



GREAT LAKES ENGINEERING GROUP, LLC

**UNDERWATER BRIDGE INSPECTION REPORT
GROSSE ILE PARKWAY OVER
TRENTON CHANNEL
STR 12006**



SUBMITTED TO:

WAYNE COUNTY

SUBMITTED BY:

GREAT LAKES ENGINEERING GROUP

NOVEMBER 9, 2021

GLEG FILE No: 1020-2-704

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Grosse Ile Parkway over Trenton Channel
STR 12006
November 9, 2021

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EXECUTIVE SUMMARY

Grosse Ile Parkway over Trenton Channel is a twelve-span moveable swing bridge with a steel superstructure. The bridge is located in Wayne County, Michigan. The original structure was built around 1873 as a railroad crossing and was converted to carry vehicular traffic in 1932. The structure carries two lanes of two-way traffic and is 1,346 feet in length. All eleven pier units (piers 1w-11w) are submerged in the channel. The bridge has undergone numerous repair projects throughout its lifespan, and most recently was closed to traffic while extensive pier repairs were performed at piers 2w, 4w, 6w, 8w, 9w, and 10w. Pier repair verification dives were performed during the project, and these reports are available as separate documents.



STR 12006
Grosse Ile Parkway over
Trenton Channel
Wayne County

Piers 1w through 11w were subject to underwater inspection on November 9-10, 2021 while the structure remained closed to vehicular traffic due to the pier repair project and ongoing superstructure repairs. The pier repair and superstructure repair projects were overseen by HNTB, Michigan on behalf of Wayne County. Coordination was required to ensure contractor equipment and operations did not impact the safety of the dive team or contractor personnel. Power to the swing span pier was turned off due to the ongoing construction projects. The dive team performed the underwater inspection under the contractor's United States Coast Guard permits.

The pier units are comprised of a mixture of three different design types. Piers 2w, 4w, 6w, 8w, and 10w are the original structure pier units. The upper portions of the even numbered piers are constructed of reinforced concrete and were originally built upon timber cribbing with a loose rock infill. Piers 2w, 4w, 6w, 8w, and 10w underwent major repairs during the second half of 2021 due to an extensive loss of the rock infill within the timber cribbing and deterioration of the timber cribbing. The repairs consisted of installing FP-475 vinyl or 6" rib-16 ga. sheet piling on the exterior of the timber cribbing which was secured with steel C5x9 walers. Grout filled bags were installed along the channel bottom at the bottom of the vinyl sheeting / channel bottom interface to anchor the stay-in-place formwork vertically and horizontally. The interior of the timber cribbing was then backfilled with grout using underwater injection methods. Steel ice breakers were installed at the upstream (north) ends of the even numbered piers during the repair project. Surface repairs were also performed at the even numbered piers.

Piers 1w, 3w, 5w, 7w and 11w are constructed of reinforced concrete and are founded on reinforced concrete footings of varying thickness. These piers were added between the original piers at the time the structure was converted to a vehicular crossing in 1932. The footings at these piers rest on limestone bedrock according to original plans.

Pier 9w is original to the 1873 design and is the swing / pivot span for the navigable channel. The pier consists of a large reinforced concrete cap supported by timber cribbing with loose rock infill. Pier 9w was also subject to the same pier repairs as the even numbered piers. Pier 9w has a timber cribbing pier protection system that extends upstream and downstream of the pier.

Based on the underwater inspection the piers are overall in **fair to poor condition**. The odd numbered piers (1w, 3w, 5w, 7w, and 11w) are in **poor condition**. Vertical footing exposure ranging from 1'-2" minimum to 10'-6" maximum was observed at these piers. Although these piers are founded on bedrock, the footing exposure is an area of concern and should be continued to be monitored at increased frequency. Piers 1w, 3w, 5w, 7w, and 11w also exhibit extensive deterioration both above and below the waterline. Areas of spalling, delamination, 1/2" to 4" deep scaling, vertical and horizontal cracking, and map cracking is present above and below the waterline at these piers.

The even numbered piers (2w, 4w, 6w, 8w, and 10w) are in **fair condition**. Extensive underwater repairs were performed at these piers during the second half of 2021. The previous loss of rock infill and deteriorated timber cribbing has been repaired with a combination of grout bags, vinyl and steel stay-in-place sheeting forms, steel walers, and pressure injected grout fill. Although these piers have been repaired, they should continue to be monitored for movement / settlement or degradation of the pier repairs and/or streambed. Piers 2w, 4w, 6w, 8w, and 10w also exhibit deterioration above the waterline consisting of spalling, delamination, map cracking, and vertical and horizontal cracking.

Pier 9w is in **fair to poor condition**. The structural portion of pier 9w received the same repairs as the even numbered piers, however steel sheeting was used as the formwork. The swing / pivot portion of pier 9w is in **fair condition**. The previous deterioration of the timber cribbing and loss of rock infill has been repaired with the same procedures detailed in the paragraph above. The previous deterioration above the waterline at pier 9w has been repaired.

The timber cribbing pier protection system at pier 9w is in **poor condition**. The purpose of the system is to protect the bridge from impacts by vessels and also to identify the navigable channel. The protection system has the visual appearance of sinking, especially at the north end (upstream end). During the 2021, 2020, 2019, and 2017 underwater inspections, water levels have been higher than in older inspections. The high water levels contribute to the sinking appearance, however the extensive deterioration of the pier protection cribbing below water, and failed previous repairs are contributing to the settlement of the pier protection system.

The following are recommendations for STR 12006 as a result of the underwater inspection:

- Adjust underwater inspection frequency to bring 2022 inspection into the months of June, July, August, or September of 2022; then set frequency to 24 months thereafter.
- Continue to survey pier elevations at 4 locations of each pier and monitor by a licensed surveyor or engineer to check for settlement.
- Perform substructure repairs (concrete patching, epoxy injection of cracks) at piers 1w, 2w, 3w, 4w, 5w, 6w, 7w, 8w, 10w, and 11w.
- Replace or retrofit the pier protection system at pier 9w, both the north and south ends.

<u>Proposed NBI ratings based on underwater inspection only</u>		
Item	Current NBI Rating	Proposed NBI Rating (based on UW insp.)
BSIR #17 (Scour Inspection)	4	4
SIA #60 (Substructure)	5	5
SIA #61 (Channel)	7	7
SIA #71 (Waterway Adequacy)	8	8
SIA #111 (Navigation Protection)	2	3
SIA #113 (Scour Criticality)	4	4

According to National Bridge Inspection Standards (NBIS), it is recommended that the substructure units of STR 12006 be inspected underwater at an increased frequency not to exceed 24 months.



Steel stay-in-place forms and walers



Grout bags and vinyl stay-place forms

GENERAL SITE PROCEDURES

QUALIFIED TEAM

The team performing the underwater inspection is qualified in accordance with the National Bridge Inspection Standards 23 CFR Part 650.309. The underwater inspection was conducted by a four-person team consisting of a Professional Engineer Dive Team Leader/Qualified Dive Inspector/Qualified Team Leader (Casey Collings, P.E.), a Qualified Dive Inspector/Qualified Team Leader (Matt Davis), a Diving Safety Supervisor (Paul Davis), and a Dive Tender (Brian Hebden, P.E.).

EQUIPMENT

The inspection was conducted using Self-Contained Underwater Breathing Apparatus (SCUBA). The inspection team accessed the bridge and worked from an 18-foot Dive Safety Boat. Two-way wired communications were used to convey inspection notes from the diver to the top-side team leader and recorded on note sheets. Additional equipment consisted of an underwater digital camera, underwater video camera, LED high intensity submersible dive light, dive knife, scraper, 4' probing rod, 25' and 50' survey rods, and a side imaging sonar unit.

LEVEL OF INSPECTION

The Level I underwater inspection consisted of a close visual and tactile examination using large sweeping motions of the hands where visibility was limited. A Level II inspection was performed on 10% of the submerged substructure units. The inspection was conducted over the total exterior surface of each underwater substructure unit. Probing along the mud line was also done along each substructure unit and the adjacent streambed. Upstream and downstream cross sections were taken and recorded using an established benchmark.

APPROVALS

This bridge falls under the jurisdiction of the United States Coast Guard (USCG). Approval was required to perform the underwater inspection. The dive team performed the underwater inspection under the contractor's United States Coast Guard permits.

FIELD INSPECTION FINDINGS

Grosse Ile Parkway over Trenton Channel is a twelve-span moveable swing bridge with a steel superstructure. The bridge is located in Wayne County, Michigan. The original structure was built around 1873 as a railroad crossing and was converted to carry vehicular traffic in 1932. The structure carries two lanes of two-way traffic and is 1,346 feet in length. All eleven pier units (piers 1w-11w) are submerged in the channel. The bridge has undergone numerous repair projects throughout its lifespan, and most recently was closed to traffic while extensive pier repairs were performed at piers 2w, 4w, 6w, 8w, 9w, and 10w. Pier repair verification dives were performed during the project, and these reports are available as separate documents. Piers 1w through 11w were subject to underwater inspection on November 9-10, 2021.

The overall condition of the submerged substructure is **fair to poor**. Below is a summary of the field site observations for the various components of the underwater inspection.

Substructure Unit	Observations Below the Waterline	Observations Above the Waterline
<p style="text-align: center;">Pier 1w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Vertical footing exposure on all sides of pier. Maximum vertical exposure was 7'-9" inches along the east side of pier. • No undermining of footing observed. • 5' tall band of 1/2" deep scaling of the concrete starting at the waterline. Scaling surrounds perimeter of pier. • 2 sft spall in the east face of pier, located approximately 4' below waterline. • Horizontal crack in the exposed footing at the southeast end. • Deep scaling of concrete on the exposed footing at the south (downstream) end, scaling 1" to 2" deep. • Full height vertical cracks in west and east elevations of pier, extending from the bolster area down to the top of footing. • Uniform algae growth on concrete surfaces up to 1" thick. • Channel bottom consists of sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • West elevation: 12 sft and 6 sft delamination in bolster area. Vertical and horizontal cracking in pier face. • East elevation: 24 sft and 4 sft spalls in bolster area. 16 sft and 6 sft spalls in pier face. Vertical and horizontal cracks in pier face and bolster area.

Continued on next page

Substructure Unit	Observations Below the Waterline	Observations Above the Waterline
<p>Pier 2w (Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Repairs made to previous timber cribbing deterioration and loss of rock infill. • FP-475 vinyl sheeting surrounds pier (used as stay-in-place formwork). • C5x9 steel walers spaced at 2'-0" vertical spacing securing formwork. • Grout backfill inside vinyl formwork. • Steel ice breaker plate at upstream end, extending 5' below waterline. • Smaller ice steel ice breaker plate extends to channel bottom. • Grout bags along channel bottom. • 2 sft spall in west pier face just below waterline. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of grout bags, sand and rocks up to 1' diameter. 	<ul style="list-style-type: none"> • South end: 5 sft spall and 25 sft area of map cracking. • West elevation: 2 sft spall w/ exp steel and 3 sft spall. 8 sft delamination and 1 sft delamination. Vertical cracking in pier face. • East elevation: 60 sft spall w/ exp steel. 2 sft delamination. Vertical crack in pier face.
<p>Pier 3w (Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Vertical footing exposure on all sides of pier. Maximum vertical exposure was 6'-10" inches along the north end of pier. • No undermining of footing observed. • 3 sft spall at south end, extends below and above waterline. • 2' tall band of 2" to 4" deep scaling in the pier wall starting at the top of footing and extending up 2'. Scaling surrounds perimeter of pier. • 1" to 2" deep scaling at north end of pier, extending approximately 4' below waterline. • Horizontal cracks in the exposed footing along the west elevation, east elevation, and north end. • Full height vertical cracks in west and east elevations of pier, extending from the bolster area down to the top of footing. • Uniform algae growth on concrete surfaces up to 1" thick. • Channel bottom consists of sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • South end: 3 sft spall extends above and below waterline. • West elevation: 3 sft delamination in bolster area. Vertical and horizontal cracking in pier face. • East elevation: 4 sft spall in bolster area. Vertical and horizontal cracks in pier face.

Substructure Unit	Observations Below the Waterline	Observations Above the Waterline
<p>Pier 4w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Repairs made to previous timber cribbing deterioration and loss of rock infill. • FP-475 vinyl sheeting surrounds pier (used as stay-in-place formwork). • C5x9 steel walers spaced at 2'-0" vertical spacing securing formwork. • Grout backfill inside vinyl formwork. • Steel ice breaker plate at upstream end, extending 5' below waterline. • Smaller ice steel ice breaker plate extends to channel bottom. • Grout bags along channel bottom. • 10 sft spall at south end starting at waterline and extending 2' below waterline. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of grout bags, sand and rocks up to 1' diameter. 	<ul style="list-style-type: none"> • South end: 25 sft area of map cracking. • West elevation: 6 sft spall at south end. Vertical cracking in pier face. • East elevation: Vertical cracks in pier face.
<p>Pier 5w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Vertical footing exposure on all sides of pier. Maximum vertical exposure was 9'-1" inches along the west elevation and at north end of pier. • No undermining of footing observed. • 4 sft spall in footing at southwest corner. • 1/8" wide horizontal and vertical cracks in footing along west and east elevations. • 4' tall band of 2" to 3" deep scaling of the concrete below and above waterline. Scaling surrounds perimeter of pier. • Vertical and horizontal cracks in west and east elevations of pier. • 50 sft area of map cracking in west elevation of pier wall extends partially below waterline. • Uniform algae growth on concrete surfaces up to 1" thick. • Channel bottom consists of sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • West elevation: 18 sft and 12 sft spalls in pier wall. 50 sft area of map cracking extends partially below waterline. 4 sft spall in bolster area. Concrete patch in bolster area. Vertical and horizontal cracking in pier wall. • East elevation: 2 sft spall in bolster area. 30 sft and 6 sft areas of map cracking in pier wall. Vertical and horizontal cracks in pier face. Concrete patches in bolster area. • 4' tall band of 2" to 3" deep scaling of concrete above and below waterline. Scaling surrounds perimeter of pier.

Continued on next page

Substructure Unit	Observations Below the Waterline	Observations Above the Waterline
<p>Pier 6w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Repairs made to previous timber cribbing deterioration and loss of rock infill. • FP-475 vinyl sheeting surrounds pier (used as stay-in-place formwork). • C5x9 steel walers spaced at 2'-0" vertical spacing securing formwork. • Grout backfill inside vinyl formwork. • Steel ice breaker plate at upstream end, extending 5' below waterline. • Smaller ice steel ice breaker plate extends to channel bottom. • Grout bags along channel bottom. • Areas of spalling on all sides just below waterline. Majority of spalled areas are above waterline. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of grout bags, sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • South end: 4 sft spall, 50% extends below waterline. • North end: 8 sft spall, 25% extends below waterline. • West elevation: 3 sft spall, 50% extends below waterline. Vertical and horizontal cracking in pier face. • East elevation: 8 sft spall, 30% extends below waterline. Vertical crack in pier face.
<p>Pier 7w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Vertical footing exposure on all sides of pier. Maximum vertical exposure was 8'-10" inches at the north end of pier. • No undermining of footing observed. • 1/8" wide horizontal cracks in footing along west and east elevations. • 4 sft spall in pier wall in east elevation at south end. • 32 sft spall in east elevation extends 50% above waterline. • 1' tall band of 2" to 4" deep scaling on exposed footing. Scaling starts at top of footing and extends down 1'. Scaling surrounds perimeter of pier. • 3' tall band of 2" deep scaling of the concrete in pier wall. Scaling starts at top of footing and extends up 3'. Scaling surrounds perimeter of pier. • Vertical cracks in west and east elevations of pier. • Uniform algae growth on concrete surfaces up to 1" thick. • Channel bottom consists of sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • West elevation: 12 sft and 2 sft spalls in bolster area. Vertical and horizontal cracking in pier wall. • East elevation: 8 sft spall in bolster area. 18 sft and 32 sft spalls in pier wall. 32 sft spall extends 50% below waterline. Vertical and horizontal cracks in pier face.

Substructure Unit	Observations Below the Waterline	Observations Above the Waterline
<p>Pier 8w (Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Repairs made to previous timber cribbing deterioration and loss of rock infill. • 6" rib-16 ga. steel sheeting surrounds pier (used as stay-in-place formwork). • C5x9 steel walers spaced at 2'-0" vertical spacing securing formwork. • Grout backfill inside vinyl formwork. • Steel ice breaker plate at upstream end, extending 5' below waterline. • Smaller ice steel ice breaker plate extends to channel bottom. • Grout bags along channel bottom. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of grout bags, sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • West elevation: 2 sft delamination in bolster area. 14 sft and 1 sft delaminated area in pier wall. Vertical crack in pier wall. • East elevation: Vertical cracks in pier wall and bolster area.
<p>Pier 9w (Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Repairs made to previous timber cribbing, plywood sheeting, grout repair deterioration and loss of rock infill. • 6" rib-16 ga. steel sheeting on west and east elevations of pier (used as stay-in-place formwork). • C5x9 steel walers spaced at 2'-0" vertical spacing securing formwork. • Grout backfill inside steel formwork. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of sand and scattered rocks 1' to 4' in diameter. 	<ul style="list-style-type: none"> • Repairs (concrete patches) made to previous spalled and delaminated areas on the pivot portion of the pier.
<p>Pier 9w - Pier Protection System (Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Vertical timbers at upstream (north) end of pier have shifted, some have fallen onto channel bottom. • Horizontal timbers in southwest corner of cribbing have come loose and are unstable. • Fluctuations in the channel bottom have created gaps below the exterior plywood along both sides of the pier. The older interior cribbing is visible, but diver was not able to reach. • Deteriorated timbers members with loss of section 30%-70%. • Scattered riprap 1' to 4' in diameter on channel bottom around perimeter 	<ul style="list-style-type: none"> • Settlement of timber cribbing at north side of pier.

Substructure Unit	Observations Below the Waterline	Observations Above the Waterline
<p>Pier 10w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Repairs made to previous timber cribbing deterioration and loss of rock infill. • FP-475 vinyl sheeting surrounds pier (used as stay-in-place formwork). • C5x9 steel walers spaced at 2'-0" vertical spacing securing formwork. • Grout backfill inside steel formwork. • Steel ice breaker plate at upstream end, extending 5' below waterline. • Smaller ice steel ice breaker plate extends to channel bottom. • Grout bags along channel bottom. • 12 sft spall at south end, 75% is above waterline. • 1 sft spall at north end, 50% is above waterline. 10 sft area of 4" deep scaling at north end, 50% is above waterline. • Vertical cracks in west and east elevations extend below waterline to top of footing elevation. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of grout bags, sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • South end: 12 sft spall, 25% extends below waterline. • North end: 1 sft spall, 50% extends below waterline. 10 sft area of 4" deep scaling, 50% extends below waterline. • West elevation: 26 sft area of delamination in south end of pier wall and bolster area. Vertical and horizontal cracking in pier wall and bolster area. • East elevation: 4 sft spall in pier wall. Vertical cracks in pier wall.
<p>Pier 11w</p> <p>(Refer to Substructure Elevation Drawings and Soundings Section)</p>	<ul style="list-style-type: none"> • Vertical footing exposure on all sides of pier. Maximum vertical exposure was 10'-6" inches at the north end of the pier. • No undermining of footing observed. • 2 sft spall in footing at southeast corner. • 4 sft spall in nose of pier wall along east elevation, just above top of footing. • 3 sft spall along east elevation extends 50% above waterline. • Uniform algae growth on concrete surfaces up to 1/16" thick. • Channel bottom consists of sand and scattered rocks up to 1' diameter. 	<ul style="list-style-type: none"> • West elevation: 10 sft and 4 sft spalls in pier wall. • East elevation: 10 sft spall in bolster area. 1 sft and 3 sft spalls in pier wall. 3 sft spall extends 50% below waterline.

SUBSTRUCTURE

Based on the underwater inspection the piers are overall in **fair to poor condition**. Vertical footing exposure ranging from 1'-2" minimum to 10'-6" maximum was observed at piers 1w, 3w, 5w, 7w, and 11w. Although these piers are founded on bedrock, the footing exposure is an area of concern and should be continued to be monitored at increased frequency. Piers 1w, 3w, 5w, 7w, and 11w also exhibit extensive deterioration both above and below the waterline. Areas of spalling, delamination, 1/2" to 4" deep scaling, vertical and horizontal cracking, and map cracking is present in these piers. Piers 1w, 3w, 5w, 7w, and 11w are in overall **poor condition**.

The even numbered piers (2w, 4w, 6w, 8w, and 10w) are in **fair condition**. Extensive underwater repairs were performed at these piers during the second half of 2021. The previous loss of rock infill and deteriorated timber cribbing has been repaired with a combination of grout bags, vinyl and steel stay-in-place sheeting forms, steel walers, and pressure injected grout fill. Above the waterline, piers 2w, 4w, 6w, 8w, and 10w have deterioration consisting of spalling, delamination, map cracking, and vertical and horizontal cracking.

Pier 9w is in **fair condition**. The structural portion of pier 9w received the same repairs as the even numbered piers, however steel sheeting was used as the formwork. The swing / pivot portion of pier 9w is in **fair condition**. The previous deterioration of the timber cribbing and loss of rock infill has been repaired with the same procedures detailed in the paragraph above. The previous deterioration above the waterline at pier 9w has been repaired.

Based upon the underwater inspection only, the submerged portions of the piers are in overall **fair to poor condition**. The current Bridge Safety Inspection Report rating for Substructure (SIA Item #60) is a 5. Based upon the underwater inspection only, it is recommended that this rating remain a 5. Please refer to the preceding table for detailed information on pier footing exposure and overall deterioration.

SCOUR COUNTERMEASURES

There is scattered riprap in place along the channel bottom at the submerged portions of the piers. Vertical footing exposure is present at piers 1w, 3w, 5w, 7w, and 11w. Scour repairs have been made to piers 2w, 4w, 6w, 8w, 9w, and 10w during the second half of 2021. Scour repairs at these piers consisted of installing stay-in-place forms on the exterior of the timber cribbing and injecting grout into the interior of the cribbing to repair the loss of stone infill. Grout filled bags were also installed along the channel bottom at these piers to secure the stay-in-place forms to the channel bottom.

The current Bridge Safety Inspection Report rating for Scour Criticality (SIA Item #113) is a 4. Based on the design of the pier units and the observations of the underwater inspection it is

recommended that this rating remain a 4.

SCOUR INSPECTION

Vertical footing exposure was observed at piers 1w, 3w, 5w, 7w, and 11w during the underwater inspection. No undermining of the footings was observed at any pier. Footing exposure observations were as follows;

Pier 1w footing exposure on all sides ranged from 1'-2" minimum to 7'-9" maximum. Maximum exposure was along the east elevation of the pier. Pier 3w footing exposure along all sides ranged from 1'-4" minimum to 6'-10" maximum, with maximum exposure at the north end (upstream end). Footing exposure on all sides of pier 5w ranged from 3'-10" minimum to 9'-1" maximum. Maximum exposure was along the east elevation. Pier 7w footing exposure on all sides ranged from 5'-10" minimum to 8'-10" maximum. Maximum exposure was at the north end (upstream end) of the pier. Pier 11w footing exposure along all sides ranged from 5'-9" minimum to 10'-6" maximum, with maximum exposure at the north end (upstream end).

The current Bridge Safety Inspection Report rating for Scour Inspection (BSIR Item #17) is a 4. Based on the observed scour conditions and vertical footing exposure at piers 1w, 3w, 5w, 7w, and 11w it is recommended that this rating remain a 4 in accordance with MDOT NBI rating guidelines.

NAVIGATION PROTECTION SYSTEMS

The watercourse is deemed navigable according to the U.S. Coast Guard; therefore, protection systems and navigation lights at or near the bridge are required. A timber cribbing pier protection system is in place at pier 9w. The protection system at pier 9w is in **poor condition**. The purpose of the system is to protect the bridge from impacts by vessels and also to identify the navigable channel. The protection system has the visual appearance of sinking, especially at the north end (upstream end). During the 2021, 2020, 2019, and 2017 underwater inspections, water levels have been higher than in older inspections. The high water levels contribute to the sinking appearance, however the extensive deterioration of the pier protection cribbing below water, and failed previous repairs are contributing to the settlement of the pier protection system. There are multiple areas within the timber cribbing system that exhibit section loss of 20%-75%. No pier protection systems are in place at piers 1w, 2w, 3w, 4w, 5w, 6w, 7w, 8w, 10w, and 11w.

Navigation lighting is installed at the structure from piers 8w to 10w as well as on southern and northern ends of the pier protection system at pier 9w. The navigation lighting was not operating at the time of underwater inspection due to power at the bridge being turned off for ongoing repair work.

The current Bridge Safety Inspection Report rating for Pier or Abutment Protection (For Navigation) (SIA Item #111) is a 2. It is recommended that this coding be changed to a 3 to indi-

CHANNEL AND CHANNEL PROTECTION

The physical conditions associated with the flow of water through the bridge, such as waterway stability and the condition of the channel and slope, were evaluated. The west channel banks are natural with no slope protection in place. Stacked stone slabs are in place in front of the west abutment. The east channel banks have stacked stone blocks in place to retain the approach slopes. Farther from the bridge, there is a boat launch in the northwest quadrant and a marina in the southeast quadrant. No major erosion or significant debris was observed in the channel banks at the bridge.

The current Bridge Safety Inspection Report rating for Channel and Channel Protection (BSIR # 16, SIA Item #61) is a 7. Based upon the underwater inspection and observed channel conditions it is recommended that this rating remain a 7.

WATERWAY ADEQUACY

The waterway opening, with respect to the passage of flow through the bridge, was evaluated. The bridge deck is above the roadway approaches. The bridge deck elevation is above the roadway approaches. The bridge deck and roadway approaches are above flood water elevations (high water) with a slight chance of overtopping the roadway approaches.

The current Bridge Safety Inspection Report rating for Waterway Adequacy (SIA Item #71) is an 8. Based upon the underwater inspection and MDOT SIA coding guidelines it is recommended that this item remain rated an 8 to coincide with the functional classification of the route carried by the structure (Urban - Minor Arterial).

STREAMBED PROFILES

The water surface elevation at the time of inspection was 575.49 feet. Piers 1w through 11w are submerged in the waterway and the channel extended from the west abutment to the east abutment. The channel was approximately 1,338 feet wide and the waterway was flowing from north to south. Both upstream and downstream cross sections were taken across the length of the bridge along the fascias, and compared to previous cross sections. Please refer to "Stream Cross Sections" tab of this report for the stream profiles.

EVALUATION AND RECOMMENDATIONS

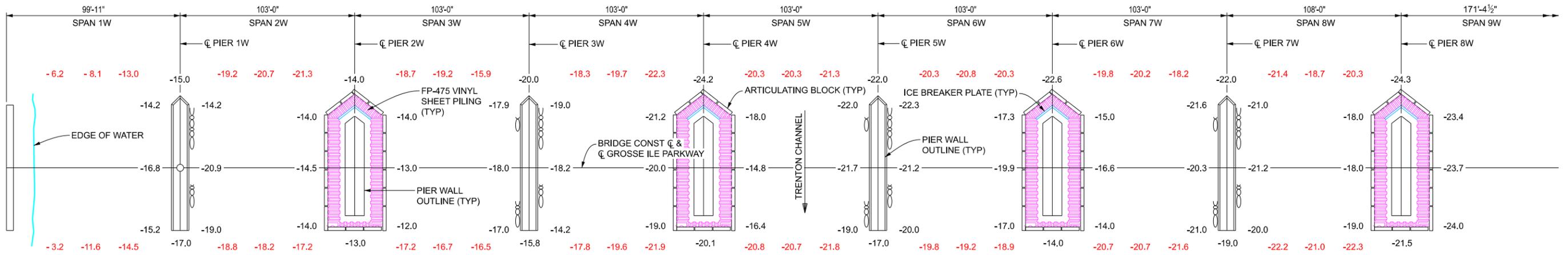
Based on the underwater inspection the piers are overall in **fair to poor condition**. The odd numbered piers (1w, 3w, 5w, 7w, and 11w) are in **poor condition**. Vertical footing exposure ranging from 1'-2" minimum to 10'-6" maximum was observed at these piers. Although these piers are founded on bedrock, the footing exposure is an area of concern and should be continued to be monitored at increased frequency. Piers 1w, 3w, 5w, 7w, and 11w also exhibit extensive deterioration both above and below the waterline. Areas of spalling, delamination, 1/2" to 4" deep scaling, vertical and horizontal cracking, and map cracking is present above and below the waterline at these piers.

The even numbered piers (2w, 4w, 6w, 8w, and 10w) are in **fair condition**. Extensive underwater repairs were performed at these piers during the second half of 2021. The previous loss of rock infill and deteriorated timber cribbing has been repaired with a combination of grout bags, vinyl and steel stay-in-place sheeting forms, steel walers, and pressure injected grout fill. Although these piers have been repaired, they should continue to be monitored for movement / settlement or degradation of the pier repairs and/or streambed. Piers 2w, 4w, 6w, 8w, and 10w also exhibit deterioration above the waterline consisting of spalling, delamination, map cracking, and vertical and horizontal cracking.

Pier 9w is in **fair to poor condition**. The structural portion of pier 9w received the same repairs as the even numbered piers, however steel sheeting was used as the formwork. The swing / pivot portion of pier 9w is in **fair condition**. The previous deterioration of the timber cribbing and loss of rock infill has been repaired with the same procedures detailed in the paragraph above. The previous deterioration above the waterline at pier 9w has been repaired.

The timber cribbing pier protection system at pier 9w is in **poor condition**. The purpose of the system is to protect the bridge from impacts by vessels and also to identify the navigable channel. The protection system has the visual appearance of sinking, especially at the north end (upstream end). During the 2021, 2020, 2019, and 2017 underwater inspections, water levels have been higher than in older inspections. The high water levels contribute to the sinking appearance, however the extensive deterioration of the pier protection cribbing below water, and failed previous repairs are contributing to the settlement of the pier protection system.

According to the National Bridge Inspection Standards (NBIS), it is recommended that the sub-structure units of STR 12006 be inspected underwater at an increased frequency not to exceed 24 months. Furthermore, it is recommended that channel cross sections be taken at the structure during biennial inspections or soon after flood occurrences.



WEST ABUTMENT

PIER 1W

PIER 2W

PIER 3W

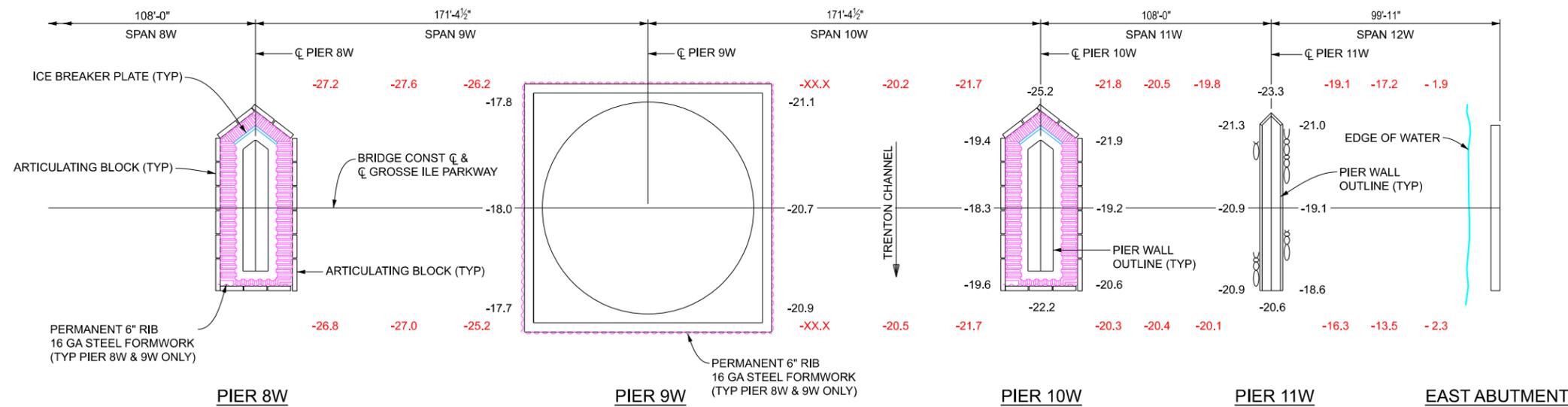
PIER 4W

PIER 5W

PIER 6W

PIER 7W

PIER 8W



PIER 8W

PIER 9W

PIER 10W

PIER 11W

EAST ABUTMENT

PLAN VIEW

AT THE TIME OF DIVE

AMBIENT AIR TEMP	55°
WATER TEMP	49°
VELOCITY OF WATER	2.5 fps
TURBIDITY	10'
STREAMBED MATERIAL	ROCK

NOTE:

WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21. BENCHMARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

LEGEND

-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM ALONG BRIDGE FASCIA
	RIPRAP
	SHEET PILING
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING PLAN

STRUCTURE NO: 12006

DRAWN BY: JLS

CHECKED BY: CJC

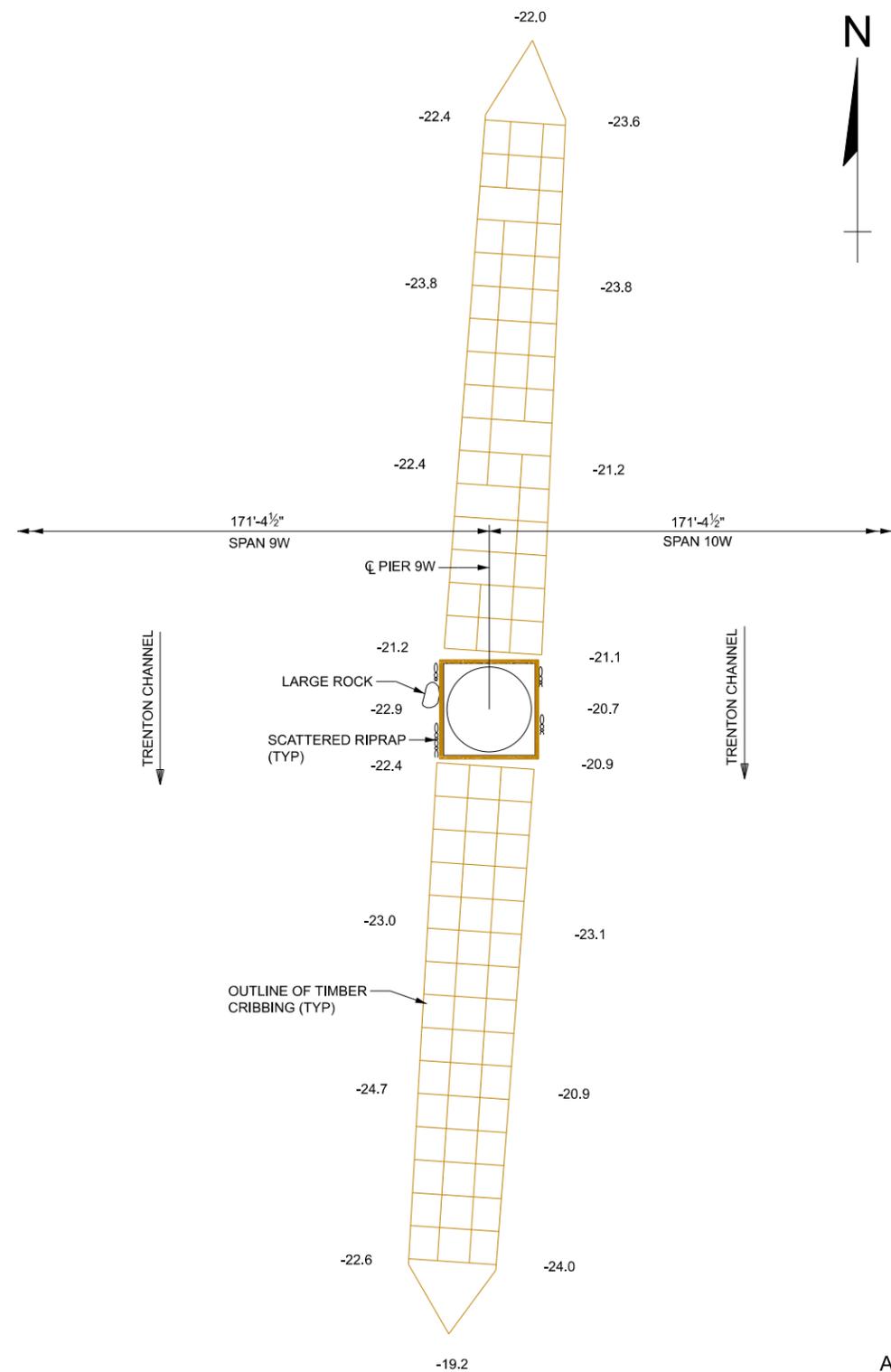
GLEG JOB NO: 1020-2-704

DATE: 11/09/21

FILE: 704 uwpl.dgn



GREAT LAKES ENGINEERING GROUP, LLC



PIER 9W

PLAN VIEW

AT THE TIME OF DIVE

AMBIENT AIR TEMP	55°
WATER TEMP	49°
VELOCITY OF WATER	2.5 fps
TURBIDITY	10'
STREAMBED MATERIAL	ROCK

NOTE:

WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21. BENCHMARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM ALONG BRIDGE FASCIA
	RIPRAP
	SHEET PILING
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING PLAN

STRUCTURE NO: 12006

GLEG JOB NO: 1020-2-704

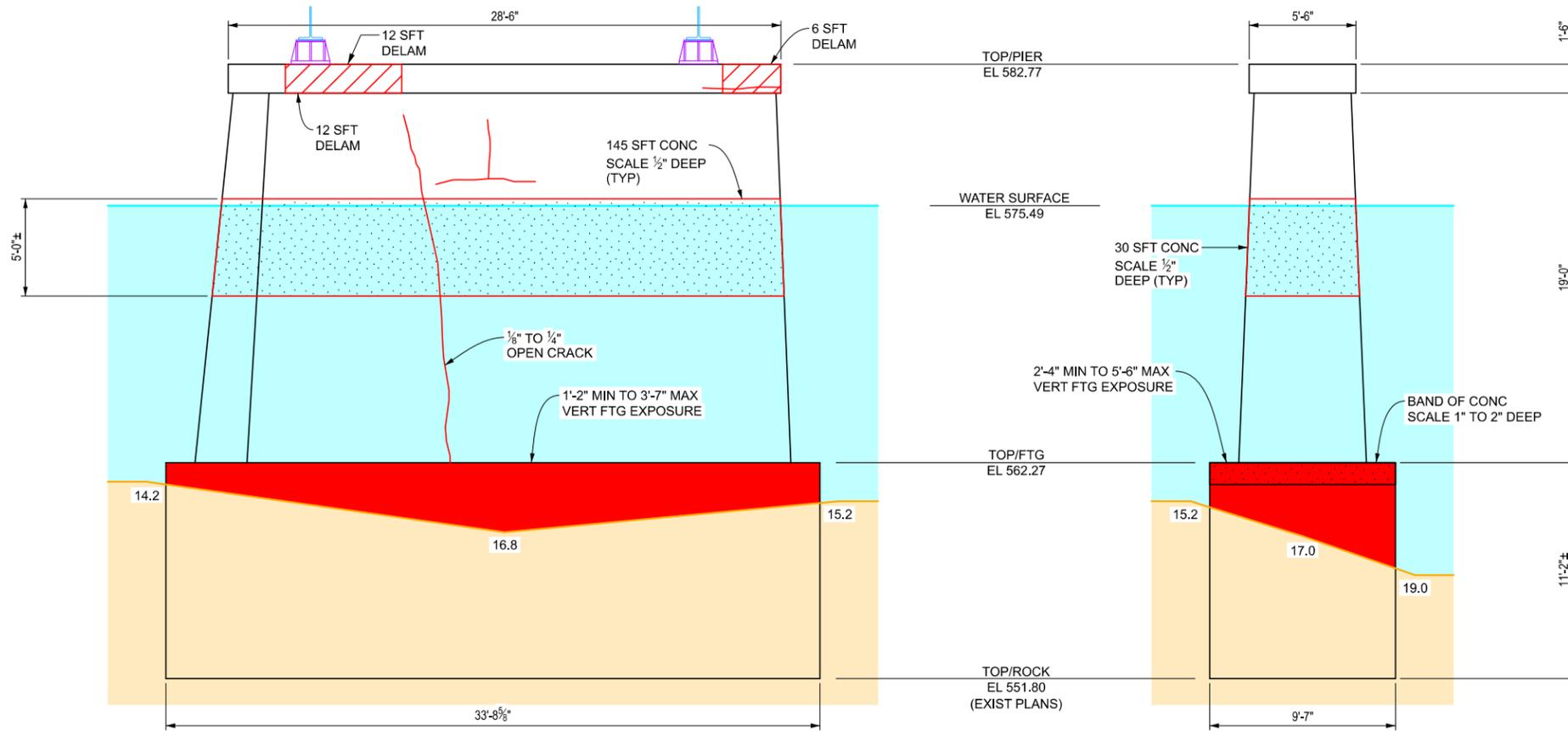
DRAWN BY: JLS

DATE: 11/09/21

CHECKED BY: CJC

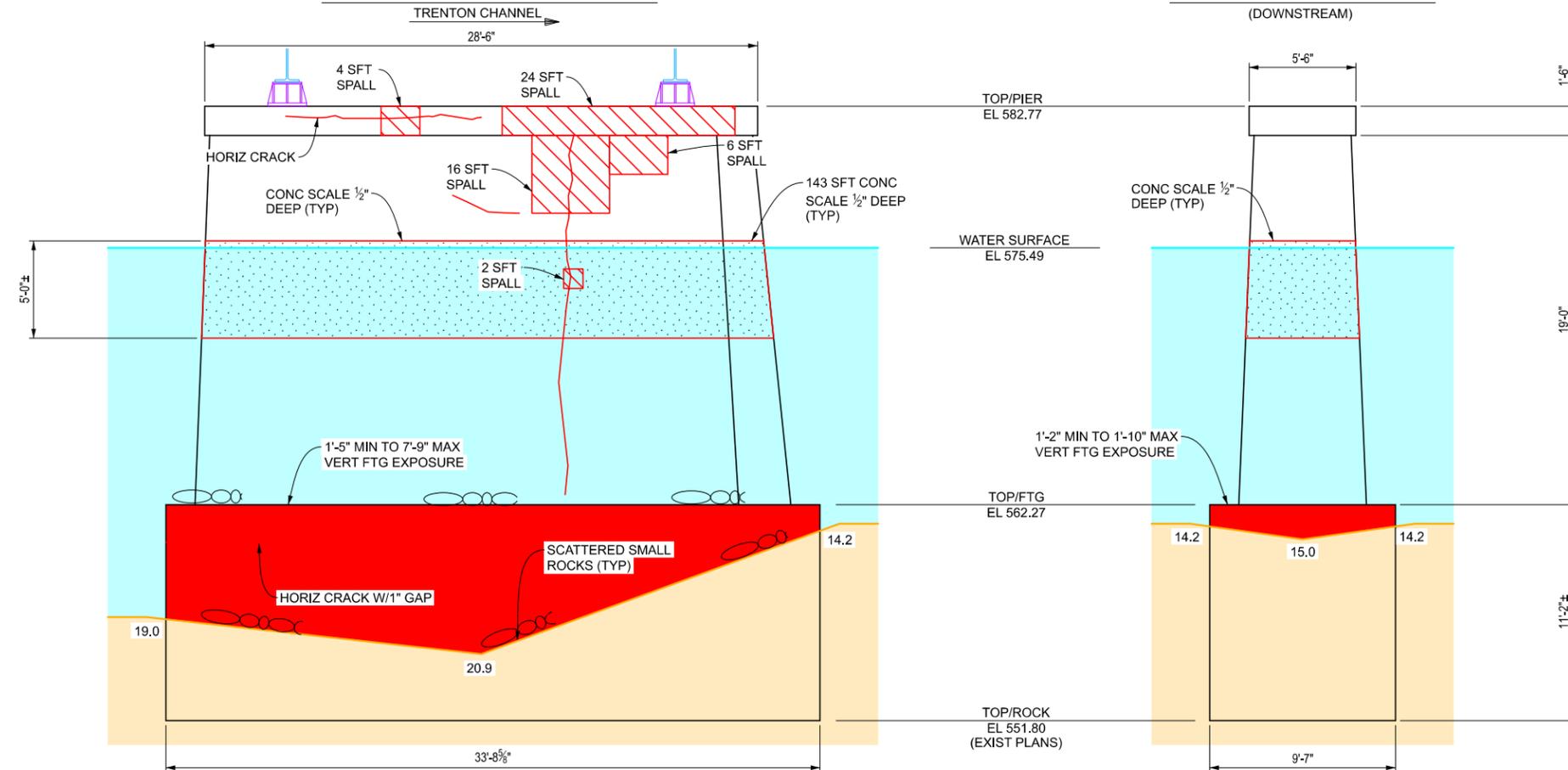
FILE: 704 uwpl.dgn





PIER 1W WEST ELEVATION

PIER 1W SOUTH END (DOWNSTREAM)



PIER 1W EAST ELEVATION

PIER 1W NORTH END (UPSTREAM)

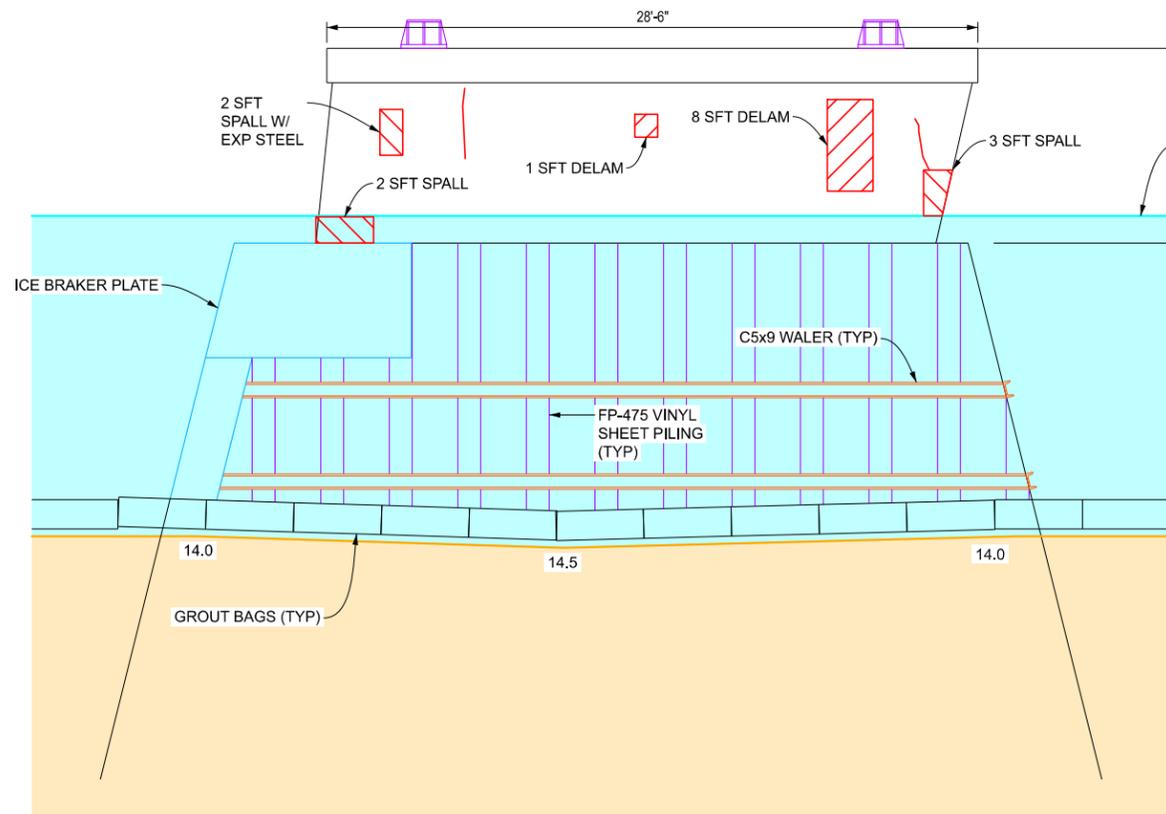
NOTE:
 WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21.
 BENCH MARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

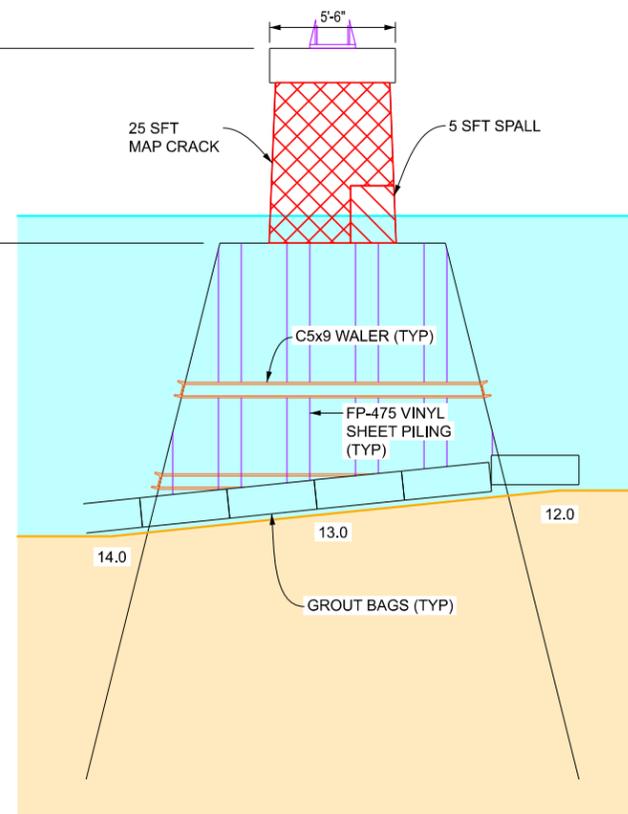
WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION		
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704	
DRAWN BY: JLS	DATE: 11/09/21	
CHECKED BY: CJC	FILE: 704 uwpi.dgn	

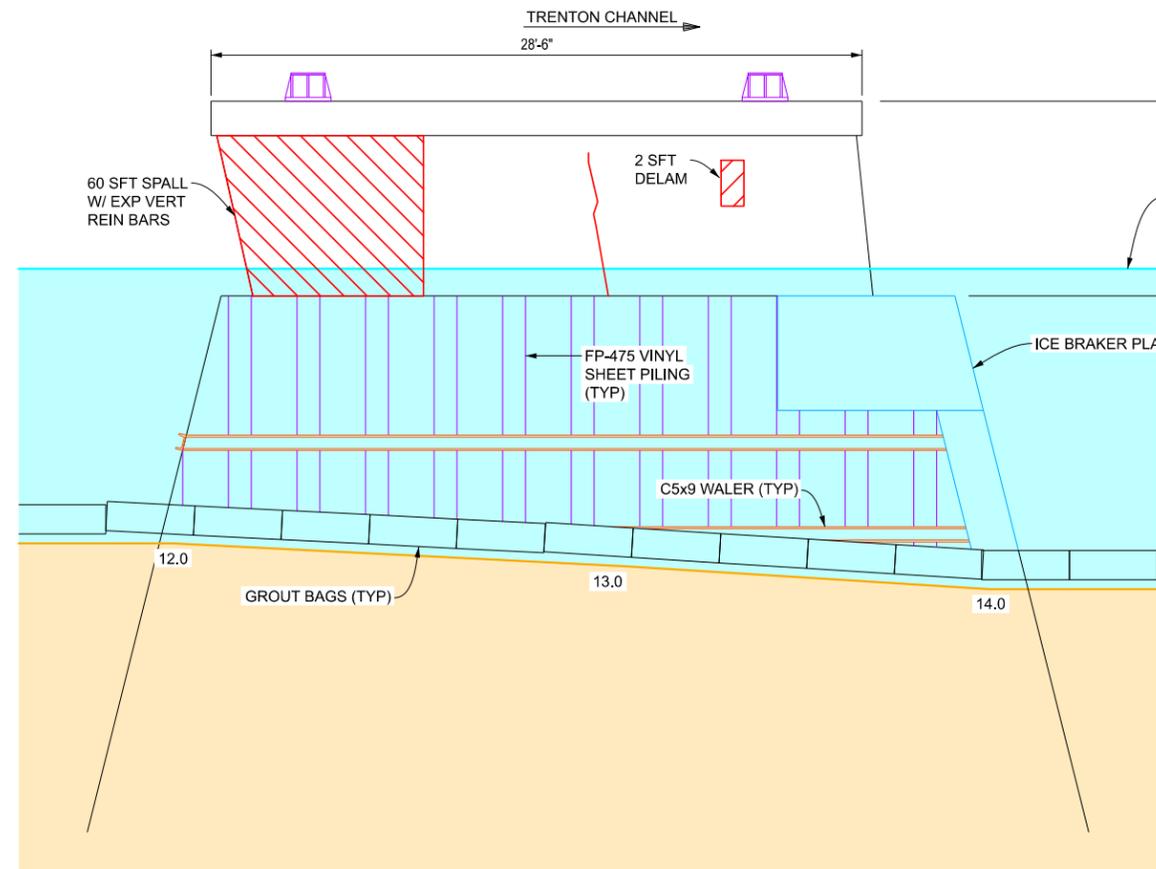


PIER 2W WEST ELEVATION

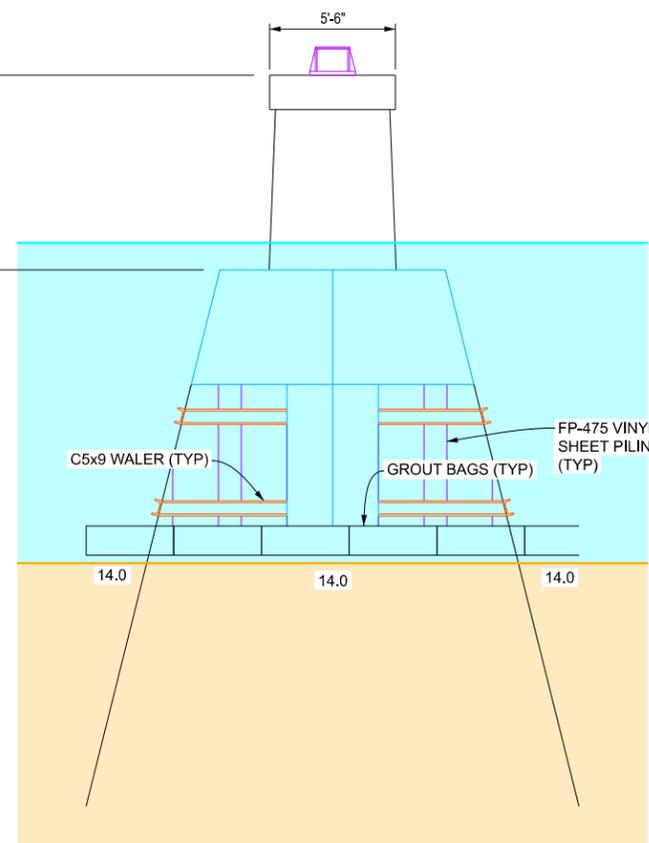


PIER 2W SOUTH END
(DOWNSTREAM)

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE



PIER 2W EAST ELEVATION



PIER 2W NORTH END
(UPSTREAM)

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

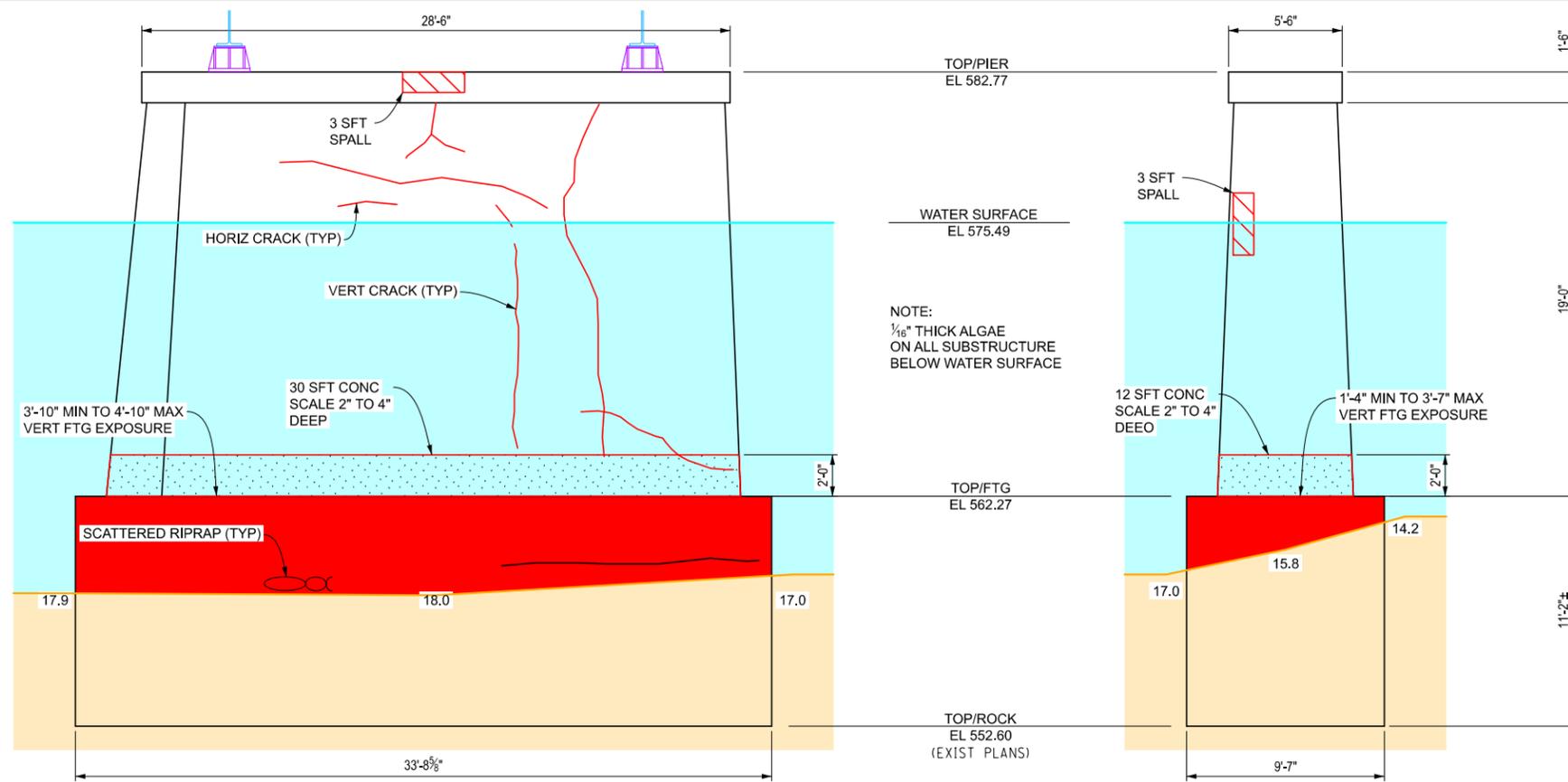
NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

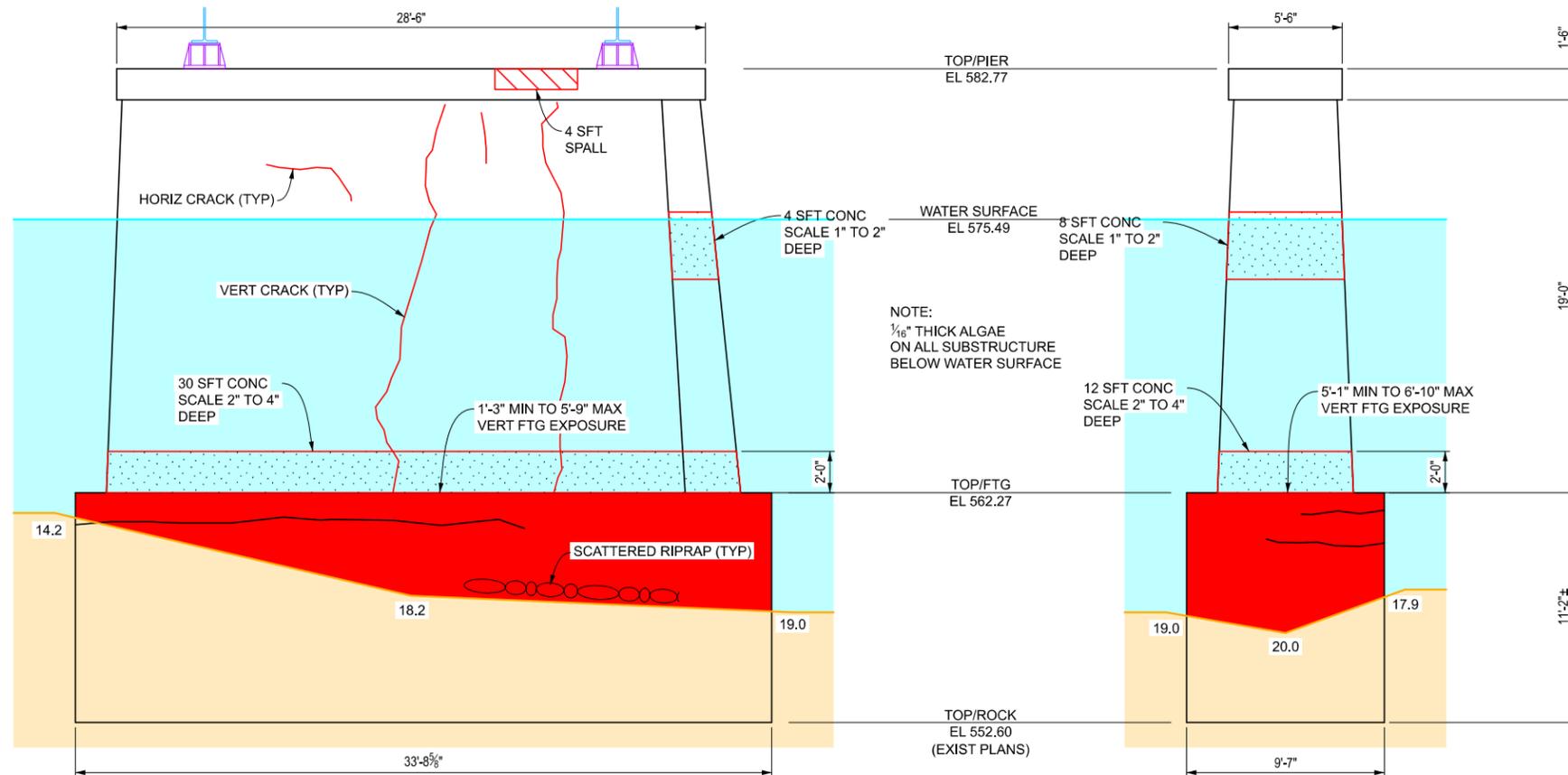
GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION	
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704
DRAWN BY: JLS	DATE: 11/09/21
CHECKED BY: CJC	FILE: 704 uwpi.dgn



PIER 3W WEST ELEVATION
TRENTON CHANNEL

PIER 3W SOUTH END
(DOWNSTREAM)



PIER 3W EAST ELEVATION
TRENTON CHANNEL

PIER 3W NORTH END
(UPSTREAM)

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

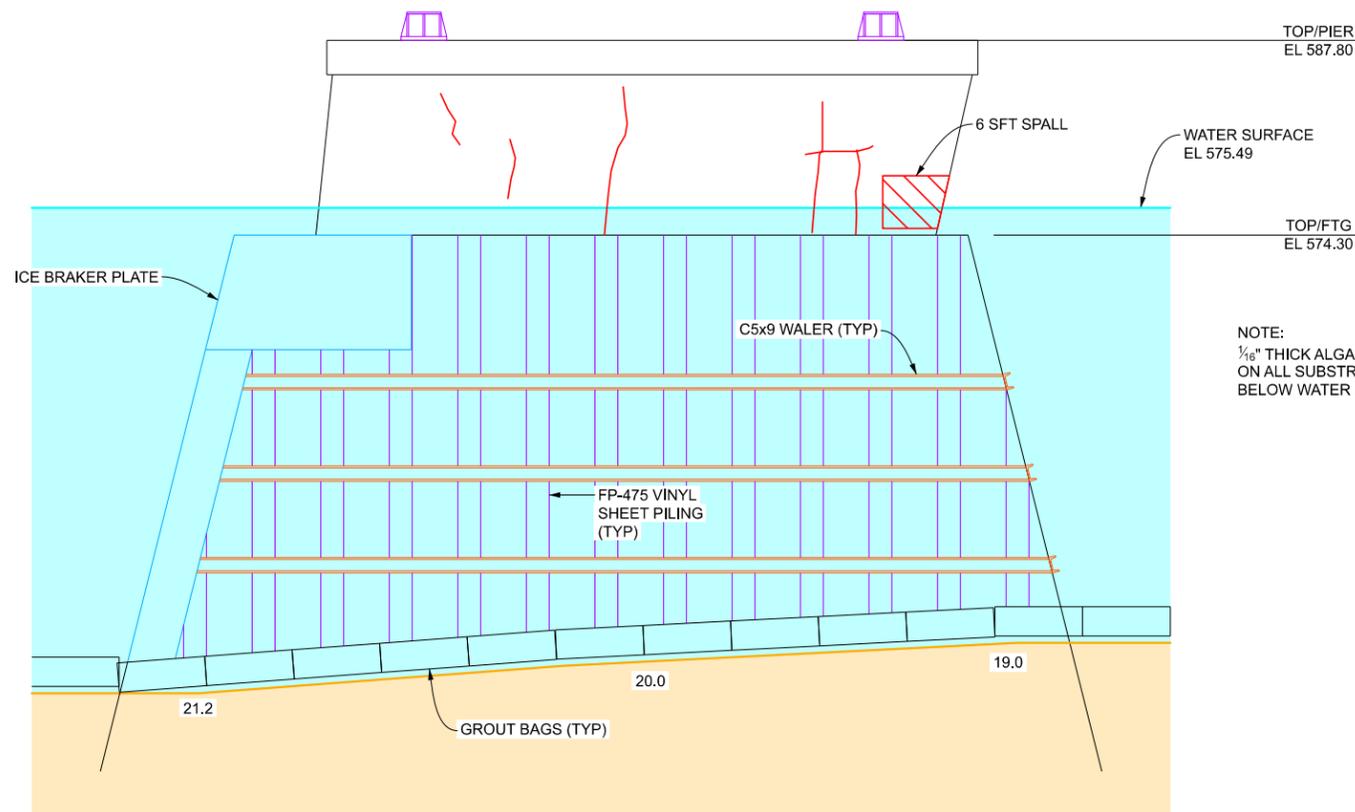
NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

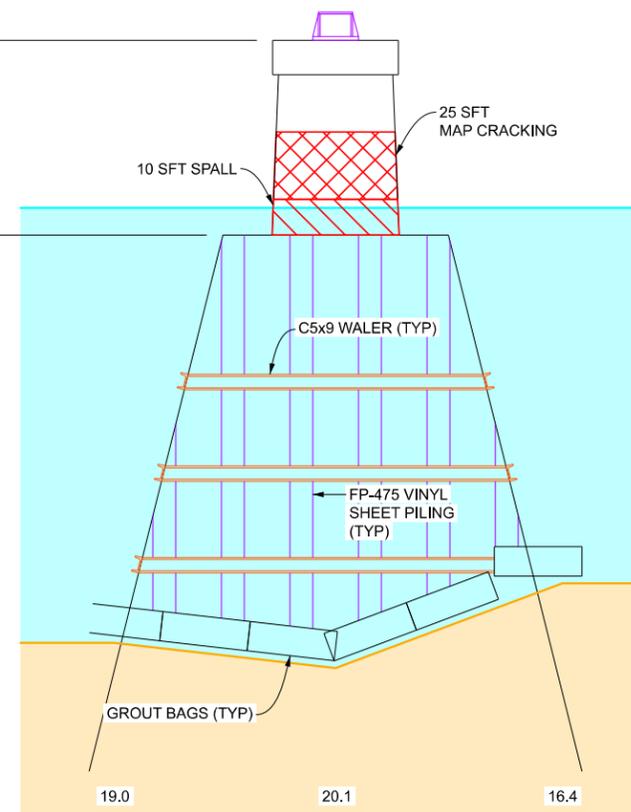
GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION		
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704	
DRAWN BY: JLS	DATE: 11/09/21	
CHECKED BY: CJC	FILE: 704 uwpi.dgn	



PIER 4W WEST ELEVATION

TRENTON CHANNEL →



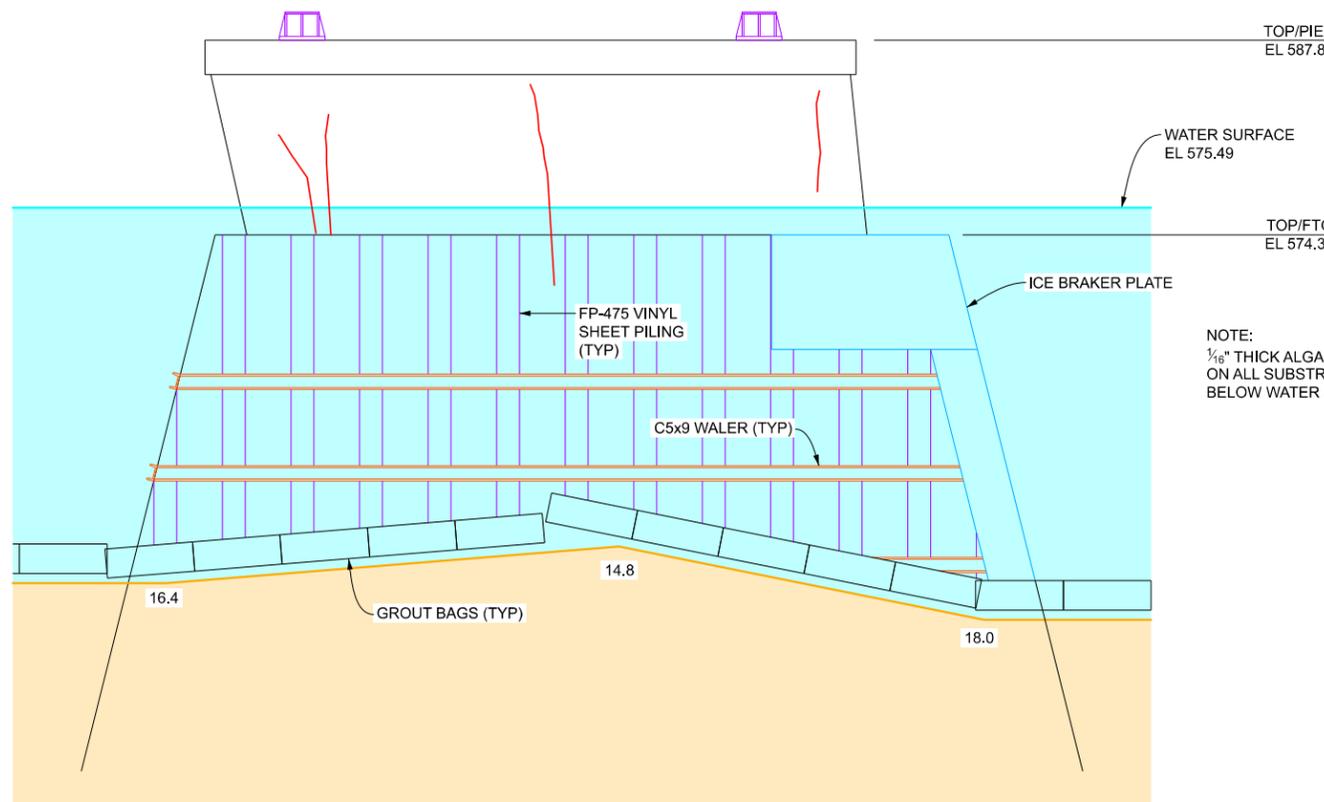
PIER 4W SOUTH END

(DOWNSTREAM)

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

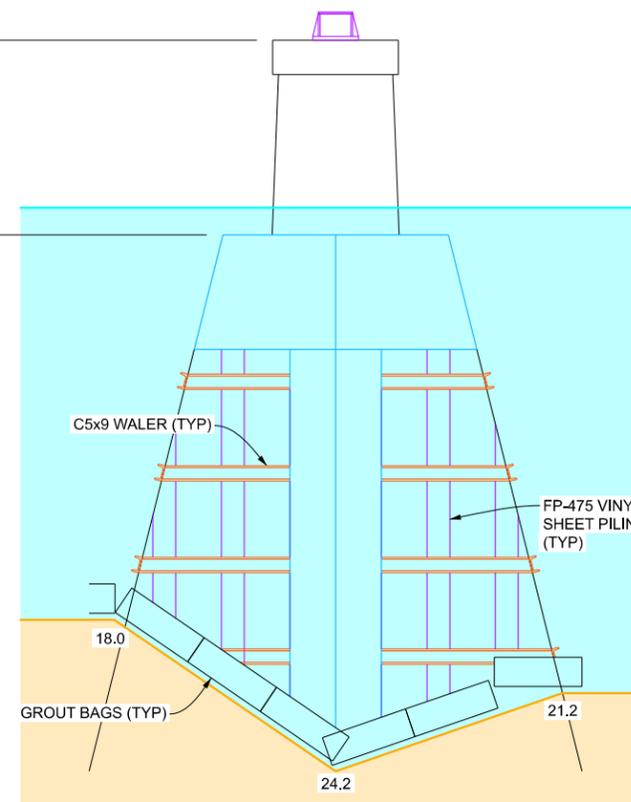
NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.



PIER 4W EAST ELEVATION

← TRENTON CHANNEL



PIER 4W NORTH END

(UPSTREAM)

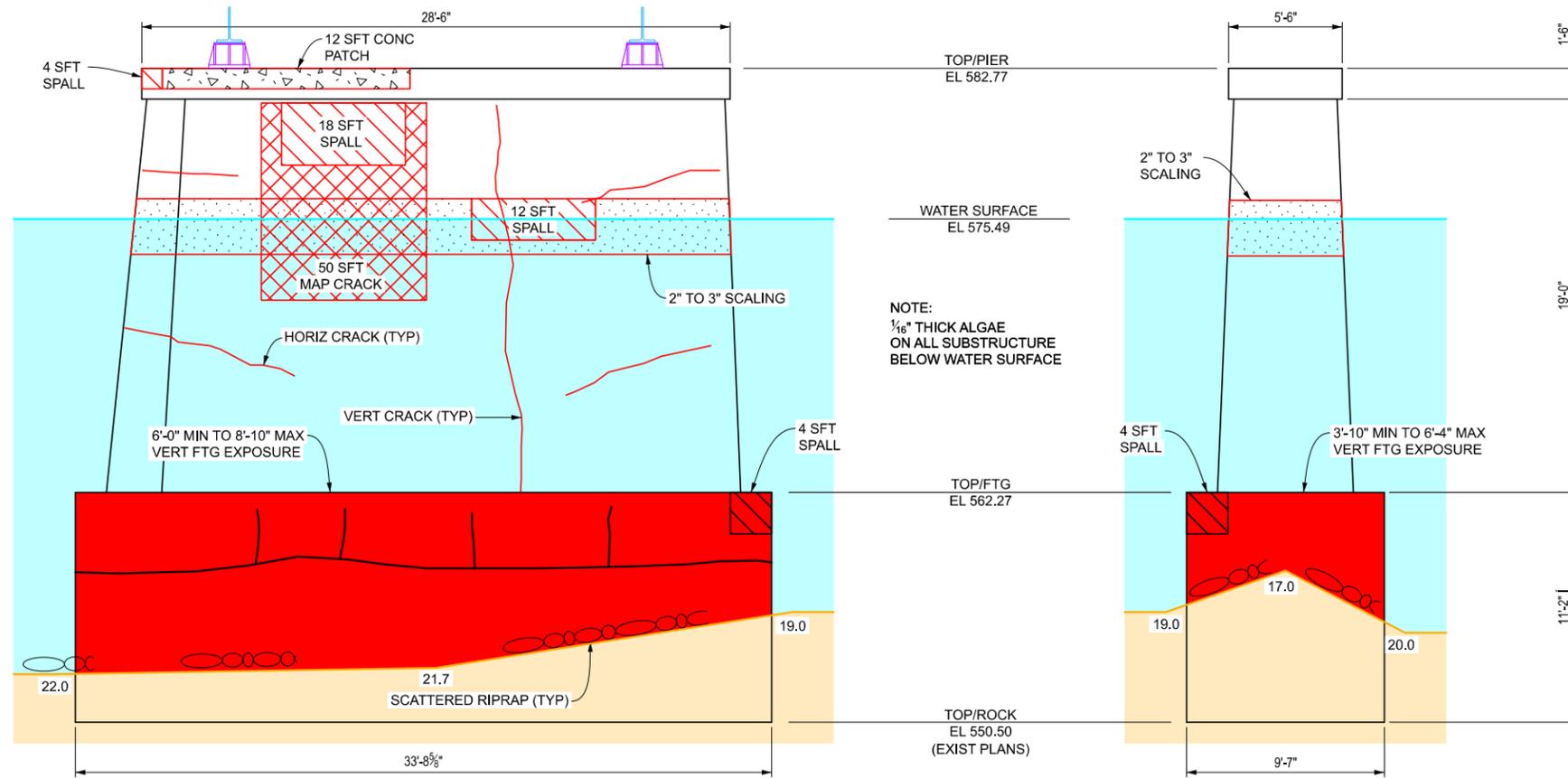
LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

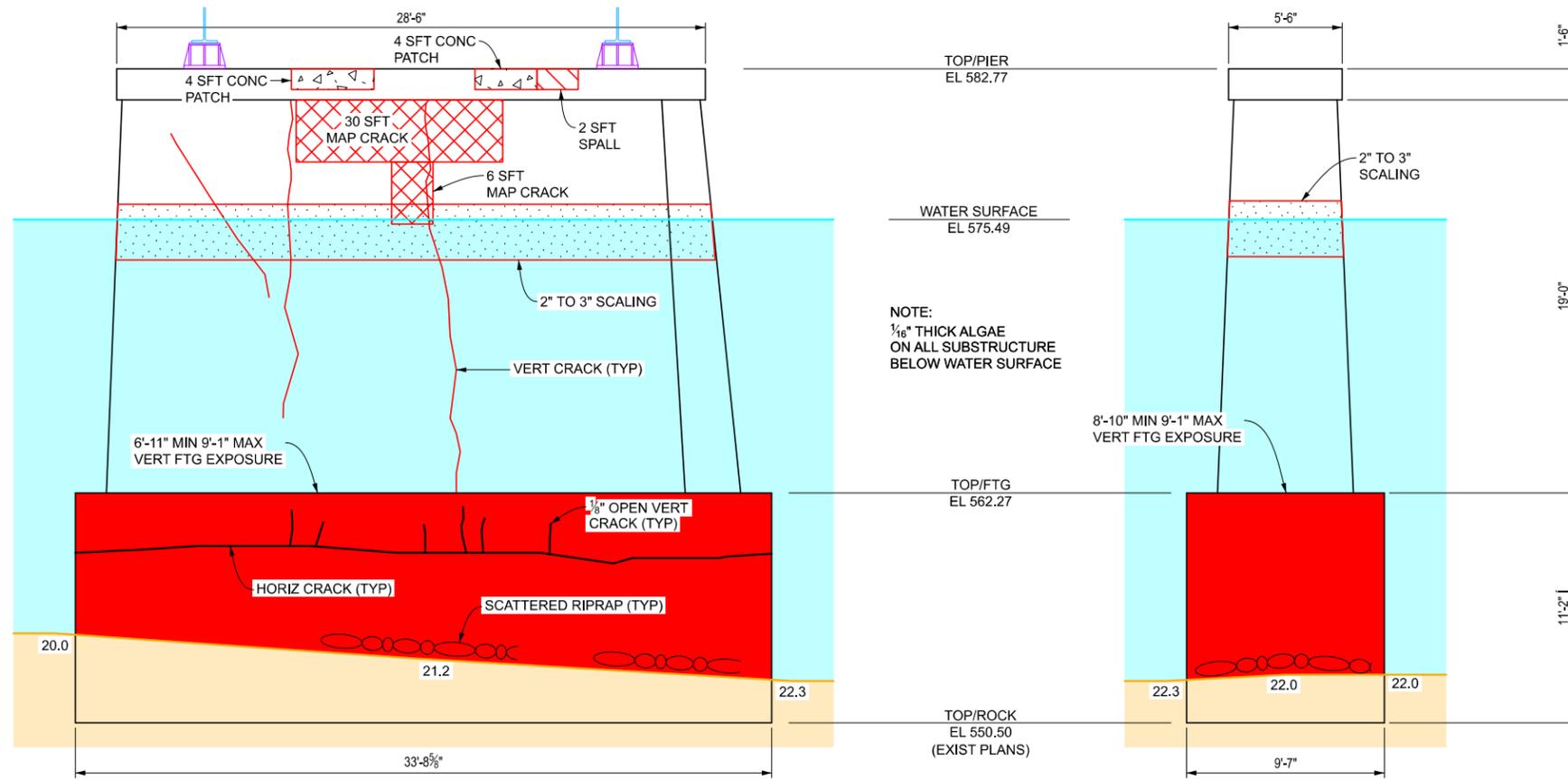
DRAWING: PIER SOUNDING ELEVATION	
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704
DRAWN BY: JLS	DATE: 11/09/21
CHECKED BY: CJC	FILE: 704 uwpi.dgn

GREAT LAKES ENGINEERING GROUP, LLC



PIER 5W WEST ELEVATION
TRENTON CHANNEL

PIER 5W SOUTH END
(DOWNSTREAM)



PIER 5W EAST ELEVATION
TRENTON CHANNEL

PIER 5W NORTH END
(UPSTREAM)

NOTE:
1/16" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

NOTE:
1/16" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

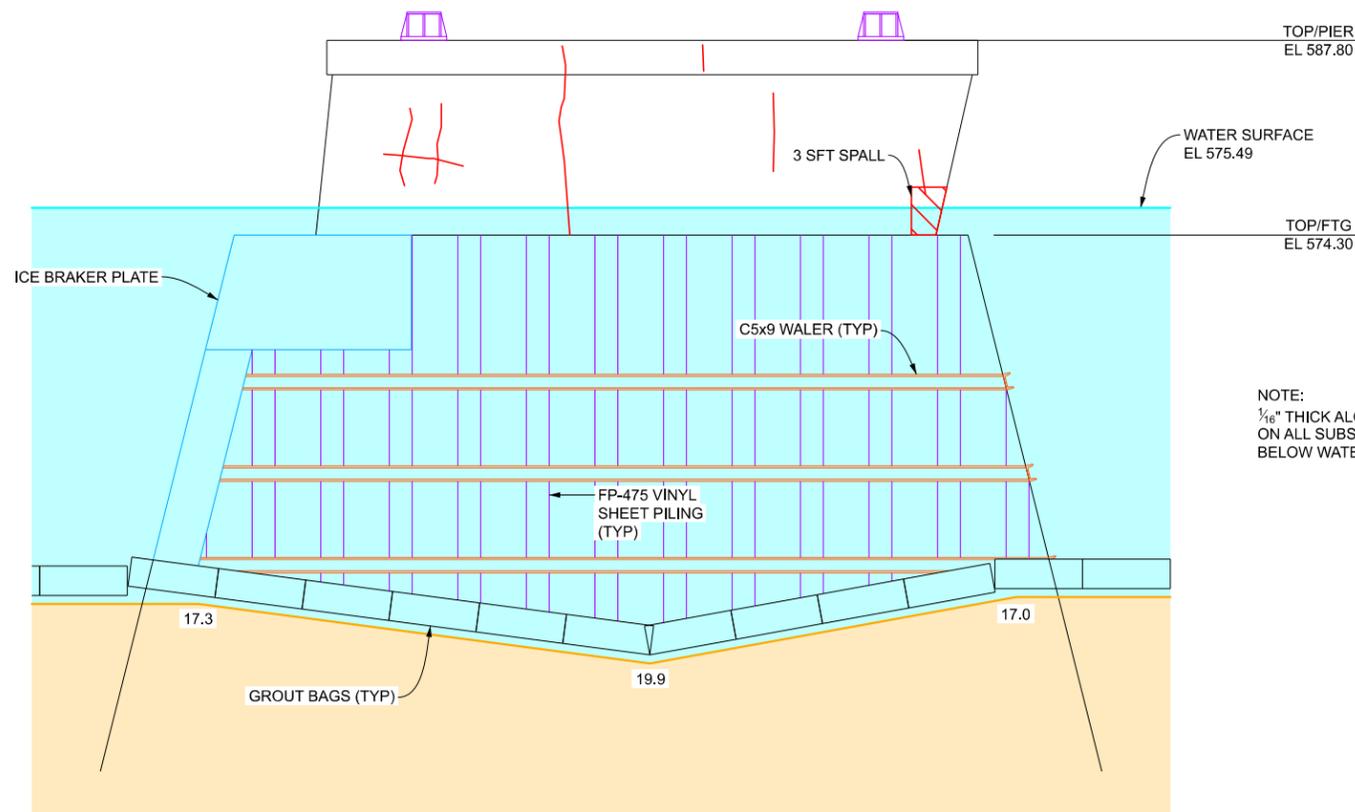
NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND	
-0.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

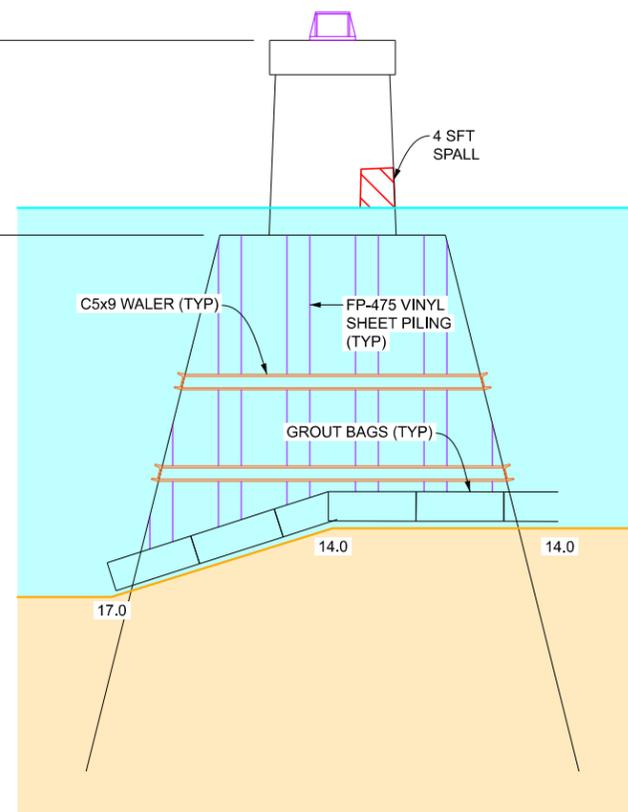
GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION		
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704	
DRAWN BY: JLS	DATE: 11/09/21	
CHECKED BY: CJC	FILE: 704 uwpi.dgn	



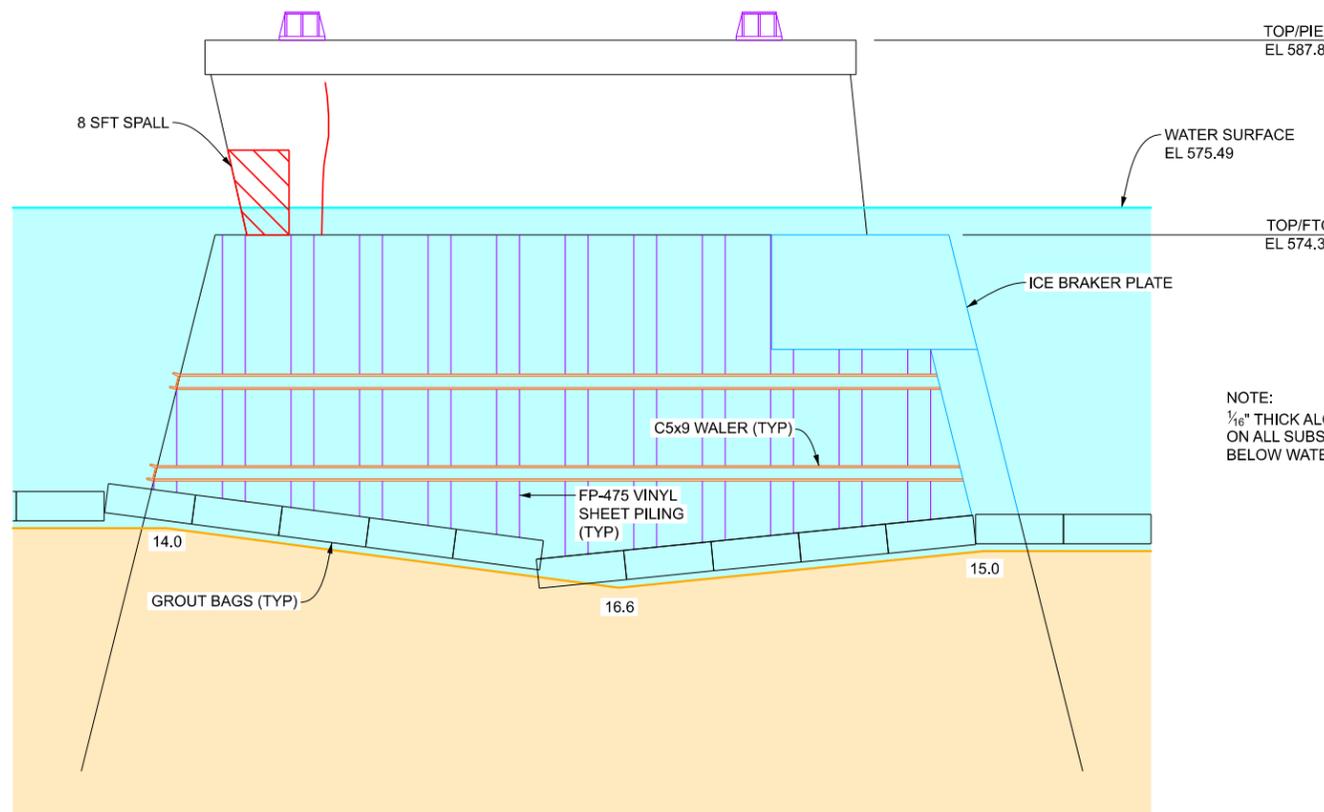
PIER 6W WEST ELEVATION

TRENTON CHANNEL →



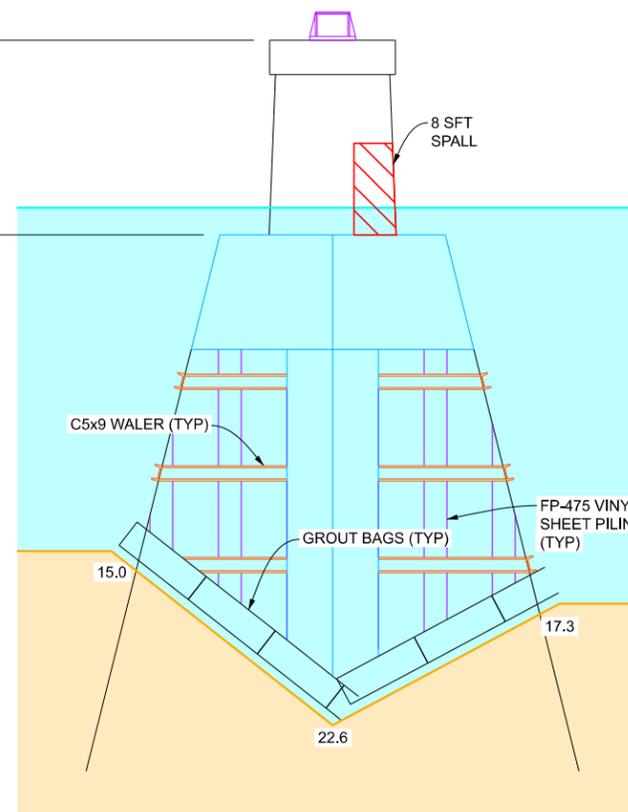
PIER 6W SOUTH END

(DOWNSTREAM)



PIER 6W EAST ELEVATION

← TRENTON CHANNEL



PIER 6W NORTH END

(UPSTREAM)

NOTE:
WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

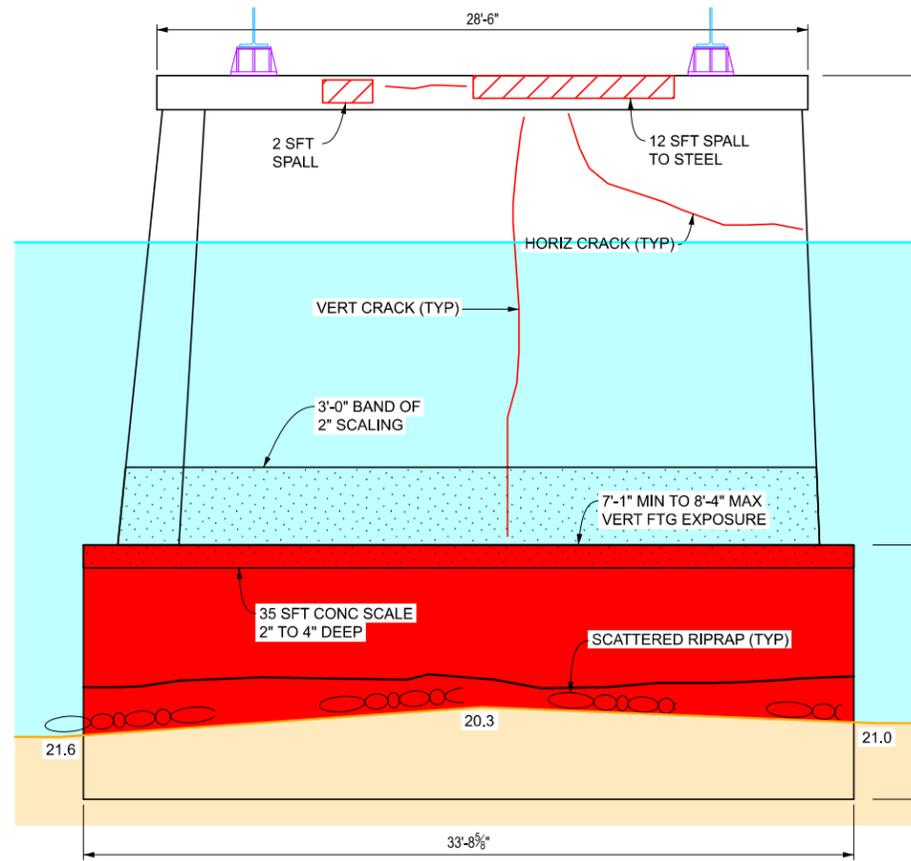
LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION	
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704
DRAWN BY: JLS	DATE: 11/09/21
CHECKED BY: CJC	FILE: 704 uwpi.dgn



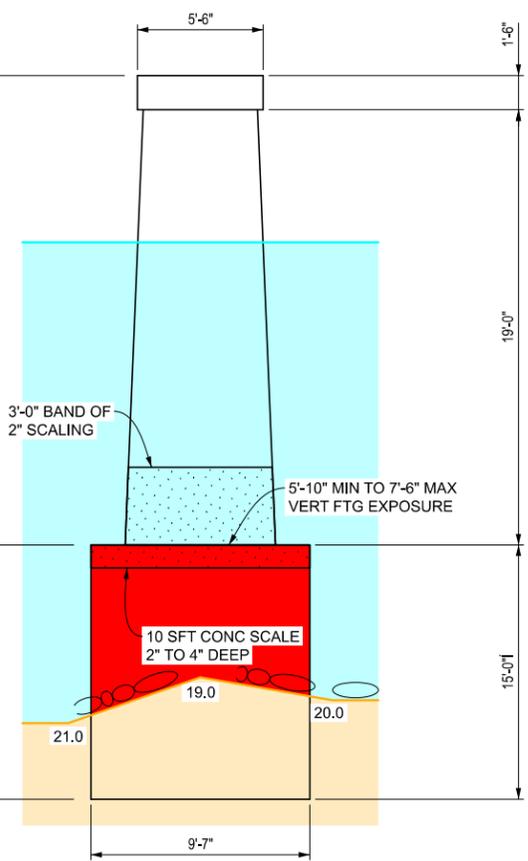


PIER 7W WEST ELEVATION
TRENTON CHANNEL

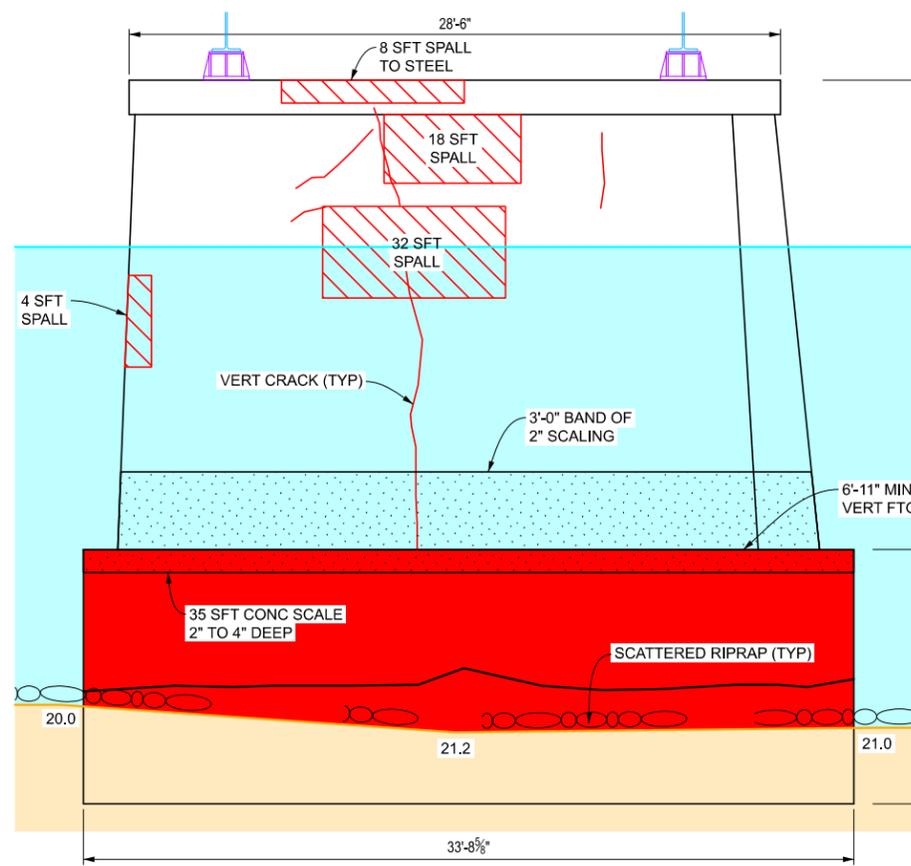
TOP/PIER
EL 582.77

WATER SURFACE
EL 575.49

NOTE:
1/16" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE



PIER 7W SOUTH END
(DOWNSTREAM)

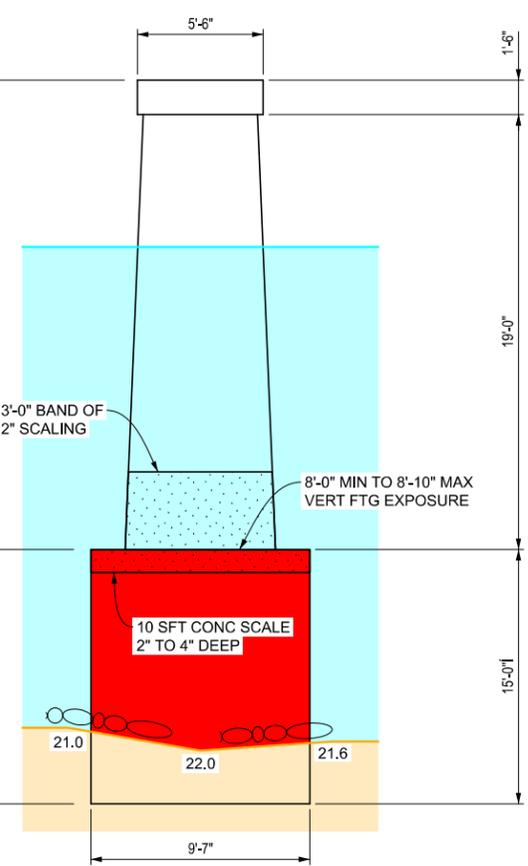


PIER 7W EAST ELEVATION
TRENTON CHANNEL

TOP/PIER
EL 582.77

WATER SURFACE
EL 575.49

NOTE:
1/16" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE



PIER 7W NORTH END
(UPSTREAM)

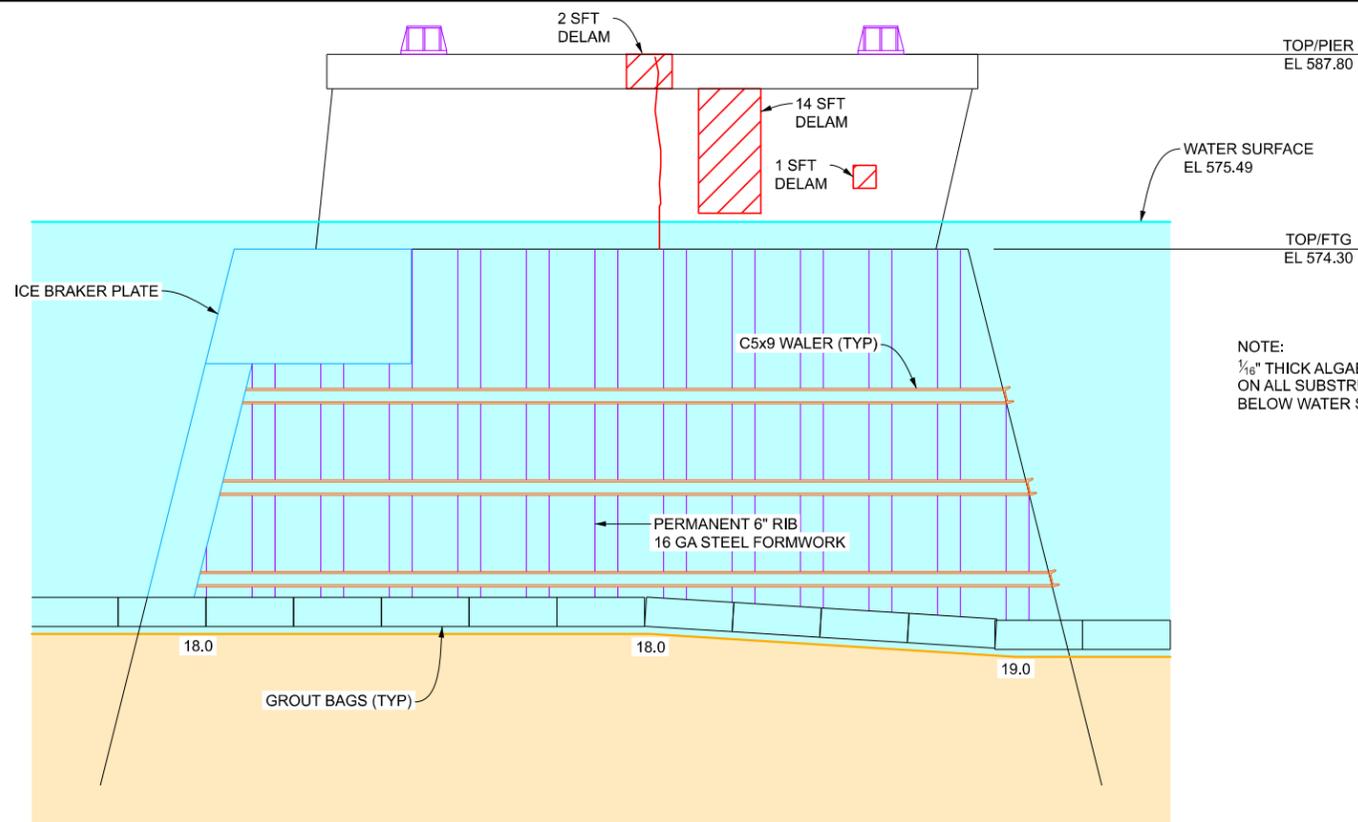
NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

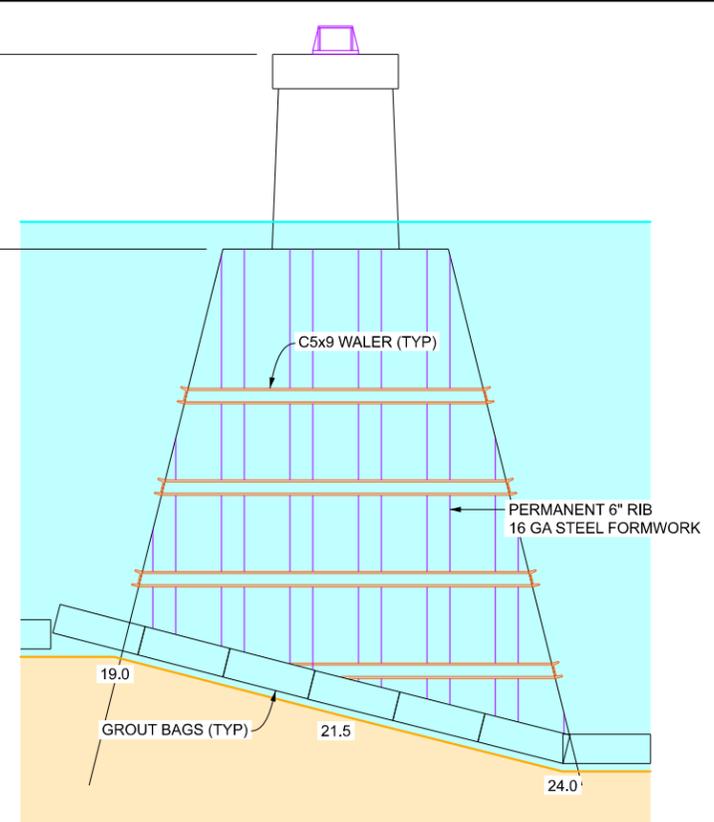
GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION		
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704	
DRAWN BY: JLS	DATE: 11/09/21	
CHECKED BY: CJC	FILE: 704 uwpi.dgn	



PIER 8W WEST ELEVATION

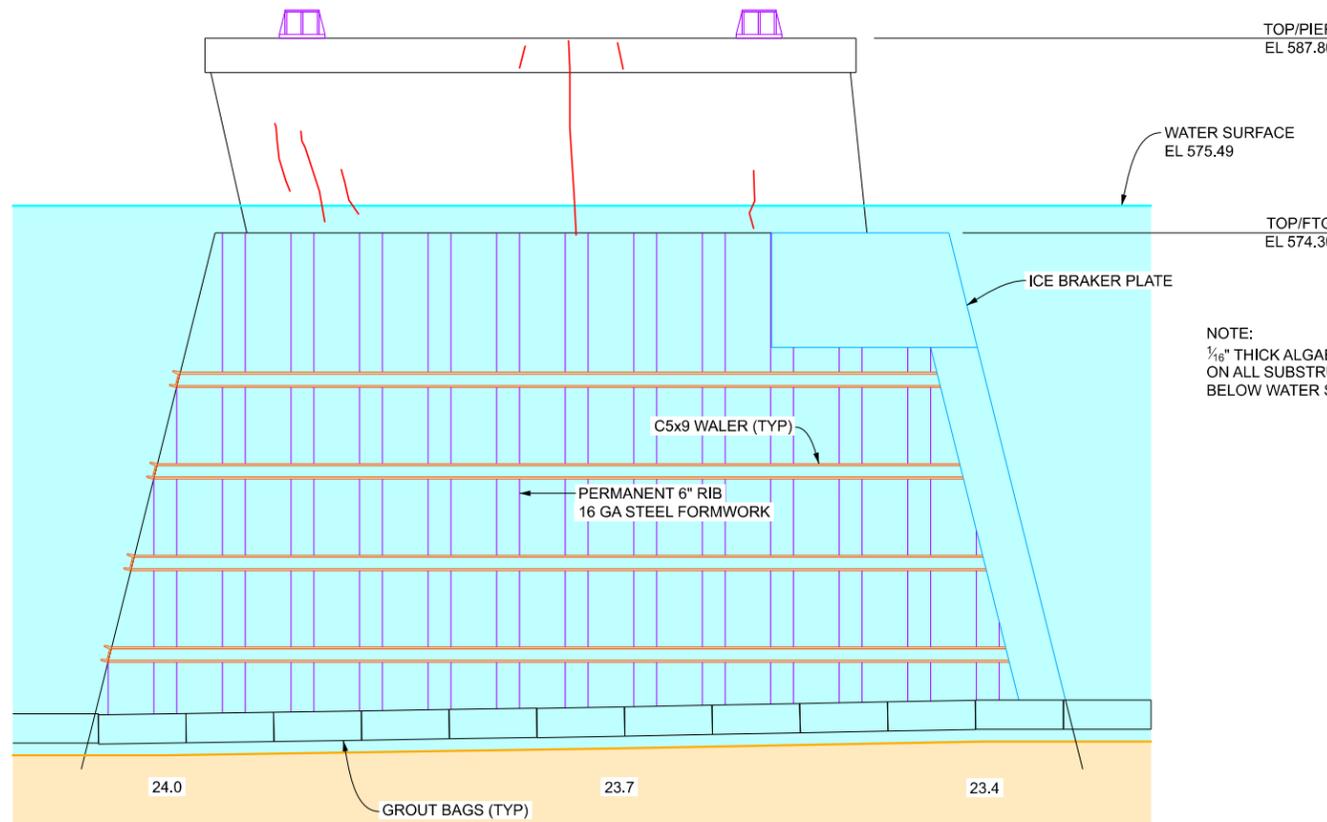
TRENTON CHANNEL →



PIER 8W SOUTH END

(DOWNSTREAM)

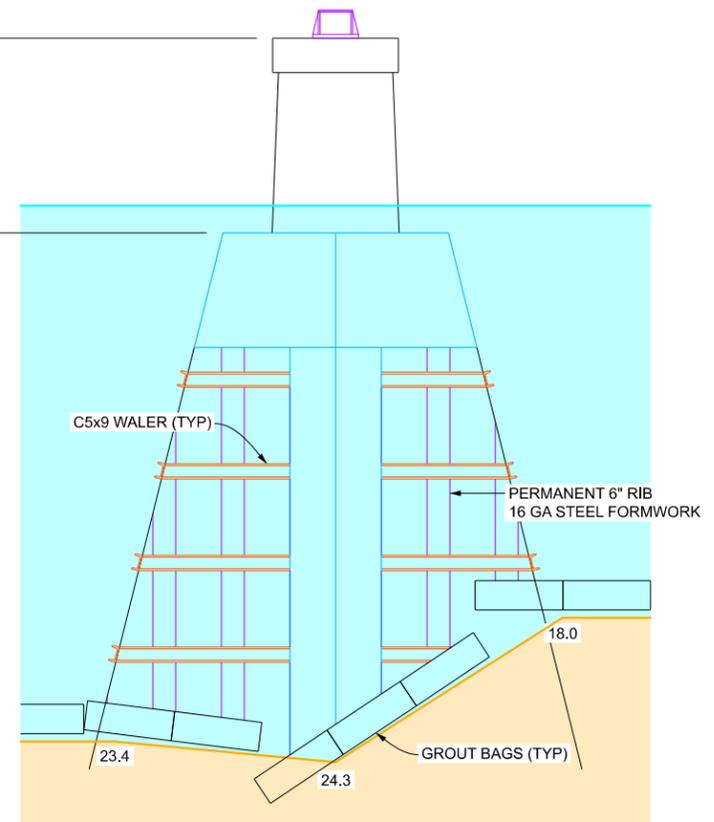
NOTE:
1/8" THICK ALGAE ON ALL SUBSTRUCTURE BELOW WATER SURFACE



PIER 8W EAST ELEVATION

← TRENTON CHANNEL

NOTE:
1/8" THICK ALGAE ON ALL SUBSTRUCTURE BELOW WATER SURFACE



PIER 8W NORTH END

(UPSTREAM)

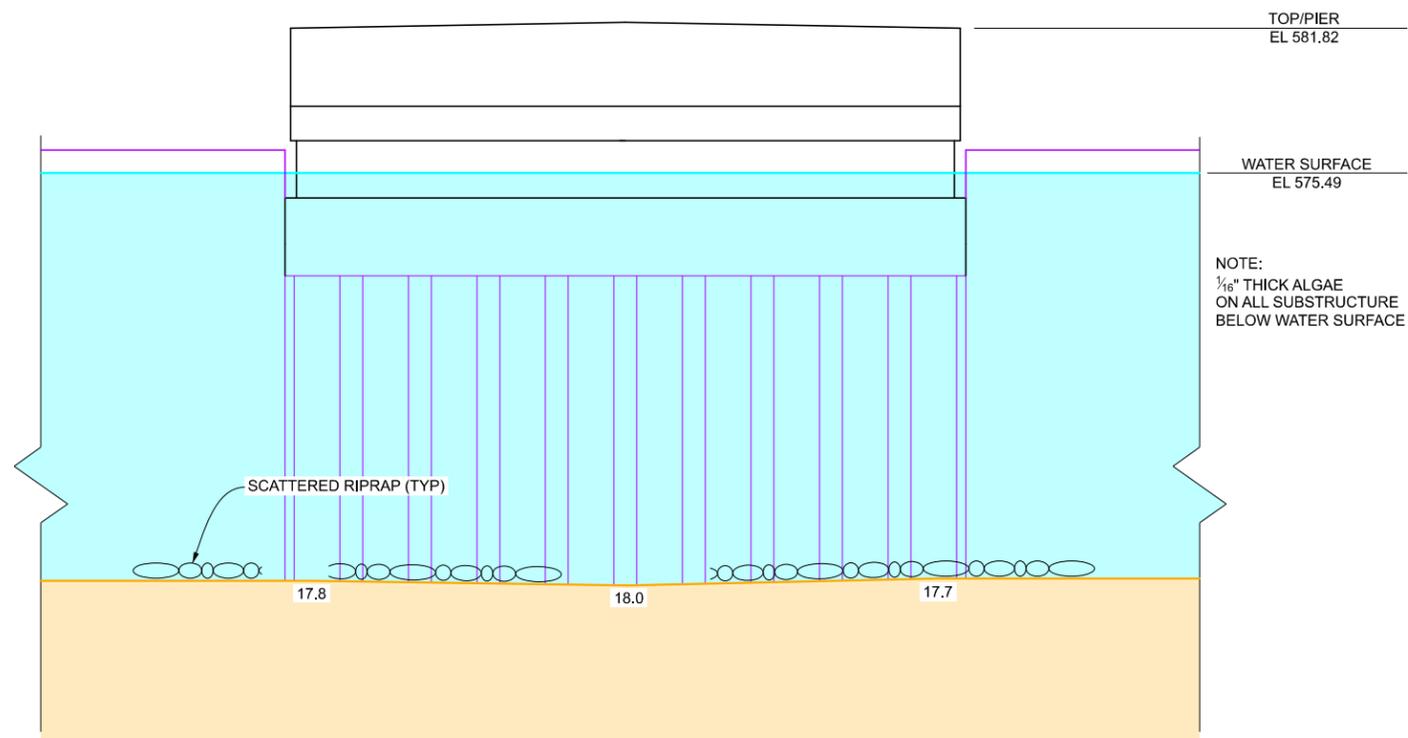
NOTE:
WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21. BENCH MARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

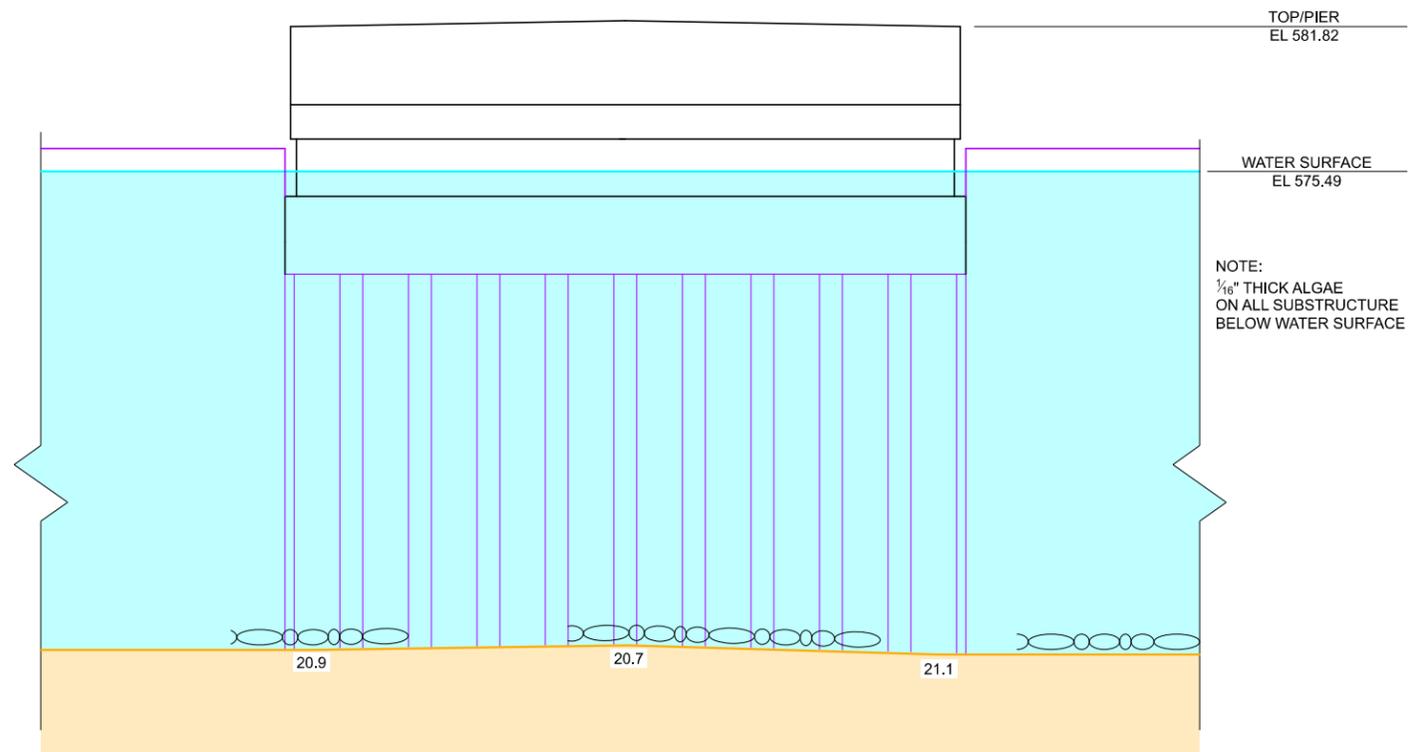
GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION		
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704	
DRAWN BY: JLS	DATE: 11/09/21	
CHECKED BY: CJC	FILE: 704 uwpi.dgn	



PIER 9W WEST ELEVATION

TRENTON CHANNEL →



PIER 9W EAST ELEVATION

← TRENTON CHANNEL

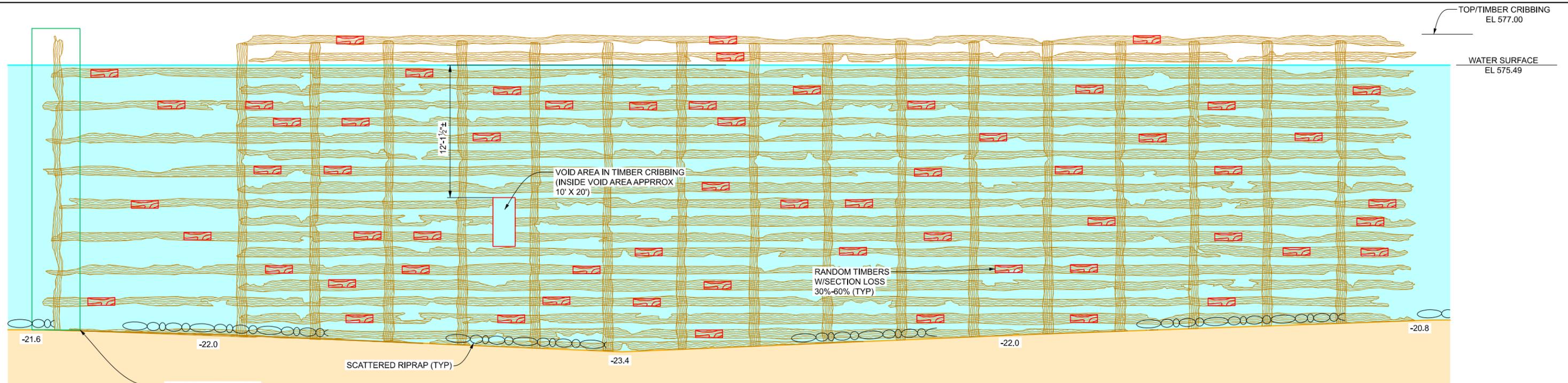
NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION
GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION	
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704
DRAWN BY: JLS	DATE: 11/09/21
CHECKED BY: CJC	FILE: 704 uwpi.dgn





PIEW 9W TIMBER CRIBBING NORTH SIDE WEST ELEVATION

TRENTON CHANNEL →



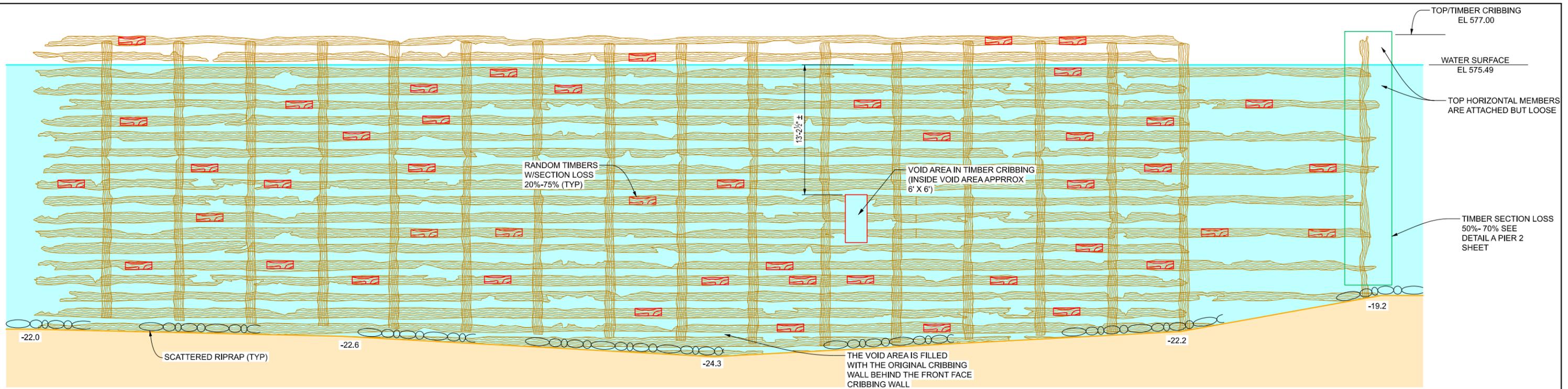
PIEW 9W TIMBER CRIBBING NORTH SIDE EAST ELEVATION

← TRENTON CHANNEL

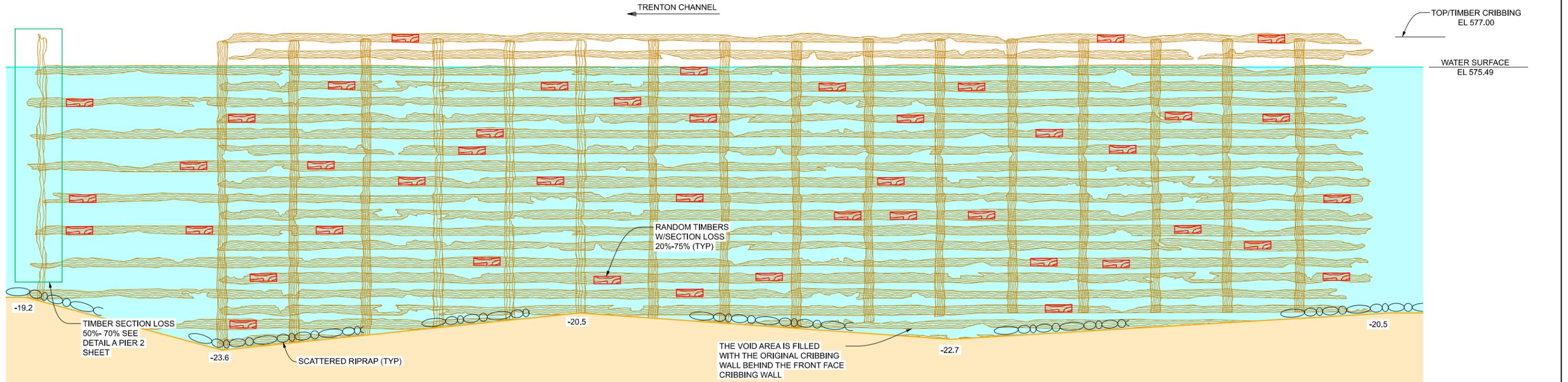
NOTE:

WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21. BENCH MARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

LEGEND		WAYNE COUNTY ROADS DIVISION		
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.	GROSSE ILE PARKWAY OVER TRENTON CHANNEL STRUCTURE NUMBER 12006 UNDERWATER BRIDGE INSPECTION GROSSE ILE, MI		
	RIPRAP			
	SHEET PILING	DRAWING: PIER SOUNDING ELEVATION		
	VERTICAL EXPOSURE OF FOOTING	STRUCTURE NO: 12006		GLEG JOB NO: 1020-2-704
	VERTICAL EXPOSURE OF TREMIE	DRAWN BY: JLS		DATE: 11/09/21
	VERTICAL UNDERMINING BELOW FOUNDATION	CHECKED BY: CJC	FILE: 704 uwpi.dgn	
	TIMBER/DEBRIS PILE			



PIEW 9W TIMBER CRIBBING SOUTH SIDE WEST ELEVATION

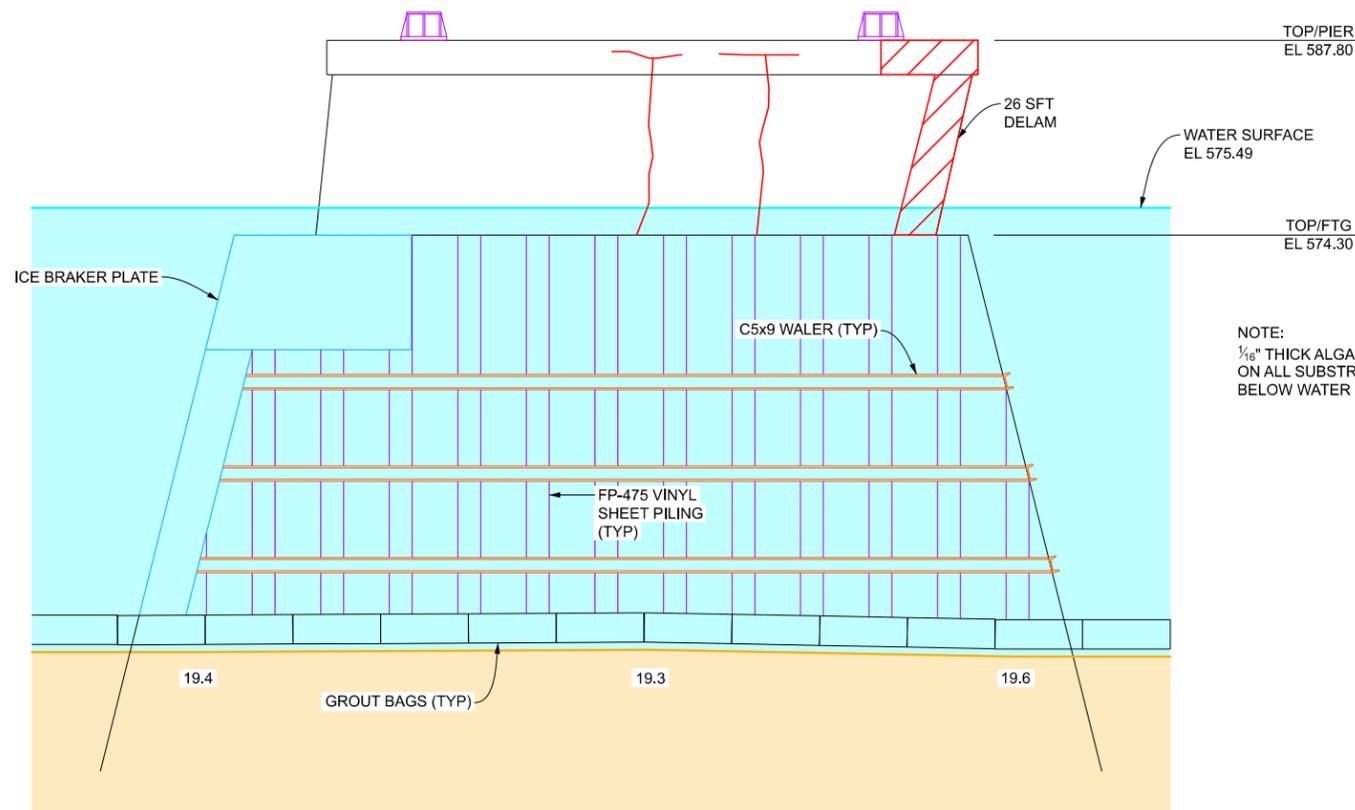


PIEW 9W TIMBER CRIBBING SOUTH SIDE EAST ELEVATION

NOTE:

WATER SURFACE ELEVATION AT THE TIME OF DIVE INSPECTION WAS 575.49 ON 11/09/21. BENCH MARK ELEVATION WAS 583.94 TAKEN AT LOW STEEL SPAN 1W.

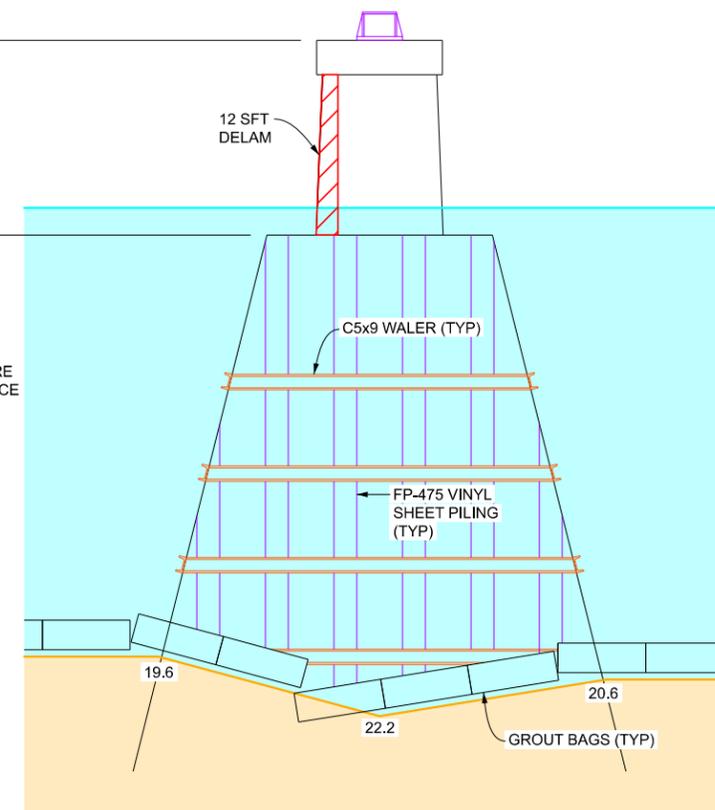
LEGEND		WAYNE COUNTY ROADS DIVISION		
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.	GROSSE ILE PARKWAY OVER TRENTON CHANNEL STRUCTURE NUMBER 12006 UNDERWATER BRIDGE INSPECTION GROSSE ILE, MI		
	RIPRAP			
	SHEET PILING	DRAWING: PIER SOUNDING ELEVATION		
	VERTICAL EXPOSURE OF FOOTING	STRUCTURE NO: 12006		GLEG JOB NO: 1020-2-704
	VERTICAL EXPOSURE OF TREMIE	DRAWN BY: JLS		DATE: 11/09/21
	VERTICAL UNDERMINING BELOW FOUNDATION	CHECKED BY: CJC	FILE: 704 uwpi.dgn	
	TIMBER/DEBRIS PILE			



PIER 10W WEST ELEVATION

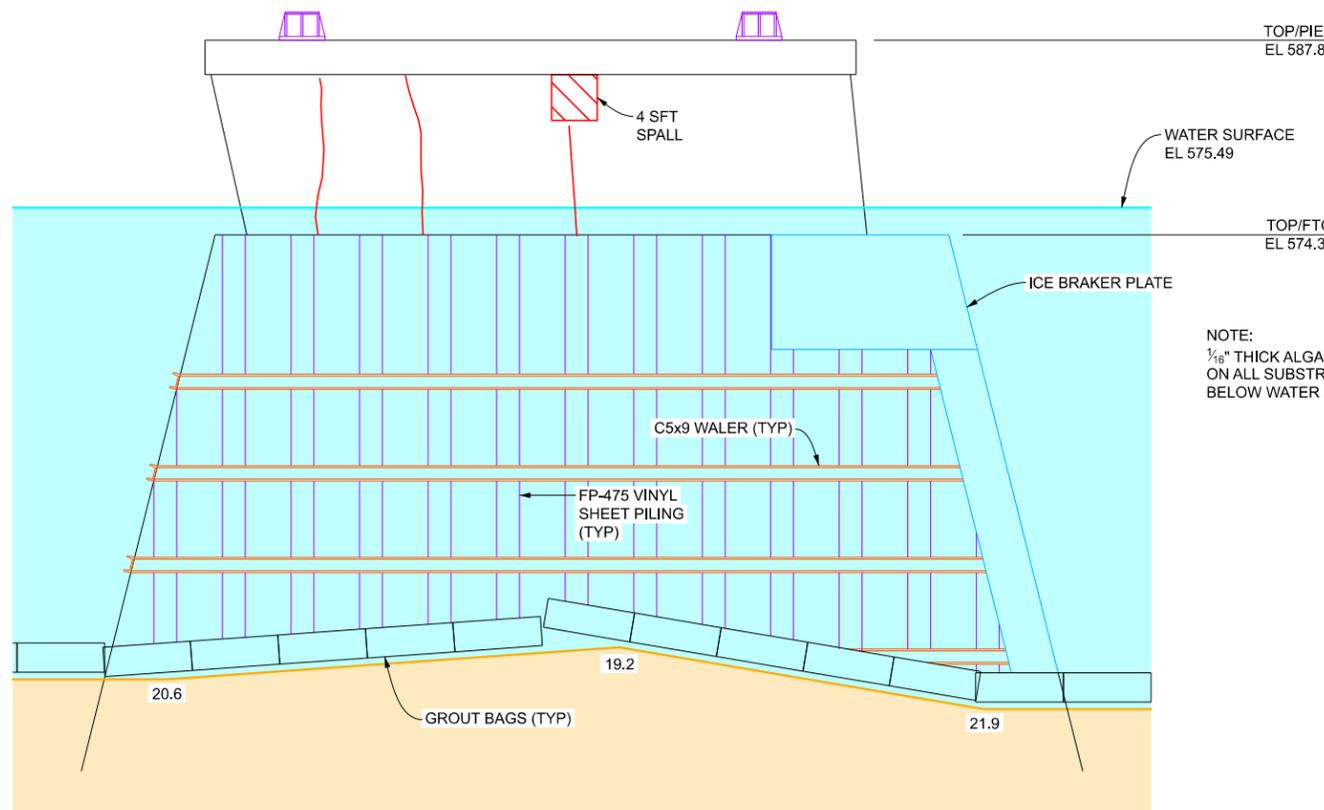
TRENTON CHANNEL →

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE



PIER 10W SOUTH END

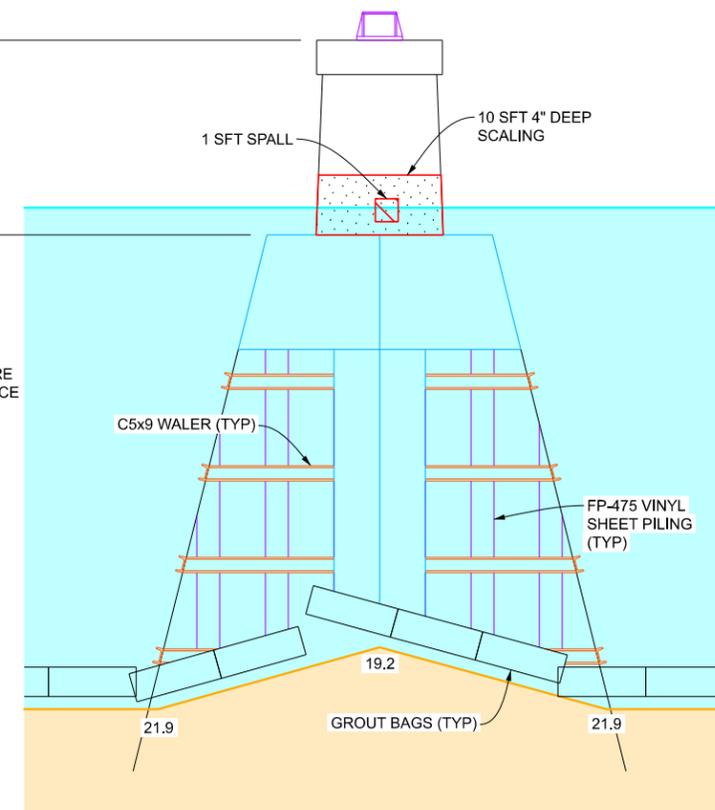
(DOWNSTREAM)



PIER 10W EAST ELEVATION

← TRENTON CHANNEL

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE



PIER 10W NORTH END

(UPSTREAM)

NOTE:

WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND

- 00.0 SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
- RIPRAP
- SHEET PILING
- VERTICAL EXPOSURE OF FOOTING
- VERTICAL EXPOSURE OF TREMIE
- VERTICAL UNDERMINING BELOW FOUNDATION
- TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION

STRUCTURE NO: 12006

GLEG JOB NO: 1020-2-704

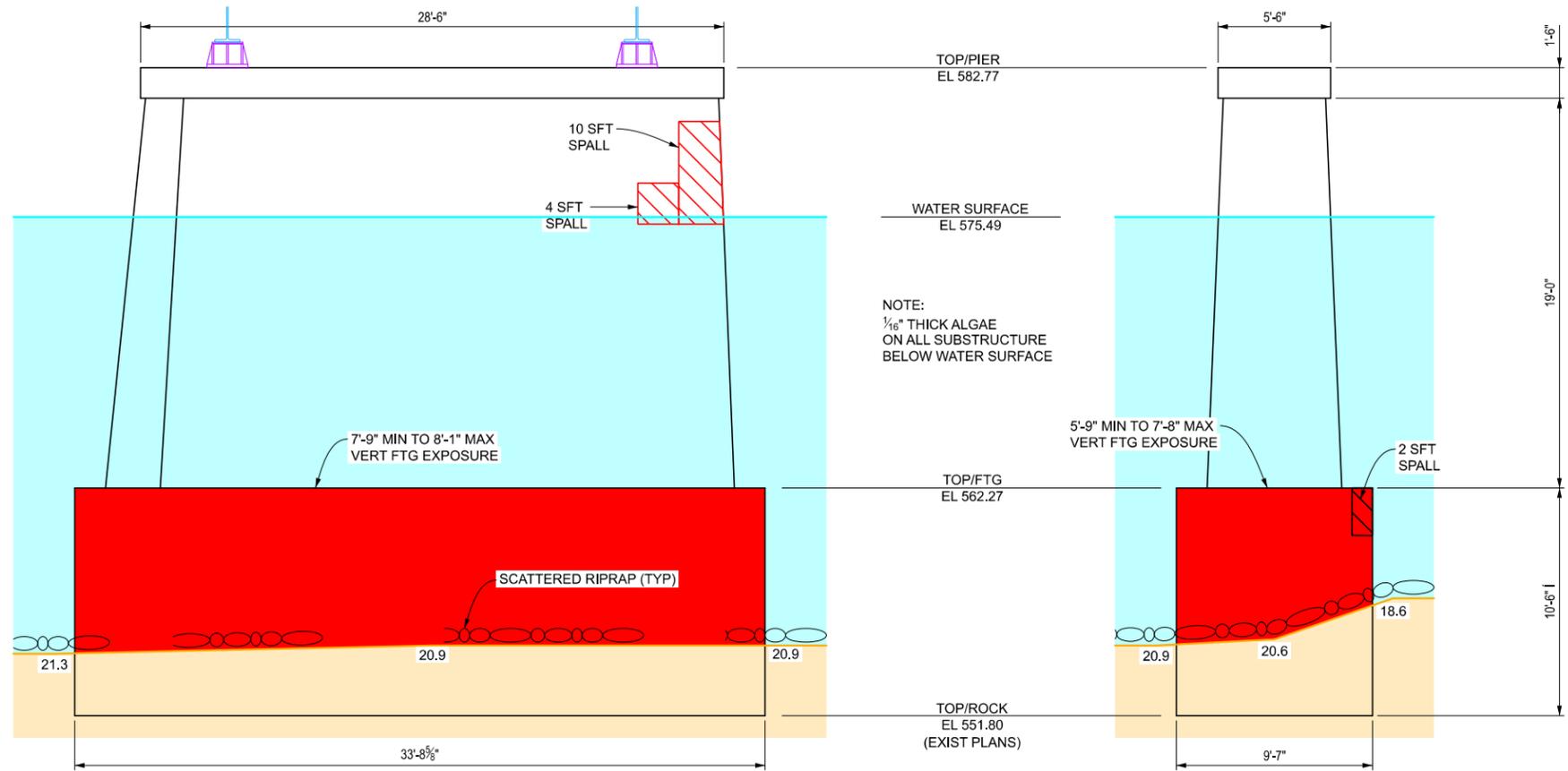
DRAWN BY: JLS

DATE: 11/09/21

CHECKED BY: CJC

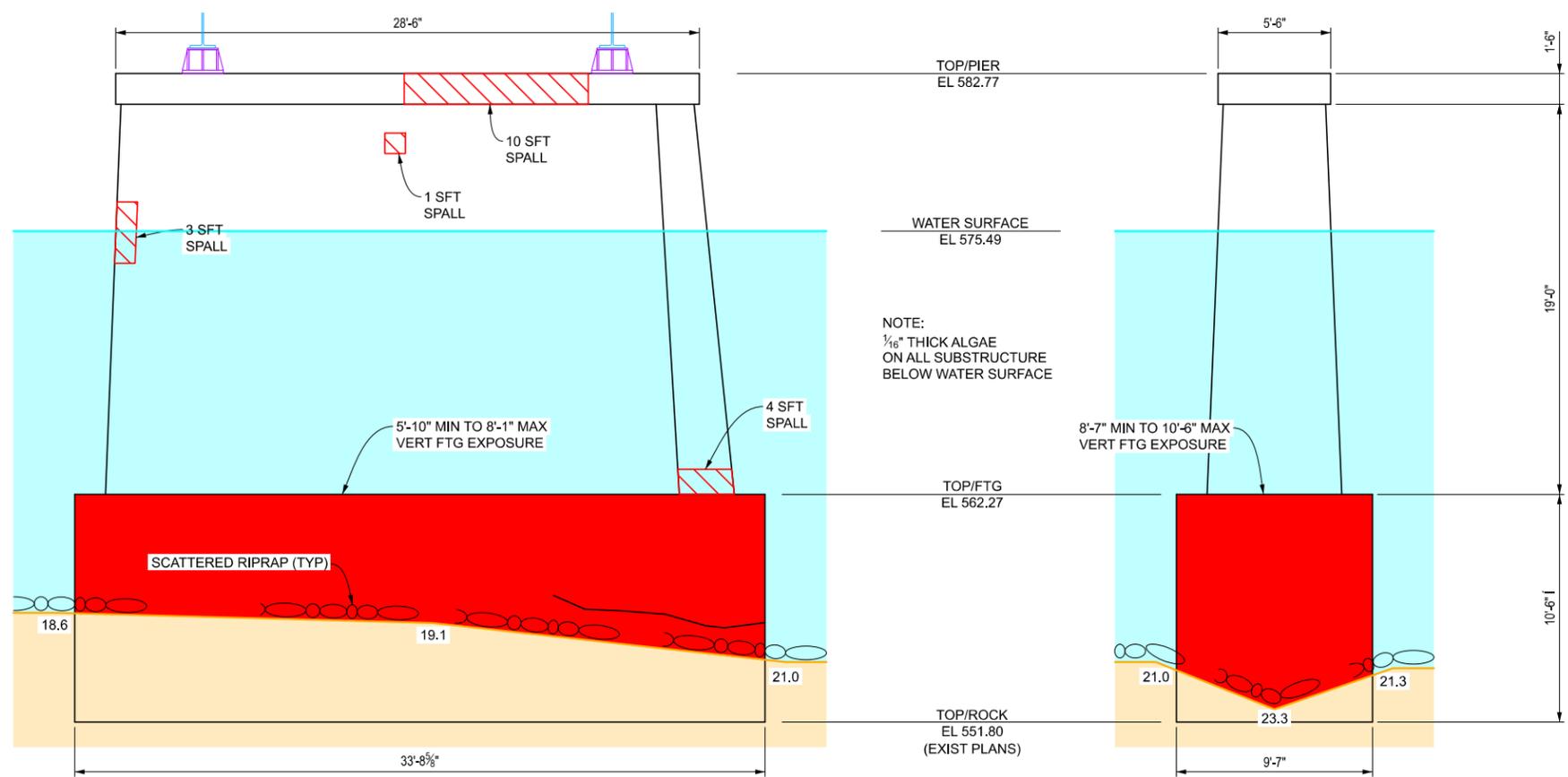
FILE: 704 uwpi.dgn





PIER 11W WEST ELEVATION
TRENTON CHANNEL

PIER 11W SOUTH END
(DOWNSTREAM)



PIER 11W EAST ELEVATION
TRENTON CHANNEL

PIER 11W NORTH END
(UPSTREAM)

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

NOTE:
1/8" THICK ALGAE
ON ALL SUBSTRUCTURE
BELOW WATER SURFACE

NOTE:
WATER SURFACE ELEVATION AT THE TIME OF
DIVE INSPECTION WAS 575.49 ON 11/09/21.
BENCH MARK ELEVATION WAS 583.94 TAKEN AT
LOW STEEL SPAN 1W.

LEGEND	
-00.0	SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.
	RIPRAP
	SHEET PILING
	VERTICAL EXPOSURE OF FOOTING
	VERTICAL EXPOSURE OF TREMIE
	VERTICAL UNDERMINING BELOW FOUNDATION
	TIMBER/DEBRIS PILE

WAYNE COUNTY ROADS DIVISION

GROSSE ILE PARKWAY OVER TRENTON CHANNEL
STRUCTURE NUMBER 12006
UNDERWATER BRIDGE INSPECTION
GROSSE ILE, MI

DRAWING: PIER SOUNDING ELEVATION		
STRUCTURE NO: 12006	GLEG JOB NO: 1020-2-704	
DRAWN BY: JLS	DATE: 11/09/21	
CHECKED BY: CJC	FILE: 704 uwpi.dgn	

BRIDGE CROSS-SECTIONS

DATE: 11/9/2021
 STRUCTURE NO.: 12006
 CONTROL SECTION: N/A
 ROUTE: Grosse Ile Parkway
 WATERCOURSE: Trenton Channel

CURRENT CROSS SECTION

UPSTREAM FACE

BENCHMARK ELEVATION: 583.94
 DESCRIPTION OF BENCHMARK: Low steel, span 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 575.49

PREVIOUS CROSS SECTION

UPSTREAM FACE

BENCHMARK ELEVATION: 583.94
 DESCRIPTION OF BENCHMARK: Low steel, span 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 575.1

PREVIOUS CROSS SECTION

UPSTREAM FACE

BENCHMARK ELEVATION: 583.94
 DESCRIPTION OF BENCHMARK: Low steel, span 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 576.4

PREVIOUS CROSS SECTION

UPSTREAM FACE

BENCHMARK ELEVATION: 582.77
 DESCRIPTION OF BENCHMARK: Top of Pier 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 574.8

DATE: 11/9/2021
 REFERENCE ELEVATION: 575.49

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	577.5	East abutment
2.0	0.0	575.5	East edge of water
25.0	1.9	573.6	Span 12W, 1/4 pt
50.0	17.2	558.3	Span 12W, 1/2 pt
74.9	19.1	556.4	Span 12W, 3/4 pt
99.9	22.9	552.6	Pier 11W
125.1	19.8	555.7	Span 11W, 1/4 pt
150.3	20.5	555.0	Span 11W, 1/2 pt
175.4	21.8	553.7	Span 11W, 3/4 pt
200.6	24.8	550.7	Pier 10W
239.0	21.7	553.8	Span 10W, 1/4 pt
277.4	20.2	555.3	Span 10W, 1/2 pt
315.9	21.7	553.8	Span 10W, 3/4 pt
354.3	20.7	554.8	Pier 9W, east side
389.6	20.8	554.7	Pier 9W, west side
428.0	26.2	549.3	Span 9W, 1/4 pt
466.5	27.6	547.9	Span 9W, 1/2 pt
504.9	27.2	548.3	Span 9W, 3/4 pt
543.3	23.2	552.3	Pier 8W
568.5	20.3	555.2	Span 8W, 1/4 pt
593.6	18.7	556.8	Span 8W, 1/2 pt
618.8	21.4	554.1	Span 8W, 3/4 pt
644.0	24.0	551.5	Pier 7W
669.0	18.2	557.3	Span 7W, 1/4 pt
694.1	20.2	555.3	Span 7W, 1/2 pt
719.2	19.8	555.7	Span 7W, 3/4 pt
744.2	22.2	553.3	Pier 6W
769.3	20.3	555.2	Span 6W, 1/4 pt
794.3	20.8	554.7	Span 6W, 1/2 pt
819.4	20.3	555.2	Span 6W, 3/4 pt
844.5	23.5	552.0	Pier 5W
869.6	21.3	554.2	Span 5W, 1/4 pt
894.6	20.3	555.2	Span 5W, 1/2 pt
919.7	20.3	555.2	Span 5W, 3/4 pt
944.8	23.8	551.7	Pier 4W
969.8	22.3	553.2	Span 4W, 1/4 pt
994.9	19.7	555.8	Span 4W, 1/2 pt
1019.9	18.3	557.2	Span 4W, 3/4 pt
1045.0	19.6	555.9	Pier 3W
1070.1	15.9	559.6	Span 3W, 1/4 pt
1095.1	19.2	556.3	Span 3W, 1/2 pt
1120.2	18.7	556.8	Span 3W, 3/4 pt
1145.3	20.6	554.9	Pier 2W
1170.3	21.3	554.2	Span 2W, 1/4 pt
1195.4	20.7	554.8	Span 2W, 1/2 pt
1220.4	19.2	556.3	Span 2W, 3/4 pt
1245.5	16.8	558.7	Pier 1W
1270.5	13.0	562.5	Span 1W, 1/4 pt
1295.5	8.1	567.4	Span 1W, 1/2 pt
1320.6	6.2	569.3	Span 1W, 3/4 pt
1340.0	0.0	575.5	West edge of water
1345.8	-2.0	577.5	West abutment

DATE: 11/4/2020
 REFERENCE ELEVATION: 575.1

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	577.1	East abutment
2.0	0.0	575.1	East edge of water
25.0	8.8	566.3	Span 12W, 1/4 pt
50.0	16.7	558.4	Span 12W, 1/2 pt
74.9	19.8	555.3	Span 12W, 3/4 pt
99.9	21.3	553.8	Pier 11W
125.1	21.8	553.3	Span 11W, 1/4 pt
150.3	22.0	553.1	Span 11W, 1/2 pt
175.4	22.5	552.6	Span 11W, 3/4 pt
200.6	22.0	553.1	Pier 10W
239.0	20.9	554.2	Span 10W, 1/4 pt
277.4	20.0	555.1	Span 10W, 1/2 pt
315.9	20.9	554.2	Span 10W, 3/4 pt
354.3	20.7	554.4	Pier 9W, east side
389.6	20.8	554.3	Pier 9W, west side
428.0	27.6	547.5	Span 9W, 1/4 pt
466.5	27.9	547.2	Span 9W, 1/2 pt
504.9	28.0	547.1	Span 9W, 3/4 pt
543.3	21.0	554.1	Pier 8W
568.5	20.2	554.9	Span 8W, 1/4 pt
593.6	20.7	554.4	Span 8W, 1/2 pt
618.8	21.6	553.5	Span 8W, 3/4 pt
644.0	22.0	553.1	Pier 7W
669.0	20.6	554.5	Span 7W, 1/4 pt
694.1	20.8	554.3	Span 7W, 1/2 pt
719.2	19.7	555.4	Span 7W, 3/4 pt
744.2	20.5	554.6	Pier 6W
769.3	21.0	554.1	Span 6W, 1/4 pt
794.3	21.4	553.7	Span 6W, 1/2 pt
819.4	21.0	554.1	Span 6W, 3/4 pt
844.5	21.7	553.4	Pier 5W
869.6	21.7	553.4	Span 5W, 1/4 pt
894.6	21.5	553.6	Span 5W, 1/2 pt
919.7	21.6	553.5	Span 5W, 3/4 pt
944.8	22.0	553.1	Pier 4W
969.8	23.2	551.9	Span 4W, 1/4 pt
994.9	19.8	555.3	Span 4W, 1/2 pt
1019.9	19.0	556.1	Span 4W, 3/4 pt
1045.0	18.3	556.8	Pier 3W
1070.1	18.8	556.3	Span 3W, 1/4 pt
1095.1	19.7	555.4	Span 3W, 1/2 pt
1120.2	18.5	556.6	Span 3W, 3/4 pt
1145.3	17.5	557.6	Pier 2W
1170.3	21.5	553.6	Span 2W, 1/4 pt
1195.4	21.2	553.9	Span 2W, 1/2 pt
1220.4	21.2	553.9	Span 2W, 3/4 pt
1245.5	13.5	561.6	Pier 1W
1270.5	8.2	566.9	Span 1W, 1/4 pt
1295.5	6.9	568.2	Span 1W, 1/2 pt
1320.6	5.6	569.5	Span 1W, 3/4 pt
1340.0	0.0	575.1	West edge of water
1345.8	-2.0	577.1	West abutment

DATE: 6/30/2020
 REFERENCE ELEVATION: 576.4

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	578.4	East abutment
2.0	0.0	576.4	East edge of water
25.0	10.8	565.6	Span 12W, 1/4 pt
50.0	17.0	559.4	Span 12W, 1/2 pt
74.9	20.0	556.4	Span 12W, 3/4 pt
99.9	22.6	553.8	Pier 11W
125.1	21.6	554.8	Span 11W, 1/4 pt
150.3	22.7	553.7	Span 11W, 1/2 pt
175.4	23.2	553.2	Span 11W, 3/4 pt
200.6	23.0	553.4	Pier 10W
239.0	23.1	553.3	Span 10W, 1/4 pt
277.4	20.9	555.5	Span 10W, 1/2 pt
315.9	21.5	554.9	Span 10W, 3/4 pt
354.3	24.0	552.4	Pier 9W, east side
389.6	28.0	548.4	Pier 9W, west side
428.0	28.2	548.2	Span 9W, 1/4 pt
466.5	28.6	547.8	Span 9W, 1/2 pt
504.9	28.7	547.7	Span 9W, 3/4 pt
543.3	20.3	556.1	Pier 8W
568.5	22.3	554.1	Span 8W, 1/4 pt
593.6	20.6	555.8	Span 8W, 1/2 pt
618.8	22.4	554.0	Span 8W, 3/4 pt
644.0	23.2	553.2	Pier 7W
669.0	20.2	556.2	Span 7W, 1/4 pt
694.1	21.9	554.5	Span 7W, 1/2 pt
719.2	20.7	555.7	Span 7W, 3/4 pt
744.2	21.3	555.1	Pier 6W
769.3	22.0	554.4	Span 6W, 1/4 pt
794.3	22.5	553.9	Span 6W, 1/2 pt
819.4	22.1	554.3	Span 6W, 3/4 pt
844.5	22.6	553.8	Pier 5W
869.6	22.7	553.7	Span 5W, 1/4 pt
894.6	22.2	554.2	Span 5W, 1/2 pt
919.7	22.6	553.8	Span 5W, 3/4 pt
944.8	22.2	554.2	Pier 4W
969.8	23.8	552.6	Span 4W, 1/4 pt
994.9	24.3	552.1	Span 4W, 1/2 pt
1019.9	19.3	557.1	Span 4W, 3/4 pt
1045.0	20.5	555.9	Pier 3W
1070.1	18.7	557.7	Span 3W, 1/4 pt
1095.1	20.0	556.4	Span 3W, 1/2 pt
1120.2	21.5	554.9	Span 3W, 3/4 pt
1145.3	17.1	559.3	Pier 2W
1170.3	23.1	553.3	Span 2W, 1/4 pt
1195.4	22.3	554.1	Span 2W, 1/2 pt
1220.4	20.7	555.7	Span 2W, 3/4 pt
1245.5	16.0	560.4	Pier 1W
1270.5	9.5	566.9	Span 1W, 1/4 pt
1295.5	6.6	569.8	Span 1W, 1/2 pt
1320.6	3.9	572.5	Span 1W, 3/4 pt
1340.0	0.0	576.4	West edge of water
1345.8	-2.0	578.4	West abutment

DATE: 12/3/2019
 REFERENCE ELEVATION: 574.8

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.5	577.3	East abutment
6.0	0.0	574.8	East edge of water
25.0	12.4	562.4	Span 12W, 1/4 pt
50.0	19.1	555.7	Span 12W, 1/2 pt
74.9	19.9	554.9	Span 12W, 3/4 pt
99.9	21.8	553.0	Pier 11W
125.1	22.0	552.8	Span 11W, 1/4 pt
150.3	22.7	552.1	Span 11W, 1/2 pt
175.4	23.1	551.7	Span 11W, 3/4 pt
200.6	23.7	551.1	Pier 10W
239.0	21.5	553.3	Span 10W, 1/4 pt
277.4	22.0	552.8	Span 10W, 1/2 pt
315.9	21.4	553.4	Span 10W, 3/4 pt
354.3	20.0	554.8	Pier 9W, east side
389.6	24.3	550.5	Pier 9W, west side
428.0	26.9	547.9	Span 9W, 1/4 pt
466.5	27.0	547.8	Span 9W, 1/2 pt
504.9	24.9	549.9	Span 9W, 3/4 pt
543.3	22.2	552.6	Pier 8W
568.5	20.6	554.2	Span 8W, 1/4 pt
593.6	21.9	552.9	Span 8W, 1/2 pt
618.8	21.9	552.9	Span 8W, 3/4 pt
644.0	22.3	552.5	Pier 7W
669.0	20.8	554.0	Span 7W, 1/4 pt
694.1	20.2	554.6	Span 7W, 1/2 pt
719.2	19.9	554.9	Span 7W, 3/4 pt
744.2	20.5	554.3	Pier 6W
769.3	20.9	553.9	Span 6W, 1/4 pt
794.3	21.0	553.8	Span 6W, 1/2 pt
819.4	20.9	553.9	Span 6W, 3/4 pt
844.5	21.8	553.0	Pier 5W
869.6	21.9	552.9	Span 5W, 1/4 pt
894.6	21.2	553.6	Span 5W, 1/2 pt
919.7	21.0	553.8	Span 5W, 3/4 pt
944.8	22.1	552.7	Pier 4W
969.8	23.8	551.0	Span 4W, 1/4 pt
994.9	21.3	553.5	Span 4W, 1/2 pt
1019.9	19.4	555.4	Span 4W, 3/4 pt
1045.0	17.9	556.9	Pier 3W
1070.1	18.9	555.9	Span 3W, 1/4 pt
1095.1	20.1	554.7	Span 3W, 1/2 pt
1120.2	20.0	554.8	Span 3W, 3/4 pt
1145.3	18.9	555.9	Pier 2W
1170.3	21.0	553.8	Span 2W, 1/4 pt
1195.4	20.7	554.1	Span 2W, 1/2 pt
1220.4	18.6	556.2	Span 2W, 3/4 pt
1245.5	15.1	559.7	Pier 1W
1270.5	9.7	565.1	Span 1W, 1/4 pt
1295.5	7.3	567.5	Span 1W, 1/2 pt
1320.6	4.1	570.7	Span 1W, 3/4 pt
1336.0	0.0	574.8	West edge of water
1345.8	-3.5	578.3	West abutment

BRIDGE CROSS-SECTIONS

DATE: 11/9/2021
 STRUCTURE NO.: 12006
 CONTROL SECTION: N/A
 ROUTE: Grosse Ile Parkway
 WATERCOURSE: Trenton Channel

CURRENT CROSS SECTION

DOWNSTREAM FACE

BENCHMARK ELEVATION: 583.94
 DESCRIPTION OF BENCHMARK: Low steel, span 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 575.49

PREVIOUS CROSS SECTION

DOWNSTREAM FACE

BENCHMARK ELEVATION: 583.94
 DESCRIPTION OF BENCHMARK: Low steel, span 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 575.14

PREVIOUS CROSS SECTION

DOWNSTREAM FACE

BENCHMARK ELEVATION: 583.94
 DESCRIPTION OF BENCHMARK: Low steel, span 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 576.44

PREVIOUS CROSS SECTION

DOWNSTREAM FACE

BENCHMARK ELEVATION: 582.77
 DESCRIPTION OF BENCHMARK: Top of Pier 1w

UNDERCLEARANCE ELEVATION:
 TOP OF ROAD ELEVATION:
 WATER SURFACE ELEVATION: 574.77

DATE: 11/9/2021
 REFERENCE ELEVATION: 575.49

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	577.5	East abutment
2.0	0.0	575.5	East edge of water
25.0	2.3	573.2	Span 12W, 1/4 pt
50.0	13.5	562.0	Span 12W, 1/2 pt
74.9	16.3	559.2	Span 12W, 3/4 pt
99.9	20.2	555.3	Pier 11W
125.1	20.1	555.4	Span 11W, 1/4 pt
150.3	20.4	555.1	Span 11W, 1/2 pt
175.4	20.3	555.2	Span 11W, 3/4 pt
200.6	21.8	553.7	Pier 10W
239.0	21.7	553.8	Span 10W, 1/4 pt
277.4	21.5	555.0	Span 10W, 1/2 pt
315.9	21.4	554.1	Span 10W, 3/4 pt
354.3	20.5	555.0	Pier 9W, east side
389.6	22.0	553.5	Pier 9W, west side
428.0	25.2	550.3	Span 9W, 1/4 pt
466.5	27.0	548.5	Span 9W, 1/2 pt
504.9	26.8	548.7	Span 9W, 3/4 pt
543.3	24.5	551.0	Pier 8W
568.5	22.3	553.2	Span 8W, 1/4 pt
593.6	21.0	554.5	Span 8W, 1/2 pt
618.8	22.3	553.2	Span 8W, 3/4 pt
644.0	22.5	553.0	Pier 7W
669.0	21.6	553.9	Span 7W, 1/4 pt
694.1	20.7	554.8	Span 7W, 1/2 pt
719.2	20.7	554.8	Span 7W, 3/4 pt
744.2	19.4	556.1	Pier 6W
769.3	18.9	556.6	Span 6W, 1/4 pt
794.3	19.2	556.3	Span 6W, 1/2 pt
819.4	19.8	555.7	Span 6W, 3/4 pt
844.5	20.8	554.7	Pier 5W
869.6	21.8	553.7	Span 5W, 1/4 pt
894.6	20.7	554.8	Span 5W, 1/2 pt
919.7	20.8	554.7	Span 5W, 3/4 pt
944.8	19.7	555.8	Pier 4W
969.8	21.9	553.6	Span 4W, 1/4 pt
994.9	19.6	555.9	Span 4W, 1/2 pt
1019.9	17.8	557.7	Span 4W, 3/4 pt
1045.0	18.1	557.4	Pier 3W
1070.1	16.5	559.0	Span 3W, 1/4 pt
1095.1	16.7	558.8	Span 3W, 1/2 pt
1120.2	17.2	558.3	Span 3W, 3/4 pt
1145.3	16.6	558.9	Pier 2W
1170.3	17.2	558.3	Span 2W, 1/4 pt
1195.4	18.2	557.3	Span 2W, 1/2 pt
1220.4	18.8	556.7	Span 2W, 3/4 pt
1245.5	18.3	557.2	Pier 1W
1270.5	14.5	561.0	Span 1W, 1/4 pt
1295.5	11.6	563.9	Span 1W, 1/2 pt
1320.6	3.2	572.3	Span 1W, 3/4 pt
1340.0	0.0	575.5	West edge of water
1345.8	-2.0	577.5	West abutment

DATE: 11/4/2020
 REFERENCE ELEVATION: 575.14

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	577.1	East abutment
2.0	0.0	575.1	East edge of water
25.0	5.6	569.5	Span 12W, 1/4 pt
50.0	8.9	566.2	Span 12W, 1/2 pt
74.9	13.8	561.3	Span 12W, 3/4 pt
99.9	19.0	556.1	Pier 11W
125.1	19.7	555.4	Span 11W, 1/4 pt
150.3	20.5	554.6	Span 11W, 1/2 pt
175.4	21.0	554.1	Span 11W, 3/4 pt
200.6	19.7	555.4	Pier 10W
239.0	21.8	553.3	Span 10W, 1/4 pt
277.4	21.7	553.4	Span 10W, 1/2 pt
315.9	21.5	553.6	Span 10W, 3/4 pt
354.3	20.5	554.6	Pier 9W, east side
389.6	22.0	553.1	Pier 9W, west side
428.0	27.6	547.5	Span 9W, 1/4 pt
466.5	27.8	547.3	Span 9W, 1/2 pt
504.9	27.9	547.2	Span 9W, 3/4 pt
543.3	21.3	553.8	Pier 8W
568.5	23.2	551.9	Span 8W, 1/4 pt
593.6	21.5	553.6	Span 8W, 1/2 pt
618.8	23.6	551.5	Span 8W, 3/4 pt
644.0	20.7	554.4	Pier 7W
669.0	21.8	553.3	Span 7W, 1/4 pt
694.1	21.9	553.2	Span 7W, 1/2 pt
719.2	21.7	553.4	Span 7W, 3/4 pt
744.2	17.5	557.6	Pier 6W
769.3	20.2	554.9	Span 6W, 1/4 pt
794.3	20.7	554.4	Span 6W, 1/2 pt
819.4	21.6	553.5	Span 6W, 3/4 pt
844.5	18.5	556.6	Pier 5W
869.6	23.7	551.4	Span 5W, 1/4 pt
894.6	22.5	552.6	Span 5W, 1/2 pt
919.7	21.8	553.3	Span 5W, 3/4 pt
944.8	20.0	555.1	Pier 4W
969.8	21.7	553.4	Span 4W, 1/4 pt
994.9	19.7	555.4	Span 4W, 1/2 pt
1019.9	16.6	558.5	Span 4W, 3/4 pt
1045.0	15.5	559.6	Pier 3W
1070.1	17.4	557.7	Span 3W, 1/4 pt
1095.1	17.2	557.9	Span 3W, 1/2 pt
1120.2	18.6	556.5	Span 3W, 3/4 pt
1145.3	17.8	557.3	Pier 2W
1170.3	19.8	555.3	Span 2W, 1/4 pt
1195.4	18.7	556.4	Span 2W, 1/2 pt
1220.4	19.2	555.9	Span 2W, 3/4 pt
1245.5	16.9	558.2	Pier 1W
1270.5	15.3	559.8	Span 1W, 1/4 pt
1295.5	11.3	563.8	Span 1W, 1/2 pt
1320.6	6.6	568.5	Span 1W, 3/4 pt
1340.0	0.0	575.1	West edge of water
1345.8	-2.0	577.1	West abutment

DATE: 6/30/2020
 REFERENCE ELEVATION: 576.44

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	578.4	East abutment
2.0	0.0	576.4	East edge of water
25.0	4.6	571.8	Span 12W, 1/4 pt
50.0	13.6	562.8	Span 12W, 1/2 pt
74.9	17.2	559.2	Span 12W, 3/4 pt
99.9	18.5	557.9	Pier 11W
125.1	21.2	555.2	Span 11W, 1/4 pt
150.3	22.7	553.7	Span 11W, 1/2 pt
175.4	21.5	554.9	Span 11W, 3/4 pt
200.6	21.2	555.2	Pier 10W
239.0	22.9	553.5	Span 10W, 1/4 pt
277.4	22.5	553.9	Span 10W, 1/2 pt
315.9	22.4	554.0	Span 10W, 3/4 pt
354.3	20.7	555.7	Pier 9W, east side
389.6	19.2	557.2	Pier 9W, west side
428.0	27.0	549.4	Span 9W, 1/4 pt
466.5	27.6	548.8	Span 9W, 1/2 pt
504.9	28.2	548.2	Span 9W, 3/4 pt
543.3	20.0	556.4	Pier 8W
568.5	24.1	552.3	Span 8W, 1/4 pt
593.6	21.7	554.7	Span 8W, 1/2 pt
618.8	22.5	553.9	Span 8W, 3/4 pt
644.0	21.8	554.6	Pier 7W
669.0	23.1	553.3	Span 7W, 1/4 pt
694.1	22.2	554.2	Span 7W, 1/2 pt
719.2	22.2	554.2	Span 7W, 3/4 pt
744.2	19.5	556.9	Pier 6W
769.3	20.0	556.4	Span 6W, 1/4 pt
794.3	20.6	555.8	Span 6W, 1/2 pt
819.4	21.4	555.0	Span 6W, 3/4 pt
844.5	21.0	555.4	Pier 5W
869.6	23.4	553.0	Span 5W, 1/4 pt
894.6	24.1	552.3	Span 5W, 1/2 pt
919.7	22.8	553.6	Span 5W, 3/4 pt
944.8	18.3	558.1	Pier 4W
969.8	23.0	553.4	Span 4W, 1/4 pt
994.9	21.7	554.7	Span 4W, 1/2 pt
1019.9	19.2	557.2	Span 4W, 3/4 pt
1045.0	18.1	558.3	Pier 3W
1070.1	17.6	558.8	Span 3W, 1/4 pt
1095.1	17.7	558.7	Span 3W, 1/2 pt
1120.2	18.2	558.2	Span 3W, 3/4 pt
1145.3	16.4	560.0	Pier 2W
1170.3	18.6	557.8	Span 2W, 1/4 pt
1195.4	19.7	556.7	Span 2W, 1/2 pt
1220.4	19.6	556.8	Span 2W, 3/4 pt
1245.5	18.5	557.9	Pier 1W
1270.5	17.0	559.4	Span 1W, 1/4 pt
1295.5	13.0	563.4	Span 1W, 1/2 pt
1320.6	5.0	571.4	Span 1W, 3/4 pt
1340.0	0.0	576.4	West edge of water
1345.8	-2.0	578.4	West abutment

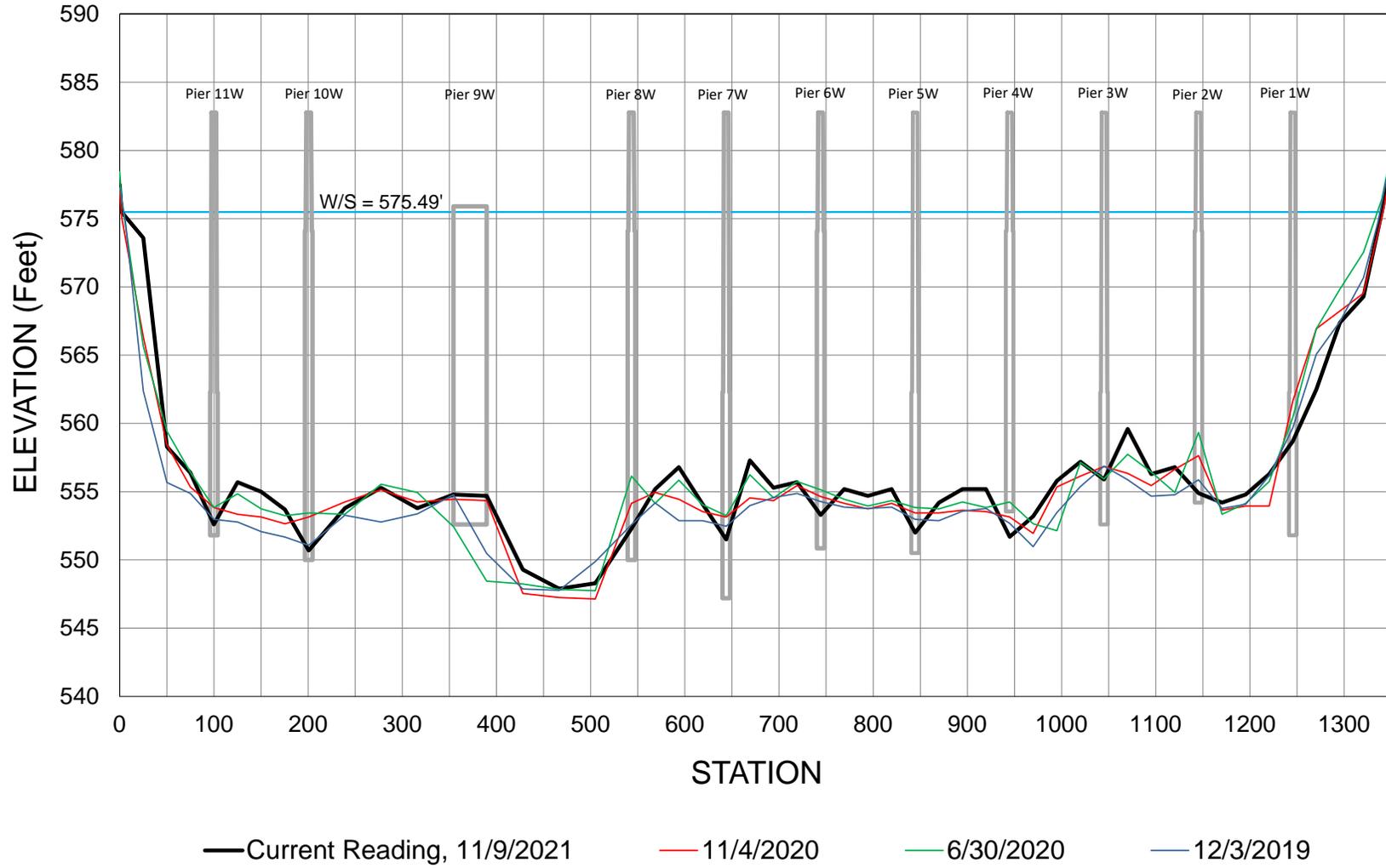
DATE: 12/3/2019
 REFERENCE ELEVATION: 574.77

STATION	READING	ELEVATION	DESCRIPTION
0.0	-2.0	576.8	East abutment
6.0	0.0	574.8	East edge of water
25.0	5.7	569.1	Span 12W, 1/4 pt
50.0	9.5	565.3	Span 12W, 1/2 pt
74.9	15.5	559.3	Span 12W, 3/4 pt
99.9	19.1	555.7	Pier 11W
125.1	19.8	555.0	Span 11W, 1/4 pt
150.3	20.9	553.9	Span 11W, 1/2 pt
175.4	21.8	553.0	Span 11W, 3/4 pt
200.6	20.7	554.1	Pier 10W
239.0	22.7	552.1	Span 10W, 1/4 pt
277.4	22.1	552.7	Span 10W, 1/2 pt
315.9	20.9	553.9	Span 10W, 3/4 pt
354.3	20.0	554.8	Pier 9W, east side
389.6	17.9	556.9	Pier 9W, west side
428.0	26.7	548.1	Span 9W, 1/4 pt
466.5	26.9	547.9	Span 9W, 1/2 pt
504.9	26.7	548.1	Span 9W, 3/4 pt
543.3	22.8	552.0	Pier 8W
568.5	22.3	552.5	Span 8W, 1/4 pt
593.6	20.9	553.9	Span 8W, 1/2 pt
618.8	22.1	552.7	Span 8W, 3/4 pt
644.0	20.8	554.0	Pier 7W
669.0	20.9	553.9	Span 7W, 1/4 pt
694.1	21.9	552.9	Span 7W, 1/2 pt
719.2	21.1	553.7	Span 7W, 3/4 pt
744.2	17.7	557.1	Pier 6W
769.3	18.7	556.1	Span 6W, 1/4 pt
794.3	18.9	555.9	Span 6W, 1/2 pt
819.4	20.3	554.5	Span 6W, 3/4 pt
844.5	19.1	555.7	Pier 5W
869.6	22.7	552.1	Span 5W, 1/4 pt
894.6	22.4	552.4	Span 5W, 1/2 pt
919.7	22.0	552.8	Span 5W, 3/4 pt
944.8	18.0	556.8	Pier 4W
969.8	21.2	553.6	Span 4W, 1/4 pt
994.9	20.8	554.0	Span 4W, 1/2 pt
1019.9	18.8	556.0	Span 4W, 3/4 pt
1045.0	16.4	558.4	Pier 3W
1070.1	16.2	558.6	Span 3W, 1/4 pt
1095.1	16.7	558.1	Span 3W, 1/2 pt
1120.2	17.1	557.7	Span 3W, 3/4 pt
1145.3	14.9	559.9	Pier 2W
1170.3	18.0	556.8	Span 2W, 1/4 pt
1195.4	19.1	555.7	Span 2W, 1/2 pt
1220.4	18.1	556.7	Span 2W, 3/4 pt
1245.5	17.9	556.9	Pier 1W
1270.5	14.7	560.1	Span 1W, 1/4 pt
1295.5	9.9	564.9	Span 1W, 1/2 pt
1320.6	5.1	569.7	Span 1W, 3/4 pt
1333.0	0.0	574.8	West edge of water
1345.8	-3.5	578.3	West abutment

Grosse Ile Pkwy over Trenton Channel
STR: 12006
11/9/2021
Wayne County

UPSTREAM FACE

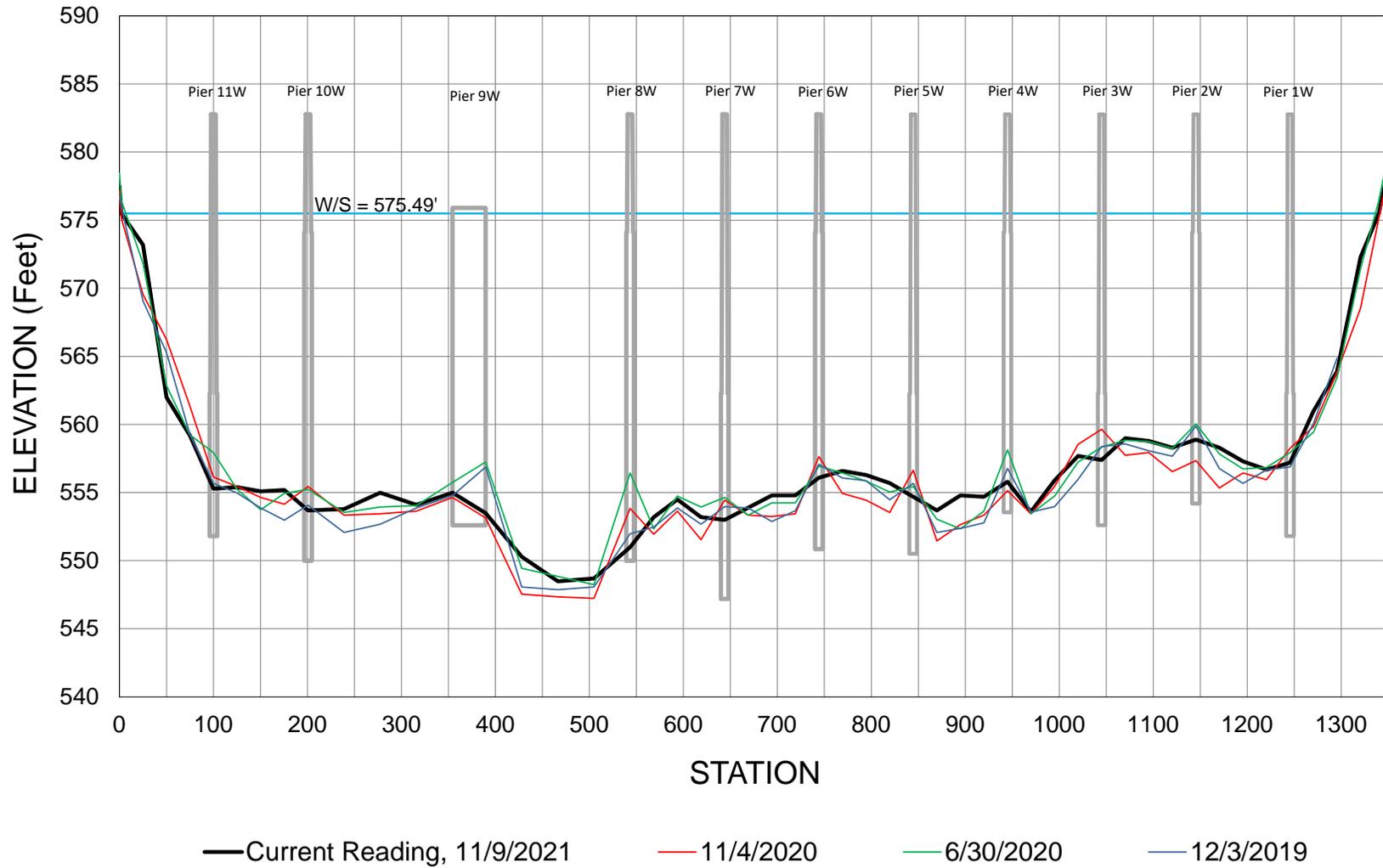
(looking downstream)

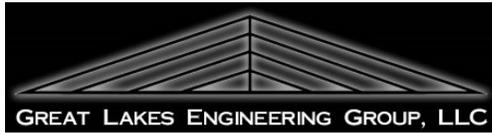


Grosse Ile Pkwy over Trenton Channel
STR: 12006
11/9/2021
Wayne County

DOWNSTREAM FACE

(looking downstream)



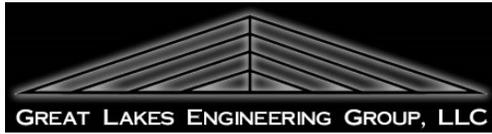


*South elevation
of bridge*



*South elevation
of bridge*





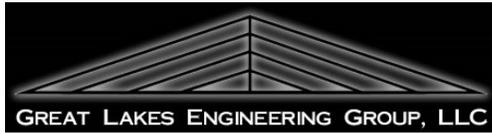
Wayne County Underwater Bridge Inspections
GLEG Project No. 1020-2-704
Grosse Ile Parkway over Trenton Channel
STR 12006
November 9, 2021

*North elevation
of bridge*



*North elevation
of bridge*





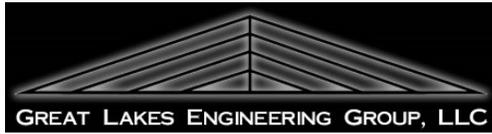
Wayne County Underwater Bridge Inspections
GLEG Project No. 1020-2-704
Grosse Ile Parkway over Trenton Channel
STR 12006
November 9, 2021

South channel



North channel



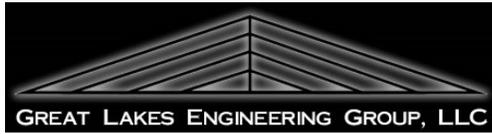


*Pier 1w,
west elevation*



*Pier 1w,
east elevation*

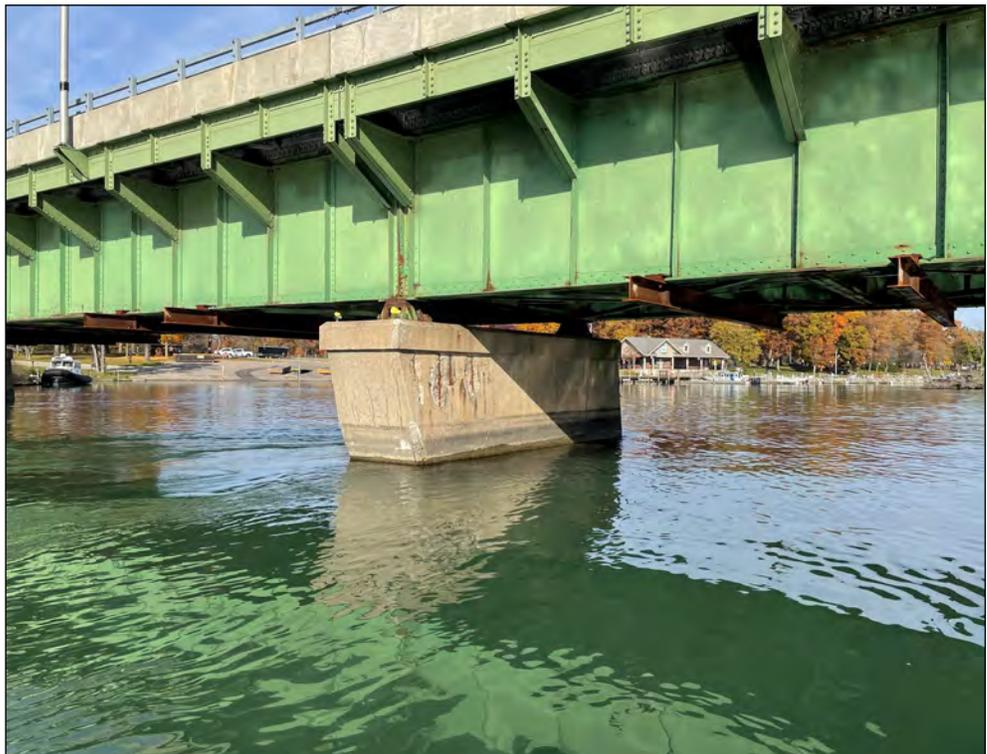




*Pier 2w,
west elevation*



*Pier 2w,
east elevation*

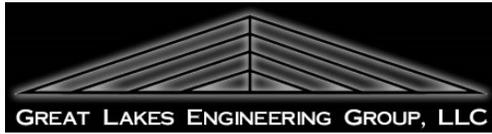


*Pier 2w, steel
ice breaker at
channel
bottom, typical*



*Pier 2w, vinyl
sheeting and
steel waler,
typical*





*Pier 3w,
west elevation*



*Pier 3w,
east elevation*

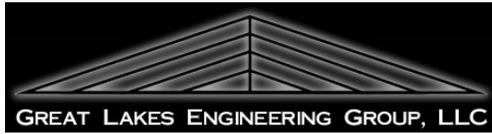


*Pier 3w,
horizontal
crack in
footing, typical
west and east
elevations*



*Pier 3w, typical
condition of
exposed footing*

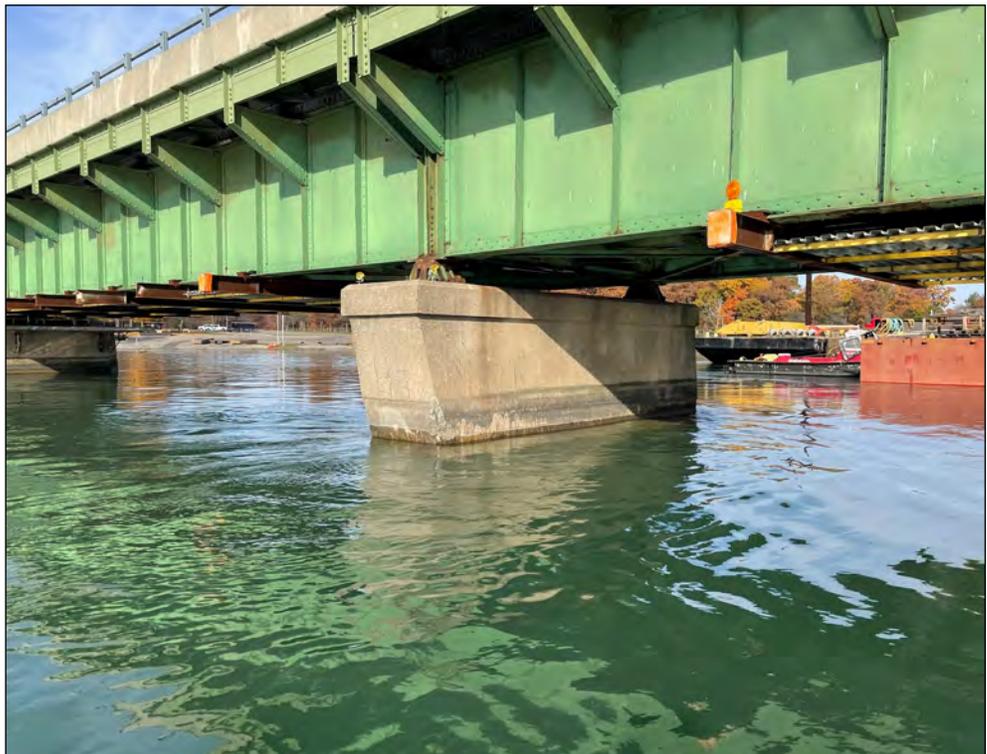




*Pier 4w,
west elevation*



*Pier 4w,
east elevation*

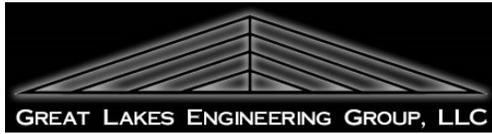


*Pier 4w, vinyl
sheeting at
channel
bottom, typical*



*Pier 4w, vinyl
sheeting and
grout bags at
channel
bottom, typical*





*Pier 5w,
west elevation*



*Pier 5w,
east elevation*



*Pier 5w, open
crack in
footing, typical
west and east
elevations*



*Pier 5w, open
crack in
footing, typical
west and east
elevations*



*Pier 6w,
west elevation*



*Pier 6w,
east elevation*

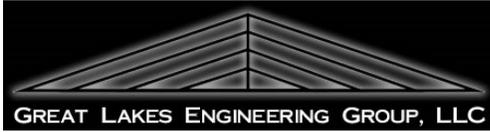


*Pier 6w, grout
bags and vinyl
sheeting at
channel
bottom, typical*



*Pier 6w, corner
of vinyl
sheeting, steel
walers and
grout bags at
channel
bottom, typical*





*Pier 7w,
west elevation*



*Pier 7w,
east elevation*

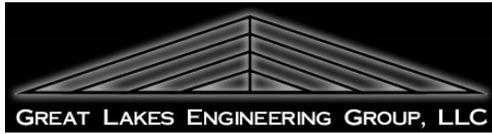


*Pier 7w,
footing
exposure at
upstream nose,
typical*



*Pier 7w, pier
stem wall and
footing
interface,
typical*

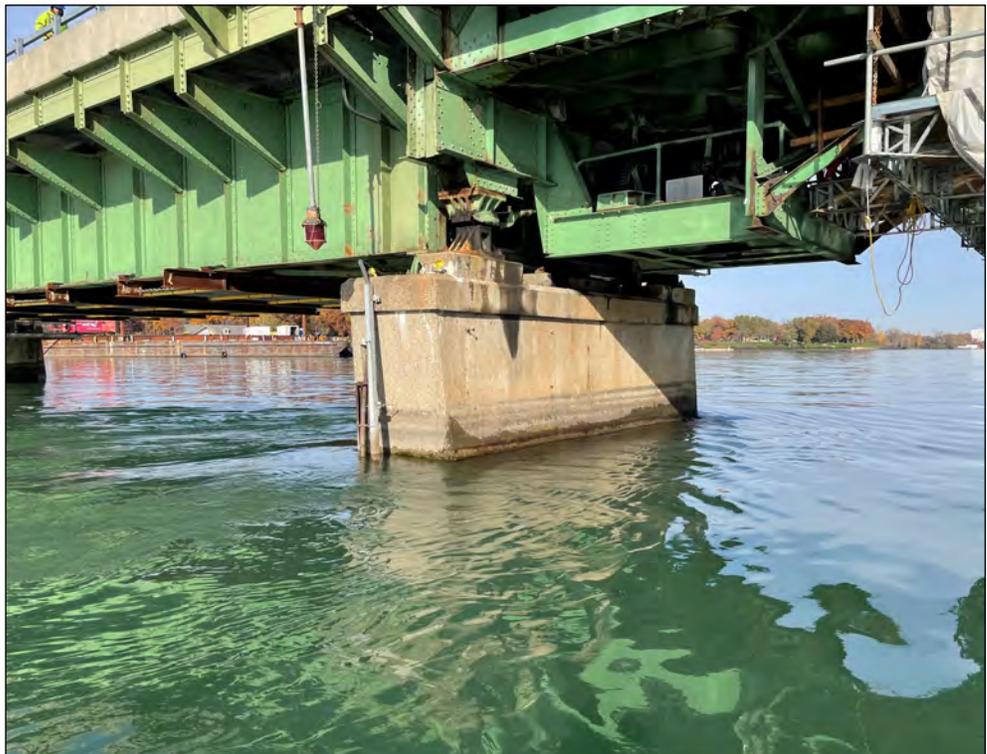




*Pier 8w,
west elevation*



*Pier 8w,
east elevation*

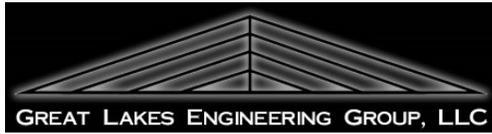


*Pier 8w, steel
sheeting and
steel walers,
typical*



*Pier 8w, steel
sheeting and
steel walers at
channel
bottom, typical*

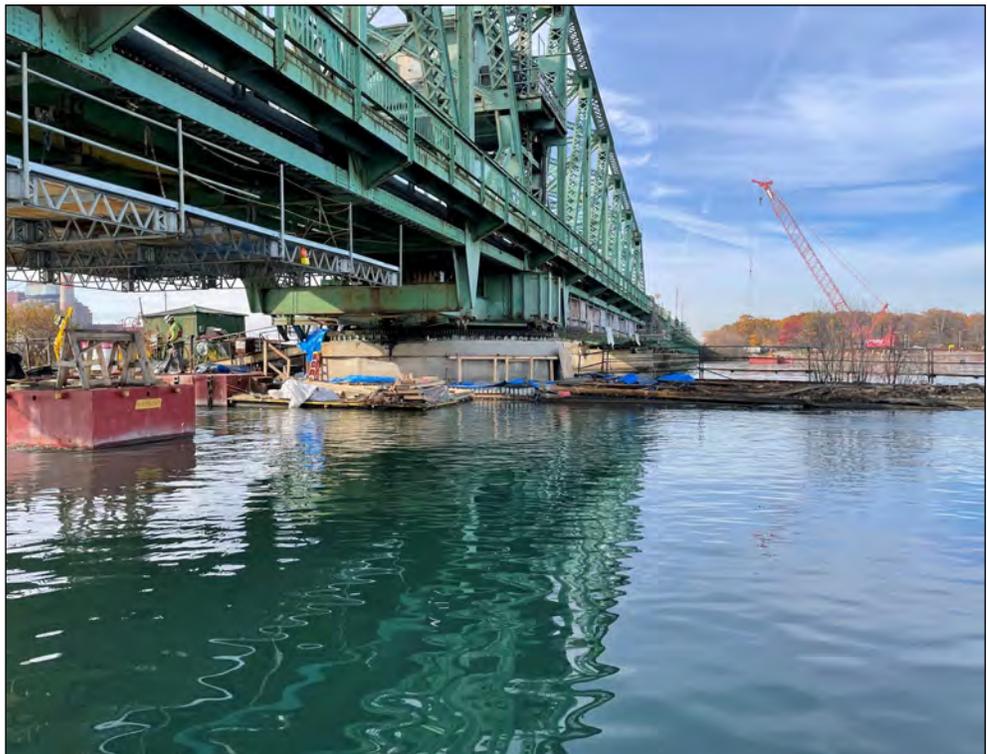




*Pier 9w,
west elevation*



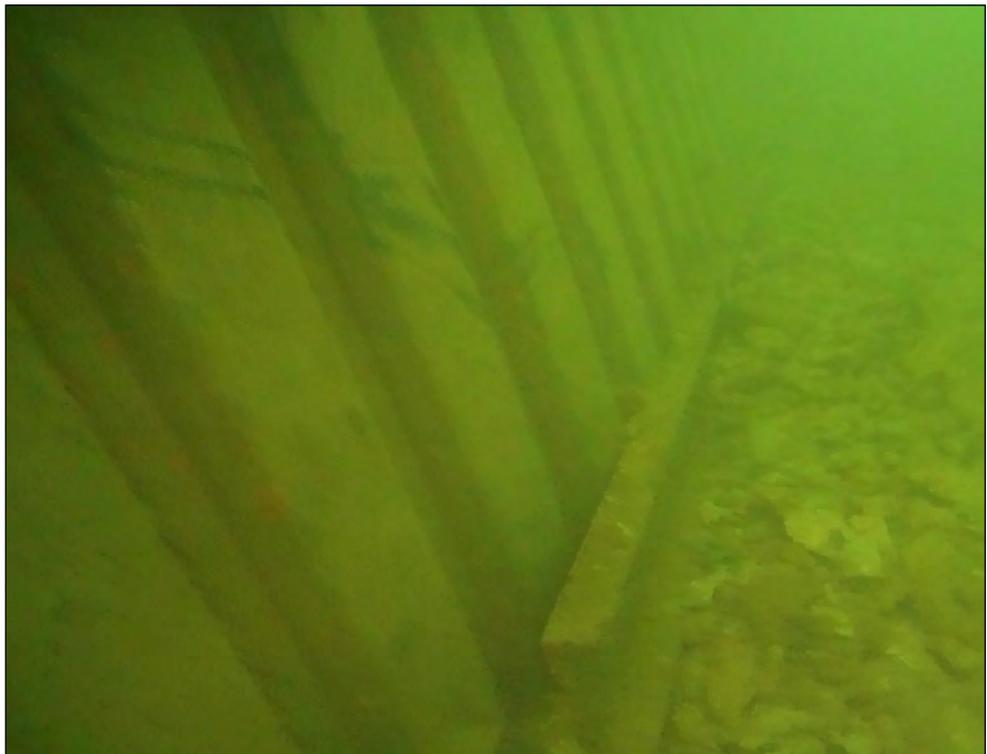
*Pier 9w,
east elevation*

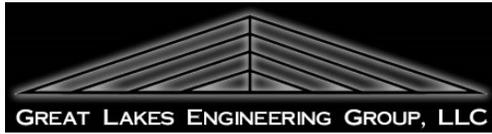


*Pier 9w, steel
sheeting and
steel walers,
typical*



*Pier 9w, steel
sheeting and
steel walers at
channel
bottom, typical*

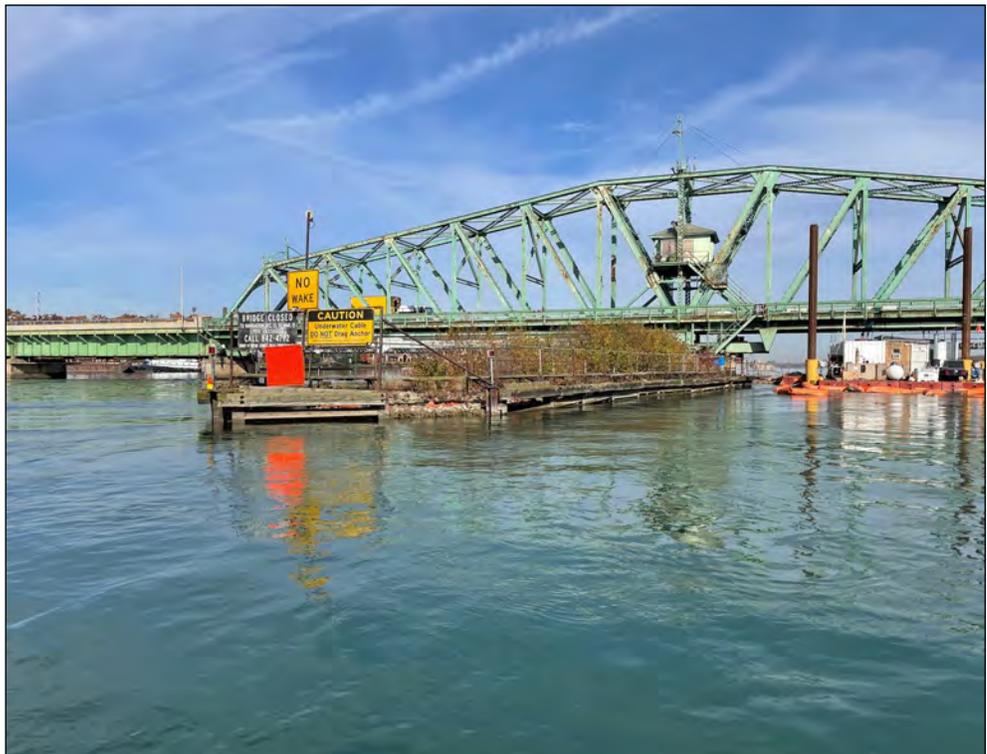


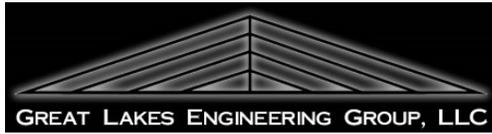


*Pier 9w,
southwest
timber fender*



*Pier 9w,
southeast
timber fender*





*Pier 9w,
northwest
timber fender*



*Pier 9w,
northeast
timber fender*



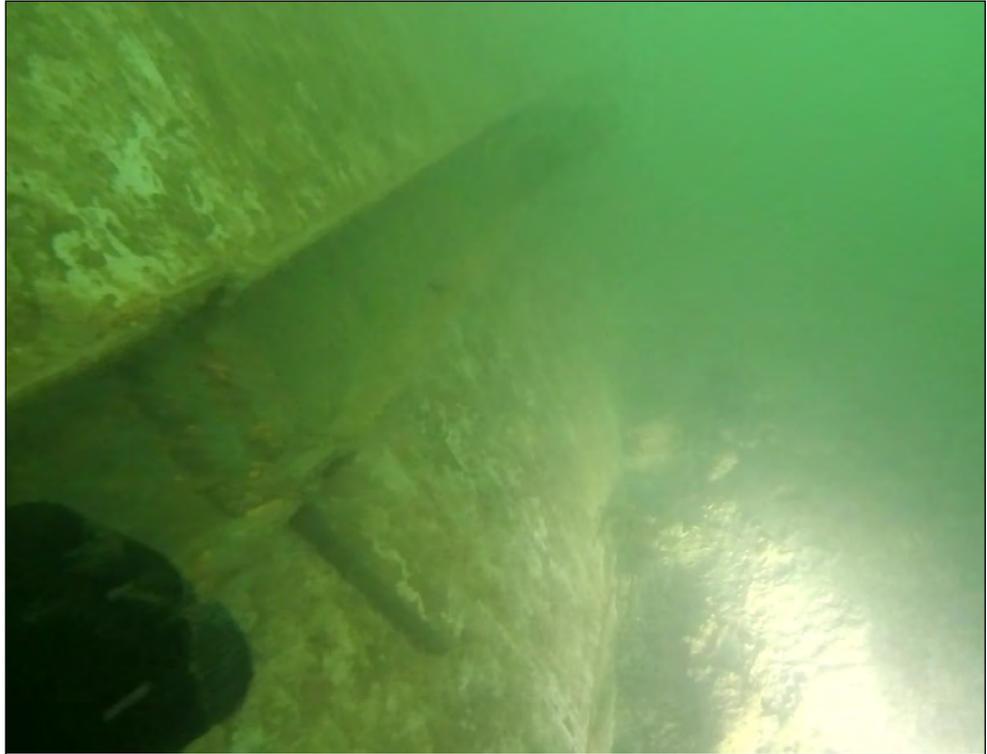
*Pier 10w,
west elevation*



*Pier 10w,
east elevation*

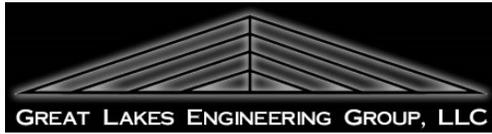


*Pier 10w, vinyl
sheeting and
steel walers,
typical*



*Pier 10w, vinyl
sheeting and
steel walers,
typical*



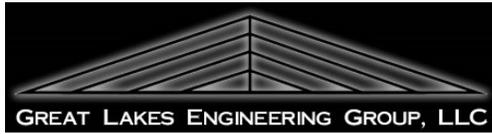


*Pier 11w,
west elevation*



*Pier 11w,
east elevation*



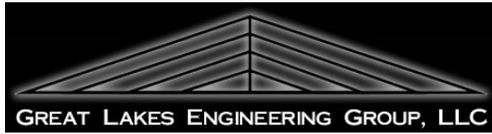


*Pier 11w,
footing
exposure and
channel
bottom, typical*



*Pier 11w,
footing
exposure and
channel
bottom, typical*



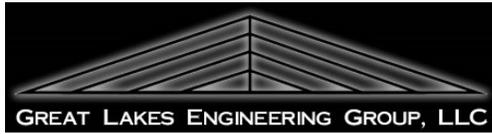


West abutment



East abutment



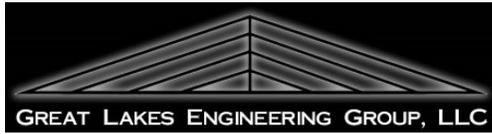


*Southwest
channel bank*



*Southeast
channel bank*





*Northwest
channel bank*



*Northeast
channel bank*



MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 12006		UNDERWATER INSPECTION REPORT [SIA #92-B]		
Facility	Latitude / Longitude	MDOT Structure ID	Structure Condition	
GROSSE ILE PARKWAY	42.1273 / -83.173	82200010000B020	Poor Condition(4)	
Feature	Length / Width / Spans	Owner		
TRENTON CHANNEL	1,345.88 / 31.8 / 12	County: Wayne(82)		
Location	Built / Recon. / Paint / Ovly.	TSC	Operational Status	
GROSSE ILE	1932 / 2007 / 1978 /	Taylor(25)	P Posted for load(26NNNN)	
Region / County	Material / Design	Last NBI Inspection	Scour Evaluation	
Metro(7) / Wayne(82)	4 Steel Continuous / 17 Movable- Swing	11/23/2021 / 6SAN	4 Stable, needs action	

UNDERWATER SPECIAL INSPECTION **E2UF**

Inspector Name	Agency / Company Name	Insp. Freq.	Insp. Date
Casey Collings	Great Lakes Engineering Group	10	11/09/2021

GENERAL NOTES

Grosse Ile Parkway over Trenton Channel is a twelve-span moveable swing bridge with a steel superstructure. The bridge is located in Wayne County, Michigan. The original structure was built around 1873 as a railroad crossing and was converted to carry vehicular traffic in 1932. The structure carries two lanes of two-way traffic and is 1,346 feet in length. All eleven pier units (piers 1w-11w) are submerged in the channel. The bridge has undergone numerous repair projects throughout its lifespan, and most recently was closed to traffic while extensive pier repairs were performed at piers 2w, 4w, 6w, 8w, 9w, and 10w. Pier repair verification dives were performed during the project, and these reports are available as separate documents.

Piers 1w through 11w were subject to underwater inspection on November 9-10, 2021 while the structure remained closed to vehicular traffic due to the pier repair project and ongoing superstructure repairs. The pier repair and superstructure repair projects were overseen by HNTB, Michigan on behalf of Wayne County. Coordination was required to ensure contractor equipment and operations did not impact the safety of the dive team or contractor personnel. Power to the swing span pier was turned off due the ongoing construction projects. The dive team performed the underwater inspection under the contractor's United States Coast Guard permits.

INSPECTION PROCEDURES

QUALIFIED TEAM
 The team performing the underwater inspection is qualified in accordance with the National Bridge Inspection Standards 23 CFR Part 650.309. The underwater inspection was conducted by a four-person team consisting of a Professional Engineer Dive Team Leader/Qualified Dive Inspector/Qualified Team Leader (Casey Collings, P.E.), a Qualified Dive Inspector/Qualified Team Leader (Matt Davis), a Diving Safety Supervisor (Paul Davis), and a Dive Tender (Brian Hedben, P.E.).

EQUIPMENT
 The inspection was conducted using Self-Contained Underwater Breathing Apparatus (SCUBA). The inspection team accessed the bridge and worked from a 18-foot Dive Safety Boat. Two-way wired communications were used to convey inspection notes from the diver to the topside team leader and recorded on note sheets. Additional equipment consisted of an underwater digital camera, underwater video camera, LED high intensity submersible dive light, dive knife, scraper, 4' probing rod, 25' and 50' survey rods, and a side imaging sonar unit.

LEVEL OF INSPECTION
 The Level I underwater inspection consisted of a close visual and tactile examination using large sweeping motions of the hands where visibility was limited. A Level II inspection was performed on 10% of the submerged substructure units. The inspection was conducted over the total exterior surface of each underwater substructure unit. Probing along the mud line was also done along each substructure unit and the adjacent streambed. Upstream and downstream cross sections were taken and recorded using a USGS benchmark.

APPROVALS
 This bridge falls under the jurisdiction of the United States Coast Guard (USCG). Approval was required to perform the underwater inspection. The dive team performed the underwater inspection under the contractor's United States Coast Guard permits.

NAVIGATION PROTECTION SYSTEMS

Protection Systems Fender Timbers

Inspection Comments
 The watercourse is deemed navigable according to the U.S. Coast Guard; therefore, protection systems and navigation lights at or near the bridge are required. A timber cribbing pier protection system is in place at pier 9w. The protection system at pier 9w is in poor condition. The purpose of the system is to protect the bridge from impacts by vessels and also to identify the navigable channel. The protection system has the visual appearance of sinking, especially at the north end (upstream end). During the 2021, 2020, 2019, and 2017 underwater inspections, water levels have been higher than in older inspections. The high water levels contribute to the sinking appearance, however the extensive deterioration of the pier protection cribbing below water, and failed previous repairs are contributing to the settlement of the pier protection system. There are multiple areas within the timber cribbing system that exhibit section loss of 20%-75%. No pier protection systems are in place at piers 1w, 2w, 3w, 4w, 5w, 6w, 7w, 8w, 10w, and 11w.

Navigation lighting is installed at the structure from piers 8w to 10w as well as on southern and northern ends of the pier protection system at pier 9w. The navigation lighting was not operating at the time of underwater inspection due to power at the bridge being turned off for ongoing repair work.

MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 12006

UNDERWATER INSPECTION REPORT [SIA #92-B]

Facility GROSSE ILE PARKWAY	Latitude / Longitude 42.1273 / -83.173	MDOT Structure ID 82200010000B020	Structure Condition Poor Condition(4)	
Feature TRENTON CHANNEL	Length / Width / Spans 1,345.88 / 31.8 / 12	Owner County: Wayne(82)		
Location GROSSE ILE	Built / Recon. / Paint / Ovly. 1932 / 2007 / 1978 /	TSC Taylor(25)	Operational Status P Posted for load(26NNNN)	
Region / County Metro(7) / Wayne(82)	Material / Design 4 Steel Continuous / 17 Movable- Swing	Last NBI Inspection 11/23/2021 / 6SAN	Scour Evaluation 4 Stable, needs action	

Weather Conditions on Day of Dive

Sunny.

INSPECTION STAFF & EQUIPMENT

Engineer	Casey Collings
Diver	Casey Collings
Tender	Matt Davis
Dive Equipment	Scuba

Nearest Boat Launch Site

Marina in the northwest quadrant.

Safety Concerns

Active construction site (above water), strong current, recreational boat traffic.

INSPECTION DETAILS

Waterway and Bank Observations

The physical conditions associated with the flow of water through the bridge, such as stream stability and the condition of the channel and slope, were evaluated.

The west channel banks are natural with no slope protection in place. The east channel banks have stacked stone blocks in place to retain the approach slopes. Farther from the bridge, there is a boat launch in the northwest quadrant and a marina in the southeast quadrant. No erosion or significant debris was found at the bridge.

Substructure Observations (Above the waterline)

Summary: Several open spalls to exposed steel, open vertical cracks and delaminations in concrete portions of the piers above water. Several areas previously marked out and include bearing bolster areas. Contractor scaffolding is present at several piers preventing visual inspection of the upper portions. Several areas of spalls and delaminations were recently repaired or in the process of being repaired.

Substructure Observations (Below the waterline)

Piers 1w, 3w, 5w, 7w, and 11w have a rocky channel bottom with some riprap along the bottom of the footings. The footing are exposed by design.

Piers 2w, 4w, 6w, 8w, 9w, 10w have newly placed grout bags placed at the bottom of stay in place forms utilized for the pier stabilization. Stay in place forms are already algae covered. Toe of stay in place forms was covered in grout and/or grout bags.

Debris in Waterway

None noted.

Recommendations

Underwater Video Available?	Y
Underwater Video Description	Mask mounted video.
Underwater Video Location	GLEG Server
Stream Bed Profile Completed?	Y
Site Plan Completed?	Y
Photographs?	Y

RECOMMENDATIONS AND ACTION ITEMS

Recommendation

Nav Protect Rpr

Priority Comments

H Replace or retrofit the pier protection system at the pivot Pier 9W, both north and south ends. Recommend destructive testing such as cores be taken for retrofit design.

MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 12006

UNDERWATER INSPECTION REPORT [SIA #92-B]

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Recommendation

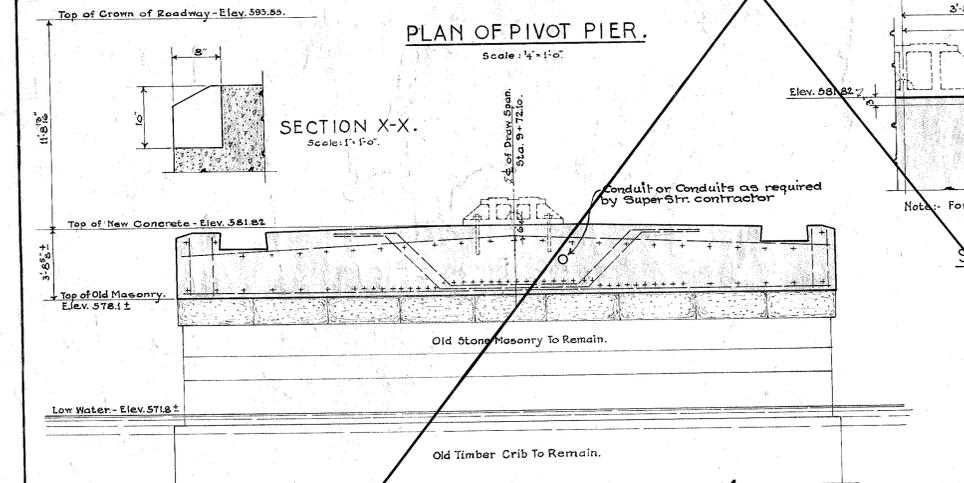
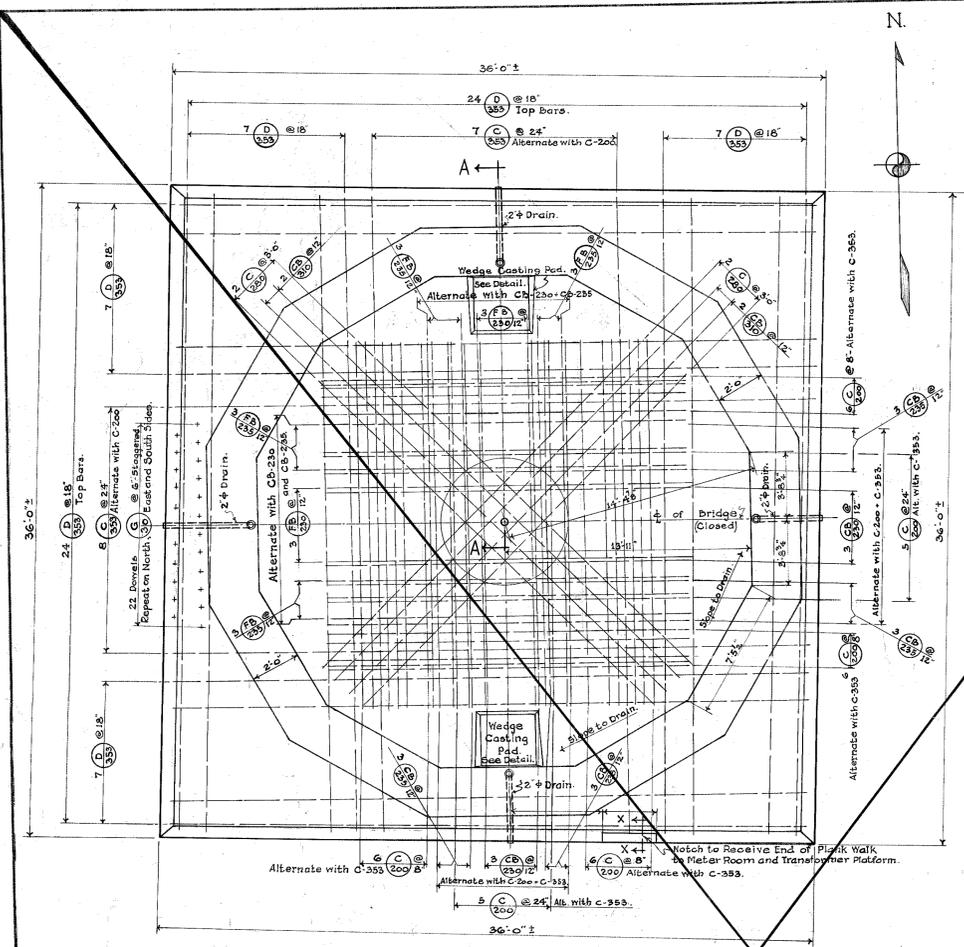
Other

Priority

H

Comments

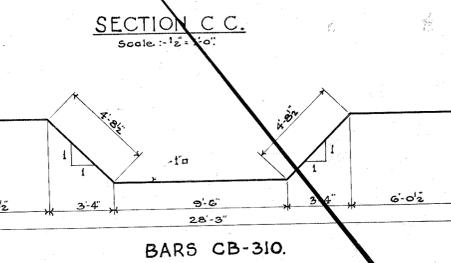
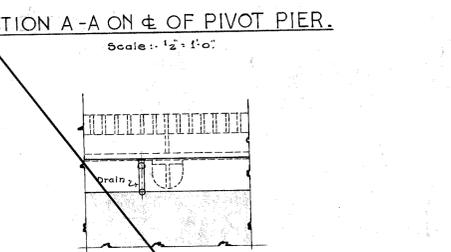
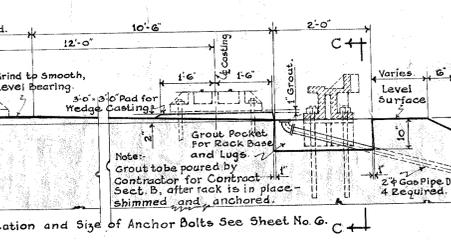
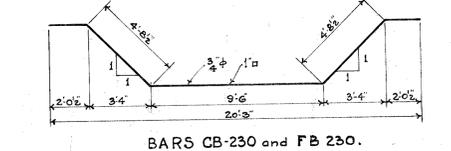
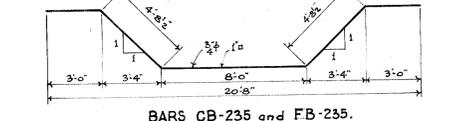
Continue to Survey Pier Elevations monthly at 4 locations at each pier and monitor monthly by an licensed surveyor or engineer to check for settlement.



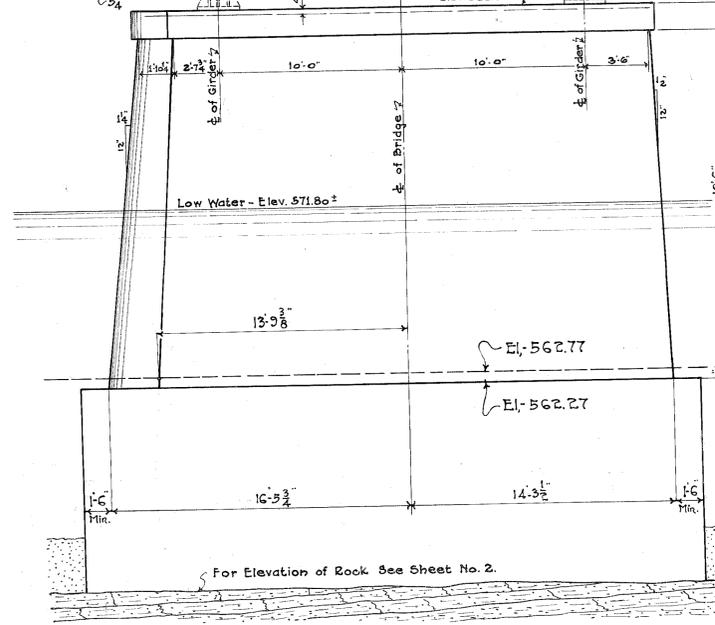
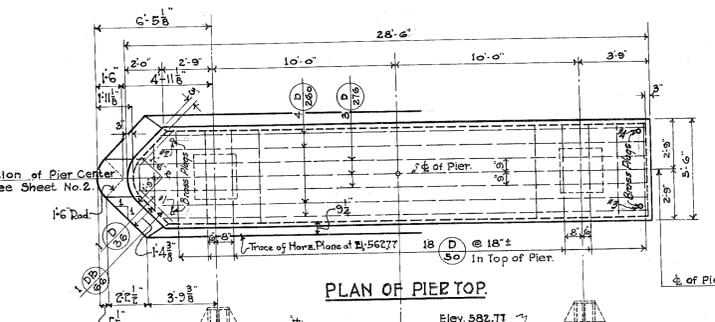
VOID

BILL OF REINFORCING BARS.				
MARK	NUMBER	SIZE	LENGTH	REMARKS.
D-353	24	1"	35'-3"	East and West Top Rods.
D-355	24	1"	35'-3"	North - South
D-353	14	1"	35'-3"	Bottom
D-353	14	1"	35'-3"	East - West
C-353	7	1"	35'-3"	North - South
C-353	7	1"	35'-3"	North - South
C-200	17	1"	26'-0"	East - West
C-200	17	1"	26'-0"	East - West
C-280	4	1"	26'-0"	Diagonal Bottom
CB-235	6	1"	23'-5"	East and West Bottom Bent Rods.
CB-230	3	1"	23'-5"	North - South
CB-230	3	1"	23'-5"	North - South
FB-235	6	3/4"	23'-5"	East - West
FB-230	3	3/4"	23'-5"	North - South
FB-235	6	3/4"	23'-5"	North - South
FB-230	3	3/4"	23'-5"	Vertical Dowels.
G-30	28	3/8"	3'-0"	Diagonal Bottom Bent Rods.
CB-310	4	1"	31'-0"	Diagonal Bottom Bent Rods.

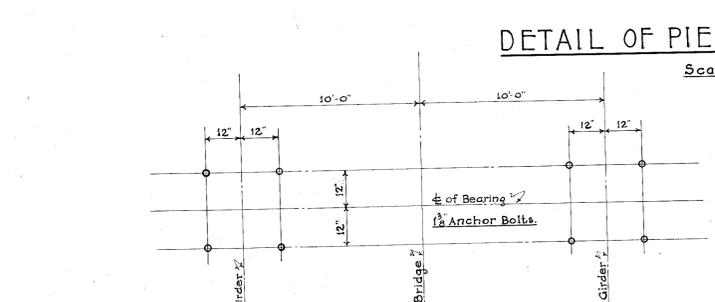
QUANTITIES.	
CONCRETE.	6 cu.yds. (Groat-Contract, Sect. B, Reg. Cons.)
REINFORCING STEEL.	14300 Lbs.
POWER CONDUIT.	Lin. Ft.
LIGHTING CONDUIT.	Lin. Ft.
GAS PIPE DRAINS.	20 Lin. Ft. ±



NOTE: For Location of Pier Center Lines, See Sheet No. 2.



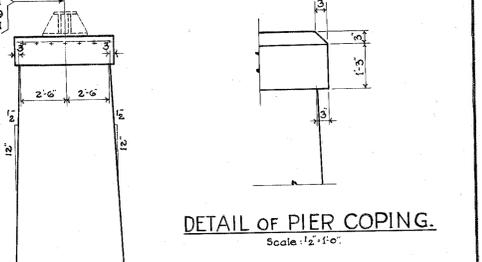
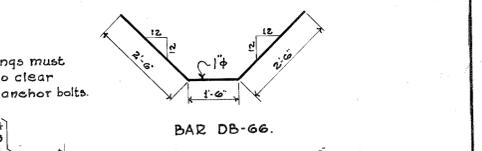
SIDE ELEVATION.



PLAN OF ANCHOR BOLTS FOR PIERS 1, 3, 5, 7 and 11.

NOTE: For General Notes Applying to this Sheet, See Sheet No. 9.

BILL OF REINFORCING BARS.				
MARK	NUMBER	SIZE	LENGTH	REMARKS.
D-50	18	1"	5'-0"	Cross Bars.
D-260	4	1"	26'-0"	Outside Longitudinal Bars.
D-276	3	1"	27'-6"	Inside
D-36	1	1"	3'-6"	Cross Bar in Nose of Pier Top.
DB-66	1	1"	6'-6"	



DETAIL OF PIER COPING.

QUANTITIES FOR EACH PIER.	
CONCRETE - Tremie.	133 CU.YDS. By Plan
CONCRETE - Dry.	125
REINFORCING STEEL.	765 LBS.

REVISIONS:
 1. Plans made under contract for Trenton Channel Bridge.
 2. Note added re. grout for rock base.
 3. Elev. of Wedge Casting Pad changed to 561.81.
 4. Elev. of Old Masonry changed to 578.11.
 5. Elev. of Low Water changed to 571.81.
 6. Plans revised 5-11-30 J.W.C.

BOARD OF WAYNE COUNTY ROAD COMMISSIONERS
 DETROIT, MICHIGAN.
 EDWARD N. HINES, CHAIRMAN
 JOHN S. HAGGERTY, COMMISSIONER
 WILLIAM F. BUTLER, COMMISSIONER

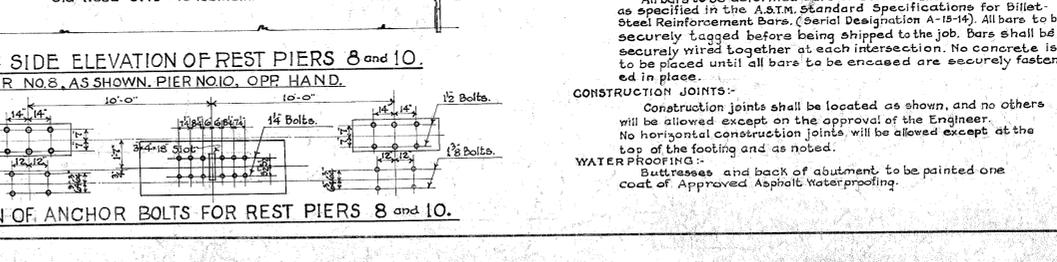
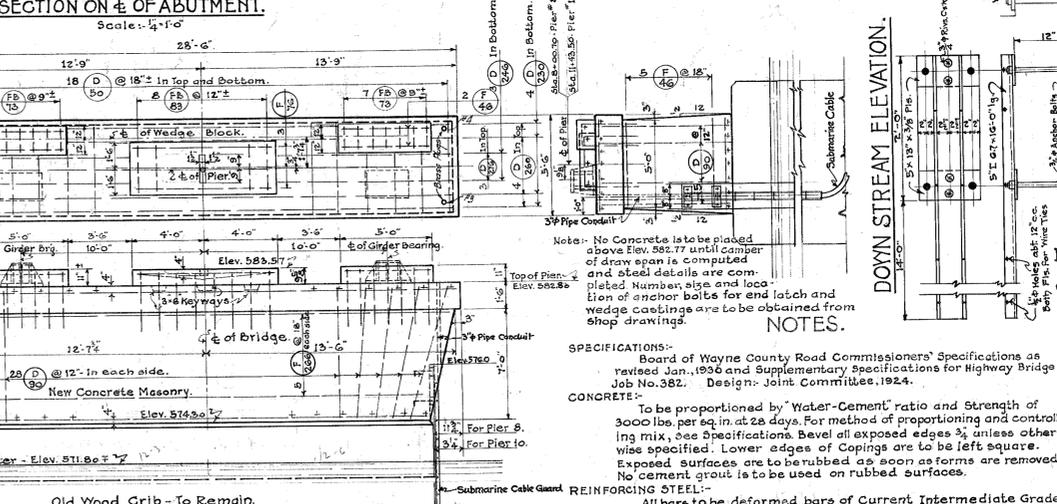
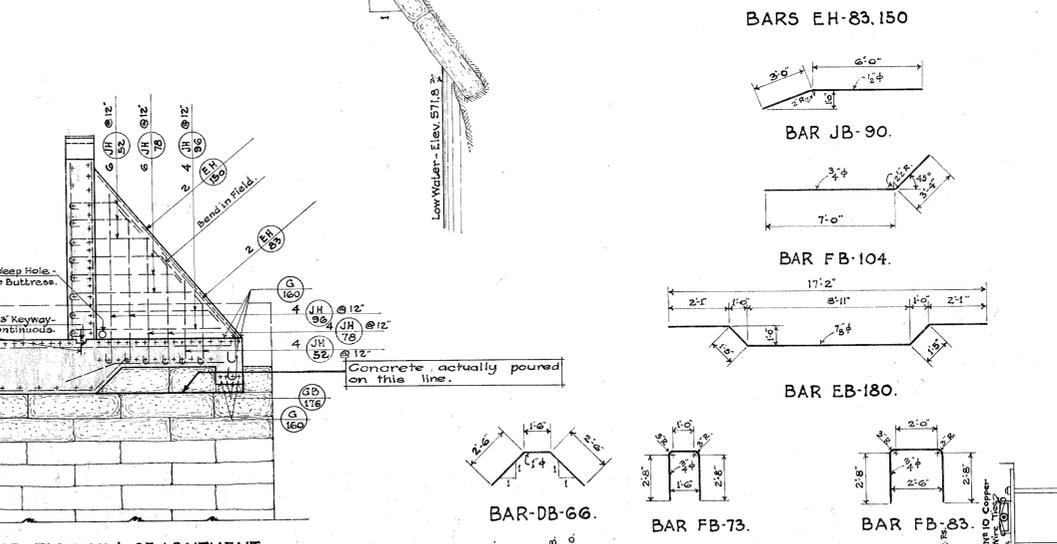
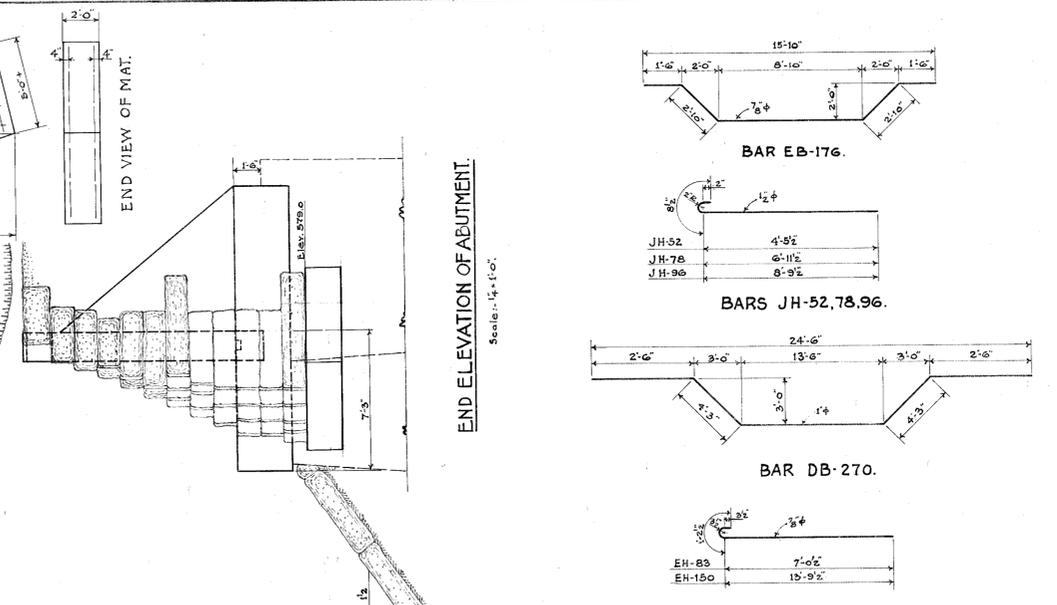
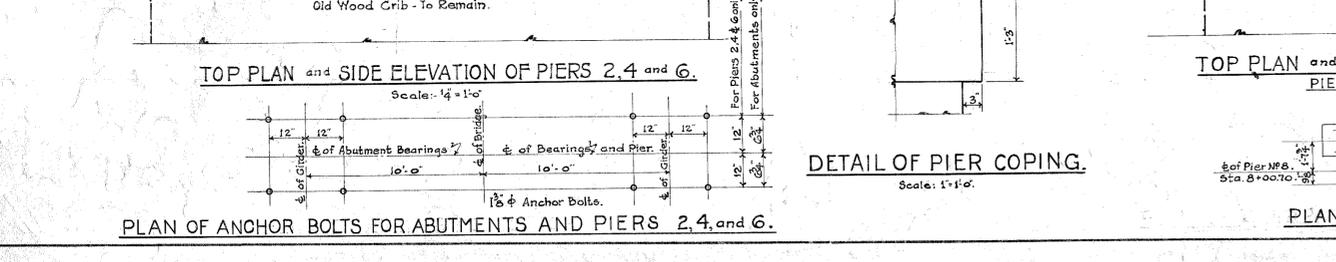
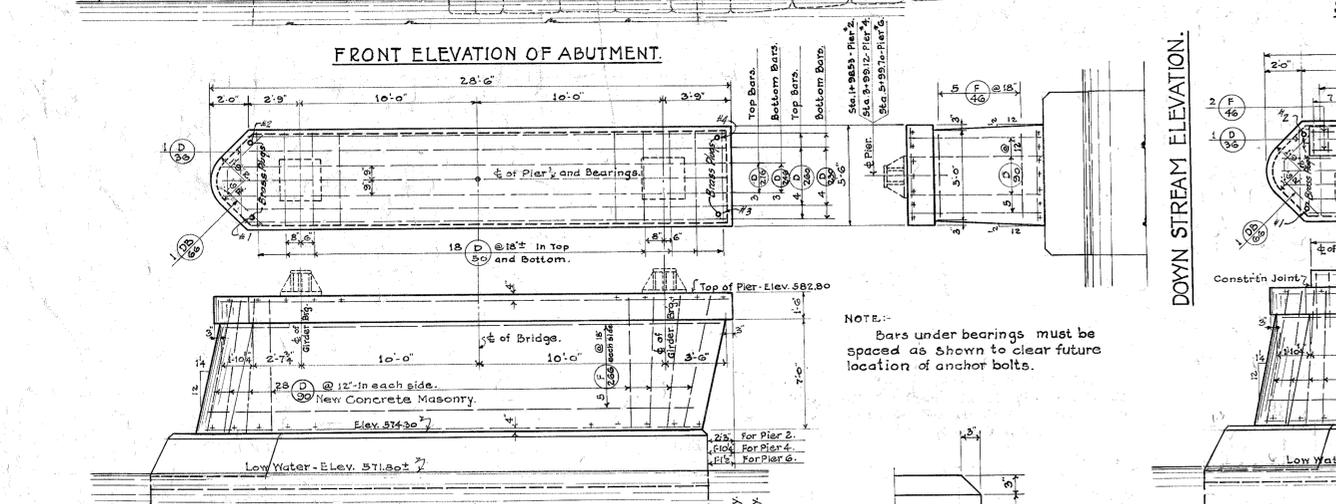
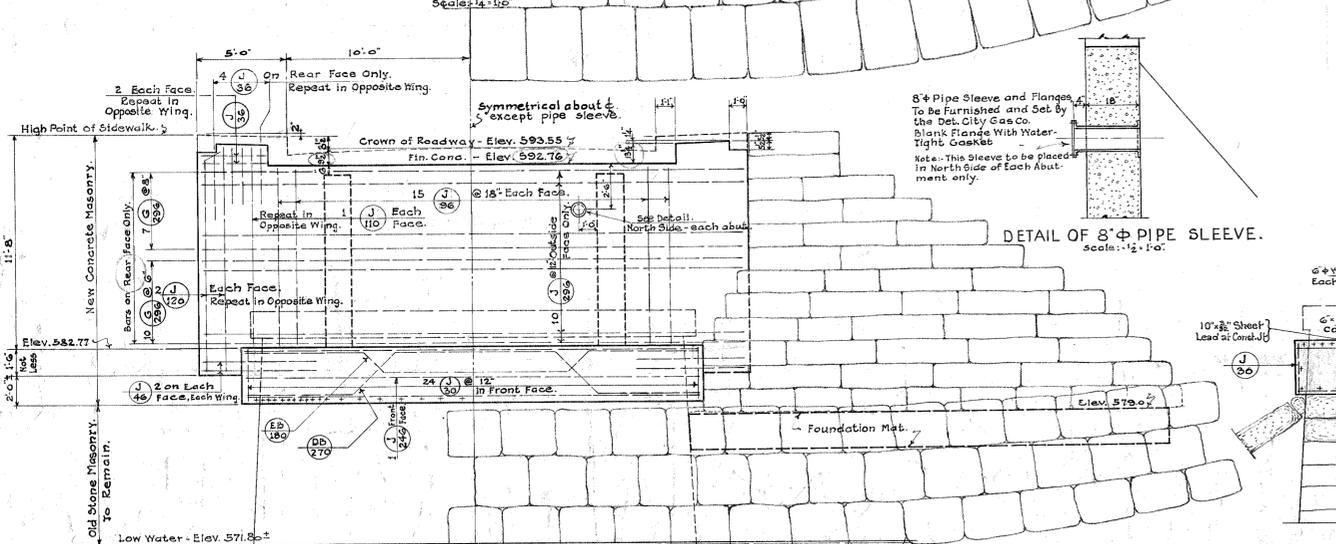
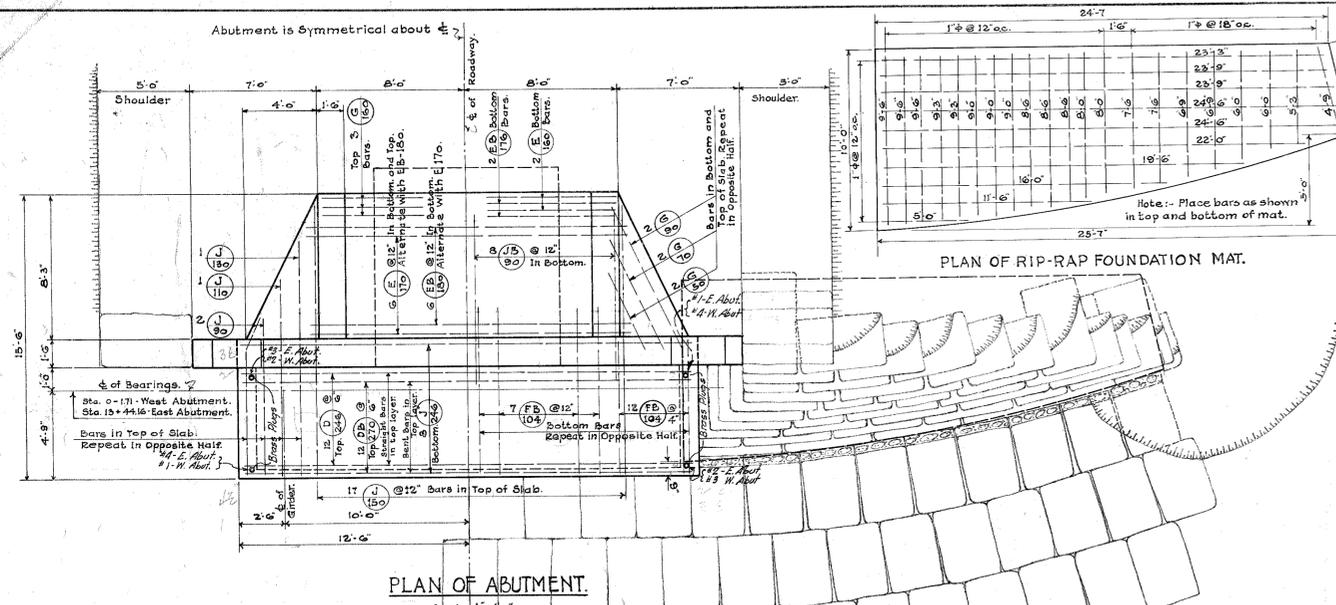
VAN HORN ROAD
 TRENTON CHANNEL BRIDGE
 TO
 GROSSE ISLE
 BRIDGE - 51 OF 82-7-32.

DESIGNED BY: *W. J. Shupline* CHECKED BY: *W. J. Shupline*
 DATE: March 3, 1930. SCALE: As Noted.

JOB 382.
 ISSUE No. 7
 DATE: 3/3/1930

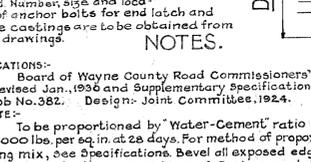
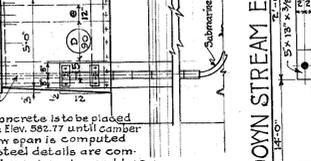
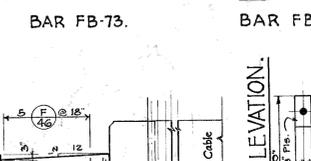
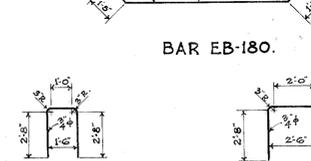
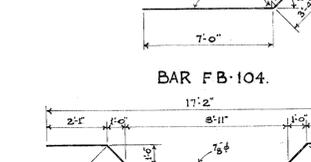
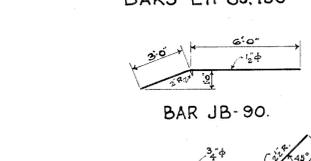
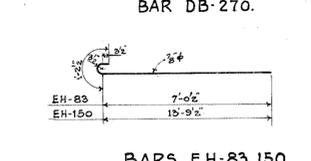
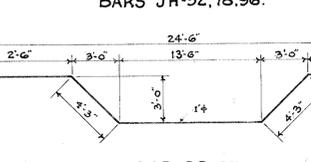
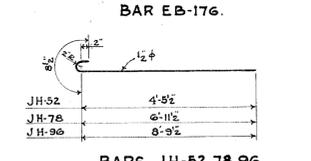
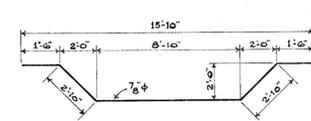
APPROVED: *W. J. Shupline* Engineer
 SHEET No. 8

JOB #382-B13



END ELEVATION OF ABUTMENT.

Scale: 1/4" = 1'-0"



BILL OF REINFORCING BARS.

MARK NUMBER	SIZE	LENGTH	REMARKS
J-30	24	1/2"	3'-0" Vert. in Front Face of Toe.
J-246	1	1/2"	24'-6" Hor. Long. in Front Face of Toe.
D-246	1	1/2"	24'-6" Hor. Top of Toe.
DB-270	12	1/4"	27'-0" Hor.
FB-104	36	3/4"	10'-4" Hor. Cross in Bottom of Toe.
J-46	8	1/2"	4'-6" Hor. Down to Wing Wall.
J-246	8	1/2"	24'-6" Hor. Long. in Bottom of Toe.
J-150	17	1/2"	15'-0" Hor. Cross Top
J-90	4	1/2"	9'-0" Hor.
J-110	2	1/2"	11'-0" Hor.
J-130	2	1/2"	13'-0" Hor.
G-160	3	5/8"	16'-0" Hor. Long. in Top of Key Beam.
E-160	2	7/8"	16'-0" Hor. - Bott.
EB-176	2	7/8"	17'-0" Hor. Bent up in
JB-90	16	1/2"	9'-0" Hor. Cross in Bottom of Heel.
G-90	2	5/8"	9'-0" Hor. Diagonal.
G-70	2	5/8"	7'-0" Hor.
G-50	2	5/8"	5'-0" Hor.
G-30	2	5/8"	3'-0" Hor. Top
G-70	2	5/8"	7'-0" Hor.
G-50	2	5/8"	5'-0" Hor.
E-170	12	7/8"	17'-0" Hor. Long. Bottom and Top
EB-180	6	7/8"	18'-0" Hor. Bent up from Bottom.
J-120	4	1/2"	12'-0" Vert. in Front Face of Stem.
J-110	2	1/2"	11'-0" Vert.
J-96	15	1/2"	9'-6" Vert. Rear
J-120	4	1/2"	12'-0" Vert.
J-110	2	1/2"	11'-0" Vert.
J-96	15	1/2"	9'-6" Vert.
G-296	20	3/4"	29'-6" Hor.
J-296	10	1/2"	29'-6" Hor. Front
J-36	8	1/2"	3'-6" Hor. Wing
J-36	8	1/2"	3'-6" Hor.
EH-150	4	7/8"	15'-0" Diagonal - 2 Bars in each Pile.
EH-83	4	7/8"	8'-3" Diagonal - 2
JH-52	12	1/2"	5'-2" Hor. - 6
JH-78	12	1/2"	7'-8" Hor. - 6
JH-96	8	1/2"	9'-6" Hor. - 4
JH-52	8	1/2"	5'-2" Vert. - 4
JH-78	8	1/2"	7'-8" Vert. - 4
JH-96	8	1/2"	9'-6" Vert. - 4
D-90	305	1"	9'-0" Vert. in all faces of Piers.
F-46	25	3/4"	4'-6" Hor. in Down Stream Face of Piers.
D-36	10	1"	3'-6" 2 Each in Nose of All Piers.
DB-66	10	1"	6'-6" 2
D-276	15	1"	27'-6" 3 - Top
D-260	20	1"	26'-0" 4 -
D-50	180	1"	18'-0" and Bottom. All Piers.
FB-73	28	3/4"	7'-3" In Tops of Rest Piers Only.
FB-83	16	3/4"	8'-3" 2
F-46	8	3/4"	4'-6" 2
F-76	6	3/4"	7'-6" 2
D-246	15	1"	24'-6" 3 Each in Bottom of All Piers.
D-230	20	1"	23'-0" 4
F-266	50	3/4"	26'-6" Hor. in side Faces of Piers

QUANTITIES.

WEST ABUTMENT	CU. YDS.	POUNDS.
CONCRETE.	31 in Abutment	3276 in Abutment
REINFORCING STEEL.	31 in Found Mat.	3840 in Found Mat.
DRY WALLS AND RIP RAP	125.	
EAST ABUTMENT.		
CONCRETE.	38 in Abutment.	3276 in Abutment
REINFORCING STEEL.	31 in Found Mat.	3840 in Found Mat.
DRY WALLS AND RIP RAP	125.	
PIERS Nos. 2, 4 and 6.		
CONCRETE. (3 Piers)	182.7 Tremie.	
REINFORCING STEEL.	137.5 Dry.	10165
REST PIERS Nos. 8 and 10.		
CONCRETE. (2 Piers)	155.3 Tremie.	
REINFORCING STEEL.	93.9 Dry.	7380

Total Concrete: 4114 CuYds. Dry - 2859 CuYds. Tremie.
Total Dry Walls & Rip Rap: 250 Cu Yds.
Total Reinforcing Steel: 36165 Lbs.

REVISIONS

BOARD OF WAYNE COUNTY ROAD COMMISSIONERS
DETROIT, MICHIGAN.

EDWARD N. HINES, CHAIRMAN
JOHN S. HAGGERTY, COMMISSIONER
WILLIAM F. BUTLER, COMMISSIONER

VAN HORN ROAD
TRENTON CHANNEL BRIDGE
TO
GROSSE ISLE
BRIDGE - B1 OF 82-7-32

ABUTMENTS & REBUILT PIERS.
#2-4-6-8 & 10

DESIGNED BY: M.S. DRAWN BY: M.S. CHECKED BY: DAN
DATE: March 3, 1930. SCALE: AS NOTED

JOB 382.
ISSUE No. 1
DATE: 1930

APPROVED: [Signature] Engineer Manager
Reg. Civ. Eng. 9

NOTES:

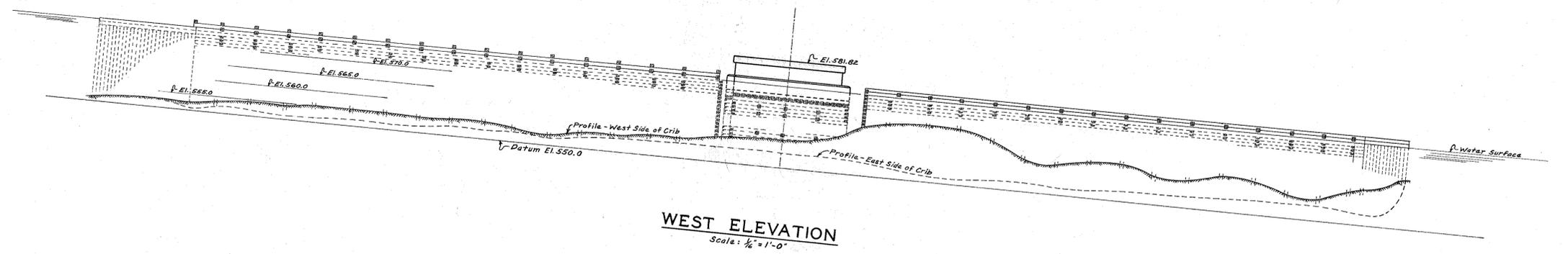
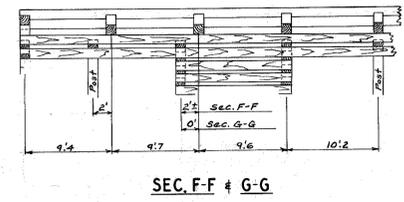
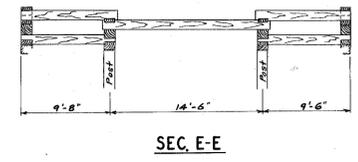
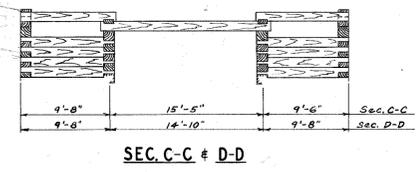
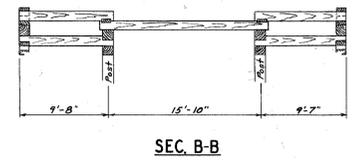
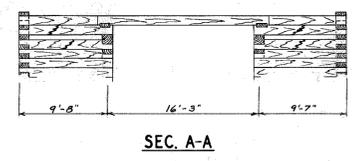
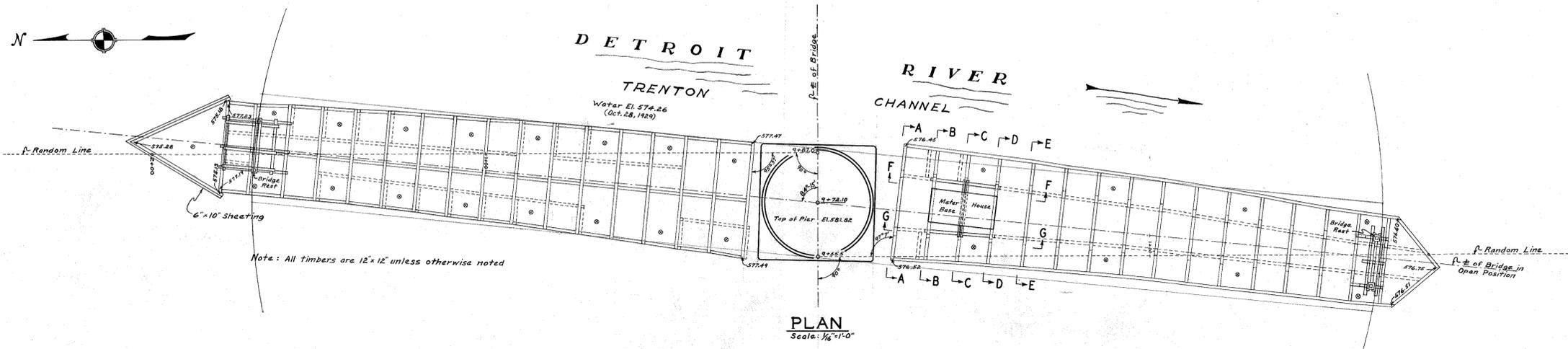
1. No concrete is to be placed above Elev. 582.77 until compair of draw span is completed and steel details are completed. Number, size and location of anchor bolts for and location of wedge castings are to be obtained from shop drawings.

2. To be proportioned by "Water-Cement" ratio and Strength of 3000 lbs. per sq. in. at 28 days. For method of proportioning and controlling mix, see Specifications. Bevel all exposed edges 3/4" unless otherwise specified. Lower edges of Copings are to be left square. Exposed surfaces are to be rubbed as soon as forms are removed. No cement grout is to be used on rubbed surfaces.

3. All bars to be deformed bars of Current Intermediate Grade as specified in the A.S.T.M. standard Specifications for Billet-Steel Reinforcement Bars. (Serial Designation A-15-14). All bars to be securely tagged before being shipped to the job. Bars shall be securely wired together at each intersection. No concrete is to be placed until all bars to be encased are securely fastened in place.

4. Construction joints shall be located as shown, and no others will be allowed except on the approval of the Engineer. No horizontal construction joints will be allowed except at the top of the footing and as noted.

5. Buttresses and back of abutment to be painted one coat of Approved Asphalt Waterproofing.



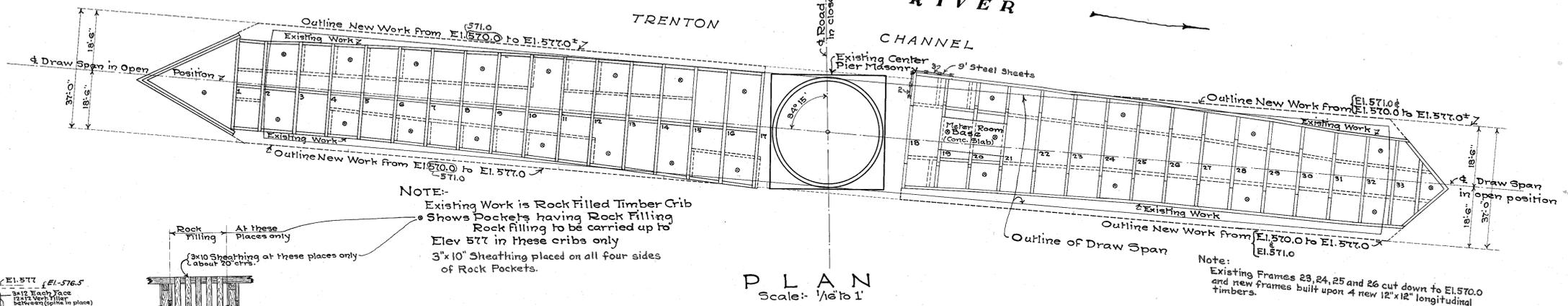
NOTE: ⊗ = Rock Filled Crib
See Field Book #136 & Field Data in General Folder

SEE SHEET 19 FOR
NEW TYP BUILT IN 1935

REVISIONS <small>Checkers Changes G.S.P. 11-21-31-1931</small>	BOARD OF WAYNE COUNTY ROAD COMMISSIONERS DETROIT, MICHIGAN. EDWARD N. HINES, CHAIRMAN JOHN S. HAGGERTY, COMMISSIONER WILLIAM F. BUTLER, COMMISSIONER
	VAN HORN ROAD TRENTON CHANNEL BRIDGE TO GROSSE ISLE <small>BRIDGE - B1 OF 82-7-32</small>
	PROTECTION CRIB
	<small>DESIGNED BY: DRAWN BY: G.M.P. CHECKED BY: R.A.N. 11-22-31</small> <small>DATE: 3-6-31 SCALE: 1/8" = 1'-0" - except as shown</small> <small>CORRECT: <i>[Signature]</i> Rep. Civ. Eng.</small> <small>APPROVED: <i>[Signature]</i> Rep. Civ. Eng.</small>
JOB 382 ISSUE No. DATE:	SHEET No. 18

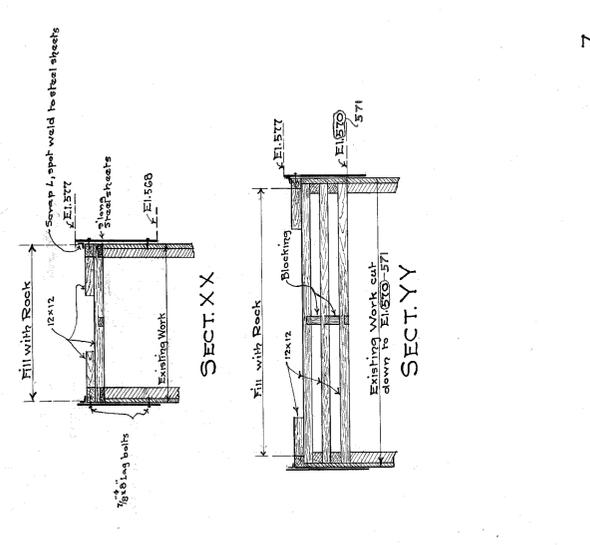
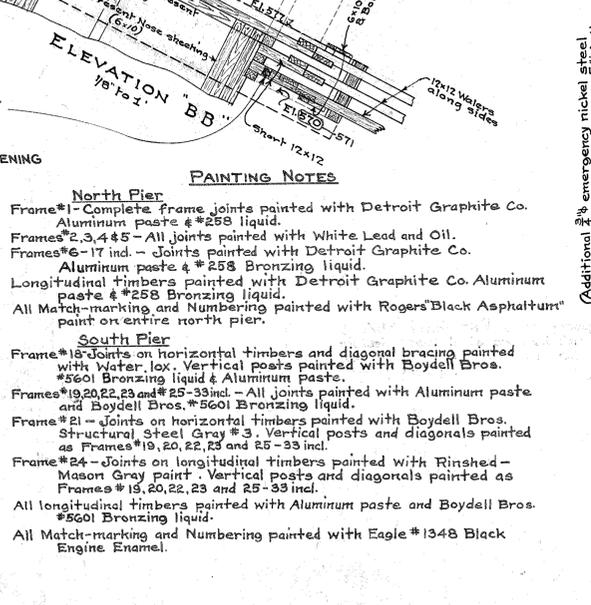
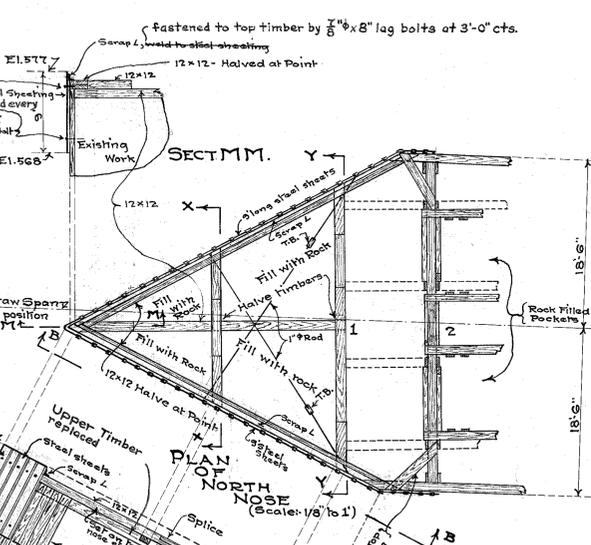
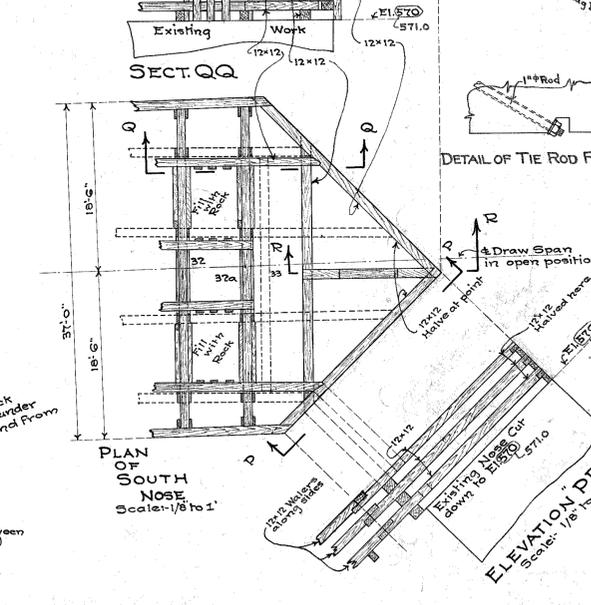
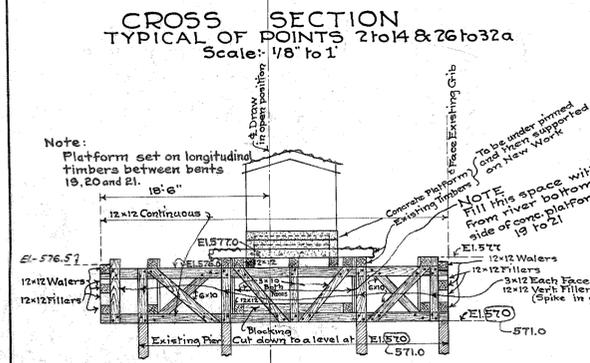
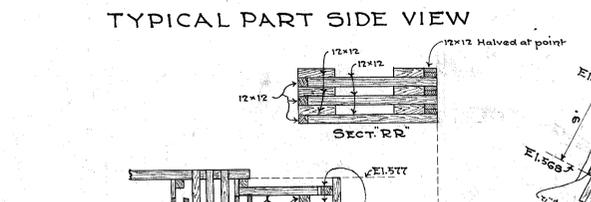
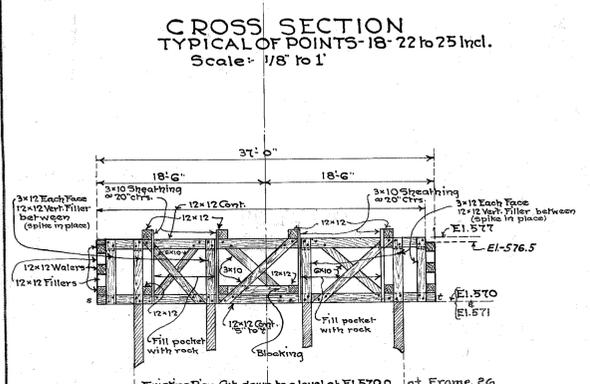
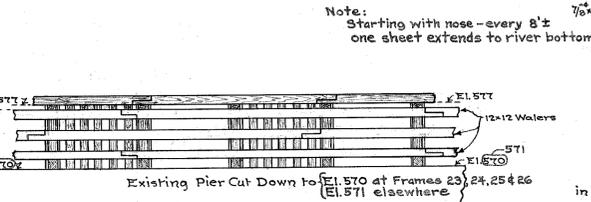
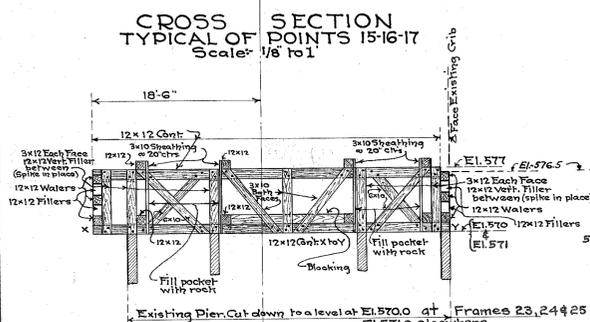
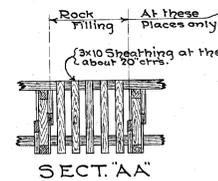
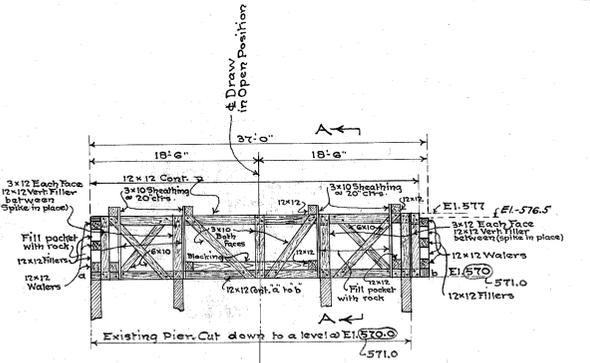
JOB# 382-B25

DETROIT RIVER TRENTON CHANNEL



NOTE:
Existing Work is Rock Filled Timber Crib
Shows Pockets having Rock Filling
Rock filling to be carried up to
Elev 577 in these cribs only
3' x 10' Sheathing placed on all four sides
of Rock Pockets.

Note:
Existing Frames 23, 24, 25 and 26 cut down to El. 570.0
and new frames built upon 4 new 12' x 12' longitudinal
timbers.



NOTES:
- Material to be Fir to conform with Sections 214, 218 of Grading Rules of the West Coast Lumberman's Association.
- Ends of Timbers, claps, cuts, bolt holes and all contact surfaces to receive a brush coat of hot Carbolinum or other approved preservative.

BILL OF TIMBER AS ORDERED				
ITEM	QUANTITY	SIZE	DESCRIPTION	
1	30888	Bd. Ft.	12" x 12" x 22'	Fir Timber
2	4320	" "	12" x 12" x 24'	" "
3	2160	" "	12" x 12" x 30'	" "
4	31416	" "	12" x 12" x 34'	" "
5	25056	" "	12" x 12" x 36'	" "
6	17328	" "	12" x 12" x 38'	" "
7	3840	" "	12" x 12" x 40'	" "
8	8544	" "	3" x 12" x 16'	" "
9	1500	" "	3" x 10" x 12'	" "
10	7200	" "	3" x 10" x 16'	" "
11	800	" "	3" x 10" x 20'	" "
12	6600	" "	6" x 10" x 10'	" "

BILL OF IRON				
No	ITEM	DIA.	LENGTH OF BOLT THROAT	REMARKS
255	Bolt - Sq. Hd. & Nut	3/4"	1'-2"	3"
765	" " " " " "	"	1'-5"	3"
960	" " " " " "	"	1'-8"	3"
1070	" " " " " "	"	2'-2"	3"
100	Drift Bolts	3/4"	1'-1"	One end pointed
215	Lag Bolts - Sq. Hd.	7/8"	0'-8"	Gimlet point
10000	60 d Wire Spikes			(11-100# Kegs)
5000	3" x 3" x 3/8" Plate Washers (for 3/4" Bolts)			(1/8" Hole)
1,100	Ogee Cast Iron Washers (for 3/4" Bolts)			
3,460	#3 TECO Toothed Rings for 3/4" Bolts			Timber Eng. Co.
10	Nickel Steel Bolts & Nuts	5/8"	1'-6"	6" each end
6	" " " " " "	"	2'-0"	8" each end
6	" " " " " "	"	2'-6"	10" each end
2	Tie Rods	1"		29'± each
	Sheet Piling (Scrap Steel Sheeting)			680 Lin. Ft.±
	6" x 6" x 3/4" Scrap L			80 Lin. Ft.±

ESTIMATED QUANTITIES
Additional Rock Filling 487 cu yds (measured)
Timber 137,492 F.B.M.

SCHEME "D"

BOARD OF
WAYNE COUNTY ROAD COMMISSIONERS
DETROIT, MICHIGAN.

EDWARD N. HINES, CHAIRMAN
JOHN S. HAGGERTY, COMMISSIONER
WILLIAM F. BUTLER, COMMISSIONER

**VAN HORN ROAD
TRENTON CHANNEL BRIDGE
TO
GROSSE ISLE**
BRIDGE-B1 OF 82-T-32

REMODELING PROTECTION PIER

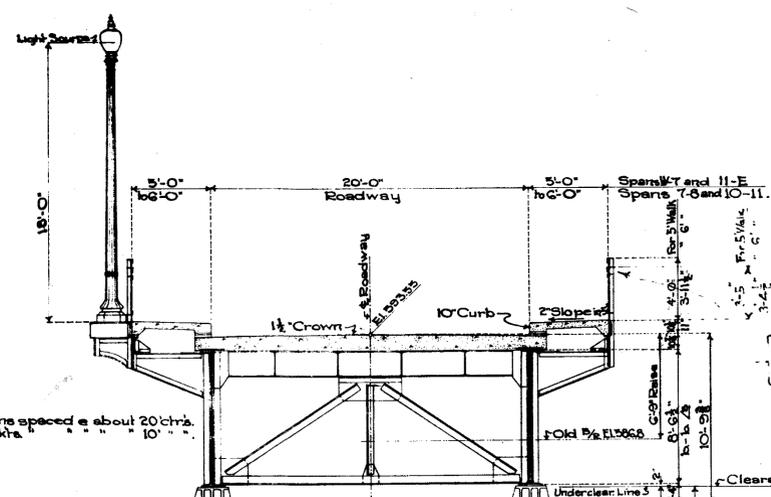
JOB 382
Issue No: _____

DESIGNED BY: W. H. S. DRAWN BY: W. H. S. CHECKED BY: J. W. C.
DATE: 2-1-1933 SCALE: As Noted

CORRECT: _____ BRIDGE ENGINEER: _____ REG. CIV. ENG.
APPROVED: _____ ENGINEER MANAGER: _____ REG. CIV. ENG.

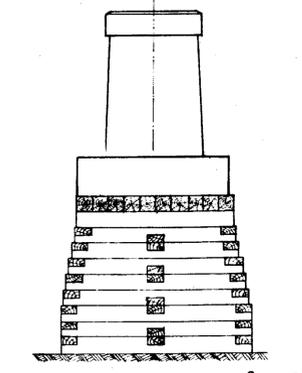
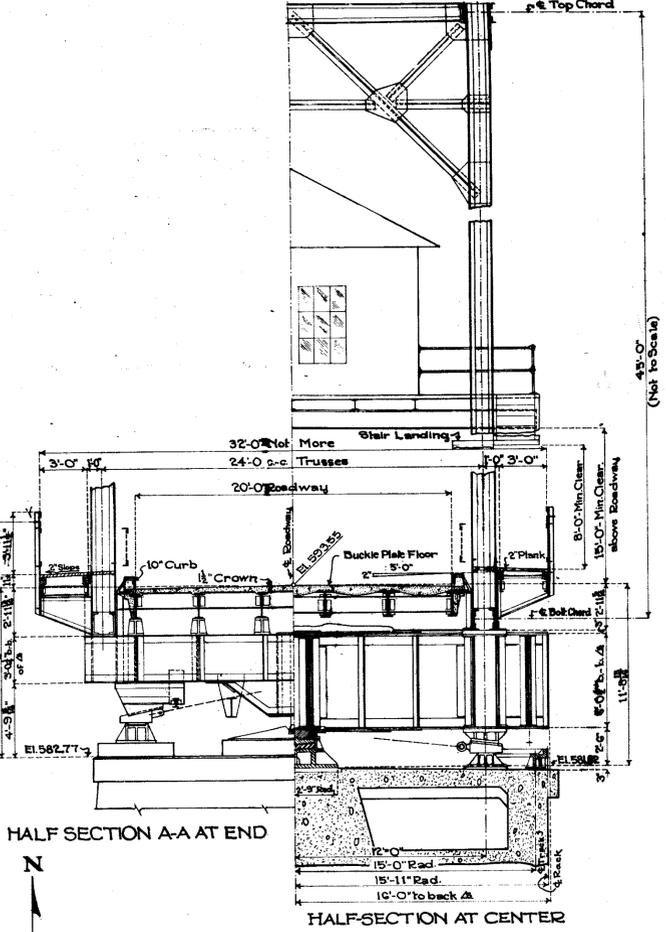
SHEET No. 19

JOB # 382-B26

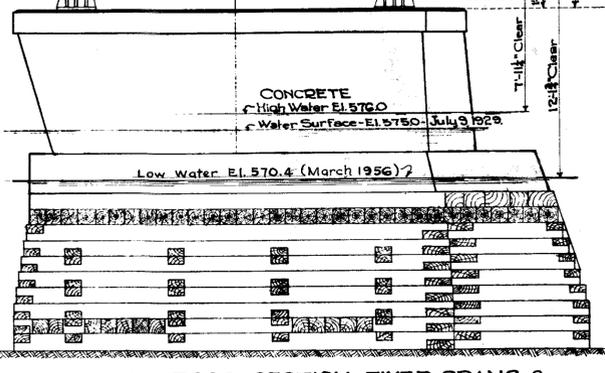


Field Alteration, Top L lowered to new location shown in Blue, Aug. 1933

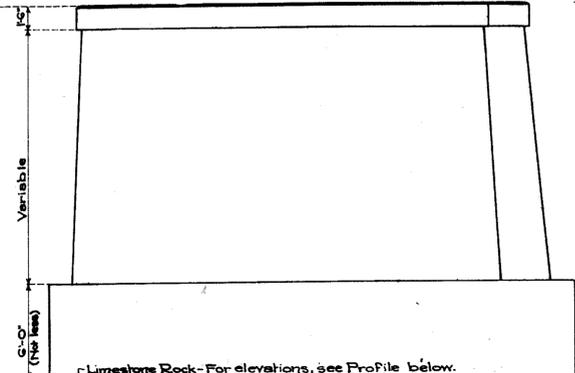
Field Alteration, Top L lowered to new location shown in Blue, Aug. 1933



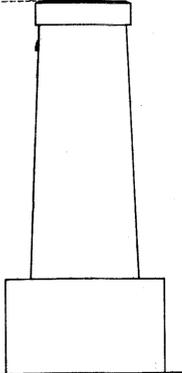
SOUTH END ELEVATION OF PIER Scale 1/2" = 1'-0"



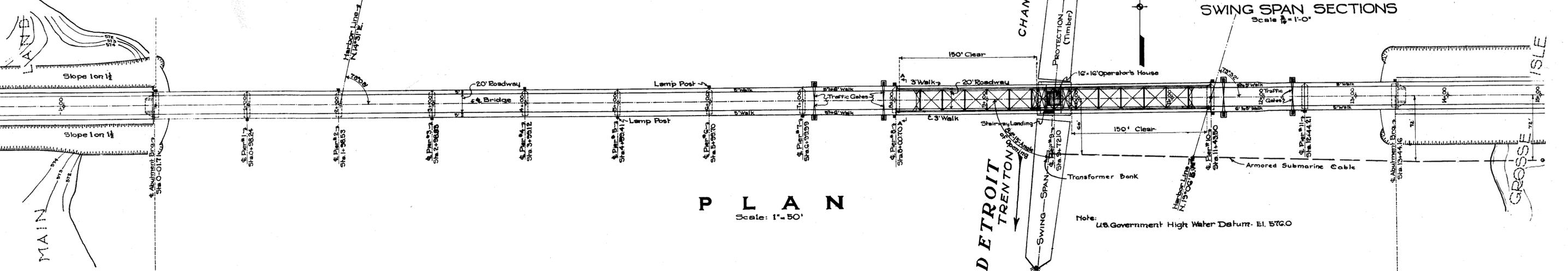
TYPICAL CROSS SECTION FIXED SPANS & SIDE ELEVATION - PIERS 2, 4, 6, 8 & 10. Scale 1/2" = 1'-0"



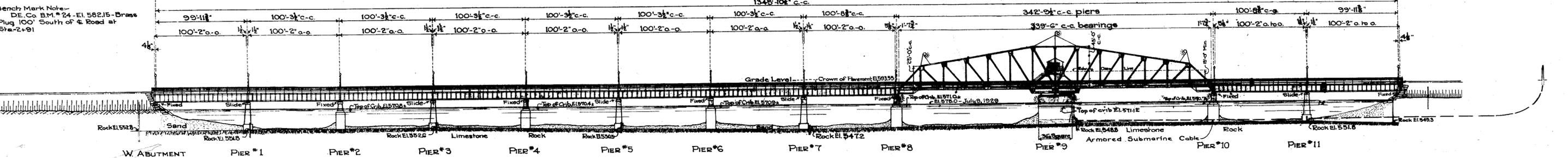
SIDE ELEVATION - PIERS 1, 3, 5, 7, & 11 Scale 1/2" = 1'-0"



END ELEVATION Scale 1/2" = 1'-0"



PLAN Scale 1" = 50'



PROFILE Scale 1" = 50'

1958 REPAIRS

GROSSE ISLE PARKWAY BRIDGE over TRENTON CHANNEL (DETROIT RIVER) EXISTING BRIDGE GENERAL DRAWING

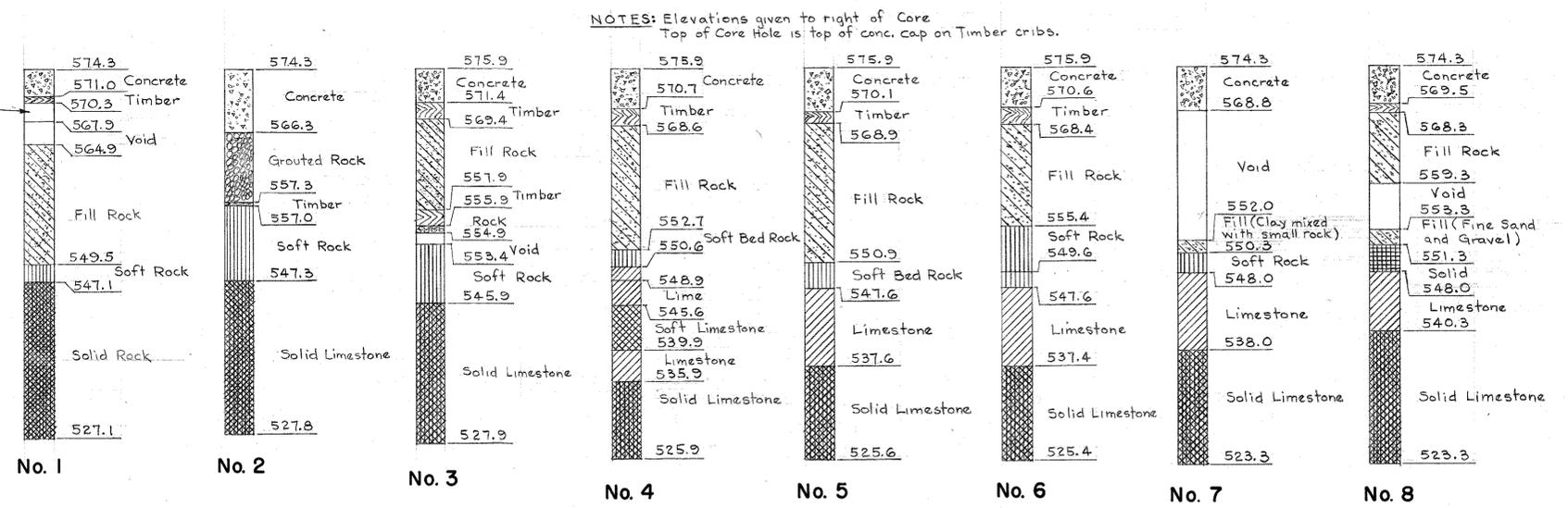
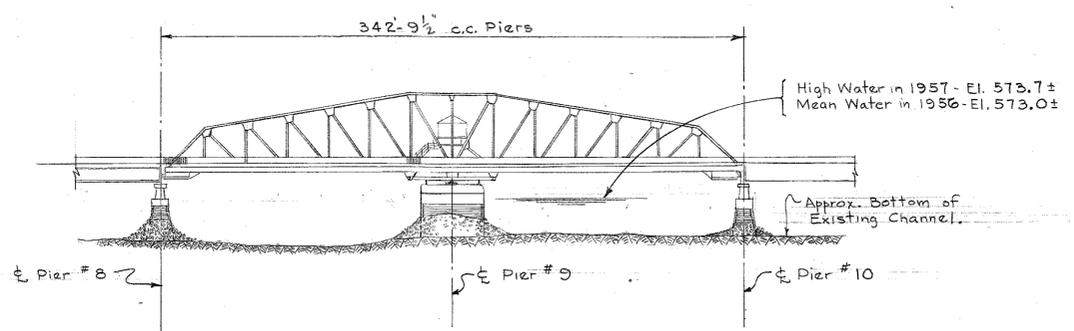
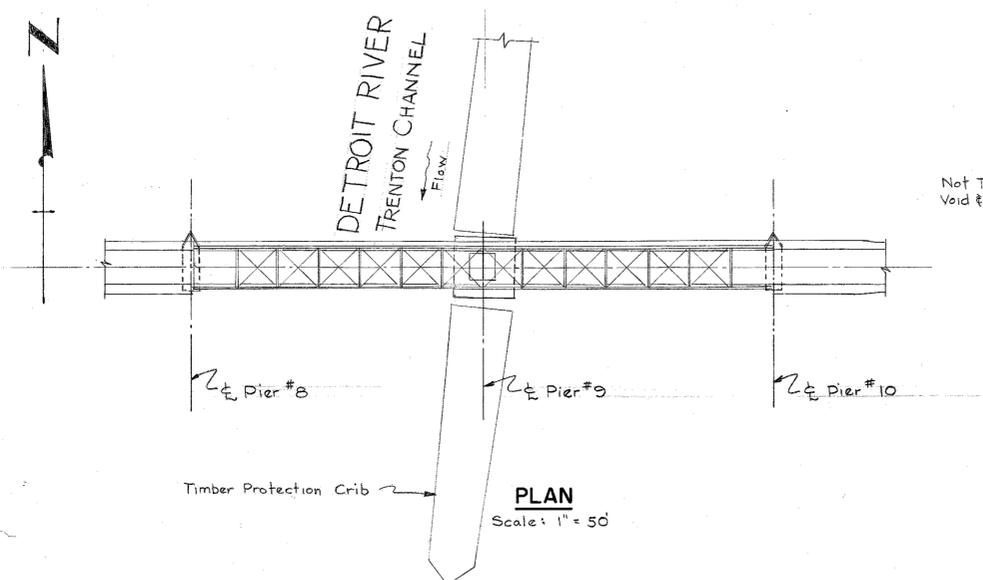
COUNTY JOB 382 SHEET NO. B-52

APPROVED [Signature] COUNTY HIGHWAY ENGINEER

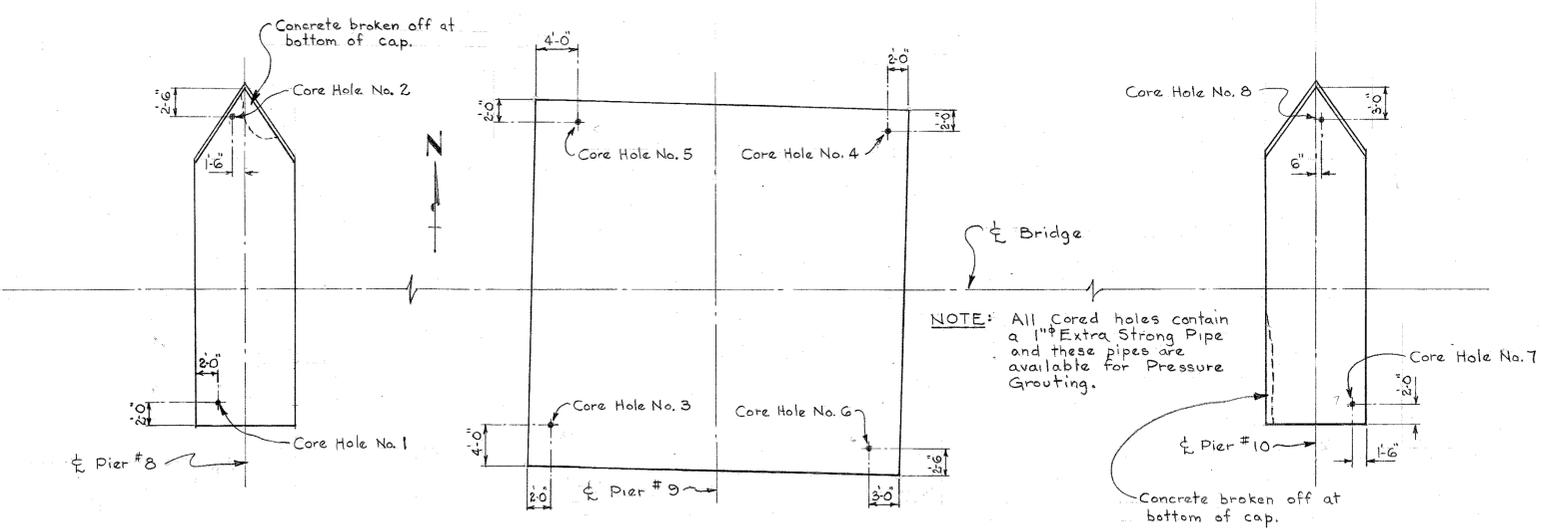
WAYNE COUNTY ROAD COMMISSIONERS BOARD OF DETROIT, MICHIGAN

ISSUE NO. 1 DATE 10-31-57

Job 382-B52 Job 382-B52



CORE HOLES



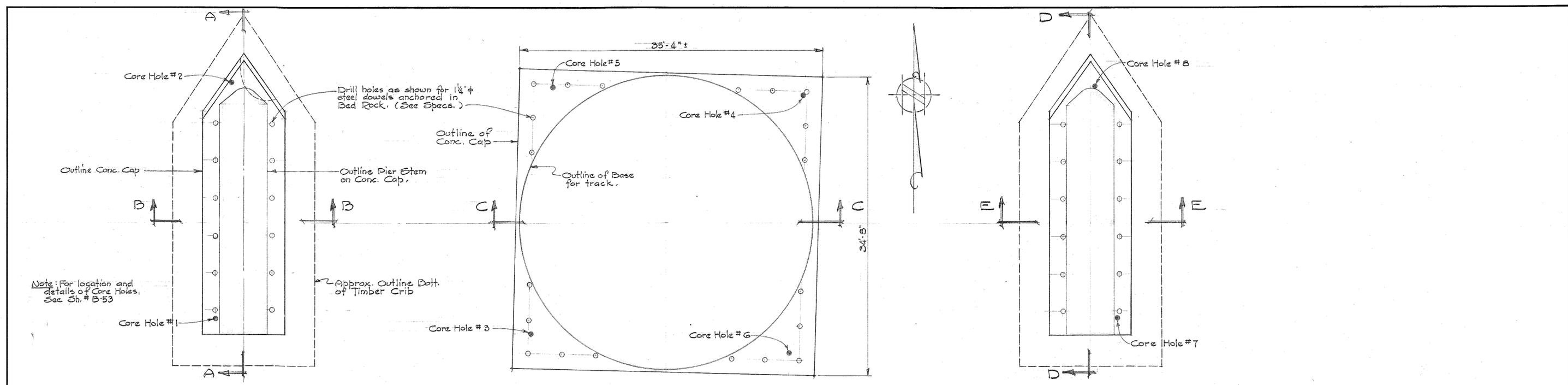
**PLAN OF CONCRETE CAPS AT PIERS #8, #9 & #10
SHOWING LOCATION OF CORE HOLES**

Scale: 1/8" = 1'-0"

<p>REVISIONS</p>		<p>SQUAD LEADER <i>A.W. Johnson</i></p>	<p>APPROVED <i>F. H. ...</i> ENGINEER OF BRIDGES AND STRUCTURES</p>	<p>BOARD OF WAYNE COUNTY ROAD COMMISSIONERS DETROIT, MICHIGAN</p>	<p>1958 REPAIRS GROSSE ISLE PARKWAY BRIDGE over TRENTON CHANNEL (DETROIT RIVER) STABILIZATION & REPAIRS TO ROCK-FILLED PIERS #8, #9 AND #10</p>	<p>COUNTY JOB 382</p>
<p>DRAWN BY <i>D.K. ...</i></p>	<p>CHECKED BY <i>R.W. ...</i></p>	<p>DATE 10-12-57</p>	<p>APPROVED <i>J.W. ...</i> COUNTY HIGHWAY ENGINEER</p>	<p>MICHAEL J. O'BRIEN</p>	<p>ISSUE NO. 1 DATE 10-31-57</p>	<p>SHEET NO. B-53</p>

Job 382-B53

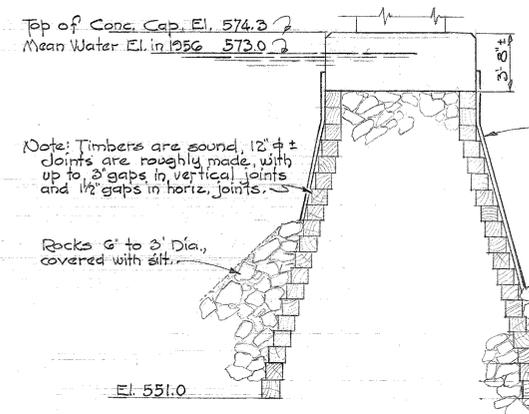
Job 382-B53



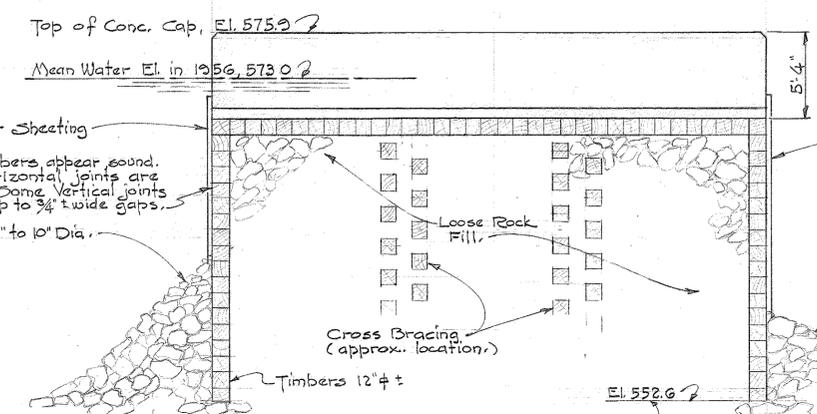
PLAN PIER NO. 8

PLAN PIER NO. 9

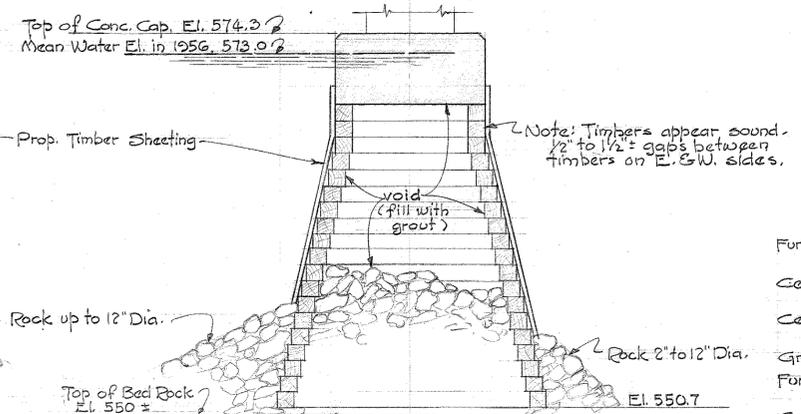
PLAN PIER NO. 10



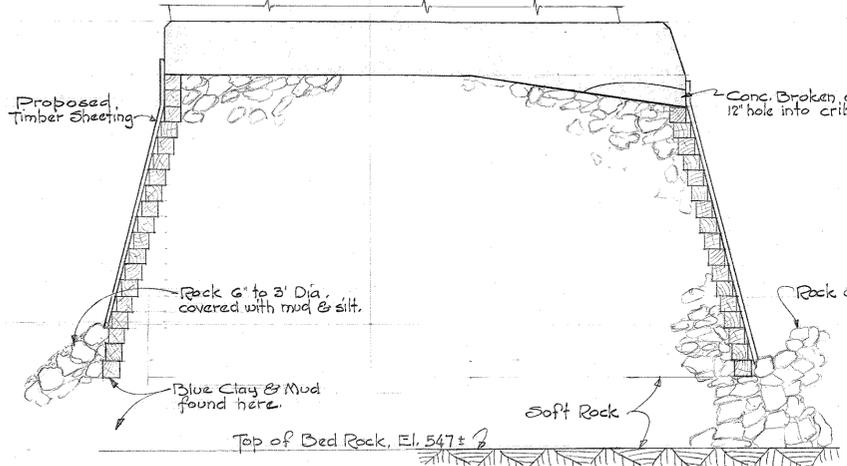
SECTION BB



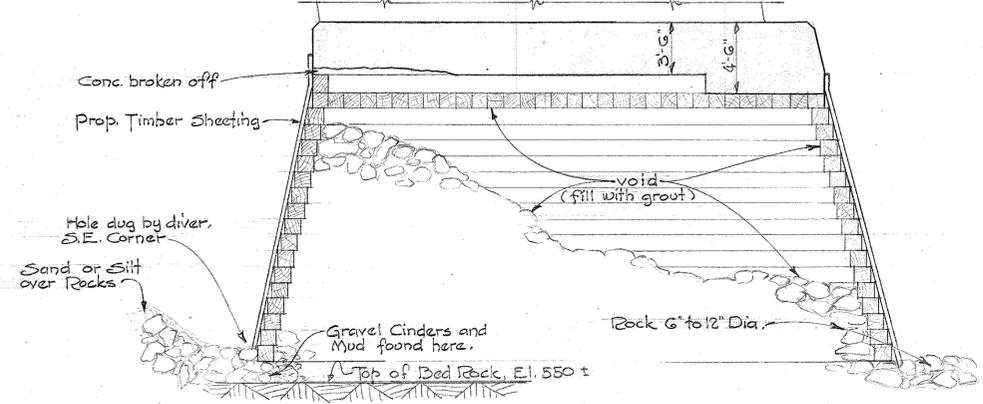
SECTION CC



SECTION EE



SECTION AA



SECTION DD

GENERAL NOTES

Contractor to repair pier caps with Grouted Aggregate Concrete where old concrete has been broken off or disintegrated. Existing core holes can be used for pressure grouting. Additional holes shall be drilled for grouting operations, and all voids above El. 536.0 shall be filled with grout.

Anchor dowels to extend 8" into bedrock or to El. 536.0 or deeper. The Contractor shall determine the usable lengths of anchor bars necessary, and shall use couplings to develop the full strength of the bar.

QUANTITIES

Furnishing and Placing Timber Sheeting	5800	S.F.
Cement Base Pressure Grout (Up to 3,200 Cu. Ft.)	3200	Cu. Ft.
Cement Base Pressure Grout (Over 3,200 Cu. Ft.)	1000	Cu. Ft.
Grouted Aggregate Concrete	15	Cu. Ft.
Furnishing and Placing Anchor Dowels	7920	Lbs.
Cold Weather Protection		Lump Sum

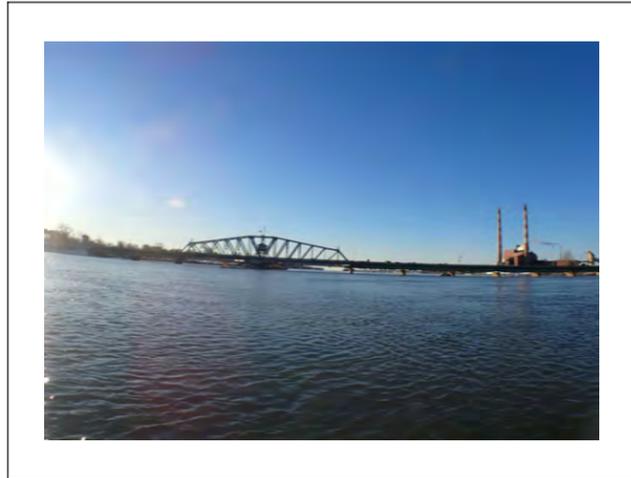
See Field Sketch # 1 & 2 in General Computation Folder for Grouting Pump Plant & Method of Sheeting used.

Scale 3/16" = 1'-0"

<p>1958 REPAIRS</p> <p>GROSSE ISLE PARKWAY BRIDGE over TRENTON CHANNEL (DETROIT RIVER)</p> <p>STABILIZATION & REPAIRS TO ROCK-FILLED PIERS *8, *9 AND *10 (CONT'D.)</p>		<p>BOARD OF</p> <p>WAYNE COUNTY ROAD COMMISSIONERS</p> <p>DETROIT, MICHIGAN</p>	<p>COUNTY JOB</p> <p>382</p> <p>SHEET NO.</p> <p>B-54</p>
<p>REVISIONS</p>	<p>DRAWN BY: <i>RAV. MARTIN</i></p> <p>CHECKED BY: <i>D.K. COMPTON</i></p> <p>DATE: 10-24-57</p>	<p>APPROVED: <i>[Signature]</i></p> <p>ENGINEER OF BRIDGES AND STRUCTURES</p>	<p>ISSUE NO. 1</p> <p>DATE 10-31-57</p>
<p>TRACED BY: <i>[Signature]</i></p> <p>CHECKED BY: <i>[Signature]</i></p> <p>DATE: <i>[Signature]</i></p>		<p>APPROVED: <i>[Signature]</i></p> <p>COUNTY HIGHWAY ENGINEER</p>	
<p>CORRECT</p> <p><i>[Signature]</i></p> <p>ENGINEER OF DESIGN, STRUCTURES AND EXPRESSWAYS</p>		<p>MICHAEL J. O'BRIEN</p> <p>WILLIAM E. KREGER</p> <p>CHARLES L. WILSON</p>	

Job 382-B52 Job 382-B54

WAYNE COUNTY DEPT. OF PUBLIC SERVICES
 CONSTRUCTION PLANS FOR PROPOSED PIER REPAIRS OF
GROSSE ILE PARKWAY BRIDGE
 BRIDGE NO. 382, SN 12006
 TRENTON AND GROSSE ISLE TWP., MI



INDEX OF DRAWINGS

SHEET NO.	SHEET TITLE
T-01	TITLE SHEET
G-01	GENERAL PLAN & ELEVATION
G-02	GENERAL NOTES
S-01	PIER 2 REPAIRS
S-02	PIER 4 REPAIRS
S-03	PIER 6 REPAIRS
S-04	PIER 8 REPAIRS
S-05	PIER 9 REPAIRS
S-06	PIER 10 REPAIRS
S-07/10	PIER REPAIR DETAILS

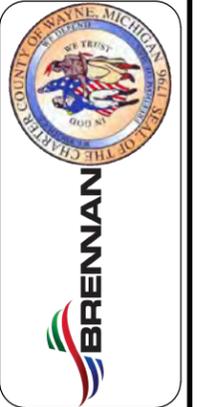
OWNER:
 WAYNE COUNTY DEPT. OF
 PUBLIC SERVICES
 400 MONROE ST.
 3RD FLOOR
 DETROIT, MICHIGAN 48226

CLIENT:
 J.F. BRENNAN CO. INC.
 818 BAINBRIDGE ST.
 LA CROSSE, WI 54603
 608-784-7173
 WWW.JFBRENNAN.COM

CIVIL ENGINEER:
 524 E. LUDINGTON ST
 SUITE 202
 ESCANABA, MI 49829
 906-285-6500
 WWW.COLLINSENGR.COM

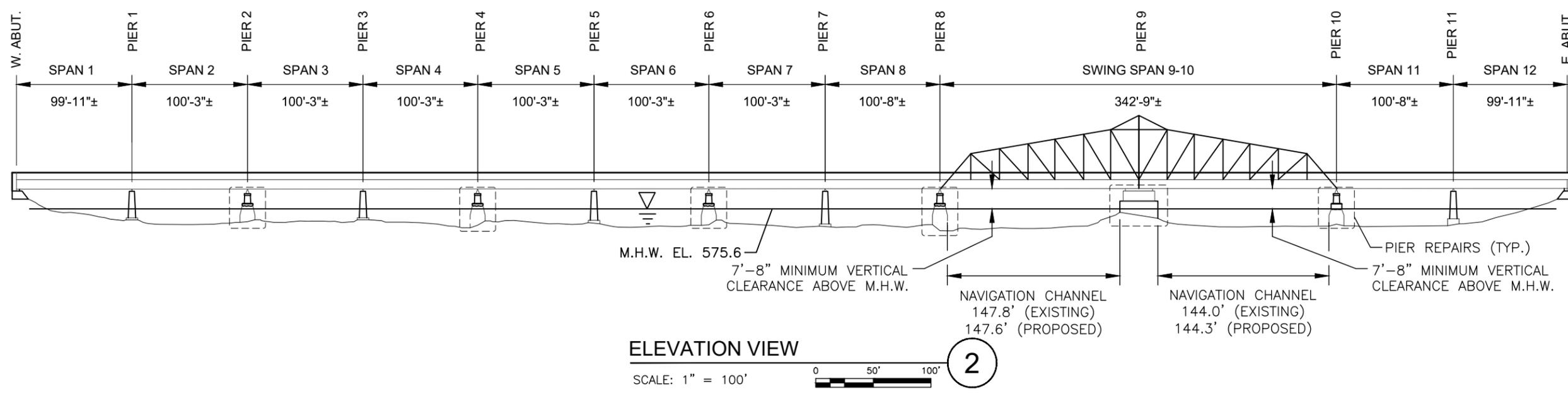
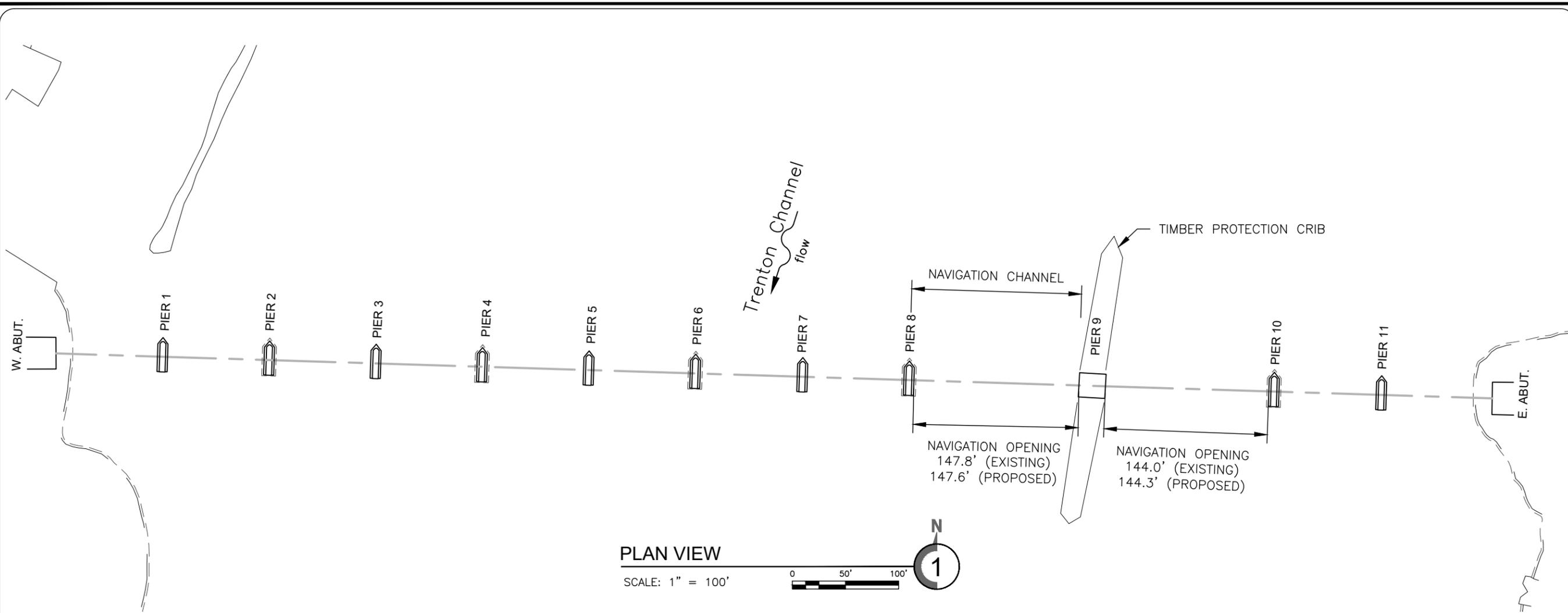


COLLINS ENGINEERS & ENGINEERS
 524 E. Ludington St., Ste. 202
 Escanaba, MI 49829
 906-285-6500
 www.collinsengr.com



Title Sheet
Grosse Ile Parkway Bridge
Pier Repairs
 Grosse Ile, MI

CEI PROJECT
 60-12797
 DESIGNED BY:
 SJM
 DRAWN BY:
 JCG
 CHECKED BY:
 SJM
 DATE:
 4-16-21
 SHEET NO:
T-01



COLLINS ENGINEERS & ENGINEERS
524 E. Ludington St., Ste. 202
Escanaba, MI 49829
906-285-6500
www.collinsengr.com



**General Plan & Elevation
Grosse Ile Parkway Bridge
Pier Repairs**
Grosse Ile, MI

CEI PROJECT 60-12797
DESIGNED BY: SJM
DRAWN BY: JCG
CHECKED BY: SJM
DATE: 4-16-21
SHEET NO: G-01

GENERAL NOTES:

1. THE WORK COVERED BY THESE PLANS INCLUDES GROUTING THE VOIDS IN THE TIMBER CRIBS FOR PIERS #2, #4, #6, #8, #9 AND #10. THIS WORK WILL BE PERFORMED UNDER LIMITED HEADROOM.
2. CONSTRUCTION LIVE LOADING ON THE BRIDGE SUPERSTRUCTURE IS NOT PERMITTED. ALL WORK SHALL BE COMPLETED FROM THE WATER UNLESS OTHERWISE APPROVED BY WAYNE COUNTY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE STRUCTURAL INTEGRITY AND OVERALL STABILITY OF THE BRIDGE AT ALL TIMES DURING CONSTRUCTION.
4. VINYL FORMWORK SHALL BE INSTALLED ON PIERS #2, #4, #6 AND #10. STEEL FORMWORK SHALL BE INSTALLED ON PIERS #8 AND #9.
5. FABRIC FORMED CONCRETE (HYDROTEX ARTICULATING BLOCK - AB600) SHALL BE PLACED ON RIVERBED TO THE LIMITS SHOWN ON THE PLANS AT PIERS #2, #4, #6 AND #10.
6. FLOATING/SUSPENDED TURBIDITY CURTAINS OR OTHER APPROVED METHODS, SHALL BE INSTALLED AROUND THE FULL PERIMETER OF ALL PIERS DURING ALL REPAIR WORK.
7. THE CONTRACTOR SHALL LOCATE ALL ACTIVE UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED. COORDINATE ANY UTILITIES REQUIRING RELOCATION WITH WAYNE COUNTY PRIOR TO BEGINNING WORK.
8. EXCEPT AS AMENDED BY THE SPECIAL PROVISIONS OR OTHERWISE INDICATED ON THE PLANS ALL WORK SHALL BE IN ACCORDANCE WITH MICHIGAN DEPARTMENT OF TRANSPORTATION, 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION.
9. PLAN ELEVATIONS REFER TO U.S.C.G. DATUM PER EXISTING PLANS FROM 1930 BRIDGE RECONSTRUCTION.
10. WATER LEVEL IS SUBJECT TO CHANGE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING A DETERMINATION OF WATER LEVELS DURING CONSTRUCTION.
11. GROUTING OF TIMBER CRIBS AT PIERS #8, #9, AND #10 WILL REQUIRE COORDINATION WITH U.S. COAST GUARD VESSEL TRAFFIC SERVICES SARNIA, TO ENSURE WORK DOES NOT AFFECT PROPER OPERATION OF THE SWING SPAN AS REQUIRED BY THE FEDERAL CODE OF REGULATIONS. IT IS NOTED THAT THE SWING SPANS ARE CURRENTLY INOPERABLE.
12. THE COAST GUARD SHALL BE NOTIFIED OF WORK WITHIN THE NAVIGATION CHANNEL AT LEAST 30 DAYS PRIOR TO BEGINNING WORK. CONTACT:

MR. WILLIAM B. STANIFER
CHIEF, BRIDGE BRANCH, NINTH COAST GUARD DISTRICT
216-902-6086
WILLIAM.B.STANIFER@USCG.MIL

MR. LEE D. SOULE
216-902-608
LEE.D.SOULE@USCG.MIL
13. SPAN 9 OF THE BRIDGE IS THE FEDERAL NAVIGATION CHANNEL. MEASUREMENTS OF THE NAVIGATION CLEARANCES IN SPANS 9 AND 10 WERE TAKEN BY SURVEYORS FROM JF BRENNAN COMPANY INC. ON MARH 24TH, 2021. THE WATER SURFACE ELEVATION ON THIS DATE WAS EL. 573.97 FT. NAVD88. THE EXISTING AND PROPOSED NAVIGATION CLEARANCES IN SPANS 9 AND 10 ARE PROVIDED IN THE TABLE BELOW.

NAVIGATION CLEARANCES							
SPAN	ELEV.	EXISTING NAVIGATION CLEAR			PROPOSED NAVIGATION CLEAR		
		U.S.	MID	D.S.	U.S.	MID	D.S.
9	571	148.7	148.4	147.8	148.5	148.2	147.6
	560	146.7	146.7	146.6	146.5	146.5	146.4
10	571	144.0	--	--	143.3	--	--
	560	--	--	--	--	--	--

U.S. = UPSTREAM ON PIER
MID = MIDDLE ON PIER
D.S. = DOWNSTREAM ON PIER

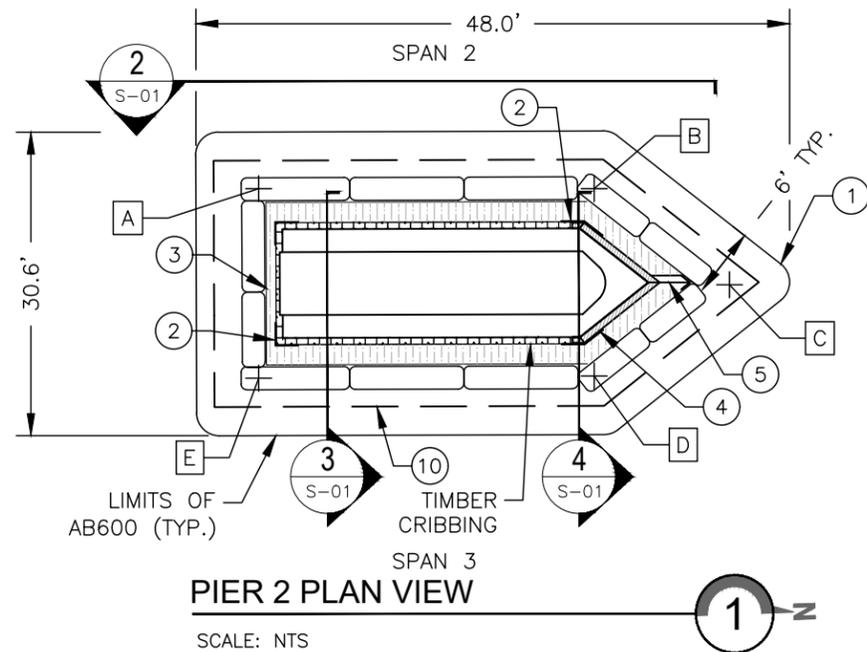
14. THE FOLLOWING DESIGN CRITERIA/MATERIALS HAVE BEEN ESTABLISHED FOR THIS PROJECT:

- A. GROUT / CONCRETE MIX
 - F'C= 3000 PSI AT 28 DAYS FOR GROUT
 - W= 150 PCF MAXIMUM UNIT WEIGHT OF CONCRETE
 - MAXIMUM CONCRETE/GROUT POUR HEIGHT IS 4 FEET
 - B. SHORE GUARD SYNTHETIC SHEET PILING FP-475 OR APPROVED EQUAL OR BETTER (PIERS 2, 4, 6 & 10)
 - SECTION MODULUS (Z) = 20.5 IN³/FT.
 - MOMENT OF INERTIA (I)= 45 IN⁴/ FT
 - ALLOWABLE MOMENT (M)= 5,467 LB-FT / FT
 - C. STEEL FORMWORK (PIERS 8 & 9)
 - (RED BIRD ENGINEERING SALES) OR EQUAL
 - 6" RIB- 16GA ALLOWABLE STRESS 20,000 PSI
 - SECTION MODULUS (Z)= 0.390 IN³/FT.
 - MOMENT OF INERTIA (I)= 0.350 IN⁴/ FT
 - ALLOWABLE MOMENT (M)= 650 LB-FT / FT
 - D. FORMWORK FABRIC
 - FABRIFORM PJ400 OR FABRIFORM BALLISTIC OR APPROVED EQUAL
 - E. HEX LAG SCREWS- ASME B18.2.1-1996
 - F. HYDROTEX ARTICULATING BLOCK (AB600 OR EQUIVALENT)
 - G. PATCH REPAIR MATERIAL- FIVE STAR STRUCTURAL CONCRETE V/O PERMANENT REPAIR MATERIAL OR APPROVED EQUAL
 - H. EPOXY BONDING COMPOUND PER MDOT SPECIFICATIONS FOR CONCRETE REPAIRS
15. ONCE ON SITE THE CONTRACTOR SHALL COMPLETE A SURVEY OF THE PROJECT SITE TO VERIFY THE EXISTING CONDITIONS. ANY CONDITIONS FOUND BY THE CONTRACTOR THAT WERE NOT ANTICIPATED ON THE CONTRACT PLANS AND THAT WILL AFFECT THE COST OR IMPLEMENTATION OF THE CONSTRUCTION SPECIFIED SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF WAYNE COUNTY AND THE ENGINEER.
16. THE CONTRACTOR SHALL EXERCISE CAUTION DURING ALL CONSTRUCTION OPERATIONS TO PREVENT ANY DAMAGE TO ADJACENT STRUCTURES, AND UTILITIES, WITHIN THE SCOPE OF THIS PROJECT'S WORK ITEMS. STRUCTURES, UTILITIES, STRUCTURAL COMPONENTS, AND IMPROVEMENTS NOT WITHIN THE SCOPE OF THIS PROJECT THAT ARE DAMAGED DURING THE CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR.
17. THE CONTRACTOR SHALL IMPLEMENT PROTECTIVE MEASURES TO CAPTURE ALL EXCESS CONSTRUCTION MATERIALS, REMOVAL ITEMS, WASTE, DEBRIS AND HAZARDOUS SUBSTANCES, AND NOT ALLOW THEIR DISCHARGE INTO THE SURROUNDING LAND, WATER OR AIR. THE CONTRACTOR SHALL PROPERLY DISPOSE OF THESE ITEMS ACCORDING TO THE REGULATIONS OF ALL GOVERNING AGENCIES.



**General Plan & Elevation
Grosse Ile Parkway Bridge
Pier Repairs**
Grosse Ile, MI

CEI PROJECT 60-12797
DESIGNED BY: SJM
DRAWN BY: JCG
CHECKED BY: SJM
DATE: 4-16-21
SHEET NO: G-02



PIER 2 PLAN VIEW

SCALE: NTS

LEGEND:

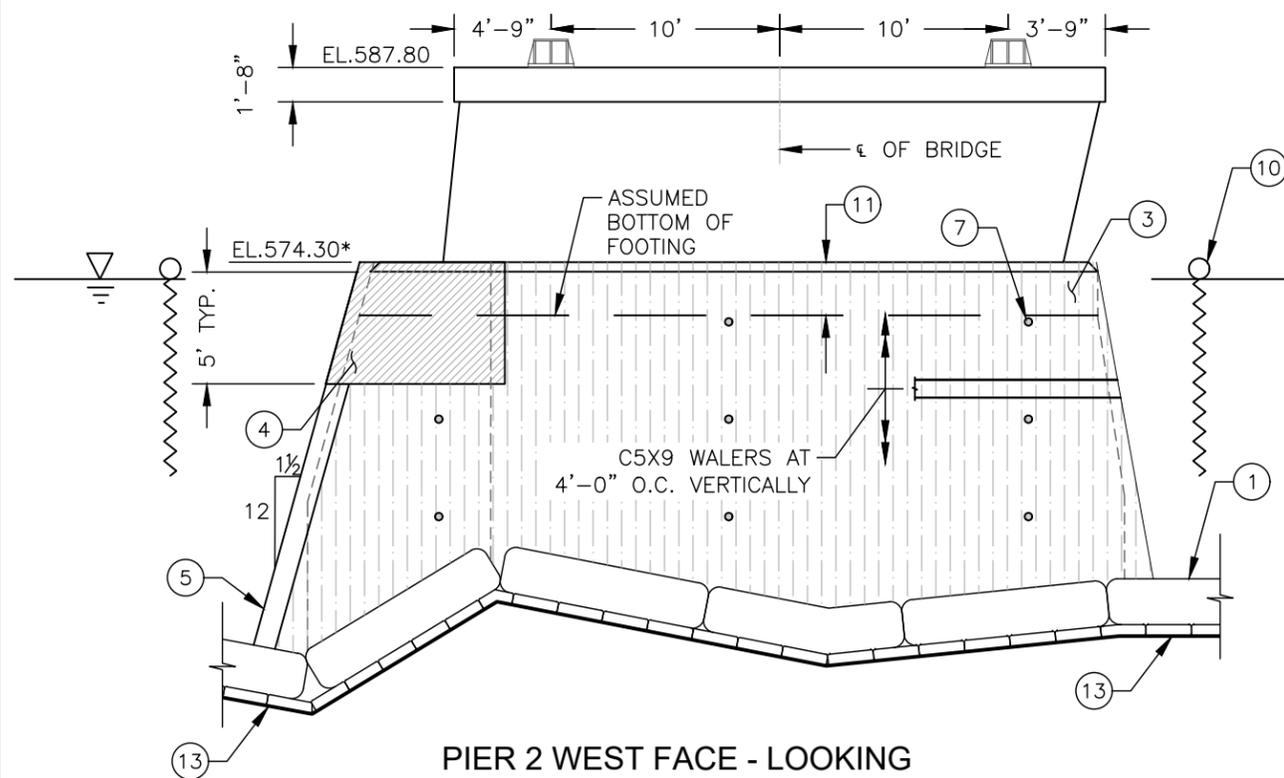
- CHANNEL BOTTOM
- ⊙ - REPAIR NOTE
- ⊕ A - STREAMBED ELEVATION
- ▨ - FP-475 VINYL SHEETPIILING
- ▩ - STEEL PLATE
- - 2" Ø CORE HOLE
- ⊞ - GROUT INFILL
- ⊞ - CRIBBING STONE WITH GROUT INFILL

PIER 2 STREAMBED ELEVATIONS		
LOCATION	CORNER	ELEVATION
A	SW	557.8
B	NW	559.3
C	N	554.7
D	NE	553.1
E	SE	558.2

NOTE: TABLE ELEVATIONS ARE ESTIMATED AND FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO STARTING WORK.

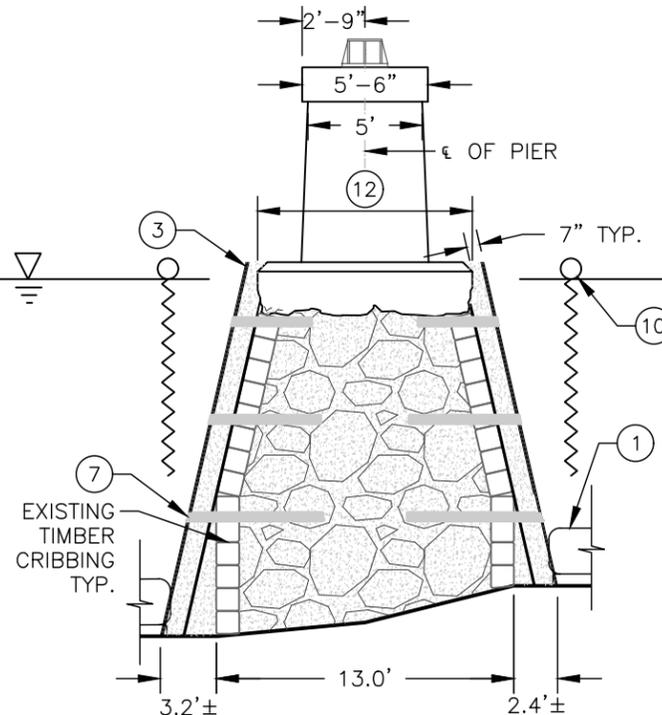
REPAIR NOTES:

1. HYDROTEX ARTICULATING BLOCK (AB600) FABRIC FORMED CONCRETE PLACED ON RIVER BED AND USED TO SEAL AGAINST GROUT ESCAPE. EXTEND FABRIC FORMED CONCRETE 6'-0" OFF PIER IN ALL DIRECTIONS. PLACE HYDROTEX GROUT BAGS AT BASE OF PIER TO HOLD FORMWORK IN PLACE.
2. INSTALL STEEL REINFORCING PLATES AT ALL 4 CORNERS OF PIER. SEE PIER DETAILS ON SHEET S-08.
3. FP-475 WEATHERABLE RIGID VINYL SYNTHETIC SHEETPIILING USED AS STAY-IN-PLACE FORMWORK.
4. PLACE LARGE STEEL 1/2" ICE BREAKER PLATE AND/OR OTHER ACCESSORIES EXTENDING FROM TOP OF FOOTING TO 5'-0" BELOW TOP OF FOOTING. SEE PIER DETAILS ON SHEET S-08.
5. PLACE SMALL STEEL 1/2" ICE BREAKER PLATE AT NOSE OF PIER. SEE PIER DETAILS ON SHEET S-08.
6. FILL ANNULAR SPACE BETWEEN FORMWORK AND CRIBBING WITH GROUT BACKFILL. FILL THE VOIDS IN THE INTERIOR OF THE CRIBBING FROM THE STREAM BED TO THE BOTTOM OF THE FOOTING WITH GROUT BACKFILL.
7. DRILL 2" Ø HORIZONTAL CORE HOLES ON EACH SIDE OF THE PIER TO VERIFY GROUT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. REPAIR CONCRETE SPALLING/DELAMINATIONS/ETC. ON PIER FOOTING/WALL SEE PIER DETAILS.
9. FOR TYPICAL FORMWORK LIMITS, SEE PIER DETAILS ON SHEET S-07.
10. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF PIER WORK AREA
11. THE THICKNESS OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 4'-10". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
12. THE WIDTH OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 9'-0". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
13. THE TABLE BELOW PROVIDES THE ESTIMATED STREAM BED ELEVATIONS AT THE PIER CORNERS BASED ON A HYDROGRAPHIC SURVEY PERFORMED ON DECEMBER 2, 2020. THE WATERLINE ELEVATION WAS MEASURED AT 574.30 AT THE TIME OF THE SURVEY.
14. THE ESTIMATED GROUT VOLUME TO BE INSTALLED AT PIER 2 IS 92 CY. THE ACTUAL VOLUME WILL DEPEND ON THE CONDITIONS ENCOUNTERED IN THE FIELD.



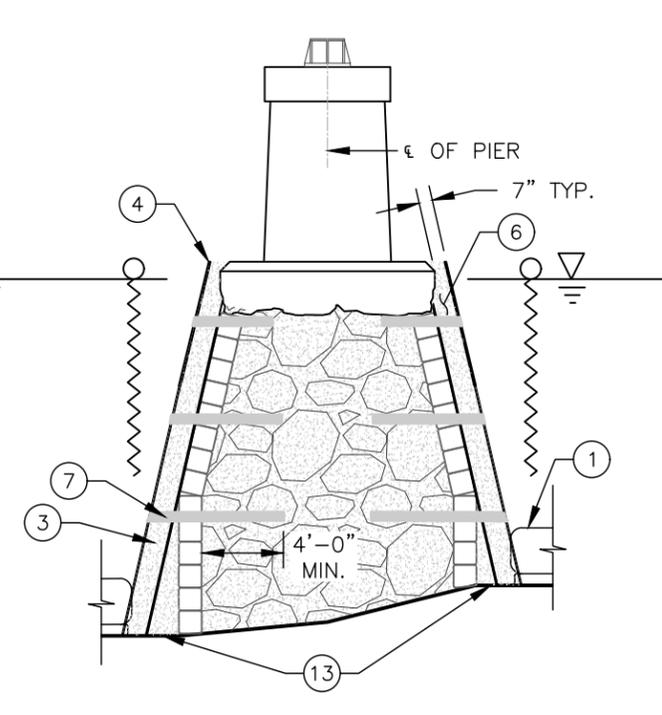
PIER 2 WEST FACE - LOOKING EAST

SCALE: NTS



PIER 2 CROSS SECTION - LOOKING NORTH

SCALE: NTS

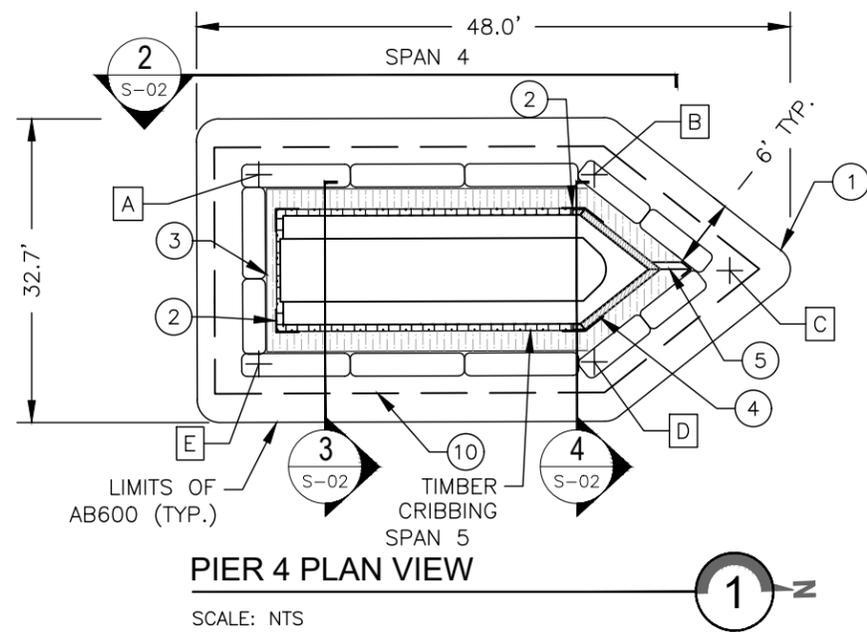


PIER 2 CROSS SECTION - LOOKING NORTH

SCALE: NTS

* FORMWORK TO BE INSTALLED TO TOP OF FOOTING ELEVATION





PIER 4 PLAN VIEW

SCALE: NTS

LEGEND:

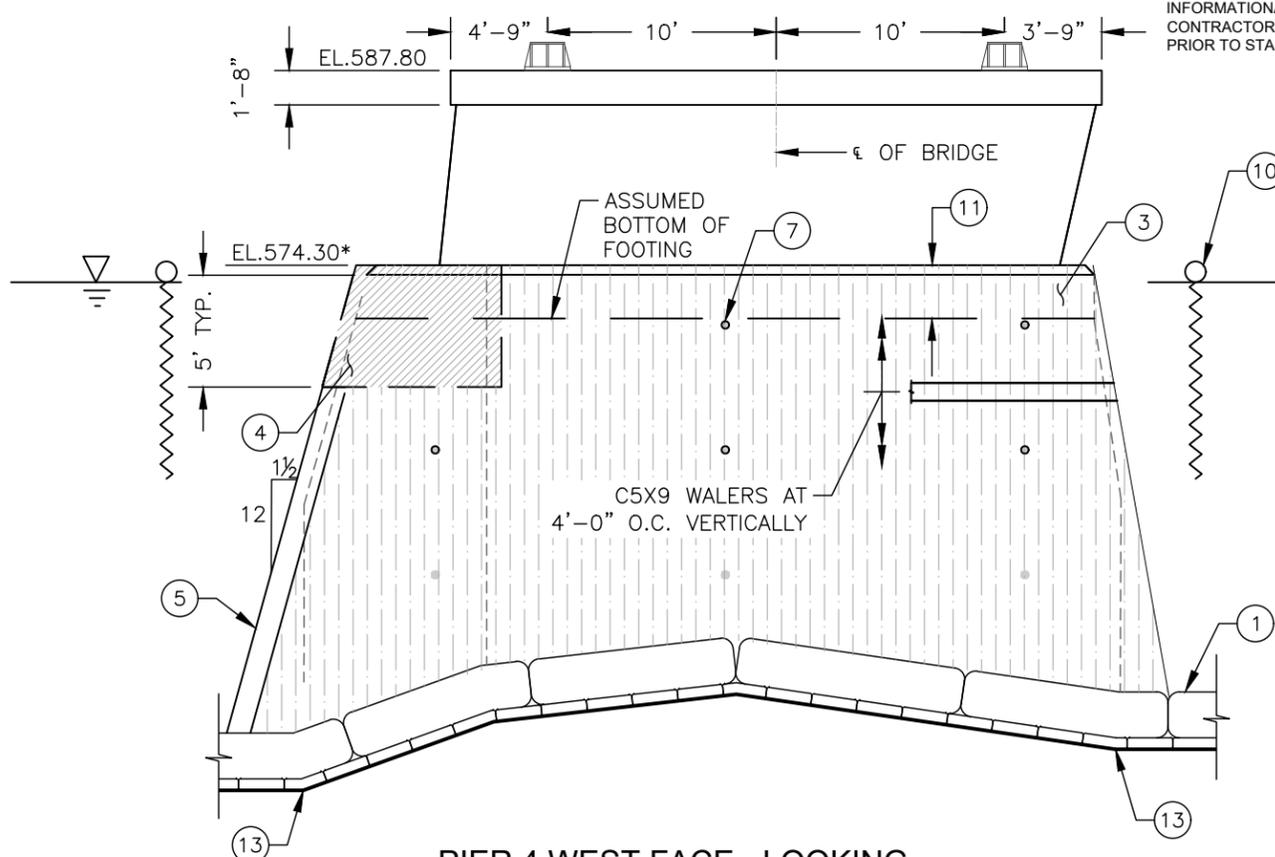
- CHANNEL BOTTOM
- ⊙ - REPAIR NOTE
- A - STREAMBED ELEVATION
- ▨ - FP-475 VINYL SHEETPIILING
- ▧ - STEEL PLATE
- - 2" Ø CORE HOLE
- ⊞ - GROUT INFILL
- ⊞ - CRIBBING STONE WITH GROUT INFILL

PIER 4 STREAMBED ELEVATIONS		
LOCATION	CORNER	ELEVATION
A	SW	553.2
B	NW	554.3
C	N	551.8
D	NE	554.7
E	SE	558.6

NOTE: TABLE ELEVATIONS ARE ESTIMATED AND FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO STARTING WORK.

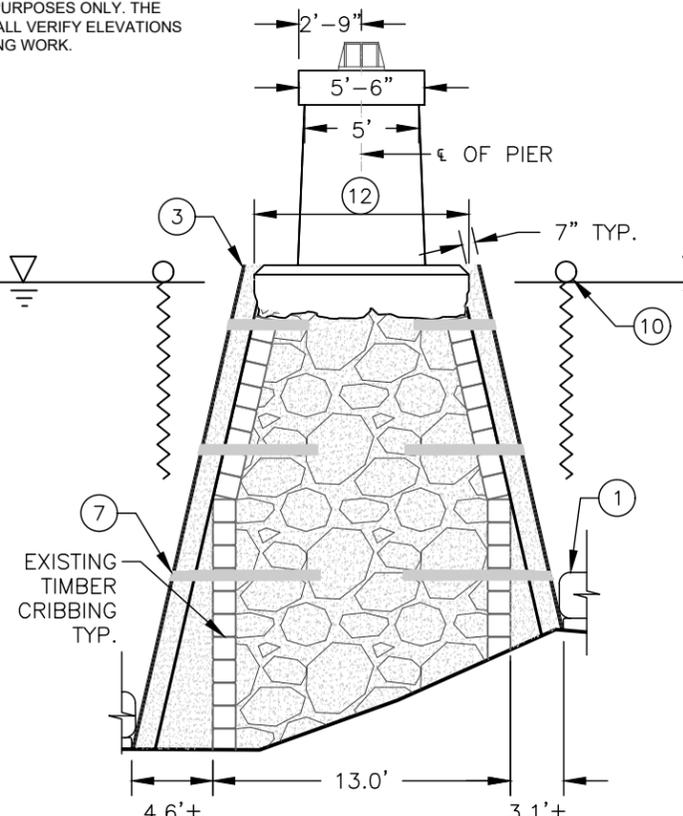
REPAIR NOTES:

1. HYDROTEx ARTICULATING BLOCK (AB600) FABRIC FORMED CONCRETE PLACED ON RIVER BED AND USED TO SEAL AGAINST GROUT ESCAPE. EXTEND FABRIC FORMED CONCRETE 6'-0" OFF PIER IN ALL DIRECTIONS. PLACE HYDROTEx GROUT BAGS AT BASE OF PIER TO HOLD FORMWORK IN PLACE.
2. INSTALL STEEL REINFORCING PLATES AT ALL 4 CORNERS OF PIER. SEE PIER DETAILS ON SHEET S-08.
3. FP-475 WEATHERABLE RIGID VINYL SYNTHETIC SHEETPIILING USED AS STAY-IN-PLACE FORMWORK.
4. PLACE LARGE STEEL 1/2" ICE BREAKER PLATE AND/OR OTHER ACCESSORIES EXTENDING FROM TOP OF FOOTING TO 5'-0" BELOW TOP OF FOOTING. SEE PIER DETAILS ON SHEET S-08.
5. PLACE SMALL STEEL 1/2" ICE BREAKER PLATE AT NOSE OF PIER. SEE PIER DETAILS ON SHEET S-08.
6. FILL ANNULAR SPACE BETWEEN FORMWORK AND CRIBBING WITH GROUT BACKFILL. FILL THE VOIDS IN THE INTERIOR OF THE CRIBBING FROM THE STREAM BED TO THE BOTTOM OF THE FOOTING WITH GROUT BACKFILL.
7. DRILL 2" Ø HORIZONTAL CORE HOLES ON EACH SIDE OF THE PIER TO VERIFY GROUT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. REPAIR CONCRETE SPALLING/DELAMINATIONS/ETC. ON PIER FOOTING/WALL SEE PIER DETAILS.
9. FOR TYPICAL FORMWORK LIMITS, SEE PIER DETAILS ON SHEET S-07.
10. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF PIER WORK AREA
11. THE THICKNESS OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 4'-10". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
12. THE WIDTH OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 9'-0". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
13. THE TABLE BELOW PROVIDES THE ESTIMATED STREAM BED ELEVATIONS AT THE PIER CORNERS BASED ON A HYDROGRAPHIC SURVEY PERFORMED ON DECEMBER 2, 2020. THE WATERLINE ELEVATION WAS MEASURED AT 574.30 AT THE TIME OF THE SURVEY.
14. THE ESTIMATED GROUT VOLUME TO BE INSTALLED AT PIER 4 IS 108 CY. THE ACTUAL VOLUME WILL DEPEND ON THE CONDITIONS ENCOUNTERED IN THE FIELD.



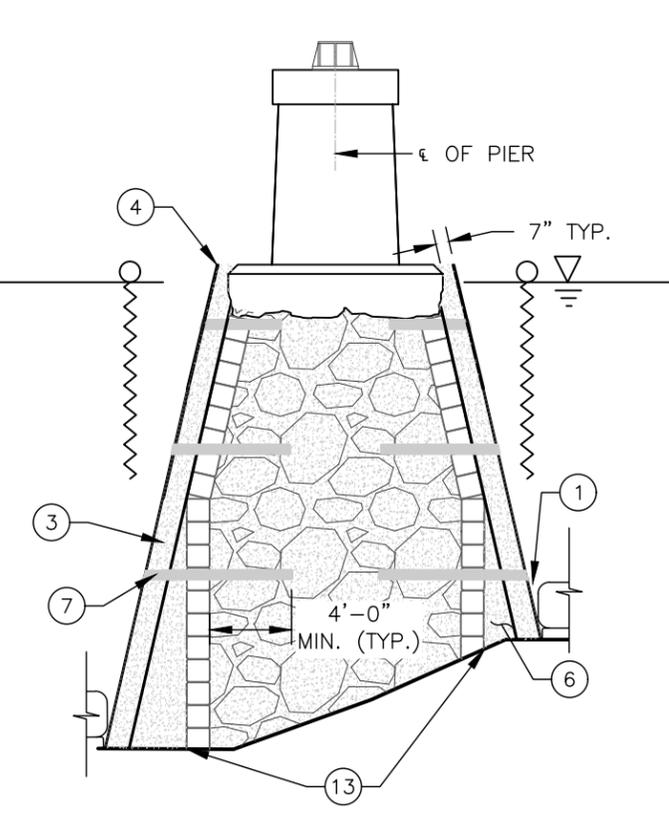
PIER 4 WEST FACE - LOOKING EAST

SCALE: NTS



PIER 4 CROSS SECTION - LOOKING NORTH

SCALE: NTS



PIER 4 CROSS SECTION - LOOKING NORTH

SCALE: NTS

* FORMWORK TO BE INSTALLED TO TOP OF FOOTING ELEVATION

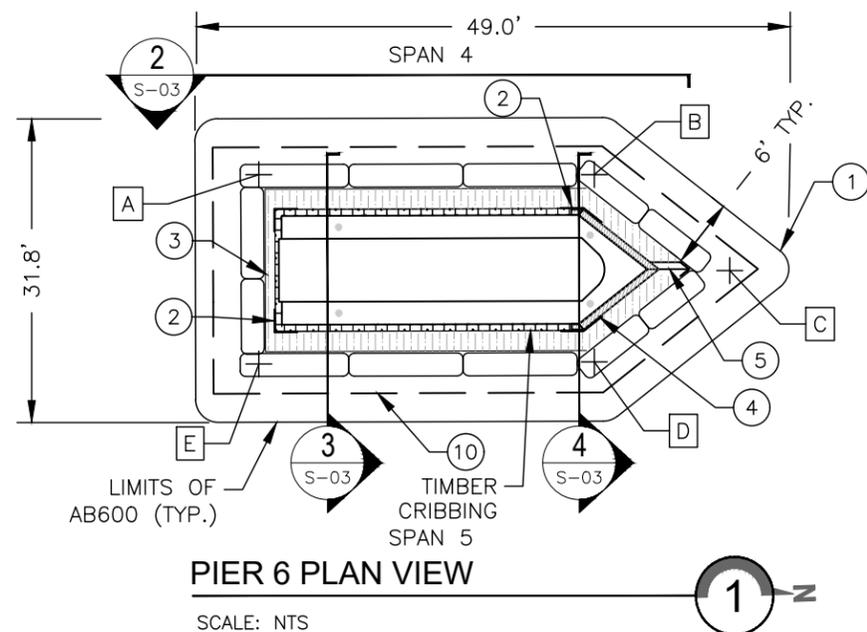
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Pier Repair Plans
Grosse Ile Parkway Bridge
Pier 4 Repairs
Grosse Ile, MI

CEI PROJECT
60-12797
DESIGNED BY:
SJM
DRAWN BY:
JCG
CHECKED BY:
SJM
DATE:
4-16-21
SHEET NO:
S-02



PIER 6 PLAN VIEW

SCALE: NTS

LEGEND:

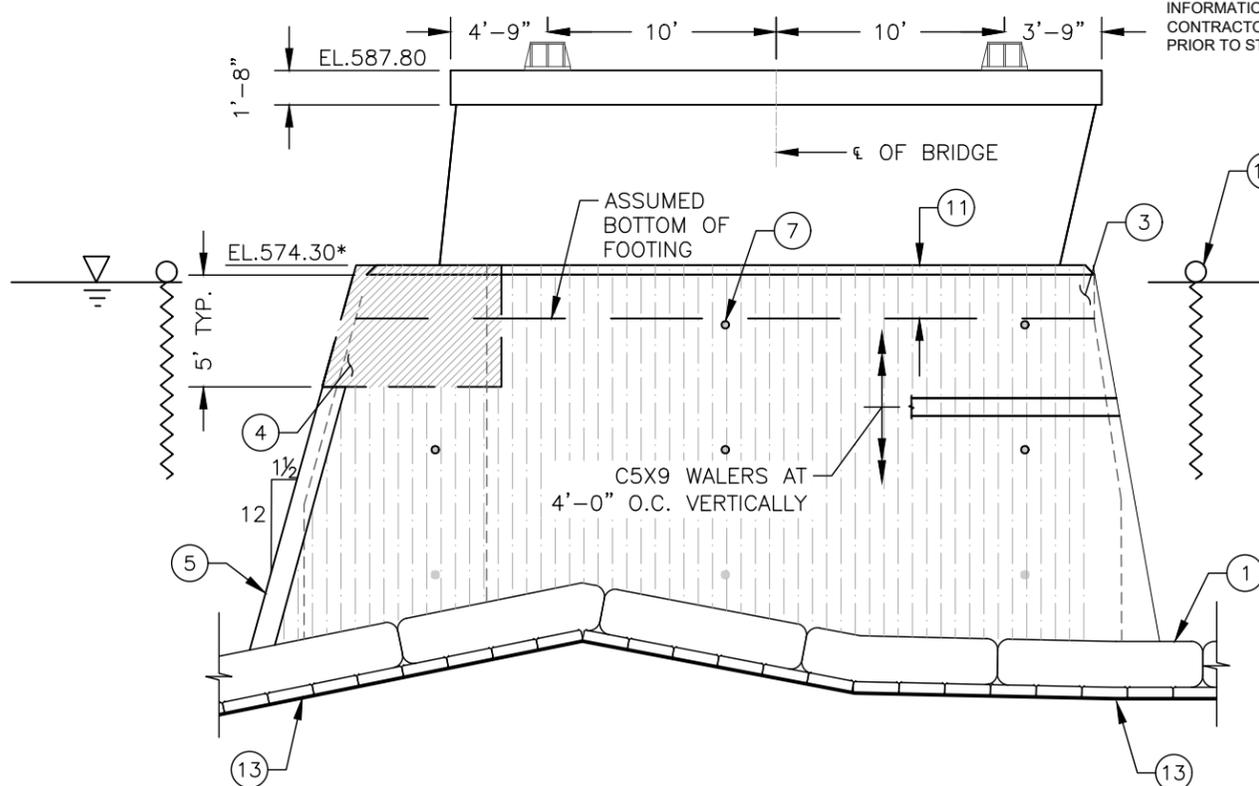
- CHANNEL BOTTOM
- REPAIR NOTE
- STREAMBED ELEVATION
- FP-475 VINYL SHEETPIILING
- STEEL PLATE
- 2" Ø CORE HOLE
- GROUT INFILL
- CRIBBING STONE WITH GROUT INFILL

PIER 6 STREAMBED ELEVATIONS		
LOCATION	CORNER	ELEVATION
A	SW	555.4
B	NW	558.0
C	N	553.1
D	NE	556.5
E	SE	559.6

NOTE: TABLE ELEVATIONS ARE ESTIMATED AND FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO STARTING WORK.

REPAIR NOTES:

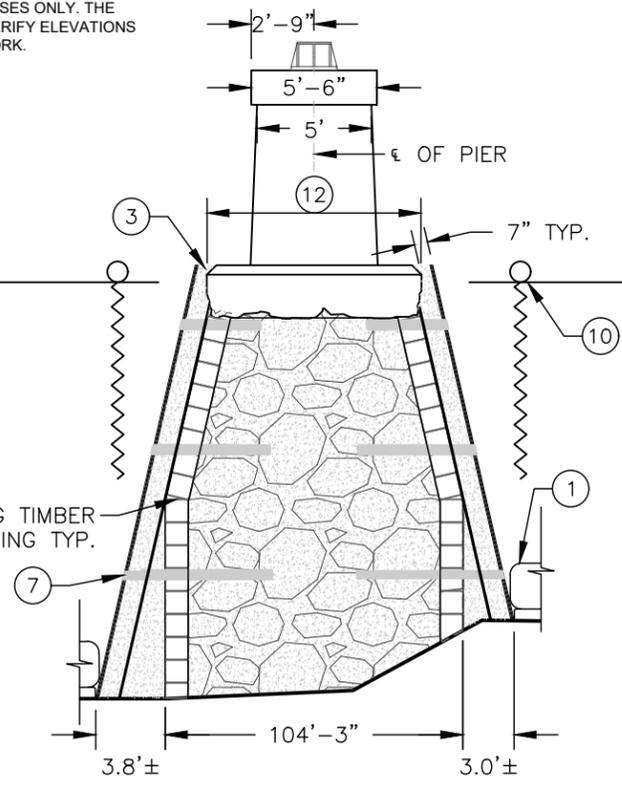
1. HYDROTEx ARTICULATING BLOCK (AB600) FABRIC FORMED CONCRETE PLACED ON RIVER BED AND USED TO SEAL AGAINST GROUT ESCAPE. EXTEND FABRIC FORMED CONCRETE 6'-0" OFF PIER IN ALL DIRECTIONS. PLACE HYDROTEx GROUT BAGS AT BASE OF PIER TO HOLD FORMWORK IN PLACE.
2. INSTALL STEEL REINFORCING PLATES AT ALL 4 CORNERS OF PIER. SEE PIER DETAILS ON SHEET S-08.
3. FP-475 WEATHERABLE RIGID VINYL SYNTHETIC SHEETPIILING USED AS STAY-IN-PLACE FORMWORK.
4. PLACE LARGE STEEL 1/2" ICE BREAKER PLATE AND/OR ACCESSORIES EXTENDING FROM TOP OF FOOTING TO 5'-0" BELOW TOP OF FOOTING. SEE PIER DETAILS ON SHEET S-08.
5. PLACE SMALL STEEL 1/2" ICE BREAKER PLATE AT NOSE OF PIER. SEE PIER DETAILS ON SHEET S-08.
6. FILL ANNULAR SPACE BETWEEN FORMWORK AND CRIBBING WITH GROUT BACKFILL. FILL THE VOIDS IN THE INTERIOR OF THE CRIBBING FROM THE STREAM BED TO THE BOTTOM OF THE FOOTING WITH GROUT BACKFILL.
7. DRILL 2" Ø HORIZONTAL CORE HOLES ON EACH SIDE OF THE PIER TO VERIFY GROUT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. REPAIR CONCRETE SPALLING/DELAMINATIONS/ETC. ON PIER FOOTING/WALL SEE PIER DETAILS.
9. FOR TYPICAL FORMWORK LIMITS, SEE PIER DETAILS ON SHEET S-07.
10. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF PIER WORK AREA
11. THE THICKNESS OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 4'-10". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
12. THE WIDTH OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 9'-0". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
13. THE TABLE BELOW PROVIDES THE ESTIMATED STREAM BED ELEVATIONS AT THE PIER CORNERS BASED ON A HYDROGRAPHIC SURVEY PERFORMED ON DECEMBER 2, 2020. THE WATERLINE ELEVATION WAS MEASURED AT 574.30 AT THE TIME OF THE SURVEY.
14. THE ESTIMATED GROUT VOLUME TO BE INSTALLED AT PIER 6 IS 96 CY. THE ACTUAL VOLUME WILL DEPEND ON THE CONDITIONS ENCOUNTERED IN THE FIELD.



PIER 6 WEST FACE - LOOKING EAST

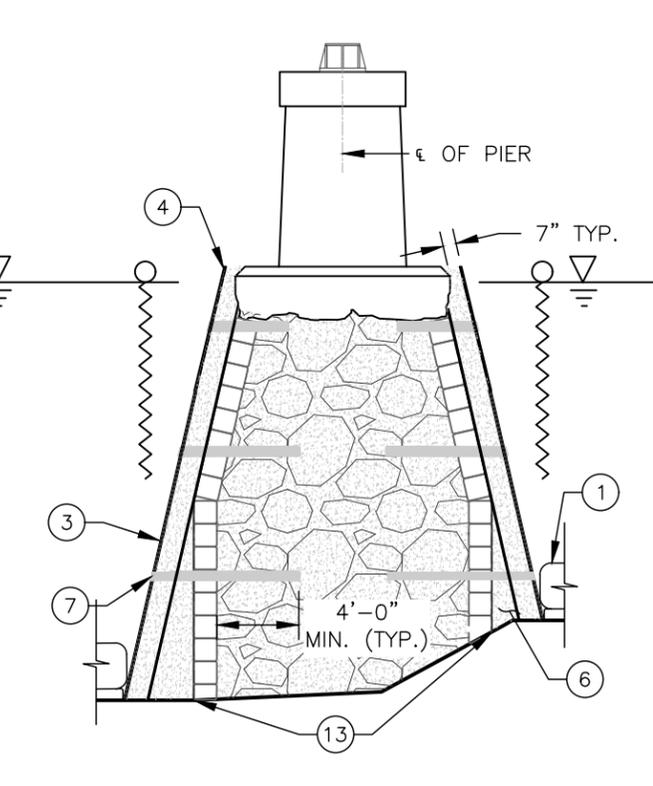
SCALE: NTS

* FORMWORK TO BE INSTALLED TO TOP OF FOOTING ELEVATION



PIER 6 CROSS SECTION - LOOKING NORTH

SCALE: NTS



PIER 6 CROSS SECTION - LOOKING NORTH

SCALE: NTS

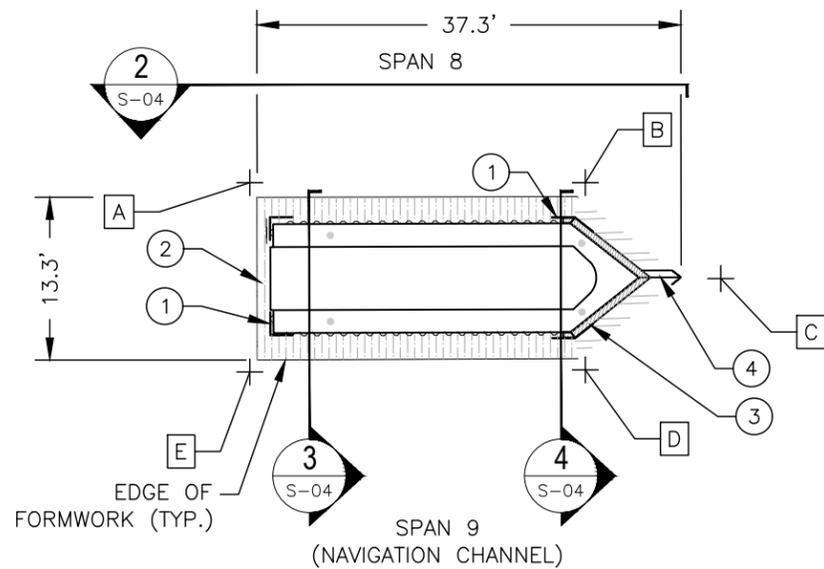
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**Pier Repair Plans
Grosse Ile Parkway Bridge
Pier 6 Repairs**
Grosse Ile, MI

CEI PROJECT
60-12797
DESIGNED BY:
SJM
DRAWN BY:
JCG
CHECKED BY:
SJM
DATE:
4-16-21
SHEET NO:
S-03



PIER 8 PLAN VIEW

SCALE: NTS

LEGEND:

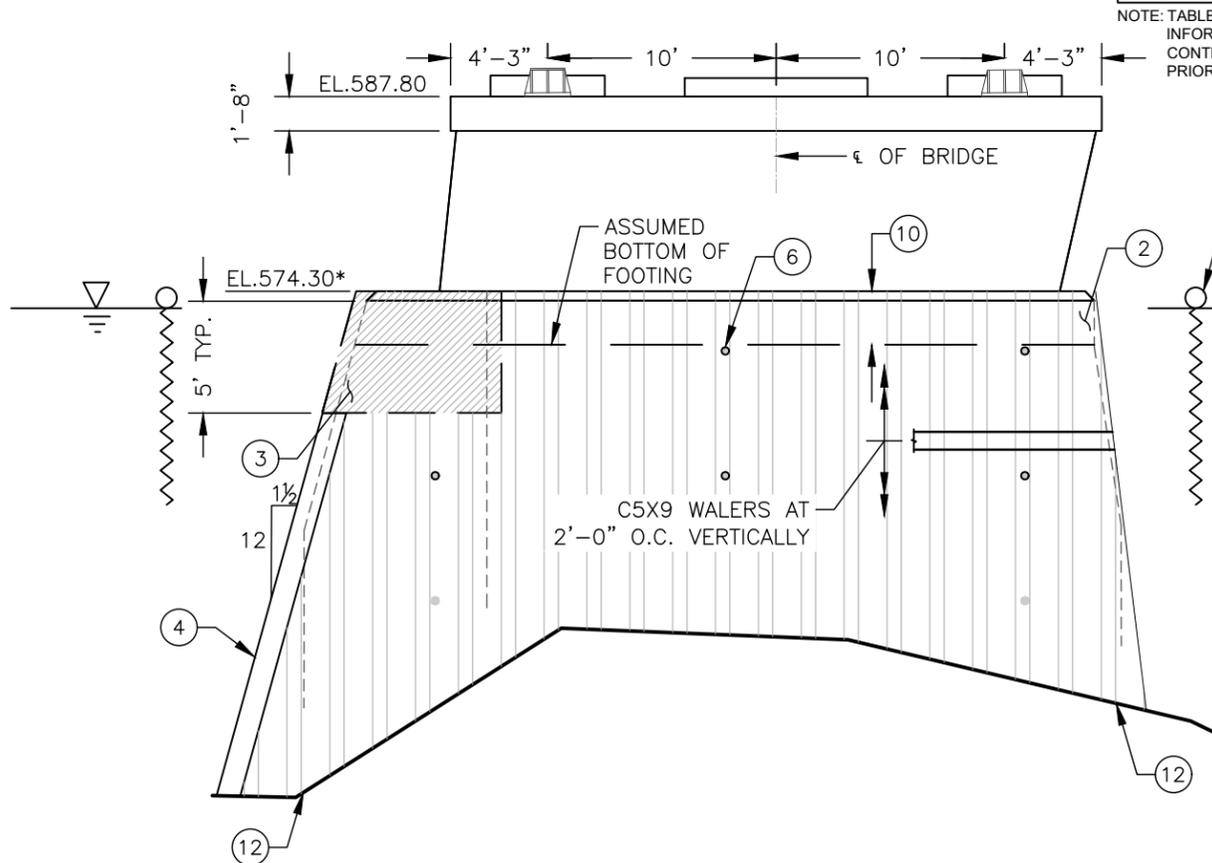
- CHANNEL BOTTOM
- REPAIR NOTE
- STREAMBED ELEVATION
- STEEL FORMWORK
- STEEL PLATE
- 2" Ø CORE HOLE
- GROUT INFILL
- CRIBBING STONE WITH GROUT INFILL

PIER 8 STREAMBED ELEVATIONS		
LOCATION	CORNER	ELEVATION
A	SW	555.7
B	NW	559.5
C	N	551.2
D	NE	552.0
E	SE	550.4

NOTE: TABLE ELEVATIONS ARE ESTIMATED AND FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO STARTING WORK.

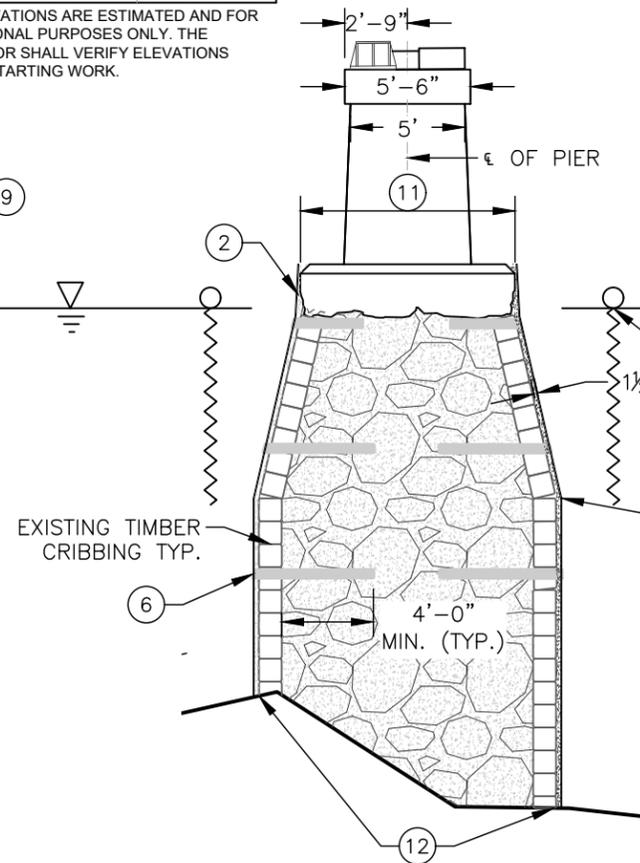
REPAIR NOTES:

1. INSTALL STEEL REINFORCING PLATES AT ALL 4 CORNERS OF PIER. SEE PIER DETAILS.
2. RED BIRD ENGINEERING 6" RIB-16 6A STEEL FORMWORK OR EQUAL USES AS FORMWORK.
3. PLACE LARGE STEEL 1/2" ICE BREAKER PLATE AND/OR OTHER ACCESSORIES EXTENDING FROM TOP OF FOOTING TO 5'-0" BELOW TOP OF FOOTING. SEE PIER DETAILS ON SHEET S-08.
4. PLACE SMALL STEEL 1/2" ICE BREAKER PLATE AT NOSE OF PIER. SEE PIER DETAILS ON SHEET S-08.
5. FILL ANNULAR SPACE BETWEEN FORMWORK AND CRIBBING WITH GROUT BACKFILL. FILL THE VOIDS IN THE INTERIOR OF THE CRIBBING FROM THE STREAM BED TO THE BOTTOM OF THE FOOTING WITH GROUT BACKFILL.
6. DRILL 2" Ø HORIZONTAL CORE HOLES ON EACH SIDE OF THE PIER TO VERIFY GROUT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
7. REPAIR CONCRETE SPALLING/DELAMINATIONS/ETC. ON PIER FOOTING/WALL SEE PIER DETAILS.
8. FOR TYPICAL FORMWORK LIMITS, SEE PIER DETAILS ON SHEET S-07.
9. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF PIER WORK AREA.
10. THE THICKNESS OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 4'-10". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
11. THE WIDTH OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 9'-0". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
12. THE TABLE BELOW PROVIDES THE ESTIMATED STREAM BED ELEVATIONS AT THE PIER CORNERS BASED ON A HYDROGRAPHIC SURVEY PERFORMED ON DECEMBER 2, 2020. THE WATERLINE ELEVATION WAS MEASURED AT 574.30 AT THE TIME OF THE SURVEY.
13. SEE PIER DETAILS FOR TYPICAL DETAIL AT FORM WORK BREAK.
14. THE ESTIMATED GROUT VOLUME TO BE INSTALLED AT PIER 8 IS 94 CY. THE ACTUAL VOLUME WILL DEPEND ON THE CONDITIONS ENCOUNTERED IN THE FIELD.



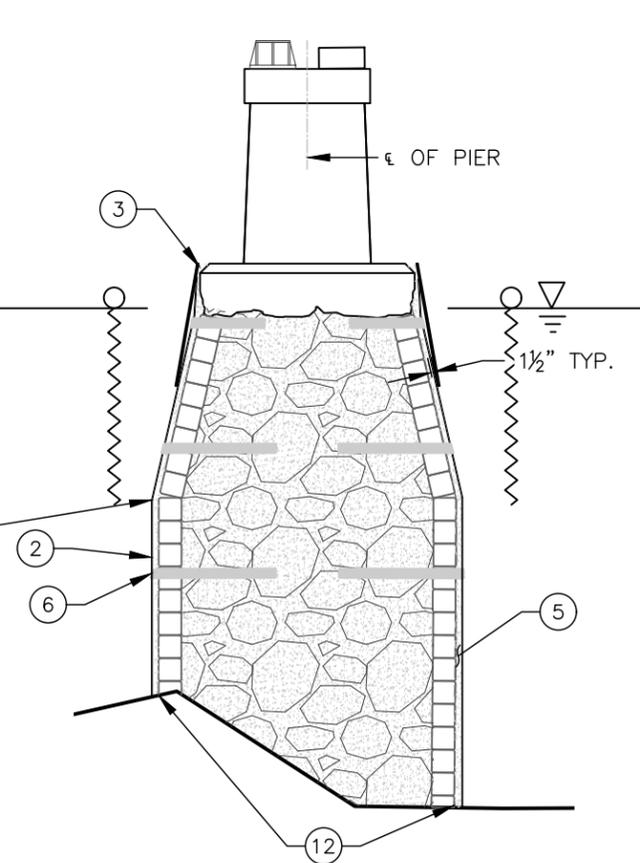
PIER 8 WEST FACE - LOOKING EAST

SCALE: NTS



PIER 8 CROSS SECTION - LOOKING NORTH

SCALE: NTS



PIER 8 CROSS SECTION - LOOKING NORTH

SCALE: NTS

* FORMWORK TO BE INSTALLED TO TOP OF FOOTING ELEVATION

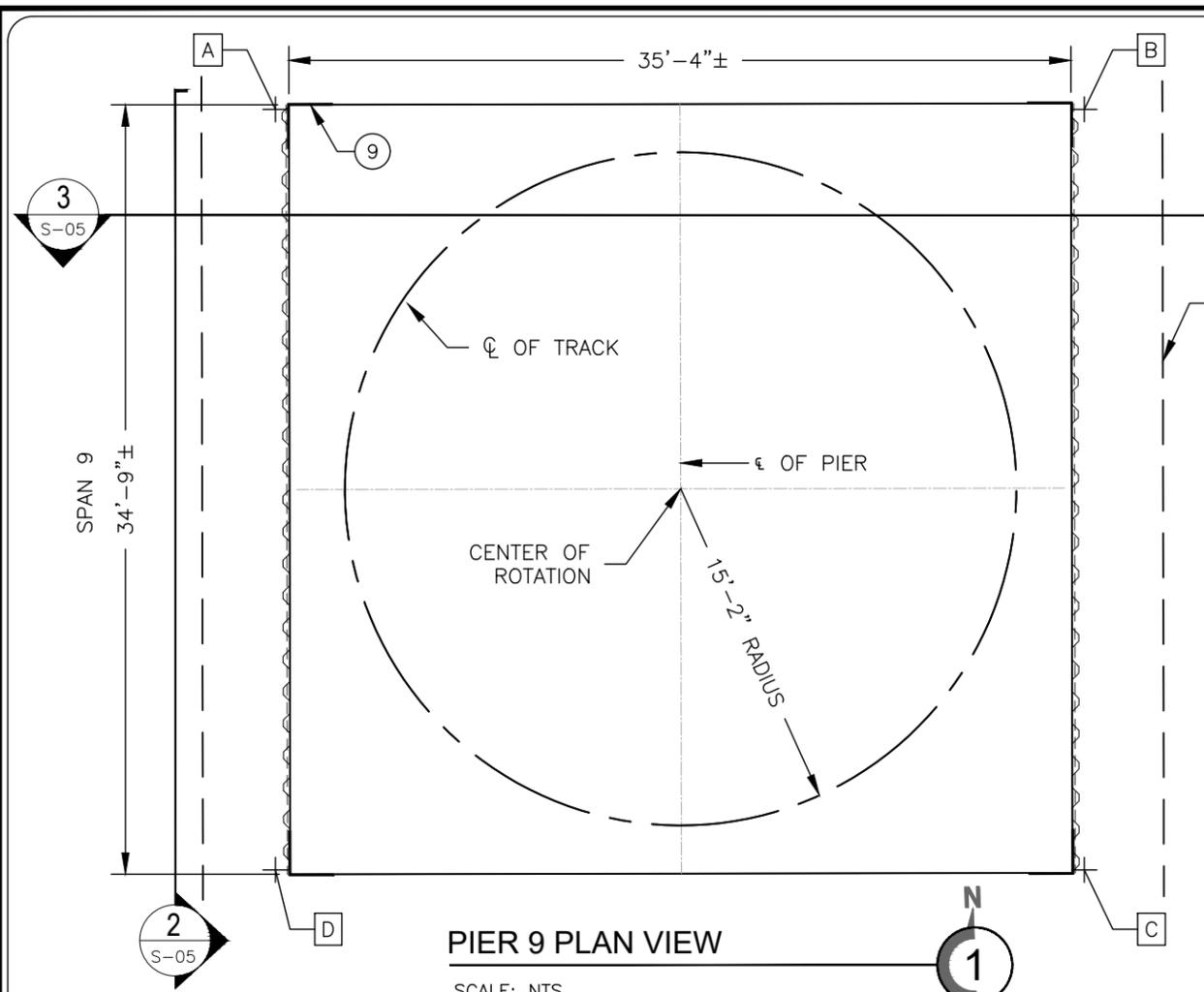
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**Pier Repair Plans
Grosse Ile Parkway Bridge
Pier 8 Repairs**
Grosse Ile, MI

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60-12797
DESIGNED BY:
SJM
DRAWN BY:
JCG
CHECKED BY:
SJM
DATE:
4-16-21
SHEET NO:
S-04



PIER 9 PLAN VIEW

SCALE: NTS

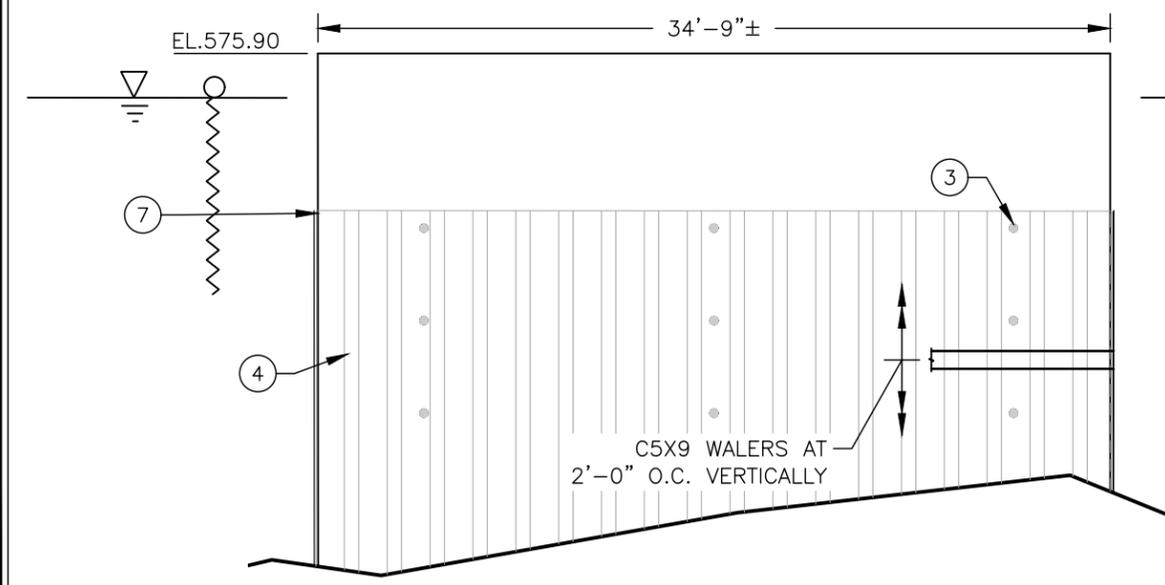
- LEGEND:**
- CHANNEL BOTTOM
 - ⊙ - REPAIR NOTE
 - STREAMBED ELEVATION
 - STEEL FORMWORK
 - 2" Ø CORE HOLE
 - GROUT INFILL
 - CRIBBING STONE WITH GROUT INFILL

REPAIR NOTES:

1. RED BIRD ENGINEERING 6" RIB-16 GA STEEL FORMWORK OR EQUAL USED AS FORM WORK. FORMWORK ATTACHED TO CRIBBING USING LAG BOLTS SPACED A MAXIMUM OF 2'-0" ON CENTER VERTICALLY.
2. FILL ANNULAR SPACE BETWEEN FORMWORK AND CRIBBING WITH GROUT BACKFILL. FILL THE VOIDS IN THE INTERIOR OF THE CRIBBING FROM THE STREAM BED TO THE BOTTOM OF THE FOOTING WITH GROUT BACKFILL.
3. DRILL 2" Ø HORIZONTAL CORE HOLES ON EACH SIDE OF THE PIER TO VERIFY GROUT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
4. REPAIR CONCRETE SPALLING/DELAMINATIONS/ETC. ON PIER FOOTING/WALL AS PER SPECIFICATIONS.
5. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF PIER WORK AREA.
6. THE TABLE BELOW PROVIDES THE ESTIMATED STREAM BED ELEVATIONS AT THE PIER CORNERS BASED ON A HYDROGRAPHIC SURVEY PERFORMED ON DECEMBER 2, 2020. THE WATERLINE ELEVATION WAS MEASURED AT 574.30 AT THE TIME OF THE SURVEY.
7. INSTALL FORMWORK TO ELEV 570.0.
8. THE ESTIMATED GROUT VOLUME TO BE INSTALLED AT PIER 2 IS 221 CY. THE ACTUAL VOLUME WILL DEPEND ON THE CONDITIONS ENCOUNTERED IN THE FIELD.
9. INSTALL STEEL REINFORCING PLATES AT ALL 4 CORNERS OF PIER. SEE PIER DETAILS ON SHEET S-08.

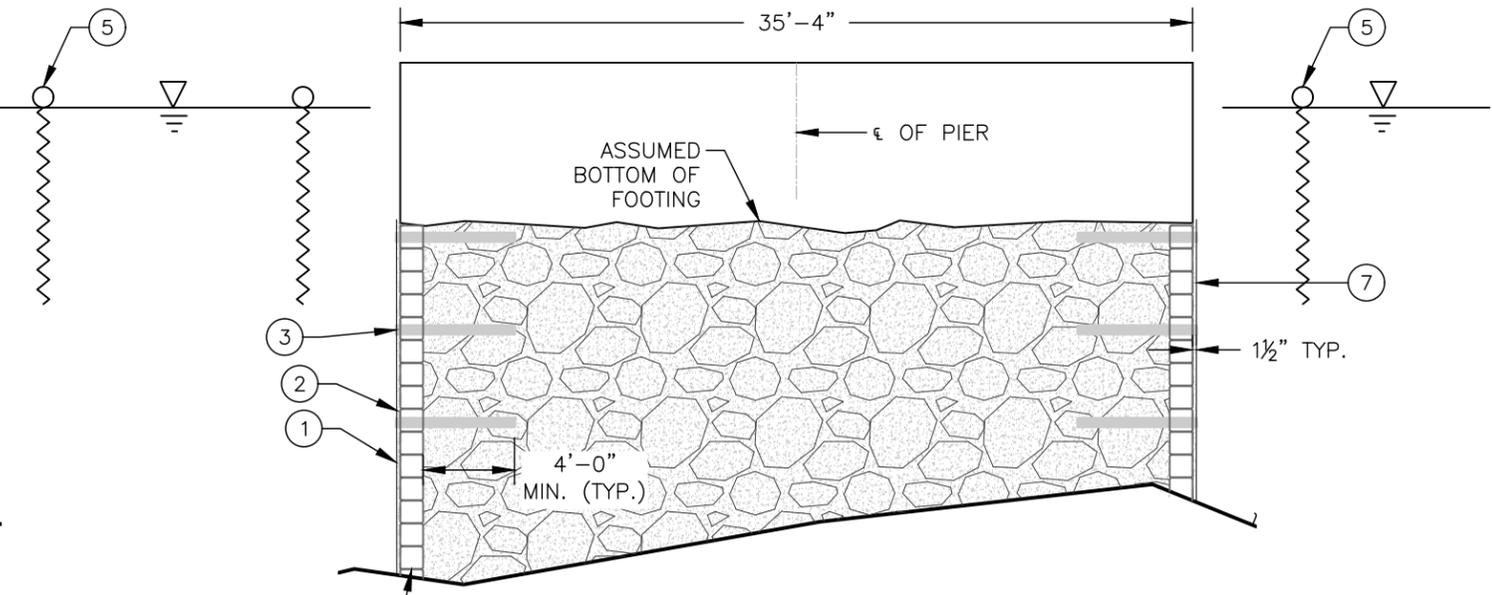
PIER 9 STREAMBED ELEVATIONS		
LOCATION	CORNER	ELEVATION
A	NW	554.7
B	NE	558.8
C	SE	556.7
D	SW	557.4

NOTE: TABLE ELEVATIONS ARE ESTIMATED AND FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO STARTING WORK.



PIER 9 EAST FACE - LOOKING WEST

SCALE: NTS



PIER 9 CROSS SECTION - LOOKING SOUTH

SCALE: NTS

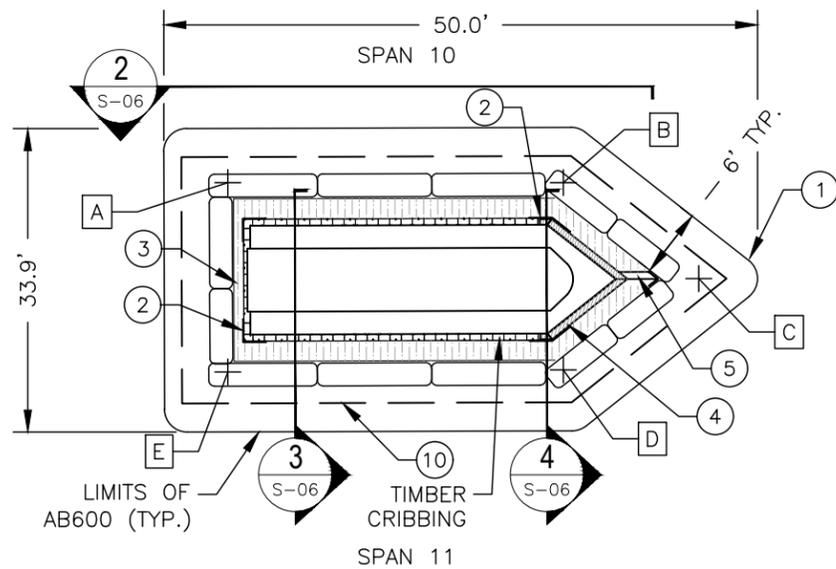
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 Grosse Ile Parkway Bridge
 Pier 9 Repairs**
 Grosse Ile, MI

CEI PROJECT
 60-12797
 DESIGNED BY:
 SJM
 DRAWN BY:
 JCG
 CHECKED BY:
 SJM
 DATE:
 4-16-21
 SHEET NO:
S-05



PIER 10 PLAN VIEW

SCALE: NTS

LEGEND:

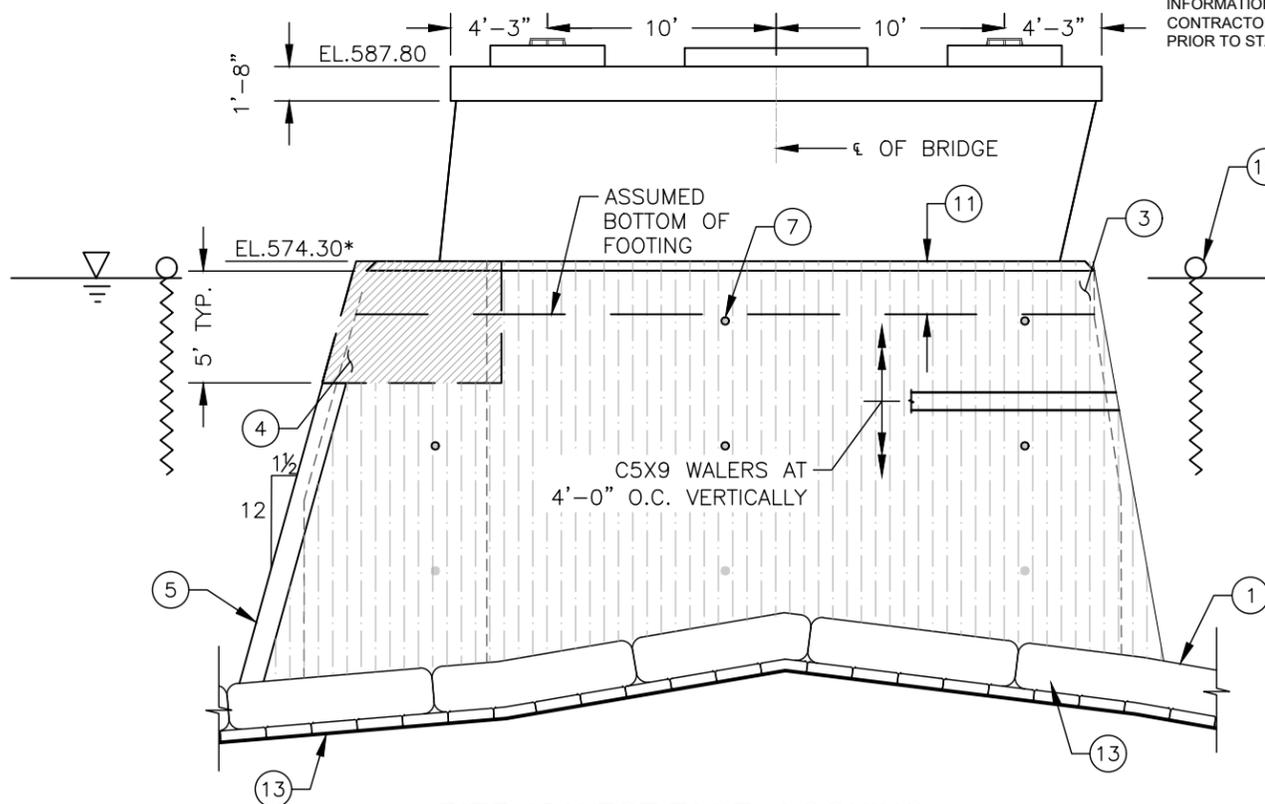
- CHANNEL BOTTOM
- REPAIR NOTE
- STREAMBED ELEVATION
- FP-475 VINYL SHEETPIILING
- STEEL PLATE
- 2" Ø CORE HOLE
- GROUT INFILL
- CRIBBING STONE WITH GROUT INFILL

PIER 10 STREAMBED ELEVATIONS		
LOCATION	CORNER	ELEVATION
A	SW	554.4
B	NW	554.4
C	N	551.1
D	NE	552.7
E	SE	554.9

NOTE: TABLE ELEVATIONS ARE ESTIMATED AND FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO STARTING WORK.

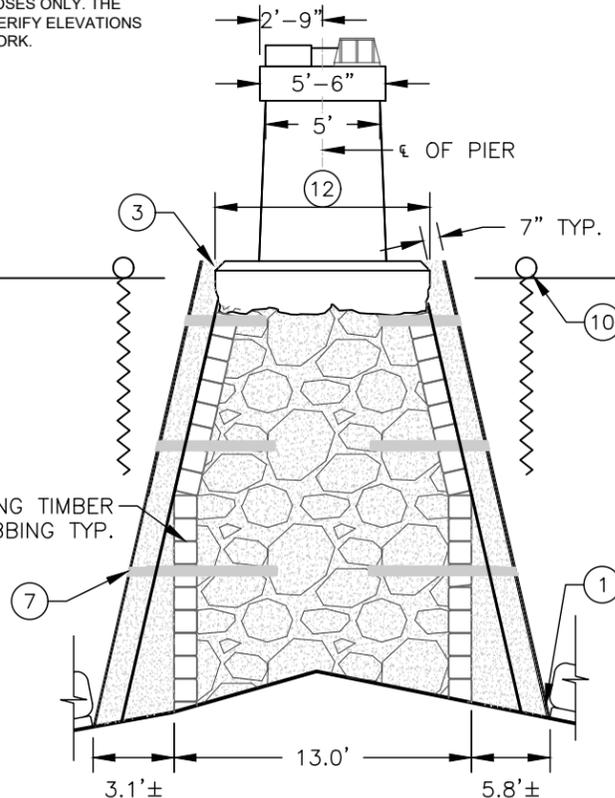
REPAIR NOTES:

1. HYDROTEx ARTICULATING BLOCK (AB600) FABRIC FORMED CONCRETE PLACED ON RIVER BED AND USED TO SEAL AGAINST GROUT ESCAPE. EXTEND FABRIC FORMED CONCRETE 6'-0" OFF PIER IN ALL DIRECTIONS. PLACE HYDROTEx GROUT BAGS AT BASE OF PIER TO HOLD FORMWORK IN PLACE.
2. INSTALL STEEL REINFORCING PLATES AT ALL 4 CORNERS OF PIER. SEE PIER DETAILS ON SHEET S-08.
3. FP-475 WEATHERABLE RIGID VINYL SYNTHETIC SHEETPIILING USED AS STAY-IN-PLACE FORMWORK.
4. PLACE LARGE STEEL 1/2" ICE BREAKER PLATE AND/OR OTHER ACCESSORIES EXTENDING FROM TOP OF FOOTING TO 5'-0" BELOW TOP OF FOOTING. SEE PIER DETAILS ON SHEET S-08.
5. PLACE SMALL STEEL 1/2" ICE BREAKER PLATE AT NOSE OF PIER. SEE PIER DETAILS ON SHEET S-08.
6. FILL ANNULAR SPACE BETWEEN FORMWORK AND CRIBBING WITH GROUT BACKFILL. FILL THE VOIDS IN THE INTERIOR OF THE CRIBBING FROM THE STREAM BED TO THE BOTTOM OF THE FOOTING WITH GROUT BACKFILL.
7. DRILL 2" Ø HORIZONTAL CORE HOLES ON EACH SIDE OF THE PIER TO VERIFY GROUT INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. REPAIR CONCRETE SPALLING/DELAMINATIONS/ETC. ON PIER FOOTING/WALL SEE PIER DETAILS.
9. FOR TYPICAL FORMWORK LIMITS, SEE PIER DETAILS ON SHEET S-07.
10. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF PIER WORK AREA
11. THE THICKNESS OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 5'-6". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
12. THE WIDTH OF THE EXISTING PIER FOOTING IS ESTIMATED TO BE 9'-0". THE CONTRACTOR, HOWEVER, SHALL VERIFY THE ACTUAL DIMENSIONS IN THE FIELD.
13. THE TABLE BELOW PROVIDES THE ESTIMATED STREAM BED ELEVATIONS AT THE PIER CORNERS BASED ON A HYDROGRAPHIC SURVEY PERFORMED ON DECEMBER 2, 2020. THE WATERLINE ELEVATION WAS MEASURED AT 574.30 AT THE TIME OF THE SURVEY.
14. THE ESTIMATED GROUT VOLUME TO BE INSTALLED AT PIER 10 IS 152 CY. THE ACTUAL VOLUME WILL DEPEND ON THE CONDITIONS ENCOUNTERED IN THE FIELD.



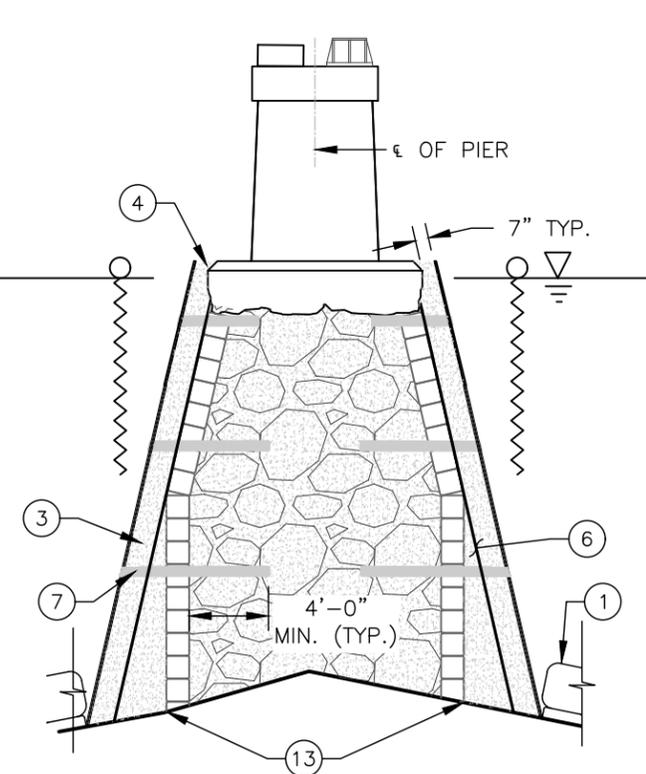
PIER 10 WEST FACE - LOOKING EAST

SCALE: NTS



PIER 10 CROSS SECTION - LOOKING NORTH

SCALE: NTS



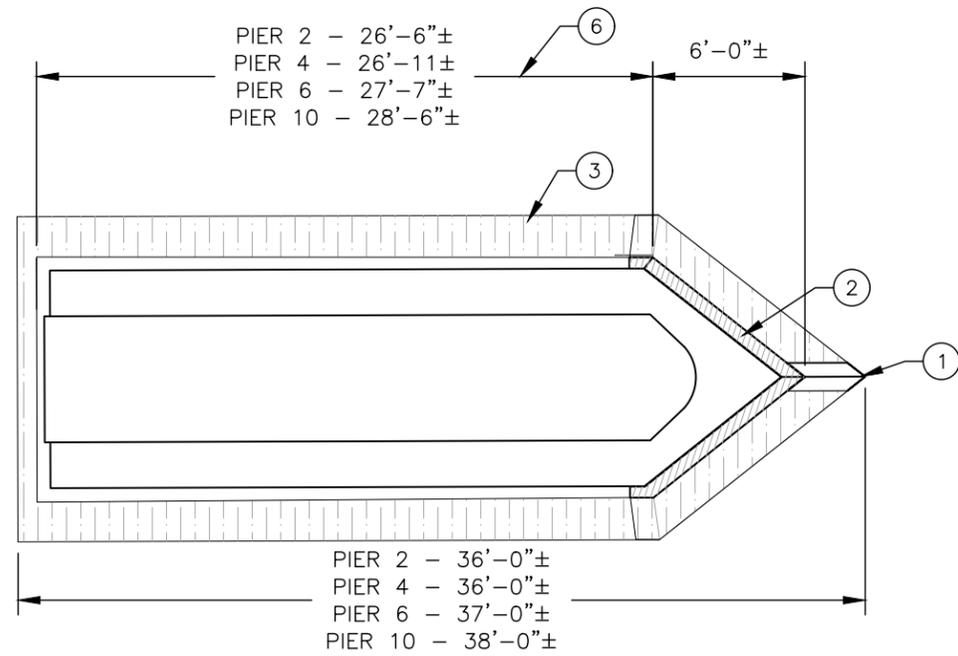
PIER 10 CROSS SECTION - LOOKING NORTH

SCALE: NTS

* FORMWORK TO BE INSTALLED TO TOP OF FOOTING ELEVATION

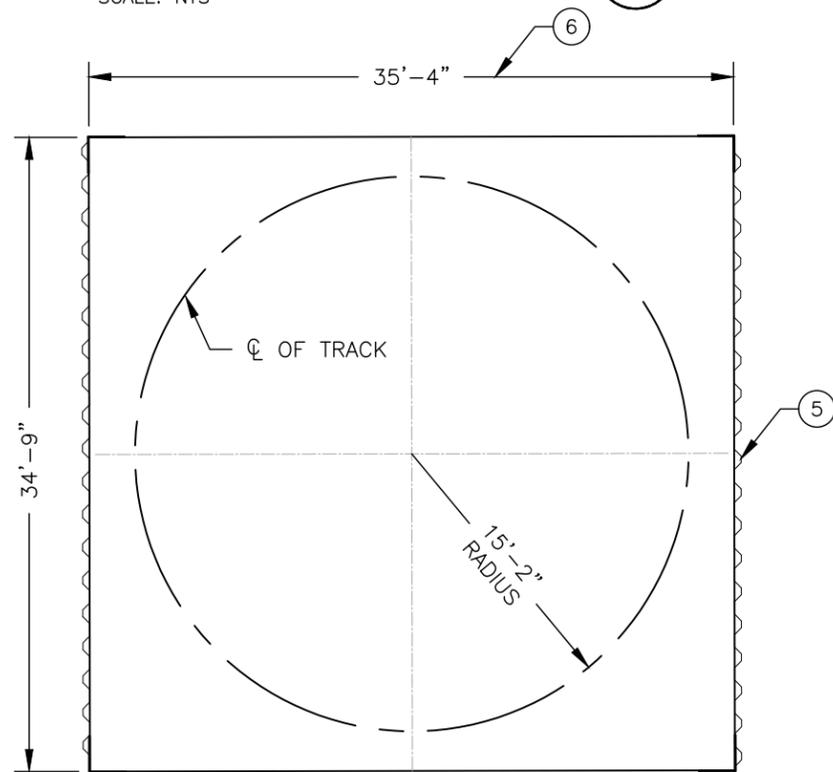


CEI PROJECT 60-12797
DESIGNED BY: SJM
DRAWN BY: JCG
CHECKED BY: SJM
DATE: 4-16-21
SHEET NO: S-06



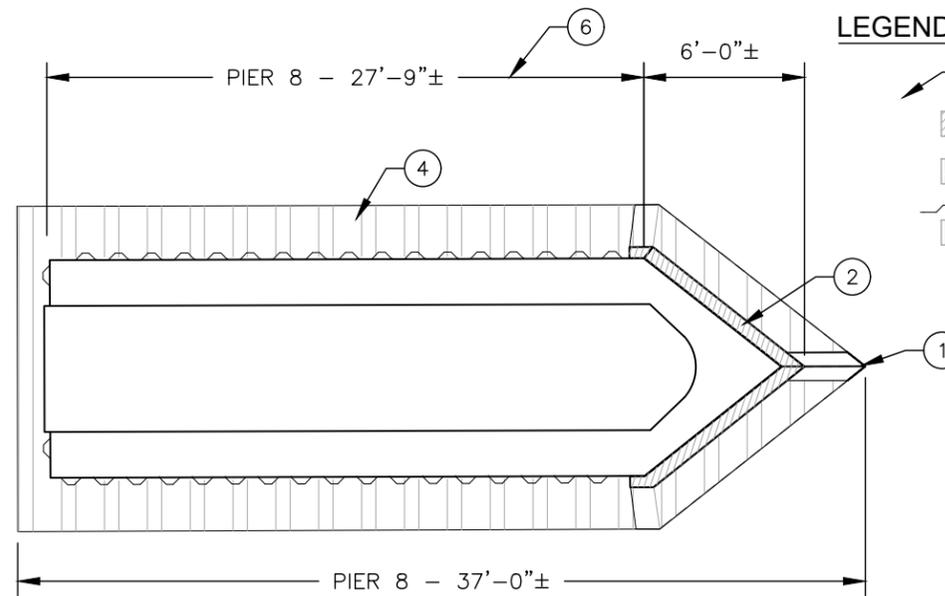
FORMWORK PIERS 2, 4, 6, & 10

SCALE: NTS



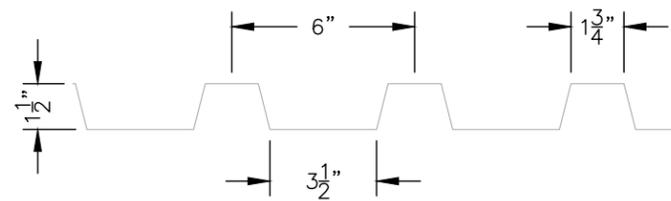
FORMWORK PIER 9

SCALE: NTS



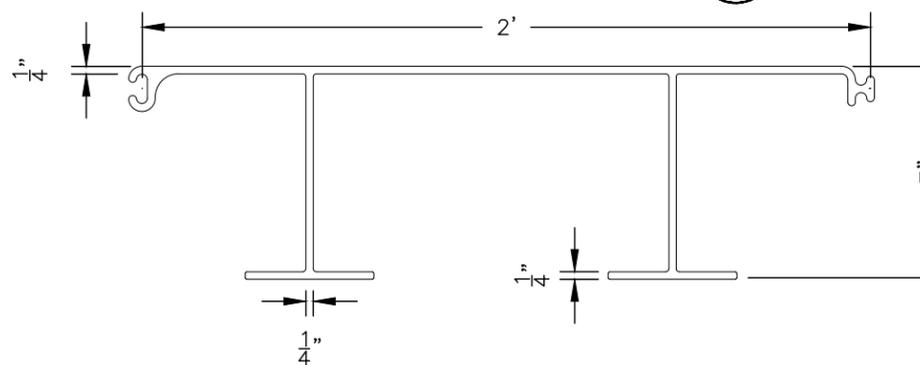
FORMWORK PIER 8

SCALE: NTS



STEEL SHEETING DETAIL

SCALE: NTS



VINYL SHEETING DETAIL

SCALE: NTS

LEGEND:

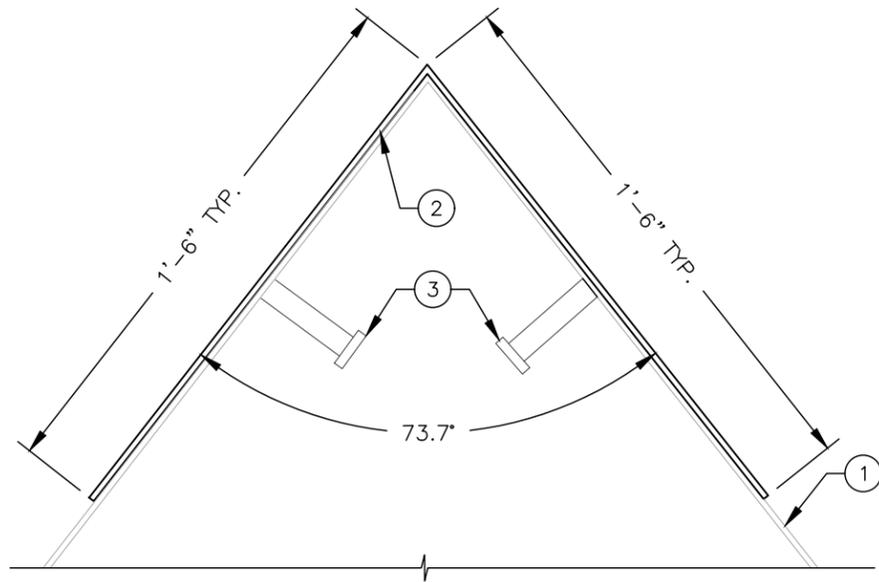
- ⓪ - REPAIR NOTE
- [Hatched Box] - STEEL PLATE
- [Vertical Lines Box] - FM-475 VINYL SHEETPIILING
- [Wavy Lines Box] - STEEL FORMWORK

DETAIL NOTES:

1. LARGE STEEL ICE BREAKER PLATE TO BE INSTALLED FROM TOP OF FOOTING TO FIVE FEET BELOW TOP OF FOOTING.
2. SMALL STEEL ICE BREAKER FROM FIVE FEET BELOW TOP OF FOOTING TO STREAM BED.
3. VINYL STAY-IN-PLACE FORMWORK TO BE INSTALLED TO TOP OF FOOTING ELEVATION ON PIERS 2, 4, 6, 10.
4. STEEL STAY-IN-PLACE FORMWORK ON PIERS 8 & 9.
5. STEEL STAY-IN-PLACE FORMWORK ON EAST AND WEST SIDES ONLY ON PIER 9.
6. PIER LENGTHS ARE ESTIMATED AND SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BEGINNING FIELD WORK

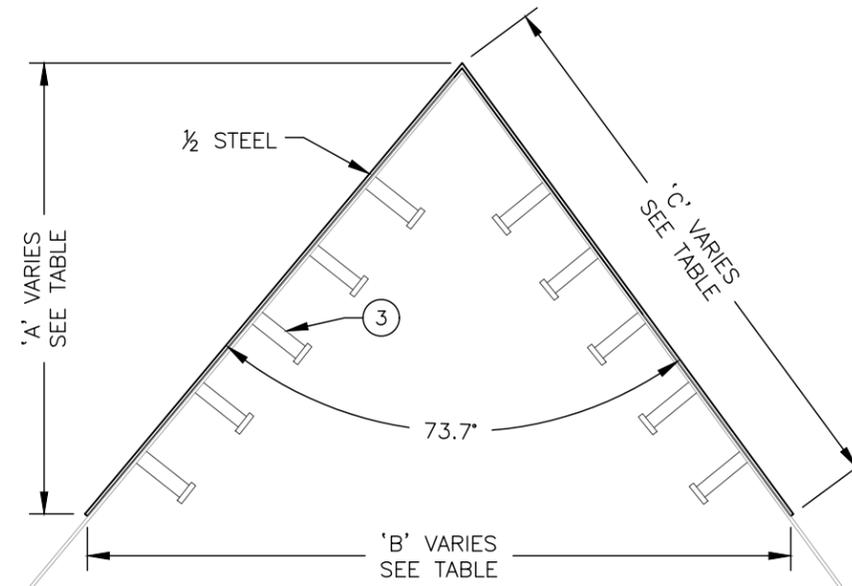
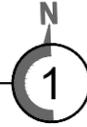


CEI PROJECT 60-12797
DESIGNED BY: SJM
DRAWN BY: JCG
CHECKED BY: SJM
DATE: 4-16-21
SHEET NO: S-07



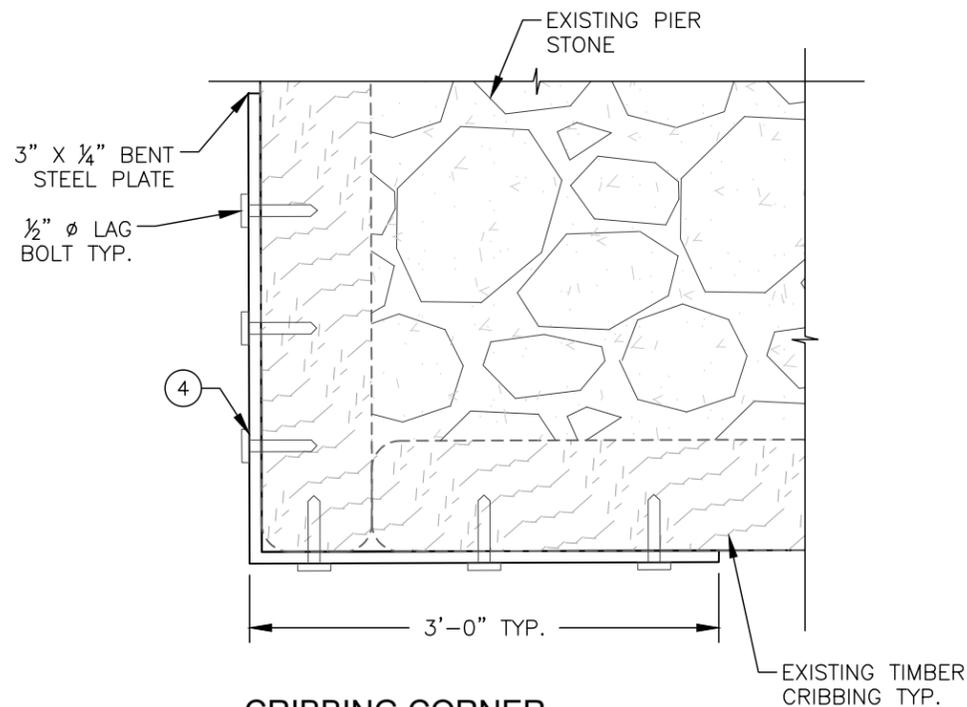
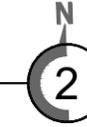
SMALL ICEBREAKER DETAIL

SCALE: NTS



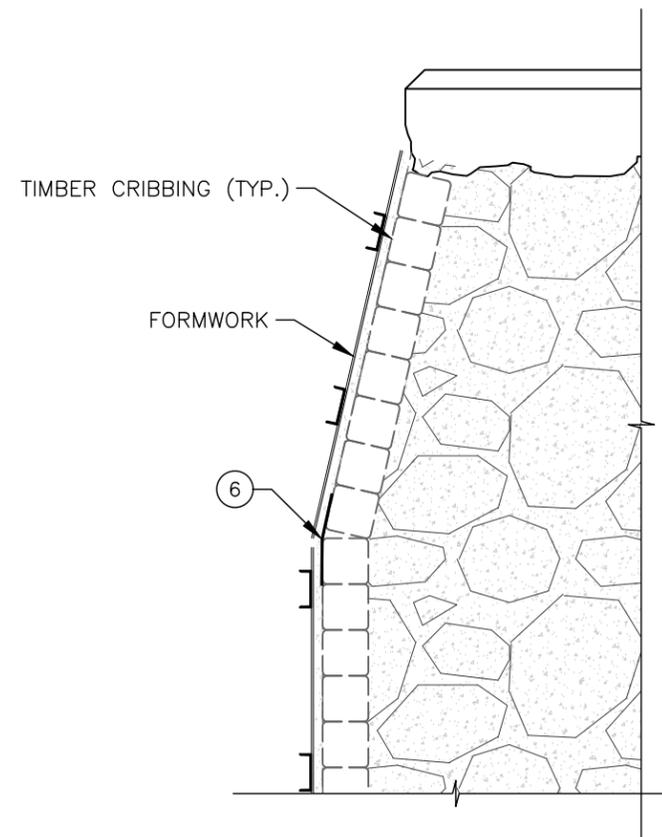
LARGE ICEBREAKER DETAIL

SCALE: NTS



CRIBBING CORNER REINFORCEMENT DETAIL

SCALE: NTS



TIMBER CRIBBING DETAIL

SCALE: NTS

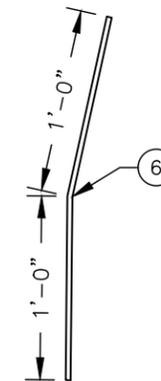


LEGEND:

- Repair Note

NOTES:

1. VINYL OR STEEL STAY-IN-PLACE FORMWORK.
2. SMALL 1/2" STEEL ICEBREAKER FROM CHANNEL BOTTOM TO 5' BELOW TOP OF FOOTING.
3. 3/4" Ø STUD WELDED AT 1'-0" SPACING VERTICALLY ON STEEL ICEBREAKER AS CONNECTION INTO GROUT.
4. INSTALL STEEL REINFORCEMENT PLATE TO REINFORCE TIMBER CRIBBING AT PIER CORNERS. REINFORCEMENT SHALL BE PLACED AT EACH CORNER AND AT ALL LEVELS OF CRIBBING VERTICALLY. ATTACH WITH A MINIMUM OF 3 EACH 1/2" LAG SCREWS PER FACE. CUSTOM MODIFY FORMWORK AND CONNECTIONS AS NEEDED AT CORNERS TO MAINTAIN THE INTEGRITY OF FORMWORK AND THE GROUT SEAL.
5. ESTIMATED LARGE STEEL ICE BREAKER PLATE DIMENSIONS ARE SHOWN IN THE TABLE BELOW. PRIOR TO FABRICATION AND INSTALLATION, THE CONTRACTOR SHALL VERIFY AND MODIFY IF NECESSARY, ALL PLATE DIMENSIONS AND ANGLES IN THE FIELD.
6. ATTACH FORMWORK FABRIC TO CRIBBING TO SEAL ANY GAPS AT CORNERS AND OTHER LOCATIONS.



FORMWORK FABRIC DETAIL

SCALE: NTS



ICEBREAKER PLATE DIMENSIONS (PIERS 2, 4, 6 & 10)			
LOCATION	DIMENSION 'A'	DIMENSION 'B'	DIMENSION 'C'
TOP OF PLATE	6'-11 1/2"	10'-5 1/2"	8'-8 1/2"
BOTTOM OF PLATE	7'-11 1/8"	11'-11"	9'-11"

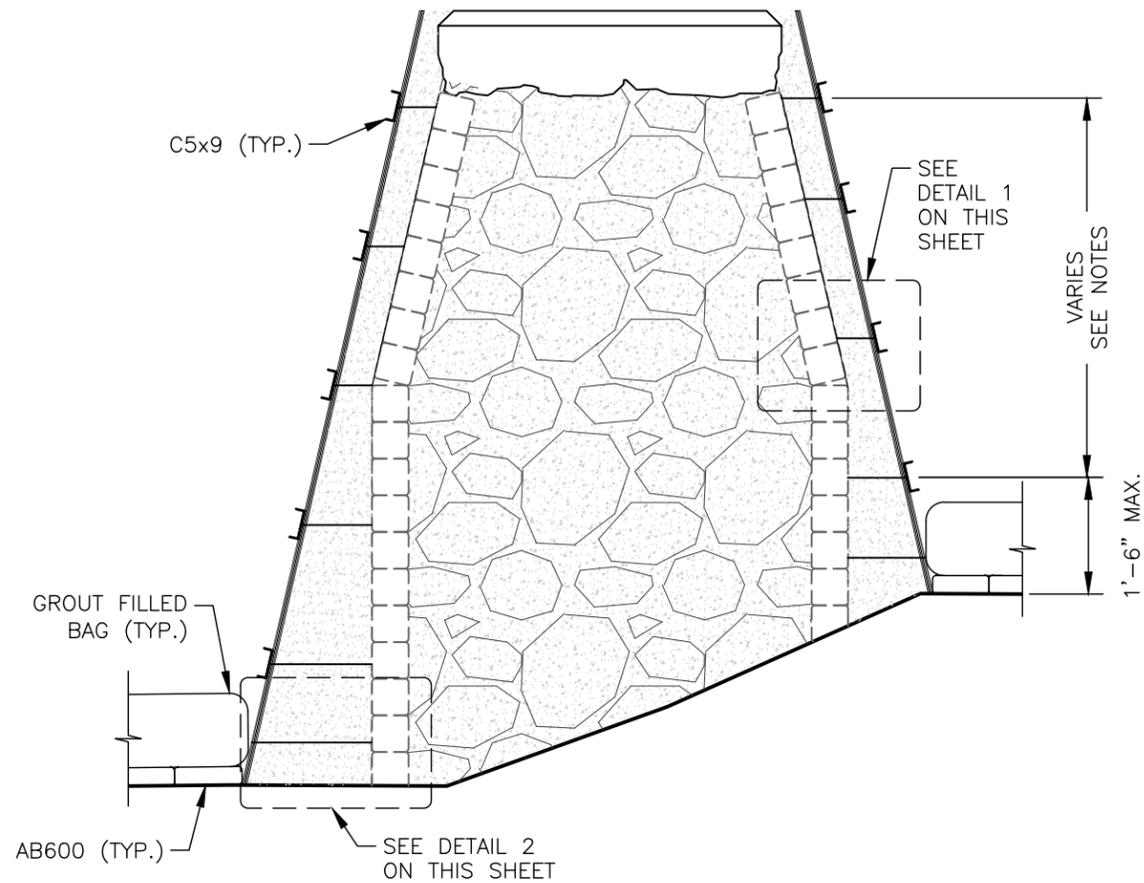
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BRENNAN

**Pier Repair Plans
 Grosse Ile Parkway Bridge
 Repair Details**
 Grosse Ile, MI

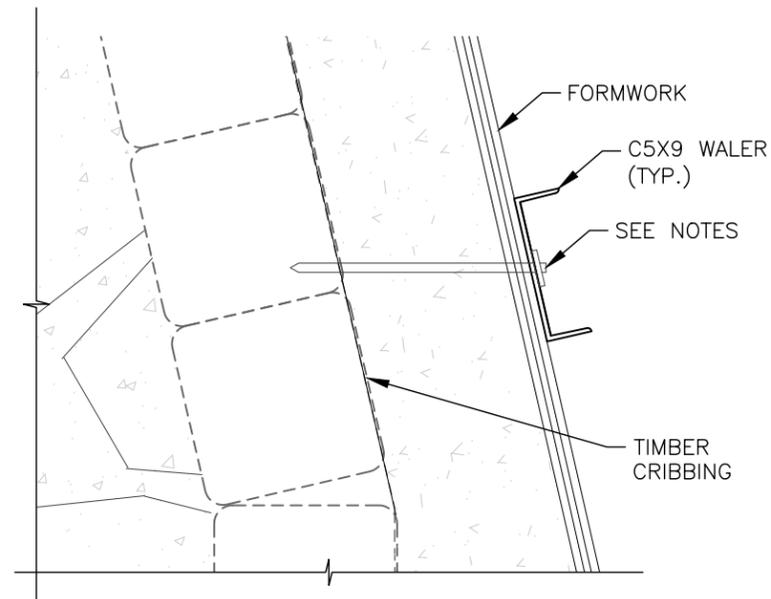
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 DESIGNED BY:
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 DRAWN BY:
 JCG
 CHECKED BY:
 SJM
 DATE:
 4-16-21
 SHEET NO:
S-08



WALER INSTALLATION

SCALE: NTS

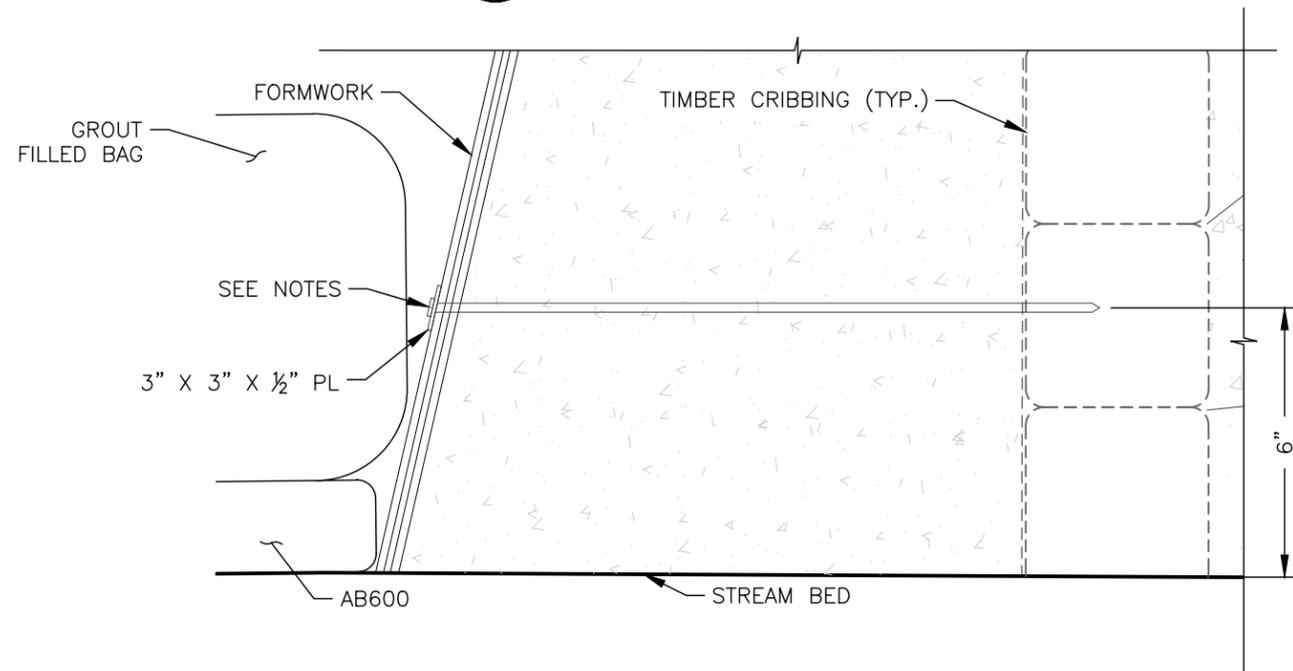
1



WALER CONNECTION DETAIL 1

SCALE: NTS

2



FORM CONNECTION DETAIL 2

SCALE: NTS

3

LEGEND:

⓪ - Repair Note

NOTES:

1. FURNISH AASHTO M270 GRADE 36 STRUCTURAL STEEL FOR THE WALERS IN ACCORDANCE WITH SECTION 906 OF THE STANDARD SPECIFICATIONS.
2. FURNISH TAPPED LAG BOLTS, COIL-LAGS, COIL BOLTS, THREADED RODS AND/OR OTHER SUITABLE ACCESSORIES AND RELATED HARDWARE TO ATTACH THE BRACING AND THE FORMWORK TO THE CRIBBING AT THE LOCATIONS SHOWN ON THE PLANS. THE MAXIMUM SPACING OF WALER CONNECTIONS IS 4'-0" ON CENTER HORIZONTALLY ALONG THE LENGTH OF THE PIER.
3. FOR PIERS 8 AND 9, THE MAXIMUM SPACING OF WALERS AND FORMWORK CONNECTIONS TO THE CRIBBING IS 2'-0" ON CENTER VERTICALLY ALONG THE LENGTH OF THE PIER.
4. FOR PIERS 2, 4, 6 AND 10, THE MAXIMUM SPACING OF WALERS AND FORMWORK CONNECTIONS TO THE CRIBBING IS 4'-0" ON CENTER VERTICALLY ALONG THE LENGTH OF THE PIER.
5. CONFIRM THE SIZE AND SPECIES OF TIMBER CRIBBING TO WHICH CONNECTIONS ARE BEING MADE, TO ASSURE THE LAG WITHDRAWAL LOAD CAPACITY IS NOT BEING EXCEEDED. PROVIDE CONNECTIONS TO SUSTAIN A MAXIMUM SAFE WORKING LOAD OF 2100 LBS. AND A 2.0 FACTOR OF SAFETY
6. ALL FORMING ACCESSORIES AND RELATED HARDWARE MUST BE OF PROPER LENGTH, DIAMETER AND CAPACITY. DO NOT EXCEED THE SPACING SHOWN ON THE PLANS. IF A GREATER SAFETY FACTOR IS REQUIRED FOR ANY REASON, THE CONTRACTOR SHALL REDUCE THE SAFE WORKING LOAD CAPACITY ACCORDINGLY.

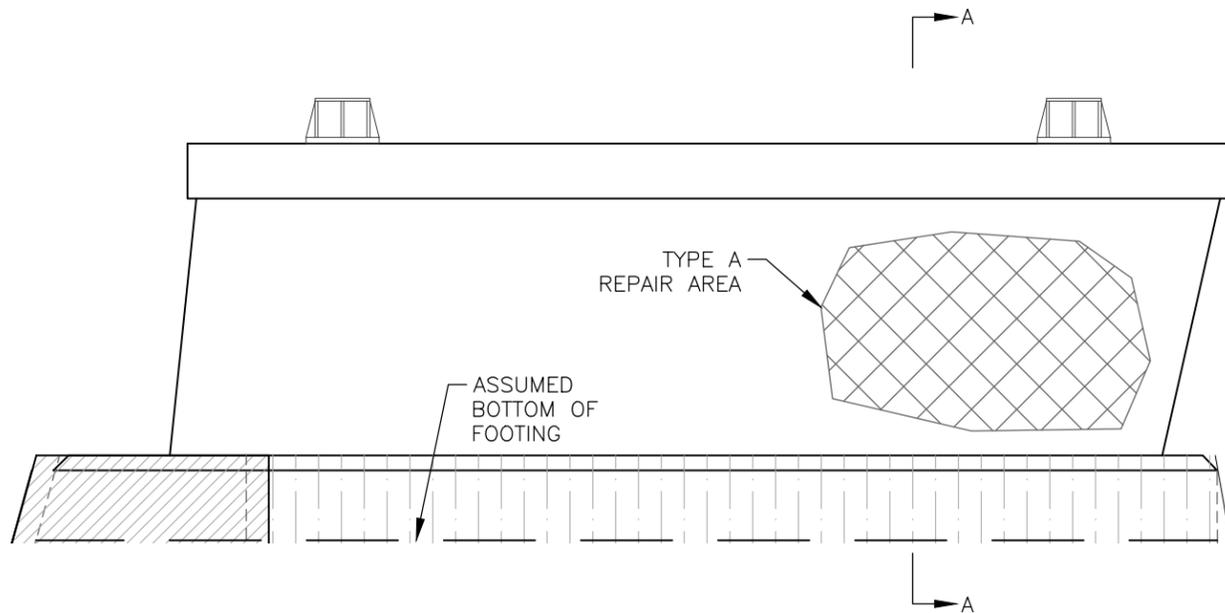
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**Pier Repair Plans
 Grosse Ile Parkway Bridge
 Repair Details**
 Grosse Ile, MI

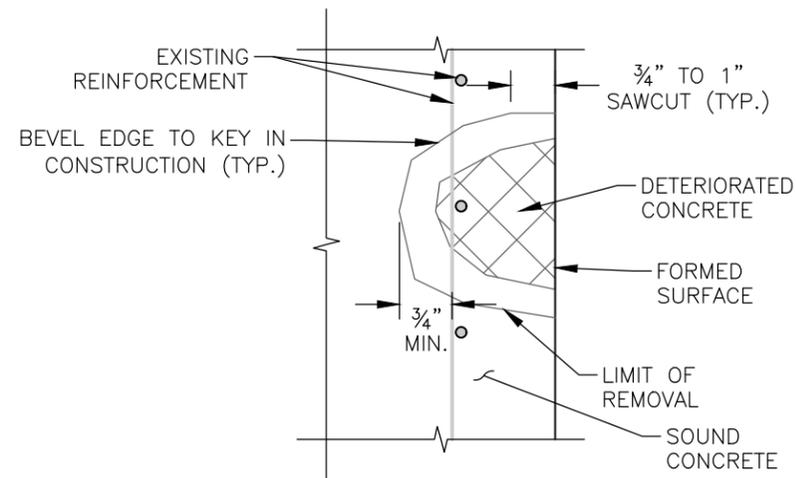
CEI PROJECT	60-12797
DESIGNED BY:	SJM
DRAWN BY:	JCG
CHECKED BY:	SJM
DATE:	4-16-21
SHEET NO:	S-09



**TYPICAL PIER WEST FACE -
LOOKING EAST**

SCALE: NTS

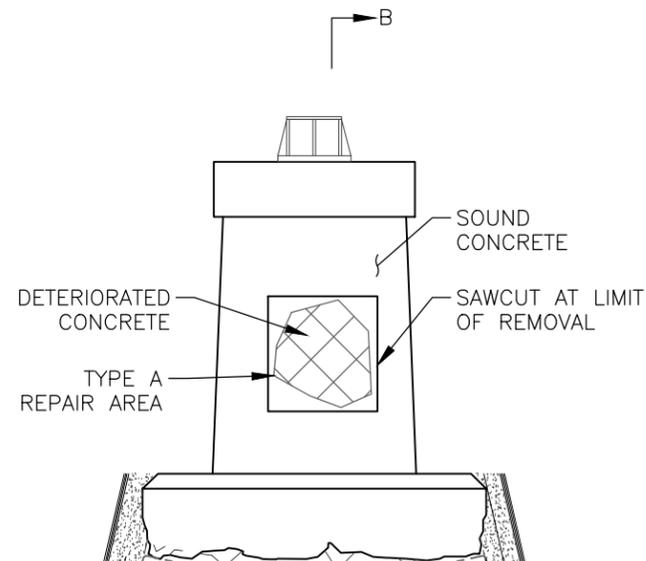
1



SECTION A-A

SCALE: NTS

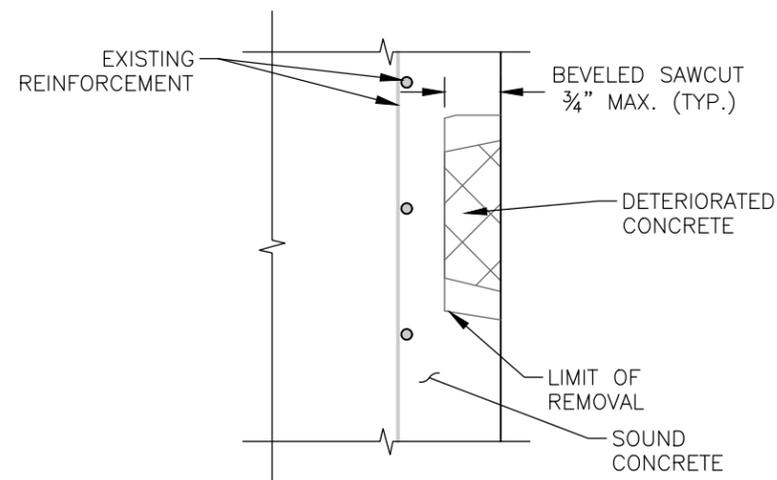
2



**TYPICAL PIER CROSS SECTION
- LOOKING NORTH**

SCALE: NTS

3



SECTION B-B

SCALE: NTS

4

LEGEND:

- CONCRETE REMOVAL

REPAIR NOTES:

CONCRETE REPAIRS ABOVE WATER SHALL NOT BE COMPLETED UNTIL AFTER BELOW WATER REPAIRS ARE COMPLETED.

REPAIR LOCATIONS SHOWN ARE ONLY EXAMPLE LOCATIONS. THE QUANTITIES SHOWN IN THE TABLE FOR TYPE A ARE ESTIMATED. THE CONTRACTOR SHALL IDENTIFY AND LOCATE THE ACTUAL LOCATIONS ON THE PIERS AND THE TYPE AND QUANTITIES OF REPAIRS TO BE CONSTRUCTED.

WHEN DEPTH OF DETERIORATED CONCRETE IS LESS THAN OR EQUAL TO 3/4"

1. SQUARE OFF DETERIORATED CONCRETE TO SOUND CONCRETE WITH A SAWCUT OF 3/4" MAXIMUM.
2. REMOVE ALL LOOSE AND DELAMINATED CONCRETE TO PROVIDE A SOUND BOND BETWEEN EXISTING CONCRETE AND PATCHING MATERIAL.
3. APPLY A RAPID HARDENING CONCRETE PATCHING MATERIAL. FIVE STAR STRUCTURAL CONCRETE WITHOUT VERTICAL LOVERHEAD PERMANENT REPAIR MATERIAL OR EQUAL.

WHEN DEPTH OF DETERIORATED CONCRETE IS GREATER THAN 3/4"

1. SQUARE OFF DETERIORATED CONCRETE TO SOUND CONCRETE WITH A SAWCUT OF 3/4" MINIMUM TO 1" MAXIMUM, BUT NOT TO THE DEPTH OF REINFORCEMENT STEEL. BACK BEVEL EDGE BEYOND SAWCUT.
2. USE HANDTOOLS TO REMOVE ALL LOOSE AND DELAMINATED CONCRETE TO PROVIDE A SOUND BOND BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
3. IF DETERIORATED CONCRETE EXTENDS BEYOND THE PRIMARY REINFORCEMENT, REMOVE THE CONCRETE TO AT LEAST 3/4" BEHIND THE REINFORCEMENT.
4. APPLY AN EPOXY BONDING COMPOUND BETWEEN THE EXISTING AND THE NEW CONCRETE.
5. CLEAN EXISTING REINFORCING BARS BY MECHANICAL MEANS.
6. APPLY A RAPID HARDENING CONCRETE PATCHING MATERIAL. FIVE STAR STRUCTURAL CONCRETE WITHOUT VERTICAL LOVERHEAD PERMANENT REPAIR MATERIAL OR EQUAL.

CONCRETE REPAIRS	
PIER 2	
PIER FACE	TYPE A (SF)
WEST	15
NORTH	--
SOUTH	25
EAST	60
PIER 4	
PIER FACE	TYPE A (SF)
WEST	10
NORTH	--
SOUTH	30
EAST	10
PIER 6	
PIER FACE	TYPE A (SF)
WEST	5
NORTH	10
SOUTH	4
EAST	10
PIER 8	
PIER FACE	TYPE A (SF)
WEST	20
NORTH	--
SOUTH	--
EAST	--

TABLE NOTES:

TYPE A PIER REPAIRS: ABOVE WATER AREA (SF) (SPALLING, DELAMINATIONS, SCALING, OR MAP CRACKING)

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**Pier Repair Plans
Grosse Ile Parkway Bridge
Repair Details**
Grosse Ile, MI

CEI PROJECT
60-12797
DESIGNED BY:
SJM
DRAWN BY:
JCG
CHECKED BY:
SJM
DATE:
4-16-21
SHEET NO:
S-10

MDOT BRIDGE LOAD RATING ASSUMPTIONS

MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 12006

LOAD RATING ASSUMPTIONS

Facility	Latitude / Longitude	MDOT Structure ID	Structure Condition	
GROSSE ILE PARKWAY	42.1273 / -83.173	82200010000B020	Poor Condition(4)	
Feature	Length / Width / Spans	Owner		
TRENTON CHANNEL	1,345.88 / 31.8 / 12	County: Wayne(82)		
Location	Built / Recon. / Paint / Ovly.	TSC	Operational Status	
GROSSE ILE	1932 / 2007 / 1978 /	Taylor(25)	P Posted for load(406580)	
Region / County	Material / Design	Last NBI Inspection	Scour Evaluation	
Metro(7) / Wayne(82)	4 Steel Continuous / 17 Movable- Swing	11/23/2021 / 6SAN	4 Stable, needs action	

Rating Considers Field Condition of Members: Yes Inspection Date: 11/23/2021

Deterioration:

SIA 58: 7, SIA 59: 4, SIA 60: 5 Summary of current (2021) section loss on floorbeams and girders in Documents Tab

Most Recent Year Construct / Reconstruct / Overlay: 2007

History of Work Impacting Load Rating:

1932: Original construction. 1942: Access stairs installed at spans 8 & 11. 1961: Traffic gates relocated to spans 7 & 12. 1980: Stringer, deck and sidewalk replacement. Misc steel repair. 2007: Deck, sidewalk and railing replacement. Suspended catwalk installed. Misc steel repair. 2021: Substructure repair below waterline to piers, Misc steel repairs throughout all spans

Superstructure Component: 3 Steel Beam fy: 30.0 ksi Beam f'c / fb: ksi

Composite: No Number of Beams: 5 Shop Drawings Verified: Yes

Beam Size(s) & Names (each span): See "Additional Loads" field.

Deck: Thickness (in.): Fy / f'c: 36.0 / ksi Deck Design Load > H15: Yes

Wearing Surface: Mat'l: Thickness (in.): Unit Weight (pcf.):

Barrier: Type / Weight (plf.): LEFT CENTER RIGHT

Sidewalk: Width / Thick (in.): / / /

Clear Roadway (ft.): 20.0

Additional Loads:

For Spans 1-8,11-12 (Fixed Spans): No. Beams = 5 (2 Girders + 3 Stringers) | Girders and Original Floorbeams and Stringers Fy = 30ksi; replaced Floorbeams and Stringers Fy = 36ksi | Size of Beams = 102.5" Web PL; L8x8x3/4 flange angles; three bottom flange cover plates totaling 1 3/8" riveted built-up Girders | Three S20x65.4 Stringers | 6-Beth 18x54.5, S18x54.7 or W18x55 floorbeams per span For Spans 9 and 10 (Swing Spans): Beam Fy = *** | Size of Beams = S20x56 (End Bays, Historic); S20x65.4 (Interior Bays) | No. Beams = 6 Stringers (End Bays); 5 Stringers (Interior Bays) | 2-Trusses (riveted built-up members) | 13 - Beth 30x149 floorbeams For Spans 1-8,11-12 (Fixed spans) Deck Thickness*: 5 in. Barrier Type/Weight: Parapet tube 354 plf. (L)(R) Traffic gate = 500 lb (estimated) For Spans 9 and 10 (Swing Spans): Deck Thickness*: 5 in. Barrier Type/Weight: Type B Rail / 110 plf. (L)(R) Sidewalk or Brush Block**: Width/Thick: 36 in./2 in. (L)(R)

Unique Factors That Affect Capacity:

For Span 1-8,11-12 (Fixed Spans) ***Steel strength: 1930 work fy = 30 ksi, 1980 & 2007 work fy = 36 ksi, for 2021 repairs fy=50 ksi *Roadway: 5" steel grating = 27.5 psf. Use equivalent 2.2" concrete deck for analysis. Sidewalk: 2" aluminum plank = 4.7 psf. Floorbeams supported at midpoint by cross-framing. Assume grating provides lateral support to stringers. Section loss on floorbeams per 2021 inspection. Assumed 2021 bolted repairs restored members to original capacity. For Spans (Span 9-10) *Roadway: 5" steel grating = 27.5 psf. Use equivalent 2.2" concrete deck for analysis. **Sidewalk: 2" concrete filled steel grate = 32 psf. Assume grating provides lateral support to stringers. 2021 Load Rating updated existing XML file in MiBRIDGE. Updates to model included bolted steel repairs and replacing floorbeams.

Analyzed By: Eric Rickert

Date: 02/04/2022

MDOT BRIDGE LOAD RATING SUMMARY

MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 12006

LOAD RATING SUMMARY

Facility GROSSE ILE PARKWAY	Latitude / Longitude 42.1273 / -83.173	MDOT Structure ID 82200010000B020	Structure Condition Poor Condition(4)
Feature TRENTON CHANNEL	Length / Width / Spans 1,345.88 / 31.8 / 12	Owner County: Wayne(82)	
Location GROSSE ILE	Built / Recon. / Paint / Ovly. 1932 / 2007 / 1978 /	TSC Taylor(25)	Operational Status P Posted for load(406580)
Region / County Metro(7) / Wayne(82)	Material / Design 4 Steel Continuous / 17 Movable- Swing	Last NBI Inspection 11/23/2021 / 6SAN	Scour Evaluation 4 Stable, needs action



Compliance Issue:	None
Compliance Verified:	No
Analysis Program:	AASHTOWare Bridge Rating (BrR)
Analysis Program Version:	6.8.4
Rating Considers Field Condition of Members:	Yes
Inspection Date:	11/23/2021

Controlling component and failure mode:

Federal and Legal: Swing Span Floorbeam 7W with Deterioration in Flexure

NEW INVENTORY CODING

NBI Item 63 - Operating Rating Method	6 LFR in Rating Factor
NBI Item 64F - Federal Operating Ratings	1.5
MDOT Item 64MA - Michigan Operating Method	6 LFR in Rating Factor
MDOT Item 64MB - Michigan Operating Rating	0.93
MDOT Item 64MC - Michigan Operating Truck	17
NBI Item 65 - Inventory Rating Method	6 LFR in Rating Factor
NBI Item 66 - Federal Inventory Rating	0.9
NBI Item 41 - Structure Open Posted Closed	P P Posted for load
NBI Item 70 - Bridge Posting	3 3 - 89% - 80%
Posted By	Truck Type
MDOT Item 141 - Posted Loading	406580
MDOT Item 193A - Michigan Overload Class	
MDOT Item 193C - Overload Status	

Sample Sign



R12-5

Analyzed By:	Eric Rickert	Date:	02/04/2022
Checked By:	Ryan Lefere	Date:	02/08/2022

BRIDGE LOAD RATING RESULTS

Michigan 2 Unit Truck 12-DL	Axle Load	LFD	Oper	73.92	1.259	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 12-DL	Axle Load Oper
Michigan 2 Unit Truck 13-DL	Axle Load	LFD	Oper	79.69	1.271	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 13-DL	Axle Load Oper
Michigan 2 Unit Truck 14	Axle Load	LFD	Oper	75.16	1.135	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 14	Axle Load Oper
Michigan 2 Unit Truck 15-DL	Axle Load	LFD	Oper	88.67	1.237	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 15-DL	Axle Load Oper
Michigan 2 Unit Truck 16-DL	Axle Load	LFD	Oper	70.72	1.022	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 16-DL	Axle Load Oper
Michigan 2 Unit Truck 17-DL	Axle Load	LFD	Oper	73.81	0.975	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 17-DL	Axle Load Oper
Michigan 2 Unit Truck 18-DL	Axle Load	LFD	Oper	76.69	0.996	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 18-DL	Axle Load Oper
Michigan 3 Unit Truck 19-DL	Axle Load	LFD	Oper	83.71	1.426	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 19-DL	Axle Load Oper
Michigan 3 Unit Truck 20	Axle Load	LFD	Oper	68.18	1.56	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 20	Axle Load Oper
Michigan 3 Unit Truck 21-DL	Axle Load	LFD	Oper	97.11	1.283	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 21-DL	Axle Load Oper
Michigan 3 Unit Truck 22-DL	Axle Load	LFD	Oper	97.14	1.204	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 22-DL	Axle Load Oper
Michigan 3 Unit Truck 23-DL	Axle Load	LFD	Oper	85.3	1.108	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 23-DL	Axle Load Oper
Michigan 3 Unit Truck 24-DL	Axle Load	LFD	Oper	91.12	1.494	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 24-DL	Axle Load Oper
Michigan 3 Unit Truck 25-DL	Axle Load	LFD	Oper	91.85	1.12	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 25-DL	Axle Load Oper

FB 7

Truck	LL Type	Rating Method	Tons	RF	Location	% Span	Limit State			
HS-20	Lane	LFD	Inv	38.04	1.057	12	1 - (50.0)	Design Flexure - Steel	HS-20LaneInv	
HS-20	Lane	LFD	Oper	63.52	1.764	12	1 - (50.0)	Design Flexure - Steel	HS-20LaneOper	
HS-20	Axle Load	LFD	Inv	32.29	0.897	12	1 - (50.0)	Design Flexure - Steel	HS-20Axle LoadInv	
HS-20	Axle Load	LFD	Oper	53.93	1.498	12	1 - (50.0)	Design Flexure - Steel	HS-20Axle LoadOper	
Michigan 1 Unit Truck 01-NL&DL	Axle Load	LFD	Oper	44.19	2.646	12	1 - (50.0)	Design Flexure - Steel	Michigan 1 Unit Truck 01-NL&DL	Axle Load Oper
Michigan 1 Unit Truck 02-DL	Axle Load	LFD	Oper	44.09	1.861	12	1 - (50.0)	Design Flexure - Steel	Michigan 1 Unit Truck 02-DL	Axle Load Oper
Michigan 1 Unit Truck 03	Axle Load	LFD	Oper	46.28	1.702	12	1 - (50.0)	Design Flexure - Steel	Michigan 1 Unit Truck 03	Axle Load Oper
Michigan 1 Unit Truck 04	Axle Load	LFD	Oper	47.52	1.41	12	1 - (50.0)	Design Flexure - Steel	Michigan 1 Unit Truck 04	Axle Load Oper
Michigan 1 Unit Truck 05-DL	Axle Load	LFD	Oper	58.16	1.385	12	1 - (50.0)	Design Flexure - Steel	Michigan 1 Unit Truck 05-DL	Axle Load Oper
Michigan 2 Unit Truck 06-DL	Axle Load	LFD	Oper	69.4	1.369	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 06-DL	Axle Load Oper
Michigan 2 Unit Truck 07-DL	Axle Load	LFD	Oper	81.72	1.369	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 07-DL	Axle Load Oper
Michigan 2 Unit Truck 08-DL	Axle Load	LFD	Oper	62.82	1.375	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 08-DL	Axle Load Oper
Michigan 2 Unit Truck 09-NL&DL	Axle Load	LFD	Oper	48.27	1.878	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 09-NL&DL	Axle Load Oper
Michigan 2 Unit Truck 10-DL	Axle Load	LFD	Oper	52.65	1.61	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 10-DL	Axle Load Oper
Michigan 2 Unit Truck 11-DL	Axle Load	LFD	Oper	57.52	1.379	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 11-DL	Axle Load Oper
Michigan 2 Unit Truck 12-DL	Axle Load	LFD	Oper	70.48	1.201	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 12-DL	Axle Load Oper
Michigan 2 Unit Truck 13-DL	Axle Load	LFD	Oper	75.98	1.212	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 13-DL	Axle Load Oper
Michigan 2 Unit Truck 14	Axle Load	LFD	Oper	71.66	1.082	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 14	Axle Load Oper
Michigan 2 Unit Truck 15-DL	Axle Load	LFD	Oper	84.54	1.179	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 15-DL	Axle Load Oper
Michigan 2 Unit Truck 16-DL	Axle Load	LFD	Oper	67.43	0.974	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 16-DL	Axle Load Oper
Michigan 2 Unit Truck 17-DL	Axle Load	LFD	Oper	70.37	0.93	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 17-DL	Axle Load Oper
Michigan 2 Unit Truck 18-DL	Axle Load	LFD	Oper	73.11	0.95	12	1 - (50.0)	Design Flexure - Steel	Michigan 2 Unit Truck 18-DL	Axle Load Oper
Michigan 3 Unit Truck 19-DL	Axle Load	LFD	Oper	79.81	1.36	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 19-DL	Axle Load Oper
Michigan 3 Unit Truck 20	Axle Load	LFD	Oper	65.01	1.488	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 20	Axle Load Oper
Michigan 3 Unit Truck 21-DL	Axle Load	LFD	Oper	92.58	1.223	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 21-DL	Axle Load Oper
Michigan 3 Unit Truck 22-DL	Axle Load	LFD	Oper	92.61	1.148	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 22-DL	Axle Load Oper
Michigan 3 Unit Truck 23-DL	Axle Load	LFD	Oper	81.33	1.056	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 23-DL	Axle Load Oper
Michigan 3 Unit Truck 24-DL	Axle Load	LFD	Oper	86.87	1.424	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 24-DL	Axle Load Oper
Michigan 3 Unit Truck 25-DL	Axle Load	LFD	Oper	87.57	1.068	12	1 - (50.0)	Design Flexure - Steel	Michigan 3 Unit Truck 25-DL	Axle Load Oper

Truck	LL Type	Rating Method		RF	Member	Tr Wt (tons)	Posting
HS-20	Lane	LFD	Inv	1.057	FB 7	36	
HS-20	Lane	LFD	Oper	1.764	FB 7	36	
HS-20	Axle Load	LFD	Inv	0.897	FB 7	36	
HS-20	Axle Load	LFD	Oper	1.498	FB 7	36	
Michigan 1 Unit Truck 01-NL&DL	Axle Load	LFD	Oper	2.646	FB 7	16.7	
Michigan 1 Unit Truck 02-DL	Axle Load	LFD	Oper	1.861	FB 7	23.7	
Michigan 1 Unit Truck 03	Axle Load	LFD	Oper	1.702	FB 7	27.2	
Michigan 1 Unit Truck 04	Axle Load	LFD	Oper	1.41	FB 7	33.7	
Michigan 1 Unit Truck 05-DL	Axle Load	LFD	Oper	1.385	FB 7	42	
Michigan 2 Unit Truck 06-DL	Axle Load	LFD	Oper	1.369	FB 7	50.7	
Michigan 2 Unit Truck 07-DL	Axle Load	LFD	Oper	1.369	FB 7	59.7	
Michigan 2 Unit Truck 08-DL	Axle Load	LFD	Oper	1.375	FB 7	45.7	
Michigan 2 Unit Truck 09-NL&DL	Axle Load	LFD	Oper	1.878	FB 7	25.7	
Michigan 2 Unit Truck 10-DL	Axle Load	LFD	Oper	1.61	FB 7	32.7	
Michigan 2 Unit Truck 11-DL	Axle Load	LFD	Oper	1.379	FB 7	41.7	
Michigan 2 Unit Truck 12-DL	Axle Load	LFD	Oper	1.201	FB 7	58.7	
Michigan 2 Unit Truck 13-DL	Axle Load	LFD	Oper	1.212	FB 7	62.7	
Michigan 2 Unit Truck 14	Axle Load	LFD	Oper	1.082	FB 7	66.2	
Michigan 2 Unit Truck 15-DL	Axle Load	LFD	Oper	1.179	FB 7	71.7	
Michigan 2 Unit Truck 16-DL	Axle Load	LFD	Oper	0.974	FB 7	69.2	67.4
Michigan 2 Unit Truck 17-DL	Axle Load	LFD	Oper	0.93	FB 7	75.7	70.4
Michigan 2 Unit Truck 18-DL	Axle Load	LFD	Oper	0.95	FB 7	77	73.2
Michigan 3 Unit Truck 19-DL	Axle Load	LFD	Oper	1.36	FB 7	58.7	
Michigan 3 Unit Truck 20	Axle Load	LFD	Oper	1.488	FB 7	43.7	
Michigan 3 Unit Truck 21-DL	Axle Load	LFD	Oper	1.223	FB 7	75.7	
Michigan 3 Unit Truck 22-DL	Axle Load	LFD	Oper	1.148	FB 7	80.7	
Michigan 3 Unit Truck 23-DL	Axle Load	LFD	Oper	1.056	FB 7	77	
Michigan 3 Unit Truck 24-DL	Axle Load	LFD	Oper	1.424	FB 7	61	
Michigan 3 Unit Truck 25-DL	Axle Load	LFD	Oper	1.068	FB 7	82	

MDOT OTHER SPECIAL INSPECTION REPORT

MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 12006

OTHER SPECIAL INSPECTION REPORT [SIA #92-C]

Facility GROSSE ILE PARKWAY	Latitude / Longitude 42.1273 / -83.173	MDOT Structure ID 82200010000B020	Structure Condition Poor Condition(4)	
Feature TRENTON CHANNEL	Length / Width / Spans 1,345.88 / 31.8 / 12	Owner County: Wayne(82)		
Location GROSSE ILE	Built / Recon. / Paint / Ovly. 1932 / 2007 / 1978 /	TSC Taylor(25)	Operational Status P Posted for load(406580)	
Region / County Metro(7) / Wayne(82)	Material / Design 4 Steel Continuous / 17 Movable- Swing	Last NBI Inspection 11/23/2021 / 6SAN	Scour Evaluation 4 Stable, needs action	

OTHER SPECIAL INSPECTION

TZTM

Inspector Name	Agency / Company Name	Insp. Freq.	Insp. Date
Eric Rickert	Great Lakes Engineering Group	6	04/04/2022

PROCEDURES

Inspect elements from catwalk below deck. Access catwalk from the west end of span 9W and the east end of span 10W

SPAN CONFIGURATION

Bridge Type	17 Movable-Swing	Appr Span Type	03 Girder-Floorbeam
Main Span	4 Steel Continuous	Appr Span	3 Steel
# of Main Spans	2	# of Appr Span	10
Lanes On	2	Lanes Under	0
47L-Left Horizontal Clear (ft)	0	47R-Right Horizontal Clear (ft)	22.01
54B-Left Underclearance (ft in)	0 ft. 0 in.	54D-Right Underclearance (ft in)	0 ft. 0 in.

ELEMENTS LOCATON

Steel superstructure elements in spans 1W-8W and 11W-12W (04/22)

INSPECTION COMMENTS

An Other Special Inspection is being created to monitor the condition of the superstructure in spans 1W-8W and 11W-12W. Special attention should be given to the floorbeam/stringer connections, especially in spans 7W and 8W. This 4/4/22 Other Special inspection report is being created as a calendar marker for the October 2022 inspection (04/22)

Need to inspect the elements that caused the bridge to be posted due to load rating analysis. Wayne County hired WSP to do in-depth complete inspection of the structural, mechanical, electrical and underwater of the bridge. The inspection was done and completed by WSP 6/12/2017. WSP recommended inspection frequency of 12 months. Spicer Group did routine and fracture critical inspection of the bridge in 6/26/2018. Spicer Group recommended 12 months inspection frequency. (03/17)

Traffic Control	N	Comments:
Special Equipment		Comments:
Photographs	N	

RECOMMENDATIONS AND ACTION ITEMS

