Reuben Clarson CONSULTING

March 12, 2021

Duane Trotter
Trailer Estates Park & Recreation
2303 Pennsylvania Ave
Bradenton, FL 34207
Email: maintenance@trailerestates.com

Re: Seawall Inspection Report for Trailer Estates Park & Recreation
2303 Pennsylvania Ave, Bradenton, FL 34207

Dear Mr. Trotter,

This letter provides a summary of the field inspection performed on March 2, 2021 of the residential seawall located at the above referenced address. The following is a summary of findings and recommendations.

Existing Conditions/Construction

- 1,090 LF +/- of seawall
- Cast-In-Place concrete cap (15" x 66", 25.5" x 70" and 36" x 18.5" segments)
- Pre-Cast Concrete Slabs
- Seawall exposed height = 53 to 93 inches

Approximately 1,090 linear feet (LF) of reinforced concrete seawall consisting of 4 ft wide x 10± ft long slabs with three different widths (15" x 66", 25.5" x 70" & 36" x 18.5") concrete cap sections and tiebacks. The exposed height from the top of the cap to the berm (mudline) is approximately 4.41 to 7.75 ft.

The subject property has an original concrete slab seawall and some original and some replaced sections of concrete cap. Structural defects (longitudinal cracking) were observed in the top and face of the cap in several locations indicating the rebars inside the concrete are starting to rust from salt intrusion. The rusting causes the rebars to expand and thus crack the concrete. Spalling of the cap was also observed in a few locations. Previous concrete repairs were evident in some locations.

Structural defects (horizontal/diagonal/vertical cracking) were observed in several of the vertical slabs. Through the underwater camera inspection (despite murky waters) even more horizontal/diagonal cracking was observed in the vertical slabs. Deteriorated slab joints and a poor concrete matrix was noted at different locations. Probing resulted in sandy soil in front of the wall.

There were no wellpoint drains observed to relieve hydrostatic pressure or aid in removing water

from behind the wall. However, the joints are open and draining. Some sediment loss was observed at the base of the wall joints in some areas.

The table below provides a summary of field observations/recommendations recorded along the seawall starting from Station 0 ft to 1,090 ft starting from the west side at the boat ramp.

Table 1: Seawall Inspection Observations

From Sta.	To Sta.	Exposed Ht.	Cap Size (H x W)	Vertical Wall	Observations
0'		89"	15" x 66"	Concrete	• 4" PVC drain
0'	23'		15" x 66"	Concrete	• Longitudinal Cracking in the face and the top of the cap • Exposed rebar
23'			15" x 66"	Concrete	• Corner • Deteriorated/Broken Slab
34.5'			15" x 66"	Concrete	• Expansion Joint
23'	34.5'		15" x 66"	Concrete	• Longitudinal Cracking in the top of the cap
68'	125'		15" x 66"	Concrete	• Longitudinal Cracking in the top of the cap
68'	133.5'		15" x 66"	Concrete	• Longitudinal Cracking in the face of the cap
85'	96.5'		15" x 66"	Concrete	• 30" out overhang: 7" x30"
110.5'		53"	15" x 66"	Concrete	• Substantial vertical crack in cap
133.5'			25.5" x 70"	Concrete	• New cap: 25.5" x 70"
143.4'	600'		25.5" x 70"	Concrete	• New retaining wall: 25" x 16"
133.5'	169'		25.5" x 70"	Concrete	• Longitudinal Cracking in the top of the cap
169'			25.5" x 70"	Concrete	• Expansion Joint
169'	245'		25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap • Rusting through the cap.
183.5'			25.5" x 70"	Concrete	• Vertical cracking in cap.
198.5'	204'		25.5" x 70"	Concrete	• Longitudinal Cracking in the top of the cap
210'			25.5" x 70"	Concrete	• Vertical crack
210'	228'		25.5" x 70"	Concrete	• Longitudinal Cracking in the top of the cap
232'	240'		25.5" x 70"	Concrete	• Horizontal Cracking in slabs
240'	273.5'		25.5" x 70"	Concrete	• Longitudinal Cracking in the top of the cap
266'	307'		25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
290'		69"	25.5" x 70"	Concrete	• Longitudinal Cracking in the top of the cap
301'			25.5" x 70"	Concrete	• Longitudinal Cracking in the top of the cap
370'		82"	25.5" x 70"	Concrete	• Change in depth of exposed height.
391'			25.5" x 70"	Concrete	• Heavily deteriorated joint
391'	227'		25.5" x 70"	Concrete	• Larger horizontal/Diagonal cracking in slabs
260.5'	275'		25.5" x 70"	Concrete	• Horizontal Cracking in vertical slabs
271'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
491'			25.5" x 70"	Concrete	• Horizontal cracking in vertical slabs

497'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
500'			25.5" x 70"	Concrete	• Severely deteriorated slab joint
514'		69"	25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
568'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face and the top of the cap
600'		53"	25.5" x 70"	Concrete	• Corner • 34" x 8" retaining wall
600'	604'		25.5" x 70"	Concrete	• Longitudinal Cracking in the face and the top of the cap
623'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap • Vertical cracking • Spalling in the cap
631'			25.5" x 70"	Concrete	• Repaired cracking in the face of the cap • Longitudinal Cracking in the top of the cap
634'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
646.5			25.5" x 70"	Concrete	• Spalling in the cap
654'			25.5" x 70"	Concrete	• Repaired longitudinal cracking in the face and the top of the cap. • Severe Transverse cracking in the cap • Spalling in the cap
663'		79"	25.5" x 70"	Concrete	• Repaired spalling • Diagonal cracking in the corner of the cap
663'	700'		25.5" x 70"	Concrete	• Horizontal cracking
684'			25.5" x 70"	Concrete	• Cap repaired
680'			25.5" x 70"	Concrete	• Spalling in the cap
700'		84"	25.5" x 70"	Concrete	• Change in depth of exposed height.
709'			25.5" x 70"	Concrete	• Horizontal cracking in vertical slabs.
718.5'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
723'			25.5" x 70"	Concrete	• Repaired spalling in the cap
732'			25.5" x 70"	Concrete	• Spalling in the cap
734'	741'		25.5" x 70"	Concrete	• Horizontal cracking in vertical slabs.
741'			25.5" x 70"	Concrete	• Repaired Longitudinal Cracking in the face of the cap. • Spalling in the cap
749'	796'		25.5" x 70"	Concrete	• Large gap between wall and sidewalk
764'			25.5" x 70"	Concrete	• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
774'			25.5" x 70"	Concrete	• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap

778'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face and the top of the cap • Spalling in the cap
785'		93"	25.5" x 70"	Concrete	• Expansion Joint location
796.5'			25.5" x 70"	Concrete	• Spalling in the cap
803'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
830'			25.5" x 70"	Concrete	• 30" RCP Drainpipe
830'	853.5		25.5" x 70"	Concrete	• Horizontal Cracking
846.5'			25.5" x 70"	Concrete	• Corner • Severe cracking in sidewalk
840'			25.5" x 70"	Concrete	• Longitudinal Cracking in the face of the cap
846.5'	853.5'		25.5" x 70"	Concrete	• Repaired Longitudinal Cracking in the face and the top of the cap
871'			25.5" x 70"	Concrete	• Longitudinal cracking in the face of the cap • Horizontal cracking
885'		88"	25.5" x 70"	Concrete	• Repaired Longitudinal cracking in the face of the cap. • Horizontal cracking
896'	900'		25.5" x 70"	Concrete	• Spalling in the cap
900'		88"	25.5" x 70"	Concrete	• Expansion Joint
885'	915'		25.5" x 70"	Concrete	• Gap between sidewalk and seawall
910'			25.5" x 70"	Concrete	• Severe transverse cracking
912'			25.5" x 70"	Concrete	• Severe transverse cracking • Severe vertical cracking • Disjointed slab • Spalling in the cap
915'			25.5" x 70"	Concrete	• Repaired spalling in the cap
918'			25.5" x 70"	Concrete	• Large longitudinal cracking in the face of the cap
926'			25.5" x 70"	Concrete	• Longitudinal cracking in the face of the cap • Spalling in the cap
926'	930'		25.5" x 70"	Concrete	• Longitudinal cracking in the face of the cap
938'			25.5" x 70"		• Severe Sediment Loss
950'		80"	25.5" x 70"		• Expansion Joint, disjointed, settling on east
988'			25.5" x 70"		• Longitudinal cracking in the face of the cap
993'			25.5" x 70"		• Sidewalk/seawall gap filled
1000'			25.5" x 70"		• Expansion Joint
1020'			25.5" x 70"		• Repaired transverse cracking
1023'			25.5" x 70"		• Spalling in the cap

1050'			25.5" x 70"		• Vertical and diagonal cracking in the cap • Spalling in the cap
1067'			25.5" x 70"		• Diagonal crack in slab
1080'			36" x 18.5"		• New cap up 12" • End of retaining wall
1083'			36" x 18.5"		• 36" drain
1085'	1090'		36" x 18.5"		• Horizontal cracking
930'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
933'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
941'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
943'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
946'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
949'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
956'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
960'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
963'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
967'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
972'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap

978'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
981.5'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
984'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
993'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1000'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1008.5'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1013'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1017'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1023'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1023'	1042'		25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1050'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1053.5'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1057'			25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
1068'	1074'		25.5" x 70"		• Repaired Longitudinal Cracking in the face and the top of the cap. • Repaired spalling in the cap
0'	1090'		25.5" x 70"		• Open Joints

					• Visible sediment buildup underwater • No drains
1090'		75"	25.5" x 70"		• End of wall • Neighbor has an original wall with a new 18" x 54" concrete cap that is 6" higher than the subjects.

Recommendations

Overall, the entire seawall system was observed to be in poor condition. Due to the age and condition of the existing seawall system, repairs to the seawall would not be financially prudent. Therefor we recommend replacement of the existing seawall system. Recommended specifications for a new seawall would include construction of a new vinyl corrugated seawall system with a new concrete cap and 1" diameter HDG PVC encased tieback rods to MR-SR manta ray anchors or deadmen. Well point drains should be installed through both walls at 6' on center and 5" above the barnacle line to relieve the hydrostatic pressure or aid in removing water from behind the wall. The existing wall would remain. Concrete filler would be applied between the two walls. The required length of seawall sheet piles required will vary based on the exposed height from the top of the cap to the mudline.

Segments of the seawall could be raised with the construction of the new seawall to a height closer to the existing retaining wall behind the seawall. However, the dock area entrances will need to be adjusted and a new sidewalk or wide seawall cap would be required. The ballpark cost for this portion of wall in today's prices is approximately $600-$800 per linear ft ($654,000-$872,000) with a useful life expectancy of 50± years.

If the budget does not allow for completion of the entire project at one time, we recommend the phasing plan below based on completing the areas first in the worst condition.

1. Phase 1 - South Wall (293 LF) replacement in within Year 1.
2. Phase 2 – North, East & West Marina Point Wall (616 LF) replacement in Year 2.
3. Phase 3 – West Wall (181 LF) replacement in Year 3.

If you should have any questions or comments, please do not hesitate to contact me. We appreciate the opportunity to provide this report.

Sincerely,

REUBEN CLARSON CONSULTING, INC.

John B. Adams, Jr., PE
FL Professional Engineer No. 53963

Photo #1- View of Wall by Marina.

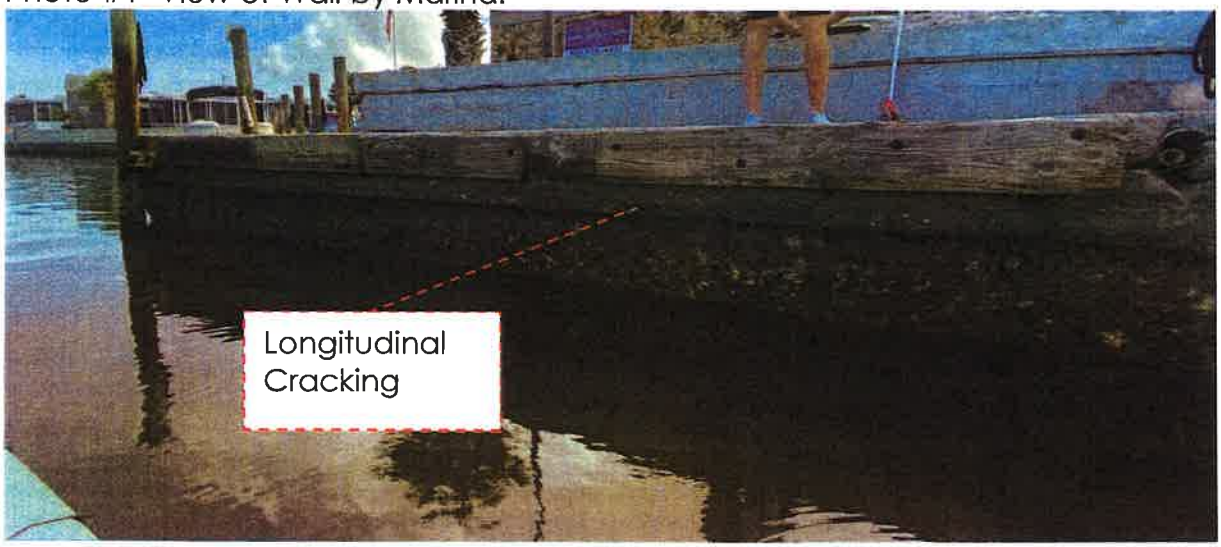

Photo #2 – View of Wall Under Dock at Marina Point.

Photo #3- View of West Wall.

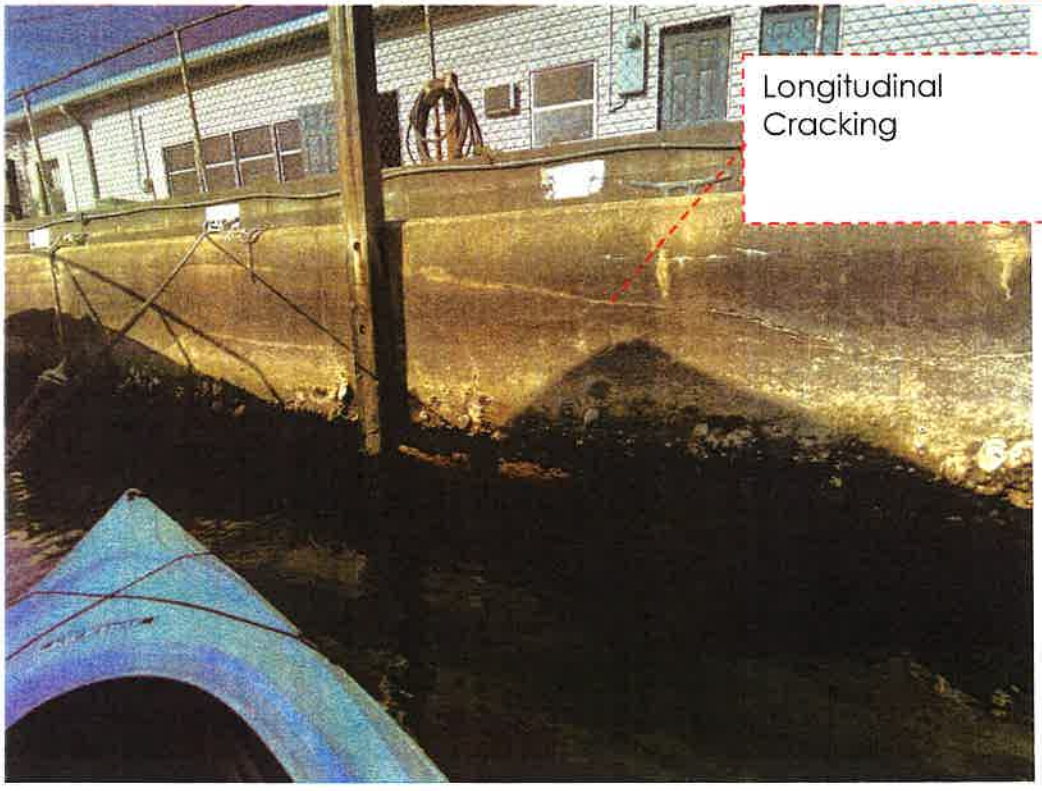

Photo #4- View of West Wall.

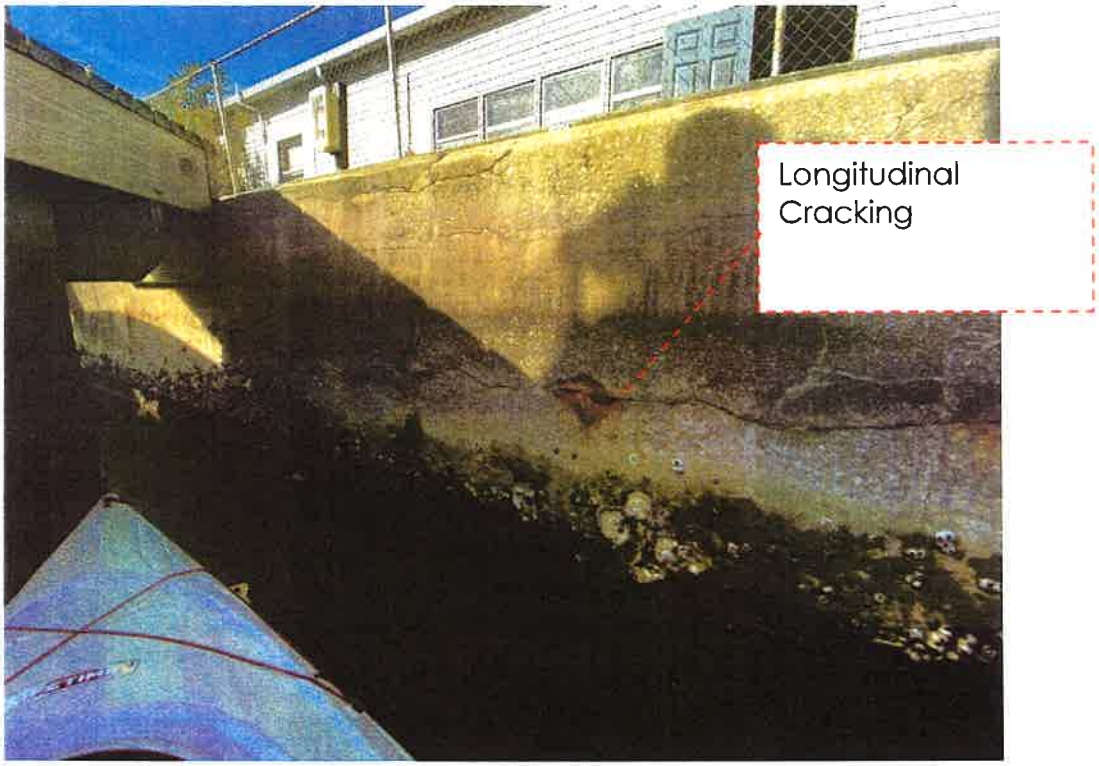

Photo #5- View of South Wall.

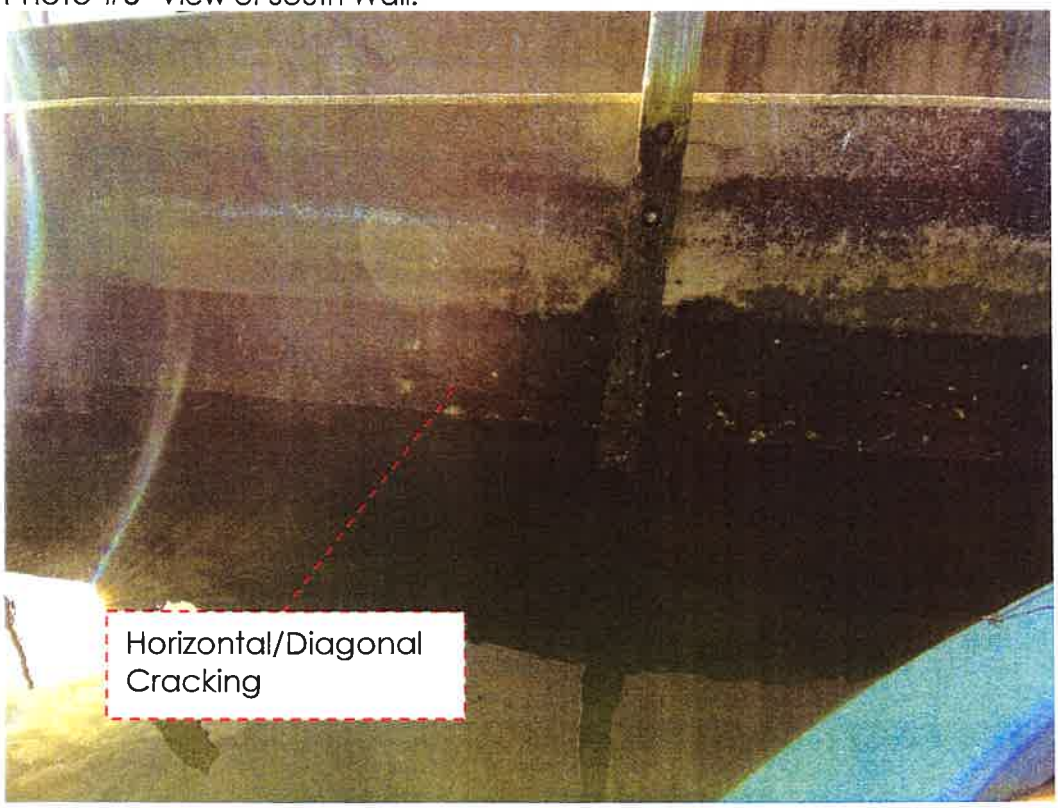

Photo #6- View of East Wall.

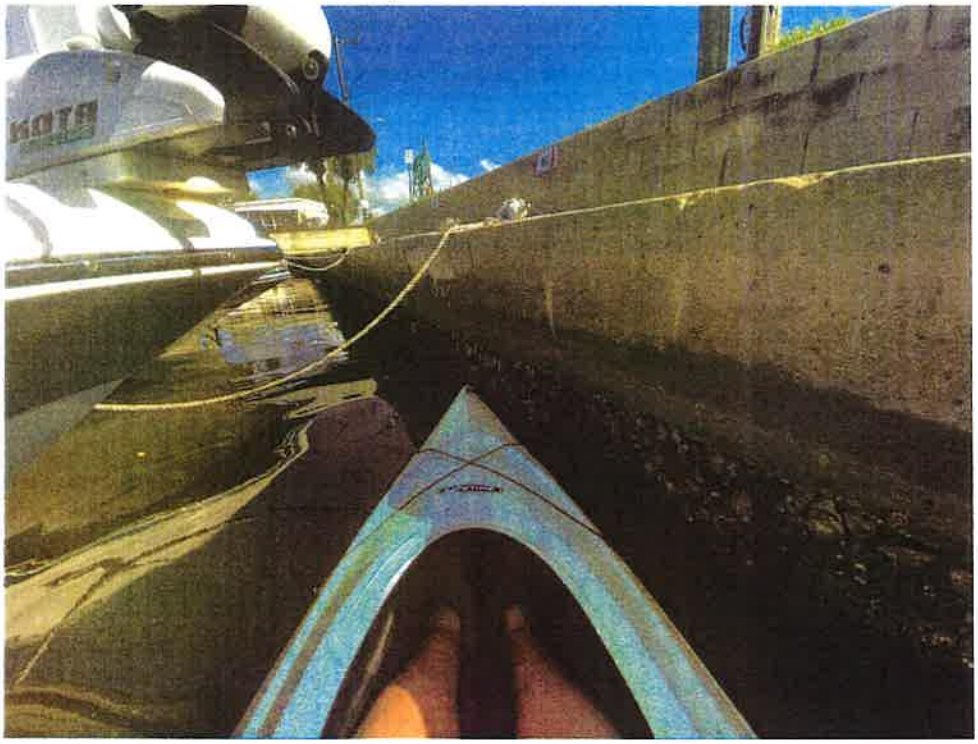

Photo #7- View of North Wall.

Photo #8 – View of North Wall at End of Property.

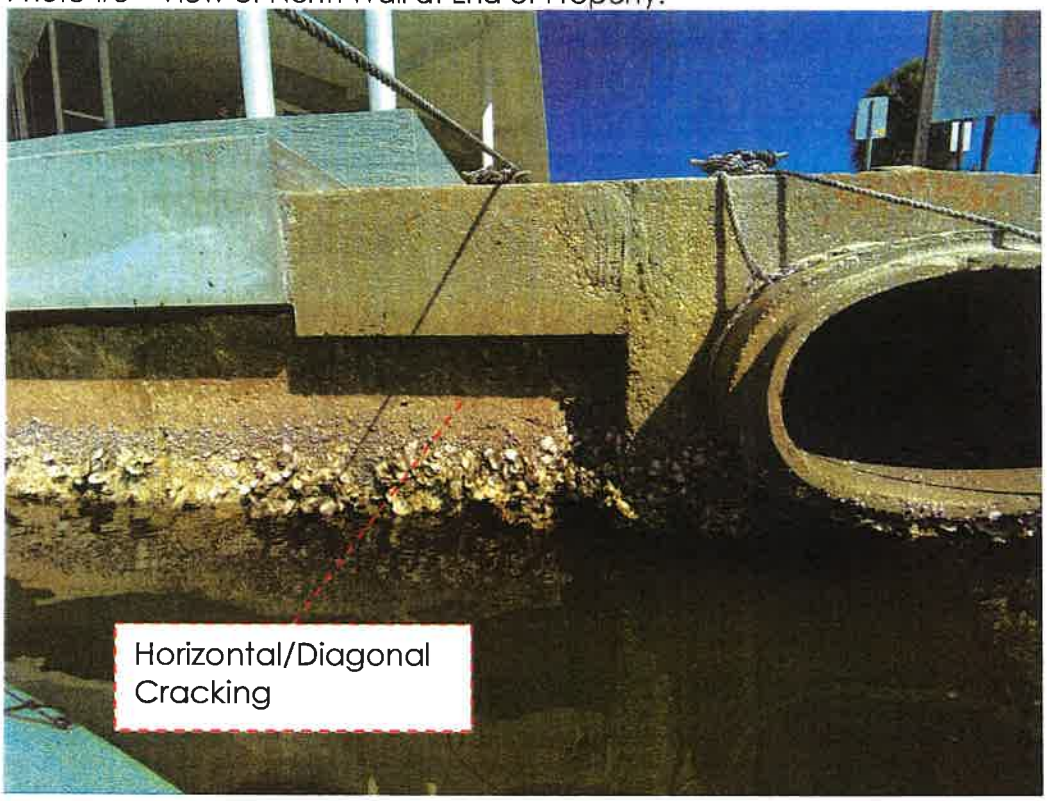

Photo #9- View of Horizontal/Diagonal Cracking in Slabs from Underwater Footage.

Photo #10- View of Horizontal/Diagonal Cracking in Slabs from Underwater Footage.

Photo #11- View of Horizontal/Diagonal Cracking in Slabs from Underwater Footage.

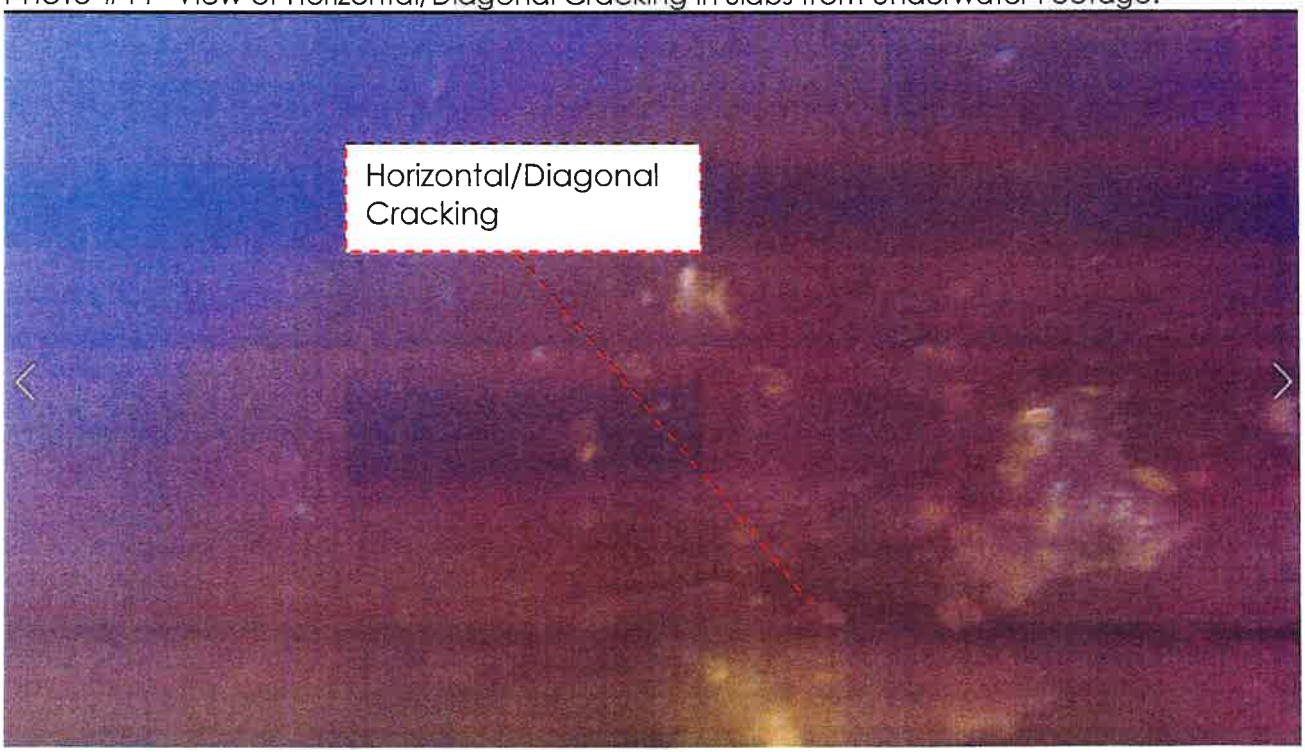

Photo #12- View of Horizontal/Diagonal Cracking in Slabs from Underwater Footage.