



Underwater Engineering Services, Inc.

Jonathan's Landing Annual Inspection Report



Prepared for:
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UESI Job No. COM 2021.270

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On July 27/28, 2021 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 preformed at (WCS) 1,2,3,4,5 and 6.

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Water control structure #1



Picture shown above is the northern most gate and one of three gates at water control structure #1.



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Picture shown above is the middle gate at water control structure #1



Picture shown above is the third and southern most gate at water control structure #1

Comments
<ul style="list-style-type: none"> Upon arrival at gate #1 UESI noted no hard or soft growth on the exterior side of all three gates. The interior side located in the water box had estimated length of soft growth at ¼" with a total coverage of 30%.
<ul style="list-style-type: none"> The diver reported a sand and shall natural bottom on the gates exterior side 6" to 12" below the gate invert. On the interior side the diver noted sand sediment on the floor of the culvert box. There was an estimated 7' of freeboard from invert of gate to sediment within the culvert.
<ul style="list-style-type: none"> Located on the exterior side below the Sothern most gate. The diver noted freshwater upwelling from the sand along the headwall. The diver made entry into the culvert trying to identify the source of freshwater. Located on the eastern headwall where the southern headwall meets the eastern headwall the diver noted 24" of missing epoxy from a construction joint. The area of missing epoxy was estimated to be at the same elevation as the upwelling. The diver also noted minor pop outs and exposed aggerate. The average pop out dimensions were 1/4" diameter x 1/8" deep. The total coverage of the pop out was an estimated 5%. The estimated coverage of exposed aggerate was 5%.
<ul style="list-style-type: none"> The overall condition of the Hardware was exceptional. Very light to moderate corrosion noted. All hardware/cotter pins were present and tight.
<ul style="list-style-type: none"> The overall condition of the gate and gate frame were exceptional. Very light corrosion noted with a estimated total coverage of 3%.
<ul style="list-style-type: none"> There were no flapper gate seals present on any of the three flapper gates. The seal between headwall and gate frame appeared to be present and in good shape.

Water control structure #2



Comments

- Upon arrival at gate #2 UESI noted little to no growth on the exterior side of all three gates. Located on the interior side of the gates the diver noted an estimated coverage of soft growth at 10% with a height of 1/4" with no hard growth.
- The diver reported a sand and shell natural bottom on the gate exterior side with 4' of freeboard below the gates invert. On the interior side the diver noted 5' of freeboard from invert to sediment within culvert box.
- The overall condition of the concrete headwall appeared to be in good shape. Some minor pop outs were noted on the interior and exterior. The average pop out dimensions were 1/4" diameter x 1/8" deep. The total coverage of the pop out was an estimated 5%. There was no indication of cracking or spalling noted. Also noted was a 12"X 6" concrete repair above the northern most gate. Repair appeared to be in sound.
- The overall condition of the Hardware was exceptional. Very light to moderate corrosion noted. All hardware/cotter pins were present and tight.
- The overall condition of the gate and gate frame were exceptional. Very light corrosion noted with an estimated total coverage of 5%.
- The condition of the gates seals was exceptional. Showed no indication of dry rot, splits or tearing.



Water control structure #3



The second picture above shows gate #3 and space between the gates flapper and the gates frame. The gate flapper would not seal against the frame. The gap was an estimated $\frac{1}{4}$ " to $\frac{1}{2}$ ".



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Picture above shows gate #3 interior flapper with heavy corrosion on the galvanized stripping holding seal into place.



Picture above shows exposed filter fabric downstream from gate.

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Comments
<ul style="list-style-type: none">• Upon arrival at gate #3 UESI noted no growth on the exterior/interior sides of the gate.
<ul style="list-style-type: none">• The diver reported a sand and shell natural bottom just east of the concrete apron. The exterior side had 2' of freeboard below the gates invert. On the interior side the diver noted a clean culvert with no sediment or debris.
<ul style="list-style-type: none">• The overall condition of the concrete rip rap headwall appeared to be in good shape with no reported damage. The concrete apron had approximately 6" of undermining at the leading eastern edge of the apron. There was also a small 12"X 4" spall in the same area. The diver also noted some soil erosion on the downstream side of the embankment where areas of filter fabric have become exposed.
<ul style="list-style-type: none">• The overall condition of the hardware was exceptional on the gate's flapper. Very light to moderate corrosion noted. All hardware/cotter pins were present and tight. There appears to have been a galvanized stripping used to hold the gates rubber seal into place. The galvanized stripping had heavy corrosion with total metal loss near the bottom of the gate's flapper
<ul style="list-style-type: none">• The overall condition of the gate and gate frame was poor. The gates flapper did not seal, due to the excessive amount of concrete between the slip liner and existing corrugated pipe. The only place the flapper made contact with the culvert was at the pipes invert. The remaining area the flapper had an average of ¼" to ½" gap between gate and flapper.
<ul style="list-style-type: none">• On the gate flapper is a horizontal seem with an 1/8" of separation in the rubber at approximately midpoint of the culvert. The seal showed no indication of dry rot, splits or tearing.

Water control structure #4



Comments
<ul style="list-style-type: none"> Upon arrival at gate #4 UESI noted very light growth on the exterior and interior of the gate. The estimated length of soft growth was ¼" and a total coverage of 60%. The estimated height of the hard growth was ¼" with a coverage of 40%
<ul style="list-style-type: none"> The diver reported a sand and shell natural bottom on the gates exterior side 2" to 4" below the gate invert. The diver noted 4" to 6" of debris and sediment inside the culvert.
<ul style="list-style-type: none"> The overall condition of the concrete headwall appeared to be in good condition. Some minor pop outs were noted. The average pop out dimensions were 1/4" diameter x 1/8" deep. The total coverage of the pop out was an estimated 5%. There was no indication of cracking or spalling on the gate side. However, the diver did note finding a section of spalled concrete just inside the pipes opening. He was unable to locate the area from which the concrete spall came from.
<ul style="list-style-type: none"> The overall condition of the hardware was exceptional. Very light to moderate corrosion noted. All hardware/cotter pins were present and tight.
<ul style="list-style-type: none"> The overall condition of the gate and gate frame were exceptional. Very light corrosion noted with an estimated total coverage of 30%.
<ul style="list-style-type: none"> The condition of the gate seal was exceptional. Showed no indication of dry rot, splits or tearing.



Water control structure #5



The two pictures above are of gate water control structure #5. The second picture shows the depression in the sidewalk.



The picture above shows the soil infiltration at the first connecting to the culvert box approximately 6' west of gate #5.

Comments
<ul style="list-style-type: none"> Upon arrival at gate #5 UESI noted very little hard growth on the exterior and interior of the gate. The estimated length of soft growth was ¼" and a total coverage of 30%. The hard growth was estimated to a height of 1/4" with a total coverage of 10%
<ul style="list-style-type: none"> The diver reported a mud/sand and shell mix for natural bottom on the gate exterior side 2" to 4" below the gate invert. The dive also noted approximately 3" to 4" inside the culvert box.
<ul style="list-style-type: none"> The overall condition of the concrete headwall appeared to be in good. Some minor pop outs were noted. The average pop out dimensions were 1/4" diameter x 1/8" deep. The total coverage of the pop out was an estimated 5%. There was no indication of cracking or spalling noted. Crew noted a depression in the sidewalk approximately 6' west from exterior side of gate. The diver penetrated the culvert box and on the western most side at the first connecting culvert joint the diver found soil infiltration from the 11 O'clock position indicating joint failure.
<ul style="list-style-type: none"> The overall condition of the Hardware was exceptional. Very light to moderate corrosion noted. All hardware/cotter pins were present and tight.
<ul style="list-style-type: none"> The overall condition of the gate and gate frame were exceptional. Very light corrosion noted with a estimated total coverage of 40%.
<ul style="list-style-type: none"> The condition of the gate seal was exceptional. Showed no indication of dry rot, splits or tearing.



Water control structure #6



Picture above is the upstream side of water control structure #6



The picture above is the down stream side of water control structure #6



Comments
<ul style="list-style-type: none">• Upon arrival at water control structure #6 UESI noted very little growth on the upstream exterior and interior of the corrugated riser and head wall. located on the downstream side was typical to the upstream side with little to no growth.
<ul style="list-style-type: none">• The diver reported large amount of organic debris consisting of leaf's sticks palm fronds on the upstream side with a depth of 3' plus with approximately 12" of freeboard to top of both the northern and southern culvert riser. Natural bottom on the downstream side was estimated to be even with the invert of both the northern and southern concrete culverts. The diver also noted approximately 9" to 10" of organic debris inside both northern and southern concrete culverts.
<ul style="list-style-type: none">• The overall condition of the concrete headwall appeared to be in good condition. Some minor pop outs were noted. The average pop out dimensions were 1/4" diameter x 1/8" deep. The total coverage of the pop out was an estimated 5%. There was no indication of cracking or spalling noted.
<ul style="list-style-type: none">• The overall condition of upstream risers appeared to be in great shape. Very light corrosion noted. located on the upstream side was a flange that attached the culvert riser to the head wall. On the Southern most riser flange the diver noted one loose nut at the 12 O'clock position. The lower half of both risers had been covered with organic debris and the diver was unable it inspect due to accessibility.
<ul style="list-style-type: none">• Located just east of the culvert riser at the first culvert joint the corrugation made a transition to concrete pipe. The concrete pipe joint where an estimated 7' in length with a total of seven sections of concrete pipe on both northern and southern pipes. On the southern most pipe the largest joint gap was estimated to be 1-1/2" located at joint #3 with no sing of soil infiltration . On the northern most pipe the largest joint gap was estimated to be 2" at joint #6 working east to west. There was no soil infiltration noted at this location.