

STRUCTURE S-252B
INSPECTION DATE: 4/2/2020



Two Barrel, 60" Diameter x 126' Long

Location:	USJRB South
	Levee L-78
Latitude:	27.6409 N
Longitude:	80.7168 W
Type:	Culvert (No gates)
No. Barrels:	Two
Inspection	
Start Date:	4/2/2020
End Date:	4/2/2020

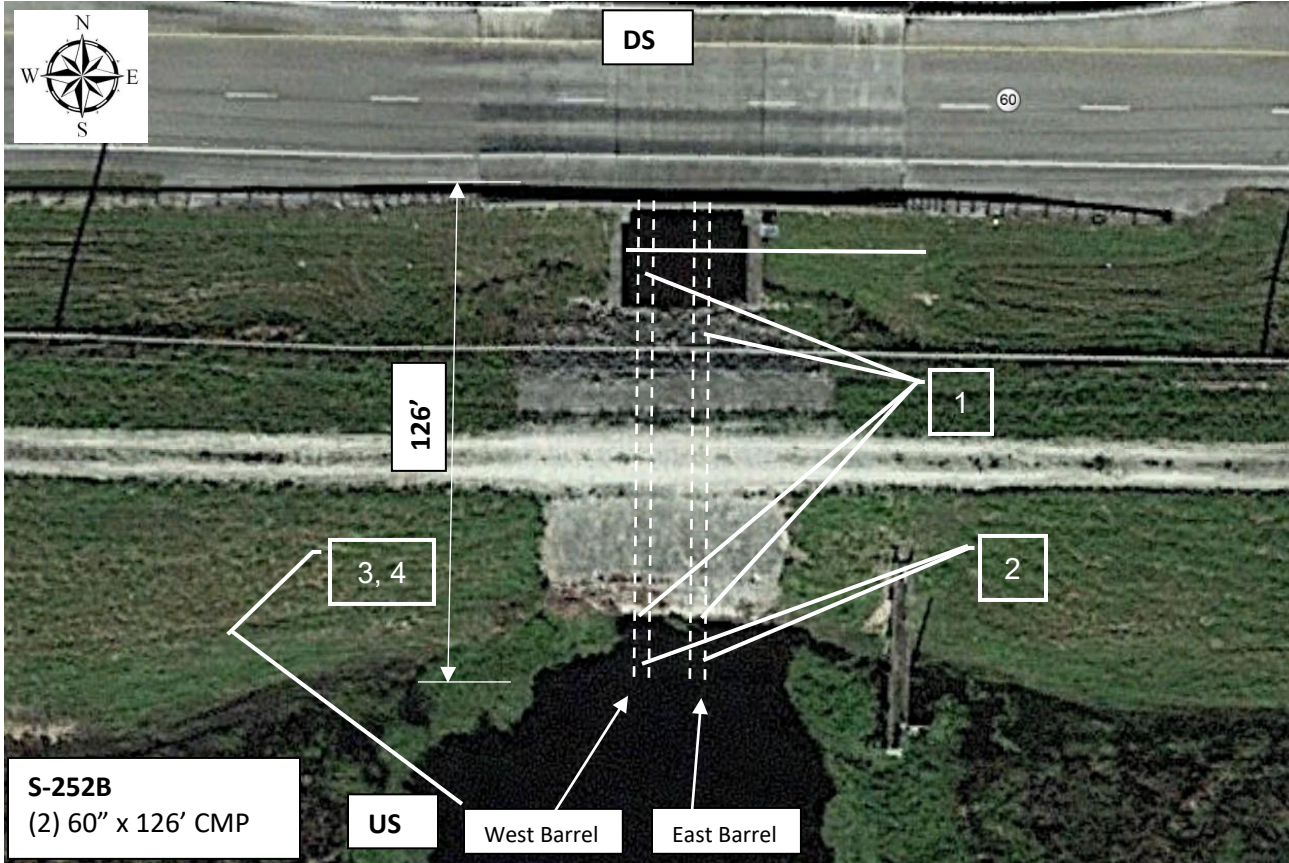
TEAM MEMBERS	
Lead Engineer	Jeffrey O'Connor, P.E.
Dive Supervisor	Jordan Klingler
Diver	Aaron Willard
Diver – Standby	Ben Harpel
Dive Tender	Natasha Daniel
Dive Tender	
Animal Control	TJ McDonagh
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Respectfully Submitted,
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Aerial View of Structure



No.	Item No.	Inspection Item	Rating	Deficiency
1	US115	Culverts	C-4	Moderate corrosion throughout and major corrosion at both ends of the barrels.
2	US56	Shoaling/Scour	C-3	The upstream ends of each barrel are suspended above the channel bottom.
3	DS1000	Additional Items	C-3	The upstream SW staff gauge is missing numbers from 26' and below.
4	DS1000	Additional Items	C-2	The SW staff gauge timber gauge board has minor weathering.

Structure Description and Method of Underwater Inspection

Structure S-252B is an ungated culvert comprised of two barrels, extending south (open end) to north under Levee L-78. The barrels are CMP, 60 inches diameter by 126' feet long. The south end has an access pier comprised of steel piles and a metal superstructure.

The underwater inspection was performed by a 5-person dive team on April 2 and 3, 2020. The dive team worked from a dive trailer, using surface-supplied air, and accessed the structure areas from the bank.

The scope of services included the underwater inspection of the submerged structure components. The area extended 20 feet beyond the structure edges. There were no boat barriers.

The air temperature was 72 degrees F. and the weather was mostly clear. The underwater visibility ranged from 0 to 1 ft. The upstream side has two staff gauges. The water level was 5.2 Ft per the eastern staff gauge and approximately 24.5 Ft per the southwestern staff gauge. There was no downstream staff gauge.

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

- Item US115: The culverts were inspected from the upstream end. (1) The upstream 10' and the downstream 25' have moderate to heavy corrosion with multiple corrosion holes from 10:00 to 2:00. These are the extension (exposed) areas beyond the embankment. (2) The west barrel has corrosion holes under the embankment portion from 97' to 100' from the upstream end. One hole extends from 09:00 to 12:00 and is 13" wide with a large rock protruding and other rocks behind the hole. There is a second hole slightly larger, 2' to the north on the same side of the culvert. (3) The downstream 20' of the western barrel was inspected from the downstream end due to safety concerns. There are large sections of the barrel missing from corrosion. (4) The remainder of the culvert typically has corrosion pitting of 1/64" covering 40% of the area.
 - Recommended Action: Schedule relining or replacement of both culverts.

Items Rated C-3

- Item US56: The east barrel is suspended 3' with 5" of vertical space under the upstream end [16:49]. The west barrel is suspended 5' with 10" of vertical space under the upstream end.
 - Recommended Action: Support the suspended barrel section with sand or grout bags and/or pumped grout.
- Item DS1000: The upstream SW staff gauge is missing numbers from 26' and below.
 - Recommended Action: Install new numbering for the upstream SW staff gauge below the 26' mark if still used.

Items Rated C-2

- Item DS1000: The SW staff gauge timber gauge board has minor weathering.
 - Recommended Action: Monitor the timber gauge board for advanced weathering and decay.

PHOTOGRAPHS

Item No.: US115 Culverts	Rating: C-4	Photo Description: Heavy corrosion on barrels
<p>Deficiency: The culverts were inspected from the upstream end. (1) The upstream 10' and the downstream 25' have moderate to heavy corrosion with multiple corrosion holes from 10:00 to 2:00. These are the extension (exposed) areas beyond the embankment. (2) The west barrel has corrosion holes under the embankment portion from 97' to 100' from the upstream end. One hole extends from 09:00 to 12:00 and is 13" wide with a large rock protruding and other rocks behind the hole. There is a second hole slightly larger, 2' to the north on the same side of the culvert. (3) The downstream 20' of the western barrel was inspected from the downstream end due to safety concerns. There are large sections of the barrel missing from corrosion. (4) The remainder of the culvert typically has corrosion pitting of 1/64" covering 40% of the area.</p>		
<p>Probable Cause: The corrosion was due to chemical attack from the water.</p>		
<p>Recommendation: Schedule relining or replacement of both culverts.</p>		



Item No.: US56 Scour/Shoaling	Rating: C-3	Photo Description: Suspended section of barrel
Deficiency: The east barrel is suspended 3' with 5" of vertical space under the upstream end. The west barrel is suspended 5' with 10" of vertical space under the upstream end.		
Probable Cause: The supporting bed material under the culverts was not protected adequately from scour.		
Recommendation: Support the suspended barrel section with sand or grout bags and/or pumped grout.		
No image available – black water conditions at the pipe invert		

Item No.: DS1000 Additional Items	Rating: C-3	Photo Description: Missing numbers on SW staff gauge
Deficiency: The upstream SW staff gauge is missing numbers from 26' and below.		
Probable Cause: The numbers failed from galvanic corrosion on the plate in contact with the stainless steel screws.		
Recommendation: Install new numbering for the upstream staff gauge below the 26' mark if still used.		



APPENDIX

CHECKLISTS

Structure No. S-252B

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	NA	Item not present		
US51	Structural - General Metal Condition	4	See US115		
US52	Structural - General Timber Condition	NA	Item not present		
US53	Construction Joints (Bolts, Welds)	NA	Item not present		
US54	Channels for Stoplogs or Flashboards	NA	Item not present		
US55	Settlement	1	No deficiencies noted		
US56	Shoaling/Scour	3	The east barrel is suspended 3' with 5" of vertical space under the upstream end [16:49]. The west barrel is suspended 5' with 10" of vertical space under the upstream end [16:52].	Support the suspended barrel section with sand or grout bags and/or pumped grout.	The supporting bed material under the culverts was not protected adequately from scour.
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	NA	Item not present		
US105	Expansion/Construction Joints	NA	Item not present		
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	1	Water Sampling Pier east of the culvert. No deficiencies noted.		

Structure No. S-252B

			<p>This structure had no gates. The culverts were inspected from the upstream end. (1) The upstream 10' and the downstream 25' have moderate to heavy corrosion with multiple corrosion holes from 10:00 to 2:00. These are the extension (exposed) areas beyond the embankment [15:20, 15:33, 16:01 and 16:20]. (2) The west barrel has corrosion holes under the embankment portion from 97' to 100' from the upstream end. One hole extends from 09:00 to 12:00 and is 13" wide with a large rock protruding and other rocks behind the hole [16:20]. There is a second hole slightly larger, 2' to the north on the same side of the culvert [16:27]. (3) The downstream 20' of the western barrel was inspected from the downstream end due to safety concerns. There are large sections of the barrel missing from corrosion. (4) The remainder of the culvert typically has corrosion pitting of 1/64" covering 40% of the area.</p>		
US115	Culverts	4		Schedule relining or replacement of both culverts.	The corrosion was due to chemical attack from the water.
US116	Risers	NA	Item not present		

UPSTREAM GATES

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
US151	Structure Gate(s)	NA	Item not present		
US152	Gate Guides and Gate Control	NA	Item not present		
US153	Gate Seals & Mating Surface	NA	Item not present		
US154	Cathodic Protection (entire structure)	NA	Item not present		
US155	Operator/Actuator Components	NA	Item not present		
US156	Emergency Closure Gates	NA	Item not present		
US306	Navigation Lock Miter Gates	NA	Item not present		

Structure Name/No.: S-252B

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	4	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	1	No deficiencies noted		
DS56	Shoaling/Scour	1	No deficiencies noted		
DS57	Fouling/Marine Growth	1	No deficiencies noted		
DS58	Debris	NA	Item not present		
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		
DS115	Culverts	4	Barrels inspected from the upstream end. Refer to US115		

Structure Name/No.: S-252B

DOWNSTREAM GATES

Finding #	Inspection Item	Rating	Comments	Recommended action	Probable cause
DS151	Structure Gate(s)	NA	Item not present		
DS152	Gate Guides and Gate Control	NA	Item not present		
DS153	Gate Seals & Mating Surface	NA	Item not present		
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	3	There are two staff gauges on the upstream side. (1) C-3: The upstream SW staff gauge is missing numbers from 26' and below. (2) C-2: The SW staff gauge timber gauge board has minor weathering.	Install new numbering for the upstream staff gauge below the 26' mark if still used. Monitor the timber gauge board for advanced weathering and decay.	The numbers failed from galvanic corrosion on the plate in contact with the stainless steel screws. The timber weathering is typical of timber of its age and in the environment.