AMI
Consulting Engineers P.A.

February 24, 2015

Tim Nelson
Minnesota Department of Transportation (MnDot)
Golden Valley Central Construction Office
2055 North Lilac Drive
Golden Valley, MN 55422

Re: Bridge No. 2440 Rehabilitation Dive Inspection Summary for 2014
AMI Project # 141122

Mr. Nelson:

This letter is written in regards to the rehabilitation of bridge number 2440 which crosses the Mississippi River in Minneapolis, MN. Three of the eight concrete bridge piers were to be rehabilitated above and below the waterline. This letter will summarize the work completed and the construction changes which occurred below the waterline on bridge piers #1, 2, & 5. A detailed description of the defects documented during the inspection process can be viewed in the Field Notes of the attached documents. This letter is a summary of the inspection and should be used in conjunction with the attached documents. An aerial view of the bridge can be seen in Picture #1 below and the location of the piers can be seen on S1.0 in the attached drawings.

Picture 1: Aerial view of bridge no. 2440

Bridge Pier #1

Bridge pier #1 was located on the far west side of the river. Deteriorated concrete was to be removed and rehabilitated with new concrete and stainless steel rebar on two different areas of the pier below the waterline. However, only one area of deteriorated concrete near the waterline

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had been rehabilitated during the 2014 construction season, due to the delays in the construction schedule. The rehabilitation of the second area of deteriorated concrete near the mud line will be completed in 2015. See attached MnDot Construction Plans for additional information on the require pier rehabilitation.

For the deteriorated concrete near the waterline, the construction documents required a horizontal saw cut at the base of the rehabilitation area that penetrated the concrete pier 3" to 5". The face of the concrete at the saw cut location was heavily deteriorated with areas of spalling concrete. Due to the spalling concrete and the resulting uneven surfaces, the saw cut did not penetrate the concrete pier the specified minimum of 3" on approximately 15% on the concrete pier. As a result of the smaller saw cut, the distance from the vertical dowel to the inside face of the concrete forms was also less than the specified minimum distance of 3".

The distance between the vertical rebar also exceeded the specified spacing of 12". The ACI code allows a placement tolerance of ¼ times the specified spacing but not to exceed 1". This results in a maximum allowable spacing of 13". Approximately 50% of the vertical rebar were spaced greater than 12" and 25% to 30% of the vertical rebar were spaced greater than 13". The maximum spacing between the vertical rebar was 14".

After each concrete pour, AMI re-inspected the new concrete to document any areas of washout or deficiencies. On the east and west side of the pier, the new concrete had migrated below the saw cut. The forms were slightly out from the original vertical concrete face of the pier which allowed the concrete to migrate below the saw cut due to the spalling concrete. The location of the forms did allow for additional concrete cover on the rebar. The concrete below the saw cut had areas of honeycombing that were about 5"to 6" in height. On the west side of the pier, a large area of concrete was missing presumably due to a failure of the concrete forms. The area of missing concrete was approximately 18.5" tall with a maximum penetration 4" which exposed one vertical bar and one vertical dowel of the new rebar. To remedy this area, the contractor installed a 3'-0" tall by 4'-0" wide concrete form that protruded from the new concrete face 1-⅞". The missing area of concrete was located approximately at station 0+35 on the west side of the pier. AMI was unable to re-inspect this repair after the concrete had been placed due to early freeze up.

In one area where the new concrete had not migrated below the saw cut, the bottom edge of the new concrete protruded out from the existing concrete face. The maximum protrusion or lip was approximately ¾" over an 8'-0" long horizontal area and was located near the upstream tip of the pier. Because of this lip, the bottom edge of the new concrete is susceptible to damage from ice impacts and abrasion.

Bridge Pier #2

Bridge pier #2 was located directly to the east of pier #1. The required rehabilitation work was similar to pier #1, however, the construction documents only required that vertical concrete face near the waterline be rehabilitated. During AMI's last site visit, the concrete forms were still present on the downstream half of the pier, so AMI was unable to inspect the new concrete in these areas. See attached MnDot Construction Plans for additional information on the require pier rehabilitation.

The condition of the horizontal saw cut and spacing of the vertical rebar were very similar to the conditions described for pier #1. However, the spacing of the bottom horizontal rebar was also outside the specified spacing of 12". The bottom horizontal rebar was not set at a consistent elevation and had a wave profile to it. This caused a maximum distance to the adjacent bar to range greatly with a maximum distance of 13 ⅜".

The condition of the new concrete on the upstream half also had areas of honeycombing concrete below the saw cut which were similar to pier #1. No areas of missing concrete were documented but the concrete forms were still present on the downstream half of the pier during AMI's last inspection. Two vertical bulges in the new concrete were documented near the upstream tip of the pier. The bulges have occurred at the location where two concrete forms butt up to each other. The bulge appears to be ground smooth above the waterline but a very apparent edge was still present below the waterline. The maximum difference between the two concrete faces was approximately 2" over a distance of 2'-0".

Bridge Pier #5

Bridge pier #5 was located just to the east of the horseshoe dam. The required rehabilitation work for pier #5 included filling the scour hole below the pier with concrete and rehabilitating an area of deteriorated concrete on the east side of the pier. See attached MnDot Construction Plans for additional information on the require pier rehabilitation.

To rehabilitate the scour hole below the pier, the contractor had to remove any loose sediment and debris from below the pier and then place 6'-0" to 7'-0" tall forms around the scour areas. The new concrete would extend up from the bedrock to the horizontal face of the concrete pier. During the process of removing loose sediment and debris below the pier, the contractor discovered very low strength concrete or grout located along the vertical face of the existing concrete footing. The thickness of the low strength concrete or grout varied from 6" to the entire height of the vertical face of the pier footing. The low strength concrete or grout also appeared to extend underneath the tapered face of the concrete pier. Due to the large volume of the low strength concrete or grout, the areas were not removed but encased in additional concrete that extended above the horizontal face of the pier A general cut section of the new repairs can be seen in detail 5/S1.0 of the attached AMI drawings.

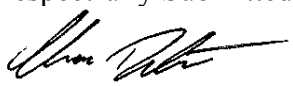
The new repairs consisted of an additional D5xD5 deformed rebar mat with 4" spacing above the horizontal face of the existing concrete pier. The mat was attached to the existing concrete pier with horizontal and vertical dowels. The vertical dowels were a mixture of #4 rebar and ½" diameter threaded rod while the horizontal dowels were primarily ½" diameter threaded rods. However, some #4 horizontal rebar dowels were documented near the upstream tip of the concrete pier. MnDot onsite personnel verbally approved the change from rebar to threaded rods.

The new concrete forms extended from the upstream tip of the pier to station 0+62 on the east side and to station 0+60 on the west side of the pier. However, the void below the footing extended further downstream of the concrete forms. Additional grout bags were placed along the void prior to concrete being placed below the pier. The grout bags extended to station 0+72 on the east side and to station 1+03 on the west side of the pier.

The construction documents call out an area of deteriorated concrete on the east side of the pier. The area was approximately 5'-0" wide by 3'-0" tall with a penetration that ranged from 2'-0" to 3'-0". This area was located on the construction documents at 3'-0" below the normal river elevation on the tapered face of the concrete pier. However, a spall of that size was not documented by the contractor or AMI. An area of honeycombed concrete with a similar area was documented near the specified area but the penetration was only 2" instead of 2'-0" to 3'-0". This area will need to be addressed during the 2015 construction.

If you have any questions or comments please contact AMI at (715) 718-2193.

Respectfully Submitted,

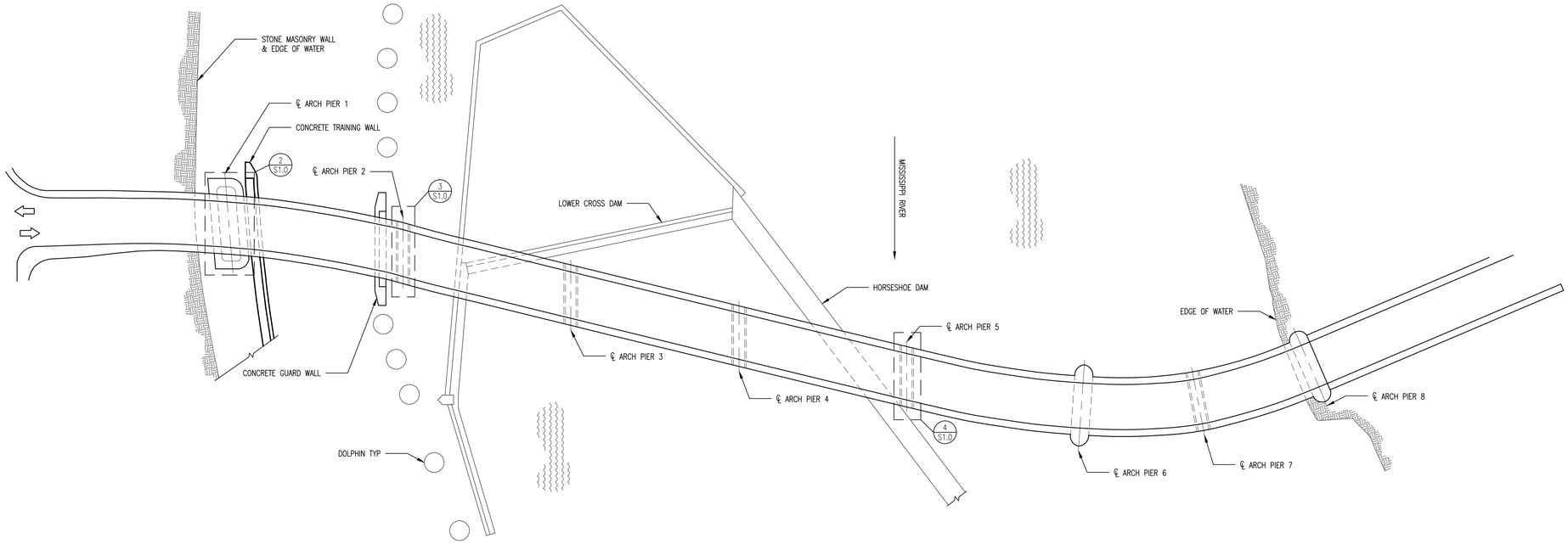


Chase Dewhirst, PE

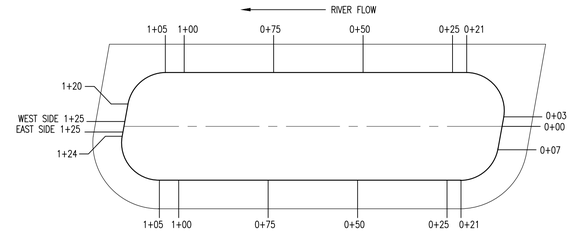
Reviewed By,
Chad W. Scott, PE
Principal

Attachments:

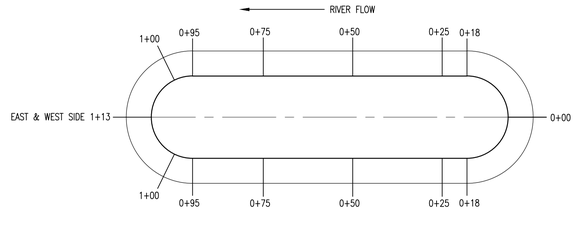
- AMI Drawings: S1.0
- AMI Field Notes: 9/23/14, 10/1/14, 10/20/14, 11/3/14, 11/4/14
- MnDot Bridge No 2440: Sheets 1 to 19



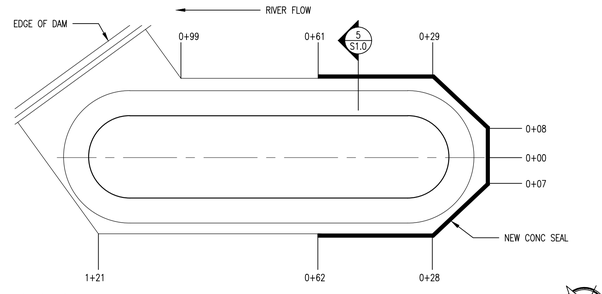
1 S1.0 GENERAL PLAN
SCALE: 1" = 40'-0"



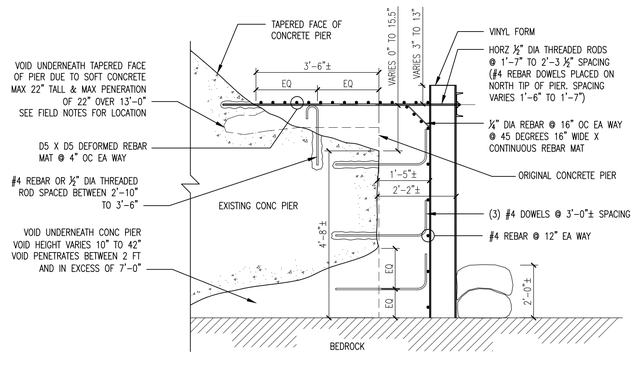
2 S1.0 PIER 1 SECTION
SCALE: 1" = 20'-0"



3 S1.0 PIER 2 SECTION
SCALE: 1" = 20'-0"



4 S1.0 PIER 5 SECTION
SCALE: 1" = 20'-0"



5 S1.0 PIER 5 DETAIL
SCALE: 1" = 2'-0"

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DATE:	REV:	DESCRIPTION	REV. BY:

Minnesota Department of Transportation
Bridge No# 2440
Dive Inspection
Saint Paul, Minnesota

General Plan & Section Details

JOB No: 141122
DATE: 2/24/15
DRAWN BY: PJB
DESIGNED BY: CAD

SHEET:
S1.0

1/7/2015 2:25 PM
J:\2014\141122\MnDOT\Revit Input\Drawings\S1.0.dwg

Bridge No. 2440 Rehabilitation Field Notes
U/W Structural Inspection
Minnesota Department of Transportation (MnDOT)

Team Leader: Chase Dewhirst
Inspection Date: 9/23/2014
Inspection Time: 11:30:00 AM to 4:45 PM
Inspection Type: Level 1
Water Elevation: 808.79' to 808.9'

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
BLUEVIEW 3D SCANS ON PIER #5															
East	Scan #1	0:00:00	7.5	-	-	-	-	-	-	-	-	-	-	-	- Scan performed at midpoint of pier #5 approximately 20'-0" out from face of pier on NE side
East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Water is approximately 15'-0" deep at edge of pier but the ML significantly rises up at 10'-0" from face of pier to
															water depth at scan location.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Bottom is gravel with some sand
East	Scan #2	-	13	-	-	-	-	-	-	-	-	-	-	-	- Scan performed off of NE corner of bridge pier
East	Scan #3	-	12	-	-	-	-	-	-	-	-	-	-	-	- Scan performed off of upstream tip of bridge pier
West	Scan #4	-	11	-	-	-	-	-	-	-	-	-	-	-	- Scan performed off of NW corner of bridge pier
West	Scan #5	-	13	-	-	-	-	-	-	-	-	-	-	-	- Scan performed at midpoint of pier #5 on SW side
PIER #5 VISUAL INSPECTION															
West	0+29	13:39:00	-	-	-	-	-	-	-	-	-	-	-	-	- Start of Inspection
-	-	13:43:00	-	-	X	See Comments	-	-	-	-	-	-	X	-	- Bottom portion of the footing appears to be spalled out with void below. Total void height is 3'-5" tall.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Bottom of concrete tapers towards the bedrock at least 7'-0" into footing. Void may continue but void
															becomes small. Bedrock present along ML
West	0+19	13:46:15	-	-	-	-	-	-	-	-	-	-	-	-	- Void height becomes more consistence at approximately 1'-9". Void penetrates footing a minimum of 7'-0"
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Void does continues further downstream
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Bedrock cleared within 5'-0" of footing edge
West	0+00	13:49:30	-	-	-	-	-	-	-	-	X	Timber	-	-	- Debris is within outside edge of footing
East	0+28	13:51:00	-	-	-	-	-	-	-	-	-	-	X	-	- Void height is 1'-4"
East	0+38	13:52:30	-	-	-	-	-	-	-	-	-	-	-	-	- Some sand built up along bottom. Approximately 2" deep of sand.
East	0+48	13:55:00	-	-	-	-	-	-	-	-	X	Rock/Conc	-	-	- Large rock/concrete block present between bottom of footing & bedrock. Significant more sand, debris, &
															material built up approximately 20'-0" wide diameter around boulder
East	0+73	13:56:45	-	-	-	-	-	-	-	-	X	Rock/Conc	X	-	- Golf ball to baseball size chunks of debris below footing beyond built up pile of material. Void still present
															with approximate height of 1'-4"
East	0+74	14:02:45	-	-	-	-	-	-	-	-	-	-	-	-	- Void full of material. Stop location of cleaning
PIER #2 VISUAL INSPECTION															
West	0+75	14:43:30	-	-	-	-	-	-	-	-	-	-	-	-	- 1" saw cut is located approximately 1'-6" below the waterline. Unable to determine the saw cut height
															above the footing due to amount of debris from chipping operations
-	-	14:49:10	-	-	-	-	-	-	-	-	-	-	-	-	- Saw cut depth is approximately 2.5" on downstream side. ML is only 2'-0" below saw cut and elevation of
															cut unknown due to debris
West	0+36	14:50:00	-	-	X	See Comments	-	-	-	X	-	-	-	-	- No longer straight edge at saw cut due to spalled out area of concrete but minimum of 5" chipped area
															obtained
West	1+13	14:57:00	-	-	-	-	-	-	-	-	-	-	-	-	- Chipping below WL stops but saw cut continues.
-	-	14:59:00	-	-	-	-	-	-	-	-	-	-	-	-	- Saw cut location varies 11.5" to 12" above the footing
West	0+96	15:00:00	-	-	X	See Comments	-	-	-	-	-	-	-	-	- 6" wide area where saw cut not present due to spalled area of concrete. This condition is present
															is sporadically present along pier (<2%)
West	0+12	15:09:00	-	-	-	-	-	-	-	-	-	-	-	-	- Chipping below WL starts
East	0+18	15:12:30	-	-	X	See Comments	-	-	-	X	-	-	-	-	- Saw cut not deep enough over a 2'-0" wide area & saw cut located approximately 11.25" above footing

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
PIER #1 VISUAL INSPECTION															
West	0+75	16:03:30	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection and also the start location of the vertical dowel installation (Dowel start & extend US).
															Diver is working downstream inspecting the saw cut.
-	-	16:04:15	-	-	-	-	-	-	-	-	-	-	-	-	- Horizontal saw cut is present and chipping penetrates 5.25" into the pier
-	-	16:06:00	-	-	X	See Comments	-	-	-	X	-	-	-	-	- Saw cut is in similar condition to pier #2 with areas of small spalling
West	1+05	16:07:30	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical dowels starts. (3) dowels at the end that do not have epoxy. Dowels have between 12" & 13"
															embedment with 28" to 29" of rebar extending above the concrete.
-	-	16:14:30	-	-	-	-	-		-	X	-	-	-	-	- Horz spacing within limits and distance between the face of concrete to dowel centerline vary between
															2" and 3". Specified was 3" to 5".
-	-	16:19:20	-	-	-	-	-	-	-	X	-	-	-	-	- Horizontal bars in rebar mat are all less than 12". Approximately 25% of the Vertical bars are spaced > 13"
-	-	16:24:00	-	-	-	-	-	-	-	-	-	-	-	-	- Concrete behind the rebar mat was chipped down to solid concrete. Some loose concrete was documented
															below the saw cut.
West	0+36	16:25:00	-	-	-	-	-	-	-	X	-	-	-	-	- Very little concrete cover (Approx. 1.25") documented on the vertical dowels. Reduced cover due to the
															spalling concrete below saw cut and poor rebar location. Area is approximately 9'-0" long.
West	0+21	16:30:43	-	-	-	-	-	-	-	-	-	-	-	-	- Clear cover on rebar approximately 4.25" at edge of form but forms not in their final position.
East	0+21	16:36:45	-	-	-	-	-	-	-	-	-	-	-	-	- Form not in final position. Rebar lap splice = 23.5"/24"/28". Clear cover on the vertical dowels approximately
															3" as specified.
-	-	16:41:15	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical dowels extend 2'-5" above the concrete
East	0+29	16:43:45	-	-	-	-	-	-	-	-	-	-	-	-	- Some debris built up behind the rebar cage. Mark present on pier so probably have not cleaned yet
East	0+39	16:45:00	-	-	-	-	-	-	-	X	-	-	-	-	- Very little clear cover on vertical dowels (Approx. 0.5") for 12'-0" long area with (1) dowel embedded into the
															footing and not the saw cut.
-	-	16:48:45	-	-	-	-	-	-	-	-	-	-	-	-	- Spacing between vertical dowels = 24.5"
-	-	16:49:45	-	-	-	-	-	-	-	X	-	-	-	-	- Approx. 50% of vertical bars spacing greater than 12" & 25% to 30% of the vertical bars greater than 13"

Bridge No. 2440 Rehabilitation Field Notes
U/W Structural Inspection
Minnesota Department of Transportation (MnDOT)

Team Leader: Chase Dewhirst
Inspection Date: 10/1/2014
Inspection Time: 11:00:00 AM to 3:15 PM
Inspection Type: Level 1
Water Elevation: 808.61' to 808.64'

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
PIER #1 VISUAL INSPECTION															
East	0+63	11:17:20	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection. Saw cut not present due to spalling out of concrete. Vertical dowels along this section
															still have adequate clear cover but the dowels are at lower elevation
-	-	11:20:46	-	-	-	-	-	-	-	-	-	-	-	-	- Area of debris present along saw cut. Cleaning not complete yet
East	0+70	11:21:30	-	-	-	-	-	-	-	X	-	-	-	-	- Inadequate cover of vertical dowels for two dowels due to spalling concrete below the saw cut.
-	-	11:22:00	-	-	-	-	-	-	-	-	-	-	-	-	- Solid concrete present behind the rebar mat
-	-	11:24:00	-	-	-	-	-	-	-	X	-	-	-	-	- Vertical rebar spacing = 12.5"/14"/10.5"/11.5"/12.25"/13.75" Similar to pier #1 rebar inspection on 9/23/14
															Approx. 50% of the bar spacing greater than 12" & 25% of the rebar spacing greater than 13"
East	1+02	11:26:15	-	-	-	-	-	-	-	-	-	-	-	-	- Existing metal dowel were extending out from pier. Dowel is approximately 0.75" in diameter and will have
															approx. 7/8" cover when forms are installed
East	1+27	11:29:00	-	-	-	-	-	-	-	X		-	-	-	- Lap splice on DS tip of pier = 16" but a 24" min lap splice was specified
West	1+05	11:33:00	-	-	-	-	-	-	-	-	-	-	-	-	- Some debris removed along the bottom. The sloped face of the footing is exposed but none of the lower
															vertical face is exposed
-	-	11:37:00	-	-	-	-	-	-	-	-	-	-	-	-	- Another existing 3/4" diameter metal dowel documented protruding from concrete pier. Concrete cover would
-															be greater than 3" once forms are installed
-	-	11:41:00	-	-	-	-	-	-	-	X	-	-	-	-	- Voids present sporadically below the forms. Max height = 1 3/8" and voids tend to be at location of spalling
															concrete
-	-	11:48:40	-	-	-	-	-	-	-	-	-	-	-	-	- 2" of concrete cover at end of installed forms
East	0+21	11:50:00	-	-	-	-	-	-	-	X	-	-	-		- Some loose debris that is present along saw cut. Material needs to removed prior to concrete placement
-	-	11:50:45	-	-	-	-	-	-	-	X	-	-	-	-	- Horizontal rebar need to be tied to vertical dowels at 8'-0" down from end of concrete form
-	-	11:53:00	-	-	-	-	-	-	-	-	-	-	-	-	- Significant amount of concrete debris along riverside of pier due too chipping operations above
PIER #2 VISUAL INSPECTION															
East	0+18	12:36:00	-	-	-	-	-	-	-	-	-	-	-	-	- No rebar installed yet. Saw cut and some chipping performed but some loose debris documented
-	-	12:38:00	-	-	-	-	-	-	-	-	-	-	-	-	- Some spalling concrete present below saw cut. Similar to pier one but condition not as prevalent as pier #1
															Saw cut located at 12" above the small flat portion of the pier
East	0+14	12:44:00	-	-	-	-	-	-	-	-	-	-	-	-	- No chipping present below WL at 4'-0" from the ice protection plate on the shore side
-	-	12:46:00	-	-	-	-	-	-	-	X	-	-	-	-	- Saw cut located at 11 1/4" above footing. Plan specified elevation = 13"
West	0+29	12:48:00	-	-	-	-	-	-	-	-	-	-	-	-	- Chipping below WL starts. Chipping not completed yet.
-	-	12:49:00	-	-	-	-	-	-	-	-	-	-	-	-	- Debris built up almost to WL from above water chipping operations causing the saw cut to become buried
West	0+53	12:50:00	-	-		-	-	-	-	-	-	-	-	-	- Saw cut becomes visible but no chipping has been completed
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Work barge present directly below middle arch. Unable to inspect area
-	-	12:51:45	-	-	-	-	-	-	-	-	-	-	-	-	- Only saw cut present DS of work barge. Same as last inspection
West	1+13	12:52:00	-	-	-	-	-	-	-	-	-	-	-	-	- Barge present on DS tip of pier so unable to inspect. Some additional chipping & clearing out of material
															on the shore side but condition not very different from previous inspection
PIER #5 VISUAL INSPECTION															
East	0+28	13:36:40	-	-	-	-	-	-	-	-	-	-	-	-	- Start location of inspection. A small void a base of the footing is present which is approximately 10" tall with
															debris out in from cleaning process below the footing

Bridge No. 2440 Rehabilitation Field Notes
U/W Structural Inspection
Minnesota Department of Transportation (MnDOT)

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
-	-	13:40:00	-	-	-	-	-	-	-	-	-	-	-	-	- A soft layer of concrete documented on the flat horizontal face of footing. The soft concrete varies in height
															from 6" to the entire height of the vertical footing face. The soft concrete appears to extend back underneath
															the tapered concrete footing face
-	-	13:51:00	-	-	-	-	-	-	-	-	-	-	-	-	- Void approximately 42" tall. Vertical face of footing is 56" from bedrock to the horizontal face
-	-	13:57:00	-	-	-	-	-	-	-	-	-	-	-	-	- Full height void due to present of poor concrete. Void extends a minimum of 6'-0" under the footing. The
															void then chokes down to 1'-0" tall and extends to some unknown distance
West	0+39	14:00:00	-	-	-	-	-	-	-	-	-	-	-	-	- Footing transition from poor concrete to somewhat sound concrete (At Metal bracket above the waterline)
West	0+59	14:08:30	-	-	-	-	-	-	-	-	-	-	-	-	- Thin layer of poor concrete on horizontal face. Void along bottom approximately 2'-0" tall from bedrock
West	1+03	14:13:30	-	-	-	-	-	-	-	-	-	-	-	-	- Void meets the ML but the void is filled with loose material. If divers kept cleaning the void would probably
															continue. ML continues to rise beyond this point and meets the tapered face of the pier. Beyond this point the
															ML continues to rise and meets the weir
West	0+29	14:21:00	-	-	-	-	-	-	-	-	-	-	-	-	- Poor concrete continues under tapered wall portion of pier. Void starts at US edge of pier radius and ends
															approximately 13'-0" further around radius. Max void height = 22 " & max penetration = 22". The
															void could extend further under tapered face. Additional poor concrete still present
East	0+00	14:29:45	-	-	-	-	-	-	-	-	-	-	-	-	- Poor concrete continues to shore side of pier. Located on top of horizontal face of pier. Limits and thickness
															of poor concrete are similar to river side (6" to full height)
-	-	14:35:30	-	-	-	-	-	-	-	-	-	-	-	-	- More concrete debris located along bottom due to chipping above. Divers will have to clean again before the
															the concrete pour
East	0+74	14:37:30	-	-	-	-	-	-	-	-	-	-	-	-	- New area of void cleaning. Void extends 5'-0" back into pier with a height of 10"
East	0+82	14:42:15	-	-	-	-	-	-	-	-	-	-	-	-	- Void at base is 8" tall by 2'-0" of penetration
-	-	14:43:45	-	-	-	-	-	-	-	-	-	-	-	-	- Dives stopped cleaning. ML continues to rise up. Void below pier might continue but probably would not be
															as significant as river side of pier.
East	1+26	14:46:20	-	-	-	-	-	-	-	-	-	-	-	-	- Sheet pile cutoff wall extending perpendicular to DS tip of pier. Wall extends toward the shore. ML rises to
															meet tapered wall face
East	1+09	14:51:00	-	-	-	-	-	-	-	-	-	-	-	-	- Area of old concrete (Possibly a very lean concrete mix) present on top of flat horizontal face and extends up
															to top of tapered wall face and is approximately 20'-0" long
-	-	15:05:45	-	-	-	-	-	-	-	-	-	-	-	-	- Unable to located spall called out on plans. Area of honeycombing was documented 5'-0" wide by 2'-0" tall
															with a penetration of 2". Only some surface deterioration documented.

Team Leader: Chase Dewhirst — **Inspection Type:** Level 1
Inspection Date: 10/20/2014 — **Water Elevation:**
Inspection Time: 11:30 AM to 3:00 PM

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
PIER #5 VISUAL INSPECTION															
West	0+61	11:33:45	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection. Void continues past the forms at the time of the inspection. Diver can penetrate approx.
															4'-0" into the pier. The void disappears at 7'-0" past the end of the forms.
-	-	11:37:30	-	-	-	-	-	-	-	-	-	-	-	-	- Repair approximately 1'-6" out from the face of the concrete.
-	-	11:38:45	-	-	-	-	-	-	-	-	-	-	-	-	- Horizontal distance between dowels is approximately 4'-0" on-center. (2) 90 degree dowel are embedded
															into the existing concrete. The bottom dowel extends into the void. Bottom dowel is a minimum of 4'-0" long
															with a 10" long hook. (Unable to verify the overall dowel length)
-	-	11:44:00	-	-	-	-	-	-	-	-	-	-	-	-	- Algae is built-up of rebar cage
West	0+61	11:44:20	-	-	-	-	-	-	-	-	-	-	-	-	- Repair extends 32'-0" DS from transition from 45 degree face to flat face
-	-	11:45:00	-	-	-	-	-	-	-	-	-	-	-	-	- Lap splices = 24". Spacing of rebar. Verts = 12 3/4" & Horizontals = 12 5/8"
-	-	11:46:00	-	-	-	-	-	-	-	X	-	-	-	-	- Forms start. Forms out of plumb approximately 1 7/8" over 4'-0"
-	-	11:48:45	-	-	-	-	-	-	-	-	-	-	-	-	- Face of rebar to inside face of the forms = 8 7/8". Forms have an overall width of 24" with two legs
															extending towards the pier. Legs are 13" apart.
-	-	11:50:30	-	-	-	-	-	-	-	X	-	-	-	-	- Distance from backside of forms to concrete = 2'-3" / 2'-2" / 2'-2 1/2" / 2'-2". Dowels extending thru the
															forms have plates washers and nuts which are not fully tightened.
-	-	11:54:00	-	-	-	-	-	-	-	-	-	-	-	-	- Distance from outside face of rebar to existing concrete face = 1'-5" / 1'-5"
West	0+29	11:55:00	-	-	-	-	-	-	-	-	-	-	-	-	- Forms extend up approximately 24" above the flat horizontal face of the existing concrete
West	0+00	11:57:45	-	-	-	-	-	-	-	-	-	-	-	-	- Lap Splice > 24". Horz spacing = 12" & Vert Spacing = 12 1/2"
-	-	11:59:00	-	-	-	-	-	-	-	-	-	-	-	-	- Overall form height = 6'-6". Bottom dowel extending into void is located approximately 6 3/4" above the
															bedrock. Plans specify 8" to 12" but dowel is centered in the void
East	0+24	12:00:45	-	-	-	-	-	-	-	-	-	-	-	-	- Forms stop on flat face of bullnose
East	0+28	12:07:45	-	-	-	-	-	-	-	-	-	-	-	-	- Distance from existing concrete to inside face of rebar = 1'-5"
East	0+44	12:08:30	-	-	-	-	-	-	-	-	-	-	-	-	- Large boulder documented in void. Clear distance between bottom bar and boulder is 1 1/2". The boulder
															is 12'-0" long and bottom dowel not present
-	-	12:11:00	-	-	-	-	-	-	-	-	-	-	-	-	- Flow is less on the shore side than the river side
East	0+62	12:11:30	-	-	-	-	-	-	-	X	-	-	-	-	- End of rebar cage. Void continues on beyond rebar. Void is 12 1/2" tall and extends DS another 24'-0".
															Void is approximately 12 1/2" tall over 22'-0" and then tapers down over the last 2'-0". Diver can penetrate
															into the pier between 1'-0" and 3'-6".
East	0+28	12:16:00	-	-	-	-	-	-	-	X	-	-	-	-	- Lap Splice is 9 1/2" & 8 3/4". Horizontal bar doesn't start until 17" back from corner
East	0+11	12:22:00	-	-	-	-	-	-	-	-	-	-	-	-	- (1) Bar embedded into the bedrock vertically, (1) dowel centered in the void horizontally, and (1) dowel
															centered into the concrete pier horizontally
PIER #2 VISUAL INSPECTION															
East	0+56	13:22:10	-	-	-	-	-	-	-	-	-	-	-	-	- Start of Inspection
-	-	13:24:00	-	-	-	-	-	-	-	X	-	-	-	-	- Minor voids present below forms approximately 3/4" tall max. Plywood and blocking installed at low spots
East	0+15	13:25:30	-	-	-	-	-	-	-	X	-	-	-	-	- Voids below on US bullnose. Void is 3'-6" long by 2" tall
-	-	13:29:00	-	-	-	-	-	-	-	-	-	-	-	-	- Horizontal ledge around bullnose not present but forms sealed up with smooth transition to tapered face
-	-	13:31:30	-	-	-	-	-	-	-	X	-	-	-	-	- Small voids below forms that need to be filled. Possibly with burlap
-	-	13:33:30	-	-	-	-	-	-	-	X	-	-	-	-	- The horizontal rebar below the WL is not a constant elevation causing vertical spacing to be off. Max
															spacing at approximately 13 3/8"
-	-	13:34:45	-	-	-	-	-	-	-	X	-	-	-	-	- Vertical dowel spacing = 18.5" / 25" / 23.5" / 26.75" / 25.5"

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
-	-	13:36:00	-	-	-	-	-	-	-	-	-	-	-	-	- Solid concrete present behind rebar cage
-	-	13:36:30	-	-	-	-	-	-	-	-	-	-	-	-	- Horizontal saw cut less than 1" at sporadic locations due to spalling of concrete
East	0+90	13:38:00	-	-	-	-	-	-	-	X	-	-	-	-	- Vertical dowel spacing = 25.25"
East	1+13	13:40:20	-	-	-	-	-	-	-	-	-	-	-	-	- (2) vertical rebar exposed over a 5'-0" tall area. Some rust present but fairly clean
		13:42:10	-	-	-	-	-	-	-	X	-	-	-	-	- Dowel spacing = 25", Vertical spacing = 12.75", & horizontal rebar still not a consistent elevation with vert
															spacing of 13"
-	-	13:43:30	-	-	-	-	-	-	-	X	-	-	-	-	- Vertical rebar spacing = 14.75" (Bars tied to dowels causing the larger bar spacing)
East	0+95	13:44:30	-	-	-	-	-	-	-	X	-	-	-	-	- (2) vertical dowels within 12" of each other. The next dowel is 4'-0" away. No hole drilled for rebar but
															vertical rebar from mat is resting on the lip from the saw cut
-	-	13:47:30	-	-	-	-	-	-	-	-	-	-	-	-	- 2.5" clear distance on vertical dowels (Could change with placement of forms)
-	-	13:48:45	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical rebar in mat stop 5" above the saw cut (Approximately 90% of bars have this condition)
West	0+64	13:50:15	-	-	-	-	-	-	-	-	-	-	-	-	- Inspection stopped
West	0+00	-	-	-	-	-	-	-	-	-	-	-	-	-	- Stop location of inspection
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical dowel lengths above saw cut = 2'-5" / 2'-5.25" / 2'-4.5" & Lap Splices = 24.5" / 25.25" / 24"
PIER #1 VISUAL INSPECTION															
West	0+63	14:34:30	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection. Forms removed on US half but still present on DS half
West	0+53	14:35:45	1.5	-	-	-	-	-	-	X	-	-	-	-	- Along bottom of new concrete, concrete is softer. Area of potential washout cement with an average height
															of 5" to 6"
West	0+33	14:44:00	-	-	-	-	-	-	-	X	-	-	-	-	- Large area of cement washout from STA 0+33 to 0+53. Max height of 18.5" & penetration of 4". (1) vertical
															dowel & (1) vertical rebar exposed at STA 0+35
West	0+21	14:48:00	-	-	-	-	-	-	-	-	-	-	-	-	- Existing concrete exposed below the saw cut
West	0+21	14:49:00	-	-	-	-	-	-	-	-	-	-	-	-	- Minor spalling could occur at transition from new concrete to old concrete due to horizontal lip. Horizontal
															Lip is approx. 3/4" wide and starts at STA 0+21 & stops at STA 0+13 around the bullnose
East	0+00	14:54:30	-	-	-	-	-	-	-	-	-	-	-	-	- Minor lip present.
East	0+62	15:01:00	-	-	-	-	-	-	-	-	-	-	-	-	- Stop point of inspection. Forms still on pier beyond this point

Bridge No. 2440 Rehabilitation Field Notes
U/W Structural Inspection
Minnesota Department of Transportation (MnDOT)

Team Leader: Chase Dewhirst — **Inspection Type:** Level 1
Inspection Date: 11/3/2014 — **Water Elevation:**
Inspection Time: 11:00 AM to 2:30 PM

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
PIER #1 VISUAL INSPECTION															
West	0+63	12:05:00	-	-	-	-	-	-	-	-	-	-	-	-	- During previous inspection, the concrete forms were still present on the downstream half of the pier (both river side & shore side). All of the forms have been removed and diver will inspect the remainder of the new concrete
-	-	12:06:30	-	-	X	See Comments	-	-	-	-	-	-	-	-	- Additional concrete placed below saw cut is starting to spall away due to the limited thickness of the concrete. Concrete above the saw cut appears to be in good condition
West	1+27	12:11:15	-	-	-	-	X	-	-	-	-	-	-	-	- Hairline to < 1/16" crack documented above the waterline (Shrinkage cracks)
		12:12:10	-	-	-	-	-	-	-	-	-	-	-	-	- Spalling documented below saw cut stops. Sporadic small spalls were documented beyond this point.
East	1+05	12:13:00	-	-	X	See Comments	-	-	-	-	-	-	-	-	- 6'-0" long area of small spalling concrete documented below the saw cut. Sporadic spalling documented beyond this point in in the concrete that was placed below the saw cut
-	-	12:16:15	-	-	-	-	-	-	-	-	-	-	-	-	- At the time of the inspection, workers were patching the holes in the concrete where dowels were penetrating the concrete for the forms (Consistent around the entire pier)
-	-	12:18:15	-	-	-	-	-	-	-	-	-	-	-	-	- Previously inspected so diver repositioned to inspect new forms by concrete washout
West	0+33	12:22:00	-	-	-	-	-	-	-	-	-	-	-	-	- Start of concrete washout repair. Forms are 3'-0" tall x 4'-0" wide x 1 7/8" Bump out. Base and side look good and everything is sealed up.
	-	12:24:30	-	-	-	-	-	-	-	-	-	-	-	-	- Some additional honeycombing/spalling of the concrete was documented below the saw cut beyond the concrete washout repair (Documented during the previous inspection)
PIER #2 VISUAL INSPECTION															
East	0+56	12:48:30	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection. Forms are still present on the DS half of the pier on the Riverside
-	-	12:49:30	-	-	-	-	-	-	-	-	-	-	-	-	- 2x4 board still present along base of repair. Board is attached to forms still present on the DS side
-	-	12:50:10	-	-	-	-	-	-	-	-	-	-	-	-	- Sporadic honeycombing documented on the concrete below the saw cut. Concrete above the saw cut appears to be in good condition
-	-	12:51:45	-	-	-	-	-	-	-	-	-	-	-	-	- Slight increase in honeycombing of concrete below the saw cut
East	0+23	12:53:15	-	-	-	-	-	-	-	-	-	-	-	-	- Concrete cold pack patch repair at 13" above the horizontal face of the pier. The patch area is 1'-6" long by maximum of 13".
East	0+18	12:58:00	-	-	-	-	-	-	-	X	-	-	-	-	- Bulge in concrete due to forms not directly inline with each other. The bulge is ground down smooth above the waterline, but it is not ground down below the waterline. Max difference between the new concrete faces is approximately 2". Area is 24" tall (Distance from WL to base of repair)
West	0+15	12:58:45	-	-	-	-	-	-	-	X	-	-	-	-	- Bulge in concrete similar to the previous location. The bulge is ground smooth above the waterline but bulge is not ground smooth below the WL. Max difference between the new concrete faces is 3/4" over a height of 12".
-	-	13:00:00	-	-	-	-	-	-	-	-	-	-	-	-	- Honeycombing still present below saw cut
West	0+05	13:00:30	-	-	-	-	-	-	-	X	-	-	-	-	- Bulge between concrete forms. Area is ground smooth above the waterline but not below the waterline. Max difference between the new concrete faces = 1" over a height of 18" (WL to base of repair)
-	-	13:02:30	-	-	-	-	-	-	-	-	-	-	-	-	- Sporadic honeycombing continues on concrete below the saw cut
West	0+56	13:04:15	-	-	-	-	-	-	-	-	-	-	-	-	- Stop location of inspection. DS half of pier on river side & shore side have forms still installed on the pier
PIER #5 VISUAL INSPECTION															
West	0+61	14:23:15	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection. No grout bags installed for the void beyond the forms at the time of the inspection. Grout tube extends into void a minimum of 5'-0". (Total length not verified)

Bridge No. 2440 Rehabilitation Field Notes
U/W Structural Inspection
Minnesota Department of Transportation (MnDOT)

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
-	-	14:24:00	-	-	-	-	-	-	-	-	-	-	-	-	- A vertical angle is installed at repair. The angle is bolted to the existing pier with epoxy. No grout bags were
															installed to prevent the new concrete on the horizontal face from flowing out from behind the forms
-	-	14:26:00	-	-	-	-	-	-	-	-	-	-	-	-	- A significant amount of algae is still present on the reinforcing
-	-	14:28:15	-	-	-	-	-	-	-	-	-	-	-	-	- Spacing of horizontal threaded bars = 1'-7" / 1'-10.5" / 1'-9.5" extend from existing concrete to secure the
															concrete forms. Bars are 1/2" diameter and the use of threaded rod vs rebar was approved by MnDOT
															personnel onsite
-	-	14:30:15	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical "candy cane" bars extend up from horizontal face. Spacing = 3'-0" / 3'-6". Bars are centered in
															horizontal face
-	-	14:32:15	-	-	-	-	-	-	-	-	-	-	-	-	- Horizontal rebar mat is 4" x 4" spacing with 1/4" diameter bar. Mat lap splice = 8"
-	-	14:34:11	-	-	-	-	-	-	-	-	-	-	-	-	- Diagonal mat at 45 degrees and is 16" wide by continuous length. Same 4" x 4" mat
-	-	14:34:45	-	-	-	-	-	-	-	-	-	-	-	-	- Top of forms located between 7" to 10" above the rebar mat
-	-	14:35:30	-	-	-	-	-	-	-	-	-	-	-	-	- Horizontal rebar mat located approximately 13" above existing concrete face. (Varies greatly, distance = 15.5"
															a foot away from previous measurement)
West	0+29	14:39:42	-	-	-	-	-	-	-	-	-	-	-	-	- Rebar in vertical reinforcement mat is directly tied to flanges or legs of forms. Unable to verify distance
															between existing vertical face of pier & forms
-	-	14:40:30	-	-	-	-	-	-	-	-	-	-	-	-	- Additional #4 horizontal dowels installed at 1'-6" / 1'-7" / 1'-6"
West	0+08	14:42:30	-	-	-	-	-	-	-	X	-	-	-	-	- Triangular shaped void in rebar mat. Maximum of 8" tall by 42" long. Void I present due to rounded shaped
															concrete pier
-	-	14:45:30	-	-	-	-	-	-	-	X	-	-	-	-	- Larger opening between concrete forms and rebar. Opening is 16" long by 7" wide (Width dimension
															measured to back of form legs)
East	0+0	14:47:00	-	-	-	-	-	-	-	-	-	-	-	-	- Length of form legs = 8 5/8" (Inside of form wall to outside of leg)
-	-	14:47:45	-	-	-	-	-	-	-	-	-	-	-	-	- No lap present on horizontal rebar mats. Last two bars are simply ties together
East	0+28	14:48:50	-	-	-	-	-	-	-	X	-	-	-	-	- Spacing of vertical "candy cane" dowels increases to 6'-3"
-	-	14:50:00	-	-	-	-	-	-	-	-	-	-	-	-	- Less debris and algae documented on shore side
East	0+32	14:51:30	-	-	-	-	-	-	-	-	-	-	-	-	- Step in horizontal rebar mat. And continues for 6'-0". From the backside of the forms rebar is flat for 1'-9" than
															steps up over 11" and then becomes flats again for 21" to 26" until it meets the face of the concrete pier
-	-	14:53:00	-	-	-	-	-	-	-	-	-	-	-	-	- Top cover of the horizontal rebar mat varies from 13" to 6"
East	0+62	14:58:30	-	-	-	-	-	-	-	-	-	-	-	-	- Top rebar cover on horizontal rebar mat = 12"
-	-	15:03:00	-	-	-	-	-	-	-	-	-	-	-	-	- Grout bags start at end of forms and extend up 2'-0" to secure the base of the concrete forms. Top of the forms
															to the top of he grout bag = 4'-0"
East	0+07	15:11:00	-	-	-	-	-	-	-	-	-	-	-	-	- Grout bags stop
East	0+45	15:13:15	-	-	-	-	-	-	-	-	-	-	-	-	- Grout tube on Riverside of pier. Form is notch around tube and extends into the void an unknown distance
															(3) grout tubes extends into the void documented during the inspection
															- Forms are 34'-0" long on shore side

Team Leader: Chase Dewhirst — **Inspection Type:** Level 1
Inspection Date: 11/4/2014 — **Water Elevation:**
Inspection Time: 9:00 AM to 9:45 AM & 12:15 PM to 7:15 PM

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
PIER #5 VISUAL INSPECTION - Dive #1															
West	0+61	10:03:45	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection
West	0+71	10:04:45	-	-	-	-	-	-	-	-	-	-	-	-	- Grout bags extend approximately 10'-0" beyond forms. Mud line transition back to sandy bottom with no
															void present
-	-	10:05:45	-	-	-	-	-	-	-	-		-	-	-	- A grout bag was positioned at the end of the horizontal rebar mat. Bag looks good and seal looks good
-	-	10:07:15	-	-	-	-	-	-	-	X	-	-	-	-	- Horizontal spacing of threaded rods that extend from existing concrete = 1'-7" / 1'-9.5" / 2'-3.5" / 1'-10.5"
															Threaded rods are 1/2" in diameter
-	-	10:08:45	-	-	-	-	-	-	-	-	-	-	-	-	- Top rebar cover = 8.5" / 8" / 9"
-	-	10:09:30	-	-	-	-	-	-	-	-	-	-	-	-	- Distance from the rebar mat to the existing concrete varies greatly due to sloping "horizontal" concrete face
															Distance is approx. 10" in the center, 13" near the forms, and 0" furthest from the forms
-	-	10:10:45	-	-	-	-	-	-	-	X	-	-	-	-	- Vertical dowels spacing = 2'-10" / 3'-3" / 2'-11" (3' Specified)
East	0+62	10:23:30	-	-	-	-	-	-	-	-	-	-	-	-	- Return and grout bags look good
East	0+89	10:25:00	-	-	-	-	-	-	-	-	-	-	-	-	- An additional grout tube was located approximately 27'-0" DS of end of forms
East	1+03	10:25:45	-	-	-	-	-	-	-	-	-	-	-	-	- Grout bags extend approximately 41'-0" beyond the forms. Everything looks sealed up good.
-	-	10:28:00	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical dowel spacing = 3'-0" / 3'-1.5" / 2'-11.5". Horizontal dowel spacing = 2'-1.5" / 2'-2" / 2'-1" / 2'-2" / 2'-0"
East	0+45	10:30:45	-	-	-	-	-	-	-	-	-	-	-	-	Horizontal rebar mat is 3.5" above the existing concrete & 8" below the top of the forms. Horizontal dowels
															into existing sloping face of are missing due to sloping "horizontal" face. Horizontal dowels are missing from
															end of forms to 15'-0" US of end of forms (Not in area of soft concrete)
East	-	10:39:15	-	-	-	-	-	-	-	-	-	-	-	-	- Void present below horizontal rebar mat due to soft layer of concrete on top of horizontal face. Void extends
															underneath the tapered face of the pier and unknown distance. Top of void is 11" below the rebar and
															mat is 23.25" above the existing horizontal concrete face
West	0+29	10:41:45	-	-	-	-	-	-	-	-	-	-	-	-	- Vertical dowel spacing = 3'-0" / 2'-10" / 3'-0". Lap splice between rebar and all thread bar = 28" / 27"
															Horizontal dowels spacing = 1'-6.75" / 1'-6.5" / 1'-6.25"
PIER #5 VISUAL INSPECTION - Dive #2															
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- Visual inspection during concrete pour. No Comments
PIER #5 VISUAL INSPECTION - Dive #3															
East	0+62	18:49:00	-	-	-	-	-	-	-	-	-	-	-	-	- Start of inspection. Concrete poured all the way to the top of the forms. Grout bags appear to be holding and
East	0+28	18:52:00	-	-	-	-	-	-	-	-	-	-	-	-	- Concrete completely filled up to tapered face of existing concrete
East	0+07	18:55:00	-	-	-	-	-	-	-	-	-	-	-	-	- Corner and grout bags are sealed up good
-	-	18:56:00	-	-	-	-	-	-	-	X	-	-	-	-	- Some missing concrete directly behind the forms in the area between the legs of the forms. Area is approx.
															2'-0" long.
East	0+00	18:59:40	-	-	-	-	-	-	-	X	-	-	-	-	- Additional spot of low concrete between the legs of the concrete forms
West	0+08	19:01:00	-	-	-	-	-	-	-	-	-	-	-	-	- Corner and grout bags all sealed up. Looks good
West	0+61	19:04:15	-	-	-	-	-	-	-	X	-	-	-	-	- Insufficient amount of concrete placed at end of forms. Low are of concrete is 2'-6" long by 4'-3" wide area.
															Horizontal mat of rebar is exposed over a 1'-0" by 1'-0" area
-	-	19:09:30	-	-	-	-	-	-	-	-	-	-	-	-	- Grout bags DS of forms appear to be in good condition and areas are sealed up
West	0+00	19:12:00	-	-	-	-	-	-	-	-	-	-	-	-	- Very little cement washout from the rest of the concrete mix. Approximately 1/2" thick layer of aggregate before
															good concrete reached
East	0+18	19:14:22	-	-	-	-	-	-	-	-	-	-	-	-	- Area around grout tube appears to be sealed up. Some grout was documented but was minor

Bridge No. 2440 Rehabilitation Field Notes
U/W Structural Inspection
Minnesota Department of Transportation (MnDOT)

Side of Concrete Pier	Station / Location Along Concrete Pier	Video Tape Time Ref.	Depth (ft)	Buckling Present	Spalling: Present	Spalling: Size (width x height x pen)	Cracking Present	Holes: Present	Holes: Size	Construction Deficiency	Debris: Present	Debris: Type	Other Damage	Addn'l Note Sheet No.	Comments
-	-	19:16:30	-	-	-	-	-	-	-	-	-	-	-	-	- New concrete extends all the way back to the existing face of the pier
East	0+62	19:19:00	-	-	-	-	-	-	-	-	-	-	-	-	- Grout bags extend DS of concrete forms appear to be in good condition with no concrete leaking out

AMI CONSULTING ENGINEERS, PA
91 Main Street
Superior, WI 55804

MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR BRIDGE REPAIR NO. 2440

BRIDGE 2440 LOCATED AT T.H. 65 OVER MISSISSIPPI RIVER AND CITY STREETS

6.0 MILES SOUTH OF JUNCTION OF I-35W AND T.H. 65

STATE FUNDS

BRIDGE NO.	STATE PROJECT NO.	JOB NO.
2440	2710-2440B	T9R548

SCHEDULE OF QUANTITIES

ITEM NO.	ITEM	UNIT	PIER 1	PIER 2	PIER 5	QUANTITY TOTAL
2021.501	MOBILIZATION	LUMP SUM				1
2031.501	FIELD OFFICE TYPE D	EACH				1
2104.601	REMOVE MISCELLANEOUS DEBRIS	LUMP SUM	0.5		0.5	1
2401.541	REINFORCEMENT BARS (STAINLESS STEEL)	POUND	3030	2410	1230	6670
2433.601	RECONSTRUCT FOUNDATION TYPE 1	LUMP SUM	1			1
2433.601	RECONSTRUCTION FOUNDATION TYPE 2	LUMP SUM			1	1
2433.602	GROUTED REINF BARS (STAINLESS STEEL)	EACH	332	220	102	654
2433.607	CEMENT GROUT	CU. YD.			3	3
2433.618	CONCRETE SURFACE REPAIR	SQ. FT.	200			200
2433.618	CONCRETE SURFACE REPAIR TYPE 1	SQ. FT.	2032	1600	15	3647
2433.618	CONCRETE SURFACE REPAIR TYPE 2	SQ. FT.	203	160	2	365
2563.601	TRAFFIC CONTROL	LUMP SUM				1

CONSTRUCTION NOTES:

THE 2014 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

NO CUTTING WILL BE PERMITTED UNTIL THE CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO SPEC. 2433.

ALL EXPOSED CUT LINES SHALL BE SAW CUT TO A MINIMUM DEPTH OF 1".

APPROVED BONDING GROUT TO BE APPLIED TO ALL ABOVE WATER CONTACT SURFACES BETWEEN NEW AND INPLACE CONCRETE AT AREAS OF RECONSTRUCTION.

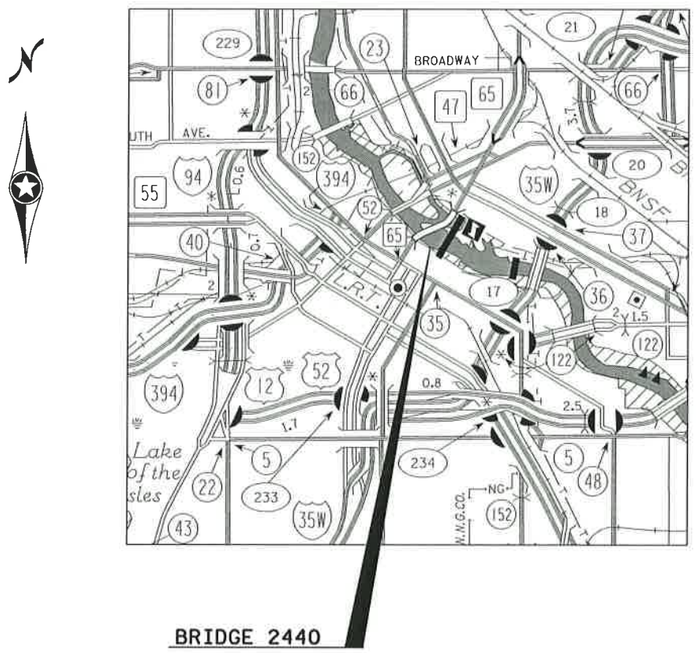
THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS.

BARS MARKED WITH SUFFIX "S" SHALL BE STAINLESS STEEL IN ACCCORDANCE WITH SPECIAL PROVISIONS.

PLANS OF INPLACE BRIDGE NO. 2440 ARE AVAILABLE AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION.

DIRECTIONS GIVEN IN PLANS (WEST FACE, EAST FACE, ETC.) ARE GIVEN BASED ON T.H. 65 RUNNING A NORTH/SOUTH ROUTE.

LIST OF SHEETS



RECOMMENDED FOR APPROVAL . . . . . METRO AREA WATER RESOURCES ENGINEER . . . . . DATE

APPROVED . . . . . STATE BRIDGE ENGINEER . . . . . DATE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: JACOB Z. BRONDER LICENSE # 41848

DATE: 5/23/14 SIGNATURE: [signature] HDR Engineering, Inc.

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: . . . . . LICENSE # . . . . .

DATE: . . . . . SIGNATURE: . . . . .

STATE PROJ. NO. 2710-2440B (T.H. 65)

SHEET NO. 1 OF 19 SHEETS

2:51:52 PM
5/23/2014
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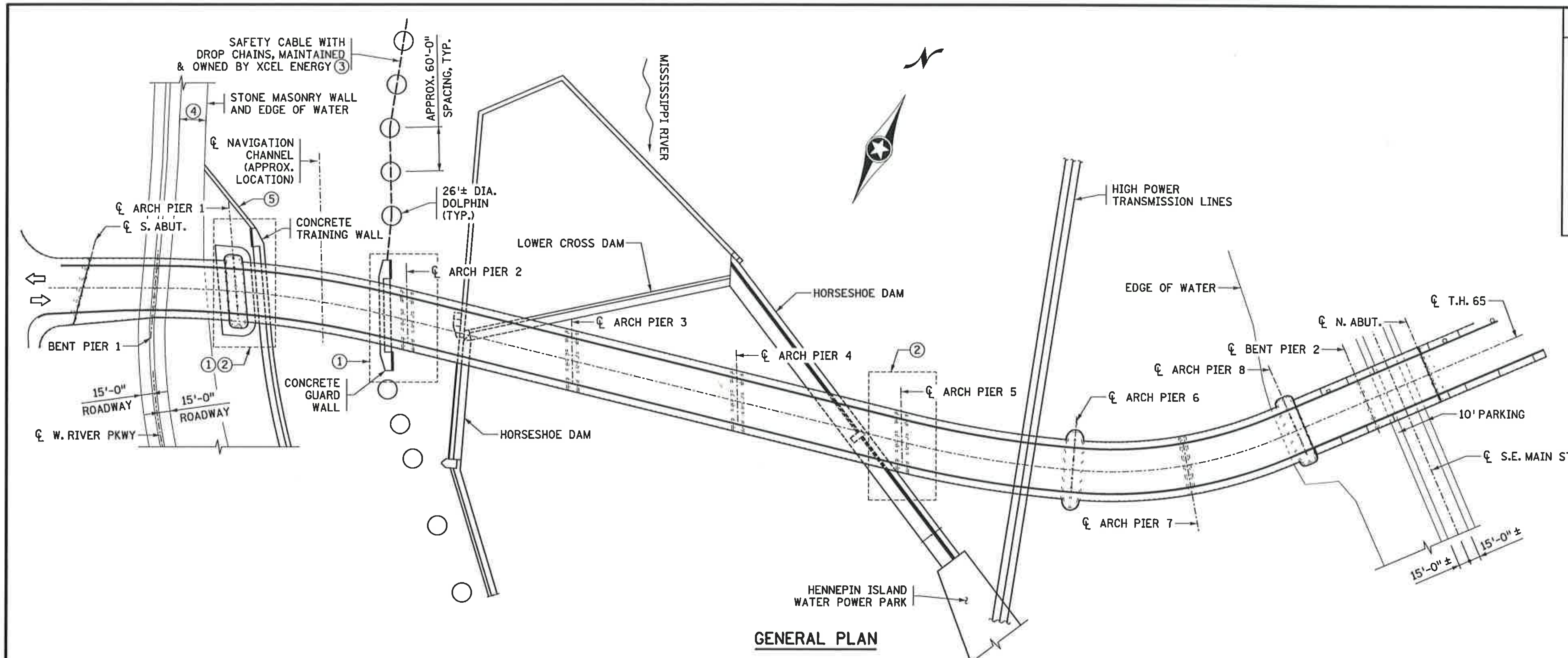
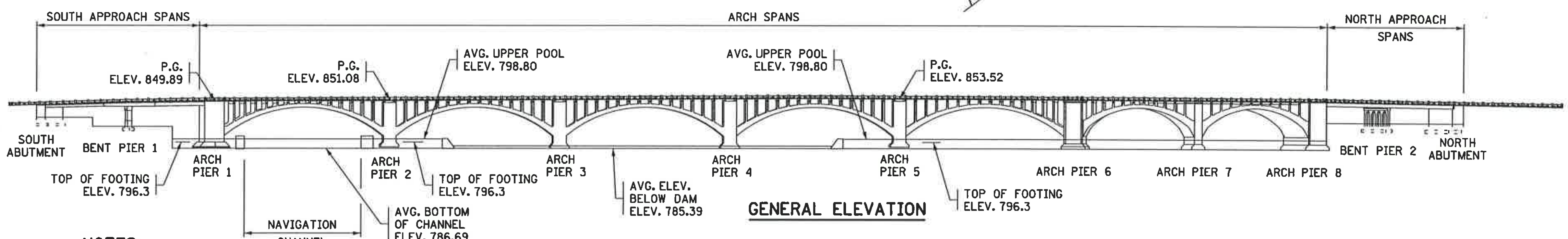


GENERAL PLAN



GENERAL ELEVATION

STATE FUNDS

DESIGN DATA

2012 AND CURRENT INTERIM A.A.S.H.T.O. DESIGN SPECIFICATIONS.

LOAD AND RESISTANCE FACTOR DESIGN METHOD

MATERIAL DESIGN PROPERTIES

REINFORCED CONCRETE:

f'c = 4000 p.s.i. n = 8

fy = 60000 p.s.i. FOR REINFORCEMENT

NOTES:

① PERFORM CONCRETE SURFACE REPAIRS FROM BOTTOM OF ARCH TO TOP OF FOOTING AROUND PERIMETER OF PIER.

② CLEAN FOOTING VOIDS TO BEDROCK SURROUNDING DETERIORATED FOOTING. GROUT ALL VOIDS UNDER AND WITHIN FOOTING (SEE SPECIAL PROVISIONS). PROVIDE ANCHORED CONCRETE ENCASEMENT WALL ALONG PERIMETER OF GROUTED VOIDS TO LIMITS SHOWN IN PLANS. SEE SPECIAL PROVISIONS.

③ CONTRACTOR RESPONSIBLE FOR TEMPORARY REMOVAL OF SAFETY CABLE TO GAIN ACCESS TO PIER 5. COORDINATE WITH XCEL ENERGY. SEE SPECIAL PROVISIONS.

④ APPROX. 36' TO CURB INCLUDES APPROX. 22' SIDEWALKS AND PAVED BIKE TRAIL.

⑤ ARMY CORPS OF ENGINEERS WALKWAY AND GATE, SEE SPECIAL PROVISIONS.

NOTES:

DIMENSIONS BASED ON AVAILABLE PLANS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING DIMENSIONS.

CONTRACTOR IS RESPONSIBLE FOR RESTRAINING ANY CONCRETE ABOVE AND AROUND REPAIR AREAS.

NO CUTTING OR REMOVAL WILL BE PERMITTED UNTIL THE CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO Mn/DOT SPEC. 2433.

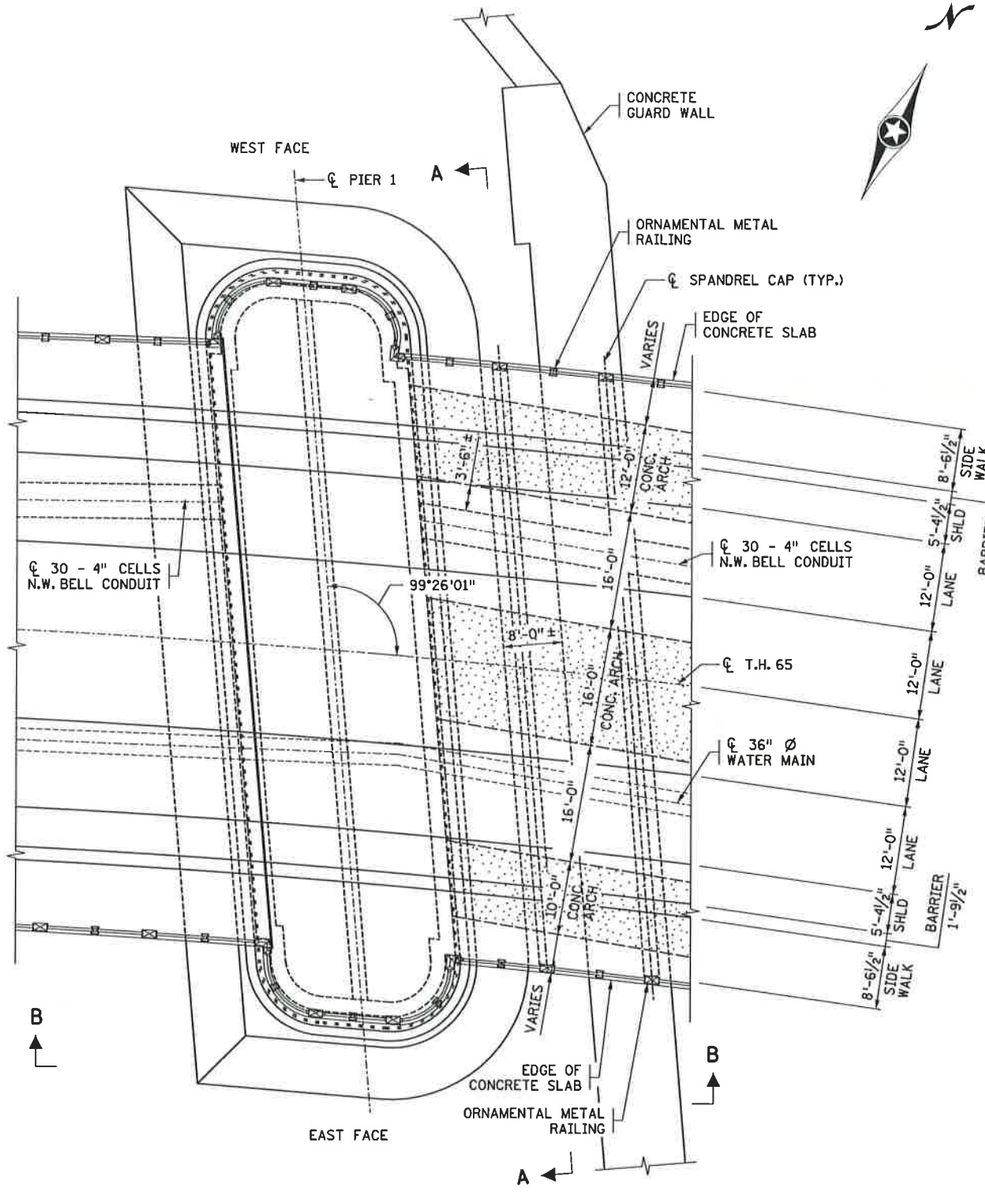
TH 65 (3RD AVENUE)
MINNESOTA DEPARTMENT OF TRANSPORTATION

T.H. 65 (3RD AVENUE) OVER MISSISSIPI RIVER
MAIN STREET AND WEST RIVER PARKWAY
6.0 MILES SOUTH OF JUNCTION OF I-35W AND T.H. 65

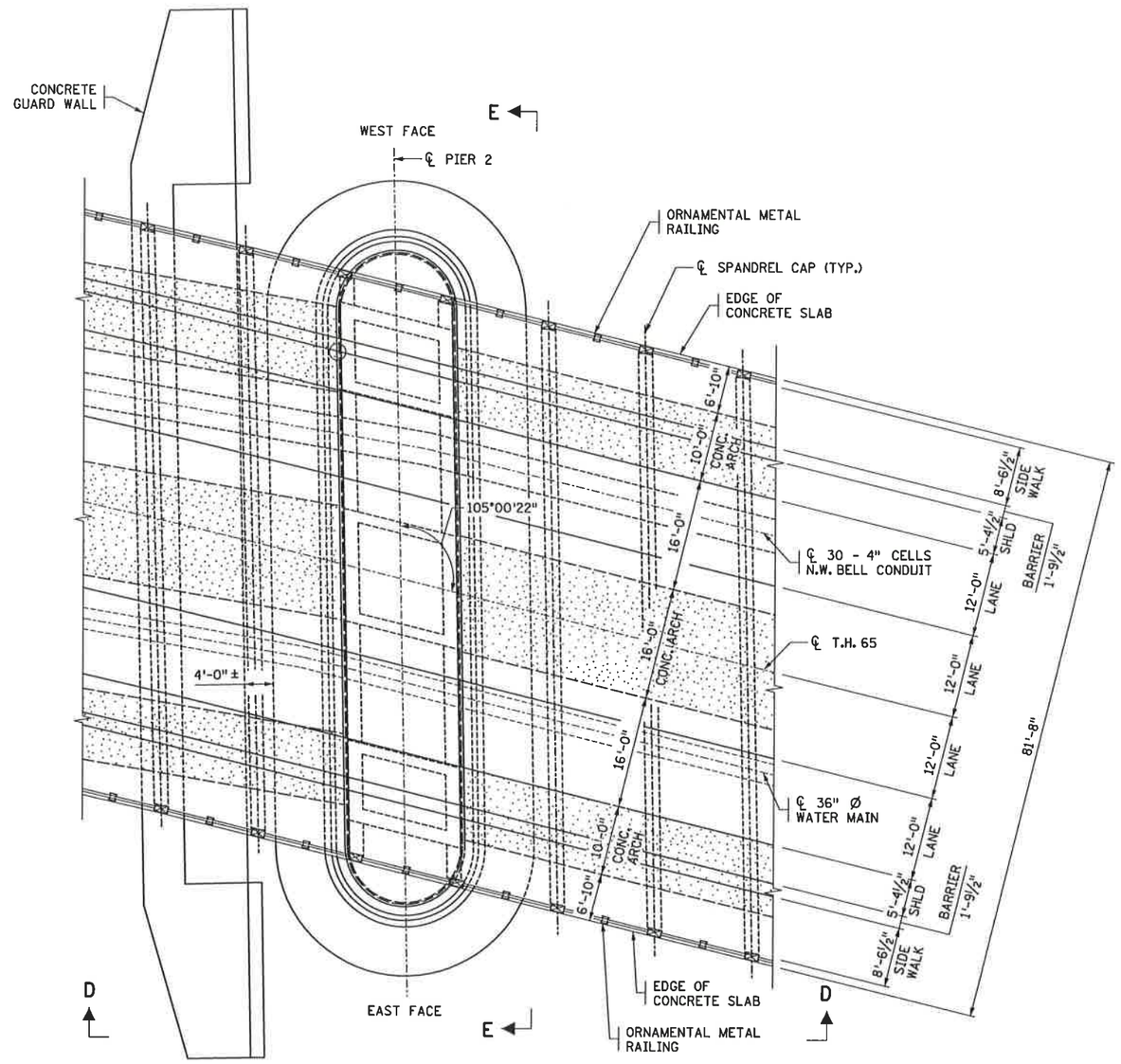
SEC. 23 TWP. 29 N. R. 24 W.
CITY OF MINNEAPOLIS HENNEPIN COUNTY

STATE BRIDGE ENGINEER DATE:

HDR Engineering, Inc.	CERTIFIED BY [signature] 5/23/14 LICENSED PROFESSIONAL ENGINEER DATE NAME: JACOB Z. BRONDER LIC. NO. 41848	TITLE: GENERAL PLAN & ELEVATION	DES: JL CHK: RJR	DR: JN CHK: RJR	APPROVED:
			SHEET NO. 2 OF 19 SHEETS		BRIDGE NO. 2440



PIER 1 PLAN



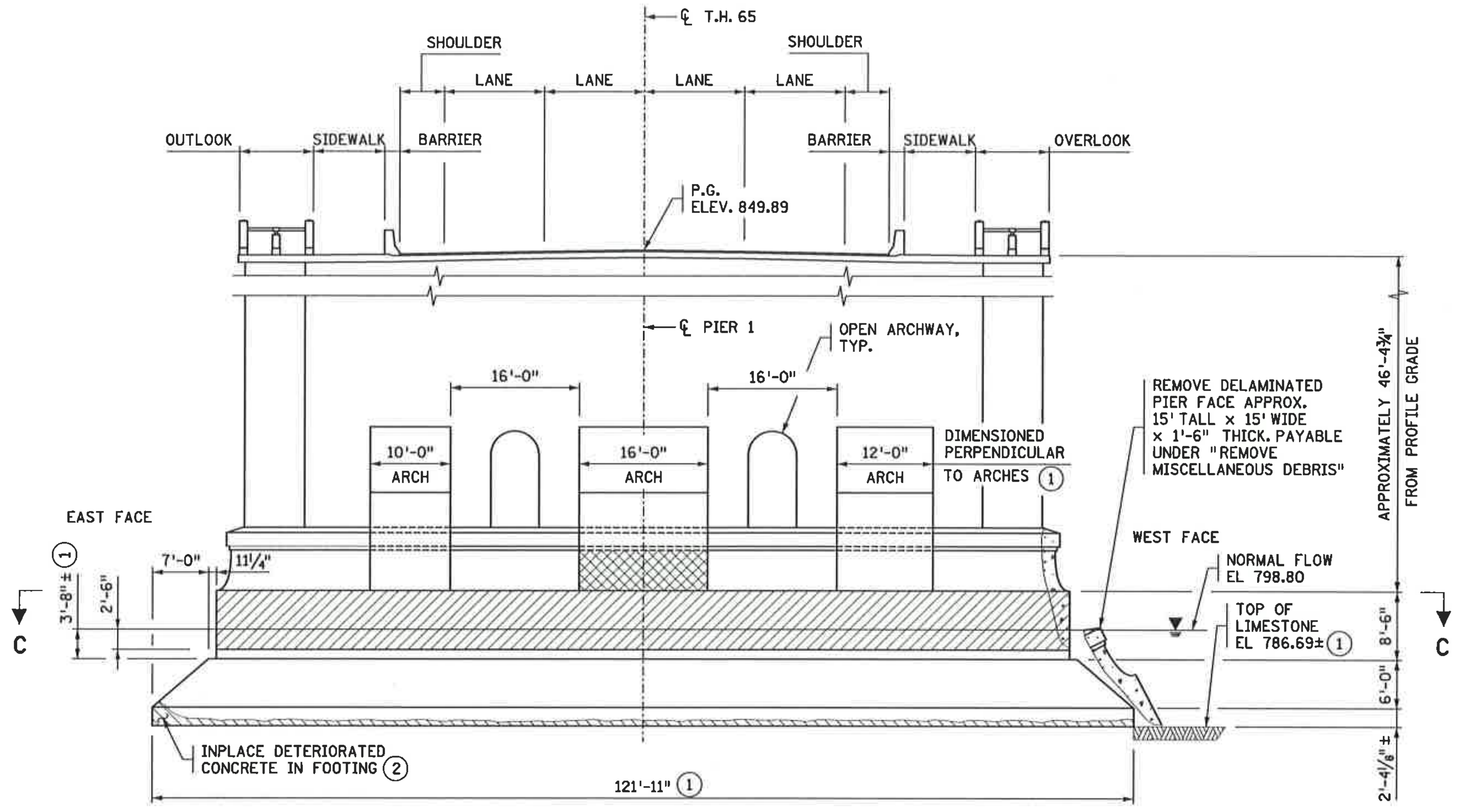
PIER 2 PLAN

NOTES:

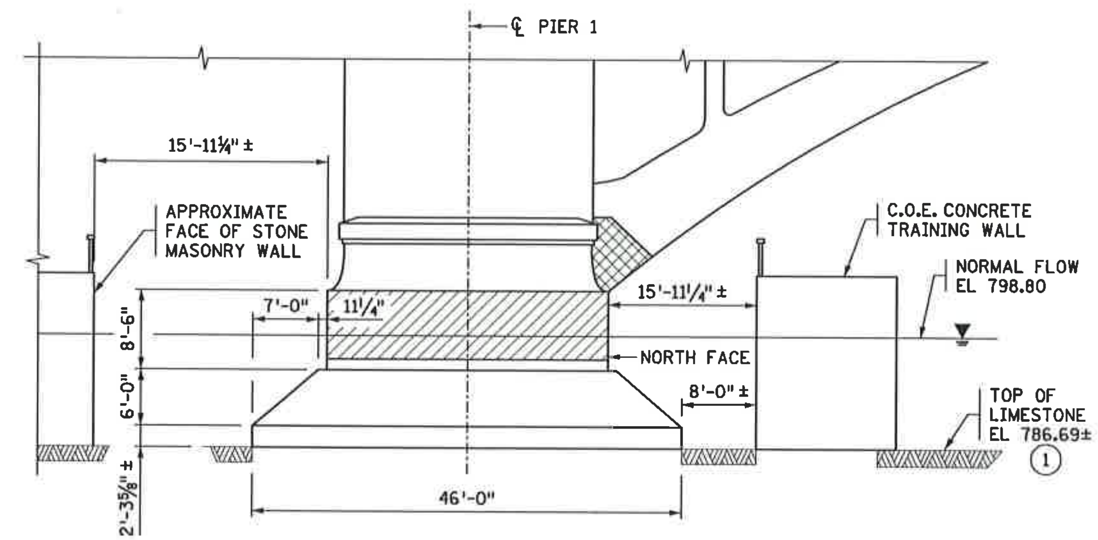
SEE SHEET 4 FOR PIER 1 ELEVATION VIEWS A-A & B-B.

SEE SHEET 5 FOR PIER 2 ELEVATION VIEWS D-D & E-E.

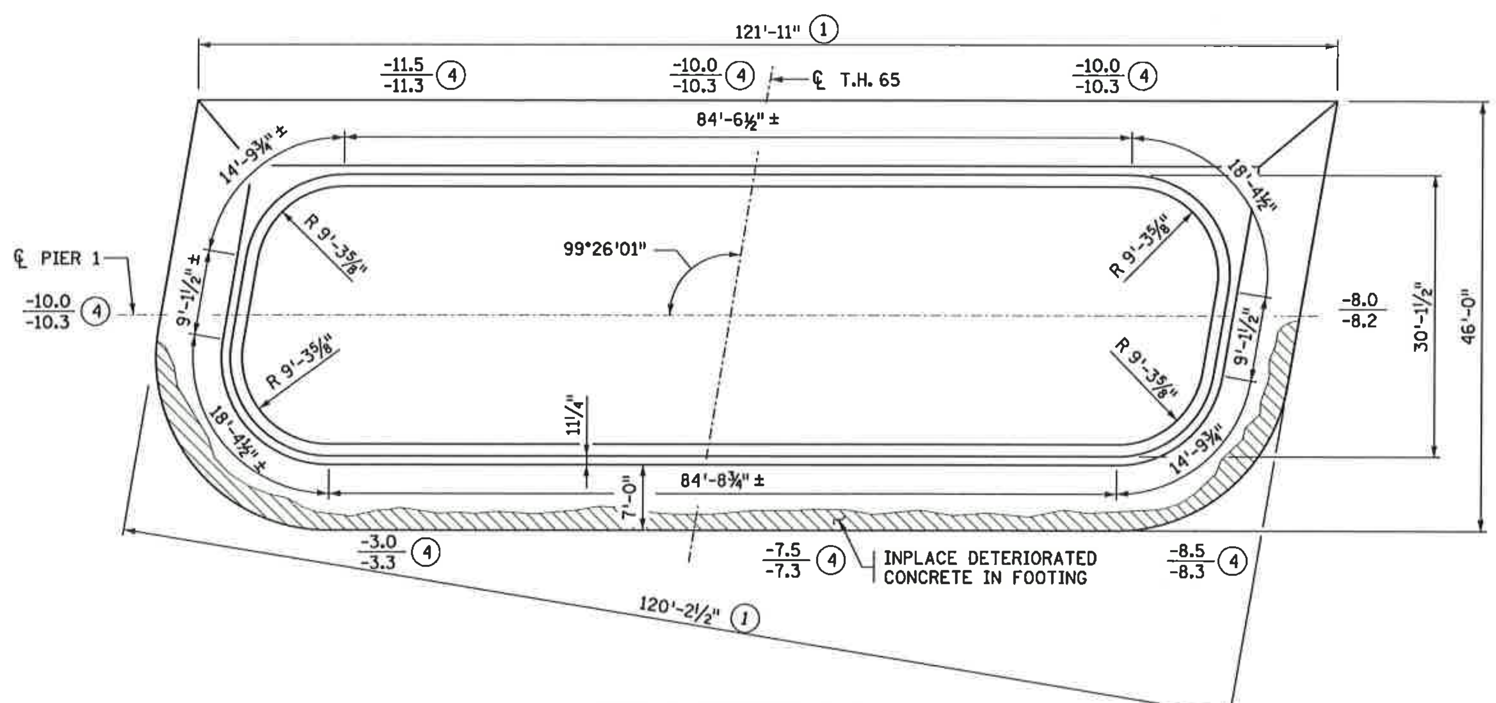
HDR Engineering, Inc.	CERTIFIED BY [signature] LICENSED PROFESSIONAL ENGINEER 5/23/14 DATE NAME: JACOB Z. BRONDER LIC. NO. 41848	TITLE: PIER 1 & 2 GEOMETRY	DES: JL DR: JN APPROVED: CHK: RJR CHK: RJR	BRIDGE NO. 2440
			SHEET NO. 3 OF 19 SHEETS	



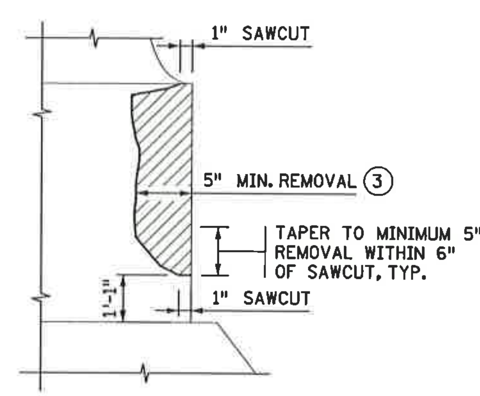
PIER 1 NORTH ELEVATION - VIEW A-A



PIER 1 EAST ELEVATION - VIEW B-B



PIER 1 SECTION C-C



PIER 1 REMOVAL

NOTES:

UNVERIFIED INFORMATION INDICATES PIER 1 MAY CONTAIN A CONCRETE FOOTING SEAL, NOT SHOWN. VERIFY FOOTING DIMENSIONS PRIOR TO ORDERING MATERIALS.

[crosshatch] REMOVE DETERIORATED CONCRETE FROM CENTER ARCH BASE BY SANDBLASTING AND REPAIR WITH SHOTCRETE OR CAST-IN PLACE CONCRETE. REMOVAL AREA NOT TO EXCEED 200 SF AND 6" DEEP. INCLUDED IN ITEM "CONCRETE SURFACE REPAIR".

[hatch] DENOTES REMOVAL OF UNSOUND CONCRETE AND REPAIR WITH SHOTCRETE OR CAST-IN PLACE CONCRETE. INCLUDED IN ITEM "CONCRETE SURFACE REPAIR TYPE __".

[hatch] DENOTES POTENTIAL SPALLED AREAS ALONG PERIMETER. REMOVE UNSOUND CONCRETE AND REPAIR WITH STRUCTURAL CONCRETE (1XJM). INCLUDED IN ITEM "RECONSTRUCT FOUNDATION".

SEE SHEET 3 FOR LOCATION OF SECTIONS A-A & B-B.

SEE SHEET 5 FOR SECTION C-C RECONSTRUCTION.

ALL CONCRETE PLACED BELOW WATER SHALL BE PUMPED OR TREMIED INPLACE AND NOT MIXED WITH WATER.

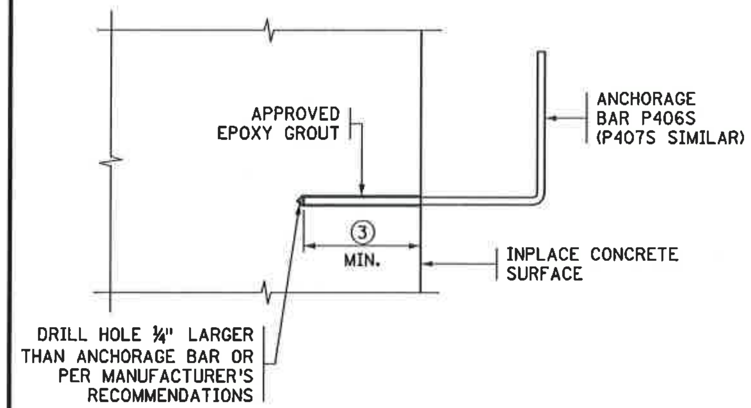
(1) FIELD VERIFY.

(2) VERTICAL FOOTING EXPOSURE BETWEEN 2' AND 3' TALL. MODERATE TO HEAVYSPALLING AND DETERIORATION WITH 6" TYPICAL AND UP TO 2' MAXIMUM PENETRATION.

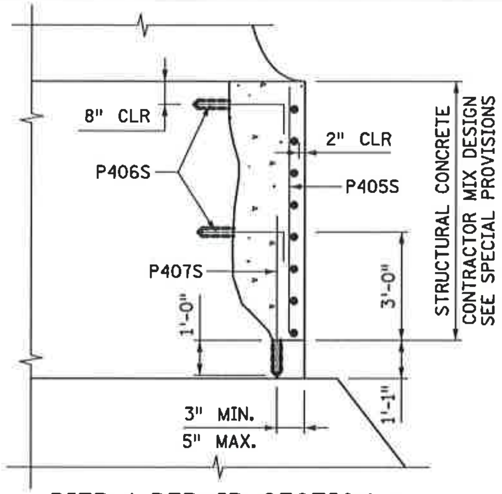
(3) REMOVE UNSOUND CONCRETE 12" MAX.

(4) -8.0 SOUNDING DEPTH FROM WATERLINE (10/28/12)
-8.2 SOUNDING DEPTH FROM WATERLINE (10/23/08)

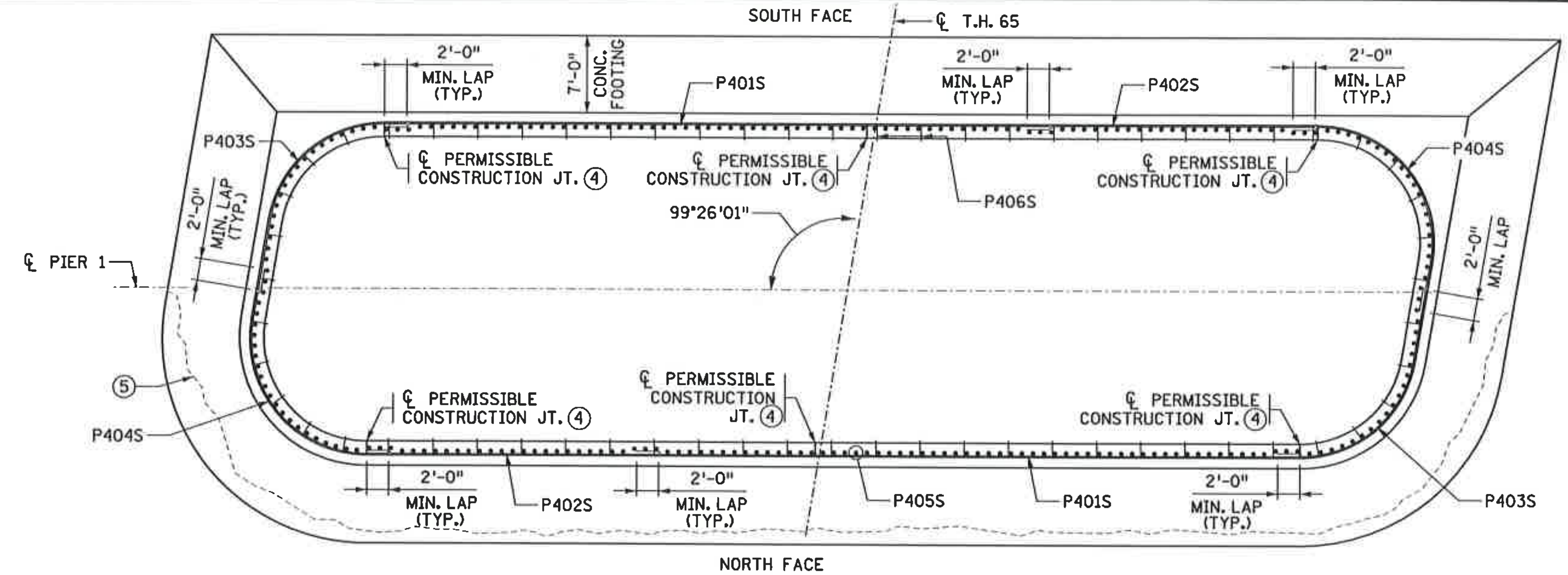
HDR Engineering, Inc.	CERTIFIED BY [signature] LICENSED PROFESSIONAL ENGINEER 5/23/14 DATE NAME: JACOB Z. BRONDER LIC. NO. 41848	TITLE: PIER 1 REMOVALS	DES: JL DR: JN CHK: RJR CHK: RJR APPROVED: SHEET NO. 4 OF 19 SHEETS	BRIDGE NO. 2440



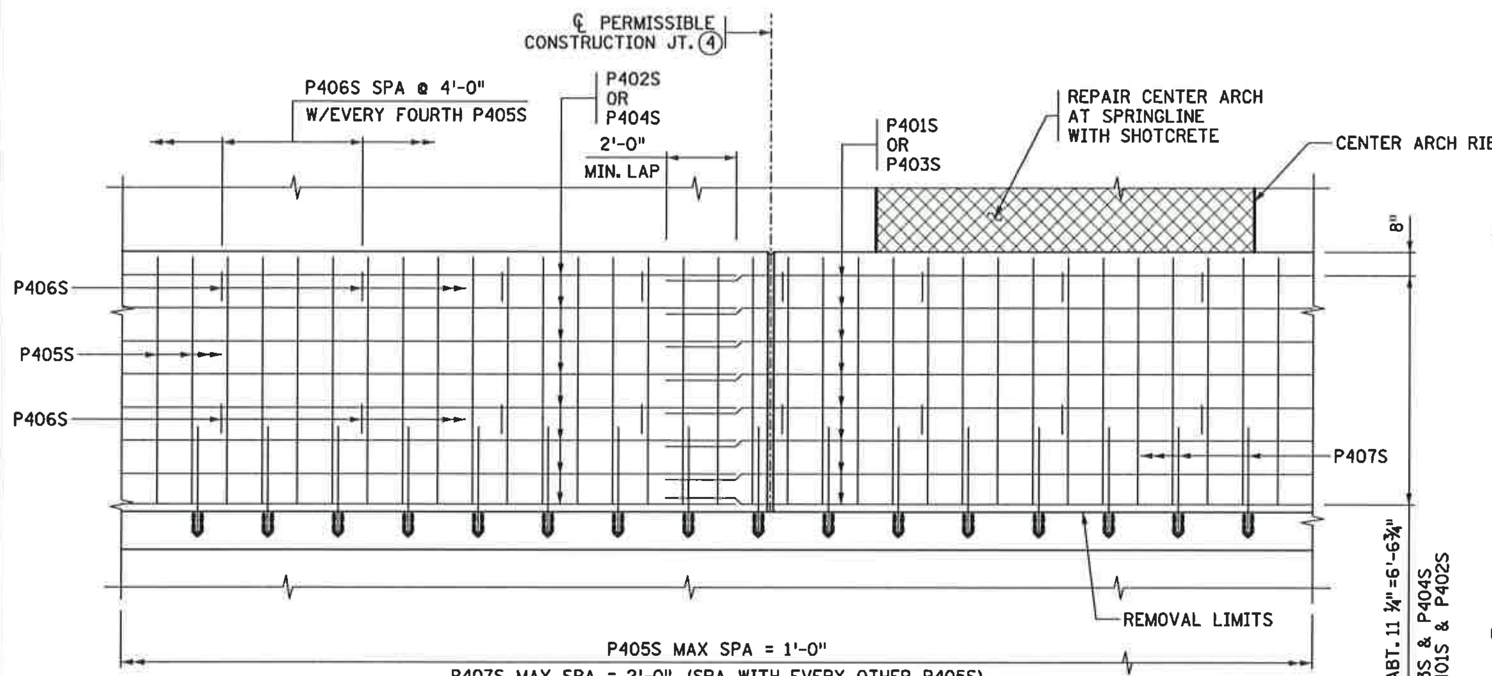
ANCHORAGE DETAIL



PIER 1 REPAIR SECTION

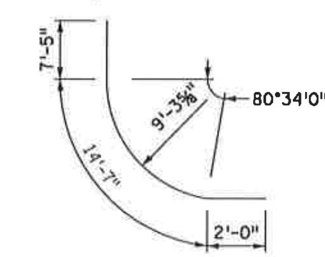


PIER 1 RECONSTRUCTION - SECTION C-C

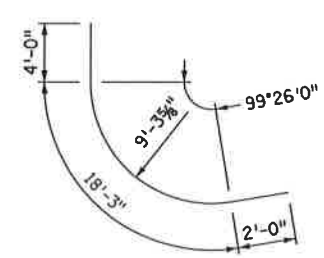


PIER 1 ELEVATION

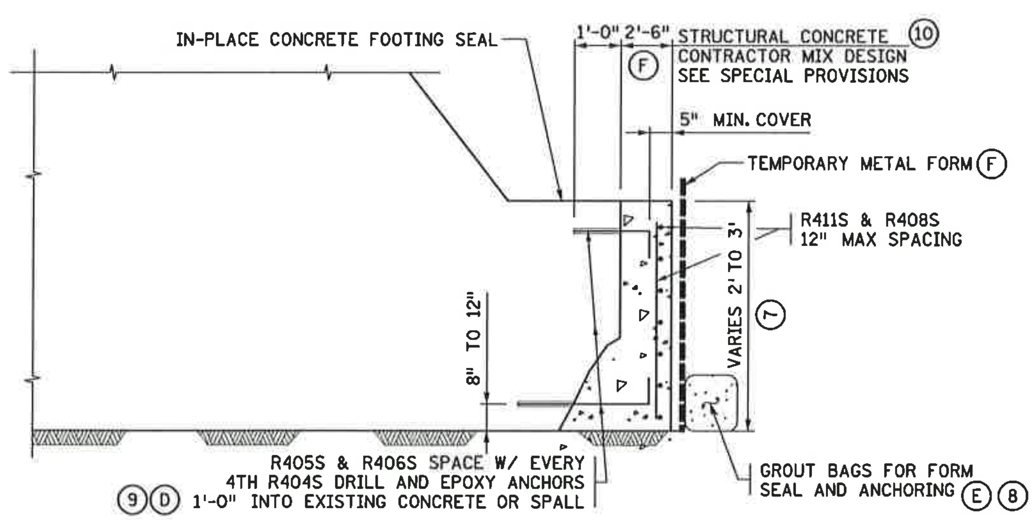
P406S, P409S & P410S ①③



P403S



P404S



RECONSTRUCT FOUNDATION TYPE 1 DETAIL

(NOT TO SCALE)

ESTIMATED QUANTITIES FOR RECONSTRUCT FOUNDATION TYPE 1 ⑥		
STRUCTURAL CONCRETE	34	CU. YD.

BILL OF REINFORCEMENT FOR RECONSTRUCT FOUNDATION TYPE 1

	BAR	NO	LENGTH	SHAPE	LOCATION
②	R408S	150	2'-0"	——	FOOTING VERTICAL
①	R409S	38	3'-10"	└──	HORIZONTAL DOWEL
②①	R410S	38	5'-10"	└──	HORIZONTAL DOWEL
②	R411S	6	50'-0"	——	FOOTING HORIZONTAL

BILL OF REINFORCEMENT FOR PIER 1 CONCRETE SURFACE REPAIR TYPE __

	BAR	NO	LENGTH	SHAPE	LOCATION
	P401S	16	50'-0"	——	FOOTING HORIZONTAL
	P402S	16	36'-5"	——	FOOTING HORIZONTAL
	P403S	16	24'-0"	╰	FOOTING HORIZONTAL
	P404S	16	24'-3"	╰	FOOTING HORIZONTAL
	P405S	254	7'-0"	——	FOOTING VERTICAL
①	P406S	128	2'-8"	└──	HORIZONTAL - DOWEL
②①	P407S	128	3'-6"	——	VERTICAL - DOWEL

SUMMARY OF QUANTITIES FOR PIER 1

	ITEM	QUANTITY	UNIT
	REINFORCEMENT BARS (STAINLESS STEEL)	3030	POUND
①	GROUTED REINF BARS (STAINLESS STEEL)	332	EACH
	RECONSTRUCT FOUNDATION TYPE 1	1	LUMP SUM
	CONCRETE SURFACE REPAIR	200	SQ. FT.
	CONCRETE SURFACE REPAIR TYPE 1	2032	SQ. FT.
	REMOVE MISCELLANEOUS DEBRIS	0.5	LUMP SUM
	CONCRETE SURFACE REPAIR TYPE 2	203	SQ. FT.

NOTES:

① REINFORCEMENT BARS PLUS DRILLING AND INSTALLING INCLUDED IN PAYMENT FOR "GROUTED REINF BARS (STAINLESS STEEL)". NOT INCLUDED IN WEIGHT OF REINFORCEMENT.

② BEND AND/OR CUT TO LENGTH IN FIELD.

③ 12" MINIMUM EMBEDMENT.

④ 6 VERTICAL CONSTRUCTION JOINTS MAY BE USED.

⑤ TOP EXPOSURE, SPALLING AND DETERIORATION OF FOOTING CONCRETE BETWEEN 6" (TYPICAL) UP TO 2' PENETRATION. CLEAN UNSUITABLE MATERIALS FROM SPALLS AND VOIDS. FORM AND CAST ENCAPSULATION CONCRETE. ALL WORK ASSOCIATED WITH REPAIRING CONCRETE FOOTING SEAL SPALLS SHALL BE PAID UNDER "RECONSTRUCT FOUNDATION TYPE 1".

⑥ 6 VERTICAL CONSTRUCTION JOINTS MAY BE USED.

⑦ THIS DIMENSION TIED TO THE CONCRETE FOOTING SEAL DIMENSION, VERIFY IN THE FIELD.

⑧ GROUT BAGS OR ENCAPSULATION FORMING SHALL NOT BE INSTALLED UNTIL ENGINEER REVIEWS AND APPROVES VOID IS ADEQUATELY CLEARED OF SEDIMENT AND DEBRIS. ALL CLEANING AND DEBRIS REMOVAL TO BE PAID FOR AS "REMOVE MISCELLANEOUS DEBRIS".

⑨ FIELD TRIM R406S AS NECESSARY.

⑩ PAID FOR UNDER "RECONSTRUCT FOUNDATION TYPE 1".

SEE SHEET 11 FOR LETTERED NOTES RELATING TO CONSTRUCTION SEQUENCE FOR UNDERWATER CONSTRUCTION.

SEE SHEET 4 FOR LOCATION OF SECTION C-C.

REPAIR WITH SHOTCRETE CENTER ARCH RIB AT SPRINGLINE.

DENOTES CAST-IN-PLACE CONCRETE REPAIR.

HDR Engineering, Inc.	CERTIFIED BY [signature] 5/23/14 LICENSED PROFESSIONAL ENGINEER DATE NAME: JACOB Z. BRONDER LIC. NO. 41848	TITLE: PIER 1 REPAIR DETAILS	DES: JL DR: JN APPROVED: CHK: RJR CHK: RJR SHEET NO. 5 OF 19 SHEETS	BRIDGE NO. 2440

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5/23/2014
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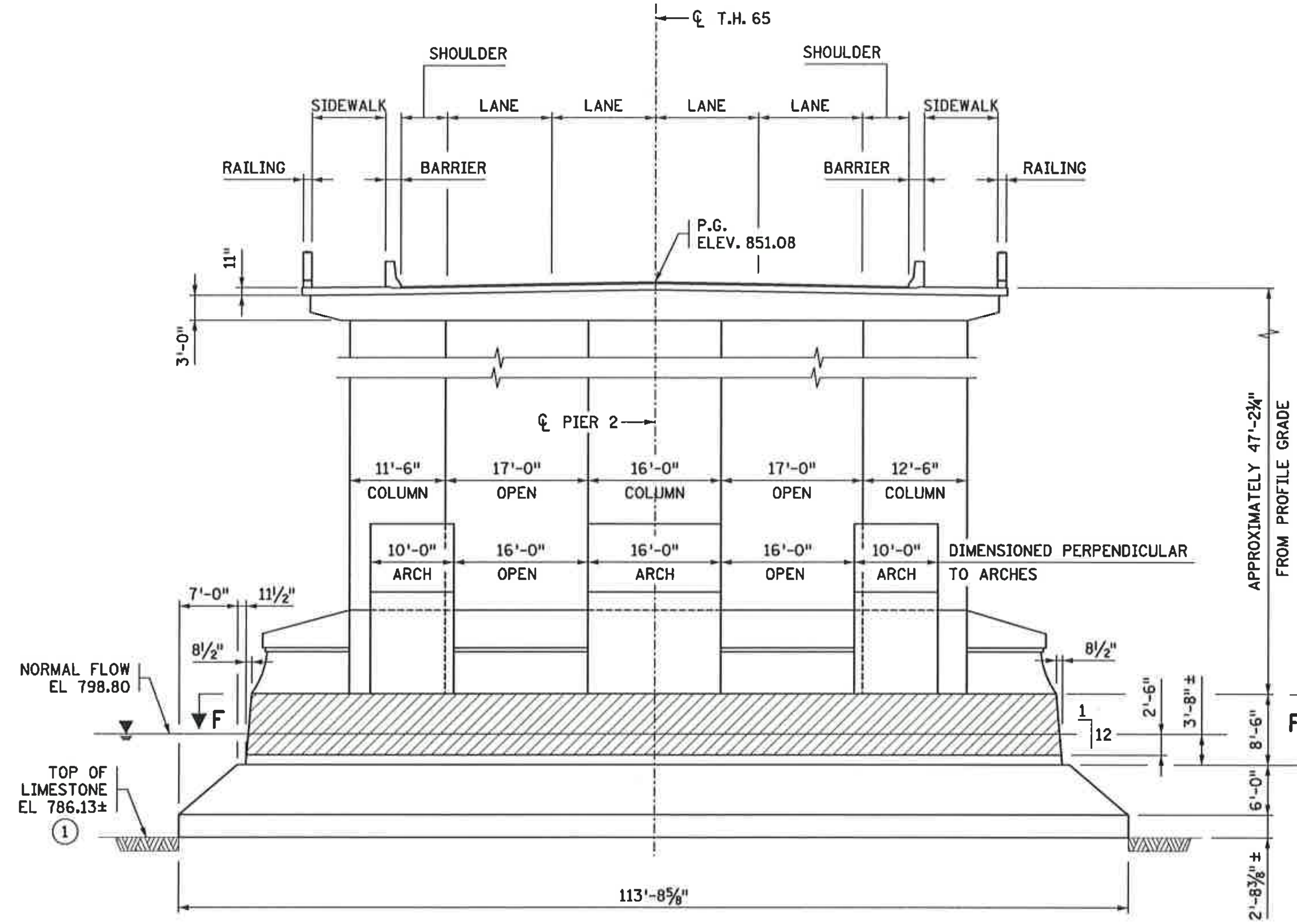
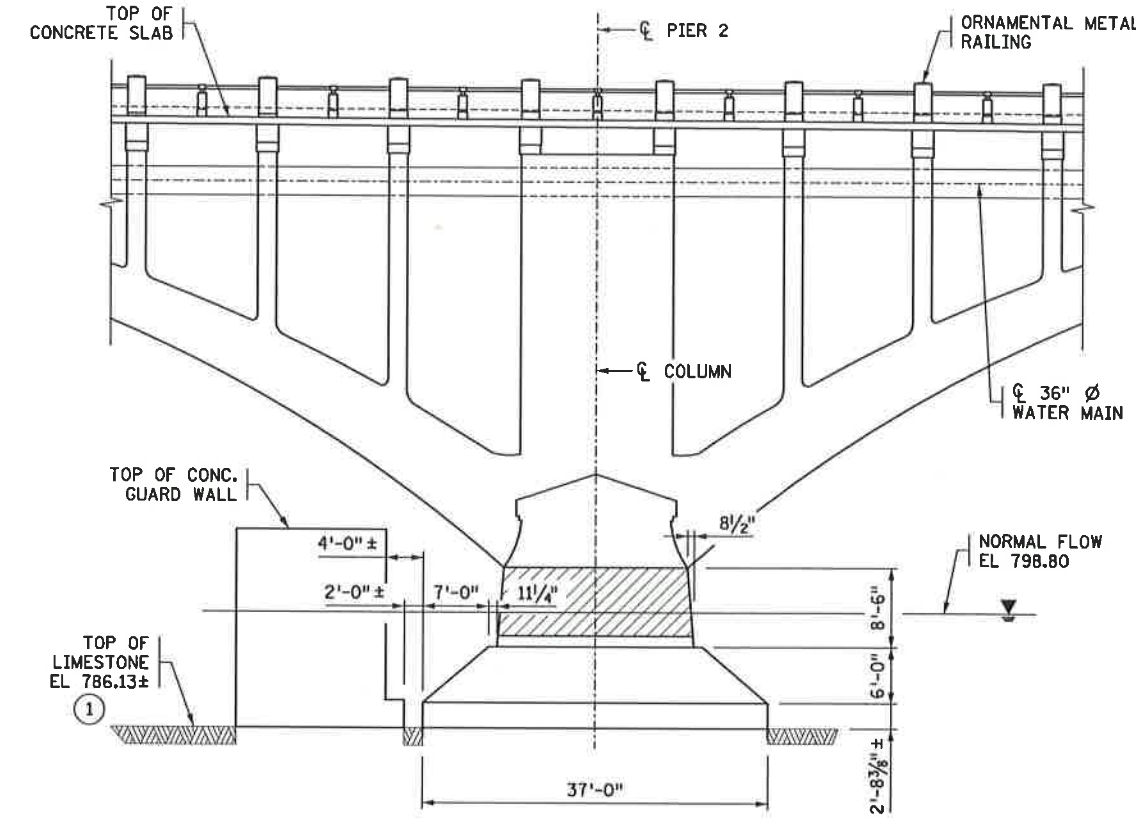
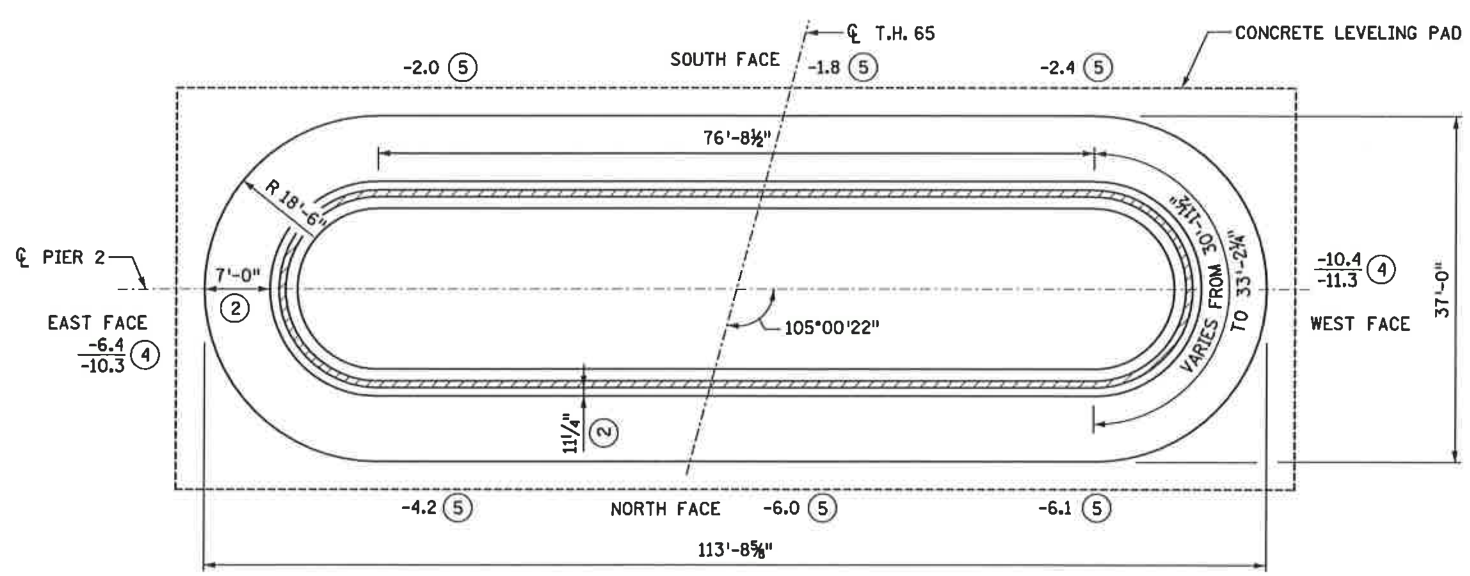


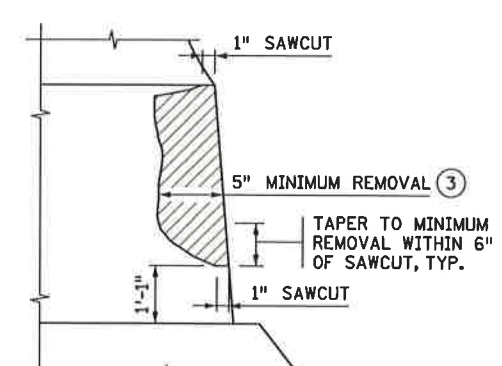
PIER 2 NORTH ELEVATION - VIEW E-E



PIER 2 EAST ELEVATION - VIEW D-D



PIER 2 SECTION F-F



PIER 2 REMOVAL SECTION

NOTES:

▨ DENOTES REMOVAL OF UNSOUND CONCRETE AND REPAIR WITH CAST-IN PLACE CONCRETE.

SEE SHEET 3 FOR LOCATION OF SECTIONS D-D & E-E.

(1) FIELD VERIFY.

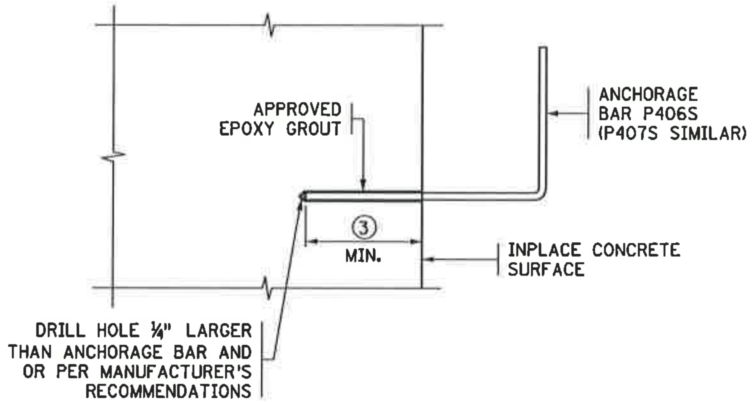
(2) AT TOP OF FOOTING.

(3) REMOVE UNSOUND CONCRETE 12" MAX.

(4) -8.0 SOUNDING DEPTH FROM WATERLINE (10/28/12)
-8.2 SOUNDING DEPTH FROM WATERLINE (10/23/08)

(5) SOUNDING DEPTH FROM WATERLINE (10/28/12).

HDR Engineering, Inc.	CERTIFIED BY [signature] LICENSED PROFESSIONAL ENGINEER 5/23/14 DATE NAME: JACOB Z. BRONDER LIC. NO. 41848	TITLE: PIER 2 REMOVALS	DES: JL DR: JN CHK: RJR CHK: RJR APPROVED: SHEET NO. 6 OF 19 SHEETS
			BRIDGE NO. 2440



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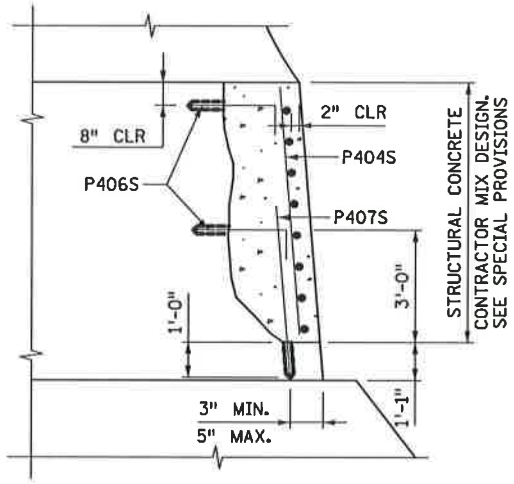
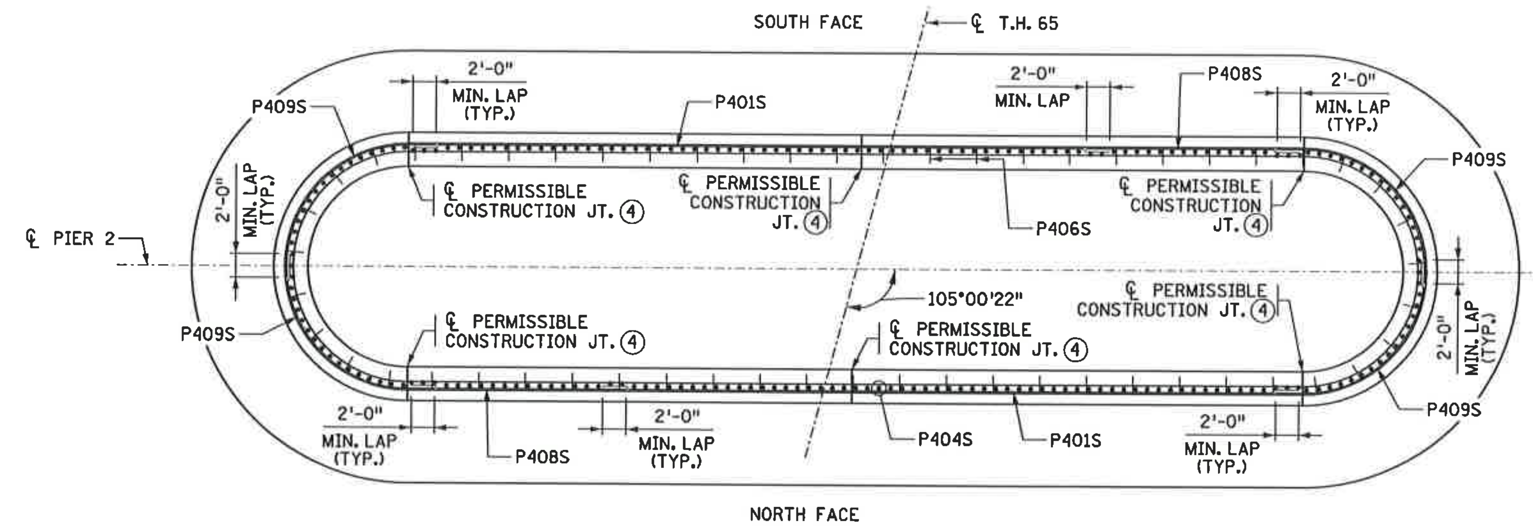
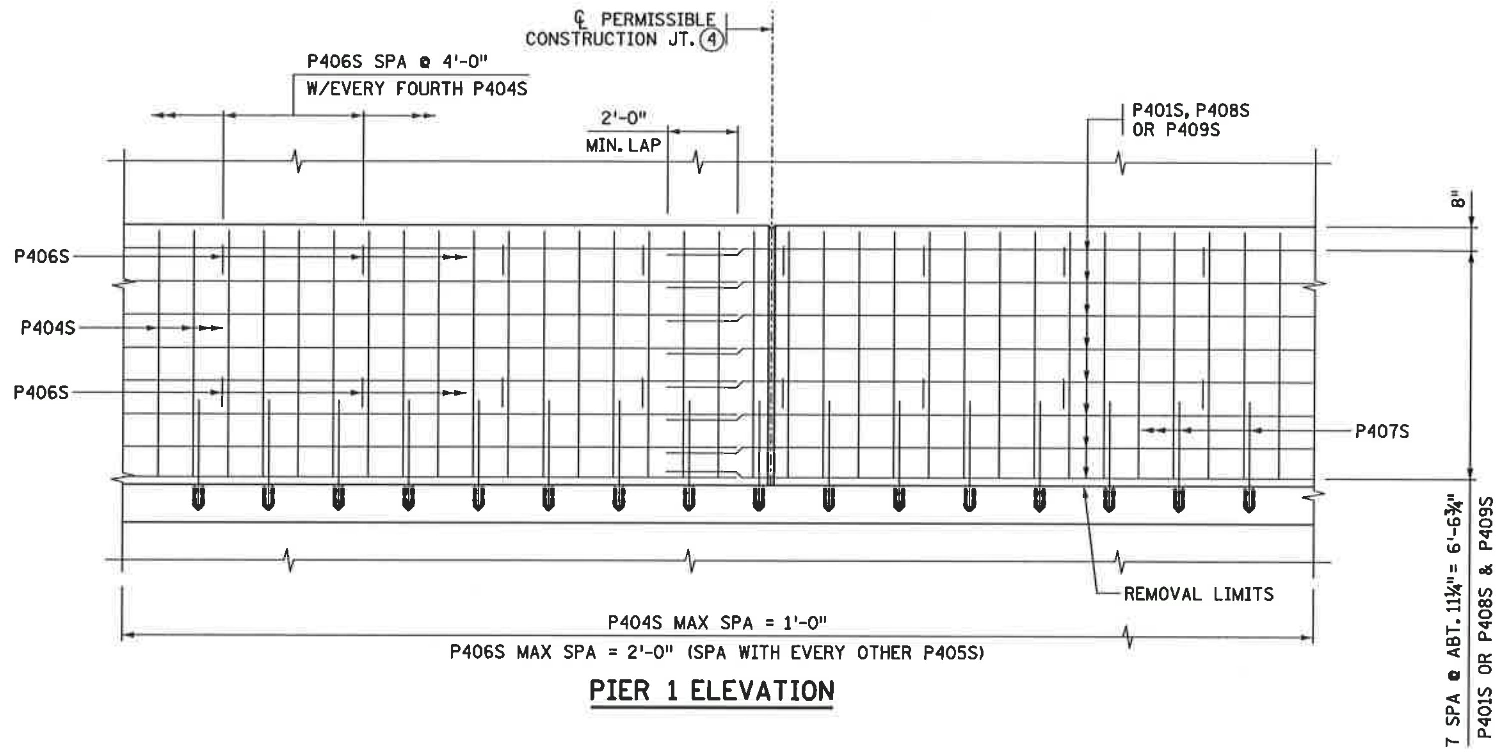


PIER 2 REPAIR SECTION



PIER 2 RECONSTRUCTION - VIEW F-F



PIER 1 ELEVATION

SUMMARY OF QUANTITIES FOR PIER 2

	REINFORCEMENT BARS (STAINLESS STEEL)	2410	POUND
①	GROUTED REINF BARS (STAINLESS STEEL)	220	EACH
	CONCRETE SURFACE REPAIR TYPE 1	1600	SQ. FT.
	CONCRETE SURFACE REPAIR TYPE 2	160	SQ. FT.

① REINFORCEMENT BARS PLUS DRILLING AND INSTALLING INCLUDED IN PAYMENT FOR "GROUTED REINF BARS (STAINLESS STEEL)".

② BEND AND/OR CUT TO LENGTH IN FIELD.

③ 12" MINIMUM EMBEDMENT.

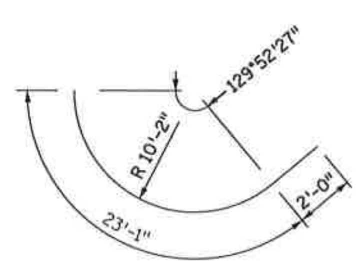
④ 6 VERTICAL CONSTRUCTION JOINTS MAY BE USED.

SEE SHEET 6 FOR LOCATION OF SECTION F-F.

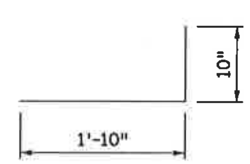
DENOTES CONCRETE REPAIR.

BILL OF REINFORCEMENT FOR PIER 2 CONCRETE SURFACE REPAIR TYPE __

	BAR	NO	LENGTH	SHAPE	LOCATION
	P401S	16	50'-0"	—	FOOTING HORIZONTAL
	P404S	220	7'-0"	—	FOOTING VERTICAL
②①	P406S	110	2'-8"	∟	HORIZONTAL DOWEL
②①	P407S	110	3'-6"	—	VERTICAL DOWEL
	P408S	16	28'-9"	—	FOOTING HORIZONTAL
	P409S	32	25'-1"	∟	FOOTING HORIZONTAL



P409S



P406S ①②

HDR Engineering, Inc. | CERTIFIED BY [signature] 5/23/14 LICENSED PROFESSIONAL ENGINEER DATE | NAME: JACOB Z. BRONDER LIC. NO. 41848

TITLE: PIER 2 REPAIR DETAILS

DES: JL | DR: JN | CHK: RJR | CHK: RJR | APPROVED:

SHEET NO. 7 OF 19 SHEETS

BRIDGE NO. 2440

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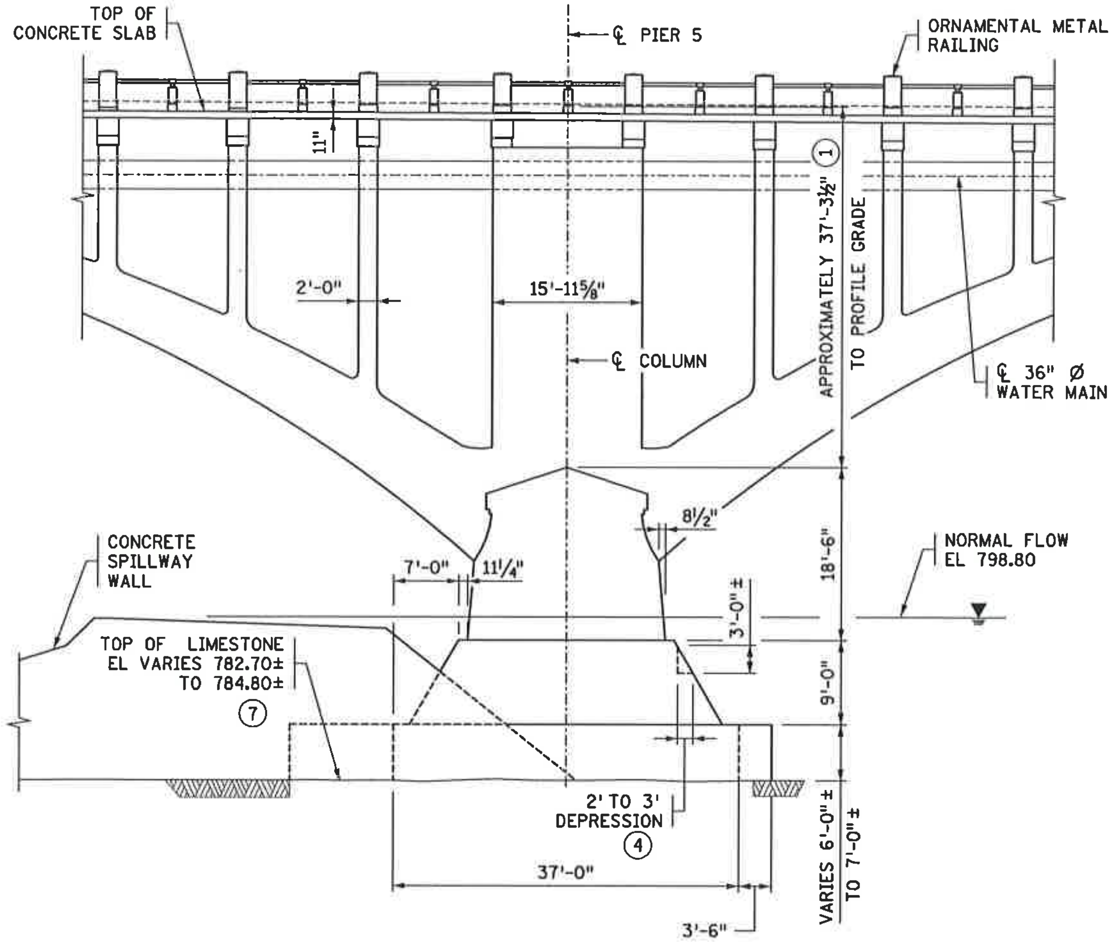
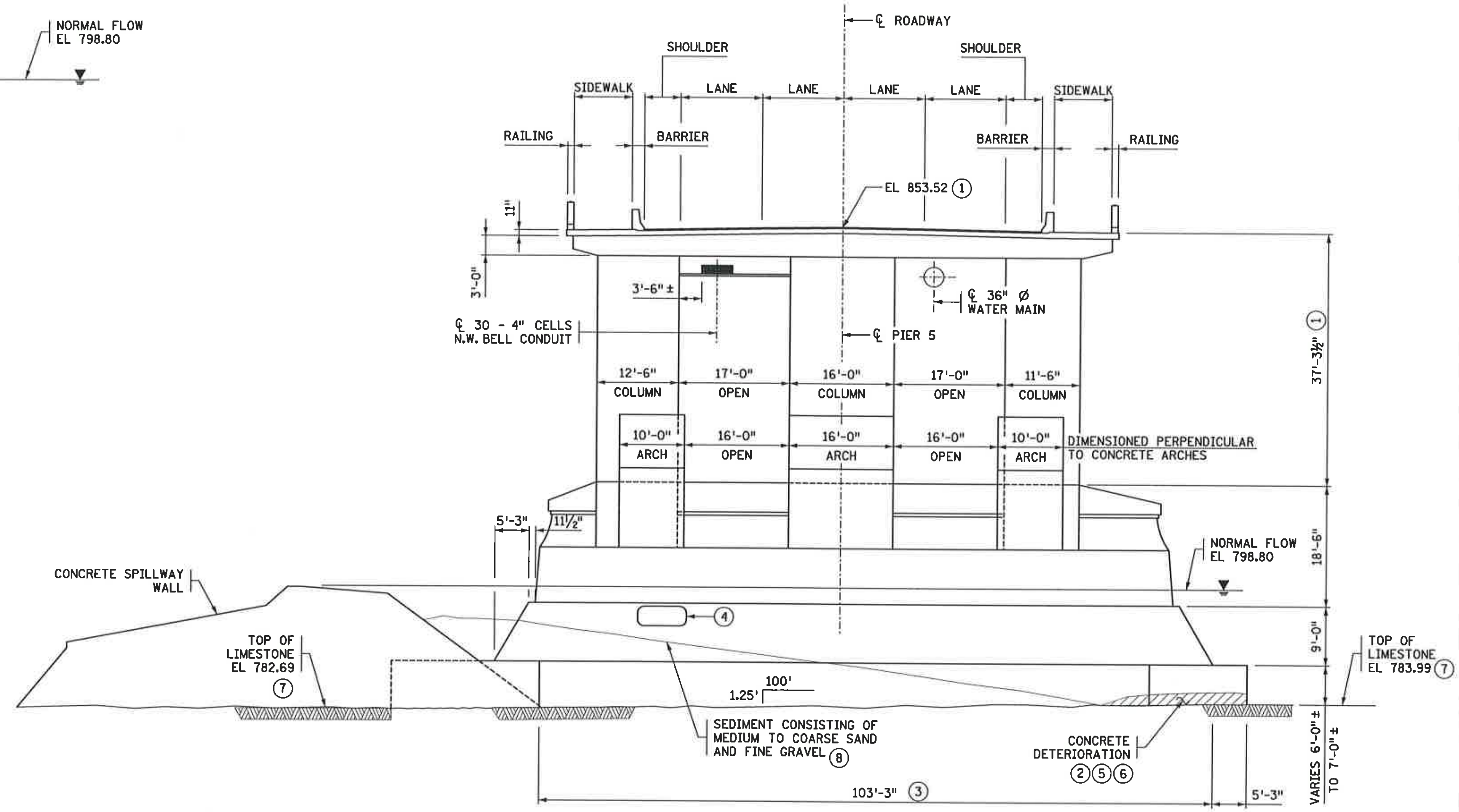


EAST ELEVATION - LOOKING WEST



NORTH ELEVATION - LOOKING SOUTH

NOTES:

▨ DENOTES KNOWN UNDERCUT AREA ALONG PERIMETER. REMOVE UNSOUND CONCRETE AND REPAIR WITH STRUCTURAL CONCRETE (1AJM). INCLUDED IN ITEM "RECONSTRUCT FOUNDATION".

SEE SHEETS 12, 13 AND 14 FOR BORING LOGS.

① ELEVATION TO PROFILE GRADE, CENTERLINE OF PIER 5.

② FIELD VERIFY ANY ADDITIONAL UNDERCUT AREAS. DETAILS SHOW KNOWN AREAS REQUIRING REPAIR. ACTUAL AREAS SHALL BE DETERMINED IN THE FIELD.

③ CONCRETE FOOTING SEAL LIMITS TO BE IDENTIFIED IN THE FIELD AS NECESSARY.

④ 5' WIDTH × 3' HEIGHT AREA OF SPALL, 2' TO 3' DEPTH, CENTERED APPROXIMATE 3' BELOW NORMAL POOL. SEE SURFACE REMOVAL AND REPAIR DETAILS SHEET 12.

⑤ A VOID, POTENTIALLY CONTINUING THROUGH CONCRETE FOOTING SEAL, WAS DISCOVERED DURING NOVEMBER 2012 UNDERWATER INSPECTION. LIMITS AT THE SOUTH FACE AT THE TIME OF INSPECTION WERE DESCRIBED AS "UP TO 6' WIDE AND VARYING IN HEIGHT FROM 1' TO 3'".

⑥ 3-D ACOUSTIC SCAN AVAILABLE FOR CONTRACTOR REVIEW. AN UNDERCUT AREA WAS DISCOVERED IN A 3-D ACOUSTIC IMAGING SCAN MEASURING MAXIMUM APPROXIMATE DEPTH OF 2'-6" AND 15' LONG ALONG CONCRETE FOOTING SEAL.

⑦ FIELD VERIFY TOP OF LIMESTONE AS NECESSARY.

⑧ SEDIMENT LEVELS APPROXIMATE AND VARY SEASONALLY. FIELD VERIFY.

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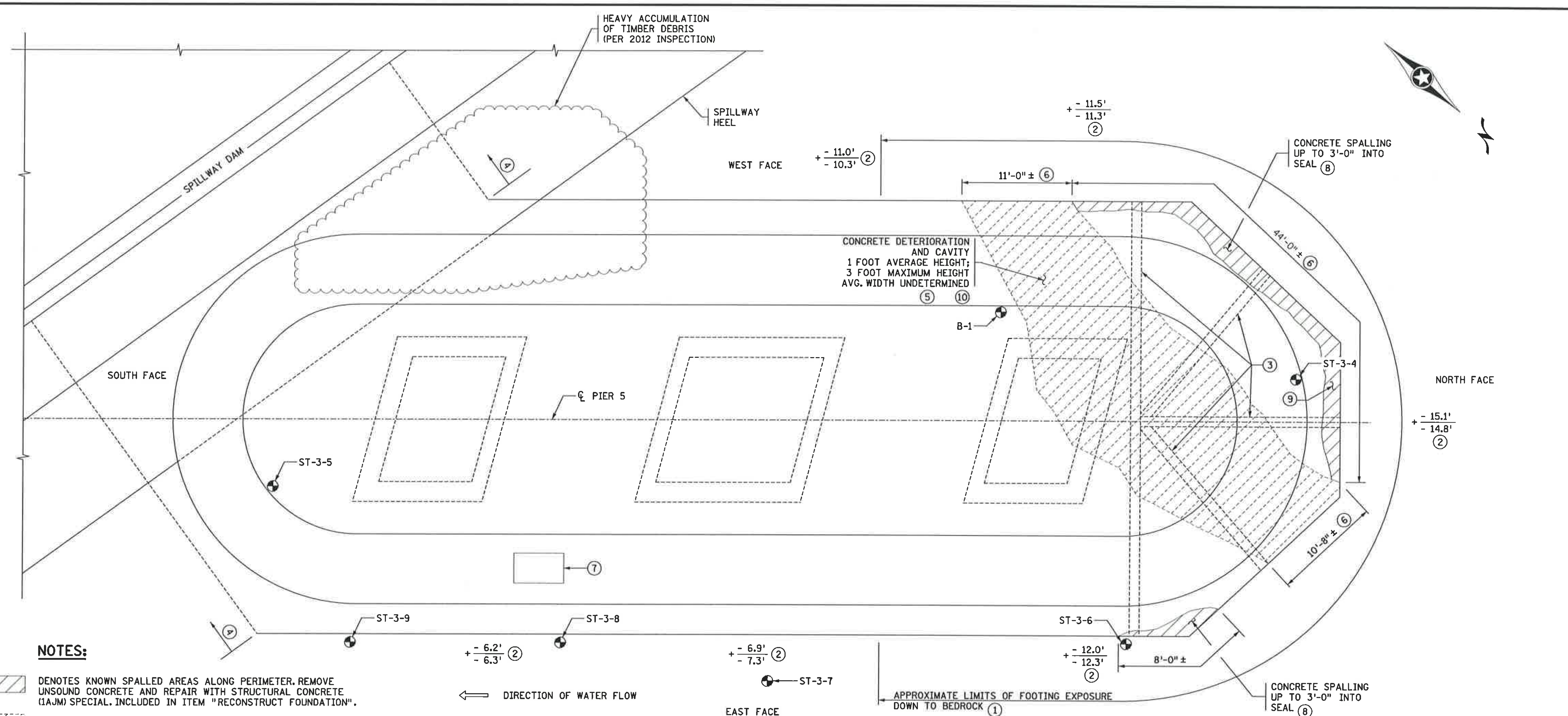


DIRECTION OF WATER FLOW

PIER 5 FOUNDATION PLAN

NOTES:

DENOTES KNOWN SPALLED AREAS ALONG PERIMETER. REMOVE UNSOUND CONCRETE AND REPAIR WITH STRUCTURAL CONCRETE (1AJM) SPECIAL. INCLUDED IN ITEM "RECONSTRUCT FOUNDATION".

DENOTES POTENTIAL CONCRETE VOID.

SEE SHEET 11 FOR REPAIR DETAILS.

BORING LOCATIONS.

SEE SHEETS 12 THRU 14 FOR BORING LOGS.

① FROM 2012 INSPECTION: THE FOOTING AT PIER 5 WAS EXPOSED DOWN TO BEDROCK AROUND UPSTREAM ⅓ OF PIER.

② -8.0 SOUNDING DEPTH FROM WATERLINE (10/28/12)
-8.2 SOUNDING DEPTH FROM WATERLINE (10/23/08)

③ POSSIBLE TIMBER EMBEDDED IN FOUNDATION. PRECISE LOCATION UNKNOWN.

④ CONCRETE SEAL LIMITS TO BE IDENTIFIED IN THE FIELD AS NECESSARY.

⑤ CONTRACTOR TO CLEAN SEDIMENT AND MISC. DEBRIS FROM CAVITY PRIOR TO FILLING. PAID FOR UNDER "REMOVE MISCELLANEOUS DEBRIS".

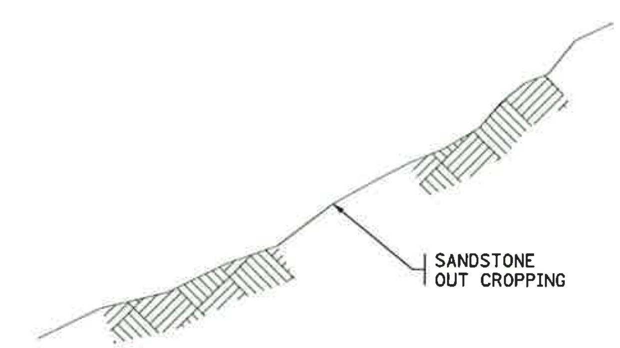
⑥ FIELD VERIFY AS REQUIRED.

⑦ AN AREA 5' WIDE BY 3' HIGH WITH PENETRATIONS BETWEEN 2' AND 3' WAS FOUND ALONG NORTH FACE OF FOOTING AT DOWNSTREAM ¼ POINT OF PIER 5. SEE SURFACE REMOVAL AND REPAIR DETAILS SHEET 12.

⑧ FIELD VERIFY ANY ADDITIONAL UNDERCUT AREAS. DETAILS SHOW KNOWN AREAS REQUIRING REPAIR. ACTUAL AREAS SHALL BE DETERMINED IN THE FIELD.

⑨ AN UNDERCUT AREA WAS DISCOVERED IN 3-D ACOUSTIC IMAGING SCAN MEASURING MAXIMUM APPROXIMATE DEPTH OF 2'-6" AND 15' LONG ALONG CONCRETE SEAL.

⑩ A VOID, POTENTIALLY CONTINUING THROUGH CONCRETE SEAL FOOTING, WAS DISCOVERED DURING NOVEMBER 2012 UNDERWATER INSPECTION. LIMITS AT THE TIME OF INSPECTION WERE DESCRIBED AS "UP TO 6' WIDE AND VARYING IN HEIGHT FROM 1' TO 3'". 3-D ACOUSTIC SCAN AVAILABLE FOR CONTRACTOR REVIEW.



HDR Engineering, Inc.	CERTIFIED BY [signature] 5/23/14 LICENSED PROFESSIONAL ENGINEER DATE	TITLE: PIER 5 INPLACE CONDITIONS (2 OF 3)	DES: JL / CHK: RJR	DR: JN / CHK: RJR	APPROVED:
	NAME: JACOB Z. BRONDER LIC. NO. 41848		SHEET NO. 9 OF 19 SHEETS		BRIDGE NO. 2440

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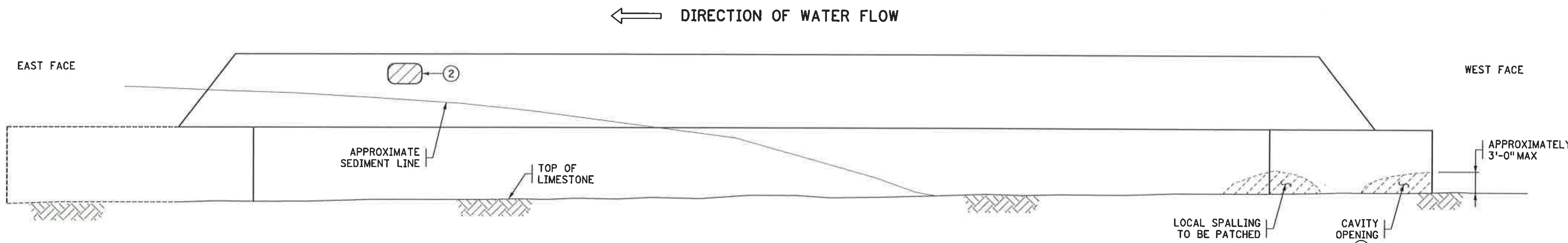
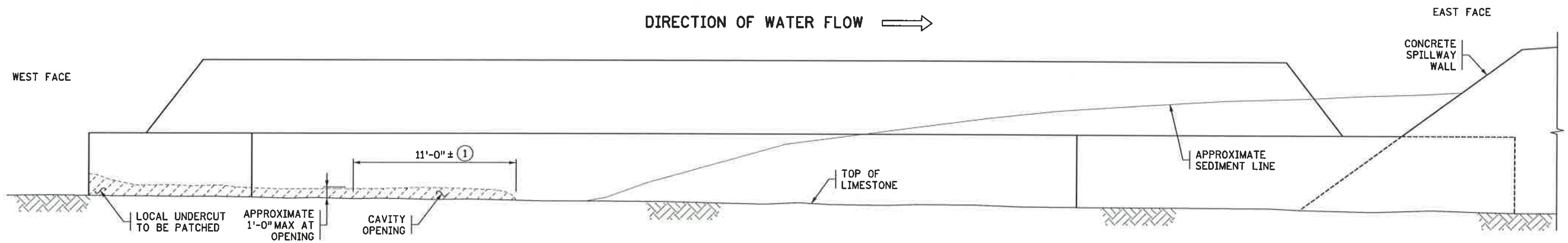


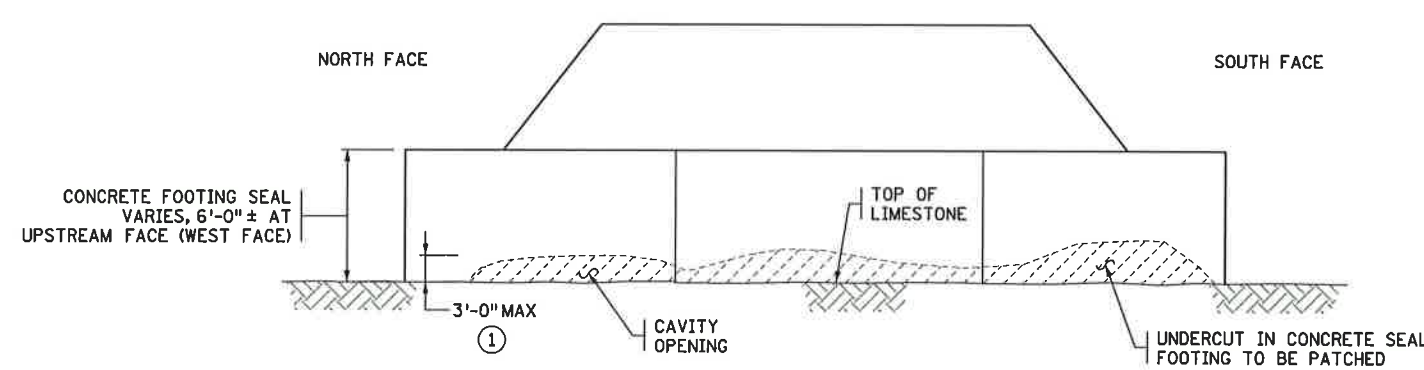
PIER 5 FOUNDATION PROFILE

LOOKING SOUTH



PIER 5 FOUNDATION PROFILE

LOOKING NORTH



PIER 5 FOUNDATION ELEVATION

UPSTREAM FACE (WEST FACE) LOOKING EAST
(SEDIMENT NOT SHOWN)

NOTES:

SEE SHEET 11 FOR REPAIR DETAILS.

(1) FIELD VERIFY.

(2) 5' WIDTH x 3' HEIGHT AREA OF SPALL, 2' TO 3' DEPTH, CENTERED APPROXIMATE 3' BELOW NORMAL POOL.

HATCHED AREA INDICATES APPROXIMATE LIMITS OF CONCRETE DETERIORATION.

SCALE : 0 5' HORIZONTAL 0 5' VERTICAL

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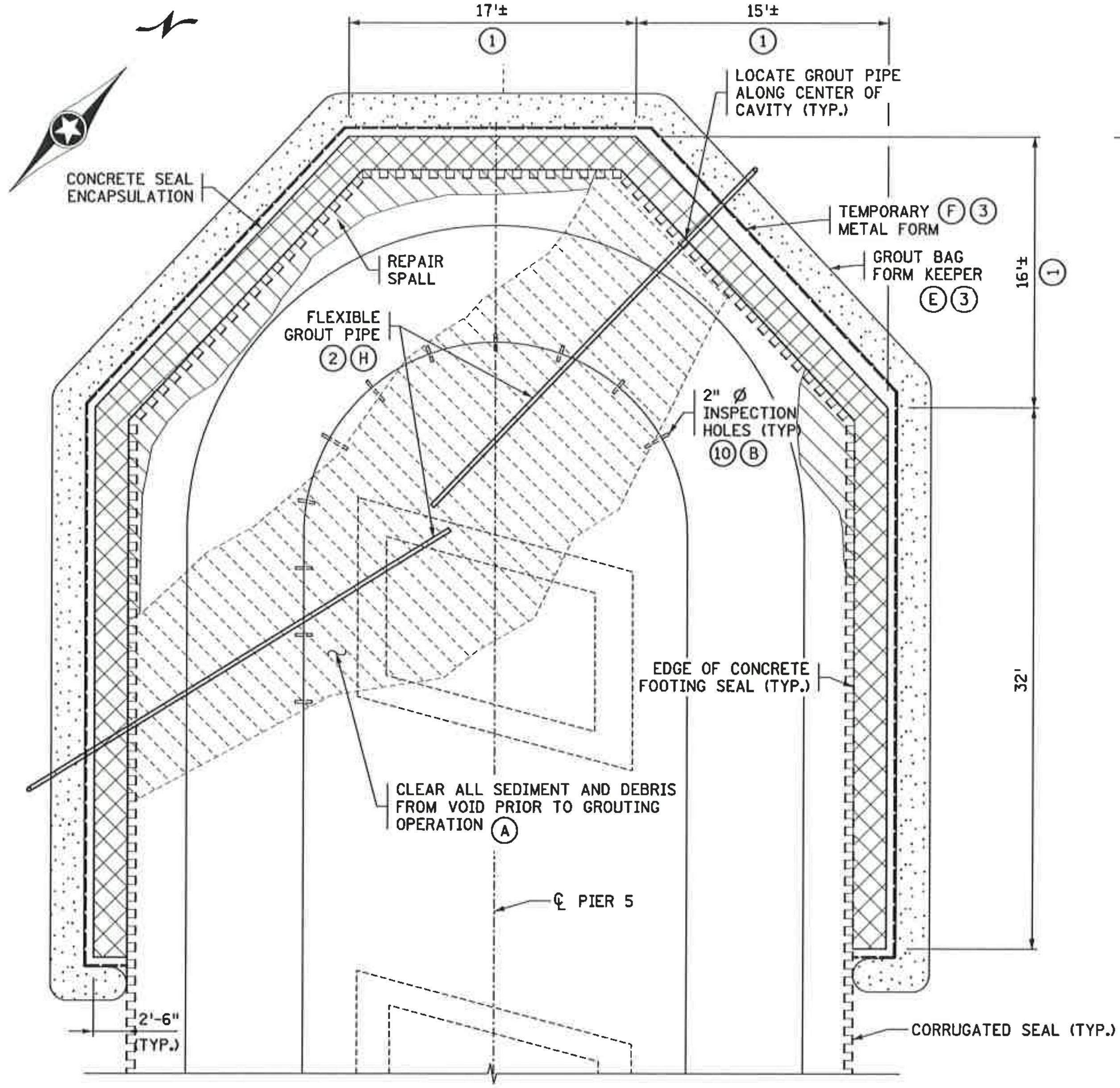
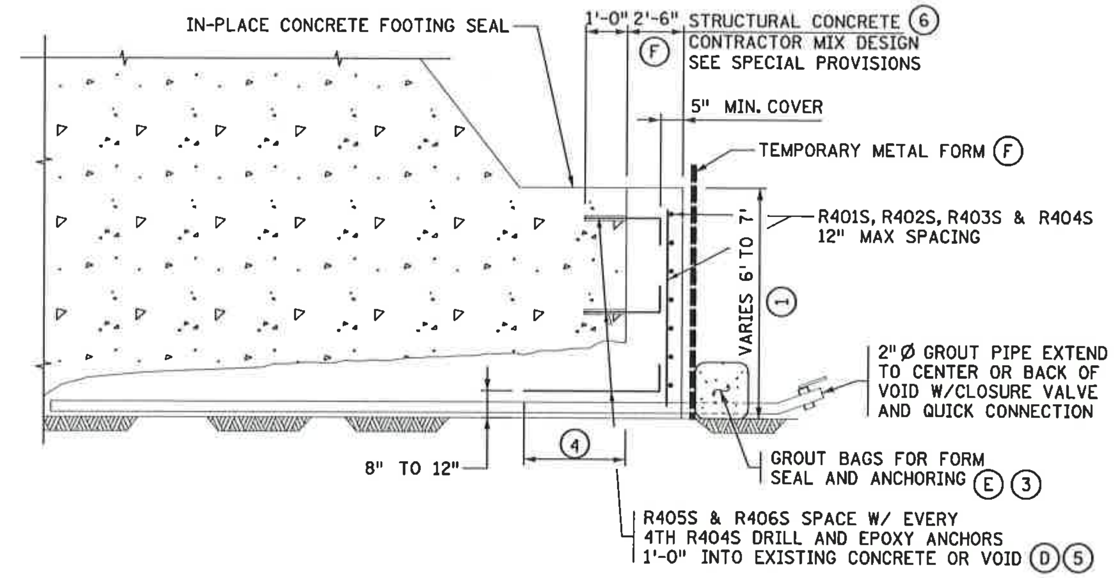


PARTIAL FOOTING PLAN VIEW
(PIER 5 SHOWN)
(NOT TO SCALE)



RECONSTRUCT FOUNDATION TYPE 2 DETAIL
(NOT TO SCALE)

CONSTRUCTION SEQUENCE FOR UNDERWATER CONSTRUCTION:

(A) CLEAN VOID AND REMOVE ALL SEDIMENT TO SOLID LIMESTONE AROUND FOOTING.

(B) CORE DRILL NOMINAL 2" DIAMETER HOLES ON ANGLE ON THE PIER AND VERTICALLY ON THE FOOTING AS SHOWN ON DRAWINGS AND DIRECTED IN THE FIELD, AND EXTEND CASING 2' MINIMUM ABOVE THE WATER SURFACE. IF HOLE DOES NOT HIT VOID DRILLING TO STOP AT BEDROCK.

(C) INSPECT VOID AND REMOVE ORGANIC MATERIAL, SAND, DRILL CUTTINGS, AND LOOSE/UNSOUND CONCRETE. REPORT CONDITION TO MNDOT FOR VERIFICATION DIVE PRIOR TO PROCEEDING.

(D) INSTALL REINFORCEMENT AND DOWELS FOR CONCRETE ENCASEMENT. INSTALL HORIZONTAL GROUT TUBES AND VENT TUBES AT VOID ONLY.

(E) INSTALL GROUT BAGS OR OTHER APPROVED MATERIAL FOR CONCRETE ENCASEMENT WHILE LEAVING SPACE FOR ACCESS TO GROUT AND VENT TUBES IN VOID. GROUT BAGS SHALL BE A MINIMUM OF 3' HIGH WHEN FILLED WITH GROUT.

(F) PLACE METAL OR OTHER FORM MATERIAL FOR CONCRETE ENCAPSULATION TO TOP OF FOOTING. CREATE FORMED BLOCK-OUT AND TUNNEL AT THE LARGEST VOID OPENING TO THE VOID IN ORDER TO ADEQUATELY VENT SUBSEQUENT INTERIOR GROUTING.

(G) TREMIE OR PUMP CONCRETE INPLACE - KEEPING THE DISCHARGE OF THE CONCRETE WITHIN THE CONCRETE MASS BEING PLACED. WORK FROM SHALLOW UNDERCUT AREAS TOWARD LARGER UNDERCUT AREAS. CONCRETE SHALL NOT BE MIXED WITH THE SURROUNDING WATER.

REMOVE VENT BLOCK-OUT AND TUNNEL FORMS.

(H) AFTER THE CONCRETE HAS SET AND GAINED STRENGTH, PRESSURE GROUT VOID FROM HORIZONTAL GROUT PIPES AT A MINIMUM OF TWO SIDES OF FOOTING. BEGIN AT THE INTERIOR CENTER OF FOOTING AND EXTEND TOWARD THE PERIMETER. CARE SHALL BE TAKEN TO FILL THE ENTIRE VOID. CONTINUE PUMPING FROM THE HORIZONTAL GROUT PIPES UNTIL GROUT CAN BE OBSERVED EXCEEDING THE TOP OF VOID FROM THE CORED HOLES. GROUTING SHALL CONTINUE FROM THE HORIZONTAL GROUT TUBES AS LONG AS THE GROUTING OPERATION CONTINUES TO PROGRESS AND FILL THE VOIDS. RETRACT HORIZONTAL GROUT PIPES WHILE GROUTING, MAINTAINING VISUAL CONFIRMATION FROM THE VERTICAL CORE HOLES THAT GROUT ELEVATION EXCEEDS TOP OF VOID ELEVATION. GROUTING FROM VERTICAL CORED HOLES IS PERMITTED WHEN GROUT IS OBSERVED AT THE TOP OF THE VOID FOR THE RESPECTIVE VERTICAL CORE HOLE. WHEN GROUT IS WITHIN THICKNESS OF CONCRETE SEAL PERIMETER, PLACE GROUT BAGS AROUND VENT BLOCKOUT AND REDUCE VENTING TO TWO 2" DIAMETER VENT TUBES WITH SHUTOFF VALVES. CONTINUE GROUTING UNTIL GROUT COMES FROM VENT PIPE AT THE EDGE OF THE VOID. A DIVER SHALL BE PROVIDED TO OBSERVE THE VENT HOLES AND GROUT SHALL BE WASTED UNTIL NO WATER FLOWS FROM THE VENTS. AT THAT TIME ALL VENTS AND GROUT PIPES SHALL BE CLOSED. ALL OPEN CORE HOLES SHALL BE FILLED WITH GROUT.

(I) CORE DRILL A MINIMUM OF FOUR 2" Ø VERIFICATION CORES AT LOCATION APPROVED BY MNDOT. ALL CORE HOLES SHALL BE FILLED WITH GROUT. IN THE EVENT SIGNIFICANT VOIDS ARE ESTABLISHED A SUPPLEMENTAL GROUTING OPERATION WILL BE REQUIRED. PAYMENT FOR CORING MADE INCIDENTAL TO "RECONSTRUCT FOUNDATION TYPE 2".

(J) REMOVE TEMPORARY WORKS EXCLUDING GROUT BAGS. CUT OFF ANY VENT PIPING AND REMOVE ANY METAL FORMS. PLACE ADDITIONAL GROUT BAGS COVERING FULL AREA OF VENTING BLOCK-OUT OR VENT TUBES.

SUMMARY OF QUANTITIES FOR PIER 5

(9)	REMOVE MISCELLANEOUS DEBRIS	0.5	LUMP SUM
(6)	REINFORCEMENT BARS (STAINLESS STEEL)	1230	POUND
(9)	RECONSTRUCT FOUNDATION TYPE 2	1	LUMP SUM
	GROUTED REINF BARS (STAINLESS STEEL)	102	EACH
	CONCRETE SURFACE REPAIR TYPE 1	15	SQ. FT.
	CONCRETE SURFACE REPAIR TYPE 2	2	SQ. FT.

BILL OF REINFORCEMENT FOR RECONSTRUCT FOUNDATION TYPE 2

	BAR	NO	LENGTH	SHAPE	LOCATION
	R401S	14	32'-1"	——	PIER 5 - FOOTING HORIZONTAL
	R402S	14	26'-2"	_/	PIER 5 - FOOTING HORIZONTAL
	R403S	7	17'-2"	——	PIER 5 - FOOTING HORIZONTAL
	R404S	128	6'-10"	——	PIER 5 - FOOTING VERTICAL
(7)	R405S	64	3'-10"	L	PIER 5 - HORIZONTAL DOWEL
(7)	R406S	32	5'-10"	L	PIER 5 - HORIZONTAL DOWEL

NOTES:

REPAIR SPALL AREAS IN CONCRETE SEAL PRIOR TO CASTING ENCAPSULATION.

(1) THIS DIMENSION TIED TO THE CONCRETE FOOTING SEAL DIMENSION, VERIFY IN THE FIELD.

(2) GROUT TO BE PUMPED FROM CENTER OF VOID OUTWARDS

(3) GROUT BAGS OR ENCAPSULATION FORMING SHALL NOT BE INSTALLED UNTIL ENGINEER REVIEWS AND APPROVES VOID IS ADEQUATELY CLEARED OF SEDIMENT AND DEBRIS. ALL CLEANING AND DEBRIS REMOVAL TO BE PAID FOR AS "REMOVE MISCELLANEOUS DEBRIS".

(4) EXTEND LESSER OF 3' OR VOID PENETRATION. MINIMUM ANCHORAGE EMBEDMENT IS 12".

(5) FIELD TRIM R406S AS NECESSARY.

(6) PAID FOR UNDER "RECONSTRUCT FOUNDATION TYPE 2".

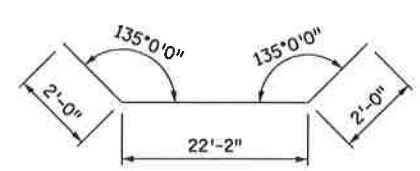
(7) REINFORCEMENT BARS PLUS DRILLING AND INSTALLING INCLUDED IN PAYMENT FOR "GROUTED REINF BARS (STAINLESS STEEL)".

(8) BEND AND/OR CUT TO LENGTH IN FIELD.

(9) SEE SPECIAL PROVISIONS FOR ESTIMATED QUANTITY INCLUDED IN LUMP SUM.

(10) DRILL A MINIMUM OF 11 HOLES SPACED AT ABOUT 4'. APPROXIMATE LENGTH = 17' EACH. PAYMENT FOR DRILLING IS INCIDENTAL TO "RECONSTRUCT FOUNDATION TYPE 2".

R405S, R406S, R409S & R410S (7)



R402S

DENOTES ENCAPSULATION CONCRETE

DENOTES CONCRETE SPALL AREAS

DENOTES POTENTIAL CONCRETE VOID

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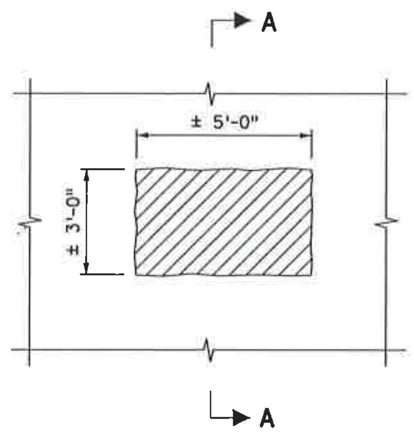
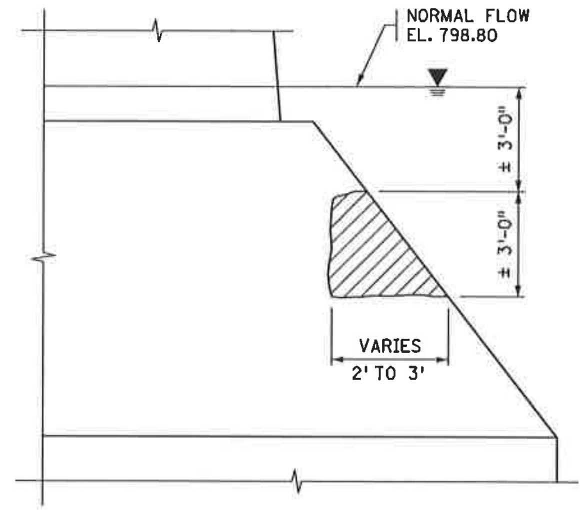


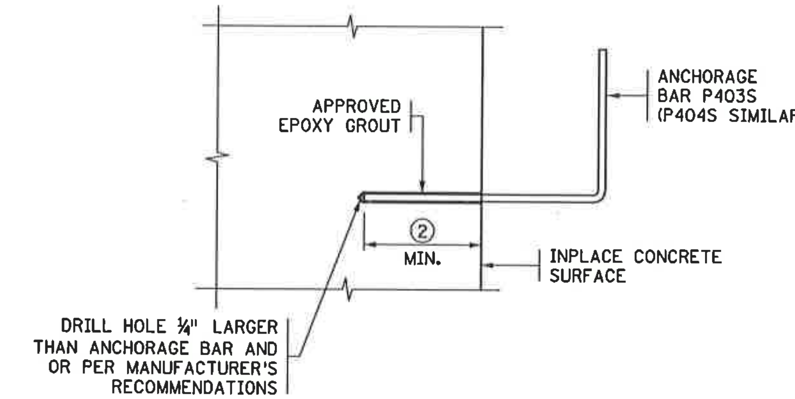
PLAN VIEW



SECTION A-A

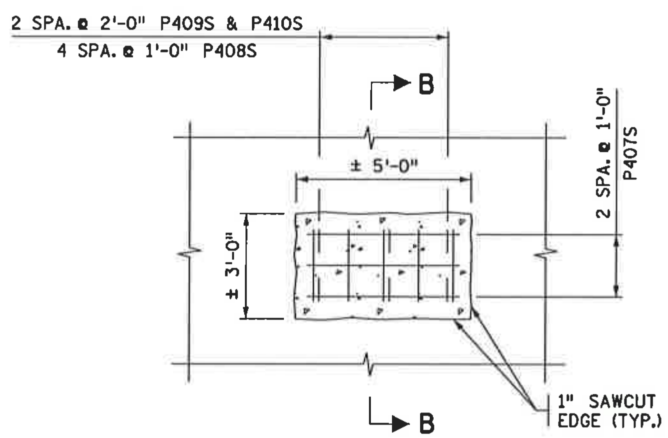
PIER 5 SURFACE REMOVALS

(FIELD VERIFY DIMENSIONS)

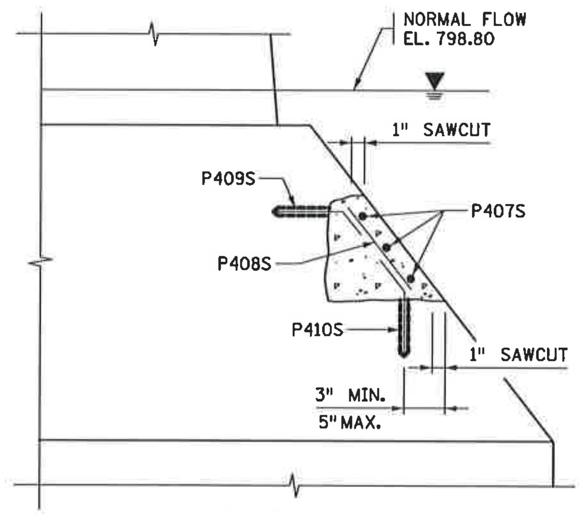


ANCHORAGE DETAIL

	ESTIMATED QUANTITIES FOR RECONSTRUCT FOUNDATION TYPE 2 ④		
	STRUCTURAL CONCRETE	86	CU. YD.
⑤	HIGH MOBILITY GROUT	36	CU. YD.
⑥	CEMENT GROUT	1.8	CU. YD.



PLAN VIEW



SECTION B-B

PIER 5 SURFACE REPAIRS

NOTES:

① REINFORCEMEMT BARS PLUS DRILLING AND INSTALLING INCLUDED IN PAYMENT FOR "GROUTED REINF BARS (STAINLESS STEEL)".

② 12" MINIMUM EMBEDMENT.

③ FIELD BEND TO MATCH FACE SLOPE.

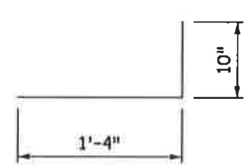
④ NO COMPENSATION WILL BE PAID ABOVE LUMP SUM PRICE FOR CHANGE IN QUANTITIES EXCEPT AS NOTED IN⑤. ESTIMATED QUANTITIES ARE BASED ON BEST AVAILABLE INFORMATION. ACTUAL QUANTITIES ARE TO BE DETERMINED BY CONTRACTOR IN FIELD AS NECESSARY TO EXECUTE REPAIRS SHOWN.

⑤ PRIMARY GROUTING OF VOID ESTIMATED.

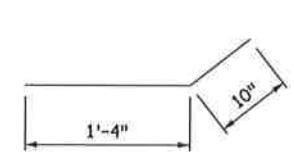
⑥ QUANTITY OF SECONDARY GROUTING IS INCIDENTAL. SEE SPECIAL PROVISIONS FOR ADDITIONAL VOLUME PAYMENT TERMS.

DENOTES REMOVAL OF UNSOUND CONCRETE INCLUDED IN ITEM "CONCRETE SURFACE REPAIR TYPE ___".

DENOTES CAST-IN-PLACE CONCRETE REPAIR. INCLUDED IN ITEM "CONCRETE SURFACE REPAIR TYPE ___".



P403S



P404S ③①

	BILL OF REINFORCEMENT FOR PIER 5 CONCRETE SURFACE REPAIR TYPE __				
	BAR	NO	LENGTH	SHAPE	LOCATION
	P407S	3	4'-8"	——	FOOTING HORIZONTAL
	P408S	5	2'-8"	——	FOOTING VERTICAL
①	P409S	3	2'-8"	└──	HORIZONTAL - DOWEL
③①	P410S	3	2'-8"	╲__	VERTICAL - DOWEL

HDR Engineering, Inc.	CERTIFIED BY [signature] 5/23/14 LICENSED PROFESSIONAL ENGINEER DATE NAME: JACOB Z. BRONDER LIC. NO. 41848	TITLE: PIER 5 FOOTING REPAIR (2 OF 2)	DES: JL CHK: RJR	DR: JN CHK: RJR	APPROVED:	BRIDGE NO. 2440
			SHEET NO. 12 OF 19 SHEETS			

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Boring By: SOIL ENGINEERING SERVICES, INC. Minneapolis, Minnesota
Logged By: P. H. Anderson
Inspector: J. Murphy

LOG OF BORING

PROJECT: 68-80 3rd Avenue Bridge, Minneapolis, Minnesota
BORING NO: ST-3-4 SHEET 1 OF 2

DATE OF BORING — STARTED: 4/11/68 COMPLETED: 4/16/68
BORING TYPE: Rotary, CME 55 Rig
GROUND WATER: ___ HOURS AFTER DRILLING: ___ (three blank lines)
LOCATION — STATION: ___ OFFSET: ___ Pier 5

SAMPLER TYPE AND DATA
- ☒ SPLIT BARREL 1 3/8" I.D., 2" O.D.
- U UNDISTURBED SAMPLE
- C ROCK CORE NX Diamond Bit
- A AUGER
- ☐ OTHER

Depth (ft)	Sample No.	Std. Penetration Resistance	Recovery, in.
5.0–10.0 (C)			60" = 100%
10.0–15.0 (C)			60" = 100%
15.0	6		18"
15.5–20.0 (C)			58½" = 97%
20.0–22.5 (C)			32" = 100%
25.0 (26")			27" = 98%
27.5	7	100 in 0.4'	26" = 94%
32.5		100 in 0.3'	0"
35.0		100 in 0.2'	0"

Drilling data: Water used as drilling fluid

Casing: NX Casing initially seated to 6.0' (1st core run begun inside casing), lost water at 15.5' when wood was then noted in split barrel sample, reamed hole with 3 3/4" drag bit to 16', advanced casing to 16' in continuous coring

SOIL DESCRIPTION AND REMARKS	Depth	ELEV.
		799.8
Water	3'	796.8
Concrete Footing	15.5'	784.3
Decayed Wood	16'	783.8
Light grey mottled with dark grey Platteville Formation. (lost water at 23.5' -- two short core runs taken)	24.7'	775.1
Bluish grey to yellowish brown Glenwood Formation	27'	772.8
*Classification below 27' on	28.7'	771.1
Very dense, greenish grey St. Peter Sandstone (upper portions well cemented -- retained in core barrell)	36.7'	763.1

FORM NO. 173-363-3 HOWARD, NEEDLES, TAMMEN & BERGENDOFF

Boring By: SOIL ENGINEERING SERVICES, INC. Minneapolis, Minnesota
Logged By: P. H. Anderson
Inspector: J. Murphy

LOG OF BORING

PROJECT: 68-80 3rd Avenue Bridge, Minneapolis, Minnesota
BORING NO: ST-3-5 SHEET 1 OF 2

DATE OF BORING — STARTED: 4/16/68 COMPLETED: 4/19/68
BORING TYPE: Rotary, CME 55 Rig
GROUND WATER: ___ HOURS AFTER DRILLING: ___ (three blank lines)
LOCATION — STATION: ___ OFFSET: ___ Pier 5

SAMPLER TYPE AND DATA
- ☒ SPLIT BARREL 1 3/8" I.D., 2" O.D.
- U UNDISTURBED SAMPLE
- C ROCK CORE NX Diamond bit
- A AUGER
- ☐ OTHER

Depth (ft)	Sample No.	Std. Penetration Resistance	Recovery, in.
5.0–10.0 (C)			60" = 100%
10.0–15.0 (C)			57½" = 96%
15.0–20.0 (C)			47" = 78%
20.0–22.5 (C)			60" = 100%
22.5–27.5 (C)			57" = 95%
30.0	8	100 in 0.5'	
35.0	9W	100 in 0.3'	0"
40.0	10W	100 in 0.3'	0"

Drilling data: Water used as drilling fluid

Casing: Drilled pilot hole to 3.5' with drag bit to seat casing, NX casing advanced to 5.4' -- 1st NX core run begun in casing.

CLASSIFICATION SYSTEM ___

SOIL DESCRIPTION AND REMARKS	Depth	ELEV.
		800.0
Water	3'	797.0
Concrete Footing (lower portions badly fractured and easier drilling -- possibly leaner concrete)	17.5'	782.5
Light grey mottled with dark grey Platteville Formation	26.5'	773.5
Bluish grey to yellowish brown Glenwood Formation	28'	772.0
Very dense, brownish grey St. Peter Sandstone (W indicates sample obtained from wash water)	40.3'	759.7

FORM NO. 173-363-3 HOWARD, NEEDLES, TAMMEN & BERGENDOFF

Boring By: SOIL ENGINEERING SERVICES, INC. Minneapolis, Minnesota
Logged By: P. Anderson
Inspector: J. Murphy

LOG OF BORING

PROJECT: 68-80 3rd Avenue Bridge, Minneapolis, Minnesota
BORING NO: ST-3-6 SHEET 1 OF 1

DATE OF BORING — STARTED: 4/11/68 COMPLETED: 4/11/68
BORING TYPE: Rotary, CME 55 Rig
GROUND WATER: ___ HOURS AFTER DRILLING: ___ (three blank lines)
LOCATION — STATION: ___ OFFSET: ___ Pier 5

SAMPLER TYPE AND DATA
- ☒ SPLIT BARREL 1 3/8" I.D., 2" O.D.
- U UNDISTURBED SAMPLE
- C ROCK CORE NX Diamond Bit
- A AUGER
- ☐ OTHER

Depth (ft)	Sample No.	Std. Penetration Resistance	Recovery, in.
15.0	5	2 / 100 in 0.2'	
15.0–20.0 (C)			62" = 100%

Drilling data: Water used as drilling fluid

Casing: NX casing advanced by rotation

CLASSIFICATION SYSTEM: U.S. Bureau of Soils

SOIL DESCRIPTION AND REMARKS	Depth	ELEV.
		799.6
Water		
*Loose, brown, Medium to Coarse Sand and Fine Gravel, wet	14.3'	785.3
*	15'	784.6
Light grey mottled with dark grey Platteville Formation	20.4'	779.2

FORM NO. 173-363-3 HOWARD, NEEDLES, TAMMEN & BERGENDOFF

HDR Engineering, Inc.	TITLE: BORING LOGS 1	DES: JL / CHK: RJR	DR: JN / CHK: RJR	APPROVED:	BRIDGE NO. 2440
	SHEET NO. 13 OF 19 SHEETS				

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LOG OF BORING

Boring By: SOIL ENGINEERING SERVICES, INC. Minneapolis, Minnesota
Logged By: P.H. Anderson
Inspector: J. Murphy

PROJECT:	68-80 3rd Avenue Bridge, Minneapolis, Minnesota
BORING NO:	ST-3-7
SHEET	1 OF 1
DATE OF BORING – STARTED:	4/30/68
COMPLETED:	5/1/68
BORING TYPE	Rotary, CME 55 Rig
GROUND WATER	___ HOURS AFTER DRILLING: ___ / ___ HOURS AFTER DRILLING: ___ / ___ HOURS AFTER DRILLING: ___
LOCATION – STATION:	
OFFSET:	Pier 5

SAMPLER TYPE AND DATA: [X] SPLIT BARREL; [U] UNDISTURBED SAMPLE; [C] ROCK CORE NX Diamond Bit; [A] AUGER; [ ] OTHER

Columns: DEPTH-FEET | SAMPLE & TYPE | SAMPLE NO. | STD. PENETRATION RESISTANCE | RECOVERY, % | COMPRESSIVE STRENGTH TSF, POCKET PENETROMETER | DRILLING DATA: BIT SIZE, TYPE, ETC. LOSS OR GAIN OF CIRCULATION, TYPE OF DRILLING FLUID | CASING SIZE, TYPE, ETC., BLOWS PER FOOT, WEIGHT OF HAMMER

Depth marks: 2.5, 5.0, 7.5, 10.0, 12.5, 14.0', 17.5, 20.0, 22.5, 25.0

Sample C (17.5–22.5): Recovery 60" = 100%
Sample C (22.5–25.0+): Recovery 53" = 92%

Drilling data: Water used as drilling fluid

Casing: NX casing seated by rotation to 17.0' -- first core run begun in casing

SOIL DESCRIPTION AND REMARKS (CLASSIFICATION SYSTEM ___)

Description	Depth	ELEV.
		800.1
Water	14.0'	786.1
Sand -- not sampled	16.5'	783.6
Light grey mottled with dark grey Platteville Limestone Formation (upper 1' fragmented)	25.3'	774.8
Bluish grey Glenwood Formation	26.5'	773.6

FORM NO. 173-363-3 — HOWARD, NEEDLES, TAMMEN & BERGENDOFF

LOG OF BORING

Boring By: SOIL ENGINEERING SERVICES, INC. Minneapolis, Minnesota
Logged By: P.H. Anderson
Inspector: J. Murphy

PROJECT:	68-80 3rd Avenue Bridge, Minneapolis, Minnesota
BORING NO:	ST-3-8
SHEET	1 OF 1
DATE OF BORING – STARTED:	5/1/68
COMPLETED:	5/1/68
BORING TYPE	Rotary, CME 55 Rig
GROUND WATER	___ HOURS AFTER DRILLING: ___ / ___ HOURS AFTER DRILLING: ___ / ___ HOURS AFTER DRILLING: ___
LOCATION – STATION:	
OFFSET:	Pier 5

SAMPLER TYPE AND DATA: [X] SPLIT BARREL; [U] UNDISTURBED SAMPLE; [C] ROCK CORE NX Diamond Bit; [A] AUGER; [ ] OTHER

Depth marks: 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0

Sample C (17.5–22.5): Recovery 60" = 100%
Sample C (22.5–27.5): Recovery 60" = 100%

Drilling data: Water Used as drilling fluid

Casing: NX Casing seated by rotation to 17.0' depth -- first core run begun in casing.

SOIL DESCRIPTION AND REMARKS (CLASSIFICATION SYSTEM ___)

Description	Depth	ELEV.
		800.0
Water	8.5'	791.5
Sand -- not sampled	16.6'	783.4
Light grey mottled with dark grey Platteville Formation	25.6'	774.4
*	26.6'	773.4
*Bluish grey Glenwood Formation		

FORM NO. 173-363-3 — HOWARD, NEEDLES, TAMMEN & BERGENDOFF

LOG OF BORING

Boring By: SOIL ENGINEERING SERVICES, INC. Minneapolis, Minnesota
Logged By: P.H. Anderson
Inspector: J. Murphy

PROJECT:	68-80 3rd Avenue Bridge, Minneapolis, Minnesota
BORING NO:	ST-3-9
SHEET	1 OF 2
DATE OF BORING – STARTED:	4/19/68
COMPLETED:	4/22/68
BORING TYPE	Rotary, CME 55 Rig
GROUND WATER	___ HOURS AFTER DRILLING: ___ / ___ HOURS AFTER DRILLING: ___ / ___ HOURS AFTER DRILLING: ___
LOCATION – STATION:	
OFFSET:	Pier 5

SAMPLER TYPE AND DATA: [X] SPLIT BARREL 1 3/8" I.D. 2" O.D.; [U] UNDISTURBED SAMPLE; [C] ROCK CORE NX Diamond Bit; [A] AUGER; [ ] OTHER

Depth marks: 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0, 27.5, 30.0, 32.5, 35.0

Sample C (17.5–22.5): Recovery 58" = 97%
Sample C (22.5–27.5): Recovery 60" = 100%
Sample C (27.5–29.5): Recovery 24" = 40%
Sample X 10 (30.0): Std. penetration 115 in 0.5'
Sample X (35.0): Std. penetration 110 in 0" 0.5'

Drilling data: Water used as drilling fluid

Casing: NX casing seated by rotation to 16.5' -- first core run began in casing

SOIL DESCRIPTION AND REMARKS (CLASSIFICATION SYSTEM ___)

Description	Depth	ELEV.
		799.6
Water	7'	792.6
Sand - not sampled	16.5'	783.1
Light grey mottled with dark grey Platteville Formation (upper 1-foot fragmented)	25.6'	774.0
Bluish grey to yellowish brown Glenwood Formation	*27.7'	771.9
Very dense, light grey mottled with brown, St. Peter Sandstone *burned up NX Diamond Bit on last run due to soft shale plugging bit	36.5'	763.6

FORM NO. 173-363-3 — HOWARD, NEEDLES, TAMMEN & BERGENDOFF

HDR Engineering, Inc.	TITLE: BORING LOGS 2	DES: JL / DR: JN / CHK: RJR / CHK: RJR	APPROVED:	BRIDGE NO. 2440
		SHEET NO. 14 OF 19 SHEETS		

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AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05995 LOG OF BORING NO. B-1 (p. 1 of 3)

PROJECT: 3rd Avenue Bridge; Minneapolis, MN

SURFACE ELEVATION: 853.0

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS: WC	REC %	RQD IN.	RQD %	% #200
1–31	0-57.1' Set HW casing between bridge deck and ledge on bridge pier										

DEPTH	DRILLING METHOD	WATER LEVEL MEASUREMENTS: DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-57.1'	Set HW Casing							
57.1-80'	HQ Coring							
80-85	RD w/DM							
BORING COMPLETED:	4/10/14							
DR: SS	LG: TK	Rig: 41						

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET CORP 01-05995.GPJ AET-GDT-WELL.GDT 4/8/14

03/2011 01-DHR-060

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05995 LOG OF BORING NO. B-1 (p. 2 of 3)

PROJECT: 3rd Avenue Bridge; Minneapolis, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS: WC	REC %	RQD IN.	RQD %	% #200
33–57	0-57.1' Set HW casing between bridge deck and ledge on bridge pier *(continued)*										
57–69	CONCRETE, horizontal cracks/weathering around 59.2', 59.4', 62.5', 63.6', 63.8', 64.2', 64.3', 64.4', 64.5', 64.6', 67.2', 67.3', 68.2', 68.4'	FILL			HQ	35		101			
					HQ	60		100			
					HQ	48		100			
69	VOID										

AET CORP 01-05995.GPJ AET-GDT-WELL.GDT 4/8/14

03/2011 01-DHR-060

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 01-05995 LOG OF BORING NO. B-1 (p. 3 of 3)

PROJECT: 3rd Avenue Bridge; Minneapolis, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS: WC	REC %	RQD IN.	RQD %	% #200
71–73	LIMESTONE, light gray and gray, crinkley bedded Weathering: Slightly weathered to fresh Fracturing: Slightly fractured Stratification: Very thinly bedded Hardness: Hard	PLATTEVILLE FORMATION MIFFLIN MEMBER			HQ	60		100	50	83	
78–80	Weathering: Fresh Fracturing: Slightly fractured Stratification: Thinly bedded Hardness: Hard	PLATTEVILLE FORMATION PECATONICA MEMBER			HQ	57		95	43.5	72	
80–81	SHALE, gray	GLENWOOD FORMATION			SS	12					
81–84	SANDSTONE, light gray, fine grained	ST. PETER FORMATION									
85	**END OF BORING** Set VW piezometer at 84.5 feet (elevation 768.5 feet)										

AET CORP 01-05995.GPJ AET-GDT-WELL.GDT 4/8/14

03/2011 01-DHR-060

HDR Engineering, Inc.

TITLE: BORING LOGS 3

DES: JL	DR: JN	APPROVED:
CHK: RJR	CHK: RJR	

SHEET NO. 15 OF 19 SHEETS

BRIDGE NO. 2440

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER ______________________________
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION ______________________________
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER ______________________________
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND ______________________________

MANUFACTURER'S IDENTIFICATION ______________________________
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER ______________________________
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: ______________ COLOR: ______________

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: ______________ COLOR: ______________

ANTI-GRAFFITI COATING

MANUFACTURER ______________________________
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: ______________ LOCATION: ______________

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER ______________________________
2478 OR 2479 OR OTHER

MANUFACTURER ______________________________
NAME AND ADDRESS (CITY, STATE)

PRIME COAT ______________________________
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT ______________________________
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT ______________________________ ______________
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. ______

BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. ______

SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. ______

(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. ______

COMMENTS: ______________________________

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: ______________ COST: $ ______________

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER ______________ DATE REMOVED ______________

DATE NEW BRIDGE WAS OPENED TO TRAFFIC ______________

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366-4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

______________________________ ______________
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: ______________________________ ______________
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10-28-2008

APPROVED: SEPTEMBER 26, 2003

STATE BRIDGE ENGINEER

AS-BUILT DETAILS (AS NEEDED)

FIG. 5-397.900

HDR Engineering, Inc.

TITLE: AS-BUILT BRIDGE DATA

DES: DR: CHK: CHK: APPROVED:

SHEET NO. 16 OF 19 SHEETS

BRIDGE NO. 2440

3RD AVENUE BRIDGE REPAIR PROJECT SP 2710-2440B
STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

PROJECT DESCRIPTION/LOCATION

SP 2710-2440B IS LOCATED ON T.H. 65 (3RD AVENUE) IN THE CITY OF MINNEAPOLIS IN HENNEPIN COUNTY.

THE SCOPE OF THE 3RD AVENUE BRIDGE REPAIR PROJECT INCLUDES THE FOLLOWING:

The Third Avenue Bridge repair work include repair of deteriorated surface concrete near the water line of the piers and foundation work to repair of voids near base of the piers. The concrete surface repair is at Piers 1, 2, and 5. This work involves removing deteriorated and poor quality concrete from the vertical face of each pier, drilling into the pier concrete and installing anchorages, placement of a matt of reinforcement, and placing new concrete to form a new repaired surface.

The foundation work at Piers 1 and 5 will involve encapsulating the damaged area and for Pier 5 grouting the void. The encapsulating effort includes removing poor quality concrete and sediment from the void and spalls, install anchorages into the existing concrete, installing grout bags to facilitate encapsulation, tying a vertical mat of reinforcement to the anchorages, and casting concrete (designed to not disperse in water) into the formed encapsulation.

For repairing the void below Pier 5 an additional step will take place after the encapsulation concrete has cured. This will involve drilling holes 2" or 3" diameter holes from the top of the footing into the void area. These holes will facilitate pressure grouting voids and other concrete fractures at the concrete footing-bedrock interface. The installation of the concrete encapsulation structure is designed to create a seal around the footing that restricts grout from exiting the foundation into the river during this operation.

The work described is planned to be staged by barge with intermittent use of the bridge deck above to convey some materials. The contractor may install a temporary scaffold around the piers while working on the surface repairs which will aid in material recovery and reduce field personnels reliance on underwater diving equipment.

Sediment and debris removal will involve jetting or vacuum equipment and sediment bags. All sediment removed shall be contained within the cofferdam and following removal, be treated from the cofferdam through the settlement system located on the barge. Calculations show that, given the sandy characteristic of the sediment involved, plume settlement distance from sand sized particles is about 600 feet or less from the source. Distance from Pier 1 to the Mill Ruins Park is roughly 1200 feet. The conclusion is that work on Pier 1 should not negatively impact the visual quality of the water at the Mill Ruins Park tailrace.

Hydropower generators downstream should not experience any reduction in power generation or damage from the project for similar reasons as described above. The equipment is generally designed to accommodate flood situations which contain much higher levels of suspended debris than could reasonably be expected to occur with this project.

PROJECT SCHEDULE (ANTICIPATED)

ESTIMATED CONSTRUCTION START DATE: AUGUST 2014
ESTIMATED CONSTRUCTION END DATE: DECEMBER 2014

SWPPP TRAINING REQUIREMENTS

THIS SWPPP WAS PREPARED BY HDR ENGINEERING PERSONNEL THAT ARE CERTIFIED IN THE DESIGN OF CONSTRUCTION SWPPPS. COPIES OF THE CERTIFICATIONS ARE ON FILE WITH HDR ENGINEERING AND ARE AVAILABLE UPON REQUEST. THE CONTRACTOR SHALL ENSURE THAT THE TRAINING REQUIREMENTS IN PART III.A.2 OF THE GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES ARE MET, AND TRAINING RECEIVED WILL BE RECORDED IN THE SWPPP BEFORE THE START OF CONSTRUCTION OR AS SOON AS PERSONNEL FOR THE PROJECT HAVE BEEN DETERMINED. THE INDIVIDUALS WHO MUST BE TRAINED INCLUDE:

- INDIVIDUAL(S) OVERSEEING THE IMPLEMENTATION OF, REVISING, AND AMENDING THE SWPPP AND INDIVIDUAL(S) PERFORMING INSPECTIONS. ONE OF THESE INDIVIDUAL(S) WILL BE AVAILABLE FOR AN ONSITE INSPECTION WITH 72 HOURS UPON REQUEST BY THE MPCA.
- INDIVIDUAL(S) PERFORMING OR SUPERVISING THE INSTALLATION, MAINTENANCE AND REPAIR OF BMPS. AT LEAST ONE INDIVIDUAL ON A PROJECT MUST BE TRAINED IN THESE JOB DUTIES.

ENVIRONMENTALLY SENSITIVE AREAS

THE MISSISSIPPI RIVER IS A MINNESOTA DNR PUBLIC WATER.

THIS PROJECT IS NOT LOCATED IN A WELLHEAD PROTECTION AREA.

THE PROJECT AREA INCLUDES WETLAND AREAS WITHIN CONSTRUCTION LIMITS AND ADJACENT AREAS. CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT WETLANDS AND AVOID ANY IMPACTS TO WETLAND AREAS, INCLUDING AREAS WITHIN CONSTRUCTION LIMITS AND ADJACENT AREAS.

SOIL TYPES

SEE THE PROJECT PLAN AND RID FOR SOIL AND SOIL BORING INFORMATION.

LAND FEATURE CHANGES

TOTAL DISTURBED AREA	0.00 ACRES

LONG TERM OPERATION AND MAINTENANCE

MNDOT IS RESPONSIBLE FOR THE LONG TERM OPERATION AND MAINTENANCE OF THE PERMANENT DRAINAGE SYSTEM WITHIN MNDOT ROW.

THE CITY OF MINNEAPOLIS SEWER DEPARTMENT WILL BE RESPONSIBLE FOR OPERATION AND MAINTENANCE OF ALL OTHER DISTURBED STORM DRAINAGE SYSTEMS NOT OPERATED BY MNDOT. THE CITY AND MNDOT HAVE DEVELOPED A MAINTENANCE AGREEMENT THAT IDENTIFIES WHICH AGENCY IS RESPONSIBLE FOR MAINTENANCE.

ENVIRONMENTAL CONTACTS AND RESPONSIBILITIES

THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP, WHICH INCLUDES THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE AND DURING CONSTRUCTION. THE CONTRACTOR SHALL PREVENT AND AVOID POLLUTION OF NATURAL RESOURCES OF AIR, LAND AND WATER IN ACCORDANCE WITH THE RULES, REGULATIONS, AND STANDARDS ADOPTED AND ESTABLISHED BY THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA), IN ACCORDANCE WITH THE SPECIAL PROVISIONS TO MNDOT STANDARD CONSTRUCTION SPECIFICATION SECTION 1717. THE CONTRACTOR SHALL REDUCE THE AREA OF DISTURBANCE TO A MINIMUM AT ALL TIMES TO REDUCE THE POTENTIAL FOR A PERMIT VIOLATION. THE CONTRACTOR IS ENCOURAGED TO MINIMIZE WORK DURATIONS OF TEMPORARY ACTIVITIES SO PERMANENT TURF ESTABLISHMENTS MAY BE PLACED AS SOON AS PRACTICABLE.

THE CONTRACTOR IS A CO-PERMITEE WITH MNDOT TO ENSURE COMPLIANCE WITH THE TERMS AND CONDITIONS OF THE GENERAL STORMWATER PERMIT (MN R100001), AND IS RESPONSIBLE FOR THOSE PORTIONS OF THE PERMIT WHERE THE OPERATOR IS REFERENCED.

THE CONTRACTOR SHALL DESIGNATE A CERTIFIED EROSION CONTROL SUPERVISOR WHO IS EITHER A RESPONSIBLE EMPLOYEE OF THE CONTRACTOR AND/OR DULY AUTHORIZED BY THE CONTRACTOR TO REPRESENT THE CONTRACTOR ON ALL MATTERS PERTAINING TO THE NPDES CONSTRUCTION STORMWATER PERMIT COMPLIANCE. THE EROSION CONTROL SUPERVISOR IS INCIDENTAL.

THE EROSION CONTROL SUPERVISOR SHALL HAVE AUTHORITY OVER ALL CONTRACTOR OPERATIONS WHICH INFLUENCE NPDES PERMIT COMPLIANCE INCLUDING GRADING, EXCAVATION, REMOVALS, TEMPORARY CONNECTIONS, UTILITY WORK, STAGING, TRAFFIC CONTROL, BACKFILLING AND COMPACTION, TEMPORARY PAVING, AND ANY OTHER OPERATIONS THAT INCREASE THE EROSION POTENTIAL ON THE PROJECT. THE EROSION CONTROL SUPERVISOR IS RESPONSIBLE FOR COORDINATING THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS AND NOTIFYING THE NECESSARY PERSONNEL FOR REPAIRS AND MAINTENANCE. THE EROSION CONTROL SUPERVISOR SHALL REPORT DIRECTLY TO THE ENVIRONMENTAL COMPLIANCE MANAGER. MEMBERS OF MNDOT'S OFFICE OF ENVIRONMENTAL SERVICES ARE ALSO AVAILABLE FOR ASSISTANCE.

THE CONTRACTOR SHALL NOT START ANY WORK UNTIL THE UPDATED SWPPP HAS BEEN APPROVED AND ACCEPTED BY THE PROJECT OVERSIGHT TEAM. THE CONTRACTOR SHALL INSTALL REQUIRED BMPS PRIOR TO BEGINNING ANY WORK.

IN THE EVENT OF AN ACCIDENTAL SEDIMENT DISCHARGE TO WATERS OF THE STATE, OR ANY DISCHARGE OF HAZARDOUS MATERIAL OF REPORTABLE QUANTITY, CONTACT THE MPCA STATE DUTY OFFICER AT 1-800-422-0798 FOR 24-HOUR EMERGENCY NOTIFICATION.

ENVIRONMENTAL CONTACT LIST

NAME	AGENCY	PERMIT	POSITION	CONTACT
JIM BRIST	MPCA	401 WATER QUALITY CERT	WATER QUALITY	651-757-2245
STATE DUTY OFFICER	MPCA	——		
TBA	MNDOT	——	CONSTRUCTION ENGINEER	
CAROLYN ADAMSON	MNDOT	——	WATER RESOURCE ENGINEER	651-234-7526
TBA	CITY OF MINNEAPOLIS	——		
TBA	MN DNR	DNR PUBLIC WATERS		
MELISSA JENNY	ARMY CORPS OF ENGINEERS	404/10		651-290-5363
TBA	UNITED STATES COAST GUARD	SECTION 9		

AMENDMENT PROCEDURES

THE EROSION AND SEDIMENT CONTROL SUPERVISOR AND SWPPP DESIGNER SHALL AMEND THE SWPPP WHENEVER THE FOLLOWING OCCUR:

- THERE IS A CHANGE IN CONSTRUCTION ACTIVITIES OR OPERATIONS THAT MAY AFFECT POLLUTANTS IN STORMWATER RUNOFF WITHIN AND DISCHARGING FROM A CONSTRUCTION SITE.
- THERE IS A VIOLATION OF THE GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY (MNR100001).
- WHEN DEEMED NECESSARY BY MNDOT.
- WHEN DEEMED NECESSARY BY THE CITY OF MINNEAPOLIS
- WHEN DEEMED NECESSARY BY THE MPCA, CORPS OF ENGINEERS, OR DNR.

THE AMENDMENTS SHALL BE STAND-ALONE DOCUMENTS THAT SHALL BE KEPT WITH THE SWPPP. THE FOLLOWING ITEMS SHALL BE INCLUDED IN EACH AMENDMENT:

- PERSON REQUESTING AMENDMENT.
- PERSON PREPARING AMENDMENT.
- REASON FOR PREPARATION OF AMENDMENT.
- SITE MAP SHOWING THE RELEVANT SITE FEATURES AND BMP LOCATIONS.
- DESCRIPTION OF THE EXISTING AND PROPOSED BMPS.

THE FOLLOWING TABLE STRUCTURE SHALL BE UTILIZED TO TRACK SWPPP AMENDMENTS PREPARED, AND WILL INCLUDE THE AMENDMENT NUMBER, DATE, BRIEF DESCRIPTION OF THE AMENDMENT, AND WHO PREPARED THE SWPPP. ALL SWPPP AMENDMENTS SHALL BE APPROVED BY MNDOT PRIOR TO STARTING CONSTRUCTION ACTIVITIES.

THE EROSION AND SEDIMENT CONTROL SUPERVISOR OR HIS/HER DESIGNEE SHALL DISTRIBUTE ALL SWPPP AMENDMENTS, VIA A DISTRIBUTION LIST, TO THE RELEVANT ONSITE SUPERINTENDENTS. THE EROSION AND SEDIMENT CONTROL SUPERVISOR OR THEIR DESIGNEE SHALL EDUCATE THE ONSITE SUPERINTENDENTS ABOUT THE CONTENT OF THE AMENDMENTS AND HOW IT MAY AFFECT THEIR WORK ZONE BEFORE CONSTRUCTION ACTIVITIES ARE PERFORMED.

AMENDMENT NO.	DATE	BRIEF DESCRIPTION OF AMENDMENT	PREPARED BY	APPROVED BY

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN AS WELL AS IN THE SPECIAL PROVISIONS, MN/DOT SPEC BOOK (2014 EDITION), OR ON FILE WITH MN/DOT.

TIMING OF BMP INSTALLATION

THE EROSION PREVENTION, SEDIMENT CONTROL AND POLLUTION MANAGEMENT BMPS SHALL BE INSTALLED AS NECESSARY TO MINIMIZE AIR, LAND AND WATER POLLUTION FROM DISTURBED SURFACES AND CAPTURE SEDIMENTS AND OTHER POLLUTION ONSITE, AND SHALL MEET THE NPDES PERMIT PART IV CONSTRUCTION ACTIVITY REQUIREMENTS. THE FOLLOWING LIST WAS TAKEN FROM THE MNDOT SPECIFICATIONS, AND MODIFIED, AND ALSO DEFINES THE TIMING OF EROSION CONTROL MEASURES IN SPECIFIC AREAS.

1. STORM SEWER AND INLET PROTECTION
   A. PRIOR TO EARTHWORK ACTIVITIES, THE CONTRACTOR SHALL CONSTRUCT STORM DRAIN INLET PROTECTION AT ALL INLETS RECEIVING CONSTRUCTION STORMWATER UNTIL THE DISTURBED AREAS THAT COULD DISCHARGE TO AN INLET HAVE BEEN STABILIZED.
   B. BEFORE RINGS AND RISERS ARE INSTALLED, INLETS SHALL BE COVERED WITH A STEEL PLATE TO PREVENT ENTRY OF SEDIMENTS. RINGS AND RISERS WILL BE INSTALLED AS ROAD COURSE LIFTS ARE INSTALLED.
2. TEMPORARY SEDIMENT TRAPS
   A. PORTABLE SEDIMENT BASINS SHALL BE PROVIDED WITH TEMPORARY OUTLET AND EMERGENCY OVERFLOW.
   B. THE DISCHARGE QUALITY SHALL BE EQUAL TO OR BETTER THAN THE RECEIVING WATER. THE USE OF FLOCCULENT SOCKS MAY BE NECESSARY.
   C. THE SEDIMENT TRAPS SHALL BE MONITORED BY THE CONTRACTOR TO ENSURE THE DEPTH OF SEDIMENT COLLECTED IN THE TRAP IS LESS THAN 50 PERCENT OF THE STORAGE VOLUME.
   D. EXCESSIVE SEDIMENT SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY.
   E. SEDIMENT TRAPS SHALL HAVE A STABILIZED EMERGENCY OVERFLOW AND CONTAIN ENERGY DISSIPATION AT THE OUTLET.
3. SUFFICIENT PERSONNEL, EQUIPMENT, MATERIALS AND INCIDENTALS SHALL BE MOBILIZED WITHIN 24 HOURS OF A WRITTEN ORDER BY A MNDOT REPRESENTATIVE TO CONDUCT CORRECTIVE WORK AND INSTALL TEMPORARY EROSION CONTROL WORK IN THE CASE OF AN EMERGENCY AS DEFINED BY THE MNDOT SPECIFICATIONS.

I HEREBY CERTIFY THAT SHEETS 17 THROUGH 19 OF THIS PLAN WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

PRINT NAME: BRETT A. VOTH LICENSE # 49045
DATE: 5-14-14 SIGNATURE: Brett Voth
DESIGNER: BRETT A. VOTH

HDR Engineering, Inc.

TITLE: STORM WATER POLLUTION PREVENTION PLAN

DES: BAV DR: BAV APPROVED:
CHK: JZB CHK: JZB

BRIDGE NO. 2440

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GENERAL SWPPP NOTES FOR CONSTRUCTION ACTIVITY

1. THE CONTRACTOR WILL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE AND THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION.

2. THE CONTRACTOR WILL PREPARE A WRITTEN, NOT ORAL, WEEKLY SCHEDULE OF PROPOSED EROSION AND SEDIMENT CONTROL ACTIVITIES FOR THE PROJECT ENGINEER'S APPROVAL AS PER MN/DOT SPEC. 1717.2D.

3. THE CONTRACTOR WILL PREPARE AND SUBMIT A SITE PLAN FOR THE PROJECT ENGINEER'S APPROVAL AS PER MN/DOT SPEC. 1717.2E FOR CONCRETE MANAGEMENT, WORK IN ENVIRONMENTALLY SENSITIVE AREAS, AND ANY WORK THAT WILL REQUIRE DEWATERING. ALL SITE PLANS MUST BE SUBMITTED TO THE PROJECT ENGINEER IN WRITING. THE CONTRACTOR SHALL ALLOW A MINIMUM OF 7 DAYS FOR MN/DOT TO REVIEW AND APPROVE SITE PLAN SUBMITTALS. THE CONTRACTOR WILL NOT BE ALLOWED TO COMMENCE WORK FOR WHICH A SITE PLAN IS REQUIRED UNTIL APPROVAL HAS BEEN GRANTED BY THE PROJECT ENGINEER. THE CONTRACTOR WILL NOT BE GIVEN ANY EXTRA TIME IN THE CONTRACT DUE TO THE UNTIMELY SUBMITTAL OF A SITE PLAN.

4. THE CONTRACTOR IS RESPONSIBLE FOR CREATING AND FOLLOWING A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. THE PLAN WILL INCLUDE HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE. SUBMIT TO THE PROJECT ENGINEER.

5. THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS SHALL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND TO CAPTURE SEDIMENT ONSITE. ALL EROSION CONTROL MEASURE SHALL BE IN PLACE PRIOR TO COMMENCEMENT OF ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITES AND SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.

6. IF SEDIMENT DEPOSITS IN A WATER OF THE STATE, THE MATERIAL MUST BE REMOVED WITHIN 7 DAYS.

7. SITE DRAINING ACTIVITIES OF TURBID OR SEDIMENT LADEN WATER WILL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS WHENEVER POSSIBLE. WATER MUST BE TREATED BEFORE DISCHARGED BACK INTO THE RECEIVING WATERS.

8. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING MAINTENANCE REQUIREMENTS:
   A. TEMPORARY SEDIMENT BASINS MUST HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME WITHIN 72 HOURS OF DISCOVERY.
   B. TRACKED SEDIMENT MUST BE REMOVED WITHIN 24 HOURS OF DISCOVERY OF TRACKING ONTO PAVED SURFACES.
   C. ALL OTHER NON-FUNCTIONAL BMPS MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WIHIN 24 HOURS OF DISCOVERY.
   D. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL BMPS UNTIL WORK HAS BEEN COMPLETED AND THE SITE HAS GONE UNDER FINAL STABILIZATION.

EROSION PREVENTION PRACTICES

ALL EROSION AND POLLUTION PREVENTION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY UPSLOPE LAND DISTURBING OR POLLUTION GENERATING ACTIVITY AND SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION OR POLLUTION GENERATION HAS BEEN ELIMINATED. LAND DISTURBING ACTIVITIES DO NOT INCLUDE INSTALLATION OF THE EROSION OR POLLUTION PREVENTION CONTROL MEASURES.

IN ACCORDANCE WITH MNDOT SPECIFICATION 1717, ALL EXPOSED SOIL AREAS MUST HAVE TEMPORARY EROSION PROTECTION OR PERMANENT COVER FOR THE EXPOSED SOIL AREAS YEAR ROUND WITHIN SEVEN (7) DAYS AFTER THE CONSTRUCTION ACTIVITY FOR THE PORTION OF THE SITE THAT HAS TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION METHODS WILL BE USED TO PROVIDE TEMPORARY COVER IN THESE AREAS, AND WILL BE IDENTIFIED BY THE CONTRACTOR. IN SOME INSTANCES THIS MAY REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING ROUGH GRADING.

BRIDGE PIER REPAIR WORK

ACCESS TO THE PIER LOCATIONS ANTICIPATED BY BARGE.

1. COFFERDAMS SHALL BE DEWATERED INTO IN-BARGE SETTLING TANKS OR DUMPSTERS.

2. IN-BARGE SETTLING TANKS SHALL BE PLACED OR CONSTRUCTED ON A BARGE. WATER FROM THE DEWATERING OF THE COFFERDAMS SHALL BE PUMPED INTO SETTLING TANKS. 2 OR MORE TANKS SHALL BE USED IN SERIES. FLOCCULANTS SHALL BE USED IN THE SECOND TANK TO INCREASE THE EFFECTIVENESS OF THE SETTLING. ONCE TREATED TO NO MORE THAN 25 NTU ABOVE RIVER BASELINE NTU'S AND 7.0 PH +/- PH (MEASURED HOURLY UNTIL DATA INDICATES NO CHANGE), WATER WILL BE DISCHARGED BACK TO RIVER. TANKS SHALL BE CLEANED OUT WHEN MORE THAN 1/3 FILLED WITH SILT. RELEASE RATE WILL BE CONTROLLED SUCH THAT SEDIMENT IS ACHIEVED. THE RELEASE RATE WILL DEPEND UPON THE TANK SIZE USED BY THE CONTRACTOR.

THIS WORK SHALL CONSIST OF PROVIDING, USING, AND MAINTAINING TEMPORARY DEWATERING DUMPSTERS DESIGNED FOR TREATING STORMWATER FROM CONSTRUCTION ACTIVITIES, AS PART OF MECHANICAL DEWATERING OPERATIONS, AND BASED ON SITE CONDITION CONSTRAINTS. THE CONTRACTOR WILL FURNISH COMMERCIALLY ENGINEERED DEWATERING DUMPSTERS TO BE KEPT OF PROJECT SITE AT ALL TIMES, FOR THE LIFE OF THE CONTRACT. THIS WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE MN/DOT STANDARD SPECIFICATIONS, THE PLAN, AND THE FOLLOWING:

THE PORTABLE SEDIMENT CONTAINMENT SYSTEM IS COMMERCIALLY AVAILABLE FROM WIMCO.
799 THEIS DRIVE, SHAKOPEE, MN 55379
952-222-3055

THIS DEVICE WILL MEASURE 8 FOOT BY 20 FOOT, SIMILAR IN FORM TO A TRASH DUMPSTER, WITH ORIFICE ATTACHMENT PORTALS FOR DEWATERING HOSES, AND SEDIMENT CLEANOUT ACCESS. THE DEVICE WILL INCLUDE A GEOTEXTILE FILTER WALL FOLLOWED BY A REPLACEABLE FILTER MEDIA IN THE FORM OF SLASH MULCH, EXCELSIOR FIBERS, OR OTHER FILTER MEDIA, DEPENDING ON POLLUTANT LOAD. THE PORTABLE SEDIMENT CONTAINMENT SYSTEM WILL BE INSTALLED IN THE FIELD FOLLOWING MANUFACTURER'S RECOMMENDATIONS AND APPROVED SITE PLANS. THE PORTABLE SEDIMENT CONTAINMENT SYSTEM WILL BE SLIGHTLY TILTED SUCH THAT THE WATER WILL FLOW OVER THE INTERNAL WEIR, AND WILL BE PLACED ON A SLASH MULCH OR FILTER AGGREGATE OVER A SUITABLE GEOTEXTILE.

FAILURE TO PERFORM

IF THE CONTRACTOR FAILS TO PROVIDE OR USE THE DEWATERING DUMPSTERS TO TREAT SEDIMENT OR OTHER POLLUTANT CONTAINING GROUND OR STORMWATER, THE CONTRACTOR SHALL SUSPEND OPERATIONS, AND RELATED OPERATIONS, IF ORDERED BY THE PROJECT ENGINEER UNTIL THE ISSUE IS RESOLVED. FAILURE TO ADEQUATELY USE OR MAINTAIN THE DEVICE, OR CEASE OPERATIONS IF ORDERED BY THE PROJECT ENGINEER WILL RESULT IN A $1000 PER CALENDAR DAY DEDUCT UNTIL CORRECTIVE ACTIONS ARE SUCCESSFUL.

EROSION AND SEDIMENT CONTROL BMPS

THE NECESSARY EROSION AND SEDIMENT CONTROL CONSTRUCTION BMPS INCLUDE, BUT ARE NOT LIMITED TO:

1. PERIMETER SEDIMENT CONTROL DEVICES
   A. SEDIMENT CONTROL DEVICES MUST BE INSTALLED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN.
   B. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE CONSTRUCTION SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE POINT OF DISCHARGE TO ANY SURFACE WATER WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER.
   C. OUTLETS INTO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION BMPS WITHIN 24 HOURS.
   D. PERIMETER CONTROL BMPS (E.G. COMPOST FILTER LOGS, SILT FENCE) SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS.
   E. DITCH CHECKS SHALL BE INSTALLED AS INDICATED AND AS SITE CONDITIONS DICTATE AND AS DIRECTED BY THE ENVIRONMENTAL MANAGER DURING ALL PHASES OF CONSTRUCTION. TEMPORARY DITCH CHECKS WILL CONSIST OF USING ROCK, SAND, OR COMPOST FILTER LOGS, BIOROLLS, OR ROCK DITCH CHECKS AND ROCK WEEPERS IN FRONT OF CULVERT INLETS.
   F. FOR SLOPE LENGTHS GREATER THAN 75 FEET WITH A GRADE OF 3:1 OR STEEPER, DIVERSION BERMS WITH SLOPE DRAINS, BIOROLLS, SILT FENCE, SEDIMENT BLANKETS OR PLASTIC/TARP SHEETING SHALL BE USED TO MINIMIZE RILL FORMATION UNTIL FINAL STABILIZATION HAS OCCURRED. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO INSTALL AND ESTABLISH PERMANENT BMPS (I.E. FINAL STABILIZATION) DURING CONSTRUCTION ACTIVITIES.

2. INLET PROTECTION
   A. INLET PROTECTION SHALL BE PROVIDED AND MAINTAINED AT ALL INLETS DURING CONSTRUCTION ACTIVITIES.

3. STOCKPILE MANAGEMENT -THE CONTRACTOR SHALL DEVELOP A WRITTEN STOCKPILE MANAGEMENT PROGRAM THAT ADDRESSES THE FOLLOWING ITEMS:
   A. ALL ACTIVE OR IN-ACTIVE PORTLAND CEMENT, CONCRETE RUBBLE, ASPHALT CONCRETE, ASPHALT RUBBLE, AGGREGATE BASE, ROADWAY SUBBASE, PRE-MIXED AGGREGATE, AND ASPHALT BINDER SHALL BE COVERED WITH PLASTIC OR COMPARABLE MATERIAL TO PREVENT WIND EROSION AND AIR POLLUTION. PERIMETER SUPER DUTY SILT FENCE WILL ALSO BE ESTABLISHED AS AN EROSION CONTROL MEASURE.
   B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STOCKPILE LOCATIONS. STOCKPILES WILL BE SHAPED TO FACILITATE STABILIZATION AND MINIMIZE EROSION. PLACE STOCKPILES NO CLOSER THAN 25 FEET FROM ANY DRIVEWAY OR CATCH BASIN. SUPER DUTY SILT FENCE SHALL BE INSTALLED AROUND THE PERIMETER OF ALL STOCKPILE AREAS.
   C. ALL SOIL STOCKPILES THAT REMAIN IN PLACE FOR 7 DAYS OR MORE WILL BE STABILIZED PER MNDOT SPECIFICATION 2575.3 RAPID STABILIZATION METHOD 3.
   D. AGGREGATE STOCKPILES WILL BE STABILIZED.
   E. IF RAPID STABILIZATION METHOD 3 CANNOT BE USED, THEN THE STOCKPILE SHALL BE COVERED WITH TARPS OR PLASTIC SHEETING AND WEIGHTED TO PREVENT DISPLACEMENT.
   F. IF TEMPORARY STOCKPILES ARE NECESSARY, CONTRACTOR SHALL ESTABLISH EROSION CONTROL MEASURES IN COMPLIANCE WITH NPDES AND SWPPP REQUIREMENTS. THE COST ASSOCIATED WITH POTENTIAL TEMPORARY STOCKPILE EROSION PREVENTION MEASURES, INCLUDING MATERIAL, LABOR, AND EQUIPMENT, SHALL BE CONSIDERED INCIDENTAL.
   G. PROTECTION OF STOCKPILES IS REQUIRED THROUGHOUT CONSTRUCTION. REPAIR AND/OR REPLACE PERIMETER CONTROLS AND COVERS AS NEEDED TO KEEP THEM FUNCTIONING PROPERLY.

5. CONSTRUCTION ENTRANCES AND EXIT WASHOFF STATIONS
   A. TEMPORARY ROCK CONSTRUCTION ENTRANCES AND EXIT WASHOFF STATIONS WILL BE FURNISHED, CONSTRUCTED AND MAINTAINED PRIOR TO BEGINNING EXCAVATION. CONSTRUCTION ENTRANCE(S) SHALL BE CONSTRUCTED ACCORDING TO MNDOT 2573 AND TO MNDOT STANDARD PLANS. WASHOFF STATIONS SHALL BE CONSTRUCTED ACCORDING TO THE TEMPORARY EROSION CONTROL DETAILS INCLUDED IN THE CONSTRUCTION PLANS. WHERE TEMPORARY ROCK ENTRANCE OR SILT FENCE BARRIER ARE NOT SUITABLE, THE CONTRACTOR SHALL ELIMINATE VEHICLE TRACKING OF SOIL BY USING ALTERNATIVE METHODS.
   B. THE CONSTRUCTION ENTRANCE PADS SHALL BE AT LEAST 50 FEET LONG.
   C. GEOTEXTILE FABRIC WILL BE PLACED UNDER THE CONSTRUCTION ENTRANCE PAD TO PREVENT MIGRATION OF MUD FROM THE UNDERLYING SOIL INTO THE CONSTRUCTION ENTRANCE PAD MATERIAL.
   D. ROCK PADS SHALL BE CONSTRUCTED OF ROCK 1 TO 3 INCHES IN SIZE AND PLACED IN 6 INCH LAYERS.
   E. CONSTRUCTION ENTRANCES SHALL BE MAINTAINED DAILY.
   F. IF TRACKING ONTO ROADWAYS BECOMES PROBLEMATIC THE ENTRANCE PADS WILL BE LENGTHENED OR ANOTHER MORE EFFECTIVE TECHNIQUE IMPLEMENTED.
   G. THE EROSION CONTROL SUPERVISOR SHALL MONITOR THE CONSTRUCTION ENTRANCES CLOSELY DURING WET CONDITIONS. IF TRACKING ONTO ADJACENT ROADWAYS OCCURS, THE FREQUENCY OF STREET SWEEPING MAY BE INCREASED. STREET SWEEPING SHALL BE INCREASED BASED ON WORK AND WEATHER CONDITIONS.

6. CONCRETE SLURRY, TRUCK AND MIXER WASHOUT
   A. A DESIGNATED WASHOUT AREA SHALL BE PROVIDED AT THE CONSTRUCTION SITE AND SHALL BE CLEARLY MARKED.
   B. THE WASHOUT SHALL BE CONSTRUCTED AND MAINTAINED TO PROVIDE SUFFICIENT IMPERVIOUS CONTAINMENT FOR ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.
   C. FOR EQUIPMENT THAT DOES NOT HAVE SELF-CONTAINED WASHOUT WATER STORAGE, CONCRETE WASHOUTS OF CONCRETE TRUCKS, CHUTES, PUMPS, MIXING PLANTS AND OTHER CONCRETE HANDLING EQUIPMENT SHALL BE WASHED OUT INTO A LEAK-PROOF CONTAINMENT FACILITY OF IMPERMEABLE LINER.
   D. THE WASHOUT SHALL BE LOCATED 25 FEET OR GREATER FROM DRAINAGE FACILITIES AND WATERCOURSES.
   E. THE LOCATIONS OF WASHOUT FACILITIES ARE ANTICIPATED TO VARY DEPENDING ON CONSTRUCTION ACTIVITIES AND PROGRESS, BUT ALL WASHOUT LOCATIONS WILL HAVE APPROPRIATE SIGNAGE.
   F. PROCESS WASTEWATER FROM GRINDING OR GROOVING OF CONCRETE SHALL BE COLLECTED AND TREATED AS CONCRETE WASH WATER AND PROPERLY DISPOSED. REFER TO THE PROJECT SWPPP DOCUMENT FOR MNDOT'S ACCEPTABLE DISPOSAL PROCEDURES OF CONCRETE WASHOUT.
   G. CONCRETE WASHOUT FACILITIES WILL BE PERIODICALLY INSPECTED AND EMPTIED/REMOVED FROM THE SITE WHEN REMAINING CAPACITY TO PREVENT OVERFLOWS.
   H. PLASTIC STRUCTURAL CONCRETE MAY BE PLACED ON ROADWAY SUBGRADE OR ON IMPERMEABLE LINER, ALLOWED TO HARDEN, AND RECYCLED OR REMOVED AS SOLID WASTE.
   I. THE SWPPP WILL BE AMENDED AS NEEDED FOR CONCRETE OPERATIONS AS THEY OCCUR.

7. VEHICLE MAINTENANCE
   A. ROUTINE MAINTENANCE OF VEHICLES SHALL OCCUR IN STAGING AREAS LOCATED OFFSITE ONLY. NO ON-SITE VEHICLE MAINTENANCE IS ALLOWED, UNLESS IN AN ENGINEER-APPROVED SYSTEM.
   B. VEHICLE WASHING SHALL BE AVOIDED. IF WASHING IS NECESSARY, RUNOFF FROM THE WASHING SHALL BE CONTAINED IN A LINED SEDIMENT TRAP AND THE WASH WATER SHALL BE PROPERLY DISPOSED OF AT A TREATMENT FACILITY.
   C. ENGINE DEGREASING SHALL ALSO BE CONTAINED IN A LINED SEDIMENT TRAP AND PROPERLY DISPOSED OF AT A TREATMENT FACILITY.

8. FUELING
   A. FUEL TRUCKS WILL BE USED PRIMARILY FOR REFUELING IN THIS AREA. STORAGE TANKS IN EXCESS OF 1,000 GALLONS WILL NOT USED. CONTAINMENT WILL BE ESTABLISHED IF STORAGE TANK IS USED.
   B. ABSORBENT MATERIALS SHALL BE AVAILABLE IN THE FUEL TRUCK FOR USE IN CLEANING UP SMALL SPILLS.
   C. EDUCATION ON SPILL RESPONSE PROCEDURES SHALL BE PROVIDED BY THE CONTRACTOR.

9. HAZARDOUS MATERIALS
   A. STORAGE OF HAZARDOUS MATERIAL SHALL NOT OCCUR IN THE CONSTRUCTION AREA.

10. CHEMICAL CONTAINMENT
   A. WHEN CHEMICALS ARE NOT NEEDED, THEY SHALL BE STORED AT STAGING AREAS.
   B. GASOLINE, OIL, PAINT, SOLVENTS, AND OTHER CHEMICALS NECESSARY FOR CONSTRUCTION ARE NOT ALLOWED TO CONTACT THE GROUND SURFACE, BE EXPOSED TO GROUNDWATER OR RELEASED TO A SURFACE OR GROUNDWATER.
   C. HAZARDOUS MATERIAL SHALL BE RETURNED TO THE HAZARDOUS MATERIAL STORAGE AREA AND LOCKED AT THE END OF EACH DAY.
   D. TEMPORARY SANITARY FACILITIES SHALL BE LOCATED AT LEAST 25 FEET FROM DRAINAGE INLETS AND 200 FEET UPGRADE FROM STREAMS AND WETLANDS. FACILITIES SHALL BE LOCATED ON STABLE, LEVEL GROUND TO AVOID TIPPING.
   E. THE CONTRACTOR SHALL PROVIDE TANKS OR BARRELS TO COLLECT LIQUID BYPRODUCTS THAT POSE A POLLUTION HAZARD.
   F. THE POLLUTANTS SHALL BE REMOVED FROM THE SITE ON, AT MOST, A WEEKLY BASIS AND DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS.
   G. ALL STATIONARY EQUIPMENT (NON-VEHICLE) WITH THE POTENTIAL TO LEAK FLUIDS OR DUE TO REFUELING OPERATIONS SHALL HAVE SECONDARY CONTAINMENT THAT PREVENTS THE DISCHARGE OF FLUIDS TO GROUND OR SURFACE WATERS.
   H. CHEMICAL SPILLS OF ANY KIND (OIL, FUEL, FERTILIZER, ETC.) MUST BE CLEANED UP AND REMOVED FROM THE SITE IMMEDIATELY. IF DRIPS AND LEAKS ARE DISCOVERED, THE SOILS MUST BE MANAGED BY THE CONTRACTOR ACCORDING TO MPCA RULES. SPILLS EQUAL TO OR GREATER THAN 5 GALLONS MUST BE REPORTED TO THE STATE DUTY OFFICER.

11. SOLID WASTE (INCLUDES TRASH)
   A. SOLID WASTE SHALL BE COLLECTED AND STORED IN APPROPRIATE CONTAINERS AND PROPERLY DISPOSED OF ON A REGULAR BASIS.
   B. CONTAINERS SHALL BE COVERED TO PREVENT WIND FROM BLOWING THE WASTE AROUND OR OFF THE SITE.
   C. NO MATERIALS SHALL BE BURIED OR BURNED ON SITE.
   D. MPCA DISPOSAL REQUIREMENTS WILL BE FOLLOWED FOR ALL SOLID WASTE.

12. DUST CONTROL
   A. THE CONTRACTOR SHALL USE A VARIETY OF DUST CONTROL METHODS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
      I. RAPID STABILIZATION METHOD 3 (MNDOT SPECIFICATION 2575.3) ON IN-ACTIVE SOIL STOCKPILES.
      II. THE CONTRACTOR SHALL PRE-WATER AND SWEEP HAUL ROADS TO MINIMIZE DUST.
      III. STREET SWEEPING UTILIZING A PICK-UP TYPE SWEEPER SHALL BE USED AS REQUIRED TO KEEP SEDIMENTS OFF OF PAVED HAUL ROADS WITHIN THE CONSTRUCTION SITE AND PAVED PUBLIC HAUL ROUTES OUTSIDE OF THE CONSTRUCTION SITE.
      IV. WATER SPRAYING WITH POLYVINYL ACETATE ADDITIVE ON ROADWAY GRADED AREAS.
      V. ALTERNATIVES TO POLYVINYL ACETATE IN THE FORM OF VEGETABLE POLYMERS, PETROLEUM EMULSION RESINS, OR ACRYLIC COPOLYMERS MAY ALSO BE USED. CALCIUM CHLORIDE WILL NOT BE ALLOWED.

HDR Engineering, Inc.	CERTIFIED BY Brett Voth (LICENSED PROFESSIONAL ENGINEER) 5-14-14 (DATE) NAME: BRETT A. VOTH LIC. NO. 49045	TITLE: STORM WATER POLLUTION PREVENTION PLAN	DES: BAV CHK: JZB	DR: BAV CHK: JZB	APPROVED:
			SHEET NO. 18 OF 19 SHEETS		BRIDGE NO. 2440

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ADDITIONAL BMPS FOR SPECIAL AND IMPAIRED WATERS, AND DUE TO SITE SOIL AND WATER CONTAMINATION

THESE REQUIREMENTS SHALL APPLY TO ALL PROJECT AREAS:

1. DURING CONSTRUCTION
   A. ALL EXPOSED SOIL AREAS WILL BE STABILIZED AS SOON AS POSSIBLE, BUT NO LATER THAN SEVEN (7) DAYS AFTER THE CONSTRUCTION ACTIVITY FOR THE PORTION OF THE SITE THAT HAS TEMPORARILY OR PERMANENTLY CEASED.

SPILL CONTAINMENT PLAN

1. EMERGENCY SPILL RESPONSE
   A. EMERGENCY PROCEDURES FOR RESPONDING TO THE RELEASE OR SPILL OF HAZARDOUS SUBSTANCES ARE ADDRESSED BY THE SITE-WIDE SPILL CONTAINMENT PLAN (SCP). ALL PERSONNEL SHALL BE INSTRUCTED AT THE TIME OF SITE-SPECIFIC ORIENTATION CONCERNING THESE SAFETY PROCEDURES, AS WELL AS AT DAILY BRIEFINGS AND WEEKLY SAFETY MEETINGS.
   B. THE PROCEDURES FOR RESPONDING TO A MINOR OR MAJOR SPILL ARE OUTLINED IN THE SPILL RESPONSE PLAN IN THE SCP. PROCEDURES FOR A MINOR SPILL INCLUDE, BUT ARE NOT LIMITED TO, ELIMINATING POTENTIAL SPARK SOURCES, NOTIFYING THE CONTRACTOR EM, CONTAINING THE SPILL WITH RESPONSE MATERIALS AND EQUIPMENT, AND CONTAINERIZING SOIL IN CONTACT WITH THE SPILLED MATERIAL OR STOCKPILING SOIL ON AND COVERING WITH 10-MIL PLASTIC. PROCEDURES FOR A MAJOR SPILL INCLUDE, BUT ARE NOT LIMITED TO, ELIMINATING POTENTIAL SPARK SOURCES, STOPPING WORK IN THE IMMEDIATE AREA AND PREPARING WORKERS TO EVACUATE THE SPILL SITE VIA DESIGNATED EXIT ROUTES AT THE DIRECTION OF THE CONTRACTOR EM. THE CONTRACTOR EM WILL NOTIFY AGENCIES LISTED ON THE EMERGENCY CONTACT LIST, THE MNDOT ECM, AND THE STATE DUTY OFFICER. THE EMERGENCY RESPONSE CONTRACTOR WILL APPROPRIATELY CONTAINERIZE FREE LIQUIDS FOR DISPOSAL, AND CONTAMINATED SOIL WILL BE STORED IN LINED ROLL-OFF CONTAINERS OR STOCKPILED ON AND COVERED WITH 10-MIL PLASTIC. AFTER THE INCIDENT, THE CONTRACTOR EM AND MNDOT ECM WILL REVIEW THE RESPONSE AND AMEND THE PROJECT SPILL CONTAINMENT PLAN IF NEEDED. A RECORD INCLUDING A DESCRIPTION OF THE SPILL, CAUSE, AND CLEANUP MEASURES TAKEN WILL BE SUBMITTED TO MNDOT.
   C. IN THE EVENT OF AN ACCIDENTAL SPILL OR RELEASE OF HAZARDOUS MATERIALS, ON-SITE PERSONNEL SHALL CONTAIN THE MATERIAL TO THE GREATEST EXTENT POSSIBLE. THESE PERSONNEL SHALL BE EQUIPPED WITH THE APPROPRIATE LEVELS OF PROTECTIVE CLOTHING AS DESCRIBED IN THE CONTRACTOR'S SITE HEALTH AND SAFETY PLAN. MNDOT AND THE EM SHALL BE NOTIFIED IMMEDIATELY WHEN ANY SPILL OCCURS.
   D. CONTAINMENT SHALL INCLUDE THE USE OF SORBENT PADS AND/OR BOOMS, DIKING WITH SOIL, COVERING AND/OR DIVERTING SPILLS FROM SEWERS, DRAINS, SURFACE WATER BODIES, ETC. FOR SPILLS THAT CANNOT BE CONTAINED BY ON-SITE PERSONNEL THE CONTRACTOR EM SHALL SECURE THE AREA AND NOTIFY THE FIRE DEPARTMENT, STATE DUTY OFFICER, AND MNDOT PM AND ECM IMMEDIATELY.

2. OIL/PETROLEUM LEAKS
   A. AN EMERGENCY SPILL KIT MUST BE ON SITE AT ALL TIMES AND BE READILY ACCESSIBLE. ALL WORK MUST BE STOPPED AT ANY TIME IN THE VICINITY OF A LARGE SPILL OR LEAK SO AS TO CONTAIN ANY LEAKS OR SHEENS.

INSPECTIONS AND MAINTENANCE

PERIODIC INSPECTIONS OF THE TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE CONDUCTED AT LEAST ONCE EVERY SEVEN (7) DAYS AND WITHIN 24 HOURS OF RAINFALL EVENTS THAT PRODUCE MORE THAN 1/2 INCH OF RAIN IN A 24-HOUR PERIOD. RECORDS SHALL BE KEPT IN THE PROJECT OFFICE FOR EACH INSPECTION AND MAINTENANCE ACTIVITY AND WILL CONTAIN THE FOLLOWING INFORMATION:

- DATE AND TIME OF INSPECTION
- NAME OF PERSON(S) CONDUCTING INSPECTION
- FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTION
- CORRECTIVE ACTIONS TAKEN (INCLUDING DATES, TIME, AND PERSON(S) COMPLETING MAINTENANCE ACTIVITIES)
- DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 1/2-INCH IN A 24-HOUR PERIOD
- DOCUMENT CHANGES TO SWPPP

AFTER VEGETATION IS 70% ESTABLISHED, THE RATE OF INSPECTIONS OF THE STABILIZED AREAS MAY BE REDUCED TO ONCE EVERY MONTH. OVER WINTER THE RATE OF INSPECTIONS IS EVERY 2 WEEKS IF WORK IS STOPPED.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND MAINTAIN SILT FENCES AND OTHER TEMPORARY EROSION AND SEDIMENT CONTROLS IN WORKING ORDER THROUGHOUT THE PROJECT AND MAKE REPAIRS AS NEEDED. MAINTENANCE SHALL INCLUDE THE FOLLOWING:

- EXCESS SEDIMENT BEHIND PERIMETER CONTROLS WILL BE REMOVED AND PROPERLY DISPOSED OF WHEN SEDIMENTS REACH 1/3 THE HEIGHT OF STRUCTURE, OR WHEN NPDES OR SAFETY INSPECTION HISTORY REQUIRES MORE FREQUENT REMOVAL.
- INLET PROTECTION DEVICES SHOULD BE REPAIRED WHEN THEY BECOME NON-FUNCTIONAL OR SEDIMENT REACHES 1/3 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
- TEMPORARY SEDIMENT BASINS MUST HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME AND WITHIN 72 HOURS OF DISCOVERY, AND AT THE END OF THE PROJECT.
- TRACKED SEDIMENTS SHALL BE REMOVED FROM PAVED SURFACES AT THE END OF EACH DAY, OR AS OFTEN AS NECESSARY TO MAINTAIN SAFE AND EFFECTIVE ROAD SURFACES, USING A PICK-UP TYPE SWEEPER. NO CONCRETE SLURRY WILL BE ALLOWED TO ENTER OPEN PUBLIC ROADWAYS.
- CONSTRUCTION ENTRANCES SHALL BE MAINTAINED DAILY.
- REPLACEMENT OF BMPS THAT ARE NOT FUNCTIONING.
- EXPOSED SOIL COVERS SHALL BE MAINTAINED OR SUPPLEMENTED TO REMAIN EFFECTIVE UNTIL THE TURF OVER THE EXPOSED SOIL IS FULLY ESTABLISHED

ALL REMAINING TEMPORARY BMPS AND ACCUMULATED SEDIMENTS WILL BE CLEANED OUT AND REMOVED UPON COMPLETION OF THE PROJECT.

IF SEDIMENT OR A CHEMICAL DEPOSITS IN A WATER OF THE STATE, THE SWPPP MUST BE IMMEDIATELY AMENDED TO ADDRESS THE PROCESS OF RECOVERY AND RESTORATION. THE MATERIAL MUST BE SCHEDULED FOR REMOVAL WITHIN 7 DAYS OF DISCOVERY AS PER NPDES PERMIT FOR ACCESS ISSUES, WITH CONTINUOUS PROGRESS UNTIL COMPLETION. THE SWPPP MUST BE AMENDED TO PREVENT ANY FURTHER LOSS OF SEDIMENT OR CHEMICAL.

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL BMPS UNTIL THE WORK HAS BEEN COMPLETED, THE SITE HAS UNDERGONE FINAL STABILIZATION, AND THE NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA. SEE APPENDIX H OF THE SWPPP DOCUMENT FOR THE SAMPLE INSPECTION FORM PROVIDED BY THE MPCA, AND APPENDIX I FOR THE NOT FORM THAT NEEDS TO BE SUBMITTED ONCE THE PROJECT HAS UNDERGONE FINAL STABILIZATION.

FINAL STABILIZATION

FOR AREAS THAT WILL NOT BE PAVED, FINAL STABILIZATION SHALL BE IMPLEMENTED AS SHOWN ON THE TURF ESTABLISHMENT PLANS INCLUDED IN THE PROJECT PLANS. FINAL STABILIZATION GENERALLY INCLUDES PERMANENT SEEDING WITH MULCH AND/OR EROSION CONTROL BLANKETS AND ENERGY DISSIPATION DEVICES. FINAL STABILIZATION OF THE CONSTRUCTION SITE WILL BE ACHIEVED ONCE ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM VEGETATIVE COVER WITH A DENSITY OF 70% OF THE NATIVE BACKGROUND COVER IS ACHIEVED AND ALL TEMPORARY BMPS HAVE BEEN REMOVED.

RECORDS RETENTION

THE SWPPP AND ALL AMENDMENTS SHALL BE KEPT ON THE CONSTRUCTION SITE DURING CONSTRUCTION ACTIVITIES. THE SWPPP SHALL BE LOCATED IN THE FIELD OFFICE AND ALL RELEVANT CONTRACTOR SUPERINTENDENTS SHALL HAVE A COPY OF THE SWPPP DOCUMENTS THAT ARE RELATED TO THEIR AREAS OF RESPONSIBILITIES.

ALL TRAINING DOCUMENTATION OF PROJECT SWPPP TEAM MEMBERS SHALL BE RETAINED WITH THE SWPPP DURING THE PROJECT.

ALL SWPPP INSPECTIONS AND SWPPP MAINTENANCE ACTIVITIES CONDUCTED DURING CONSTRUCTION ACTIVITIES SHALL BE RECORDED IN WRITING AND THESE RECORDS SHALL BE RETAINED WITH THE SWPPP DURING THE PROJECT.

ALL PERMANENT OPERATION AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING RIGHT-OF-WAY AGREEMENTS, CONTRACTS, COVENANTS, AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE, SHALL BE AVAILABLE FROM MNDOT.

ALL CALCULATIONS FOR THE DESIGN OF TEMPORARY AND PERMANENT STORMWATER MEASURES SHALL BE AVAILABLE IN THE PROJECT OFFICE.

SHEET 3 OF 3

HDR Engineering, Inc.	CERTIFIED BY Brett Voth (LICENSED PROFESSIONAL ENGINEER) 5-14-14 (DATE) NAME: BRETT A. VOTH LIC. NO. 49045	TITLE: STORM WATER POLLUTION PREVENTION PLAN	DES: BAV CHK: JZB	DR: BAV CHK: JZB	APPROVED:	BRIDGE NO. 2440
			SHEET NO. 19 OF 19 SHEETS			

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