2022 IN-DEPTH AND FRACTURE CRITICAL INSPECTION REPORT

BRIDGE NO. HAM-50-0376L

SFN: 3102521

PID No.: 100838

City of Cleves

Submitted to ODOT, District 8

September 9, 2022

Prepared by

AECOM

Prepared for

OHIO DEPARTMENT OF TRANSPORTATION

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1 INTRODUCTION

1.1 Bridge Description

HAM-50-0376L (SFN 3102521) is a four-span structure that carries two lanes of U.S. Route 50 westbound vehicular traffic over the Great Miami River in Cleves (Figure 1). Eastbound traffic is carried by the adjacent bridge HAM-50-0376R (SFN 3102548). The roadway width on the bridge is 32'-0" with an overall bridge length of 892'-8". The bridge was opened to traffic in 1959, with rehabilitations in 1992 and 2017-2018.

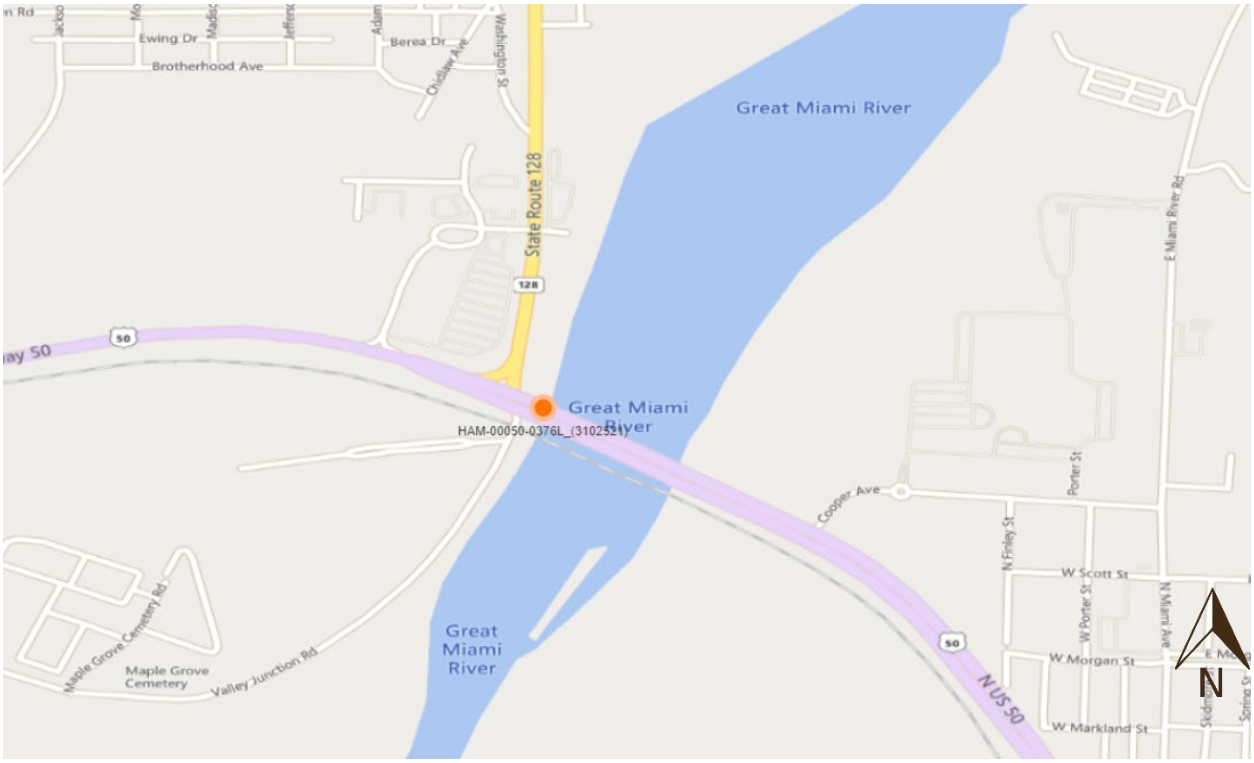

Figure 1- Location Map

The bridge consists of four simply supported modified Pratt Truss spans. Interior spans (Spans 2 & 3) measure 250'-0" c/c bearings with ten 25'-0" panels. End spans (Spans 1 & 4) measure 191'-4" c/c bearings with eight 23'-11" panels. The truss upper chord members consist of rivetted built-up members made from channels, plates, and lacing bars. The lower chord members consist of plates connected with diaphragms. The diagonals and verticals are rolled wide flange sections. Sway bracing and upper lateral bracing are riveted to the gusset plates and truss members at panel points. No lower lateral bracing exists on the structure.

The floor system consists of five stringers spaced at 7'-0" with nine floorbeams spaced at panel points in end spans and eleven floorbeams spaced at panel points in interior spans. The substructures are reinforced concrete on steel piles, with a wall-type rear abutment, three wall piers, and a stub-type forward abutment.

The nomenclature for this bridge follows a west-to-east stationing with trusses labeled as North and South. Floorbeams are labeled from 0 to 8 (Spans 1 and 4) and 0 to 10 (Spans 2 and 3) from west to east. The stringers are labeled from 1 to 5 from north to south (left to right looking east/forward). Abutments are labeled as Abutment 1 (west/rear) and Abutment 5

(east/forward). Piers are labeled from 2 to 4 (west to east). The stream flows from north to south.

1.2 Recent Maintenance and Construction History

1959 Construction

- Bridge opened to traffic

1992 Rehabilitation

- Replaced reinforced concrete deck
- Painted all structural steel

2017-2018 Rehabilitation

- Patched deck wearing surface
- Replaced approach guardrail and bridge rail
- Removed debris buildup at substructure units
- Isolated painting of structural steel
- Isolated replacement of existing riveted connections with high strength steel bolt connections
- Performed weld repairs to stringer crossframe connections
- Replaced lacing bars with advanced section loss
- Removed stringer erection angles welded to floorbeam webs

1.3 Inspection Method

AECOM performed the in-depth and Fracture-Critical inspection of Bridge HAM-50-0376L from July 11, 2022 to July 14, 2022. The fracture-critical members are all floorbeams and lower chord members, as well as certain vertical and diagonal members (Figure 2 and Figure 3).

The wearing surface and portions of the trusses in the splash zone (within approximately 5’ of the deck surface) were inspected from the bridge deck. The lower chords were inspected by structure climbing. The diagonal, vertical and upper chord truss members were inspected using a boom lift with single lane closures on U.S. 50. The floorbeams and stringers were inspected either from the boom lift, from a ladder, or by rope access techniques. The piers and pier bearings were inspected either from the boom lift or by rope access. The abutments and abutment bearings were inspected from the ground with a ladder. A drone was used to provide supplemental photographs of portions of the bridge over water, as well as aerial photographs of the overall bridge and approaches. The inspection was performed in accordance with the Consultant Bridge Inspection Scope of Services, dated January 6,2021. Underwater inspection is not part of the scope for this project and was not performed. An underwater inspection was last performed in August 2019 by Terracon.

Inspection Team:
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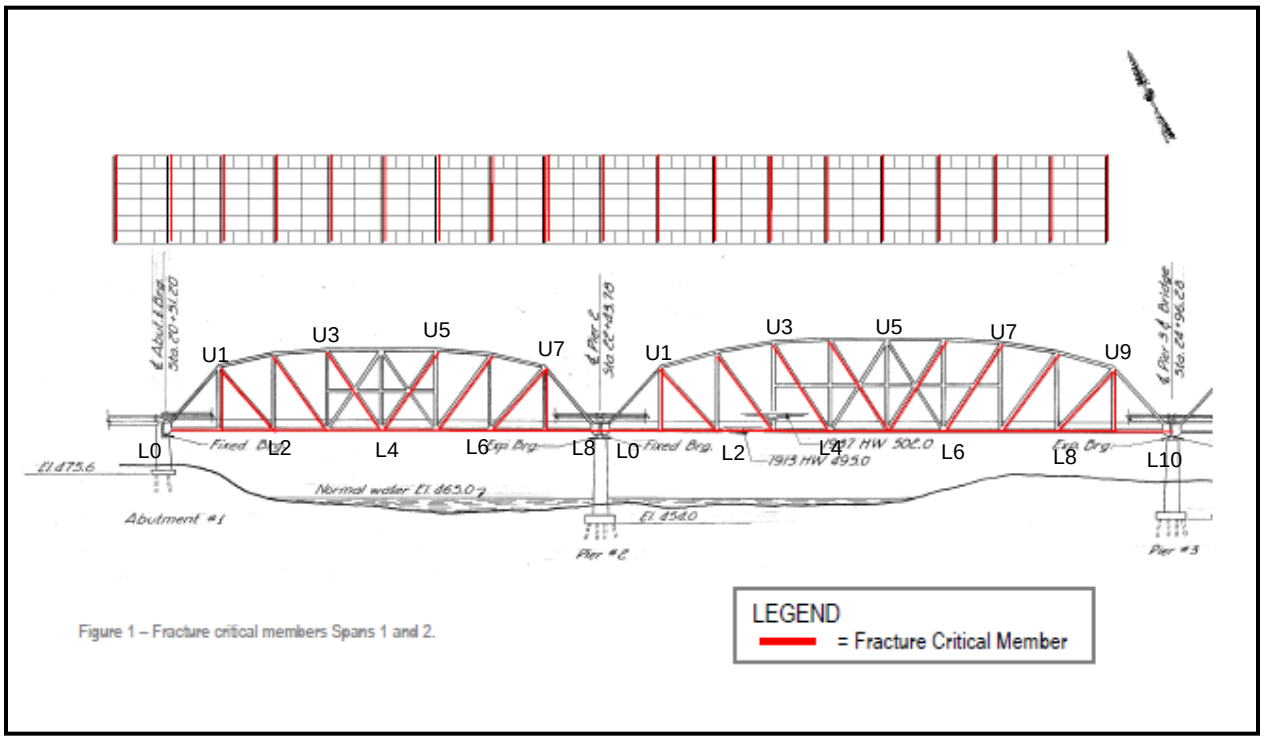


Figure 1 – Fracture critical members Spans 1 and 2.

Figure 2- Plan and Elevation for Span 1 and 2

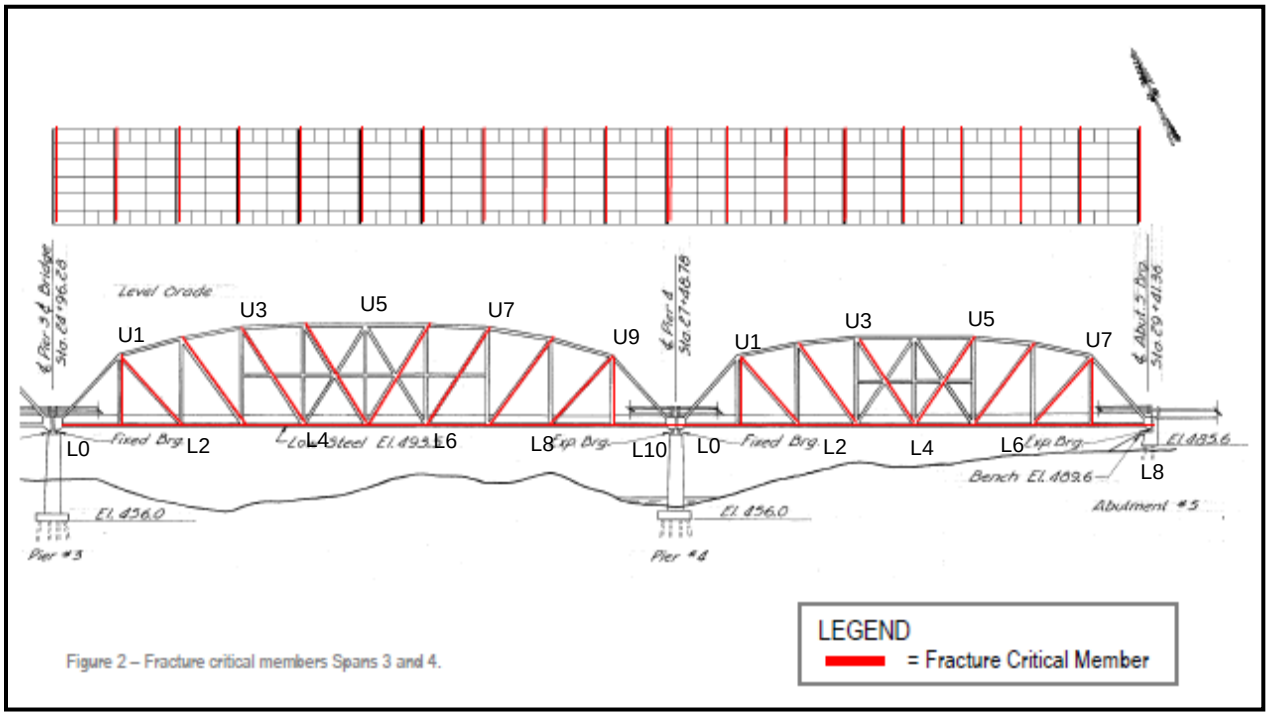


Figure 2 – Fracture critical members Spans 3 and 4.

Figure 3- Plan and Elevation for Span 3 and 4

1.4 Condition Descriptions and Ratings

Condition descriptions for all elements are provided in the sections below according to Table 1. For quantities and condition states for all elements, see the AssetWise Bridge Inspection report in Appendix C.

***Table 1**: Condition Rating Guidelines*

Condition	NBIS Condition Rating	Guidelines
Excellent	9	Excellent Condition. No problems noted: no section loss or general deterioration.
Very Good	8	
Good	7	Some minor problems.
Satisfactory	6	Structural elements show some minor deterioration.
Fair	5	Structural elements show deterioration but are sound.
Poor	4	Advanced widespread deficiencies or a likely reduction to capacity. Usually the load path appears to be affected for primary members or there are obvious structural changes since the as-built condition that are advanced.
Serious	3	Poor condition and local failures possible.
Critical	2	Serious condition and unless closely monitored it may be necessary to close the bridge until corrective action is taken.
Imminent Failure	1	Critical and major deterioration is affecting stability. Bridge or lane(s) shall be closed to traffic, but corrective action may put bridge back into light service.
Failed	0	Imminent Failure and out of service, beyond corrective action.

2 BRIDGE CONDITION

2.1 Item 58 – Deck

The deck is in ***Good*** condition. The deck underside exhibits transverse hairline cracks and isolated hairline map cracking.

2.1.1 Element 12 – Reinforced Concrete Deck

The reinforced concrete deck is in ***Good*** condition. In all spans, the underside of the deck typically exhibits transverse hairline cracks and isolated hairline map cracking. Spalls are typical along the stringer haunches up to 1 inch deep with no exposed reinforcing steel (**Photo 1** and **Photo 2**). There are isolated hairline cracks in the deck fascias at the floorbeams (**Photo 3**).

***Photo 1**: Typical haunch spall (Bay 5 in Span 3 shown)*

***Photo 2**: Typical map cracking throughout the deck underside (Span 1 shown)*

***Photo 3**: Hairline radial cracking in deck edge at Floorbeam 2 in Span1*

2.1.2 Element 510 – Wearing Surface (Item 58.01)

The monolithic concrete deck wearing surface is in ***Satisfactory*** condition. Isolated hairline longitudinal and transverse cracks are present throughout all spans. The wearing surface exhibits moderate wear throughout the spans. The concrete patches exhibit some hairline cracks but are in good condition (**Photo 4**). Hairline transverse shrinkage cracks are typical along the gutter lines.

There are small spalls due to missing raised pavement markers (RPMs) in Spans 1, 3, and 4 (**Photo 5**). There is a broken RPM with pointed metal protruding above the deck in Span 4 near L2 (**Photo 6**). There are small spalls along both sides of the Pier 2 joint (**Photo 7**). There is a 10 S.F. shallow spall at the downstream curb of Span 2 between L5 and L6. There is a 4 S.F. shallow spall with exposed rebar in the south lane of Span 3 (**Photo 8**), and a 1 S.F. shallow spall near the centerline in Span 4 (**Photo 9**).

***Photo 4**: Deck patches with hairline cracks in Span 2*

Photo 5: *Missing RPM in Span 1*

Photo 6: *Broken RPM with sharp metal edge in Span 4*

***Photo 7**: Isolated spalls adjacent to Pier 2 joint*

***Photo 8**: Missing RPM and 4 S.F. spall in south lane in Span 3*

***Photo 9**: 1 S.F spall near centerline of Span 4*

2.1.3 Element 300 – Strip Seal Expansion Joint (Item 58.02)

The expansion joints are in ***Satisfactory*** condition. Strip seal expansion joints are located at the end of every span. Moderate debris accumulation is present in all joints with heavy accumulation along the shoulders. There is minor surface corrosion on the armored edges and small spalls in the deck along the joints (**Photo 7**). The joint opening measurements were taken at deck level (Table 2).

Table 2: Expansion joint measurements (inches)

Joint	2014 Measurement at 65° F	2018 Measurement at 84° F	2020 Measurement at 80° F	2022 Measurement at 90° F
West Abut.	7/8	5/8	5/8	5/8
Pier 2	1 7/8	1 1/8	1 3/16	1 1/8
Pier 3	1 11/16	1 5/16	1 9/16	1 1/4
Pier 4	3 1/16	2 1/4	2 1/4	2 3/4
East Abut.	1 7/16	1 1/8	1 1/4	1 1/4

Note: Measurements shown from previous inspections were populated from previous inspection reports created by other consultants; these measurements were not verified by AECOM.

2.1.4 Element 330 – Metal Bridge Railing

The metal bridge railings are in ***Satisfactory*** condition. There are several locations of vehicular impact damage to the railings, totaling approximately 60’ long on the north railing and 45’ long on the south railing (**Photo 10**). There is a 10’ long curb spall on the south curb in Span 2 (**Photo 11**).

Photo 10: *Impact damage to north railing in Span 3*

Photo 11: *Curb spall at south railing in Span 2*

2.1.5 Element 815 – Drainage

The bridge deck drainage is in ***Satisfactory*** condition with debris accumulation at the roadway edge. There is a partially clogged deck drain in the downstream gutter line in Span 3 (**Photo 12**). Some scuppers exhibit minor corrosion at the outlets.

***Photo 12**: Partially clogged drain*

2.2 Item 59 – Superstructure

The superstructure is in ***Satisfactory*** condition, with active corrosion, pack rust, and section loss throughout the truss members and floorbeams.

2.2.1 Element 113 - Steel Stringers

The steel stringers are in ***Good*** condition. Haunch spalls are present along the top flange of stringers resulting in surface corrosion with no measurable section loss along exposed unpainted top flange edges (**Photo 13**).

Top and bottom flange cover/splice plates are welded to the stringer ends at each floorbeam and the welds at the ends of the plates are Category E details. The top flange plates are encased in the deck and could not be inspected. Some of the welds in the stringer cover plate connections have rough edges or other indications of poor quality welding, but no cracks or other defects in the welds were observed (**Photo 14**).

***Photo 13**: Typical stringer surface corrosion at haunch spalls*

***Photo 14**: Typical poor quality weld between stringer and coverplate (S1 at FB6 in Span 3 shown)*

2.2.2 Element 120 - Steel Truss

The steel truss is in ***Satisfactory*** condition, with active corrosion, pack rust, and section loss in the splash zones and throughout the lower chord.

Lower Chord

Pack rust between 1/8" and 1/4" thick is typical between lower chord plates in all spans (**Photo 15**), with isolated locations up to 1/2" thick (**Photo 16** and **Photo 17**). There is also pack rust up to 3/4" thick under the lower chord diaphragm angles (**Photo 18**).

The lower chords exhibit surface corrosion throughout with active pitting up to 3/16" deep on the plate edges (**Photo 19**) and around the diaphragm angles (**Photo 20**), with laminating corrosion with section loss up to 1/8" deep at the gusset plates (**Photo 21**). The most significant area of section loss is L0L1 near L0 in Span 2 of the North Truss with 1/8" section loss along the full width of the inboard plate (originally 13/16" thick), approximately 8% of the total cross-sectional area of the member (**Photo 22**).

Several lower chord members exhibit minor bowing and local deformations (**Photo 23** and **Photo 24**).

Tack welds are common between lower chord web plates and internal diaphragms, as well as the lower chord plates and gusset plates. These tack welds are located on fracture-critical members and are considered fatigue prone details since they can create stress risers and propagate cracks into adjacent members. Some of the welds are of poor quality, but no cracks were observed (**Photo 25**).

Photo 15: *Typical pack rust between lower chord plates (L6L7, Span 3, South Truss shown)*

Photo 16: *Active pack rust up to 1/2" thick on L7L8, Span 2, North Truss*

***Photo 17**: Active pack rust at L7, Span 2, South Truss*

***Photo 18**: Pack rust up to 3/4" thick at L0L1, Span 2, South Truss*

***Photo 19**: Active pitting on plate edges, L3L4, Span 1, North Truss*

***Photo 20**: Active pitting up to 3/16" deep at L5L6, Span 1, North Truss*

***Photo 21**: Laminating corrosion on L1L2, Span 2, North Truss*

***Photo 22**: Active laminating corrosion with section loss up to 1/8" deep x full plate width on L0L1 at L0, Span 2, North Truss*

Photo 23: *Inconsistent diaphragm dimensions causing bowing in L0L1 at L0, Span 3, South Truss*

Photo 24: *Bow on outboard plate of L6L7, Span 4, North Truss*

***Photo 25**: Tack weld between lower chord and gusset plate at L1, Span 1, South Truss*

Upper Chord

The upper chord members exhibit minor spot rust and isolated surface corrosion throughout (**Photo 26**), with reactivating corrosion between the channels and web plates (**Photo 27**). There are tack welds between the upper chord and the gusset plates in several locations; no cracks or other defects were observed at these compression member locations. There is a gouged area on U7U8 at U7 in Span 2, north truss which appears to be a rolled defect.

***Photo 26**: Active corrosion on U1U2, Span 4, North Truss*

***Photo 27**: Corrosion on upper chord channel and web plate, U3U4, Span 3, North Truss*

<u>End Posts</u>

The end posts exhibit surface corrosion throughout. In the splash zones, there is laminating corrosion with section loss up to 3/16" deep on the channels and pack rust up to 1/8" thick

under the cover plates (**Photo 28**). The lacing bars exhibit advanced section loss (**Photo 29**) and deformations due to pack rust (**Photo 30**). Vegetation growth is seen on L0U1, Span 4, South Truss (**Photo 31**).

***Photo 28**: Active pack rust up to 1/8" thick in U7L8, Span 1, North Truss*

***Photo 29**: Active corrosion with section loss up to 1/8" deep on lacing of L0U1, Span 4, North Truss*

***Photo 30**: Pack rust up to 3/16" thick under lacing bars of L0U1, Span 3, South Truss*

***Photo 31**: Vegetation grown on end post L0U1, Span 4, South Truss*

Verticals

The verticals exhibit active corrosion with section loss up to 1/8" deep (**Photo 32**) as well as painted over pitting up to 3/16" deep (**Photo 33**) in the splash zone, at the gusset plates, and near former railing attachments. There is a 1" diameter active corrosion hole in the web of L6U6 near L6 of Span 2, North Truss (**Photo 34**). There are undercut tack welds on the flange of L2U2 (compression member) of Span 1, South Truss (**Photo 35**). There is a 1' long deformation in the flange of L7U7 of Span 4, South Truss (**Photo 36**) causing outward bowing up to 1/2" for 8" in length. There are minor deformations in the flange of L4U4 of Span 1, South Truss (**Photo 37**).

***Photo 32**: Active pitting with section loss up to 1/16" deep at L3U3 on Span 2, North Truss*

Photo 33: *Section loss in U9L9, Span 3, North Truss*

Photo 34: *1" Diameter corrosion hole at L6U6, Span 2, North Truss*

***Photo 35**: Undercut tack welds between the vertical and fill plate, L2U2, Span 1, South Truss*

***Photo 36**: Bowing of outboard flange of L7U7, Span 4, North Truss*

***Photo 37**: Deformations of L4U4, Span 1, South Truss*

Diagonals

The diagonals exhibit active corrosion with section loss up to 3/16" deep (**Photo 38**) as well as painted over pitting up to 3/16" deep (**Photo 39**) in the splash zone, at the gusset plates, and near former railing attachments. The inboard flange of U1L2, Span 4, North Truss is deformed up to 1/2" out of plane (**Photo 40**).

There are tack welds between fracture-critical diagonals and middle gusset plates in the following locations:

- L4U5, Span 1, South Truss
- L3U4, Span 4, South Truss (**Photo 41**)
- L4U5, Span 4, South Truss

The tack welds are located on tension members and are considered fatigue prone details since they can create stress risers and propagate cracks into adjacent members. Some of the tack welds are of poor quality, but no cracks were observed.

Photo 38: *Active pitting up to 3/16" deep on L8U9, Span 2, North Truss*

Photo 39: *Painted over pitting on U3L4, Span 2, South Truss*

***Photo 40**: Bowing of inboard flange of U1L2, Span 4, North Truss*

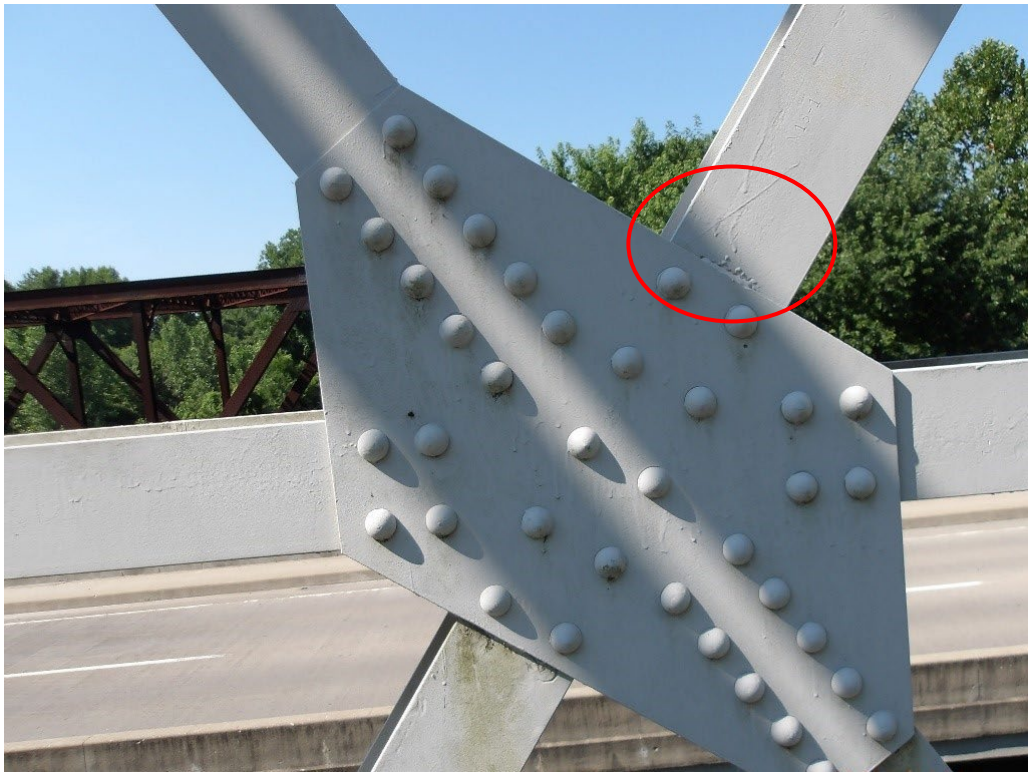


***Photo 41**: Tack weld on L3U4, Span 4, South Truss at middle gusset plate*

2.2.3 Element 152 - Steel Floorbeam

The steel floorbeams are in ***Satisfactory*** condition. Painted over pitting with section loss up to 3/16" deep is typical throughout the bottom flange and web (**Photo 42**) and in the top flange near the truss connections (**Photo 43**), with isolated areas of reactivating corrosion (**Photo 44**). Active corrosion is typical on the web and flange at the interface with the deck fascia (**Photo 45)**. There are isolated areas of laminating corrosion and pack rust at the gusset plate connection angles (**Photo 46**). Isolated rivet heads at the connection angles exhibit up to 25% section loss which is generally less than 1/8" deep.

The stringers are welded to floor beam webs via a connection plate on both sides of the stringer web, as well as along the stringer bottom flange. The welded plate connection of the stringer web to the floor beam web, and the stringer bottom flange weld, are both Category E details. Several locations of poor-quality welds exist; however, no cracks were observed (**Photo 47**).

***Photo 42**: Pitting up to 1/8" deep in FB6, Span 1*

***Photo 43**: Pitting up to 3/16" deep in top flange of FB 4, Span 1, South end*

***Photo 44**: Laminating corrosion on top flange of FB 5, Span 3, South end*

***Photo 45**: Typical corrosion on top flange and web at the deck penetration at FB 9, Span 2, South end*

***Photo 46**: Laminating corrosion and pack rust at FB7 connection to gusset plate, Span 3, South end*

***Photo 47**: Stringer 1 connection to Floor Beam 2, Span 2*

2.2.4 Element 162 - Steel Gusset Plate

The steel gusset plates are in ***Satisfactory*** condition. The gusset plates typically exhibit active pack rust up to 1/4" thick (**Photo 48**), with active pack rust up to 3/8" thick under the lower chord splice plates (**Photo 49**). There are improperly installed rivets at U6, Span 2, South Truss (**Photo 50**). The gusset plates exhibit active laminating and surface corrosion with section loss up to 3/16" deep, as well as painted over pitting up to 3/16" deep (**Photo 51**).

The side cover plate is bowed 3/4" due to pack rust at L0, Span 2, North Truss (**Photo 52**). There is laminating corrosion and corrosion holes in the gusset plate stiffening angles at L0, Span 2, North Truss (**Photo 52**); L0, Span 3, North Truss (**Photo 53**); and L0, Span 3, South Truss (**Photo 54**). There are also corrosion holes in the top cover plate of the gusset connection at L10 in Span 2 (**Photo 55**) of the North Truss and L8 of Span 1 (**Photo 56**) of both trusses. The stiffening angles and cover plates are secondary members of the gusset connections, and their section loss is not in the primary load path of the truss (Figure 4). While conventional load rating methods would not be impacted by section loss in these stiffening angles and cover plates, continued deterioration of these elements could lead to instability of the connections. If the corrosion of these elements progresses, a refined analysis of the gusset connections should be considered.

The gussets exhibit bowing up to 1/4" out of plane (**Photo 57**); no significant changes in the gusset bowing dimensions were observed compared to the 2020 inspection (see Appendix A).

***Photo 48**: Pack rust deforming L4 gusset plate up to 1/4" in Span 1, North Truss*

***Photo 49**: Active pack rust up to 3/8" thick at L5 splice plate, Span 1, North Truss*

***Photo 50**: Improperly installed rivets at U6, Span 2, South Truss*

***Photo 51**: Pitting in L8, Span 3, North Truss*

***Photo 52**: Corrosion holes in L0 gusset plate stiffening angles and bowed side cover plate behind Pier 2 bearing, Span 2, North Truss*

***Photo 53**: Corrosion holes in L0 gusset plate stiffening angles behind Pier 3 bearing, Span 3, North Truss*

Photo 54: *Laminating corrosion on the south bearing pin at Span 3, Pier 3*

Photo 55: *Corrosion holes in top cover plate of L10, Span 2, North Truss*

***Photo 56**: Corrosion holes in top cover plate of L8, Span1, North Truss*

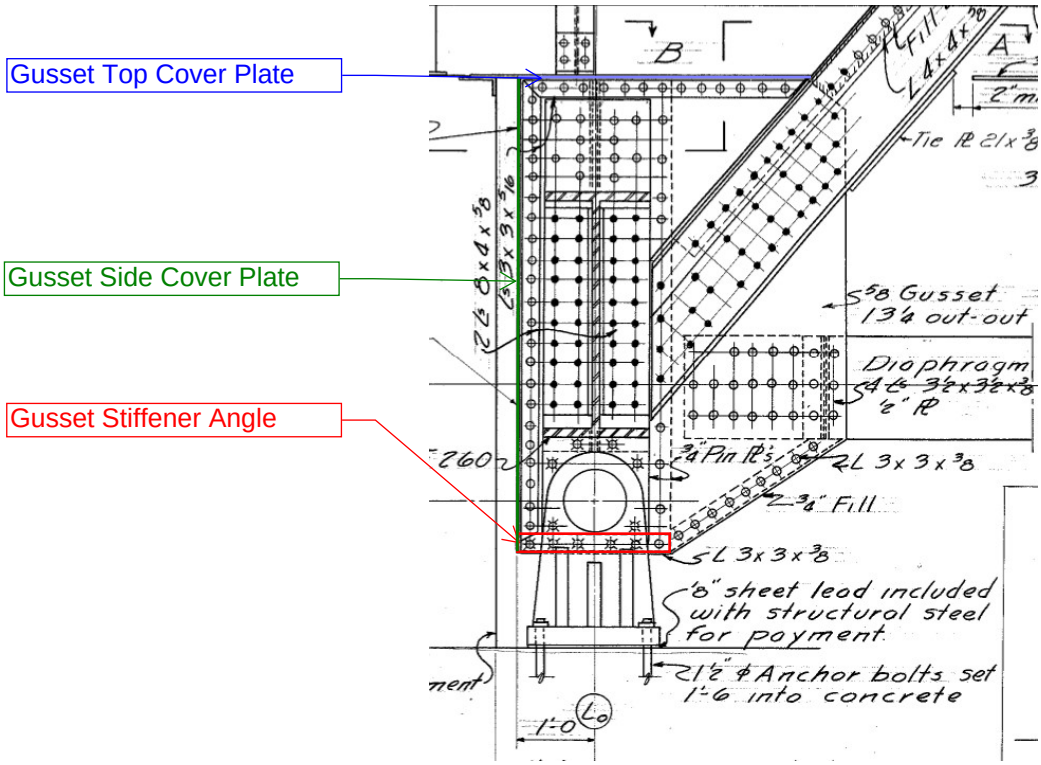


Figure 4- Typical gusset configuration at truss bearing

Photo 57: *Positive bowing on outboard gusset plate L7, Span 2, South Truss*

2.2.5 Element 311/313 – Bearings

The bearings overall are in ***Satisfactory*** condition. Active surface corrosion and laminating corrosion with isolated minor section loss is typical on all bearings (**Photo 58** and **Photo 59**), as well as on the pins (**Photo 54)** and masonry plates (**Photo 60**). Several bearings have loose anchor nuts, including the south bearing of Span 2 at Pier 3 (**Photo 61**) and the north bearing of Span 3 at Pier 4 (**Photo 60**).

***Photo 58**: Active corrosion with minor section loss on North bearing, Span 2, Pier 2*

***Photo 59**: Laminating corrosion with section loss at North bearing, Span 3, Pier 3*

***Photo 60**: Loose anchor nut and laminating corrosion at North bearings, Pier 4*

Photo 61: *Loose southeast anchor nut at South bearing, Span 2, Pier 3*

2.2.6 Element 515 - Steel Protective Coating System (Item 59.01)

The steel protective coating system is OZEU paint, which was applied in 1992. Overall, the protective coating system is in ***Fair*** condition, based on the condition on the gusset plates and truss members. There are areas of paint failure and corrosion throughout the truss, particularly in the splash zone, lower chords, and bearings (**Photo 62**). The paint on the upper half of the trusses is in good condition with isolated areas of peeling paint and surface corrosion. The paint on the stringers and floorbeams has minor freckling with isolated areas of corrosion at the floorbeam ends (**Photo 63**).

***Photo 62**: Typical lower paint condition (L6L7 at Span 3, South Truss shown)*

***Photo 63**: Typical floorbeam freckling corrosion (FB7, Span 2 looking South shown)*

2.2.7 Alignment

Alignment is in ***Fair*** condition with isolated misalignment in the stringers as well as minor bowing and local deformations in several truss members (lower chords, verticals, and diagonals).

2.2.8 Crossframes and Diaphragms

The steel cross frames between the stringers are in ***Good*** condition with isolated bent cross frames in Span 1, 2, and 4 (**Photo 64**).

Photo 64: *Bent stringer cross frame between FB4 and FB5 in Span 4*

2.2.9 Lateral Bracing

The lateral bracing is in ***Satisfactory*** condition, with isolated surface corrosion. The upper lateral bracing is bent up to 1/2" out of plane laterally in several locations (**Photo 65**). There is pack rust up to 1/8" thick between lateral bracing connection plates and upper chord cover plates.

***Photo 65**: Bent lateral bracing at U5U6 on Span 2*

2.2.10 Sway Bracing

The sway bracing is in ***Satisfactory*** condition overall, with several isolated areas of impact/construction damage (**Photo 66**). The bottom sway brace gusset plate at PP4 in Span 3 is deformed 5/8" due to pack rust (**Photo 67**).

***Photo 66**: Impact damage of the sway bracing member in Span 4 below U3*

***Photo 67**: Warped sway brace gusset plate at PP4 in Span 3*

2.2.11 Fatigue

The fatigue elements are in ***Satisfactory*** condition. The welds below are fatigue sensitive details and while no cracks were found during the current inspection, some of the welds are of poor quality and these details should be monitored during future inspections,

- Tack welds between lower chord web plates and internal diaphragms
- Tack welds between lower chord web plates and gusset plates
- Tack welds between diagonals and middle gusset plates
- Welds between stringers and floorbeams
- Welds at ends of stringer flange cover plates

2.3 Item 60 – Substructure

The substructure is in ***Fair*** condition, with widespread delaminations and spalls with exposed rebar with minor section loss.

2.3.1 Element 210 - Reinforced Concrete Pier Wall

The reinforced concrete pier walls are in ***Fair*** condition with large areas of delaminations and spalls with exposed rebar typical throughout. Pier Wall 2 has map cracking with efflorescence and delamination on the west face (**Photo 68**) and two 4'x4'x2" deep spalls with exposed rebar with minor section loss on the east face (**Photo 69**). Pier Wall 3 has delaminations and map cracking throughout (**Photo 70**). There is widespread spalling with exposed rebar with minor section loss on the west face of Pier 4 and a spall with exposed rebar with minor section loss on the east face (**Photo 71**).

***Photo 68**: Cracks and delaminations on west face of Pier 2*

***Photo 69**: Delaminations and spalls with exposed rebar on east face of Pier 2*

***Photo 70**: West face of Pier 3*

***Photo 71**: Widespread spalls with exposed rebar on the west face of Pier 4*

2.3.2 Element 215 - Reinforced Concrete Abutment

The reinforced concrete abutments are in ***Fair*** condition.

The rear abutment has a 24’ wide by 3” deep by full height delaminated area between Stringers 1 and 4 (**Photo 72** and **Photo 73**); delaminations could not be removed with a hammer. There are also multiple large spalls and cracks up to 1/2” wide between Stringers 2 and 4. There are widespread areas of delamination on the rear abutment seat between Stringers 1 and 4 (**Photo 74**).

The forward abutment has a 10’W x 2.5’H area of delamination and spalls with exposed rebar with minor section loss between Stringers 3 and 4 and a 6”W x 1’ H spall with exposed rebar under Stringer 2 (**Photo 75**).

Photo 72: *Extents of delaminations on Rear Abutment*

Photo 73: *Spalls, cracks and delaminations on Rear Abutment*

Photo 74: *Rear Abutment seat looking North*

Photo 75: *Spalls with exposed rebar at Forward Abutment*

2.3.3 Element 234 - Reinforced Concrete Pier Cap

The reinforced concrete pier caps are in ***Fair*** condition. Pier caps typically exhibit areas of delamination, minor spalls, and debris accumulation around the bearings. Pier Cap 2 has a 4W' x 3'H spall and a 1'W x 2'H spall on the west face (**Photo 68**). Pier Cap 3 has a 12'W x 2'H x 2"D spall with minor section loss on the exposed rebar on the east face (**Photo 76**) and a 5'W x 4'H spall with exposed rebar on the west face (**Photo 77**). Pier Cap 4 has a 15'W x 3'H area of spalls with exposed rebar with minor section loss on the west face (**Photo 71**) and a 2' x 2' spall on the east face (**Photo 78**).

Photo 76: *Spall with exposed rebar on east face of Pier 3 cap*

Photo 77: *Spall with exposed rebar on west face of Pier 3 cap*

Photo 78: *Spall on east face of Pier 4 cap*

2.3.4 Element 830 - Abutment Backwall

The reinforced concrete abutment backwalls are ***Satisfactory*** condition. The rear abutment backwall has cracks and delaminations throughout (**Photo 79**).

Photo 79: *Cracks and delaminations in Rear Abutment backwall*

2.3.5 Wingwalls

The reinforced concrete wingwalls are in ***Satisfactory*** condition overall. The southwest wingwall has two 1'x4" spalls with exposed rebar. The west abutment exhibits cracks and delaminations throughout.

2.3.6 Slope Protection

Slope protection is in ***Good*** condition. Dumped rocks are present in front of both abutments.

2.4 Approach

The approaches are in ***Satisfactory*** condition, with cracked asphalt patches and spalls in the approach slab and vehicular damage to the southwest approach guardrail.

2.4.1 Element 321 - Reinforced Concrete Approach Slabs

The approach slabs are in ***Satisfactory*** condition. Asphalt patches are present in the rear approach slab with hairline longitudinal cracks near the abutment (**Photo 80**). There is 3 S.F. of cracking with broken up concrete in the rear approach slab near the abutment joint (**Photo 81**). There are 4 spalls between 1 S.F. and 3 S.F. in the forward approach slab along the longitudinal joint and a 2'x2' spall near the abutment joint (**Photo 82**).

Photo 80: *Asphalt patches and longitudinal cracks in Rear Approach Slab near abutment joint*

Photo 81: *3 S.F. of cracking with broken up concrete in Rear Approach Slab adjacent to abutment joint*

Photo 82: *Spalls in Forward Approach Slab*

2.4.2 Approach Wearing Surface

The asphalt approach wearing surface is in ***Good*** condition, with longitudinal and transverse hairline cracks throughout (**Photo 83**).

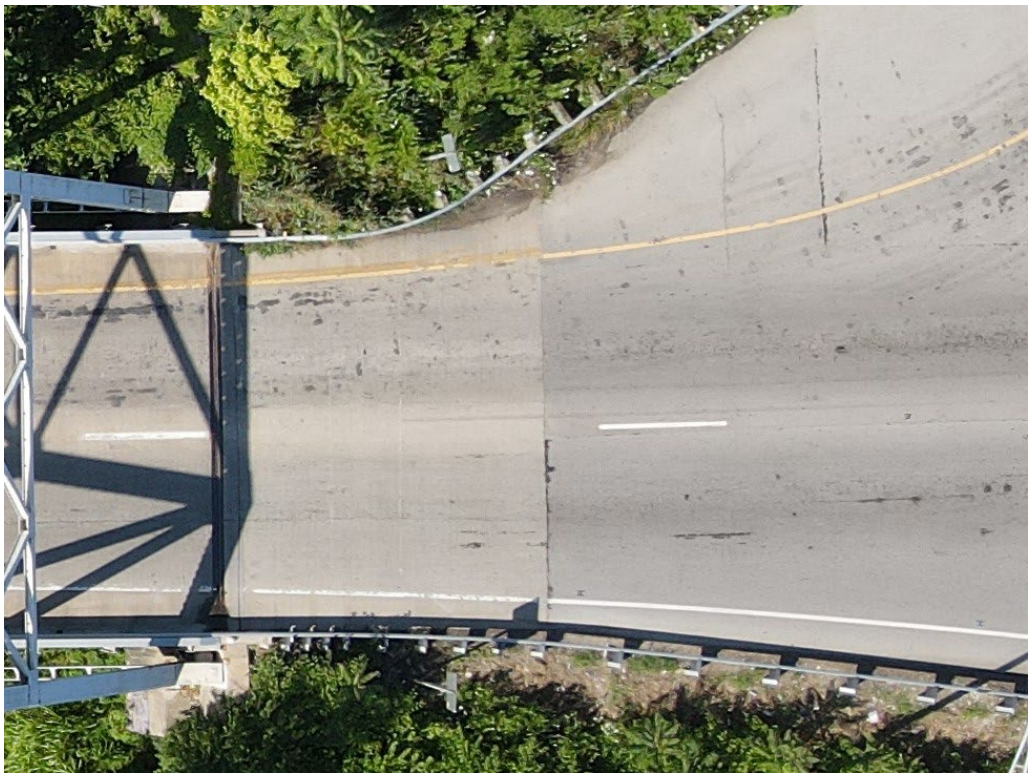


***Photo 83**: Forward approach wearing surface*

2.4.3 Approach Guardrail

The approach guardrail is in ***Poor*** condition. There is vehicular damage to the southwest approach guardrail near the adjacent bridge.

2.4.4 Embankment

The approach embankment is in ***Satisfactory*** condition. The embankments are covered in heavy vegetation, but no significant deficiencies were observed. The previous inspection noted minor erosion at the northwest corner, but this could not be verified in 2022 due to heavy vegetation.

2.5 Signs and Utility Items

2.5.1 Signs

The approach warning signs are in ***Good*** condition. There are no sign supports on the bridge.

2.6 Item 61 – Channel

The channel is in ***Satisfactory*** condition, with indications of scour and a large debris pile around Pier 3 (**Photo 84**).

***Photo 84**: Scour and debris around Pier 3*

2.6.1 Scour (Item 61.01)

Scour is in ***Good*** condition. At the time of the inspection, only Pier 2 was in the water. An underwater inspection was last performed in August 2019 by Terracon, which found no significant local scour at Pier 2. There are indications of scour around Pier 3, likely caused by the debris pile built up there (**Photo 84**). No notable scour was observed at the other substructure units.

2.6.2 Alignment

The channel alignment is in ***Good*** condition.

2.6.3 Protection

Channel protection is in ***Good*** condition with moderate vegetation along each embankment (**Photo 85**).

***Photo 85**: Channel under Span 1*

2.6.4 Hydraulic Opening

The hydraulic opening is in ***Satisfactory*** condition with a large debris pile built up around Pier 3 (**Photo 84**).

2.7 Item 67.01 - General Appraisal

Based on the 2022 In-Depth Element Level and Fracture-Critical Inspection findings, the HAM-50-0376L bridge is in ***Fair*** condition. The overall rating is controlled by the conditions of the substructure. The AssetWise Bridge Inspection Report reflecting the element level condition ratings can be found in Appendix C.

3 RECOMMENDATIONS

Repair and maintenance recommendations have been prioritized according to **Table 3** below. The repair and maintenance recommendations for the HAM-50-0376L bridge are shown in **Table 4**.

***Table 3**: Recommendation Classification*

Priority Level	Description	Timeframe
Critical	Immediate action required. Integrity of the structure/public safety is in jeopardy.	Within 7 days
High Priority	Complete work as soon as possible. Serious structural deficiency exists to a primary bridge element that if not corrected could jeopardize the structure or public safety.	Within 6 months
Priority	Review work plan and re-prioritize schedule. Advanced deficiency exists to a primary members or appurtenance that may lead to further deterioration or compromise public safety if not corrected.	Within 1-2 years
Schedule	Add to scheduled work. Minor but noteworthy deficiencies exist to a primary member or appurtenance that may become more serious if left unaddressed for an extended period of time.	Add to schedule
Program	Add to programmed work. Minor deficiencies exist to a primary or secondary member or appurtenance that may lead to a noteworthy defect if left unaddressed for an extended period of time.	Upon availability of funds
Routine	As per the existing maintenance schedule. Non-structural condition exists that does not affect public safety and occurs over time with normal use of the structure.	Within next maintenance cycle

Table 4: *List of Recommendations*

Priority Level	Recommendations
Critical	None
High Priority	Approach: • Replace impact-damaged southwest approach guardrail. Deck: • Replace broken and missing RPMs.
Priority	Deck: • Patch spalls in wearing surface. Superstructure: • Replace impact-damaged bridge railing. • Tighten bearing anchor nuts. • Clean and paint bridge steel. • Caulk areas of pack rust on the lower chord and gusset plates. Substructure: • Repair spalls and delaminations in substructure concrete. • Remove channel debris built up at Pier 3. Approach: • Patch spalls in east approach slab.
Schedule	Superstructure: • Remove vegetation from L0U1, Span 4, South Truss.
Program	Deck: • Overlay wearing surface. Superstructure: • Monitor section loss on secondary members (stiffening angles and cover plates) on gusset connections at truss bearings.
Routine	Deck: • Clean debris from the expansion joints.

Appendix A – Gusset Plate Bowing Tables

North Truss Upper Chord Gusset Plates													
Span	Location	Plan Plate Thickness (in)	North Gusset Plate						South Gusset Plate					
			2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)	2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)
1	U1	1/2	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16
	U2	1/2	- 1/8	- 1/8	- 1/16	- 1/16	- 1/16	- 1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U3	1/2	Flat	Flat	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16
	U4	1/2	1/16	1/16	Flat	Flat	Flat	Flat	1/16	1/16	- 1/16	- 1/16	- 1/16	- 1/16
	U5	1/2	1/16	- 1/16	- 1/16	- 1/16	- 1/16	1/8*	Flat	Flat	- 1/16	- 1/16	- 1/16	- 1/8
	U6	1/2	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16
	U7	1/2	Flat	Flat	- 1/16	- 1/16	- 1/16	- 1/16	Flat	Flat	Flat	Flat	Flat	Flat
2	U1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	- 1/16	- 1/16	Flat	- 1/16	- 1/16	- 1/16
	U2	9/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	1/16	1/16	1/16	1/16	1/16	1/16
	U3	9/16	1/16	1/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U5	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U6	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U7	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U8	9/16	Flat	Flat	Flat	Flat	Flat	Flat	1/8	1/8	1/8	1/8	1/8	1/8
	U9	9/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	Flat	Flat	Flat	Flat	Flat	Flat
3	U1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16	1/16	1/16
	U2	9/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	1/16	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8
	U3	9/16	1/16	1/16	1/16	1/16	1/16	1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	- 1/16	- 1/16	- 1/16	- 1/16
	U5	1/2	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U6	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U7	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U8	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U9	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
4	U1	1/2	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16	- 1/16
	U2	1/2	1/8	1/8	1/16	1/16	1/16	1/8	- 1/8	- 1/8	- 1/16	- 1/16	- 1/16	- 1/16
	U3	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16	1/16	1/16	1/16	1/16
	U5	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U6	1/2	Flat	Flat	Flat	Flat	Flat	Flat	- 1/16	- 1/16	Flat	- 1/16	- 1/16	- 1/16
	U7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat

Note:
Positive bow indicates the center of the gusset plate is bowing away from the centerline of the truss.
Negative bow indicates the center of the gusset plate is bowing towards from the centerline of the truss.
+/- indicates both positive and negative bows measured at different locations on the plate.
Measurements shown from previous inspections were populated from previous inspection reports created by other consultants; these measurements were not verified by AECOM.
Yellow highlight indicates changes in bowing measurements.
*Gusset does not visually appear to have changed since the last inspection. Measurements between current and previous inspections appear to disagree. Verify during next inspection.

North Truss Lower Chord Gusset Plates													
Span	Location	Plan Plate Thickness (in)	North Gusset Plate						South Gusset Plate					
			2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)	2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)
1	L0	5/8	Flat	Flat	Flat	Flat	1/8	1/8	Flat	Flat	Flat	Flat	Flat	Flat
	L1	1/2	Flat	Flat	Flat	Flat	1/16	1/16	Flat	Flat	Flat	Flat	Flat	Flat
	L2	1/2	1/8	1/8	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
	L3	1/2	1/16	3/16	-1/16	-1/16	-1/16	-1/16	-1/16	3/16	-1/16	-1/16	-1/16	-1/16
	L4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/4	1/4
	L5	1/2	1/8	3/16	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/16	-1/16	-1/16	-1/16
	L6	1/2	1/8	1/8	-1/8	-1/8	-1/8	-1/8	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L8	5/8	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/8	1/8
2	L0	3/4	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	-1/16	-1/16	-1/16	-1/16
	L2	9/16	Flat	Flat	-1/16	-1/16	-1/16	-1/16	1/8	1/8	1/8	1/8	3/16	3/16
	L3	9/16	Flat	Flat	1/8	1/8	Flat	Flat	1/4	1/4	3/16	3/16	3/16	3/16
	L4	9/16	Flat	Flat	1/8	1/8	1/16	1/16	Flat	Flat	3/16	3/16	3/16	3/16
	L5	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L6	9/16	1/8	3/16	3/16	3/16	3/16	3/16	Flat	Flat	1/16	1/16	1/16	1/16
	L7	9/16	1/4	1/4	1/4	1/4	1/4	1/4	1/8	1/8	1/8	1/8	1/8	1/8
	L8	9/16	1/8	1/8	-1/8	-1/8	-1/8	-1/8	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L9	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L10	3/4	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
3	L0	3/4	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat
	L1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L2	9/16	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	-1/16	-1/16	1/8	1/8
	L3	9/16	Flat	Flat	Flat	Flat	Flat	Flat	1/4	1/4	-1/4	-1/4	1/8	1/8
	L4	9/16	1/8	1/8	-1/8	-1/8	-1/16	-1/16	1/8	1/8	Flat	Flat	1/8	1/8
	L5	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L6	9/16	1/8	1/8	1/8	1/8	1/16	1/16	1/8	1/8	Flat	Flat	1/16	1/16
	L7	9/16	1/4	1/4	1/4	1/4	1/4	1/4	1/8	1/8	1/8	1/8	1/16	1/16
	L8	9/16	1/4	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16	1/16	1/16
	L9	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L10	3/4	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
4	L0	5/8	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L1	1/2	Flat	Flat	1/16	1/16	1/16	1/16	Flat	Flat	Flat	Flat	Flat	Flat
	L2	1/2	1/8	1/8	-1/8	-1/8	-1/8	-1/8	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L3	1/2	Flat	Flat	-1/16	-1/16	-1/16	-1/16	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L4	1/2	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat
	L5	1/2	1/8	1/4	-1/4	-1/4	-1/4	-1/4	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L6	1/2	3/16	3/16	-1/8	-1/8	-1/8	-1/8	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L8	5/8	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat

Note:
Positive bow indicates the center of the gusset plate is bowing away from the centerline of the truss.
Negative bow indicates the center of the gusset plate is bowing towards from the centerline of the truss.
+/- indicates both positive and negative bows measured at different locations on the plate.
Measurements shown from previous inspections were populated from previous inspection reports created by other consultants; these measurements were not verified by AECOM.
Yellow highlight indicates changes in bowing measurements.

South Truss Upper Chord Gusset Plates													
Span	Location	Plan Plate Thickness (in)	North Gusset Plate						South Gusset Plate					
			2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)	2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)
1	U1	1/2	+/- 1/16	+/- 1/16	+/- 1/16	+/- 1/16	+/- 1/16	+/- 1/16	1/8	Flat	Flat	Flat	Flat	Flat
	U2	1/2	- 1/8	- 3/16	- 1/16	- 1/16	- 1/16	- 1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U3	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U5	1/2	- 1/8	- 1/8	- 1/16	- 1/16	- 1/16	- 1/16	Flat	Flat	Flat	Flat	-1/16	-1/16
	U6	1/2	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	- 1/8	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
	U7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16	1/16	1/16
2	U1	9/16	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U2	9/16	Flat	Flat	-1/8	-1/8	-1/8	-1/8	Flat	Flat	Flat	Flat	Flat	Flat
	U3	9/16	-1/16	-1/16	Flat	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U4	1/2	1/16	1/16	Flat	1/16	1/16	1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U5	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U6	1/2	-1/16	-1/16	Flat	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U7	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16
	U8	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U9	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
3	U1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	-1/16	-1/16	Flat	Flat	Flat	Flat
	U2	9/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	1/8	1/8	1/16	1/16	1/16	1/16
	U3	9/16	Flat	Flat	Flat	Flat	Flat	Flat	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
	U4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U5	1/2	1/16	1/16	Flat	1/16	1/16	1/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
	U6	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U7	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U8	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U9	9/16	1/16	1/16	1/16	1/16	Flat	Flat	Flat	Flat	1/16	1/16	1/16	1/16
4	U1	1/2	Flat	Flat	Flat	Flat	Flat	Flat	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
	U2	1/2	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8
	U3	1/2	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	Flat	Flat	Flat	Flat
	U4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16	1/16	1/16
	U5	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	U6	1/2	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16	Flat	Flat	-1/16	-1/16	-1/16	-1/16
	U7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat

Note:
Positive bow indicates the center of the gusset plate is bowing away from the centerline of the truss.
Negative bow indicates the center of the gusset plate is bowing towards from the centerline of the truss.
+/- indicates both positive and negative bows measured at different locations on the plate.
Measurements shown from previous inspections were populated from previous inspection reports created by other consultants; these measurements were not verified by AECOM.
Yellow highlight indicates changes in bowing measurements.

South Truss Lower Chord Gusset Plates													
Span	Location	Plan Plate Thickness (in)	North Gusset Plate						South Gusset Plate					
			2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)	2010 Bowing(in)	2012 Bowing(in)	2014 Bowing(in)	2018 Bowing(in)	2020 Bowing(in)	2022 Bowing(in)
1	L0	5/8	Flat	Flat	Flat	Flat	1/4	1/4	Flat	1/8	1/16	1/16	1/8	1/8
	L1	1/2	Flat	Flat	-1/16	-1/16	-1/16	-1/16	Flat	Flat	-1/16	-1/16	-1/16	-1/16
	L2	1/2	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16	1/16	1/16	1/16	1/16
	L3	1/2	1/8	1/8	1/8	1/8	1/8	1/8	1/4	1/4	3/16	3/16	3/16	3/16
	L4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L5	1/2	1/8	1/8	1/8	1/8	1/16	1/16	Flat	Flat	1/16	1/16	1/16	1/16
	L6	1/2	1/4	1/4	3/16	3/16	1/8	1/8	Flat	Flat	1/16	1/16	1/16	1/16
	L7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	-1/16	-1/16	-1/8	-1/8
	L8	5/8	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16
2	L0	3/4	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16
	L2	9/16	Flat	Flat	-1/8	-1/8	-1/8	-1/8	3/16	3/16	1/16	1/16	1/16	1/16
	L3	9/16	Flat	Flat	1/16	1/16	1/16	1/16	3/16	3/16	3/16	3/16	3/16	3/16
	L4	9/16	1/8	1/8	3/16	3/16	1/8	1/8	1/4	1/4	1/4	1/4	1/8	1/8
	L5	9/16	Flat	Flat	1/8	1/8	1/8	1/8	Flat	Flat	-1/16	-1/16	-1/16	-1/16
	L6	9/16	3/16	3/16	3/16	3/16	3/16	3/16	1/8	1/8	1/8	1/8	1/8	1/8
	L7	9/16	1/4	1/4	1/4	1/4	1/8	1/8	Flat	Flat	1/8	1/8	1/8	1/8
	L8	9/16	Flat	Flat	1/16	1/16	1/16	1/16	Flat	Flat	1/8	1/8	1/8	1/8
	L9	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/4	1/4
	L10	3/4	Flat	Flat	1/16	1/16	1/16	1/16	Flat	Flat	Flat	Flat	Flat	Flat
3	L0	3/4	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16
	L1	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/8	1/8
	L2	9/16	1/4	1/4	- 3/16	- 3/16	- 1/16	- 1/16	-1/16	-1/16	-1/16	-1/16	-1/8	-1/8
	L3	9/16	-1/16	-1/16	Flat	Flat	Flat	Flat	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L4	9/16	+/-1/16	+/-1/16	+/- 1/16	+/- 1/16	+/- 3/16	+/- 3/16	3/16	3/16	-1/8	-1/8	-1/8	-1/8
	L5	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	1/16	1/16	1/16	1/16
	L6	9/16	1/8	1/8	- 1/8	- 1/8	- 1/8	- 1/8	Flat	Flat	Flat	Flat	Flat	Flat
	L7	9/16	1/8	1/8	Flat	Flat	Flat	Flat	Flat	1/8	-1/16	-1/16	-1/16	-1/16
	L8	9/16	Flat	Flat	Flat	Flat	1/16	1/16	Flat	Flat	Flat	Flat	1/16	1/16
	L9	9/16	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L10	3/4	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	-1/16	-1/16	-1/16	-1/16
4	L0	5/8	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L1	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L2	1/2	Flat	1/16	-1/8	-1/8	-1/8	-1/8	1/16	1/16	1/16	1/16	1/16	1/16
	L3	1/2	Flat	Flat	1/8	1/8	1/8	1/8	Flat	Flat	Flat	Flat	Flat	Flat
	L4	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L5	1/2	1/8	1/8	-1/8	-1/8	-1/8	-1/8	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L6	1/2	1/8	1/8	-1/8	-1/8	-1/8	-1/8	1/8	1/8	-1/8	-1/8	-1/8	-1/8
	L7	1/2	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
	L8	5/8	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat

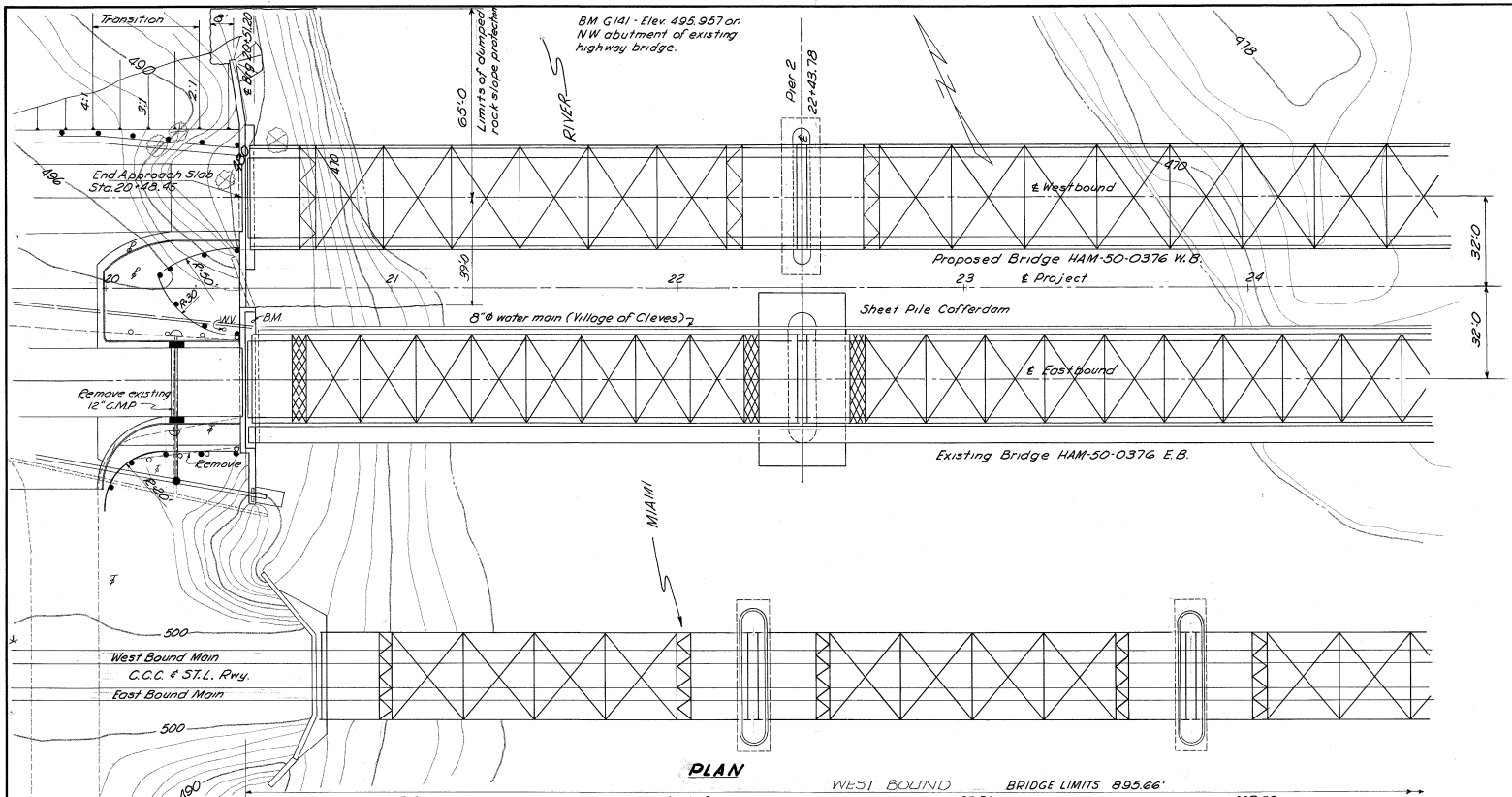
Note:
Positive bow indicates the center of the gusset plate is bowing away from the centerline of the truss.
Negative bow indicates the center of the gusset plate is bowing towards from the centerline of the truss.
+/- indicates both positive and negative bows measured at different locations on the plate.
Measurements shown from previous inspections were populated from previous inspection reports created by other consultants; these measurements were not verified by AECOM.
Yellow highlight indicates changes in bowing measurements.

Appendix B- Selected Plan Sheets

FED. HWY. DIVISION	STATE	FED. PROJECT	FISCAL YEAR
5	OHIO		

HAM - 50 - 3.72

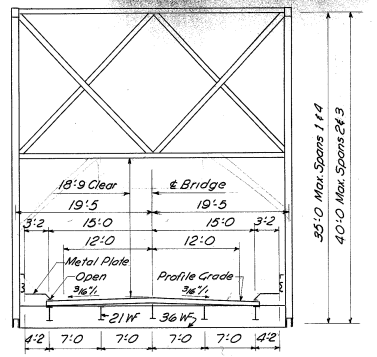
272



WEST BOUND BRIDGE LIMITS 895.66'

PLAN

ELEVATION



TYPICAL SECTION

EXISTING BRIDGE DATA

GREAT MIAMI RIVER BRIDGE HAM-50-0376 E.B.
TYPE - High Truss - Conc. Deck & Substruct.
SPANS - 190'-10, 250'-0, 250'-0, 190'-10
ROADWAY - 26'-1 with 5'-9 sidewalk, 3 side
WEARING SURFACE - Mono. Concrete
LOADING - H-15
SKEW - None
DATE BUILT - 1914
CONDITION - See Sheets 268, 269, 270 & 271
CCC & St. L. RAILWAY BRIDGE No. 132
TYPE - Thru Truss - Masonry Substruct.
SPANS - 6 @ 150'0" c/c Pins
ROADWAY - Double track main line
WEARING SURFACE - 139# rail
LOADING -
SKEW - None
DATE BUILT - 1913
CONDITION - Good

DRAINAGE AREA = 3,950 Sq. Mi.

Foundation design and foundation quantities are based on a study of rod soundings and soil sampling soundings made at the site. This sounding information may be inspected in the office of the Bureau of Bridges in Columbus, or in an abridged form in the Division office, but the State assumes no responsibility for the accuracy thereof.

PROPOSED STRUCTURE

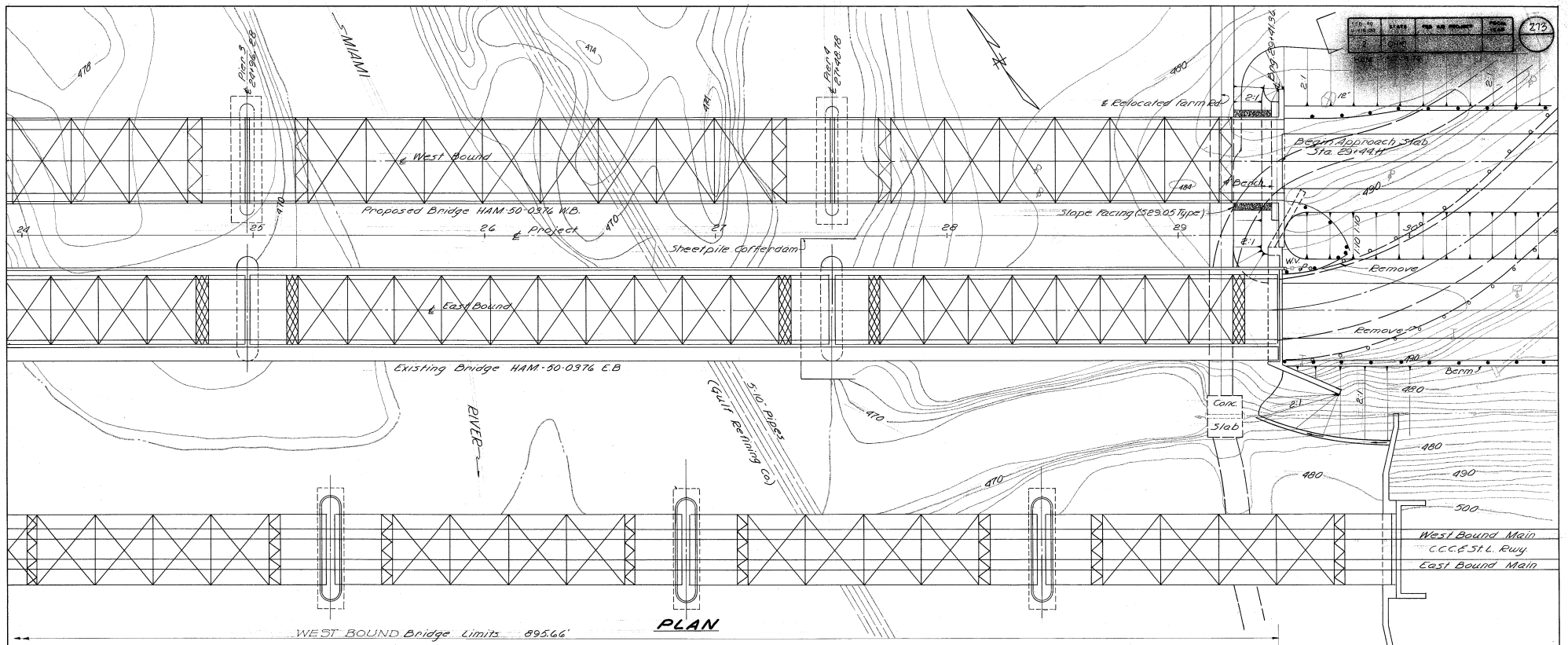
TYPE - High Truss, Concrete Deck & Substructure
SPANS - 191'-4, 250'-0, 250'-0, 191'-4
ROADWAY - 30'-0 Curb to Curb
SIDEWALKS - 3'-0 Safety Walk each Side
LIVE LOAD - CF 2000 (57), Adequate for AASHO alternate loading.
SKEW - None
ALIGNMENT - Tangent
APPROACH SLABS - 25' long, 24' Wide
WEARING SURFACE - 1" Monolithic

HARRY BALKE ENGINEERS
2330 VICTORY PARKWAY
CINCINNATI 6, O.

SITE PLAN

BRIDGE HAM-50-0376 E.B. & W.B.
EXISTING & PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA. 24+96.28

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.A.K.	R.A.K.	D.S.	R.C.B.	A.C.A.	9/8/65	



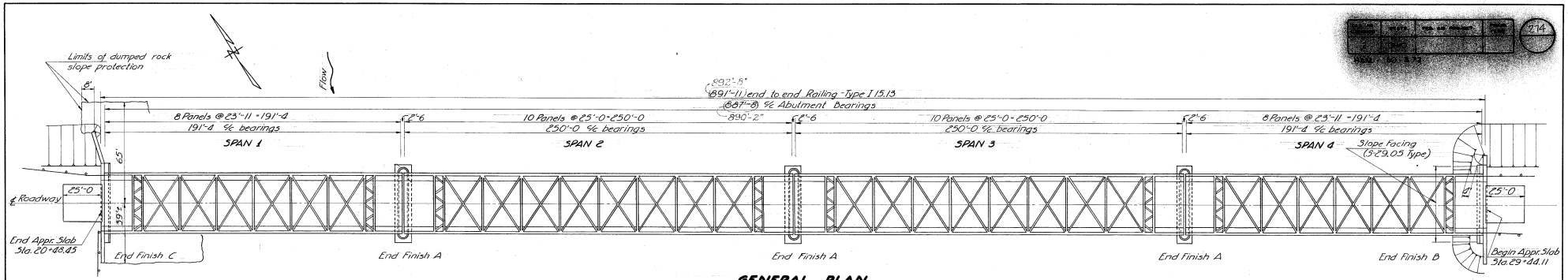
273

HARRY BALKE ENGINEERS
2330 VICTORY PARKWAY
CINCINNATI 6, O.

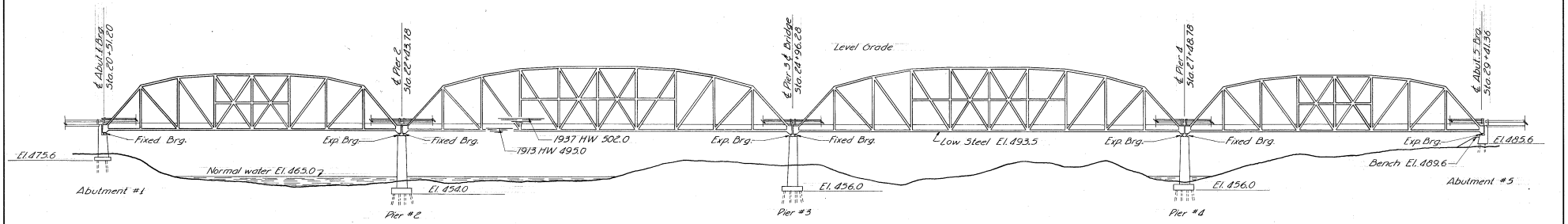
SITE PLAN

BRIDGE HAM-50-0376 EB&WB
EXISTING & PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 5-TE STA. 24+96.28

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	PARTY
RAK	RAK	DG	RCB	ACA	8/27/58	



GENERAL PLAN



ELEVATION

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	Abut. 1	Pier 2	Pier 3	Pier 4	Abut 5	Superstr.	General	
E-2	lump sum	lump sum	Cofferdams, cribs & sheeting							lump sum	
E-2	1,372	cu.yds.	Unclassified excavation	227	664	561	186	134			
S-1	749.2	cu.yds.	Class "C" concrete, superstructure						749.2		
S-1	321.1	cu.yds.	Class "C" concrete, abutments	222.5				98.6			
S-1	378.6	cu.yds.	Class "E" concrete, footings	83.4	98.4	98.4	98.4				
S-1	933.8	cu.yds.	Class "E" concrete, piers above footings		327.6	303.1	303.1				
S-2	125	sq.ft.	Patching concrete	93				32			
S-3	14	lin.ft.	Waterproofing, ½" premolded sealing strip (12" wide)	16							
S-4	863,971	lbs.	Reinforcing steel	127,649	71,476	74,282	74,282	71,693	223,594		
S-7	2226,806	lbs.	Structural steel						2226,806		
S-8	2226,806	lbs.	Field painting of structural steel						2226,806		
S-9	95	sq.ft.	1 in. Preformed expansion joint filler (Type M-10.02)	73				22			
	1785.33								1785.33		
S-14	1,783.83	lin.ft.	Railing (Type T-15.13 steel, 4x3x⅜ handrail, 6WF20 Posts)						1783.83		
S-16	lump sum	lump sum	First test pile							lump sum	
S-18	11,185	lin.ft.	Steel piles (12 BP53)	2160	2700	2700	2700	925			
S-22	lump sum	lump sum	Removal of portions of existing structure							lump sum	
S-29	115	cu.yds.	Porous backfill	76				39			
S-29	34	cu.yds.	Slope facing (S-29.05 Type)					34			
I-10	414	cu.yds.	Dumped rock fill	414							

GENERAL NOTES

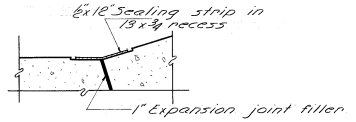
REFERENCE shall be made to Standard Drawing A3-1-54 dated December 1, 1954.
DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated Sept. 1, 1957.
PILING shall be driven to a minimum bearing capacity of 30 tons.
WELDING shall be class "A" unless otherwise shown. Any weld shown as a field weld may be made in the shop at the option of the contractor.
SLOPE FACING (S-29.05, TYPE) shall be provided under the structure at Abutment 5. The slope facing material shall be 12 inches thick and shall extend from the face of the abutment down to Elev. 484.0 and transversely to 3 ft. outside the edge of the superstructure.
DUMPED ROCK FILL 2 ft. thick shall be provided under the bridge at Abutment 1. The dumped rock fill shall be constructed above Elevation 465 and to the limits shown on the plans.
CONCRETE DECK PLACING: The slab may be placed in sections, between transverse construction joints which are normal to the centerline of the bridge and are located near the center of any span.
COFFERDAMS: Before construction is started on the Piers, three sets of prints showing details of the cofferdams at each pier shall be submitted to the Director for approval by the Department of Highways.

HARRY BALKE ENGINEERS
CINCINNATI 9, O.

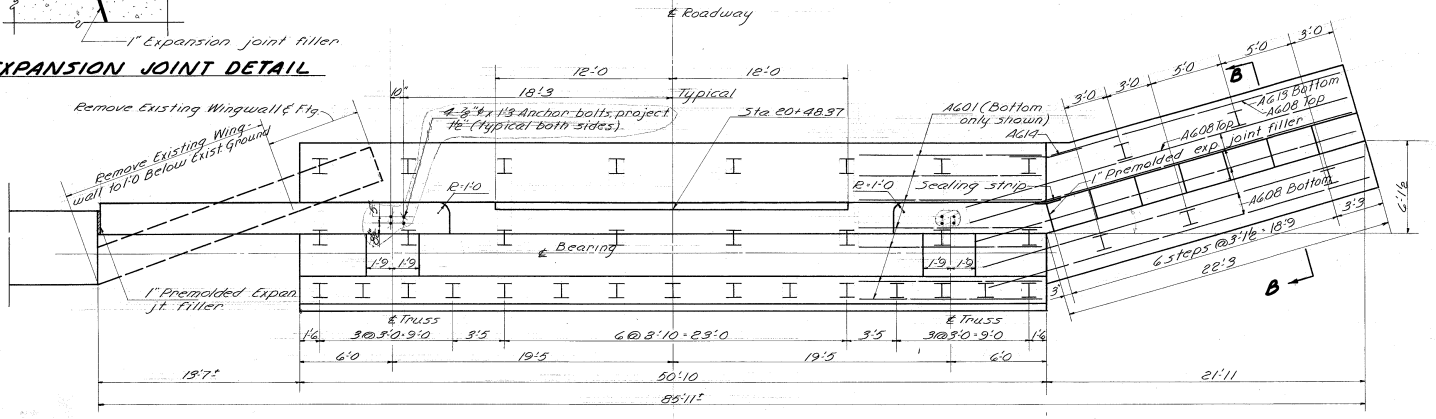
GENERAL PLAN & ELEVATION NOTES & ESTIMATED QUANTITIES

BRIDGE HAM-50-0376 WB
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.

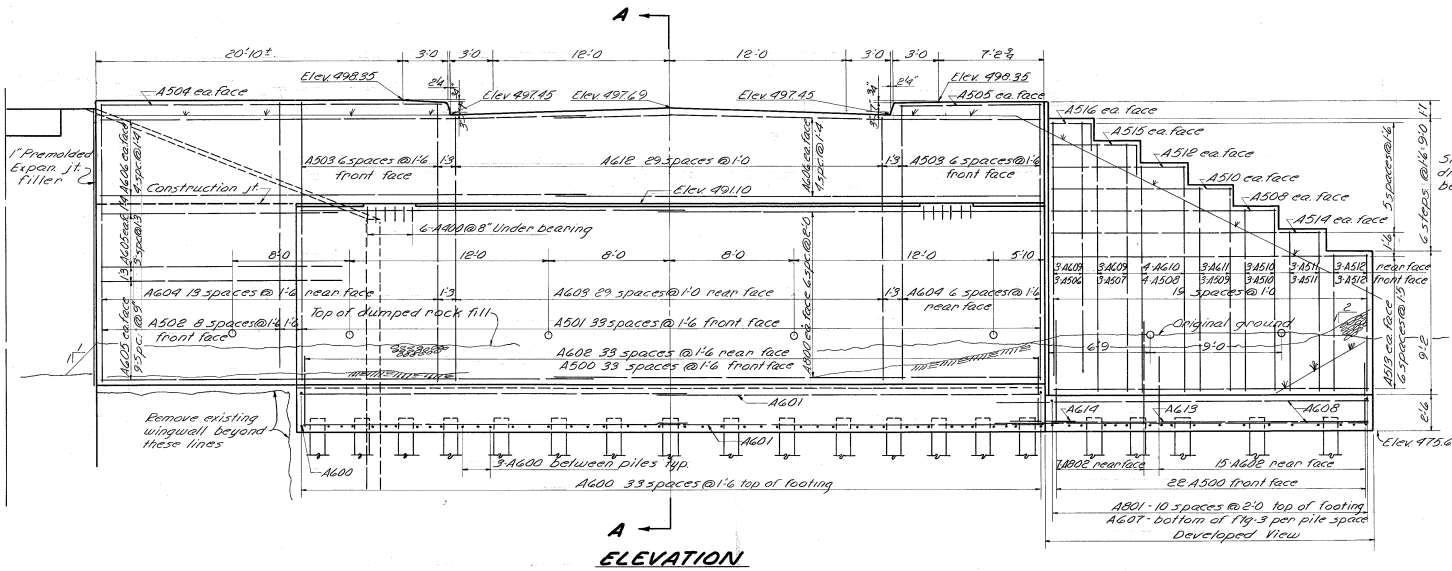
DES.	DET.	CH.	QUAN.	APPROVED	DATE
EWS LLT	L.P.	CHL	RCB	A.C.A. 8/27/58	



EXPANSION JOINT DETAIL



PLAN



ABUTMENT NOTES

Before construction is started, the North wingwalls on Existing Bridge No. HAM-50-0376 E.B shall be removed to the limits shown on the plans. Waste masonry shall be used as bank protection in front of proposed Abutment 1. The exposed end of the existing breastwalls shall be thoroughly cleaned and all loose material removed. A dressing coat of concrete mortar shall be applied to the exposed breastwall ends in accordance with item 511 of the construction and materials specifications.

Excavation shall be made for abutment cap & wingwall footings, after which piling shall be driven.

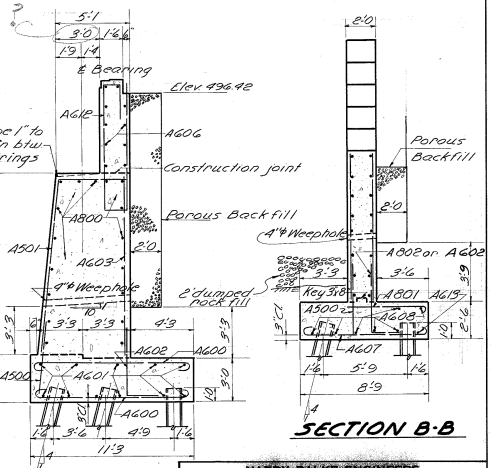
Concrete for Abutments shall be Class "E".

Reinforcing bars in the bridge seat shall be placed to clear anchor bolts.

Concrete above bridge seat construction joint shall not be placed until steel work is erected. Steel end finish shall be used as a template for top of backwall.

Porous backfill, 2' thick shall extend upward to the approach slab and to the shoulders, and outward to the surface of embankment slope on the North and to end of wingwall on the South.

PILE DESIGN LOAD : 45 Tons per pile.

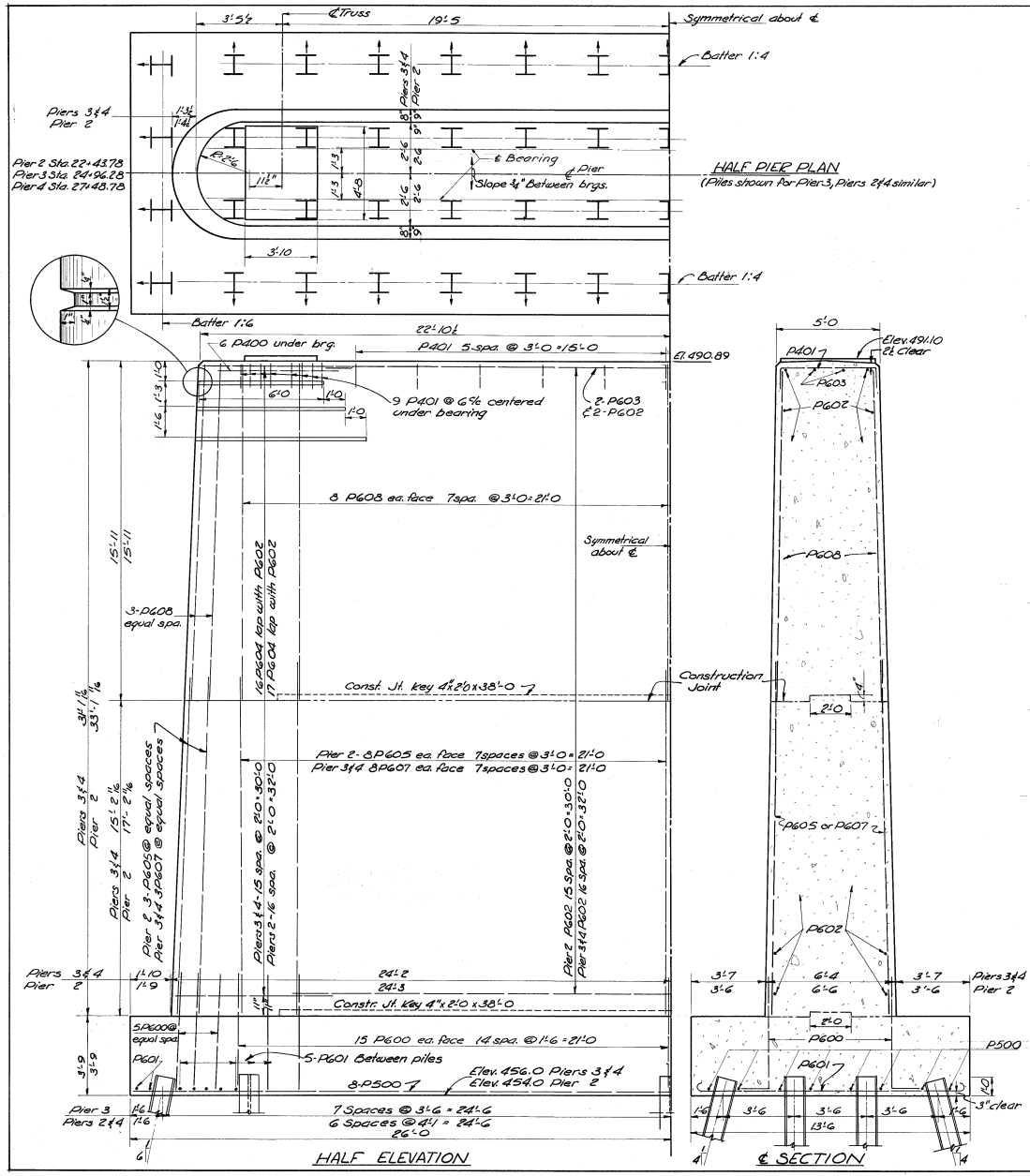


HARRY BALKE ENGINEERS
2306 VICTORY PARKWAY
CINCINNATI, O.

ABUTMENT 1 DETAILS

BRIDGE HAM-50-0376 WB
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72

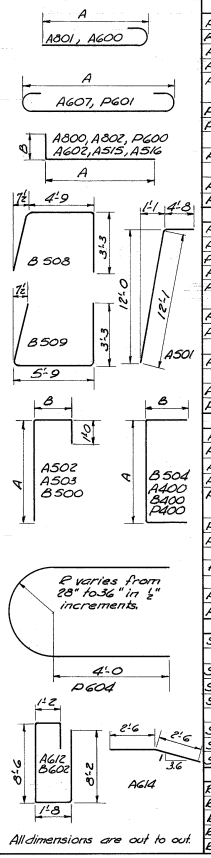
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
EM EA	RB WB RKH	DG	RCB	ACA	8E75



REINFORCING STEEL LIST

Mark	No.	Length	Weight	Shape	A	B
ABUTMENT 1						
A800	34	30-9	2,791	B	26-9	4-0
A801	11	7-6	220	B	6-5	
A802	7	8-6	45	B	7-0	1-6
A600	78	11-5	1,338	B	10-9	
A601	22	26-6	876	S		
A602	49	6-0	442	B	5-0	1-0
A603	30	12-0	541	S		
A604	23	19-3	665	S		
A605	28	18-0	757	S		
A606	20	33-0	991	S		
A607	18	9-7	259	B	8-3	
A608	7	27-0	284	S		
A609	6	16-6	149	S		
A610	4	15-0	90	S		
A611	3	13-6	61	S		
A612	30	22-0	991	B	–	–
A613	1	20-0	30	S		
A614	1	5-0	8	B		
A500	56	5-0	292	S		
A501	34	16-9	594	B		
A502	9	21-8	203	B	19-0	1-8
A503	14	11-4	165	B	8-8	1-8
A504	2	23-6	49	S		
A505	2	9-9	20	S		
A506	3	18-0	56	S		
A507	3	16-6	52	S		
A508	6	15-0	94	S		
A509	3	13-6	42	S		
A510	8	12-0	100	S		
A511	6	10-6	66	S		
A512	8	9-0	75	S		
A513	14	21-6	314	S		
A514	2	18-3	38	S		
A515	2	7-9	16	B	5-9	2-0
A516	2	4-9	10	B	2-9	2-0
A400	12	5-0	40	B	3-0	1-0
ABUTMENT 5						
B800	32	30-9	2627	S		
B801	4	26-9	286	S		
B600	18	18-0	216	S		
B601	4	33-0	198	S		
B602	30	22-0	991	B		
B603	16	36-0	865	S		
B604	14	9-9	205	S		
B500	14	11-4	165	B	8-8	1-8
B501	20	14-8	306	B	12-0	1-8
B502	2	23-6	49	S		
B503	2	9-9	20	S		
B504	32	9-0	300	B	3-8	1-8
B505	10	7-9	81	S		
B506	4	9-6	40	S		
B507	4	11-0	46	S		
B508	35	11-3	411	B		
B509	35	12-3	447	B		
A400	12	5-0	40	B	3-0	1-0

Bending Diagrams



All dimensions are out to out.

Mark	No.	Length	Weight	Shape	A	B
PIER 2						
P600	68	7'-3	740	B	6-0	1-3
P601	64	14-4	1378	B	13-0	
P602	36	36-6	1974	S		
P603	2	10-6	32	S		
P604	2ea.	Varies	856	B		
	=34	15-4 to 17-5				
P605	36	19-3	1041	S		
P606	36	15-9	852	S		
P500	16	26-9	446	S		
P400	12	6-0	48	S		
P401	29	6-8	129	B	4-8	1-0
PIER 3						
P600	68	7-3	740	B	6-0	1-3
P601	74	14-4	1593	B	13-0	
P602	34	36-6	1864	S		
P603	2	10-6	32	S		
P604	2ea.	Varies	785	B		
	=32	15-4 to 17-4				
P607	36	17-3	933	S		
P608	36	15-9	852	S		
P500	16	26-9	446	S		
P400	12	6-0	48	S		
P401	29	6-8	129	B	4-8	1-0
PIER 4						
P600	68	7-3	740	B	6-0	1-3
P601	74	14-4	1593	B	13-0	
P602	34	36-6	1864	S		
P603	2	10-6	32	S		
P604	2ea.	Varies	785	B		
	=32	15-4 to 17-4				
P607	36	17-3	933	S		
P608	36	15-9	852	S		
P500	16	26-9	446	S		
P400	12	6-0	48	S		
P401	29	8-0	129	B	4-8	1-0
SUPERSTRUCTURE						
S700	1294	30-3	80,000	S		
S600	1294	30-3	58,794	S		
S601	372	33-9	18,858	S		
S602	434	37-6	24,441	S		
S500	960	11-6	11,515	S		
S501	372	33-6	15,998	S		
S502	434	37-6	16,975	S		
REPLACEMENT STEEL						
RS800	1	6-6		S		
RS700	5	6-3		S		
RS600	7	5-11		S		
RS500	3	5-7		S		
RS400	1	5-8		S		

REPLACEMENT BARS. If reinforcing bars are fabricated from stock which has been previously tested and approved by the Ohio Highway Testing Laboratory, test samples as provided in Sec. S-4.02 need not be furnished and replacement bars will not be required.

REINFORCING under bearings shall be placed to clear anchor bolts.

CONCRETE for piers shall be Class "E."

PILE DESIGN LOAD: 50 tons per pile

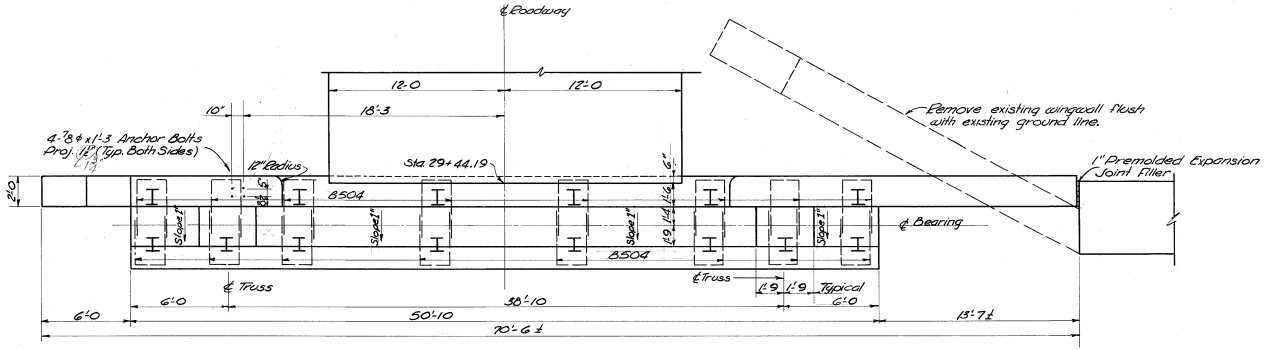
BAR SIZE is indicated in the bar mark. The first digit indicates the bar size number. For example #5 is a #5 S size bar and A803 is a #3 B size bar.

HARRY SALKE ENGINEERS
2320 VICTORY PARKWAY
CINCINNATI 6, O.

PIER DETAILS & REINFORCING BAR LIST

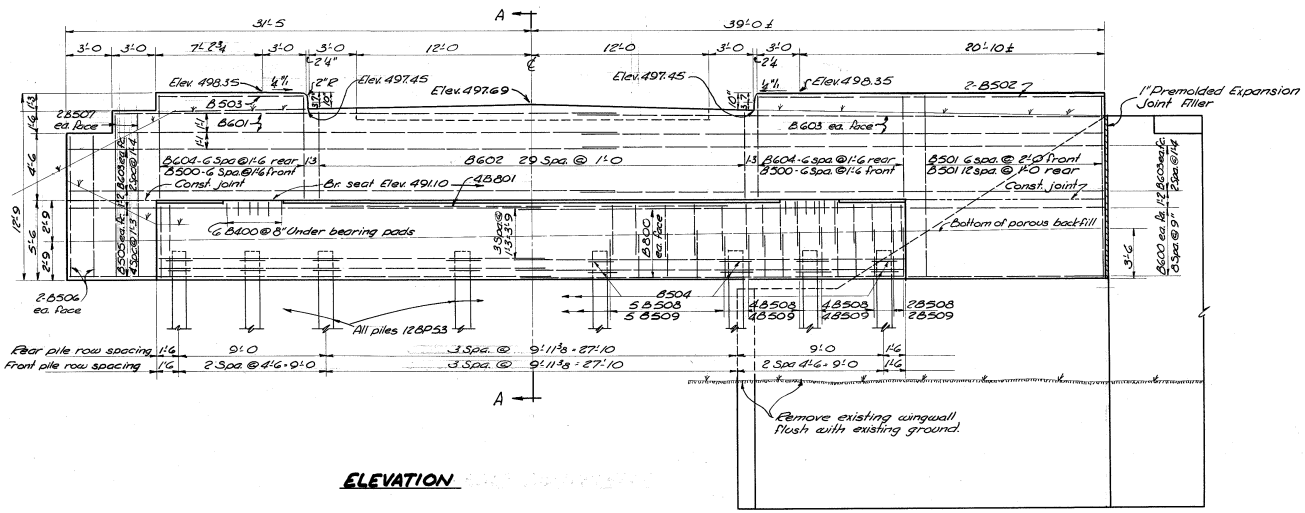
BRIDGE HAM-50-08.76 W.B.
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA. 24+96.28

DESIGNED	DETAILED	CHECKED	REVISED	DATE
H.J. W.H.	AL	R.C.B.	A.C.A.	12/1959

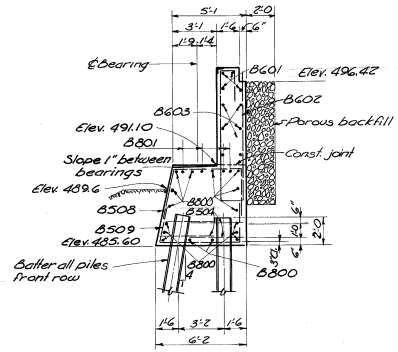


PLAN

ABUTMENT NOTES
See sheet 275
PILE DESIGN LOAD: 45 tons per pile



ELEVATION



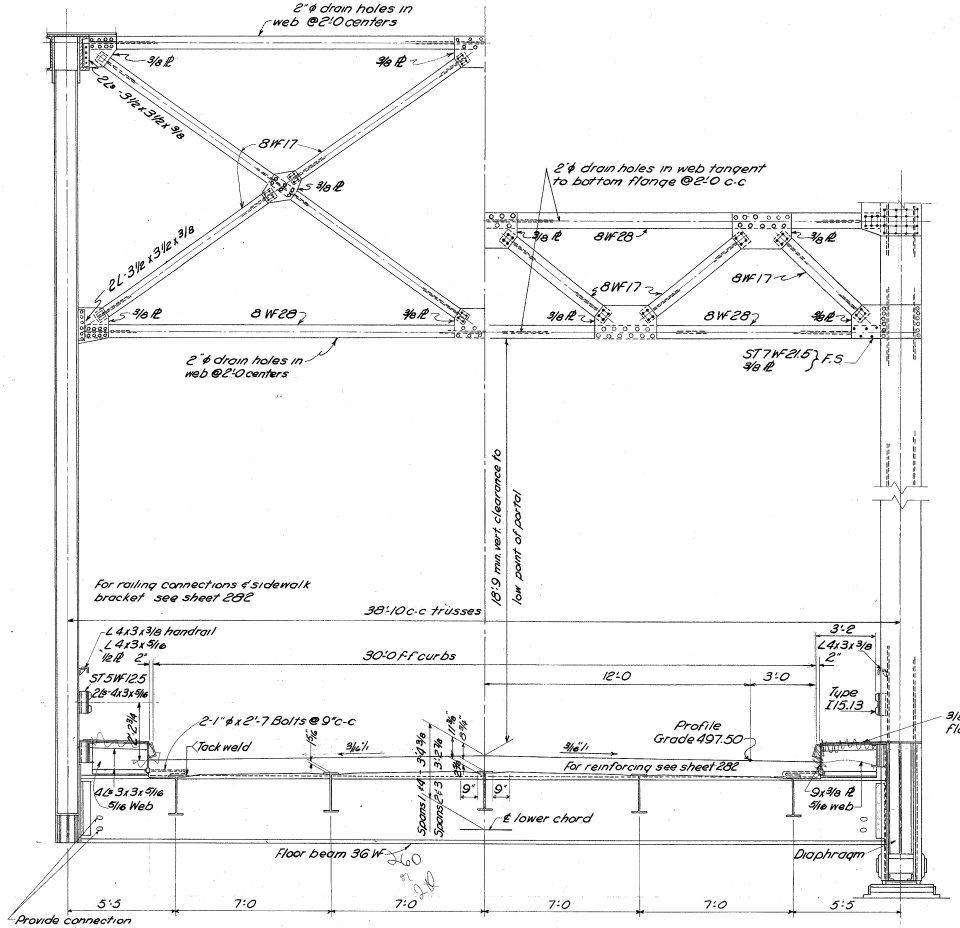
SECTION-A-A

HARRY BALKE ENGINEERS
2300 VICTORY PARKWAY
CINCINNATI 6, O.

ABUTMENT 5 DETAILS

BRIDGE HAM-50-0376 WB
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA. 24+96.28

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
EA	HJ	AL	KM FRCB	ACA	2/27/58	

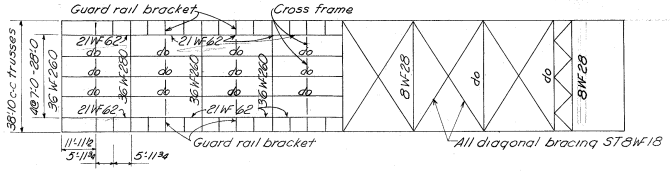


HALF CROSS SECTION

HALF END ELEVATION

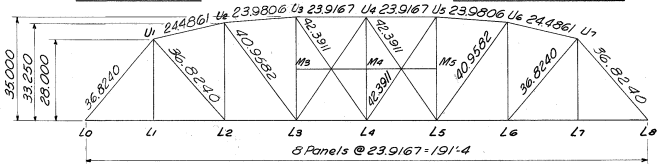
TYPICAL FOR ALL SPANS

SPANS 1 & 4

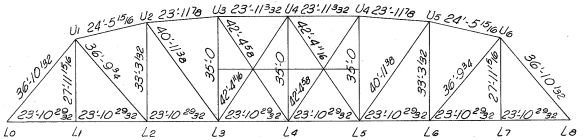


HALF FLOOR PLAN

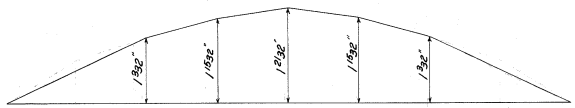
HALF TOP CHORD PLAN



ELEVATION



FABRICATED LENGTHS



CAMBER BLOCKING ORDINATES

TABLE OF MODIFIED STRESSES (SPANS 1 & 4)

Member	Modified Stresses in Kips DL	LL & I	Total	Section		
L_0U_1	-284	-200	-484	2-15 ℄ 50	1-PL 21 x 9/16	
U_1U_2	-275	-179	-454	2-15 ℄ 40	1-PL 21 x 1/2	
U_2U_3	-319	-210	-529	2-15 ℄ 40	1-PL 21 x 11/16	
U_3U_4	-340	-224	-564	2-15 ℄ 50	1-PL 21 x 9/16	
L_0L_2	+185	+121	+306	2 PL 15 x 3/4		6 holes out
L_2L_3	+268	+177	+445	2-PL 15 x 11/16	2 PL 15 x 3/8	do
L_3L_4	+319	+207	+526	2-PL 15 x 11/16	2 PL 15 x 9/16	do
U_1L_2	+129	+109	+238	12WF58		4 holes out
U_2L_3	+88	+96	+184	12WF53		do
U_3L_4	+39	+79	+118	12WF36		do
U_1L_1	+59	+108	+167	12WF40		do
U_2L_2	-36	-62	-98	12WF65		do
U_3L_3	-9	-63	-72	12WF36		do
Substruts				12WF36		do
Floor beam reactions	56.6	86.4	143			

All Rivets 7/8" unless noted

Note: Stresses modified according to sec. 76 of the 1957 Design Specification

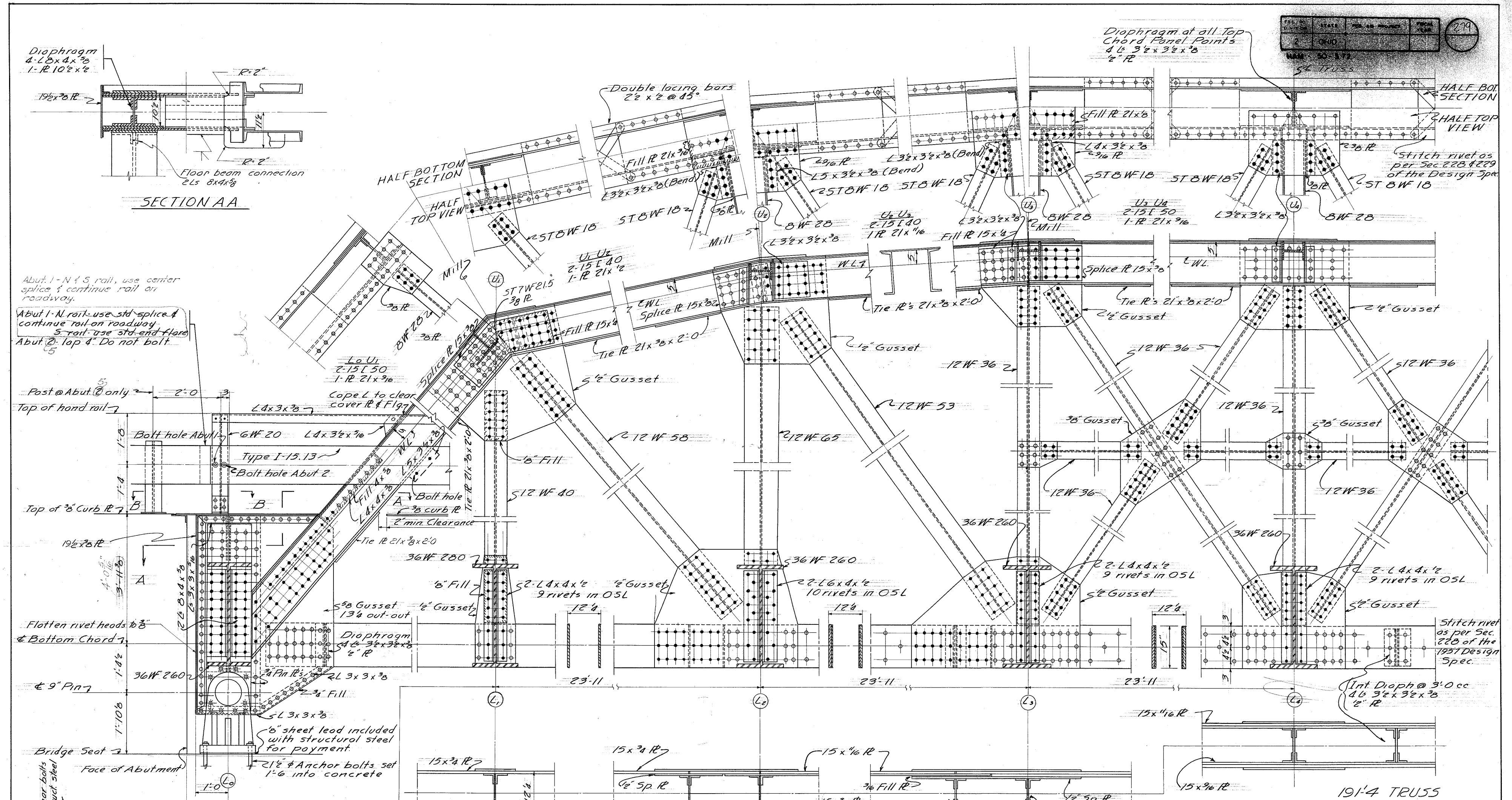
191'-4" TRUSS

HARRY BALKE ENGINEERS
9330 VICTORY PARKWAY
CINCINNATI 6, O.

SUPERSTRUCTURE DETAILS

BRIDGE HAM-50-03.76 WB
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.76 STA 24+96.28

ORIGINAL	DRAWN	TRACED	CHECKED	REVIEWED	DATE
EWS LLT	RW	DS	RCB	ACA	2/6/58

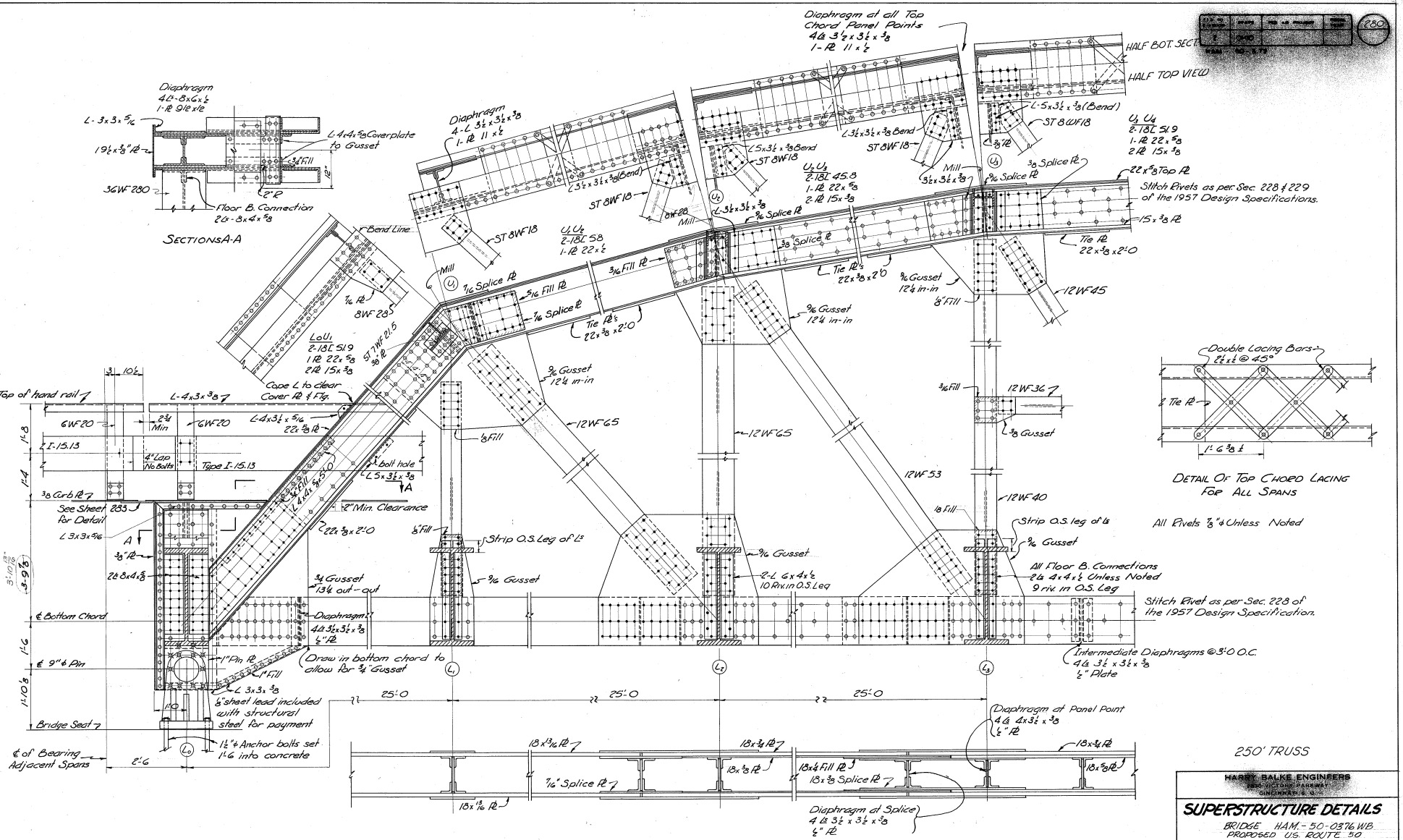


HARRY BALKE ENGINEERS
2330 VICTORY PARKWAY
CINCINNATI 6, O.

SUPERSTRUCTURE DETAILS

BRIDGE HAM-50-0376WB
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA. 24+96.22

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
EWS	EWS	HS	RCB	ACA	2/27/58

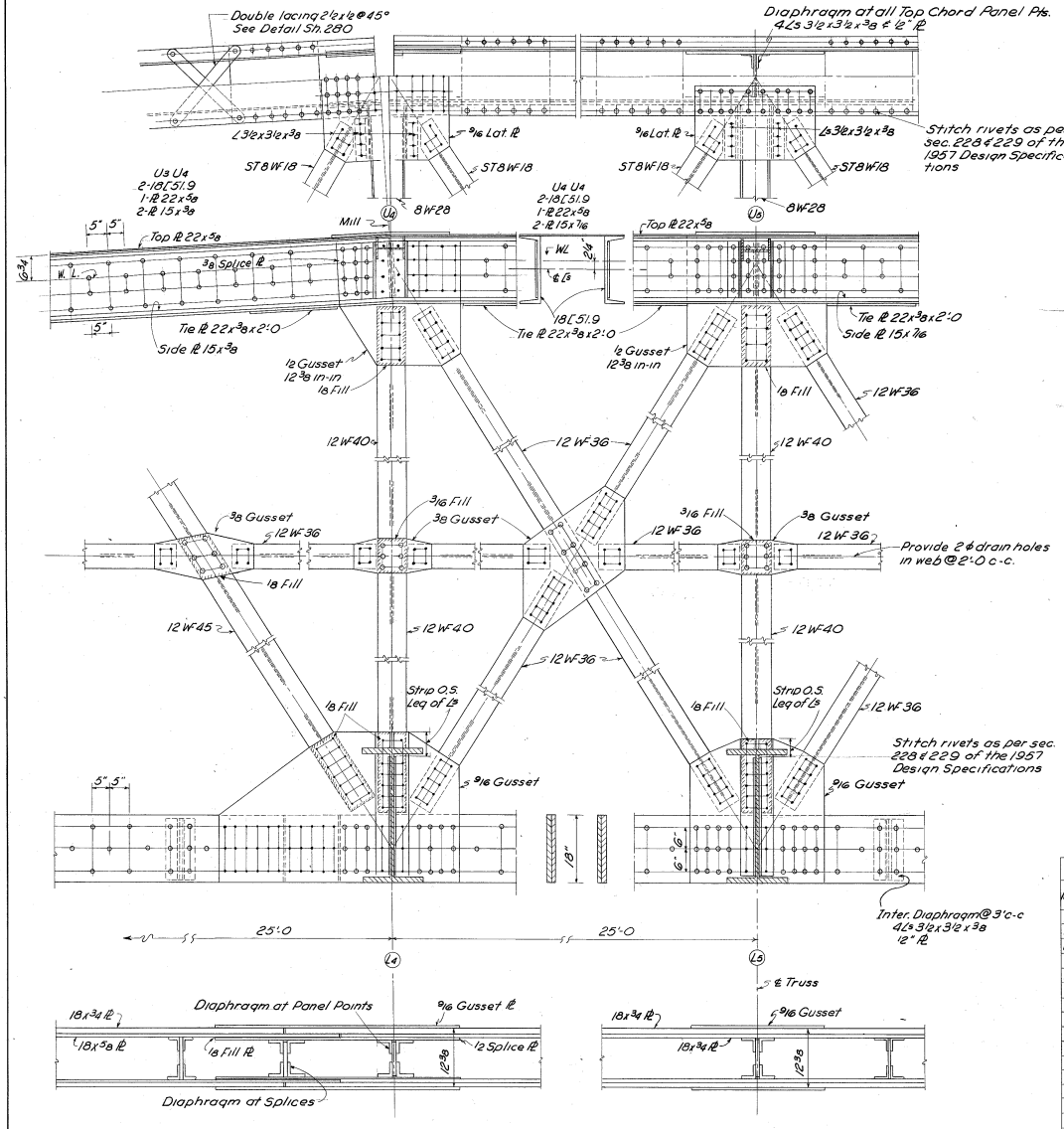


HARRY BALKE ENGINEERS
1600 VICTORY PARKWAY
CINCINNATI, O.

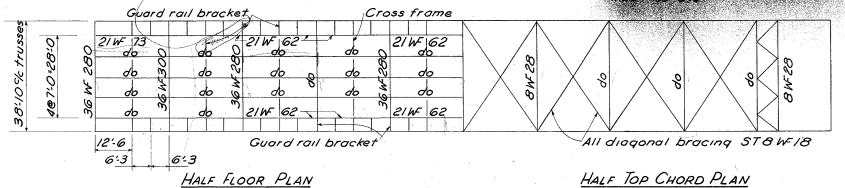
SUPERSTRUCTURE DETAILS

BRIDGE HAM.-50-0876 W.B.
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA 24 + 76.28

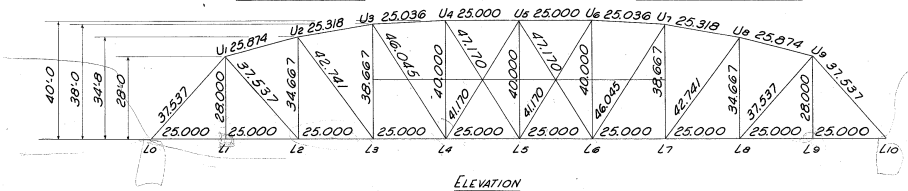
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
LTT	LTT	AL	RCB	A.C.A.	2/27/58



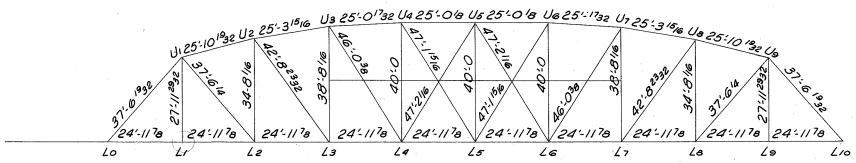
SPANS 2 & 3



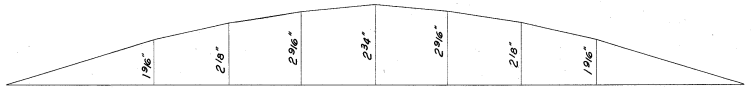
HALF FLOOR PLAN — HALF TOP CHORD PLAN



ELEVATION



FABRICATED LENGTHS



CAMBER BLOCKING ORDINATES

TABLE OF MODIFIED STRESSES FOR 250' SPANS

MEMBER	MODIFIED STRESSES IN KIPS			SECTION		
	DL	LL+I	TOTAL			
Lo U1	-398	-240	-638	2-18 [51.9	1 PL 22 x 3/8	2 PLs 15 x 3/8
U1 U2	-394	-224	-618	2-18 [58	1 PL 22 x 1/2	—
U2 U3	-455	-260	-715	2-18 [45.8	1 PL 22 x 3/8	2 PLs 15 x 3/8
U3 U4	-499	-281	-780	2-18 [51.9	1 PL 22 x 3/8	2 PLs 15 x 3/8
U4 U5	-520	-293	-813	2-18 [51.9	1 PL 22 x 3/8	2 PLs 15 x 3/8
Lo L2	+266	+151	+417	2 PLs 18 x 9/16		6 holes out
L2 L3	+381	+215	+596	2 PLs 18 x 3/4	2 PLs 18 x 3/8	do
L3 L4	+451	+254	+705	2 PLs 18 x 3/4	2 PLs 18 x 3/8	do
L4 L5	+498	+281	+779	4 PLs 18 x 3/4		do
U1 L2	+175	+114	+289	12 WF 65		4 holes out
U2 L3	+118	+97	+215	12 WF 53		do
U3 L4	+89	+96	+185	12 WF 45		do
U4 L5	+40	+84	+124	12 WF 36		do
U1 L1	+63	+95	+158	12 WF 40		do
U2 L2	-65	-69	-134	12 WF 65		do
U3 L3	-29	-63	-92	12 WF 40		do
U4 L4	-8	-71	-79	12 WF 40		do
Substruts				12 WF 36		
Floor Beam Reactions	60	87.4	147.4			

Note: Stresses modified according to Sec. 76 of the 1957 Design Specifications

All rivets 7/8 ø unless noted

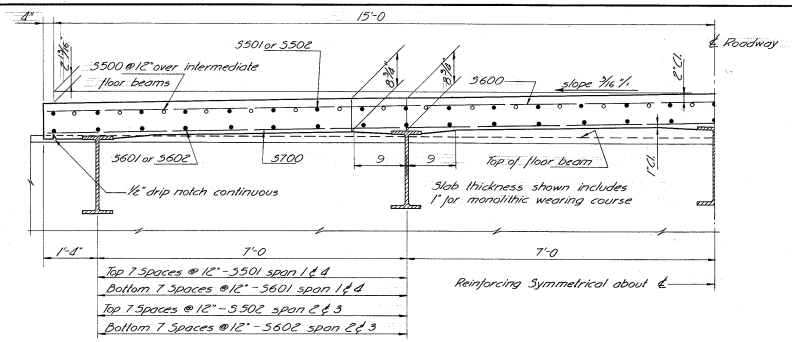
250' TRUSS

HARRY BALKE ENGINEERS
2330 VICTORY PARKWAY
CINCINNATI 6, O.

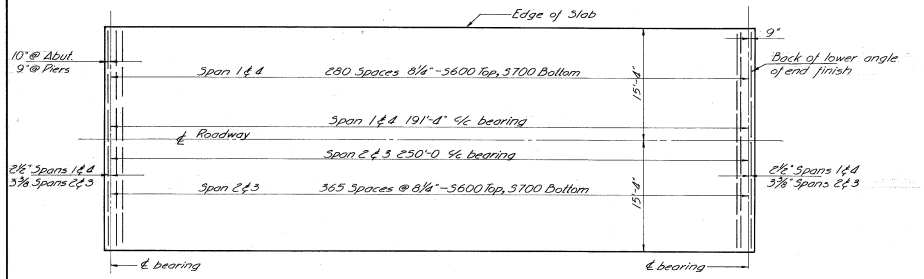
SUPERSTRUCTURE DETAILS

BRIDGE HAM-50-0376 WB.
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA. 24+96.28

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE REVISED
CLT	LLT	DS	RCB	ACA	2/27/58

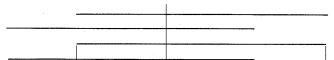


TYPICAL SECTION

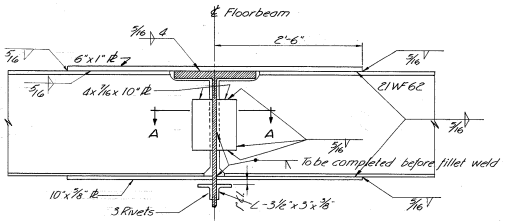


NOTE: One transverse, keyed construction joint may be used in each truss span, at the Contractor's option. If used, the joint shall be located not less than four feet from a transverse floor beam.

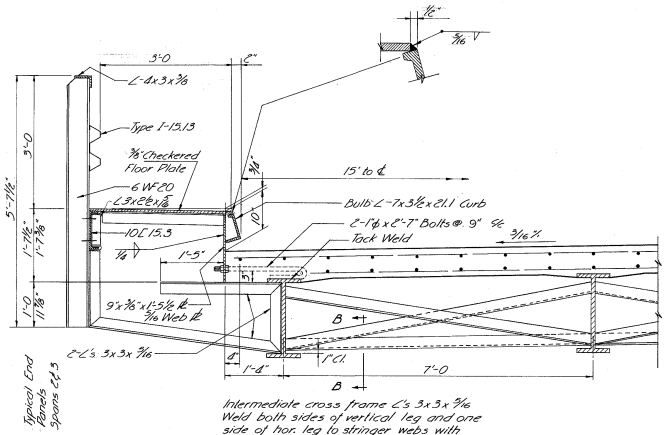
SLAB PLAN



SPACING OF 3500 BARS OVER FLOOR BEAMS



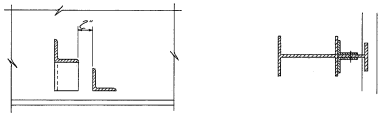
SPLICE DETAIL



Intermediate cross frame L's 3x3x⅜
Weld both sides of vertical leg and one side of thor. leg to stringer webs with ⅛" cont. fillet weld.

All slab concrete shall be class 'C'.
All welding shall be class A.
Rivets ⅞ ϕ unless noted.

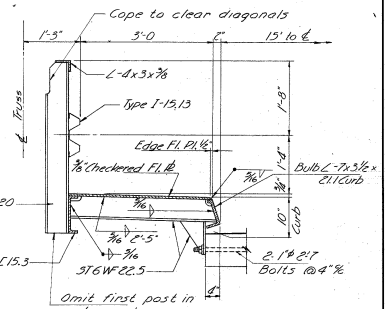
SECTION AT INTERMEDIATE CROSS FRAME



SECTION B-B

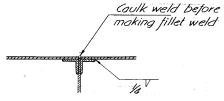
SECTION D

NOTE: 3-1d, shall include the type I-13.13 railing, 4x3x⅜ top angle railing, railing post and railing connections to trusses for payment.

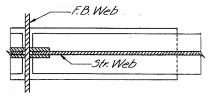


INTERMEDIATE RAILING AND CURB SUPPORT

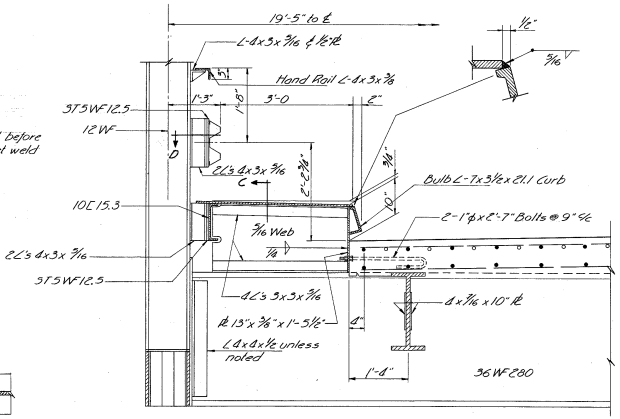
NOTE: See sheet C76 for reinforcing steel schedule



SECTION C



SECTION A-A



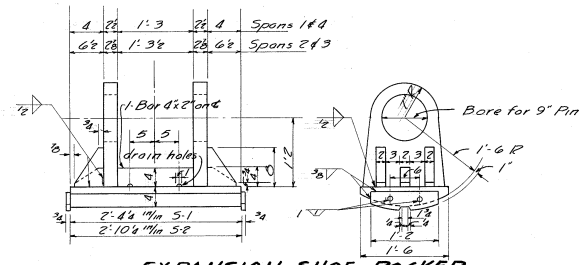
SECTION AT FLOOR BEAM

HARRY BALKE ENGINEERS
2330 VICTORY PARKWAY
CINCINNATI, O.

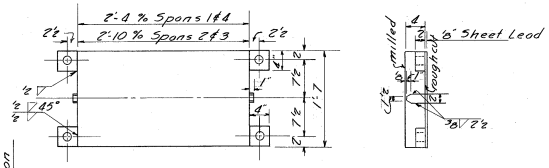
SUPERSTRUCTURE DETAILS

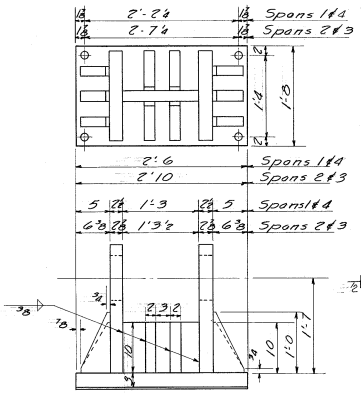
BRIDGE HAM-50-0876 WB
PROPOSED US ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA 24+96.78

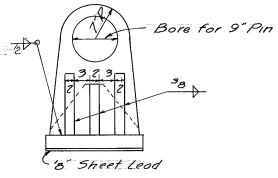
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
L.L.T.	A.C.	C.L.	R.C.B.	A.C.A.	2/27/73	



EXPANSION SHOE ROCKER

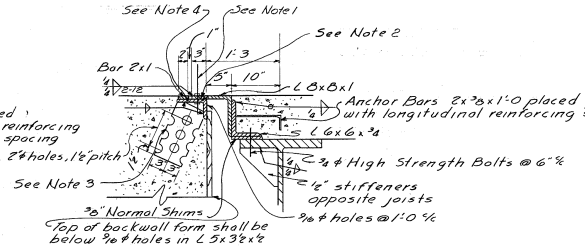




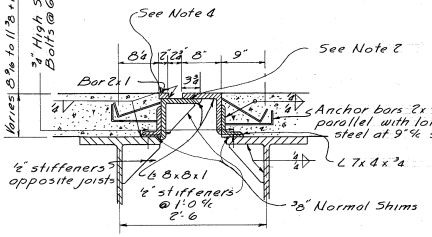


FIXED SHOES

All edges are to be square and true



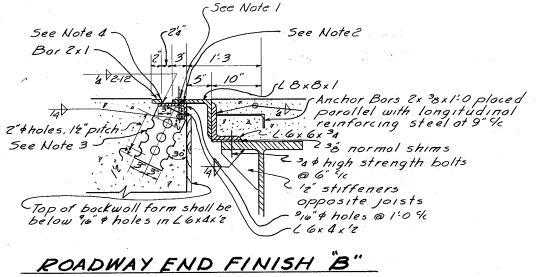
ROADWAY END FINISH "C"



BASE PLATE FOR EXPANSION ROCKER

All edges are to be square and true

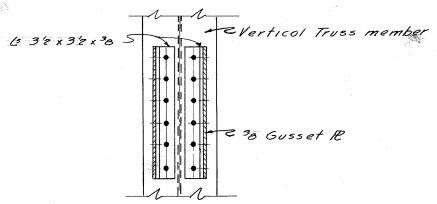
ROADWAY END FINISH "A"



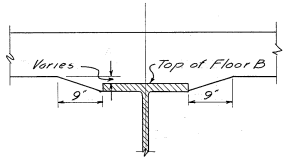
ROADWAY END FINISH "B"

NOTES:

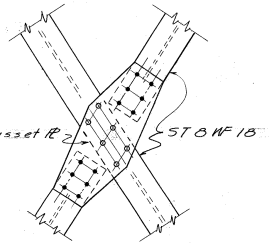
1. ⅞ x 2 bolts at not more than 2'-0 c with nuts tack-welded to under side of lower angle. 1 1/16" ϕ holes in upper angle. Center ⅞ ϕ bolts in 1 1/16" ϕ holes. Apply flake graphite between washers and angles turn bolt tight and release one-half turn. Remove bolts as soon as concrete has reasonably set preferably within two hours, to avoid effect of temperature expansion or contraction of superstructure. Fill hole with bituminous material.
2. This contact surface shall not be painted and shall be lubricated with flake graphite prior to placing of backwall concrete.
3. 6x⅜x18" plates spaced at approximately 15" c except near joints in the angle, where the plates shall be placed within 6" of each side of the joint. The holes may be burned in the plate.
4. Provide a joint in the edge bar and in the angle on the center line of the roadway. Additional joints may be provided in them at a minimum spacing of 6'-0". (Joints shall not be welded.)



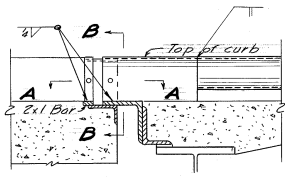
TYPICAL CONNECTION OF SWAY BRACING TO TRUSS VERTICAL



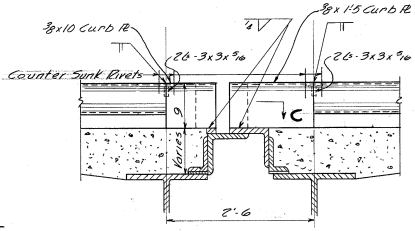
SECTION AT FLOOR BEAM



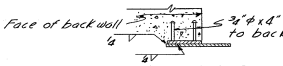
TYPICAL CONNECTION FOR TOP CHORD BRACING



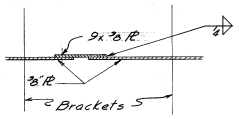
CURB PLATE AT ABUTMENT



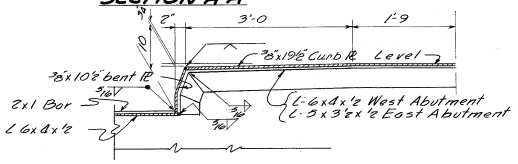
CURB PLATE AT PIERS



SECTION A-A



SECTION C-C



SECTION B-B

See Sheets 279 and 280 for railing details for bridge ends

HARRY BALKE ENGINEERS
2330 VICTORY PARKWAY
CINCINNATI 6, O.

SUPERSTRUCTURE DETAILS

BRIDGE HAM-50-0376 WB
PROPOSED U.S. ROUTE 50
OVER GREAT MIAMI RIVER
HAMILTON CO.
SEC. 3.72 STA 24+96.28

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
L.L.T. E.W.S.	A.L.	J.S.	R.C.B.	A.C.A.	8/27/58	

HAM - 50 - 37.72

Appendix C- AssetWise Bridge Inspection Report

Summary Report

Inspector:	Compton-Troesch,Kyle	**Structure Number:**	3102521
Inspection Date:	07/14/2022	**Facility Carried:**	US50

Bridge Inspection Report

Ohio Bridge Inspection Summary Report

HAM-00050-0376L (3102521)

2: District	District 08	84938 - WHITEWATER TWP (HAM county)	
5A: Inventory Route	1	00050	
21: Major Maint A/B	01 - State Highway Agency	/	
225 Routine Main A/B	01 - State Highway Agency	/	
221 Inspection A/B	01 - State Highway Agency	/	
220: Inv. Location	DISTRICT 08		
7: Facility On	US50		
6: Feature Ints	GREAT MIAMI R;PRIVATE DR		
9: Location	JUST E OF SR128		
Lat, Lon	39.1703976663762	,-84.759054594733	

Condition

58: Deck	**7 - Good Condition**
58.01 Wearing Surface	7 - Good (1% distress)
58.02 Joint	6- Satisfactory (isolated leaking)
59: Superstructure	**6 - Satisfactory Condition**
59.01 Paint & PCS	5 - Fair (10-15% corr.)
60: Substructure	**5 - Fair Condition**
61: Channel	**6**
61.01 Scour	**7 - Good**
62: Culverts	**N - Not Applicable**
67.01 GA	**5**

Appraisal

Sufficiency Rating	78.7 SD/FO 0 - ND
36: Rail, Tr, Gd, Term Std	1 1 1 1
72: Approach Alignment	8 - Equal to present desirable criteria
113: Scour Critical	7 - Countermeasures installed to correct scour problem
71: Waterway Adequacy	9 - Bridge Above Flood Water Elevations

Geometric

48: Max Span Length (ft)	248.0
49: Structure Length (ft)	893.0
52: Deck Width, Out-To-Out (ft)	40.6
424: Deck Area (sf)	36255.8
32: Appr Roadway Width (ft)	24.0
51: Road Width, Curb-Curb (ft)	32.0
50A: Curb/SW Width: Left (ft)	0
50A: Curb/SW Width: Right (ft)	0
34: Skew (deg)	0
33: Bridge Median	0 - No median
54B: Min Vert Underclearance (ft)	12.08
336A: Min Vert Clrnce IR Cardinal (ft)	18.583
336B: Min V Clr IR Non-Cardinal (ft)	0
578: Culvert Length (ft)	0

Load Posting

41: Op/Post/Closed	A - Open
70: Posting	5 - Equal to or above legal loads
70.01: Date	
70.02: Sign Type	
734: Percent Legal (%)	150
704: Analysis Date	02/28/2020

Structure Type

43: Bridge Type	3 - Steel
	10 - Truss - Thru
	N- Not Applicable
45: Spans Main / Approach	4 / 0
107: Deck Type	1 - Concrete Cast-in-Place
408: Composite Deck	N - Non-composite Construction
414A Joint Type 1	2 - Sliding Metal Plate Angle
414B: Joint Type 2	N - None
108A: Wearing Surface	1 - Monolithic Concrete (concurrently placed with structural deck)
	N- Not Applicable
422: WS Date	01/01/1989
423: WS Thick (in)	1.2
482: Protective Coating	0 - Other Paint
483: PCS Date	01/01/1992
453: Bearing Type 1	2 - Rockers & Bolsters
455: Bearing Type 2	N - None
528: Foundn: Abut Fwd	1 - Steel H Piles (Other size)
533: Foundn: Abut Rear	1 - Steel H Piles (Other Size)
536: Foundn: Pier 1	1 - Steel H Piles (Other size)
539: Foundn: Pier 2	N - None (Such as most Culverts)

Age and Service

27: Year Built/ 106 Rehab	1959 / 0000
42A: Service On	1 - Highway
42B: Service Under	5 - Waterway
28A: Lanes on	02
28B: Lanes Under	00
19: Bypass Length	4
29: ADT	9907
109: % Trucks (%)	7

Inspections

		Months	
90: Routine Insp.		12	07/14/2022
92A: FCM Insp.	Y	12	07/14/2022
92B: Dive Insp.	Y	60	08/30/2019
92C: Special Insp.	N	0	
92D: UBIT Insp.	N	0	
92E: Drone Insp.	N	0	

Inspector Compton-Troesch,Kyle

Inspector:	Compton-Troesch,Kyle	**Structure Number:**	3102521
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Bridge Inspection Report

63: Analysis Method	6 - Load Factor (LF) rating reported by rating factor (RF) method using MS18 loading.

Elements

Inspector: Compton-Troesch,Kyle **Structure Number:** 3102521

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Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
12-Reinforced Concrete Deck	3 - Mod.	29867	sq. ft.	12791	17038	38	0
	CS3: -Spalling is typical along the top flanges of the exterior stringers, up to 1-inch deep with no exposed reinforcement noted -A few isolated spalls are present near deck fascia cracks at the floor beams. This typically occurs at the piers. The spalls average 10 inches wide x 20 inches high and are up to 8 inches deep CS2: -The bridge floor (underside) exhibits extensive transverse, random, and map cracking throughout and there are isolated locations of abrasion dust between the deck soffit and stringer top flange interfaces. No “pumping” was observed between the deck and the stringer top flange -Moderate vertical, diagonal and random cracks are present to the deck fascia above the floor beams						
805-Wearing Surface - Monolithic Concrete		29867	sq. ft.	26829	3000	38	0
	CS3: -There is a 4 SF spall in the south lane of Span 3, Panel 3 -There is a 10SF spall at the downstream curb of Span 2 between PP5 and PP6 -There is a broken RPM with pointed metal protruding above the deck in Span 4 near PP2 CS2: -The wearing surface exhibits moderate wear throughout the length of the structure -Minor shallow spalls up to 6 inches in diameter exist adjacent to the Pier 2 expansion joint -Several patches exist on the concrete wearing surface. These patches are in good condition, but exhibit hairline cracks. -Hairline transverse shrinkage cracks are typical along the gutter line						
113-Steel Stringer	3 - Mod.	4413	ft.	3736	662	15	0
	CS2: -The edges of the exterior stringer top flanges exhibit active surface corrosion with no section loss due to the deck haunches being spalled off. No gaps were noted between the stringer top flanges and the deck floor. This indicates that pack rust has not formed between the stringer and the deck -There are isolated examples of interior stringers exhibiting minor fretting corrosion at the top flange near the deck interface -Isolated exterior stringers exhibit minor painted over pitting, usually less than 1/16-inch deep -Several locations of poor quality welds exist at stringer connections to floor beams and top and bottom flange cover/splice plate end welds. No cracks were observed; however, these are fatigue prone details and should continue to be monitored during future inspections						
515-Steel Protective Coating		19390	sq. ft.	19293	97	0	0
	Stringers have minor freckling						
120-Steel Truss	3 - Mod.	1786	ft.	0	1339	447	0

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Bridge Inspection Report

Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
Verticals CS3: -The verticals exhibit active corrosion with section loss up to 1/8” deep as well as painted over pitting up to 3/16” deep in the splash zone, at the gusset plates, and near former railing attachments -There is a 1” diameter active corrosion hole in the web of L6U6 near L6 of Span 2, North Truss -There are undercut tack welds on the flange of L2U2 of Span 1, South Truss -There is a 1’ long deformation in the flange of L7U7 of Span 4, North Truss -Pack rust up to 1/8-inch thick is typical between truss verticals and gusset plates Diagonals CS3: -The diagonals exhibit active corrosion with section loss up to 3/16” deep as well as painted over pitting up to 3/16” deep in the splash zone, at the gusset plates, and near former railing attachments -The diagonals exhibit pack rust up to 1/4-inch thick between the member and the lower gusset plates -The inboard flange of U1L2, Span 4, North Truss is deformed up to 1/2” out of plane -Span 2, South Truss U4L5, 5 feet above M4.5, there is a 1/2-inch inward kink in the bottom inboard flange over an 8-inch length Upper Chord CS3: -There is pack rust up to 1/8-inch thick between lateral bracing connection plates and upper chord cover plates CS2: -The upper chord members exhibit minor spot rust and isolated surface corrosion throughout -There is reactivating corrosion between the channels and web plates -A ground/gouged area exists to U7U8 at U7 in Span 2, north truss. This appears to be a rolled defect End Posts: CS3: -In the splash zones, there is laminating corrosion with section loss up to 3/16” on the channels and pack rust up to 1/8” thick under the cover plates -The lacing bars exhibit typically exhibit advanced section loss and deformations due to pack rust -Deterioration to lacing bars at endposts is present at L0U1 in Span 4 NT, U9L10 in Span 2 ST, and L0U1 in Span 3 ST -Isolated locations of painted over pitting up to 1/8-inch deep were observed on the exterior of the channel webs -The endposts typically exhibit pack rust up to 1/8-inch thick between the top cover plate and portal bracing connection plates CS2: -The end posts exhibit surface corrosion throughout Lower Chord CS3: -Pack rust of 1/8” to 1/4” is typical between lower chord plates in all spans with isolated locations up to 1/2" -Pack rust up to 1/4" exists between the lower chord and the gusset plates -Pack rust up to 3/4" thick is present under the lower chord diaphragm angles -The lower chords exhibit surface corrosion throughout with active pitting up to 3/16” deep on the plate edges and around the diaphragm angles, with laminating corrosion with section loss up to 1/8” deep at the gusset plates -The most significant area of section loss is L0L1 near L0 in Span 2 of the North Truss with 1/8” section loss along the full width of the inboard plate (originally 13/16” thick), approximately 8% of the total cross-sectional area of the member - Several lower chord members exhibit minor bowing and local deformations CS2: -Active surface corrosion is present on the lower chords throughout						

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Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
515-Steel Protective Coating		54837	sq. ft.	51053	1755	1645	384
	CS4: -The protective coating system exhibits isolated areas of paint failure and active corrosion to the upper portions of the truss -Throughout the lower chords and splash zone of the trusses the paint system is failing, with active pack rust and corrosion CS3: -The paint on the upper half of the trusses is in good condition with isolated areas of peeling paint and surface corrosion.						
152-Steel Floor Beam	3 - Mod.	1500	ft.	780	390	330	0
	CS3: -Painted over section loss up to 3/16-inch deep exists on the bottom 4 inches of the webs for the end 4 feet of the floor beams -The floor beams typically exhibit painted over section loss up to 3/16-inch deep along the top faces of the top flange near the truss connection -There are isolated areas of laminating corrosion and pack rust at the gusset plate connection angles CS2: -Reactivating corrosion exists at the interface of the floor beam top flange and the deck fascia, and on the bottom flange near the truss connections -Isolated rivet heads at the connection angles exhibit up to 25% section loss. The section loss generally is less than 1/8-inch deep -Several locations of poor quality welds exist at stringer connections to floor beams. No cracks were observed; however, this detail is a fatigue prone detail and should continue to be monitored during future inspections						
515-Steel Protective Coating		8360	sq. ft.	8142	84	92	42
	The paint system for the floorbeams are in good condition with isolated areas of corrosion.						
162-Steel Gusset Plate	3 - Mod.	400	each	28	292	80	0
	CS3: -The gusset plates typically exhibit active pack rust up to 3/16” thick -There is active pack rust up to 3/8" thick under the lower chord splice plates at the gussets -The gusset plates exhibit active laminating and surface corrosion with section loss up to 3/16” deep, as well as painted over pitting up to 3/16” deep -There is laminating corrosion and corrosion holes in the gusset plate stiffening angles behind the bearings in several locations -There are corrosion holes in the top cover plate of L10 in Span 2 of the North Truss -There are corrosion holes in the top cover plate of L8 of Span 1 of both trusses -The gussets exhibit bowing up to 1/4” out of plane; no significant changes in the gusset bowing dimensions were observed compared to the 2020 inspection CS2: -There are improperly installed rivets at U6, Span 2, South Truss						
515-Steel Protective Coating		3120	sq. ft.	2889	100	94	37
	The protective coating system typically exhibits areas of paint failure and active corrosion at all lower chord gusset plates						
210-Reinforced Concrete Pier Wall	3 - Mod.	138	ft.	13	90	35	0

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Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	CS3: -Pier 2 has two 4'x4' spalls with exposed rebar on the east face -There is widespread spalling with exposed rebar on the west face of Pier 4 and a spall with exposed rebar on the east face CS2: -The piers typically exhibit full height vertical cracks up to 1/16-inch wide, which typically wrap around the top face of the wall -Pier 2 has map cracking with efflorescence and delamination on both faces -Pier 3 has delaminations and map cracking throughout						
215-Reinforced Concrete Abutment	3 - Mod.	101	ft.	41	25	35	0
	CS3: -The rear abutment has a 24' wide by 3" deep by full height delaminated area between Stringers 1 and 4; delaminations could not be removed with a hammer -There are multiple large spalls and cracks up to 1/2" wide between Stringers 2 and 4 of the rear abutment -The forward abutment has a 10'W x 2.5'H area of delamination and spalls with exposed rebar between Stringers 3 and 4 The forward abutment has a a 6"W x 1' H spall with exposed rebar under Stringer 2 CS2: -There are widespread areas of delamination on the rear abutment seat between Stringers 1 and 4						
234-Reinforced Concrete Pier Cap	3 - Mod.	141	ft.	54	48	39	0
	CS3: -Pier Cap 2 has a 4W' x 3'H spall and a 1'W x 2'H spall on the west face -Pier Cap 3 has a 12'W x 2'H x 2"D spall with exposed rebar on the east face and a 5'W x 4'H spall with exposed rebar on the west face -Pier Cap 4 has a 15'W x 3'H area of spalls with exposed rebar with minor section loss on the west face and a 2' x 2' spall on the east face CS2: -The pier caps typically exhibit areas of delamination, minor spalls, and debris accumulation around the bearings						
300-Strip Seal Expansion Joint	3 - Mod.	167	ft.	0	152	15	0
	CS3: -There is heavy debris accumulation in the joints at the shoulders CS2: -Small spalls exist on the concrete header in isolated locations along the length of the joints -There is minor surface corrosion on the armored edges See the 2022 in-depth and fracture critical report for joint measurements						
311-Movable Bearing	3 - Mod.	8	each	0	6	2	0
	CS3: -Active laminating corrosion with isolated minor section loss is present on the castings, pins and/or masonry plates of two bearings (Pier 2, Span 2, North bearing and Pier 4, Span 3, North bearing) CS2: -Active surface corrosion is present on all bearings, pins, and masonry plates. -Loose anchor rod nuts are present on several bearings						
313-Fixed Bearing	3 - Mod.	8	each	0	1	7	0

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Bridge Inspection Report

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
	CS3: -Active laminating corrosion with isolated minor section loss is typical on the castings, pins and/or masonry plates CS2: -Active surface corrosion is present on all bearings, pins, and masonry plates -Loose anchor rod nuts are present on several bearings						
321-Reinforced Concrete Approach Slab	3 - Mod.	1716	sq. ft.	1489	215	12	0
	CS3: -There is 3 S.F. cracking and broken up concrete in the rear approach slab near the abutment joint -There are 4 spalls between 1 S.F. and 3 S.F. in the forward approach slab along the longitudinal joint and a 2'x2' spall near the abutment joint CS2: -Asphalt patches are present in the rear approach slab with hairline longitudinal cracks near the abutment						
330-Metal Bridge Railing	3 - Mod.	1792	ft.	1677	115	0	0
	CS2: -The North Railing has been damaged by vehicle impact for a total length of 60 ft and the South Railing has been damaged by vehicle impact for a total length of 45 ft -There is a 10 ft long curb spall on the south curb in Span 2						
815-Drainage	3 - Mod.	88	each	87	1	0	0
	Small amounts of debris are present at the edge of the roadway. Some scuppers exhibit minor corrosion at the outlets. Partially clogged deck drain in the downstream gutter line in Span 3						
830-Abutment Backwall	3 - Mod.	101	ft.	60	41	0	0
	CS2: -Hairline cracks are present in the backwalls -The West Abutment exhibits cracks and delaminations throughout						

Inspector Comments - All

Inspector:	Compton-Troesch,Kyle	**Structure Number:**	3102521
Inspection Date:	07/14/2022	**Facility Carried:**	US50

Bridge Inspection Report

HAM-00050-0376L_(3102521)

ODOT District:	District 08					Date Built:	07/01/1959
Major Maint:	01 - State Highway Agency	Facility Carried:	US50	Traffic On:	1 - Highway	Rehab Date:	
Routine Maint:	01 - State Highway Agency	Feature Inters:	GREAT MIAMI R;PRIVATE DR	Traffic Under:	5 - Waterway	Insp. Resp A:	01 - State Highway Agency
FIPS Code:	84938 - WHITEWATER TWP (HAM county)	Location:	DISTRICT 08	JUST E OF SR128		Insp Resp B:	
Inspector	Compton-Troesch,Kyle	Inspection Date	07/14/2022	Reviewer	Not Approved		

Inspector Comments - Deck and Approach

Deck

The deck is in Good condition. The deck underside exhibits transverse hairline cracks and isolated hairline map cracking.

Approach

Approach Wearing Surface

The asphalt approach wearing surface is in Good condition, with longitudinal and transverse hairline cracks throughout.

Approach Guardrail

The approach guardrail is in Poor condition. There is vehicular damage to the southwest approach guardrail near the adjacent bridge.

Embankment

The approach embankment is in Satisfactory condition. The embankments are covered in heavy vegetation, but no significant deficiencies were observed. The previous inspection noted minor erosion at the northwest corner, but this could not be verified in 2022 due to heavy vegetation.

Inspector Comments - General Appraisal

Superstructure

The superstructure is in Satisfactory condition, with active corrosion, pack rust, and section loss throughout the truss members and floorbeams.

Alignment

Alignment is in Fair condition with isolated misalignment in the stringers as well as minor bowing and local deformations in several truss members (lower chords, verticals, and diagonals).

Crossframes and Diaphragms

The steel cross frames between the stringers are in Good condition with isolated bent cross frames in Span 1, 2, and 4.

Lateral Bracing

The lateral bracing is in Satisfactory condition, with isolated surface corrosion. The upper lateral bracing is bent up to 1/2" out of plane laterally in several locations. There is pack rust up to 1/8" thick between lateral bracing connection plates and upper chord cover plates.

Sway Bracing

The sway bracing is in Satisfactory condition overall, with several isolated areas of impact/construction damage. The bottom sway brace gusset plate at PP4 in Span 3 is deformed 5/8" due to pack rust.

Fatigue

1.The stringers are welded to floor beam webs via a connection plate on both sides of the stringer web, as well as along the stringer bottom flange. This creates susceptible locations for fatigue cracking in floor beams. The welded plate connection of the stringer web to the floor beam web, and the stringer bottom flange weld, are both Category E details. In effect, as the floor beam flexes there are axially-loaded plates welded perpendicular to the floor beam web that do not flex the same. This creates multiple areas on each floor beam for out-of-plane bending in the web. Given the lack of cracks at these locations it appears that the existence of stringer web plates on both sides of the floor beam webs (or stringer bottom flanges on both sides of the floor beam webs) gives the floor beam web adequate rigidity to counter this out of plane bending. This is not the case for the end floor beams, however, and these locations should be monitored in future inspections for fatigue cracks. No cracks on the end floor beams were observed.

2.With the stringers not being continuous over the floor beams, most of the stringer stress at the floor beams is carried by the web rather than the stringer bottom flange. With the stringer web welded to the floor beam web via a steel plate, this area is susceptible to out of plane bending. The lack of cracking seems to indicate having plates on both faces of the floor beam web supplies adequate rigidity. Again, this is not the case at the end floor beams and these should be monitored in future inspections.

3.Tack welds were typically noted between chord members and fill plates, lower chord web plates and internal diaphragms, lower chord web plates and gusset plates, lateral bracing connection angles and upper chord splice plates, and lateral brace connection plates to upper chord cover plates. These tack welds were typically noted as poor quality but no cracks were observed in the base metal at the time of inspection.

4. Poor quality welds consisting of porosity, undercutting, or roughness were present throughout the structure and should be monitored for cracks during future inspections.

5. Top and bottom flange cover/splice plates are welded to the stringer ends at each floorbeam and the welds at the ends of the plates are Category E details. The top flange plates are encased in the deck and could not be inspected.

Substructure

The substructure is in Fair condition, with widespread delaminations and spalls with exposed rebar with minor section loss.

Wingwalls

The reinforced concrete wingwalls are in Satisfactory condition overall. The southwest wingwall has two 1'x4" spalls with exposed rebar. The west abutment exhibits cracks and delaminations throughout.

Slope Protection

Slope protection is in Good condition. Dumped rocks are present in front of both abutments.

Culvert

N/A

Inspector Comments - Waterway

Waterway Adequacy

Channel Hydraulic Opening

The hydraulic opening is adequate. Heavy debris and log buildup is currently located at Pier 3.

Channel

The channel is in Satisfactory condition, with indications of scour and a large debris pile around Pier 3.

Scour

Scour is in Good condition. At the time of the inspection, only Pier 2 was in the water. An underwater inspection was last performed in August 2019 by Terracon, which found no significant local scour at Pier 2. There are indications of scour around Pier 3, likely caused by the debris pile built up there. No notable scour was observed at the other substructure units.

Channel Alignment

The alignment is good with the waterway running under Spans 1 and 2. There is a slight skew with gradual bends upstream and downstream.

Channel Protection

The channel protection is natural with moderate vegetation along each embankment.

Scour Critical

N/A