



Underwater Engineering Services, Inc.

Jonathan's Landing Annual Inspection Report



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On December 12-13 of 2022 UESI performed an annual underwater Inspection of the (WCS) Water Control Structure located within Jonathan's Landing. This inspection included: (1) Water Blasting the interior/exterior gate, frame and 6" of head wall around gate frame. (2) Assessing the condition of the exterior/interior concrete head wall, gate frame hardware and gate seals (3) Clean and lubricate gate seals and moving parts. (4) Determine the percentage of hard and soft growth (5) Identify any sediment/debris located within culverts as well as outside the WCS. This process was performed at (WCS) 1,2,3,4,5 and 6.

WATER CONTROL STRUCTURE #1



- **Hard Growth on the Exterior side** of the WCS had a total of **0 %** coverage of Hard Growth at an estimated height of **0 "** **Soft Growth on the Exterior side** was an estimated total coverage of **5 %** and a height of **1/16 "**.

NOTES:

- **Hard Growth on the Interior side** of the WCS had a total of **0 %** coverage of Hard Growth at an estimated height of **0 "** **Soft Growth on the Interior side** was an estimated total coverage of **100 %** and a height of **1/16" to 1/4"**.

NOTES:

- **Natural Bottom Report on the gate Exterior side:** was reported as a **SAND** bottom on the gate exterior side with **14** " of freeboard below the gates invert.
- **Natural Bottom Report on the gate Interior side:** was reported as a **SAND/ SHELL/ORGANIC** bottom on the gate Interior side with **46** " of freeboard below the gates invert.

WATER CONTROL STRUCTURE #1

Exterior Concrete Headwall appeared to be in **MODERATE** condition with **LIGHT** pop outs noted. The average pop out dimensions were **1/4** " in diameter and **1/8** " in depth? The total coverage of the pop out was an estimated at **100** %. There was **HEAVY** indication of cracking and loss in wall definition noted.

NOTES: 20 small 1" X 1" Splash zone repairs have been noted on the exterior headwall. Two of the splash zone repairs had rust staining or bleed through. Also noted was a hairline crack that started on the exterior headwall cap and ran vertical down through the southern side of the gate.

- **Interior Concrete Headwall** appeared to be in **POOR** condition with **HEAVY** loss in definition noted. The total coverage of the definition loss was an estimated at **60%**. There was **HEAVY** indication of cracking or spalling noted.

NOTES: The diver noted heavy definition loss on the interior wall of the culvert box. The definition loss was estimated to be 10% at an estimated 60% wall coverage below the waterline. The diver also noted a vertical diagonal hairline crack that ran from the bottom on the north side of the culvert box approximately 36" were it terminated. The diver was unable to detect any water flowing through the cracks.

- **The Gate and Gate frame Condition** was **MODERATE** with **LIGHT** corrosion noted with an estimated total coverage of **10%**.

NOTES:

- **Hardware on the Gate and Gate Frame** showed signs of **LIGHT** corrosion. All hardware/cotter pins were present **NO** and tight **YES**
Bolt Count **26 total / MISSING 11 STUDS** in gate frame to headwall

NOTES:

- **Gates seals** showed **HEAVY** indication of dry rot, splits or tearing. Overall condition of gate seals appeared to be in **POOR**. Needs replaced **YES**

NOTES

WATER CONTROL STRUCTURE #2



- ***Hard Growth on the Exterior side*** of the WCS had a total of **40 %** coverage of Hard Growth at an estimated height of **1/2"** **Soft Growth on the Exterior side** was an estimated total coverage of **10 %** and a height of **1/2 "**.

NOTES:

- ***Hard Growth on the Interior side*** of the WCS had a total of **0 %** coverage of Hard Growth at an estimated height of **0 "** **Soft Growth on the Interior side** was an estimated total coverage of **50 %** and a height of **5"**.

NOTES:

- ***Natural Bottom Report on the gate Exterior side:*** was reported as a **SAND/MUD/ORGANIC** bottom on the gate exterior side with **53 "** of freeboard below the gates invert.
- ***Natural Bottom Report on the gate Interior side:*** was reported as a **SAND/ SHELL/ORGANIC** bottom on the gate Interior side with **68 "** of freeboard below the gates invert.

WATER CONTROL STRUCTURE #2

- **Exterior Concrete Headwall** appeared to be in **MODERATE** condition with **LIGHT** pop outs noted. The average pop out dimensions were **1/4"** in diameter and **1/8"** in depth? The total coverage of the pop out was an estimated at **100** %. There was **HEAVY** indication of cracking and loss in wall definition noted.

NOTES:

- **Interior Concrete Headwall** appeared to be in **MODERATE** condition with **LIGHT** pop outs noted. The average pop out dimensions were **1/4"** in diameter and **1/8"** in depth? The total coverage of the pop out was an estimated at **3%**. There was **NO** indication of cracking or spalling noted.

NOTES:

- **The Gate and Gate frame Condition** was in **EXCELLENT** condition with **LIGHT** corrosion noted with an estimated total coverage of **5%**.

NOTES:

- **Hardware on the Gate and Gate Frame** showed signs of **LIGHT** corrosion. All hardware/cotter pins were present **YES** and tight **YES**
Bolt Count **26 total / MISSING 11 STUDS** in gate frame to headwall

NOTES: **WALL STUDS: 72 total**

CARTER PIN: 24 total

- **Gates seals** showed **MODERIT** indication of dry rot, splits or tearing. Overall condition of gate seals appeared to be in **POOR**. Needs replaced **YES**

NOTES: All three gate seals at structure #2 the bottom corner are splitting and need replacing.



WATER CONTROL STRUCTURE #3



- ***Hard Growth on the Exterior side*** of the WCS had a total of **0 %** coverage of Hard Growth at an estimated height of **0 "** ***Soft Growth on the Exterior side*** was an estimated total coverage of **25 %** and a height of **1/16 "**.

NOTES:

- ***Hard Growth on the Interior side*** of the WCS had a total of **0 %** coverage of Hard Growth at an estimated height of **0 "** ***Soft Growth on the Interior side*** was an estimated total coverage of **25 %** and a height of **1/16 "**.

NOTES:

- ***Natural Bottom Report on the gate Exterior side:*** was reported as a **SAND/SHELL** bottom on the gate exterior side with **5 ½ "** of freeboard below the gates invert. UESI recommends adding pump mats to prevent bank erosion
- ***Natural Bottom Report on the gate Interior side:*** was reported as a **N/A** bottom on the gate Interior side with **N/A "** of freeboard below the gates invert.

WATER CONTROL STRUCTURE #3

- **Exterior Concrete Headwall** appeared to be in **EXCELLENT** condition with **NO** pop outs noted. The average pop out dimensions were **N/A** " in diameter and **N/A** " in depth? The total coverage of the pop out was an estimated at **0** %. There was **NO** indication of cracking and loss in wall definition noted.

NOTES:

- **Interior Concrete Headwall** appeared to be in **EXCELLENT** condition with **NO** pop outs noted. The average pop out dimensions were **N/A** " in diameter and **N/A** " in depth? The total coverage of the pop out was an estimated at **0** %? There was **NO** indication of cracking or spalling noted.

NOTES:

- **The Gate and Gate frame Condition** was **MODERATE** with **LIGHT** corrosion noted with an estimated total coverage of **10**%.

NOTES:

- **Hardware on the Gate and Gate Frame** showed signs of **LIGHT** corrosion. All hardware/cotter pins were present **NO** and tight **YES**
Bolt Count **26 total / MISSING 11 STUDS** in gate frame to headwall

NOTES:

- **Gates seals** showed **NO** indication of dry rot, splits or tearing. Overall condition of gate seals appeared to be in **EXCELLENT**. Needs replaced **NO**

NOTES:

WATER CONTROL STRUCTURE #4



- **Hard Growth on the Exterior side** of the WCS had a total of **70 %** coverage of Hard Growth at an estimated height of **1/2"** **Soft Growth on the Exterior side** was an estimated total coverage of **30 %** and a height of **1"**.

NOTES:

- **Hard Growth on the Interior side** of the WCS had a total of **70 %** coverage of Hard Growth at an estimated height of **1/2"** **Soft Growth on the Interior side** was an estimated total coverage of **30 %** and a height of **1"**.

NOTES:

- **Natural Bottom Report on the gate Exterior side:** was reported as a **SAND/MUD/** bottom on the gate exterior side with **3"** of freeboard below the gates invert.
- **Natural Bottom Report on the gate Interior side:** was reported as a **NO SEDIMENT** was noted b on the gate Interior side with **0"** of freeboard below the gates invert.

WATER CONTROL STRUCTURE #4

- ***Exterior Concrete Headwall*** appeared to be in **MODERATE** condition with **MODERATE** pop outs noted. The average pop out dimensions were **1/4** " in diameter and **1/8** " in depth? The total coverage of the pop out was an estimated at **5** %. There was **NO** indication of cracking and loss in wall definition noted.

NOTES:

- ***Interior Concrete Headwall*** appeared to be in **MODERATE** condition with **LIGHT** pop outs noted. The average pop out dimensions were **1/4** " in diameter and **1/8** " in depth? The total coverage of the pop out was an estimated at **3** %? There was **NO** indication of cracking or spalling noted.

NOTES:

- ***The Gate and Gate frame Condition*** was in **EXCEPTIONAL** condition with **LIGHT** corrosion noted with an estimated total coverage of **40%**.

NOTES:

- ***Hardware on the Gate and Gate Frame*** showed signs of **LIGHT** corrosion. All hardware/cotter pins were present **YES** and tight **YES**
Bolt Count **32 total**

NOTES:

- ***Gates seals*** showed **MODERATE** indication of dry rot, splits or tearing. Overall condition of gate seals appeared to be in **POOR**. Needs replaced **YES**

NOTES: Gate seals at structure #4 the bottom corner are splitting and need replacing.

WATER CONTROL STRUCTURE #5



- ***Hard Growth on the Exterior side*** of the WCS had a total of **70 %** coverage of Hard Growth at an estimated height of **1/2"** **Soft Growth on the Exterior side** was an estimated total coverage of **30 %** and a height of **1"**.

NOTES:

- ***Hard Growth on the Interior side*** of the WCS had a total of **70 %** coverage of Hard Growth at an estimated height of **1/2"** **Soft Growth on the Interior side** was an estimated total coverage of **30 %** and a height of **1"**.

NOTES:

- ***Natural Bottom Report on the gate Exterior side:*** was reported as a **SAND/MUD/** bottom on the gate exterior side with **3"** of freeboard below the gates invert.
- ***Natural Bottom Report on the gate Interior side:*** was reported as a **NO SEDIMENT** was noted b on the gate Interior side with **0"** of freeboard below the gates invert.

WATER CONTROL STRUCTURE #5

- **Exterior Concrete Headwall** appeared to be in **MODERATE** condition with **MODERATE** pop outs noted. The average pop out dimensions were **1/4 "** in diameter and **1/8 "** in depth? The total coverage of the pop out was an estimated at **5 %**. There was **NO** indication of cracking and loss in wall definition noted.

NOTES:

- **Interior Concrete Headwall** appeared to be in **MODERATE** condition with **LIGHT** pop outs noted. The average pop out dimensions were **1/4 "** in diameter and **1/8 "** in depth? The total coverage of the pop out was an estimated at **3 %**? There was **NO** indication of cracking or spalling noted.

NOTES:

- **The Gate and Gate frame Condition** was in **EXCEPTIONAL** condition with **LIGHT** corrosion noted with an estimated total coverage of **40%**.

NOTES:

- **Hardware on the Gate and Gate Frame** showed signs of **LIGHT** corrosion. All hardware/cotter pins were present **YES** and tight **YES**
Bolt Count **32 total**

NOTES:

- **Gates seals** showed **MODERATE** indication of dry rot, splits or tearing. Overall condition of gate seals appeared to be in **POOR**. Needs replaced **YES**

NOTES: Gate seals at structure #5 the bottom and top corners are splitting and need replacing.

The divers couldn't complete the interior gate inspection due to a vessel being moored on the gates exterior side. See photo above

WATER CONTROL STRUCTURE #6



- **Upstream Exterior Concrete Headwall** appeared to be in **MODERATE** condition with **MODERATE** pop outs noted. The average pop out dimensions were **1/4** " in diameter and **1/8** " in depth? The total coverage of the pop out was an estimated at **5** %. There was **NO** indication of cracking and loss in wall definition noted.
- **Downstream Exterior Concrete Headwall** appeared to be in **MODERIT** condition with **MODERIT** pop outs noted. The average pop out dimensions were **1/4** " in diameter and **1/8** " in depth? The total coverage of the pop out was an estimated at **5** %. There was **NO** indication of cracking and loss in wall definition noted.
- **Natural Bottom Report on the upstream side of both the Northern and Southern culvert risers** was reported as an **ORGANIC/MUD** bottom on the upstream side with **31** " of freeboard below the culvert riser opening to top of sediment.

- **Natural Bottom Report on the downstream side of both Northern and Southern culverts:** was reported as an ORGANIC/SAND/MUD bottom on the downstream side with 3" of freeboard below the culverts invert.
- **Sediment reported within both culverts** the diver reported very little to no sediment within the two culverts. An estimated 1" of sediment was found within the first seven foot west of the pipes opening.

Date 12/13/2022

Structure #6 Culvert Joint Insp.

Northern Culvert # Note diver entered from East & worked west

Clock Position	12 O'clock	3 O'clock	6 O'clock	9 O'clock
1)	3/8"	1/8"	1/8"	1/8"
2)	1 3/8"	1/4"	1/2"	1"
3)	1"	1"	1"	3/4"
4)	1"	1"	1/2"	1"
5)	3/8"	1/8"	1"	1"
6)	1 1/2"	1/2"	1 1/8"	1"
7)	1/2"	1/8"	1/8"	1/2"

Southern Culvert

Clock Position	12 O'clock	3 O'clock	6 O'clock	9 O'clock
1)	1/4"	1/4"	1/4"	1/4"
2)	1"	1"	1"	1 1/4"
3)	1 1/4"	1 1/4"	1 1/4"	1 1/4"
4)	1/4"	1/4"	1/4"	1/4"
5)	1"	1"	1"	1/4"
6)	1/4"	1/8"	1/8"	1/2"
7)	3/8"	1/8"	1"	1/4"

REVIEW

1. WCS #1 was in poor condition. There weren't any rubber gate seals on all three gate flappers. Also noted when crew first arrived the gates flappers were opening and closing due to the boat traffic wake on the intercoastal allowing saltwater back feed the system. The diver also noted heavy definition loss to the concrete wall within the interior culvert box. Uesi recommends Jonathan's Landing consider replacing the head wall as well as the WCS.
2. WCS #2 overall was in excellent condition the only thing noted was that the flapper gate seals need to be replaced.
3. WCS #3 gate and headwall was in excellent condition. UESI recommends Jonathan's Landing consider adding a pump mat to prevent embankment erosion.
4. WCS #4 gate and headwall was in excellent condition. UESI recommends Jonathan's Landing consider replacing flapper gate seals due to splitting and tearing on the existing gate seal.
5. WCS #5 gate and headwall was in excellent condition. UESI recommends Jonathan's Landing consider replacing flapper gate seals due to splitting and tearing on the existing gate seal.
6. WCS #6 headwall and culverts are in excellent condition. No attention needed.