STRUCTURES INSPECTION FIELD REPORT

ROUTINE INSPECTION

2-DIST	B.I.N.	BR. DEPT. NO.
05	437	C-07-001

CITY/TOWN	8.-STRUCTURE NO.	11-Kilo. POINT	41-STATUS	90-ROUTINE INSP. DATE
CHATHAM	C07001-437-MUN-NBI	000.322	A:OPEN	NOV 1, 2012

07-FACILITY CARRIED	MEMORIAL NAME/LOCAL NAME	27-YR BUILT	106-YR REBUILT	YR REHAB'D (NON 106)
HWY BRIDGE ST		1936	1980	2007

06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS	DIST. BRIDGE INSPECTION ENGINEER
WATER MITCHELL RIVER	Urban Collector	D. A. Palmer

43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER	PROJ MGR
716 : Timber Movable - Bascule	Town Agency	Town Agency	C. Ballesteros	Transystems

107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBERS
8 : Timber	Varied	15°C	J. CAHILL

ITEM 58 — DECK: 5

		DEF
1.Wearing Surface	5	M-P
2.Deck Condition	5	M-P
3.Stay-in-Place Forms	N	–
4.Curbs	5	M-P
5.Median	N	–
6.Sidewalks	6	M-P
7.Parapets	N	–
8.Railing	6	M-P
9.Anti Missile Fence	N	–
10.Drainage System	N	–
11.Lighting Standards	N	–
12.Utilities	5	M-P
13.Deck Joints	4	S-P
14.Shielding	N	–
15.	N	–
16.	N	–

CURB REVEAL (In millimeters)	N	S
	330	330

APPROACHES

		DEF
a. Appr. Pavement Condition	5	M-P
b. Appr. Roadway Settlement	5	M-P
c. Appr. Sidewalk Settlement	5	M-P
d.	N	-

OVERHEAD SIGNS (Attached to bridge) (Y/N): N

		DEF
a. Condition of Welds	N	-
b. Condition of Bolts	N	-
c. Condition of Signs	N	-

ITEM 59 — SUPERSTRUCTURE: 6

		DEF
1.Stringers	N	-
2.Floorbeams	N	-
3.Floor System Bracing	N	-
4.Girders or Beams	6	M-P
5.Trusses - General	N	-
a. Upper Chords	N	-
b. Lower Chords	N	-
c. Web Members	N	-
d. Lateral Bracing	N	-
e. Sway Bracings	N	-
f. Portals	N	-
g. End Posts	N	-
6.Pin & Hangers	N	-
7.Conn Plt's, Gussets & Angles	N	-
8.Cover Plates	N	-
9.Bearing Devices	N	-
10. Diaphragms/Cross Frames	6	M-P
11. Rivets & Bolts	5	M-P
12. Welds	6	M-P
13. Member Alignment	6	M-P
14. Paint/Coating	5	M-P
15. King Posts	6	M-P

Year Painted: N

COLLISION DAMAGE: *Please explain*
None ( ) Minor (X) Moderate ( ) Severe ( )

LOAD DEFLECTION: *Please explain*
None ( ) Minor (X) Moderate ( ) Severe ( )

LOAD VIBRATION: *Please explain*
None ( ) Minor (X) Moderate ( ) Severe ( )

Any Fracture Critical Member: (Y/N) N

Any Cracks: (Y/N) N

ITEM 60 — SUBSTRUCTURE: 4

	Dive	Cur		DEF
1. Abutments			5	
a. Pedestals	N	N		-
b. Bridge Seats	N	7		-
c. Backwalls	N	6		M-P
d. Breastwalls	N	6		M-P
e. Wingwalls	N	6		M-P
f. Slope Paving/Rip-Rap	N	6		M-P
g. Pointing	N	N		-
h. Footings	N	5		M-P
i. Piles	N	H		-
j. Scour	N	N		-
k. Settlement	N	6		M-P
l.	N	N		-
m.	N	N		-
2. Piers or Bents			N	
a. Pedestals	N	N		-
b. Caps	N	N		-
c. Columns	N	N		-
d. Stems/Webs/Pierwalls	N	N		-
e. Pointing	N	N		-
f. Footing	N	N		-
g. Piles	N	N		-
h. Scour	N	N		-
i. Settlement	N	N		-
j.	N	N		-
k.	N	N		-
3. Pile Bents			5	
a. Pile Caps	N	6		M-P
b. Piles	4	5		S-P
c. Diagonal Bracing	4	4		S-A
d. Horizontal Bracing	4	4		S-A
e. Fasteners	3	4		S-P

UNDERMINING (Y/N) If YES please explain: N

COLLISION DAMAGE:
None ( ) Minor ( ) Moderate (X) Severe ( )

SCOUR: *Please explain*
None (X) Minor ( ) Moderate ( ) Severe ( )

I-60 (Dive Report): 4 *I-60 (This Report):* 5

93B-U/W (DIVE) Insp 03/08/2012

X=UNKNOWN N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE R=REMOVED

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ITEM 61 — CHANNEL & CHANNEL PROTECTION

4

	Dive	Cur	DEF
1.Channel Scour	7	H	-
2.Embankment Erosion	7	7	-
3.Debris	7	7	-
4.Vegetation	7	7	-
5.Utilities	7	H	-
6.Rip-Rap/Slope Protection	7	6	M-P
7.Aggradation	7	7	-
8.Fender System	2	3	S-A
9. Navigational Lights	N	0	S-P

STREAM FLOW VELOCITY:

Tidal (**X**) High ( ) Moderate ( ) Low ( ) None ( )

ITEM 61 (Dive Report): **4** *ITEM 61 (This Report)* **4**

93b-U/W INSP. DATE: 03/08/2012

ITEM 36 — *TRAFFIC SAFETY*

	36	COND	DEF
A. Bridge Railing	0	5	M-P
B. Transitions	0	0	-
C. Approach Guardrail	0	5	M-P
D. Approach Guardrail Ends	0	7	-

WEIGHT POSTING

Not Applicable **X**

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: 03/26/1997 **EJDMT Date:** 00/00/00

Signs In Place (Y=Yes,N=No, NR=NotRequired) Legibility/ Visibility	At bridge E	At bridge W	Other Advance E	Other Advance W

CLEARANCE POSTING

Not Applicable **X**

	N ft	N in	S ft	S in	meter
Actual Field Measurement		0		0	
Posted Clearance		0		0	

Signs In Place (Y=Yes,N=No, NR=NotRequired) Legibility/ Visibility	At bridge N	At bridge S	Advance N	Advance S

ACCESSIBILITY (Y/N/P)

	Needed	Used
Lift Bucket	N	N
Ladder	N	N
Boat	Y	Y
Waders	N	N
Inspector 50	N	N
Rigging	N	N
Staging	P	N
Traffic Control	N	N
RR Flagger	N	N
Police	N	N
Other:		
	N	N

TOTAL HOURS **96**

PLANS (Y/N): **Y**

(V.C.R.) (Y/N): **N**

TAPE#: _____

List of field tests performed:

RATING

Rating Report (Y/N): **Y**

Date: 02/01/1997

Inspection data at time of existing rating

I 58: **7** I 59: **7** I 60: **6** Date : 03/02/1994

(To be filled out by DBIE)

Request for Rating or Rerating (Y/N): **N**

If YES please give priority: HIGH ( ) MEDIUM ( ) LOW ( )

REASON: _____

CONDITION RATING GUIDE (For Items 58, 59, 60 and 61)

	CODE	CONDITION	DEFECTS
	N	NOT APPLICABLE	
G	9	EXCELLENT	Excellent condition.
G	8	VERY GOOD	No problem noted.
G	7	GOOD	Some minor problems.
F	6	SATISFACTORY	Structural elements show some minor deterioration.
F	5	FAIR	All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
P	4	POOR	Advance section loss, deterioration, spalling or scour.
P	3	SERIOUS	Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
C	2	CRITICAL	Advance deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
C	1	"IMMINENT" FAILURE	Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stablility. Bridge is closed to traffic but corrective action may put it back in light service.
	0	FAILED	Out of service - beyond corrective action.

DEFICIENCY REPORTING GUIDE

DEFICIENCY: A defect in a structure that requires corrective action.

CATEGORIES OF DEFICIENCIES:

M= Minor Deficiency - Deficiencies which are minor in nature, generally do not impact the structural integrity of the bridge and could easily be repaired. Examples include but are not limited to: Spalled concrete, Minor pot holes, Minor corrosion of steel, Minor scouring, Clogged drainage, etc.

S= Severe/Major Deficiency - Deficiencies which are more extensive in nature and need more planning and effort to repair. Examples include but are not limited to: Moderate to major deterioration in concrete, Exposed and corroded rebars, Considerable settlement, Considerable scouring or undermining, Moderate to extensive corrosion to structural steel with measurable loss of section, etc.

C-S= Critical Structural Deficiency - A deficiency in a structural element of a bridge that poses an extreme unsafe condition due to the failure or imminent failure of the element which will affect the structural integrity of the bridge.

C-H= Critical Hazard Deficiency - A deficiency in a component or element of a bridge that poses an extreme hazard or unsafe condition to the public, but does not impair the structural integrity of the bridge. Examples include but are not limited to: Loose concrete hanging down over traffic or pedestrians, A hole in a sidewalk that may cause injuries to pedestrians, Missing section of bridge railing, etc.

URGENCY OF REPAIR:

I = Immediate- [Inspector(s) immediately contact District Bridge Inspection Engineer (DBIE) to report the Deficiency and to receive further instruction from him/her].

A = ASAP- [Action/Repair should be initiated by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) upon receipt of the Inspection Report].

P = Prioritize- [Shall be prioritized by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) and repairs made when funds and/or manpower is available].

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REMARKS

BRIDGE ORIENTATION

This bridge is oriented from west to east with all elements designated from west to east and south to north.

GENERAL REMARKS

Bridge C-07-001 (437) carries Bridge Street over the Mitchell River in the Town of Chatham.

The superstructure consists of eleven timber multi-beam approach spans (spans 1-7 and 9-12) with a timber deck and one movable timber multi-beam bascule span (span 8) with a timber deck **(see sketch 1 and photo 1)**. The beams are labeled as stringers in the design plans. The number of beams vary in each span throughout the bridge. There are 25 beams in spans 1 and 8; 29 beams in spans 2, 5, 6, 10, and 11; 30 beams in spans 3, 4, 7, and 9; and 26 beams is span 12. In addition, there is a partial width, cast-in-place concrete slab span adjacent to each abutment. These spans were integrated into the north side of the existing abutments to accommodate the bridge widening in 1949.

The substructure consists of reinforced concrete abutments and timber pile bents. The timber pile bents are numbered 1-6, 7A, and 8-11. There are smaller supplemental bents at bents 4 and 6 which are numbered 4A and 6A, respectively.

CRITICAL FINDINGS

A summary of the critical findings is as follows:

- No items were identified as having critical-structural (C-S) deficiencies;
- No items were identified as having critical-hazard (C-H) deficiencies;
- Three items were identified as having an urgency of repair designated "as soon as possible" (A), as follows:
  - **Item 60.3.c Diagonal Bracing** - There are 5'-0" long sections of the bracing which have completely deteriorated at the south end of bent 3 and the north end of bent 5.
  - **Item 60.3.d Horizontal Bracing** - There is a 4'-0" long section of the bracing which has completely deteriorated at the south end of bent 8.
  - **Item 61.8 Fender System** - The vertical and horizontal members of the fender system exhibit moderate to heavy deterioration and up to 100% loss in the tidal zone.

SCOPE OF INSPECTION

The scope of the routine inspection covered by this report was to determine the physical and functional condition of the bridge and to identify any changes from previously recorded conditions to ensure that the structure continues to satisfy present service requirements. It includes close-up, hands on inspection of selected members (at worse-case locations) to establish condition codings; identify deficiencies/defects that require corrective action; and determine the urgency of any needed repairs. This Structures Inspection Field Report is prepared exclusively for the use of the Massachusetts Department of Transportation and the Town of Chatham (the owner) and not for any other purpose.

WEIGHT POSTING NOTES

This bridge does not appear to be posted for load; however, there are signs which read "Passenger Vehicles and Light Trucks Only; No Tour Buses Beyond This Point" at both ends of Bridge Street.

WORK ACCESS NOTES

The underside of the deck, the superstructure and the substructure were accessed utilizing a boat and work float system. Due to the storm surge and higher than normal high tides occuring during the inspection, scaffolding was not required during this inspection, but has been used in the past. Inspection of the substructure should be done at low tide in order to view the majority of the piles and bracing members within

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REMARKS

the tidal zone. A bridge opening was coordinated with the Town of Chatham Harbormaster who can be contacted at (508) 945-5185.

ITEM 58 - DECK

Item 58.1 - Wearing Surface

(Fair): The timber wearing surface exhibits moderate wear with slight punkiness, warped planks, splits, and checks throughout. The knots in the wood and the fastener heads generally protrude above the surface of the roadway creating an uneven riding surface. Several wearing surface planks have been replaced throughout the deck. These replacement planks do not sit flush with the remaining worn planks creating up to 1/2" of vertical differential between adjacent planks **(see photo 2)**. Isolated wearing surface planks are loose or have deteriorated with areas of up to 100% loss **(see photo 3)**. There is a 10'-0" wide by 5'-0" long area of loose and deteriorated planks at the south end of span 8 adjacent to the joint at bent 7A.

The bituminous wearing surface on the abutment spans has random cracks, up to 3/8" wide, and minor wheel line rutting.

Item 58.2 - Deck Condition

(Fair): The underside of the timber deck typically exhibits some scattered areas of rot with slight punkiness and checks. There is an area of 100% loss by 10" wide by 7" long to the timber deck plank between beams 10 and 11 near bent 3 in span 4 **(see photo 4)**.

There is a 1'-0" diameter by 2" deep spall around a weep hole with heavy efflorescence and stalactites on the underside of the concrete deck at the east abutment span **(see photo 5)**. There is also a full depth core hole through the concrete deck near midspan of the east abutment span.

Item 58.4 - Curbs

(Fair): The 1'-1" high timber curbs, which also act as a traffic rail, typically have minor deterioration, splits, and checks throughout. The worst case is a 3'-0" long area of rot to the south curb at the east end of the bascule span (span 8) **(see photo 6)**. At several locations, the curbs exhibit minor collision damage and transverse misalignment of up to 1 1/2". In addition, there is a damaged/missing section of the blocking for the curb which exposes the anchor bolt at the misaligned north curb at the west end of span 3 **(see photo 7)**.

Item 58.6 - Sidewalks

(Satisfactory): The timber sidewalks have minor wear, splits and checks throughout with minor build-up of sand and debris along the curbs. The wear is typically less severe throughout the south sidewalk as compared to the north sidewalk.

Item 58.8 - Railing

(Satisfactory): There are minor to moderate checks and splits in the timber pedestrian rails and posts throughout the length of the bridge.

Item 58.12 - Utilities

(Fair): There are several deteriorated, broken, loose or missing support brackets for the metal electrical conduit along the north side of the bridge in spans 9 through 12. At the east end of span 10, the conduit has been temporarily fastened with rope. In addition, there are deteriorated, broken and loose electrical conduits with exposed wiring, which appear abandoned along the west side of bents 5 and 7A **(see photo 8)**.

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Item 58.13 - Deck Joints

(Poor): The steel armor at both abutment deck joints exhibits minor scrapes and gouges, particularly at the east abutment. The timber joint at the east end of the bascule span (span 8) is extremely tight when the bridge is closed. In addition, the bascule span (span 8) is laterally misaligned 1 1/2" to the north along the toe of the bascule span at bent 8 **(see photo 9)**.

APPROACHES

Approaches a - Appr. Pavement Condition

(Fair): The bituminous pavement at both approaches exhibits longitudinal and transverse cracks up to 1" wide. Previously sealed cracks in the east approach have opened up. There is a 9" wide by 5" long by 2" deep spall at the center of the west approach roadway at the west abutment deck joint **(see photo 10)**.

Approaches b - Appr. Roadway Settlement

(Fair): There is up to 1" settlement of an 8'-0" wide by 16'-0" long bituminous patch in the westbound lane of the west approach. There is moderate cracking up to 1/2" wide, with up to 1" of settlement, adjacent to the north drainage scupper on the east approach **(see photo 11)**. There is up to 1/2" deep wheel line rutting in the east and west approach roadway pavement.

Approaches c - Appr. Sidewalk Settlement

(Fair): The northwest and southwest approach sidewalks have settled up to 2 1/2". There is up to 4 1/2" of settlement along the curb of the northeast approach sidewalk **(see photo 12)**.

ITEM 59 - SUPERSTRUCTURE

Item 59.4 - Girders or Beams

(Satisfactory): The timber beams exhibit minor shakes and checks which are typically 1/8" wide located along the vertical faces **(see photo 13)**. Isolated beams exhibit checks up to 5/16" wide. In addition, there are isolated areas of minor mold/fungal growth on the beams throughout the bridge. There is minor collision damage consisting of scrapes and gouges on the underside of beams 1, 10 and 11 in the bascule span (span 8) **(see photo 14)**.

The beams are not bearing on the pile caps at a few locations. There is up to a 1/4" gap between beams 5 through 8 and the pile cap at bent 10 **(see photo 15)**.

There is a 3'-1" long by 8" high by 3" deep spall with exposed reinforcing and one broken bar on the south side of the northern concrete beam of the east abutment span **(see photo 16)**.

Item 59.10 - Diaphragms/Cross Frames

(Satisfactory): Many of the timber spacer blocks between the beams are loose and have rotated **(see photo 17)**. Random blocks exhibit minor shakes and checks. There is severe deterioration with areas of up to 100% loss to the spacer block between beams 2 & 3 and 3 & 4 in span 12.

Item 59.11 - Rivets & Bolts

(Fair): There is minor corrosion of the bolts throughout the superstructure. The bascule span (span 8) counterweight steel shell connection bolts (located in span 7) exhibit moderate to heavy corrosion with some minor section loss.

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Item 59.12 - Welds
(Satisfactory): The bascule span (span 8) counterweight steel shell welds (located in span 7) exhibit light rust.

Item 59.13 - Member Alignment
(Satisfactory): The toe end of the bascule span (span 8) appears to have shifted 1 1/2" to the north. See Item 58.13 for additional comments.

Item 59.14 - Paint/Coating
(Fair): The bascule span (span 8) counterweight steel shell galvanized coating (located in span 7) exhibits moderate to heavy corrosion and minor section loss along the west end of the counterweight **(see photo 18)**.

Item 59.15 - King Posts
(Satisfactory): The timber king posts typically exhibit 3/16" wide by 4'-0" high checks throughout. There are several checks up to 3/8" wide by 4'-0" high with a maximum depth of 3" throughout the entire height of the north face of the south post **(see photo 19)**.

SuperStructure Collision Notes
(Minor): See Item 59.4 for comments.

SuperStructure Load Deflection Notes
(Minor): There is minor deflection under live load.

SuperStructure Load Vibration Notes
(Minor): There is minor vibration under live load.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments
Item 60.1.c - Backwalls
(Satisfactory): There are several vertical and diagonal hairline cracks in the east abutment backwall. There is a 1'-0" long by 9" high by 6 1/2" deep spall with exposed reinforcing at the south end of the east abutment backwall, which also serves as a sidewalk joint header.

Item 60.1.d - Breastwalls
(Satisfactory): There is a 1/8" wide horizontal crack along the south half of the east abutment breastwall. In addition, there is a 4'-4" wide by up to 4 1/2" high by 2 1/2" deep spall along the crack near the center of the east abutment breastwall **(see photo 20)**. Both the east and west abutment breastwalls exhibit hairline cracks with efflorescence as well as delaminations and peeling of the concrete skim coat. The timber sill beam on the west abutment breastwall exhibits minor checks.

Item 60.1.e - Wingwalls
(Satisfactory): The wingwalls are covered with a concrete skim coat which exhibits delaminated and peeling areas and hairline cracks, some with efflorescence. The southwest wingwall exhibits a full length horizontal crack, up to 1/8" wide, with several vertical hairline cracks by up to full height extending from the horizontal crack.

Item 60.1.f - Slope Paving/Rip-Rap
(Satisfactory): There is minor settlement and movement of the placed rip-rap stones.

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Item 60.1.h - Footings
(Fair): The concrete footings are partially exposed through the rip-rap stones at the south end of both abutments. These abutment footings appear to function as a concrete apron/fender wall to the abutment. There is up to a 4" wide crack in the southeast corner of the concrete footing/apron of the west abutment. In addition, the corner of this concrete footing/apron is undermined up to 1'-6" deep and exhibits up to 2" of settlement at this location **(see photo 21)**.

Item 60.1.k - Settlement
(Satisfactory): See Item 60.1.h for comments.

Item 60.3 - Pile Bents
Item 60.3.a - Pile Caps
(Satisfactory): The timber pile caps typically have up to 1/16" wide checks. Isolated timber caps have 1/8" to 3/8" wide checks which measure up to 3'-0" long. Scattered pile caps exhibit full height splits at the end of the cap that extend to the first pile.

Item 60.3.b - Piles
(Fair): The timber piles typically have heavy marine growth with minor to moderate brooming and section loss in the tidal zone **(see photo 22)**. Isolated piles exhibit heavy brooming and moderate section loss in the tidal zone with up to 1 1/2" deep by full circumference areas of soft, punky timber **(see photo 23)**. Above the tidal zone, the piles have vertical checks, up to 3/4" wide, at random locations. Random piles have had a section of the pile removed just below the pile cap, typically 2'-6" high by 3" deep.

There is a 3/8" gap between the top of the pile and the underside of the pile cap at pile 5 of bent 2 and pile 5 of bent 10 **(see photo 24)**. In addition, there are several scattered piles that are not centered under the pile cap and overhang the pile cap by up to 5".

Pile 6 of bent 2 has 100% loss by 5" wide by 9" high by 4 1/2" deep on the north face and 100% loss by 8" wide by 2'-0" high by 2 1/2" deep on the south face with up to a 1/4" wide vertical split. Isolated piles throughout the structure exhibit full depth splits extending down from the top of the pile.

There is little to no protective creosote coating remaining on the piles. Protective sleeves have been placed around several piles at bents 1, 2, 3 and 4. See the attached Underwater Inspection Report, dated 3/8/12, for additional comments.

Item 60.3.c - Diagonal Bracing
(Poor): **(DEFICIENCY/URGENCY OF REPAIR=S/A)** The diagonal timber bracing for each individual pile bent generally exhibits moderate to severe deterioration and section loss in the tidal zone **(see photo 22)**. **The worst cases are at the south end of bent 3 and the north end of bent 5 (see photo 25) where there are 5'-0" long sections of the bracing which have completely deteriorated.** In addition, the diagonal bracing members exhibit moderate pigeon debris scattered throughout.

Item 60.3.d - Horizontal Bracing
(Poor): **(DEFICIENCY/URGENCY OF REPAIR=S/A)** The timber bracing between adjacent pile bents generally exhibits moderate to heavy deterioration and section loss in the tidal zone. **The worst case was below the water line during inspection at the south end of bent 8 where there is a 4'-0" long section of the bracing which has completely deteriorated.**

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REMARKS

Item 60.3.e - Fasteners
(Poor): The fasteners that attach the bracing members generally exhibit moderate to heavy corrosion with moderate to heavy section loss in the tidal zone. See the attached Underwater Inspection Report, dated 3/8/12, for additional comments.

SubStructure Collision Notes
(Moderate): The timber fender system is directly attached to the piles at bents 7A and 8. The east fender exhibits moderate collision damage at the north and south ends with several vertical timber members leaning/rotated (see photo 26). The west fender exhibits moderate collision damage, and the south end of the top horizontal member has failed. The vertical member at this location is displaced up to 1 1/2" to the west (see photo 27).

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.6 - Rip-Rap/Slope Protection
(Satisfactory): See Item 60.1.f for comments.

Item 61.8 - Fender System
(Serious): **(DEFICIENCY/URGENCY OF REPAIR=S/A)** The timber fender system is directly attached to the piles at bents 7A and 8. The vertical and horizontal timber members generally exhibit moderate splitting and checking above the tidal zone. **In the tidal zone, these members exhibit heavy marine growth with moderate to heavy deterioration and up to 100% loss (see photo 26)**.

The east fender exhibits moderate collision damage at the north and south ends with several vertical timber members leaning/rotated **(see photo 26)**. The west fender exhibits moderate collision damage, and the south end of the top horizontal member has failed. The vertical member at this location is displaced up to 1 1/2" to the west **(see photo 27)**.

The fasteners exhibit heavy rust and are deteriorated within the tidal zone. See the attached Underwater Inspection Report, dated 3/8/12, for more information.

Item 61.9 - Navigational Lights
(Missing): There are no navigational lights present on the bridge which does not conform to current United States Coast Guard minimum lighting requirements for single-opening drawbridges.

TRAFFIC SAFETY

Item 36a - Bridge Railing
(Fair): The timber curbs, which are non-mountable, act as a traffic safety rail and do not conform to the current standards. See Item 58.4 for comments.

Item 36b - Transitions
(Missing): There are no transitions between the timber pedestrian rail and the thrie beam guardrails at the approaches.

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REMARKS

Item 36c - Approach Guardrail

(Fair): The approach guardrails consist of thrie beam and w-beam which are not continuous for the entire length at each approach. There are five posts for the south guardrail at the east approach with loose anchor bolts and up to a 1 1/2" gap between the east abutment wingwall and the posts. This guardrail leans up to 3" to the south. There is moderate collision damage to the north guardrail at the east and west approaches. These guardrails and posts lean up to 3" to the north **(see photo 28)**. The approach guardrails do not conform to the current standards.

Item 36d - Approach Guardrail Ends

(Good): The approach guardrail ends consist of buried end sections at both approaches. The approach guardrail ends do not conform to the current standards.

Sketch / Photo Log

Sketch 1 : Framing plan.
Photo 1 : North elevation of the bridge.
Photo 2 : Typical uneven wearing surface planks (spans 1-7, looking east shown).
Photo 3 : Area of 100% loss to wearing surface planks at the south side of span 1 at the west abutment.
Photo 4 : Area of 100% loss to the timber deck plank between stringers 10 and 11 near bent 3 in span 4.
Photo 5 : Spall around a weep hole with heavy efflorescence on the underside of the concrete deck at the east abutment span.
Photo 6 : A 3'-0" long area of rot to the south curb at the east end of the bascule span (span 8).
Photo 7 : Misaligned curb and exposed anchor bolt at the north curb at the west end of span 3.
Photo 8 : Deteriorated and broken electrical conduit with exposed wires at the west face at the north end of bent 7A.
Photo 9 : Lateral misalignment of the bascule span (span 8) on the south end of the toe of the bascule span at bent 8. (Note: Tight joint.)
Photo 10 : Spall at the west approach roadway adjacent to the west abutment deck joint.
Photo 11 : Moderate cracking with up to 1" of settlement adjacent to the north drainage scupper on the east approach, looking south.
Photo 12 : Settlement of the northeast approach sidewalk along the curb, looking west.
Photo 13 : Horizontal check of the north fascia beam in span 1.
Photo 14 : Minor collision damage to the underside of beams 10 and 11 in the bascule span (span 8).
Photo 15 : Up to 1/4" gap between beams 5 through 8 and the pile cap at bent 10.
Photo 16 : Spall with exposed and one broken reinforcing bar on the south side of the northern concrete beam of the east abutment span.
Photo 17 : Typical loose and rotated spacer blocks on the underside of the bascule span (span 8) during a bridge opening.
Photo 18 : Failed galvanized coating on the underside of the counterweight steel shell, looking north.
Photo 19 : Up to 3/8" wide checks in the north face of the bascule span south king post.
Photo 20 : Spall and cracking in the east abutment breastwall.
Photo 21 : A 4" wide crack with settlement of the exposed concrete footing/apron at the south end of the west abutment.
Photo 22 : Typical condition of the timber piles and bracing members in the tidal zone (north end of bents 2 - 5 shown).
Photo 23 : Heavy deterioration, marine growth, and brooming of pile 10 at bent 1.
Photo 24 : Gap between pile 5 and the pile cap at pile bent 10 (east face shown).
Photo 25 : Diagonal bracing member with severe deterioration at the north end of bent 5.
Photo 26 : Collision damage and deterioration to the south end of the fender (east face) at bent 8.
Photo 27 : Collision damage to the south end of the fender (east face) at bent 7A.

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REMARKS

Sketch / Photo Log (Cont'd)

Photo 28 : Moderate collision damage causing the northwest approach guardrail and posts to lean up to 3" to the north.

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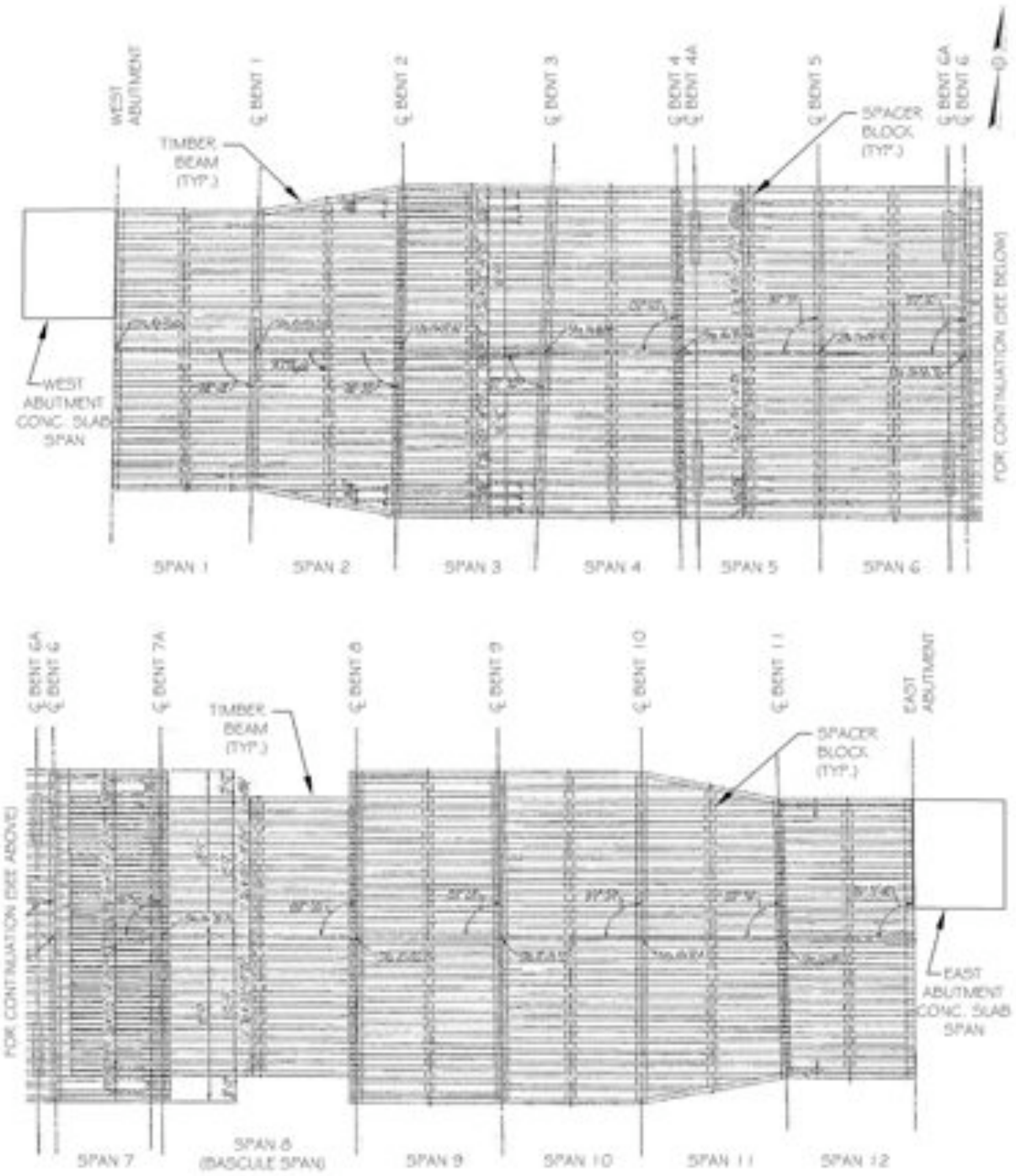
SKETCHES



FRAMING PLAN

NOTE:
NUMBER OF BEAMS VARY FROM SPAN TO SPAN.
BEAMS ARE NUMBERED FROM SOUTH TO NORTH

Sketch 1: Framing plan.

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PHOTOS

Photo 1: **North elevation of the bridge.**

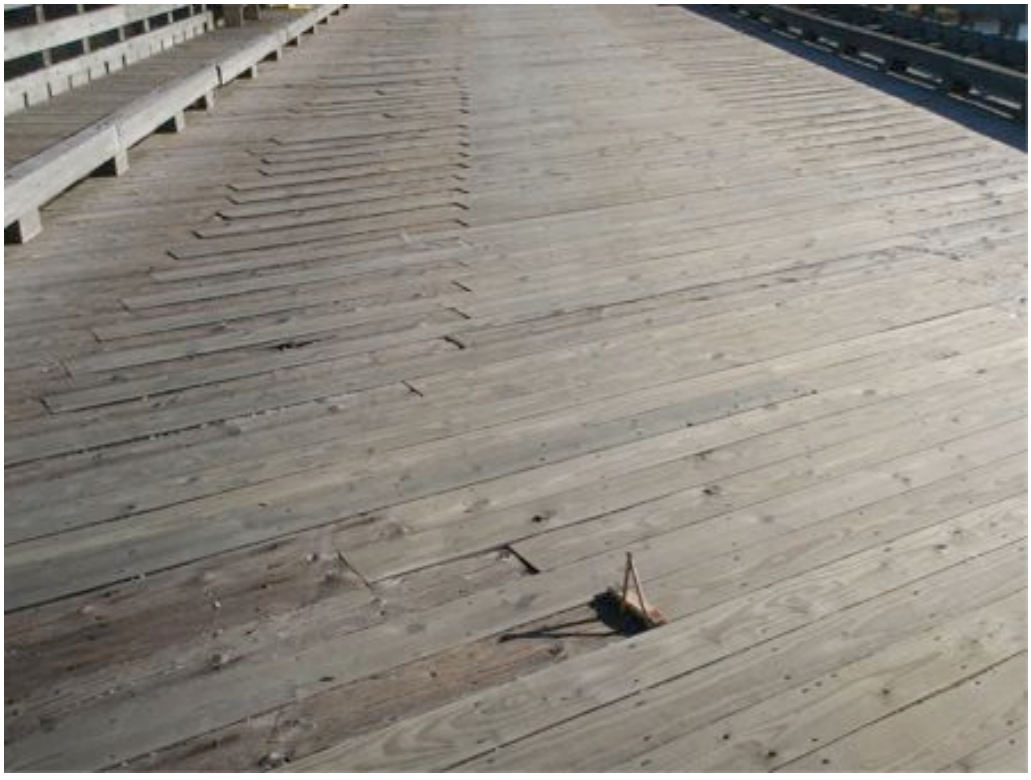

Photo 2: **Typical uneven wearing surface planks (spans 1-7, looking east shown).**

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PHOTOS

Photo 3: **Area of 100% loss to wearing surface planks at the south side of span 1 at the west abutment.**

Photo 4: **Area of 100% loss to the timber deck plank between stringers 10 and 11 near bent 3 in span 4.**

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PHOTOS

Photo 5: **Spall around a weep hole with heavy efflorescence on the underside of the concrete deck at the east abutment span.**

Photo 6: **A 3'-0" long area of rot to the south curb at the east end of the bascule span (span 8).**

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PHOTOS

Photo 7: **Misaligned curb and exposed anchor bolt at the north curb at the west end of span 3.**

Photo 8: **Deteriorated and broken electrical conduit with exposed wires at the west face at the north end of bent 7A.**

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PHOTOS

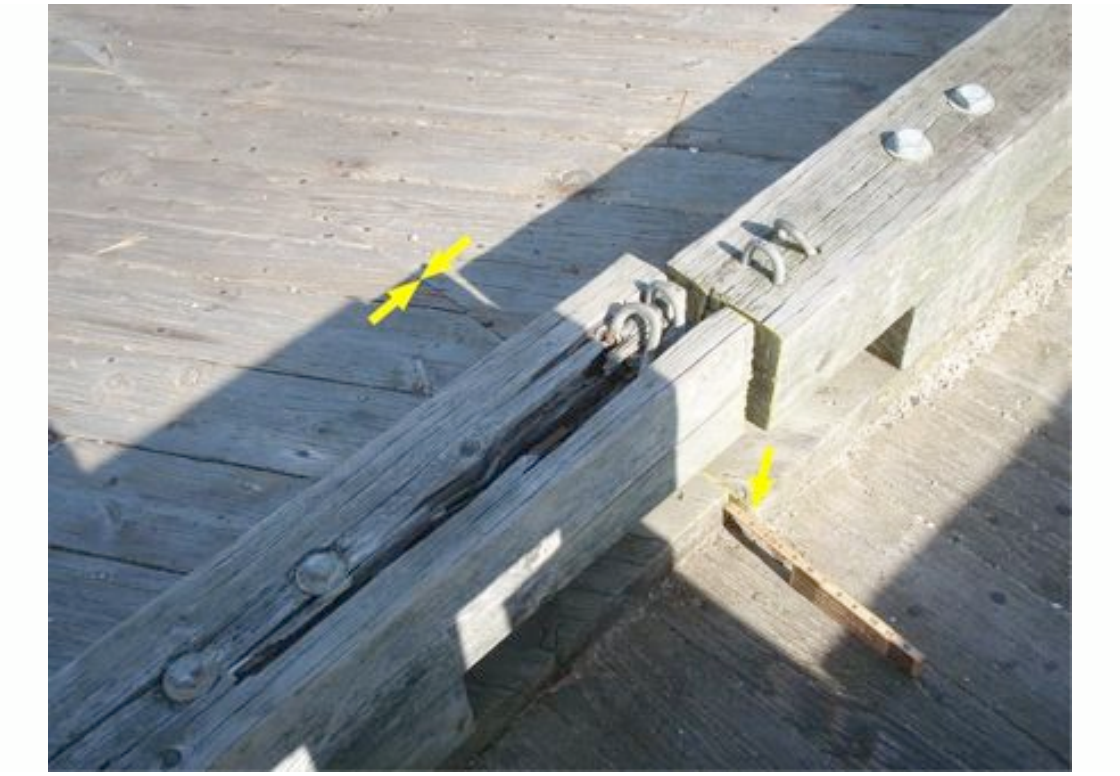

Photo 9: **Lateral misalignment of the bascule span (span 8) on the south end of the toe of the bascule span at bent 8. (Note: Tight joint.)**

Photo 10: **Spall at the west approach roadway adjacent to the west abutment deck joint.**

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PHOTOS

Photo 11: **Moderate cracking with up to 1" of settlement adjacent to the north drainage scupper on the east approach, looking south.**

Photo 12: **Settlement of the northeast approach sidewalk along the curb, looking west.**

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PHOTOS

Photo 13: Horizontal check of the north fascia beam in span 1.

Photo 14: Minor collision damage to the underside of beams 10 and 11 in the bascule span (span 8).

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PHOTOS

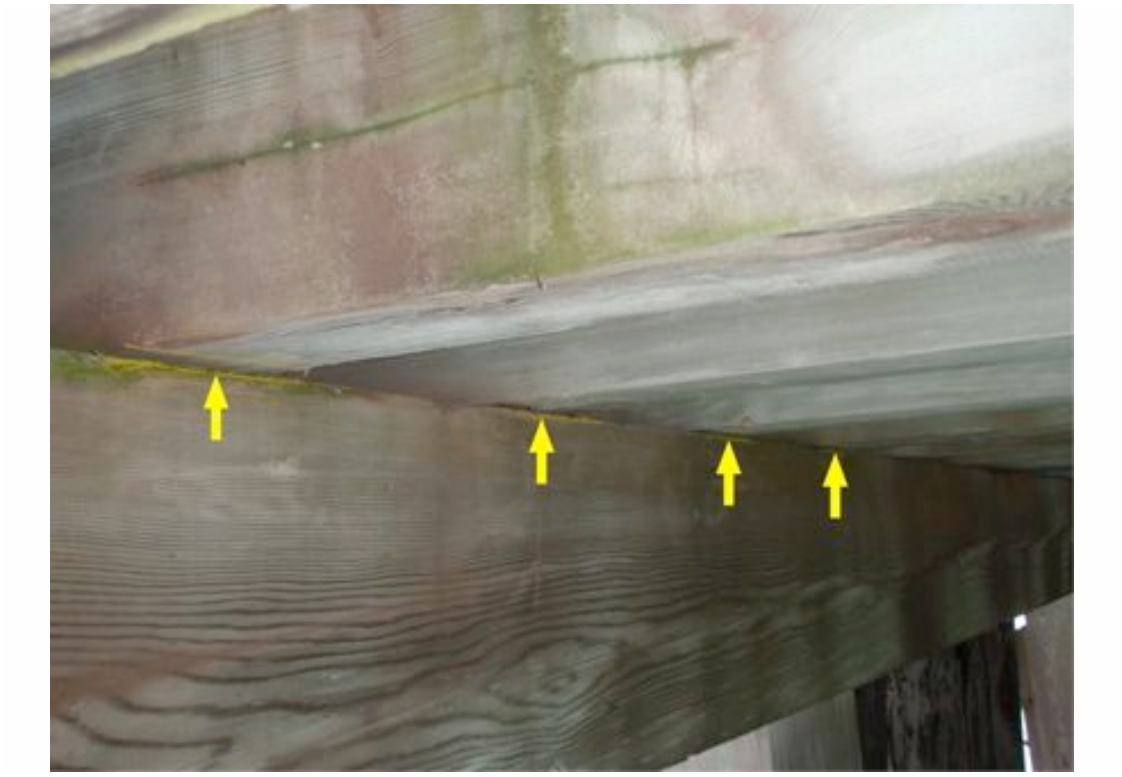

Photo 15: Up to 1/4" gap between beams 5 through 8 and the pile cap at bent 10.

Photo 16: Spall with exposed and one broken reinforcing bar on the south side of the northern concrete beam of the east abutment span.

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PHOTOS

Photo 17: **Typical loose and rotated spacer blocks on the underside of the bascule span (span 8) during a bridge opening.**

Photo 18: **Failed galvanized coating on the underside of the counterweight steel shell, looking north.**

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PHOTOS

Photo 19: Up to 3/8" wide checks in the north face of the bascule span south king post.

Photo 20: Spall and cracking in the east abutment breastwall.

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PHOTOS

Photo 21: **A 4" wide crack with settlement of the exposed concrete footing/ apron at the south end of the west abutment.**

Photo 22: **Typical condition of the timber piles and bracing members in the tidal zone (north end of bents 2 - 5 shown).**

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PHOTOS

Photo 23: Heavy deterioration, marine growth, and brooming of pile 10 at bent 1.

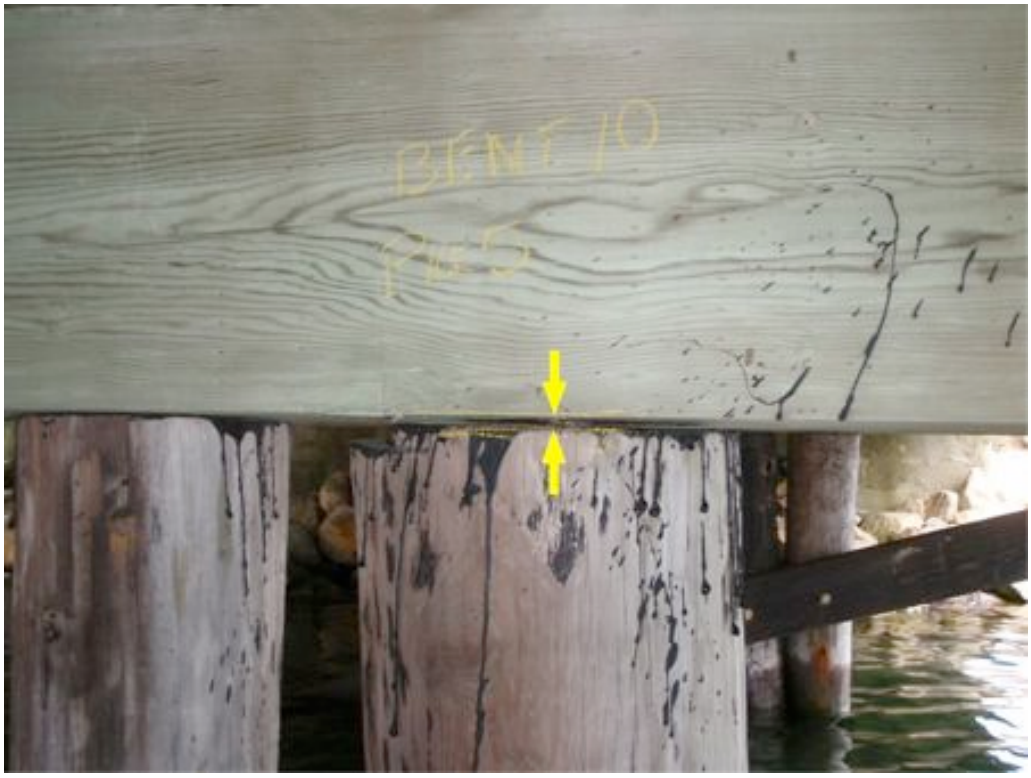

Photo 24: Gap between pile 5 and the pile cap at pile bent 10 (east face shown).

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PHOTOS

Photo 25: Diagonal bracing member with severe deterioration at the north end of bent 5.

Photo 26: Collision damage and deterioration to the south end of the fender (east face) at bent 8.

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PHOTOS

Photo 27: Collision damage to the south end of the fender (east face) at bent 7A.

Photo 28: Moderate collision damage causing the northwest approach guardrail and posts to lean up to 3" to the north.