

STRUCTURE S-6B
INSPECTION DATE: 2/19/2020



Three Barrels, 60" x 64' Long

Location:	USJRB South
	Levee L-75
Latitude:	27.6996 N
Longitude:	80.6753 W
Type:	Gated Culvert
No. Barrels:	Three
Inspection	
Start Date:	2/19/2020
End Date:	2/19/2020

TEAM MEMBERS	
Lead Engineer	Jeffrey O'Connor, P.E.
Dive Supervisor	Vince Trotta
Diver	Ryan Duncan
Diver – Standby	Natasha Daniel
Dive Tender	Mike LaRocco
Dive Tender	
Animal Control	TJ McDonagh
SJRWMD Agent	

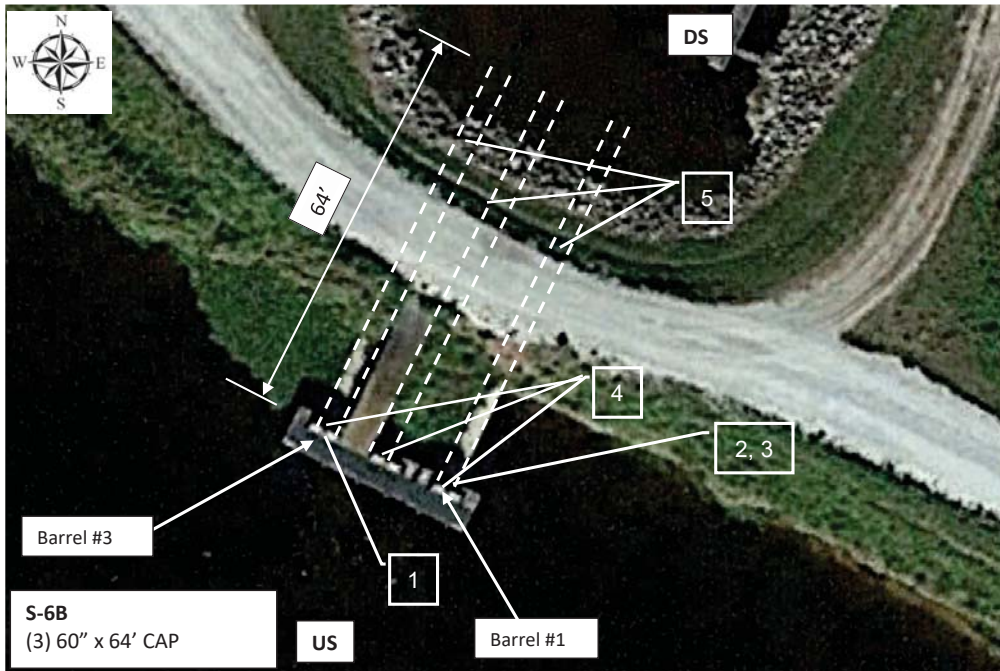
Respectfully Submitted,
UNDERWATER ENGINEERING SERVICES, INC.
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Jeffrey O'Connor, P.E. (FL 50914)
Vice President
Project Manager



Digitally signed by
Jeffrey H O'Connor
Date: 2020.06.25
10:55:18 -04'00'

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Aerial View of Structure



No.	Item No.	Inspection Item	Rating	Deficiency
1	US54	Channels for Stoplogs	C-3	Gate #3 stoplog channel on east side has missing grout over a 9" height at the waterline.
2	US105	Expansion/Const. Joints	C-3	Box #1 has a construction joint with soft sealant material.
3	US104	Headwall	C-2	Box # 1 has a diagonal hairline crack on the west face.
4	DS58	Debris	C-2	All three culverts had vegetation debris and sediment on top of the sills and seals.
5	DS115	Culverts	C-2	All three barrels have minor pitting corrosion.

Structure Description and Method of Underwater Inspection

Structure S-6B is a gated culvert comprised of three culverts, extending southwest (gated end) to northeast (discharge end) under Levee L-75. The barrels are CAP, 60 inches diameter x 64' long.

The underwater inspection was performed by a 5-person dive team on February 19, 2020. The dive team worked from a dive trailer, using surface-supplied air, and accessed the structure areas from the banks.

The scope of services included the underwater inspection of the submerged structure components. The area extended 20 feet beyond the structure edges.

The air temperature was 75 degrees F. and the weather was mostly clear. The underwater visibility ranged from 1 to 2 feet. There were no staff gauges, so the water level was unknown.

Rating System

- C-1: No action needed
- C-2: Monitor condition at next dive inspection (5 years)
- C-3: Schedule repair/replacement (for routine items)
- C-4: Schedule repair/replacement (for safety or operational items)
- C-5: Repair/replace immediately (for structural items)
- C-6: Critical - Repair/replace immediately (for operational items)

Summary of Observations

Items Rated C-5 and Above

There were no items rated C-5 and above.

Items Rated C-4

There were no items rated C-4

Items Rated C-3

- Item US54: Gate #3 stoplog channel on east side has missing grout up to 3.5" deep maximum over a 9" vertical height at the waterline.
 - Recommended Action: Install new grout where missing on Gate #3 east side stoplog channel.
- Item US105: Box #1 has a 1" wide construction joint from the west frame to the southwest corner with soft sealant material. The flexible sealant could be pushed into the joint.
 - Recommended Action: Remove and install new construction joint flex sealant in Box #1 from the southwest corner to the gate.

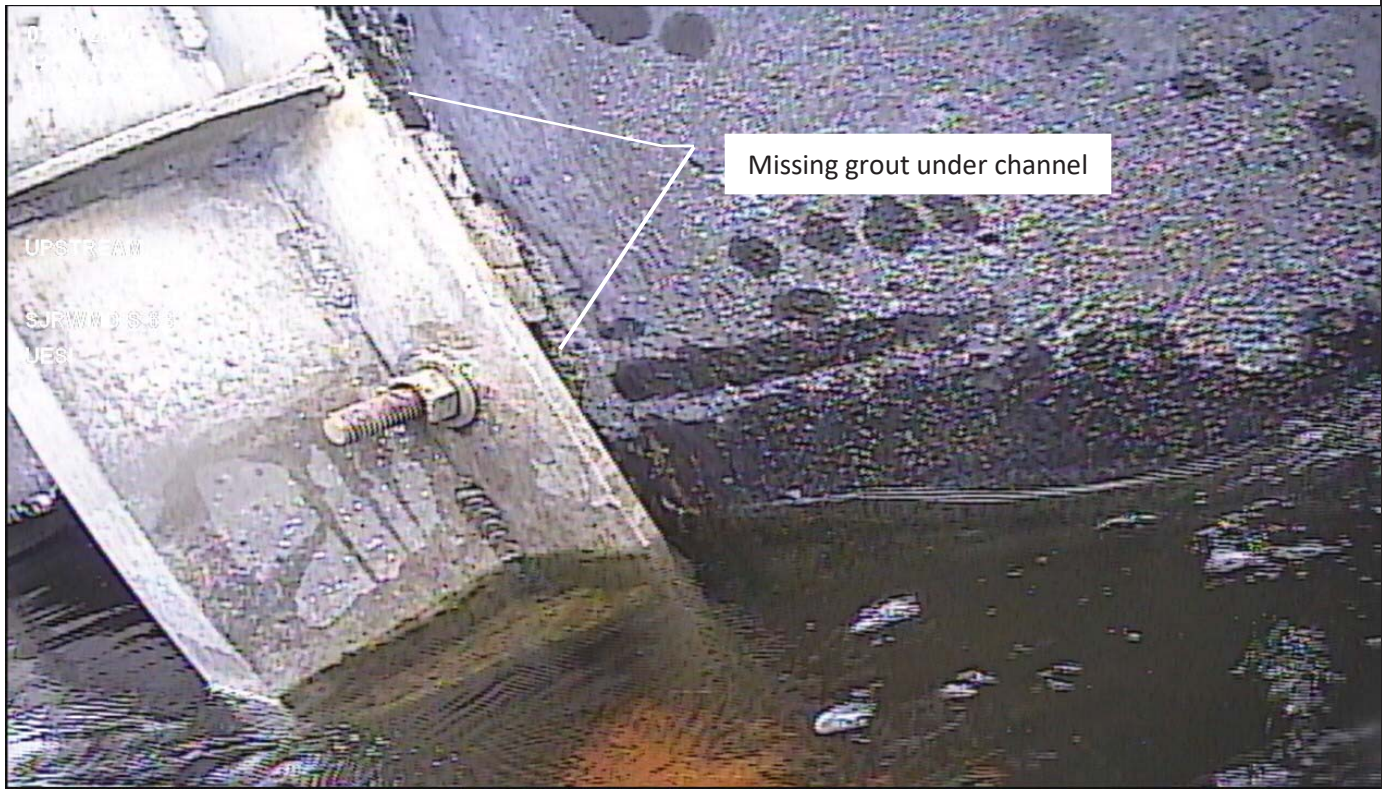
Items Rated C-2

- Item US104: Box # 1 has a diagonal hairline crack on the west face from the upper west opening extending 18" up and east.

- Recommended Action: Monitor hairline crack for worsening conditions.
- Item DS58: All three culverts had vegetation debris and sediment built up ranging in depth from 2" to 6" on top of the sill where the bottom of the gate would mate.
 - Recommended Action: Monitor debris and remove it if it interferes with the function of gate and seal.
- DS115: All three barrels have minor to moderate pitting corrosion typically 1/32" deep maximum from 2:00 through the invert to 10:00 with 50% coverage, and 1/64" deep maximum from 10:00 across the crown to 2:00 with 10% coverage.
 - Recommended Action: Monitor culvert for advanced corrosion and/or section loss.

PHOTOGRAPHS

Item No.: US54 Channel Stoplogs	Rating: C-3	Photo Description: Missing grout under channel.
Deficiency: Gate #3 stoplog channel on east side has missing grout up to 3.5" deep maximum over a 9" vertical height at the waterline.		
Probable Cause: The missing grout is most likely due to poor construction.		
Recommendation: Install new grout where missing on Gate #3 east side stoplog channel.		



Item No.: US105 Expansion/Construction Joints	Rating: C-3	Photo Description: Soft, movable joint sealant.
Deficiency: Box #1 has a 1" wide construction joint from the west frame to the southwest corner with soft sealant material. The flexible sealant could be pushed into the joint.		
Probable Cause: Joint flex sealant most likely damaged during install or degrading due to chemicals in the water and age.		
Recommendation: Remove and install new construction joint flex sealant in Box #1 from the southwest corner to the gate.		



APPENDIX

CHECKLISTS

Structure No. S-6B

UPSTREAM EROSION CONTROL

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
US1	Slope/Banks of Channel	1	No deficiencies noted		
US2	Rip Rap	1	No deficiencies noted		
US3	Exposed erosion-Control Fabric	1	No deficiencies noted		
US4	Evidence of stone displacement (bedding stone)	1	No deficiencies noted		
US5	Channel Stabilization and erosion control	1	No deficiencies noted		

UPSTREAM GENERAL

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
US50	Structural - General Concrete Condition	2	Refer to US104		
US51	Structural - General Metal Condition	1	No deficiencies noted		
US52	Structural - General Timber Condition	NA	Item not present		
US53	Construction Joints (Bolts, Welds)	NA	Item not present		
US54	Channels for Stoplogs or Flashboards	3	Gate #3 stoplog channel on east side has missing grout up to 3.5" deep maximum over a 9" vertical height at the waterline [12:23].	Install new grout where missing on Gate #3 east side stoplog channel.	The missing grout is most likely due to poor construction.
US55	Settlement	1	No deficiencies noted		
US56	Shoaling/Scour	1	No deficiencies noted		
US57	Fouling/Marine Growth	1	No deficiencies noted		
US58	Debris	NA	Item not present		
US59	Stilling Wells	NA	Item not present		
US60	Underwater Controls/Instruments	NA	Item not present		
US61	Fenders	NA	Item not present		

UPSTREAM STRUCTURE

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
US100	Wingwalls	NA	Item not present		
US101	Buttresses (support arms for wall)	NA	Item not present		
US102	Abutments	NA	Item not present		
US103	Retention Walls	NA	Item not present		
US104	Headwall	2	Box # 1 has a diagonal hairline crack on the west face from the upper west opening extending 18" up and east [12:58].	Monitor hairline crack for worsening conditions.	Crack is most likely due to concrete shrinkage.
US105	Expansion/Construction Joints	3	Box #1 has a 1" wide construction joint from the west frame to the southwest corner with soft sealant material. The flexible sealant could be pushed into the joint [12:16].	Remove and install new construction joint flex sealant in Box #1 from the southwest corner to the gate (exterior side).	Joint flex sealant most likely damaged during install or degrading due to chemicals in the water and age.
US106	Sheetpiles and Bulkheads	NA	Item not present		
US107	Wales/Tiebacks	NA	Item not present		
US108	Intake Bays	NA	Item not present		
US109	Piers	NA	Item not present		
US110	Foundation	NA	Item not present		
US111	Weir/Weir crest	NA	Item not present		
US112	Baffles	NA	Item not present		
US113	Underwater Apron Slabs	NA	Item not present		
US114	Structural Support, Bracing or Frames	NA	Item not present		

Structure No. S-6B

US115	Culverts	NA	Item not present		
US116	Risers	NA	Item not present		

UPSTREAM GATES

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
US151	Structure Gate(s)	1	No deficiencies noted		
US152	Gate Guides and Gate Control	1	No deficiencies noted		
US153	Gate Seals & Mating Surface	1	No deficiencies noted		
US154	Cathodic Protection (entire structure)	NA	Item not present		
US155	Operator/Actuator Components	1	Above water		
US156	Emergency Closure Gates	NA	Item not present		
US306	Navigation Lock Miter Gates	NA	Item not present		

Structure Name/No.: S-6B

DOWNSTREAM EROSION CONTROL

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
DS1	Slope/Banks of Channel	1	No deficiencies noted		
DS2	Rip Rap	1	No deficiencies noted		
DS3	Exposed erosion-Control Fabric	1	No deficiencies noted		
DS4	Evidence of stone displacement (bedding stone)	1	No deficiencies noted		
DS5	Channel Stabilization and erosion control	1	No deficiencies noted		

DOWNSTREAM GENERAL

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
DS50	Structural - General Concrete Condition	NA	Item not present		
DS51	Structural - General Metal Condition	2	See DS115		
DS52	Structural - General Timber Condition	NA	Item not present		
DS53	Construction Joints (Bolts, Welds)	NA	Item not present		
DS54	Channels for Stoplogs or Flashboards	NA	Item not present		
DS55	Settlement	NA	Item not present		
DS56	Shoaling/Scour	NA	Item not present		
DS57	Fouling/Marine Growth	NA	Item not present		
DS58	Debris	2	All three culverts had vegetation debris and sediment built up ranging in depth from 2" to 6" on top of the sill where the bottom of the gate would mate [10:47, 11:06, 11:20].	Monitor debris and remove it if it interferes with the function of gate and seal.	The debris deposit and vegetation is natural with a low flow condition.
DS59	Stilling Wells	NA	Item not present		
DS60	Underwater Controls/Instruments	NA	Item not present		
DS61	Fenders	NA	Item not present		

DOWNSTREAM STRUCTURE

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
DS100	Wingwalls	NA	Item not present		
DS101	Buttresses (support arms for wall)	NA	Item not present		
DS102	Abutments	NA	Item not present		
DS103	Retention Walls	NA	Item not present		
DS104	Headwall	NA	Item not present		
DS105	Expansion/Construction Joints	NA	Item not present		
DS106	Sheetpiles and Bulkheads	NA	Item not present		
DS107	Wales/Tiebacks	NA	Item not present		
DS108	Intake Bays	NA	Item not present		
DS109	Piers	NA	Item not present		
DS110	Foundation	NA	Item not present		
DS111	Weir/Weir crest	NA	Item not present		
DS112	Baffles	NA	Item not present		
DS113	Underwater Apron Slabs	NA	Item not present		
DS114	Structural Support, Bracing or Frames	NA	Item not present		

Structure Name/No.: S-6B

DS115	Culverts	2	All three barrels have pitting corrosion typically 1/32" deep maximum from 2:00 through the invert to 10:00 with 50% coverage, and 1/64" deep maximum from 10:00 across the crown to 2:00 with 10% coverage [10:33, 10:59, 11:12].	Monitor culvert for advanced corrosion and/or section loss.	The corrosion was due to chemical attack from the water.
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DOWNSTREAM GATES

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
DS151	Structure Gate(s)	1	Above water		
DS152	Gate Guides and Gate Control	1	No deficiencies noted		
DS153	Gate Seals & Mating Surface	1	No deficiencies noted. Refer also to DS58.		
DS154	Cathodic Protection (entire structure)	NA	Item not present		
DS155	Operator/Actuator Components	NA	Item not present		
DS156	Emergency Closure Gates	NA	Item not present		
DS157	Navigation Lock Miter Gates	NA	Item not present		
DS1000	Additional Items and Comments	NA	Item not present		