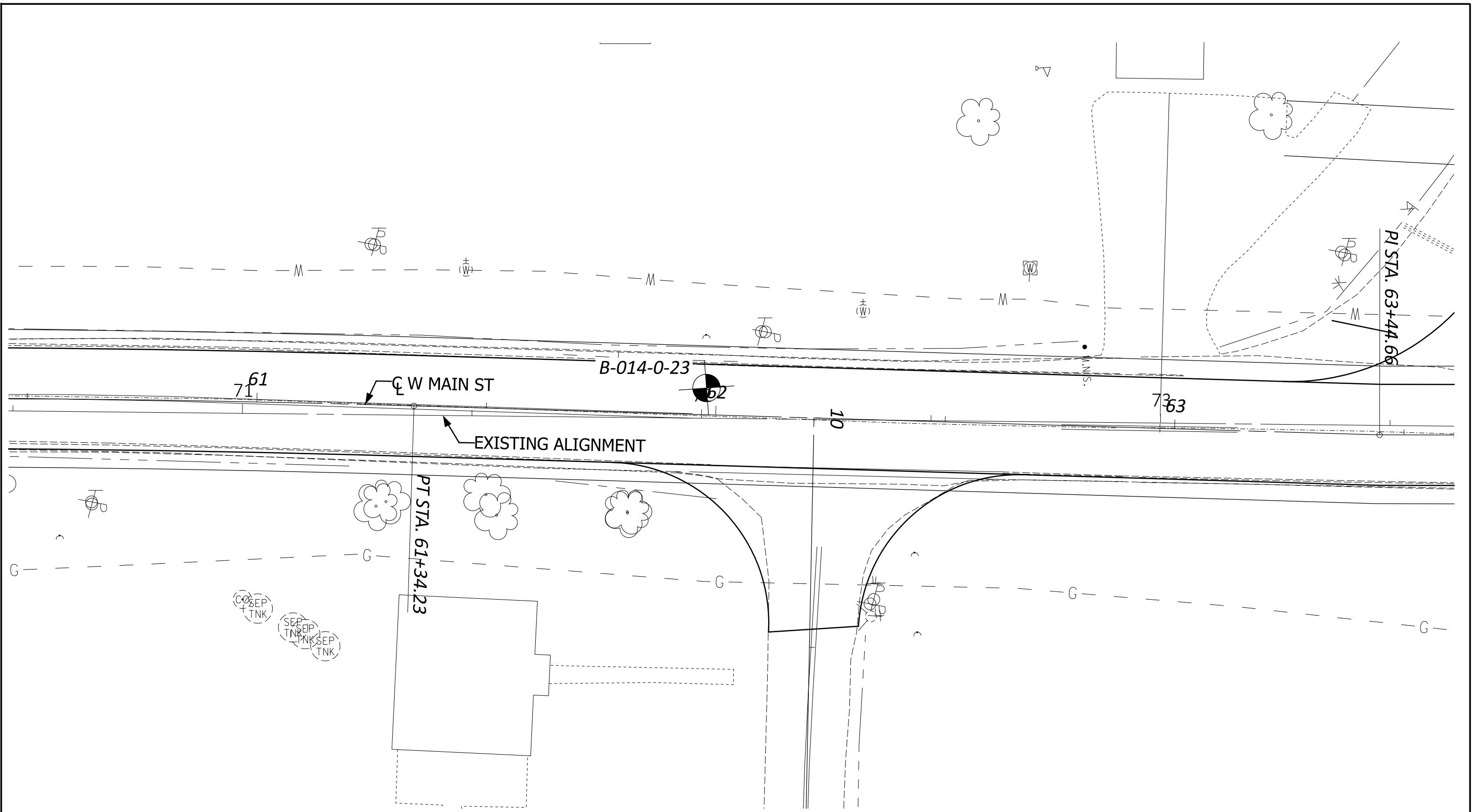
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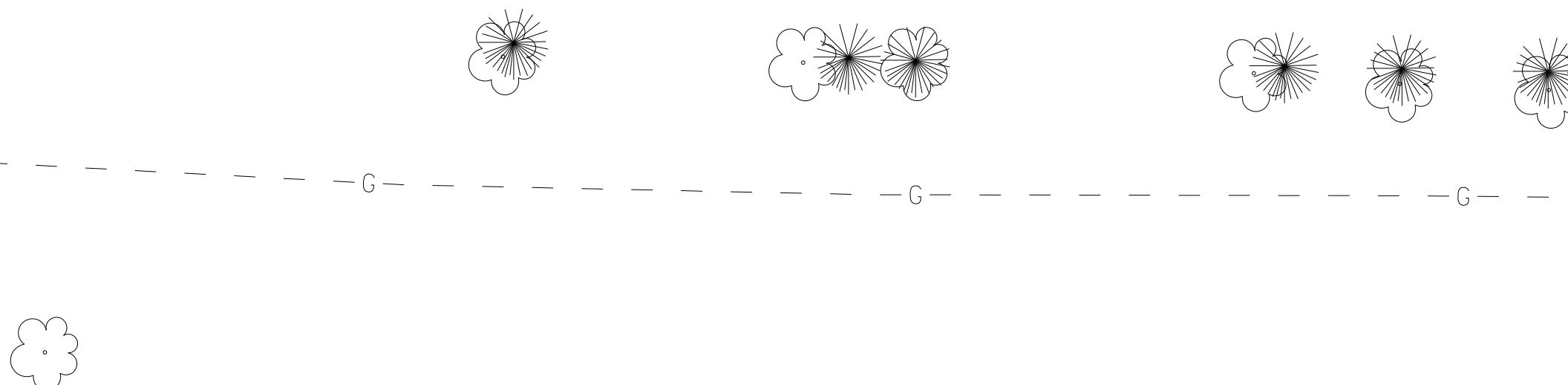
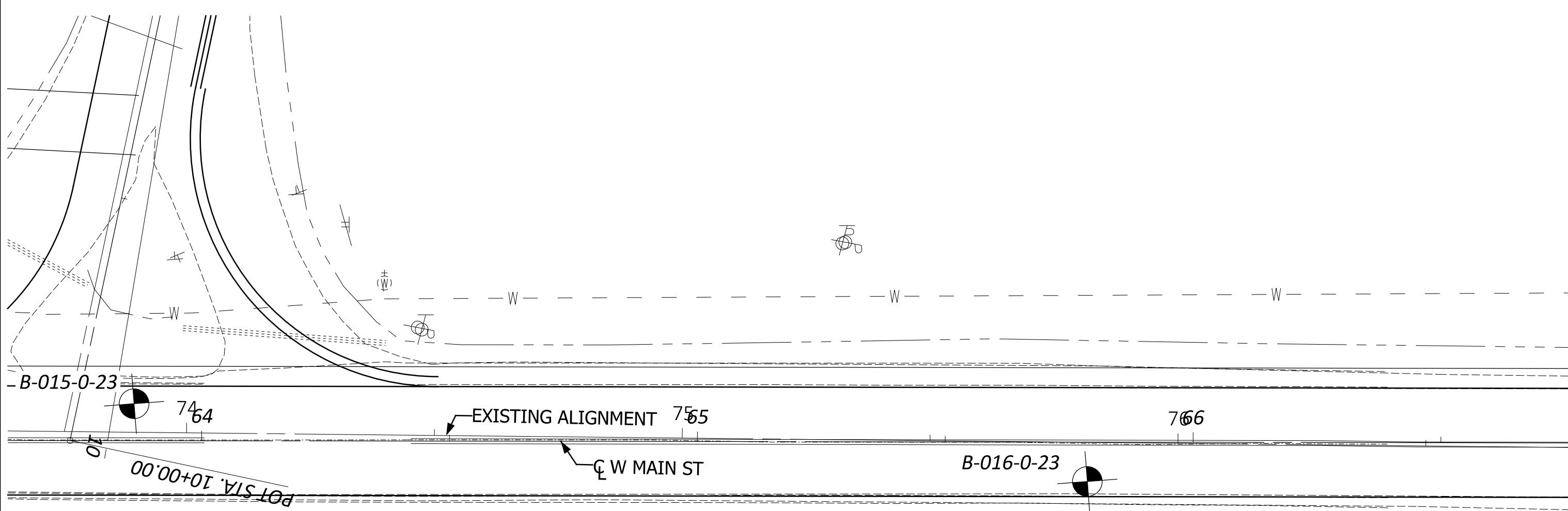
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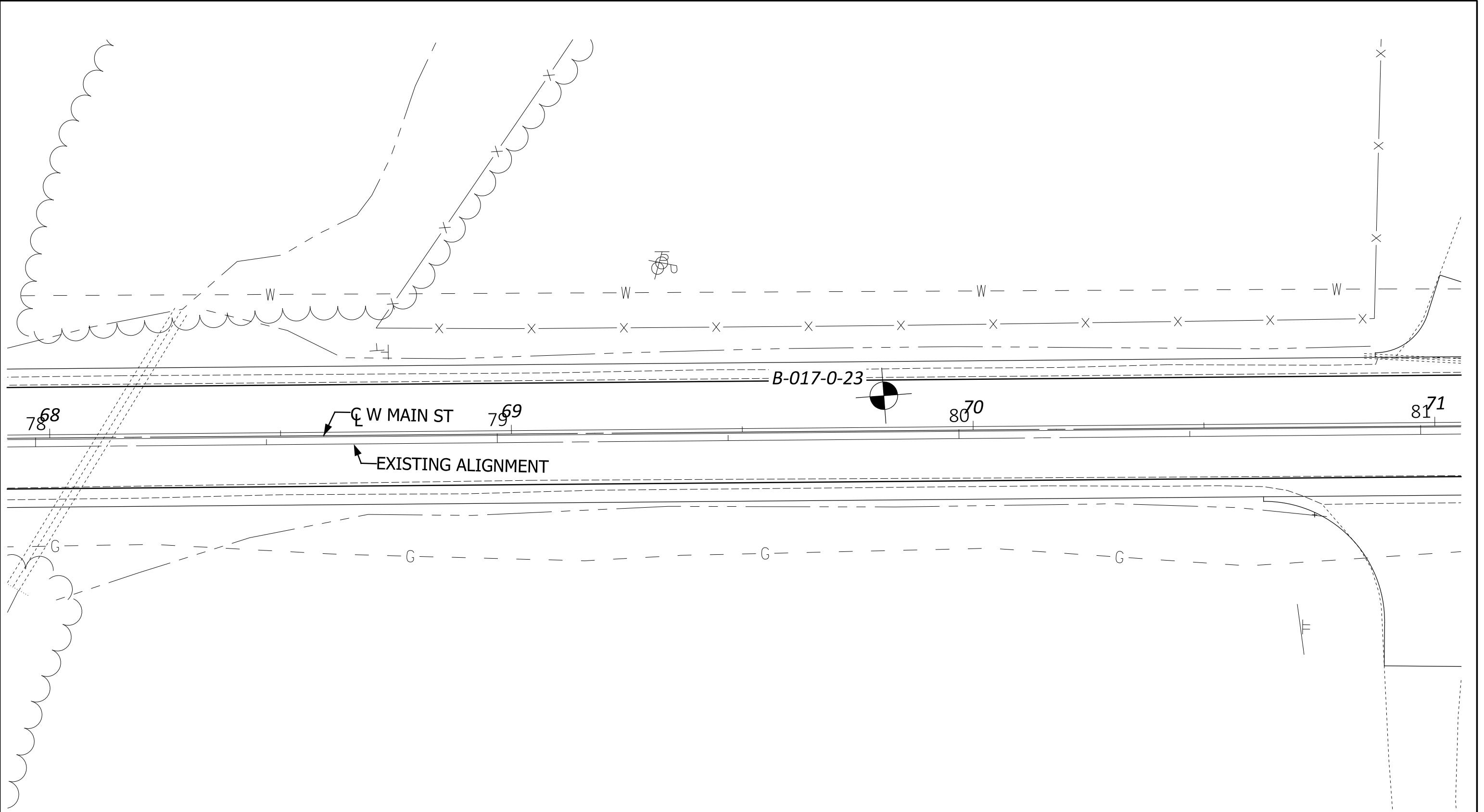
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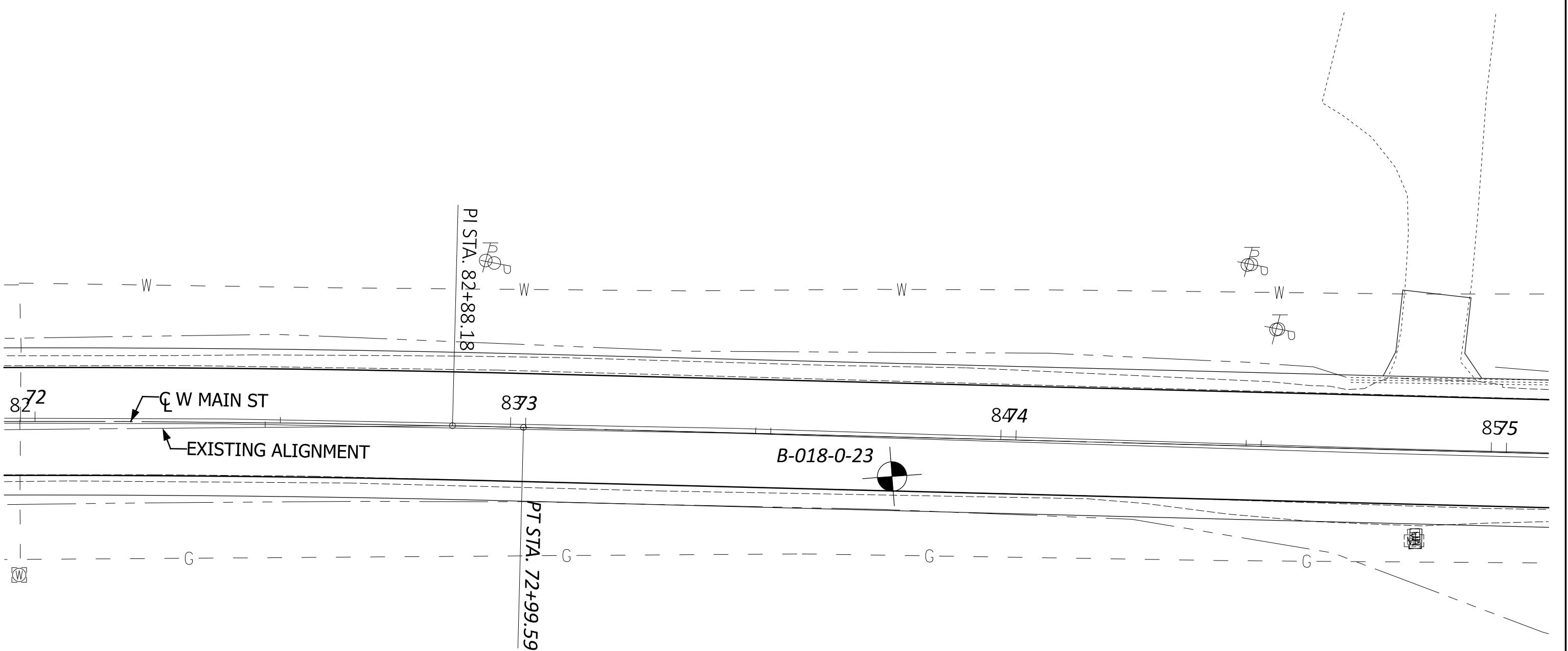
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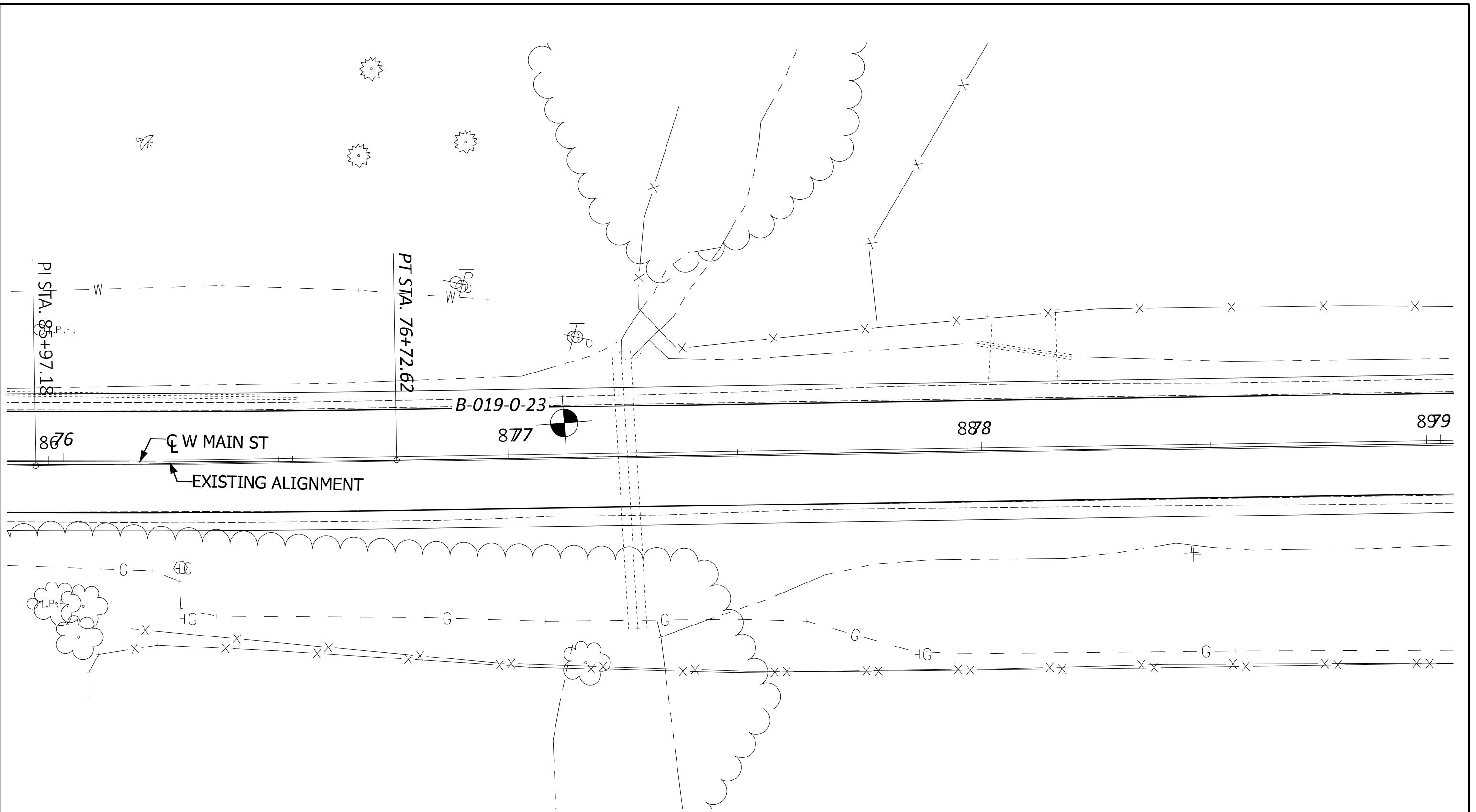
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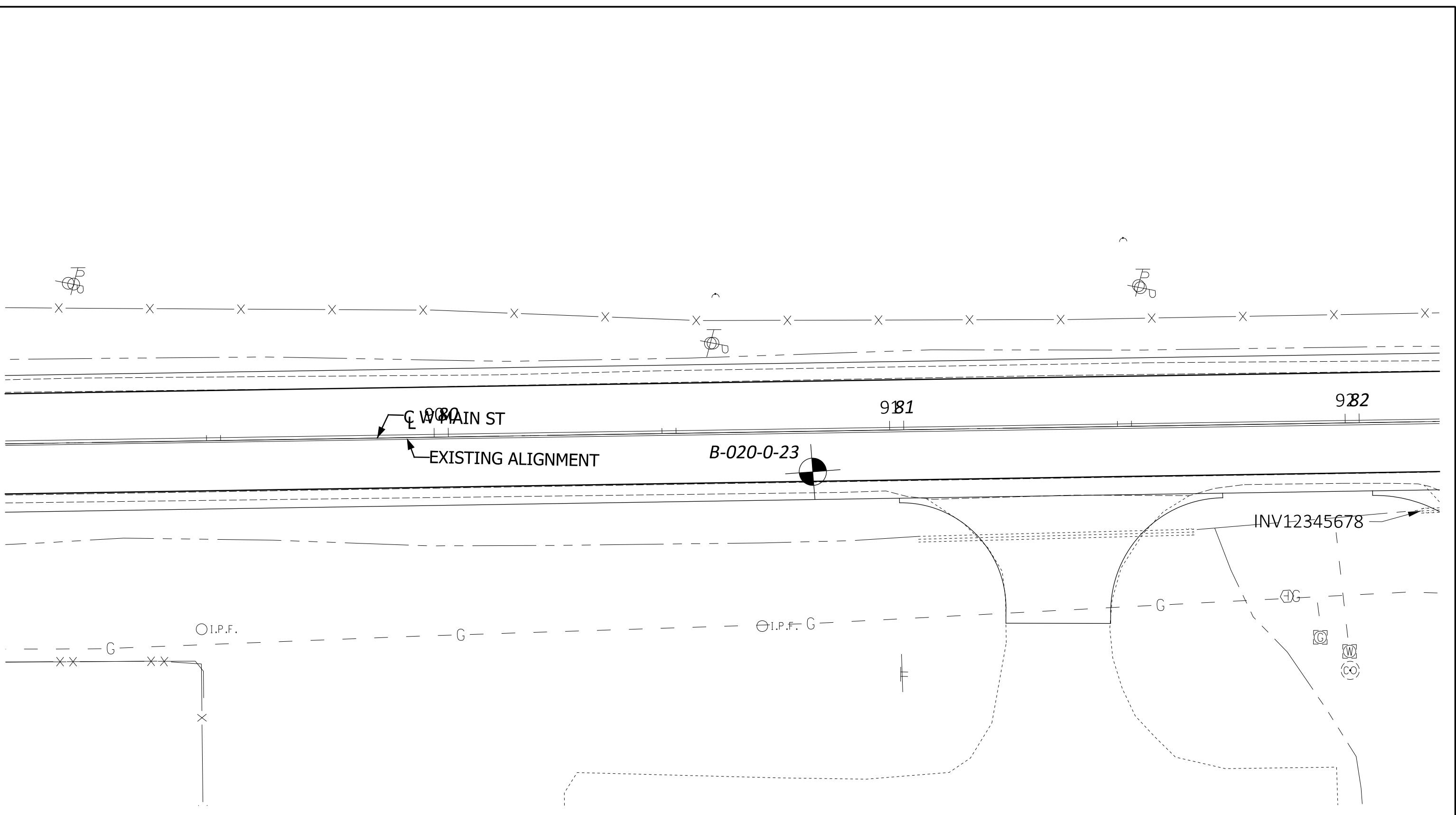
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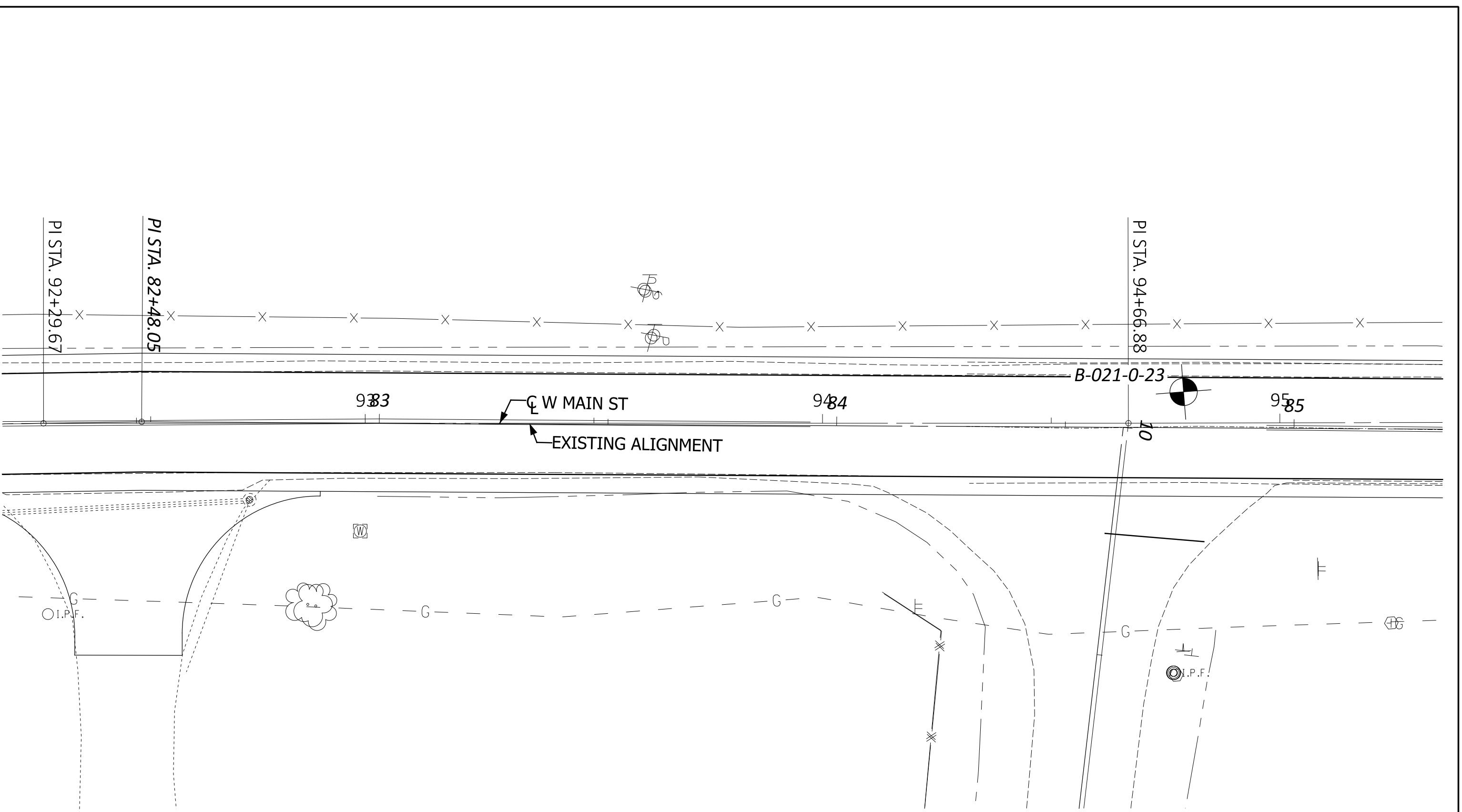
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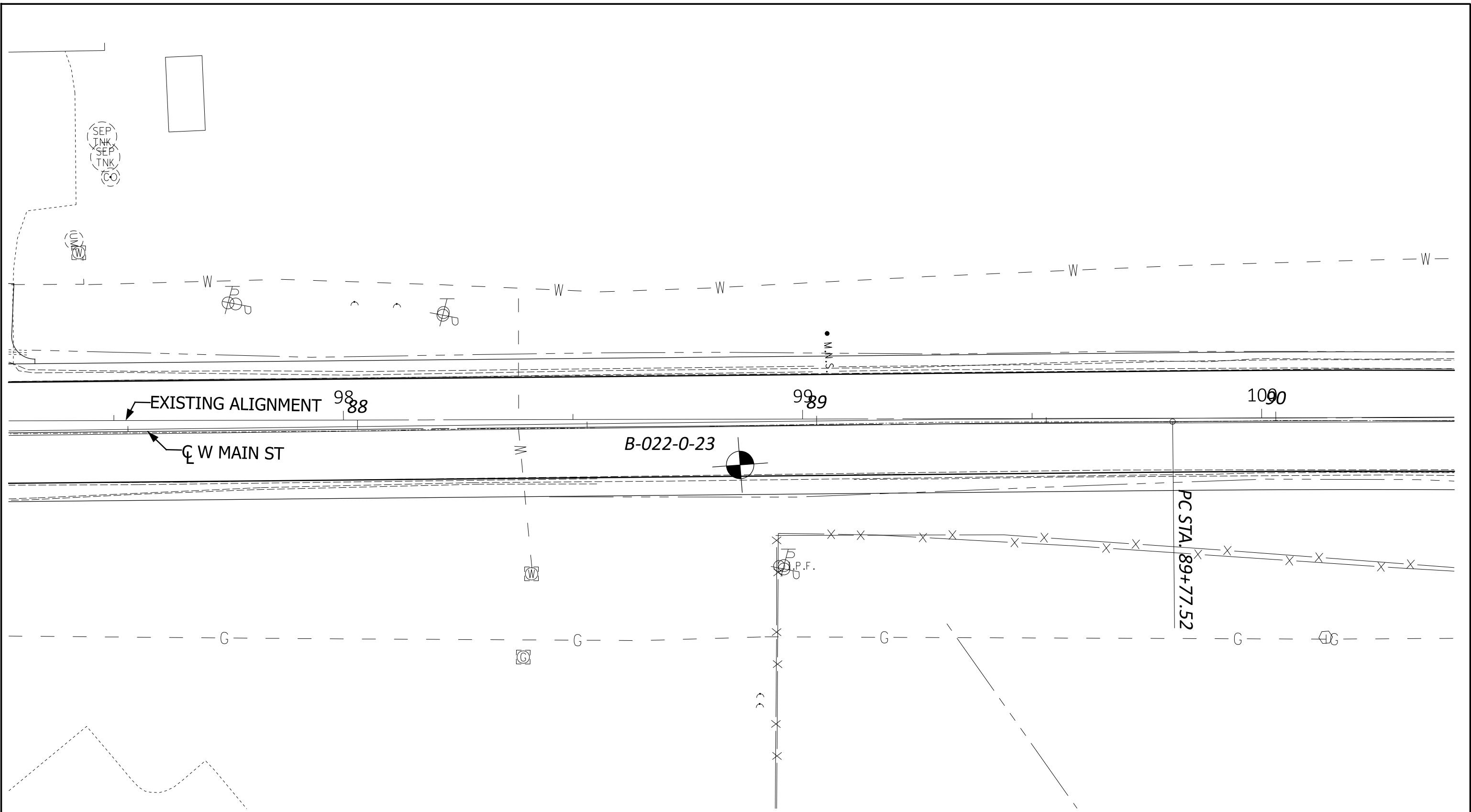
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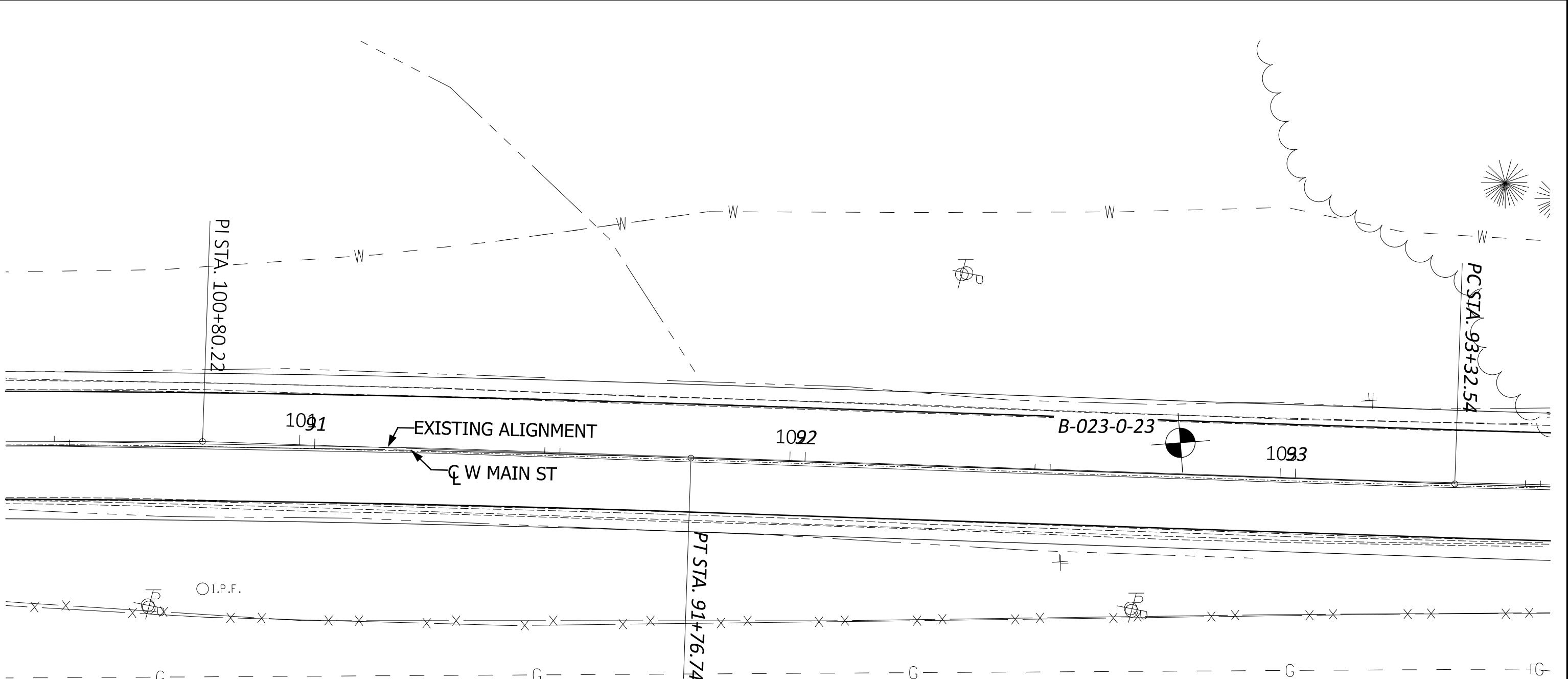
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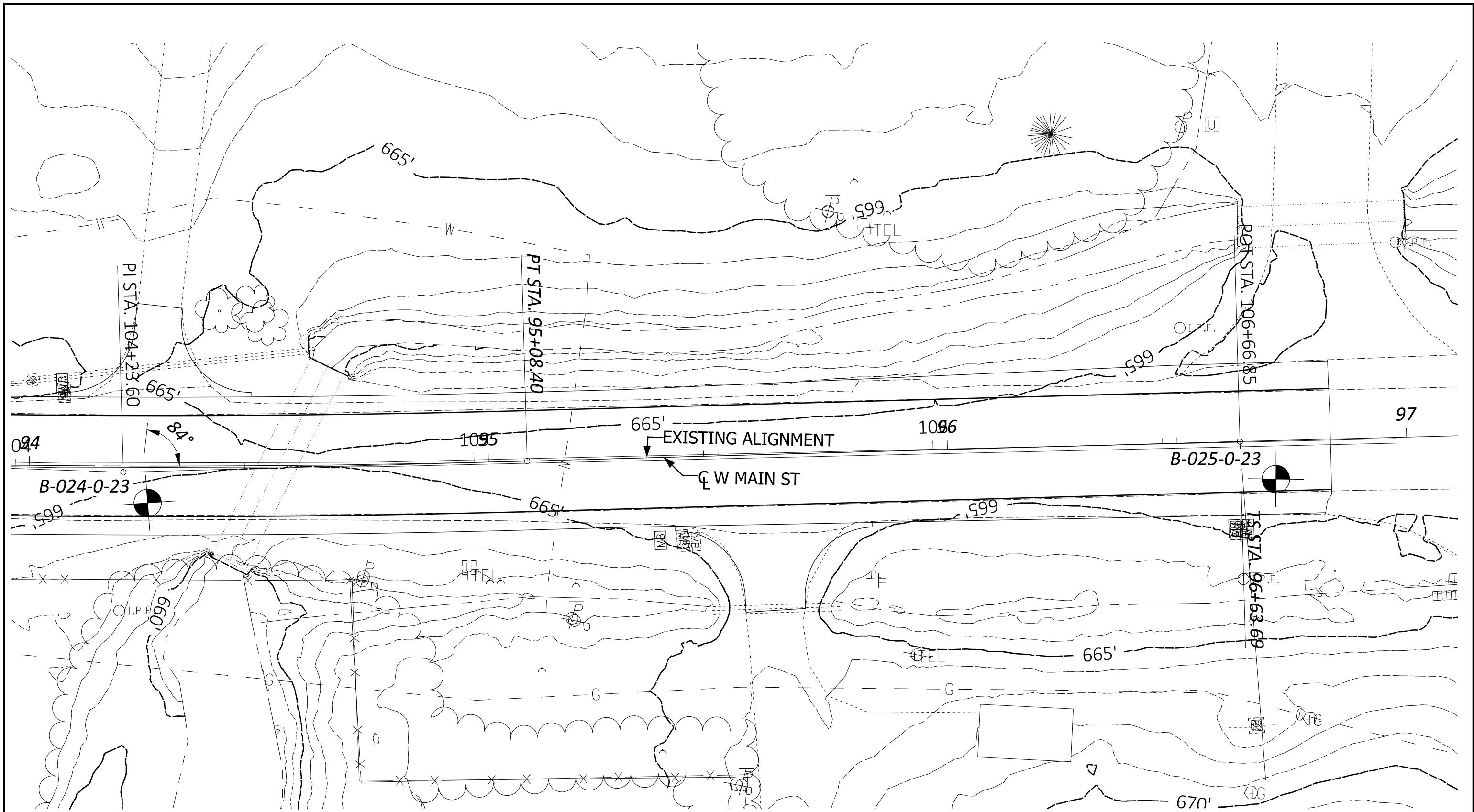
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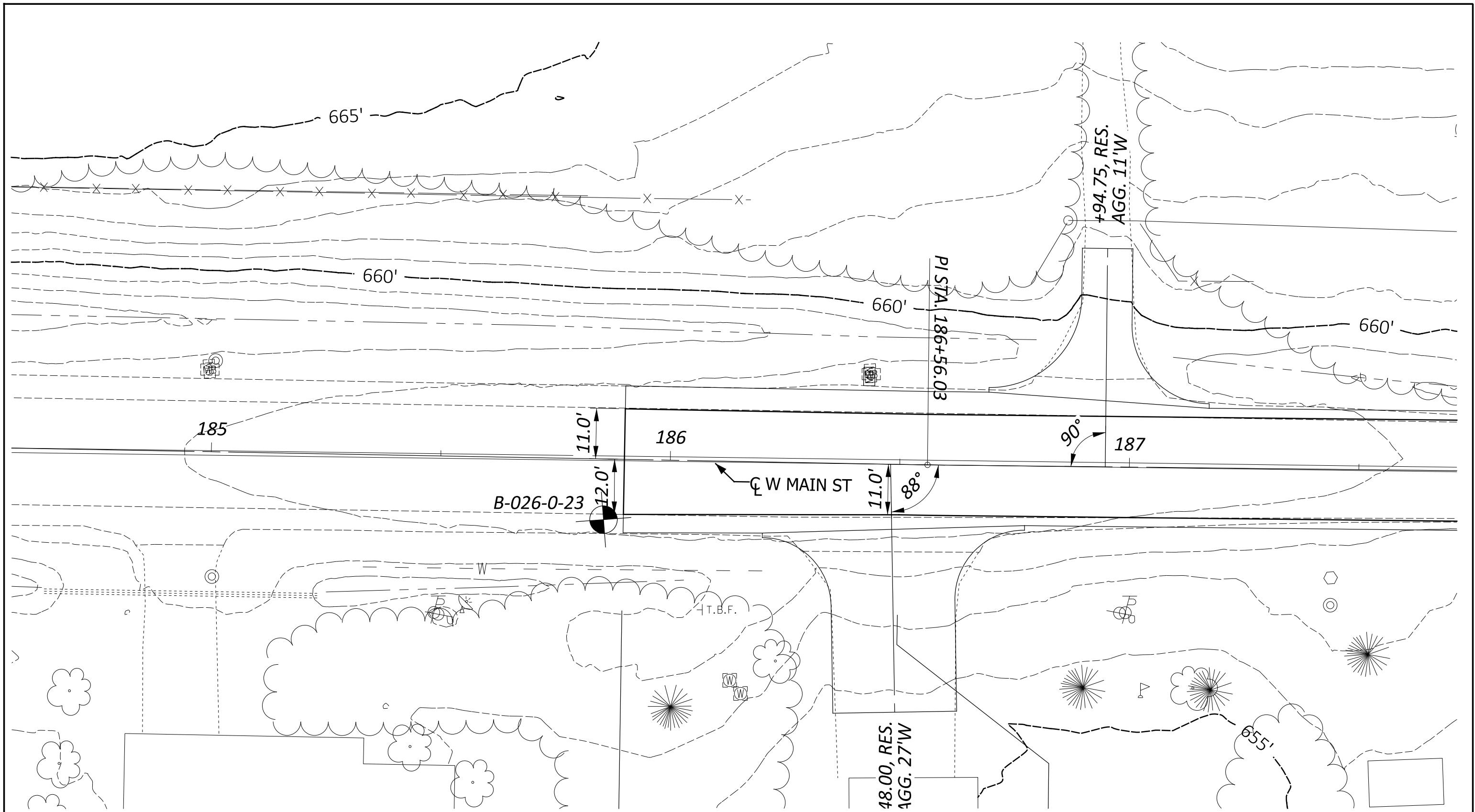
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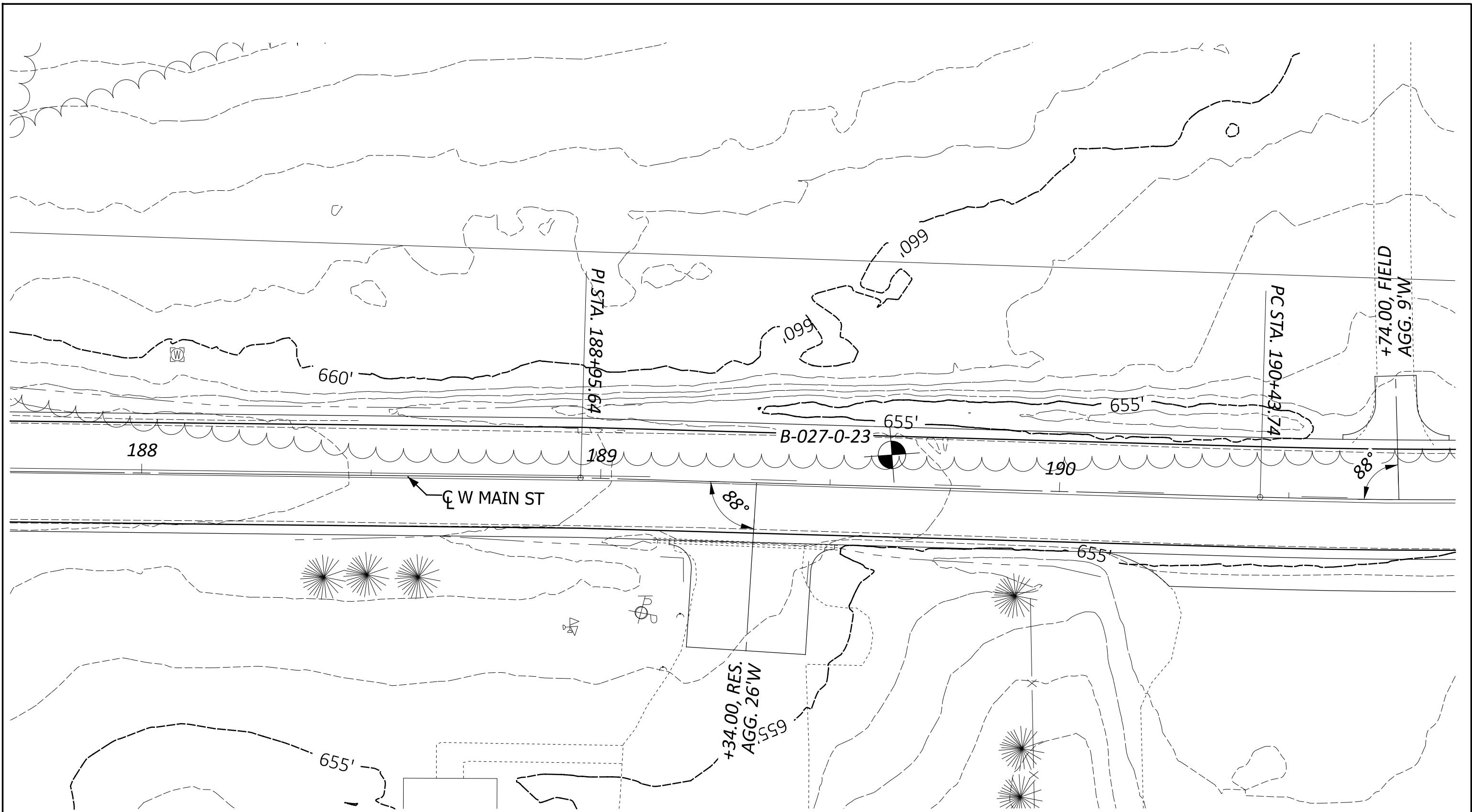
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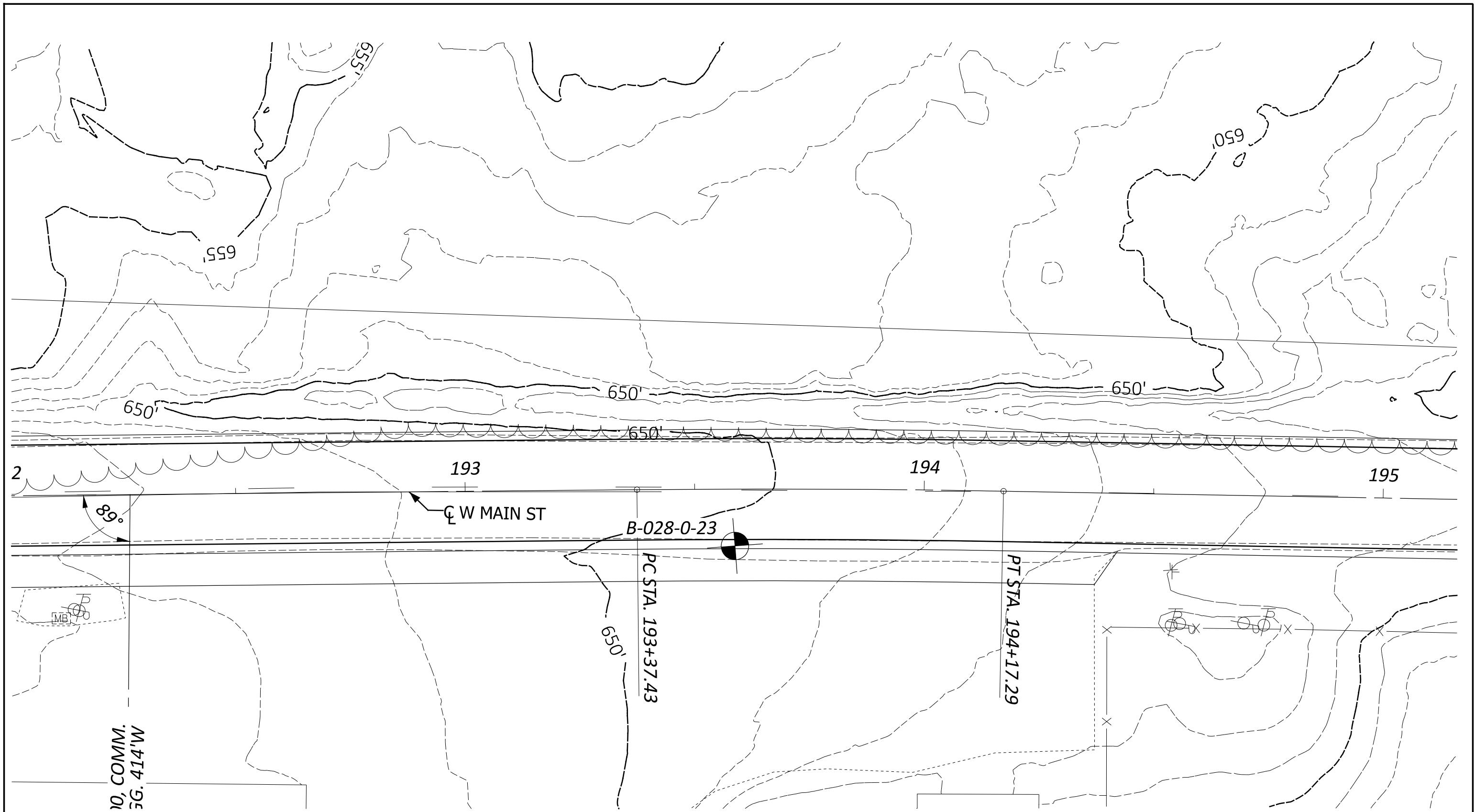
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ODOT GAL-850-0.21 PID 117244
GALLIA, OHIO

RII PROJECT NO.
W-22-198

SCALE: 1"=20'

DRAWN ALF
REVIEWED DEK
DATE 6/13/2023





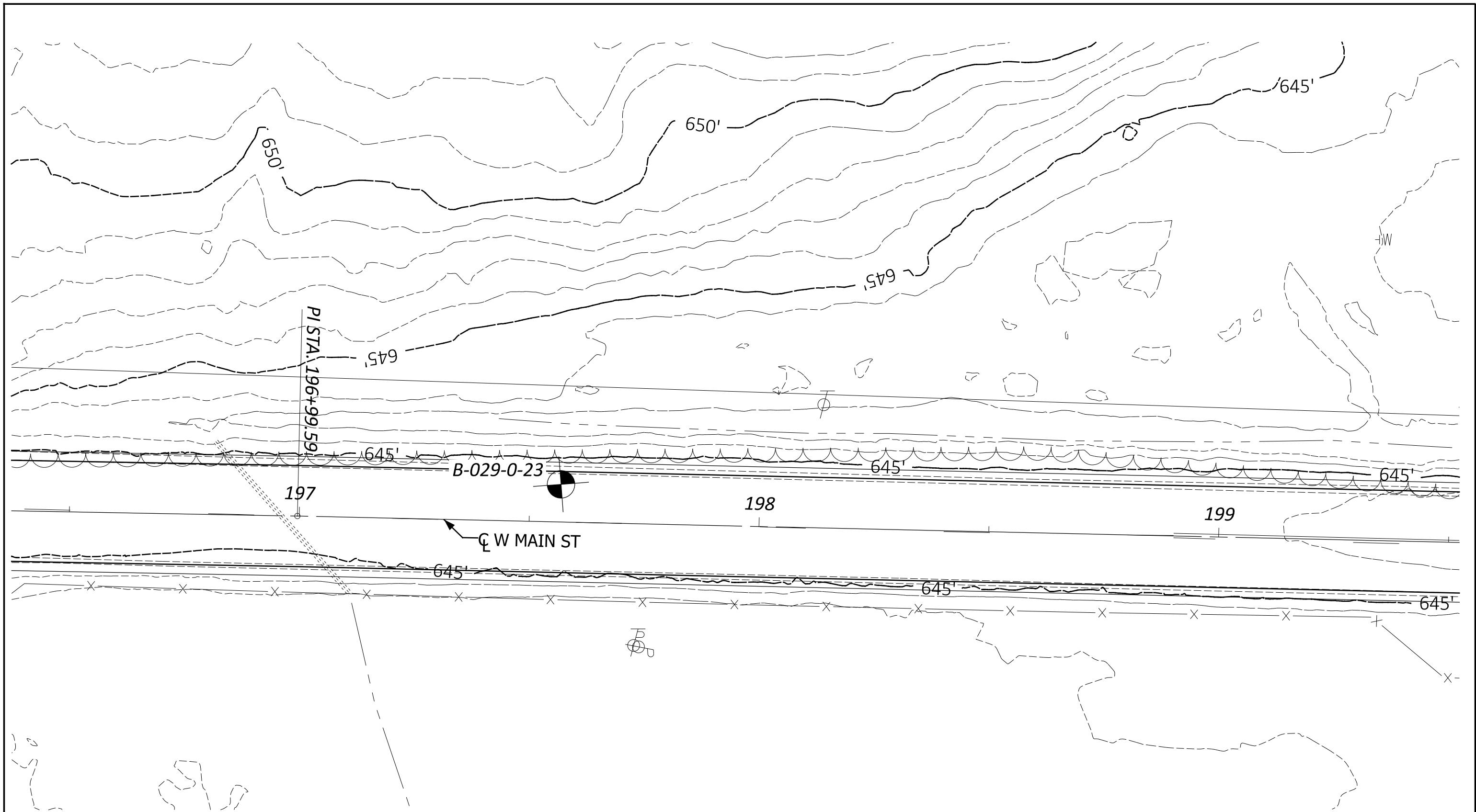
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ODOT GAL-850-0.21 PID 117244
GALLIA, OHIO

RII PROJECT NO.
W-22-198

DRAWN
ALF
REVIEWED
DEK
DATE
6/13/2023

SCALE: 1"=20'
0 10 20





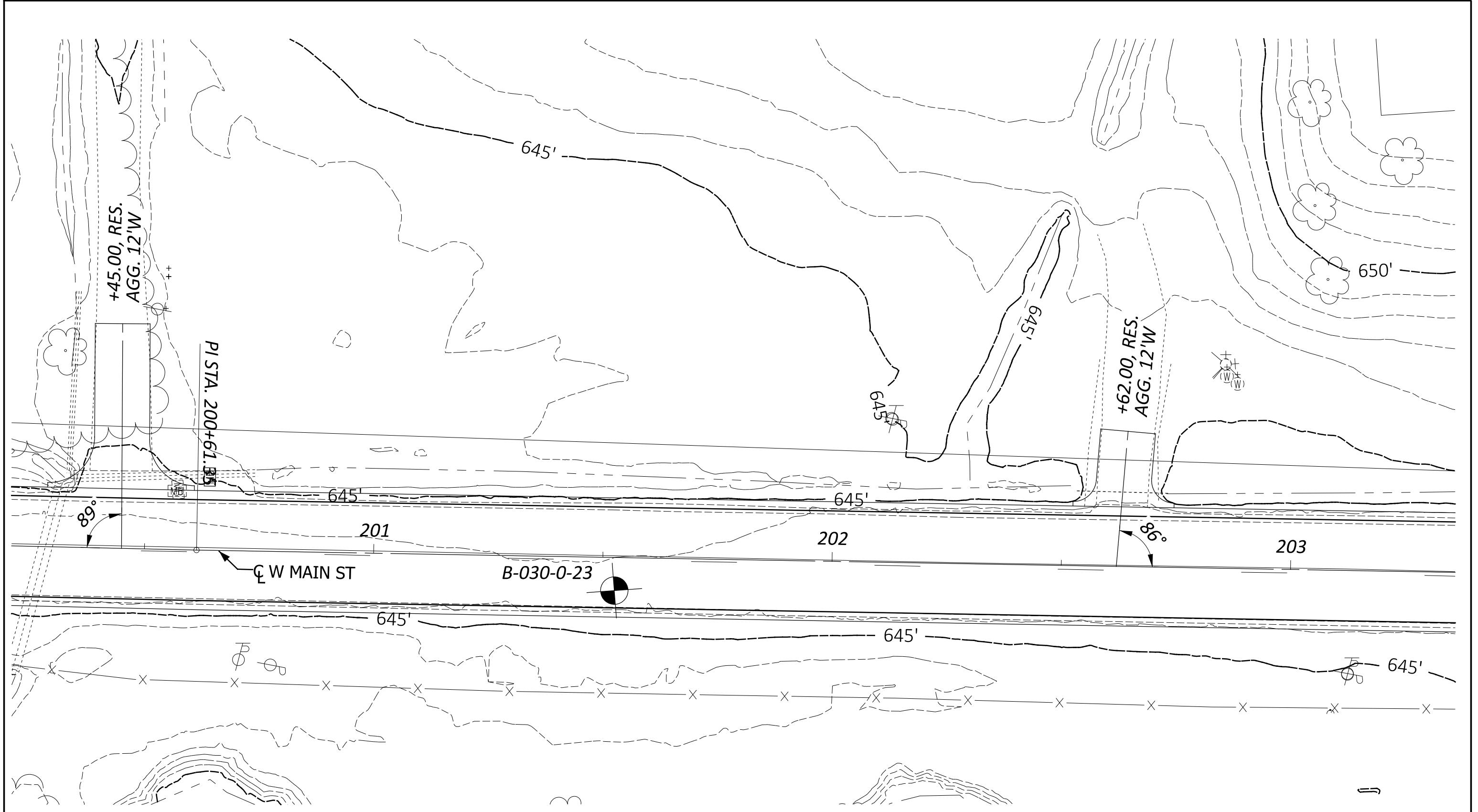
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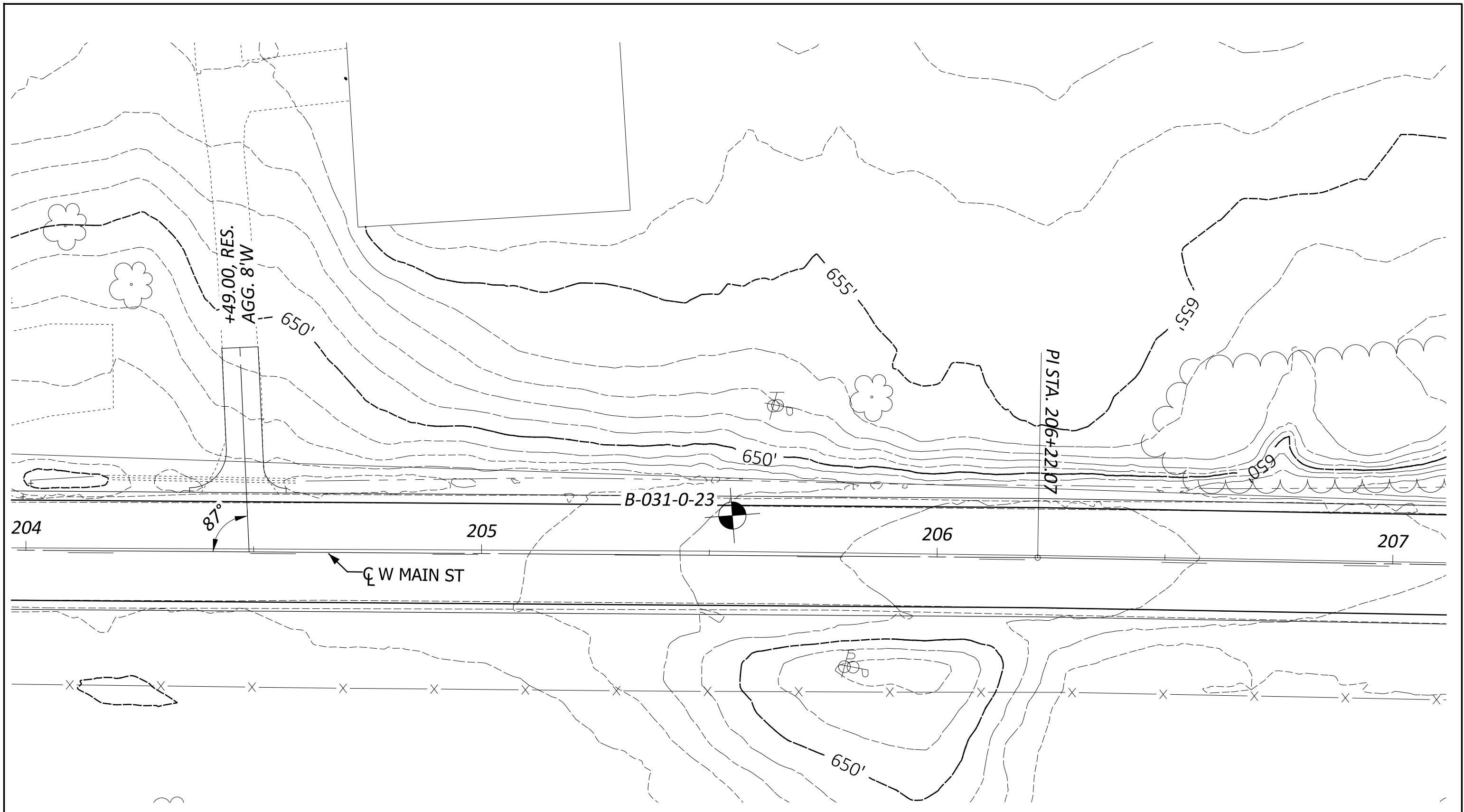
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BORING PLAN
ODOT GAL-850-0.21 PID 117244
GALLIA, OHIO

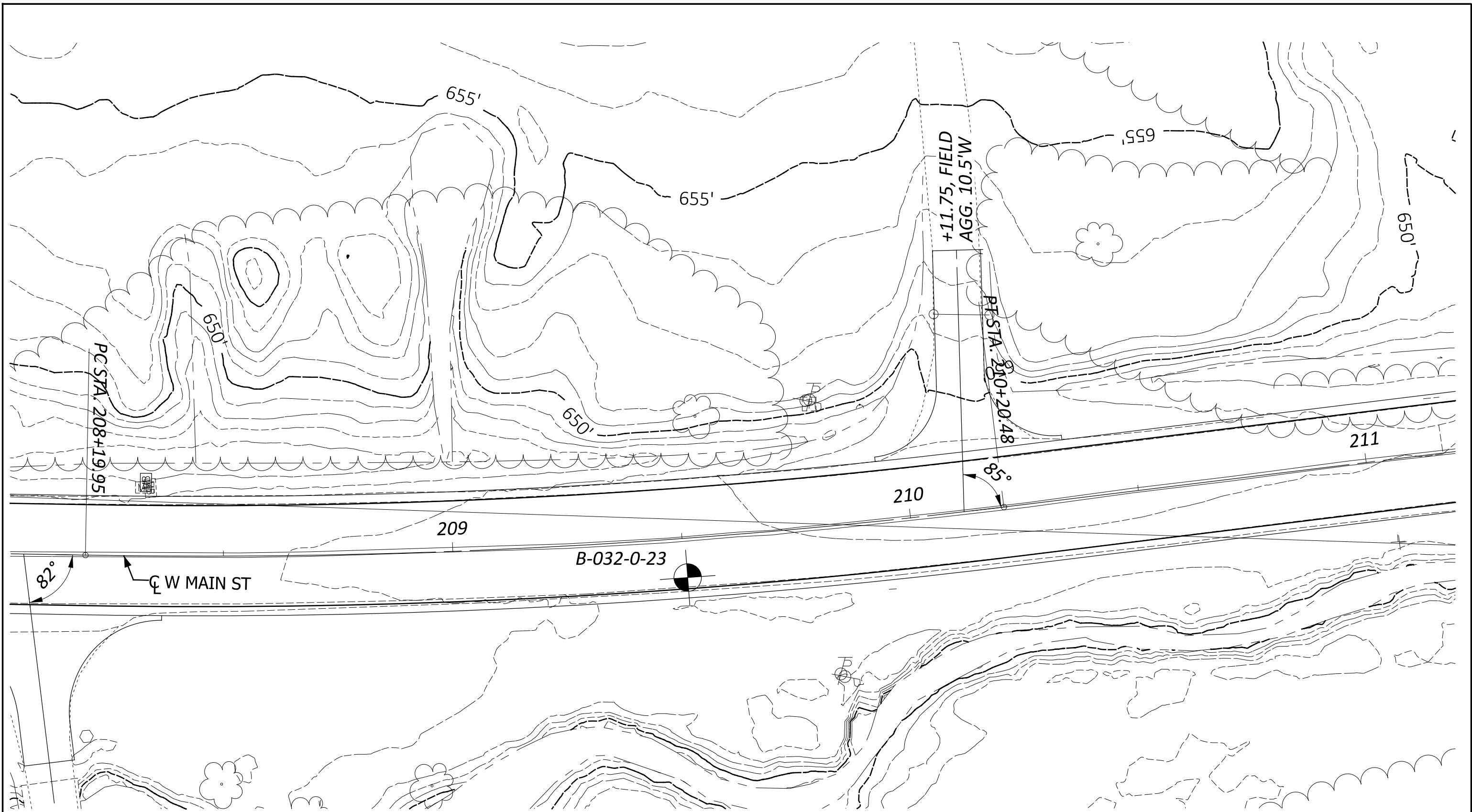
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DRAWN ALF
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DATE 6/13/2023





BORING PLAN
ODOT GAL-850-0.21 PID 117244
GALLIA, OHIO

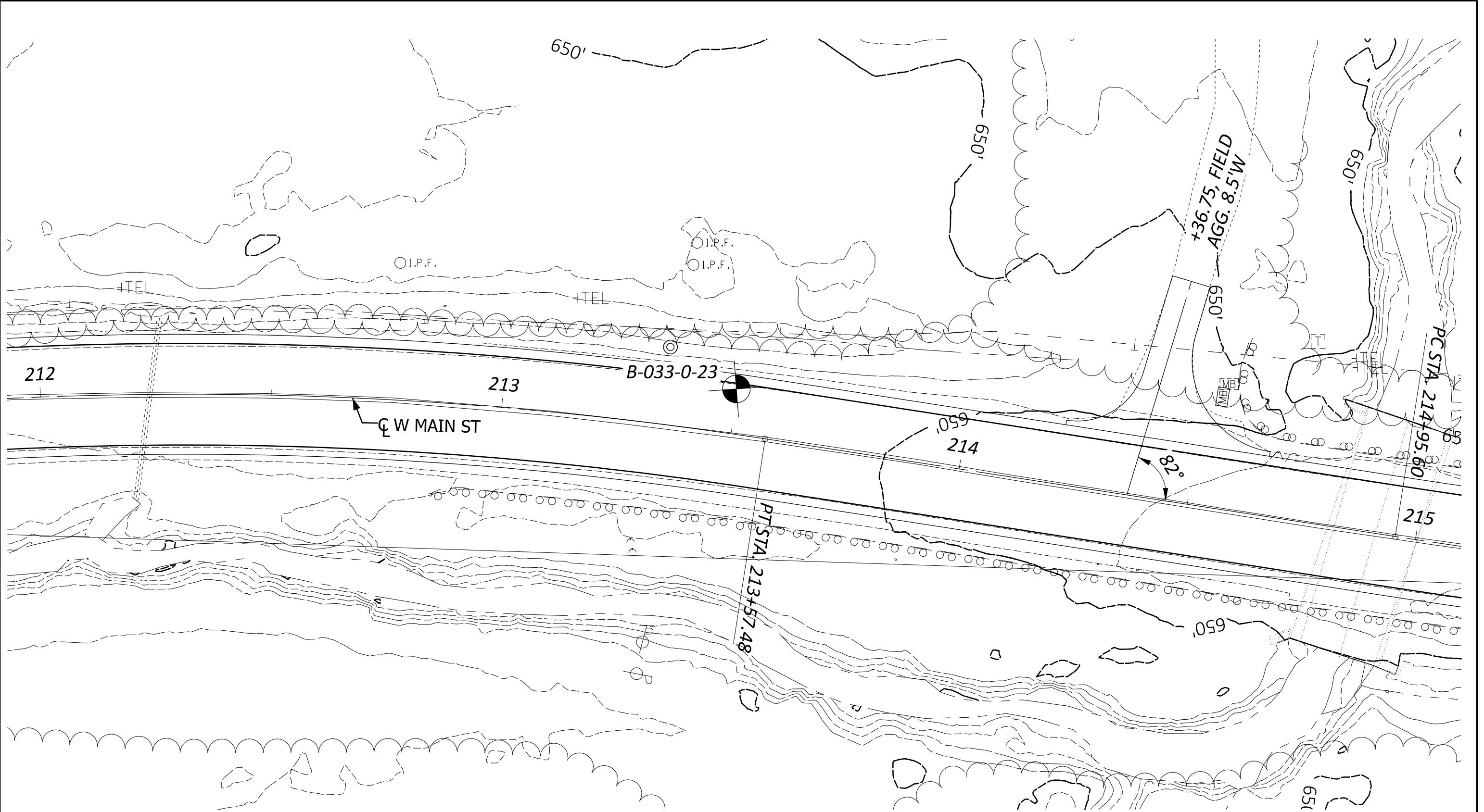
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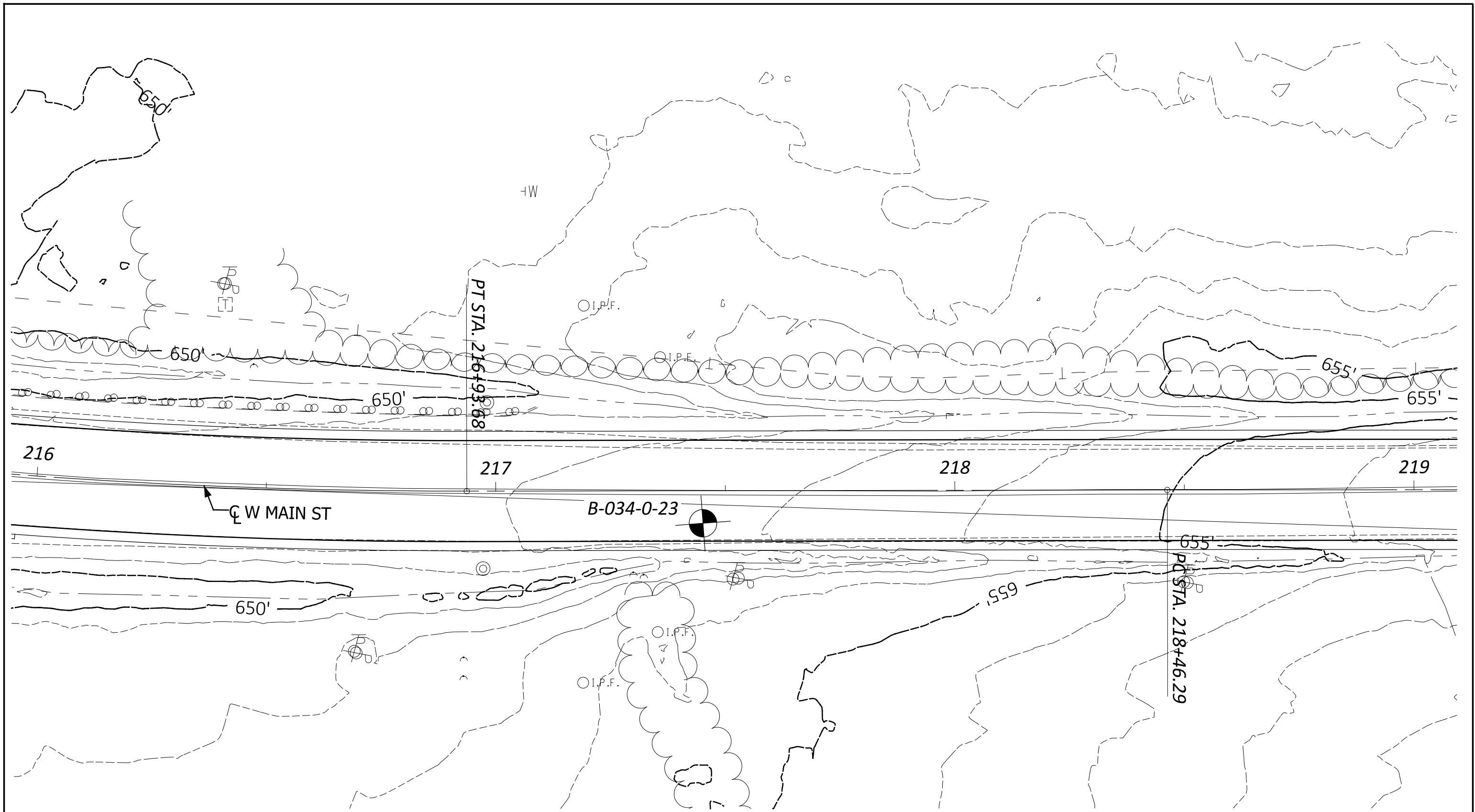
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DATE
/13/2023





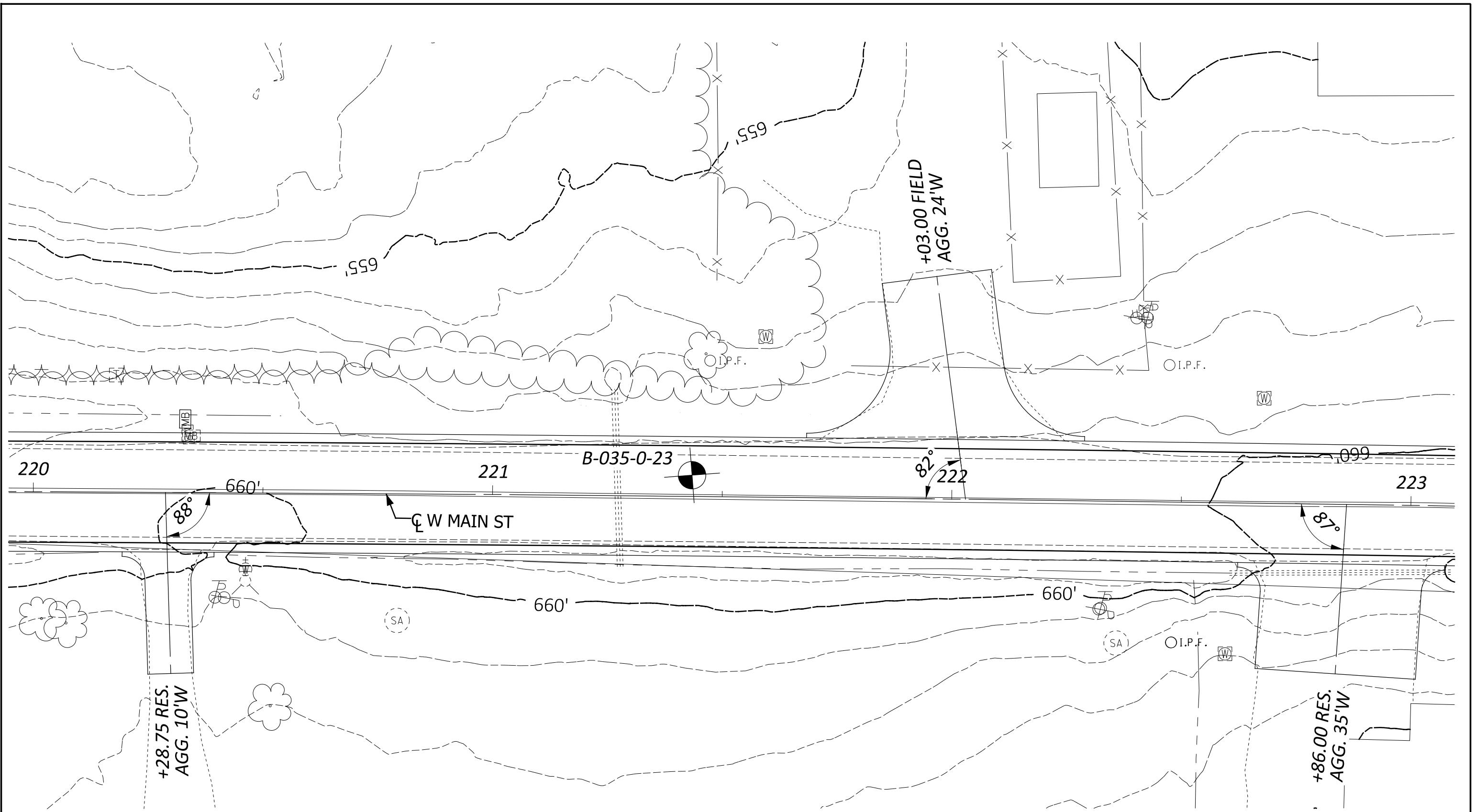
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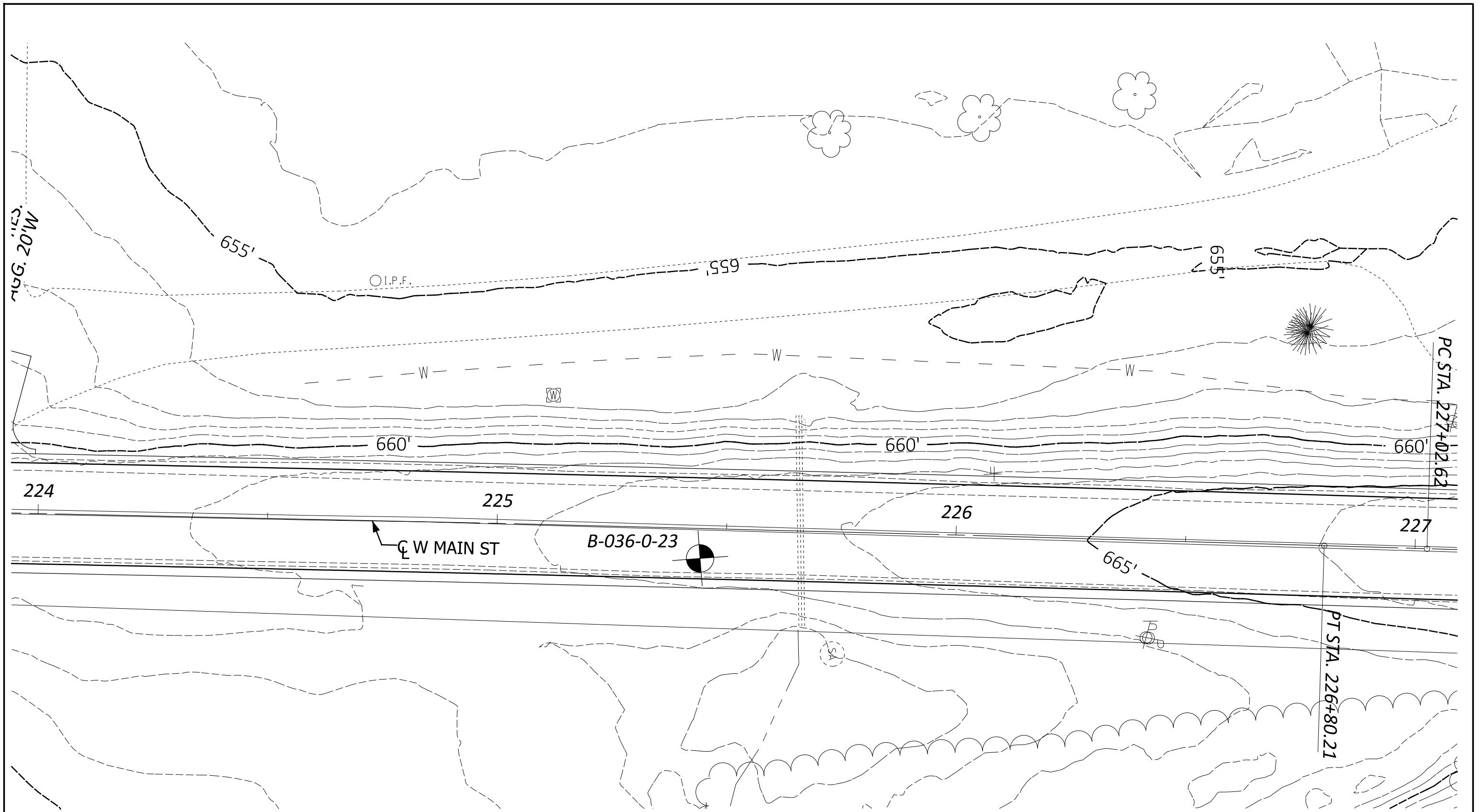
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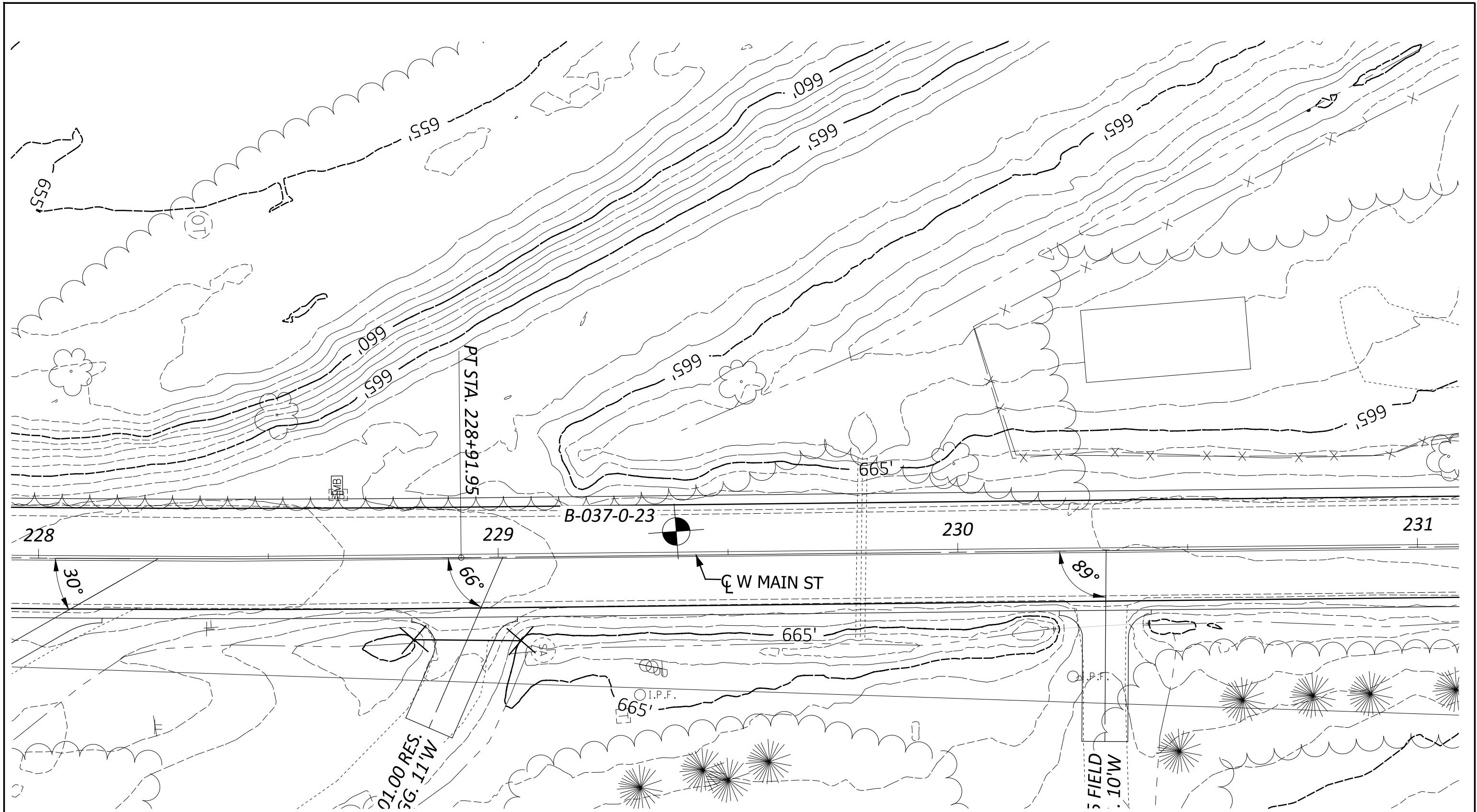
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6/13/2023



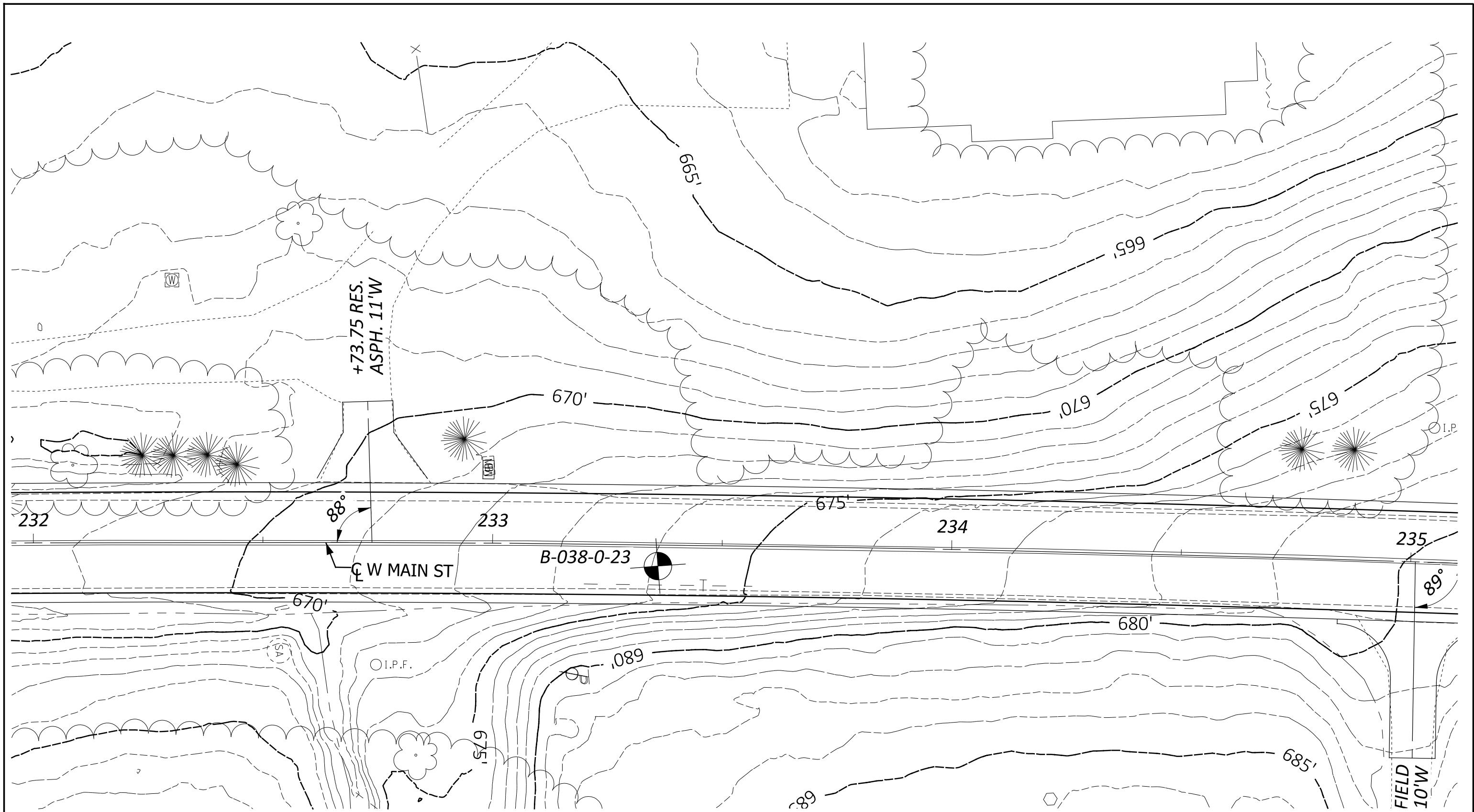
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RII PROJECT NO.
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DRAWN ALF
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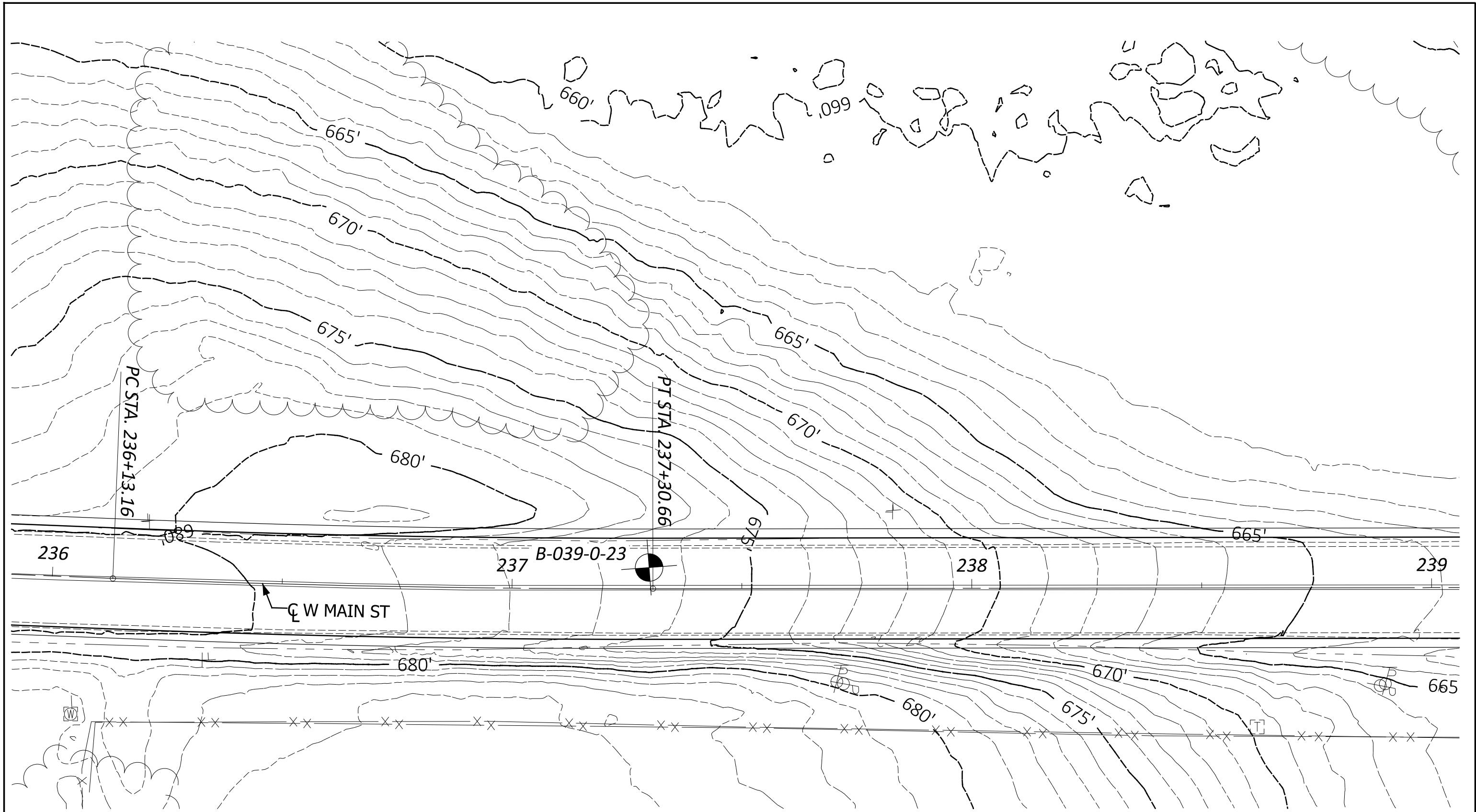
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ODOT GAL-850-0.21 PID 117244
GALLIA, OHIO

RII PROJECT NO.
W-22-198

CALE: 1"=20'

DRAWN
ALF
REVIEWED
DEK
DATE
6/13/2023





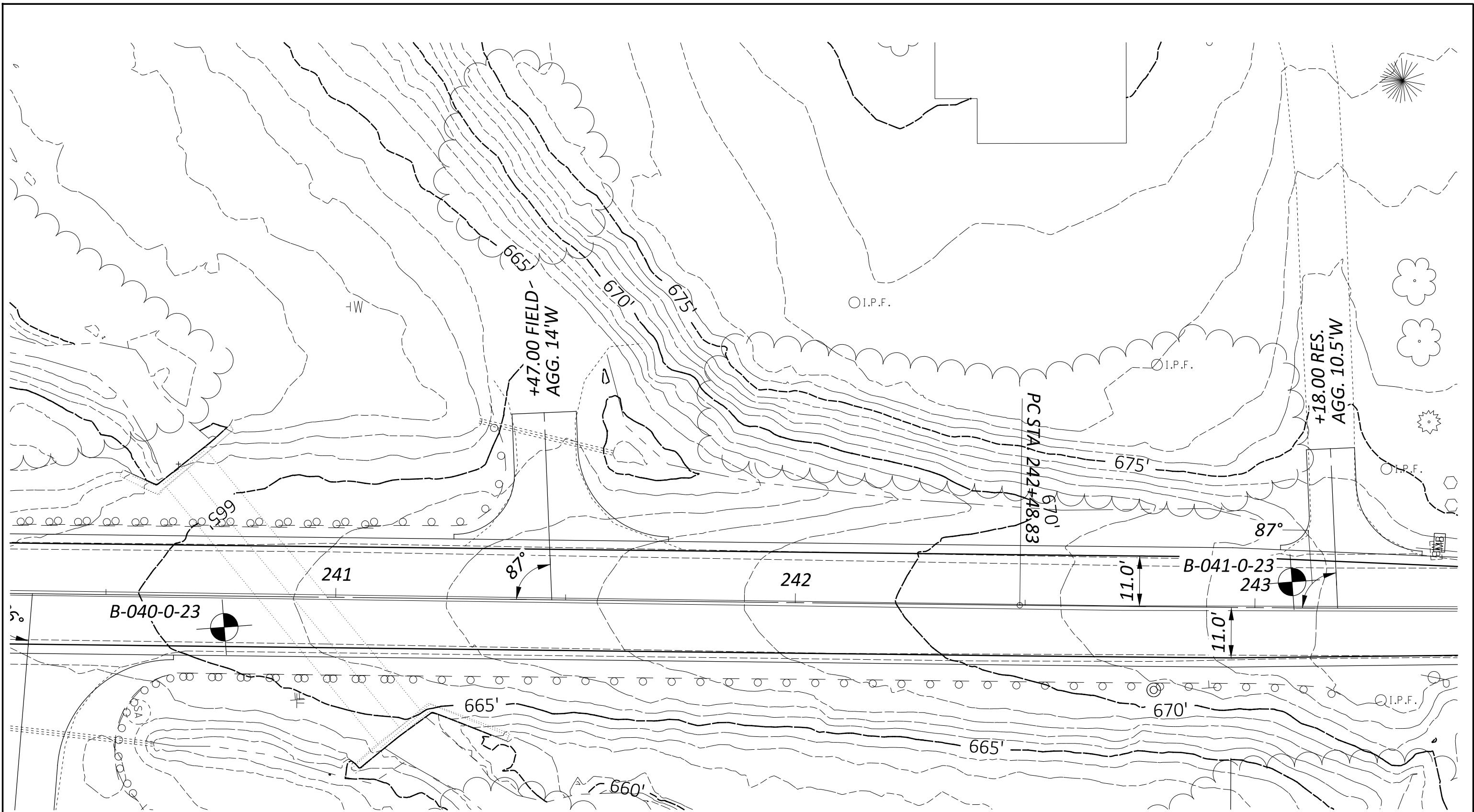
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APPENDIX II
SUMMARY OF GAL-850-0.21 BORINGS

SUMMARY OF GAL-850-0.21 BORINGS

Boring Number	Alignment	Station	Offset	Latitude	Longitude	Ground Elevation (feet) ¹	Boring Depth (feet)
B-001-0-23	SR 850 (South)	12+14	10' RT	38.851391	-82.300931	682.5	6.0
B-002-0-23		15+39	6' LT	38.852292	-82.300951	681.6	6.0
B-003-0-23		18+91	7' RT	38.853197	-82.300744	666.1	6.0
B-004-0-23		22+45	6' LT	38.854296	-82.300721	672.3	6.0
B-005-0-23		26+34	5' RT	38.855375	-82.300526	688.7	6.0
B-006-0-23		30+52	11' LT	38.856477	-82.300513	737.5	3.2
B-007-0-23		34+43	8' RT	38.857556	-82.300291	716.4	6.0
B-008-0-23		38+42	7' LT	38.858658	-82.300284	694.0	6.0
B-009-0-23		42+50	7' LT	38.859756	-82.300085	690.2	6.0
B-010-0-23		46+38	7' LT	38.860835	-82.300074	687.2	6.0
B-011-0-23		50+26	6' LT	38.861908	-82.299873	693.5	6.0
B-012-0-23		54+16	5' RT	38.862975	-82.299881	685.5	6.0
B-013-0-23		57+83	6' LT	38.863988	-82.299701	674.4	6.0
B-014-0-23		61+98	6' LT	38.865078	-82.299690	688.7	6.0
B-015-0-23		63+86	7' LT	38.865631	-82.299630	687.7	6.0
B-016-0-23		65+79	8' RT	38.866151	-82.299474	673.1	6.0
B-017-0-23		69+81	8' LT	38.867257	-82.299472	671.1	6.0
B-018-0-23		73+75	8' RT	38.868331	-82.299260	678.0	6.0
B-019-0-23		77+9	8' LT	38.869247	-82.299268	665.1	6.0
B-020-0-23		80+80	9' RT	38.870266	-82.299075	677.4	6.0
B-021-0-23		84+76	8' LT	38.871346	-82.299091	694.2	6.0
B-022-0-23		88+83	9' RT	38.872439	-82.298875	692.4	6.0
B-023-0-23		92+76	6' LT	38.873540	-82.298856	667.6	6.0
B-024-0-23	SR 850 (North)	94+26	8' RT	38.873946	-82.298701	664.8	9.5
B-025-0-23		96+72	8' RT	38.874631	-82.298631	667.3	6.0
B-026-0-23		185+85	13' RT	38.898856	-82.296287	659.1	6.0
B-027-0-23		189+63	7' LT	38.899890	-82.296273	656.1	6.0
B-028-0-23		193+59	12' RT	38.900982	-82.296082	649.7	6.0
B-029-0-23		197+57	8' LT	38.902073	-82.296050	645.6	6.0
B-030-0-23		201+52	7' RT	38.903154	-82.295809	645.9	6.0
B-031-0-23		205+55	9' LT	38.904243	-82.295784	648.1	4.7
B-032-0-23		209+51	9' RT	38.905327	-82.295587	648.4	6.0
B-033-0-23		213+50	10' LT	38.906426	-82.295632	649.7	6.0
B-034-0-23		217+45	7' RT	38.907494	-82.295309	652.7	6.0
B-035-0-23		221+43	5' LT	38.908581	-82.295287	659.4	6.0
B-036-0-23		225+44	7' RT	38.909665	-82.295070	663.4	6.0
B-037-0-23		229+39	5' LT	38.910756	-82.295034	667.8	6.0
B-038-0-23		233+36	5' RT	38.911841	-82.294845	674.1	3.6
B-039-0-23		237+30	5' LT	38.912919	-82.294796	676.4	3.2
B-040-0-23		240+76	7' RT	38.913856	-82.294605	665.4	6.0
B-041-0-23		243+8	6' LT	38.914508	-82.294629	672.7	6.0

¹ Ground surface elevations interpolated from basemapping provided by Korda

APPENDIX III
DESCRIPTION OF SOIL TERMS



CLASSIFICATION OF SOILS

Ohio Department of Transportation

(The classification of a soil is found by proceeding from top to bottom of the chart.
The first classification that the test data fits is the correct classification.)

SYMBOL	DESCRIPTION	Classification		LL ₀ /LL x 100*	% Pass #40	% Pass #200	Liquid Limit (LL)	Plastic Index (PI)	Group Index Max.	REMARKS
		AASHTO	OHIO							
	Gravel and/or Stone Fragments		A-1-a		30 Max.	15 Max.		6 Max.	0	Min. of 50% combined gravel, cobble and boulder sizes
	Gravel and/or Stone Fragments with Sand		A-1-b		50 Max.	25 Max.		6 Max.	0	
	Fine Sand		A-3		51 Min.	10 Max.	NON-PLASTIC		0	
	Coarse and Fine Sand	--	A-3a			35 Max.		6 Max.	0	Min. of 50% combined coarse and fine sand sizes
	Gravel and/or Stone Fragments with Sand and Silt	A-2-4			35 Max.	40 Max. 41 Min.	10 Max.	0		
		A-2-5								
	Gravel and/or Stone Fragments with Sand, Silt and Clay	A-2-6			35 Max.	40 Max. 41 Min.	11 Min.	4		
		A-2-7								
	Sandy Silt	A-4	A-4a	76 Min.		36 Min.	40 Max.	10 Max.	8	Less than 50% silt sizes
	Silt	A-4	A-4b	76 Min.		50 Min.	40 Max.	10 Max.	8	50% or more silt sizes
	Elastic Silt and Clay		A-5	76 Min.		36 Min.	41 Min.	10 Max.	12	
	Silt and Clay	A-6	A-6a	76 Min.		36 Min.	40 Max.	11 - 15	10	
	Silty Clay	A-6	A-6b	76 Min.		36 Min.	40 Max.	16 Min.	16	
	Elastic Clay		A-7-5	76 Min.		36 Min.	41 Min.	≤ LL-30	20	
	Clay		A-7-6	76 Min.		36 Min.	41 Min.	> LL-30	20	
	Organic Silt	A-8	A-8a	75 Max.		36 Min.				W/o organics would classify as A-4a or A-4b
	Organic Clay	A-8	A-8b	75 Max.		36 Min.				W/o organics would classify as A-5, A-6a, A-6b, A-7-5 or A-7-6
MATERIAL CLASSIFIED BY VISUAL INSPECTION										
	Sod and Topsoil									
	Pavement or Base									
	Uncontrolled Fill (Describe)									
	Bouldery Zone									
	Peat									

* Only perform the oven-dried liquid limit test and this calculation if organic material is present in the sample.

DESCRIPTION OF SOIL TERMS

The following terminology was used to describe soils throughout this report and is generally adapted from ASTM 2487/2488 and ODOT Specifications for Geotechnical Explorations.

Granular Soils – ODOT A-1, A-2, A-3, A-4 (non-plastic)

The relative compactness of granular soils is described as:

<u>Description</u>	<u>Blows per foot – SPT (N₆₀)</u>		
Very Loose	Below	5	
Loose	5	-	10
Medium Dense	11	-	30
Dense	31	-	50
Very Dense	Over		50

Cohesive Soils – ODOT A-4, A-5, A-6, A-7, A-8

The relative consistency of cohesive soils is described as:

<u>Description</u>	<u>Unconfined Compression (tsf)</u>		
	Less than	0.25	
Very Soft	0.25	-	0.5
Soft	0.5	-	1.0
Medium Stiff	1.0	-	2.0
Stiff	2.0	-	4.0
Very Stiff	Over		4.0
Hard			

Gradation - The following size-related denominations are used to describe soils:

<u>Soil Fraction</u>	<u>Size</u>	
Boulders	Larger than 12"	
Cobbles	12" to 3"	
Gravel	coarse fine	3" to $\frac{3}{4}$ " $\frac{3}{4}$ " to 2.0 mm ($\frac{3}{4}$ " to #10 Sieve)
Sand	coarse fine	2.0 mm to 0.42 mm (#10 to #40 Sieve) 0.42 mm to 0.074 mm (#40 to #200 Sieve)
Silt		0.074 mm to 0.005 mm (#200 to 0.005 mm)
Clay		Smaller than 0.005 mm

Modifiers of Components - The following modifiers indicate the range of percentages of the minor soil components:

<u>Term</u>	<u>Range</u>		
Trace	0%	-	10%
Little	10%	-	20%
Some	20%	-	35%
And	35%	-	50%

Moisture Table - The following moisture-related denominations are used to describe cohesive soils:

<u>Term</u>	<u>Range - ODOT</u>
Dry	Well below Plastic Limit
Damp	Below Plastic Limit
Moist	Above PL to 3% below LL
Wet	3% below LL to above LL

Organic Content – The following terms are used to describe organic soils:

<u>Term</u>	<u>Organic Content (%)</u>
Slightly organic	2-4
Moderately organic	4-10
Highly organic	>10

Bedrock – The following terms are used to describe the relative strength of bedrock:

<u>Description</u>	<u>Field Parameter</u>
Very Weak	Can be carved with knife and scratched by fingernail. Pieces 1 in. thick can be broken by finger pressure.
Weak	Can be grooved or gouged with knife readily. Small, thin pieces can be broken by finger pressure.
Slightly Strong	Can be grooved or gouged 0.05 in deep with knife. 1 in. size pieces from hard blows of geologist hammer.
Moderately Strong	Can be scratched with knife or pick. 1/4 in. size grooves or gouges from blows of geologist hammer.
Strong	Can be scratched with knife or pick with difficulty. Hard hammer blows to detach hand specimen.
Very Strong	Cannot be scratched by knife or pick. Hard repeated blows of geologist hammer to detach hand specimen.
Extremely Strong	Cannot be scratched by knife or pick. Hard repeated blows of geologist hammer to chip hand specimen.

DESCRIPTION OF ROCK TERMS

The following terminology was used to describe the rock throughout this report and is generally adapted from ASTM D5878 and the ODOT Specifications for Geotechnical Explorations.

Weathering – Describes the degree of weathering of the rock mass:

<u>Description</u>	<u>Field Parameter</u>
Unweathered	No evidence of any chemical or mechanical alteration of the rock mass. Mineral crystals have a right appearance with no discoloration. Fractures show little or not staining on surfaces.
Slightly Weathered	Slight discoloration of the rock surface with minor alterations along discontinuities. Less than 10% of the rock volume presents alteration.
Moderately Weathered	Portions of the rock mass are discolored as evident by a dull appearance. Surfaces may have a pitted appearance with weathering "halos" evident. Isolated zones of varying rock strengths due to alteration may be present. 10 to 15% of the rock volume presents alterations.
Highly Weathered	Entire rock mass appears discolored and dull. Some pockets of slightly to moderately weathered rock may be present and some areas of severely weathered materials may be present.
Severely Weathered	Majority of the rock mass reduced to a soil-like state with relic rock structure discernable. Zones of more resistant rock may be present but the material can generally be molded and crumbled by hand pressures.

Strength of Bedrock – The following terms are used to describe the relative strength of bedrock:

<u>Description</u>	<u>Field Parameter</u>
Very Weak	Can be carved with knife and scratched by fingernail. Pieces 1 in. thick can be broken by finger pressure.
Weak	Can be grooved or gouged with knife readily. Small, thin pieces can be broken by finger pressure.
Slightly Strong	Can be grooved or gouged 0.05 in deep with knife. 1 in. size pieces from hard blows of geologist hammer.
Moderately Strong	Can be scratched with knife or pick. 1/4 in. size grooves or gouges from blows of geologist hammer.
Strong	Can be scratched with knife or pick with difficulty. Hard hammer blows to detach hand specimen.
Very Strong	Cannot be scratched by knife or pick. Hard repeated blows of geologist hammer to detach hand specimen.
Extremely Strong	Cannot be scratched by knife or pick. Hard repeated blows of geologist hammer to chip hand specimen.

Bedding Thickness – Description of bedding thickness as the average perpendicular distances between bedding surfaces:

<u>Description</u>	<u>Thickness</u>
Very Thick	Greater than 36 inches
Thick	18 to 36 inches
Medium	10 to 18 inches
Thin	2 to 10 inches
Very Thin	0.4 to 2 inches
Laminated	0.1 to 0.4 inches
Thinly Laminated	Less than 0.1 inches

Fracturing – Describes the degree and condition of fracturing (fault, joint, or shear):

Degree of Fracturing	
<u>Description</u>	<u>Spacing</u>
Unfractured	Greater than 10 feet
Intact	3 to 10 feet
Slightly Fractured	1 to 3 feet
Moderately Fractured	

Aperture Width		Surface Roughness	
<u>Description</u>	<u>Width</u>	<u>Description</u>	<u>Criteria</u>
Open	Greater than 0.2 inches	Very Rough	Near vertical steps and ridges occur on surface
Narrow	0.05 to 0.2 inches	Slightly Rough	Asperities on the surfaces distinguishable
Tight	Less than 0.05 inches	Slickensided	Surface has smooth, glassy finish, evidence of striations

RQD – Rock Quality Designation (calculation shown in report) and Rock Quality (ODOT, GB 3, January 13, 2006):

<u>RQD %</u>	<u>Rock Index Property Classification (based on RQD, not slake durability index)</u>
0 – 25%	Very Poor
26 – 50%	Poor
51 – 70%	Fair
71 – 85%	Good
86 – 100%	Very Good

APPENDIX IV
BORING LOGS:
B-001-0-23 through B-0041-0-23

BORING LOGS

Definitions of Abbreviations

AS	=	Auger sample
GI	=	Group index as determined from the Ohio Department of Transportation classification system
HP	=	Unconfined compressive strength as determined by a hand penetrometer (tons per square foot)
LL _o	=	Oven-dried liquid limit as determined by ASTM D4318. Per ASTM D2487, if LL _o /LL is less than 75 percent, soil is classified as "organic".
LOI	=	Percent organic content (by weight) as determined by ASTM D2974 (loss on ignition test)
PID	=	Photo-ionization detector reading (parts per million)
QR	=	Unconfined compressive strength of intact rock core sample as determined by ASTM D2938 (pounds per square inch)
QU	=	Unconfined compressive strength of soil sample as determined by ASTM D2166 (pounds per square foot)
RC	=	Rock core sample
REC	=	Ratio of total length of recovered soil or rock to the total sample length, expressed as a percentage
RQD	=	Rock quality designation – estimate of the degree of jointing or fracture in a rock mass, expressed as a percentage:

$$\frac{\sum \text{ segments equal to or longer than 4.0 inches}}{\text{core run length}} \times 100$$

S	=	Sulfate content (parts per million)
SPT	=	Standard penetration test blow counts, per ASTM D1586. Driving resistance recorded in terms of blows per 6-inch interval while letting a 140-pound hammer free fall 30 inches to drive a 2-inch outer diameter (O.D.) split spoon sampler a total of 18 inches. The second and third intervals are added to obtain the number of blows per foot (N _m).
N ₆₀	=	Measured blow counts corrected to an equivalent (60 percent) energy ratio (ER) by the following equation: N ₆₀ = N _m *(ER/60)
SS	=	Split spoon sample
2S	=	For instances of no recovery from standard SS interval, a 2.5 inch O.D. split spoon is driven the full length of the standard SS interval plus an additional 6.0 inches to obtain a representative sample. Only the final 6.0 inches of sample is retained. Blow counts from 2S sampling are not correlated with N ₆₀ values.
3S	=	Same as 2S, but using a 3.0 inch O.D. split spoon sampler.
TR	=	Top of rock
W	=	Initial water level measured during drilling
▼	=	Water level measured at completion of drilling

Classification Test Data

Gradation (as defined on Description of Soil Terms):

GR	=	% Gravel
SA	=	% Sand
SI	=	% Silt
CL	=	% Clay

Atterberg Limits:

LL	=	Liquid limit
PL	=	Plastic limit
PI	=	Plasticity Index
WC	=	Water content (%)



PROJECT: GAL-850-0.21 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/8/23 END: 2/8/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 12+14 / 10' RT
C ALIGNMENT: SR 850
1/22 ELEVATION: 682.5 (MSL) EOB: 6.
7 LAT / LONG: 38.851391, -82.300931

EXPLORATION ID
B-001-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-0.21 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/8/23 END: 2/8/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2010
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	15+39 / 6' LT	E
C	ALIGNMENT:	SR 850	
1/22	ELEVATION:	681.6 (MSL)	EOB: 6.0 ft.
7	LAT / LONG:	38.852292, -82.300951	

EXPLORATION ID
B-002-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/8/23 END: 2/8/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2010
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	18+91 / 7' RT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	666.1 (MSL) EOB: 6.0
7	LAT / LONG:	38.853197, -82.300744

EXPLORATION ID
B-003-0-23

ft. PAGE
1 OF 1

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/8/23 END: 2/8/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	22+45 / 6' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	672.3 (MSL) EOB: 6.
7	LAT / LONG:	38.854296, -82.300721

EXPLORATION ID
B-004-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/8/23 END: 2/8/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2010
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 26+34 / 5' RT E
C ALIGNMENT: SR 850
1/22 ELEVATION: 688.7 (MSL) EOB: 6.0 ft.
7 LAT / LONG: 38.855375, -82.300526

EXPLORATION ID
B-005-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	30+52 / 11' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	737.5 (MSL) EOB: 3.
7	LAT / LONG:	38.856477, -82.300513

EXPLORATION ID
B-006-0-23

MATERIAL DESCRIPTION AND NOTES	ELEV. 737.5	DEPTHs	SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
1.0'- ASPHALT (11.5")																			
0.3'- AGGREGATE BASE (4.0")		736.5			1														
		736.2			2	15	48 50/2"	-	86	SS-1	-	1	17	15	57	10	35	20	15
HARD, LIGHT BROWN SILT AND CLAY, SOME FINE TO COARSE SAND, TRACE FINE GRAVEL, DRY. -WEATHERED SILTONE PRESENT					3	50/2"	-	100	SS-2	-	-	-	-	-	-	-	6	A-6a (8)	210
AUGER REFUSAL @ 3.2'		734.3	EOP														5	A-6a (V)	-

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 34+43 / 8'
C ALIGNMENT: SR 850
1/22 ELEVATION: 716.4 (MSL) EOB
7 LAT / LONG: 38.857556, -80.382500

EXPLORATION ID
B-007-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-0.21 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2008
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 38+42 / 7' LT
C ALIGNMENT: SR 850
1/22 ELEVATION: 694.0 (MSL) EOB: 0
7 LAT / LONG: 38.858658, -82.300284

EXPLORATION ID
B-008-0-23

6.0 ft. PAGE
1 OF 1

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2008
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	42+50 / 7' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	690.2 (MSL) EOB: 6.0
7	LAT / LONG:	38.859756, -82.300085

EXPLORATION ID
B-009-0-23

ft. PAGE
1 OF 1

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 3.0' AND AT COMPLETION @ 5.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2010
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	46+38 / 7' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	687.2 (MSL) EOB:
7	LAT / LONG:	38.860835, -82.3000

EXPLORATION ID
B-010-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-0.21 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 50+26 / 6' LT
C ALIGNMENT: SR 850
1/22 ELEVATION: 693.5 (MSL) EOB:
7 LAT / LONG: 38.861908, -82.300000

EXPLORATION ID
B-011-0-23
0 ft.
PAGE
1 OF 1

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (38634)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/21/08
SPT	ENERGY RATIO (%): 87

5) STATION / OFFSET: 54+16 / 5' RT
ALIGNMENT: SR 850
22 ELEVATION: 685.5 (MSL) EOB: 6.0 ft.
LAT / LONG: 38.862975, -82.299881

**EXPLORATION ID
B-012-0-23**

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2010
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 57+83 / 6' LT
C ALIGNMENT: SR 850
1/22 ELEVATION: 674.4 (MSL) EOB: 0
7 LAT / LONG: 38.863988, -82.29970

EXPLORATION ID
B-013-0-23

6.0 ft. PAGE
1 1 OF 1

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/7/23 END: 2/7/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 61+98 / 6' LT ALIGNMENT: SR 850	EXPLORATION ID B-014-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 688.7 (MSL) EOB: 6.0 ft. LAT / LONG: 38.865078, -82.299690	PAGE 1 OF 1
	MATERIAL DESCRIPTION AND NOTES	ELEV. 688.7	DEPTHs	SPT / RQD N ₆₀
	1.0'- ASPHALT (12.0") 0.3'- AGGREGATE BASE (2.25") VERY STIFF, REDDISH BROWN CLAY, SOME SILT, TRACE COARSE TO FINE SAND, MOIST.	687.7 687.5 685.7 682.7		REC (%) HP (tsf)
GRADATION (%)				
GR CS FS SI CL				
ATTERBERG				
LL PL PI				
WC				
ODOT CLASS (GI)				
SO4 ppm				
BACK FILL				
682.7 EOB				

 PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/7/23 END: 2/7/23	DRILLING FIRM / OPERATOR: RII / LH	DRILL RIG: CME 55 (386345)	STATION / OFFSET: 63+86 / 7' LT	EXPLORATION ID B-015-0-23																				
	SAMPLING FIRM / LOGGER: RII / IS	HAMMER: AUTOMATIC	ALIGNMENT: SR 850																					
	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 3/21/22	ELEVATION: 687.7 (MSL)	EOB: 6.0 ft.																				
	SAMPLING METHOD: SPT	ENERGY RATIO (%): 87	LAT / LONG: 38.865631, -82.299630	PAGE 1 OF 1																				
MATERIAL DESCRIPTION AND NOTES	ELEV. 687.7	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL					
								GR	CS	FS	SI	CL	LL	PL	PI									
1.2'- ASPHALT (13.75")																								
		686.5			1																			
0.2'- AGGREGATE BASE (1.75")		686.0			2	16	5	4	13	33	SS-1	-	62	20	5	9	4	NP	NP	NP	1	A-1-a (0)	200	
MEDIUM DENSE, GRAY GRAVEL, SOME FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, DRY.		684.7			3	3	3	3	9	33	SS-2	0.50	19	10	2	27	42	58	19	39	16	A-7-6 (18)	-	
SOFT TO STIFF, REDDISH BROWN CLAY, SOME SILT, LITTLE FINE TO COARSE SAND, LITTLE FINE GRAVEL, DAMP.		681.7			4	9	10	10	29	-	SS-3	1.50	-	-	-	-	-	-	-	-	17	A-7-6 (V)	-	
			EOB	6																				



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	65+79 / 8' RT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	673.1 (MSL) EOB: 6.
7	LAT / LONG:	38.866151, -82.299474

EXPLORATION ID
B-016-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 69+81 / 8' LT
C ALIGNMENT: SR 850
1/22 ELEVATION: 671.1 (MSL) EOB:
7 LAT / LONG: 38.867257, -82.29947

EXPLORATION ID
B-017-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/6/23 END: 2/6/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 73+75 / 8' RT ALIGNMENT: SR 850	EXPLORATION ID B-018-0-23																
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 678.0 (MSL) EOB: 6.0 ft. LAT / LONG: 38.868331, -82.299260	PAGE 1 OF 1																
MATERIAL DESCRIPTION AND NOTES		ELEV. 678.0	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
1.3'- ASPHALT (14.75")									GR	CS	FS	SI	CL	LL	PL	PI				
LOOSE, DARK GRAY AND GRAY GRAVEL WITH SAND, MOIST.			676.7																	
STIFF, REDDISH BROWN CLAY, SOME SILT, TRACE FINE GRAVEL, MOIST.			675.0																	
			672.0																	
			EOB	6																



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	77+9 / 8' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	665.1 (MSL) EOB: 6.
7	LAT / LONG:	38.869247, -82.299268

EXPLORATION ID
B-019-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 80+80 / 9' RT
C ALIGNMENT: SR 850
1/22 ELEVATION: 677.4 (MSL) EOB:
7 LAT / LONG: 38.870266, -82.29907

EXPLORATION ID
B-020-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/7/23 END: 2/7/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	84+76 / 8' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	694.2 (MSL) EOB: 6.
7	LAT / LONG:	38.871346, -82.299091

EXPLORATION ID
B-021-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.

 PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/8/23 END: 2/8/23	DRILLING FIRM / OPERATOR: RII / LH	DRILL RIG: CME 55 (386345)	STATION / OFFSET: 88+83 / 9' RT	EXPLORATION ID B-022-0-23
	SAMPLING FIRM / LOGGER: RII / IS	HAMMER: AUTOMATIC	ALIGNMENT: SR 850	
	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 3/21/22	ELEVATION: 692.4 (MSL)	6.0 ft.
	SAMPLING METHOD: SPT	ENERGY RATIO (%): 87	LAT / LONG: 38.872439, -82.298875	PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 692.4	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
0.3'- ASPHALT (4.25")		692.1																	
0.7'- AGGREGATE BASE (8.25")		691.3																	
STIFF, LIGHT AND DARK BROWN CLAY, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		689.4																	
HARD, REDDISH BROWN SILTY CLAY, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		686.4																	
		EOB	6																

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/6/23 END: 2/6/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 92+76 / 6' LT ALIGNMENT: SR 850	EXPLORATION ID B-023-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 667.6 (MSL) EOB: 6.0 ft. LAT / LONG: 38.873540, -82.298856	PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 667.6	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
0.6'- ASPHALT (7.0")		667.0																	
0.4'- AGGREGATE BASE (4.5")		666.6																	
VERY STIFF, BROWN SILT AND CLAY, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		663.1																	
MEDIUM STIFF, BROWN TO GRAY SANDY SILT, LITTLE CLAY, TRACE FINE GRAVEL, MOIST.		661.6																	
		EOB	6																

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/6/23 END: 2/6/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 94+26 / 8' RT ALIGNMENT: SR 850	EXPLORATION ID B-024-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 664.8 (MSL) EOB: 9.5 ft. LAT / LONG: 38.873946, -82.298701	PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 664.8	DEPTHs	SPT / RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
0.7'- ASPHALT (8.25")																			
STIFF, BROWN SANDY SILT, LITTLE CLAY, LITTLE FINE GRAVEL, MOIST.		664.1																	
VERY LOOSE TO DENSE, BROWN SANDY SILT, LITTLE CLAY, MOIST.		661.6																	
HARD, LIGHT BROWN SILT AND CLAY, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -WEATHERED SILTSONE PRESENT		657.8																	
		655.3																	
		EOB																	

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/6/23 END: 2/6/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 96+72 / 8' RT ALIGNMENT: SR 850	EXPLORATION ID B-025-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 667.3 (MSL) EOB: 6.0 ft. LAT / LONG: 38.874631, -82.298631	PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 667.3	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
0.8'- ASPHALT (8.75")		666.5																	
0.3'- AGGREGATE BASE (4.25")		666.2																	
VERY STIFF, BROWN SANDY SILT, LITTLE CLAY, TRACE FINE GRAVEL, MOIST.		664.3																	
LOOSE, BROWN TO GRAY GRAVEL WITH SAND AND SILT, TRACE CLAY, MOIST.		662.8																	
SOFT, REDDISH BROWN SILTY CLAY, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		661.3																	
		EOB	6																

 PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/8/23 END: 2/8/23	DRILLING FIRM / OPERATOR: RII / LH	DRILL RIG: CME 55 (386345)	STATION / OFFSET: 185+85 / 13' RT	EXPLORATION ID B-026-0-23
	SAMPLING FIRM / LOGGER: RII / IS	HAMMER: AUTOMATIC	ALIGNMENT: SR 850	
	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 3/21/22	ELEVATION: 659.1 (MSL)	EOB: 6.0 ft.
	SAMPLING METHOD: SPT	ENERGY RATIO (%): 87	LAT / LONG: 38.898856, -82.296287	PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 659.1	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
1.0'- ASPHALT (12.0")																			
0.3'- AGGREGATE BASE (3.0")		658.1																	
DENSE, GRAY GRAVEL, LITTLE FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, DAMP.		657.7																	
MEDIUM STIFF TO VERY STIFF, GRAY TO BROWN SILT AND CLAY, "AND" COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		656.1																	
		653.1	EOB	6															



PROJECT: GAL-850-0.21 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/10/23 END: 2/10/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	189+63 / 7' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	656.1 (MSL) EOB: 6.
7	LAT / LONG:	38.899890, -82.296273

EXPLORATION ID
B-027-0-23

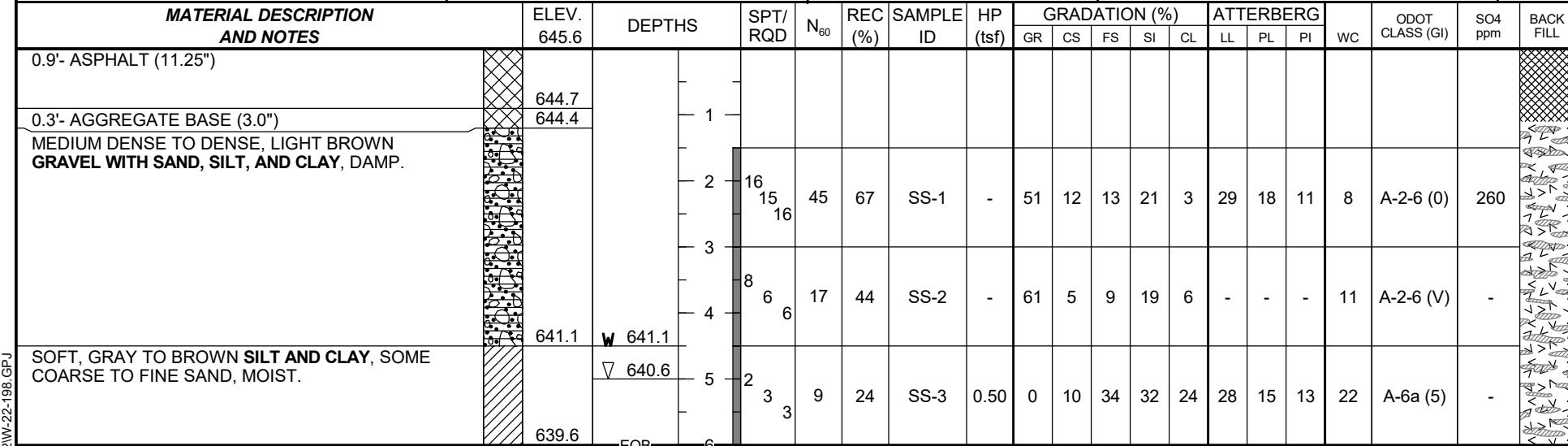
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.

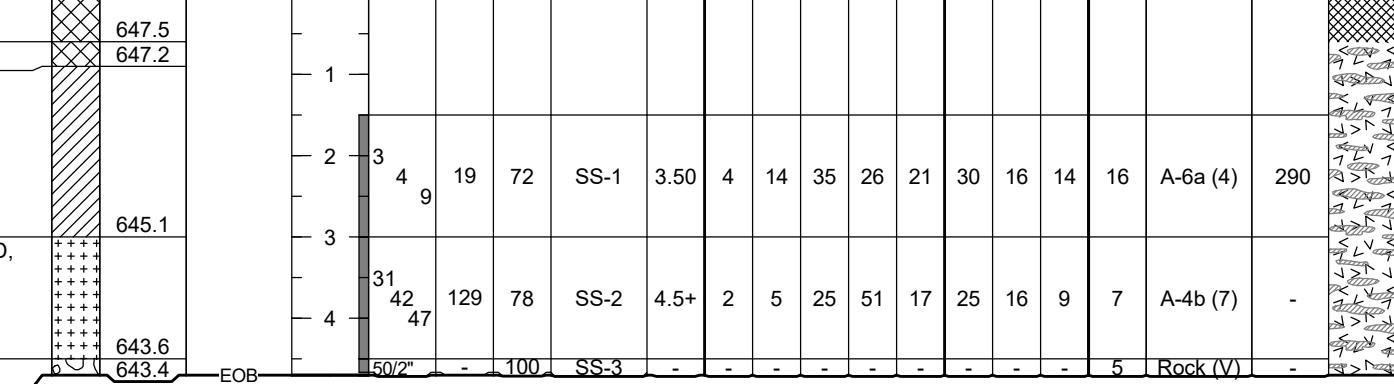
 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/8/23 END: 2/8/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 193+59 / 12' RT ALIGNMENT: SR 850	EXPLORATION ID B-028-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 649.7 (MSL) EOB: 6.0 ft. LAT / LONG: 38.900982, -82.296082	PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 649.7	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
								GR	CS	FS	SI	CL	LL	PL	PI				
0.3'- ASPHALT (4.5")		649.4																	
0.2'- AGGREGATE BASE (2.0")		649.2																	
MEDIUM STIFF, GRAY SANDY SILT, LITTLE CLAY, LITTLE FINE GRAVEL, MOIST.																			
		646.7																	
STIFF TO VERY STIFF, GRAY TO BROWN SILTY CLAY, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		644.7																	
HARD, BROWN SANDY SILT, LITTLE CLAY, LITTLE FINE GRAVEL, MOIST.		643.7																	
		EOB	6																

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/10/23 END: 2/10/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 197+57 / 8' LT ALIGNMENT: SR 850	EXPLORATION ID B-029-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 645.6 (MSL) EOB: 6.0 ft. LAT / LONG: 38.902073, -82.296050	PAGE 1 OF 1



 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/8/23 END: 2/8/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 201+52 / 7' RT ALIGNMENT: SR 850	EXPLORATION ID B-030-0-23																																																
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 645.9 (MSL) EOB: 6.0 ft. LAT / LONG: 38.903154, -82.295809	PAGE 1 OF 1																																																
	MATERIAL DESCRIPTION AND NOTES	ELEV. 645.9	DEPTHs	SPT / RQD N ₆₀																																																
				REC (%) HP (tsf)																																																
0.8'- ASPHALT (9.25")																																																				
0.3'- AGGREGATE BASE (3.25")																																																				
DENSE, LIGHT BROWN GRAVEL AND STONE FRAGMENTS WITH SAND, SILT, AND CLAY, DAMP.																																																				
HARD, BROWN SILT AND CLAY, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.																																																				
VERY SOFT, BROWN SILTY SAND, LITTLE CLAY, MOIST.																																																				
Elevations: 645.1, 644.8, 642.9, 641.4, 639.9, EOB																																																				
GRADATION (%) <table border="1"> <thead> <tr> <th>GR</th><th>CS</th><th>FS</th><th>SI</th><th>CL</th><th>LL</th><th>PL</th><th>PI</th> </tr> </thead> <tbody> <tr> <td>46</td><td>12</td><td>7</td><td>26</td><td>9</td><td>35</td><td>21</td><td>14</td> </tr> <tr> <td>4.50</td><td>2</td><td>1</td><td>21</td><td>57</td><td>19</td><td>28</td><td>17</td> </tr> <tr> <td>0.25</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </tbody> </table> ATTERBERG <table border="1"> <thead> <tr> <th>WC</th><th>ODOT CLASS (GI)</th><th>SO4 ppm</th><th>BACK FILL</th> </tr> </thead> <tbody> <tr> <td>9</td><td>A-2-6 (1)</td><td>100</td><td></td> </tr> <tr> <td>18</td><td>A-6a (8)</td><td>-</td><td></td> </tr> <tr> <td>24</td><td>A-4a (V)</td><td>-</td><td></td> </tr> </tbody> </table>					GR	CS	FS	SI	CL	LL	PL	PI	46	12	7	26	9	35	21	14	4.50	2	1	21	57	19	28	17	0.25	-	-	-	-	-	-	-	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL	9	A-2-6 (1)	100		18	A-6a (8)	-		24	A-4a (V)	-	
GR	CS	FS	SI	CL	LL	PL	PI																																													
46	12	7	26	9	35	21	14																																													
4.50	2	1	21	57	19	28	17																																													
0.25	-	-	-	-	-	-	-																																													
WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL																																																	
9	A-2-6 (1)	100																																																		
18	A-6a (8)	-																																																		
24	A-4a (V)	-																																																		

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/9/23 END: 2/9/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 205+55 / 9' LT ALIGNMENT: SR 850	EXPLORATION ID B-031-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 648.1 (MSL) EOB: 4.7 ft. LAT / LONG: 38.904243, -82.295784	PAGE 1 OF 1
	MATERIAL DESCRIPTION AND NOTES	ELEV. 648.1	DEPTHs	SPT/ RQD N ₆₀ REC (%) SAMPLE ID HP (tsf) GR CS FS SI CL LL PL PI WC ODOT CLASS (GI) SO4 ppm BACK FILL
	0.6'- ASPHALT (7.25") 0.3'- AGGREGATE BASE (3.75") VERY STIFF, REDDISH BROWN SILT AND CLAY, "AND" COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	647.5 647.2 645.1	1 2 3 4	643.6 643.4 EOB
				



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/8/23 END: 2/8/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	209+51 / 9' RT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	648.4 (MSL) EOB:
7	LAT / LONG:	38.905327, -82.29558

EXPLORATION ID
B-032-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/9/23 END: 2/9/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2010
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	213+50 / 10' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	649.7 (MSL) EOB:
7	LAT / LONG:	38.906426, -82.2956

EXPLORATION ID
B-033-0-23

6.0 ft. PAGE
2 1 OF 1

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/9/23 END: 2/9/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 217+45 / 7' RT ALIGNMENT: SR 850	EXPLORATION ID B-034-0-23
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 652.7 (MSL) EOB: 6.0 ft. LAT / LONG: 38.907494, -82.295309	PAGE 1 OF 1
	MATERIAL DESCRIPTION AND NOTES	ELEV. 652.7	DEPTHs	SPT/RQD N ₆₀
	0.8'- ASPHALT (14.25") 0.2'- AGGREGATE BASE (2.5") HARD, BROWN TO GRAY SILT , SOME CLAY, SOME COARSE TO FINE SAND, DAMP.	651.9 651.7 649.7 646.7	1 2 3 4 5 6	REC (%) HP (tsf) GR CS FS SI CL LL PL PI WC ODOT CLASS (GI) SO4 ppm BACK FILL
GRADATION (%)				
ATTERBERG				
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.				

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/9/23 END: 2/9/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 221+43 / 5' LT ALIGNMENT: SR 850	EXPLORATION ID B-035-0-23																	
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 659.4 (MSL) EOB: 6.0 ft. LAT / LONG: 38.908581, -82.295287	PAGE 1 OF 1																	
MATERIAL DESCRIPTION AND NOTES		ELEV. 659.4	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL	
1.2'- ASPHALT (13.5")									GR	CS	FS	SI	CL	LL	PL	PI					
0.3'- AGGREGATE BASE (3.25") MEDIUM STIFF TO VERY STIFF, BROWN SILT, LITTLE TO SOME CLAY, LITTLE TO SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -TRACE ROOT FIBERS IN SS-2			658.2		1																
			658.0		2	14 9 6	22 58	SS-1	2.00	2	6	22	52	18	24	17	7	19	A-4b (7)	<100	
					3																
					4	4 4 5	13 78	SS-2	1.00	3	7	13	54	23	28	18	10	22	A-4b (8)	-	
					5	4 5 7	17 75	SS-3	2.50	-	-	-	-	-	-	-	-	21	A-4b (V)	-	
			653.4	EOB	6																

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/9/23 END: 2/9/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 225+44 / 7' RT ALIGNMENT: SR 850	EXPLORATION ID B-036-0-23																		
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 663.4 (MSL) EOB: 6.0 ft. LAT / LONG: 38.909665, -82.295070	PAGE 1 OF 1																		
MATERIAL DESCRIPTION AND NOTES		ELEV. 663.4	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL		
1.2'- ASPHALT (13.75")									GR	CS	FS	SI	CL	LL	PL	PI						
0.2'- AGGREGATE BASE (2.0") VERY STIFF, BROWN SILTY CLAY, SOME FINE GRAVEL, LITTLE FINE TO COARSE SAND, DAMP.			662.2		1																	
MEDIUM DENSE, BROWN GRAVEL WITH SAND, SILT, AND CLAY, DAMP.			662.1		2	4	5	19	53	SS-1	3.00	32	9	7	32	20	39	21	18	17	A-6b (6)	220
			660.4		3																	
			657.4		4	5	4	13	39	SS-2	-	45	11	9	23	12	35	20	15	15	A-2-6 (1)	-
			657.4		5	5	7	23	50	SS-3	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	-
			657.4		6																	
			657.4		EOB																	



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/9/23 END: 2/9/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2008
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	229+39 / 5' LT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	667.8 (MSL) EOB: 6.0
7	LAT / LONG:	38.910756, -82.295034

EXPLORATION ID
B-037-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.



PROJECT: GAL-850-0.21 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/9/23 END: 2/9/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.5
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
" CFA	CALIBRATION DATE: 3/2000
SPT	ENERGY RATIO (%): 8

45) STATION / OFFSET: 233+36 / 5' RT
C ALIGNMENT: SR 850
1/22 ELEVATION: 674.1 (MSL) EOB: _____
7 LAT / LONG: 38.911841, -82.29484

EXPLORATION ID
B-038-0-23

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 12.5 LBS BENTONITE CHIPS AND SOIL CUTTINGS. PAVEMENT PATCHED WITH ASPHALT COLD PATCH.

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/9/23 END: 2/9/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 237+30 / 5' LT ALIGNMENT: SR 850	EXPLORATION ID B-039-0-23																			
	DRILLING METHOD: 4.5" CFA SAMPLING METHOD: SPT	CALIBRATION DATE: 3/21/22 ENERGY RATIO (%): 87	ELEVATION: 676.4 (MSL) EOB: 3.2 ft. LAT / LONG: 38.912919, -82.294796	PAGE 1 OF 1																			
	MATERIAL DESCRIPTION AND NOTES		ELEV. 676.4	DEPTHs	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL		
	1.3'- ASPHALT (14.5")									GR	CS	FS	SI	CL	LL	PL	PI						
0.3'- AGGREGATE BASE (3.5") HARD, LIGHT BROWN SANDY SILT, LITTLE CLAY, TRACE FINE GRAVEL, DAMP.			675.1			1																	
SILTSTONE : BROWN, HIGHLY WEATHERED.			674.9			2	11 23 33	81	72	SS-1	4.5+	7	4	24	48	17	28	19	9	11	A-4a (6)	360	
			673.4			3	50 1/2"	-	100	SS-2	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
			673.2	EOB																			



PROJECT: GAL-850-021 IMPROVEMENTS
TYPE: ROADWAY
PID: 117244 SFN: NA
START: 2/9/23 END: 2/9/23

DRILLING FIRM / OPERATOR: _____
SAMPLING FIRM / LOGGER: _____
DRILLING METHOD: _____ 4.
SAMPLING METHOD: _____

RII / LH	DRILL RIG: CME 55 (3863)
RII / IS	HAMMER: AUTOMATIC
5" CFA	CALIBRATION DATE: 3/2008
SPT	ENERGY RATIO (%): 8

45)	STATION / OFFSET:	240+76 / 7' RT
C	ALIGNMENT:	SR 850
1/22	ELEVATION:	665.4 (MSL) EOB: 0
7	LAT / LONG:	38.913856, -82.294608

EXPLORATION ID
B-040-0-23

 <p>PROJECT: GAL-850-0.21 IMPROVEMENTS TYPE: ROADWAY PID: 117244 SFN: NA START: 2/9/23 END: 2/9/23</p>	DRILLING FIRM / OPERATOR: RII / LH SAMPLING FIRM / LOGGER: RII / IS	DRILL RIG: CME 55 (386345) HAMMER: AUTOMATIC	STATION / OFFSET: 243+8 / 6' LT ALIGNMENT: SR 850	EXPLORATION ID B-041-0-23																				
	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 3/21/22	ELEVATION: 672.7 (MSL) EOB: 6.0 ft.	PAGE																				
	SAMPLING METHOD: SPT	ENERGY RATIO (%): 87	LAT / LONG: 38.914508, -82.294629	1 OF 1																				
	MATERIAL DESCRIPTION AND NOTES	ELEV. 672.7	DEPTH(S)	SPT/RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL				
0.8'- ASPHALT (9.25")									GR	CS	FS	SI	CL	LL	PL	PI								
0.3'- AGGREGATE BASE (4.25")			671.9			1															xxxxxx			
FILL: VERY DENSE, BLACK GRAVEL WITH SAND, TRACE SILT, DAMP. -ASPHALT FRAGMENTS IN SS-1			671.5			2	48 24 15	57	22	SS-1	-	-	-	-	-	-	-	7	A-1-b (V)	280	<><><><>			
VERY STIFF, BROWN SILTY CLAY, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			669.7			3															<><><><>			
			666.7			4	4 6 6	17	65	SS-2	2.50	-	-	-	-	-	-	-	A-6b (V)	-	<><><><>			
						5	5 7 9	23	69	SS-3	4.00	7	7	14	39	33	38	18	20	19	A-6b (11)	-	<><><><>	
						6																		
																	EOB							

APPENDIX V
PAVEMENT CORE DATA SHEETS



6350 Presidential Gateway
Columbus, Ohio 43231
Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-01
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-01	1.50	6	✓					- The core is separated between layers 1 & 2.
	1.50	5	✓					- Layer 1 is broken vertically throughout; it is also broken horizontally @ 7.00" & 8.50"; it is deteriorated.
	1.00	4	✓					- Layer 2 is deteriorating at the bottom.
	1.00	3	✓					
	1.00	2	✓					
	3.75	1	✓					
	3.50			✓				
								- Aggregate Base: Gravel (visual)



Total Pavement Thickness = 9.75 in. Total Asphalt Thickness = 9.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.50 in.





6350 Presidential Gateway
Columbus, Ohio 43231
Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-02
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

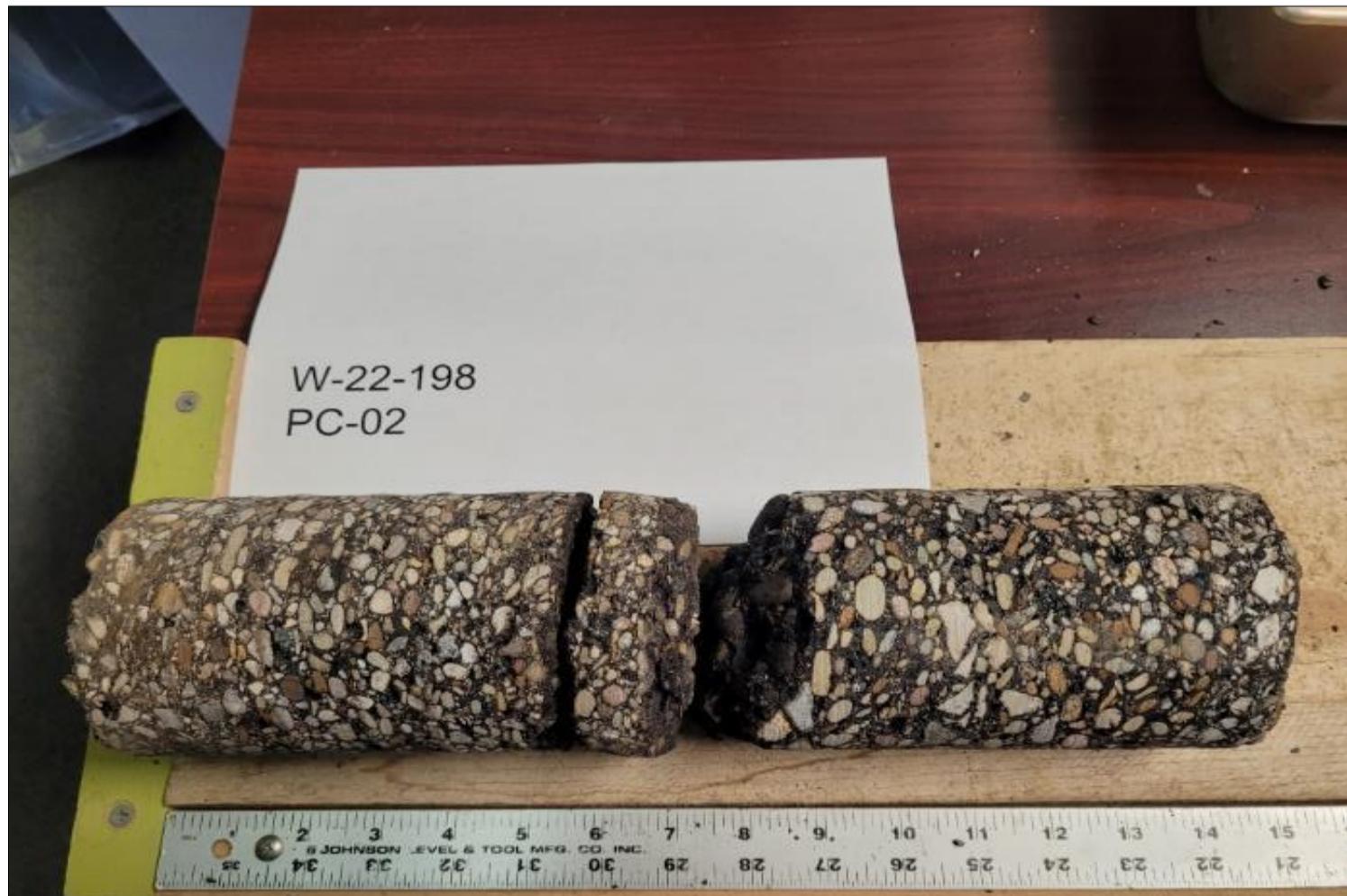
Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-02	1.00	10	✓					- The core separated between layers 4 & 5, and layers 5 & 6.
	1.00	9	✓					- Layer 4 is broken @ 7.00" to 8.50" & highly deteriorated throughout, it appears to have excess of asphalt binder.
	1.25	8	✓					- Layer 5 is deteriorated at the interface with layer 4.
	0.75	7	✓					
	1.75	6	✓					
	1.25	5	✓					
	2.00	4		✓				
	1.75	3		✓				
	1.50	2		✓				
	1.75	1		✓				
	5.50				✓			

- Aggregate Base:
Gravel with sand (visual)



Total Pavement Thickness = 14.00 in. Total Asphalt Thickness = 14.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 5.50 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-03
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

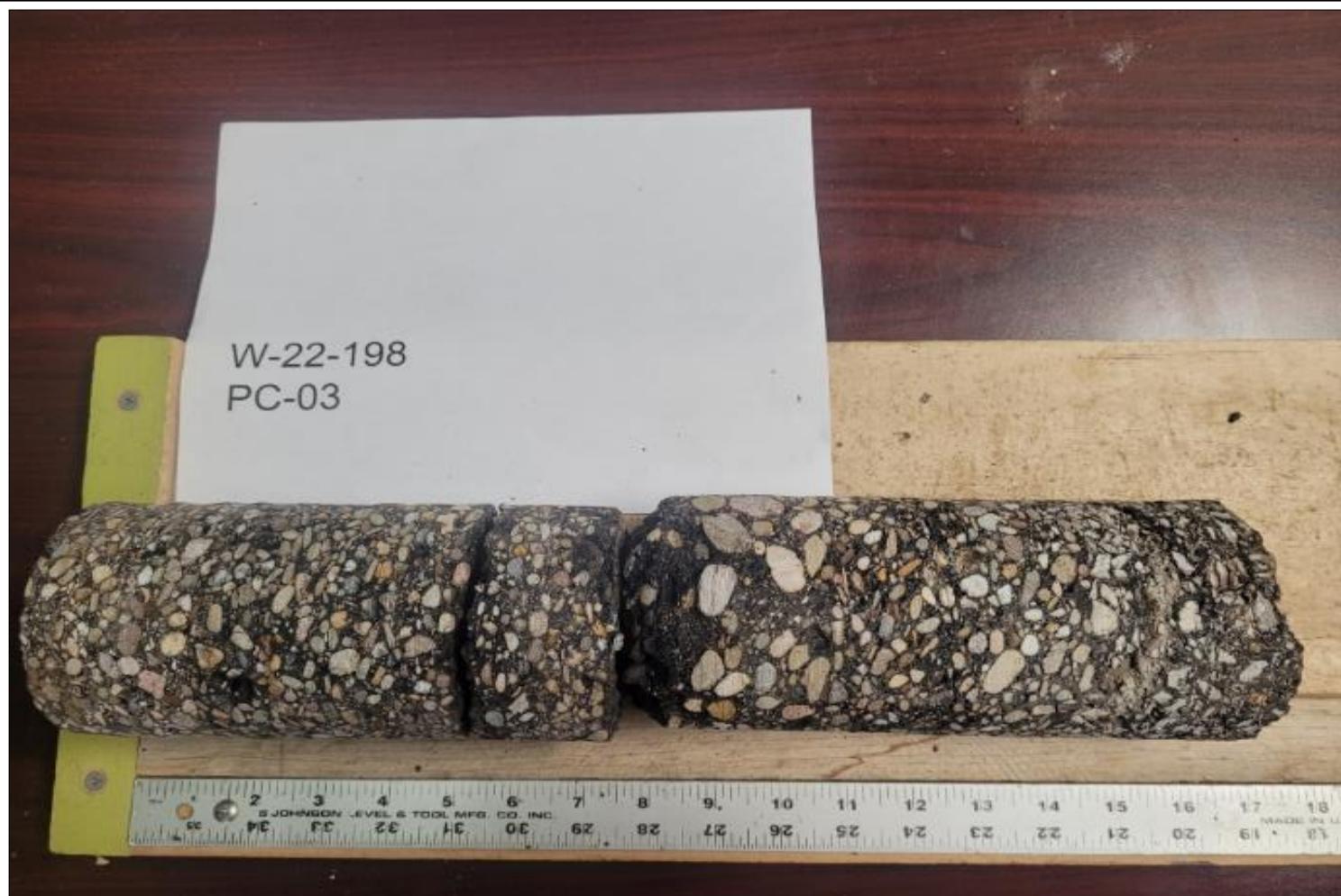
Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-03	1.50	10	✓					- The core separated between layers 5 & 6, and 6 & 7.
	1.50	9	✓					- Layer 1 is deteriorated & appears to have excess of asphalt binder
	1.25	8	✓					- Layer 4 has some voids due to loss of aggregates
	1.50	7	✓					- Layer 5 is deteriorated & appears to have excess of asphalt binder
	2.00	6	✓					- Layer 6 is deteriorating at interface with layer 7.
	2.75	5		✓				- Layer 9 has voids due to loss of aggregates
	1.50	4		✓				
	1.50	3	✓					
	1.00	2	✓					
	1.75	1	✓					
	4.00				✓			

- Aggregate Base:
Gravel with sand (visual)



Total Pavement Thickness = 16.25 in. Total Asphalt Thickness = 16.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 4.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-04
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

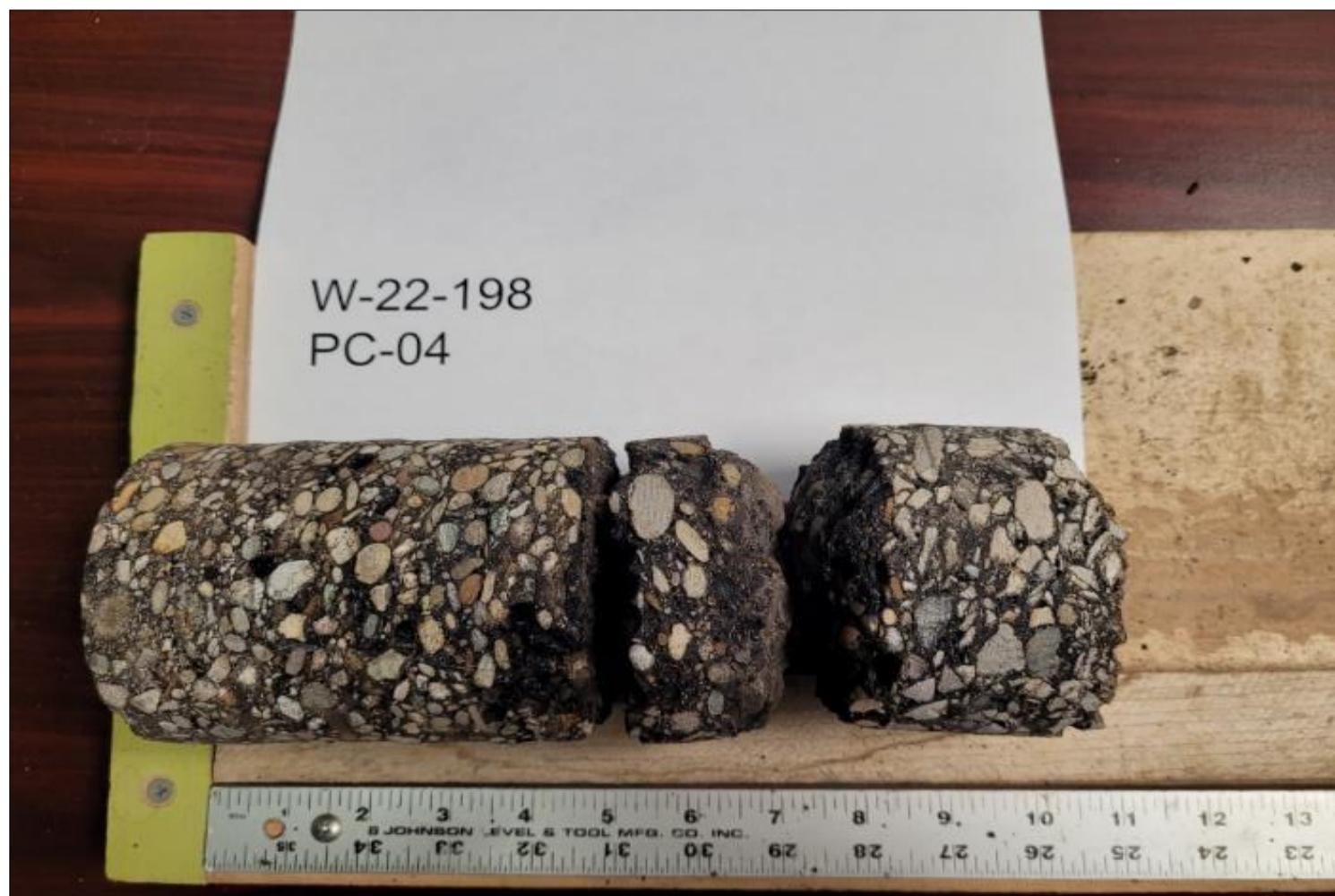
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-04	1.00	6	✓					- The core separated between layers 1 & 2, and 2 & 3.
	1.00	5	✓					- Layer 1 is deteriorated.
	1.50	4	✓					- Layer 2 is deteriorated.
	1.50	3	✓					- Layer 3 is slightly deteriorated, it has voids due to loss of aggregates
	2.00	2		✓				
	3.50	1		✓				
	2.50				✓			
								- Aggregate Base: Gravel with sand (visual)



Total Pavement Thickness = 10.50 in. Total Asphalt Thickness = 10.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.50 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-05
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-05	1.00	7	✓					- The core separated between layers 2 & 3, 3 & 4, and 4 & 5.
	1.00	6	✓					- Layer 2 is deteriorated at the top, with signs of stripping.
	2.00	5	✓					- Layer 3 is deteriorated; it has voids due to loss of aggregates
	2.00	4	✓					- Layer 4 is cracked horizontally @ 5.00".
	3.50	3		✓				- Layer 5 is cracked horizontally @ 2.75".
	2.50	2		✓				
	1.75	1		✓				
	2.00				✓			

- Aggregate Base:
Gravel with sand (visual)



Total Pavement Thickness = 13.75 in. Total Asphalt Thickness = 13.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-07
DATE CORE OBTAINED 2/7/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-07	1.25	4	✓					- The core is broken between layers 1 & 2.
	1.25	3		✓				- Layer 1 is disintegrated.
	1.75	2		✓				- Layer 2 is deteriorated and has voids likely due to compaction or segregation issues.
	3.25	1			✓			
	2.50					✓		

- Aggregate Base:
Gravel with sand (visual)



Total Pavement Thickness = 7.50 in. Total Asphalt Thickness = 7.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.50 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-08
DATE CORE OBTAINED 2/7/2023
CORE OBTAINED BY IS & LH

Core Composition

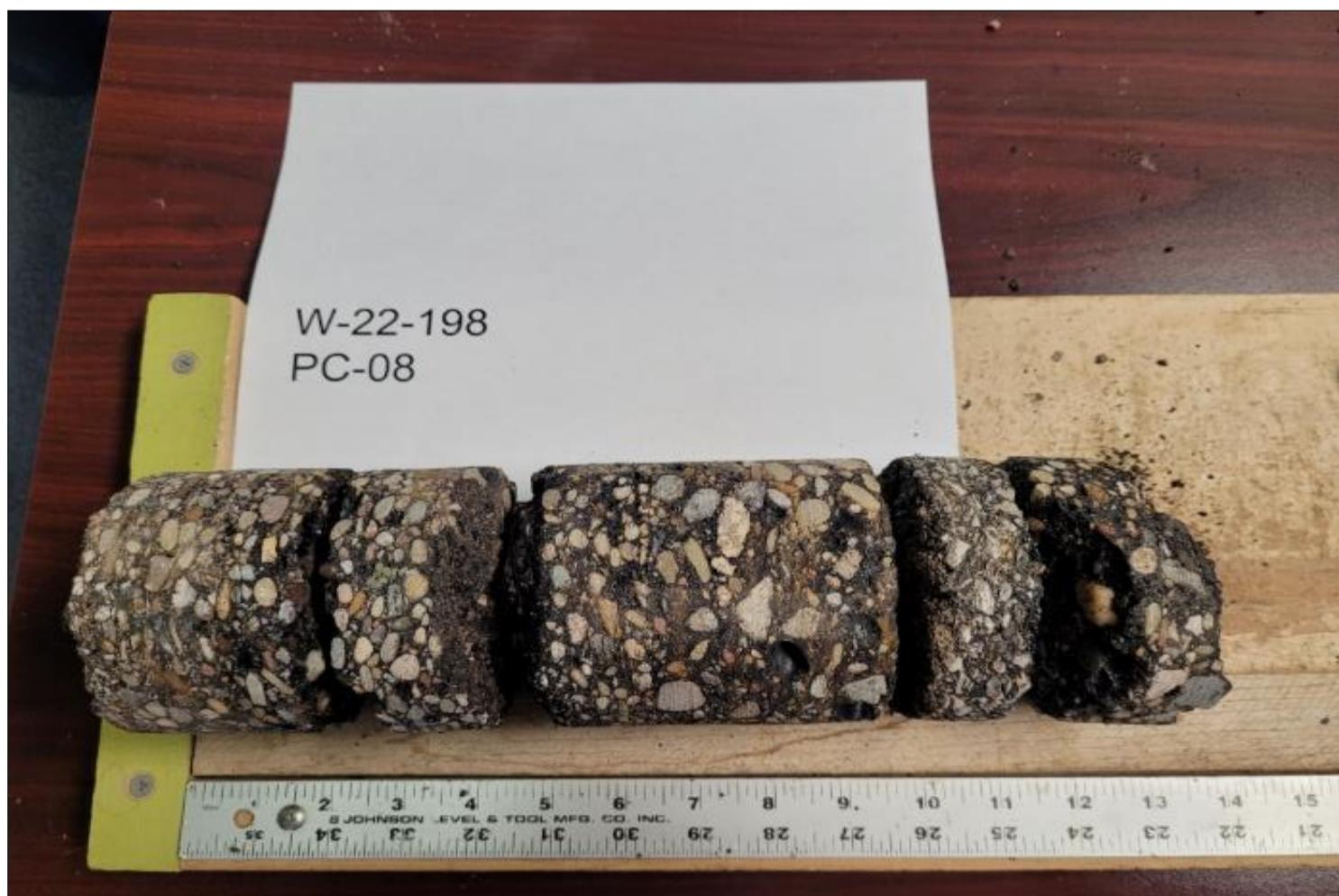
Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-08	1.00	9	✓					- The core separated between layers 1 & 2, 2 & 3, 5 & 6, and 6 & 7.
	1.00	8	✓					- Layer 1 is deteriorated and broken.
	1.00	7	✓					- Layers 3 has voids due to loss of aggregates.
	1.75	6	✓					- Layers 5 & 6 are deteriorated towards their interface.
	2.00	5	✓					- Layers 6 & 7 are deteriorated towards their interface.
	1.00	4			✓			
	1.50	3			✓			
	1.50	2		✓				
	2.25	1		✓				
	4.50				✓			

- Aggregate Base:
Gravel with sand (visual)



Total Pavement Thickness = 13.00 in. Total Asphalt Thickness = 13.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 4.50 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-09
DATE CORE OBTAINED 2/7/2023
CORE OBTAINED BY IS & LH

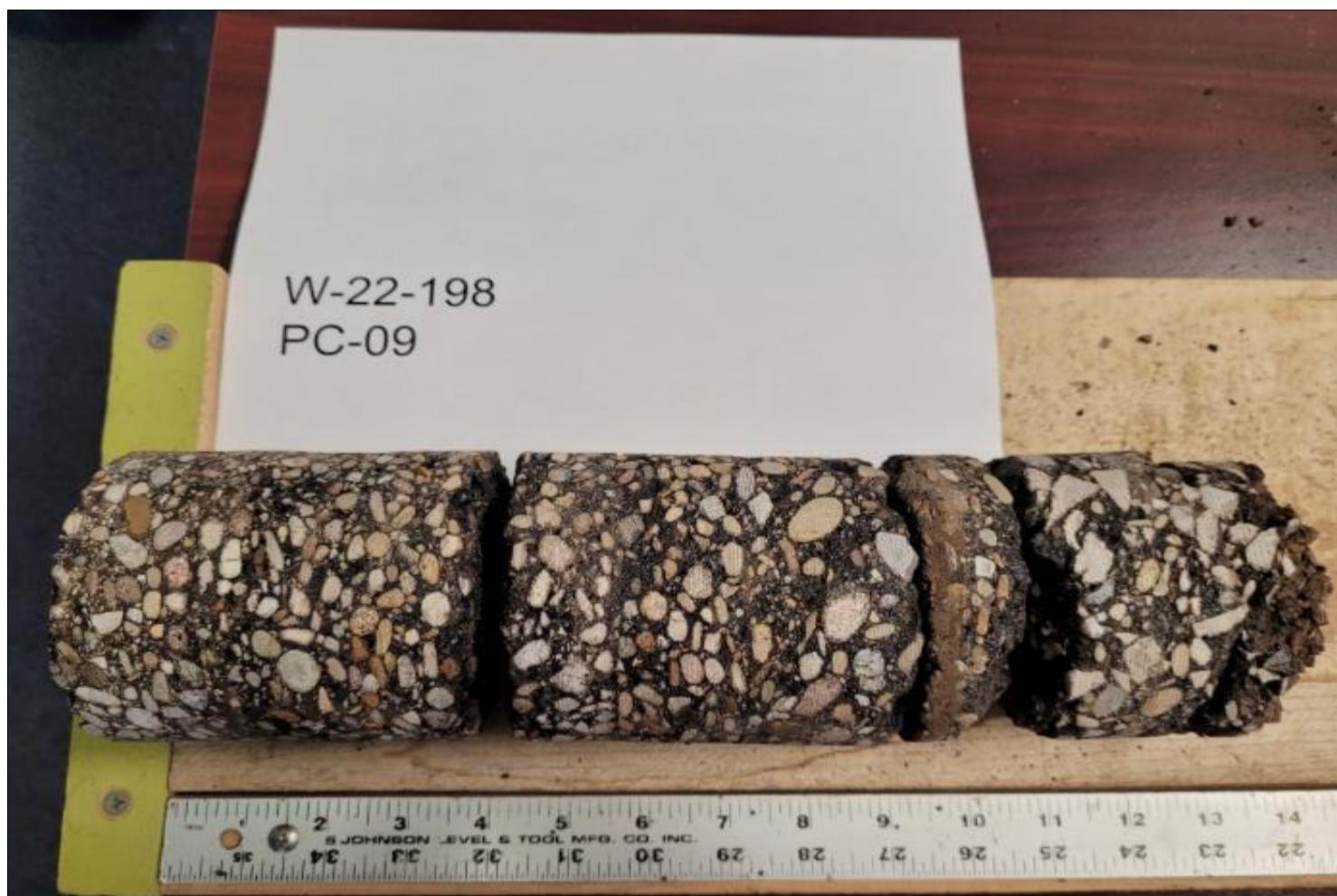
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-09	1.00	10	✓					- The core separated between layers 1 & 2, 2 & 3, 3 & 4, and 6 & 7.
	1.00	9	✓					- Layers 1 through 3 are deteriorated
	1.00	8	✓					
	1.00	7	✓					
	1.75	6	✓					
	1.00	5	✓					
	2.00	4		✓				
	1.00	3		✓				
	2.00	2		✓				
	2.25	1		✓				- Aggregate Base: Gravel with sand, silt and clay (visual)
	4.00				✓			



Total Pavement Thickness = 14.00 in. Total Asphalt Thickness = 14.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 4.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-10
DATE CORE OBTAINED 2/7/2023
CORE OBTAINED BY IS & LH

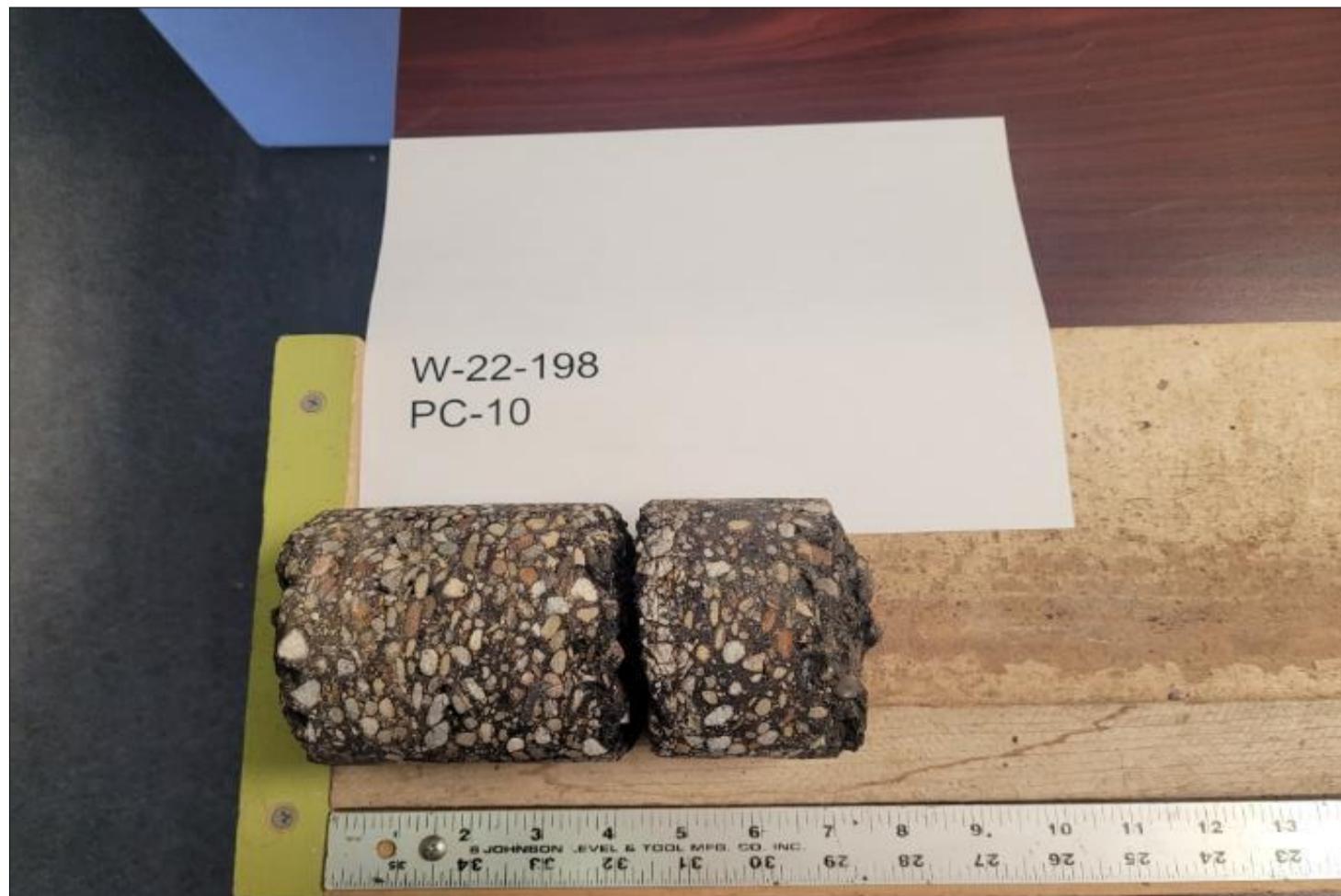
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-10	1.00	4	✓					- The core separated between layers 1 & 2.
	1.50	3	✓					- Layers 1 & 2 are slightly deteriorated towards their interface.
	1.50	2	✓					
	3.25	1	✓					
	2.75				✓			



Total Pavement Thickness = 7.25 in. Total Asphalt Thickness = 7.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.75 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-11
DATE CORE OBTAINED 2/7/2023
CORE OBTAINED BY IS & LH

Core Composition

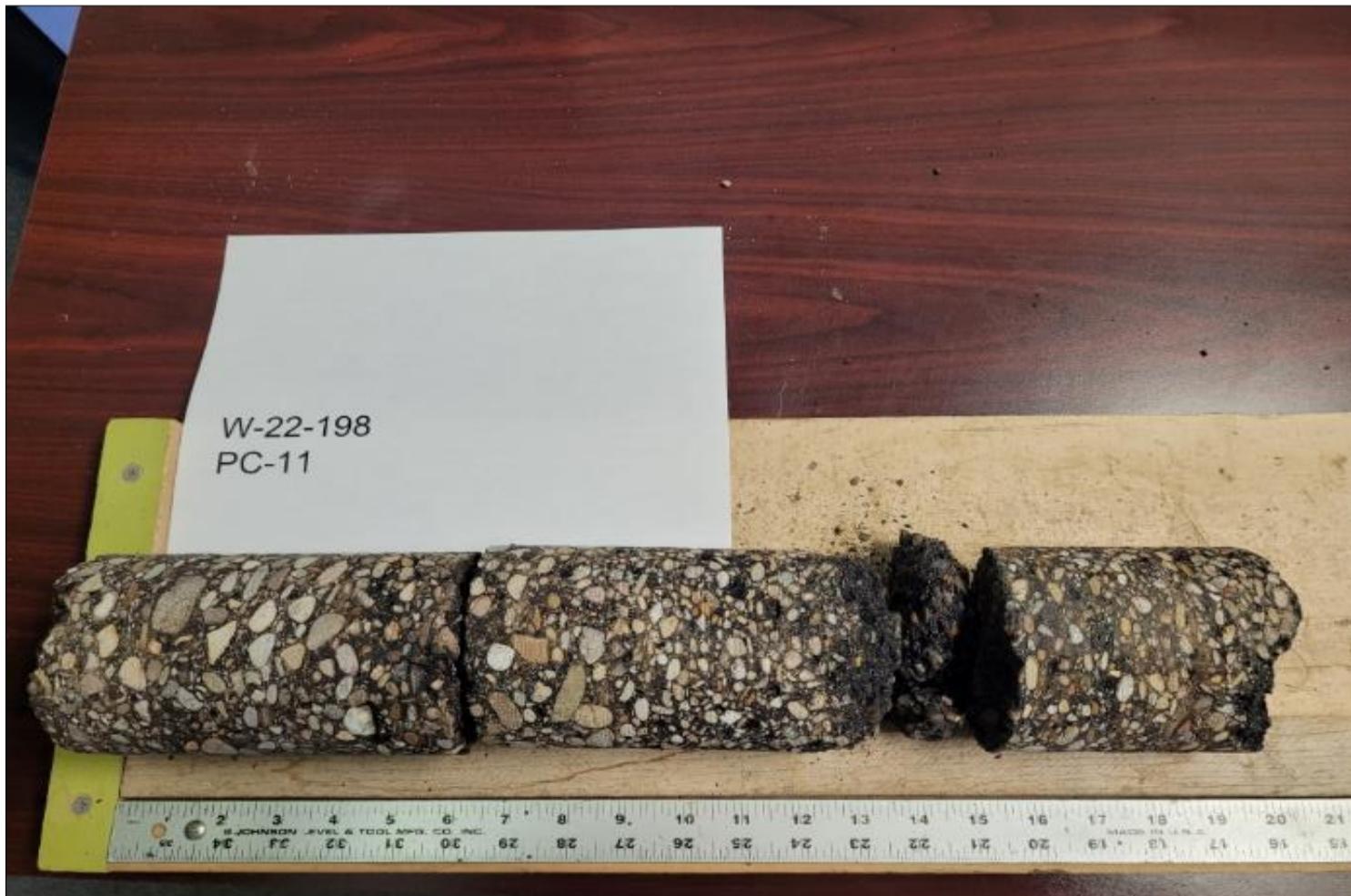
Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt			Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete	
PC-11	2.00	10	✓				- The core separated between layers 2 & 3, 3 & 4, and 8 & 9.
	2.00	9		✓			- Layer 1 is cracked from 18.5" to 19.5"
	1.50	8	✓				- Layer 3 is highly deteriorated with signs of stripping.
	1.50	7	✓				- Layer 4 has voids due to loss of aggregates.
	2.00	6		✓			- Layer 10 is slightly deteriorated.
	0.50	5	✓				
	4.00	4	✓				
	1.50	3	✓				
	3.00	2		✓			
	1.50	1	✓				
	2.00				✓		

- Aggregate Base:
Gravel with sand (visual)



Total Pavement Thickness = 19.50 in. Total Asphalt Thickness = 19.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-12
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-12	1.00	7	✓					- The core separated between layers 3 & 4.
	1.00	6	✓					- Layer 1 is deteriorated at the bottom.
	1.00	5	✓					- Layer 3 is deteriorated, with signs of stripping, it has voids due to loss of aggregates.
	2.75	4	✓					- Layer 4 is deteriorated, it has voids due to loss of aggregates.
	1.75	3		✓				
	1.00	2	✓					
	1.25	1	✓					
	1.75				✓			

Total Pavement Thickness = 9.75 in. Total Asphalt Thickness = 9.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 1.75 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-13
DATE CORE OBTAINED 2/6/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-13	0.75	6	✓					- The core is almost entirely disintegrated from 3.00" to 10.75", it is hard to discern layers
	2.25	5		✓				- Layer 1 is deteriorated and cracked from 13.5" to 14.5".
	7.75	4		✓				- Layers 3 is deteriorated.
	1.25	3		✓				- Layer 5 is cracked from 1.75" to 3.0".
	1.50	2		✓				
	1.00	1		✓				
								- Subbase: Silt and clay (visual)

Total Pavement Thickness = 14.50 in. Total Asphalt Thickness = 14.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 0.00 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-14
DATE CORE OBTAINED IS & LH
CORE OBTAINED BY 2/8/2023

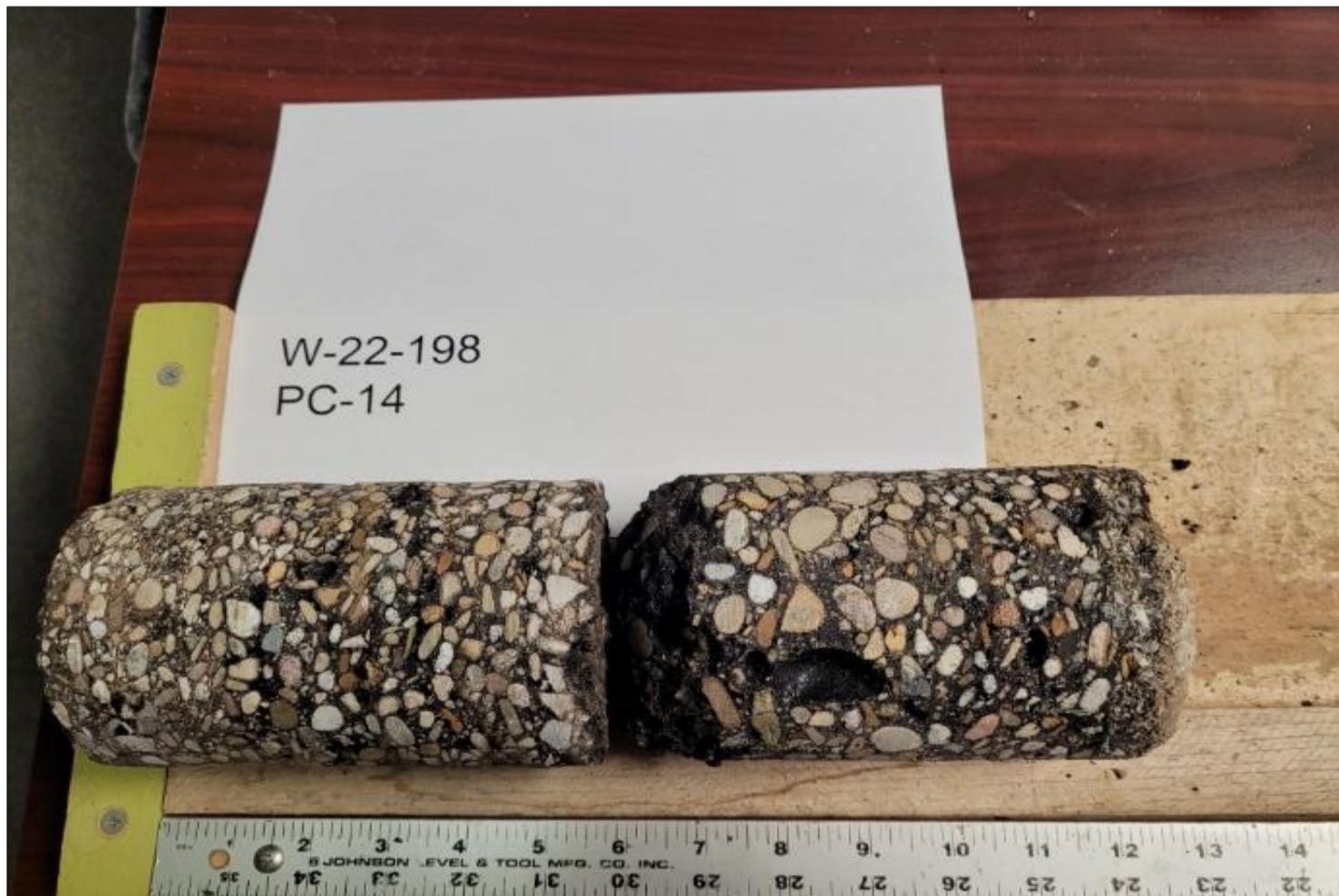
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-14	1.00	7	✓					- The core separated between layers 2 & 3.
	0.50	6	✓					- Layer 2 is deteriorated at the top, it has voids due to loss of aggregates.
	1.00	5	✓					- Layers 4 & 5 have voids due to loss of aggregates
	1.50	4	✓					
	2.00	3	✓					
	3.25	2		✓				
	2.75	1	✓					
	2.25				✓			
								- Aggregate Base: Gravel with sand (visual)



Total Pavement Thickness = 12.00 in. Total Asphalt Thickness = 12.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.25 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-15
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-15	1.25	9	✓					- Core is broken @ 7.25", within layer 5.
	0.75	8	✓					- Layer 4 has voids towards its interface with layers 3 & 5, due likely to compaction issues
	1.50	7	✓					
	2.00	6	✓					
	3.00	5	✓					
	2.00	4		✓				
	1.00	3		✓				
	1.00	2	✓					
	1.25	1	✓					
	1.75			✓				- Aggregate Base: Gravel with sand (visual)



Total Pavement Thickness = 13.75 in. Total Asphalt Thickness = 13.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 1.75 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-16
DATE CORE OBTAINED IS & LH
CORE OBTAINED BY 2/6/2023

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-16	0.75	8	✓					- The core separated between layers 1 & 2, 2 & 3; and 5 & 6.
	1.25	7	✓					- Layers 1 & 2 are deteriorated with signs of stripping.
	1.50	6	✓					- Layer 3 is deteriorated at the bottom.
	1.75	5	✓					- Layers 5 & 6 are deteriorated towards their interface.
	2.00	4	✓					- Layer 6 has voids due to loss of aggregates
	2.75	3		✓				
	1.00	2		✓				
	2.75	1		✓				

Total Pavement Thickness = 13.75 in. Total Asphalt Thickness = 13.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 0.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

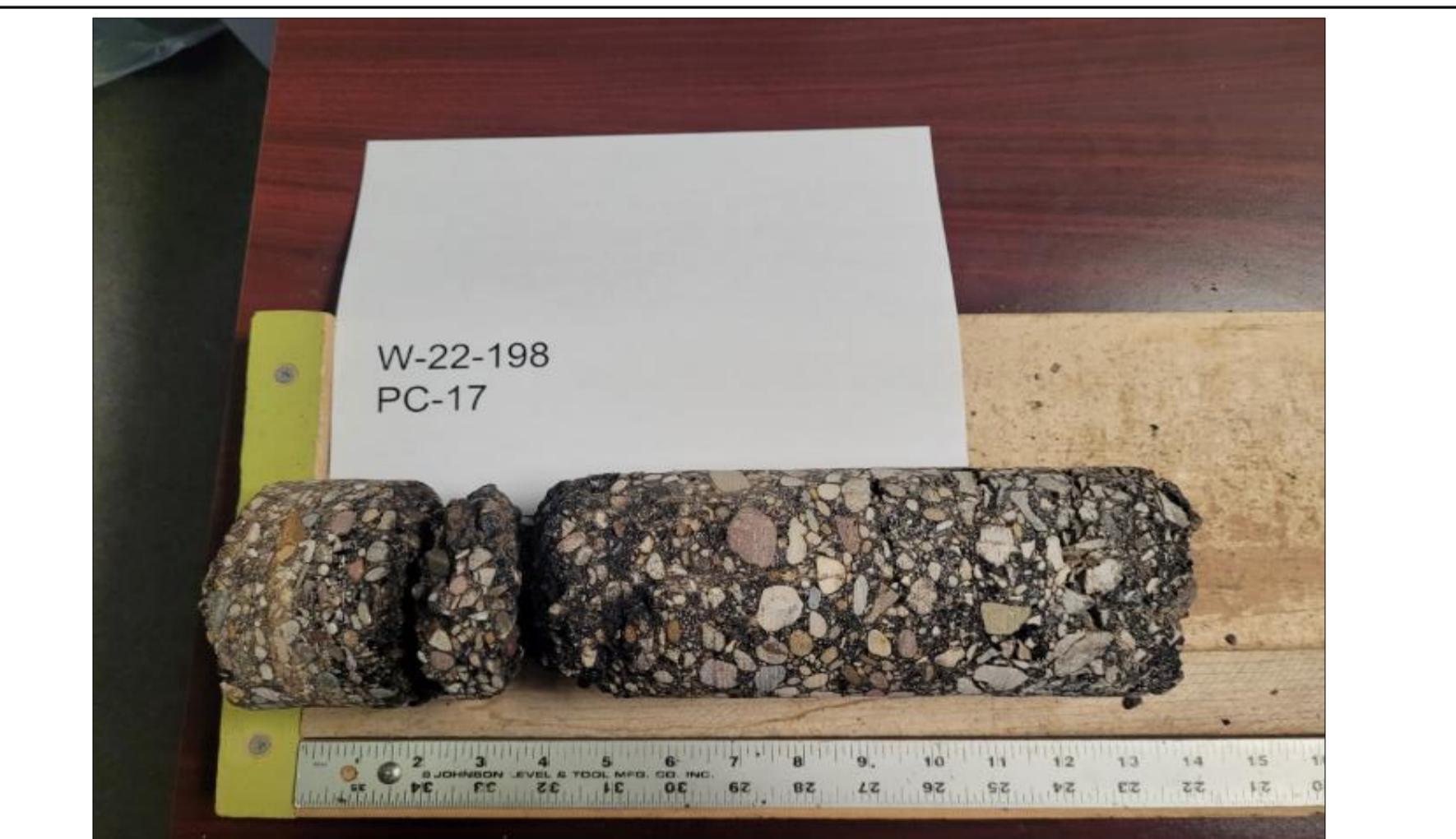
BORING/CORE No. PC-17
DATE CORE OBTAINED IS & LH
CORE OBTAINED BY 2/8/2023

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-17	1.00	8	✓					- The core separated between layers 5 & 6, and 6 & 7.
	1.25	7	✓					- Layer 1 is deteriorated and cracked from 11.50" to 11.75", with voids due to loss of aggregates.
	1.50	6	✓					- Layer 2 is cracked horizontally @ 9.0"
	2.50	5	✓					- Layers 5 & 7 are deteriorated towards their interface with layer 6
	0.75	4		✓				- Layer 6 is highly deteriorated.
	1.75	3		✓				
	1.75	2	✓					
	2.75	1	✓					
	3.00			✓				- Aggregate Base: Silt and clay (visual)
								

Total Pavement Thickness = 13.25 in. Total Asphalt Thickness = 13.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.00 in.





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Pavement Core Data Summary

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LOCATION Gallia County, Ohio
JOB No. W-22-198

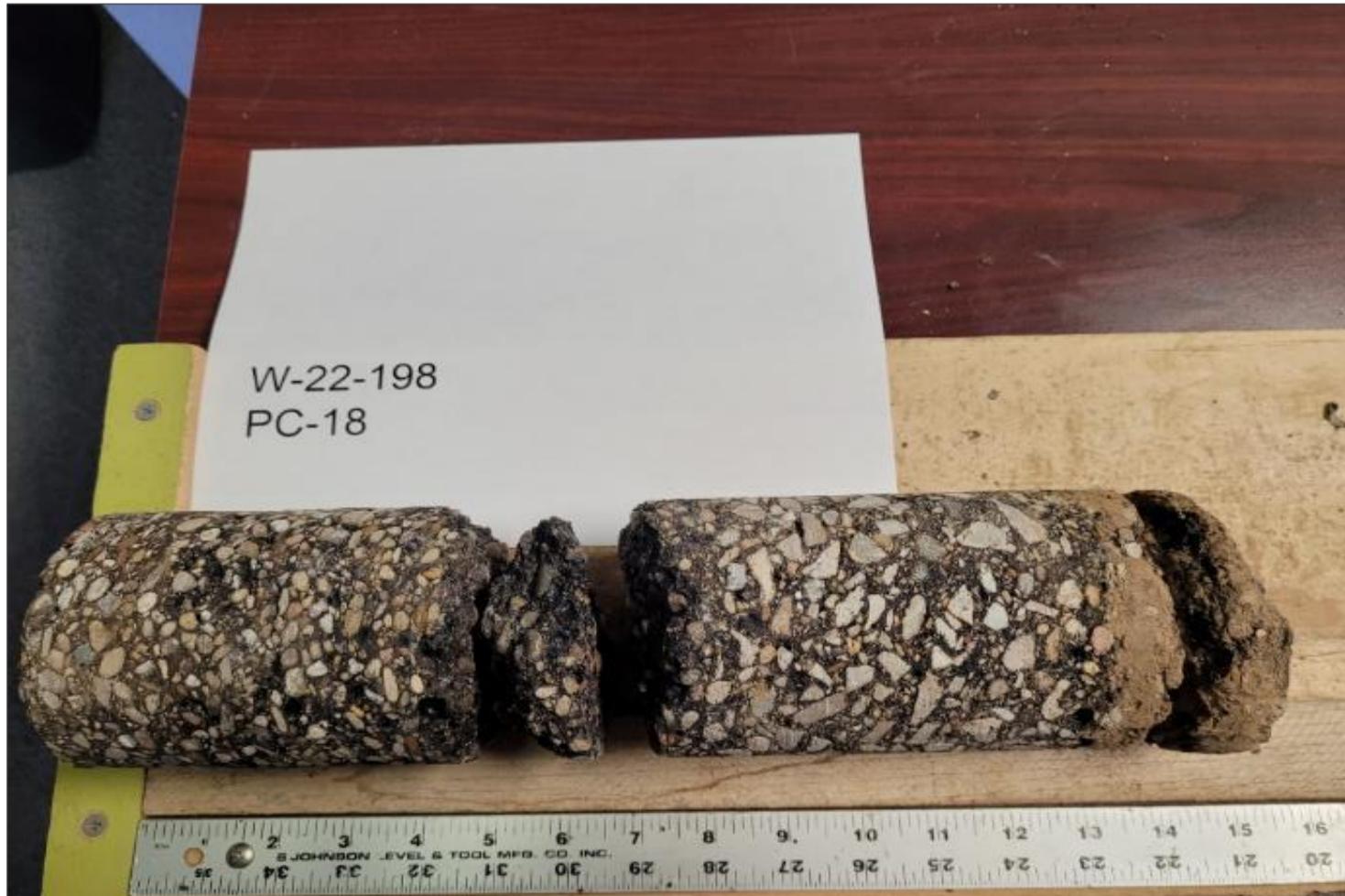
BORING/CORE No. PC-18
DATE CORE OBTAINED 2/6/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	- The core separated between layers 1 & 2, 5 & 6, and 6 & 7. - Layers 1, & 6 are highly deteriorated - Layers 5 & 7 are deteriorated towards their interface with layer 6. - Layers 2 & 3 have voids due to loss of aggregates
			Surface Binder	Intermediate Binder	Base Binder	Concrete	Aggregate/Granular Base	
PC-18	1.00	11	✓					
	1.00	10	✓					
	1.00	9	✓					
	1.25	8	✓					
	1.00	7	✓					
	2.25	6	✓					
	1.00	5	✓					
	2.00	4	✓					
	1.50	3	✓					
	1.50	2	✓					
	1.25	1	✓					

Total Pavement Thickness = 14.75 in. Total Asphalt Thickness = 14.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 0.00 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-19
DATE CORE OBTAINED 2/7/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-19	1.25	8	✓					- The core separated between layers 1 & 2.
	1.00	7	✓					- The core is broken @ 6.0", within layer 4
	1.50	6		✓				
	1.50	5		✓				
	2.00	4	✓					
	1.50	3			✓			
	1.25	2			✓			
	2.50	1		✓				
	3.00					✓		

Total Pavement Thickness = 12.50 in. Total Asphalt Thickness = 12.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

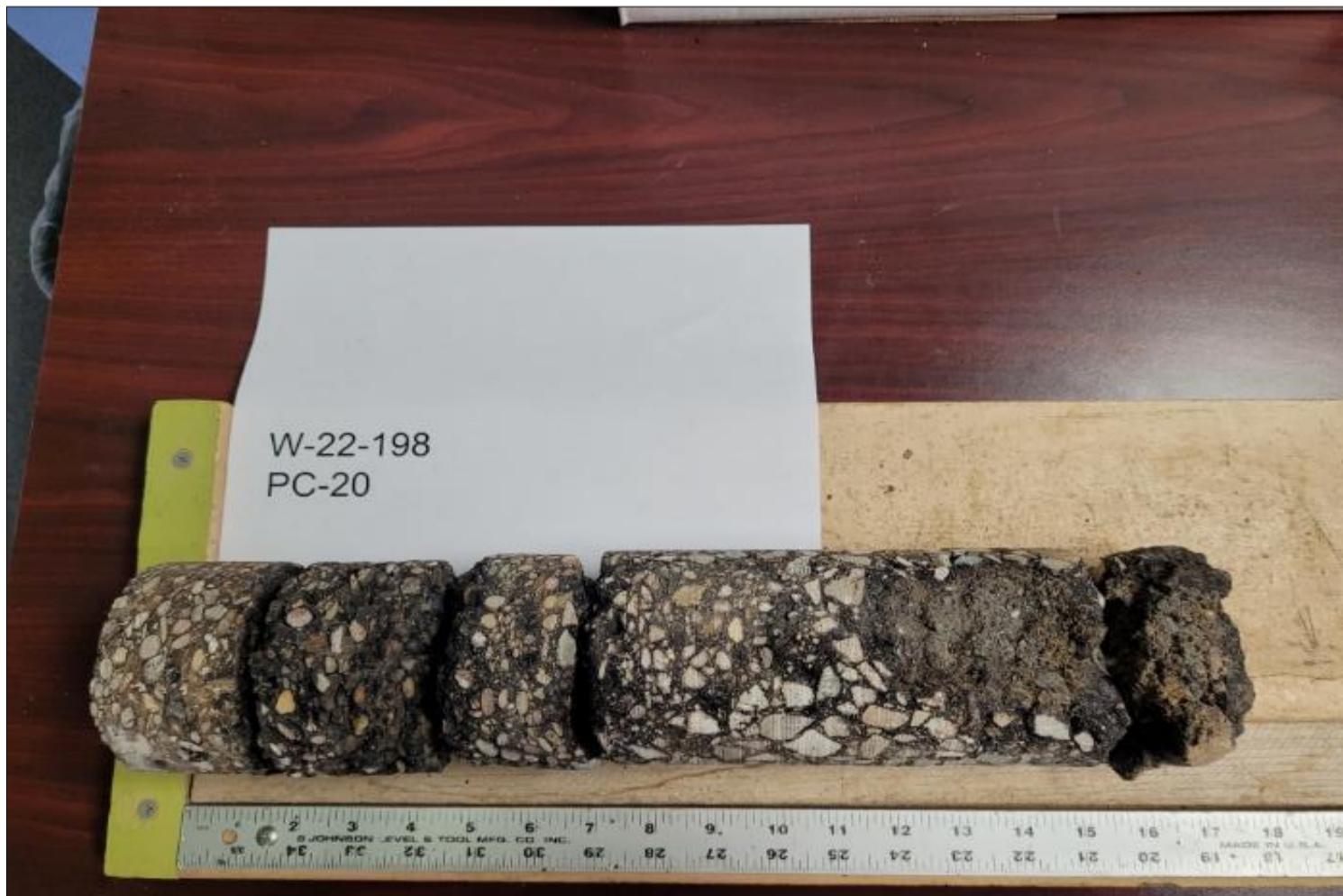
BORING/CORE No. PC-20
DATE CORE OBTAINED 2/6/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-20	1.00	9	✓					- The core is separated between layers 1 & 2, 5 & 6, 6 & 7, and 7 & 8.
	1.00	8	✓					- Core is deteriorated and cracked vertically from 11.0" to 17.0", through Layers 1 to 3.
	3.00	7	✓					- Layer 1 is highly deteriorated.
	2.00	6		✓				- Layer 5 through 8 are deteriorated towards the interface between the layers
	2.00	5		✓				- Layer 7 is deteriorated.
	2.00	4			✓			
	2.25	3			✓			
	2.25	2			✓			
	1.50	1			✓			

Total Pavement Thickness = 17.00 in. Total Asphalt Thickness = 17.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 0.00 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-21
DATE CORE OBTAINED IS & LH
CORE OBTAINED BY 2/7/2023

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-21	1.00	10	✓					- The core separated between layers 1 & 2.
	1.00	9	✓					- The core is broken @ 4.0", within layer 6.
	0.50	8	✓					- Layer 1 is highly deteriorated and cracked @12.25"
	1.25	7	✓					- Layer 6 is deteriorated
	2.75	6		✓				
	2.00	5			✓			
	1.00	4	✓					
	1.50	3		✓				
	1.25	2		✓				
	1.00	1		✓				
	2.25					✓		
Total Pavement Thickness =		13.25	in.	Total Asphalt Thickness =	13.25	in.	Total Concrete Thickness =	0.00 in.
							Total Base Thickness =	2.25 in.

- Aggregate Base:
Gravel (visual)





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-22
DATE CORE OBTAINED 2/6/2022
CORE OBTAINED BY IS & LH

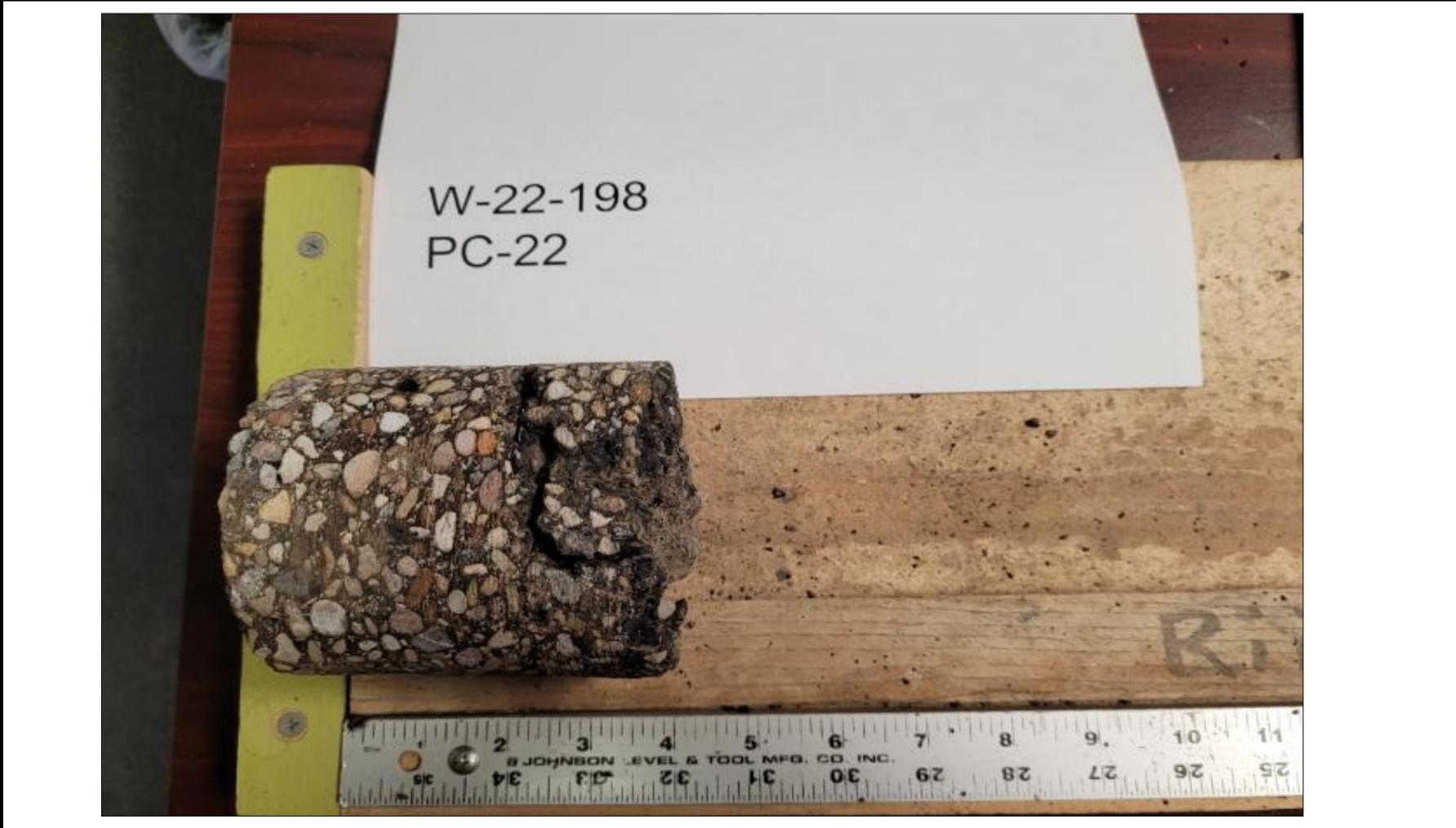
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-22	1.50	3	✓					- The core is broken vertically from 3.00" to 4.25", within layer 1
	1.50	2	✓					
	1.25	1	✓					
	8.25				✓			

Total Pavement Thickness = 4.25 in. Total Asphalt Thickness = 4.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 8.25 in.

- Aggregate Base:
Gravel with sand (visual)





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-23
DATE CORE OBTAINED 2/6/2023
CORE OBTAINED BY IS & LH

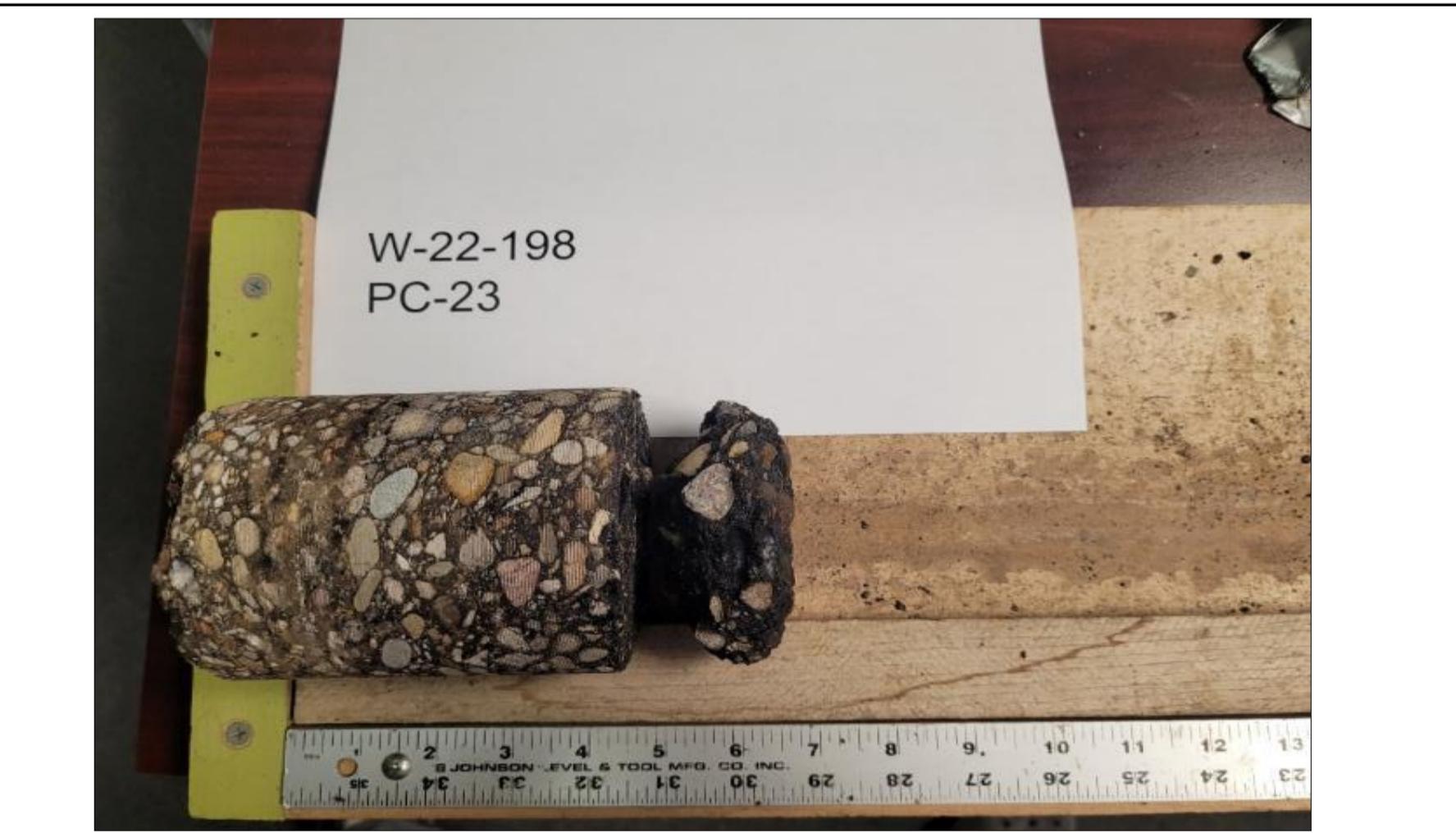
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-23	1.00	4	✓					- The core separated between layers 1 & 2.
	1.25	3		✓				- Layer 1 is highly deteriorated
	2.25	2		✓				- Layer 4 is slightly deteriorating.
	2.50	1		✓				
	4.50				✓			



Total Pavement Thickness = 7.00 in. Total Asphalt Thickness = 7.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 4.50 in.





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Pavement Core Data Summary

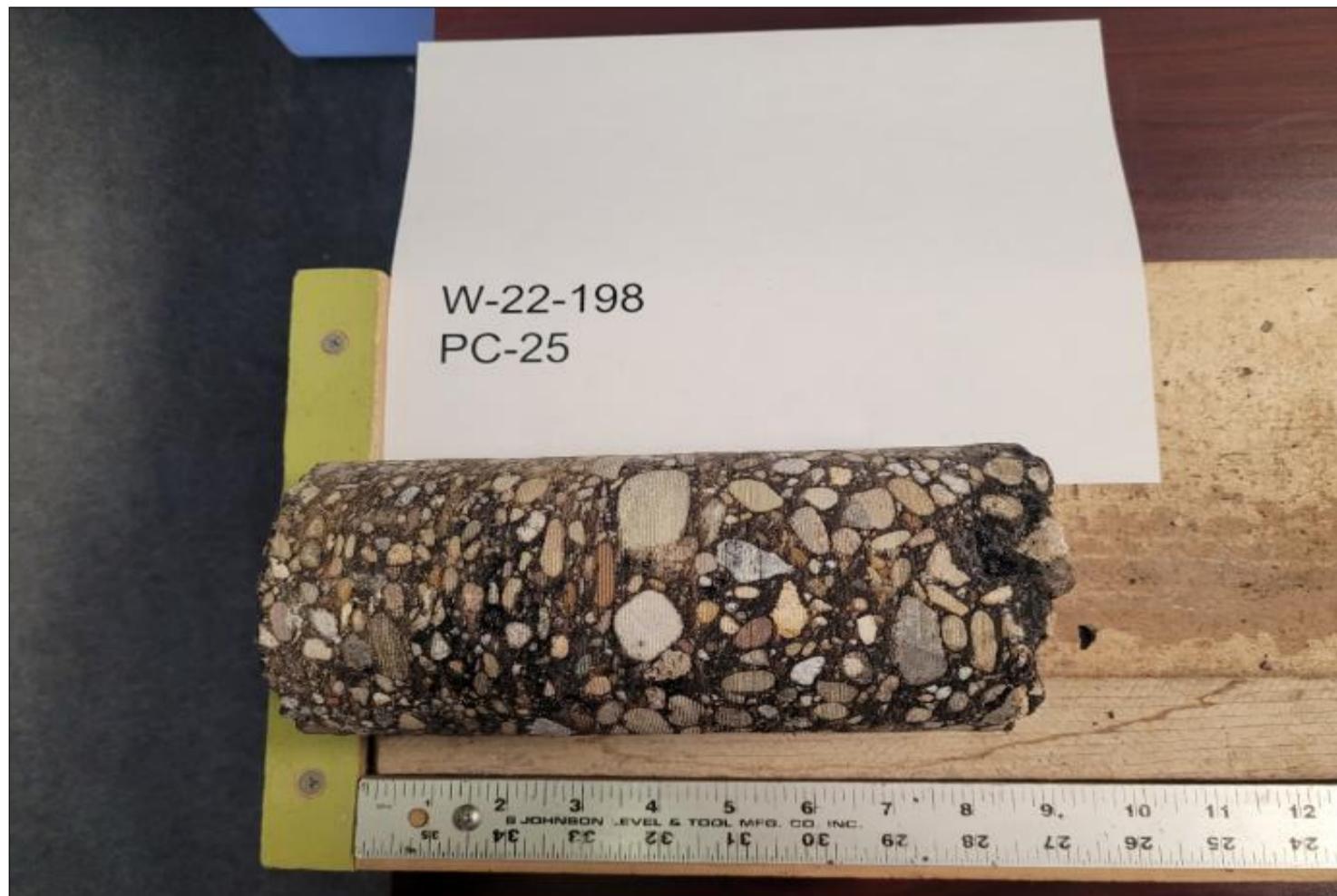
PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-25
DATE CORE OBTAINED 2/6/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-25	1.00	6	✓					- The core is intact
	1.75	5	✓					- Layer 1 is slightly deteriorated at the bottom
	1.25	4		✓				
	0.75	3			✓			
	1.25	2		✓				
	2.75	1			✓			
	4.25					✓		
Total Pavement Thickness =		8.75	in.	Total Asphalt Thickness =	8.75	in.	Total Concrete Thickness =	0.00 in.
							Total Base Thickness =	4.25 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

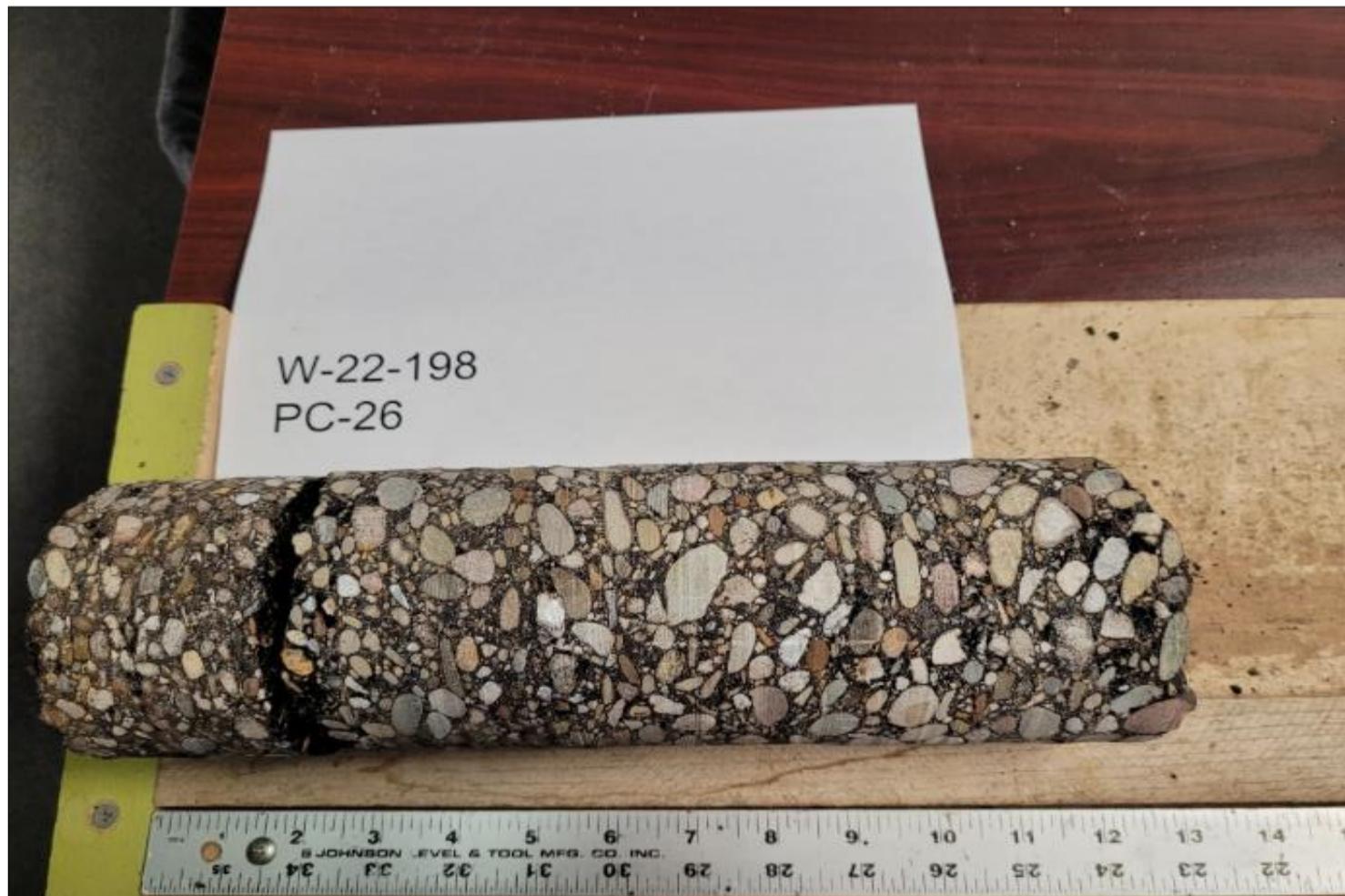
BORING/CORE No. PC-26
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-26	1.25	6	✓					- The core separated @ 2.5", between layers 4 & 5.
	1.25	5	✓					- Layers 1 has voids likely due to compaction issues.
	2.50	4	✓					- Layer 4 is slightly deteriorated towards the interface with layer 5.
	2.50	3	✓					
	2.00	2	✓					
	2.50	1	✓					
	3.00				✓			

Total Pavement Thickness = 12.00 in. Total Asphalt Thickness = 12.00 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.00 in.





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Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-28
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-28	1.25	3	✓					- Layers 1 is broken diagonally from @ 2.50" to 4.50". It is deteriorated with signs of stripping.
	1.00	2	✓					
	2.25	1	✓					
	2.00				✓			



Total Pavement Thickness = 4.50 in. Total Asphalt Thickness = 4.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.00 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-29
DATE CORE OBTAINED 2/10/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-29	1.25	7	✓					- The core is broken @ 4.5", 7.25", 9.0", and 9.5", It is difficult to discern between layers
	1.25	6	✓					- Layer 1 is highly deteriorated and broken vertically.
	2.25	5	✓					- Layers 2, 3 & 4 (from 4.75" to 9.5") are deteriorated.
	2.50	4	✓					
	1.75	3	✓					
	0.50	2	✓					
	1.75	1	✓					
	3.00				✓			
								- Aggregate Base: Gravel (visual)



Total Pavement Thickness = 11.25 in. Total Asphalt Thickness = 11.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.00 in.





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Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-30
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-30	1.00	7	✓					- The core separated between layers 1 & 2, and 4 & 5.
	1.00	6	✓					- Layer 1 is deteriorated.
	2.00	5	✓					- Layer 3 has voids due to loss of aggregates
	1.00	4	✓					
	1.50	3	✓					
	1.50	2	✓					
	1.25	1	✓					
	3.25				✓			
								- Aggregate Base: Gravel (visual)

Total Pavement Thickness = 9.25 in. Total Asphalt Thickness = 9.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.25 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-31
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

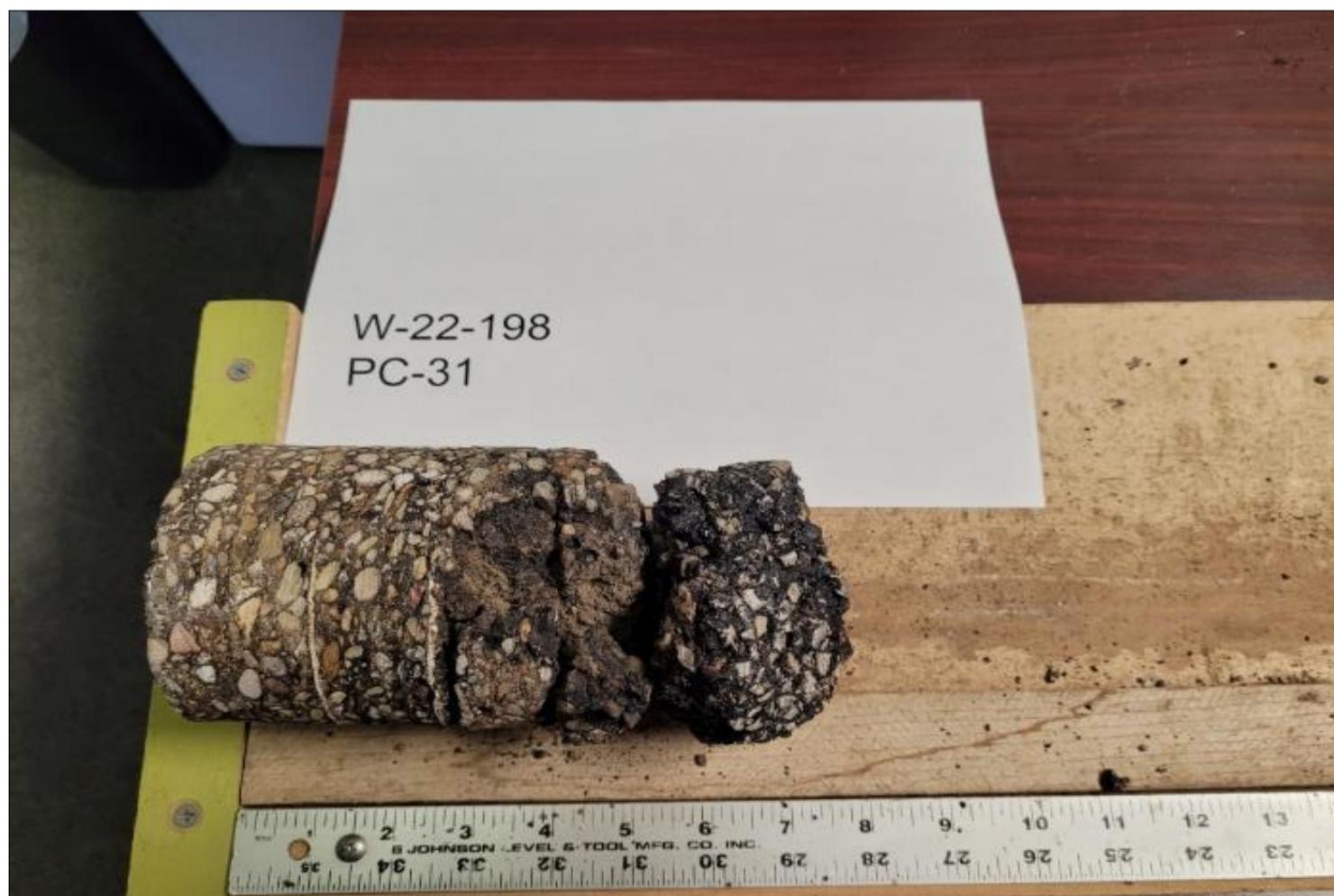
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-31	0.75	6	✓					- The core is separated between layers 1 & 2.
	1.00	5	✓					- Layer 1 is highly deteriorated with signs of stripping
	1.25	4	✓					- Layer 2 is highly deteriorated and cracked horizontally @ 4.5"
	2.50	2	✓					
	1.75	1	✓					
	3.75			✓				
								- Aggregate Base: Gravel (visual)



Total Pavement Thickness = 7.25 in. Total Asphalt Thickness = 7.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.75 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-32
DATE CORE OBTAINED 2/8/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-32	1.75	6	✓					- The core separated between layers 2 & 3. - Layer 1 is broken and highly deteriorated.
	1.25	5		✓				
	2.00	4			✓			
	2.50	3			✓			
	2.25	2		✓				
	2.00	1		✓				
	3.75				✓			

Total Pavement Thickness = 11.75 in. Total Asphalt Thickness = 11.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.75 in.





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Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Pavement Core Data Summary

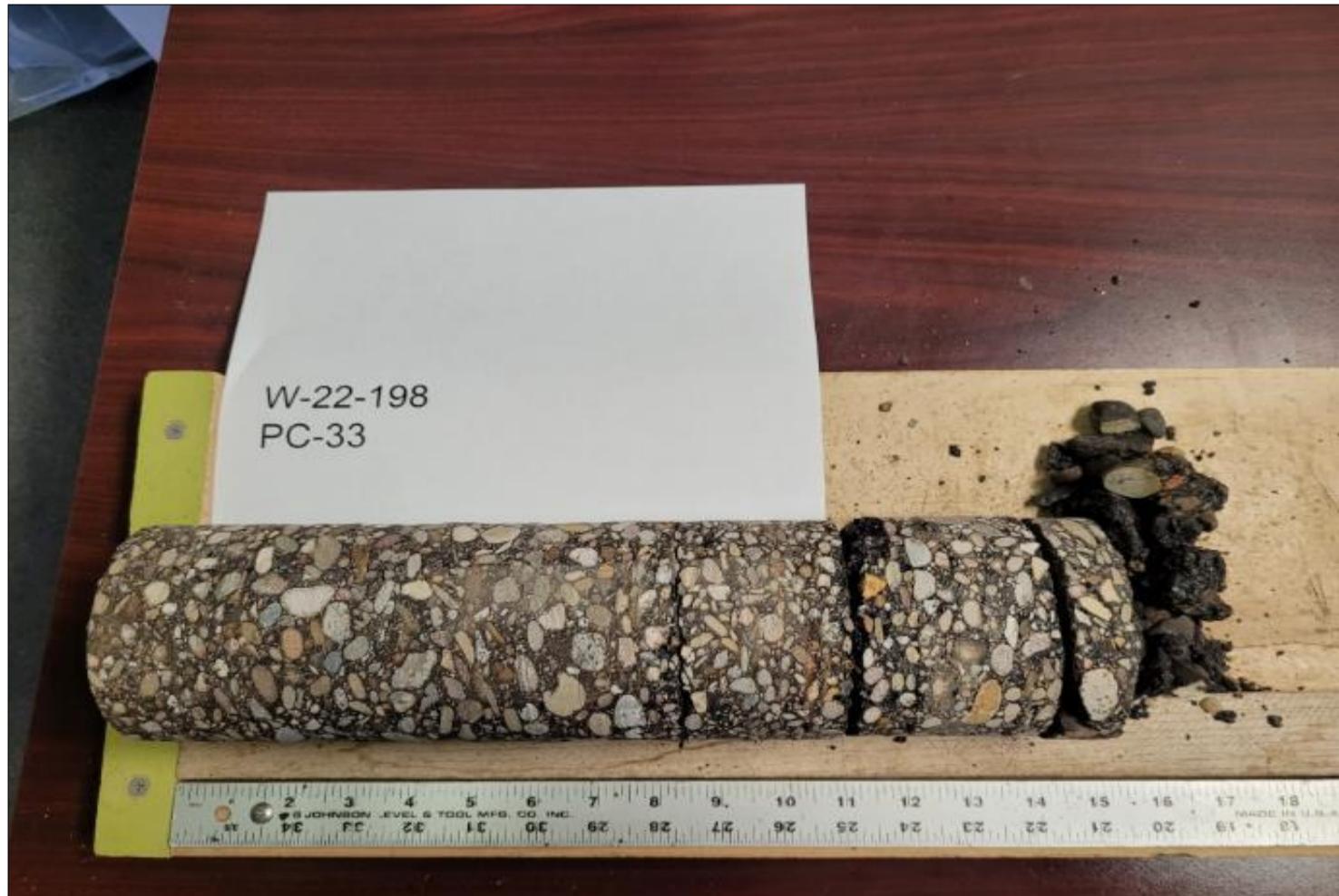
PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-33
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-33	1.25	10	✓					- The core separated between layers 2 & 3, and 4 & 5.
	1.00	9	✓					- The core is broken @ 8.5", within layer 5
	1.75	8		✓				- Layer 1 is entirely disintegrated.
	2.00	7		✓				- Layer 4 is slightly deteriorated at the top.
	2.00	6		✓				
	3.00	5	✓					
	0.75	4		✓				
	2.00	3		✓				
	1.00	2		✓				
	1.75	1		✓				
	3.50				✓			
Total Pavement Thickness =	16.50	in.	Total Asphalt Thickness =	16.50	in.	Total Concrete Thickness =	0.00	in.
							Total Base Thickness =	3.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-34
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-34	1.25	10	✓					- The core is highly deteriorated from 3.0" to 6.5", it is difficult to discern the different layers.
	1.25	9	✓					- Layer 1 & 2 has voids due likely to compaction or segregation issues
	1.00	8	✓					- Layer 5 is deteriorated at the top.
	1.50	7	✓					- Layers 6 & 7 are highly deteriorated.
	1.50	6	✓					- Layer 8 is deteriorated at the bottom.
	2.00	5	✓					
	1.50	4	✓					
	1.00	3	✓					
	1.50	2		✓				- Aggregate Base: Gravel (visual)
	1.75	1		✓				
	2.50				✓			



Total Pavement Thickness = 14.25 in. Total Asphalt Thickness = 14.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.50 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-35
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-35	1.00	9	✓					- The core is highly deteriorated from 4.5" to 5.5", it is difficult to discern the layers interface.
	1.25	8	✓					- The core separated between layers 3 & 4; 5 & 6, and 6 & 7
	2.25	7	✓					- Layer 1 is deteriorated, it has voids due likely to compaction or segregation issues
	1.00	6	✓					- Layers 3 & 4 are deteriorated towards their interface
	1.00	5	✓					- Layer 6 is highly deteriorated.
	1.50	4	✓					- Layer 7 is deteriorated at the bottom
	1.50	3	✓					
	1.75	2		✓				
	2.25	1		✓				
	3.25				✓			- Aggregate Base: Gravel (visual)



Total Pavement Thickness = 13.50 in. Total Asphalt Thickness = 13.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.25 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-36
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-36	0.75	10	✓					- The core is broken horizontally @ 8.75", 10.25", 11.5", it is difficult to discern between layers 1 through 3
	1.25	9	✓					- The core is separated between layers 8 & 9.
	0.75	8		✓				- Layers 1 and 3 are highly deteriorated and broken vertically.
	1.50	7	✓					- Layer 2 is deteriorated.
	1.25	6	✓					
	1.50	5	✓					
	1.75	4	✓					
	1.50	3	✓					
	1.25	2	✓					
	2.25	1	✓					- Aggregate Base: Gravel (visual)
	2.00				✓			



Total Pavement Thickness = 13.75 in. Total Asphalt Thickness = 13.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-37
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

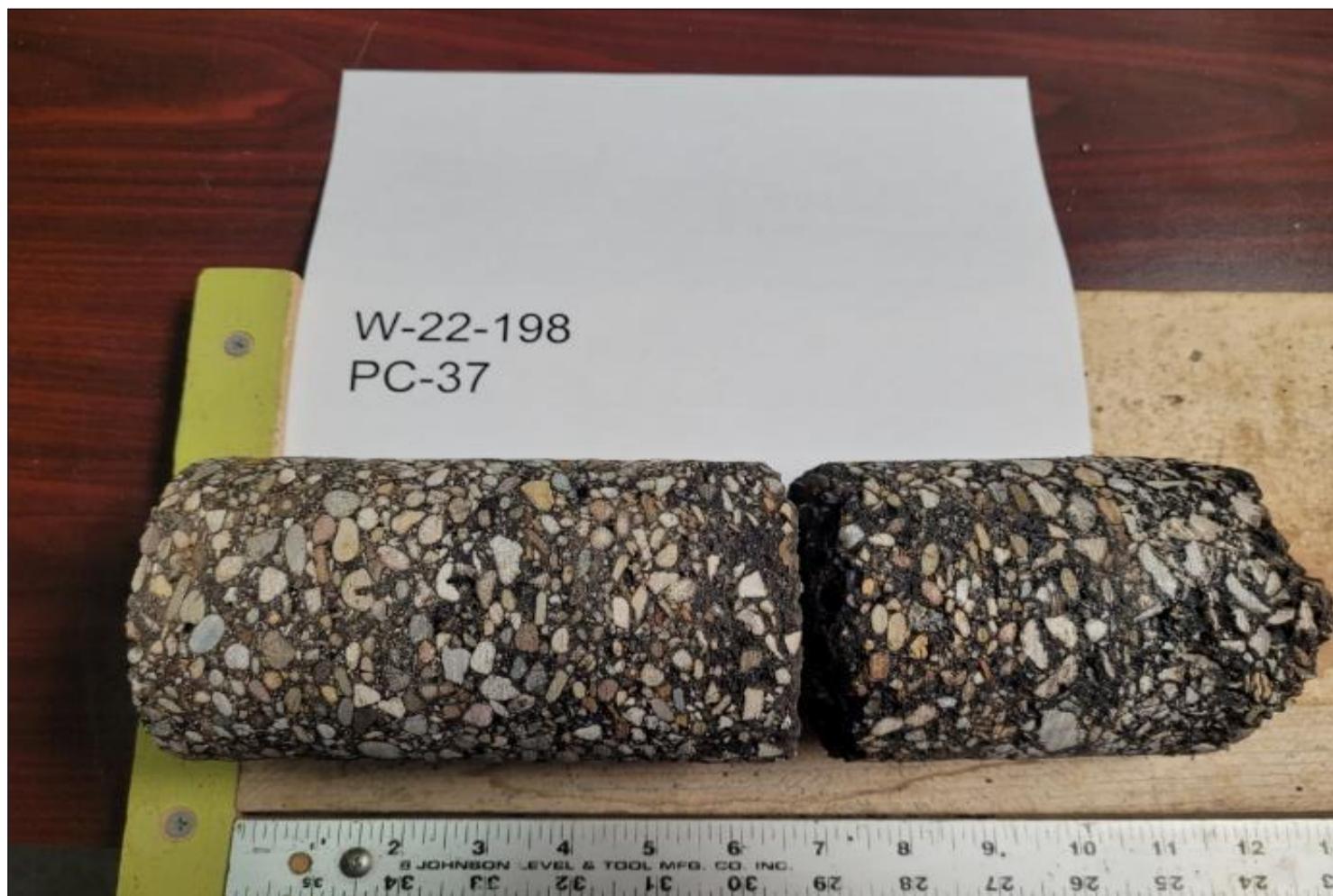
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-37	1.00	8	✓					- The core separated between layers 3 & 4.
	1.00	7	✓					- Layer 1 is deteriorated, it has voids due to loss of aggregates.
	1.00	6	✓					- Layers 3 & 4 are slightly deteriorated towards their interface
	1.50	5	✓					
	1.75	4	✓					
	1.75	3	✓					
	1.50	2		✓				
	3.00	1		✓				
	4.00				✓			
								- Aggregate Base: Gravel with sand (visual)



Total Pavement Thickness = 12.50 in. Total Asphalt Thickness = 12.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 4.00 in.





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Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

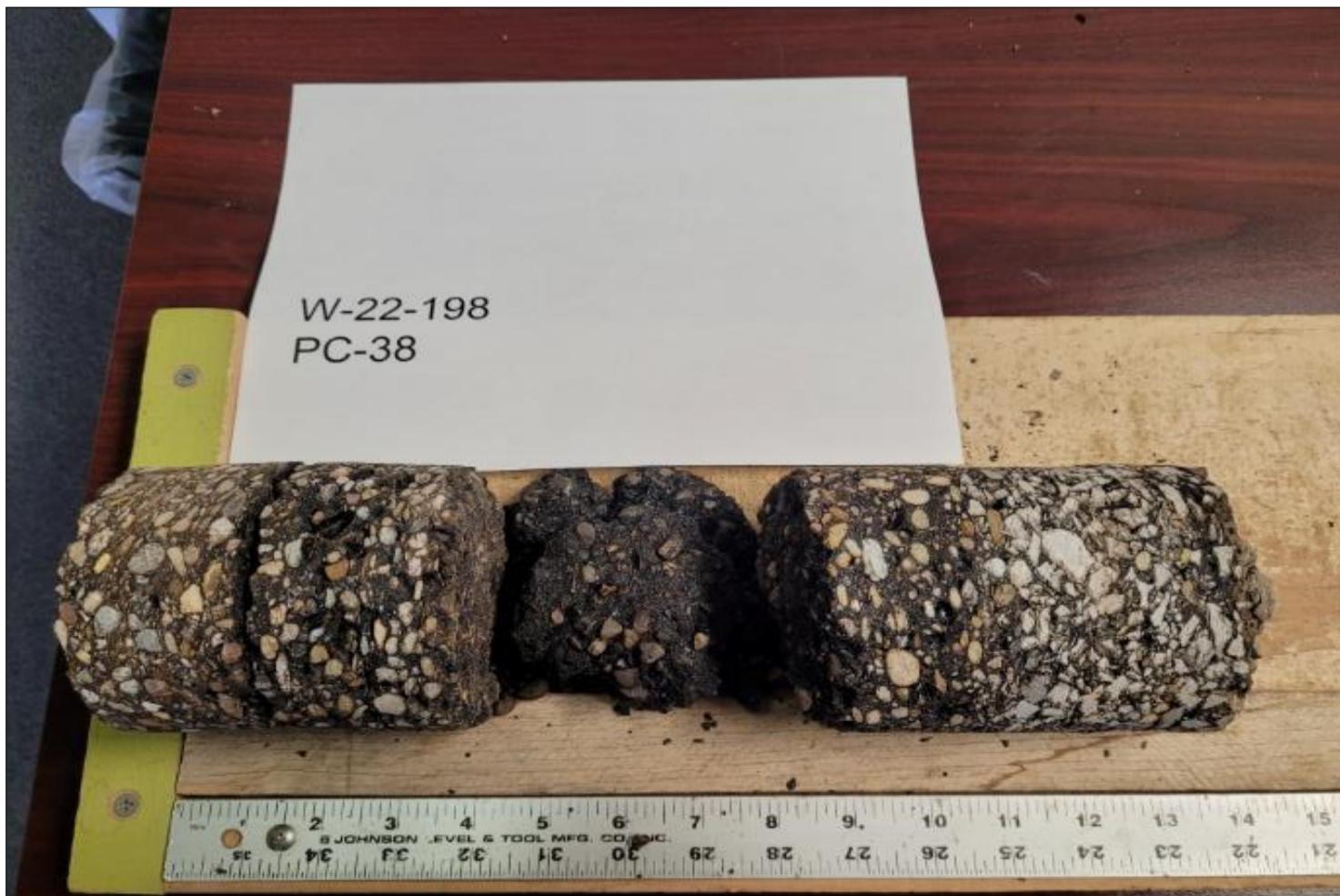
BORING/CORE No. PC-38
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-38	1.25	8	✓					- The core is highly deteriorated and broken from 4.0" to 8.0", it is difficult to discern the different layers.
	0.75	7	✓					- The core separated between layers 6 & 7.
	1.25	6	✓					- Layers 1, 2 & 3 are slightly deteriorated, and have voids due to loss of aggregates
	0.75	5	✓					- Layer 4 is highly deteriorated and broken with signs of stripping.
	4.00	4	✓					- Layers 5 & 6 are slightly deteriorated, and have voids due to loss of aggregates
	2.00	3	✓					
	2.00	2	✓					
	1.50	1	✓					
	2.00			✓				- Aggregate Base: Gravel (visual)

Total Pavement Thickness = 13.50 in. Total Asphalt Thickness = 13.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.00 in.





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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-39
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

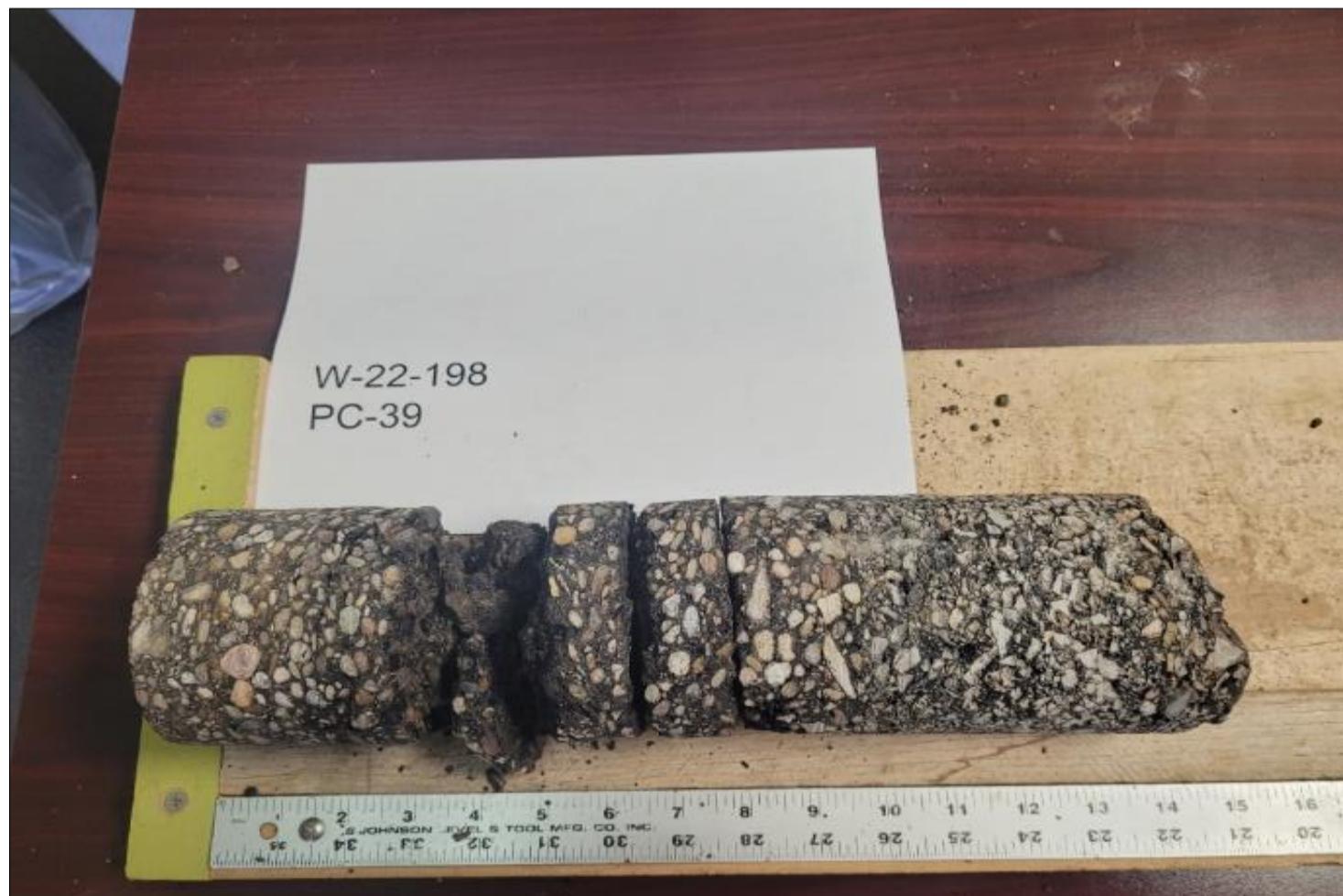
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-39	1.00	10	✓					- The core is highly deteriorated and broken from 3.5" to 6.75", it is difficult to discern the different layers.
	1.00	9		✓				- The core separated between layers 4 & 5, and 5 & 6.
	1.50	8		✓				- Layers 1 thorough 3 are slightly deteriorated
	1.75	7	✓					- Layers 5 & 6 deteriorated at the top.
	1.50	6	✓					- Layer 7 is highly deteriorated and broken.
	1.00	5		✓				- Layer 8 is deteriorated at the bottom.
	1.50	4		✓				
	1.50	3		✓				
	1.75	2		✓				
	2.00	1		✓				
	3.50				✓			- Aggregate Base: Gravel (visual)



Total Pavement Thickness = 14.50 in. Total Asphalt Thickness = 14.50 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 3.50 in.





6350 Presidential Gateway
Columbus, Ohio 43231
Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-40
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

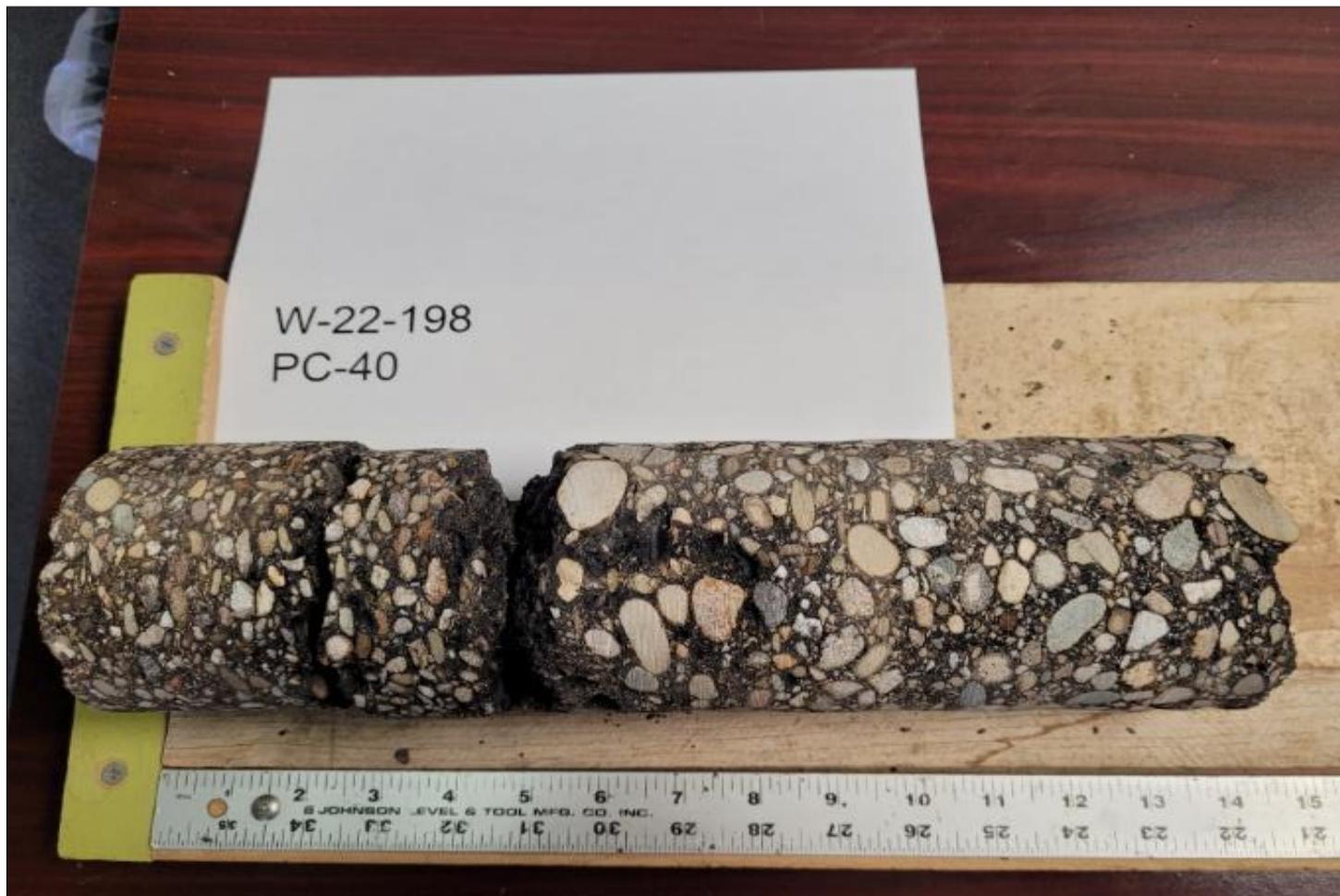
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-40	1.00	8	✓					- The core is broken @ 3.0" and 5.0"
	1.00	7	✓					- Layer 4 is deteriorated, it has voids due to loss aggregates
	1.00	6	✓					- Layer 5 is deteriorated
	2.00	5	✓					- Layer 6 is slightly deteriorated at the bottom.
	3.00	4		✓				
	2.00	3		✓				
	2.00	2		✓				
	1.75	1		✓				
	2.75				✓			



Total Pavement Thickness = 13.75 in. Total Asphalt Thickness = 13.75 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 2.75 in.





6350 Presidential Gateway
Columbus, Ohio 43231
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Fax Number: (614) 823-4990

Pavement Core Data Summary

PROJECT ODOT GAL-850-0.21 PID 117244
LOCATION Gallia County, Ohio
JOB No. W-22-198

BORING/CORE No. PC-41
DATE CORE OBTAINED 2/9/2023
CORE OBTAINED BY IS & LH

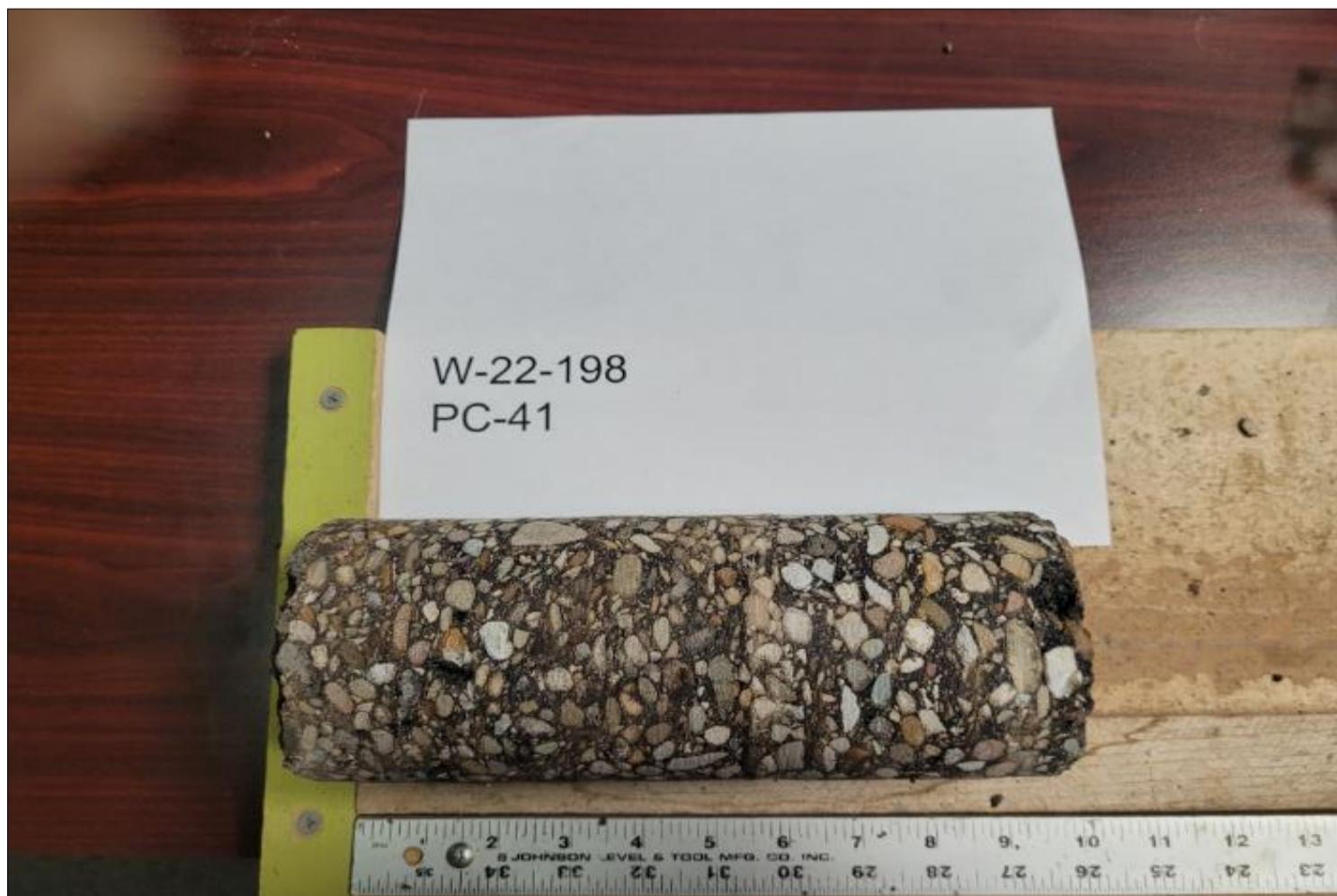
Core Composition

Comments/Remarks

Core Number	Layer Thickness (in.)	Pavement Layer Number	Asphalt				Other	Comments/Remarks
			Surface Binder	Intermediate Binder	Base Binder	Concrete		
PC-41	1.00	6	✓					- The core is intact
	1.00	5	✓					- Layer 1 is slightly deteriorated at the bottom.
	1.75	4	✓					
	1.50	3		✓				
	1.25	2		✓				
	2.75	1		✓				
	4.25	1			✓			
								- Aggregate Base: Gravel (visual)



Total Pavement Thickness = 9.25 in. Total Asphalt Thickness = 9.25 in. Total Concrete Thickness = 0.00 in. Total Base Thickness = 4.25 in.



APPENDIX VI
SUBGRADE ANALYSIS SUMMARY

OHIO DEPARTMENT OF TRANSPORTATION**OFFICE OF GEOTECHNICAL ENGINEERING****PLAN SUBGRADES**
Geotechnical Design Manual Section 600

Instructions: Enter data in the shaded cells only.

(Enter state route number, project description, county, consultant's name, prepared by name, and date prepared. This information will be transferred to all other sheets. The date prepared must be entered in the appropriate cell on this sheet to remove these instructions prior to printing.)

GAL-850-0.21**117244****South Section****Resource International, Inc.**

Prepared By: Daniel E. Karch, P.E.
Date prepared: Wednesday, December 6, 2023

Resource International, Inc.
6350 Presidential Gateway
Columbus, Ohio 43231

614-823-4949
danielk@resourceinternational.com

NO. OF BORINGS:**25**

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-23	CL of SR 850	12+14	10	RT	CME 55	87	682.5	679.6	2.9 C
2	B-002-0-23	CL of SR 850	15+39	6	LT	CME 55	87	681.6	680.3	1.3 C
3	B-003-0-23	CL of SR 850	18+91	7	RT	CME 55	87	666.1	664.7	1.4 C
4	B-004-0-23	CL of SR 850	22+45	6	LT	CME 55	87	672.3	671.3	1.0 C
5	B-005-0-23	CL of SR 850	26+34	5	RT	CME 55	87	688.7	687.5	1.2 C
6	B-006-0-23	CL of SR 850	30+52	11	LT	CME 55	87	737.5	732.3	5.2 C
7	B-007-0-23	CL of SR 850	34+43	8	RT	CME 55	87	716.4	721.6	5.2 F
8	B-008-0-23	CL of SR 850	38+42	7	LT	CME 55	87	694.0	693.0	1.0 C
9	B-009-0-23	CL of SR 850	42+50	7	LT	CME 55	87	690.2	688.6	1.6 C
10	B-010-0-23	CL of SR 850	46+38	7	LT	CME 55	87	687.2	686.0	1.2 C
11	B-011-0-23	CL of SR 850	50+26	6	LT	CME 55	87	693.5	691.9	1.6 C
12	B-012-0-23	CL of SR 850	54+16	5	RT	CME 55	87	685.5	684.2	1.3 C
13	B-013-0-23	CL of SR 850	57+83	6	LT	CME 55	87	674.4	673.0	1.4 C
14	B-014-0-23	CL of SR 850	61+98	6	LT	CME 55	87	688.7	686.5	2.2 C
15	B-015-0-23	CL of SR 850	63+86	7	LT	CME 55	87	687.7	686.3	1.4 C
16	B-016-0-23	CL of SR 850	65+79	8	RT	CME 55	87	673.1	676.1	3.0 F
17	B-017-0-23	CL of SR 850	69+81	8	LT	CME 55	87	671.1	669.8	1.3 C
18	B-018-0-23	CL of SR 850	73+75	8	RT	CME 55	87	678.0	676.8	1.2 C
19	B-019-0-23	CL of SR 850	77+9	8	LT	CME 55	87	665.1	663.8	1.3 C
20	B-020-0-23	CL of SR 850	80+80	9	RT	CME 55	87	677.4	676.1	1.3 C
21	B-021-0-23	CL of SR 850	84+76	8	LT	CME 55	87	694.2	692.7	1.5 C
22	B-022-0-23	CL of SR 850	88+83	9	RT	CME 55	87	692.4	689.8	2.6 C
23	B-023-0-23	CL of SR 850	92+76	6	LT	CME 55	87	667.6	666.7	0.9 C
24	B-024-0-23	CL of SR 850	94+26	8	RT	CME 55	87	664.8	663.7	1.1 C
25	B-025-0-23	CL of SR 850	96+72	8	RT	CME 55	87	667.3	663.9	3.4 C



#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _c	M _{opt}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
			From	To	From	To																			
1	B 001-0 23	SS-1	1.5	3.0	-1.4	0.1	15	15	3.5	43	18	25	59	32	91	21	18	A-7-6	15	130		Mc			206 Lime or 204 Geotextile
		SS-2	3.0	4.5	0.1	1.6	26		4.5	47	20	27	48	33	81	21	18	A-7-6	16			Mc			
		SS-3	4.5	6.0	1.6	3.1	52		4.5							18	18	A-7-6	16						
2	B 002-0 23	SS-1	1.5	3.0	0.2	1.7	9	9	3	65	24	41	32	65	97	20	21	A-7-6	20	220	High LL	N ₆₀	20"	12"	206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.7	3.2	28		3.5	46	21	25	48	46	94	20	18	A-7-6	15						
		SS-3	4.5	6.0	3.2	4.7	30		2.5							23	18	A-7-6	16						
3	B 003-0 23	SS-1	1.5	3.0	0.1	1.6	41	30	4.5	35	20	15	39	14	53	9	15	A-6a	6	180					206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.6	3.1	41		4.5	25	16	9	53	13	66	15	11	A-4b	6		A-4b	Mc			
		SS-3	4.5	6.0	3.1	4.6	35		1.5							16	10	A-4b	8						
4	B 004-0 23	SS-1	1.5	3.0	0.5	2.0	16	16	2.5	33	17	16	51	29	80	18	16	A-6b	10	120					206 Lime or 204 Geotextile
		SS-2	3.0	4.5	2.0	3.5	20		2	30	15	15	59	27	86	18	14	A-6a	10			Mc			
		SS-3	4.5	6.0	3.5	5.0	35		3							21	14	A-6a	10						
5	B 005-0 23	SS-1	1.5	3.0	0.3	1.8	10	10	2.5	39	17	22	39	24	63	8	16	A-6b	10	173		N ₆₀		12"	206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	20		2.5	51	19	32	52	44	96	24	18	A-7-6	18			Mc			
		SS-3	4.5	6.0	3.3	4.8	29		3							24	18	A-7-6	16						
6	B 006-0 23	SS-1	1.5	2.7	-3.7	-2.5	50	30		35	20	15	57	10	67	6	15	A-6a	8	213					
		SS-2	3.0	3.2	-2.2	-2.0	50									5	14	A-6a	10						
7	B 007-0 23	SS-1	1.5	3.0	6.7	8.2	15			0	0	NP	18	5	23	6	6	A-1-b		160					
		2S-2	3.0	4.5	8.2	9.7	15		2.5	55	22	33	28	53	81	29	19	A-7-6							
		SS-3	4.5	6.0	9.7	11.2	10		2.5							25	18	A-7-6							
8	B 008-0 23	SS-1	1.5	3.0	0.5	2.0	16	16	4.5	41	20	21	59	31	90	19	18	A-7-6	13	600					
		SS-2	3.0	4.5	2.0	3.5	26		4.25	38	19	19	55	33	88	17	16	A-6b	12						
		SS-3	4.5	6.0	3.5	5.0	36		4.5							20	16	A-6b	16						
9	B 009-0 23	SS-1	1.5	3.0	-0.1	1.4	7	7	2	65	24	41	28	64	92	22	21	A-7-6	20	147	High LL	N ₆₀	17"	15"	206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.4	2.9	16		2.5	58	21	37	29	69	98	27	18	A-7-6	20			Mc			
		SS-3	4.5	6.0	2.9	4.4	26		2.5							29	18	A-7-6	16						



#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)	
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _c	M _{opt}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable		
			From	To	From	To																				
10	B 010-0 23	SS-1	1.5	3.0	0.3	1.8	19	19	4	38	15	23	60	30	90	19	16	A-6b	13	187		Mc				206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	25		3.5	36	17	19	67	30	97	19	16	A-6b	12			Mc				
		SS-3	4.5	6.0	3.3	4.8	38		3							16	16	A-6b	16							
11	B 011-0 23	SS-1	1.5	3.0	-0.1	1.4	9	9	2.5	59	18	41	21	40	61	7	18	A-7-6	16	260		N ₆₀		12"		206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.4	2.9	19		2	63	22	41	21	74	95	22	19	A-7-6	20			Mc				
		SS-3	4.5	6.0	2.9	4.4	30		2.5							28	18	A-7-6	16							
12	B 012-0 23	SS-1	1.5	3.0	0.2	1.7	25	25	4.5	39	18	21	45	39	84	17	16	A-6b	12	107						
		SS-2	3.0	4.5	1.7	3.2	38		4.5	33	16	17	40	29	69	16	16	A-6b	10							
		SS-3	4.5	6.0	3.2	4.7	52		3.5							15	16	A-6b	16							
13	B 013-0 23	SS-1	1.5	3.0	0.1	1.6	28	17	4.5	32	17	15	26	15	41	9	14	A-6a	3	340						206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.6	3.1	17		1	30	16	14	44	27	71	17	14	A-6a	9			HP & Mc				
		SS-3	4.5	6.0	3.1	4.6	19		1.5							22	14	A-6a	10							
14	B 014-0 23	SS-1	1.5	3.0	-0.7	0.8	13	13	4	49	19	30	32	61	93	22	18	A-7-6	18	140		N ₆₀ & Mc		12"		206 Lime or 204 Geotextile
		SS-2	3.0	4.5	0.8	2.3	25		3.5	28	14	14	48	26	74	15	14	A-6a	9							
		SS-3	4.5	6.0	2.3	3.8	30		3.5							16	14	A-6a	10							
15	B 015-0 23	SS-1	1.5	3.0	0.1	1.6	13	9		0	0	NP	9	4	13	1	6	A-1-a	0	200						206 Cement or 204 Geotextile
		SS-2	3.0	4.5	1.6	3.1	9		0.5	58	19	39	27	42	69	16	18	A-7-6	18			HP				
		SS-3	4.5	6.0	3.1	4.6	29		1.5							17	18	A-7-6	16							
16	B 016-0 23	SS-1	1.5	3.0	4.5	6.0	38	9								4	6	A-1-b	0	420						
		SS-2	3.0	4.5	6.0	7.5	9		1.5	54	20	34	26	63	89	24	18	A-7-6								
		SS-3	4.5	6.0	7.5	9.0	19		1.5	66	24	42	15	74	89	32	21	A-7-6								
17	B 017-0 23	SS-1	1.5	3.0	0.2	1.7	15	15	1.5	27	13	14	30	30	60	14	14	A-6a	7	220		HP		12"		206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.7	3.2	16			22	16	6	26	16	42	16	11	A-4a	1			Mc				
		SS-3	4.5	6.0	3.2	4.7	23								24	10	A-4a	8								
18	B 018-0 23	SS-1	1.5	3.0	0.3	1.8	6	6								6	6	A-1-b	0	120						206 Lime or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	12		2	62	22	40	28	67	95	31	19	A-7-6	20			N ₆₀ & Mc				
		SS-3	4.5	6.0	3.3	4.8	23		2							30	18	A-7-6	16							



#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)		
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _c	M _{opt}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable			
			From	To	From	To																					
19	B 019-0 23	SS-1	1.5	3.0	0.2	1.7	7	4	0.5	26	12	14	32	25	57	21	14	A-6a	6	820		HP & Mc		24"	206 Lime or 204 Geotextile		
		SS-2	3.0	4.5	1.7	3.2	4		0.5	28	12	16	16	27	43	23	16	A-6b	3			HP & Mc					
		SS-3	4.5	6.0	3.2	4.7	10		0.5							25	16	A-6b	16								
20	B 020-0 23	SS-1	1.5	3.0	0.2	1.7	13	13		0	0	NP	10	11	21	5	6	A-1-b	0	320						206 Lime or 204 Geotextile	
		SS-2	3.0	4.5	1.7	3.2	26			0	0	NP	19	10	29	12	8	A-3a	0								
		SS-3	4.5	6.0	3.2	4.7	20		0.5							24	18	A-7-6	16								
21	B 021-0 23	SS-1	1.5	3.0	0.0	1.5	12	12					11	11	22	4	10	A-2-4	0	107						206 Lime or 204 Geotextile	
		SS-2	3.0	4.5	1.5	3.0	16		2.5	63	24	39	27	72	99	28	21	A-7-6	20			Mc					
		SS-3	4.5	6.0	3.0	4.5	22		2.5							32	18	A-7-6	16								
22	B 022-0 23	SS-1	1.5	3.0	-1.1	0.4	12	12		1.75	60	21	39	38	49	87	20	18	A-7-6	20	160						206 Lime or 204 Geotextile
		SS-2	3.0	4.5	0.4	1.9	20		4.5	38	17	21	46	34	80	16	16	A-6b	12								
		SS-3	4.5	6.0	1.9	3.4	48		4.5							16	16	A-6b	16								
23	B 023-0 23	SS-1	1.5	3.0	0.6	2.1	15	13		4	26	15	11	47	20	67	16	14	A-6a	7	300						206 Lime or 204 Geotextile
		SS-2	3.0	4.5	2.1	3.6	13		3.5	29	14	15	58	25	83	22	14	A-6a	10								
		SS-3	4.5	6.0	3.6	5.1	20		1							19	10	A-4a	8								
24	B 024-0 23	SS-1	1.5	3.0	0.4	1.9	9	4	1.25	23	15	8	43	11	54	20	10	A-4a	4	400		HP & Mc		12"		206 Lime or 204 Geotextile	
		SS-2	3.5	5.0	2.4	3.9	4			0	0	NP	34	20	54	23	11	A-4a	4								
		SS-3a	6.0	7.0	4.9	5.9	35									16	10	A-4a	8								
		SS-3b	7.0	7.5	5.9	6.4	35		4.5	29	15	14	49	23	72	13	14	A-6a									
25	B 025-0 23	SS-1	1.5	3.0	-1.9	-0.4	13	10		4	22	15	7	47	16	63	17	10	A-4a	6	180						206 Lime or 204 Geotextile
		SS-2	3.0	4.5	-0.4	1.1	10			24	16	8	24	10	34	23	10	A-2-4	0			N ₆₀ & Mc		12"			
		SS-3	4.5	6.0	1.1	2.6	33		1									16	A-6b	16		HP					

PID: 117244

County-Route-Section: GAL-850-0.21

No. of Borings: 25

Geotechnical Consultant: Resource International, Inc.

Prepared By: Daniel E. Karch, P.E.

Date prepared: 12/6/2023

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	No
	Lime Stabilization	Option
206	Depth	12"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L): Average(HP):	12" 0"
Global Geogrid Average(N60L): Average(HP):	0" 0"

Design CBR	6
------------	---

% Samples within 6 feet of subgrade			
N ₆₀ ≤ 5	3%	HP ≤ 0.5	7%
N ₆₀ < 12	19%	0.5 < HP ≤ 1	4%
12 ≤ N ₆₀ < 15	10%	1 < HP ≤ 2	18%
N ₆₀ ≥ 20	53%	HP > 2	54%
M+	26%		
Rock	0%		
Unsuitable	3%		

Excavate and Replace at Surface	
Average	0"
Maximum	0"
Minimum	0"

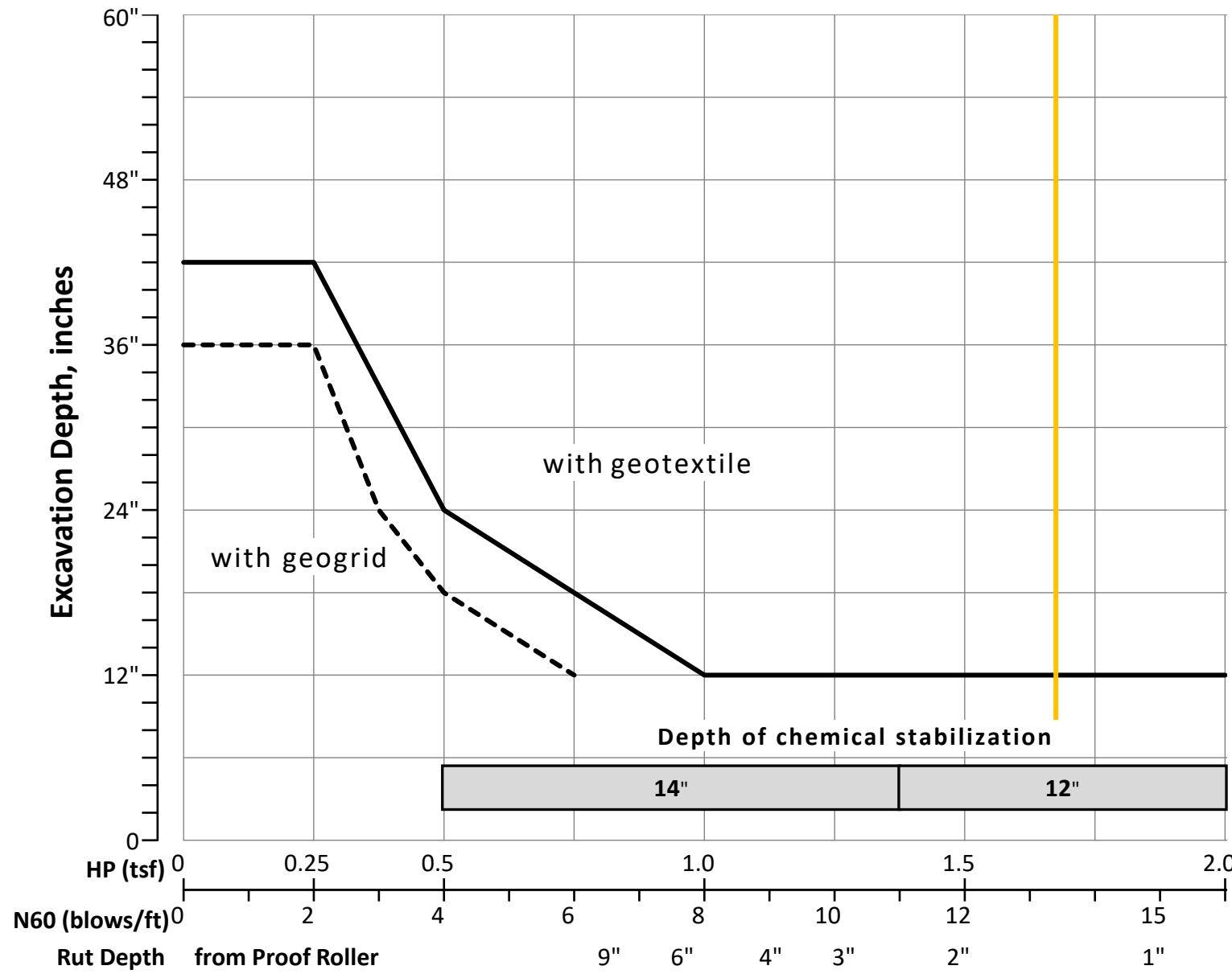
% Proposed Subgrade Surface	
Unstable & Unsuitable	56%
Unstable	50%
Unsuitable	6%

	N ₆₀	N _{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M _c	M _{opt}	GI
Average	22	13	2.74	37	16	24	37	34	70	19	15	11
Maximum	52	30	4.50	66	24	42	67	74	99	32	21	20
Minimum	4	4	0.50	0	0	6	9	4	13	1	6	0

Classification Counts by Sample																			
ODOT Class	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	1	4	2	0	0	0	0	1	6	2	0	13	15	0	28	0	0	72
Percent	0%	1%	6%	3%	0%	0%	0%	0%	1%	8%	3%	0%	18%	21%	0%	39%	0%	0%	100%
% Rock Granular Cohesive	0%																		100%
Surface Class Count	0	1	2	2	0	0	0	0	1	4	1	0	12	11	0	16	0	0	50
Surface Class Percent	0%	2%	4%	4%	0%	0%	0%	0%	0%	8%	2%	0%	24%	22%	0%	32%	0%	0%	100%



Fig. 600-1 – Subgrade Stabilization

OVERIDE TABLE

Calculated Average	New Values	Check to Override
2.74		<input type="checkbox"/> HP <input type="checkbox"/> N _{60L}
13.46		<input type="checkbox"/> HP <input type="checkbox"/> N _{60L}

Average HP
Average N_{60L}

OHIO DEPARTMENT OF TRANSPORTATION**OFFICE OF GEOTECHNICAL ENGINEERING****PLAN SUBGRADES**
Geotechnical Design Manual Section 600

Instructions: Enter data in the shaded cells only.

(Enter state route number, project description, county, consultant's name, prepared by name, and date prepared. This information will be transferred to all other sheets. The date prepared must be entered in the appropriate cell on this sheet to remove these instructions prior to printing.)

GAL-850-0.21**117244****North Section****Resource International, Inc.**

Prepared By: Daniel E. Karch, P.E.
Date prepared: Wednesday, December 6, 2023

Resource International, Inc.
6350 Presidential Gateway
Columbus, Ohio 43231

614-823-4949
danielk@resourceinternational.com

NO. OF BORINGS:**16**

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-026-0-23	CL of SR 850	185+85	13	RT	CME 55	87	659.1	657.6	1.5 C
2	B-027-0-23	CL of SR 850	189+63	7	LT	CME 55	87	656.1	655.4	0.7 C
3	B-028-0-23	CL of SR 850	193+59	12	RT	CME 55	87	649.7	648.7	1.0 C
4	B-029-0-23	CL of SR 850	197+57	8	LT	CME 55	87	645.6	644.6	1.0 C
5	B-030-0-23	CL of SR 850	201+52	7	RT	CME 55	87	645.9	644.7	1.2 C
6	B-031-0-23	CL of SR 850	205+55	9	LT	CME 55	87	648.1	647.4	0.7 C
7	B-032-0-23	CL of SR 850	209+51	9	RT	CME 55	87	648.4	647.8	0.6 C
8	B-033-0-23	CL of SR 850	213+50	10	LT	CME 55	87	649.7	648.9	0.8 C
9	B-034-0-23	CL of SR 850	217+45	7	RT	CME 55	87	652.7	651.5	1.2 C
10	B-035-0-23	CL of SR 850	221+43	5	LT	CME 55	87	659.4	658.2	1.2 C
11	B-036-0-23	CL of SR 850	225+44	7	RT	CME 55	87	663.4	662.2	1.2 C
12	B-037-0-23	CL of SR 850	229+39	5	LT	CME 55	87	667.8	666.4	1.4 C
13	B-038-0-23	CL of SR 850	233+36	5	RT	CME 55	87	674.1	672.6	1.5 C
14	B-039-0-23	CL of SR 850	237+30	5	LT	CME 55	87	676.4	675.4	1.0 C
15	B-040-0-23	CL of SR 850	240+76	7	RT	CME 55	87	665.4	664.2	1.2 C
16	B-041-0-23	CL of SR 850	243+80	6	LT	CME 55	87	672.7	671.3	1.4 C



#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)	
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _c	M _{opt}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable		
1	B 026-0 23	SS-1	1.5	3.0	0.0	1.5	38	16	2.5	0	0	NP	10	4	14	4	6	A-1-a	0	780						
		SS-2	3.0	4.5	1.5	3.0	16		1				25	12	37	14	14	A-6a	1							
		SS-3	4.5	6.0	3.0	4.5	23									16	14	A-6a	10							
2	B 027-0 23	SS-1	1.5	3.0	0.8	2.3	16	16		0	0	NP	24	10	34	15	8	A-3a	0	33						
		SS-2	3.0	4.5	2.3	3.8	17			0	0	NP	15	2	17	23	8	A-3a	0							
		SS-3	4.5	6.0	3.8	5.3	23									24	10	A-2-4	0							
3	B 028-0 23	SS-1	1.5	3.0	0.5	2.0	6	6	1	21	13	8	37	15	52	14	10	A-4a	3	120						206 Cement or 204 Geotextile
		SS-2	3.0	4.5	2.0	3.5	10		1.5	39	15	24	38	36	74	29	16	A-6b	13							
		SS-3a	4.5	5.0	3.5	4.0	30		4							26	16	A-6b	16							
		SS-3b	5.0	6.0	4.0	5.0			4.5							22	10	A-4a	8							
4	B 029-0 23	SS-1	1.5	3.0	0.5	2.0	45	9		29	18	11	21	3	24	8	10	A-2-6	0	260						
		SS-2	3.0	4.5	2.0	3.5	17						19	6	25	11	10	A-2-6	2							
		SS-3	4.5	6.0	3.5	5.0	9		0.5	28	15	13	32	24	56	22	14	A-6a	5							
5	B 030-0 23	SS-1	1.5	3.0	0.3	1.8	42	15		35	21	14	26	9	35	9	10	A-2-6	1	100						206 Cement or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	15		4.5	28	17	11	57	19	76	18	14	A-6a	8							
		SS-3	4.5	6.0	3.3	4.8	15		0.25							24	10	A-4a	8							
6	B 031-0 23	SS-1	1.5	3.0	0.8	2.3	19	19	3.5	30	16	14	26	21	47	16	14	A-6a	4	287						
		SS-2	3.0	4.5	2.3	3.8	129		4.5	25	16	9	51	17	68	7	11	A-4b	7							
		SS-3	4.5	4.7	3.8	4.0	-									5	0	Rock	0							
7	B 032-0 23	SS-1	1.5	3.0	0.9	2.4	22	13	3.5	23	15	8	47	19	66	16	10	A-4a	6	160						206 Cement or 204 Geotextile
		SS-2	3.0	4.5	2.4	3.9	13		1.5	23	16	7	44	16	60	18	11	A-4a	5							
		SS-3	4.5	6.0	3.9	5.4	59									11	0	Rock	0							
8	B 033-0 23	SS-1	1.5	3.0	0.7	2.2	16	7	3	21	15	6	41	13	54	14	10	A-4a	4	200						206 Cement or 204 Geotextile
		SS-2	3.0	4.5	2.2	3.7	7		0.25	21	14	7	36	15	51	22	10	A-4a	3							
		SS-3	4.5	6.0	3.7	5.2	19		4.5							14	10	A-4a	8							
9	B 034-0 23	SS-1	1.5	3.0	0.3	1.8	30	13	4.5	26	18	8	54	23	77	16	13	A-4b	8	47	A-4b	Mc	22"			206 Cement or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	13		1	29	17	12	52	21	73	22	14	A-6a	8							
		SS-3	4.5	6.0	3.3	4.8	13		0.5							25	14	A-6a	10							



#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N ₆₀	N _{60L}		LL	PL	PI	% Silt	% Clay	P200	M _c	M _{opt}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
			From	To	From	To																			
10	B 035-0 23	SS-1	1.5	3.0	0.3	1.8	22	13	2	24	17	7	52	18	70	19	12	A-4b	7	87	A-4b	Mc			206 Cement or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	13		1	28	18	10	54	23	77	22	13	A-4b	8		A-4b	HP & Mc	40"		
		SS-3	4.5	6.0	3.3	4.8	17		2.5							21	10	A-4b	8						
11	B 036-0 23	SS-1	1.5	3.0	0.3	1.8	19	13	3	39	21	18	32	20	52	17	16	A-6b	6	220					206 Cement or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	13			35	20	15	23	12	35	15	10	A-2-6	1			N ₆₀ & Mc			
		SS-3	4.5	6.0	3.3	4.8	23									15	10	A-2-6	4						
12	B 037-0 23	SS-1	1.5	3.0	0.1	1.6	23	19	4.5	36	22	14	27	12	39	9	17	A-6a	2	200					
		SS-2	3.0	4.5	1.6	3.1	19		4.5				33	17	50	11	14	A-6a	10						
		SS-3	4.5	6.0	3.1	4.6	20		1.5							18	14	A-6a	10						
13	B 038-0 23	SS-1	1.5	3.0	0.0	1.5	80	30	4.5	22	18	4	37	13	50	11	13	A-4a	3	120					206 Cement or 204 Geotextile
		SS-2	3.0	3.6	1.5	2.1	-									8	0	Rock	0			Rock	Mc		
14	B 039-0 23	SS-1	1.5	3.0	0.5	2.0	81	30	4.5	28	19	9	48	17	65	11	14	A-4a	6	360					206 Cement or 204 Geotextile
		SS-2	3.0	3.2	2.0	2.2	-									8	0	Rock	0				Mc		
15	B 040-0 23	SS-1	1.5	3.0	0.3	1.8	25	15	4.5	26	16	10	37	17	54	13	11	A-4a	4	933					206 Cement or 204 Geotextile
		SS-2	3.0	4.5	1.8	3.3	22		4.5							19	10	A-4a	8				Mc		
		SS-3	4.5	6.0	3.3	4.8	15		0.5								10	A-4a	8						
16	B 041-0 23	SS-1	1.5	3.0	0.1	1.6	57	17								7	6	A-1-b	0	280					
		SS-2	3.0	4.5	1.6	3.1	17		2.5								16	A-6b	16						
		SS-3	4.5	6.0	3.1	4.6	23		4	38	18	20	39	33	72	19	16	A-6b	11						

PID: 117244

County-Route-Section: GAL-850-0.21

No. of Borings: 16

Geotechnical Consultant: Resource International, Inc.

Prepared By: Daniel E. Karch, P.E.

Date prepared: 12/6/2023

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L):	12"
Global Geotextile Average(HP):	0"
Global Geogrid Average(N60L):	0"
Global Geogrid Average(HP):	0"

Design CBR	8
------------	---

% Samples within 6 feet of subgrade			
N ₆₀ ≤ 5	0%	HP ≤ 0.5	11%
N ₆₀ < 12	9%	0.5 < HP ≤ 1	9%
12 ≤ N ₆₀ < 15	11%	1 < HP ≤ 2	9%
N ₆₀ ≥ 20	43%	HP > 2	43%
M+	28%		
Rock	6%		
Unsuitable	19%		

Excavate and Replace at Surface	
Average	0"
Maximum	0"
Minimum	0"

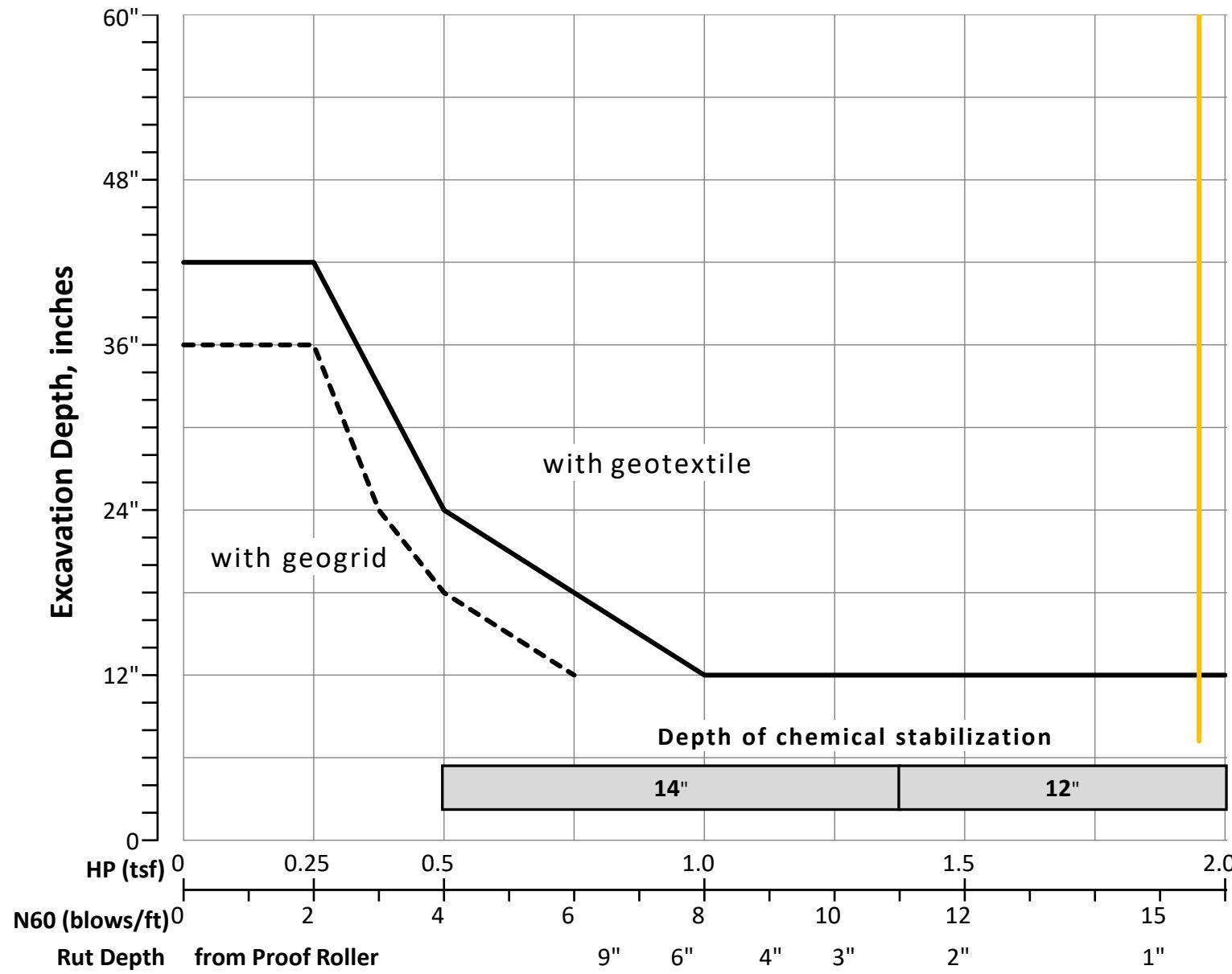
% Proposed Subgrade Surface	
Unstable & Unsuitable	53%
Unstable	41%
Unsuitable	13%

	N ₆₀	N _{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M _c	M _{opt}	GI
Average	27	16	2.74	25	15	11	36	16	52	16	11	5
Maximum	129	30	4.50	39	22	24	57	36	77	29	17	16
Minimum	6	6	0.25	0	0	4	10	2	14	4	0	0

Classification Counts by Sample																			
ODOT Class	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	4	1	1	1	0	5	0	0	2	13	5	0	10	5	0	0	0	47	
Percent	9%	2%	2%	2%	0%	11%	0%	0%	4%	28%	11%	0%	21%	11%	0%	0%	0%	100%	
% Rock Granular Cohesive	9%																	100%	
Surface Class Count	2	1	1	0	0	4	0	0	2	9	4	0	6	3	0	0	0	32	
Surface Class Percent	6%	3%	3%	0%	0%	13%	0%	0%	6%	28%	13%	0%	19%	9%	0%	0%	0%	100%	



Fig. 600-1 – Subgrade Stabilization

OVERIDE TABLE

Calculated Average	New Values	Check to Override
2.74		<input type="checkbox"/> HP <input type="checkbox"/> N60L
15.69		<input type="checkbox"/> HP <input type="checkbox"/> N60L

Average HP
Average N_{60L}