

2-DIST
05

B.I.N.
45E

UNDERWATER OPERATIONS TEAM
ROUTINE UNDERWATER INSPECTION REPORT

BR. DEPT. NO.
M-05-001=W-06-013

CITY/TOWN MARION=WAREHAM		8-STRUCTURE NO. M05001-45E-DOT-NBI		LEVEL OF INSPECTION II	93B-DATE INSPECTED NOV 18, 2022
07-FACILITY CARRIED US 6 WAREHAM ROAD		ACCESS TO BRIDGE EMBANKMENT		UNDERWATER OPERATIONS ENGINEER WILLIAM J. COLLERAN	
06-FEATURES INTERSECTED WATER WEWEANTIC RIVER		DEPTH 8 m	VISIBILITY 1 m	TEAM LEADER (DIVE MASTER) WILLIAM FERRY	Report submitted by:
BOTTOM CONDITION BOULDERS, GRAVEL		CURRENT TIDAL/SWIFT	TEAM MEMBERS W. J. COLLERAN, B. FITZGERALD, M. GRIFFIN		

ITEM 60		4	ITEM 61	6	ITEM 62	N	
SUBSTRUCTURE		DEF	CHANNEL & CHANNEL PROTECTION	DEF	CULVERTS	DEF	
1. Abutments	N		1. Channel Scour	6	-	-	
a. Pedestals	N	-	2. Embankment Erosion	6	-	-	
b. Bridge Seats	N	-	3. Debris	7	-	-	
c. Backwalls	N	-	4. Vegetation	7	-	-	
d. Breastwalls	N	-	5. Utilities	N	-	-	
e. Wingwalls	N	-	6. Rip-Rap/Slope Protection	6	-	-	
f. Slope Paving/Rip-Rap	N	-	7. Aggradation	8	-	-	
g. Pointing	N	-	8. Fender System	N	-	-	
h. Footings	N	-	a. Piles	N	-	-	
i. Piles	N	-	b. Diagonal Bracing	N	-	-	
j. Scour	N	-	c. Horizontal Bracing	N	-	-	
k. Settlement	N	-	d. Wales	N	-	-	
l.	N	-	e. Fasteners	N	-	-	
2. Piers or Bents	4		f. Ladders	N	-	-	
a. Pedestals	N	-	9.	N	-	-	
b. Caps	N	-	ITEM 59 SUPERSTRUCTURE				
c. Columns	N	-		N	DEF	-	
d. Stems/Webs/Pierwalls	5	S-P		N	-	-	
e. Pointing	4	S-A		N	-	-	
f. Footing	4	S-P		N	-	-	
g. Piles	N	-					
h. Scour	6	-					
i. Settlement	6	-					
j.	N	-					
k.	N	-					
3. Pile Bents	N						
a. Pile Caps	N	-					
b. Piles	N	-					
c. Diagonal Bracing	N	-					
d. Horizontal Bracing	N	-					
e. Fasteners	N	-					
UNDERMINING (Y/N)		N	UNDERMINING (Y/N)				N

DEFICIENCY REPORTING GUIDE

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

CATEGORIES OF DEFICIENCIES:

M= Minor 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 scouring, 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 corroding rebars, Deteriorated timber piles, Considerable settlement, Considerable scouring or undermining, 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: Any part of piles or fender system which are projecting outward and may become a safety hazard for the navigational traffic, 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.]

Y-UNKNOWN N-NOT APPLICABLE H-HIDDEN/INACCESSIBLE R=REMOVED

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REMARKS

GENERAL REMARKS

This structure is a two span bridge with granite block abutments. The bridge is dated 1956. When the bridge was widened a new pier was added at the downstream end of the original pier. The piers are granite faced in the tidal zone with concrete below and a concrete footing. Each pier has a separate footing but has a common concrete pier cap.

Orientation:

Abutments are labeled left and right, looking downstream. Sta 10+00 is at the upstream end of the new pier (see Plan). Sta 10+00 was changed from downstream end of abutments to upstream end of new pier for ease of measurement in 2009.

The newer pierwall is from Sta 9+84 to Sta 10+00.

The original (old) pierwall is from Sta 10+04 to Sta 10+53.

Access:

High Tide at the bridge is the same as High Tide Sippican Harbor.

Low Tide at the bridge is 1 hour after Low Tide Sippican Harbor.

ITEM 60 - SUBSTRUCTURE

Item 60.2 - Piers or Bents

Item 60.2.d - Stems/Webs/Pierwalls

Right Side:

At Sta 10+04 there is severe concrete deterioration with laitance above and in the footing (4.5' L (from nose to angle point) x 2.5' H x 2.5' P). The void is at the bottom of the pier/top of the footing. Due to the irregular top of the footing it is difficult to tell how much of void is in footing and how much is in pier.

At Sta 10+05 there is concrete deterioration above the footing (7.5' L x 2.0' H x 2.0' P).

At Sta 10+40 there is a void in the pierwall (top of footing/mudline) caused by deterioration and laitance (4.0' L x 1.0' H x 1.8' P horizontal penetration). The void is upstream of a deteriorated timber through the pier.

There are several random cracks in the pier cap.

The following cracks were measured at the right side.

Sta 10+08	1/8" max. width.	In 1 st granite course.
Sta 10+27	1/8" max. width.	In 1 st granite course.
Sta 10+33	1/16" max. width.	In 1 st granite course.
Sta 10+41	1/16" max. width.	In 1 st granite course.
Sta 10+45	1/4" max. width.	In 1 st granite course.
Sta 10+48	1/4" max. width.	In 1 st granite course.
	3/4" max. width.	In 2 nd granite course, split block with 1/2" displacement.

Left Side:

At Sta 10+04 there is concrete deterioration with laitance above the footing in the pierwall (4.5' L (from nose to angle point) x 2.6' H x 1.9' P). The void is at the bottom of the pier/top of the footing. Due to the irregular top of the footing it is difficult to tell how much of void is in footing and how much is in pier.

At Sta 10+42 there is concrete deterioration above a deteriorated transverse timber in the footing (1.4' L x 0.4' H x 0.8' P).

At Sta 10+48 there is concrete deterioration just above the footing at the upstream angle point (5.3' L x 1.9' H x 1.5' P).

There are several random cracks in the pier cap.

The following cracks were measured at the left side.

CITY/TOWN MARION=WAREHAM	B.I.N. 45E	BR. DEPT. NO. M-05-001=W-06-013	8.-STRUCTURE NO. M05001-45E-DOT-NBI	INSPECTION DATE NOV 18, 2022
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REMARKS

Sta 9+91	1/16" max. width	In 2 nd granite course.
Sta 10+26	HL max. width	In 1 st granite course.

Item 60.2.e - Pointing

Joints are generally tight below tidal zone with isolated joint penetrations. Pointing is mostly missing in tidal zone with full depth penetrations.

Old Pier (Upstream): Maximum penetration is full depth at the upstream angle point.

New Pier (Downstream): Maximum penetration is full depth at the downstream angle point.

Item 60.2.f - Footing

Old Pier:

The footing is covered by dumped stones at the upstream end. There are severely deteriorated transverse timbers through the pierwall just above the footing at various locations.

Right Side:

The footing is exposed the full length of the right side. The footing toe is 1.5' wide and is severely deteriorated due to laitance. Maximum exposed height is 1.7' (top 0.6' is deteriorated).

Left Side:

The footing is exposed the full length of the left side. The footing toe is 1.5' wide and is severely deteriorated due to laitance. Maximum exposed height is 2.4'.

Downstream End:

The footing toe at the downstream end is 1.3'.

At Sta 10+03 there is severe concrete deterioration with laitance above and in the footing (4.0' L (from nose to angle point) x 2.5' H x 2.5' P). The void is at the bottom of the pier/top of the footing. Due to the irregular top of the footing it is difficult to tell how much of void is in footing and how much is in pier. The void is 1.3' high x 0.7' wide at Sta 10+06, a location with a deteriorated timber in the void.

New Pier:

There is irregular steel sheeting exposed around the new pier. It is cut off at varying heights (0.2'-2.5' above the footing). Maximum height above the mudline at the downstream end is 9.5'.

Item 60.2.g - Piles

According to plans for both the original bridge (1929) and the bridge extension (1956) the pier is not pile supported although the abutments are pile supported.

Item 60.2.h - Scour

Old Pier:

The footing is covered by dumped stones at the upstream end. There are severely deteriorated transverse timbers through the pierwall just above the footing at various locations.

Right Side:

The footing is exposed the full length of the right side. The footing toe is 1.5' wide and is severely deteriorated due to laitance. Maximum exposed height is 1.7' (top 0.6' is deteriorated).

Left Side:

The footing is exposed the full length of the left side. The footing toe is 1.5' wide and is severely deteriorated due to laitance. Maximum exposed height is 2.4'.

Downstream End:

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REMARKS

The footing toe at the downstream end is 1.3'.

At Sta 10+03 there is severe concrete deterioration with laitance above and in the footing (4.0' L (from nose to angle point) x 2.5' H x 2.5' P). The void is at the bottom of the pier/top of the footing. Due to the irregular top of the footing it is difficult to tell how much of void is in footing and how much is in pier. The void is 1.3' high x 0.7' wide at Sta 10+06, a location with a deteriorated timber in the void.

New Pier:

There is irregular steel sheeting exposed around the new pier. It is cut off at varying heights (0.2'-2.5' above the footing). Maximum height above the mudline at the downstream end is 9.5'.

Item 60.2.i - Settlement

Right Side:

There are several random cracks in the pier cap.

The following cracks were measured at the right side.

Sta 10+08	1/8" max. width.	In 1 st granite course.
Sta 10+27	1/8" max. width.	In 1 st granite course.
Sta 10+33	1/16" max. width.	In 1 st granite course.
Sta 10+41	1/16" max. width.	In 1 st granite course.
Sta 10+45	1/4" max. width.	In 1 st granite course.
Sta 10+48	1/4" max. width.	In 1 st granite course.
	3/4" max. width.	In 2 nd granite course, split block with 1/2" displacement.

Left Side:

There are several random cracks in the pier cap.

The following cracks were measured at the left side.

Sta 9+91	1/16" max. width.	In 2 nd granite course.
Sta 10+26	HL max. width.	In 1 st granite course.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.1 - Channel Scour

Old Pier:

The footing is covered by dumped stones at the upstream end. There are severely deteriorated transverse timbers through the pierwall just above the footing at various locations.

Right Side:

The footing is exposed the full length of the right side. The footing toe is 1.5' wide and is severely deteriorated due to laitance. Maximum exposed height is 1.7' (top 0.6' is deteriorated).

Left Side:

The footing is exposed the full length of the left side. The footing toe is 1.5' wide and is severely deteriorated due to laitance. Maximum exposed height is 2.4'.

Downstream End:

The footing toe at the downstream end is 1.3'.

At Sta 10+03 there is severe concrete deterioration with laitance above and in the footing (4.0' L (from nose to angle point) x 2.5' H x 2.5' P). The void is at the bottom of the pier/top of the footing. Due to the irregular top of the footing it is difficult to tell how much of void is in footing and how much is in pier. The void is 1.3' high x 0.7' wide at Sta 10+06, a location with a deteriorated timber in the void.

CITY/TOWN MARION=WAREHAM	B.I.N. 45E	BR. DEPT. NO. M-05-001=W-06-013	8.-STRUCTURE NO. M05001-45E-DOT-NBI	INSPECTION DATE NOV 18, 2022
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REMARKS

New Pier:

There is irregular steel sheeting exposed around the new pier. It is cut off at varying heights (0.2'-2.5' above the footing). Maximum height above the mudline at the downstream end is 9.5'.

Item 61.2 - Embankment Erosion

There is some sloping to rip-rap along both abutments.

Item 61.6 - Rip-Rap/Slope Protection

There is some sloping to rip-rap along both abutments.

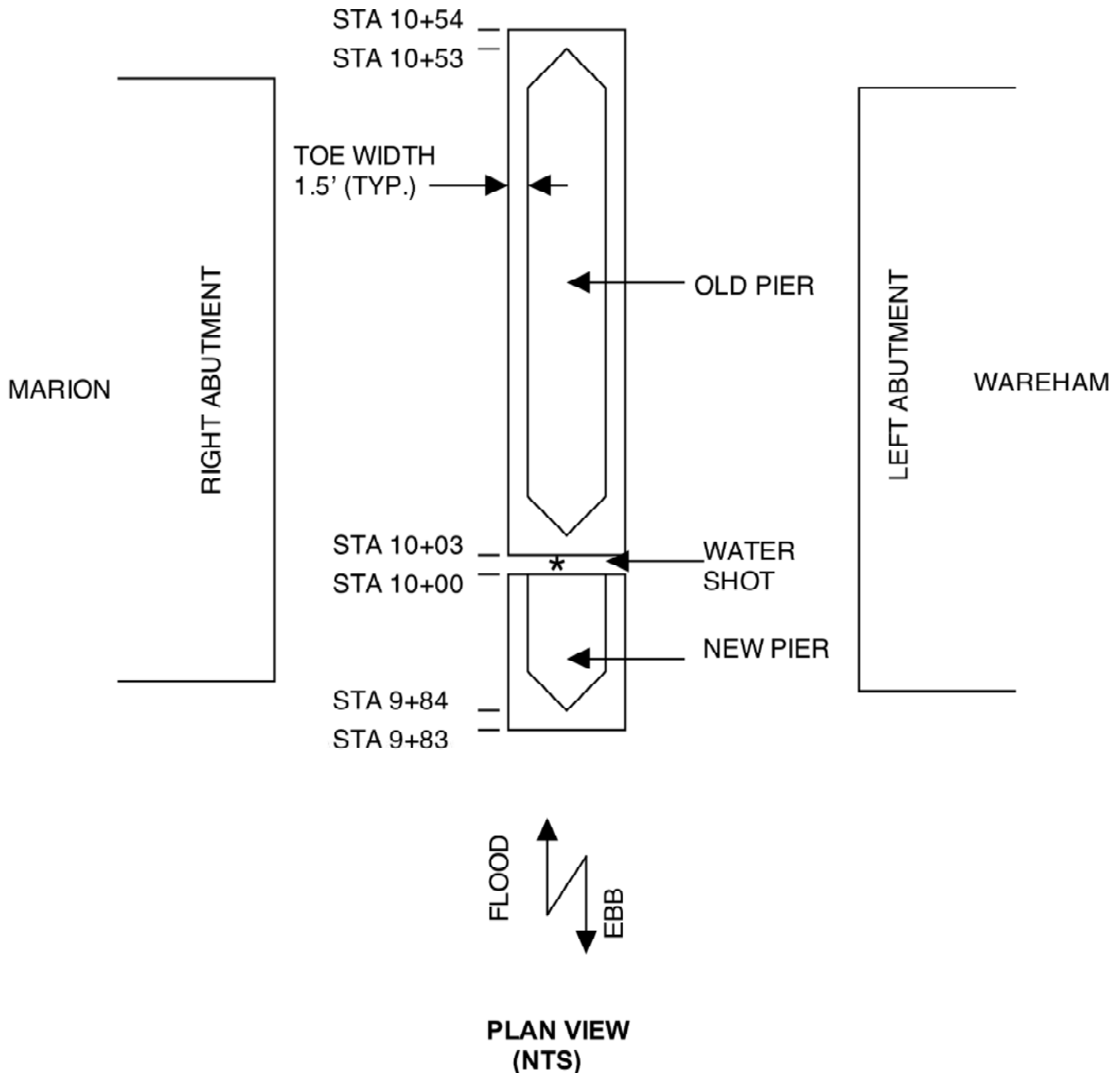
Sketch / Chart Log

Sketch 1 : PLAN VIEW - NOT TO SCALE

Chart 1 : SCOUR MONITORING CHART @ UPSTREAM END OF OLD PIER AT DIAPHRAGMS

CITY/TOWN MARION=WAREHAM	B.I.N. 45E	BR. DEPT. NO. M-05-001=W-06-013	8.-STRUCTURE NO. M05001-45E-DOT-NBI	INSPECTION DATE NOV 18, 2022
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SKETCHES



Sketch 1: PLAN VIEW - NOT TO SCALE

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CHARTS

SCOUR MONITORING CHART (UPSTREAM END OF OLD PIER @ CONCRETE DIAPHRAGMS)

	9/6/96		10/7/15	10/18/16	10/30/17	11/26/18	11/22/19
RIGHT ABUTMENT	DRY	SEE	DRY	+2.9'	DRY	+3.4'	+3.6'
16' OFF RIGHT ABUT.	5.1'	PREVIOUS	5.3'	4.3'	4.5'	5.3'	5.3'
32' OFF RIGHT ABUT.	15.4'	REPORTS	15.5'	16.6'	16.4'	17.0'	15.8'
RIGHT SIDE OF PIER	13.2'	FOR	13.0'	13.7'	12.5'	13.7'	13.5'
LEFT SIDE OF PIER	13.7'	YEARS	13.6'	13.6'	13.4'	13.6'	13.7'
71' OFF RIGHT ABUT.	16.0'	9/14/99	15.9'	17.3'	15.9'	16.9'	16.2'
87' OFF RIGHT ABUT.	3.8'	TO	5.1'	6.6'	6.6'	5.8'	5.9'
LEFT ABUTMENT	DRY	10/29/14	DRY	+3.3'	DRY	+2.8'	+3.6'
Y	4.2'		4.3'	+0.4'	2.8'	4.4'	4.6'
CORRECTION FACTOR	--		+0.1'	-4.6'	-1.4'	+0.2'	+0.4'
	11/19/20	11/2/21	11/18/22				
RIGHT ABUTMENT	+3.4'	+3.4'	DRY				
16' OFF RIGHT ABUT.	6.2'	5.6'	4.9'				
32' OFF RIGHT ABUT.	15.4'	15.6'	15.1'				
RIGHT SIDE OF PIER	13.2'	13.1'	13.2'				
LEFT SIDE OF PIER	13.7'	13.4'	13.8'				
71' OFF RIGHT ABUT.	16.4'	16.4'	15.2'				
87' OFF RIGHT ABUT.	7.1'	6.6'	7.2'				
LEFT ABUTMENT	+3.2'	+3.2'	DRY				
Y	1.3'	5.0'	4.1'				
CORRECTION FACTOR	-2.9'	+0.8'	-0.1'				

NOTES:

1. WATERLINE TO BOTTOM OF PIER CAP, UPSTREAM END OF NEW PIER (STA 10+00) = Y = 4.2' (9/6/96).
2. SOUNDINGS ADJUSTED TO 9/6/96 WATERLINE WITH CORRECTION FACTOR.
3. STA 10+00 IS AT THE UPSTREAM END OF THE NEW PIER.
4. SOUNDINGS ARE TAKEN BELOW DIAPHRAGMS.

Chart 1: SCOUR MONITORING CHART @ UPSTREAM END OF OLD PIER AT DIAPHRAGMS