STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

Inspection Report for B-47-040

USH 10 over ST CROIX RIVER 01

Apr 09,2018

Type	Prior	Frequency (mos)	Performed
Routine	04-13-17	24	X
Damage	08-15-10		
Fracture Critical	04-13-17	24	X
Interim	06-23-09	0	
Movable	04-13-17	24	X
Uw-Dive	10-26-17	48	
Reach All	04-13-17	12	X
SIA Review	04-26-16	48	
Uw-Profile	10-26-17	24	

	Start Coordinates	End Coordinates (optional)
Latitude	44°44'57.33"N	
Longitude	92°48'11.93"W	

Owner	STATE HIGHWAY DEPT	Maintainer	STATE HIGHWAY DEPT

Time Log

Hours	Minutes
9	0

Team members

	Name	Number	Signature	Date
Inspector	Haig, Gregory	5014	Gregory Haig E-signed by Gregory H Haig(dotghh)	04-30-18

BRIDGE INSPECTION REPORT
Wisconsin Department of Transportation
DT2007 2003 s.84.17 Wis. Stats.

Identification & Location

Feature On: USH 10	Section Town Range: S09 T26N R20W	Structure Number: **B-47-040**
Feature Under: ST CROIX RIVER 01	County: PIERCE	
Location: MINNESOTA STATE LINE	Municipality: PRESCOTT	Structure Name:

Geometry

measurements in feet, except where noted

Approach Roadway Width: 54	Bridge Roadway Width: 54.0	Total Length: 682.7
Approach Pavement Width: 54	Deck Width: 66.0	Deck Area (sq ft): 45058

Traffic

	Lanes	ADT	ADT year	Traffic Pattern
On	4	13900	2012	TWO WAY TRAFFIC

Capacity

Load Rating

Inventory rating: HS21	Overburden depth (in): 0.0	Last rating date:	Controlling:
Operating rating: HS30	Deck surface material: CONCRETE	Re-rate for capacity (Y/N):	Control location:
Posting: MAX PERMIT WEIGHT 350K	Re-rate notes:		

Hydraulic

Classification

Scour Critical Code(113): (8) STABLE-ABOVE TOP FOOTING	Q100 (ft3/sec): 55000	
High water elevation (ft): 691.0	Velocity (ft/sec): 6.0	Sufficiency #: 61.7

Span(s)

Span #	Material	Configuration	Depth (in)	Length (ft)	Main
1	STEEL	DECK GIRDER		115.0	
2	STEEL	DECK GIRDER		133.5	
3	STEEL	BASCULE		205.5	Y
4	STEEL	DECK GIRDER		116.5	
5	STEEL	DECK GIRDER		108.0	

Expansion joint(s)

Temperature:

File:	New:

Clearance

Item	File Measurement (ft)	File Date	New Measurement (ft)
Highway Min Vertical On Cardinal			
Horizontal On Cardinal			

Special Components

Component	Year	Work Performed	Note
CONC. PROTECTIVE TREATMENT - TK-590-1 MS			APPLIED IN 2014 MAINTENANCE PROJECT

Construction History

Year	Work Performed	FOS id
9999	NOT BUILT	1530-01-75
9999	NOT BUILT	
1991	SEAL CONCRETE	
1990	NEW STRUCTURE	1530-00-71

Maintenance Items History

Item	Recommended by	Status	Status change	Year completed
Deck - Seal w/ Concrete Sealer		COMPLETE		2014
UPLOADED ON 4/28/2015 FROM EXCEL SHEET COMPILED BY ALLAN JOHNSON. SEE SPECIAL COMPONENT TAB FOR SPECIFIC PRODUCT				

Maintenance Items

Item	Priority	Recommended by	Status	Status change
Misc - Paint Spot / Complete	MEDIUM	Haig, Gregory (5014)	IDENTIFIED	06/02/15
Ends of Span 3 girders and surrounding areas will need paint soon.				
Superstructure - Other Work		Haig, Gregory (5014)	DEFERRED	04/30/18
Clean, paint and protect the southwest corner rear lock				

Elements

Chk	Element	Defect	Description	UOM	Total	Quantity in Condition State 1	2	3	4
X	**12**		**Reinforced Concrete Deck-Coated Reinforcing**	SF	45,079	39,779	5,000	300	0
		1130	Cracking (RC)	SF		0	5,000	300	0
			Underside - numerous hairline (about every 4 ft) transverse cracks with light/medium efflorescence leaching. Cracks are located throughout the entire underside of the bridge. Bay 3 between girders 4 and 5 in span 3 has numerous cracks with rust staining. Rust is leaching through on top of girder 4 in span 3. The soffit on the outside north edge along the sidewalk has numerous vertical cracks at rail posts with rust staining.						
	8000		Wearing Surface (Bare)	SF	45,079	43,078	2,000	1	0
		3210	Debonding/Spall/Patched Area/Pothole	SF		0	0	1	0
			Small spall (6 in. x 6 in.) near finger joint on Wisconsin side located in the center of the left east bound lane.						
		3220	Crack (Wearing Surface)	SF		0	2,000	0	0
			Map cracking throughout spans 1, 2, 4, 5.						
X	**28**		**Steel Deck With Open Grid**	SF	1,001	100	901	0	0
			Span 3						
		1000	Corrosion	SF		0	450	0	0
			Surface corrosion throughout.						
		1020	Connection	SF		0	451	0	0
			2008 some of the welds in steel grates have broken loose. During 2009 inspection Pierce Co Hwy Dept welded broken areas of steel grates. Slight mis-alignment (0.25IN) of center span locks has caused minor wear due to rubbing. 2 areas in each direction are "clicking" as traffic drives over. Could not pin down exact location. broken riveted areas were repaired in 2016 by welding.						
	8518		Galvanization	SF	10,000	10,000	0	0	0
X	**29**		**Steel Deck With Concrete Filled Grid**	SF	1,500	0	1,500	0	0
		1000	Corrosion	SF		0	1,500	0	0
			Rust staining throughout. The bottom side of the sidewalk in the bascule span has heavy rust staining throughout.						
	8513		Thin Polymer Overlay	SF	1,500	1,437	63	0	0
		8911	Abrasion, Wear, or Rutting (Wear. Surf.)	SF		0	63	0	0
			Grid is filled on the outside edges of the bascule span. Polymer overlay was placed over the area in 2007. The polymer at the ends of the span is beginning to "peel up"						

X	**107**		**Steel Open Girder**	LF	4,198	4,135	63	0	0
		1000	Corrosion	LF		0	63	0	0
			Small amounts of freckle rust is present in all spans.						
	8516		Painted Steel	SF	5,060	4,060	500	500	0
		3440	Effectiveness (Steel Protective Coatings)	SF		0	500	500	0
			There are small area of freckle rust throughout the entire structure. Approximately 50% of the paint on the bridge is beginning to chalk. Chalking is most prevalent on the south facia girders in which a majority of the paint is in poor condition. Further more several area of the paint on the south facia side is peeling off exposing the undercoating.						
X	**113**		**Steel Stringer**	LF	3,999	2,999	1,000	0	0
		1000	Corrosion	LF		0	1,000	0	0
			Some paint is peeling off in different areas and surface rust starting to form. Stringer in span 4, betweem floor beams 2 and 3 has a 2 foot cut on bottom flange. Approximately 25% of the stringers have some distress in the paint.						
X	**152**		**Steel Floor Beam**	LF	652	601	51	0	0
		1000	Corrosion	LF		0	51	0	0
			The bascule span had approximately 3 ft. of exposed steel that is actively rusting in each floor beam.						
X	**210**		**Reinforced Concrete Pier Wall**	LF	215	161	50	4	0
			The concrete surfaces at Piers 1 through 4 were typically smooth, sound, and in good condition. Piers 2 east face and pier 3 west face have treated timbers bolted to them.						
		1130	Cracking (RC)	LF		78	50	4	0
			See attached sketches for cracks and locations.						
X	**215**		**Reinforced Concrete Abutment**	LF	130	124	6	0	0
		1130	Cracking (RC)	LF		0	6	0	0
			East abutment backwall has a couple hairline/medium horizontal/vertical cracks. Joints are leaking badly on to abutment footing causing staining. OLD NOTE: West abutment is moving East about 2", Dead men were place behind west abutment and abutment seems to have stablize. 2016- bearings appear to be about 4 in. off center at 50 degrees f. It appears to be the same as previous inspections.						
X	**220**		**Reinforced Concrete Pile Cap/Footing**	LF	4	4	0	0	0
			Vertical footing and seal exposure at Piers 1 through 4. Voids are present only in the seal and do not affect structural capacity. (Dive inspection note) Can't be observed from above the waterline.						
X	**300**		**Strip Seal Expansion Joint**	LF	130	67	13	20	30
			West joint replaced in 2007.						
		2310	Leakage, Seal Adhesion, Damage,Cracking	LF		0	13	20	30
			Dirty - Minor leaking in East joint. Majority of the east joint has failed and is leaking badly. Approximately 1 foot of the west strip seal is torn (near the southeast corner).						
X	**311**		**Moveable Bearing**	EA	32	0	32	0	0
			At both abutments and piers 2 and 3.						
		1000	Corrosion	EA		0	32	0	0
			Light rust on all w/ some medium on ends.						

X	**313**		**Fixed Bearing**	EA	16	0	16	0	0
			At piers 1 and 4.						
		1000	Corrosion	EA		0	16	0	0
			Light rusting on all. Minor rusting at SW corner on bascule leaf.						
X	**330**		**Metal Bridge Rail**	LF	166	83	83	0	0
		1000	Corrosion	LF		0	83	0	0
			Approximately 50% has minor corrosion majority of which is next to the flow line						
	8516		Painted Steel	SF	1,062	531	531	0	0
		3440	Effectiveness (Steel Protective Coatings)	SF		0	531	0	0
			Approximately 50% has minor corrosion majority of which is next to the flow line. Southern parapet paint is flaking off and chalking throughout.						
X	**331**		**Reinforced Concrete Bridge Rail**	LF	1,538	207	1,327	4	0
		1080	Delamination - Spall - Patched Area	LF		0	0	4	0
			Minor spall at the southeast corner of bridge (from impact?)						
		1130	Cracking (RC)	LF		0	177	0	0
			Many hairline vertical cracks thru-out.						
		1190	Abrasion-Wear (PSC-RC)	LF		0	1,150	0	0
			Approx 75% surface scaling. Some rubbing along the pier 4 where the railing changes from steel to concrete. Rubbing was caused by the twisting of the bascule span which has since been remedied.						
X	**8400**		**Integral Wingwall**	EA	4	4	0	0	0

Assessments

Chk	Element	Defect	Description	UOM	Total	Quantity in Condition State 1	2	3	4
X	**9001**		**Drainage - Ends of Structure**	EA	3	3	0	0	0
			Curb & Gutter w/ inlet - NE, SE, & NW. Asp/gravel shldr at SW.						
X	**9009**		**Sidewalk**	EA	2	2	0	0	0
			North side of bridge and Southeast area. Many hairline transverse cracks. Stay in place forms under sidewalk are starting to rust.						
X	**9020**		**Movable Bridge - Counterweight**	EA	2	0	0	2	0
			Large spalls in both counter weights (see sketches). No significant changes in 2016.						
X	**9045**		**Slope Protection- Riprap**	EA	2	1	1	0	0
			Eastside is grouted. A bike trail has been placed under the west end of bridge. There is minor settlement and erosion just above the retaining wall that was built for the bike trail.						
X	**9167**		**Steel Diaphragm**	EA	173	120	53	0	0
			Very minor freckle rust on approximately 1/3 of the diaphragms.						
X	**9290**		**Dolphin or Fender System**	EA	4	4	0	0	0
X	**9322**		**Approach Roadway - Concrete (non-structural)**	EA	1	0	1	0	0
			At east end of bridge only. Settled. Asp patches at longitudinal and transverse joints.						

X	9323		**Approach Roadway - Asphalt** At west side of bridge only.	EA	1	1	0	0	0
X	9335		**Decorative Rail** **Railing at the NE corner struck by vehicle**	EA	2	1	0	1	0

NBI Ratings

	File	New
Deck	6	6
Superstructure	7	7
Substructure	7	7
Culvert	N	N
Channel	8	8
Waterway	8	8

Structure Specific Notes

NBI rating is a 6 for substructure because of the movement of the West abutment which seems to be stable now.
Oil Airs gave the structure and hydrolic systems a tune up the fall of 1998 - Ed says still not working correctly.
Welded 1/16 inch shims on the male to female mating mechenism in 1999
Extended 1 1/2 inch pump pipe on outside of pier wall in 2001 to the to keep pier wall from staining.

**On 8-15-2010 while in computer mode the lift bridges locking system engaged before lift bridge was completely down bending both steel locking beams on Minnesota side (NW-SW corners) . On the Wisconsin side (SE and NE corners) the steel locking beams were only scraped but no real structural damage to beams. Pierce County did the repair work on bridges locking beams.

Inspection Specific Notes

May need to repaint or spot paint soon - detailed paint condition needed (i.e. top coat condition). A bike trail was constructed under span1 on the Minnesota end of the bridge in 2016. A retaining wall was also constructed as part of the bike trail. Both are owned and are to be maintained by Mn/DOT.

Inspector Site-Specific Safety Considerations

Marine Traffic

Structure Inspection Procedures

The only portion of the bridge that is fracture critical is the bascule span. Although we generally inspect the entire bridge, this procedure only applies to the fracture critical inspection. In order to see both outside girders the snooper truck must set up twice, once on the westbound side and once on the east bound side. Traffic control is set up by the county. We first close the north lane on the westbound side (single lane closure, there are 4 lanes on the bridge). The snooper truck is then positioned on the bascule span and deployed to the north. The entire inspection of the westbound side generally takes 2-3 hours. After we have inspected the north side of the bridge the traffic control is picked up and re-set on the eastbound side of the bridge and the same inspection procedure is used except the truck will deploy to the south. In addition if the bridge must be lifted during the inspection, the inspection will have to be halted, the snooper will have to moved off the bascule span and the traffic control cones will have to be moved. After the span is lowered back down, the traffic cones can be put back and the inspection continued.

During the inspection the two main bascule girders are to be inspected at an arms length or less.

Additionally, the inspection of the connections to the main counter weights have to be inspected from inside the tower or accessed through the sidewalk on the Minnesota side.

Special Requirements

	Chk	Hours	Cost	Comments
A52 Reach-All Unit	X			
Traffic Control	X			County sets up traffic control

Movable

	Rating	Comment
Mechanical	GOOD	See Documents for details
Electrical	GOOD	See Documents for details
Hydraulic	GOOD	See Documents for details
Operator House	GOOD	See Documents for details
Safety Device	GOOD	See Documents for details

Maintenance Notes

Underwater Probe Form
B-47-040

General Site Conditions - Scour

None

General Site Conditions - Embankment Erosion/Conditions

Embankments appear stable. W. Abutment in good condition with few missing stones and exposed fabric. E. Abutment in fair condition with grouted riprap breaking apart and undermining at the shoreline.

Substructure Notes

Chk	Unit	Max Water Depth(ft)	Mode	Notes
X	Cardinal		Dry	The West Abutment was dry at the time of inspection and was not inspected.
X	Pier 1	9.8	Surface Supplied Air	The footing is exposed from the west quarter point on the north face along the east and south faces, to the north quarter point on the west face with up to full height exposure. The seal is exposed along the east face with up to 4 feet of vertical exposure.
X	Pier 2	31.0	Surface Supplied Air	The seal is exposed along the west, north, and east faces with 6.5 feet veritcal exposure at the southeast corner, 7.5 feet along the east face, 4 feet at the northeast corner, 8 feet at the northwest corner, 7.5 feet along the west face and is buried at the southwest corner. Along the south face only the top of footing is exposed.
X	Pier 3	33.7	Surface Supplied Air	The seal is exposed around the entire perimeter with up to 6.5 feet vertical exposure. Formwork remains in place at the footing on the east face near mid-length.
X	Pier 4	27.8	Surface Supplied Air	The seal is exposed along the north and west faces with 3 feet of vertical exposure along the north face, 4 feet along the west face, and 3 feet at the southwest corner.
X	Non Cardinal		Dry	The East Abutment was dry at the time of inspection and was not inspected.

Movable Mechanical

Document Comment/Description

Bascule girder bearing plates (Southeast)

Movable Mechanical

Document Comment/Description

Wisconsin finger joint with spalling concrete under (Part of counterweight)

Movable Mechanical

Document Comment/Description

Wisconsin finger joint with spalling concrete under (Part of counterweight)

Movable Mechanical

Document Comment/Description

Main Rocker bearing at Southeast corner

Movable Mechanical

Document Comment/Description

Bottom and face of counter weight (Wisconsin side)

Movable Mechanical

Document Comment/Description

Bottom and face of counter weight (Wisconsin side)

Movable Mechanical

Document Comment/Description

Bottom and face of counter weight (Wisconsin side)

Movable Mechanical

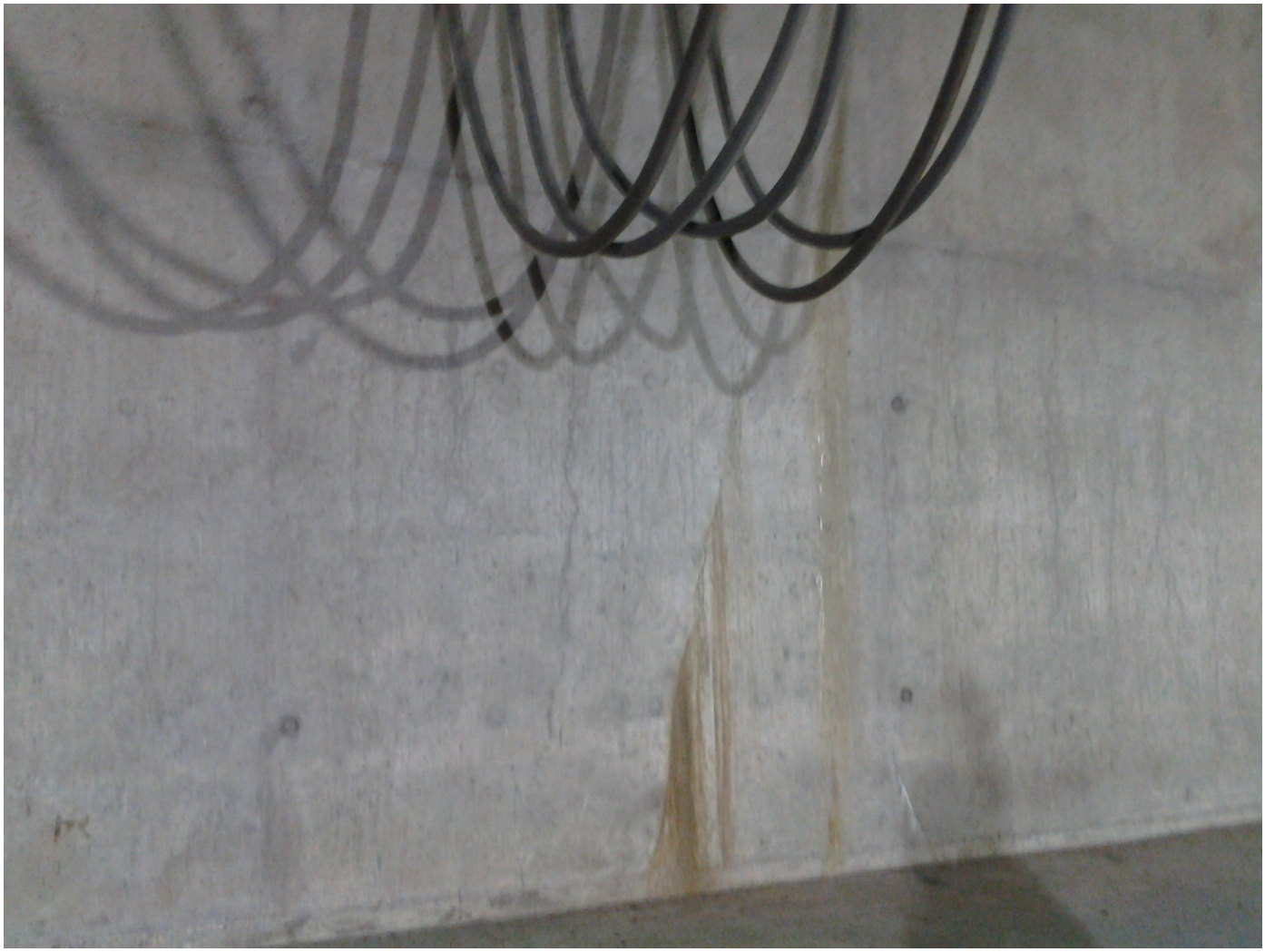
Document Comment/Description

Cracks in the west wall of the east counterweight pit

Movable Mechanical

Document Comment/Description

Cracks in the west wall of the east counterweight pit



Movable Mechanical

Document Comment/Description

Northeast Rocker

Movable Mechanical

Document Comment/Description

Wisconsin side counterweight

Movable Mechanical

Document Comment/Description

Wisconsin side counterweight

Movable Mechanical

Document Comment/Description

Northeast connection near the northeast rocker (minor corrosion)

Movable Mechanical

Document Comment/Description

Minor rust on main spokes at the northeast rocker.

Movable Mechanical

Document Comment/Description

Bascule bearing plates at northeast corner. Minor misalignment (constructed that way)

Movable Mechanical

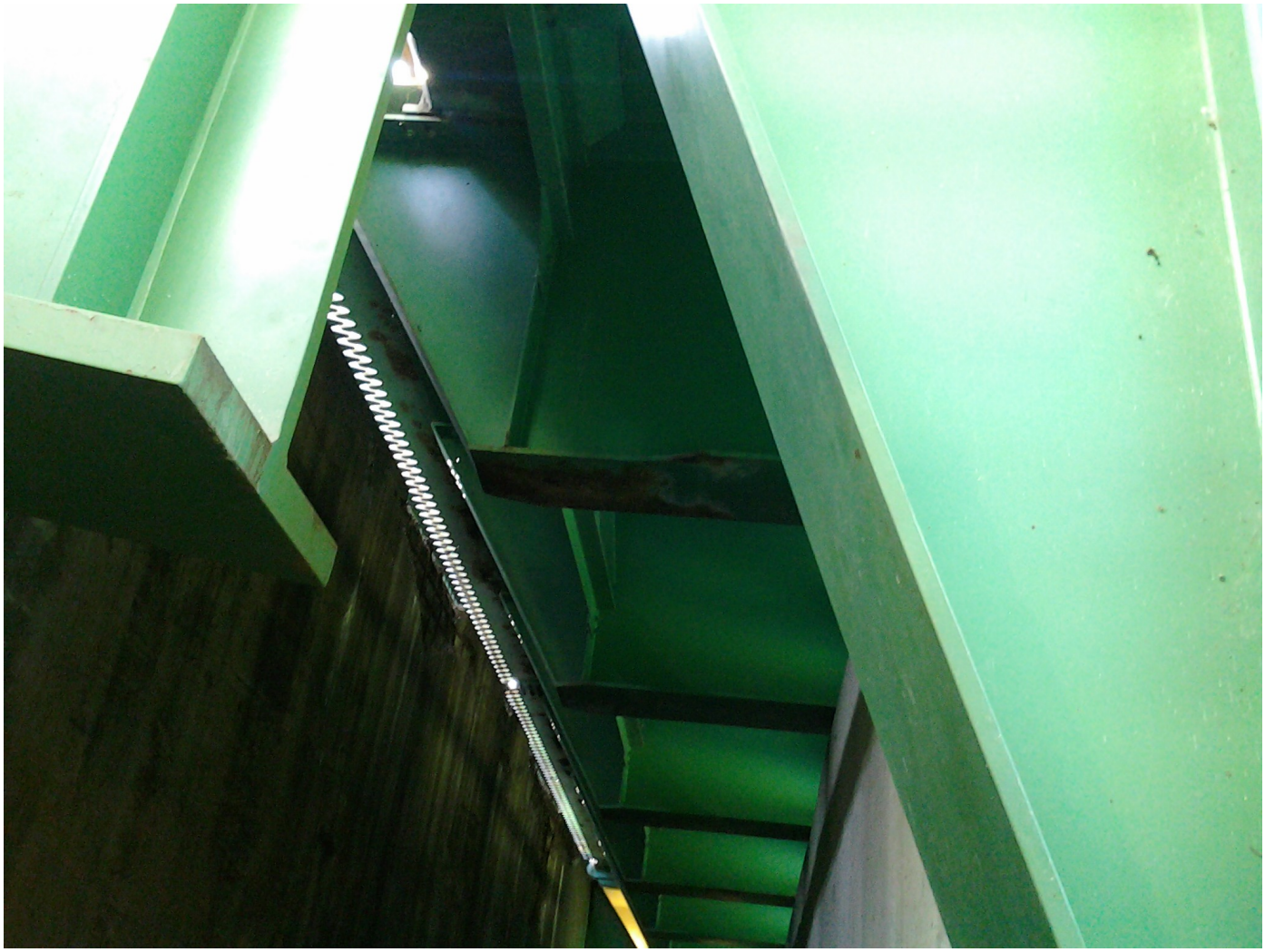
Document Comment/Description

Minnesota side counterweight

Movable Mechanical

Document Comment/Description

Minnesota side counterweight. Also, some corrosion under finger joint in the stringers.



Movable Mechanical

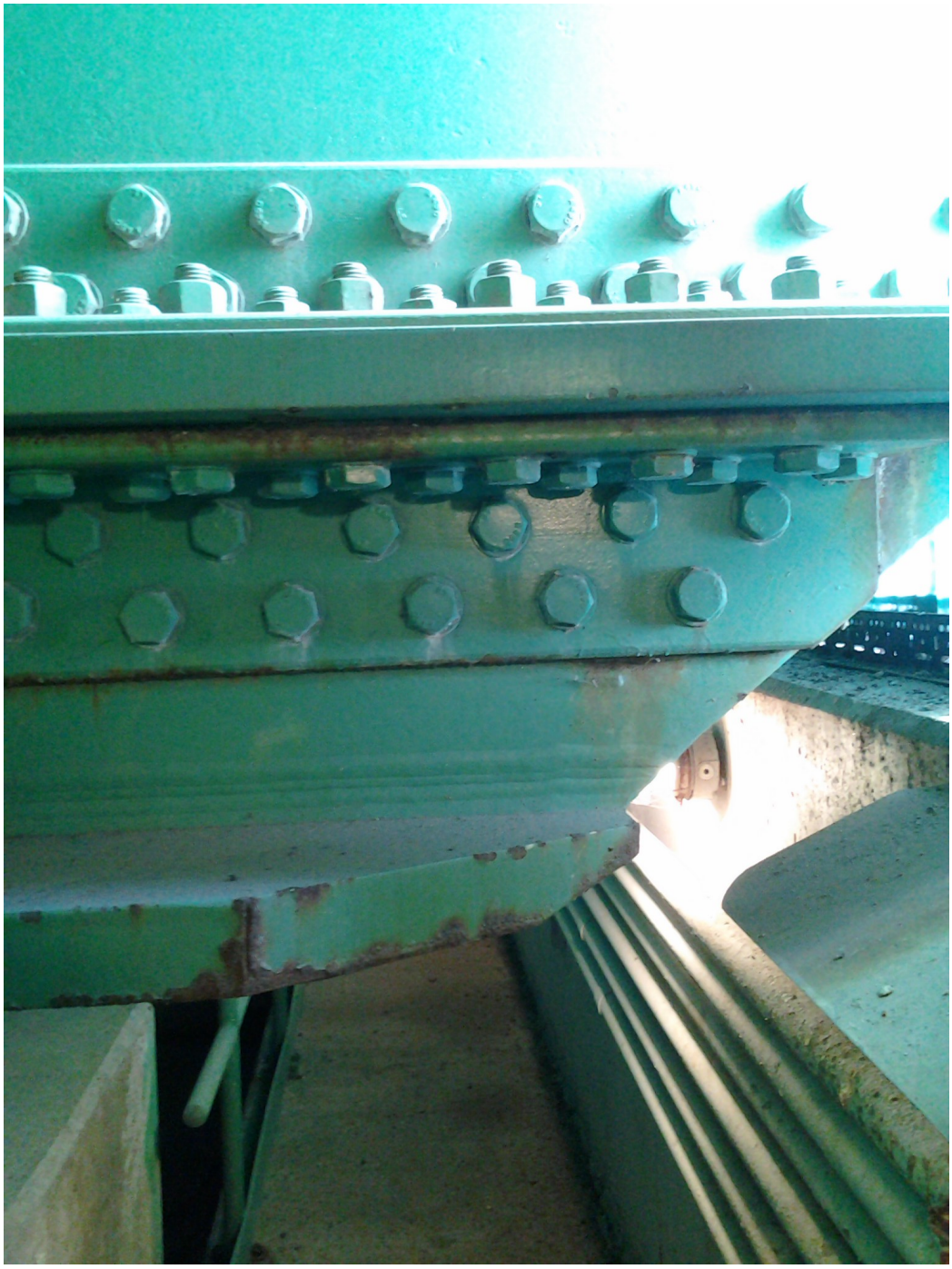
Document Comment/Description

Minor corrosion in the southwest connection just in front of the counterweights.

Movable Mechanical

Document Comment/Description

Minor corrosion in the southwest connection just in front of the counterweights. (backside)



Movable Mechanical

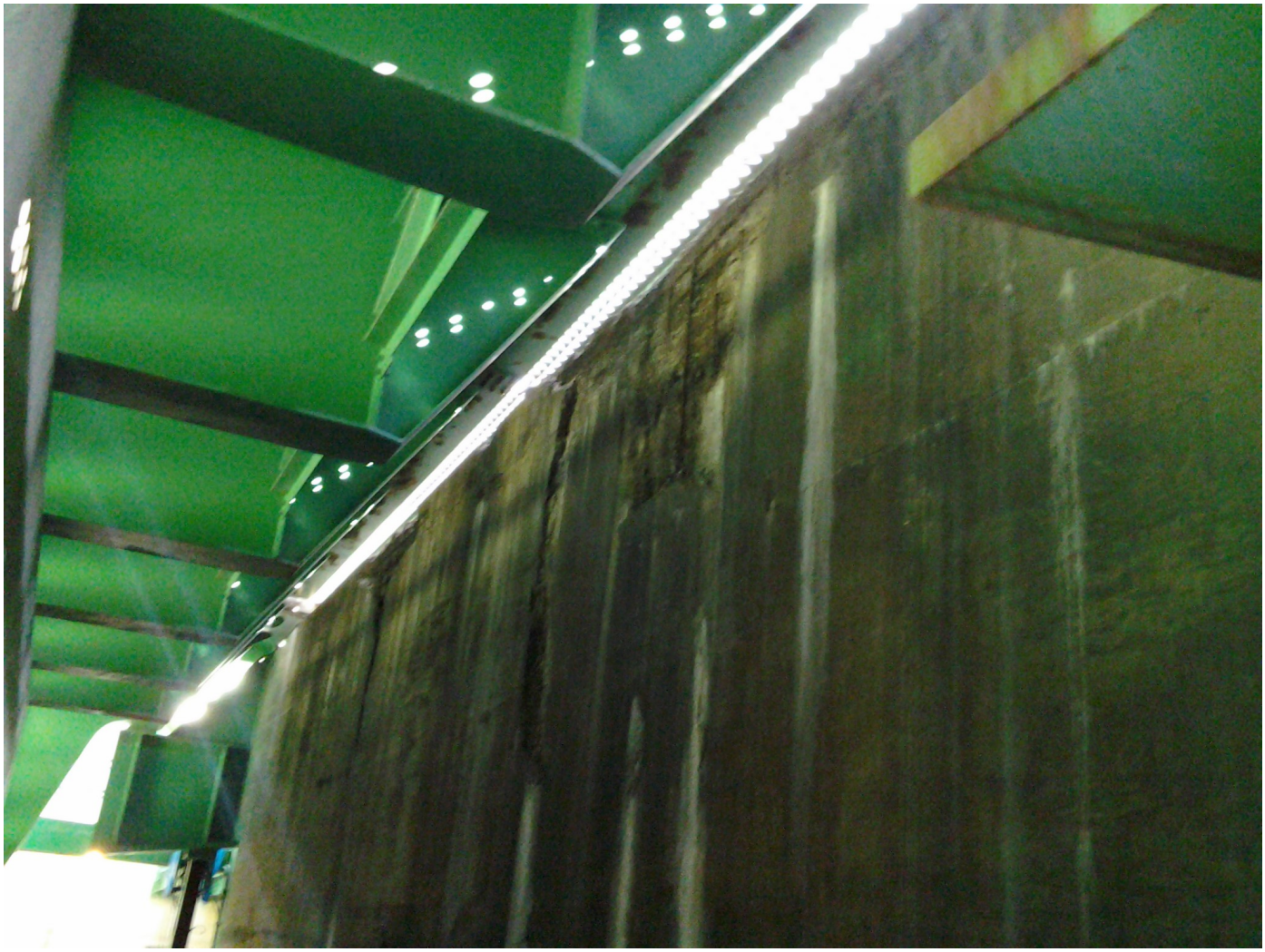
Document Comment/Description

Minnesota counterweight

Movable Mechanical

Document Comment/Description

Minnesota counterweight



Movable Mechanical

Document Comment/Description

Southwest rear lock corrosion

Movable Mechanical

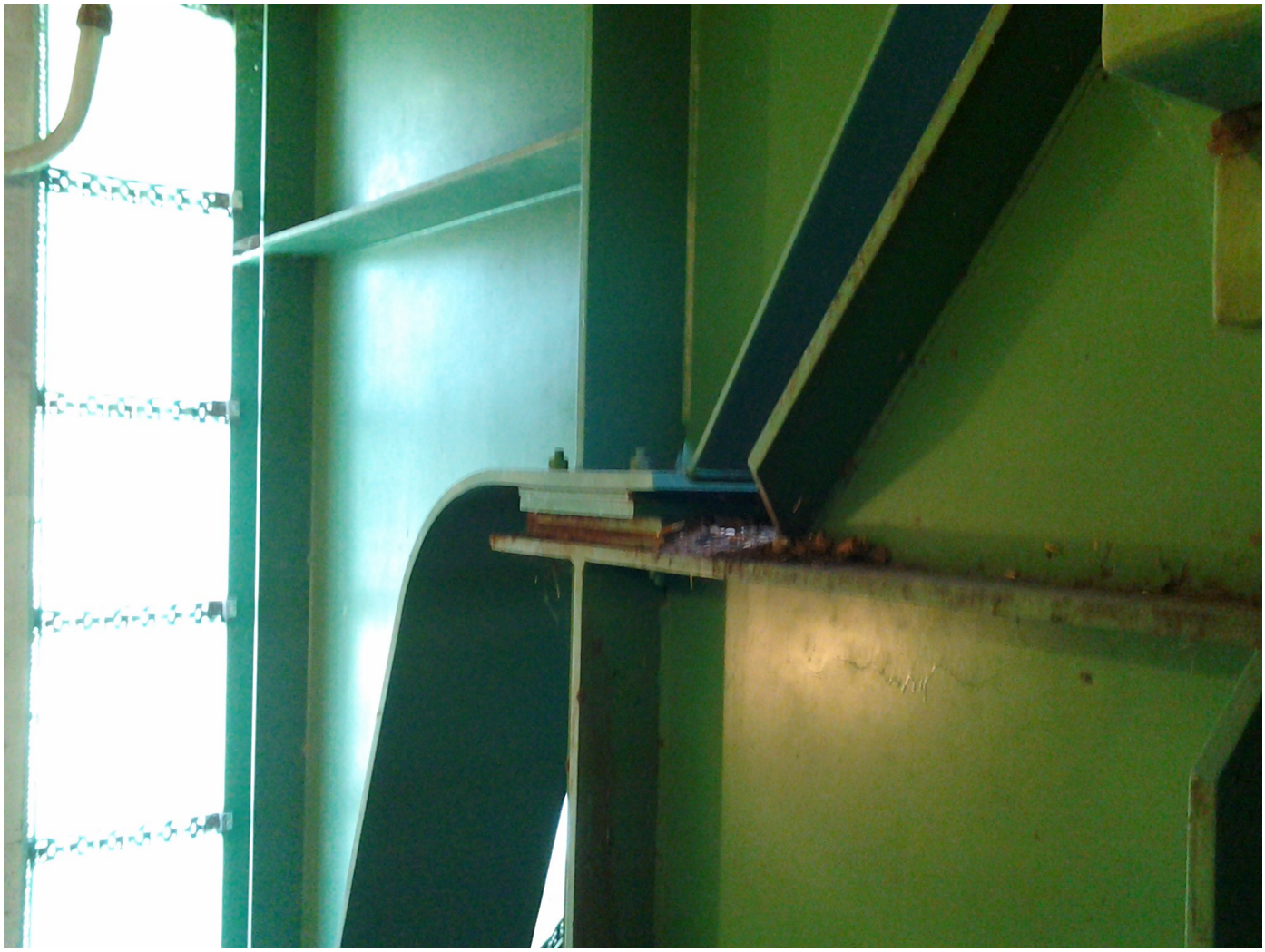
Document Comment/Description

Southwest rear lock corrosion

Movable Mechanical

Document Comment/Description

Southwest bascule bearing misalignment.



Routine

Document Comment/Description

East abutment

Routine

Document Comment/Description

West abutment

Routine

Document Comment/Description

Pier 1 - west face

Routine

Document Comment/Description

Pier 2 - west face

Routine

Document Comment/Description

Pier 3 - east face

Routine

Document Comment/Description

Pier 4 - west face

Routine

Document Comment/Description

Span 1 - deck underside (typ.)

Routine

Document Comment/Description

Bay 1 between girders 5 and 6 at pier 4. Plywood left from original construction.

Routine

Document Comment/Description

Rust staining on the bottom of the deck in span 4 between girders 4 and 5.

Routine

Document Comment/Description

Rust staining on the bottom of the deck in span 4 between girders 4 and 5.

Routine

Document Comment/Description

Cracks in pier 3. Looking west at the northwest corner.

Routine

Document Comment/Description

Diaphragm corrosion on the west side of pier 3.

Routine

Document Comment/Description

Diaphragm corrosion on the west side of pier 3.

Routine

Document Comment/Description

Spot rusting in the bascule span floor beams.

Routine

Document Comment/Description

Spot rusting in the bascule span floor beams.

Routine

Document Comment/Description

Spalled concrete at pier 3 on the bascule span side.

Routine

Document Comment/Description

Corrosion of the cross members near pier 2.

Routine

Document Comment/Description

Span 1 southside chalking paint and exposed under coating.

Routine

Document Comment/Description

Span 1 southside chalking paint and exposed under coating.

Routine

Document Comment/Description

Cracking in pier 3 looking to the southeast.

Routine

Document Comment/Description

southside of girder 1 in bascule span. Chalking paint

Routine

Document Comment/Description

Loss of paint on galvanized steel parapet.

Routine

Document Comment/Description

Pier 2 looking west cracking.

Routine

Document Comment/Description

South bascule center joint. Wearing can be seen on the bottom plate.

Routine

Document Comment/Description

Erosion around NW wing

Non-Image Documents

Type	Document	Document Comment/Description	Attached
Movable Mechanical	b47-040__xmd25.docx	Mechanical, Electrical, Hydraulic and Generator Inspection	
Routine	b47-040_18_Rd1.pdf	Pier cracking hand sketches	X
Routine	b47-040_18_Rd2.pdf	Counterweight Deterioration	X

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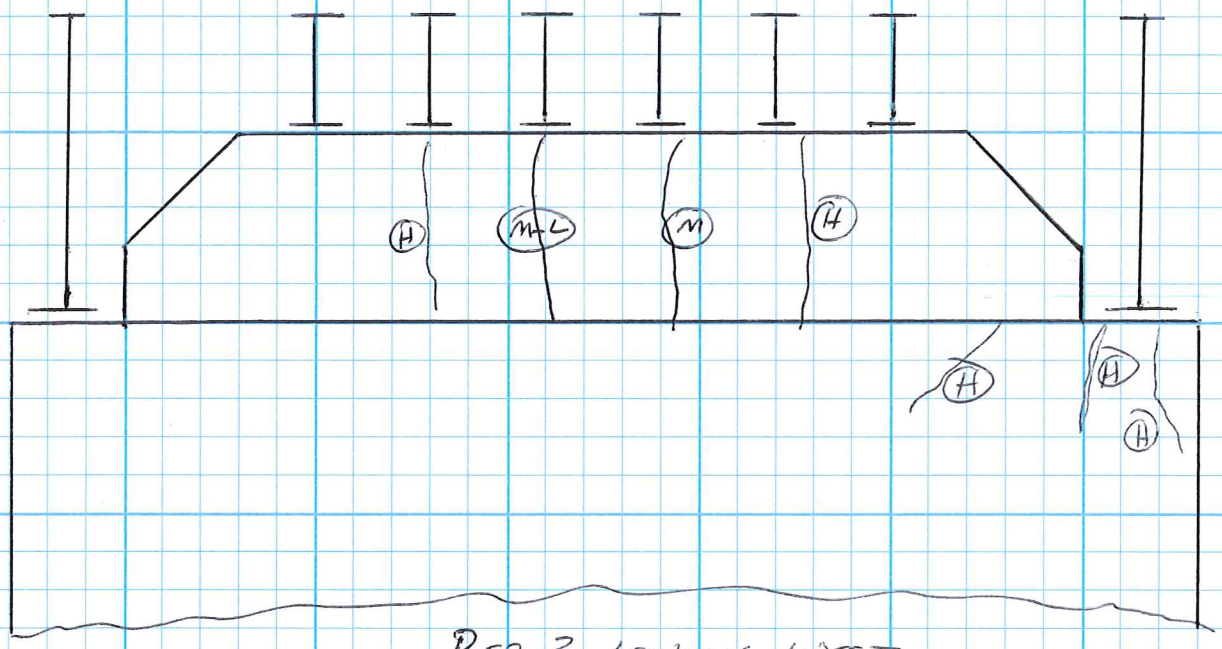
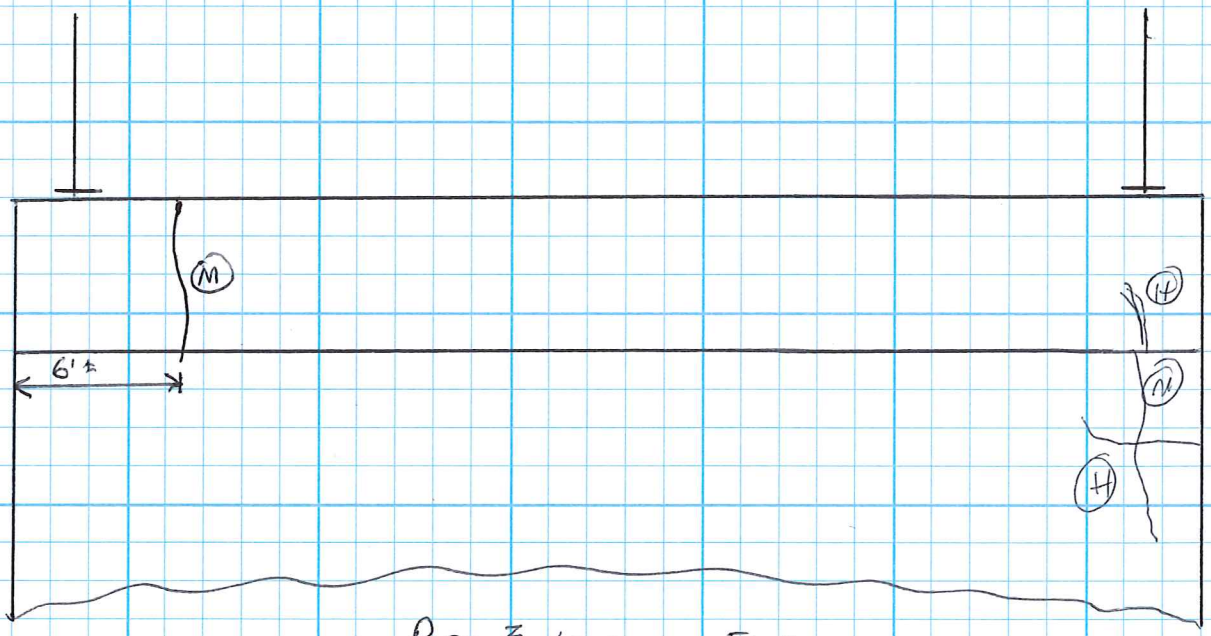


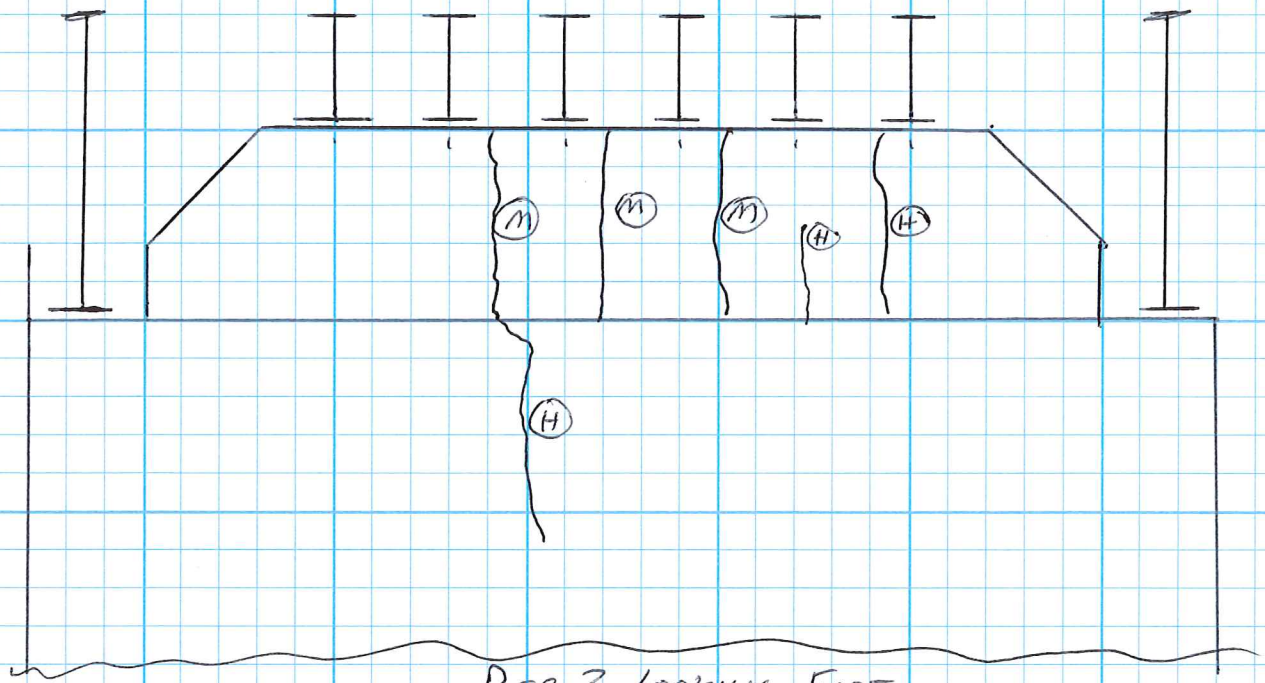
PIER 3 LOOKING WEST



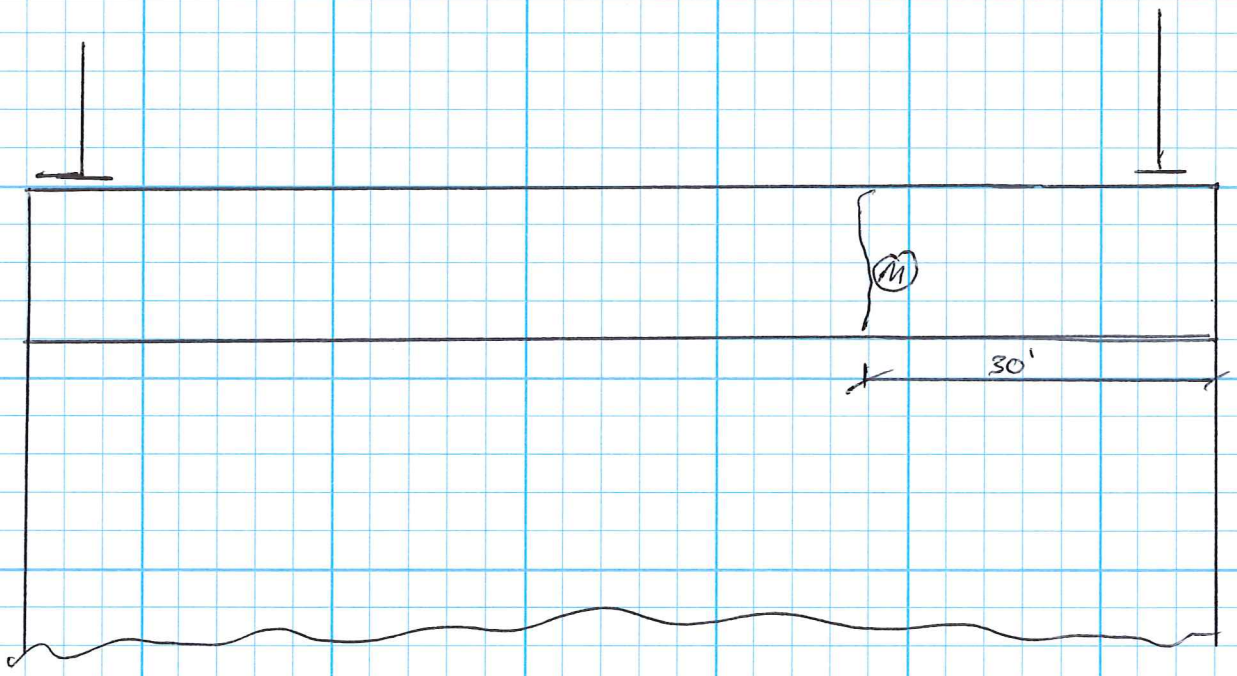
PIER 3 LOOKING EAST

(H) HAIRLINE
(M) MEDIUM
(M-L) MEDIUM TO LARGE
(L) LARGE

Project/Structure No.	Hwy. No.	County	Computations by	Date
B-47-0040	10	PIERCE	GHH	4/26/10
Name of Road: BASCULE BRIDGE			Checked by	Date
Title/Item: INSPECTION SKETCHES			Sheet	Of



PIER 2 LOOKING EAST



PIER 2 LOOKING WEST

(H) HAIRLINE
(M) MEDIUM
(L) LARGE

Project/Structure No.	Hwy. No.	County	Computations by	Date
B-47-0040	10	PIERCE	GHH	4/26/16
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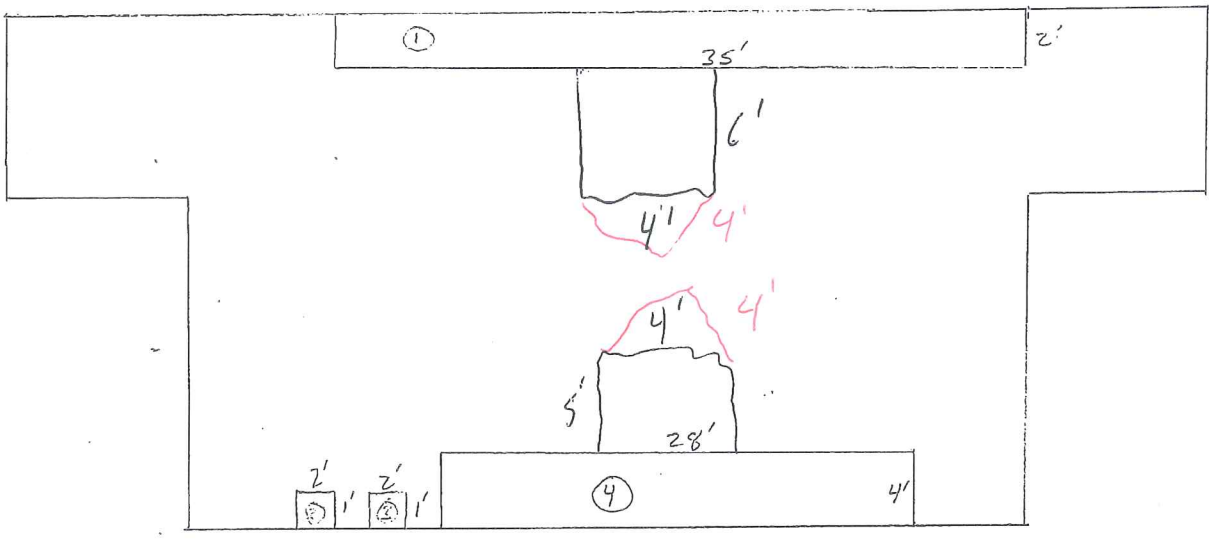
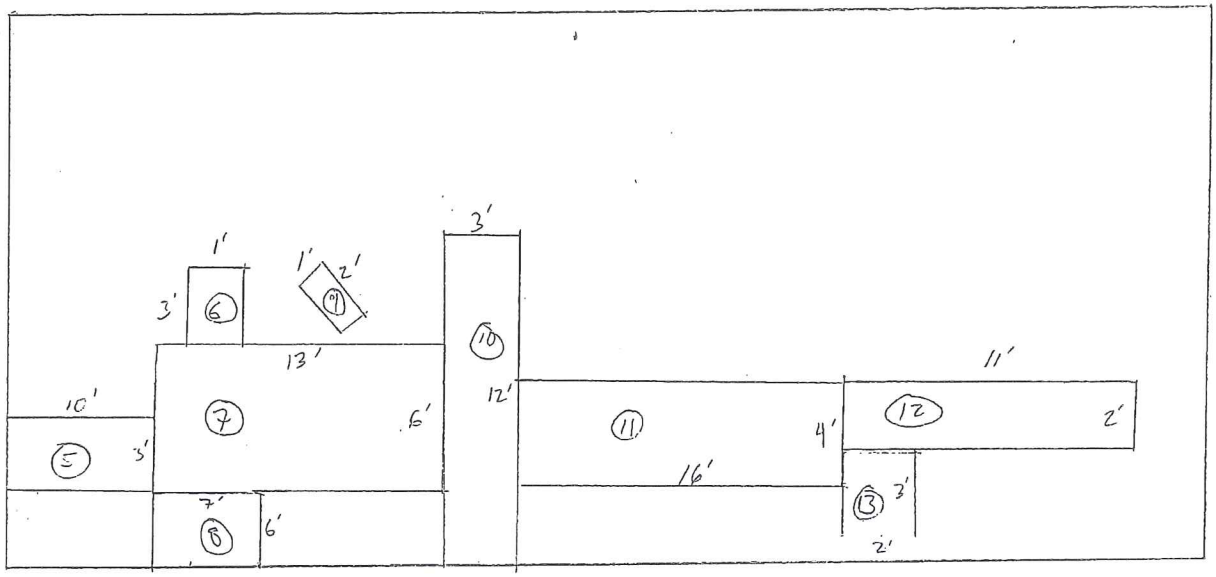
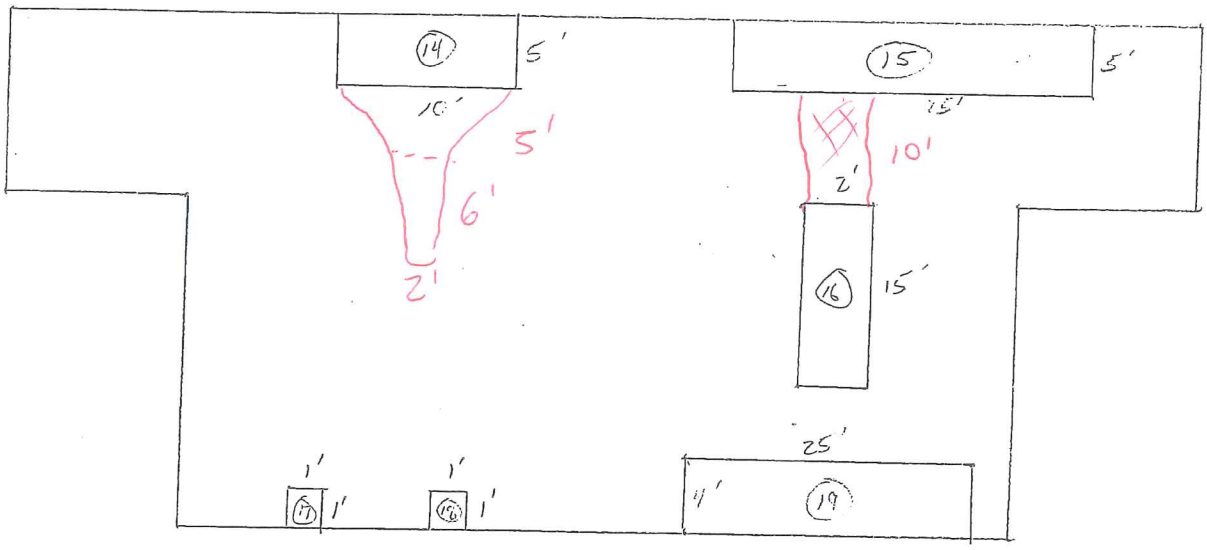


COUNTER WEIGHT

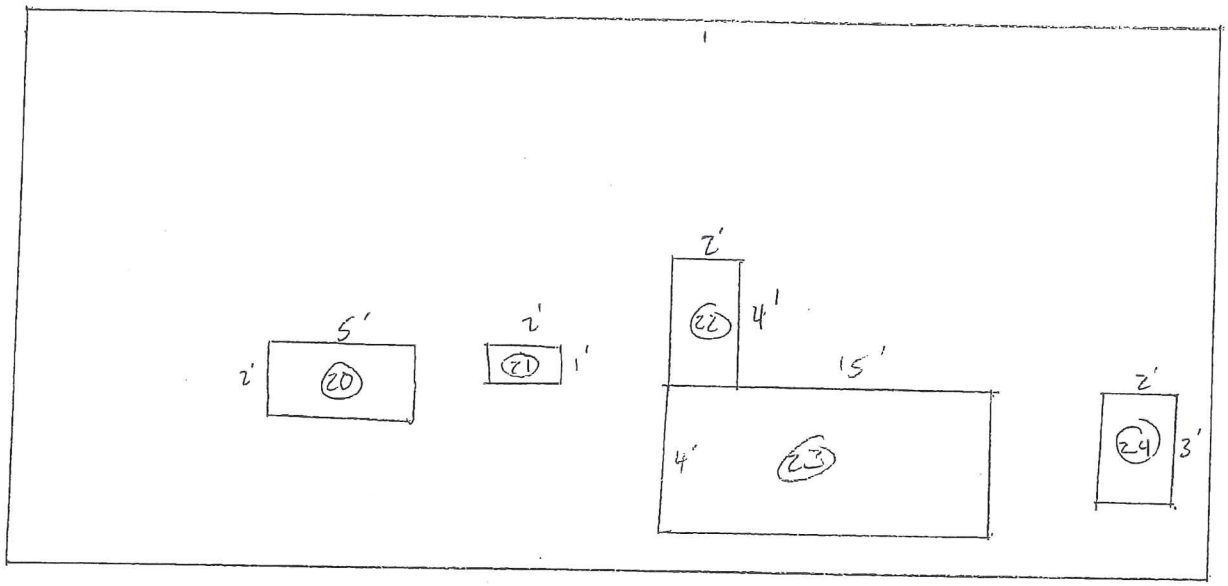


FLOOR

B-47-40 USH 10 PIERCE KSH 6-24-13
PRESCOTT BRIDGE
CONCRETE SURFACE REPAIR (NE SIDE)



COUNTER WEIGHT



FLOOR

B-47-40 USH 10 PIERCE G-2413

PRESCOTT BRIDGE

CONCRETE SURFACE REPAIR (MN SIDE)

2 3