

**COM PROJ. NO. 100.21.019
SEAWALL REPAIR (INSPECTION PROJECT)
FINAL FINDINGS/ASSESSMENT REPORT**

Prepared for:



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EXECUTIVE SUMMARY

The City of Mandeville selected Burk-Kleinpeter, Inc. (BKI) to perform structural condition inspection and assessment of the Old Mandeville Lakefront Seawall (seawall) in the St. Tammany Parish, Louisiana. Constructed over 30 years ago, the existing retaining wall is a vital structure providing flooding and erosion protection to recreational facilities in the City’s historic park along Lakeshore Drive.

The main objective of this Report is to provide an engineer’s review and analysis of field collected data from the underwater inspection performed by Specialty Diving of Louisiana Inc (SDI) and above water (i.e., landside) inspection performed by BKI. Data collected including field notes, videos and photo logs will be presented with analyses, commentary, and recommendations in this Final Report. Per existing plans, the seawall is approximately 8321.84 feet (1.576 miles) long consisting of steel sheet piling (PZ-22) with 1’-9” x 1’-9” reinforced concrete cap. Wall features include twelve (12) - 6’-0” wide precast concrete stairs supported on fully grouted steel pipe piles at set locations to provide access to Lake Pontchartrain. This Findings/Assessment Report documents the existing condition of the seawall and highlights any noted deficiencies and suggested repairs.

Section 2 presents a summary of noted existing seawall deficiencies and **Section 3** presents the recommended methods to mitigate them. For cost estimation and analysis purposes, seawall repairs were divided into two main groups:

1. Short-term repairs dealing with the immediate inspection findings and the cost to perform them.
2. Long-term repairs include the short-term ones. In addition, they incorporate actions aiming to preserve and prolong the service life of the seawall.

The Engineer’s probable cost estimate for the short-term repairs is \$506,599.15 as itemized in **Table 3.3.1**, and the long-term repairs cost estimate is \$3,710,540.09 as itemized in **Table 3.3.2**.

In addition to short-term and long-term repair estimates, **Section 3.3.3** presents the project Life Cycle Cost Analysis (LCCA). LCCA is based on the wall’s 31-yr presumptive remaining service life during which several long-term alternatives to maintain the structure are investigated:

1. **Alternative 1** is the “do-nothing” approach with minor as-needed repairs performed and eventually replacing the structure at the end of its remaining service life (31-years).
2. **Alternative 2** calls for performing long-term repairs (**Table 3.3.2**) now and periodically inspect and repair as needed to extend the service life beyond the 31-year remaining service life.
3. **Alternative 3** calls for replacing the existing seawall with a new 75-yr minimum design service life seawall.

Each of these alternatives was evaluated for present, 10-year, 20-year, and 30-year costs. Below is the Engineer’s Probable Cost Estimate of each Alternative at the end of 30 years.

Alternative	Alternative 1	Alternative 2	Alternative 3
Engineer’s Probable Cost Estimate	\$ 27,477,911.55	\$ 7,215,688.83	\$ 16,350,759.37

Per the above, although short-term repairs (\$506,599.15) are the least costly, however they may not extend the seawall service life or addresses the escalating costs of potential future repairs.

BKI recommends a long-term strategy **Alternative 2** to repair, preserve, and extend the service life of the structure.

1.0 BACKGROUND

The City of Mandeville tasked Burk-Kleinpeter, Inc. (BKI) to inspect and document the existing condition of the Old Mandeville Seawall (seawall) along the Mandeville Lakefront and Lakeshore Drive in St. Tammany Parish. The seawall is maintained by the City of Mandeville and provides a barrier against flooding and erosion from Lake Pontchartrain. The lake water is brackish with a salinity level between fresh and seawater. This Report documents the field inspection findings and data assessment by the teams of BKI and Specialty Diving of Louisiana Inc. (SDI). This includes the steel sheet piling, concrete cap, and concrete stairs.



SDI was contracted to perform the underwater (lakeside) inspection of the seawall as a part of Phase I of this project. SDI inspected approximately 8300 linear feet of seawall using surface supplied air diving. Work began at the West end of the wall, mobilizing daily during the inspection period, and inspecting approximately 400 to 500 linear feet per day depending on weather or other elements. During inspection, the diver visually inspected both the pile cap and sheet piling for any anomaly or deterioration. Ultrasonic Testing of the wall was completed approximately every 100 feet at 3 locations, above the waterline, beneath the waterline, and within 1 foot below the natural bottom. The Specialty Diving Final Inspection Reports is enclosed in **Appendix A**.

BKI, was contracted to complete Phase II of the project, Findings/Assessment Report. This phase included preparations for inspection, an engineer's review of the seawall inspection including inspection of the sheet pile cap, stair inspection, coordination with SDI, and site visits to review sheet pile wall damage, evaluation of data from the diver inspections, and findings and recommendations that analyze both short- and long-term options including budgetary opinion of repair costs. All findings and recommendations are presented in this Report. BKI's Field Photo Log is enclosed in **Appendix B** and Field Notes are enclosed in **Appendix C**.

1.1 OLD MANDEVILLE SEAWALL

The Old Mandeville Seawall standing today was constructed in 1993 as a replacement for the original concrete seawall constructed in 1938. Per the as-built plans (see **Appendix D**), the steel sheet pile wall was constructed in front of an existing concrete sheet pile wall. Aggregate backfill was used to fill the space between the original wall and the seawall that stands today.

The seawall that stands today and was inspected under this project consists of PZ-22 steel sheet piling embedded into the lake bottom between EL. -16.2 and -18.7. The top of the wall consists of a 1'-9" x 1'-9" concrete cap. The top of cap elevation ranges between El. 5.5 and 6.5 with transitions to lower elevations at the limits of the seawall to match existing ground line. Behind the seawall cap for most of the length of seawall, except along Little Bayou Castine and the unnamed bayou, is a concrete splash block of varying width.

At 12 locations along the length of the seawall, 6'-0" wide, precast concrete stairs with handrails lead over the wall and down to Lake Pontchartrain. These stairs are supported by 10 $\frac{3}{4}$ " O.D. pipe piles with $\frac{1}{2}$ " thick wall. The piles are tipped at El. -16.0 and filled with 4'-0" of concrete, minimum.

2.0 OLD MANDEVILLE SEAWALL FINDINGS AND DEFICIENCIES

The seawall inspections performed by BKI and SDI were completed within 45 days of the Notice to Proceed (NTP) for this project. During inspections, BKI and SDI took notes, pictures, and video of the existing seawall paying certain attention to any visible anomalies and deficiencies. SDI's final inspection report is enclosed in **Appendix A**, Final Inspection Report (SDI). BKI's inspection documentation including the Photo Log is enclosed in **Appendix B**, and the Field Notes are enclosed in **Appendix C**.

Once the inspections were completed, BKI evaluated all the collected data, including the reports from Specialty Diving. Below is a summary of BKI's findings, with a description of all anomalies and deficiencies. All stations are approximate and shown in view on drawings in **Appendix E**.

2.1 CONCRETE BULKHEAD

The concrete cap of the seawall was visually inspected by both BKI, from the land, and Specialty Diving, from the water side. Below is the summary of findings:

2.1.1 Cracking

1. Hairline cracking was observed by BKI and Specialty Diving throughout the entire length of the concrete cap. A single hairline crack running horizontal along the bottom of the cap was visible from the water from Sta. 00+00 to 17+73, 22+00 to 37+00, 41+00 to 58+50, and 72+00 to 73+00. Multiple linear hairline cracks running horizontal along the bottom of the cap were observed from Sta. 17+73 to 22+00, 37+00 to 40+00, 58+50 to 72+00, and 73+00 to 83+00 on the water side.
2. Multiple horizontal and vertical cracks were noted on the top and landside of the concrete cap as well, along the entire length of the wall, see **Appendix B**, Field Photo Log, for specific locations.

2.1.2 Spalling

Spalled concrete cap was noted by both BKI and Specialty Diving. This mainly occurs near the wall cap expansion joints. Spalling happens when the wall joints, which allow for some movement of the wall, begin to deteriorate and the concrete edges at these joints can strike one another.

All spall locations have been noted in **Appendix A & Appendix B**.

2.2 STEEL SHEET PILE WALL

The PZ-22 sheet pile wall was visually inspected by Specialty Diving from the water. Ultrasonic testing of the sheet pile wall was completed every 100 feet at 3 locations, above the waterline, beneath the waterline, and within 1 foot below the natural bottom. Below is the summary of findings. See **Appendix A** for Specialty Diving's Final Report.

2.2.1 Corrosion in Splash Zone

Corrosion of the steel sheet pile wall within the splash zone typically fell in the moderate to heavy range including Sta. ranges 0+00 to 1+00 and 3+00 to 83+00. Heavy corrosion within the splash zone was only noted from Sta. 1+00 to 3+00.

2.2.2 Corrosion Below Waterline

Corrosion was noted at several locations below the waterline and away from the bulkhead expansion joints. This includes the following:

1. At Sta. 54+70, near the break wall which extends into the lake, heavy corrosion and deterioration of the sheet pile wall was seen. To the left of the break wall, the area was approximately 7"x7", and to the right of the break wall, the area was approximately 9"x8".

2. Near Sta. 57+83, there is a drainpipe that discharges into the lake. Around the pipe are multiple areas with heavy corrosion and deterioration, 9"x4", 1'-2"x4", and 9"x4" in size.
3. At Sta. 64+79, near the natural bottom and another break wall are more signs of heavy corrosion and deterioration of the sheet pile wall. This area is approximately 1'-3"x8" in size.
4. Near Sta. 69+00, heavy corrosion and deterioration near the natural bottom was measured to be 8"x3".
5. While most of the sheet pile wall deficiencies noted occur near joints in the wall, listed above is a summary of additional deterioration locations.

2.2.3 Joints at Bent Corners

1. Bends in the seawall are created using joints in the steel sheet pile wall which are held together using a 1/2" L shaped plate and 2, 7/8" high strength bolts with flat washers spaced vertically at 6" centers for the length of the section except for 2' at each end where they are spaced at 3" centers.
2. Heavy corrosion on all joint hardware was visible at Sta. 1+00, 5+00, 5+45, 6+75, 7+25, 7+70, 11+60, 12+00, 13+35, 17+73, 36+84, 42+15, 42+20, 46+00, 67+20, 67+25, 81+55, and 82+55.
3. Missing hardware was observed at or beneath the natural bottom of the lake at Sta. 13+35. At Sta. 17+73, there are two missing high strength bolts near the natural bottom of the lake. At Sta. 21+20, hardware is missing near the natural bottom, along with heavy corrosion and deterioration of the seawall, approximately 2'x2' in area, at the joint causing a slight bow outward. Near Sta. 26+33, there is a slight turn in the wall with missing fasteners.
4. The joint at Sta. 25+40 shows heavy corrosion and deterioration near the natural bottom approximately 8"x11" in size, along with missing fasteners.
5. Sta. 28+63 includes heavy corrosion and deterioration of the joint plate as well as the hardware near the natural bottom of the lake. At this same location, there is approximately a 2' section of separation between the sheets, and a 9" section missing at the bottom.
6. Sta. 32+24 includes heavy corrosion and deterioration of the joint plate and hardware near the natural bottom of the lake in an area approximately 11"x7".
7. At Sta. 35+00, noted heavy hardware corrosion with separation from the concrete bulkhead with approximately 1" gap at its widest and along the entire length of the joint line.
8. Sta. 46+00 includes heavy corrosion and deterioration at the joint, near the natural bottom, approximately 3'x8" in area.
9. Near Sta. 69+07, including heavy corrosion and deterioration of the sheet pile wall, there are 6 pieces of hardware missing at the bottom, corner plate, causing a section 1'-4" in length to separate 3" from the sheet pile wall.
10. Near Sta. 82+00, there is a 1/4" gap between the wall and the L shaped plate with heavily corroded steel hardware (fasteners).
11. As noted above, most steel sheet pile deficiencies are located near the joints at bends in seawall.

2.3 PRECAST CONCRETE STAIRS

Precast concrete stairs are located at twelve different locations throughout the length of the project. They are supported by four 10³/₄" outer diameter, 1/2" thick, pipe piles filled with concrete. Each staircase includes extra strong C.R.S pipe handrails.

2.3.1 Cracking

Some cracks and rust stains were noted on the concrete stairs. The stairs near Sta. 38+61 on the land side contain exposed rebar.

2.3.2 Handrails

The handrails were noted to be in generally good condition.

2.4 SPLASH BLOCKS

1. Concrete splash blocks run behind the seawall concrete cap along nearly the entire length. It has minimal amounts of damage, except for a few locations.
2. Near Sta. 25+35 to 25+50, the splash blocks discontinue onto a gravel path which is uneven and settling near the corner of the seawall.
3. From Sta. 45+95 to 46+26, the splash blocks terminate again onto a gravel path. The gravel at this location has settled and uneven creating a hole in the gravel along the back of the seawall. The gravel then spills onto the splash blocks.
4. From Sta. 47+83 to Sta. 47+92 is another discontinuity in the splash blocks. At the joint in the seawall, there is a concrete spall and cavity in the sheet pile wall, thus causing loss of fill material and settlement at this location.
5. From Sta. 54+00 to 55+00, there is a discontinuation of the splash blocks where gravel has been laid as well as from Sta. 64+73 to 64+88 and Sta. 69+00 to Sta. 69+12.

3.0 OLD MANDEVILLE SEAWALL RECOMMENDATIONS

3.1 CONCRETE BULKHEAD REPAIRS

Per field noted deficiencies, preliminary proposed repairs of concrete bulkhead can be grouped into the following main tasks:

1. Repair spalled concrete without exposed corroded reinforcing bars.
2. Repair spalled concrete with exposed corroded rebars.
3. Repair full-depth spalled concrete with exposed sheet piling at the expansion joints.
4. Patching and sealing concrete cracks (crack width $\geq 1/16''$)
5. Apply protective coating to seal hairline cracks and waterproof bulkhead concrete surfaces.

3.1.1 Spalled Concrete Repairs

Repairing spalled concrete confined to concrete cover limits can be achieved per the following:

1. Saw-cut the concrete surface to limits extending 2" beyond the spall limits.
2. Chip and remove spalled concrete per plan limits.
3. Apply surface bonding agent to repair surfaces and patch utilizing non-shrink grout.

3.1.2 Spalled Concrete Repairs with Exposed Corroded Rebars

Repairing spalled concrete with exposed corroded rebars can be achieved in the following steps:

1. Saw-cut the concrete surface to limits extending 2" beyond the spall limits.

2. Remove loose and delaminated concrete above corroded reinforcing bars and to a depth approximately $\frac{3}{4}$ " beyond the deepest affected rebar.
3. If rebar section loss exceeds 50%, then splice a new bar of equal size per plan details.
4. Remove all heavy oxides and other bond-inhibiting materials from all exposed surfaces.
5. Apply surface bonding agents to repair surfaces and patch utilizing non-shrink grout.



3.1.3 Full-Depth Spalled Concrete Section with Exposed Sheet Piling

This condition was mainly noted at the bulkhead expansion joints. A typical full-depth spall repair can be accomplished in the following steps:

1. Saw-cut full-depth concrete bulkhead to limits extending 2" beyond the spall limits.
2. Carefully chip and remove spalled concrete per plan limits and avoid damaging sheet piling.
3. Remove all heavy oxides and other bond-inhibiting materials from all exposed surfaces.
4. Install epoxy-bonded dowel bars into joint contact surfaces as per plan details.
5. Apply surface bonding agent and pour non-shrink concrete section.
6. Seal Expansion joint with approved marine-grade silicone joint sealant.



During the Design Phase and as a potential long-term cost-saving measure, BKI will investigate the following strategies to eliminate future spalling at the expansion joints:

1. The first approach can be accomplished by full-depth removal of bulkhead section on both sides of the expansion joint and casting a jointless reinforced section. A $\frac{1}{2}$ " V-groove will be installed along the full circumference of the section at the same original location of the expansion joint.
2. The second approach calls for the full-depth removal of bulkhead section on both sides of the expansion joint and installing a cold-contraction joint by termination the bulkhead reinforcement at the contraction joint. A $\frac{1}{2}$ " V-groove will be installed and sealed utilizing hot-poured joint sealant. This approach can produce joints which are more resistant to moisture infiltration and thus reduces the potential for corrosion.

3.1.4 Sealing Concrete Cracks (Crack Width $\geq 1/16$ ")

Repairing cracked concrete can be accomplished utilizing two approaches. The first approach consists of the following steps:

1. Saw-cut the concrete surface to limits extending 3- inches to each side and longitudinal crack limits. Remove concrete to a 1" minimum depth to rebars within the saw-cut limits.
2. If exposed rebars are corroded, then repair as detailed above.
3. Patch utilizing recommended cementitious grout mix.

The second approach utilizes epoxy sealant injected under pressure to penetrate and seal the crack This approach consists of the following steps:

1. Utilize a router to rout a v-groove along the entire length of the crack.

2. Drill ¼” dia. x ½” deep holes approximately 12” apart along the crack.
3. Inject epoxy sealant per manufacturer’s recommendations to seal crack.

3.1.5 Sealing Hairline and Crack Widths ≤ 1/16”

This can be accomplished utilizing concrete sealant and protective coating. Alternative 1 consists of applying a water-based and water/UV resistant coating. Pigment and aggregate additive can be included to color the concrete surfaces (aesthetic enhancement) and provide a skid-resistant surfaces. Alternative 2 consists of applying a clear sealer of water based high solids water/UV resistant protective coating. In both cases, the protective coating shall be applied over clean concrete surfaces.

3.2 STEEL SHEET PILING REPAIRS

Per the as-built plans (**Appendix D**), the existing steel sheet pile wall consist of PZ-22 sections measuring 1’-10” long x 9” deep and 3/8” (0.375”) thick. A protective coating was applied to the sheet piling and was painted from elevation -5.0 and terminated at two (2) inches above the bottom of concrete cap. Sheet piling was visually inspected including the steel sections (panels) and fabricated bolted field splice connections, corners, sleeves and connection angles and recorded noted deficiencies. Ultrasonic instrumentation was used to record the thickness of the steel at approximately 100 ft. intervals measured along the wall near face (lakeside) and at the following locations:



1. Within the top 1 ft. of the mudline (natural round line).
2. Below the water line (approximately mid-depth).
3. Above the waterline within the splash zone.

A log of noted deficiencies is enclosed in **Appendix A**, Final Inspection Report (Specialty Diving). Steel deficiencies can be grouped into the following:

1. Mild to moderate surface corrosion, most notably within the splash zone.
2. Moderate to heavy corrosion with section loss mostly noted at the cap expansion joints with full-depth concrete cover loss and deteriorated expansion joint sealant.
3. Corroded and missing fasteners at wall field splice L-connection plates above and below the water line (See **Appendix A** for photo logs and locations).
4. Noted full-depth sheet pile section loss and erosion of backfill material at several locations.

3.2.1 Approach to Steel Sheet Pile Repairs

The recorded ultrasonic steel section thickness measurements seem to indicate limited loss in thickness (or section) which does not impact the structural capacity of the wall. Moderate to severe corrosion with section loss was mainly observed at the bulkhead expansion joints and wall connection plates mainly due to water infiltration. Repair techniques of deteriorated steel sections will vary depending on the location of the repair area and the severity of section loss. The following are the main groups of deficiencies and suggested repair methods to mitigate them.

1. Sheet section loss < 25% above or below the water line.
2. Sheet section loss > 25% and < 50% above or below the water line.
3. Sheet section loss > 50% including backfill erosion above or below the water line.
4. Deteriorated sheet piling at the bulkhead expansion joints.

3.2.2 Sheet Section loss < 25% Above or Below the Waterline

Per the recorded field measurements, this is the overwhelming current condition of the wall. In this case, it is recommended to monitor the wall via periodic field inspections and record any changes.

3.2.3 Sheet Section loss > 25% and < 50% Above or Below the Waterline

If the deteriorated steel section(s) is located above the water line, then:

1. In this case, utilize high-pressure washing with potable water to remove rust, salt, and other contaminants. Clean at least 1-foot beyond deterioration limits. Utilize a debris containment system to prevent the release of contaminants into the environment.
2. Measure soluble salts and other contaminants to clean as needed to levels below what is recommended by the coating manufacturer.
3. Apply the approved protective coating per manufacturer recommendations.

If the deteriorated section is below the waterline, then:

1. In this case, install sheet pile section (or steel plate or composite sheet) in front of deteriorated section.
2. Fill the cavity utilizing specialty grout or epoxy to structurally bond the two sections.
3. Section can be extended to include the deteriorated section areas above the water line.
4. Welded steel sections may be utilized in lieu of bonded sections.

3.2.4 Sheet Section loss > 50% With Backfill Erosion Above or Below the Waterline

If sheet piling experience section loss > 50% and up to 100 % section loss with backfill seepage through voids in the sheet piling whether above or below the waterline, then:

1. If section deterioration extends over a large section of the wall with noted large wall voids, then bridge the deteriorated section utilizing driven or welded steel plates or sheet section placed in front or behind the existing sheet piling. Water-proof the repair area by injecting sealing grout or epoxy into the repair cavity and backfill as needed.
2. If section deterioration is confined to small patches, then if the repair area is above the waterline, patch the area with welded steel plate or inject propriety hydraulic and non-shrink cement to seal the opening in sheet piling and backfill as needed.
3. If section deterioration is confined into small patches, then if the repair area is below the waterline, patch the area by injecting propriety hydraulic and non-shrink grout cement behind the wall to seal the opening in sheet piling and backfill as needed.

3.2.5 Deteriorated Sheet Piling at the Bulkhead Expansion Joints

Heavy corrosion with section loss was noted at the bulkhead expansion joints. This is caused by deterioration of expansion joint material and sealant due to the impact pressure of wave action. In some cases, voids in sheet piling contributed to the loss of fill material as previously noted. The following is the proposed repair procedure:

1. Saw-cut and remove the deteriorated concrete bulkhead. Cut the deteriorated steel section and bridge the opening by welding steel plates or structural shapes. Extend welding along the seams to seal the opening.
2. Restore concrete bulkhead section and backfill as needed.

If section deterioration extends over a large section of the wall with noted large wall voids, then bridge the deteriorated section utilizing drive or welded steel plates or sheet sections.

3.3 COST ANALYSES OF PROPOSED SEAWALL REPAIRS

Preliminary cost analyses of wall repairs will briefly examine long-term or short-term strategies to perform the seawall repairs. Short-term repairs will focus on performing emergency or near-future repairs to control active existing deficiencies that can compromise the structural integrity of the wall. Per field observations, no active conditions such as wall translation or rotation, or large sections of wall experiencing significant section loss were noted. Therefore, emergency repairs are not needed and will not be incorporated into the proposed repairs and Engineer's Estimates.

The design service life of sheet pile walls is approximately 75 years. The service life is directly related to the rate of steel corrosion. In the case of marine structures, the wall surface experiences different rates of corrosion depending on location: immersed zone, tidal zone, splash zone and atmospheric zone. Given the wall height and as noted in the report, the Mandeville Sewall is divided into immersed zone and splash zone. The existing wall consists of PZ-22 sheet pile sections with nominal thickness of 3/8" (0.375") Per field thickness measurements taken along the entire length of the wall, limited section loss was noted which is mainly attributed to the existing protective coating and the brackish water (less soluble salt content). Per field findings, surface corrosion and loss of protective coating was noted on sheet pile in the splash zone and the immersed zone. The loss of protective coating may accelerate the rate of corrosion.

Based on design studies, the rate of corrosion in the immersed zone is approximately 0.003 in/yr. and 0.006 in/yr. in the splash zone. It is BKI's professional opinion, the end of service life of a sheet pile is theoretically estimated based on 50% loss of section thickness, thus exceeding allowable design stresses and increasing the potential for structural failures. Based on existing wall thickness of 0.375", the remaining service life can be estimated based on the splash zone rate of 0.006 in/yr. as follows:

The approximate remaining service life = $0.5 * 0.375 / 0.006$ in/yr. = 31 yrs.

The primary focus of this section is to present repairs and associated Engineer's Estimates aimed at extending the services life of the seawall. The proposed repairs can be divided into short-term and long-term repairs. Short-term repairs are repairs to be performed in the near future to control/stop further deterioration leading to more extensive and expensive repairs. This includes bulk-head concrete and sheet piles repairs to mitigate the noted deficiencies in this Report. The long-term repairs include preventive measures aimed at preserving or greatly reducing the rate of deterioration of the wall (bulkhead concrete or steel sheet piling). Note that long-term repairs should take into consideration the wall existing condition and the expected (or remaining) service life of the structure.

3.3.1 Short-Term Seawall Repairs

Short-term repairs noted in this Report consists of the following:

1. Bulkhead concrete repairs include patching/repairing concrete spalls and reinforcement away from the expansion joint locations.
2. Sealing bulkhead concrete cracks $\geq 1/16$ " wide by grouting or epoxy injection.
3. Repair deteriorated expansion joints including spalled bulkhead concrete and corroded steel.
4. Repair/replace deteriorated steel with splice plates and fasteners.
5. Replace Sections of Seawall bulkhead exhibiting widespread cracking, spalling, delamination, and reinforcement corrosion.

- Apply protective coating to seal (waterproof) the bulkhead concrete and to provide a uniform aesthetically pleasing finish, including the stairs. The finish color of the protective to be approved by the City of Mandeville.

Table 3.3.1 Lists the proposed Engineer’s Estimate to perform the short-term repairs listed above.

Item No.	Description	Unit	Quantity	Unit Cost	Cost
1	Repair Concrete Bulkhead (Concrete Patching)	SF	421	\$450.00	\$189,525.00
2	Epoxy Sealing of Concrete Cracks	LF	2000	\$40.00	\$80,000.00
3	Structural Steel Joint Repair	EA	29	\$1723.55	\$49,983.07
4	Structural Steel (A36)	LB	571	\$10.00	\$5,710.27
5	Concrete Surface Protective Coating	SY	7687	\$15.00	\$115,302.66
Subtotal Cost =					\$ 440,521.00
Contingency (15%)					\$ 66,078.15
Engineer’s Probable Cost Estimate					\$ 506,599.15

3.3.2 Long-Term Seawall Repairs

Field reconnaissance findings supplemented by field measurements indicate that the existing steel sheet piling experienced limited section loss due to corrosion. The existing protective coating (above or below water line) is deteriorated which may allow accelerated corrosion rate as evident with surface corrosion currently present on sheet pile surface. As mentioned earlier, the approximate predicted service life of the wall is approximately 31 years. Given the length of the wall (3800 LF ±) and potential future replacement and maintenance costs if left unchecked, it is recommended to perform long-term maintenance repairs that can assist in maintaining or possibly extending the service life of the wall. Two long-term maintenance items are proposed to achieve this objective:



- Investigate installing a cathodic protection system consisting of sacrificial Zinc or Aluminum alloys installed at selective locations to promote good electrical continuity and effective corrosion protection. Typically, anodes are designed for a corrosion protection lifespan of 20-30 years. Each anode typically weighs approximately 60 lbs. and installed set spacing as per design requirements.
- Another system of cathodic protection is the immersed current system. This system is well suited for large structures such as buried conduits, retaining walls and offshore platforms.
- Replace the existing concrete bulkhead. This includes investigating reducing the number of bulkhead expansion joints and using extruded corner sections in lieu of bolted ones. The objective is to reduce the number of potentially maintenance prone locations, and thus reduce future maintenance costs.

4. Apply and maintain concrete surface protective coating to water-proof concrete surfaces to improve wall aesthetics. Apply the protective coating periodically (8-10 yrs.) to maintain its look and effectiveness.

Table 3.3.2: Engineer’s Estimate for Proposed Long-Term Seawall Repairs

Item No.	Description	Unit	Quantity	Unit Cost	Cost
1	Removal of Structural Concrete (Bulkhead)	LS	LS	\$ 581,840.00	\$ 581,840.00
2	Removal of Existing Splash Blocks	SY	4620	\$16.00	\$ 73,920.00
3	Install Cathodic Protection System	LS	LS	\$ 1,040,000.00	\$ 1,040,000.00
4	Structural Concrete (Bulkhead)	CY	943	\$ 1,500.00	\$ 1,414,136.00
5	Reinforcing Steel (Bulkhead)	LB	94276	\$ 1.25	\$ 117,845.00
6	New Splash Blocks (4” Thick)	SY	4620	\$ 90.00	\$415,800.00
7	Concrete Surface Protective Coating	SY	4849	\$15.00	\$ 72,735.00
Subtotal Cost =					\$ 3,716,276.60
Contingency (15%)					\$ 557,441.49
Engineer’s Probable Cost Estimate					\$ 4,273,718.09

3.3.3 Life Cycle Cost Analysis

The purpose of the project life cycle cost analysis is to present the economic impacts of the recommended alternatives for repairing the City Mandeville Seawall. The life cycle cost analysis will present the initial cost of each alternative, the long-term maintenance cost, and final cost at the end of service life. The life cycle cost (LCC) will be limited to 30 years, which is the presumptive remaining service life of the existing seawall and will be estimated at 10-year intervals. The following are the wall repair alternatives that can be implemented and their associated current and future impacts:

1. **Alternative 1:** Do-nothing or minor repairs as needed, and eventually replace the wall after 30 years. This alternative assumes no structural issues will arise within the next 30 years.
2. **Alternative 2:** Perform long-term repairs now and continue to maintain the wall to extend its service beyond the projected 30-yr. remaining design service life. This includes installing a new cathodic protection system after 30 years.
3. **Alternative 3:** Replace the wall now with a new 75-yr service life wall. This alternative assumes no repairs will be required for the first 10 years of service life and minor maintenance for the following 20 years. In addition, it assumes replacement in kind consisting of removing the existing bulkhead and building a new sheet pile wall close to and in front of the existing wall.

Life cycle cost analysis of the Alternatives listed above is based on the following assumptions:

1. Replacement Cost inflation rate is estimated at 2.5%, compounded yearly. This will be applied to **Alternative 1** replacement cost.
2. Escalating maintenance cost is estimated at 2.5% inflation rate compounded yearly for the next 30 years. This will be applied to **Alternatives 2** and **3**.
3. In the case of **Alternatives 2** and **3**, minor repairs over the next 20 years include new applied protective coating and miscellaneous repairs estimated at \$100,000.00 performed every 10 years and at yearly compounded inflationary rate of 2.5%.
4. Inflationary Future Cost after (n) years = Present Cost (at n = 0) * (1 + Inflation Rate/100)ⁿ

3.3.4 Alternative 1 Cost Analysis

Alternative 1 is based on a do-nothing approach and replacing the existing seawall at the end of 30-yr. service life. **Table 3.3.4-1** lists the present replacement cost estimate of the existing seawall.

Table 3.3.4-1: Engineer’s Probable Cost Estimate for Alternative 1

Item No.	Description	Unit	Quantity	Unit Cost	Cost
1	Removal of Structural Concrete (Bulkhead)	LS	LS	\$ 581,840.00	\$ 581,840.00
2	Removal of Existing Splash Blocks	SY	4620	\$16.00	\$ 73,920.00
3	Driven Steel Sheet Piling, PZ-22	SF	177,652	\$ 40.00	\$ 7,106,080.00
4	Install Cathodic Protection System	LS	LS	\$ 1,040,000.00	\$ 1,040,000.00
5	Structural Concrete (Bulkhead)	CY	943	\$ 1500.00	\$ 1,414,136.00
6	Reinforcing Steel (Bulkhead)	LB	94276	\$ 1.25	\$ 117,845.00
7	New Splash Blocks (4” Thick)	SY	4620	\$ 90.00	\$415,800.00
8	Concrete Surface Protective Coating	SY	4849	\$15.00	\$ 72,735.00
9	Drainage Pipe Through Bulkhead	EA	21	\$ 10,400.00	\$ 218,400.00
10	New Concrete Stairs	EA	12	\$ 50,000	\$ 600,000.00
11	Backfill & Reconstruct Asphalt Pavement	LS	LS	\$ 240,175.00	\$ 240,175.00
Subtotal Cost =					\$ 11,880,931.60
Contingency (15%)					\$ 1,782,139.74
Engineer’s Probable Cost Estimate					\$ 13,663,071.34

Based on a 30-yr. remaining service life and 2.5% inflation applied to the replacement cost, the future replacement costs are listed at 10-year intervals are presented in **Table 3.3.5** below:

Table 3.3.4-2: Present and Future Engineer’s Probable Cost Estimate for Alternative 1

Time Period	Present	After 10 Years	After 20 Years	End of Service Life After 30 Years
Alternative 1 Cost	\$ 0.00	\$ 17,489,886.44	\$ 22,388,533.32	\$ 28,659,215.47

Estimated Alternative 1, 30-Year Probable Engineer’s Cost Estimate = \$ 28,659,215.47

3.3.5 Alternative 2 Cost Analysis

Alternative 2 calls for performing long-term repairs aimed to upgrade/protect and extend the service life of the seawall. This includes installing a cathodic protection system now and after 30 years to extend the service life of the wall beyond the 30-year presumptive remaining service life of the wall. **Table 3.3.5** lists the present and future maintenance costs of **Alternative 2**:

Table 3.3.5: Present and Future Engineer’s Probable Cost Estimate for Alternative 2

Time Period	Present	After 10 Years	After 20 Years	End of Service Life After 30 Years
Maintenance Cost	\$ 2,676,276.60	\$ 221,115.40*	\$ 283,046.41*	\$ 362,323.34*
Cathodic Protection	\$ 1,040,000.00	N/A	N/A	\$ 2,181,470.28
Subtotal Cost	\$ 3,716,276.60	\$ 211,115.40	\$ 283,046.41	\$ 2,543,793.62
Contingency (15%)	\$ 557,441.49	\$ 33,167.31	\$ 42,456.96	\$ 381,569.04
Total Periodic Maintenance Cost	\$ 4,273,718.09	\$ 254,282.71	\$ 325,503.37	\$ 2,925,362.66
Alternative 2 Cumulative Cost	\$ 4,273,718.09	\$ 4,528,000.80	\$ 4,853,504.17	\$ 7,778,866.83

(*) 10-yr, 20-yr and 30-yr. maintenance cost is the combined cost of bulkhead surface protective coating and other miscellaneous repairs estimated at \$100,000 every 10 years subject to inflation rate of 2.5%.

Estimated Alternative 2, 30-Year Probable Engineer’s Cost Estimate = \$ 7,778,866.83

3.3.6 Alternative 3 Cost Analysis

Alternative 3 calls for replacing the wall now and performing long-term repairs aimed to upgrade/protect and extend the service life of the seawall. This includes installing a cathodic protection system now and after 30 years to extend the service life of the wall to the 75-year service life of the wall. **Table 3.3.6** lists the present construction cost and future maintenance costs of **Alternative 3**:

Table 3.3.6: Present and Future Engineer’s Probable Cost Estimate for Alternative 3

Time Period	Present	After 10 Years	After 20 Years	End of Service Life After 30 Years
Maintenance Cost	12,623,071.34	N/A	\$ 283,046.41*	\$ 362,323.34*
Cathodic Protection	\$ 1,040,000.00	N/A	N/A	\$ 2,181,470.28
Subtotal Cost	\$ 13,663,071.34	\$ 0.00	\$ 283,046.41	\$ 2,543,793.62
Contingency (15%)	\$ 2,049,460.70	\$ 0.00	\$ 42,456.96	\$ 381,569.04
Total Periodic Maintenance Cost	\$ 15,712,532.04	\$ 0.00	\$ 325,503.37	\$ 2,925,362.66
Alternative 3 Cumulative Cost	\$ 15,712,532.04	\$ 15,712,532.04	\$ 16,038,035.41	\$ 18,963,398.07

(*) 10-yr, 20-yr and 30-yr. maintenance cost is the combined cost of bulkhead surface protective coating and other miscellaneous repairs estimated at \$100,000 every 10 years subject to inflation rate of 2.5%.

Estimated Alternative 3, 30-Year Probable Engineer’s Cost Estimate = \$ 18,963,398.07

3.3.7 Cost Analysis and Recommendation

Alternative 2 calls for extensive rehabilitation efforts (See **Table 3.3.5**) aiming at repairing the existing deficiencies and preserving the existing seawall by installing cathodic protection system to extend the structure service life.

Alternative 2 is considered feasible based on the collected field measurements indicating limited wall thickness loss due to corrosion. In addition, it provides the most cost-effective approach to address the short-term needs to correct existing deficiencies and long-term needs to limit wall degradation with time.

The 30-yr. Cumulative Cost of Alternative 2 is \$ 7,778,866.83 which is 41.02% of the 30-Year Cumulative Cost of **Alternative 3** and 27.14% of the 30-Year Cumulative Cost of **Alternative 1**.

Per the above, Alternative 2 is the recommended alternative because it provides the most feasible and cost-effective measure to preserving and extending the service-life of the seawall.

Appendix A Final Inspection Report:
Inspection of Lakefront Retainer Wall
Mandeville, LA
(Specialty Diving, Inc)



Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Inspection of Lakefront Retainer Wall Mandeville, LA

Conducted by:
Specialty Offshore, Inc.

24358 Gliderport
Loranger, LA 70446
(985) 542-8770

Job Number: 22-1034
December 12, 2022

Prepared for:
Burk Kleinpeter
P.O. Box 19087
New Orleans La, 70109



Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Client: Burk Kleinpeter

Location: Mandeville, LA

Client Rep: Henry Picard

Specialty Representative: Marshall Whitmer

Dive Supervisor: Ben Swan

Introduction:

Specialty Diving was contracted to inspect approximately 8400 feet of sea wall at the Lakefront in Mandeville, LA. This will be done using surface supplied air diving. Starting at the farthest, west end of the wall.

Scope of work:

Specialty Diving will mob every day with all dive and inspection equipment. Starting at the farthest west end, the dive crew will inspect approximately 400 to 500 feet per day depending on weather or other elements. During inspection diver will give a visual of both the pile cap and sheet piling for any anomaly's or deterioration as he travels East down the sea wall.



Specialty Diving, Inc.
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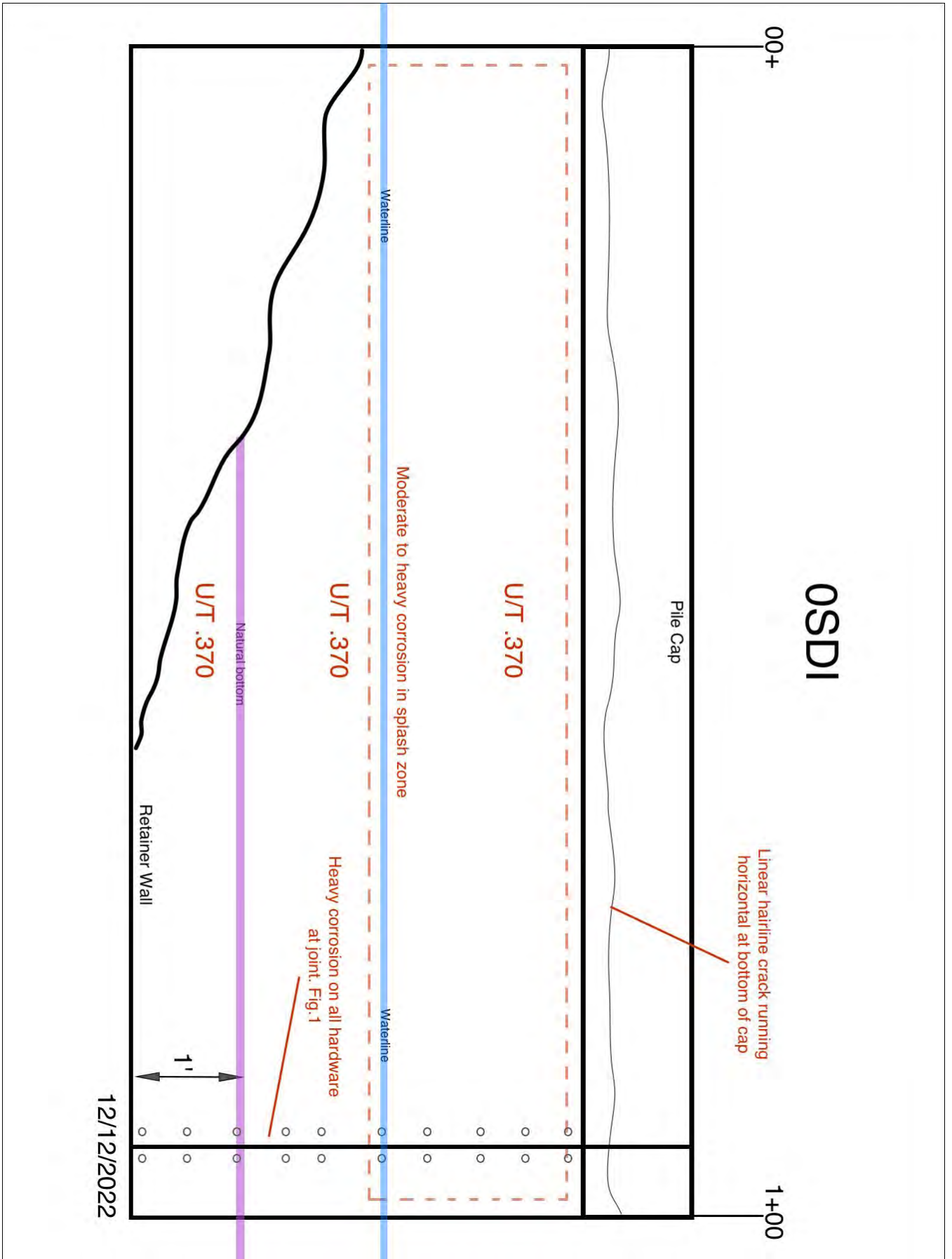
WEEK 1

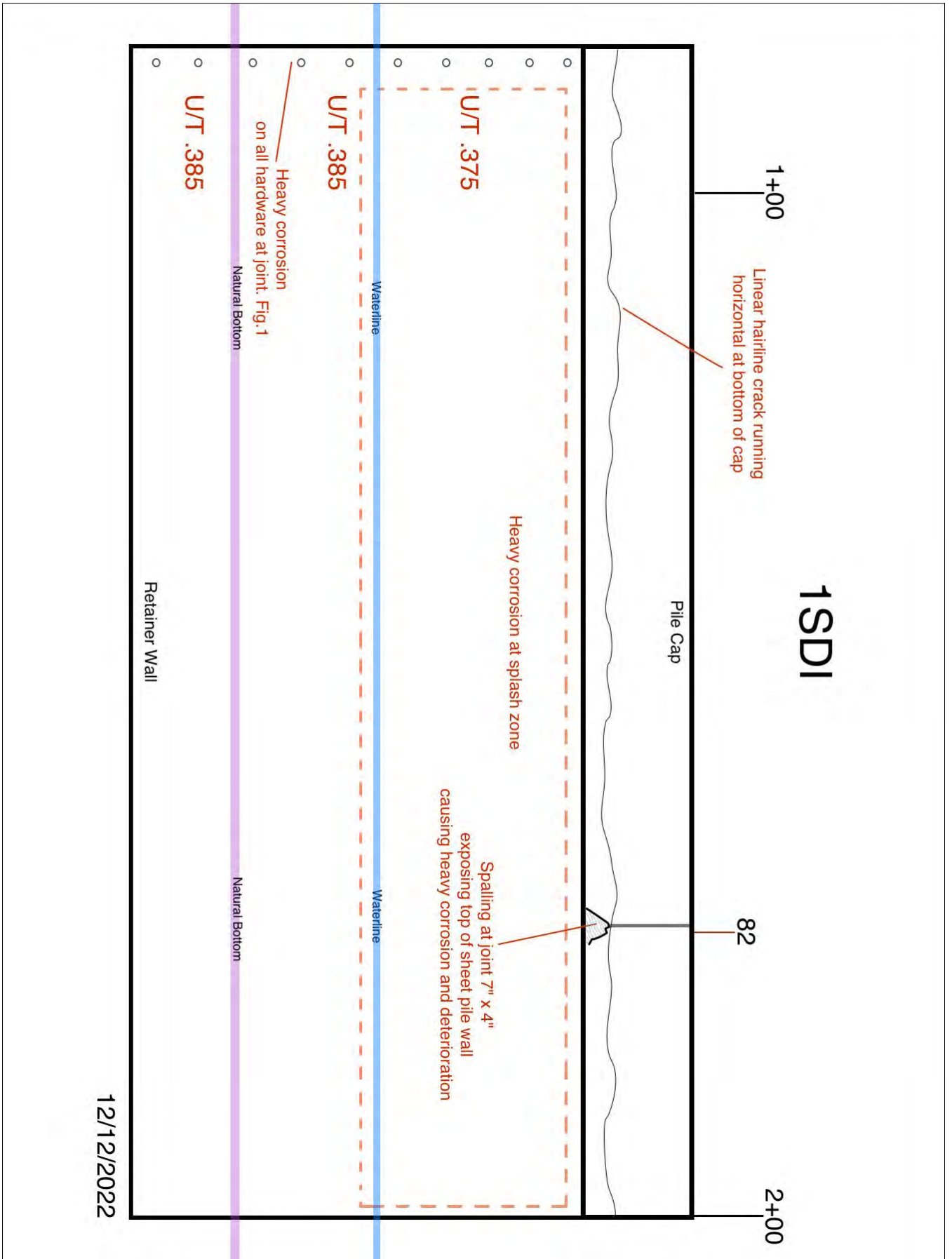
12/12/2022

Specialty Diving inspected approximately 2000 feet of sea wall. Starting at the 00+ and ended at the 20 + mark. A full inspection of the pile cap and sheet pile wall (extending one foot below the mud line) was thoroughly checked for any major indications.

Numerous anomaly's were discovered along the sea wall such as heavy spalling on the pile cap and heavy corrosion and deterioration on the sheet pile wall. This deterioration was mostly in areas at a turn with bracket and hardware and at each spall on pile cap. Moderate to heavy corrosion and coating failure was consistent throughout the splash zone and at each knuckle joint. Along with a linear horizontal crack running the length of the pile cap.

All indications and findings are documented below, along with the dimensions of each indication. An ultrasonic thickness measurement was taken at each mark approximately 100' apart. One below the water line, mid and one above.





2SDI

2+00

3+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Heavy corrosion in splash zone

UT .370

UT .375

UT .370

Waterline

Waterline

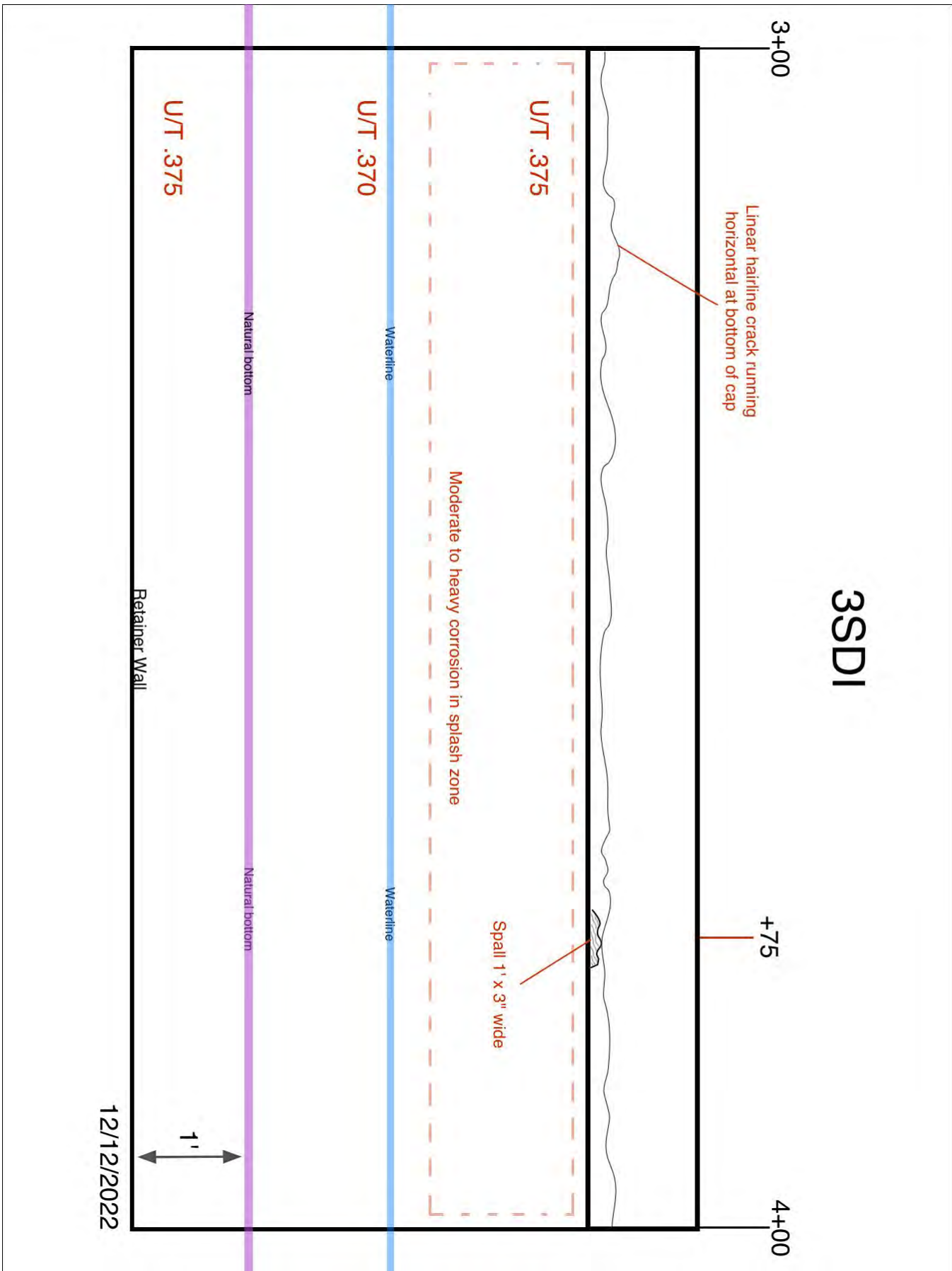
Natural bottom

Natural bottom

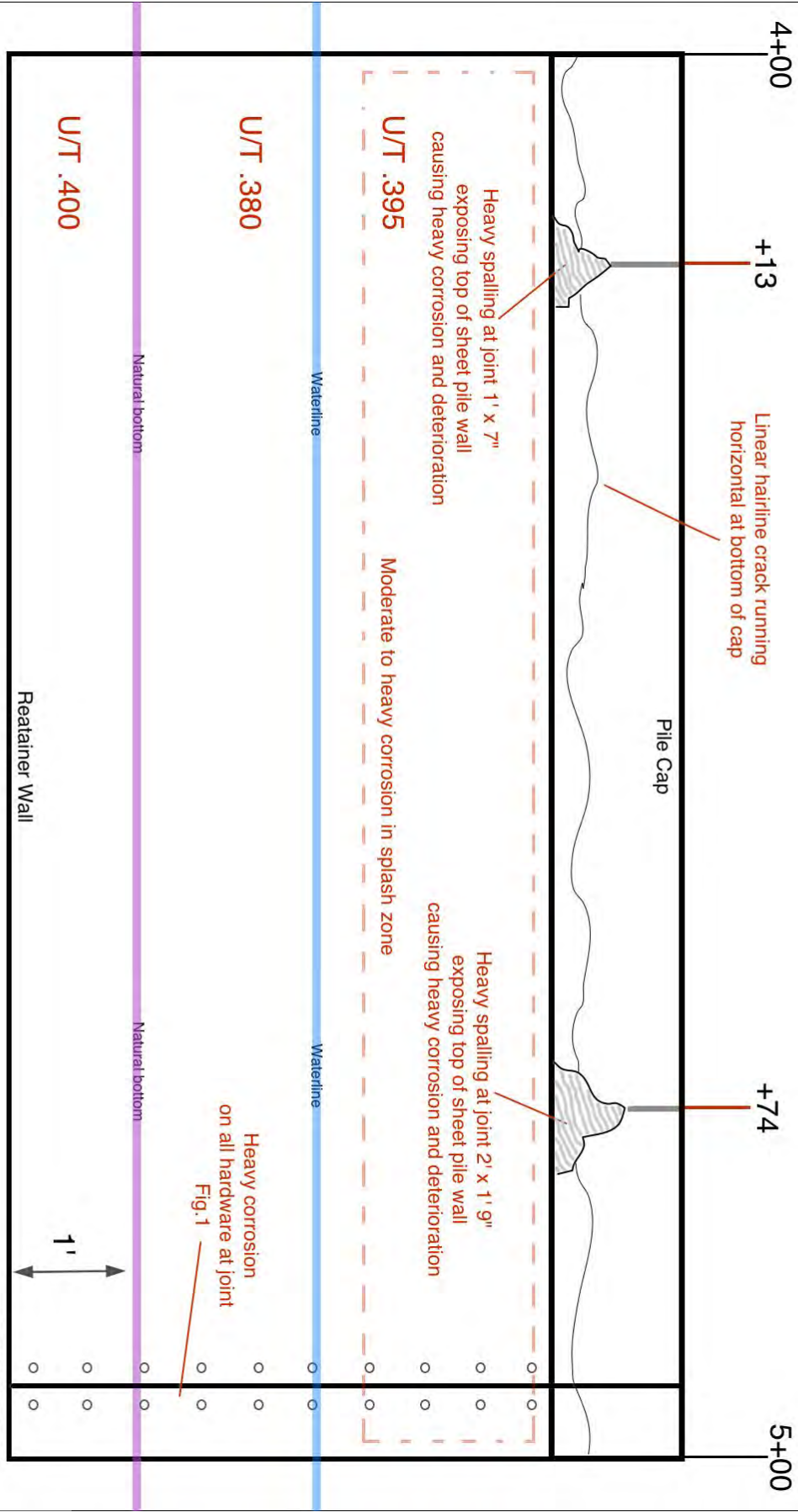
Retainer Wall

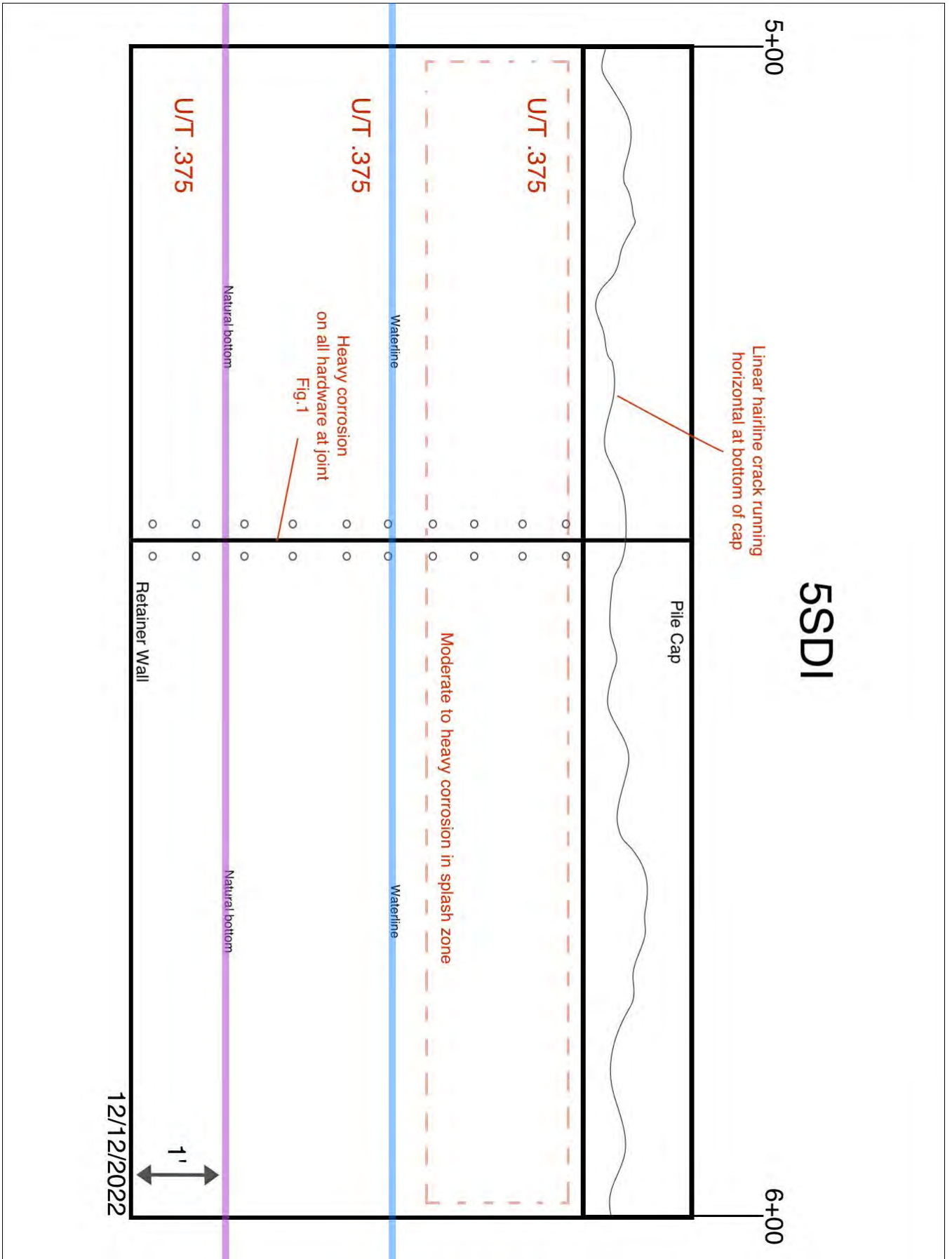
12/12/2022

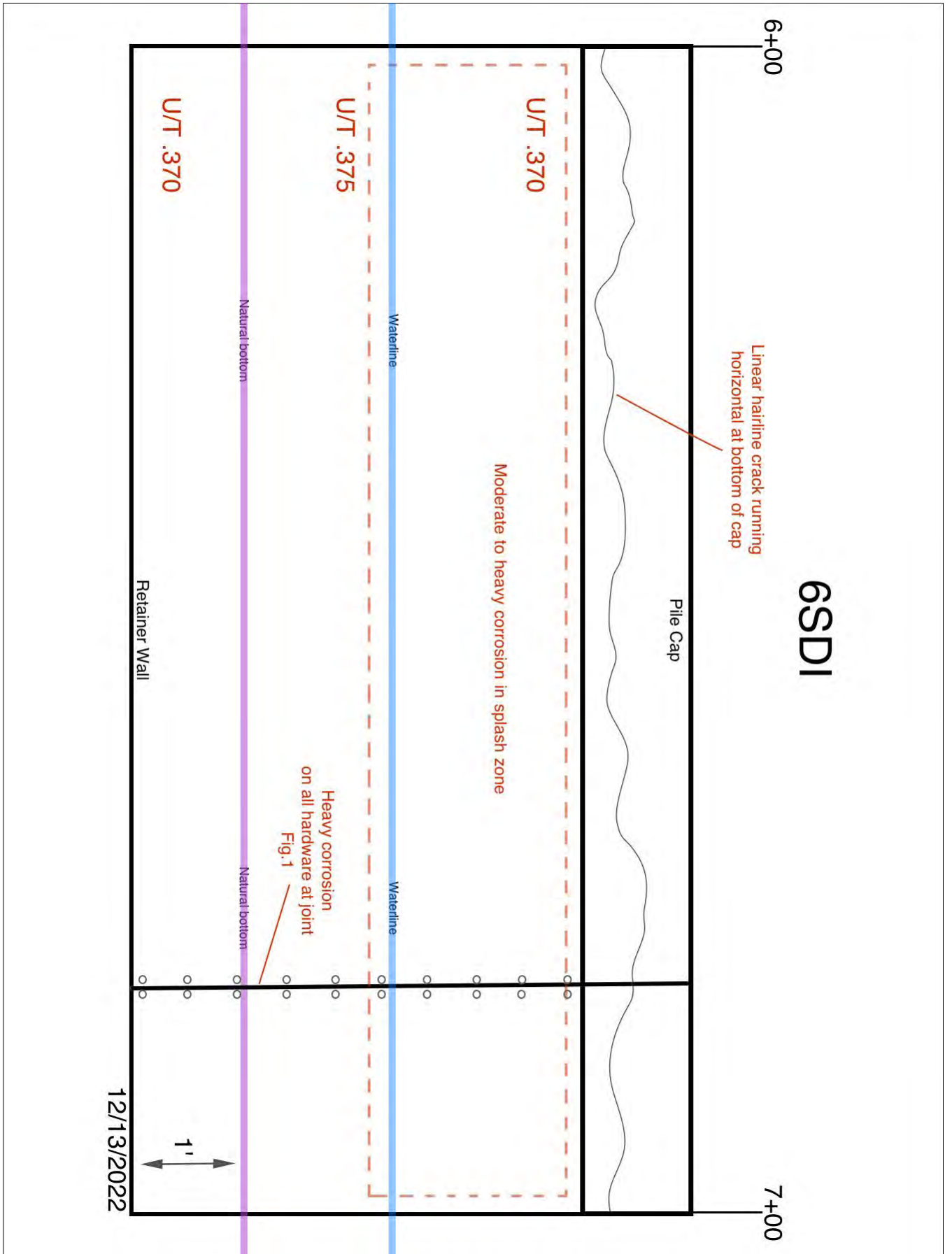
3SDI

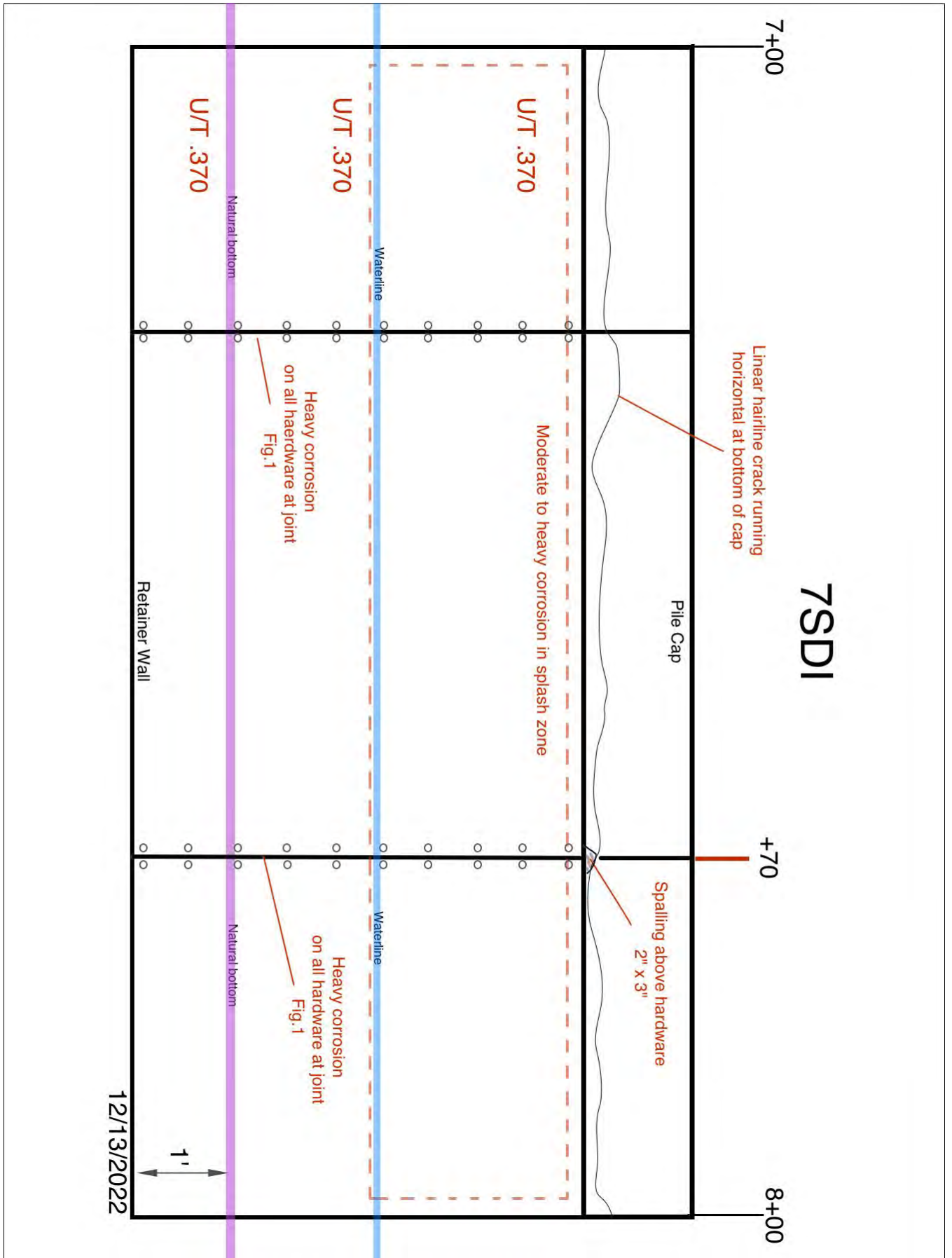


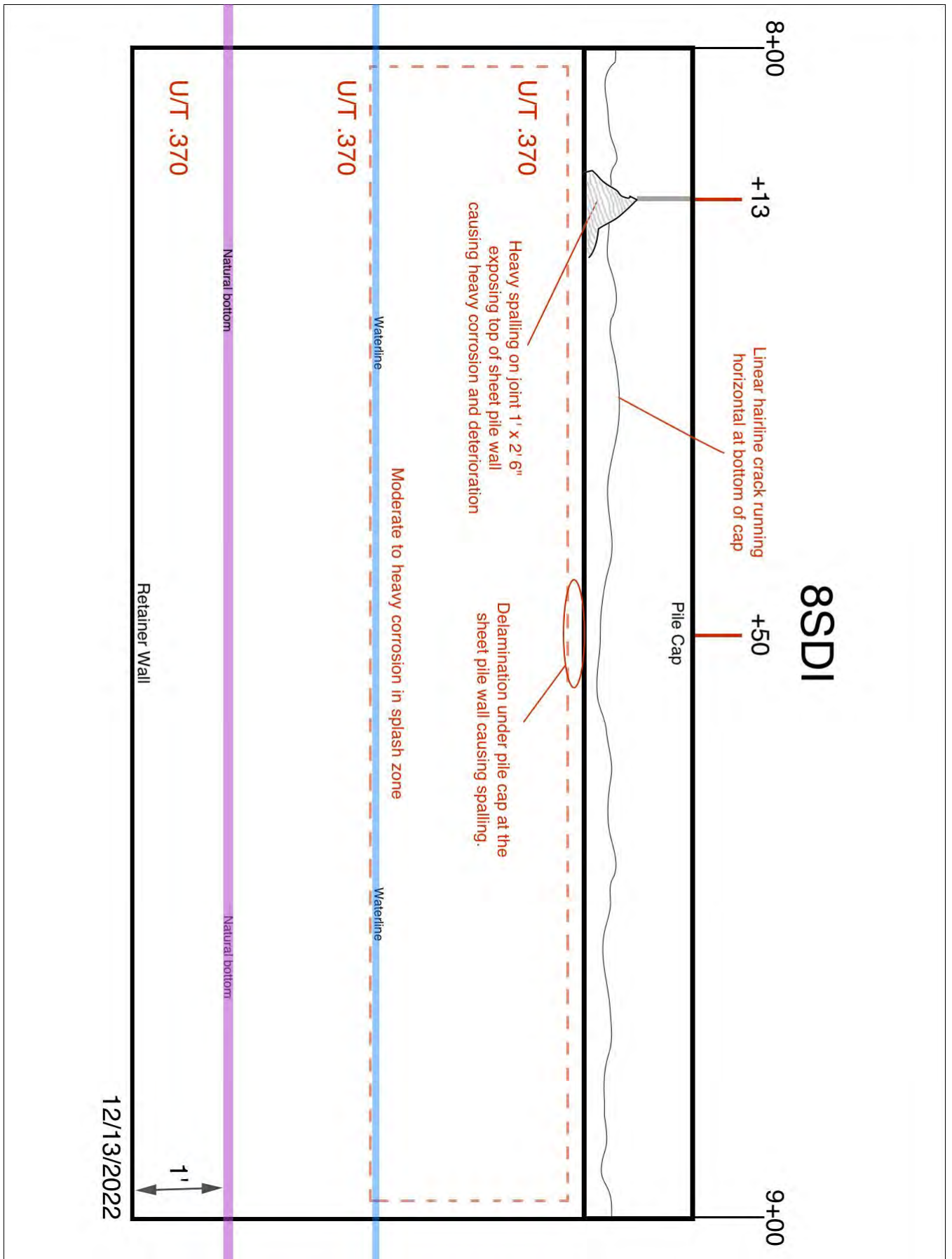
4SDI

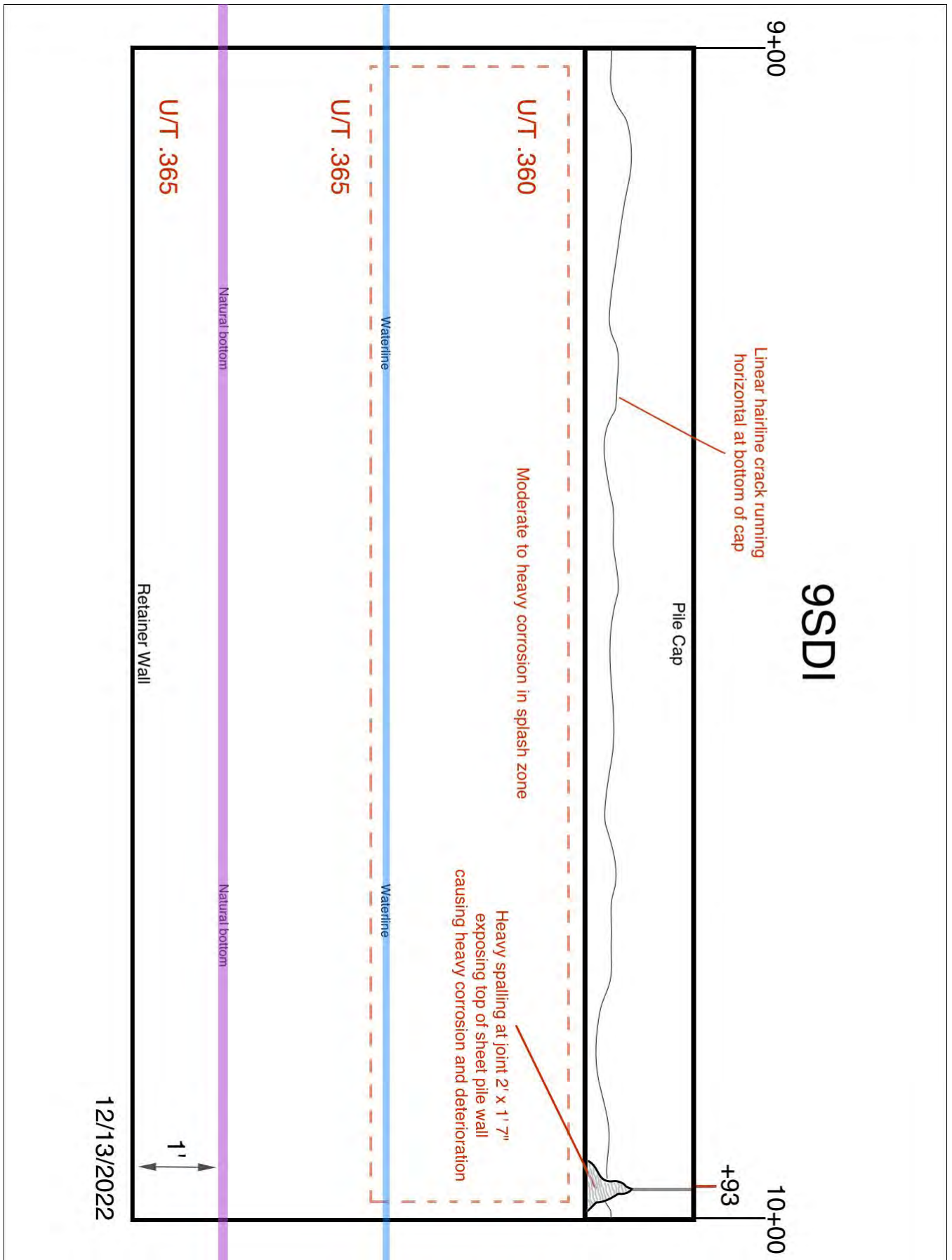




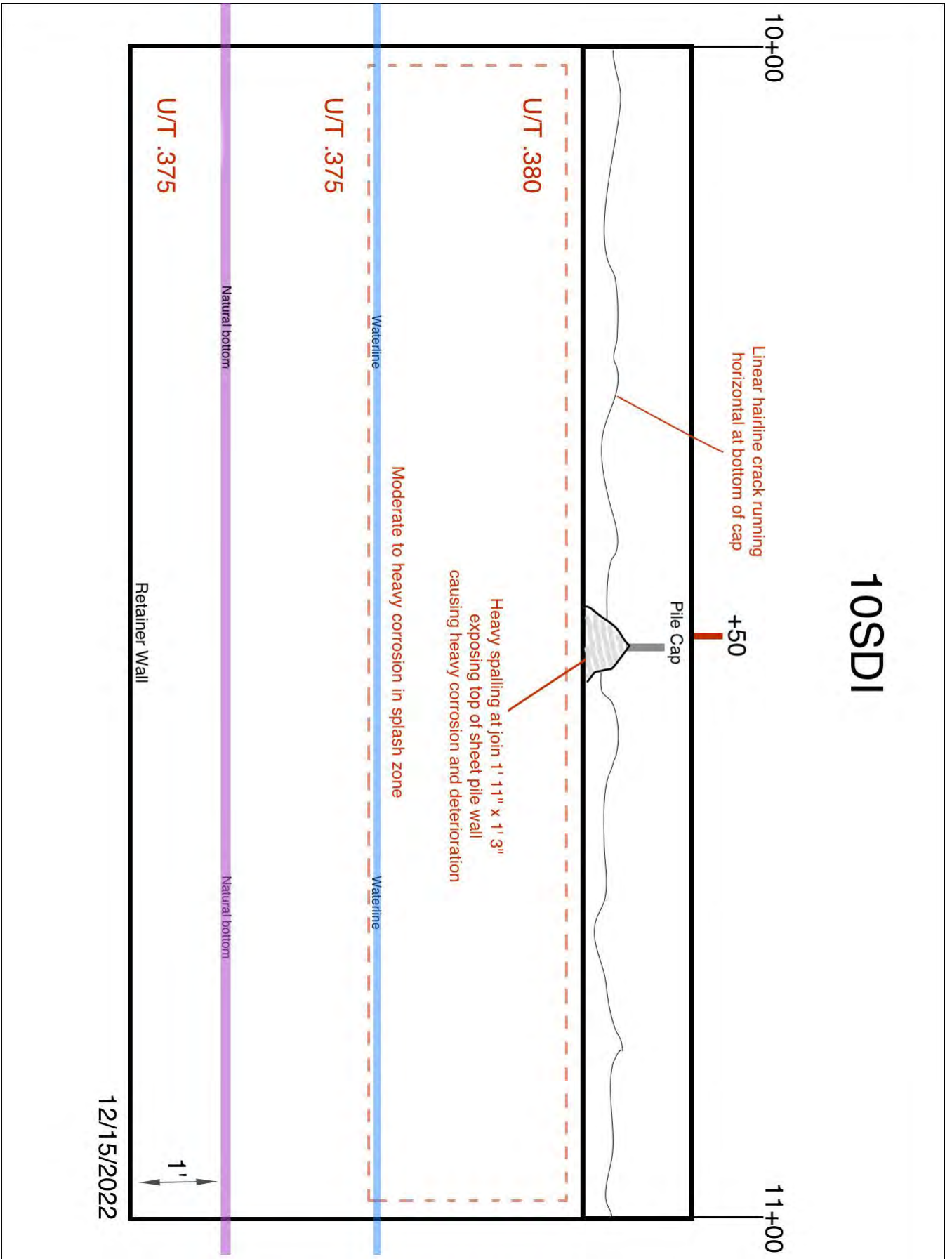








10SDI



10+00

Linear hairline crack running horizontal at bottom of cap

+50

Pile Cap

U/T .380

Heavy spalling at join 1' 11" x 1' 3" exposing top of sheet pile wall causing heavy corrosion and deterioration

Moderate to heavy corrosion in splash zone

Waterline

U/T .375

Natural bottom

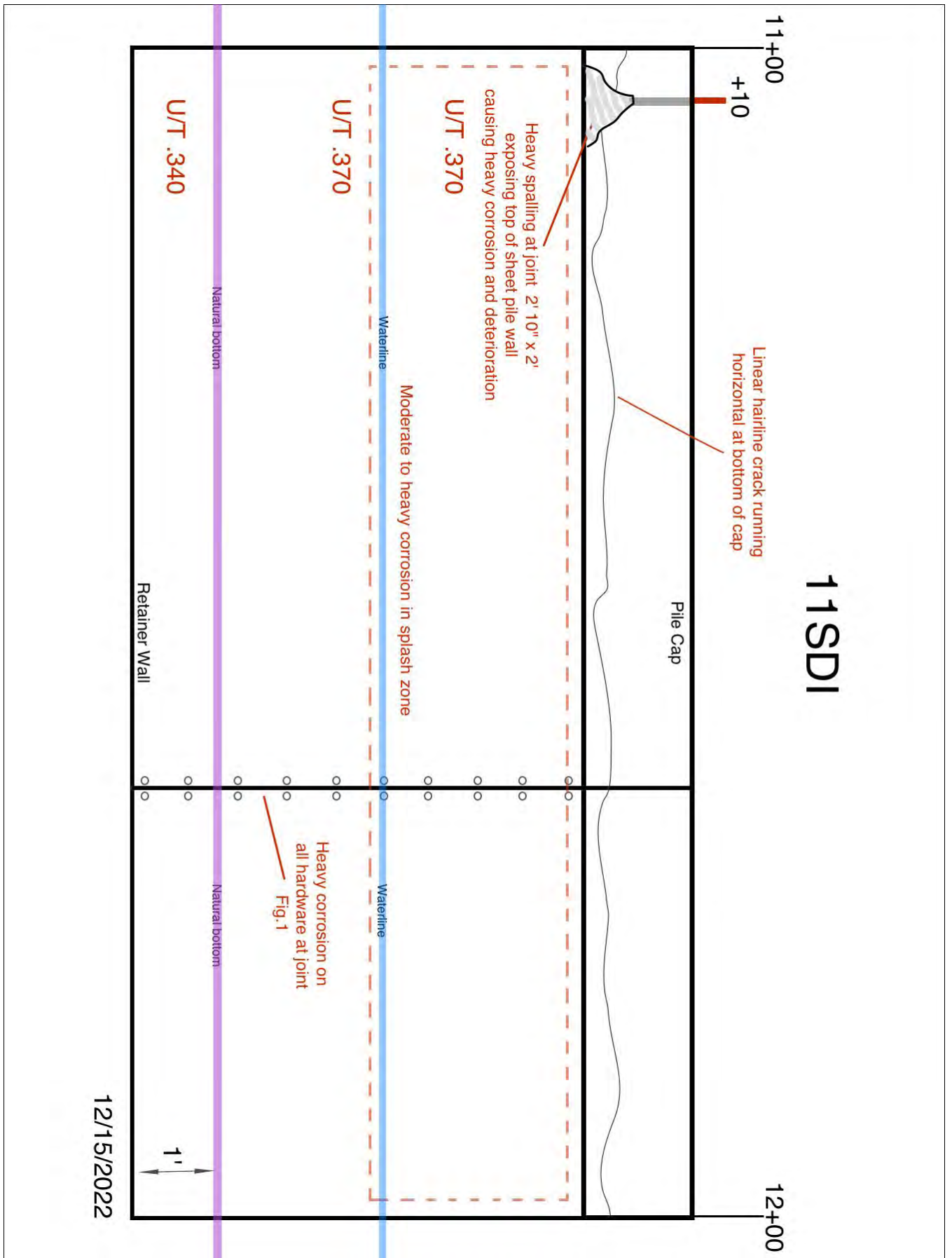
Retainer Wall

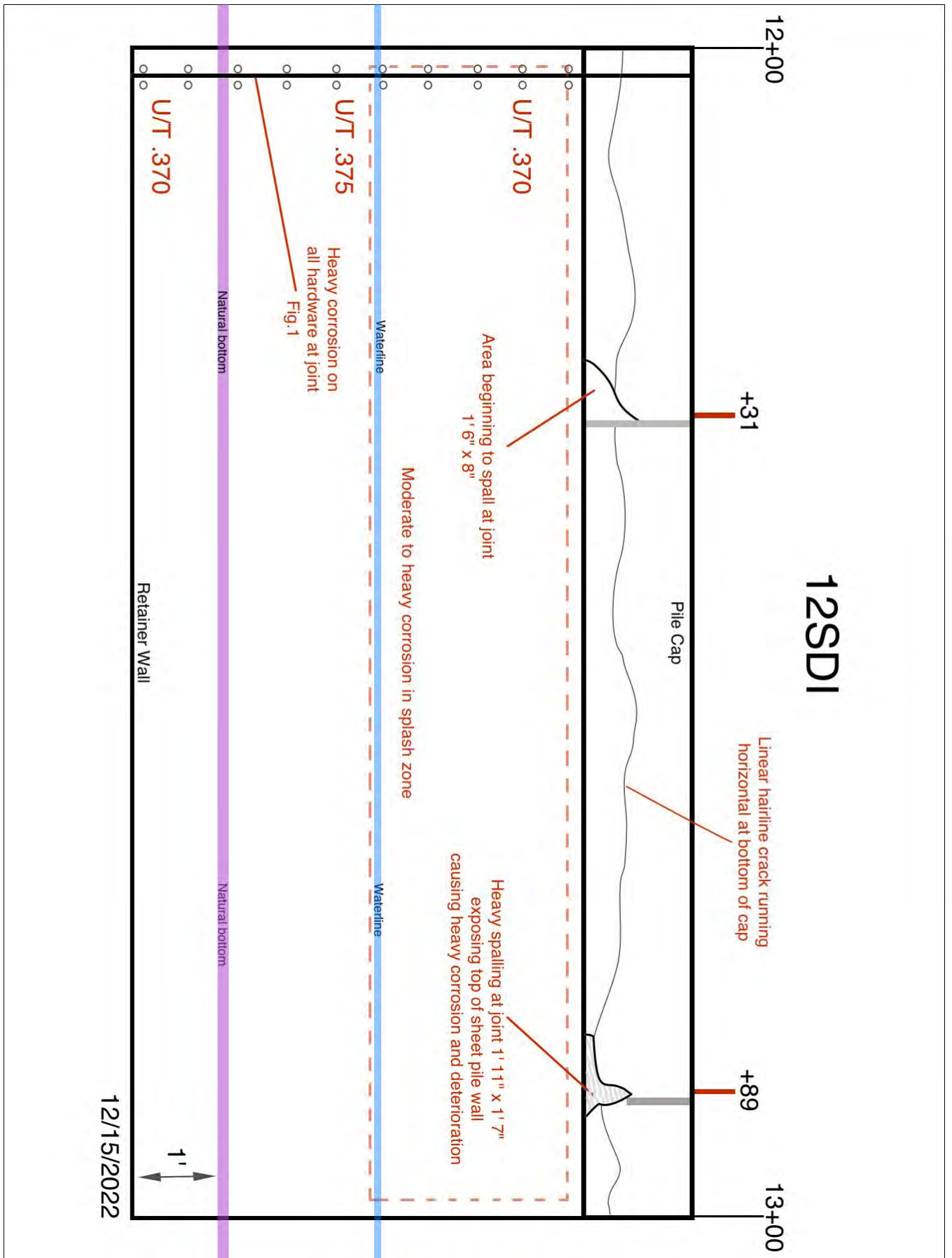
Natural bottom

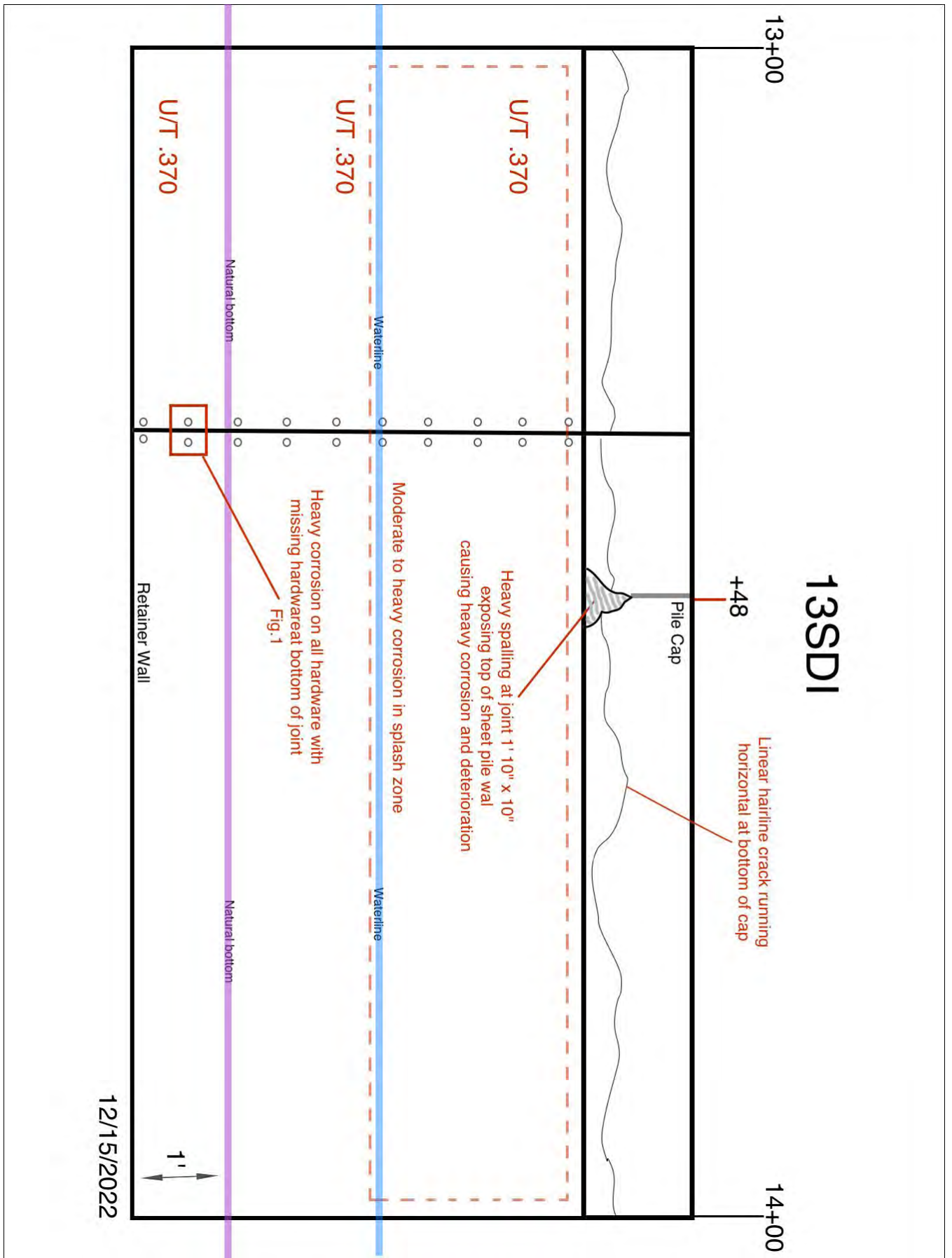
1'

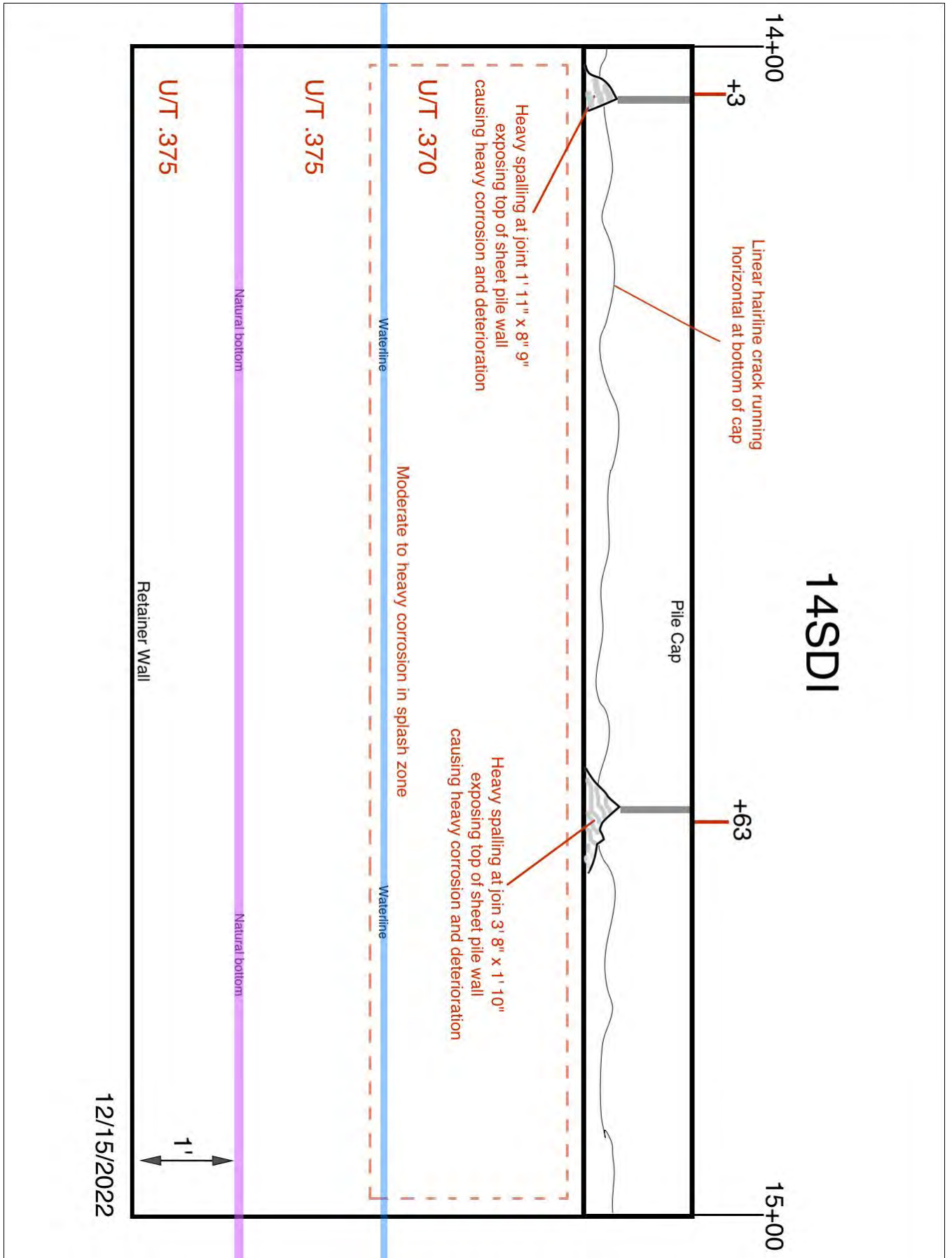
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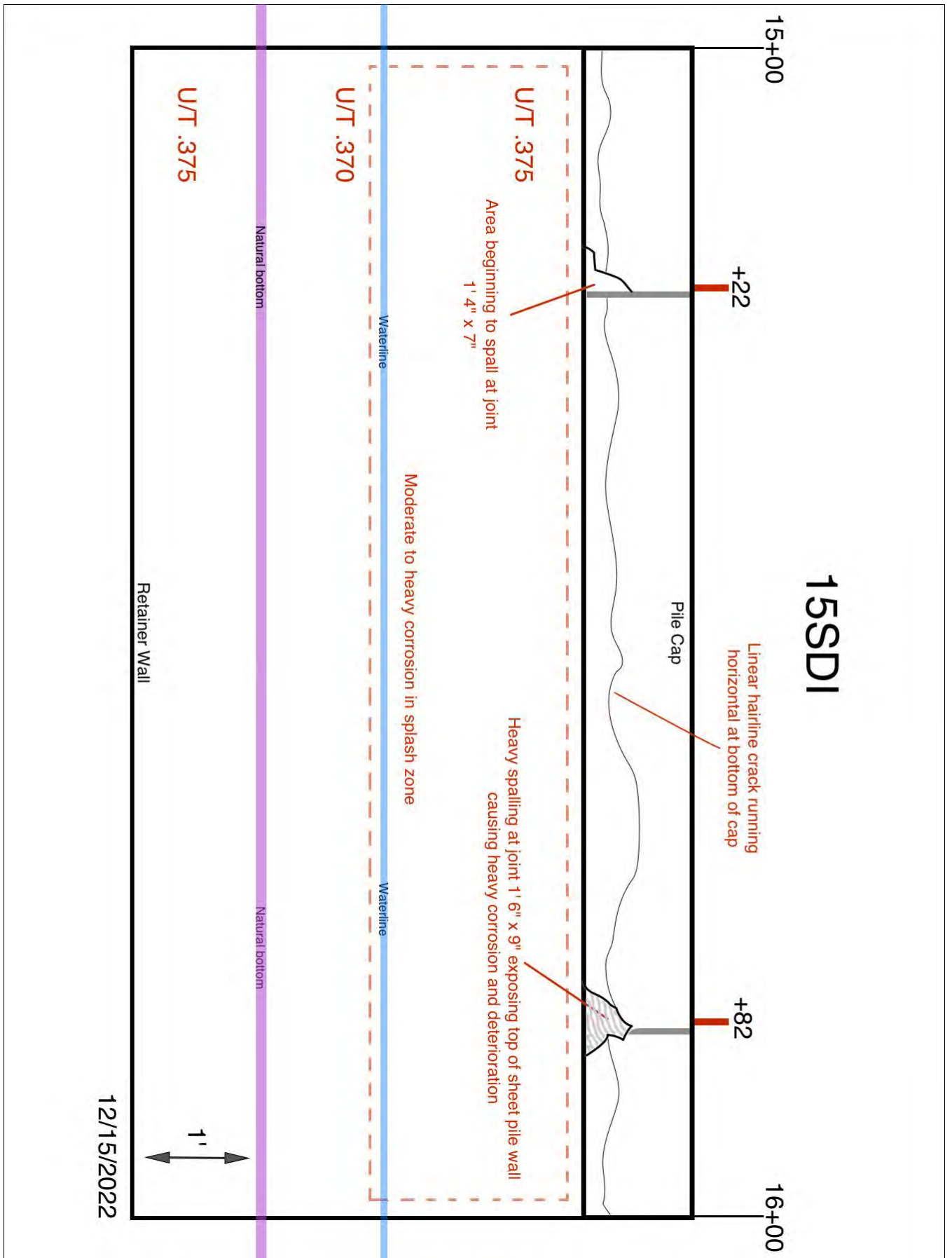
11+00

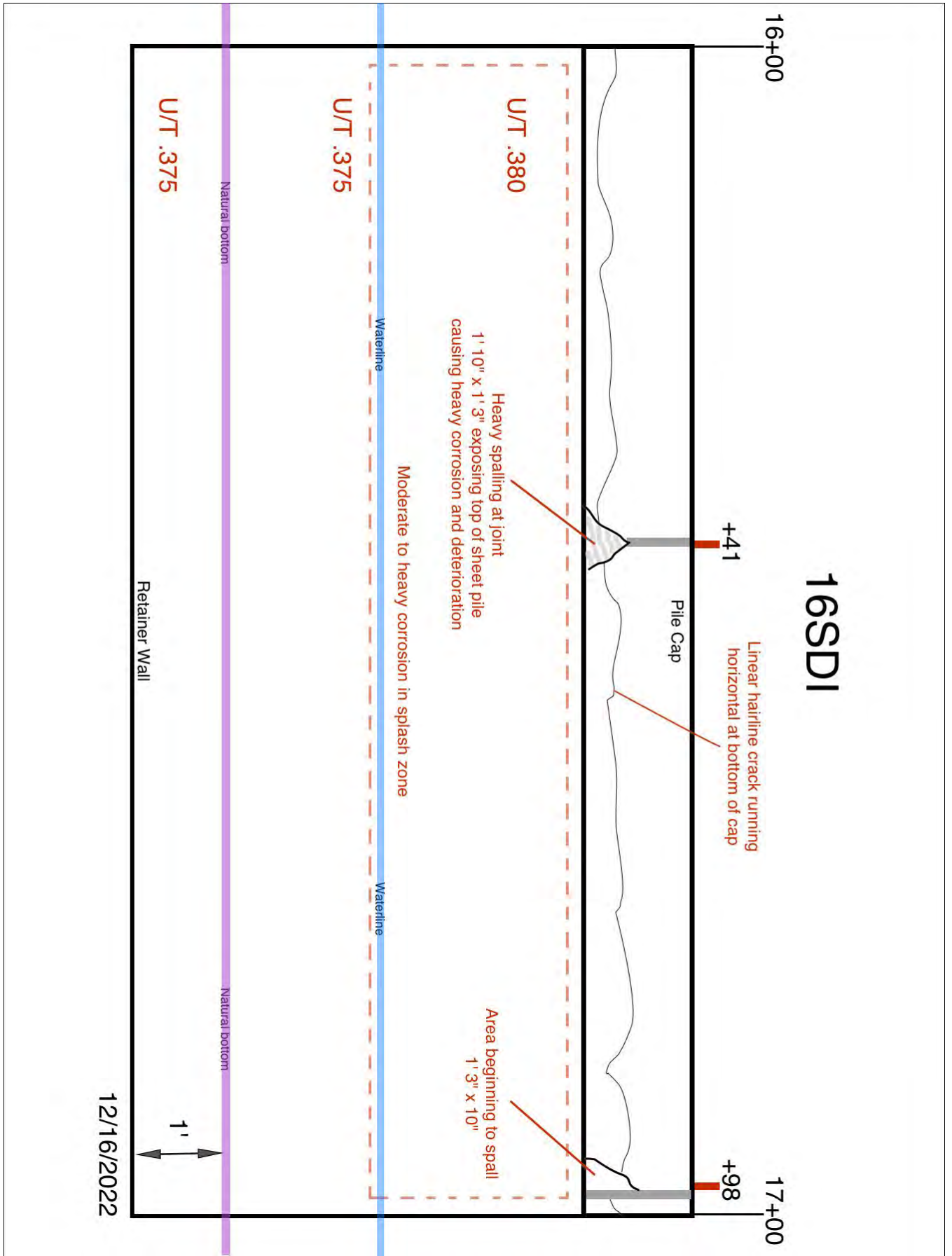












16SDI

17SDI

17+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+73

18+00

U/T .380

Waterline

Moderate to heavy corrosion in splash zone

U/T .375

Heavy corrosion on all hardware with 2 missing hardware at bottom of joint

Fig. 1

Natural bottom

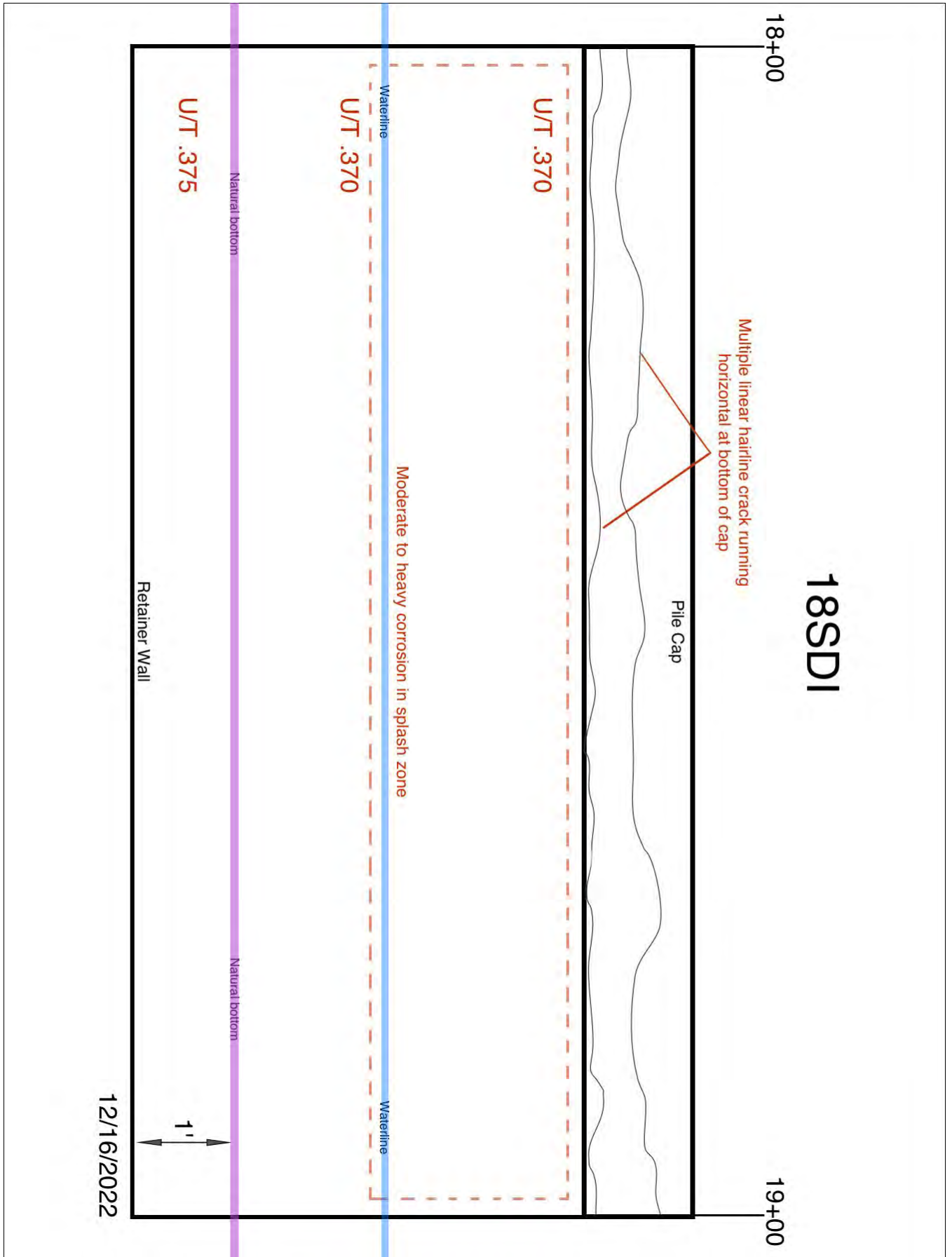
U/T .380

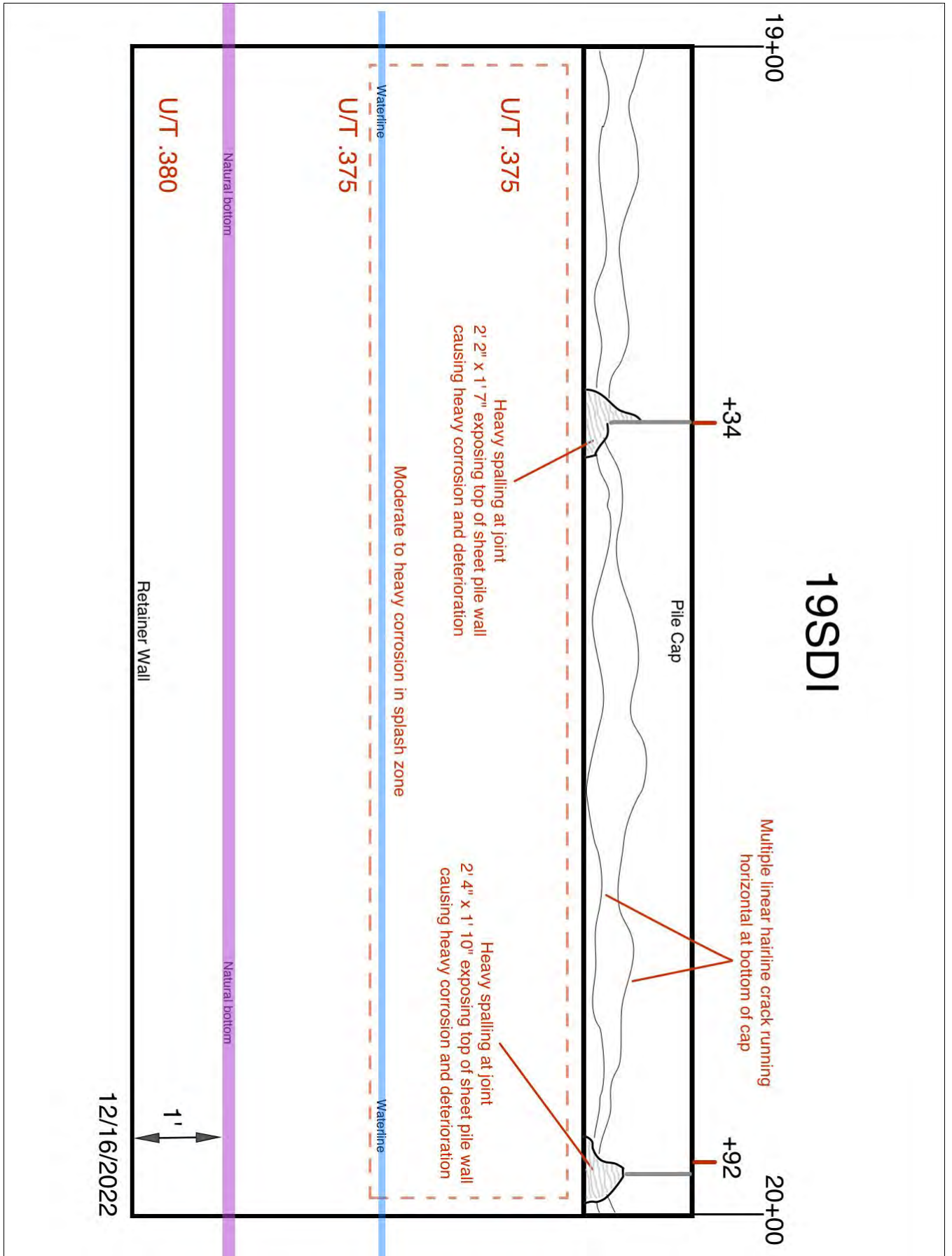
Retainer Wall

Natural bottom

1'

12/16/2022





19SDI

19+00

20+00

+34

+92

Pile Cap

Heavy spalling at joint
2' 2" x 1' 7" exposing top of sheet pile wall
causing heavy corrosion and deterioration

Moderate to heavy corrosion in splash zone

Heavy spalling at joint
2' 4" x 1' 10" exposing top of sheet pile wall
causing heavy corrosion and deterioration

Multiple linear hairline crack running
horizontal at bottom of cap

Retainer Wall

1"

12/16/2022

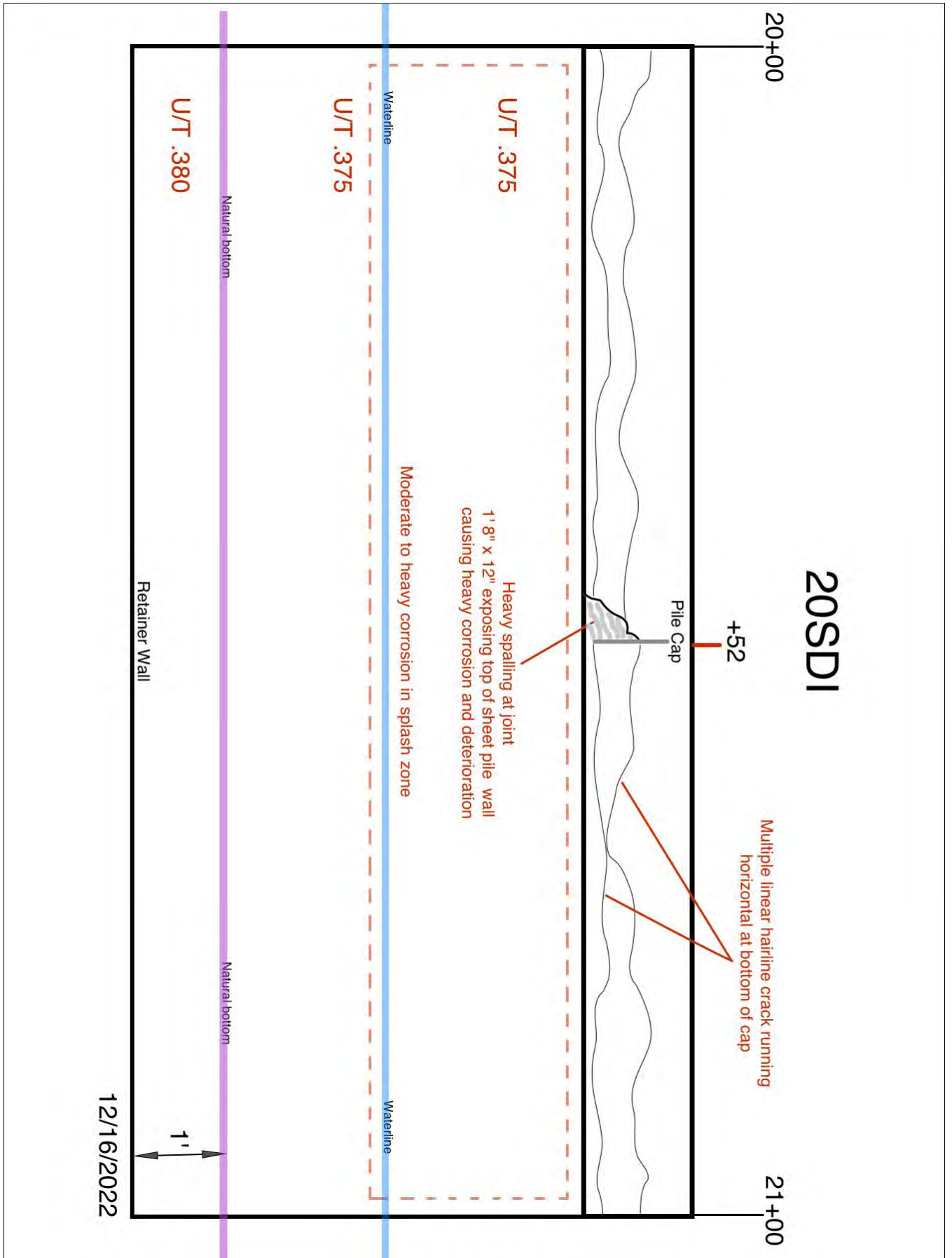
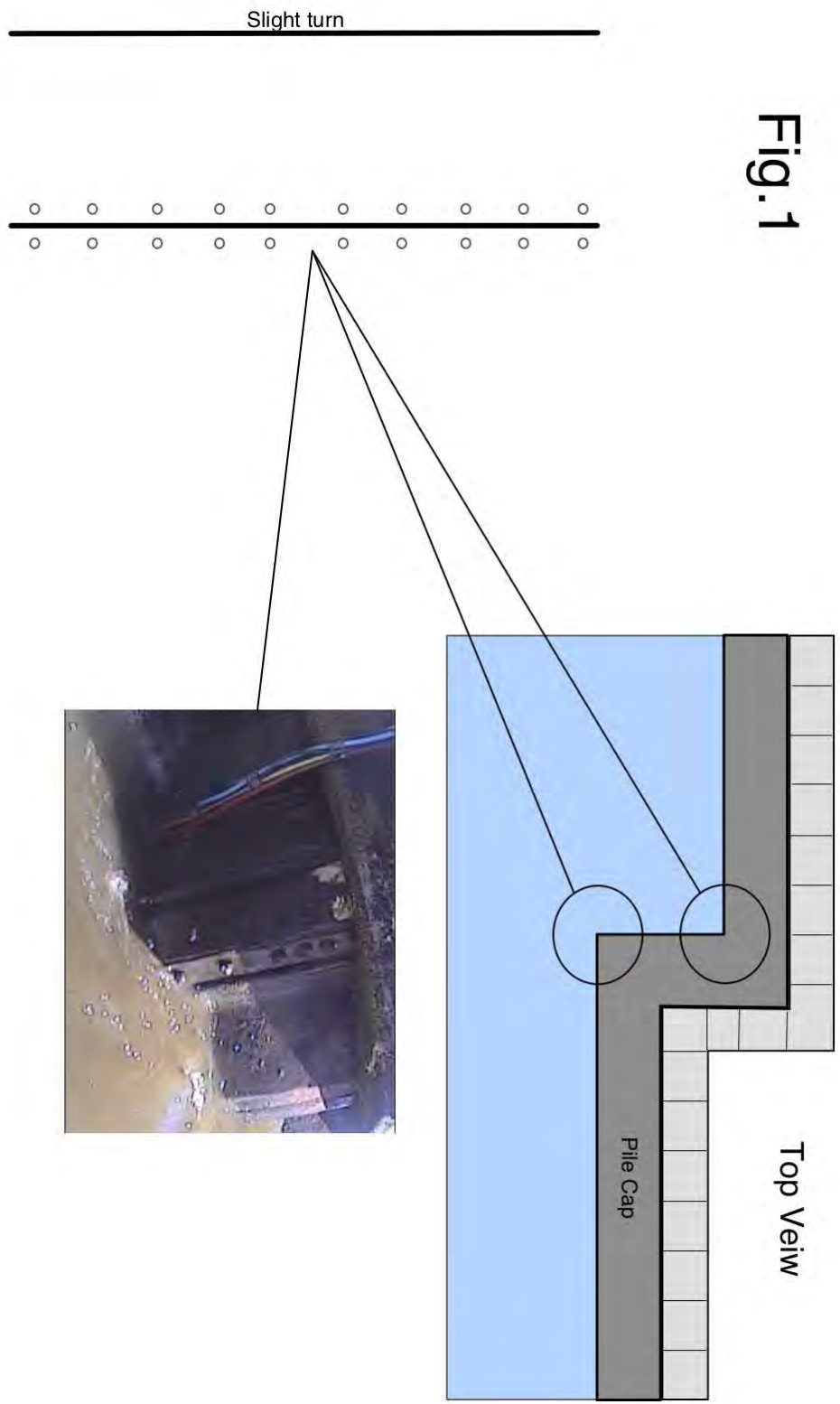


Fig. 1



This drawing represents a hard turn on the sea wall with an L shaped bracket and hardware joining two sections of sheet pile. Aslo displayed is a slight turn with no preexisting hardware

SDI ULTRASONIC THICKNES MEASUREMENTS 00+ - 20+

0SDI .370 .370 .370	1SDI .375 .385 .385	2SDI .370 .375 .370	3SDI .375 .370 .375	4SDI .395 .380 .400
5SDI .375 .375 .375	6SDI .370 .375 .370	7SDI .370 .370 .370	8SDI .370 .370 .370	9SDI .360 .365 .365
10SDI .380 .375 .375	11SDI .370 .370 .340	12SDI .370 .375 .370	13SDI .370 .370 .370	14SDI .370 .375 .375
15SDI .375 .370 .375	16SDI .380 .375 .375	17SDI .380 .375 .380	18SDI .370 .370 .375	19SDI .375 .375 .380
20SDI .375 .375 .380				

Fig.2

1SD1

1+82



Fig.3

3SD1

3+75



Fig.4

4SDI



4+13



4+75

Fig.5

8SDI

8+13



8+50



Fig.6

9SDI



9+93

Fig.7

10SDI

10+50



Fig.8

11SD1

11+10



Fig.9

12SD1



12+31



12+89

Fig.10

13SDI

13+48



Fig. 11

14SDI



14+03



14+63

Fig. 12

15SDI



15+22



15+82

Fig. 13

16SDI



16+41



16+98

Fig. 14

19SDI



19+34



19+92

Fig.14

20SDI

20+52





Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Inspection of Lakefront
Retainer Wall
Mandeville, LA

Conducted by:
Specialty Offshore, Inc.

24358 Gliderport
Loranger, LA 70446
(985) 542-8770

Job Number: 22-1034
December 12, 2022

Prepared for:
Burk Kleinpeter
P.O. Box 19087
New Orleans La, 70109



Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Location: Mandeville, LA

Client Rep: Henry Picard

Specialty Representative: Marshall Whitmer

Dive Supervisor: Ben Swan

Introduction:

Specialty Diving was contracted to inspect approximately 8400 feet of sea wall at the Lakefront in Mandeville, LA. This will be done using surface supplied air diving starting at the farthest west end of the wall.

Scope of work:

Specialty Diving will mob every day with all dive and inspection equipment. Starting at the farthest west end, the dive crew will inspect approximately 400 to 500 feet per day depending on weather or other elements. During inspection diver will give a visual of both the pile cap and sheet piling for any anomaly's or deterioration as he travels East down the sea wall.



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WEEK 2

12/19/2022

Specialty Diving inspected approximately 2000 feet of sea wall, starting at the 21+ and ended at the 41 + mark. A full inspection of the pile cap and sheet pile wall (extending one foot below the mud line) was thoroughly checked for any major indications.

Numerous anomaly's were discovered along the sea wall, such as heavy spalling on the pile cap and heavy corrosion and deterioration on the sheet pile. This deterioration was mostly in areas at a turn with bracket and hardware and each spall at pile cap. Moderate to heavy corrosion and coating failure was consistent in the splash zone throughout and at each knuckle joint. Along with a linear horizontal crack running the length of the pile cap.

All indications and findings are documented below, along with the dimensions of each indication. An ultrasonic thickness measurement was taken at each mark approximately 100' apart, one below the water line, mid and one above.

21SDI

21+00

22+00

+05

+20

Pile Cap

Multiple linear hairline crack running horizontal at bottom of cap

Heavy Spalling at joint
1' 5" x 10" exposing top of
sheet pile causing heavy corrosion
and deterioration.
Fig. 16

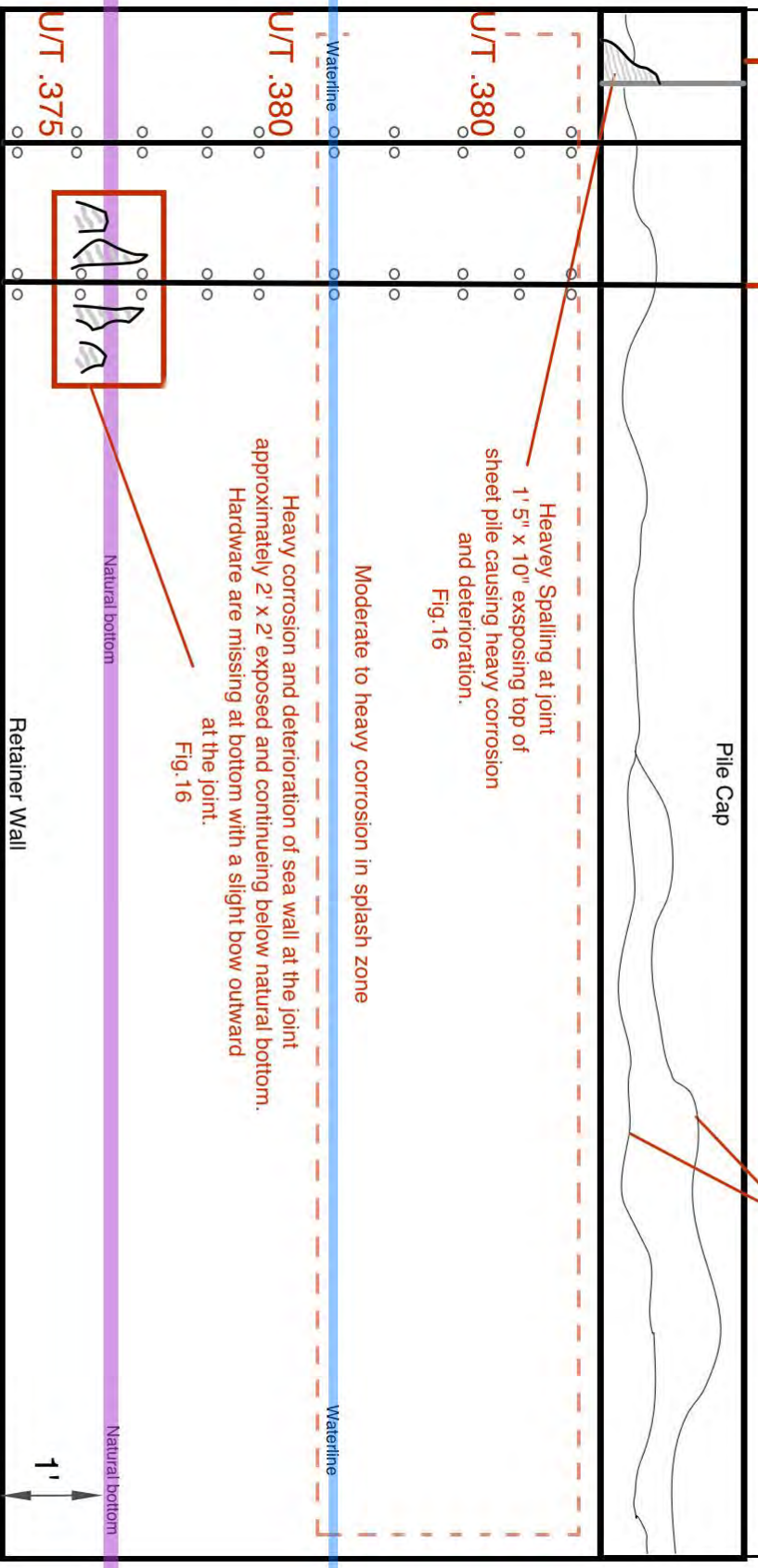
Moderate to heavy corrosion in splash zone

Heavy corrosion and deterioration of sea wall at the joint
approximately 2' x 2' exposed and continuing below natural bottom.
Hardware are missing at bottom with a slight bow outward
at the joint.
Fig. 16

Natural bottom

Natural bottom

Retainer Wall



U/T .375

U/T .380

U/T .380

12/19/2022

22SDI

22+00

23+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Moderate to heavy corrosion in splash zone

U/T .370

U/T .370

U/T .370

Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall

1'-1"

12/19/2022

23SDI

23+00

24+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Moderate to heavy corrosion in splash zone

UT .370

Area beginning to spall at joint 1' x 8" Fig. 17

Waterline

Waterline

UT .370

Natural bottom

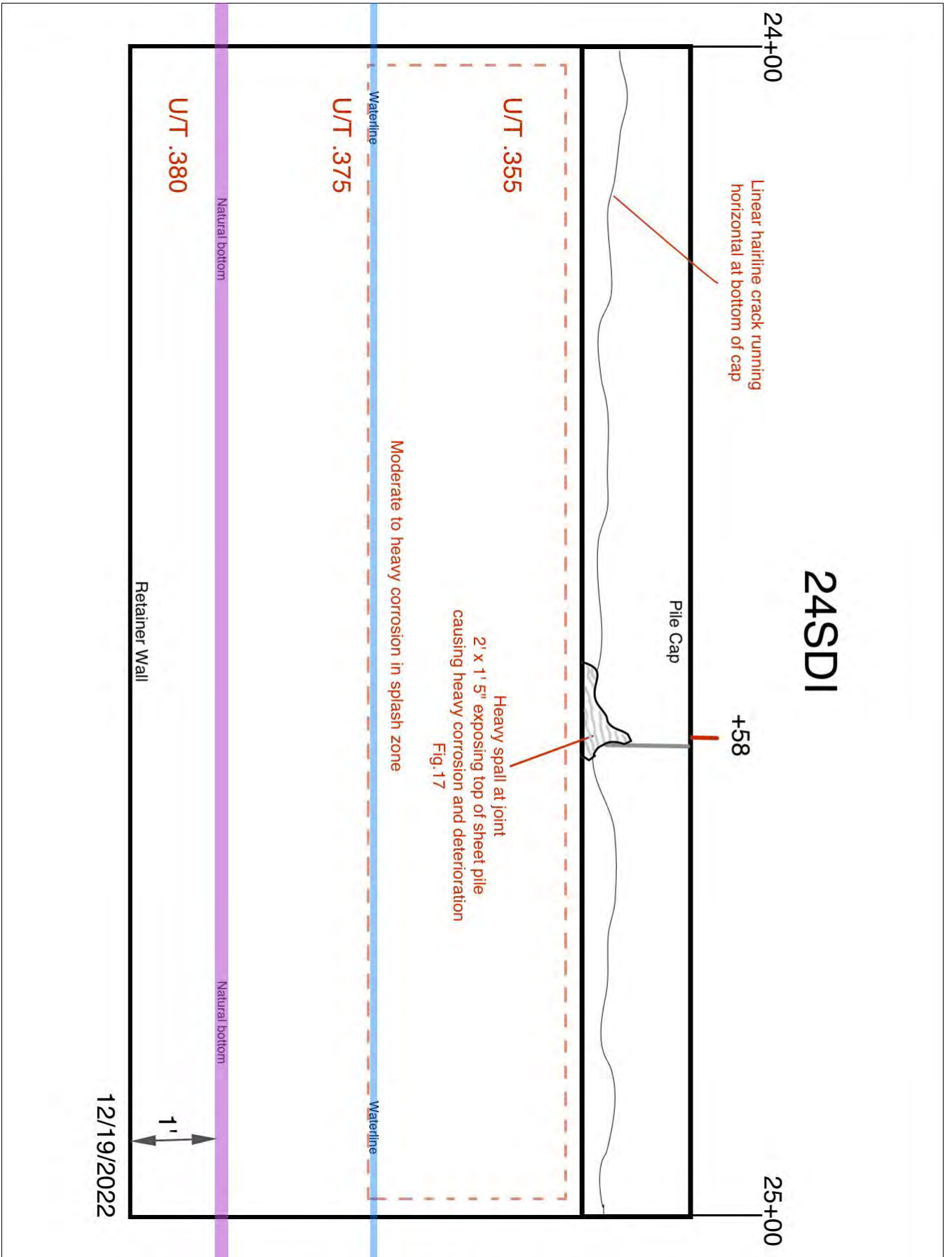
Natural bottom

UT .375

Retainer Wall

1'

12/19/2022



25SDI

25+00

26+00

+21

+40

+70

Linear hairline crack running horizontal at bottom of cap

Pile Cap

UT .350

Heavy spalling at joint 1' 10" x 2' exposing top of sheet pile causing heavy corrosion and deterioration Fig. 18

UT .360

Waterline

Moderate to heavy corrosion in splash zone

Heavy spalling at the joint 1' 1 1/2" x 9" exposing top of sheet pile causing heavy corrosion and deterioration Fig. 18

Heavy corrosion and deterioration on sheet pile at bottom of joint approximately 8" x 11" with hardware missing. Fig. 18

UT .360

Natural bottom

Retainer Wall

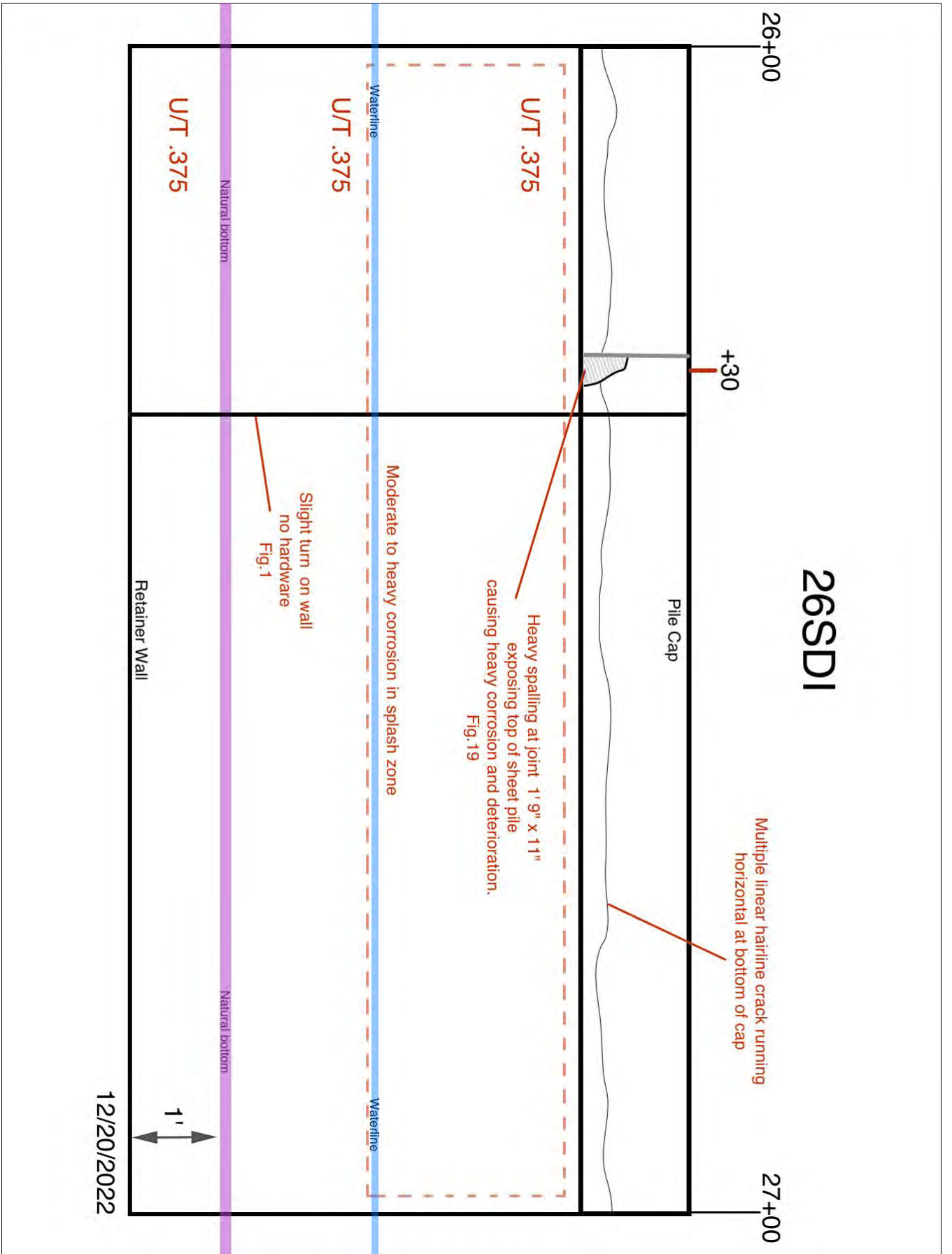
Natural bottom

1'

12/20/2022



Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770



27SDI

27+00

28+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Moderate to heavy corrosion in splash zone

U/T .365

U/T .370

U/T .370

Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall

1'

12/20/2022

Linear hairline crack running horizontal at bottom of cap

28SDI

28+00



Pile Cap

+63

+72

29+00

U/T .395

Waterline

Moderate to heavy corrosion in splash zone

U/T .385

Heavy corrosion and deterioration on joint bracket and hardware. Approximately 2' section separated from sheet piles and 9" section missing at bottom.

Fig.20

Natural bottom

U/T .370

Retainer Wall

Heavy spalling at joint 3' x 1' 6" exposing top of sheet pile causing heavy corrosion and deterioration Fig.20

Waterline

Natural bottom

1'

12/20/2022

29SD1

29+00

30+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Moderate to heavy corrosion in splash zone

UT .380

UT .375

UT .375

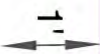
Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall



12/21/2022

30SDI

30+00

31+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Moderate to heavy corrosion in splash zone

UT .375

UT .375

UT .375

Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall

1'

12/21/2022

31SDI

31+00

32+00

Pile Cap

Linear hairline crack running horizontal at bottom of cap

UT .375

Moderate to heavy corrosion in splash zone

UT .380

UT .380

Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall

1'

12/21/2022

32SDI

32+00

33+00

+24

+73

Linear hairline crack running horizontal at bottom of cap

Pile Cap

Bayou

U/T .380

U/T .380

U/T .380

Moderate to heavy corrosion in splash zone

Heavy corrosion and deterioration at bottom of corner braket and hardware 11" x 7" Fig:21

Natural bottom

Waterline

Waterline

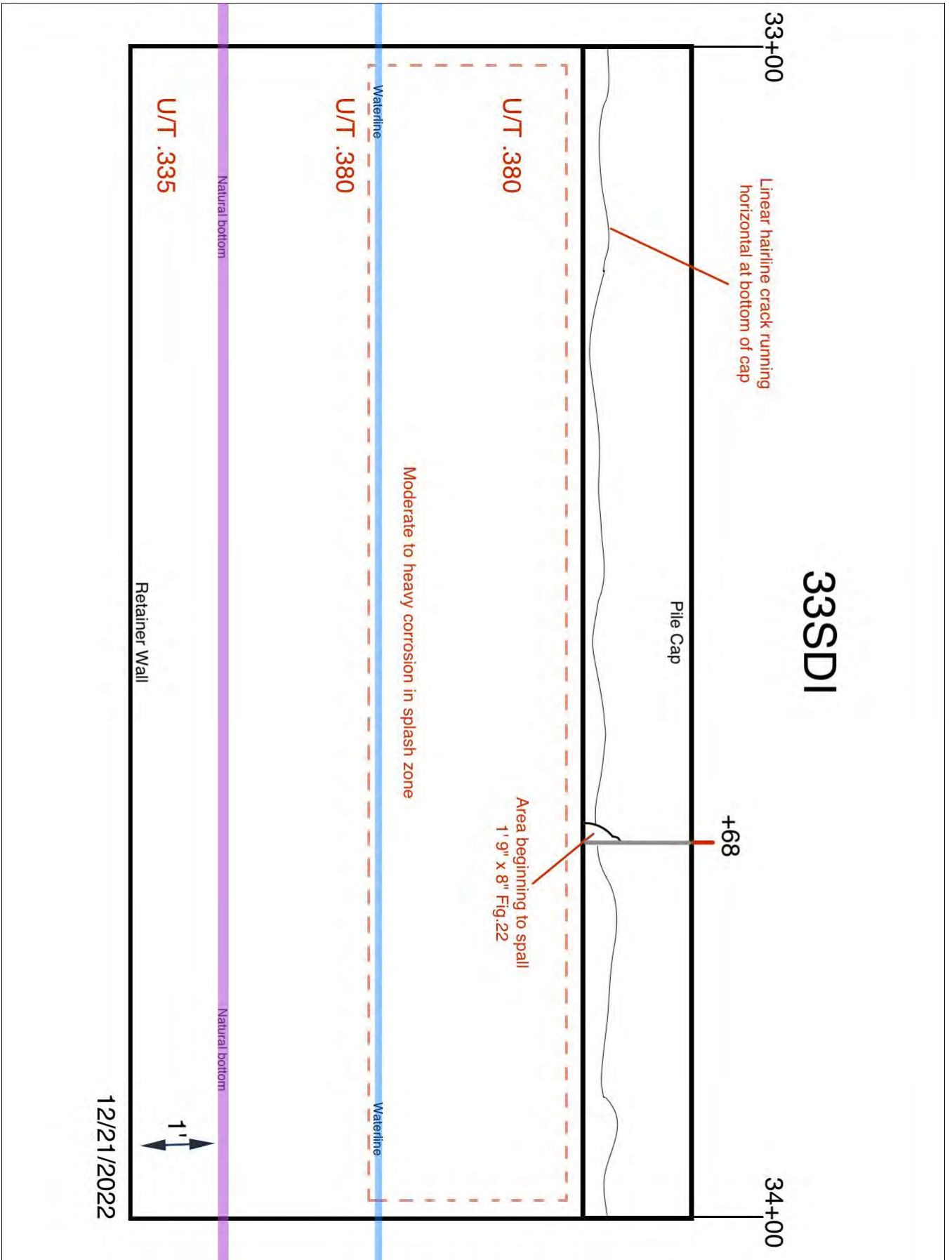
Retainer Wall

1'

12/21/2022



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24358 Gliderport Rd.
Loranger, LA 70446
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33SD1

33+00

34+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+68

Area beginning to spall
1' 9" x 8" Fig.22

Moderate to heavy corrosion in splash zone

Waterline

Waterline

UT .380

UT .380

UT .335

Natural bottom

Natural bottom

Retainer Wall

1' 1"

12/21/2022



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S

N

34+00

34SDI Bayou

Pile Cap

Linear hairline crack running horizontal at bottom of cap

Waterline

Waterline

U/T .380

U/T .380

Moderate to heavy corrosion in splash zone

Heavy corrosion on all hardware Fig. 1

Natural bottom

Natural bottom

Retainer Wall

1'

12/21/2022

N

35SDI

S

35+00

36+00

Bayou

Pile Cap

Linear hairline crack running horizontal at bottom of cap

Waterline

Waterline

U/T .370

U/T .370

U/T .375

Separation at the concrete wall from sheet pile bracket: approximately 1" at widest. No photo

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1"

12/22/2022



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36SDI

S

36+00

Linear hairline crack running horizontal at bottom of cap

Bayou

Pile Cap

+84

37+00

Waterline

Waterline

UT .380

Area beginning to spall
1' 8" x 8" Fig:23

Area beginning to spall
1' 8" x 10" with exposed top of sheet pile
Fig:23

UT .375

Moderate to heavy corrosion in splash zone

Heavy corrosion
on all hardware at joint
Fig:1

UT .375

Natural bottom

Retainer Wall

Natural bottom



12/22/2022



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37SDI

37+00

Multiple Linear hairline cracks running horizontal along pile cap

Pile Cap

+91

38+00

UT .375

Moderate to heavy corrosion in splash zone

Heavy spalling at joint
2' 5" x 1' 9" exposing top of sheet pile causing heavy corrosion and deterioration
Fig.24

UT .375

Waterline

Waterline

Natural bottom

Natural bottom

UT .375

Retainer Wall



12/22/2022



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38SDI

38+00

39+00

Multiple linear hairline cracks running horizontal at bottom of cap

+50

Pile Cap

U/T .370

Heavy spalling at joint
4' 1" x 2' 1" exposing top of sheet pile
causing heavy corrosion and deterioration
Fig.25

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .370

Natural bottom

Natural bottom

U/T .365

Retainer Wall



12/22/2022



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39SD1

39+00

40+00

+09

Pile Cap

Multiple linear hairline cracks running horizontal at bottom of cap

UT .375

Heavy spalling at the joint
2' x 1' 2" exposing top of sheet pile
causing heavy corrosion and deterioration
Fig.26

Moderate to heavy corrosion in splash zone

UT .380

UT .380

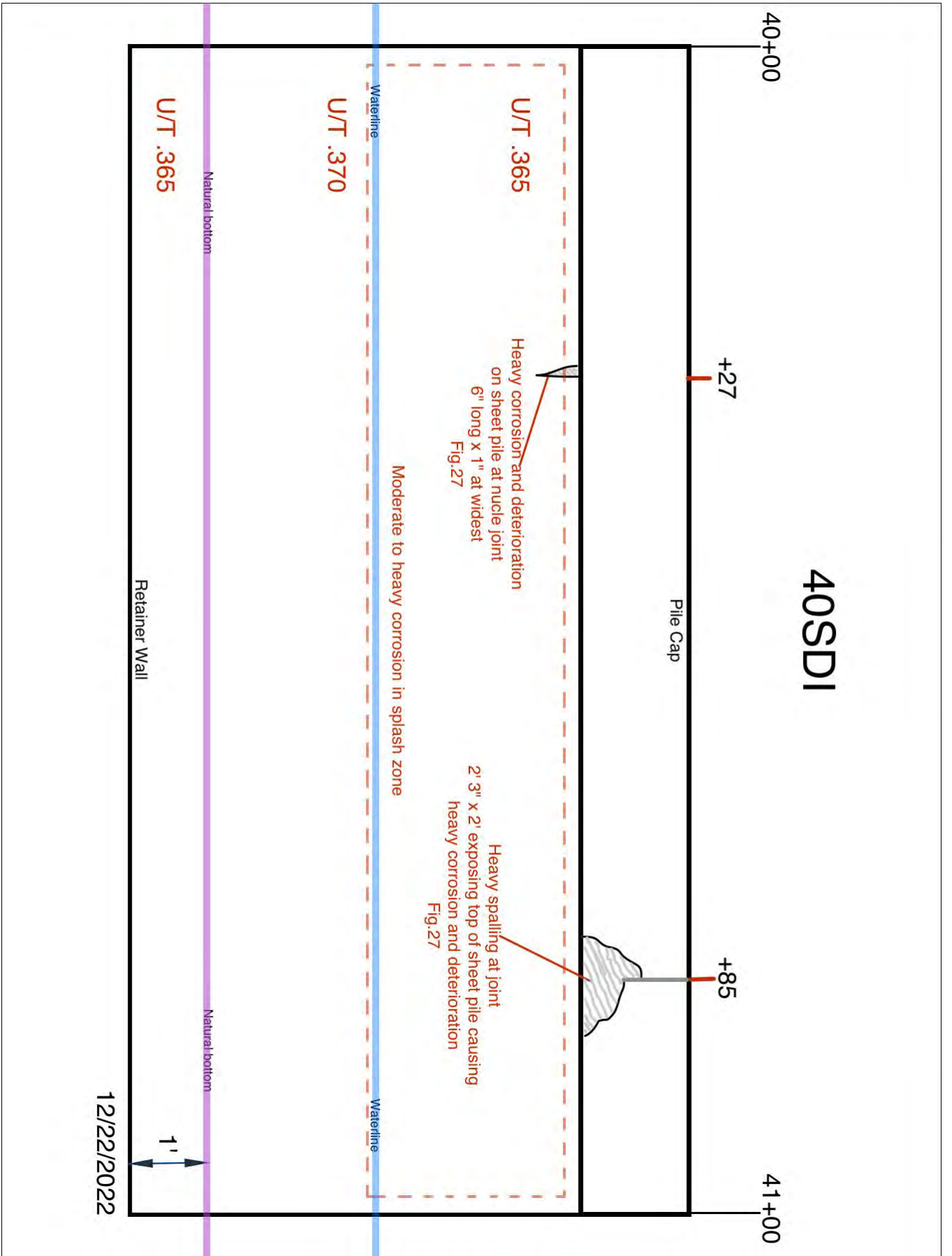
Retainer Wall



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41SDI

41+00

42+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .370

Moderate to heavy corrosion in splash zone

U/T .370

U/T .350

Waterline

Waterline

Natural bottom

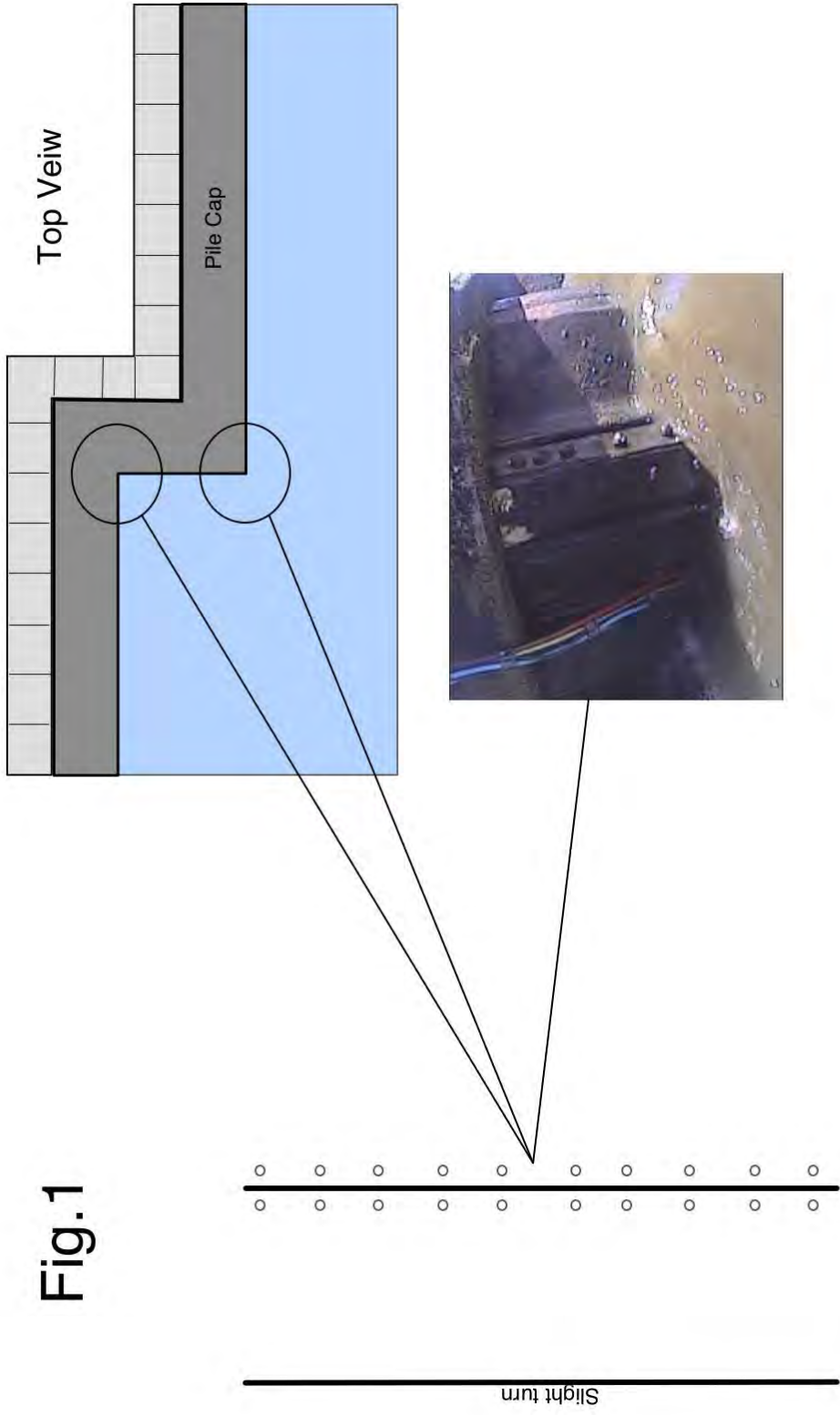
Natural bottom

Retainer Wall

1'

12/22/2022

Fig.1



This drawing represents a hard turn on the sea wall with an L shaped bracket and hardware joining two sections of sheet pile. Also displayed is a slight turn with no preexisting hardware



SDI ULTRASONIC THICKNES MEASUREMENTS

21+ - 41+

21SDI .380 .380 .375	22SDI .370 .370 .370	23SDI .370 .370 .375	24SDI .355 .375 .380	25SDI .350 .360 .360
26SDI .375 .375 .375	27SDI .365 .370 .370	28SDI .395 .385 .370	29SDI .380 .375 .375	30SDI .375 .375 .375
31SDI .375 .380 .380	32SDI .380 .380 .380	33SDI .380 .380 .335	34SDI .380 .380 .380	35SDI .370 .370 .375
36SDI .380 .375 .375	37SDI .375 .375 .375	38SDI .370 .370 .365	39SDI .375 .380 .380	40SDI .365 .370 .365
41SDI .370 .370 .350				



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Fig. 16

21SDI



21+05



21+20

Fig. 17

24SDI



24+00



24+58

Fig. 18

25SDI

25+21



25+70



25+40



Fig.19

26SD1

26+30



Fig.20

28SD1

28+63



28+72



Fig.21

32SD1

32+24

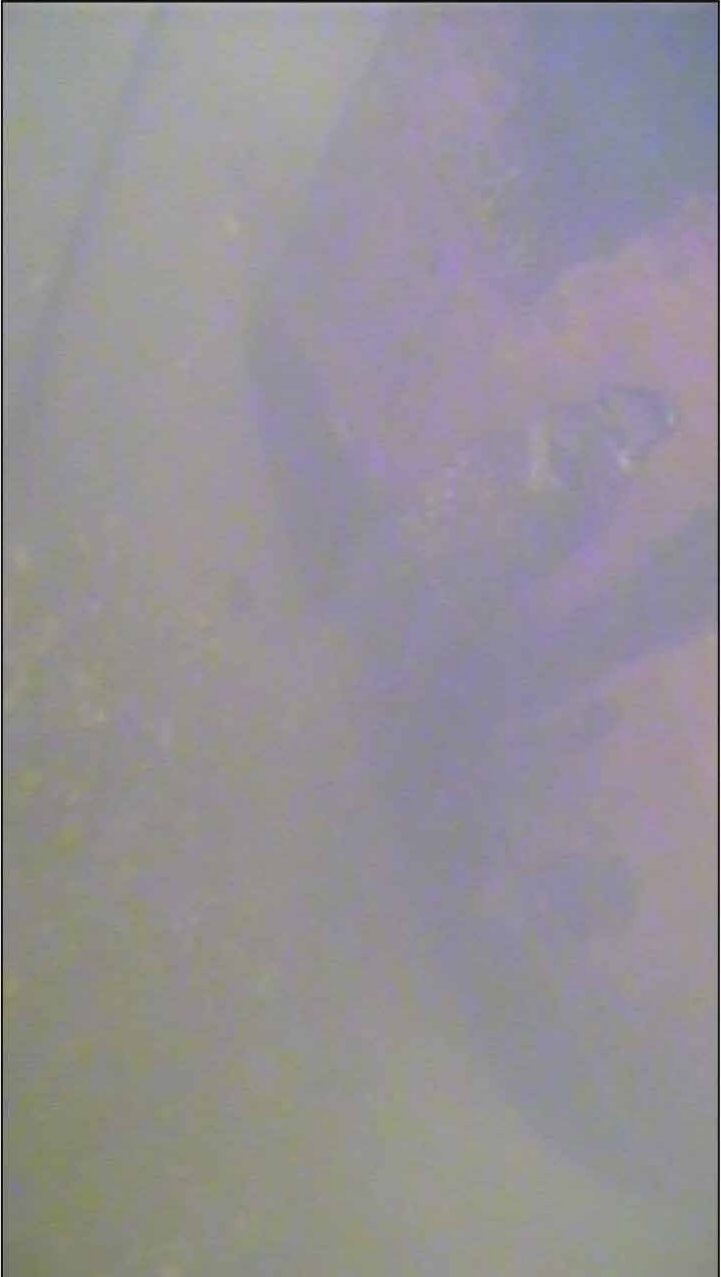


Fig.22

33SD1

33+68



Fig.23

36SD1

36+00



36+64



Fig.24

37SDI

37+91



Fig.25

38SD1

38+50



Fig.26

39SD1

39+09



Fig.27

40SDI

40+27



40+85





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Inspection of Lakefront
Retainer Wall
Mandeville, LA

Conducted by:
Specialty Offshore, Inc.
24358 Gliderport
Loranger, LA 70446
(985) 542-8770

Job Number: 22-1034
December 12, 2022

Prepared for:
Burk Kleinpeter
P.O. Box 19087
New Orleans La, 70109



Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Location: Mandeville, LA

Client Rep: Henry Picard

Specialty Representative: Marshall Whitmer

Dive Supervisor: Ben Swan

Introduction:

Specialty Diving was contracted to inspect approximately 8400 feet of sea wall at the Lakefront in Mandeville, LA. This will be done using surface supplied air diving starting at the farthest west end of the wall.

Scope of work:

Specialty Diving will mob every day with all dive and inspection equipment. Starting at the farthest west end, the dive crew will inspect approximately 400 to 500 feet per day depending on weather or other elements. During inspection, diver will give a visual of both the pile cap and sheet piling for any anomaly's or deterioration as he travels East down the sea wall.



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WEEK 3

12/27/2022

Specialty Diving inspected approximately 2000 feet of sea wall, starting at the 42+ and ended at the 52 + mark. A full inspection of the pile cap and sheet pile wall (extending one foot below the mud line) was thoroughly checked for any major indications.

Numerous anomaly's were discovered along the sea wall such as heavy spalling on the pile cap and heavy corrosion and deterioration on the sheet pile. This deterioration was mostly in areas at a turn with bracket and hardware and each spall at pile cap.

Moderate to heavy corrosion and coating failure was consistent in the splash zone throughout and at each knuckle joint. Along with a linear horizontal crack running the length of the pile cap.

All indications and findings are documented below along with the dimensions of each indication. An ultrasonic thickness measurement was taken at each mark approximately 100' apart, one below the water line, mid and one above.

42SDI

42+00

43+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

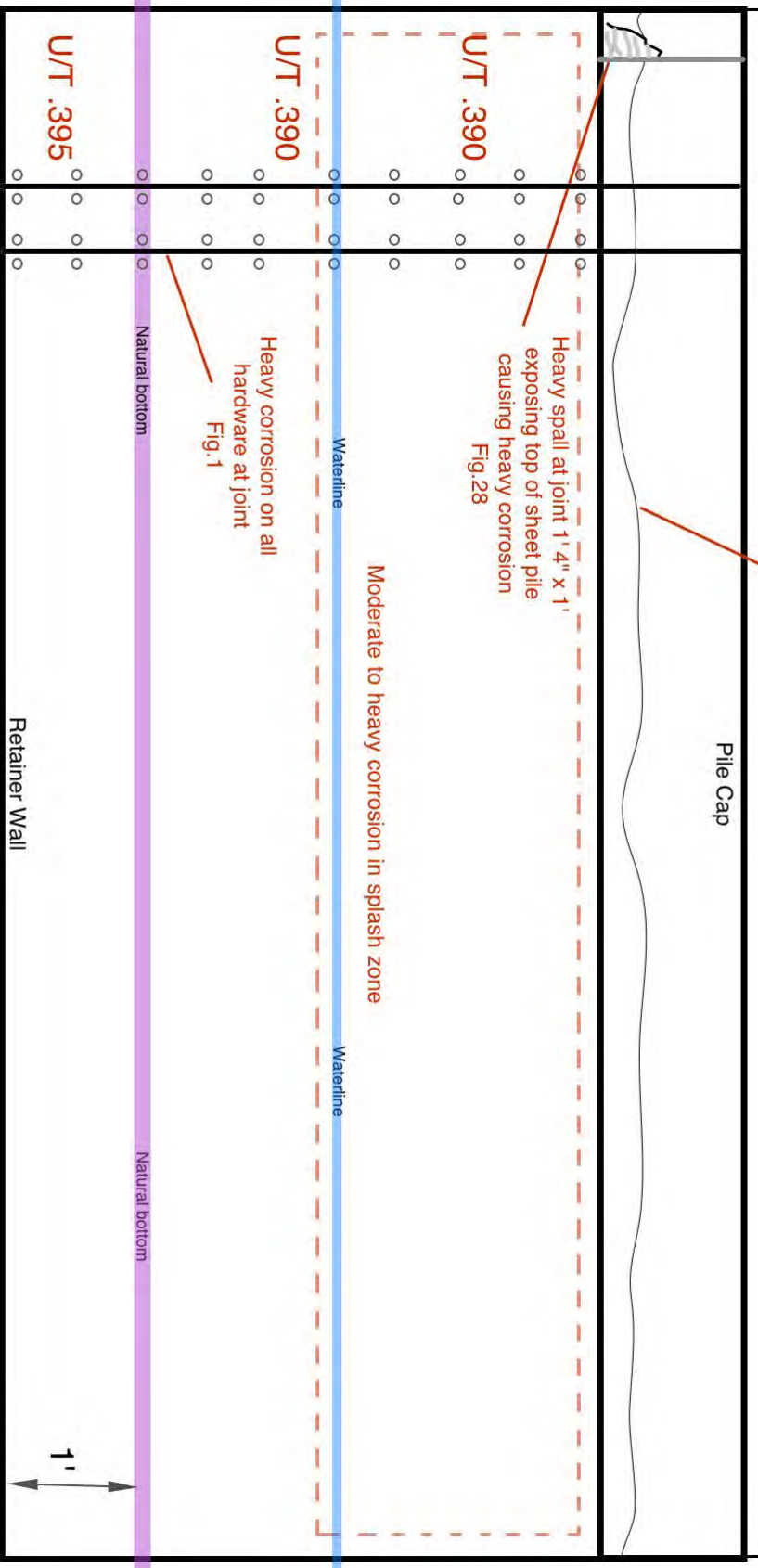
Heavy spall at joint 1' 4" x 1' exposing top of sheet pile causing heavy corrosion Fig. 28

Moderate to heavy corrosion in splash zone

Heavy corrosion on all hardware at joint Fig. 1

Natural bottom

Natural bottom



U/T .395

U/T .390

U/T .390

12/27/2022

43SD1

43+00

44+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+69

Heavy spalling at the joint 4' 5" x 1' 10" exposing the top of sheet pile causing heavy corrosion and deterioration Fig. 29

Moderate to heavy corrosion in splash zone

U/T .380

U/T .375

U/T .380

Waterline

Waterline

Natural bottom

Natural bottom

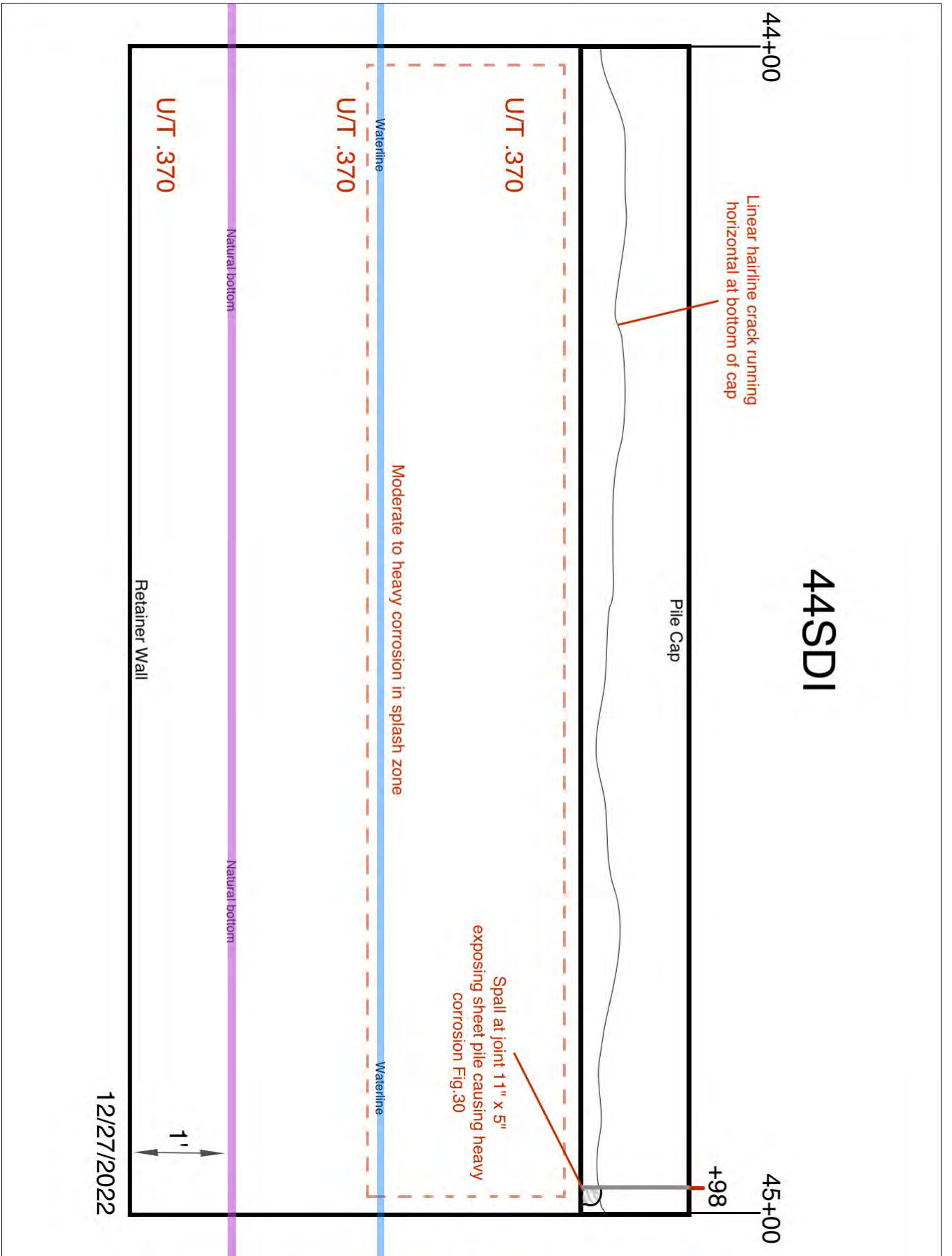
Retainer Wall

1'

12/27/2022



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45SDI

45+00

46+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .365

U/T .365

U/T .370

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Heavy corrosion on all hardware Fig. 1

Waterline

Retainer Wall

1'

12/27/2022



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46SDI

46+00

47+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .365

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .355

Heavy corrosion and deterioration at the joint approximately 3' x 8" Fig.31

Natural bottom

Natural bottom

U/T .365

Retainer Wall

1'

12/28/2022



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47SDI

47+00

48+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+86

U/T .380

U/T .380

U/T .390

Waterline

Waterline

Moderate to heavy corrosion in splash zone

Heavy corrosion and deterioration on sheet pile wall at knuckle 11" x 7" Fig.32

Natural bottom

Natural bottom

Retainer Wall

1'

12/28/2022



48SDI

48+00

49+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .380

U/T .370

U/T .390

Waterline

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1'

12/28/2022



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49SDI

49+00

50+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .360

U/T .365

U/T .375

Waterline

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1'

12/29/2022



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50SDI

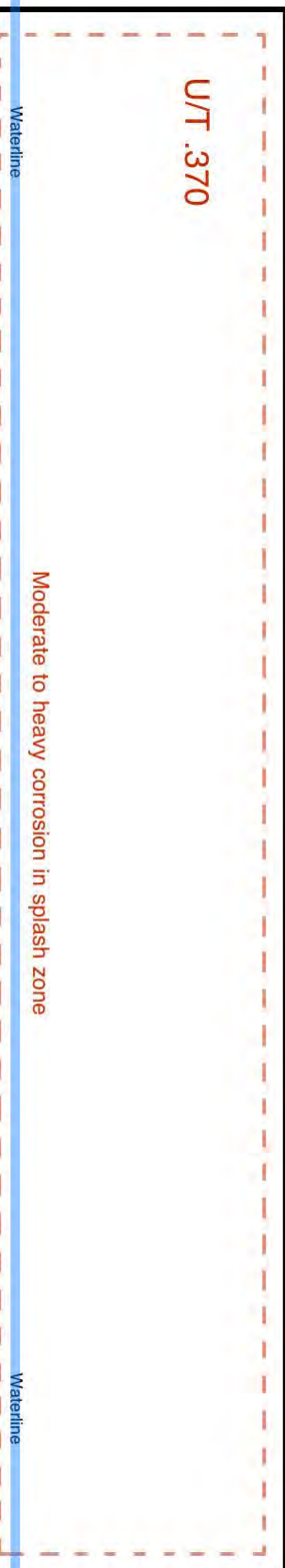
50+00

51+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .370



U/T .330

Natural bottom

Natural bottom

U/T .355

Retainer Wall



12/29/2022



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51SDI

51+00

52+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+98

Heavy spalling at joint
2' 6" x 1' 5" exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig.33

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .365

U/T .360

Natural bottom

Natural bottom

U/T .360

Retainer Wall

1'

12/29/2022



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52SD1

52+00

53+00

Linear hairline crack running horizontal at bottom of cap

+57

Pile Cap

UT .375

Heavy spalling at joint
3' 4" x 1' 3" exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig. 34

Moderate to heavy corrosion in splash zone

Waterline

Waterline

UT .370

Natural bottom

Natural bottom

Retainer Wall

1'

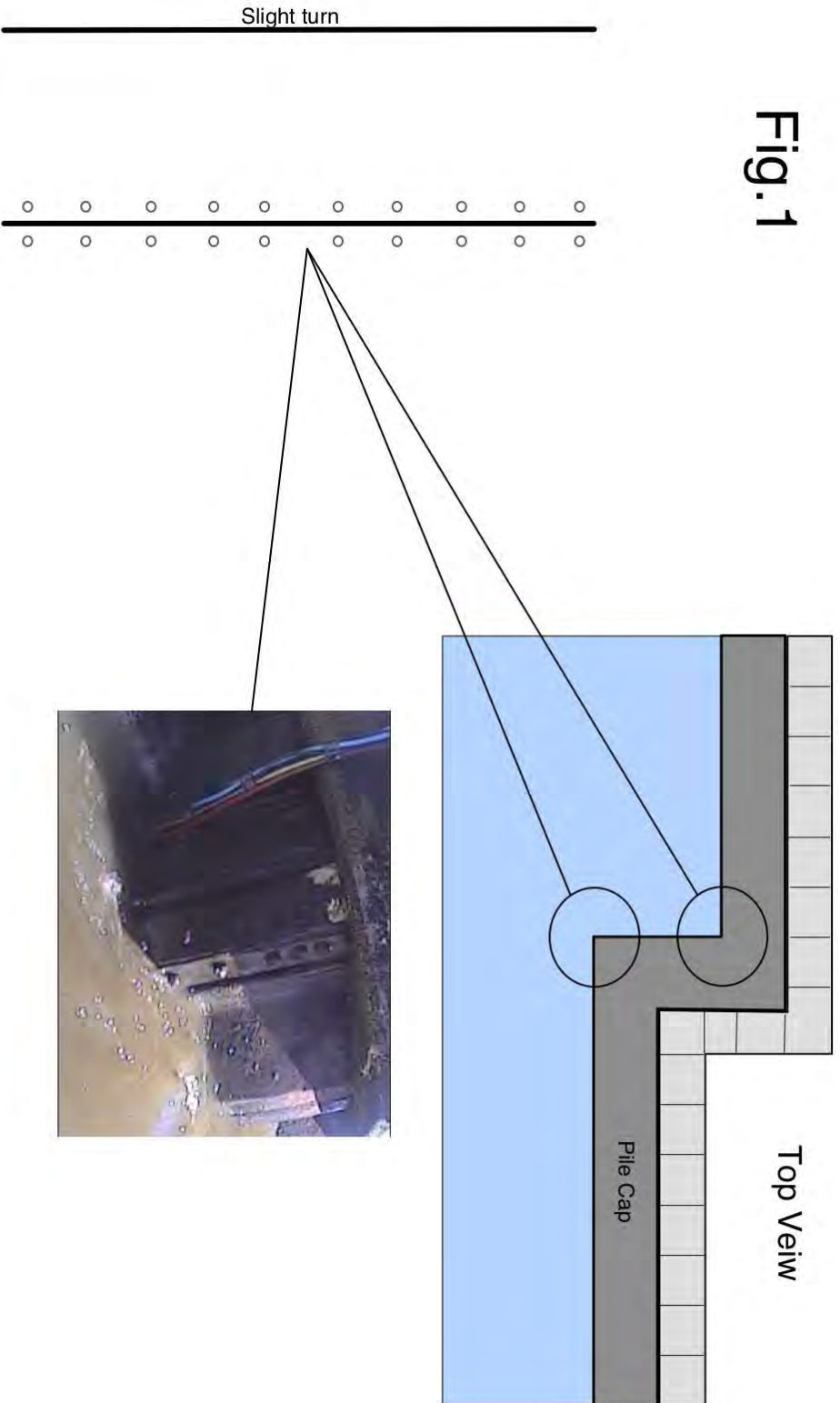
UT .370

12/29/2022



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Fig. 1



This drawing represents a hard turn on the sea wall with an L shaped bracket and hardware joining two sections of sheet pile. Aslo displayed is a slight turn with no preexisting hardware

SDI ULTRASONIC THICKNES MEASUREMENTS

42+ - 52+

42SDI	43SDI	44SDI	45SDI	46SDI
.390	.380	.370	.365	.365
.390	.375	.370	.365	.355
.395	.380	.370	.370	.365
47SDI	48SDI	49SDI	50SDI	51SDI
.380	.380	.360	.370	.365
.380	.370	.365	.330	.360
.390	.390	.375	.355	.360
52SDI				
.375				
.370				
.370				



Fig.28

42SD1

42+00



Fig.29

43SDI

43+69



Fig.30

44SDI

44+98



Fig.31

46SDI

46+00



Fig.32

47SDI



47+86

Noth side wall

Fig.33

51SDI

51+98



Fig.34

52SD1

52+57





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24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Inspection of Lakefront Retainer Wall Mandeville, LA

Conducted by:
Specialty Offshore, Inc.

24358 Gliderport
Loranger, LA 70446
(985) 542-8770

Job Number: 22-1034
December 12, 2022

Prepared for:
Burk Kleinpeter
P.O. Box 19087
New Orleans La, 70109



Specialty Diving, Inc.
24358 Gliderport Rd.
Loranger, LA 70446
(985) 542 - 8770

Location: Mandeville, LA

Client Rep: Henry Picard

Specialty Representative: Marshall Whitmer

Dive Supervisor: Ben Swan

Introduction:

Specialty Diving was contracted to inspect approximately 8400 feet of sea wall at the Lakefront in Mandeville, LA. This will be done using surface supplied air diving starting at the farthest west end of the wall.

Scope of work:

Specialty Diving will mob every day with all dive and inspection equipment. Starting at the farthest west end, the dive crew will inspect approximately 400 to 500 feet per day depending on weather or other elements. During inspection diver will give a visual of both the pile cap and sheet piling for any anomaly's or deterioration as he travels East down the sea wall.



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WEEK 4

01/02/2023

Specialty Diving inspected approximately 3000 feet of sea wall starting at the 53+ and ended at the 83+ mark. A full inspection of the pile cap and sheet pile wall (extending one foot below the mud line) was thoroughly checked for any major indications.

Numerous anomaly's were discovered along the sea wall such as heavy spalling on the pile cap and heavy corrosion and deterioration on the sheet pile. This deterioration was mostly in areas at a turn with bracket and hardware and each spall at pile cap.

Moderate to heavy corrosion and coating failure was consistent in the splash zone throughout and at each knuckle joint. Along with a linear horizontal crack running the length of the pile cap.

All indications and findings are documented below along with the dimensions of each indication. An ultrasonic thickness measurement was taken at each mark approximately 100' apart, one below the water line, mid and one above.

53SD1

53+00

54+00

+16
Linear hairline crack running horizontal at bottom of cap

+85

Pile Cap

UT .365
Cracking on the sheet pile wall at the knuckle below pile cap 5" x 1/4"
Fig.35

Heavy Spalling at the joint 1' x 10" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.35

Moderate to heavy corrosion in splash zone

Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall

UT .365

1'
↑ ↓

01/02/2023



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54SDI

54+00

55+00

Linear hairline crack running horizontal at bottom of cap

+36

+70

+94

Pile Cap

U/T .365

Heavy spalling at joint
3' 10" x 2' exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.36

Heavy spalling at joint
3' 11" x 1' 4" exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig.36

U/T .365

Moderate to heavy corrosion in splash zone
Heavy corrosion and deterioration on sheeppile wall 7" x 7" on left of break wall and 9" x 8" on right.
Fig.36

U/T .360

Retainer Wall

Natural bottom

Natural bottom

Waterline

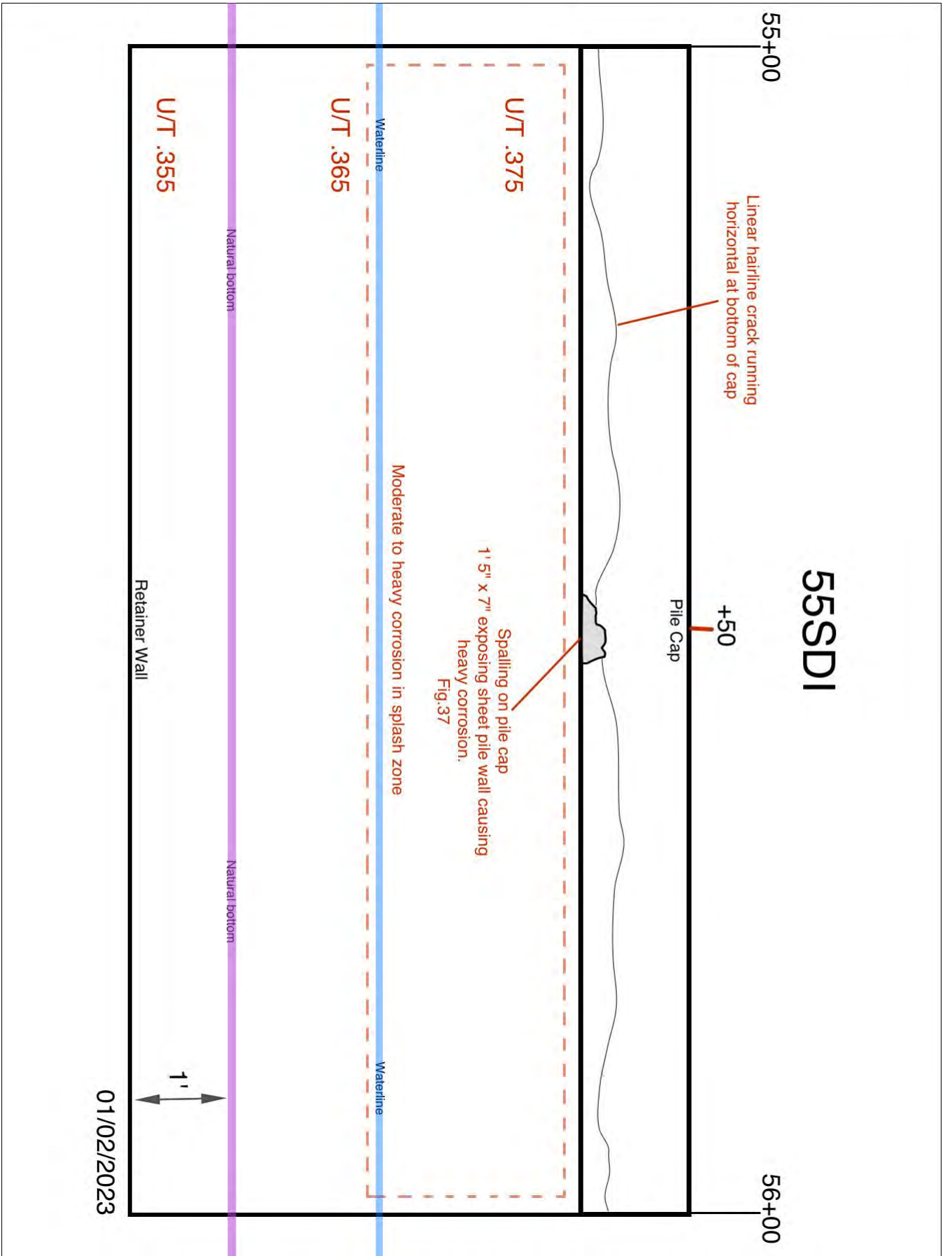
Waterline

1'

01/02/2023



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55SD1

56SDI

56+00

57+00

+11

+70

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .365

Heavy Spalling at joint
3' x 1' 10" exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig.38

Heavy spalling at joint
2' 8" x 1' 6" exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig.38

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .360

Natural bottom

Natural bottom

U/T .365

Retainer Wall

1'

01/02/2023



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57SD1

57+00

58+00

+27

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+83
+86

UT .375
Heavy spalling at joint
1' 6" x 1' exposing top of sheet pile wall
causing heavy corrosion and deterioration
Fig.39

Heavy spalling at joint
2' x 1' exposing top of sheet pile wall
causing heavy corrosion and deterioration
Fig.39

Moderate to heavy corrosion in splash zone

UT .375

Multiple areas with heavy corrosion and deterioration around drain pipe
Fig.39

Natural bottom

UT .375

Retainer Wall



01/02/2023

58SDI

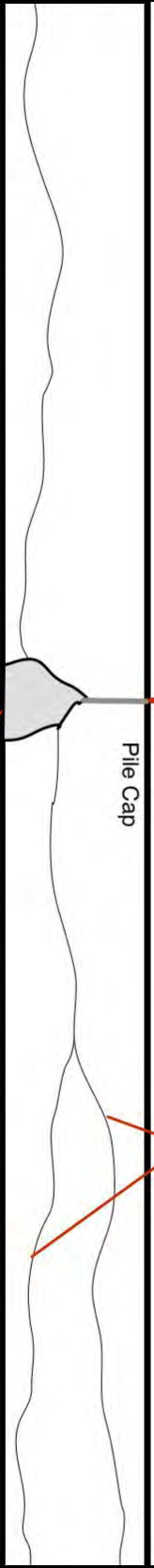
58+00

59+00

Multiple linear hairline cracks running horizontal at cap

+46

Pile Cap



Heavy spalling at joint
1' 8" x 1' 7" exposing top of sheet pile wall
causing heavy corrosion and deterioration.
Fig. 40

Moderate to heavy corrosion in splash zone

UT .375

UT .370

UT .370

Natural bottom

Natural bottom

Retainer Wall

1'

01/04/2023



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59SD1

59+00

60+00

+05
Multiple linear hairline cracks running horizontal at pile cap

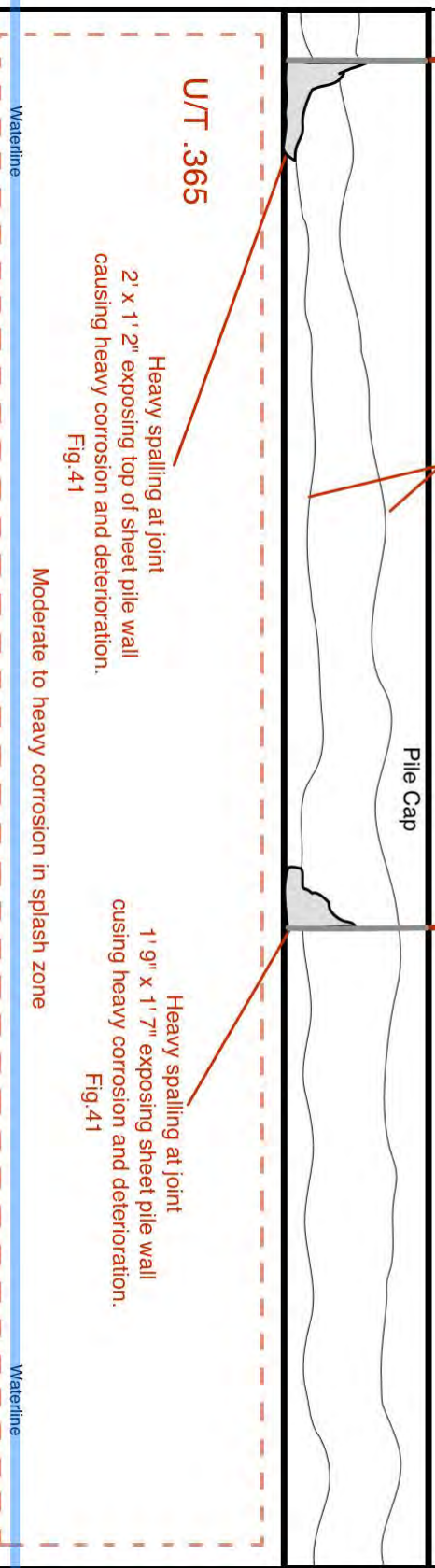
Pile Cap

+63

UT .365
Heavy spalling at joint
2' x 1' 2" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.41

UT .365
Heavy spalling at joint
1' 9" x 1' 7" exposing sheet pile wall causing heavy corrosion and deterioration.
Fig.41

Moderate to heavy corrosion in splash zone



Natural bottom

Natural bottom

Retainer Wall

UT .360

01/04/2023



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60SDI

60+00

61+00

Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

+80

U/T .315

Heavy spalling at joint
3' 6" x 2' exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig.42

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .360

Natural bottom

Natural bottom

U/T .360

Retainer Wall

1'

01/04/2023



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61SDI

61+00

62+00

+38

+98

Pile Cap

Multiple linear hairline cracks running horizontal at pile cap

Heavy spalling at joint
3' 3" x 2' exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig. 43

Heavy spalling at joint
3' 5" x 2' exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig. 43

U/T .380

U/T .375

U/T .375

Waterline

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1'

01/04/2023



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62SD1

62+00

63+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+56

Heavy spalling at joint
1' 10" x 1' 4" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig. 44



Moderate to heavy corrosion in splash zone



Waterline

Waterline

U/T .365

Natural bottom

Natural bottom

U/T .365

Retainer Wall



01/04/2023

63SDI

63+00

64+00

+15

+74

Linear hairline crack running horizontal at bottom of cap

Pile Cap

UT .375

Heavy spalling at joint
3' x 2' 4" exposing top of sheet pile wall
causing heavy corrosion and deterioration
Fig. 45

Heavy spalling at joint
1' 8" x 1' 7" exposing top of sheet pile wall
causing heavy corrosion and deterioration.
Fig. 45

Moderate to heavy corrosion in splash zone

Waterline

Waterline

UT .375

Natural bottom

Natural bottom

UT .370

Retainer Wall

1'

01/04/2023



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64SDI

64+00

65+00

+31

+79

+90

Pile Cap

UT .365

Heavy spalling at joint
4' 3" x 1' 7" exposing top of sheet pile wall
causing heavy corrosion and deterioration.
Fig.46

Heavy spalling at joint
2' 4" x 2' exposing top of sheet pile wall
causing heavy corrosion and deterioration.
Fig.46

UT .375

Heavy corrosion and deterioration
at bottom of sheet pile wall directly behind
break wall 1' 3" x 8"
Fig.46

UT .375

Retainer Wall

01/05/2023

1'

Waterline

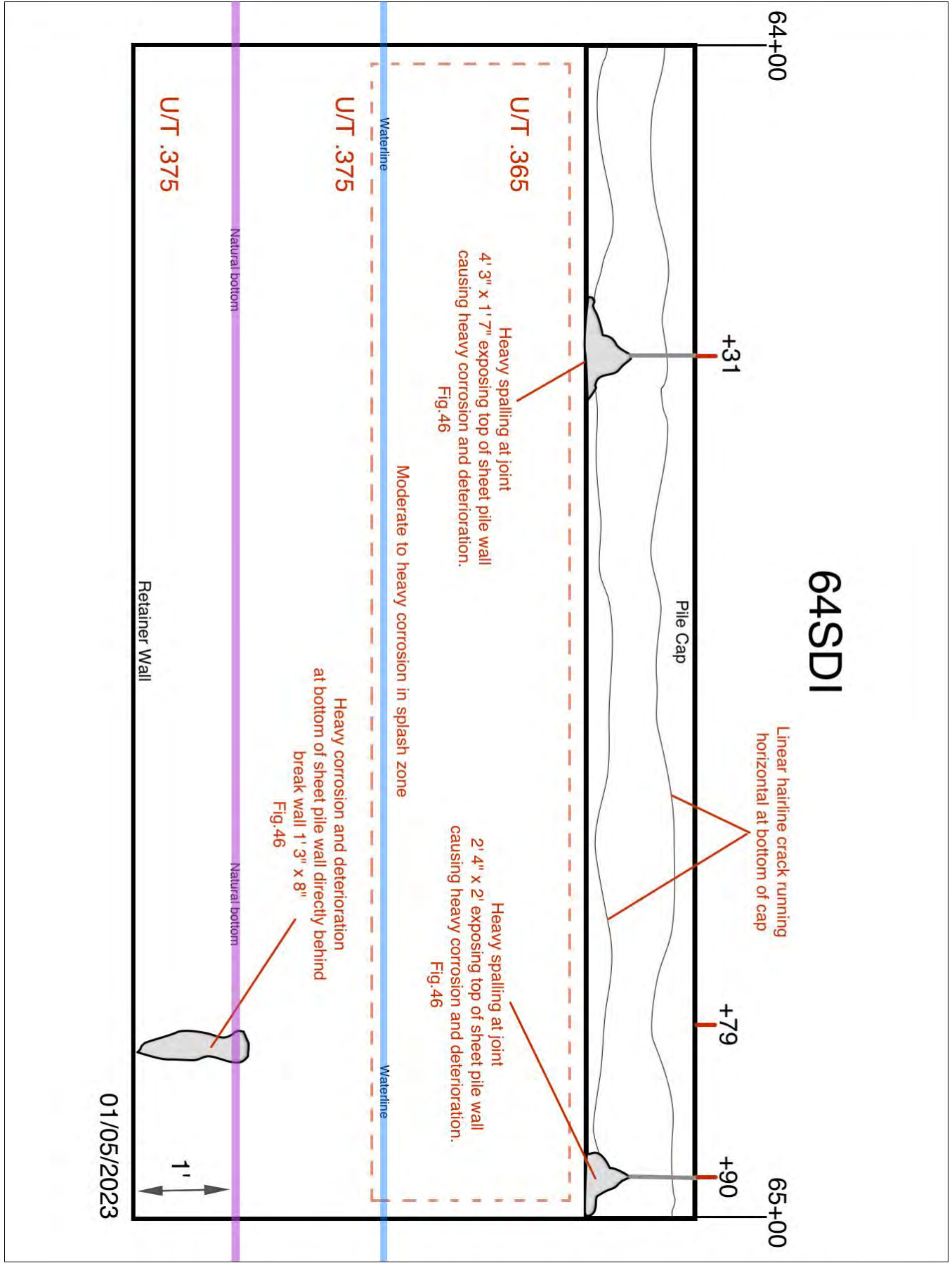
Waterline

Natural bottom

Natural bottom

Moderate to heavy corrosion in splash zone

Linear hairline crack running
horizontal at bottom of cap



65SD1

65+00

66+00

Linear hairline crack running horizontal at bottom of cap

+49

Pile Cap

U/T .365

Heavy spalling at joint
1' 8" x 1' 4" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.47

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .365

Natural bottom

Natural bottom

Retainer Wall

1'

U/T .365

01/05/2023



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66SDI

66+00

67+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .380

U/T .385

U/T .385

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1'

01/05/2023



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67SDI

67+00

68+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

+77

Heavy spalling at joint
1' 8" x 10" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.48

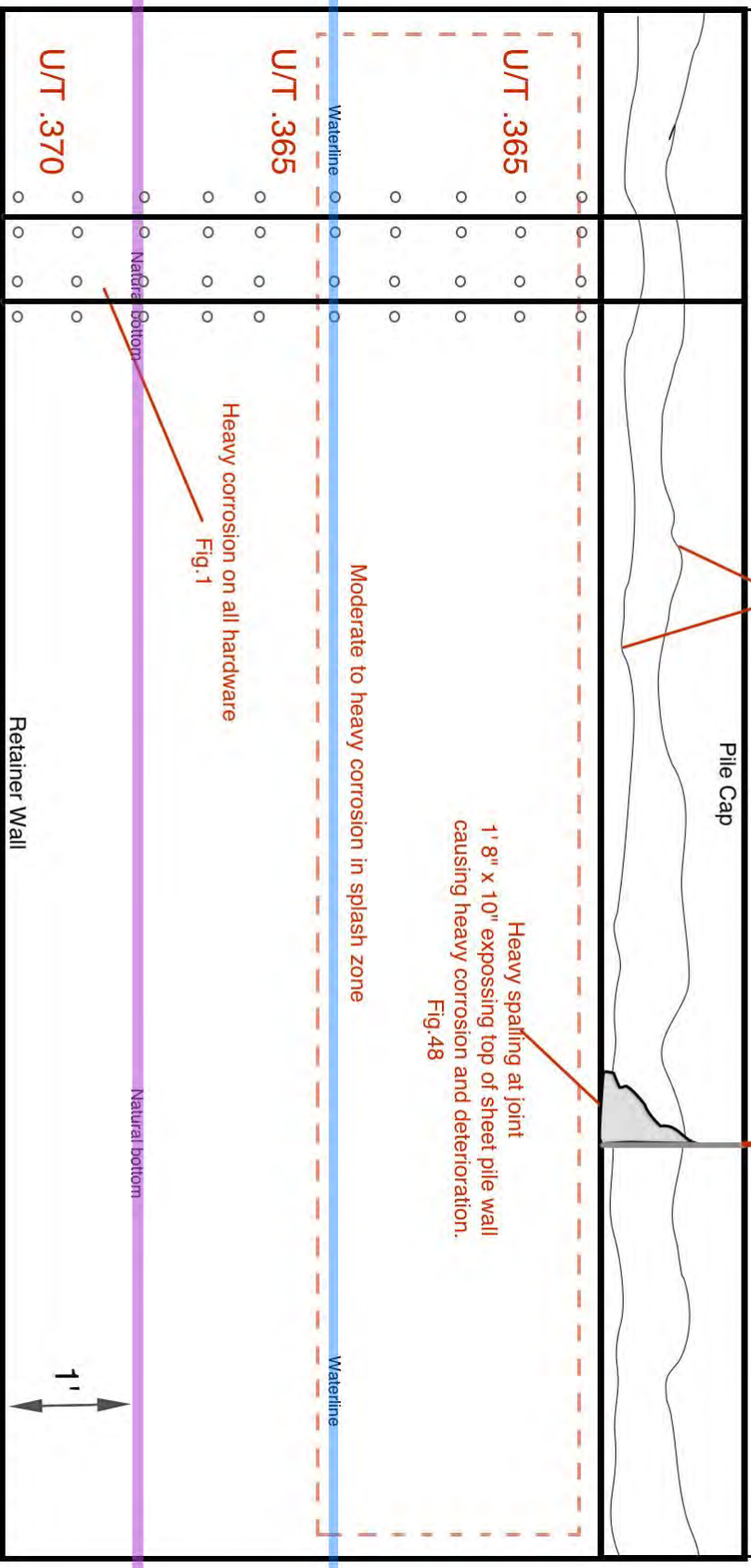
Moderate to heavy corrosion in splash zone

Heavy corrosion on all hardware
Fig.1

Natural Bottom

Natural bottom

Retainer Wall



01/05/2023

68SDI

68+00

69+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .380

U/T .360

U/T .360

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1'

01/05/2023



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24358 Gliderport Rd
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(985) 542 - 8770

69SDI

69+00

70+00

+07

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .380

U/T .360

Moderate to heavy corrosion in splash zone

Heavy corrosion and deterioration on sheet pile wall 8" x 3" Fig.49

Natural bottom
6 hardware missing at bottom of corner bracket causing a section 1' 4" in length to separate 3" from sheet pile wall

U/T .350

Retainer Wall

Natural bottom

Waterline

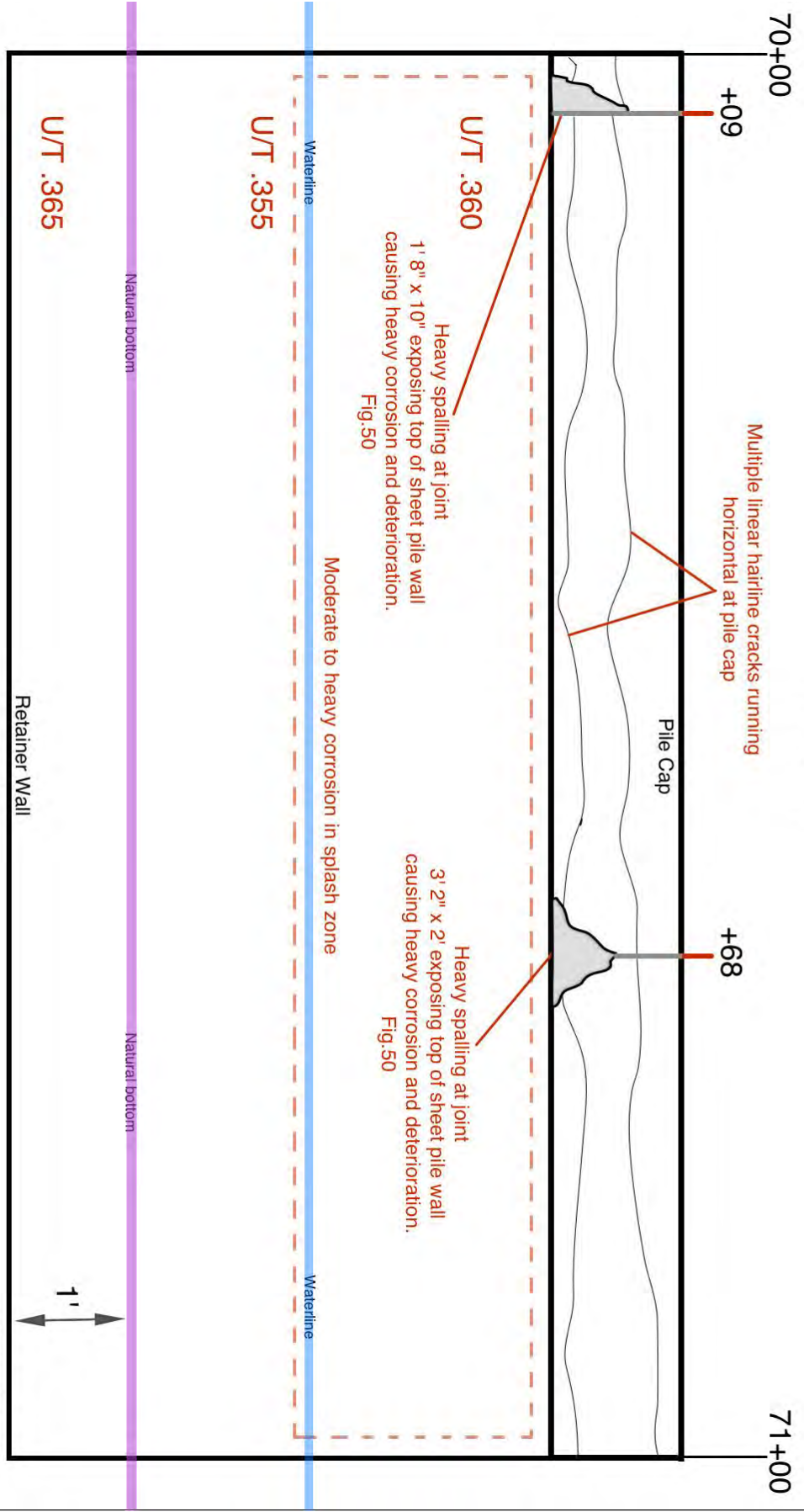
1'

01/05/2023



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(985) 542 - 8770

70SDI



Specialty Diving, Inc.
24358 Gliderport Rd
Loranger, LA 70446
(985) 542 - 8770

71SDI

71+00

72+00

+27

+86

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .365

Heavy spalling at joint
2' 4" x 1' 9" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.51

Heavy spalling at joint
1' 9" x 10" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig.51

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .360

Natural bottom

Natural bottom

U/T .345

Retainer Wall

1'

01/05/2023



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24358 Gliderport Rd
Loranger, LA 70446
(985) 542 - 8770

72SDI

72+00

73+00

Linear hairline crack running horizontal at bottom of cap

Pile Cap

U/T .365

U/T .370

U/T .365

Waterline

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

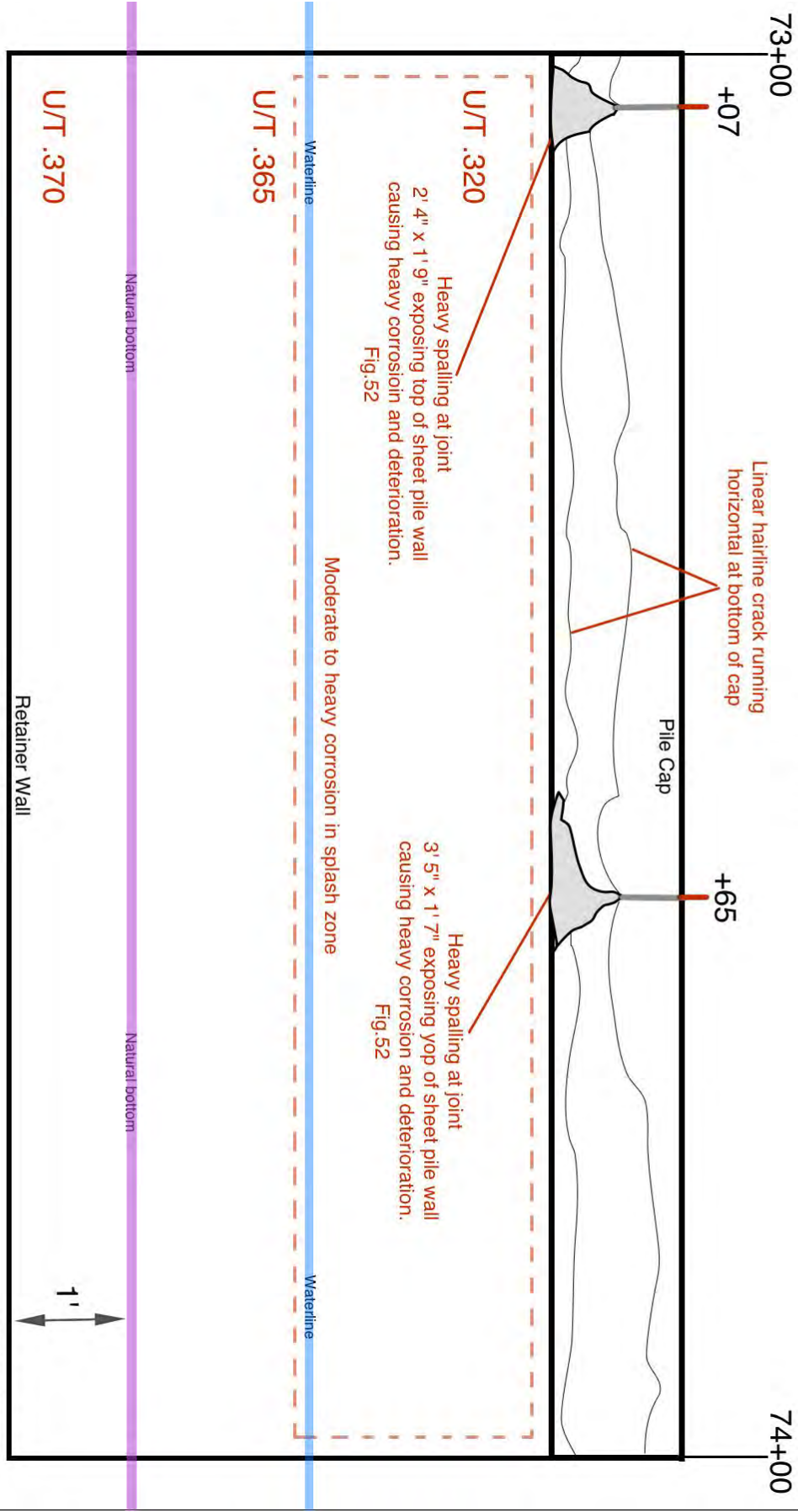
1'

01/06/2023



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(985) 542 - 8770

73SD1



01/06/2023



Specialty Diving, Inc.
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Loranger, LA 70446
(985) 542 - 8770

74SDI

74+00

75+00

+21

+81

Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

U/T .370

Heavy spalling at joint
2' 5" x 1' 8" exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig. 53

Heavy spalling at joint
2' 7" x 2' exposing top of sheet pile wall causing heavy corrosion and deterioration.
Fig. 53

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .380

Natural bottom

Natural bottom

U/T .385

Retainer Wall



01/06/2023



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75SD1

75+00

76+00

Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

+91

U/T .370

Heavy spalling at joint
2' 5" x 2' exposing top of sheet pile wall
causing heavy corrosion and deterioration.
Fig.54

Moderate to heavy corrosion in splash zone

Waterline

Waterline

U/T .380

Natural bottom

Natural bottom

U/T .380

Retainer Wall

1'

01/06/2023

76SDI

76+00

77+00

Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

U/T .380

U/T .380

U/T .380

Waterline

Moderate to heavy corrosion in splash zone

Natural bottom

Natural bottom

Retainer Wall

1'

01/06/2023



Specialty Diving, Inc.
24358 Gliderport Rd
Loranger, LA 70446
(985) 542 - 8770

77SDI

77+00

78+00

Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

+62

Area beginning to spall at joint
1' 5" x 1' 2" Fig.55

Moderate to heavy corrosion in splash zone

Waterline

Waterline

Natural bottom

Natural bottom

Retainer Wall

U/T .320

U/T .380

U/T .380

1'

01/06/2023



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24358 Gliderport Rd
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(985) 542 - 8770

78SDI

78+00

79+00

+21
Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

U/T .375
Heavy spalling at joint
3' x 1' 6" exposing top of sheet pile wall causing heavy corrosion and deterioration
Fig.56

Moderate to heavy corrosion in splash zone

Waterline

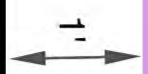
Waterline

Natural bottom

Natural bottom

Retainer Wall

U/T .380



01/06/2023



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(985) 542 - 8770

79SDI

79+00

80+00

Multiple linear hairline cracks running horizontal at pile cap

Pile Cap

U/T .370

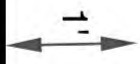
Waterline

U/T .370

Moderate to heavy corrosion in splash zone

Natural bottom

U/T .365



Retainer Wall

Sand mound

01/06/2023



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24358 Gliderport Rd
Loranger, LA 70446
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80SD1

80+00

81+00

Multiple linear hairline cracks running horizontal at pile cap



+55

Pile Cap

Area beginning to spall at joint 2' x 9" Fig.57

Moderate to heavy corrosion in splash zone

Waterline

Sand mound

Natural bottom

Retainer Wall

1'

01/07/2023

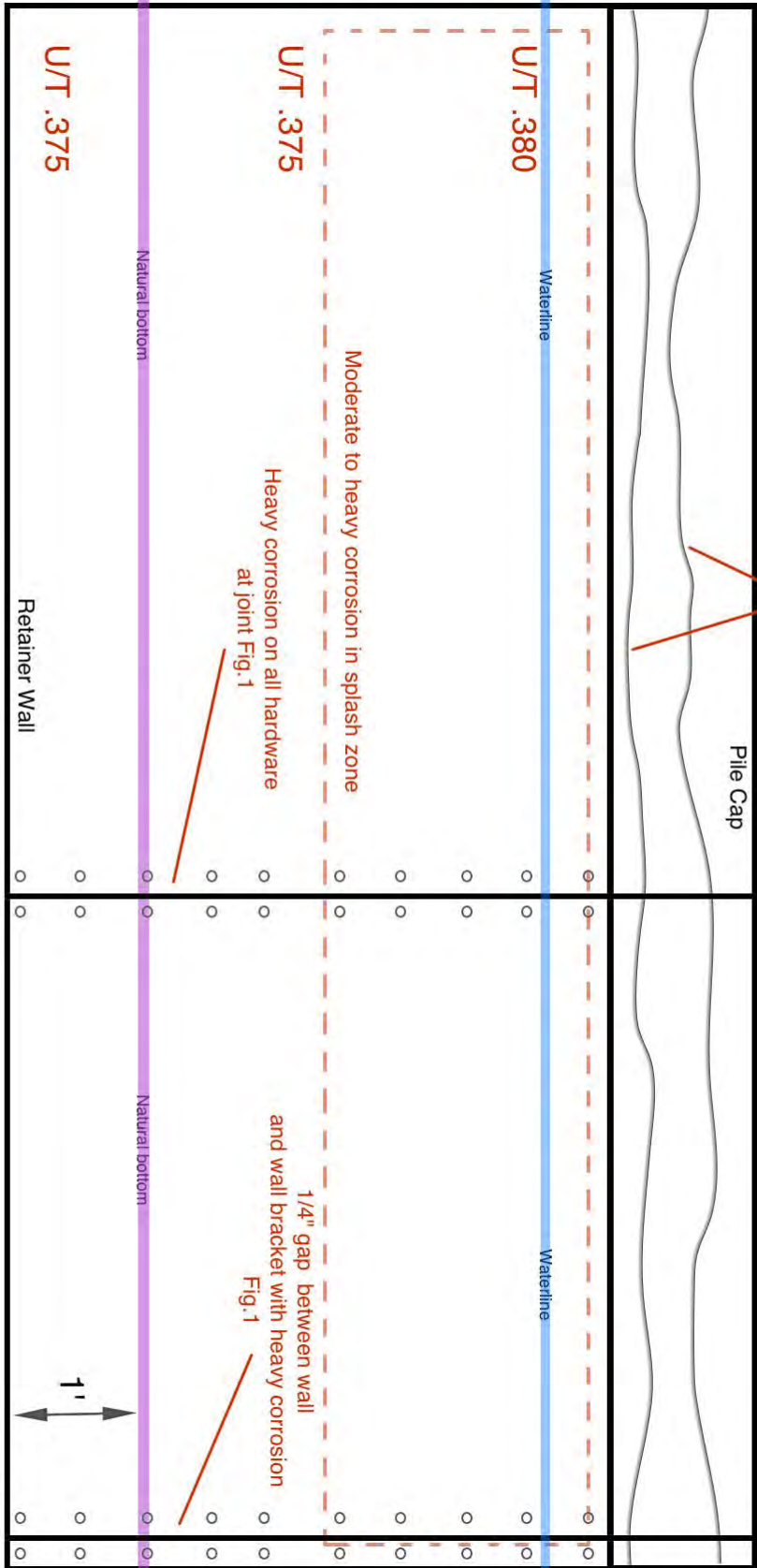
81SDI

81+00

Multiple linear hairline cracks running horizontal at pile cap

Bayou

82+00



01/07/2023

82SD1

Bayou

Multiple linear hairline cracks running horizontal at pile cap

83+00

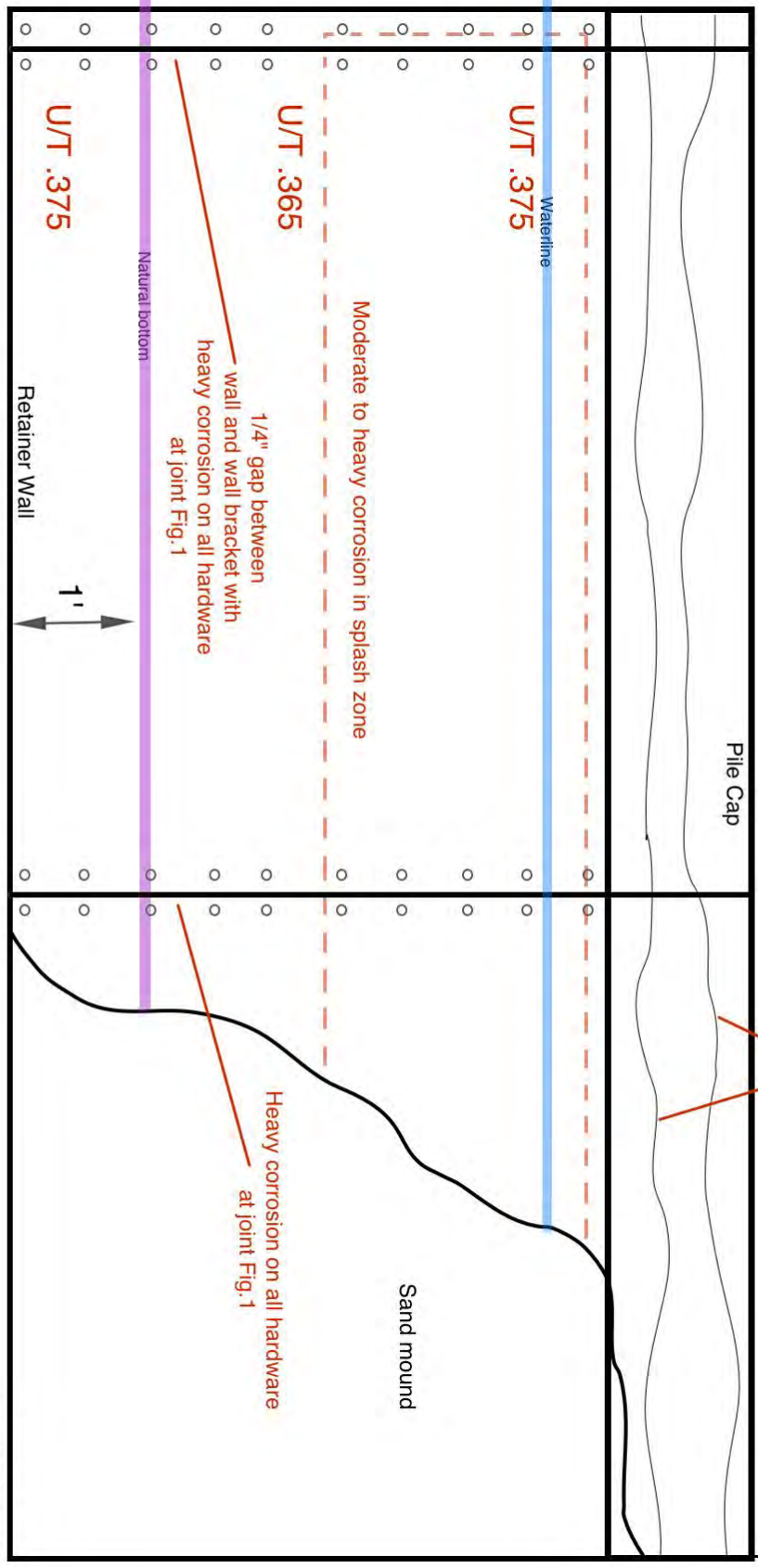
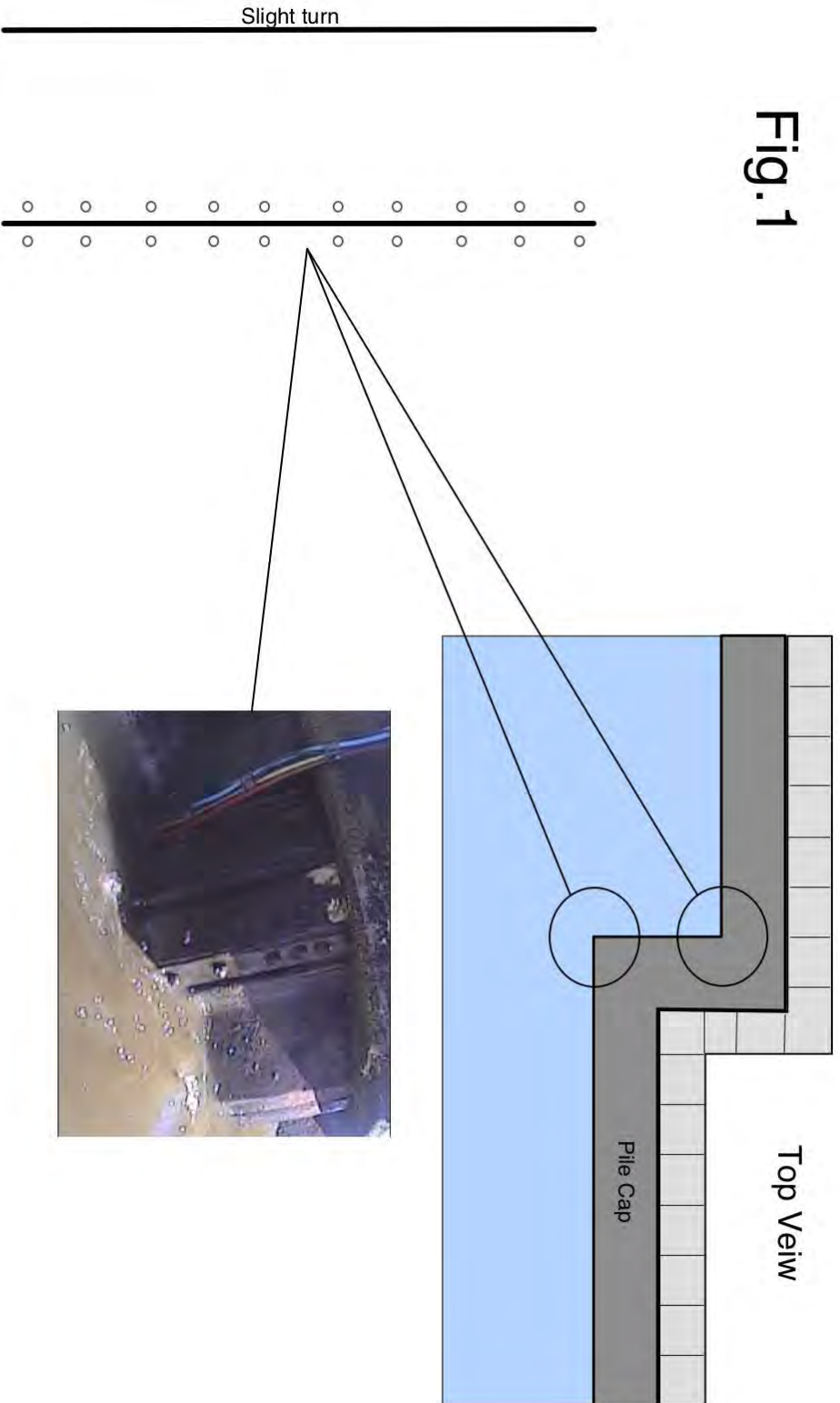


Fig. 1



This drawing represents a hard turn on the sea wall with an L shaped bracket and hardware joining two sections of sheet pile. Aslo displayed is a slight turn with no preexisting hardware

SDI ULTRASONIC THICKNES MEASUREMENTS

53+ - 82+

53SDI .365 .365 .365	54SDI .365 .365 .360	55SDI .375 .365 .355	56SDI .365 .360 .365	57SDI .375 .375 .375
58SDI .375 .370 .370	59SDI .365 .365 .360	60SDI .315 .360 .360	61SDI .380 .375 .375	62SDI .365 .365 .365
63SDI .375 .375 .370	64SDI .365 .375 .375	65SDI .365 .365 .365	66SDI .380 .385 .385	67SDI .365 .365 .370
68SDI .380 .360 .360	69SDI .380 .360 .350	70SDI .360 .355 .365	71SDI .365 .360 .345	72SDI .365 .370 .365
73SDI .320 .365 .370	74SDI .370 .380 .385	75SDI .370 .380 .380	76SDI .380 .380 .380	77SDI .380 .380 .320
78SDI .375 .380 .380	79SDI .370 .370 .365	81SDI .380 .375 .375	82SDI .375 .365 .375	



Fig.35

53SDI



53+16



53+85

Fig.36

54SDI



54+36



54+94



54+70

Fig.37

55SD1

55+50



Fig.38

56SDI

56+11



56+70



Fig.39

57SDI

57+27



57+86



57+83



Fig.40

58SD1

58+46



Fig.41

59SDI



59+05



59+63

Fig.42

60SDI

60+80



Fig.43

61SDI



61+38



61+98

Fig.44

62SD1

62+56



Fig.45

63SDI



63+15



63+74

Fig.46

64SDI

64+31



64+90



64+79



Fig.47

65SDI

65+49



Fig.48

67SDI

67+77



Fig.49

69SDI

69+07



Fig.50

70SDI



70+09



70+68

Fig.51

71SDI



71+27



71+86

Fig.52

73SDI



73+07



73+65

Fig.53

74SDI



74+21



74+81

Fig.54

75SDI



75+91

Fig.55

77SDI

77+62



Fig.56

78SDI

78+21



Fig.57

80SD1


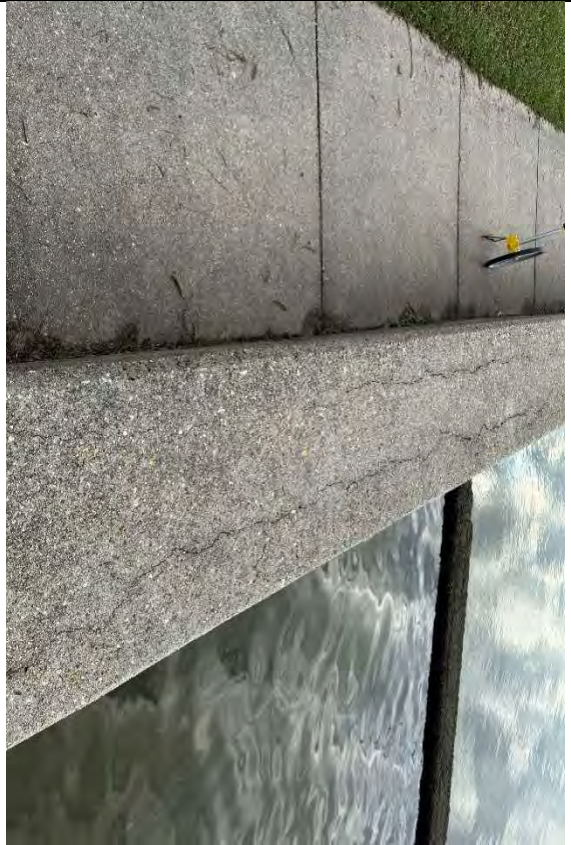
80+55



Appendix B



Field Photo Log

Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0048 Inspection Field Notes Photo # : 2 Date: 12-12-2022 Approximate Station: Station 09+57 Description: Horizontal Crack in Corner of Cap Coordinates: Latitude: 90 ; 4 ; 58.03 Longitude: 30 ; 21 ; 35.0099</p>
	<p>Photo Name: IMG_0049 Inspection Field Notes Photo # : 3 Date: 12-12-22 Approximate Station: Station 1+13 to 1+23 Description: Horizontal cracks that are reflective of sheet pile Coordinates: Latitude: 30 ; 21 ; 34.97 Longitude: 90 ; 4 ; 57.84</p>

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0050 Inspection Field Notes Photo # : 3 Date: 12-12-2022 Approximate Station: Station 1+13 to 1+23 Description: Horizontal cracks that are reflective of sheet pile Coordinates: Latitude: 30 ; 21 ; 34.77 Longitude: 90 ; 4 ; 57.45</p>
	<p>Photo Name: IMG_0051 Inspection Field Notes Photo # : 4 Date: 12-12-2022 Approximate Station: Station 1+25 to 1+82 Description: Horizontal and Vertical cracks in the wall Coordinates: Latitude: 30 ; 21 ; 34.7599 Longitude: 90 ; 4 ; 57.45</p>

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Mandeville Seawall Site Inspection Log

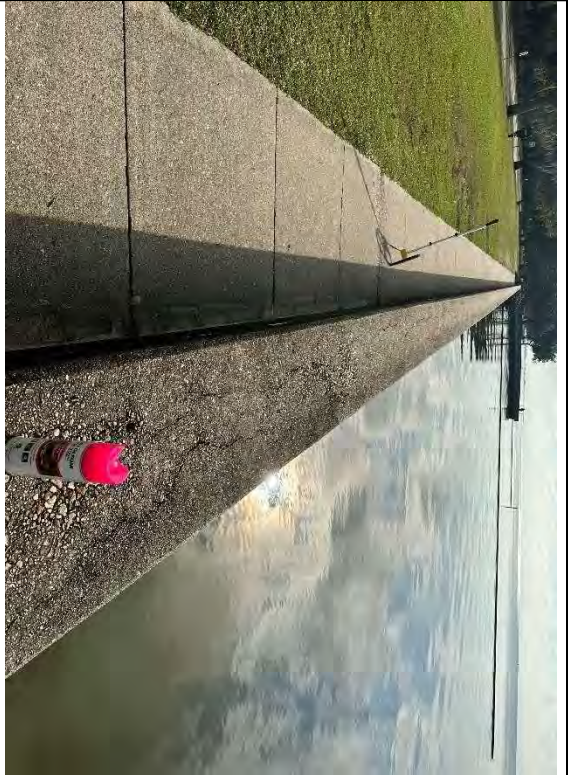
For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0052 Inspection Field Notes Photo # : 5 Date: 12-12-22 Approximate Station: Station 1+25 to 1+82 Description : Vertical Cracks every 3 to 5 feet Coordinates: No coordinates Longitude: Latitude:</p>
	<p>Photo Name: IMG_0053 Inspection Field Notes Photo # : 6 Date: 12-12-22 Approximate Station: Station 1+82 Description : Bottom Corner of expansion joint is missing Coordinates: Latitude: 30 ; 21 ; 34.6199 Longitude: 90 ; 4 ; 57.15</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0055 Inspection Field Notes Photo # : 8 Date: 12-12-22 Approximate Station: Station 1+82 to 2+00 Description: Horizontal cracks and vertical cracks on land face side Coordinates: Latitude: 30 ; 21 ; 34.49 Longitude: 90 ; 4 ; 57.1799</p>
	<p>Photo Name: IMG_0056 Inspection Field Notes Photo # : 9 Date: 12-12-2022 Approximate Station: Station 2+00 Description: N/A Coordinates: Latitude: 30 ; 21 ; 34.55 Longitude: 90 ; 4 ; 56.9899</p>

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0057 Inspection Field Notes Photo # : 11 Date: 12-12-22 Approximate Station: Station 2+40 Description: Expansion Joint has reflective horizontal cracks Coordinates: Latitude: 30 ; 21 ; 34.5099 Longitude: 90 ; 4 ; 56.799</p>
	<p>Photo Name: IMG_0058 Inspection Field Notes Photo # : 12 Date: 12-12-22 Approximate Station: Station 3+00 Description: N/A Coordinates: Latitude: 30 ; 21 ; 34.0899 Longitude: 90 ; 4 ; 55.83</p>

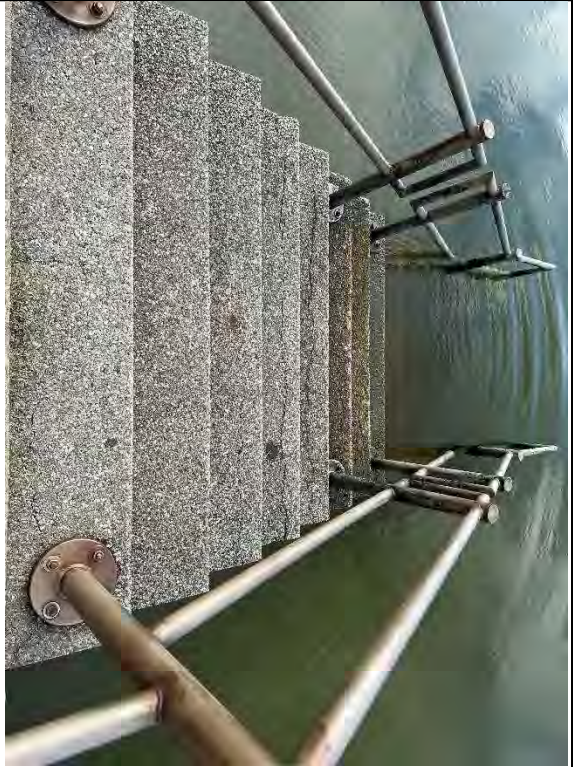
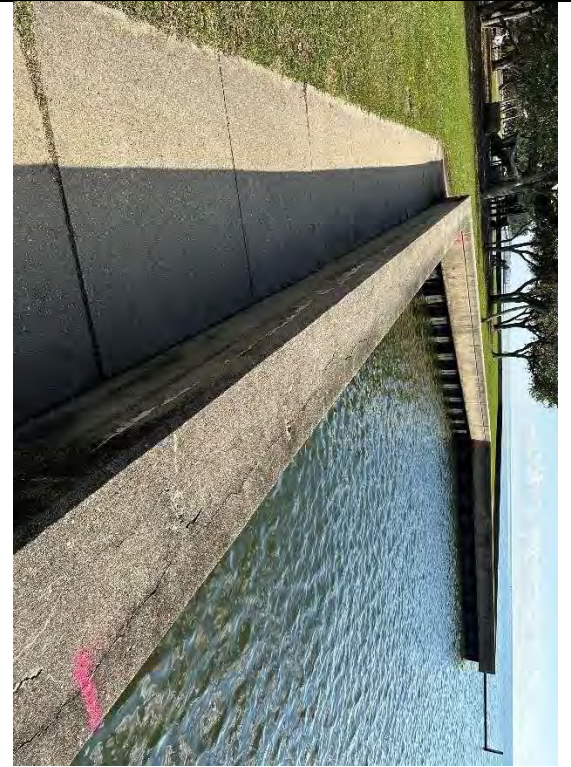
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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0059 Inspection Field Notes Photo # : 13 Date: 12-12-22 Approximate Station: Station 3+68 to 3+78 Description: Spalling of top of Cap on Lake side Coordinates: Latitude: 30 ; 21 ; 33.6499 Longitude: 90 ; 4 ; 55.20</p>
	<p>Photo Name: IMG_0060 Inspection Field Notes Photo # : 14 Date: 12-12-22 Approximate Station: Station N/A Description: Light Cracking that is reflective of Sheet Pile Coordinates: Latitude: 30 ; 21 ; 33.57 Longitude: 90 ; 4 ; 55.3099</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0061 Inspection Field Notes Photo # : 16 Date: 12-12-22 Approximate Station: Station N/A Description: Stairs with steps 5 through 7 being cracked Coordinates: Latitude: 30 ; 21 ; 33.49 Longitude: 90 ; 4 ; 54.76</p>
	<p>Photo Name: IMG_0066 Inspection Field Notes Photo # : 17 Date: 12-12-22 Approximate Station: Station 4+24 to 4+92 Description: Horizontal and vertical cracks reflective of sheet pile. Land side cracks alongside of cap Coordinates: Latitude: 30 ; 21 ; 33.30 Longitude: 90 ; 4 ; 54.57</p>


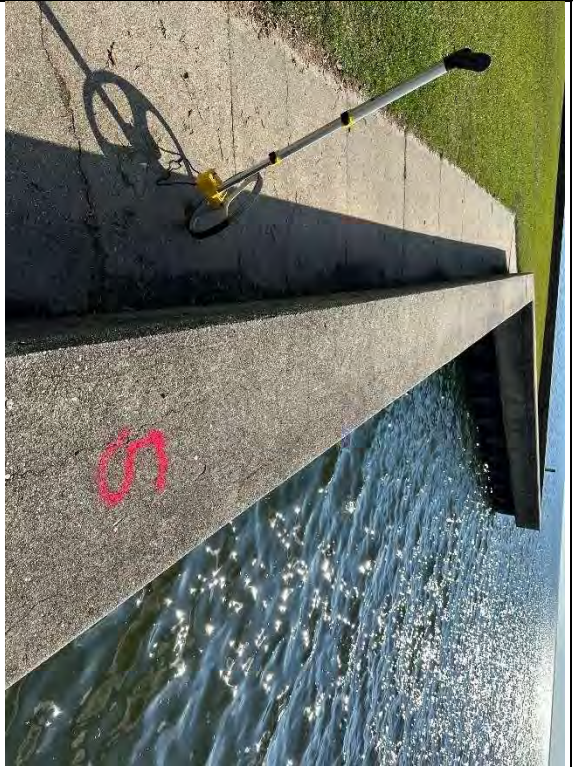
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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0067 Inspection Field Notes Photo # : 18 Date: 12-12-22 Approximate Station: Station 4+30 to 4+90 Description: Lake Side of wall Coordinates: Latitude: 30 ; 21 ; 33.2599 Longitude: 90 ; 4 ; 54.710</p>
	<p>Photo Name: IMG_0068 Inspection Field Notes Photo # : 19 Date: 12-12-22 Approximate Station: Station 4+70 Description: Spall on Lake Side at End joint Coordinates: Latitude: 30 ; 21 ; 32.919 Longitude: 90 ; 4 ; 54.080</p>

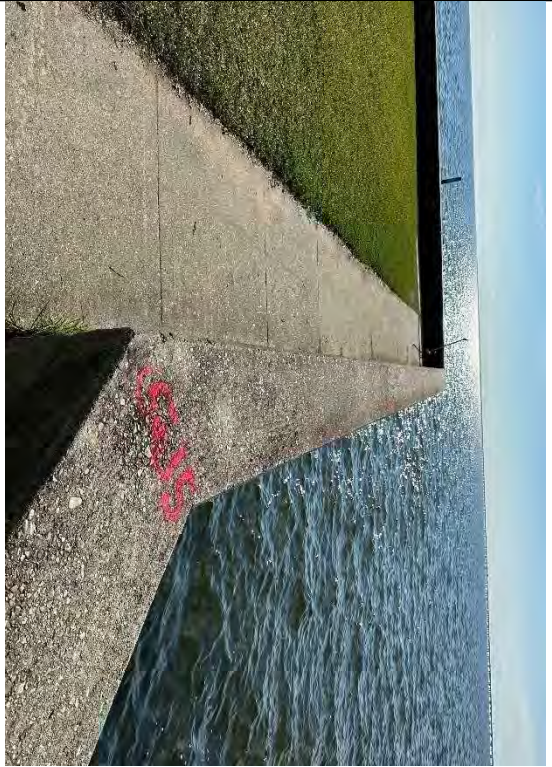
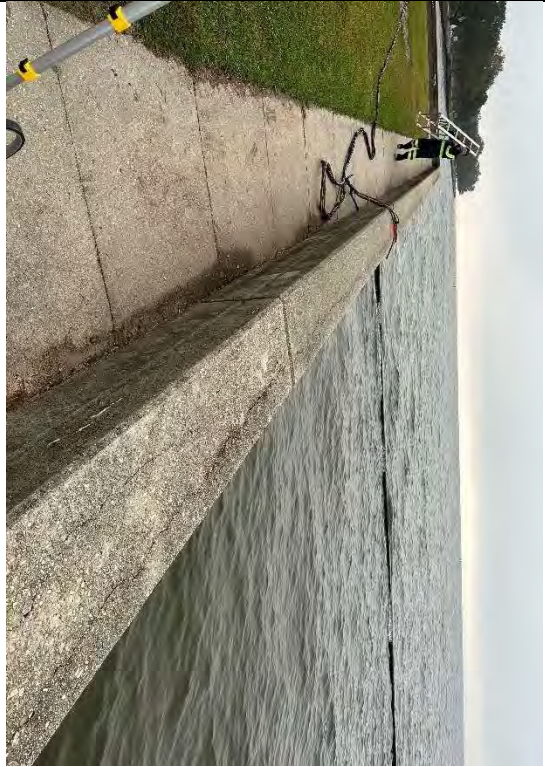
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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0069 Inspection Field Notes Photo # : 20 Date: 12-12-22 Approximate Station: Station 4+89 to 5+02 Description: Horizontal cracks reflective of sheet pile. Some vertical cracks along land side of wall face Coordinates: Latitude: 30 ; 21 ; 33.1399 Longitude: 90 ; 4 ; 54.02</p>
	<p>Photo Name: IMG_0070 Inspection Field Notes Photo # : 21 Date: 12-12-22 Approximate Station: Station 5+00 Description: Minor horizontal and vertical surface cracks Coordinates: Latitude: 30 ; 21 ; 32.74 Longitude: 90 ; 4 ; 53.9899</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0071 Inspection Field Notes Photo # : 22 Date: 12-12-22 Approximate Station: Station 5+35 to 5+42 Description: Minor Vertical cracks Coordinates: Latitude: 30 ; 21 ; 32.6199 Longitude: 90 ; 4 ; 53.9699</p>
	<p>Photo Name: IMG_0074 Inspection Field Notes Photo # : 23 Date: 12-13-22 Approximate Station: Station 5+47 to 6+00 Description: Horizontal cracks on top of seawall. Minor horizontal cracks on land face side of seawall Coordinates: Latitude: 30 ; 21 ; 32.25 Longitude: 90 ; 4 ; 54.19</p>

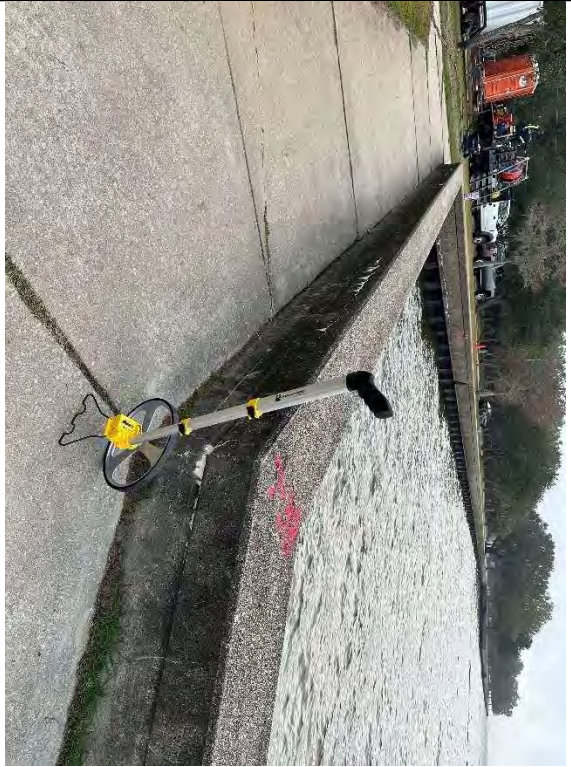
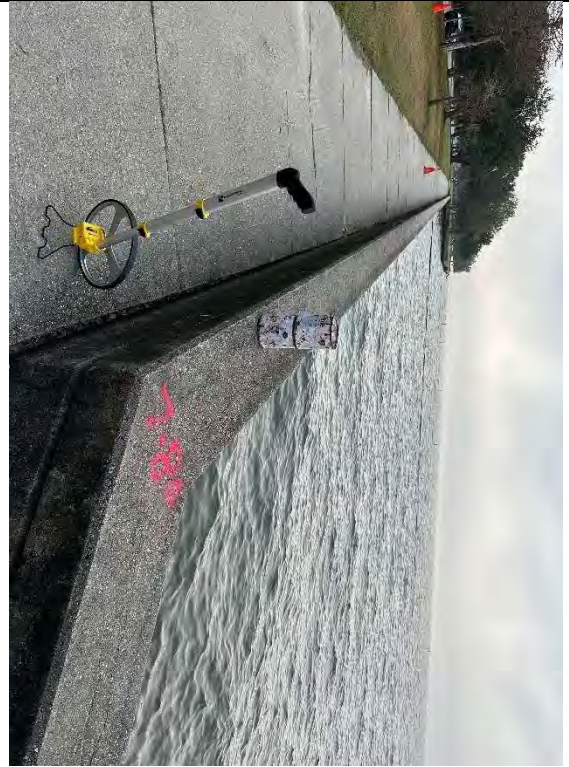
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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0075 Inspection Field Notes Photo # : 24 Date: 12-13-22 Approximate Station: Station 6+00 to 6+15 Description: Top of seawall contains horizontal cracks reflective of the sheet pile. Land face side contains horizontal cracks with minor vertical cracks as well Coordinates: Latitude: 30 ; 21 ; 31.899 Longitude: 90 ; 4 ; 53.5499</p>
	<p>Photo Name: IMG_0076 Inspection Field Notes Photo # : 25 Date: 12-13-22 Approximate Station: Station 6+95 to 7+02 Description: Top of seawall contains horizontal cracks reflective of the sheet pile. Land face side contains horizontal cracks every 10' Coordinates: Latitude: 30 ; 21 ; 31.610 Longitude: 90 ; 4 ; 52.7899</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0077 Inspection Field Notes Photo # : 26 Date: 12-13-22 Approximate Station: Station 7+38 to 7+84 Description: Top of seawall contains horizontal cracks reflective of the sheet pile. Land face side contains horizontal cracks with minor vertical cracks as well Coordinates: Latitude: 30 ; 21 ; 31.9799 Longitude: 90 ; 4 ; 52.900</p>
	<p>Photo Name: IMG_0078 Inspection Field Notes Photo # : 27 Date: 12-13-22 Approximate Station: Station 7+80 to 8+00 Description: Minor cracks on top of seawall. Horizontal cracks on both land and sea face sides Coordinates: Latitude: 30 ; 21 ; 32.25 Longitude: 90 ; 4 ; 52.400</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0079 Inspection Field Notes Photo # : 28 Date: 12-13-22 Approximate Station: Station 8+00 to 8+25 Description: Heavy cracks at top of seawall. Concrete spall on the seaside of expansion joint. Landside face contains minor horizontal cracks Coordinates: Latitude: 30 ; 21 ; 32.100 Longitude: 90 ; 4 ; 52.1799</p>
	<p>Photo Name: IMG_0080 Inspection Field Notes Photo # : 29 Date: 12-13-22 Approximate Station: Station 8+25 to 9+00 Description: Horizontal cracks on the top of the seawall that is reflective of sheet pile Coordinates: Latitude: 30 ; 21 ; 31.600 Longitude: 90 ; 4 ; 51.19</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0081 Inspection Field Notes Photo # : 30 Date: 12-13-22 Approximate Station: Station 10+00 to 11+00 Description: Top of seawall contains horizontal cracks that are reflective of the sheet pile. The land side face contains minor vertical and horizontal cracks as well Coordinates: Latitude: 30 ; 21 ; 31.1499 Longitude: 90 ; 4 ; 50.26</p>
	<p>Photo Name: IMG_0082 Inspection Field Notes Photo # : 31 Date: 12-13-22 Approximate Station: Station 10+57 Description: Concrete spall at expansion joint Coordinates: Latitude: 30 ; 21 ; 30.82 Longitude: 90 ; 4 ; 49.5399</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0083 Inspection Field Notes Photo # : 33 Date: 12-13-22 Approximate Station: Station 11+16 Description: Concrete spall at seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 30.499 Longitude: 90 ; 4 ; 49.0499</p>
	<p>Photo Name: IMG_0084 Inspection Field Notes Photo # : 34 Date: 12-13-22 Approximate Station: Station 11+66 to 11+76 Description: Top of seawall contains horizontal cracks that are reflective of the sheet pile Coordinates: Latitude: 30 ; 21 ; 30.33 Longitude: 90 ; 4 ; 48.4199</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0085 Inspection Field Notes Photo # : 35 Date: 12-13-22 Approximate Station: Station 12+07 to 13+00 Description: Horizontal cracks at top of seawall that are reflective of the sheet pile. Landside contains minor cracks as well Coordinates: Latitude: 30 ; 21 ; 29.94 Longitude: 90 ; 4 ; 48.7199</p>
	<p>Photo Name: IMG_0086 Inspection Field Notes Photo # : 36 Date: 12-13-22 Approximate Station: Station 12+25 to 12+35 Description: Top side and land side of the seawall both contain horizontal cracks Coordinates: Latitude: 30 ; 21 ; 29.8899 Longitude: 90 ; 4 ; 48.28</p>

Burk-Kleinpeter, Inc.


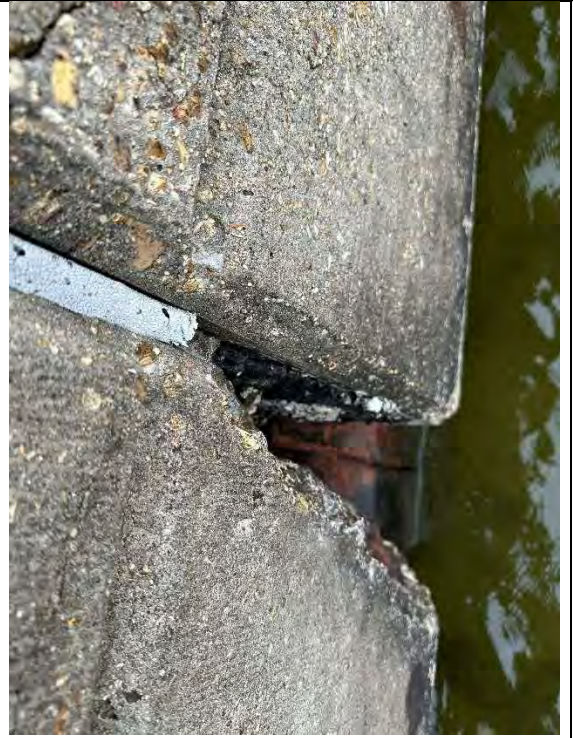
Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0087 Inspection Field Notes Photo # : 37 Date: 12-13-22 Approximate Station: Station 12+93 Description: Large concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 29.399 Longitude: 90 ; 4 ; 47.70</p>
	<p>Photo Name: IMG_0088 Inspection Field Notes Photo # : 38 Date: 12-13-22 Approximate Station: Station 13+00 to 13+42 Description: Minor horizontal on top side of seawall Coordinates: Latitude: 30 ; 21 ; 29.36 Longitude: 90 ; 4 ; 47.9199</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0089 Inspection Field Notes Photo # : 39 Date: 12-13-22 Approximate Station: Station 13+40 to 13+50 Description: Minor horizontal cracks on top side of seawall. Minor cracks on seaside of seawall as well. Coordinates: Latitude: 30 ; 21 ; 29.0899 Longitude: 90 ; 4 ; 47.4299</p>
	<p>Photo Name: IMG_0090 Inspection Field Notes Photo # : 37.2 Date: 12-13-22 Approximate Station: Station 13+50 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 28.970 Longitude: 90 ; 4 ; 47.5399</p>

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0091 Inspection Field Notes Photo # : 38.2 Date: 12-13-22 Approximate Station: Station 13+50 to 14+00 Description: Top side of seawall contains horizontal cracks and minor vertical cracks along land face side Coordinates: Latitude: 30 ; 21 ; 29.0399 Longitude: 90 ; 4 ; 47.1599</p>
	<p>Photo Name: IMG_0092 Inspection Field Notes Photo # : 39.2 Date: 12-13-22 Approximate Station: Station 14+07 Description: Concrete spall along seaside face of expansion joint Coordinates: Latitude: 30 ; 21 ; 28.6399 Longitude: 90 ; 4 ; 47.02</p>

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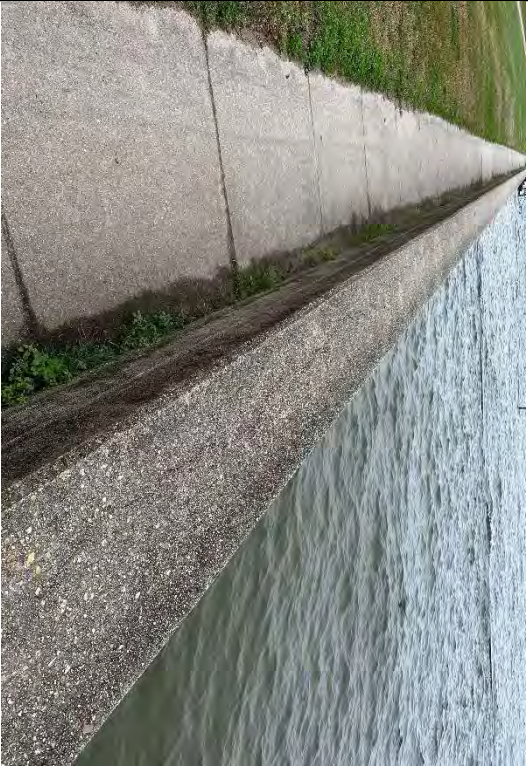

Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0093 Inspection Field Notes Photo # : 39.3 Date: 12-13-22 Approximate Station: Station 14+28 to 15+00 Description: Top side of seawall contains horizontal cracks and minor horizontal and vertical cracks on the land face side Coordinates: Latitude: 30 ; 21 ; 28.55 Longitude: 90 ; 4 ; 46.799</p>
	<p>Photo Name: IMG_0094 Inspection Field Notes Photo # : 40 Date: 12-13-22 Approximate Station: Station 14+67 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 28.4299 Longitude: 90 ; 4 ; 46.299</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0095 Inspection Field Notes Photo # : 41 Date: 12-13-22 Approximate Station: Station 14+67 to 15+00 Description: Horizontal cracks on top side of seawall Coordinates: Latitude: 30 ; 21 ; 28.46 Longitude: 90 ; 4 ; 46.7399</p>
	<p>Photo Name: IMG_0096 Inspection Field Notes Photo # : 42 Date: 12-13-22 Approximate Station: Station 15+00 to 16+00 Description: Horizontal cracks on top side of seawall Coordinates: Latitude: 30 ; 21 ; 28.27 Longitude: 90 ; 4 ; 46.1099</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0097 Inspection Field Notes Photo # : 43 Date: 12-13-22 Approximate Station: Station 15+24 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 27.9199 Longitude: 90 ; 4 ; 45.9199</p>
	<p>Photo Name: IMG_0098 Inspection Field Notes Photo # : 44 Date: 12-13-22 Approximate Station: Station 15+73 Description: Rust spot on Land side of seawall Coordinates: Latitude: 30 ; 21 ; 28.41 Longitude: 90 ; 4 ; 44.63</p>

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Mandeville Seawall Site Inspection Log
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	<p>Photo Name: IMG_0099 Inspection Field Notes Photo # : 45 Date: 12-13-22 Approximate Station: Station 15+84 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 27.53999 Longitude: 90 ; 4 ; 45.34</p>
	<p>Photo Name: IMG_0100 Inspection Field Notes Photo # : 46 Date: 12-13-22 Approximate Station: Station 16+00 to 16+42 Description: Horizontal cracks on top side of seawall. Minor horizontal cracks on the land side of the seawall as well Coordinates: Latitude: 30 ; 21 ; 27.5899 Longitude: 90 ; 4 ; 45.21</p>

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Mandeville Seawall Site Inspection Log



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	<p>Photo Name: IMG_0101 Inspection Field Notes Photo # : 47 Date: 12-13-22 Approximate Station: Station 16+47 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 27.19 Longitude: 90 ; 4 ; 44.8499</p>
	<p>Photo Name: IMG_0102 Inspection Field Notes Photo # : 48 Date: 12-13-22 Approximate Station: Station 16+98 Description: Stairway. Cracks in steps and on the sides of the steps as well. Rust is coming to surface Coordinates: Latitude: 30 ; 21 ; 27.10 Longitude: 90 ; 4 ; 44.38</p>

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Mandeville Seawall Site Inspection Log



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	<p>Photo Name: IMG_0103 Inspection Field Notes Photo # : 49 Date: 12-13-22 Approximate Station: Station 17+00 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 26.9199 Longitude: 90 ; 4 ; 44.44</p>
	<p>Photo Name: IMG_0104 Inspection Field Notes Photo # : 50 Date: 12-13-22 Approximate Station: Station 17+00 Description: Bottom of the steps on the land face side shows signs of rust coming to the top Coordinates: Latitude: 30 ; 21 ; 26.94 Longitude: 90 ; 4 ; 44.27</p>

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Mandeville Seawall Site Inspection Log



For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0105 Inspection Field Notes Photo # : 51 Date: 12-13-22 Approximate Station: Station 17+25 to 17+50 Description: Horizontal cracks that are reflective of the sheet pile on top side of seawall. Horizontal and vertical cracks along land face side Coordinates: Latitude: 30 ; 21 ; 26.8399 Longitude: 90 ; 4 ; 44.1099</p>
	<p>Photo Name: IMG_0106 Inspection Field Notes Photo # : 52 Date: 12-13-22 Approximate Station: Station 17+79 to 17+89 Description: Vertical and horizontal cracks at seaside face of seawall Coordinates: Latitude: 30 ; 21 ; 26.4299 Longitude: 90 ; 4 ; 43.6099</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0107 Inspection Field Notes Photo # : 53 Date: 12-13-22 Approximate Station: Station 18+21 to 18+43 Description: Horizontal and vertical cracks on top side of seawall. Horizontal cracks on face of landside of seawall Coordinates: Latitude: 30 ; 21 ; 26.2599 Longitude: 90 ; 4 ; 43.28</p>
	<p>Photo Name: IMG_0108 Inspection Field Notes Photo # : 54 Date: 12-13-22 Approximate Station: Station 18+50 Description: Steel hatch structure on seaside of seawall. Possibly for drainage pipe? Coordinates: Latitude: 30 ; 21 ; 26.1799 Longitude: 90 ; 4 ; 42.9799</p>


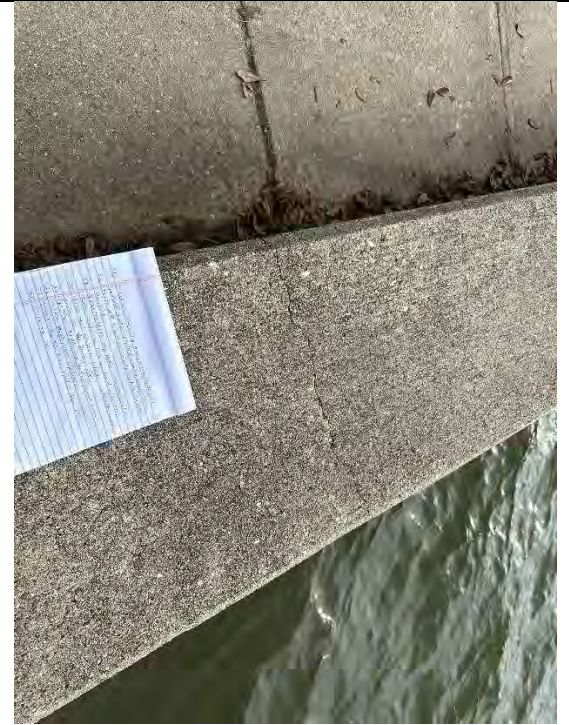
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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0109 Inspection Field Notes Photo # : 55 Date: 12-13-22 Approximate Station: Station 18+70 to 18+80 Description: Horizontal and vertical cracks on top side of seawall Coordinates: Latitude: 30 ; 21 ; 25.96 Longitude: 90 ; 4 ; 42.84</p>
	<p>Photo Name: IMG_0110 Inspection Field Notes Photo # : 56 Date: 12-13-22 Approximate Station: Station 19+00 to 19+40 Description: Minor cracks on top side of seawall Coordinates: Latitude: 30 ; 21 ; 25.91 Longitude: 90 ; 4 ; 42.84</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0111 Inspection Field Notes Photo # : 57 Date: 12-13-22 Approximate Station: Station 19+40 Description: Concrete spall in seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 25.52 Longitude: 90 ; 4 ; 42.21</p>
	<p>Photo Name: IMG_0112 Inspection Field Notes Photo # : 58 Date: 12-13-22 Approximate Station: Station 19+90 to 20+00 Description: Vertical crack on top side of seawall Coordinates: Latitude: 30 ; 21 ; 25.38 Longitude: 90 ; 4 ; 41.20</p>



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Mandeville Seawall Site Inspection Log
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	<p>Photo Name: IMG_0113 Inspection Field Notes Photo # : 59 Date: 12-13-22 Approximate Station: Station 19+98 Description: Concrete spall in seaside of expansion side Coordinates: Latitude: 30 ; 21 ; 25.1699 Longitude: 90 ; 4 ; 41.7399</p>
	<p>Photo Name: IMG_0114 Inspection Field Notes Photo # : 60 Date: 12-13-22 Approximate Station: Station 20+22 to 20+50 Description: Horizontal cracks along top side of seawall. Horizontal cracks along land face side of seawall Coordinates: Latitude: 30 ; 21 ; 25.0599 Longitude: 90 ; 4 ; 41.3599</p>



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	<p>Photo Name: IMG_0115 Inspection Field Notes Photo # : 61 Date: 12-13-22 Approximate Station: Station 20+57 Description: Concrete spall on seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 24.820 Longitude: 90 ; 4 ; 41.1699</p>
	<p>Photo Name: IMG_0116 Inspection Field Notes Photo # : 63 Date: 12-13-22 Approximate Station: Station 21+16 Description: Hole under concrete seawall on land face side at repair area Coordinates: Latitude: 30 ; 21 ; 24.4499 Longitude: 90 ; 4 ; 40.5599</p>

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	<p>Photo Name: IMG_0117 Inspection Field Notes Photo # : 64 Date: 12-13-22 Approximate Station: Station 22+08 Description: Stairway. Steps 3 and 4 are cracked Coordinates: Latitude: 30 ; 21 ; 23.9199 Longitude: 90 ; 4 ; 39.6799</p>
	<p>Photo Name: IMG_0118 Inspection Field Notes Photo # : 65 Date: 12-13-22 Approximate Station: Station 22+08 Description: Step 3 on landside face of seawall settled 1 1/2 “ Coordinates: Latitude: 30 ; 21 ; 23.9499 Longitude: 90 ; 4 ; 39.4899</p>

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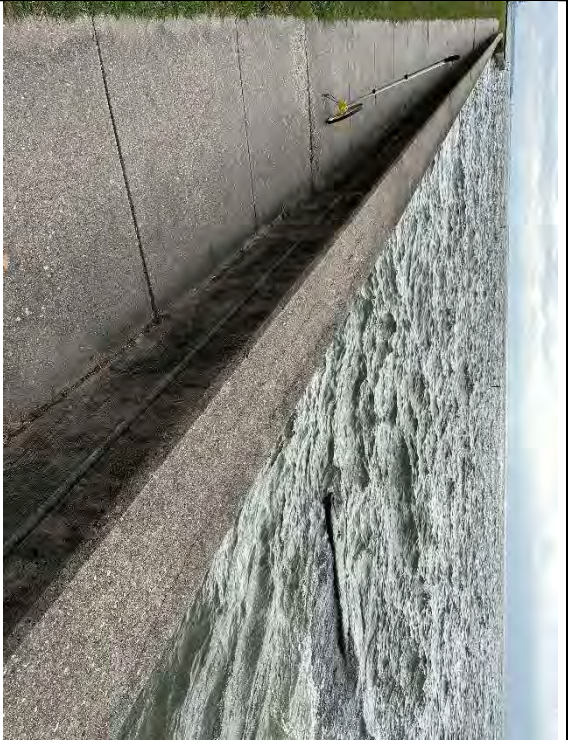

Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0119 Inspection Field Notes Photo #: Date: 12-13-22 Approximate Station: Station Description: Coordinates: Longitude: Latitude:</p> <p>Photo file is corrupted.</p>
	<p>Photo Name: IMG_0120 Inspection Field Notes Photo # : 67 Date: 12-13-22 Approximate Station: Station 22+45 to 22+50 Description: Horizontal and vertical cracks along top side of seawall Coordinates: Latitude: 30 ; 21 ; 23.809 Longitude: 90 ; 4 ; 39.800</p>

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0121 Inspection Field Notes Photo # : 68 Date: 12-13-22 Approximate Station: Station 22+66 to 22+88 Description: Horizontal cracks along top side of seawall. 2 vertical cracks Coordinates: Latitude: 30 ; 21 ; 23.6199 Longitude: 90 ; 4 ; 39.0499</p>
	<p>Photo Name: IMG_0122 Inspection Field Notes Photo # : 69 Date: 12-13-22 Approximate Station: Station 23+00 to 24+00 Description: Horizontal cracks along top side of seawall. Horizontal cracks along land face side of seawall. Sidewalk is settling along wall Coordinates: Latitude: 30 ; 21 ; 24.74 Longitude: 90 ; 4 ; 36.2</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0123 Inspection Field Notes Photo # : 70 Date: 12-13-22 Approximate Station: Station 23+33 Description: Concrete spall along land face side of expansion joint of seawall Coordinates: Latitude: 30 ; 21 ; 23.3399 Longitude: 90 ; 4 ; 38.01</p>
	<p>Photo Name: IMG_0125 Inspection Field Notes Photo # : 71 Date: 12-13-22 Approximate Station: Station 23+57 Description: Rust spots on top side of seawall. Coordinates: Latitude: 30 ; 21 ; 23.16 Longitude: 90 ; 4 ; 38.09</p>



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	<p>Photo Name: IMG_0126 Inspection Field Notes Photo # : 72 Date: 12-13-22 Approximate Station: Station 23+93 Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 22.97 Longitude: 90 ; 4 ; 37.95</p>
	<p>Photo Name: IMG_0127 Inspection Field Notes Photo # : 73.1 Date: 12-13-22 Approximate Station: Station 24+49 Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 22.6699 Longitude: 90 ; 4 ; 37.32</p>

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Mandeville Seawall Site Inspection Log
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	<p>Photo Name: IMG_0128 Inspection Field Notes Photo # : 73.2 Date: 12-13-22 Approximate Station: Station 25+00 to 25+09 Description: Horizontal cracks along top side of seawall. Horizontal cracks with rust coming out on the land face side of the seawall as well Coordinates: Latitude: 30 ; 21 ; 22.5599 Longitude: 90 ; 4 ; 36.7499</p>
	<p>Photo Name: IMG_0129 Inspection Field Notes Photo # : 74 Date: 12-13-22 Approximate Station: Station 25+09 Description: Concrete spall along seaside of expansion joint. Sidewalk is sunken in this area as well Coordinates: Latitude: 30 ; 21 ; 22.2799 Longitude: 90 ; 4 ; 36.799</p>



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	<p>Photo Name: IMG_0130 Inspection Field Notes Photo # : 75 Date: 12-13-22 Approximate Station: Station 25+35 to 25+50 Description: Horizontal and vertical cracks along top side of seawall. Rust spots as well Coordinates: Latitude: 30 ; 21 ; 26.899 Longitude: 90 ; 4 ; 36.83</p>
	<p>Photo Name: IMG_0131 Inspection Field Notes Photo # : 77 Date: 12-13-22 Approximate Station: Station 25+73 Description: Concrete spall along the seaside of the expansion joint Coordinates: Latitude: 30 ; 21 ; 22.050 Longitude: 90 ; 4 ; 36.39</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0132 Inspection Field Notes Photo # : 79 Date: 12-13-22 Approximate Station: Station 26+32 Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 21.57 Longitude: 90 ; 4 ; 35.89</p>
	<p>Photo Name: IMG_0133 Inspection Field Notes Photo # : 80 Date: 12-13-22 Approximate Station: Station 26+37 to 27+00 Description: Horizontal cracks along top side of seawall. Coordinates: Latitude: 30 ; 21 ; 21.72 Longitude: 90 ; 4 ; 35.84</p>



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Mandeville Seawall Site Inspection Log
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	<p>Photo Name: IMG_0135 Inspection Field Notes Photo # : 81 Date: 12-13-22 Approximate Station: Station 27+00 to 28+00 Description: Horizontal cracks on top side of seawall. Horizontal and vertical cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 21.699 Longitude: 90 ; 4 ; 35.2299</p>
	<p>Photo Name: IMG_0136 Inspection Field Notes Photo # : 82 Date: 12-13-22 Approximate Station: Station 28+00 to 28+63 Description: Horizontal cracks along the top side of seawall. A few horizontal cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 20.99 Longitude: 90 ; 4 ; 34.19</p>



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	<p>Photo Name: IMG_0137 Inspection Field Notes Photo # : 83 Date: 12-13-22 Approximate Station: Station 28+68 Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 20.63 Longitude: 90 ; 4 ; 33.010</p>
	<p>Photo Name: IMG_0138 Inspection Field Notes Photo # : 84 Date: 12-13-22 Approximate Station: Station 28+76 Description: Stairway. Steps have cracks on them along the seaside Coordinates: Latitude: 30 ; 21 ; 20.4799 Longitude: 90 ; 4 ; 33.1199</p>

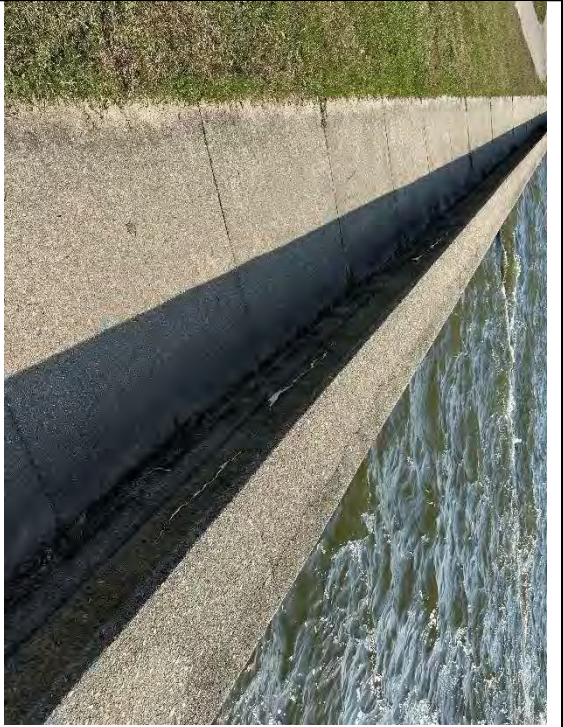

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0139 Inspection Field Notes Photo # : 87 Date: 12-13-22 Approximate Station: Station 29+00 to 29+38 Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks along the land face side of the seawall as well Coordinates: Latitude: 30 ; 21 ; 21.5899 Longitude: 90 ; 4 ; 33.1199</p>
	<p>Photo Name: IMG_0140 Inspection Field Notes Photo # : 86 Date: 12-13-22 Approximate Station: Station 28+76 to 29+00 Description: Horizontal and vertical cracks along the top side of the seawall. Horizontal cracks along the seaside face of the seawall as well Coordinates: Latitude: 30 ; 21 ; 20.49 Longitude: 90 ; 4 ; 33.0399</p>



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	<p>Photo Name: IMG_0141 Inspection Field Notes Photo # : 88 Date: 12-13-22 Approximate Station: Station 29+72 to 30+00 Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 19.91 Longitude: 90 ; 4 ; 32.099</p>
	<p>Photo Name: IMG_0142 Inspection Field Notes Photo # : 89 Date: 12-13-22 Approximate Station: Station 30+00 to 31+00 Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall. Some rust spots as well. Coordinates: Latitude: 30 ; 21 ; 19.9299 Longitude: 90 ; 4 ; 31.75</p>


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Mandeville Seawall Site Inspection Log
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	<p>Photo Name: IMG_0143 Inspection Field Notes Photo # : 91 Date: 12-13-22 Approximate Station: Station 32+00 to 32+21 Description: Horizontal cracks along the top side of seawall. Horizontal cracks along the land face side of the seawall as well Coordinates: Latitude: 30 ; 21 ; 19.8899 Longitude: 90 ; 4 ; 30.47999</p>
	<p>Photo Name: IMG_0144 Inspection Field Notes Photo # : 90 Date: 12-13-22 Approximate Station: Station 31+00 to 32+00 Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall as well. Sidewalk is settling along with seawall. Coordinates: Latitude: 30 ; 21 ; 19.61 Longitude: 90 ; 4 ; 30.9</p>

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Mandeville Seawall Site Inspection Log
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	<p>Photo Name: IMG_0145 Inspection Field Notes Photo # : 92 Date: 12-13-22 Approximate Station: Station 32+18 to 32+30 Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall as well. Sidewalk is settling along with seawall. Coordinates: Latitude: 30 ; 21 ; 19.3899 Longitude: 90 ; 4 ; 30.1799</p>
	<p>Photo Name: IMG_0146 Inspection Field Notes Photo # : Date: 12-13-22 Approximate Station: Station Description: Coordinates: Longitude: Latitude: File is corrupted.</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

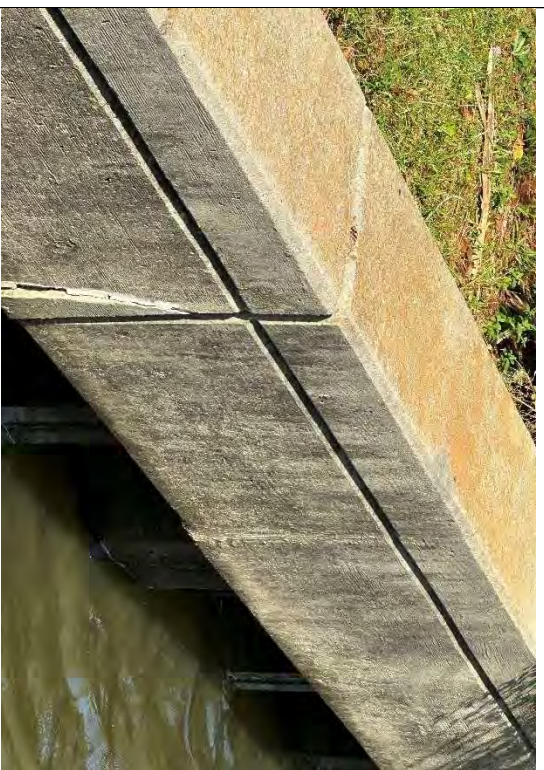


Photo Name: IMG_0147
Inspection Field Notes Photo # : 95
Date: 12-13-22
Approximate Station: Station 33+61
Description: Concrete Spall at Expansion Joint
Coordinates:
Latitude: 30 ; 21 ; 19.4299
Longitude: 90 ; 4 ; 28.89



Photo Name: IMG_0148
Inspection Field Notes Photo # : 96
Date: 12-13-22
Approximate Station: Station 34+25
Description: Water line crossing canal
Coordinates:
Latitude: 30 ; 21 19.919
Longitude: 90 ; 4 ; 27.71

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report



Photo Name: IMG_0149
Inspection Field Notes Photo # : 97
Date: 12-13-22
Approximate Station: Station 34+64
Description: Water line crossing canal on West side of bridge
Coordinates:
Latitude: 30 ; 21 ; 21.02
Longitude: 90 ; 4 ; 27.9299



Photo Name: IMG_0150
Inspection Field Notes Photo # : 98
Date: 12-13-22
Approximate Station: Station
Description: Water line crossing canal on East side of bridge
Coordinates:
Latitude: 30 ; 21 ; 20.3899
Longitude: 90 ; 4 ; 27.76

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

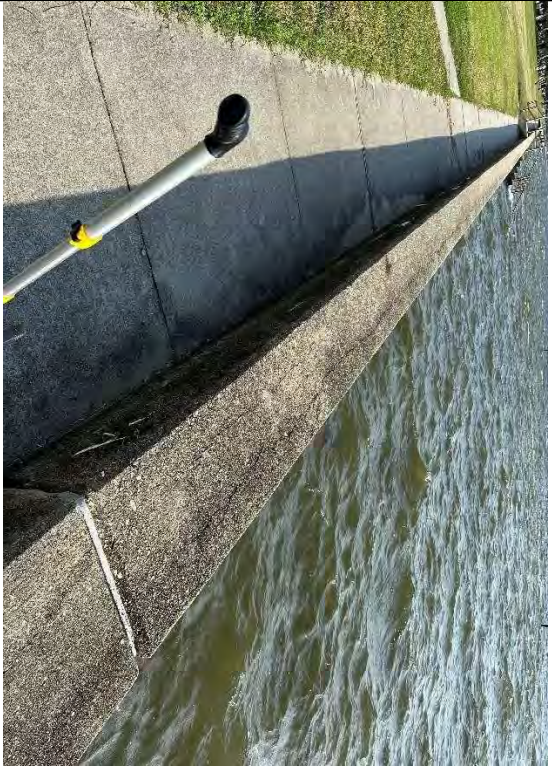



Photo Name: IMG_0152
Inspection Field Notes Photo # : 99
Date: 12-13-22
Approximate Station: Station 35+62
Description: Concrete Spall on East side of Expansion Joint
Coordinates:
Latitude: 30 ; 21 ; 19.7599
Longitude: 90 ; 4 ; 28.700



Photo Name: IMG_0153
Inspection Field Notes Photo # : 100
Date: 12-13-22
Approximate Station: Station 36+84 to 37+32
Description: Seawall is in okay condition
Coordinates:
Latitude: 30 ; 21 ; 18.690
Longitude: 90 ; 4 ; 28.590

Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0154 Inspection Field Notes Photo # : 101 Date: 12-13-22 Approximate Station: Station 37+32 to 37+77 Description: Horizontal cracks on top of seawall. Horizontal cracks on Land side of seawall Coordinates: Latitude: 30 ; 21 ; 18.66 Longitude: 90 ; 4 ; 28.619</p>
	<p>Photo Name: IMG_0156 Inspection Field Notes Photo # : 102 Date: 12-13-22 Approximate Station: Station 38+00 to 38+49 Description: Minor horizontal cracks on top of seal wall Coordinates: Latitude: 30 ; 21 ; 18.38 Longitude: 90 ; 4 ; 27.8699</p>

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Mandeville Seawall Site Inspection Log
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Photo Name: IMG_0157
Inspection Field Notes Photo # : 103
Date: 12-13-22
Approximate Station: Station 38+50
Description: Concrete spall at seaside of expansion joint
Coordinates:
Latitude: 30 ; 21 ; 18.1199
Longitude: 90 ; 4 ; 27.3800

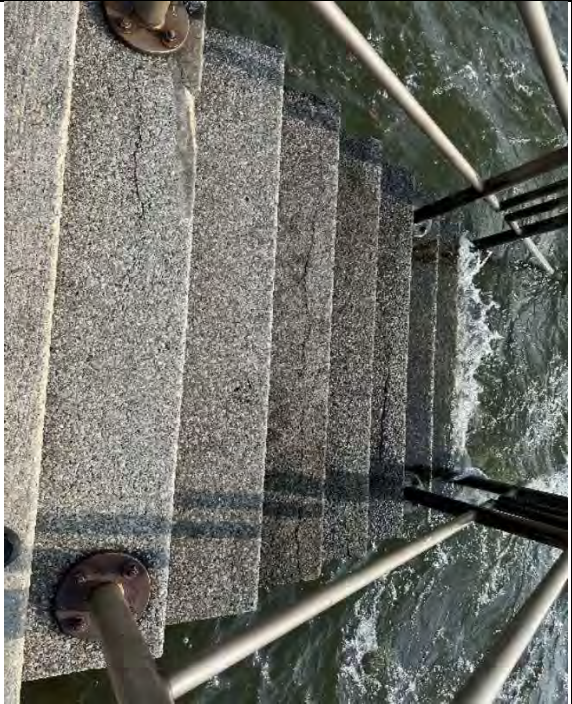


Photo Name: IMG_0158
Inspection Field Notes Photo # : 104
Date: 12-13-22
Approximate Station: Station 38+61
Description: Stairway. Step 7 is cracked on seaside face of seawall
Coordinates:
Latitude: 30 ; 21 ; 17.91
Longitude: 90 ; 4 ; 27.5399

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0159 Inspection Field Notes Photo # : 105 Date: 12-13-22 Approximate Station: Station 38+61 Description: Step 7's rebar on the land face side of the seawall is showing Coordinates: Latitude: 30 ; 21 ; 18.19 Longitude: 90 ; 4 ; 27.32</p>
	<p>Photo Name: IMG_0161 Inspection Field Notes Photo # : 106 Date: 12-14-22 Approximate Station: Station 39+09 Description: Concrete spall along seaside face of expansion joint Coordinates: Latitude: 30 ; 21 ; 17.47 Longitude: 90 ; 4 ; 26.28</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0162 Inspection Field Notes Photo # : 108 Date: 12-14-22 Approximate Station: Station 39+00 to 40+00 Description: Minor hairline crack along the top side of the seawall. Sidewalk is setting along the wall as well Coordinates: Latitude: 30 ; 21 ; 17.83 Longitude: 90 ; 4 ; 27.02</p>
	<p>Photo Name: IMG_0163 Inspection Field Notes Photo # : 109 Date: 12-14-22 Approximate Station: Station 39+68 Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 17.49 Longitude: 90 ; 4 ; 26.169</p>

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0164 Inspection Field Notes Photo # : 110 Date: 12-14-22 Approximate Station: Station 40+00 to 41+00 Description: Sidewalk settling along side of seawall. Top side of wall contains minor vertical cracks Coordinates: Latitude: 30 ; 21 ; 17.50 Longitude: 90 ; 4 ; 25.76</p>
	<p>Photo Name: IMG_0165 Inspection Field Notes Photo # : 111 Date: 12-14-22 Approximate Station: Station 40+26 Description: Concrete spall along the seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 17.57 Longitude: 90 ; 4 ; 25.510</p>

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Mandeville Seawall Site Inspection Log
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Photo Name: IMG_0166
Inspection Field Notes Photo # : 112
Date: 12-14-22
Approximate Station: Station 40+85
Description: Concrete spall along seaside of expansion joint
Coordinates:
Latitude: 30 ; 21 ; 16.899
Longitude: 90 ; 4 ; 25.02



Photo Name: IMG_0167
Inspection Field Notes Photo # : 113
Date: 12-14-22
Approximate Station: Station 40+86 to 41+07
Description: Top side of seawall contains horizontal cracks that are reflective of the sheet pile
Coordinates:
Latitude: 30 ; 21 ; 17.00
Longitude: 90 ; 4 ; 24.94

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0168 Inspection Field Notes Photo # : 114 Date: 12-14-22 Approximate Station: Station N/A Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 16.7899 Longitude: 90 ; 4 ; 24.3599</p>
	<p>Photo Name: IMG_0169 Inspection Field Notes Photo # : 116 Date: 12-14-22 Approximate Station: Station 41+60 to 42+10 Description: Horizontal cracks along land face side of seawall Coordinates: Latitude: 30 ; 21 ; 16.83 Longitude: 90 ; 4 ; 24.3599</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report



Photo Name: IMG_0170
Inspection Field Notes Photo # : 118
Date: 12-14-22
Approximate Station: Station 42+03 to 42+19
Description: Bottom edge of concrete wall needs repairing on seaside
Coordinates:
Latitude: 30 ; 21 ; 16.610
Longitude: 90 ; 4 ; 23.809




Photo Name: IMG_0171
Inspection Field Notes Photo # : 119
Date: 12-14-22
Approximate Station: Station 42+15 to 42+60
Description: Horizontal cracks along top side of seawall that are reflective of sheet pile. Horizontal cracks along land face side of seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 16.66
Longitude: 90 ; 4 ; 23.5599

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Mandeville Seawall Site Inspection Log



For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0172 Inspection Field Notes Photo # : Date: 12-14-22 Approximate Station: Station 19+08 (Stop Sign on Left Side Toe) Description: Sign at levee toe Coordinates: Longitude: Latitude:</p> <p>File is corrupted, needs to be redownloaded</p>
	<p>Photo Name: IMG_0173 Inspection Field Notes Photo # : 121 Date: 12-14-22 Approximate Station: Station 42+00 to 43+00 Description: Horizontal cracks along top side of seawall that are reflective of sheet pile. Horizontal and vertical cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 16.32 Longitude: 90 ; 4 ; 22.9299</p>

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Mandeville Seawall Site Inspection Log

For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0174 Inspection Field Notes Photo # : 122 Date: 12-14-22 Approximate Station: Station 43+00 to 43+24 Description: Horizontal cracks along the top side of the seawall that are reflective of sheet pile. Horizontal and vertical cracks along the land face side as well. Coordinates: Latitude: 30 ; 21 ; 16.32 Longitude: 90 ; 4 ; 22.9299</p>
	<p>Photo Name: IMG_0175 Inspection Field Notes Photo # : 123 Date: 12-14-22 Approximate Station: Station 43+68 Description: Concrete spall along the seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 15.85 Longitude: 90 ; 4 ; 22.38</p>


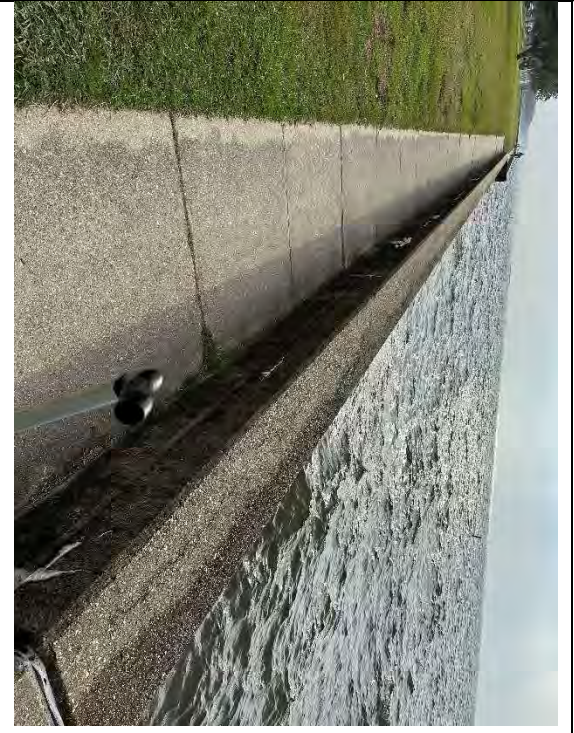
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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0176 Inspection Field Notes Photo # : 125 Date: 12-14-22 Approximate Station: Station 43+73 Description: Stairway. Steps 5 and 6 on the seaside contains cracks Coordinates: Latitude: 30 ; 21 ; 15.899 Longitude: 90 ; 4 ; 22.08</p>
	<p>Photo Name: IMG_0177 Inspection Field Notes Photo # : 125 Date: 12-14-22 Approximate Station: Station 43+73 Description: Stairway. Steps 5 and 6 on the seaside contains cracks Coordinates: Latitude: 30 ; 21 ; 15.8699 Longitude: 90 ; 4 ; 22.130</p>

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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0178 Inspection Field Notes Photo # : 126 Date: 12-14-22 Approximate Station: Station 43+68 to 44+00 Description: Minor horizontal cracks along the top side of the seawall Coordinates: Latitude: 30 ; 21 ; 16.1999 Longitude: 90 ; 4 ; 22.130</p>
	<p>Photo Name: IMG_0179 Inspection Field Notes Photo # : 127 Date: 12-14-22 Approximate Station: Station 44+16 to 4+38 Description: Cracks on the top side of the seawall that are reflective of sheet pile. Horizontal cracks along the land face side of the seawall. Coordinates: Latitude: 30 ; 21 ; 15.88 Longitude: 90 ; 4 ; 21.9099</p>

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Mandeville Seawall Site Inspection Log

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	<p>Photo Name: IMG_0180 Inspection Field Notes Photo # : 128 Date: 12-14-22 Approximate Station: Station 44+38 to 45+00 Description: Horizontal cracks on the top side of the seawall that are reflective of sheet pile. Horizontal cracks along the land face side of the seawall as well Coordinates: Latitude: 30 ; 21 ; 15.60 Longitude: 90 ; 4 ; 21.53</p>
	<p>Photo Name: IMG_0181 Inspection Field Notes Photo # : 129 Date: 12-14-22 Approximate Station: Station 44+97 Description: Concrete spall along seaside of expansion joint Coordinates: Latitude: 30 ; 21 ; 15.2899 Longitude: 90 ; 4 ; 20.9299</p>



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Mandeville Seawall Site Inspection Log
 For the Seawall Repair (Inspection Project) Findings/Assessment Report

	<p>Photo Name: IMG_0182 Inspection Field Notes Photo # : Date: 12-14-22 Approximate Station: Station Description: Coordinates: Longitude: Latitude:</p>
	<p>Photo Name: IMG_0183 Inspection Field Notes Photo # : 130 Date: 12-14-22 Approximate Station: Station 45+00 to 45+95 Description: Cracks along top side of seawall and also rust spots as well. Horizontal cracks along the land face side of the seawall. Sidewalk is sunken along wall as well. Coordinates: Latitude: 30 ; 21 ; 14.72 Longitude: 90 ; 4 ; 19.9899</p>



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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0184 Inspection Field Notes Photo # : 131 Date: 12-14-22 Approximate Station: Station 43+63 to 46+00 Description: Horizontal cracks along the seaside face of the seawall. Coordinates: Latitude: 30 ; 21 ; 14.910 Longitude: 90 ; 4 ; 19.94</p>
	<p>Photo Name: IMG_0185 Inspection Field Notes Photo # : 132 Date: 12-14-22 Approximate Station: Station 45+95 to 46+26 Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall. Repairs are needed for sidewalk along seawall. Coordinates: Latitude: 30 ; 21 ; 14.8699 Longitude: 90 ; 4 ; 19.83</p>

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0186 Inspection Field Notes Photo # : 133 Date: 12-14-22 Approximate Station: Station 46+02 to 46+07 Description: 5' long sunken hole along the land face side of the seawall Coordinates: Latitude: 30 ; 21 ; 15.7499 Longitude: 90 ; 4 ; 18.2299</p>
	<p>Photo Name: IMG_0188 Inspection Field Notes Photo # : 134 Date: 12-15-22 Approximate Station: Station 46+90 to 47+00 Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall. Coordinates: Latitude: 30 ; 21 ; 14.5899 Longitude: 90 ; 4 ; 19.63</p>

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

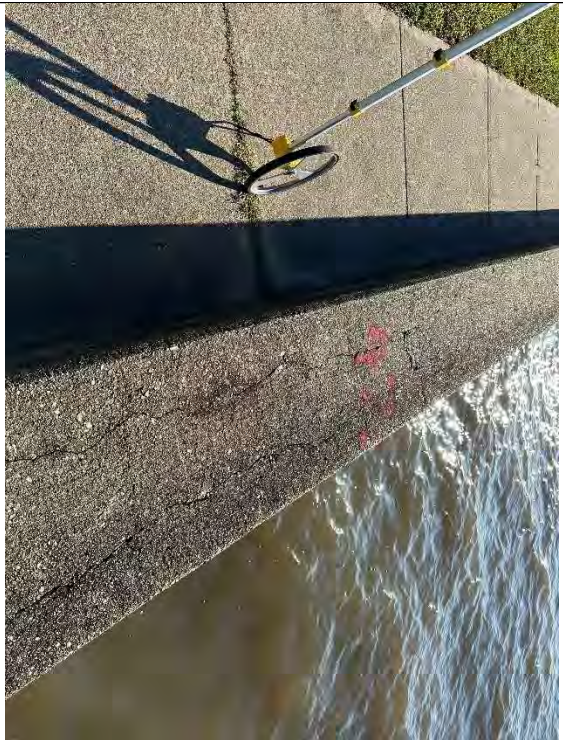



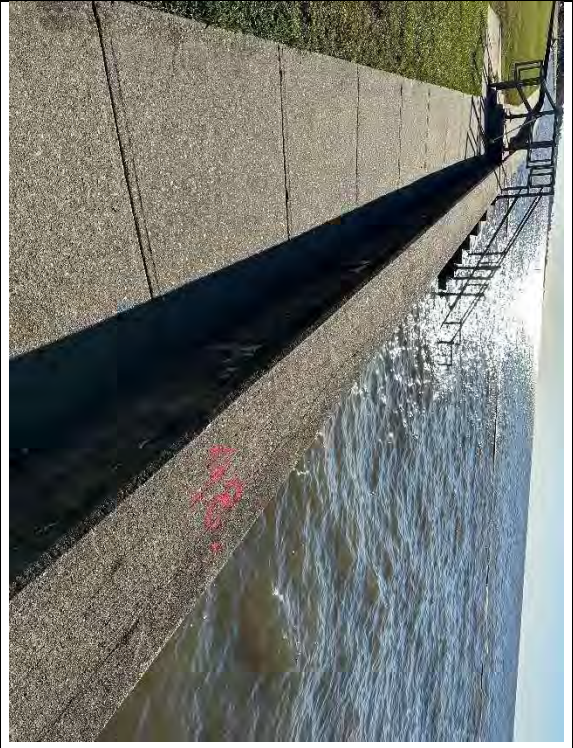
Photo Name: IMG_0189
Inspection Field Notes Photo # : 135
Date: 12-15-22
Approximate Station: Station 46+90 to 4+83
Description: Horizontal cracks along with rust spots on the top side of the seawall. Horizontal cracks along the land face side of the seawall. Sidewalk is also sunken along the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 14.2899
Longitude: 90 ; 4 ; 18.999



Photo Name: IMG_190
Inspection Field Notes Photo # : 136
Date: 12-15-22
Approximate Station: Station 47+83 to 47+92
Description: Concrete spall along the land face side of the sheet pile. Sidewalk repair is needed at concrete spall in seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 13.8899
Longitude: 90 ; 4 ; 18.1199

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0191 Inspection Field Notes Photo # : 136 Date: 12-15-22 Approximate Station: Station 47+83 to 47+92 Description: Concrete spall along the land face side of the sheet pile. Sidewalk repair is needed at concrete spall in seawall as well. Coordinates: Latitude: 30 ; 21 ; 13.88 Longitude: 90 ; 4 ; 18.070</p>
	<p>Photo Name: IMG_0192 Inspection Field Notes Photo # : 137 Date: 12-15-22 Approximate Station: Station 48+00 to 48+36 Description: Horizontal cracks along the top side of the seawall that are reflective with rust spots. Horizontal cracks along the land face side of the seawall. Sidewalk settles along seawall. Coordinates: Latitude: 30 ; 21 ; 14.22 Longitude: 90 ; 4 ; 17.52</p>


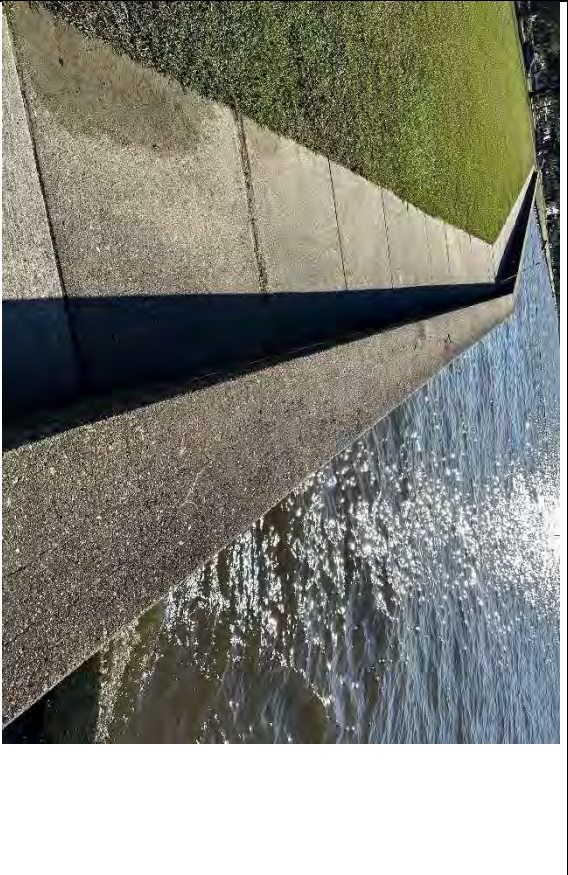
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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0193 Inspection Field Notes Photo # : 138 Date: 12-15-22 Approximate Station: Station 48+36 to 48+46 Description: Horizontal cracks that continue through stairway. Coordinates: Latitude: 30 ; 21 ; 13.6199 Longitude: 90 ; 4 ; 17.57</p>
	<p>Photo Name: IMG_0194 Inspection Field Notes Photo # : 139 Date: 12-15-22 Approximate Station: Station 48+41 Description: Seaside of the stairway contains cracks on the top and side of the stairway. Horizontal & vertical cracks along the land face side of the seawall Coordinates: Latitude: 30 ; 21 ; 13.5599 Longitude: 90 ; 4 ; 17.4899</p>

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Mandeville Seawall Site Reconnaissance
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	<p>Photo Name: IMG_0195 Inspection Field Notes Photo # : 141 Date: 12-15-22 Approximate Station: Station 48+73 Description: Point of curve in seawall Coordinates: Latitude: 30 ; 21 ; 13.4199 Longitude: 90 ; 4 ; 17.14</p>
	<p>Photo Name: IMG_0196 Inspection Field Notes Photo # : 142.1 Date: 12-15-22 Approximate Station: Station 49+00 to 49+58 Description: Horizontal cracks along the top side of the seawall. Coordinates: Latitude: 30 ; 21 ; 13.5399 Longitude: 90 ; 4 ; 16.26</p>


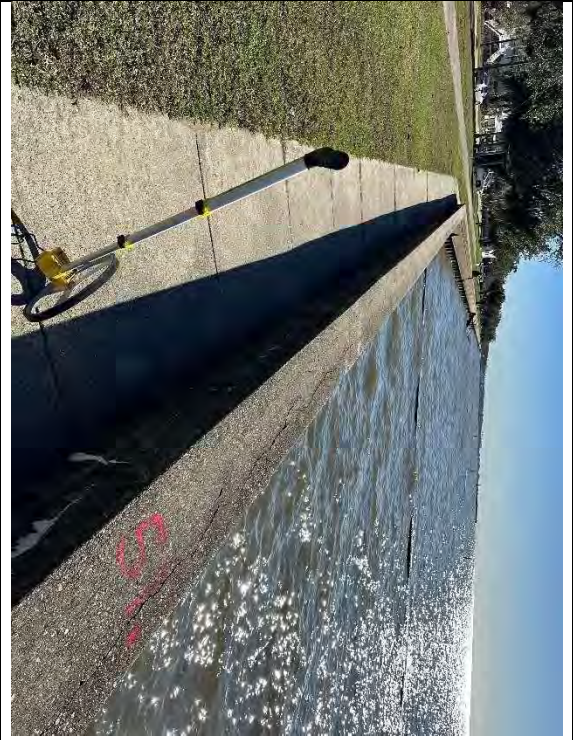
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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0197 Inspection Field Notes Photo # : 142.2 Date: 12-15-22 Approximate Station: Station 49+58 to 50+00 Description: Point of curve of seawall. Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks along the land face of cap. Coordinates: Latitude: 30 ; 21 ; 13.0299 Longitude: 90 ; 4 ; 16.3699</p>
	<p>Photo Name: IMG_0198 Inspection Field Notes Photo # : 143 Date: 12-15-22 Approximate Station: Station 50+00 to 50+80 Description: Horizontal cracks along the top side of the seawall, that are reflective of the sheet pile. Horizontal and vertical cracks along the land face side of the seawall. Coordinates: Latitude: 30 ; 21 ; 13.05 Longitude: 90 ; 4 ; 15.8699</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0199 Inspection Field Notes Photo # : 144 Date: 12-15-22 Approximate Station: Station 50+80 to 51+00 Description: Horizontal cracks along the top side of the seawall. Large horizontal and vertical cracks along the land face side of the seawall. Coordinates: Latitude: 30 ; 21 ; 12.89999 Longitude: 90 ; 4 ; 15.08</p>
	<p>Photo Name: IMG_0200 Inspection Field Notes Photo # : 145 Date: 12-15-22 Approximate Station: Station 51+00 to 51+74 Description: Horizontal cracks and rust spots along the top side of the seawall that are reflective of the sheet pile. Horizontal and vertical cracks and rust spots along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 12.74999 Longitude: 90 ; 4 ; 14.799</p>



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Mandeville Seawall Site Reconnaissance
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	<p>Photo Name: IMG_0201 Inspection Field Notes Photo # : 146 Date: 12-15-22 Approximate Station: Station 51+84 to 52+00 Description: Point of curve in the seawall. Horizontal cracks along the top side of the seawall that are reflective of the sheet pile. Horizontal cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 12.6799 Longitude: 90 ; 4 ; 14.14</p>
	<p>Photo Name: IMG_0202 Inspection Field Notes Photo # : 146 Date: 12-15-22 Approximate Station: Station 51+84 to 52+00 Description: Point of curve in the seawall. Horizontal cracks along the top side of the seawall that are reflective of the sheet pile. Horizontal cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 12.6499 Longitude: 90 ; 4 ; 13.9199</p>

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0203 Inspection Field Notes Photo # : 146 Date: 12-15-22 Approximate Station: Station 51+84 to 52+00 Description: Point of curve in the seawall. Horizontal cracks along the top side of the seawall that are reflective of the sheet pile. Horizontal cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 12.6499 Longitude: 90 ; 4 ; 13.8099</p>
	<p>Photo Name: IMG_0204 Inspection Field Notes Photo # : 147 Date: 12-15-22 Approximate Station: Station 51+97 Description: Concrete spall along the seaside face of the expansion joint Coordinates: Latitude: 30 ; 21 ; 12.55 Longitude: 90 ; 4 ; 13.6199</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report



Photo Name: IMG_0205
Inspection Field Notes Photo # : 149
Date: 12-15-22
Approximate Station: Station 52+57
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 12.22999
Longitude: 90 ; 4 ; 13.1799

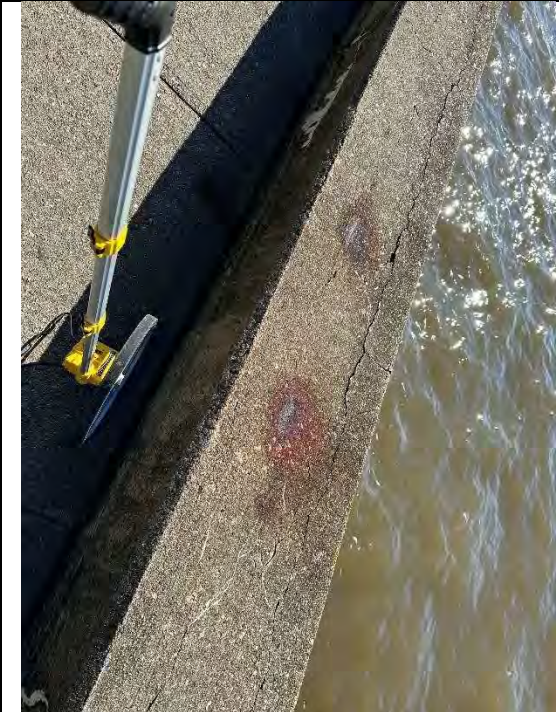


Photo Name: IMG_0206
Inspection Field Notes Photo # : 145 REPEATED
Date: 12-15-22
Approximate Station: Station 52+86
Description: Horizontal and vertical cracks, along with rust spots that are along the top side of the seawall.
Coordinates:
Latitude: 30 ; 21 ; 12.7699
Longitude: 90 ; 4 ; 13.4299

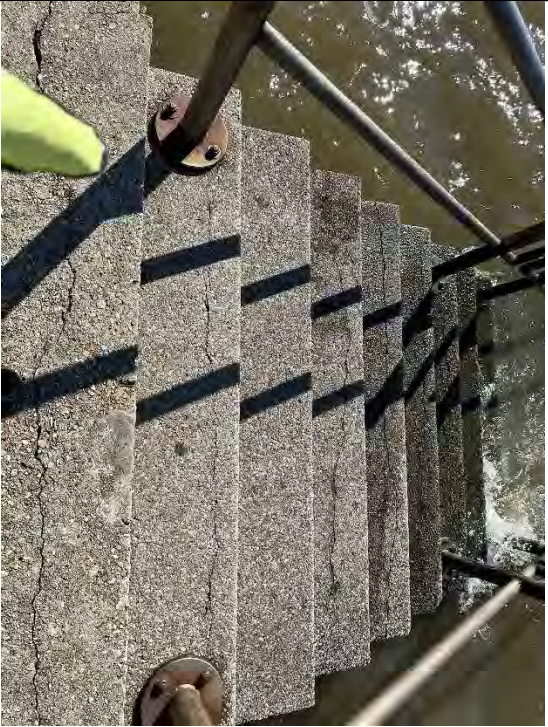

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0207 Inspection Field Notes Photo # : 146 REPEATED Date: 12-15-22 Approximate Station: Station 53+00 to 53+75 Description: Horizontal cracks along the top side of the seawall that are reflective of sheet pile. Horizontal and vertical cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 12.070 Longitude: 90 ; 4 ; 12.69</p>
	<p>Photo Name: IMG_0208 Inspection Field Notes Photo # : 147 REPEATED Date: 12-15-22 Approximate Station: Station 53+75 to 53+85 Description: Horizontal cracks along the top side of the cap and also goes through the stairway Coordinates: Latitude: 30 ; 21 ; 11.570 Longitude: 90 ; 4 ; 11.89</p>

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0209 Inspection Field Notes Photo # : 148 REPEATED Date: 12-15-22 Approximate Station: Station 53+80 Description: Cracks along the seaside face of the stairway. Coordinates: Latitude: 30 ; 14 ; 11.5899 Longitude: 90 ; 4 ; 11.9699</p>
	<p>Photo Name: IMG_0210 Inspection Field Notes Photo # : 149 REPEATED Date: 12-15-22 Approximate Station: Station 53+85 Description: Concrete spall along the seaside face of the expansion joint. Coordinates: Latitude: 30 ; 21 ; 11.60 Longitude: 90 ; 4 ; 11.9199</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report



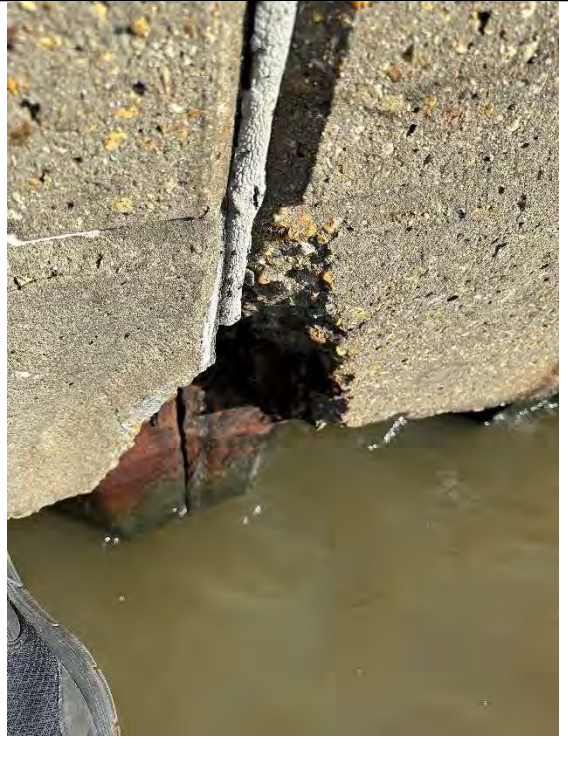

Photo Name: IMG_0211
Inspection Field Notes Photo # : 150
Date: 12-15-22
Approximate Station: Station 53+85 to 54+00
Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 11.6499
Longitude: 90 ; 4 ; 11.8599



Photo Name: IMG_0212
Inspection Field Notes Photo # : 151
Date: 12-15-22
Approximate Station: Station 54+00 to 54+36
Description: Horizontal cracks along the top side of the seawall. Horizontal cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 11.49
Longitude: 90 ; 4 ; 11.4799


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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0213 Inspection Field Notes Photo # : 152 Date: 12-15-22 Approximate Station: Station 54+36 Description: Concrete spall along the seaside face of the expansion joint. Coordinates: Latitude: 30 ; 21 ; 11.32 Longitude: 90 ; 4 ; 11.3699</p>
	<p>Photo Name: IMG_0214 Inspection Field Notes Photo # : 153 Date: 12-15-22 Approximate Station: Station 54+61 54+81 Description: Sidewalk missing near seawall and needs to be repaired. Coordinates: Latitude: 30 ; 21 ; 11.240 Longitude: 90 ; 4 ; 10.7399</p>

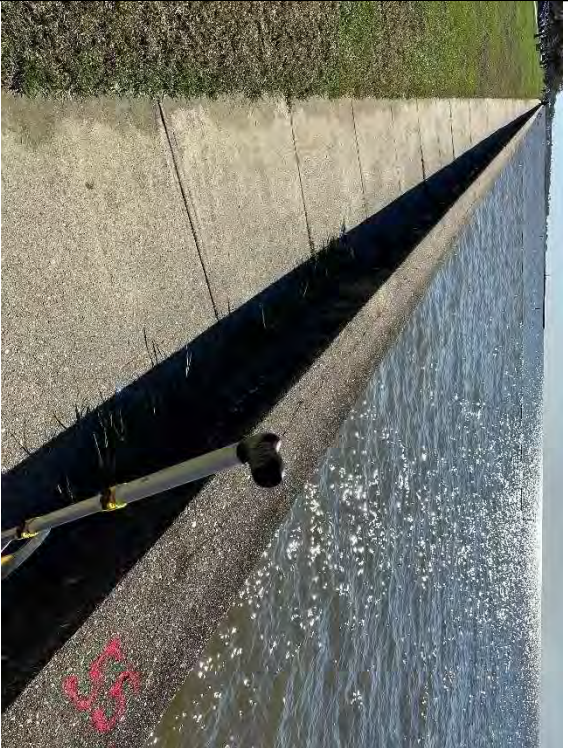

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0214 Inspection Field Notes Photo # : 153 Date: 12-15-22 Approximate Station: Station 54+00 to 55+00 Description: Horizontal cracks with rust spots along the top side of the seawall. Coordinates: Latitude: 30 ; 21 ; 11.240 Longitude: 90 ; 4 ; 10.7399</p>
	<p>Photo Name: IMG_0215 Inspection Field Notes Photo # : 154 Date: 12-15-22 Approximate Station: Station 54+94 Description: Concrete spall along the seaside face of the expansion joint. Coordinates: Latitude: 30 ; 21 ; 11.0599 Longitude: 90 ; 4 ; 10.82</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0216 Inspection Field Notes Photo # : 155 Date: 12-15-22 Approximate Station: Station 55+00 to 55+80 Description: Horizontal cracks with rust spots along the top side of the seawall. Horizontal and vertical cracks along the land face side of the cap. Coordinates: Latitude: 30 ; 21 ; 11.050 Longitude: 90 ; 4 ; 10.710</p>
	<p>Photo Name: IMG_0217 Inspection Field Notes Photo # : 156 Date: 12-15-22 Approximate Station: Station 55+80 to 56+00 Description: Horizontal cracks with rust spots along the top side of the seawall. Horizontal and vertical cracks along the land face side of the seawall. Coordinates: Latitude: 30 ; 21 ; 10.7299 Longitude: 90 ; 4 ; 9.88</p>

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

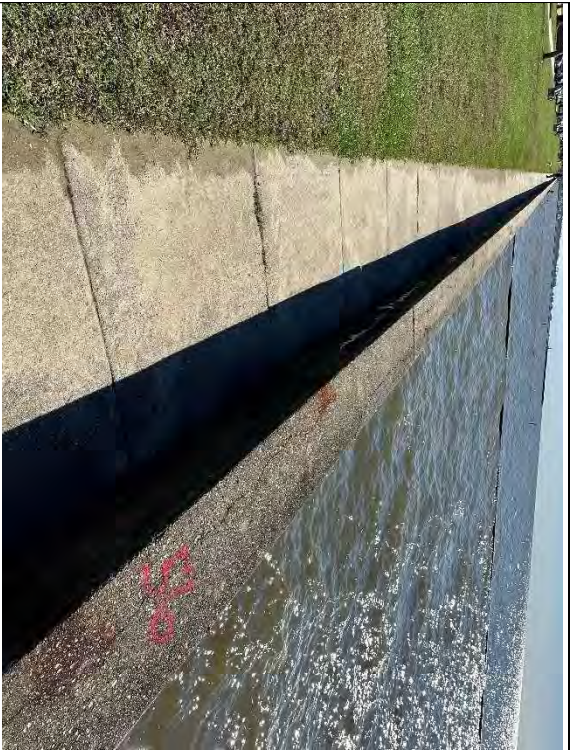


Photo Name: IMG_0218
Inspection Field Notes Photo # : 157
Date: 12-15-22
Approximate Station: Station 56+00 to 57+00
Description: Horizontal and vertical cracks with rust spots along the top side of the seawall. Horizontal and vertical cracks along the land face side as well.
Coordinates:
Latitude: 30 ; 21 ; 10.66
Longitude: 90 ; 4 ; 9.77



Photo Name: IMG_0219
Inspection Field Notes Photo # : 158
Date: 12-15-22
Approximate Station: Station 56+11
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 10.3999
Longitude: 90 ; 4 ; 9.6599

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0220 Inspection Field Notes Photo # : 159 Date: 12-15-22 Approximate Station: Station 56+45 Description: Concrete spall along the top side of the seawall. Coordinates: Latitude: 30 ; 21 ; 10.2599 Longitude: 90 ; 4 ; 9.14</p>
	<p>Photo Name: IMG_0221 Inspection Field Notes Photo # : 160 Date: 12-15-22 Approximate Station: Station 56+70 Description: Concrete spall along the seaside face of the expansion joint Coordinates: Latitude: 30 ; 21 ; 10.16 Longitude: 90 ; 4 ; 9.0599</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report



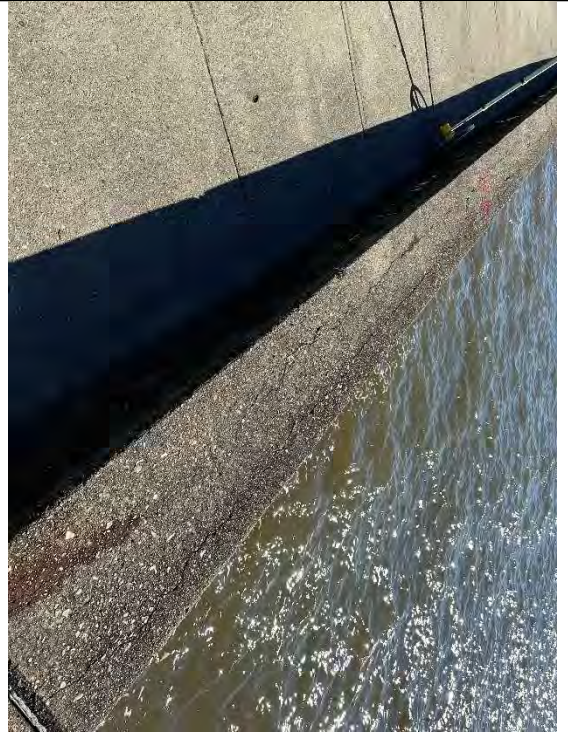
Photo Name: IMG_0222
Inspection Field Notes Photo # : 161
Date: 12-15-22
Approximate Station: Station 57+00 to 57+88
Description: Horizontal cracks and rust spots along the top side of the seawall. Horizontal and vertical cracks along the land face side of the seawall
Coordinates:
Latitude: 30 ; 21 ; 10.13
Longitude: 90 ; 4 ; 8.84



Photo Name: IMG_0224
Inspection Field Notes Photo # : 163
Date: 12-15-22
Approximate Station: Station 57+88
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 9.91
Longitude: 90 ; 4 ; 8.5399

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Mandeville Seawall Site Reconnaissance
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	<p>Photo Name: IMG_0225 Inspection Field Notes Photo # : 164 Date: 12-15-22 Approximate Station: Station 57+88 to 58+00 Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks along the land face side of the cap. Coordinates: Latitude: 30 ; 21 ; 9.58999 Longitude: 90 ; 4 ; 7.96</p>
	<p>Photo Name: IMG_0226 Inspection Field Notes Photo # : 164 Date: 12-15-22 Approximate Station: Station 57+88 to 58+00 Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks along the land face side of the cap. Coordinates: Latitude: 30 ; 21 ; 9.500 Longitude: 90 ; 4 ; 7.820</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

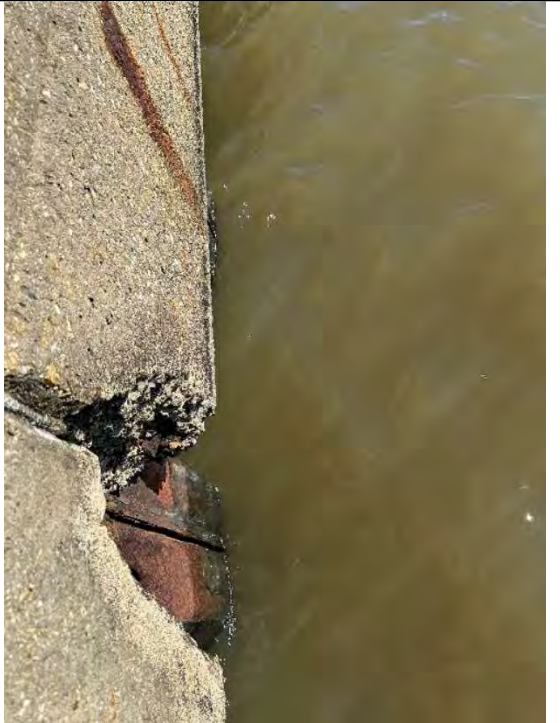


Photo Name: IMG_0227
Inspection Field Notes Photo # : 165
Date: 12-15-22
Approximate Station: Station 58+46
Description: Concrete spall and rust spot along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 9.020
Longitude: 90 ; 4 ; 7.44



Photo Name: IMG_0228
Inspection Field Notes Photo # : 166
Date: 12-15-22
Approximate Station: Station 58+46 to 59+00
Description: Horizontal cracks along the top side of the seawall that are reflective of the sheet pile along with a few rust spots. Horizontal and vertical cracks along the land face side of the cap.
Coordinates:
Latitude: 30 ; 21 ; 10.88
Longitude: 90 ; 4 ; 6.6699

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

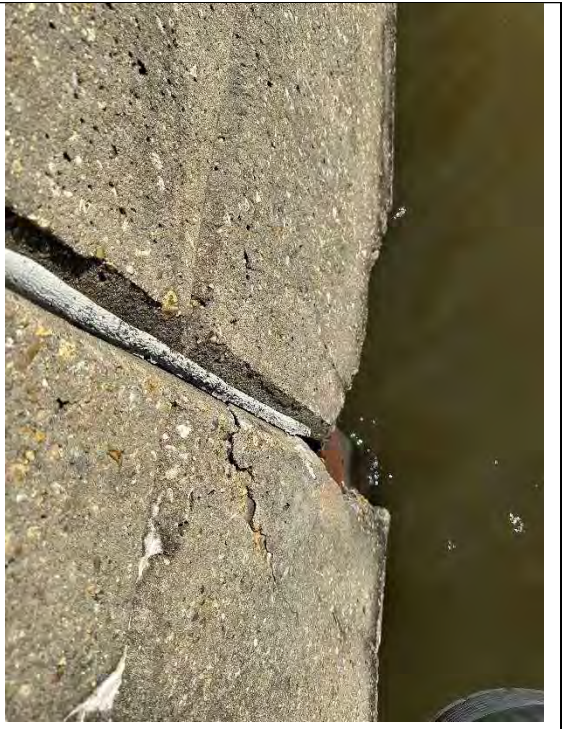


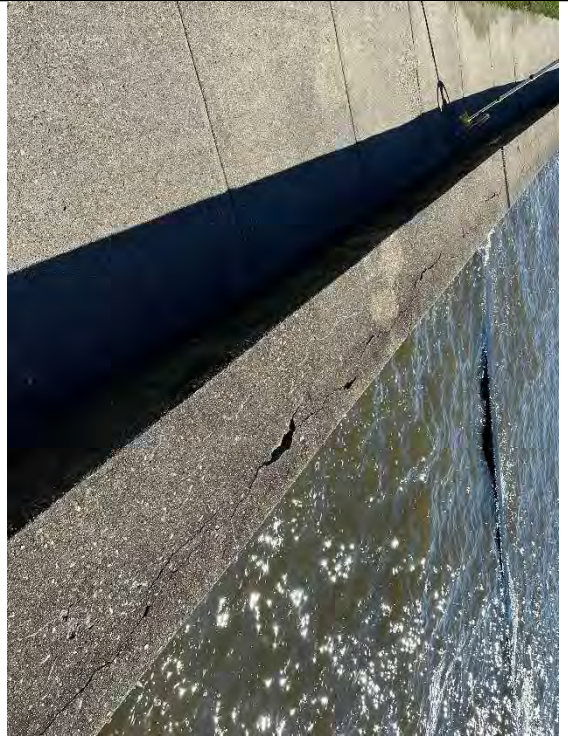
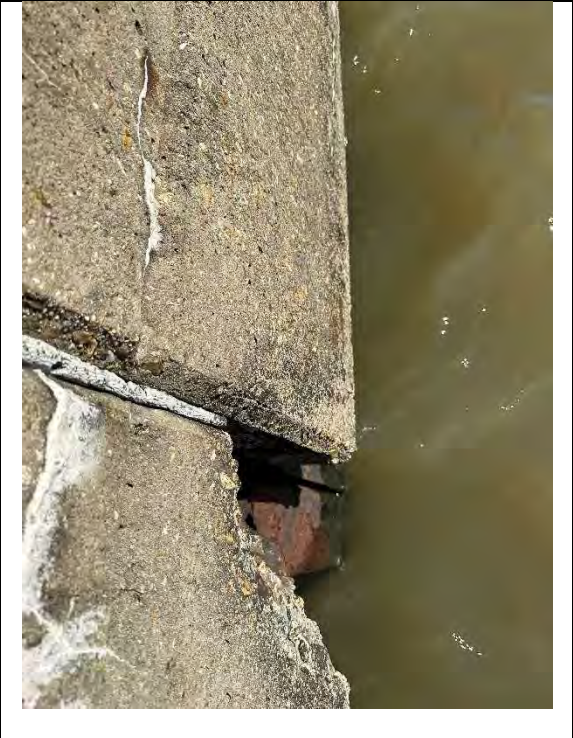
Photo Name: IMG_0229
Inspection Field Notes Photo # : 167
Date: 12-15-22
Approximate Station: Station 59+04
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 9.020
Longitude: 90 ; 4 ; 6.7499



Photo Name: IMG_0230
Inspection Field Notes Photo # : 168
Date: 12-15-22
Approximate Station: Station 59+04 to 59+50
Description: Horizontal cracks along the top side of the cap. Horizontal cracks along the land face side of the cap as well.
Coordinates:
Latitude: 30 ; 21 ; 9.020
Longitude: 90 ; 4 ; 6.5599

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0231 Inspection Field Notes Photo # : 168 Date: 12-15-22 Approximate Station: Station 59+04 to 59+50 Description: Horizontal cracks along the top side of the cap. Horizontal cracks along the land face side of the cap as well. Coordinates: Latitude: 30 ; 21 ; 8.6699 Longitude: 90 ; 4 ; 6.1799</p>
	<p>Photo Name: IMG_0232 Inspection Field Notes Photo # : 169 Date: 12-15-22 Approximate Station: Station 59+62 Description: Concrete spall along the seaside face of the expansion joint Coordinates: Latitude: 30 ; 21 ; 8.63 Longitude: 90 ; 4 ; 6.1199</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

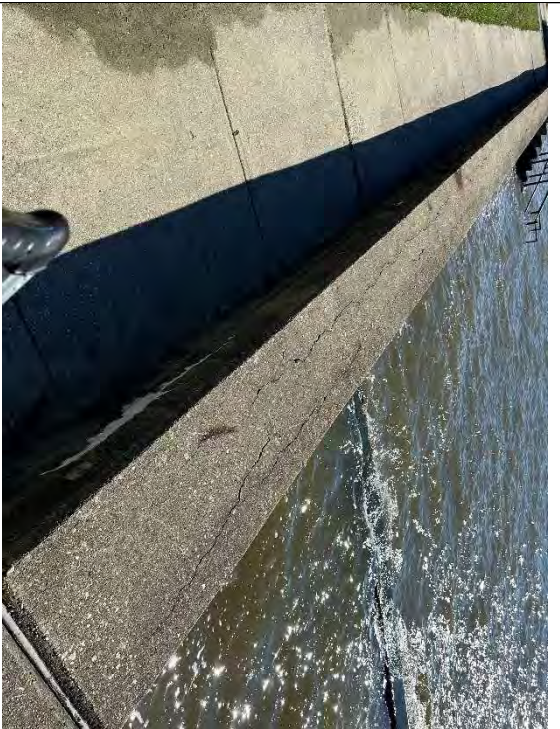




Photo Name: IMG_0233
Inspection Field Notes Photo # : 170
Date: 12-15-22
Approximate Station: Station 59+62 to 60+00
Description: Horizontal cracks with rust spots along the top side of the cap that is reflective of the sheet piles
Coordinates:
Latitude: 30 ; 21 ; 8.4299
Longitude: 90 ; 4 ; 6.070



Photo Name: IMG_0234
Inspection Field Notes Photo # : 170.2
Date: 12-15-22
Approximate Station: Station 60+26
Description: Stairway. Rust spots along the top side of the seaside face stairway. Steps appear to contain cracks on the top of the seaside face of the stairway.
Coordinates:
Latitude: 30 ; 21 ; 8.6399
Longitude: 90 ; 4 ; 5.2399

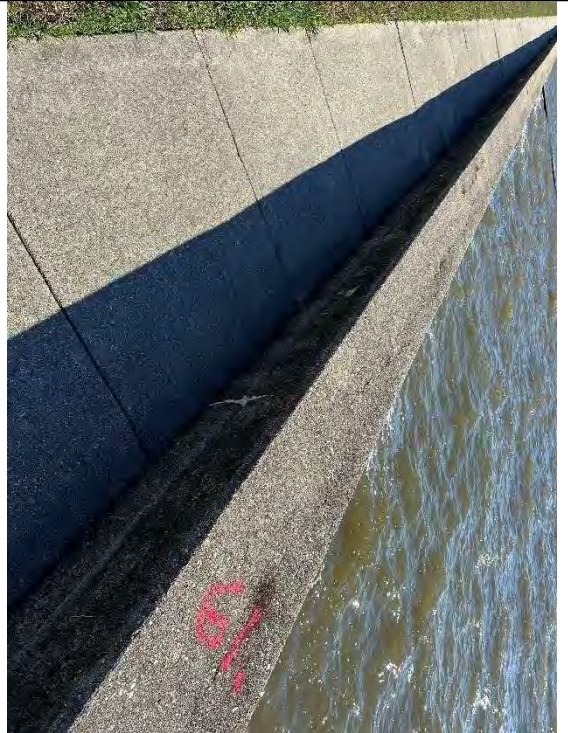
Burk-Kleinpeter, Inc.

Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0235 Inspection Field Notes Photo # : 172 Date: 12-15-22 Approximate Station: Station 60+26 to 61+00 Description: Horizontal and vertical cracks with rust spots along the top side of the seawall. Coordinates: Latitude: 30 ; 21 ; 8.1499 Longitude: 90 ; 4 ; 5.2999</p>
	<p>Photo Name: IMG_0236 Inspection Field Notes Photo # : 173 Date: 12-15-22 Approximate Station: Station 60+80 Description: Concrete spall along the seaside face of the expansion joint. Coordinates: Latitude: 30 ; 21 ; 8.0599 Longitude: 90 ; 4 ; 4.8599</p>

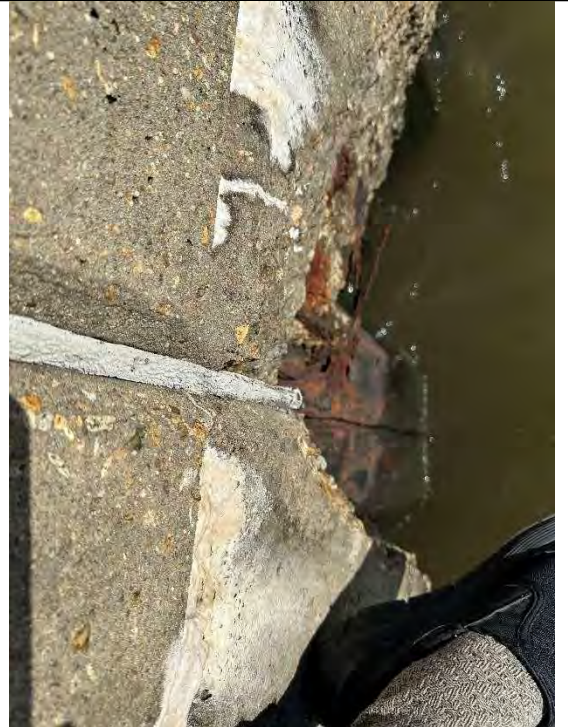
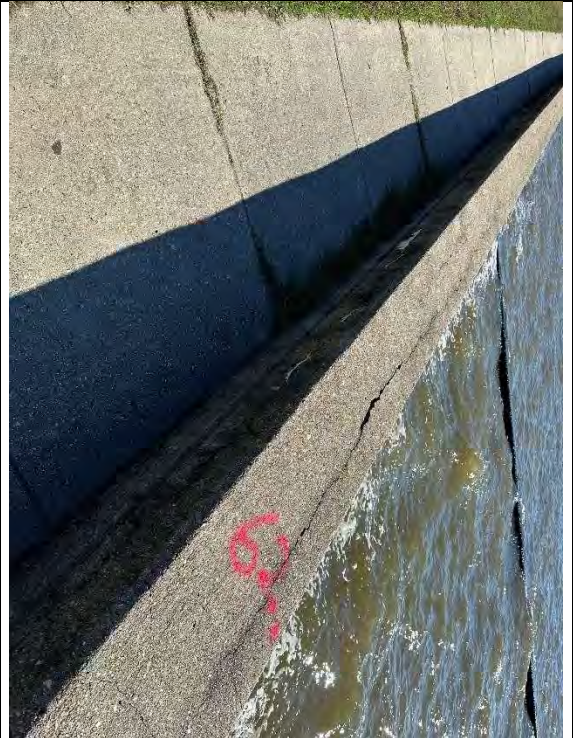
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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0237 Inspection Field Notes Photo # : 174 Date: 12-15-22 Approximate Station: Station 61+00 to 62+00 Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks along the land face side as well. Coordinates: Latitude: 30 ; 21 ; 7.9299 Longitude: 90 ; 4 ; 4.64</p>
	<p>Photo Name: IMG_0238 Date: 12-15-22 Inspection Field Notes Photo # : 175 Approximate Station: Station 61+39 Description: Concrete spall along the seaside face of the expansion joint. Coordinates: Latitude: 30 ; 21 ; 8.0599 Longitude: 90 ; 4 ; .7299</p>



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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0239 Inspection Field Notes Photo # : 176 Date: 12-15-22 Approximate Station: Station 61+98 Description: Concrete spall along the seaside face of the expansion joint. There is also some rebar exposure as well. Coordinates: Latitude: 30 ; 21 ; 7.47 Longitude: 90 ; 4 ; 3.900</p>
	<p>Photo Name: IMG_0240 Inspection Field Notes Photo # : 177 Date: 12-15-22 Approximate Station: Station 62+00 to 62+60 Description: Horizontal cracks along the top side of the seawall that is reflective of the sheet pile. Horizontal and vertical cracks with some rust spots along the land face side of the seawall. Coordinates: Latitude: 30 ; 21 ; 7.6399 Longitude: 90 ; 4 ; 3.57</p>

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Mandeville Seawall Site Reconnaissance
 For the Seawall Site Inspection Report

	<p>Photo Name: IMG_0241 Inspection Field Notes Photo # : 178 Date: 12-15-22 Approximate Station: Station 62+60 to 63+00 Description: Horizontal cracks with heavy rust spots along the top side of the seawall that are reflective of the sheet pile. Horizontal and vertical cracks along the land face side of the seawall as well. Coordinates: Latitude: 30 ; 21 ; 7.5399 Longitude: 90 ; 4 ; 3.0499</p>
	<p>Photo Name: IMG_0242 Inspection Field Notes Photo # : 179 Date: 12-15-22 Approximate Station: Station 63+00 to 64+00 Description: Horizontal cracks and rust spots along the top side of the seawall that are reflective of the sheet pile. Coordinates: Latitude: 30 ; 21 ; 7.050 Longitude: 90 ; 4 ; 2.69</p>

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Mandeville Seawall Site Reconnaissance
For the Seawall Site Inspection Report

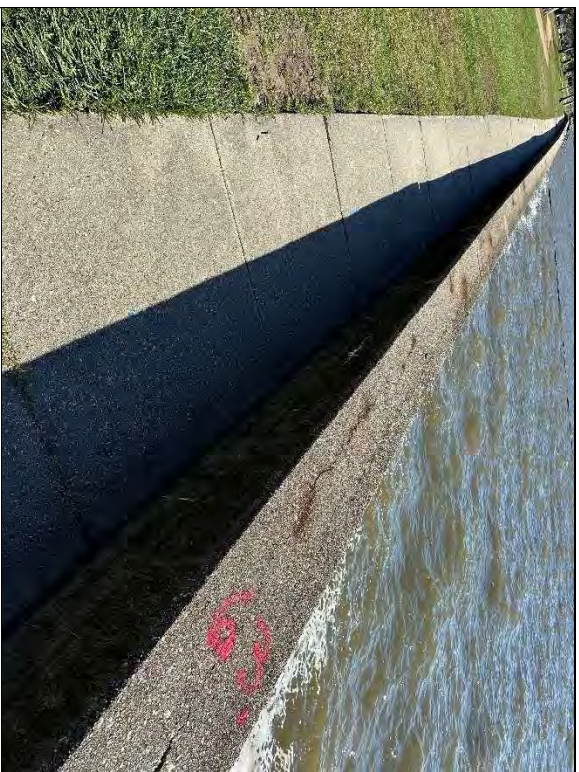


Photo Name: IMG_0243
Inspection Field Notes Photo # : 179
Date: 12-15-22
Approximate Station: Station 63+00 to 64+00
Description: Horizontal cracks and rust spots along the top side of the seawall that are reflective of the sheet pile.
Coordinates:
Latitude: 30 ; 21 ; 7.0299
Longitude: 90 ; 4 ; 2.690



Photo Name: IMG_0244
Inspection Field Notes Photo # : 180
Date: 12-15-22
Approximate Station: Station 63+15
Description: Concrete spall along the seaside face of the expansion joint. Rebar is exposed as well.
Coordinates:
Latitude: 30 ; 21 ; 6.9199
Longitude: 90 ; 4 ; 2.7399

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Photo Name: IMG_0245
Inspection Field Notes Photo # : 180
Date: 12-15-22
Approximate Station: Station 63+15
Description: Concrete spall along the seaside face of the expansion joint. Rebar is exposed as well.
Coordinates:
Latitude: 30 ; 21 ; 6.6999
Longitude: 90 ; 4 ; 1.9699



Photo Name: IMG_0246
Inspection Field Notes Photo # : 181
Date: 12-15-22
Approximate Station: Station 64+00 to 65+00
Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 6.5899
Longitude: 90 ; 4 ; 1.6699

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Photo Name: IMG_0247
Inspection Field Notes Photo # : 182
Date: 12-15-22
Approximate Station: Station 64+32
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 6.33
Longitude: 90 ; 4 ; 1.51



Photo Name: IMG_0248
Inspection Field Notes Photo # : 183
Date: 12-15-22
Approximate Station: Station 64+72 to 64+88
Description: Missing sidewalk along the seawall. Suggest repairing sidewalk.
Coordinates:
Latitude: 30 ; 21 ; 6.270
Longitude: 90 ; 4 ; 0.96

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Photo Name: IMG_0249
Inspection Field Notes Photo # : 184
Date: 12-15-22
Approximate Station: Station 64+90
Description: Concrete spall along the seaside face of the expansion joint. Rebar is also exposed as well.
Coordinates:
Latitude: 30 ; 21 ; 5.6799
Longitude: 90 ; 4 ; 1.45



Photo Name: IMG_0250
Inspection Field Notes Photo # : 185
Date: 12-15-22
Approximate Station: Station 65+00 to 66+00
Description: Horizontal cracks with rust spots and flakey concrete along the top side of the seawall. Horizontal and vertical cracks along the land face side as well.
Coordinates:
Latitude: 30 ; 21 ; 6.0899
Longitude: 90 ; 4 ; 0.5700

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Photo Name: IMG_0251
Inspection Field Notes Photo # : 186
Date: 12-15-22
Approximate Station: Station 65+23
Description: Concrete spall along the top side of cap. Rebar is exposed as well.
Coordinates:
Latitude: 30 ; 21 ; 6.070
Longitude: 90 ; 4 ; 0.38



Photo Name: IMG_0252
Inspection Field Notes Photo # : 187
Date: 12-15-22
Approximate Station: Station 65+49
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 5.7599
Longitude: 90 ; 4 ; 0.2999

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Photo Name: IMG_0253
Inspection Field Notes Photo # : 188
Date: 12-15-22
Approximate Station: Station 66+00
Description: Horizontal cracks and rust spots along the top side of the cap that is reflective of the sheet pile. Horizontal and vertical cracks along the land face side of the cap as well.
Coordinates:
Latitude: 30 ; 21 ; 5.5599
Longitude: 90 ; 3 ; 59.58



Photo Name: IMG_0257
Inspection Field Notes Photo # : 189
Date: 12-16-22
Approximate Station: Station 66+08
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 5.41
Longitude: 90 ; 3 ; 59.75

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Photo Name: IMG_0258
Inspection Field Notes Photo # : 189
Date: 12-16-22
Approximate Station: Station 66+86
Description: Stairway. Cracks along the top side of the seaside steps.
Coordinates:
Latitude: 30 ; 21 ; 5.19
Longitude: 90 ; 3 ; 59.0399



Photo Name: IMG_0259
Inspection Field Notes Photo # : 190
Date: 12-16-22
Approximate Station: Station 67+00 to 67+22
Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks with rust spots along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 5.0299
Longitude: 90 ; 3 ; 58.95

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Photo Name: IMG_0260
Inspection Field Notes Photo # : 190
Date: 12-16-22
Approximate Station: Station 67+22 to 67+26
Description: Jog in the seawall.
Coordinates:
Latitude: 30 ; 21 ; 5.7799
Longitude: 90 ; 3 ; 57.030



Photo Name: IMG_0261
Inspection Field Notes Photo # : 190
Date: 12-16-22
Approximate Station: Station 67+26 to 67+28
Description: Horizontal cracks along the top side of the seawall. Horizontal and vertical cracks with rust spots along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 4.8899
Longitude: 90 ; 3 ; 58.6199

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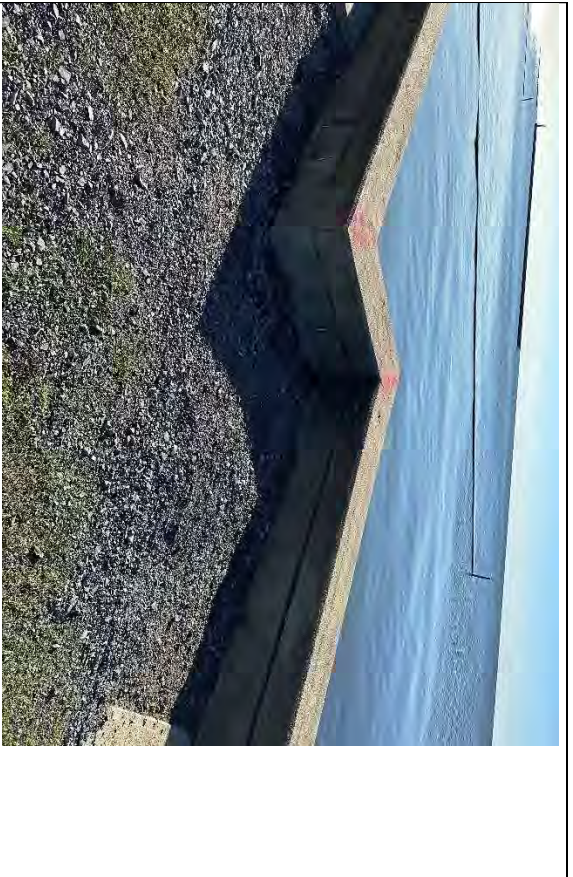



Photo Name: IMG_0262
Inspection Field Notes Photo # : 191
Date: 12-16-22
Approximate Station: Station 67+75
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 4.5299
Longitude: 90 ; 3 ; 58.2399



Photo Name: IMG_0263
Inspection Field Notes Photo # : 192
Date: 12-16-22
Approximate Station: Station 68+00 to 69+00
Description: Horizontal cracks along the top side of the seawall that are reflective of the sheet pile.
Coordinates:
Latitude: 30 ; 21 ; 4.77
Longitude: 90 ; 3 ; 58.1599

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	<p>Photo Name: IMG_0266 Inspection Field Notes Photo # : 192 Date: 12-16-22 Approximate Station: Station 69+00 to 69+12 Description: Jog along the seawall. Coordinates: Latitude: 30 ; 21 ; 4.1499 Longitude: 90 ; 3 ; 56.8699</p>
	<p>Photo Name: IMG_0266 Inspection Field Notes Photo # : 192 Date: 12-16-22 Approximate Station: Station 68+98 to 69+18 Description: Horizontal and vertical cracks along both the top side, and also the land face side of the seawall. Sidewalk is missing along the seawall as well. Coordinates: Latitude: 30 ; 21 ; 4.1499 Longitude: 90 ; 3 ; 56.8699</p>

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Photo Name: IMG_0267
Inspection Field Notes Photo # : 193
Date: 12-16-22
Approximate Station: Station 69+12 to 69+52
Description: Horizontal cracks along the top side of the seawall. Vertical cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 4.070
Longitude: 90 ; 3 ; 56.84



Photo Name: IMG_0268
Inspection Field Notes Photo # : 194
Date: 12-16-22
Approximate Station: Station 69+52
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 4.16
Longitude: 90 ; 3 ; 56.4299

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Photo Name: IMG_0270
Inspection Field Notes Photo # : 195
Date: 12-16-22
Approximate Station: Station 69+52 to 70+00
Description: Horizontal cracks along the top side of the cap. Horizontal and vertical cracks along the land face side of the cap as well.
Coordinates:
Latitude: 30 ; 21 ; 4.19
Longitude: 90 ; 3 ; 56.1799



Photo Name: IMG_0271
Inspection Field Notes Photo # : 196
Date: 12-16-22
Approximate Station: Station 70+00 to 71+00
Description: Horizontal cracks along the top side of the cap that is reflective of the sheet pile. Horizontal and vertical cracks with rust spots along the land face side of the cap as well.
Coordinates:
Latitude: 30 ; 21 ; 3.58
Longitude: 90 ; 3 ; 55.90

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Photo Name: IMG_0272
Inspection Field Notes Photo # : 197
Date: 12-16-22
Approximate Station: Station 70+08
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 3.5399
Longitude: 90 ; 3 ; 55.7899



Photo Name: IMG_0273
Inspection Field Notes Photo # : 198
Date: 12-16-22
Approximate Station: Station 70+67
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 3.2299
Longitude: 90 ; 3 ; 54.28

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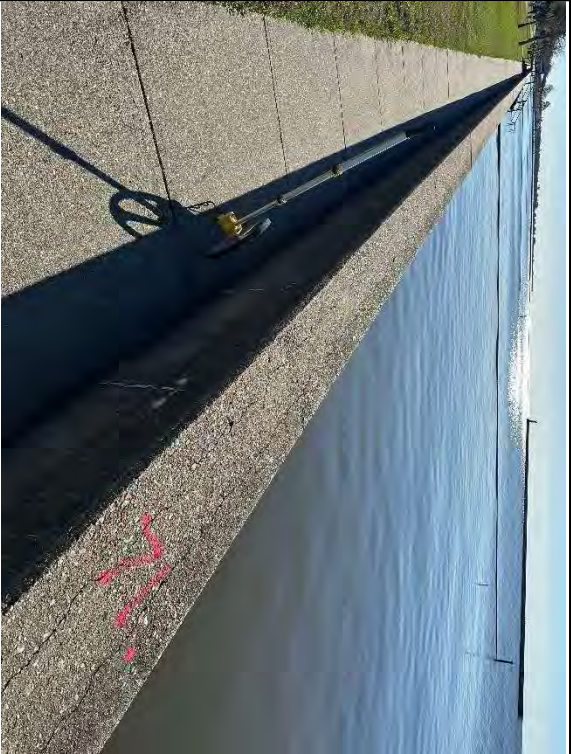


Photo Name: IMG_0274
Inspection Field Notes Photo # : 199
Date: 12-16-22
Approximate Station: Station 71+00 to 71+85
Description: Horizontal cracks along the top side of the seawall that are reflective of the sheet pile. Vertical cracks with rust spots along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 3.22
Longitude: 90 ; 3 ; 54.89



Photo Name: IMG_0275
Inspection Field Notes Photo # : 200
Date: 12-16-22
Approximate Station: Station 71+26
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 3.41
Longitude: 90 ; 3 ; 53.020

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Photo Name: IMG_0276
Inspection Field Notes Photo # : 202
Date: 12-16-22
Approximate Station: Station 72+00 to 73+00
Description: Horizontal cracks along the top side of the seawall that are reflective of the sheet pile. Minor vertical cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 2.60
Longitude: 90 ; 3 ; 54.090



Photo Name: IMG_0277
Inspection Field Notes Photo # : 203
Date: 12-16-22
Approximate Station: Station 73+03
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 1.9299
Longitude: 90 ; 3 ; 52.9899

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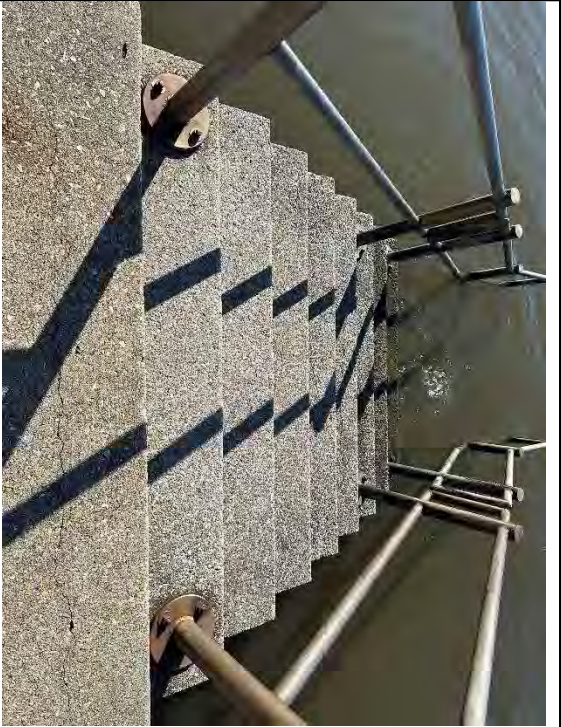


Photo Name: IMG_0278
Inspection Field Notes Photo # : 204
Date: 12-16-22
Approximate Station: Station 73+09
Description: Stairway. Only one seaside step contains cracks.
Coordinates:
Latitude: 30 ; 21 ; 3.5299
Longitude: 90 ; 3 ; 53.2399



Photo Name: IMG_0286
Inspection Field Notes Photo # : 205
Date: 12-16-22
Approximate Station: Station 73+00 to 73+64
Description: Horizontal cracks along the top side of the seawall that are reflective of the sheet pile. Minor vertical cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 1.99
Longitude: 90 ; 3 ; 52.88

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Photo Name: IMG_0287
Inspection Field Notes Photo # : 206
Date: 12-16-22
Approximate Station: Station 73+64
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 1.800
Longitude: 90 ; 3 ; 52.39



Photo Name: IMG_0288
Inspection Field Notes Photo # : 207
Date: 12-16-22
Approximate Station: Station 73+64 to 74+00
Description: Minor horizontal cracks along the top side of the seawall. Minor horizontal cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 2.35
Longitude: 90 ; 3 ; 52.25

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Photo Name: IMG_0289
Inspection Field Notes Photo # : 208
Date: 12-16-22
Approximate Station: Station 74+00 to 75+00
Description: Minor horizontal cracks along the top side of the seawall. Minor cracks along the land face side of the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 1.6699
Longitude: 90 ; 3 ; 52.1099



Photo Name: IMG_0290
Inspection Field Notes Photo # : 209
Date: 12-16-22
Approximate Station: Station 74+73
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 1.6699
Longitude: 90 ; 3 ; 51.9799

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Photo Name: IMG_0291
Inspection Field Notes Photo # : 210
Date: 12-16-22
Approximate Station: Station 74+80
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 1.30
Longitude: 90 ; 3 ; 51.26

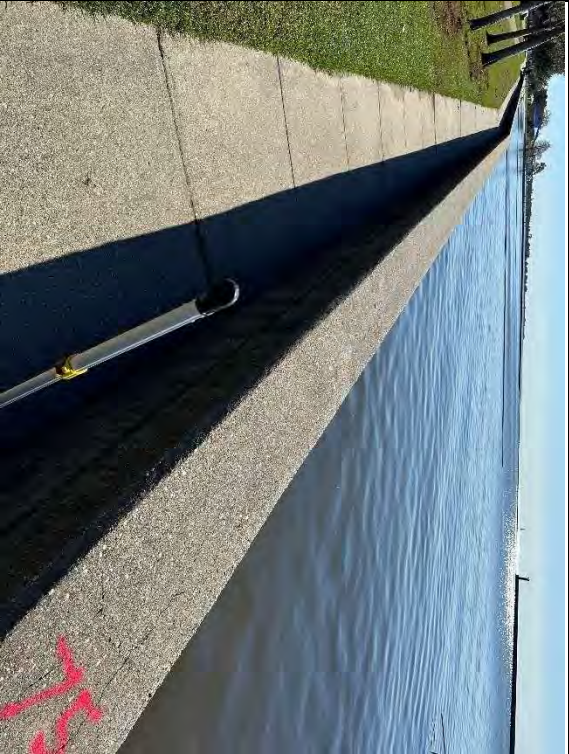


Photo Name: IMG_0292
Inspection Field Notes Photo # : 211
Date: 12-16-22
Approximate Station: Station 75+00 to 75+95
Description: Horizontal cracks along the top side of the seawall.
Coordinates:
Latitude: 30 ; 21 ; 1.1799
Longitude: 90 ; 3 ; 51.21

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Photo Name: IMG_0293
Inspection Field Notes Photo # : 211
Date: 12-16-22
Approximate Station: Station 75+91
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 0.69
Longitude: 90 ; 3 ; 50.19



Photo Name: IMG_0294
Inspection Field Notes Photo # : 212
Date: 12-16-22
Approximate Station: Station 75+95 to 76+00
Description: No cracks on either the top side or the land face side of the seawall. Point of curve in the seawall as well.
Coordinates:
Latitude: 30 ; 21 ; 0.8899
Longitude: 90 ; 3 ; 47.2199

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Photo Name: IMG_0295
Inspection Field Notes Photo # : 213
Date: 12-16-22
Approximate Station: Station 76+68
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 21 ; 0.3899
Longitude: 90 ; 3 ; 49.6099



Photo Name: IMG_0296
Inspection Field Notes Photo # : 214
Date: 12-16-22
Approximate Station: Station 77+00 to 77+20
Description: No cracks on either the top side or the land face side of the seawall.
Coordinates:
Latitude: 30 ; 21 ; 0.020
Longitude: 90 ; 3 ; 48.82

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Photo Name: IMG_0297
Inspection Field Notes Photo # : 216
Date: 12-16-22
Approximate Station: Station 77+62
Description: Concrete spall along the seaside face of the expansion joint.
Coordinates:
Latitude: 30 ; 21 ; 0.1199
Longitude: 90 ; 3 ; 47.7999

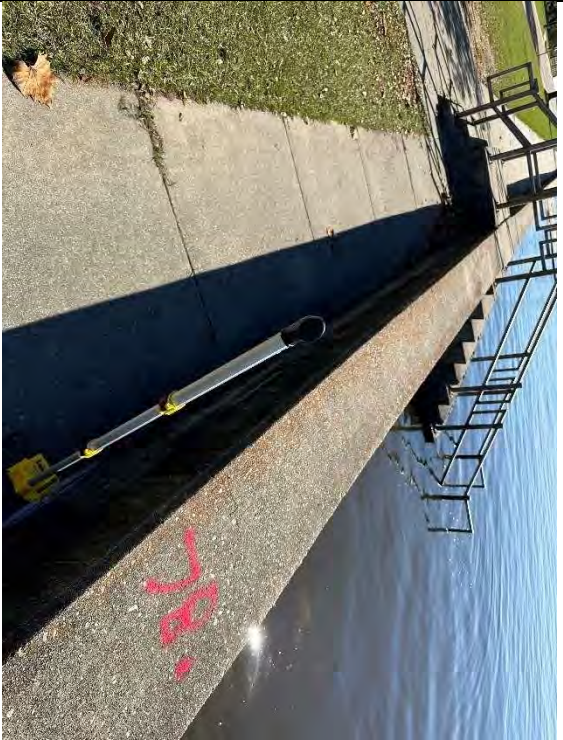


Photo Name: IMG_0298
Inspection Field Notes Photo # : 217
Date: 12-16-22
Approximate Station: Station 78+00 to 79+00
Description: No cracks on either the top side or the land face side of the seawall.
Coordinates:
Latitude: 30 ; 20 ; 59.77
Longitude: 90 ; 3 ; 48.0200

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Photo Name: IMG_0299
Inspection Field Notes Photo # : 218
Date: 12-16-22
Approximate Station: Station 78+20
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 20 ; 59.7799
Longitude: 90 ; 3 ; 47.9899



Photo Name: IMG_0300
Inspection Field Notes Photo # : 219
Date: 12-16-22
Approximate Station: Station 78+25
Description: Stairway. One step contains cracks along the seaside face of the stairway.
Coordinates:
Latitude: 30 ; 20 ; 59.4199
Longitude: 90 ; 3 ; 48.0499

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Photo Name: IMG_0301
Inspection Field Notes Photo # : 221
Date: 12-16-22
Approximate Station: Station 79+00 to 80+00
Description: No cracks on either the top side or the land face side of the seawall.
Coordinates:
Latitude: 30 ; 20 ; 59.49
Longitude: 90 ; 3 ; 46.7899



Photo Name: IMG_0302
Inspection Field Notes Photo # : 222
Date: 12-16-22
Approximate Station: Station 79+38
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 20 ; 59.1900
Longitude: 90 ; 3 ; 46.46

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Photo Name: IMG_0303
Inspection Field Notes Photo # : 223
Date: 12-16-22
Approximate Station: Station 79+96
Description: Concrete spall along the seaside face of the expansion joint
Coordinates:
Latitude: 30 ; 20 ; 59.44
Longitude: 90 ; 3 ; 44.1199

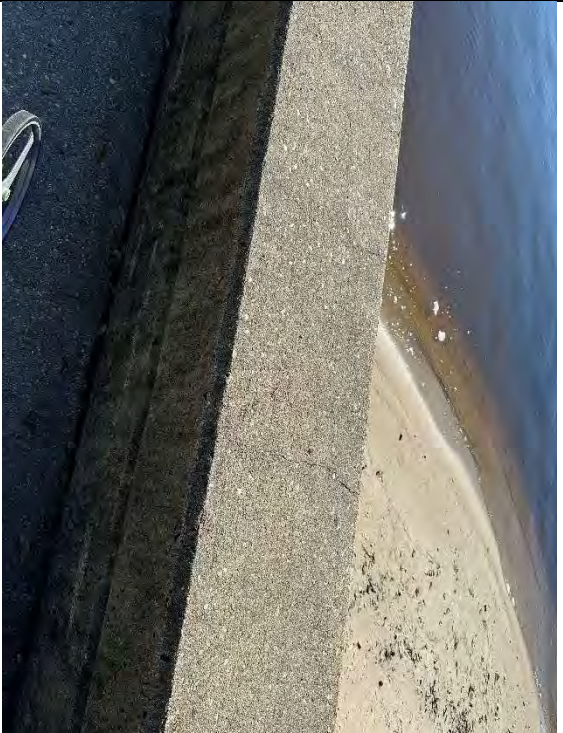


Photo Name: IMG_0304
Inspection Field Notes Photo # : 224
Date: 12-16-22
Approximate Station: Station 80+30 to 80+35
Description: Vertical hairline cracks along the top side of the seawall
Coordinates:
Latitude: 30 ; 20 ; 58.7799
Longitude: 90 ; 3 ; 45.25

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Photo Name: IMG_0305
Inspection Field Notes Photo # : 226
Date: 12-16-22
Approximate Station: Station 81+00 to 82+04
Description: No cracks on either the top side or the land face side of the seawall.
Coordinates:
Latitude: 30 ; 20 ; 58.60
Longitude: 90 ; 3 ; 44.8599



Photo Name: IMG_0306
Inspection Field Notes Photo # : 226
Date: 12-16-22
Approximate Station: Station 82+04
Description: 6" water or sewer line that is running along the bridge across the canal
Coordinates:
Latitude: 30 ; 20 ; 58.22
Longitude: 90 ; 3 ; 44.200

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Photo Name: IMG_0309
Inspection Field Notes Photo # : 227
Date: 12-16-22
Approximate Station: Station 82+36
Description: No cracks along the corner of the seawall
Coordinates:
Latitude: 30 ; 20 ; 57.9100
Longitude: 90 ; 3 ; 43.7899



Photo Name: IMG_0310
Inspection Field Notes Photo # : 227
Date: 12-16-22
Approximate Station: Station N/A
Description: Pedestrian bridge next to roadway bridge
Coordinates:
Latitude: 30 ; 20 ; 58.11
Longitude: 90 ; 3 ; 43.52

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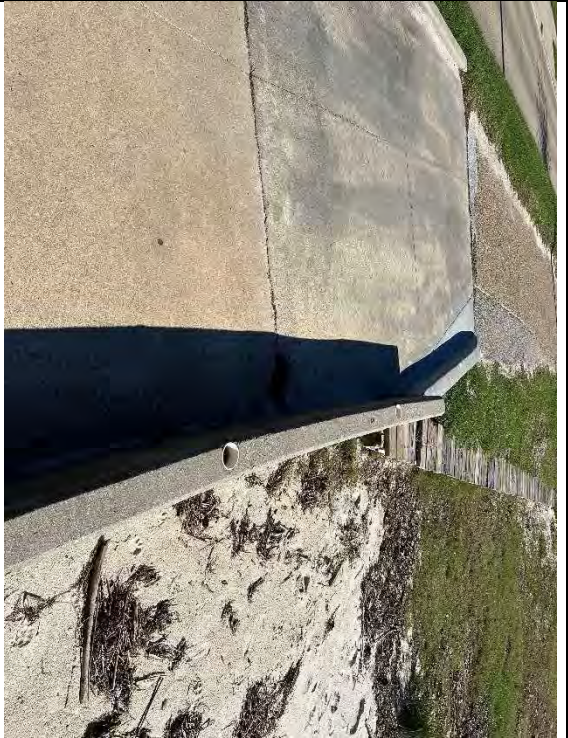


Photo Name: IMG_0311

Inspection Field Notes Photo # : 227

Date: 12-16-22

Approximate Station: Station N/A

Description: Pedestrian bridge next to roadway bridge

Coordinates:

Latitude: 30; 20 ; 57.80

Longitude: 90 ; 3 ; 43.0499

Appendix C

Field Notes

PIC Madeville Flood wall Inspection

- 1 Speciality Drilling
- 2 09+57 corner crack cap Hertz.
- 3 1+13 To 1+23 Hertz cracks (Reflective of sheet pile)
- 4 1+25 To 1+82 Hertz + vertical wall cracks
- 5 1+25 To 1+82 VERT cracks EVERY 3' to 5'
- 6 1+82 Bottom corner missing @ Exp JT
- 7 Sample Pie
- 8 1+82 To 2+00 Hertz cracks + VERT on Land Face
- 9 2+00
- 10 2+09 To 2+14 Hertz + vertical cracks
- 11 2+40 / Exp JT. Hertz cracks (Reflection) Top
- 12 3+00
- 13 3+68 to 3+73 Lake side spoiling, top of cap
- 14 + light horizontal (crack (Reflection))
- ~~15~~ 4+00 light Hertz cracks (Reflection)
- 16 STAIRS ST-1 ~~exp~~ stops 5, 6, 7 cracked Hertz
- 17 4+24 To 4+92 Hertz + VERT cracks ~~on~~ landside cracks along side of cap

PIC Drive + Dip grinder to check wall thickness UT testing Every 100' test wall thickness (sheet pile)

- 18 4+30 To 4+89 Hertz cracks + Hertz/vert crack along Land side face.
- 18 4+30 to 4+90 Lake side of wall Pie.
- 19 4+70 Lake side spoil @ Exp JT.
- 20 4+89 To 5+02 Hertz reflective cracks + some vertical along land side wall face
- 21 5+00 minor surface cracks Hertz + vert

22 5+35 TO 5+42 minor vertical cracks

NOTE } 100% VREPPED lake side water cap
concrete spoiling noted
They ARE checking the thickness of the sheet pile
wall noting corrosion @ joints & bottom
of cap spoiling note 2.

23 5+47 TO 6+00 Top Hartz cracks (reflective)
LAND FACE minor Hartz cracks

24 6+00 TO 6+55 Top Hartz cracks (reflective)
LAND side Hartz cracks with minor vertical crack

25 6+95 TO 7+00 Top Hartz cracks & land side
Hartz cracks every 10'

26 7+38 TO 7+84 Top Hartz cracks (reflective) & land
side Hartz crack & vertical cracks (minor)

27 7+80 TO 8+00 light top Hartz crack LAND SEA
side Hartz cracks

28 8+00 TO 8+25 Heavy top cracks & spoil
SEA side @ Exp. JT, LAND side Hartz cracks minor

29 8+25 TO 9+00 Top Hartz cracks (reflective)
SEA/LAND side Hartz cracks minor

30 10+00 TO 11 Top Hartz cracks (reflective) LAND side
Hartz & vertical cracks (minor)

31 10+57 spoil @ SEA side @ Expansive JT.

32 11+00 TO 11+66 Top Hartz cracks

33 11+14 SEA side large spoil @ Exp. JT

34 11+66 TO 11+76 Top Hartz cracks Reflective

11+76 TO 12 OK

Exp JT \cong Expansion Joints

- 35 12+07 to 13+00 Top Horiz cracks (Reflection)
Land side min. cracks
- 34 12+25 to 12+35 Top + Land side Horiz crack
- 37 12+93 sea side large spoil @ Exp JT
- 38 13+00 to 13+42 minor Top Horiz cracks
- 36 13+40 to 13+50 top ~~sea~~ Horiz crack minor ~~si~~
seaside minor
- 37 ~~13~~ 13+50 conc. spoil sea side @ Exp JT
- 38 13+50 to 14 top Horiz cracks & minor
vertical cracks along land side face
- 39 14+07 sea side conc. spoil @ Exp JT
- 39 14+28 to 15+00 top Horiz cracks & minor Horiz/ver
land side face
- 40 14+67 sea side conc. spoil @ Exp JT
- 41 14+69 to 15+00 Top Horiz cracks
- 42 15+00 to 16+00 top Horiz cracks
- 43 15+24 sea side conc. spoil @ Exp JT
- 44 15+73 Land side Rust spot
- 45 15+84 sea side conc. spoil @ Exp JT
- 46 16 to 16+42 Top Horiz crack Land side
Horiz cracks minor
- 47 16+47 sea side conc. spoil @ Exp JT.
- 48 16+78 stair way. cracks in step &
on side of steps Rust coming to surface
- 49 17+00 sea side spoil @ Exp JT.
- 50 17+00 Land side bottom step shows Rust coming
top

57
22/3/8

- 51 17+25 to 17+50 Top Horiz cracks (reflective)
Land side Horiz + vertical cracks along Face
- 52 17+79 + 17+89 9 vertical/horiz cracks @ sea side
Wall Face
- 53 18+21 to 18+43 top Horiz + vertical cracks
Horiz cracks on face of land side wall
- 54 18+50 steel structure attach to sea side wall
possibly for ~~the~~ drainage pipe?
- 55 18+70 to 18+90 top Horiz/vertical cracks
- 56 19+00 to 19+40 minor top cracks
- 57 19+40 sea side conc. spoil @ Exp JT
- 58 19+90 to 20+00 vertical cracks on top of wall
- 59 19+98 sea side conc. spoil @ Exp JT
- ~~60 20+22 top Horiz cracks (reflective)~~
- 60 20+22 to 20+50 top Horiz cracks land side Horiz
cracks (side walk repair area)
- 61 20+57 conc. spoil @ Exp JT sea side
- 62 21+00 conc. spoil @ Exp JT " "
- 63 21+16 hole under conc. wall @ repair area
- 64 22+08 stairway St 3 1. cracked ~~at~~ step #4
seaside
- 65 St 3 land side Landing settled $1\frac{1}{2}$ "
- 66 22+13 Land side conc. spoil @ Exp JT
- 67 22+45 to 22+50 Horiz crack + 1 vertical.
22+46 to 22+88 Horiz top cracks + 2 verticals
- 68 Note From 23 to 24 sidewalk settling @
wall

544 28170

- 69 23+00 TO 24 TOP HORIZ CRACKS, LAND SIDE
HORIZ CRACK + SUNKEN SIDE WALK
- 70 23+33 LANDSIDE CONC. SPOIL @ EXP JT
- 71 23+57 TOP RUST SPOT ON TOP OF WALK (REBAR?)
- 72 23+93 CONC. SPOIL ~~SEA~~ SEASIDE @ EXP JT
- 73 24+49 CONC. SPOIL @ EXP. JT SEASIDE
25 TO 25+09 TOP HORIZ CRACK + LANDSIDE
HORIZ CRACKS WITH RUST (COMMING) LANDFACE
- 74 25+09 CONC. SPOIL @ EXP JT SEA SIDE
SIDEWALK AND SUNKEN IN THIS AREA
- 75 25+25 TO 25+50 TOP HORIZ/VERTICAL CRACK
+ RUST SPOT ALL IN A REPAIR AREA
- 76 25+50 TO 25+62 TOP CRACK + HORIZ/VERT @
LAND SIDE FACE
- 77 25+73 CONC. SPOIL SEASIDE @ EXP JT
- 78 25+73 TO 26+37 TOP HORIZ CRACK (REPETITIVE)
+ HORIZ CRACK LANDSIDE FACE.
- 79 26+32 CONC. SPOIL @ EXP JT SEASIDE
- 80 26+37 TO 27+00 TOP HORIZ CRACKS
- 81 27+00 TO 28+00 TOP HORIZ CRACK + HORIZ CRACK/VEGETATION
ALONG LAND SIDE CAP
- 82 28+00 TO 28+63 TOP HORIZ CRACKS + A FEW HORIZ
ALONG LAND SIDE WALL FACE
- 83 ~~28+63~~ 28+63 CONC. SPOIL @ SEASIDE EXP JT
- 84 28+70 STAIRWAY OF 4 STEPS, SOME CRACKS SEA SIDE
- 85 28+76 TO 29+00 TOP HORIZ/VERT CRACK
- 86 " " " " SEA SIDE WALL HORIZ CRACKS

STP 5

- 87 29+00 to 29+38 Horiz Top cracks Land side
Horizontal cracks
- 88 29+72 to 30 Top of wall Horiz cracks +
landside Horiz crack along wall face
- 89 30+00 to ~~30+50~~ 31+00 Top Horiz cracks
+ landside Horiz face cracks some Rust spots
- 90 31+00 to 32+00 Top Horiz cracks Land side
Horiz crack along face, note sidewalk settled @ wall
- 91 32+00 to 32+21 Top Horiz cracks + Horiz
crack along face of Land side wall
- 92 32+18 to 32+30 on top Horiz cracks & cracks
along face of Landside wall (Repair Area)
sidewalk missing.
- 93 32+73 to CAVAL OUTLET
- 94 33+06 conc spoil @ Exp Joint (CAVAL INLET)
- 95 33+61 conc. spoil @ Exp Jt
- 96 34+25 water line crossing canal
- 97 34+64 water line crossing canal (West)
- 98 34+92 water line crossing canal (East)
- 99 35+63 conc. spoil @ Exp joint (East)
- 100 36+84 to 37+32 OK
- 101 37+32 to 37+77 Horiz cracks on Top
+ landside Horiz cracks
- 102 38+00 to 38+45 minor top Horiz cracks
- 103 38+50 conc. spoil @ Exp Jt sea side
- 104 51-7 steps cracked sea side steps 38+61
- 105 51-7 steps REBAR showing Land side " "

106 39+09 ~~SP~~ CONC. spoil @ Exp JT sea side

107 39+60 CONC. spoil @ Exp JT sea side

108 39+00 to 40 top hairline crack (minor)

* side walk settling along wall

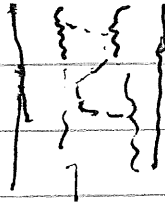
109 39+68 CONC. spoil @ Exp. JT

110 40+00 to 41+00 sidewall settling along wall top of wall minor vertical cracks

111 40+26 CONC. corner spoil @ Exp JT

112 40+85 CONC. spoil @ Exp JT

113 40+86 to 41+07 Horiz crack on top (reflective) of sheet pile



114 41+43 CONC. spoil @ Exp JT sea side

115 41+50 to 42+10 top vertical cracks minor

116 Land side face has Horiz cracks sta 41+60 to 42+10

117 42+03 CONC. spoil @ Exp JT

118 42+03 to 42+19 wall repair

119 42+15 to 42+60 top Horiz cracks (reflective) + Horiz crack along wall face land side

120 42+60 CONC. spoil land side

121 42+70 to 43+00 top Horiz. cracks reflective and Horiz/Vert crack land side face of wall

122 43+00 to 43+24 top Horiz reflective cracks Horiz/vert cracks along land side wall face

123 43+68 CONC. spoil @ sea side Exp JT

124 43+68 to 43+78 top Horiz cracks

- 125 43+73 STAIRWAY ST? 5th & 6th step seaward
HAS cracks
- 126 43+68 TO 44 MIDDL HORTZ crack ON TOP of wall
- 127 44+~~66~~ TO ⁴⁴⁺³⁸ ~~45~~ cracks ON TOP of wall (REFLECTED)
and HORTZ crack ALONG wall FACE LAND side.
- 128 44+38 TO 45+00 cracks HORTZ ON TOP (REFLECTED)
+ cracks ALONG the LANDSIDE FACE (HORTZ)
- 129 44+97 conc. spoil @ seaward Exp JT
45+00 TO 45+95 cracks ON TOP HORTZ + RUST
- 130 spots HORTZ cracks ALONG LANDSIDE wall FACE
& side WALK sunken @ wall
- 131 NOTE From 43+63 seaward HAS HORTZ cracks to 46
- 132 45+95 46+26 cracks ON TOP HORTZ/VERT. LAND side
has HORTZ cracks along wall + Repair sidewalk Area
- pic 133 1-5' long sink hole @ wall 46+20 TO 46+80
~~46+100~~
- 134 46+07 TO 47+00 TOP HORTZ cracks +
LANDSIDE HORTZ cracks ALONG the FACE of the wall
- 135 46+90 TO 47+83 TOP HORTZ crack +
Rust spots ALONG the cracks. HORTZ cracks along
LANDSIDE wall FACE, side walk sunken @ wall 3' ear
- 136 47+83 TO 47+92 conc spoil LANDSIDE
hole in sheet pile side walk Repair
- 137 48+00 48+36 HORTZ cracks ON TOP wall REFLECTED
with Rust spots @ cracks. LANDSIDE HORTZ cracks
side walk settled @ wall 3" ~~5"~~ low

- 138 48+36 to 48+46 top Hertz cracks through stair way
- 139 48+41 ST stair way seaside cracks in steps
 settlement at land side wall
- 140 48+46 to 48+73 Hertz cracks on top
 Horiz/vert cracks along land side wall
- 141 48+73 wall P.I (wall curve)
- 142 49+00 to 49+58 Hertz cracks & ~~the~~ land side
 Horiz + vert cracks.
- 142 49+58 P.I (curve) to 50+00 Hertz cracks
 on top land side Horiz/vert cracks along face
 of cap
- 143 50+00 to 50+80 top Hertz cracks (some reflective)
 land side Horiz/vert cracks
- 144 50+80 to 51+00 top Hertz cracks & land side
 Horiz/vert cracks (large)
- 145 51+00 to 51+74 top Hertz cracks + Rust
 spot (reflective) land side Horiz/vert cracks + Rust spot
- 146 51+84 (P.I) to 52+00 top Hertz cracks (reflect)
 land side Hertz cracks
- 147 51+97 conc. spoil seaside @ Exp JT
- 148 52+00 to 53 Hertz cracks on top land side
 Horiz/vert cracks along cap face
- 149 52+57 conc. spoil seaside @ Exp JT
- 145 52+84 top Rust spots @ Hertz cracks & vert cracks
~~52+84 to 52+75~~
- 146 53+00 to 53+75 top Hertz cracks (reflective)
 land side Hertz cracks & vert cracks

- 147 53+75 to 53+85 top of cap Hertz cracks (through stairs)
- 148 53+80 stairway steps seaside has cracks
- 149 53+85 conc. spoil @ sea side Exp JT
- 150 53+85 to 54+00 top Hertz cracks + land side Hertz cracks
- 151 54+00 to 54+36 top Hertz cracks land side
Hertz cracks
- 152 54+36 conc. spoil @ sea side Exp JT
- 153 54+61 to 54+81 side walk missing (repair area)
54+00 to 55+00 top Hertz cracks + land side Hertz/vert
cracks along cap face
- 154 54+94 conc. spoil @ sea side Exp JT
- 155 55+00 to 55+80 top Hertz cracks with Rust spots
land side Hertz/vert cracks along face of cap
- 156 55+80 to 56+00 top Hertz cracks Rust spots
land side Hertz/vert cracks
- 157 56+00 to 57+00 top Hertz/vert cracks along with
Rust spot. ~~land~~ land side Hertz/vert along face
- 158 56+11 conc. spoil @ sea side Exp JT
- 159 56+45 top conc. spoil @ at @ patch
- 160 56+70 conc. spoil seaside @ Exp JT
- 161 57+00 to 57+~~88~~ top Hertz cracks + Rust spots
land side Hertz/vert cracks along wall face
- 162 57+29 conc. spoil @ cross side Exp JT
- 163 57+88 conc. spoil @ sea side Exp JT
- 164 57+88 ~~to~~ 58+00 Hertz cracks on top +
land side Hertz/vert on cap face

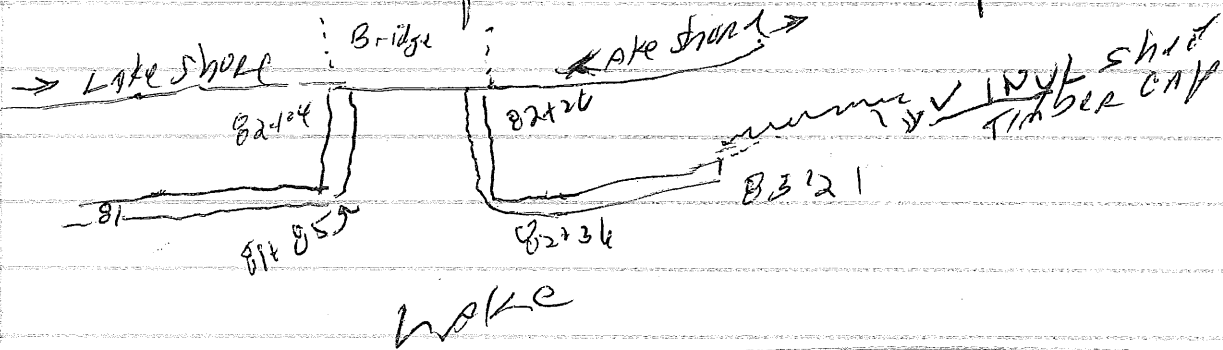
NUMBER LIKE SEAWALL

- 165 58+44 CONC. SPOIL SEASIDE @ Exp JT
+ Rust spot along same seawall
- 166 58+46 to 59+00 Top Horiz/vert cracks ^{Reflective}
a few Rust spots Land side Horiz/vert
cracks along cap face
- 167 59+04 CONC. SPOIL @ SEASIDE Exp JT
- 168 59+04 TO 59+50 Top Horiz cracks Land side Horiz.
- 169 59+62 CONC. SPOIL @ SEASIDE Exp JT
- 170 59+62 TO 60+00
60+00 to 60+26 stair way (cont'd) Land side Land side
- 171 Settled approx 3" sea side steps (4) cracked
- 172 60+26 TO 61+60 top Horiz/vert cracks Rust spot
- 173 60+80 CONC. SPOIL @ SEASIDE Exp JT
- 174 61+00 TO 62+00 top Horiz cracks
Land side Horiz/vert cracks
- 175 61+39 CONC. SPOIL @ SEASIDE Exp JT
- 176 61+98 CONC SPOIL @ SEASIDE Exp JT +
Rebar exposed
- 177 62+00 TO 62+60 top Horiz cracks (reflective)
~~some~~ some Rust spots Land side Horiz/vert cracks
- 178 62+60 TO 63+00 Horiz cracks (reflective)
heavy Rust spots, Land side Horiz/vert cracks
- 179 63+00 TO 64+00 top Horiz cracks (reflective)
Rust spots Land side Horiz/vert cracks
- 180 63+15 CONC. SPOIL @ SEASIDE Exp JT Rebar Exposed
- 181 64+00 TO 65+00 top Horiz cracks Land side Horiz/vert cracks
- 182 64+32 CONC. SPOIL @ SEASIDE Exp JT

- 183 64+72 to 64+88 missing sidewalk @ Repair
- 184 64+90
- 185 65+00 to 66+00 Top Bad Hertz cracks Rust spots & flaky concrete, land side Hertz/vert cracks
- 186 65+23 conc spoil on top of cap Exposed Rebar
- 187 65+49 conc spoil @ seaside @ Exp JT
- 188 66+00 to bad top cracks Hertz (reflective) Rust spots land side Hertz/vert cracks
~~66+00 to 66+00~~
- 189 66+00 conc. spoil seaside @ Exp JT
66+06 stair way seaside cracks in steps
- 190 67+00 to 67+22 wall jog
67+26 wall jog to 67+28 top Hertz/vert cracks
land side Hertz/vert cracks + Rust spots
- 191 67+75 conc. spoil seaside @ Exp JT
- 192 68+00 to 69+00 top Hertz cracks (reflective)
- 192 68+98 to 69+18 Top Hertz/vert cracks
missing sidewalk land side Hertz/vert cracks
- 193 69+12 to 69+52 Hertz cracks on top of wall
land side vert cracks only
- 194 69+52 conc. spoil seaside @ Exp JT
- 195 69+52 to 70+60 Hertz cracks on top + land side
= few Hertz/vert cracks along cap.
- 196 70+00 to 71+00 Hertz cracks on top (reflective)
land side Hertz cracks & Rust spots
- 197 70+08 conc spoil sea side @ Exp JT
- 198 70+67 conc spoil @ seaside @ Exp JT

- 199 71+00 to ~~72+00~~ 71+85 Top Hertz cracks (Reflective)
Landside vert cracks with rust spots
- 200 71+26 conc. spoil seaside @ Exp JT
- 201 71+26 to 71+44 minor top cracks landside w/ ~~71+26 to 72+00~~
- 202 72+00 to 73+00 Top Hertz cracks (reflective)
Landside minor vert cracks
- 203 73+03 conc. spoil @ seaside Exp JT
- 204 73+09 stairway only 1 step with crack
- 205 73+00 to ~~74+00~~ ⁷³⁺⁶⁴ Top Hertz cracks (Reflective)
Landside minor Hertz/vert cracks
- 206 73+64 conc. spoil seaside @ Exp JT
- 207 73+64 to 74+00 minor Hertz cracks & landside
minor Hertz cracks
- 208 74+00 + 75+00 minor Hertz cracks landside
minor cracks
- 209 74+23 conc. spoil seaside @ Exp JT
- 210 74+80 conc. spoil seaside @ Exp JT
74+80 to 75+00 top Hertz cracks landside
OK
- 211 75+00 to 75+95
75+91 conc. spoil sea side @ Exp JT
- 212 75+95 wall P.I. curve)
75+95 to 76+00 no cracks top or landside
~~OK~~
- 213 76+48 conc. spoil sea side @ Exp JT

- 214 77+00 77+20 NO CRACKS
 77+20 TO 77+45 TOP MOST 2 CRACKS 1 RUST SPOT
- 215 77+62 + 78+00 NO CRACKS
- 216 77+62 CONC. SPOIL SEA SIDE @ EXP JT
- 217 78+00 79+00 NO CRACK TOP & LAND SIDE CAP.
- 218 78+20 CONC. SPOIL SEA SIDE @ EXP JT
- 219 78+25 STAINWAY 1 CRACK STEP SEA SIDE
- 220 78+79 CONC SPOIL SEA SIDE @ EXP JT
- 221 79+00 ~~NO CRACKS~~ ^{TO 80} NO CRACKS
- 222 79+38 CONC. SPOIL SEA SIDE @ EXP JT
- 223 79+96 CONC. SPOIL SEA SIDE @ EXP JT
- 224 80+30 TO 80+35 TOP VERT HAINLINE CRACKS
- 225 80+55 CONC. SPOIL SEA SIDE @ EXP JT

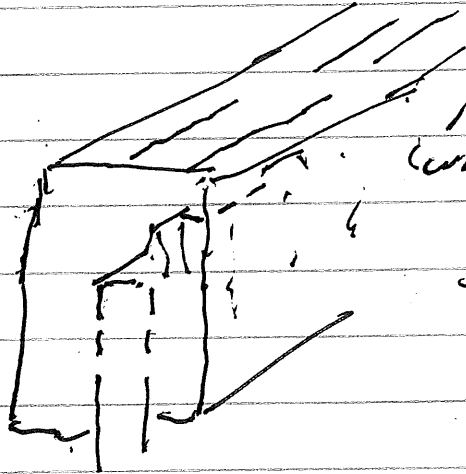


- 226 81+00 TO 82+04 NO CRACKS
 NOTE 6" WATER OR SEWER LINE RUNNING ALONG BRIDGE ACROSS
 THE CANAL
- 227 82+36 CORNER NO CRACKS
 82+36 TO 83+00 OK NO CRACKS
- 227 Pedestrian Bridge next to Roadway whorkey
 Bridge

BRI NO. 22.028

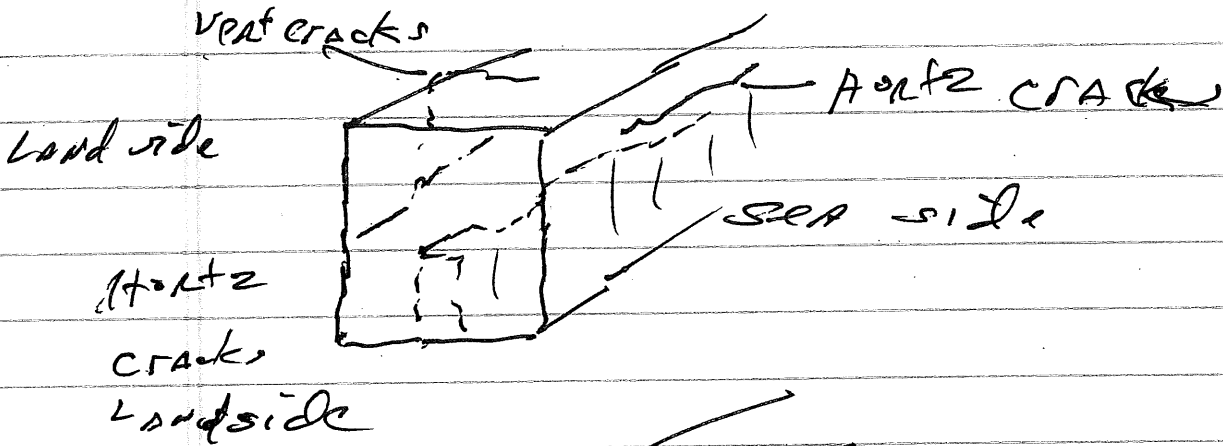
MARDEVILLE SEAWALL

Sample Details



Reflective cracks HORTZ
with Rest spots (sheet pile

SEASIDE



Land side

VERT CRACKS

SEA side

VERT CRACKS

SEA side

Land side

Exp. JT Typ

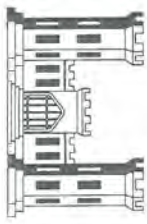
SEA side

Concrete spilt @ Exp JT
top of sheetpile wall
exposed.

Appendix D Existing Seawall Plans (As-Built)

Safety is a Part
of Your Contract

PLANS FOR
REPLACEMENT OF MANDEVILLE SEAWALL
ST. TAMMANY PARISH, LOUISIANA



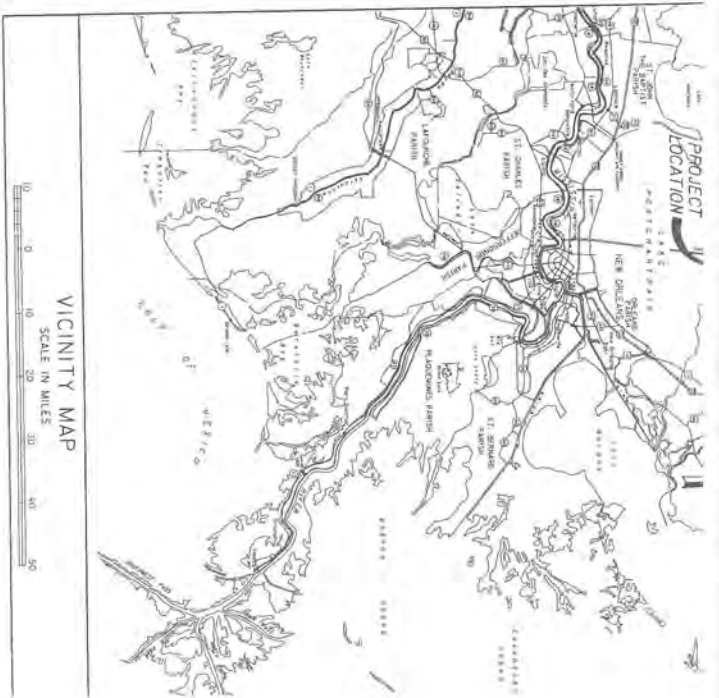
US ARMY CORPS of ENGINEERS
New Orleans District
1993

Drawn Birmingham Conn

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED ONE
HALF THE ORIGINAL SCALE

U.S. ARMY





INDEX TO DRAWINGS

NO.	TITLE	DWG.	TITLE
1	LOCATION AND VICINITY MAP	17	TYPICAL SECTIONS - STA. 0+00 W/L TO STA. 0+36.74 W/L
2	AL NOTES	18	TYPICAL SECTIONS - STA. 13+35 W/L TO STA. 28+50 W/L
3	AND PROFILE - STA. 0+00 W/L TO STA. 0+36.74 W/L	19	TYPICAL SECTIONS - STA. 34+10 W/L TO STA. 38+95 W/L
4	AND PROFILE - STA. 0+36.74 W/L TO STA. 12+90.19 W/L	20	TYPICAL SECTIONS - STA. 42+15 W/L TO STA. 55+10 W/L
5	AND PROFILE - STA. 12+90.19 W/L TO STA. 18+78.71 W/L	21	TYPICAL SECTIONS - STA. 58+20 W/L TO STA. 60+50 W/L
6	AND PROFILE - STA. 18+78.71 W/L TO STA. 24+70.98 W/L	22	TYPICAL SECTIONS - STA. 72+25 W/L TO STA. 82+45 W/L
7	AND PROFILE - STA. 24+70.98 W/L TO STA. 31+11.81 W/L	23	STEEL SHEET PILE LAYOUT
8	AND PROFILE - STA. 31+11.81 W/L TO STA. 39+00.22 W/L	24	SHEET PILE DETAILS
9	AND PROFILE - STA. 39+00.22 W/L TO STA. 45+33.59 W/L	25	SEAWALL REINFORCEMENT AND DETAILS
10	AND PROFILE - STA. 45+33.59 W/L TO STA. 51+43.73 W/L	26	ORNLINAGE MODIFICATION DETAILS
11	AND PROFILE - STA. 51+43.73 W/L TO STA. 57+31.52 W/L	27	CONCRETE STAIR DETAILS
12	AND PROFILE - STA. 57+31.52 W/L TO STA. 63+13.52 W/L	28	EXISTING WALL PROFILE
13	AND PROFILE - STA. 63+13.52 W/L TO STA. 68+66.21 W/L	29	SOIL BORING LEGEND
14	AND PROFILE - STA. 68+66.21 W/L TO STA. 74+39.28 W/L	30	BORING LOGS
15	AND PROFILE - STA. 74+39.28 W/L TO STA. 80+07.75 W/L	31	STAGE HYDROGRAPH
16	AND PROFILE - STA. 80+07.75 W/L TO STA. 83+51.84 W/L		

BENCH MARK DESCRIPTION

DESIGNATION	DESCRIPTION	ELEV.
MANDEVILLE 1928 4	LOCATED 0.7 MILE SOUTH OF THE INTERSECTION OF STATE HIGHWAY 114 AND U.S. HIGHWAY 190, IN THE NORTHEAST CORNER OF THE LOT 52 IN THE SOUTH-WEST CORNER OF THE LAWN OF THE OLD GERARDIAN MANNER HOTEL, 1 FOOT EAST OF THE EAST EDGE OF THE SIDEWALK AND 1 1/2 IN A STANDARD 0.5M SET IN THE TOP OF A CONCRETE POST, 2 INCHES BELOW THE SURFACE OF THE LAWN AND IS ABOUT 3 INCHES ABOVE THE LEVEL OF THE SIDEWALK.	4.285 M.S.V.D. (1989 EPOCH)

Safety is a Part
of Your Contract

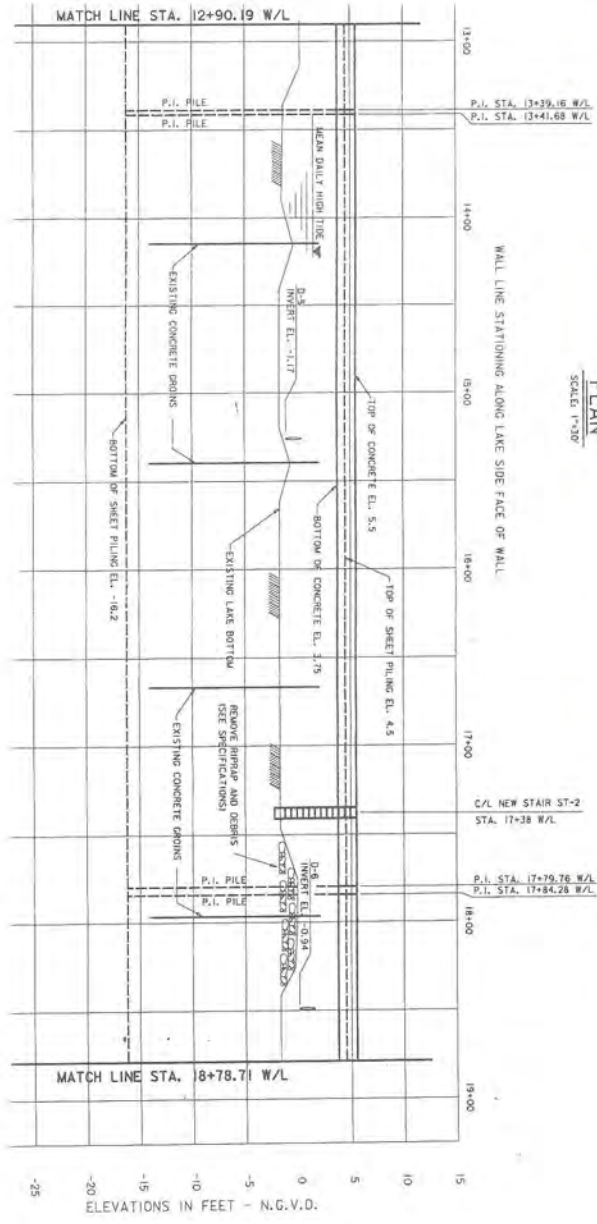
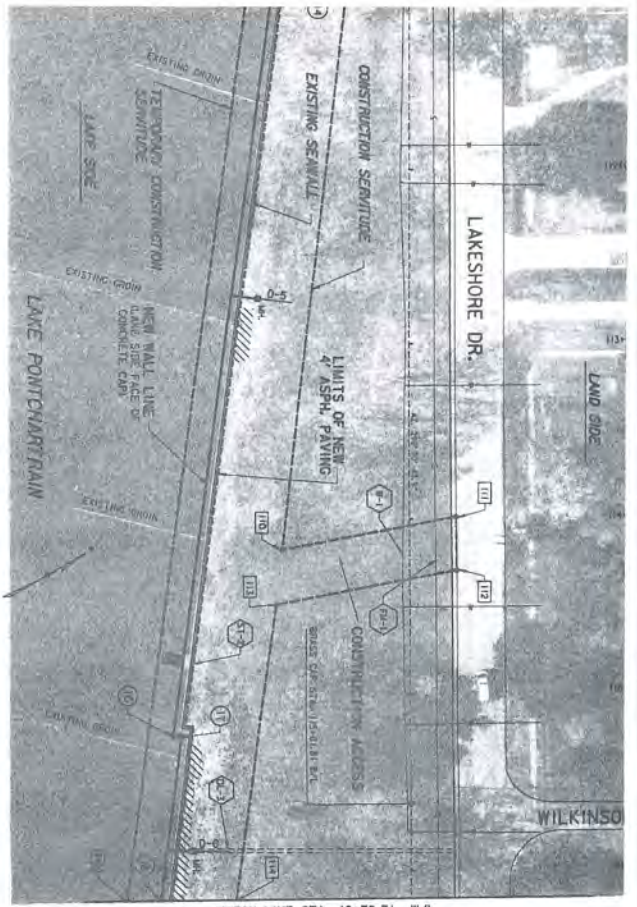


Brown Cunningham Conru
 U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, LOUISIANA
 BOARD OF ENGINEERS
 NEW ORLEANS, LOUISIANA

MANDEVILLE SEAWALL, LA.
 REPLACEMENT OF MANDEVILLE SEAWALL
 ST. TAMMANT PARISH, LA.
 INDEX, LOCATION AND
 VICINITY MAP

DESIGNED BY: [Signature]
 CHECKED BY: [Signature]
 DATE: [Date]

SCALE: 1" = 1000'
 DATE: 04/27/20



STATION	DESCRIPTION	RT.	LT.
14	110+88.44	71.18	13+29.18
15	110+81.90	76.65	13+41.68
16	115+21.97	134.72	17+79.76
17	115+22.37	130.21	17+84.28
18	116+16	142.45	18+78.71

NO.	STATION	FROM B.L.	TO B.L.	NO.	STATION	FROM B.L.	TO B.L.
109	110+40.0	29.0'	RT.	309	110+10.0	84.3'	RT.
110	114+17.1	72.4'	RT.	310	116+18.0	181.8'	RT.
111	114+26.9	86.5'	RT.				
112	114+36.7	100.6'	RT.				
113	114+46.2	114.7'	RT.				
114	118+16.0	199.6'	RT.				

ITEM	DESCRIPTION	B.L. STATION	QMS	DISPOSITION
ST-2	CONCRETE STEPS	114+80		CITY OF MANDEVILLE CONTR. REMOVE
W-1	8" WATER MAIN	114+42 TO 114+55.0		CITY OF MANDEVILLE NOT AFFECTED
FM-1	8" SEWER FORCE MAIN	114+01.8 TO 114+31.8		CITY OF MANDEVILLE NOT AFFECTED
DL-3	24" CLAY PIPE DRAIN LINE	115+87.1		CITY OF MANDEVILLE CONTR. RELOC.

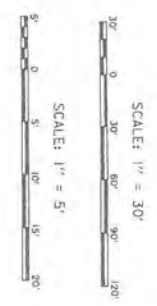
- * CONTRACTOR NOT TO DISTURB
- 0000 DENOTES CONSTRUCTION SERVICE TRENCH P.I. NUMBERS
- 6 DENOTES WALL LINE P.I. NUMBERS

- NOTES:**
- FOR GENERAL NOTES, SEE DWG. 2
 - FOR LEGEND, SEE DWG. 3
 - FOR GROUND MODIFICATIONS, SEE DWG. 24
 - FOR WALL TRANSITION DETAILS, SEE DWG. 25
 - FOR DRAIN DETAILS, SEE DWG. 26
 - FOR STAIR DETAILS, SEE DWG. 27
 - FOR SOIL BORING LOGS SEE DWG. 30
 - FOR LAKE HYDROGRAPH SEE DWG. 31
 - STAKES AND GUY WIRES AROUND SMALL TREES NOT SHOWN, CONTRACTOR TO MAINTAIN.
 - EXTENT OF RIPRAP ON LAKE BOTTOM AND DEBRIS BEHIND WALL MAY VARY FROM THAT SHOWN.

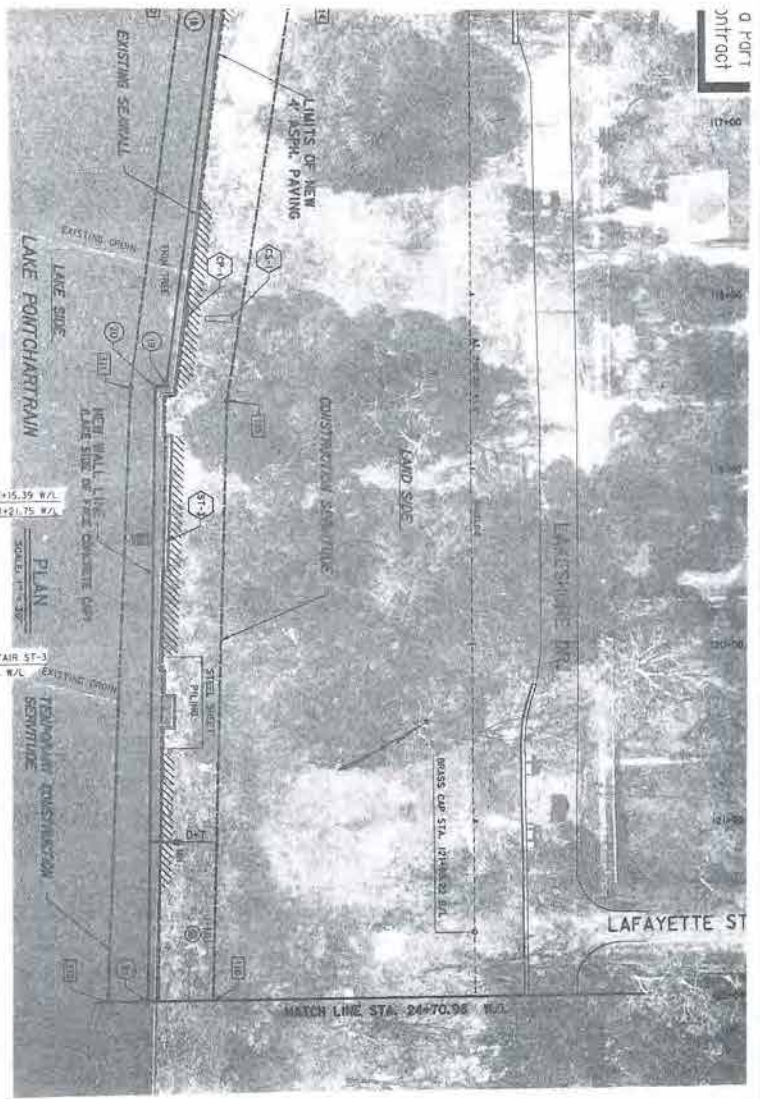


PLAN AND PROFILE
 STA. 12+90.19 W/L TO STA. 18+78.71 I

Brown Cunningham Gannuc
 ENGINEERS - ARCHITECTS - CONSULTANTS
 U. S. ARMY ENGINEER DISTRICT, NEW OR
 LEONARD S. BROWN, P.E.
 NEW ORLEANS, LOUISIANA



D PORT
CONTRACT



ELEVATIONS IN FEET - N.C.V.D.

P.I. NO.	BASELINE STATION	DISTANCE FROM BASELINE	CONSTRUCTION STATION
18	118 + 16.00	142.45 FT.	
19	118 + 50.68	171.16 FT.	
20	118 + 50.64	179.52 FT.	
21	122 + 00.00	186.16 FT.	

P.I. NO.	LAND SIDE		CONSTRUCTION SERVITUDE		TEMPORARY SERVITUDE	
	B/L STATION	MEASURED FROM B/L	P.I. STATION	B/L STATION	P.I. STATION	B/L STATION
18	118+16.00	93.8 FT.	118+16.00	118+16.00	118+16.00	118+16.00
19	118+50.68	149.3 FT.	119+37.6	119+37.6	119+37.6	119+37.6
20	118+50.64	149.3 FT.	119+37.6	119+37.6	119+37.6	119+37.6
21	122+00.00	149.3 FT.	122+00.00	122+00.00	122+00.00	122+00.00

ITEM	DESCRIPTION	QTY	UNIT
CP-1	CONCRETE PIER	118+10.5	CITY OF MANDEVILLE
CS-1	CONCRETE SLAB	118+12.1	CITY OF MANDEVILLE
ST-3	CONCRETE STEPS	119+37.6	CITY OF MANDEVILLE

1000 DENOTES CONSTRUCTION SERVITUDE
 6 DENOTES WALL LINE P.I. NUMBERS

NOTES:

- FOR GENERAL NOTES, SEE DWG. 2
- FOR LEGEND, SEE DWG. 3
- FOR GROUND MODIFICATIONS, SEE DWG. 24
- FOR WALL TRANSITION DETAILS, SEE DWG. 4
- FOR DRAIN DETAILS, SEE DWG. 28
- FOR STAIR DETAILS, SEE DWG. 27
- FOR SOIL BORING LOGS, SEE DWG. 20
- FOR LAKE HYDROGRAPH, SEE DWG. 31
- FOR SOIL BORING LOGS, SEE DWG. 20
- FOR LAKE HYDROGRAPH, SEE DWG. 31
- NOTES AND CONTRACTOR TO MAINTAIN EXTENT OF RIRRAP ON LAKE BOTTOM AND BEHIND WALL MAY VARY FROM THAT SHOWN



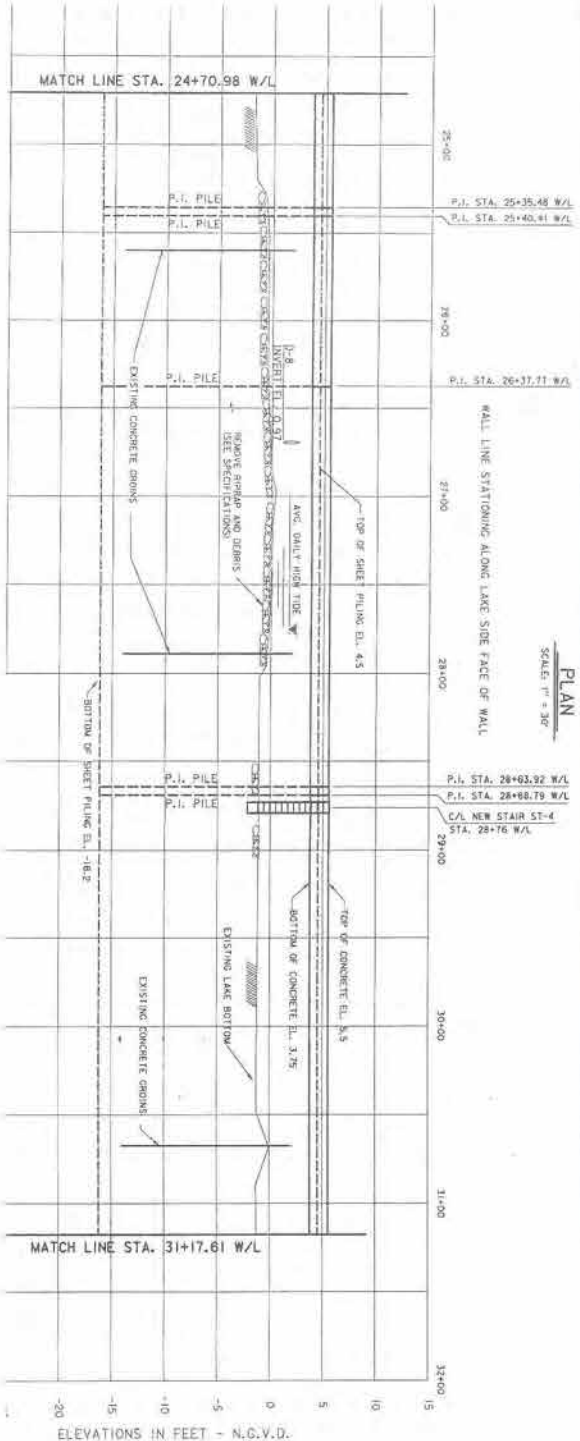
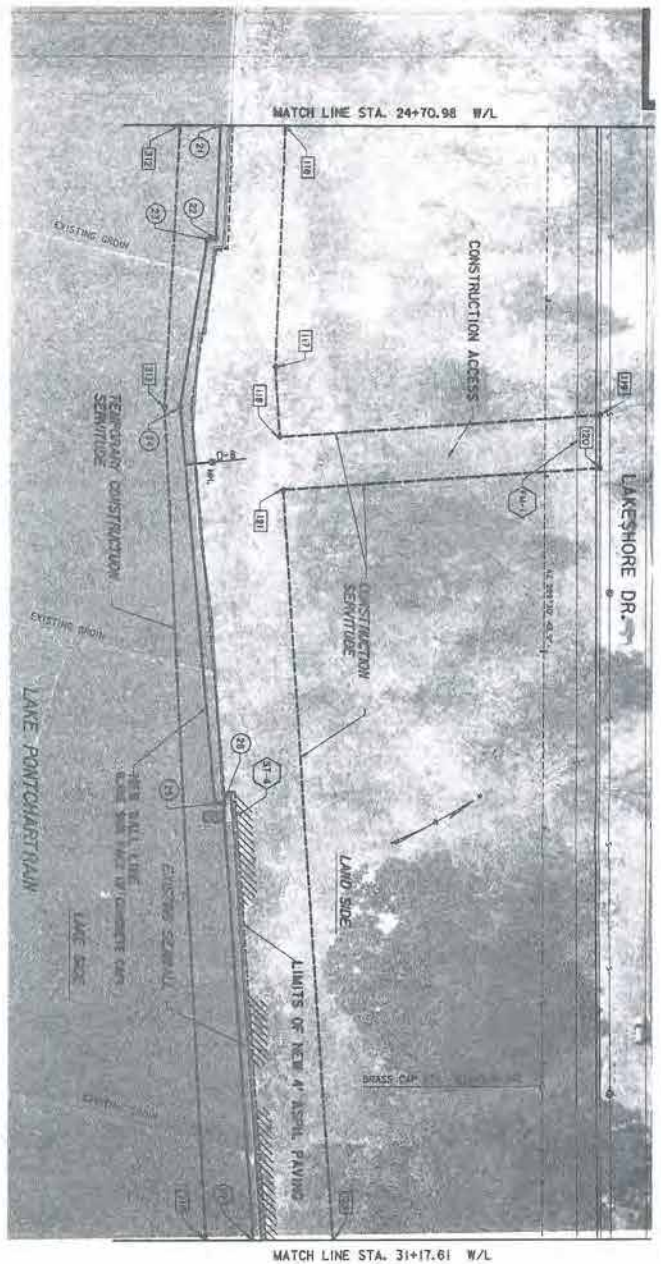
SCALE: 1" = 30'



SCALE: 1" = 5'



Brown Cunningham
 ENGINEERS - ARCHITECTS
 1111 TAMMANY PARISH, LT.
 NEW ORLEANS, LA 70112
 U.S. ARMY ENGINEERS DISTRICT
 NEW ORLEANS, LA 70112
 REPLACEMENT OF MANDEVILLE ST. TAMMANY PARISH, LT.



PLAN
SCALE: 1" = 30'

ELEVATIONS IN FEET - N.G.V.D.

ITEM NO.	DESCRIPTION	BOI STATION	OWNER
* P1-1	6" SERRER FORCE MAIN	1924+98.2 TO CITY OF WANDREVILLE	121+96.3
ST-4	CONCRETE STEPS	125+92.2	CITY OF WANDREVILLE

P.I. NO.	B/L STATION	DISTANCE FROM B/L	P.I. NO.	B/L STATION	DISTANCE FROM B/L
115	122+00.0	149.2'	RT.	117	123+00.0
116	123+31.9	153.5'	RT.	118	123+78.0
117	123+31.9	153.5'	RT.	119	123+78.0
118	123+78.0	150.7'	RT.	120	123+56.4
119	123+78.0	150.7'	RT.	121	123+56.4
120	123+56.4	148.6'	RT.	122	123+08.0
121	123+56.4	148.6'	RT.	123	123+34.0
122	123+08.0	118.8'	RT.		

- EXISTING FACILITIES**
- CONTRACTOR NOT TO DISTURB
- ☐ DENOTES CONSTRUCTION SERVICE
- DENOTES WALL LINE P.I. NUMBER
- NOTES:**
- FOR GENERAL NOTES, SEE DWG.
 - FOR LEGEND, SEE DWG. 3
 - FOR ORIGIN MODIFICATIONS, SEE DWG. 3
 - FOR WALL TRANSITION DETAILS, SEE DWG. 3
 - FOR DRAIN DETAILS, SEE DWG. 3
 - FOR STAIR DETAILS, SEE DWG. 3
 - FOR SOIL BORING LOGS SEE DWG. 3
 - FOR LAKE HYDROGRAPH SEE DWG. 3
 - STAKES AND GUY WIRES AROUND NOT SHOWN, CONTRACTOR TO MAINTAIN EXTENT OF BRISER ON LAKE BE BEHIND WALL MAY VARY FROM

SCALE: 1" = 30'

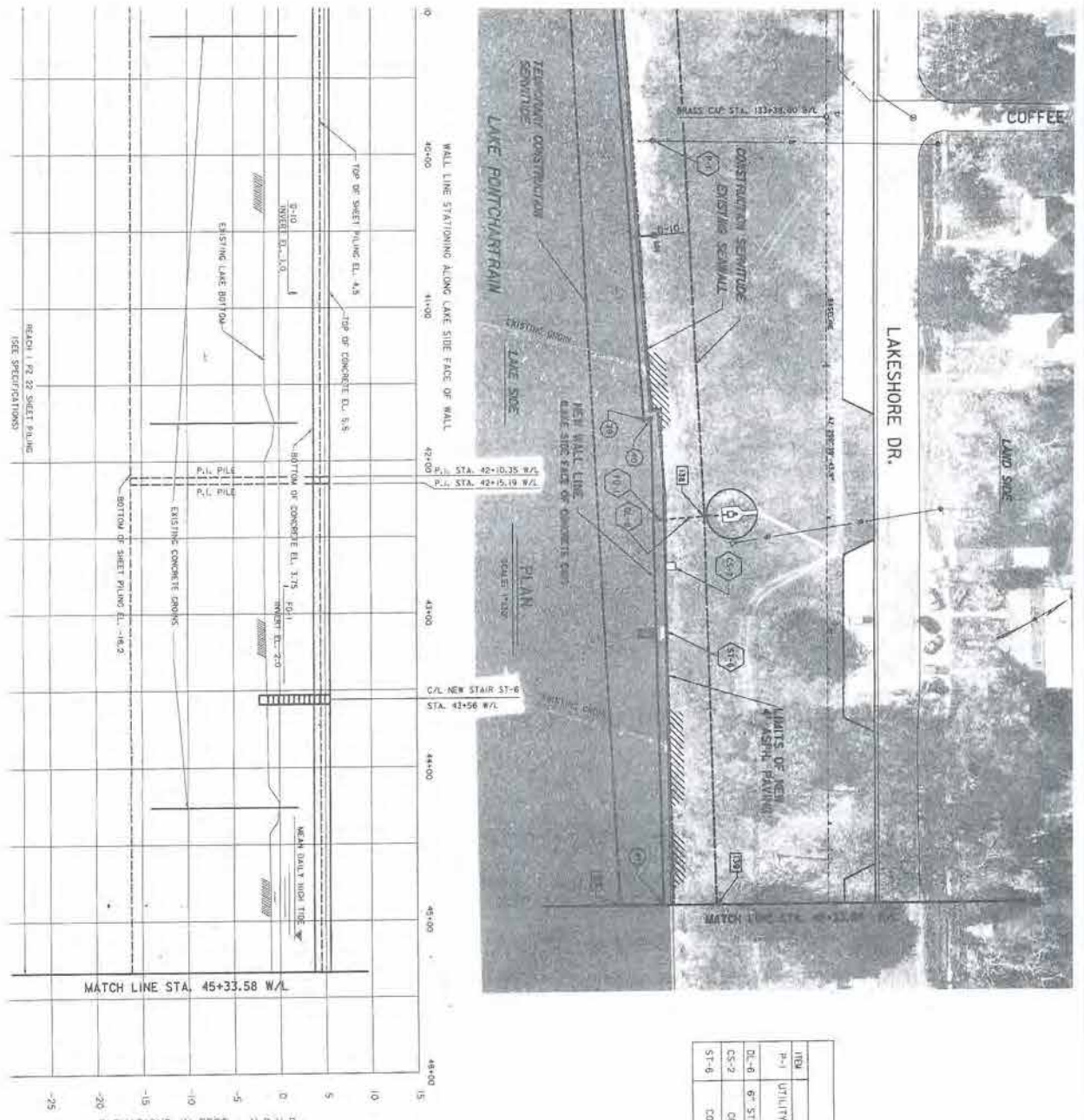
SCALE: 1" = 30'

SCALE: 1" = 30'

U. S. ARMY ENGINEER 1
NEW ORLEANS
NEW ORLEANS

BC Brown Consulting
MANDEVILLE SKAWILL
REPLACEMENT OF WANDRE
ST. TAMMANY PARISH

PLAN AND P



EXISTING FACILITIES

ITEM	DESCRIPTION	BL. STATION	OWNER	DISPOSITION
P-1	UTILITY POLE & GUY WIRE W/O/P LINE	133+51.5	CLECO	OWNER RELOC.
DL-6	6" STEEL DRAIN LINE	135+98.8	CITY OF MANDEVILLE	CONTR. RELOC.
CS-2	CONCRETE SLAB	138+11.2	CITY OF MANDEVILLE	CONTR. REMOVE
ST-6	CONCRETE STEPS	158+14.8	CITY OF MANDEVILLE	CONTR. REMOVE

CONSTRUCTION SERVIDUDE		TEMPORARY CONSTRUCTION SERVIDUDE	
P.I. NO.	STATION	P.I. NO.	STATION
137	132+25.0	115	132+25.0
138	135+98.0	116	138+52.0
139	138+52.0	117	138+52.0

NOTES:

- FOR GENERAL NOTES, SEE DWG. 2
- FOR LEGEND, SEE DWG. 3
- FOR DRAIN MODIFICATIONS, SEE DWG. 24
- FOR WALL TRANSITION DETAILS, SEE DWG. 75
- FOR DRAIN DETAILS, SEE DWG. 26
- FOR STAIR DETAILS, SEE DWG. 27
- FOR SOIL BORING LOGS, SEE DWG. 30
- FOR LAKE HYDROGRAPH, SEE DWG. 31
- STAKES AND GUY WIRES AROUND SMALL TREES NOT SHOWN, CONTRACTOR TO MAINTAIN.
- EXTENT OF RIPRAP ON LAKE BOTTOM AND DEBRIS BERMED WALL MAY VARY FROM THAT SHOWN.

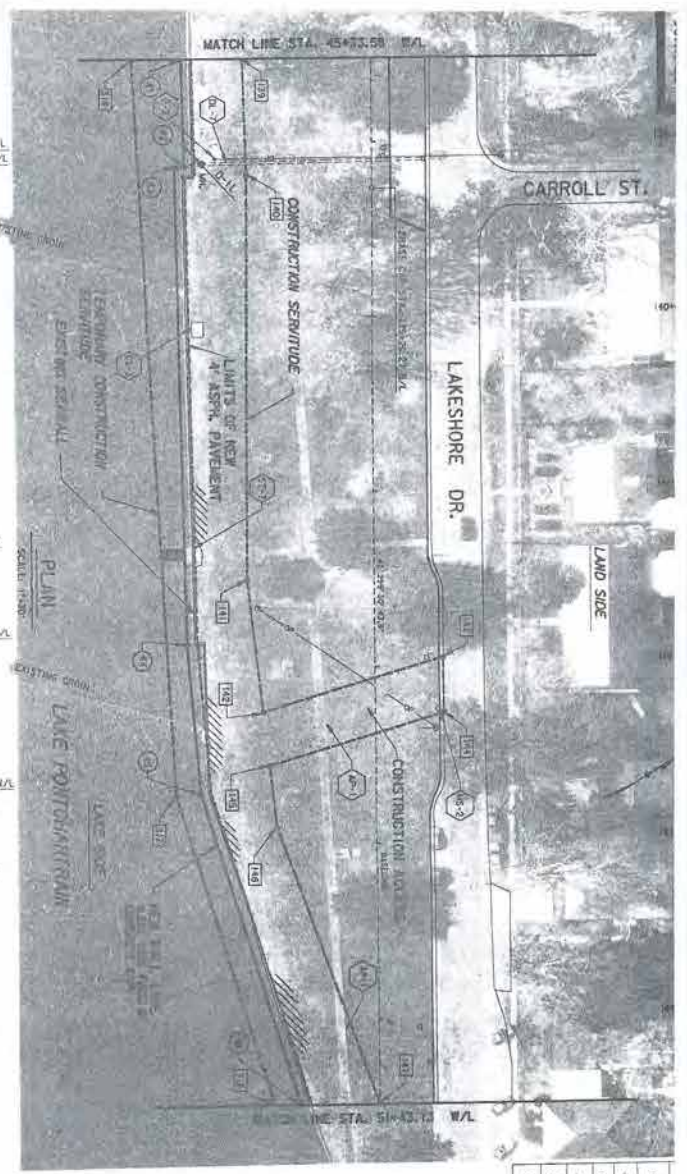
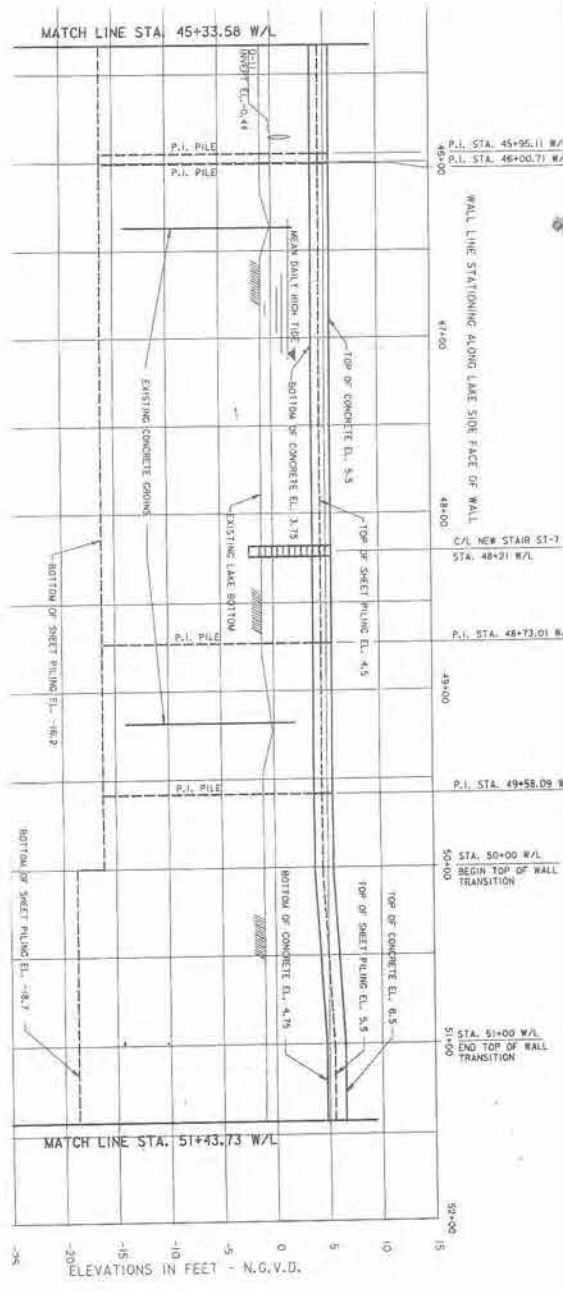
SCALE: 1" = 30'

SCALE: 1" = 5'

Brown Cunningham Gornuch
 ENGINEERS - ARCHITECTS - CONSULTANTS
 11 S. ARMY ENGINEER DISTRICT, NEW ORLEANS
 CORPUS OF ENGINEERS
 NEW ORLEANS, LOUISIANA

REPLACEMENT OF LAKEVILLE SEAWALL
 ST. TAMMANY PARISH, LOUISIANA

PLAN AND PROFILE
 STA. 39+00.22 W/L TO STA. 45+33.58 W/L



NO.	STATION	DESCRIPTION	RT.	WIDTH
41	138+52.00	RT.	45-51.58	
42	139+13.51	RT.	45-95.11	
43	139+13.86	RT.	46-00.71	
44	141+95.90	RT.	48+73.01	
45	142+10.70	RT.	49-58.09	
46	144+48.00	RT.	51+43.73	

NO.	STATION	DESCRIPTION	RT.	WIDTH
127	144+48.00	D.O.		

EXISTING FACILITIES

ITEM	DESCRIPTION	OWNER	DATE
AP-1	ASPHALT PAVEMENT	CITY OF MANDEVILLE	142+14 TO 142+44
P-2	UTILITY POLE W/2P LINE	DECO	139+08.7
DL-7	24" CLAY PIPE DRAIN LINE	CITY OF MANDEVILLE	139+18.6
CS-3	CONCRETE SLAB	CITY OF MANDEVILLE	140+08.1
ST-7	CONCRETE STEPS	CITY OF MANDEVILLE	141+35.2
MS-2	METAL SIGN & POST	CITY OF MANDEVILLE	142+24.8
AP-1	ASPHALT PAVEMENT	CITY OF MANDEVILLE	143+85 TO 144+49

- CONTRACTOR TO REPAIR CONSTRUCTION DAMAGE DENOTES CONSTRUCTION SERVICE P.I. NO. DENOTES WALL LINE P.I. NUMBERS

- NOTES:**
- FOR GENERAL NOTES, SEE DWG. 2
 - FOR LEGEND, SEE DWG. 3
 - FOR ORIGIN MODIFICATIONS, SEE DWG. 24
 - FOR WALL TRANSITION DETAILS, SEE DWG. 4
 - FOR DRAIN DETAILS, SEE DWG. 26
 - FOR STAIR DETAILS, SEE DWG. 27
 - FOR SOIL BORING LOGS SEE DWG. 29
 - FOR LAKE HYDROGRAPH, SEE DWG. 31
 - STATES AND GUY WIRES AROUND SMALL, FE NOT SHOWN, CONTRACTOR TO MAINTAIN, AND EXTENT OF REPAIR ON LAKE BOTTOM AND BEHIND WALL, MAY VARY FROM THAT SHOWN

SCALE: 1" = 30'

SCALE: 1" = 5'

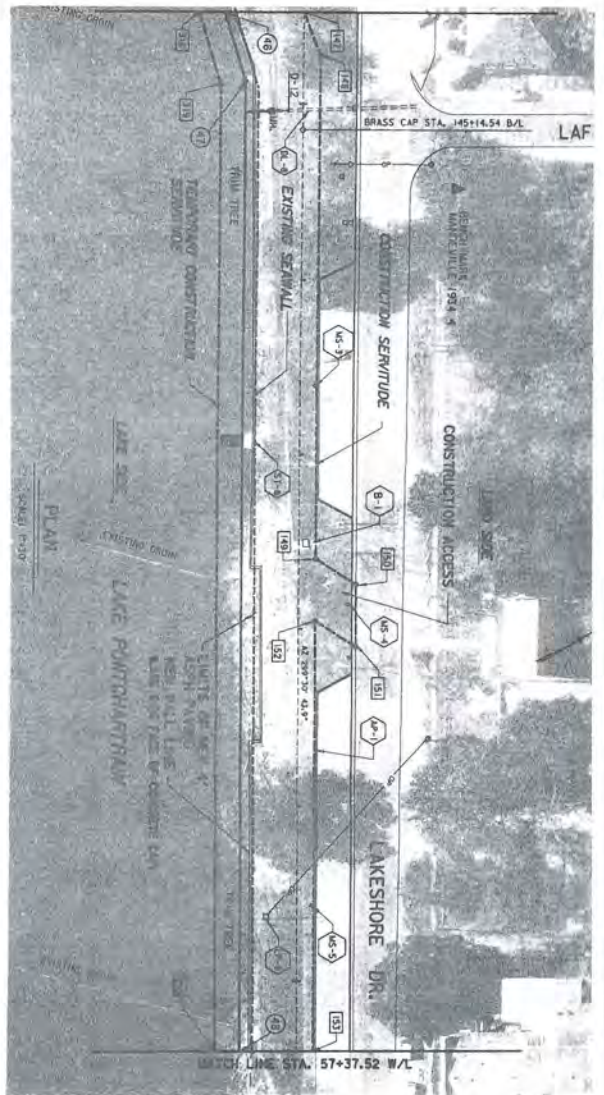
BROWN CUNTI
 ENGINEER & ARCHITECT
 1100 W. 11TH ST. SUITE 100
 TAMMANY PARK, LA 70086
 PHONE: (504) 885-1100
 FAX: (504) 885-1101

DR. S. ARMY ENGINEER
 CORPS OF ENGINEERS
 NEW ORLEANS
 DISTRICT OFFICE

UNIVERSITY OF MISSISSIPPI
 SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING
 300 UNIVERSITY BLVD.
 TAMMANY PARK, LA 70086
 PHONE: (504) 885-1100
 FAX: (504) 885-1101

REPLACEMENT OF MANK ST., TAMMANY PARK

PLAN AND



47	144+81.25	32.90	R.I.	51+84.77
48	150+40.00	32.41	R.I.	51+31.52

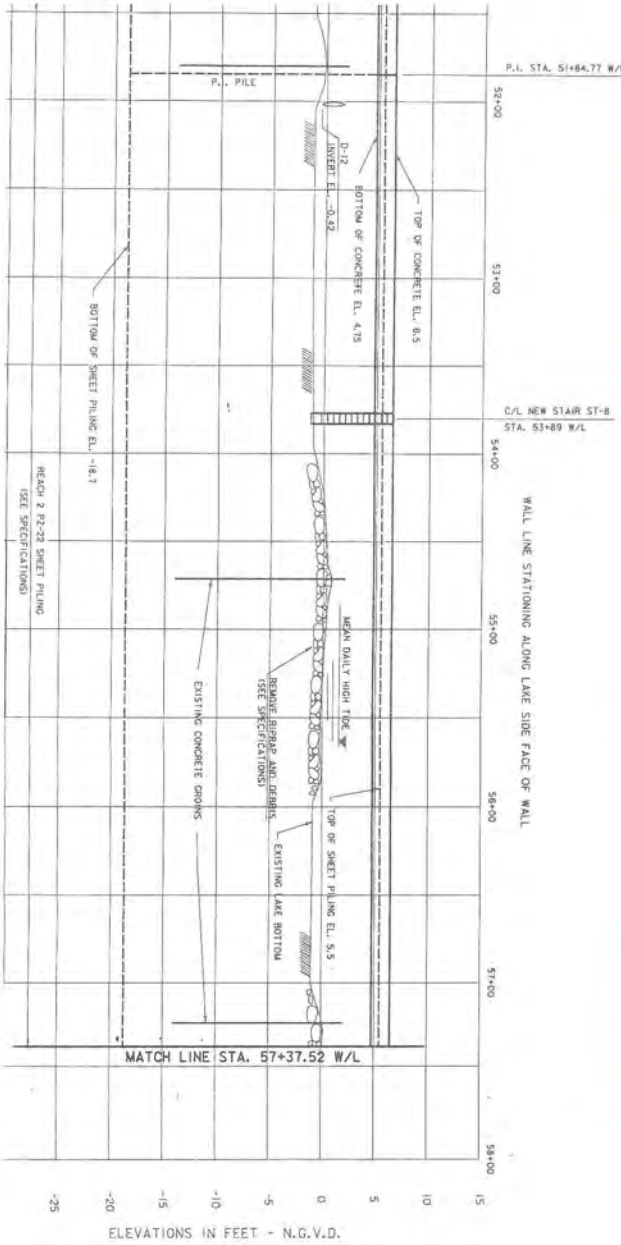
NO.	STATION	PROPOSED	NO.	STATION
147	144+48.0	32.90	318	144+48.0
148	144+52.0	32.90	319	144+52.0
149	147+59.7	32.41	320	150+40.0
150	147+14.8	32.41		
151	147+10.2	32.41		
152	147+10.2	32.41		
153	150+40.0	32.41		

ID#	DESCRIPTION	B/L STATION	OWNER	TI
AP-1	ASPHALT PATH	144+48 TO 150+40	CITY OF MANDEVILLE	0
DL-8	24" CLAY PIPE DRAIN LINE	145+04.1	CITY OF MANDEVILLE	0
MS-3	METAL SIGN & POST	148+80.9	CITY OF MANDEVILLE	0
ST-8	CONCRETE STEPS	146+91.9	CITY OF MANDEVILLE	0
B-1	WOODEN BENCH	147+51	CITY OF MANDEVILLE	0
MS-4	METAL SIGN & POST	147+86.1	CITY OF MANDEVILLE	0
MS-5	METAL SIGN & POST	149+56.7	CITY OF MANDEVILLE	0
LP-8	LIGHT POLE W/O P LINE	149+82.8	CLECO	0

CONTRACTOR NOT TO DISTURB
 CONTRACTOR TO REPAIR CONSTRUCTION DAMAGE
 DENOTES CONSTRUCTION SERVICE P.I. NUMBERS
 DENOTES WALL LINE P.I. NUMBERS

NOTES:

- FOR GENERAL NOTES, SEE DWG. 2
- FOR LEGEND, SEE DWG. 3
- FOR GROUND MODIFICATIONS, SEE DWG. 24
- FOR WALL TRANSITION DETAILS, SEE DWG. 5
- FOR DRAIN DETAILS, SEE DWG. 28
- FOR STAIR DETAILS, SEE DWG. 27
- FOR SOIL BORING LOGS SEE DWG. 30
- FOR LAKE HYDROGRAPH SEE DWG. 31
- STAKES AND OUF WIPES AROUND SMALL EXTERIOR OF BRIDGE CONTAINED ON THAT MAIN BEHIND WALL MAY VARY FROM THAT SHOWN.



WALL LINE STATIONING ALONG LAKE SIDE FACE OF WALL

SCALE: 1" = 30'

SCALE: 1" = 5'

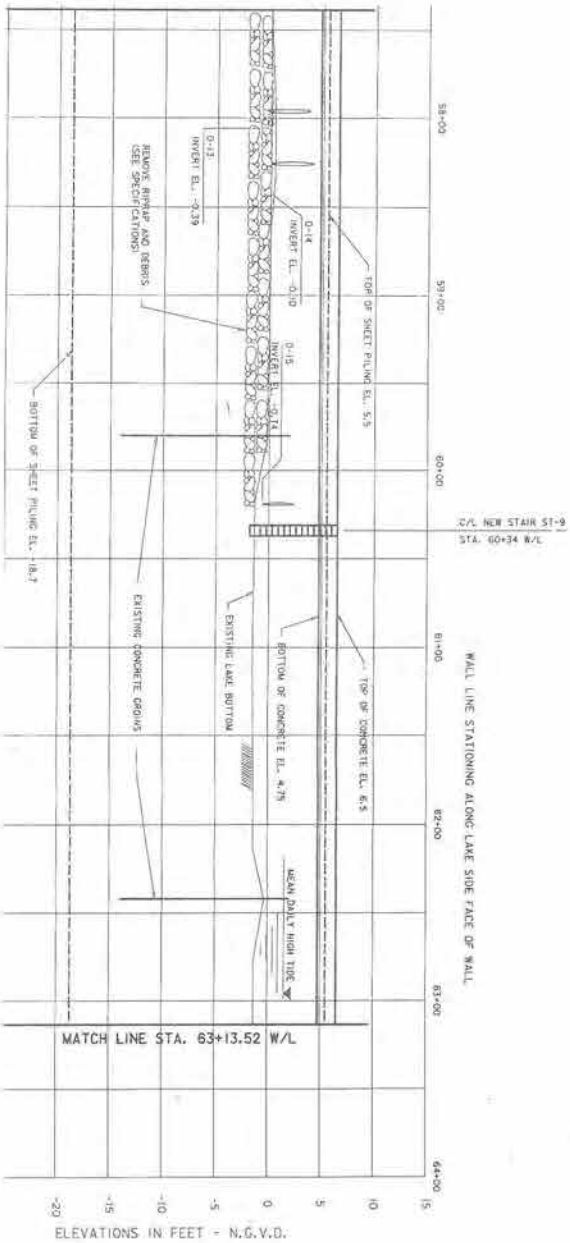
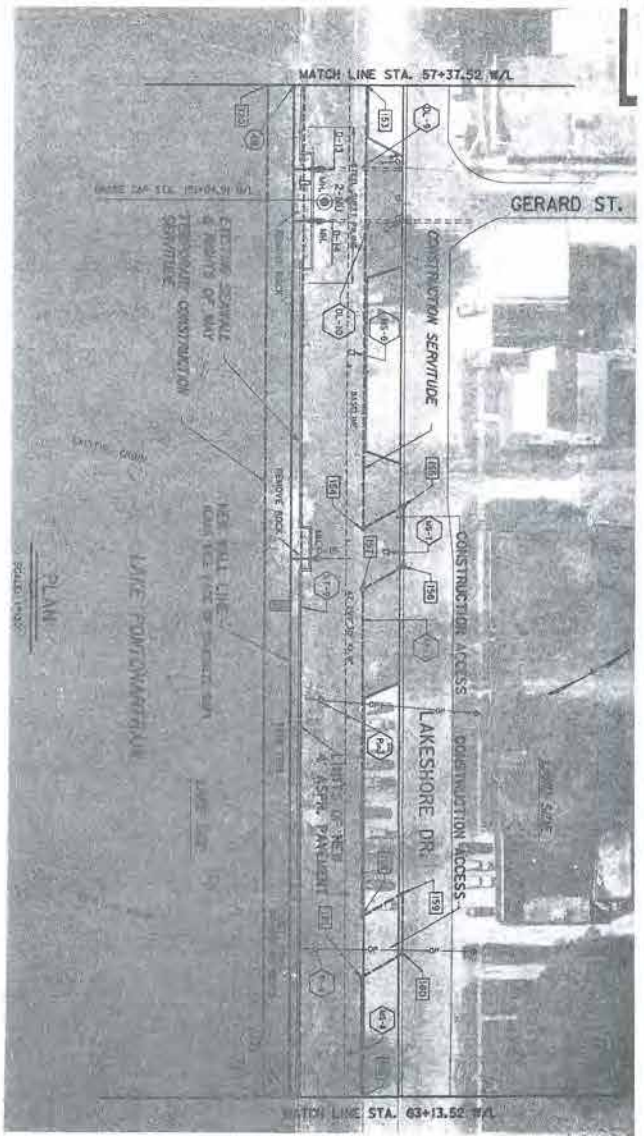
U. S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 NEW ORLEANS, LOUISIANA

Brown Cunningham
 ENGINEERS • ARCHITECTS • CM

REPLACEMENT OF LAKE SHORE DRIVE
 ST. TAMMANY PARISH, LOUISIANA

PLAN AND PROFILE
 STA. 51+43.73 W/L TO STA. 57

REVISION BY: DATE: (NOT SCALE) 2



P.I. NO.	BASELINE STATION	DISTANCE FROM BASELINE	WALL LINE STATION
48	150+40.00	32.41	57+37.52
49	156+18.00	31.91	63+13.52

P.I. NO.	BASELINE STATION	DISTANCE FROM BASELINE	WALL LINE STATION	SEVERITY		LUNGS	
				SEV. I	SEV. II	SEV. I	SEV. II
153	150+40.00	9.6'	130'	150+40.00	150+40.00	150+40.00	150+40.00
154	152+82.9	9.6'	130'	152+82.9	152+82.9	152+82.9	152+82.9
155	152+80.0	32.6'	130'	152+80.0	152+80.0	152+80.0	152+80.0
156	153+42.5	32.6'	130'	153+42.5	153+42.5	153+42.5	153+42.5
157	153+72.2	9.6'	130'	153+72.2	153+72.2	153+72.2	153+72.2
158	153+72.2	9.6'	130'	153+72.2	153+72.2	153+72.2	153+72.2
159	155+00.0	32.7'	130'	155+00.0	155+00.0	155+00.0	155+00.0
160	155+24.7	32.7'	130'	155+24.7	155+24.7	155+24.7	155+24.7
161	155+48.1	9.6'	130'	155+48.1	155+48.1	155+48.1	155+48.1
162	156+16.0	9.6'	130'	156+16.0	156+16.0	156+16.0	156+16.0

ITEM	DESCRIPTION	BY STATION	OWNER	DISTRICT
40-1	ASPHALT PATH	150+40 TO 156+16	CITY OF MANDEVILLE	TO RCM
DL-9	24-CLAY PIPE DRAIN LINE	150+81.5	CITY OF MANDEVILLE	CONTR. 8
DL-10	24-CLAY PIPE DRAIN LINE	151+18.8	CITY OF MANDEVILLE	CONTR. 8
MS-6	METAL SIGN & POST	151+42.1	CITY OF MANDEVILLE	OWNER 2
MS-7	METAL SIGN & POST	151+46.1	CITY OF MANDEVILLE	OWNER 2
ST-9	CONCRETE STEPS	153+26.3	CITY OF MANDEVILLE	CONTR. 8
P-3	UTILITY POLE & GUY WIRE	153+90.1	CLECOT	OWNER 2
P-4	UTILITY POLE & GUY WIRE	155+31.7	CLECOT	OWNER 2
MS-8	METAL SIGN & POST	155+91	CITY OF MANDEVILLE	OWNER 2

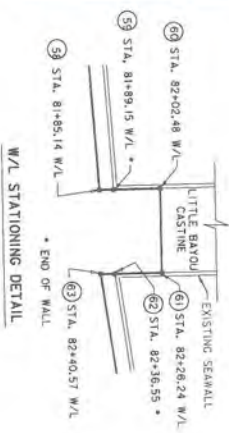
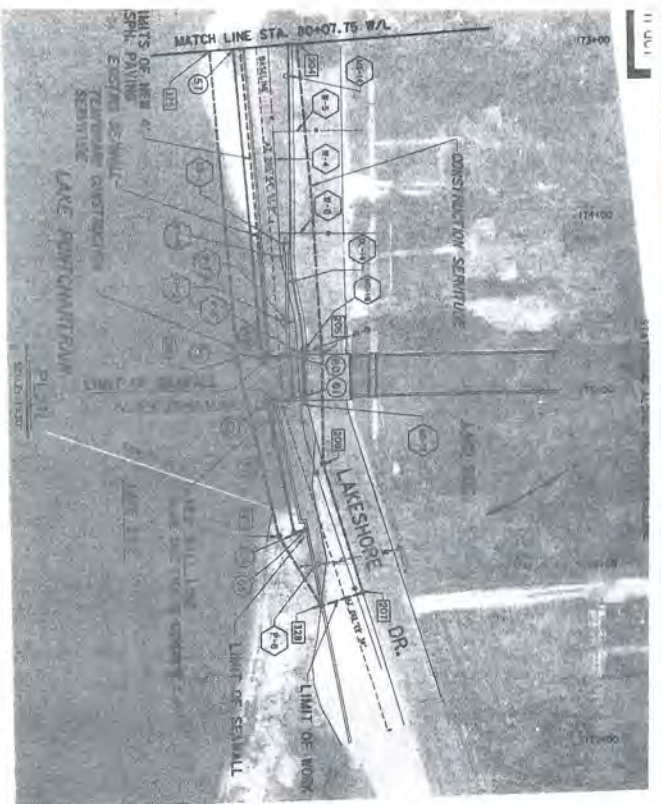
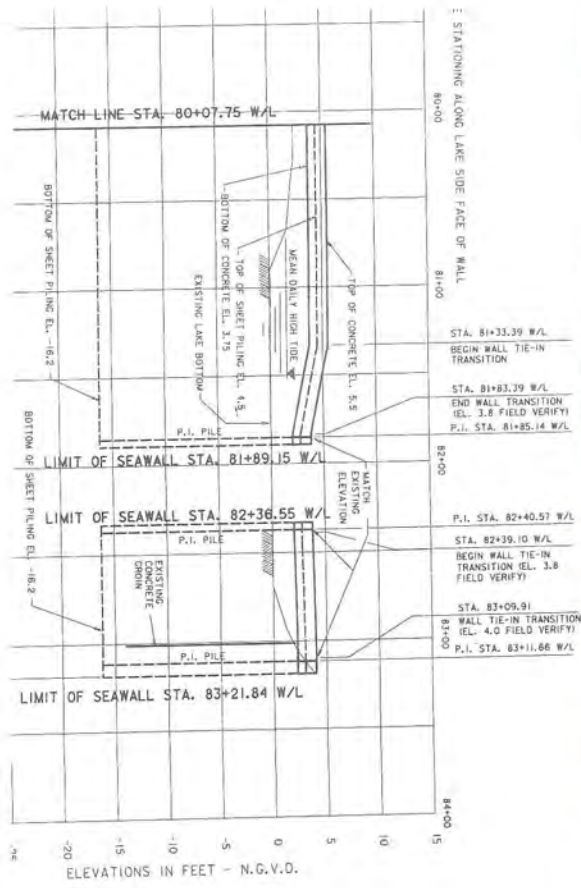
- NOTES:**
- FOR GENERAL NOTES, SEE DWG. 2
 - FOR LEGEND, SEE DWG. 3
 - FOR GRON MODIFICATIONS, SEE DWG. 24
 - FOR WALL TRANSITION DETAILS, SEE DWG. 25
 - FOR DRAIN DETAILS, SEE DWG. 26
 - FOR STAIR DETAILS, SEE DWG. 27
 - FOR SOIL BORING LOGS SEE DWG. 30
 - FOR LAKE HYDROGRAPH SEE DWG. 31
 - STAKES AND GUY WIRES AROUND SMALL TREES NOT SHOWN, CONTRACTOR TO MAINTAIN.
 - EXTENT OF RIPRAP ON LAKE BOTTOM AND DEBRIS BEHIND WALL MAY VARY FROM THAT SHOWN.

U. S. ARMY ENGINEER DISTRICT
NEW ORLEANS, LA
NEW ORLEANS, LA

Brown Cunningham
 ENGINEERS - ARCHITECTS

REPLACEMENT OF MANDEVILLE ST. TAMMANY PARISH, LOU

PLAN AND PRO



NO.	STATION	BASELINE	STATION
57	173 + 00.00	13.15	RT.
58	174 + 77.37	10.41	RT.
59	174 + 77.01	6.41	RT.
60	174 + 78.41	6.90	L.T.
61	175 + 02.13	5.63	L.T.
62	175 + 02.24	4.68	RT.
63	175 + 02.47	8.70	RT.
64	175 + 76.43	15.94	RT.
65	175 + 76.42	8.98	RT.

* LIMIT OF NEW SEAWALL

ITEM	DESCRIPTION	BL. STATION	OWNER	DE
W-4	8" WATER MAIN	173+00 TO 176+20.7	CITY OF MANDEVILLE	NOT
MS-14	METAL SIGN & POST	173+17.9	CITY OF MANDEVILLE	DM
W-5	2" WATER LINE	173+50.4	CITY OF MANDEVILLE	NOT
W-6	2" WATER LINE	174+08.5	CITY OF MANDEVILLE	NOT
CB-1	CATCH BASIN	174+15.5	CITY OF MANDEVILLE	NOT
DL-14	18" RCP DRAIN LINE	174+18.5 TO 174+18.3	CITY OF MANDEVILLE	NOT
MS-15	METAL SIGN & POST	174+21.1	CITY OF MANDEVILLE	DM
W-7	2" WATER LINE	173+50.4	CITY OF MANDEVILLE	NOT
FH-2	FIRE HYDRANT	174+58.6	CITY OF MANDEVILLE	NOT
MS-16	METAL SIGN & POST	174+75.9	CITY OF MANDEVILLE	DM
P-5	UTILITY POLE & CUY WIRE W/O/P LINE	174+76.5	CITY OF MANDEVILLE	OM
MS-17	METAL SIGN & POST	175+04.2	CITY OF MANDEVILLE	DM
P-6	UTILITY POLE & CUY WIRE W/O/P LINE	175+07.4	CITY OF MANDEVILLE	DM

* CONTRACTOR NOT TO DISTURB

NO.	BL. STATION	DISTANCE FROM BL. STATION	BL. STATION	LINE SIDE
57	173+00.00	13.15	RT.	80 + 07.75
58	174 + 77.37	10.41	RT.	81 + 89.14
59	174 + 77.01	6.41	RT.	81 + 89.15
60	174 + 78.41	6.90	L.T.	82 + 02.48
61	175 + 02.13	5.63	L.T.	82 + 26.24
62	175 + 02.24	4.68	RT.	82 + 36.55
63	175 + 02.47	8.70	RT.	82 + 40.57
64	175 + 76.43	15.94	RT.	83 + 14.88
65	175 + 76.42	8.98	RT.	83 + 21.84

- NOTES:
- FOR GENERAL NOTES, SEE DWG. 2
 - FOR LEGEND, SEE DWG. 3
 - FOR ORIGIN MODIFICATIONS, SEE DWG. 24
 - FOR WALL TRANSITION DETAILS, SEE DWG. 2
 - FOR DRAIN DETAILS, SEE DWG. 26
 - FOR STAIR DETAILS, SEE DWG. 27
 - FOR SOIL BORING LOGS, SEE DWG. 30
 - FOR LAKE HYDROGRAPH, SEE DWG. 31
 - STAKES AND CUY WIRES AROUND SMALL TREES NOT SHOWN, CONTRACTOR TO MAINTAIN EXTENT OF RIPRAP ON LAKE BOTTOM AND DR BEHIND WALL MAY VARY FROM THAT SHOWN.
 - CONTRACTOR NOT TO DISTURB
 - DENOTES CONSTRUCTION SERVICE P.I. NUMBERS
 - DENOTES WALL LINE P.I. NUMBERS

SCALE: 1" = 5'

SCALE: 1" = 30'

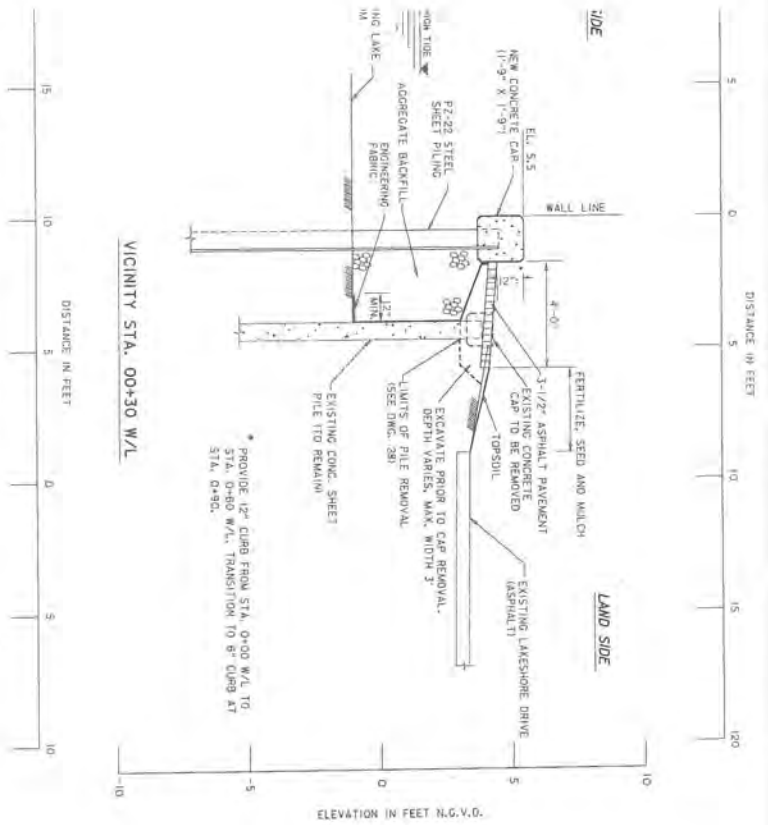
SCALE: 1" = 5'

SCALE: 1" = 30'

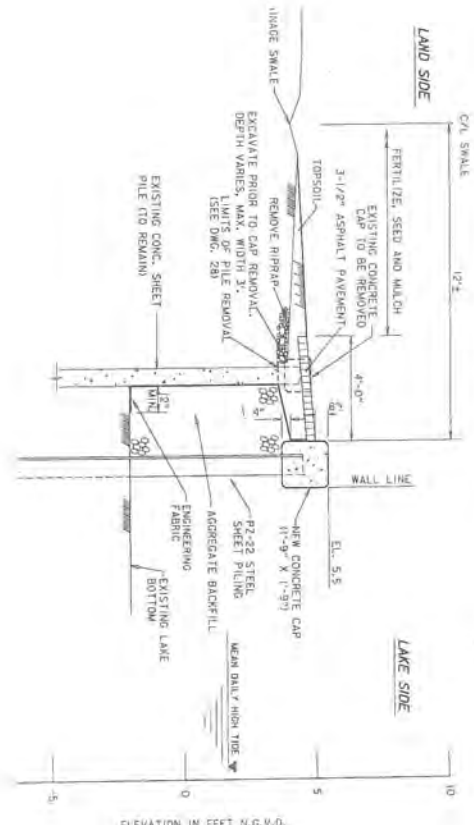
U. S. ARMY ENGINEER DISTRICT
NEW ORLEANS, LOUISIANA

Brown Cunningham
MANDEVILLE SEAWALL, LA
REPLACEMENT OF MANDEVILLE
ST. TAMMANY PARISH, LOUISIANA

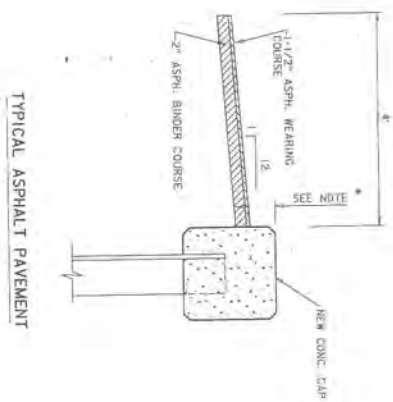
CTA 80+07.75 W/L TO STA.



VICINITY STA. 00+30 W/L



VICINITY STA. 10+00 W/L

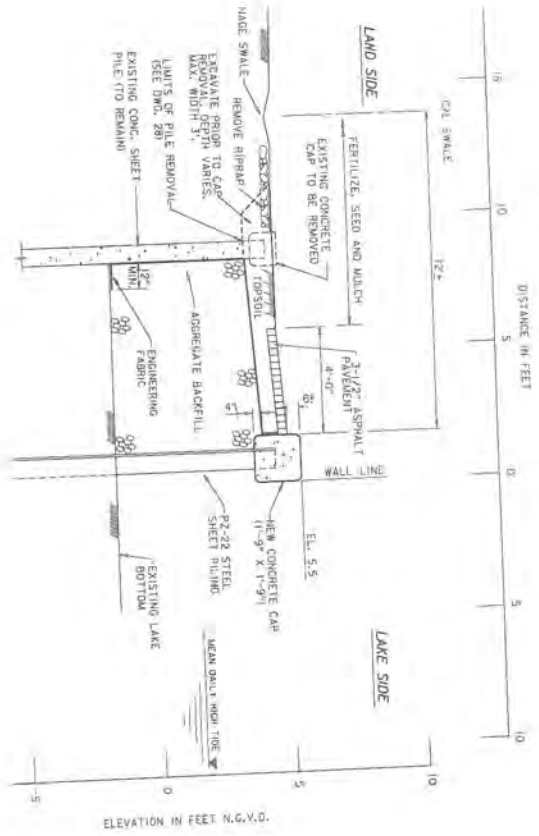
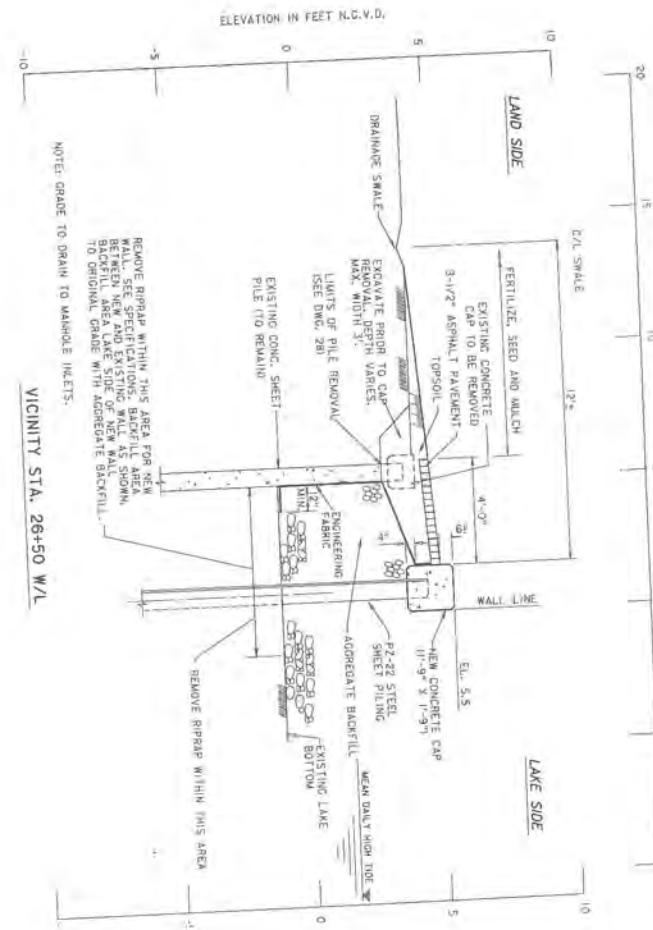
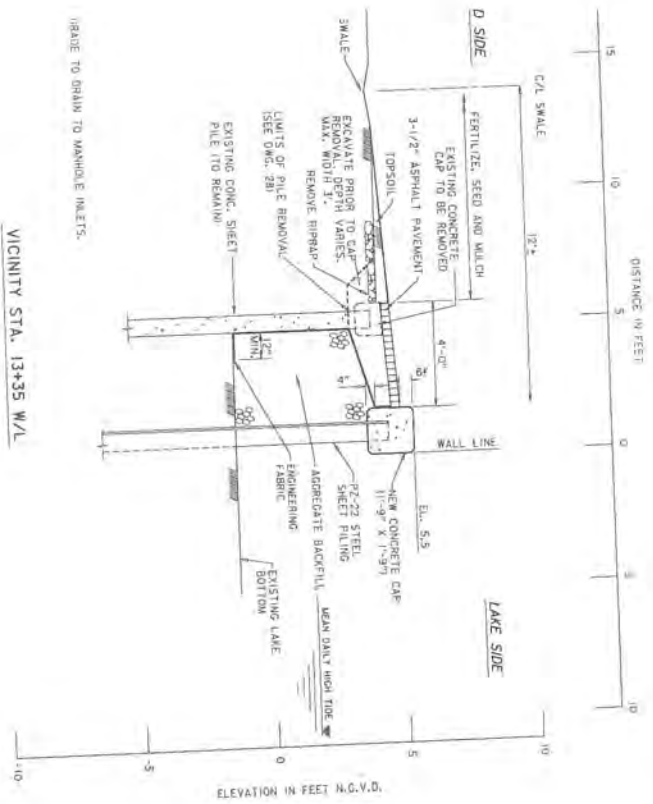


TYPICAL ASPHALT PAVEMENT

Brown Cunningham
 ENGINEERS & ARCHITECTS - ONE
 MANDEVILLE SQUARE, L.A.
 REPLACEMENT OF MANDEVILLE
 ST. TAMMAY PARISH, LOUISIA

SYMBOL	DESCRIPTION

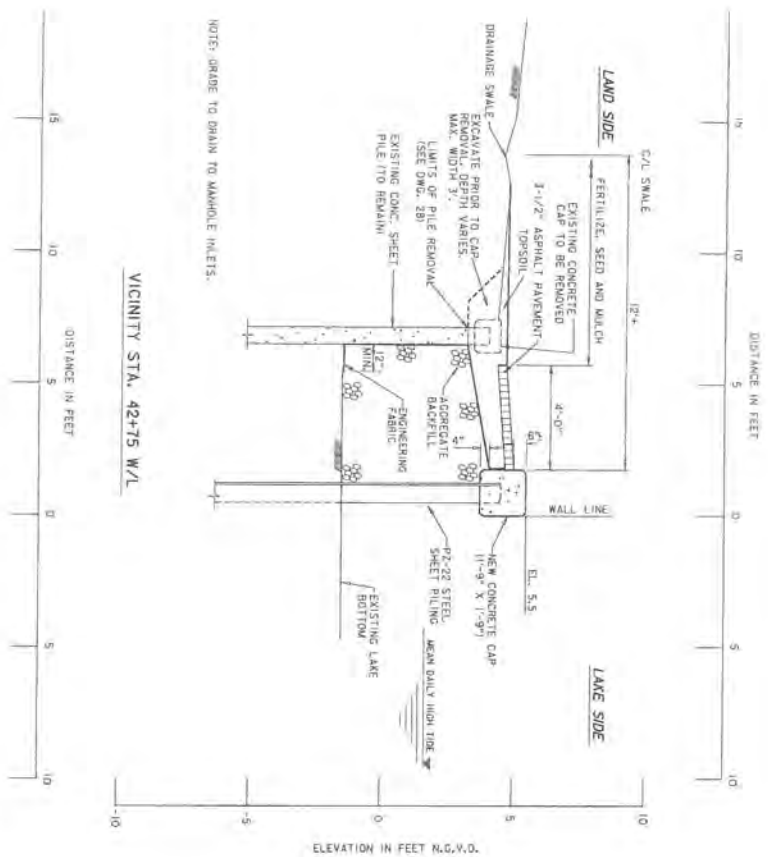




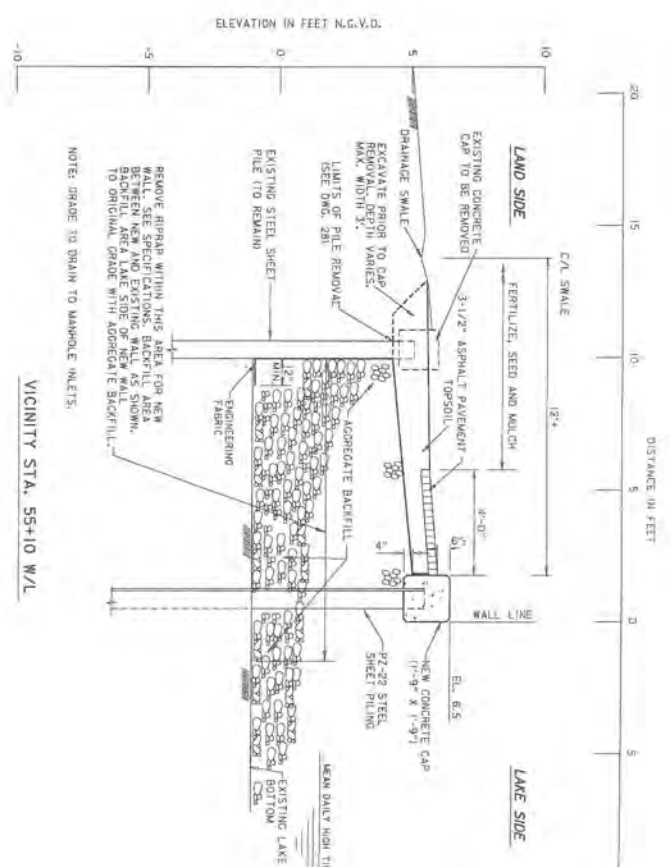
Safety is a Part of Your Contract

SCALE 1" = 2'

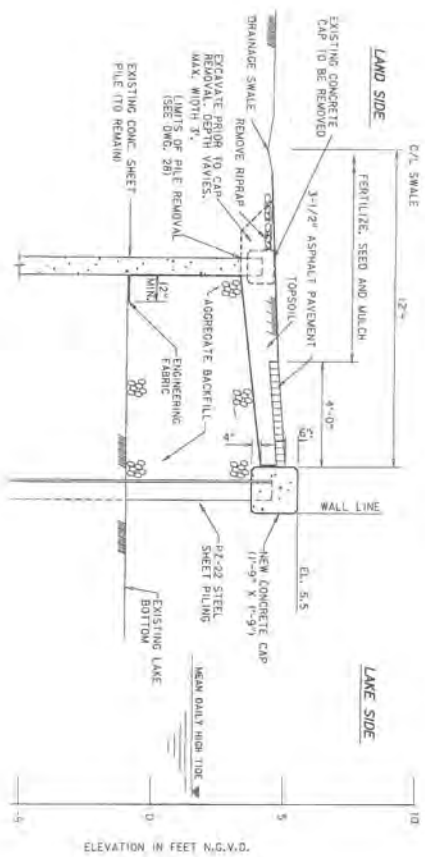
<p>Brown Cunningham INCORPORATED</p>	<p>U. S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS NEW ORLEANS, LOUISIANA</p>
<p>MANCHESTER, LOUISIANA ENGINEER - PROJECTS - 1008</p>	<p>REPLACEMENT OF MANDEVILLE ST. TAMMANY PARISH, LOUISIANA TYPICAL SECTION 13+35 W/L TO STA. 26+50 W/L</p>



VICINITY STA. 42+75 W/L



VICINITY STA. 55+10 W/L



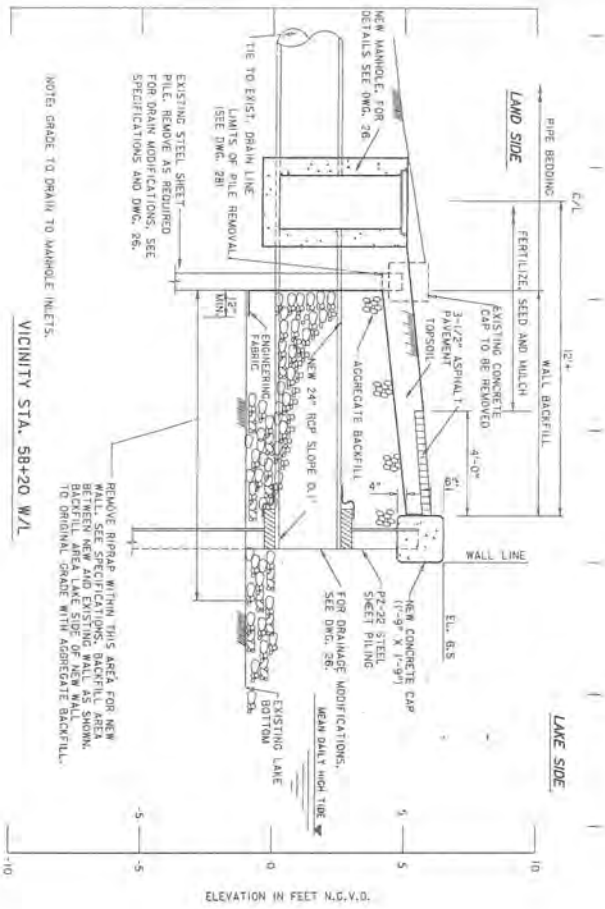
ELEVATION IN FEET N.G.V.D.



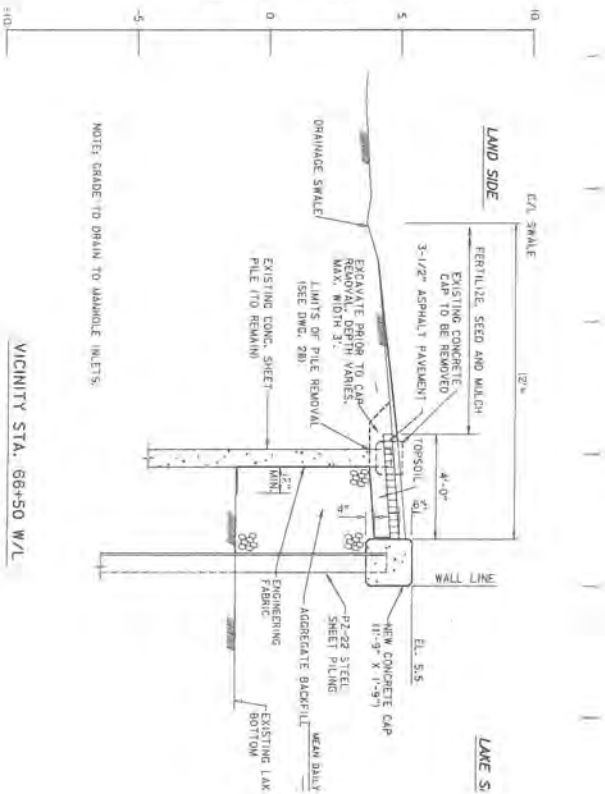
ELEVATION IN FEET N.G.V.D.

Safety is a Part of Your Contract

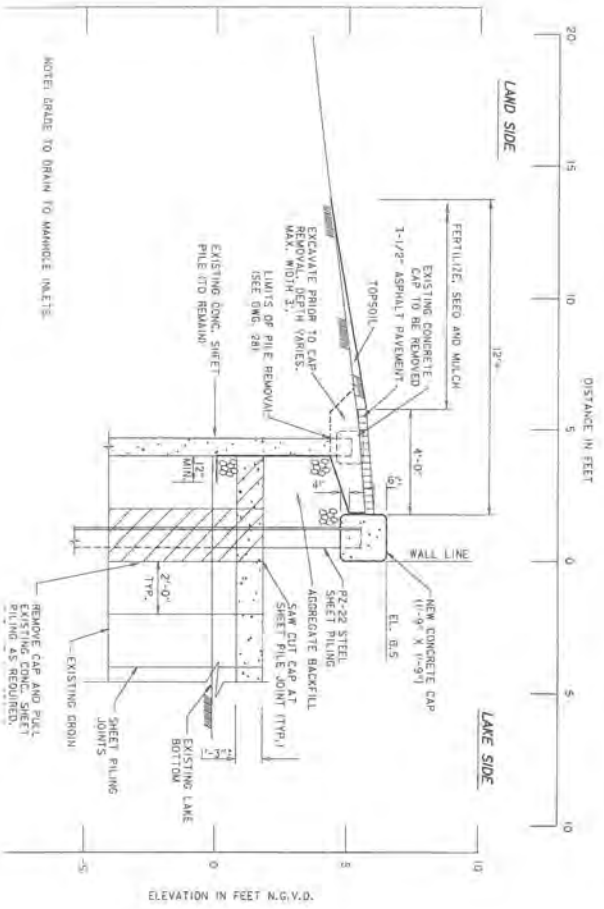

Brown & Cummings
 CONSULTING ENGINEERS
 11 S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 NEW ORLEANS, LOUISIANA 70119
 PHONE: 504-586-1131
 FAX: 504-586-1132
 WWW.BROWN-CUMMINGS.COM
 REPLACEMENT OF MANDEVILL



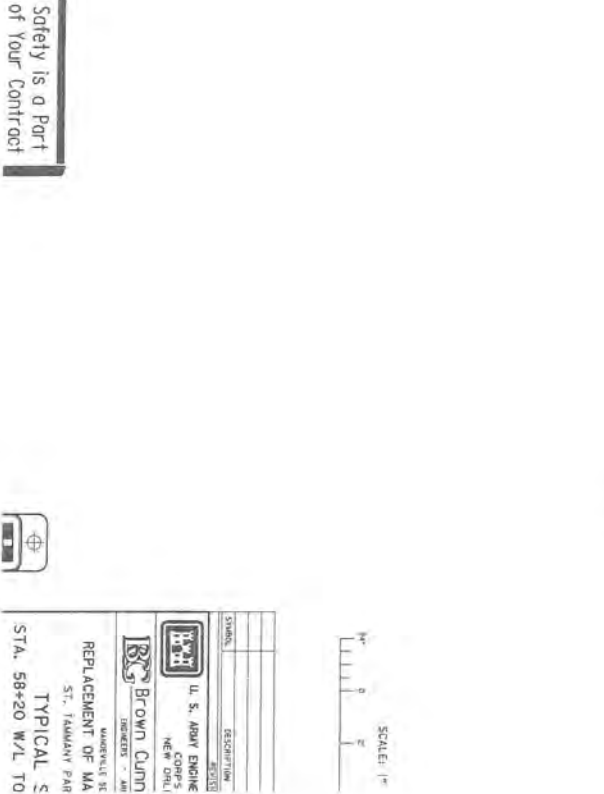
VICINITY STA. 58+20 W/L



VICINITY STA. 58+20 W/L



VICINITY STA. 58+20 W/L



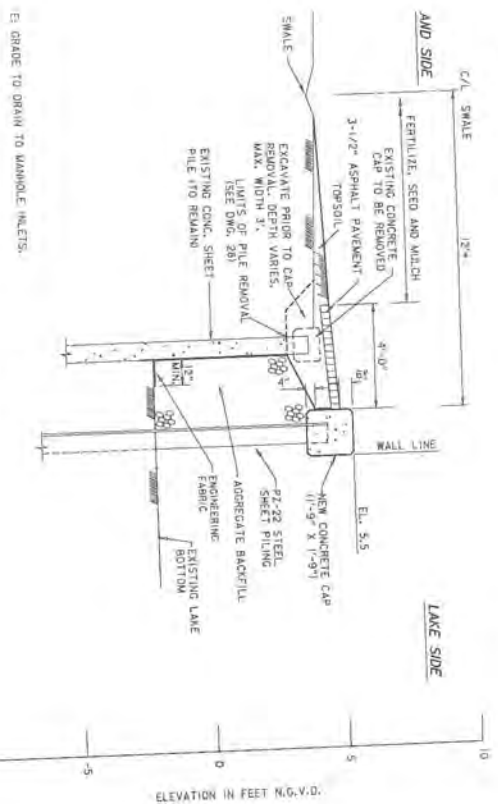
VICINITY STA. 58+20 W/L

Safety is a Part of Your Contract

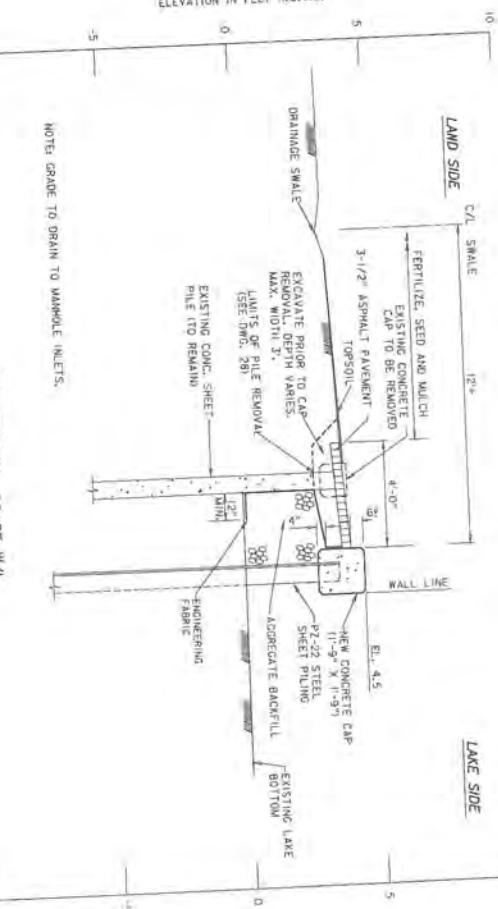


SYMBOL	DESCRIPTION
	EXISTING CONCRETE CAP
	NEW CONCRETE CAP
	EXISTING STEEL SHEET PILING
	NEW STEEL SHEET PILING
	AGGREGATE BACKFILL
	ASPHALT PAVEMENT
	RCP SLOPE DRAIN
	TRENCH
	WALL LINE
	TOPSOIL
	FERTILIZER, SEED AND MULCH
	EXCAVATION
	EXISTING LAKE
	MEAN DAILY HIGH TIDE
	ENGINEERING FABRIC
	SHEET PILING JOINTS
	SHEET PILING BOTTOM
	EXISTING GROUND
	REMOVE CAP AND BACKFILL
	SHEET PILING JOINTS
	SHEET PILING BOTTOM
	EXISTING GROUND

U. S. ARMY ENGINEERING CENTER
BROWN CUNN
 CORP.
 NEW ORLEANS, LA
 DIRECTOR - AM
 WASHINGTON, DC
 REPLACEMENT OF WALL
 ST., TAMMANY PAR
 TYPICAL S
 STA. 58+20 W/L TO



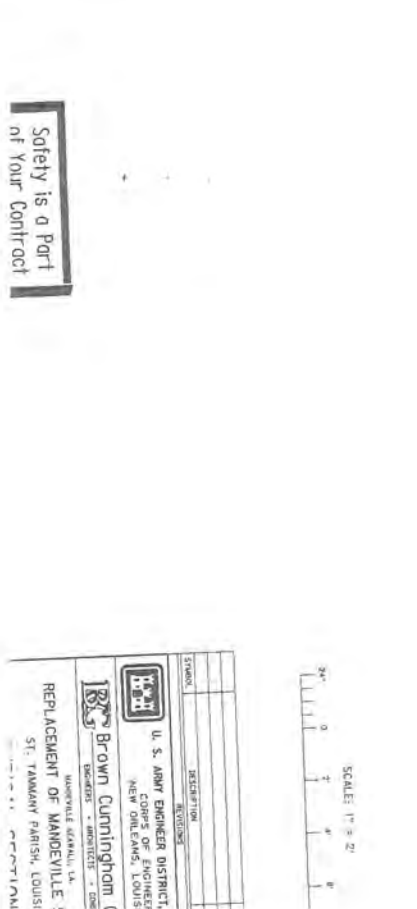
VICINITY STA. 72+25 W/L



VICINITY STA. 82+85 W/L



VICINITY STA. 72+25 W/L

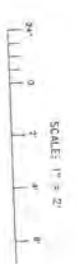


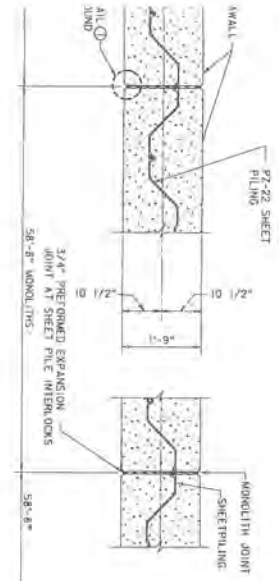
VICINITY STA. 82+85 W/L

NO.	REVISION	DATE

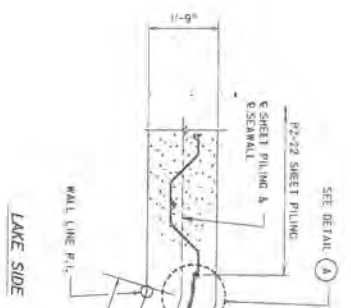
U. S. ARMY ENGINEER DISTRICT,
 CORPS OF ENGINEERS
 NEW ORLEANS, LOUISIANA
Brown Cunningham
 ENGINEERS - ARCHITECTS - SURVEYORS
 1225 MARSHALL SQUARE, L.A.
 NEW ORLEANS, LOUISIANA 70114
 REPLACEMENT OF MANDEVILLE
 ST. TAMMANY PARISH, LOUISIANA

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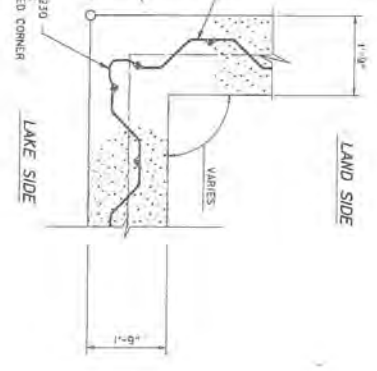




TYPICAL SEAWALL MONOLITH AT SHEET PILE INTERLOCKS
N.T.S.

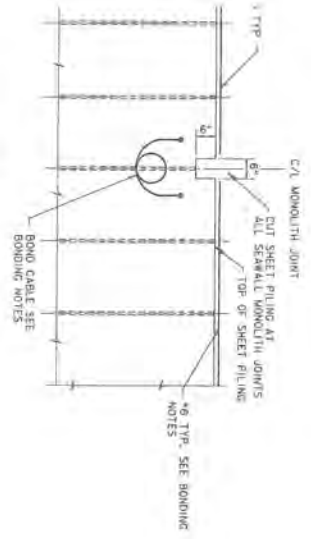


TYPICAL SHEET PILING LAYOUT AT POINTS OF INTERSECTION
N.T.S.

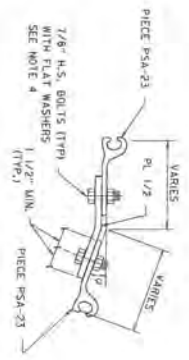


SHEET PILE NOTES:

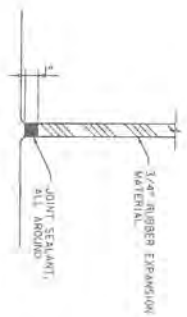
1. A MINIMUM OF 6 INCHES OF CONCRETE COVER SHALL BE PROVIDED OVER SHEET PILING AT ALL POINTS.
2. HOLES CUT IN STEEL SHEET PILING FOR PASSING REINFORCING BARS SHALL NOT EXCEED 2'-2\"/>



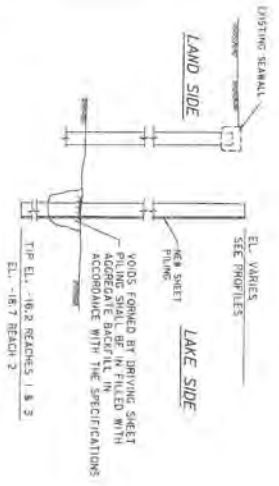
LAND SIDE ELEVATION SHEET PILING DETAILS SEAWALL MONOLITH JOINTS
SCALE 3/4\"/>



DETAIL D TYPE L BENT CORNER
SCALE 3\"/>



DETAIL D
SCALE 3\"/>



LAND SIDE ELEVATION SHEET PILING DETAILS
SCALE 3/4\"/>

BONDING NOTES:

#6 REINFORCING BARS TO BE WELDED TO THE TOP OF EACH STEEL SHEET PILE. #6 REINFORCING BARS SHALL NOT EXTEND ACROSS THE MONOLITH JOINT. INSTALL BOND CABLE ON THE LAND SIDE OF THE MONOLITH JOINT. BOND CABLE SHALL HAVE AN 8\"/>

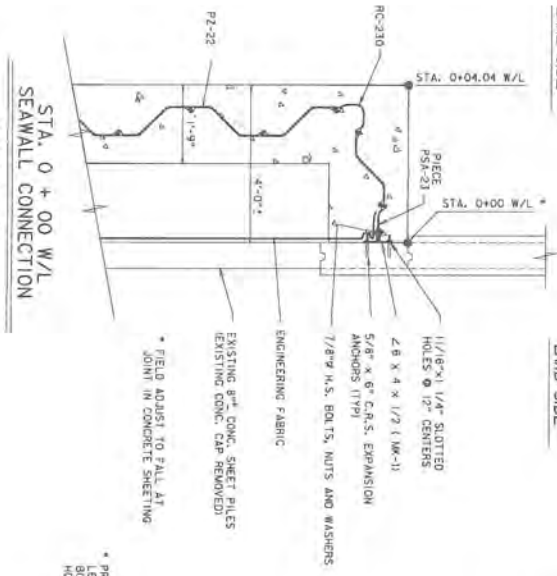


NO.	REVISION	DATE	BY

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS, LOUISIANA
 Brown Cunningham Gonucci
 ENGINEER - ARCHITECT - CONSULTANTS
 REPLACEMENT AND REPAIR OF SEAWALL
 ST. MANVILLE, LOUISIANA

LAKE SIDE

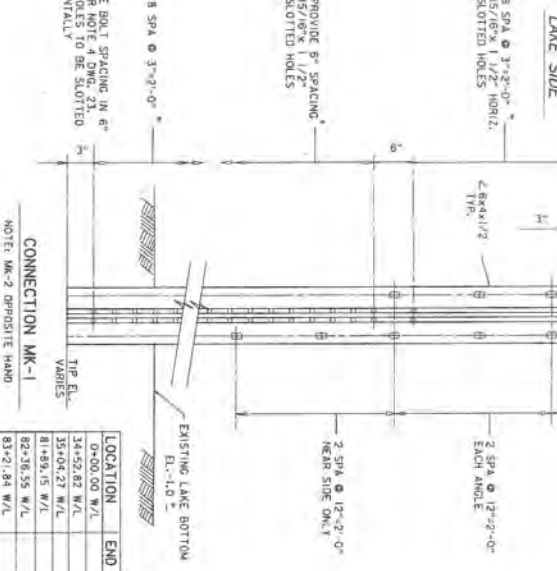
LAND SIDE



NOTE: CONNECTION AT W/L STATION 0+53.15, 82+36.55 AND 83+21.84 SIMILAR

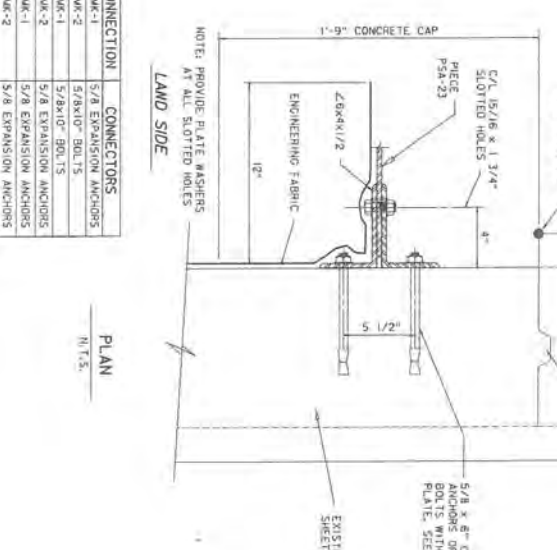
STA. 0 + 00 W/L
SEAWALL CONNECTION
SCALE: 3/4" = 1'-0"

LAKE SIDE



NOTE: MK-2 OPPOSITE HAND

CONNECTION MK-1
SCALE: 1/2" = 1'-0"



PLAN
N.T.S.

LAKE SIDE

LAND SIDE



NOTE: CONNECTION AT W/L STATION 0+53.15, 82+36.55 AND 83+21.84 SIMILAR

STA. 34+52.82 W/L
SEAWALL CONNECTION DETAILS
SCALE: 3/4" = 1'-0"



NOTE: MK-2 OPPOSITE HAND

CONNECTION MK-1
SCALE: 1/2" = 1'-0"



PLAN
N.T.S.

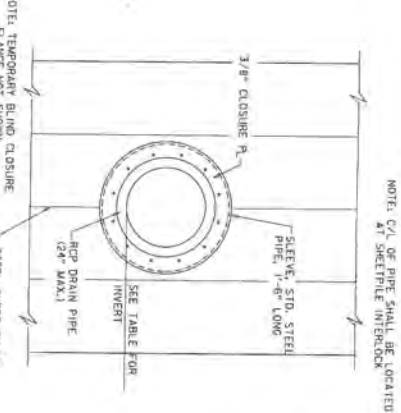
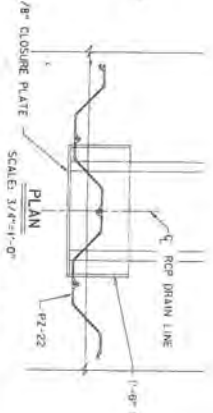
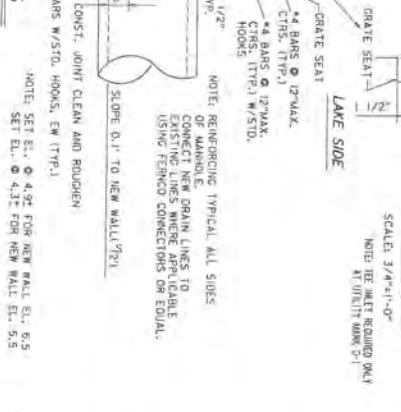
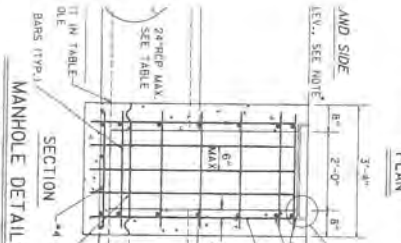
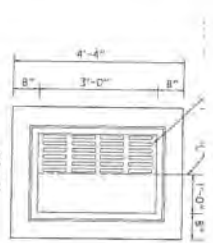
LOCATION	END CONNECTION	CONNECTORS
0+00.00 W/L	MK-1	5/8 EXPANSION ANCHORS
34+52.82 W/L	MK-2	5/8 EXPANSION ANCHORS
35+04.27 W/L	MK-1	5/8 EXPANSION ANCHORS
81+89.15 W/L	MK-2	5/8 EXPANSION ANCHORS
82+36.55 W/L	MK-1	5/8 EXPANSION ANCHORS
83+21.84 W/L	MK-2	5/8 EXPANSION ANCHORS



SECTION
SCALE: 1/2" = 1'-0"

SYMBOL	DESCRIPTION	REVISIONS

Brown Cunningham
 U. S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 NEW ORLEANS, LOUISIANA
 ST. TAMMANY PARISH, LOUISIANA
 PROJECT NO. NCTA



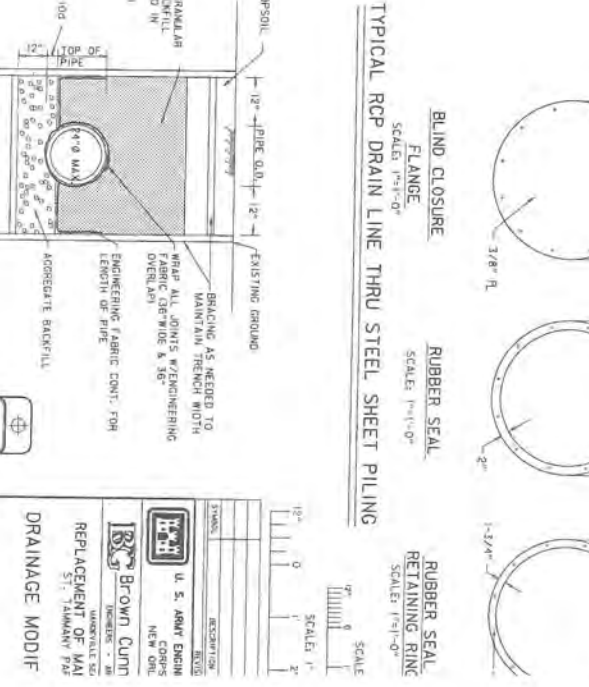
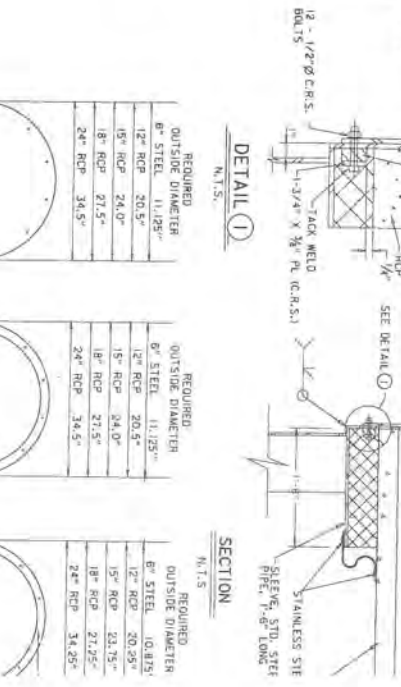
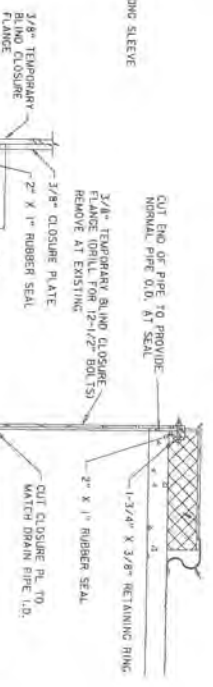
NOTE: AT UTILITY MARK D-13, D-16 AND D-19, THE DRAIN INVERT ON LAND SIDE IS ABOVE MANHOLE INVERT. SEE NOTE 3 BELOW.

SCALE: 3/4"=1'-0"

PIPE TABULATION AND SLEEVE TABLE

UTILITY MARK	APPROX. W/L STA.	EXISTING PIPE SIZE	EXISTING SLOPE	EXISTING INVERT ELEVATION	NEW INVERT ELEVATION	MINIMUM SLEEVE SIZE (INCHES)	CLOSURE FLANGE (INCHES)		RUBBER SEAL (INCHES)	UTILITY NOTES	
							INSIDE DIA.	OUTSIDE DIA.			
D-1	0+54.7	12" VCLAY BOX	-	15.5 RCP	1.5	30	29.25	30	24	20	1
D-2	3+69.2	-	-	15" RCP	-0.58	30	29.25	30	24	20	4
D-3	9+13.0	-	-	15" RCP	-0.55	30	29.25	30	24	20	4
D-4	12+48.3	24" RCP	.0085	-1.00	-1.0	40	39.25	40	34.5	30.5	2
D-5	15+66.0	-	-	18" RCP	-1.07	34	33.25	34	27.5	23.5	4
D-6	18+48.3	24" VCLAY	.0055	-1.22	-1.22	40	39.25	40	34.5	30.5	2
D-7	23+78.4	-	-	24" RCP	1.14	40	39.25	40	34.5	30.5	4
D-8	26+89.8	-	-	18" RCP	1.07	34	33.25	34	27.5	23.5	4
D-9	31+83.8	-	-	12" RCP	0.90	24	23.25	24	20.5	16.5	5
D-10	40+90.2	-	-	12" RCP	0.82	24	23.25	24	20.5	16.5	5
D-11	45+85.6	24" VCLAY	.0036	-0.44	-0.44	40	39.25	40	34.5	30.5	2
D-12	52+04.8	24" VCLAY	.0034	-0.29	-0.29	40	39.25	40	34.5	30.5	2
D-13	57+98.6	24" VCLAY	.0017	0.15	0.15	40	39.25	40	34.5	30.5	3
D-14	58+25.6	24" VCLAY	-	0.35	0.35	40	39.25	40	34.5	30.5	3
D-15	60+18.8	-	-	18" RCP	-0.64	34	33.25	34	27.5	23.5	2
D-16	63+88.3	24" VCLAY	.0052	0.31	0.31	40	39.25	40	34.5	30.5	3
D-17	64+82.7	24" VCLAY	.0005	0.11	0.11	40	39.25	40	34.5	30.5	3
D-18	67+13.8	-	-	15" RCP	-0.09	30	29.25	30	24	20	4
D-19	70+29.7	18" VCLAY	.0111	0.14	0.14	30	29.25	30	24	20	4
D-20	74+50.6	-	-	15" RCP	-0.08	30	29.25	30	24	20	4
D-21	76+83.2	-	-	18" RCP	-0.13	34	33.25	34	27.5	23.5	4
D-22	80+07.3	-	-	15" RCP	-0.52	30	29.25	30	24	20	4
D-23	82.0	6" STEEL	-	2.0'	2.0'	12	12.00	12.75	11.25	7.125	8

1. MANHOLE NOT REQUIRED, USE TEE INLET.
2. PROVIDE MANHOLE, TEE TO EXISTING DRAIN LINE (BY REVERSED ENGINEERING) AS SHOWN.

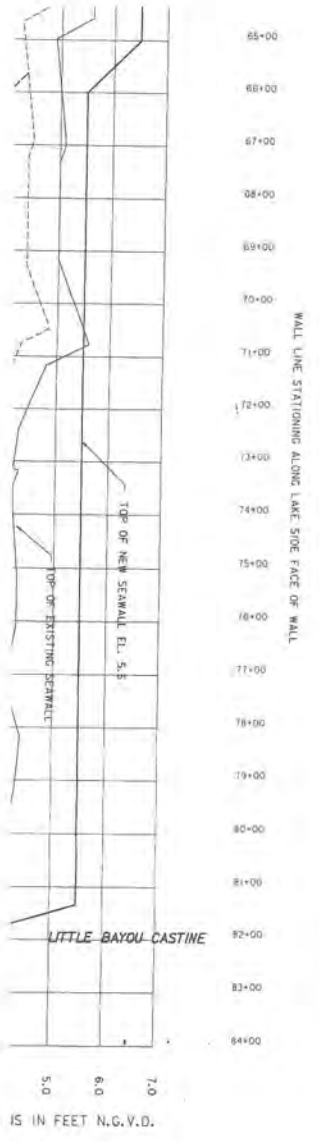
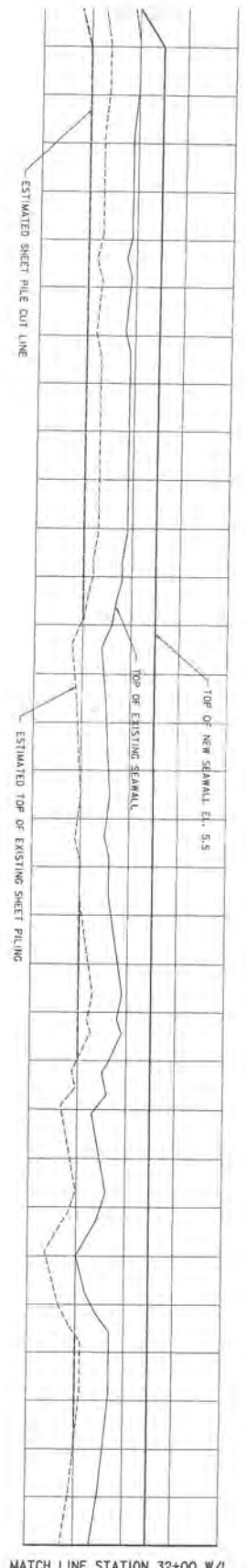


BROWN CUMM
ENGINEERS - ARCHITECTS
REPLACEMENT OF MANHOLE AT STA. 7+14.00
NEW ONE

DRAINAGE MODIF

MATCH LINE STATION 32+00 W/L

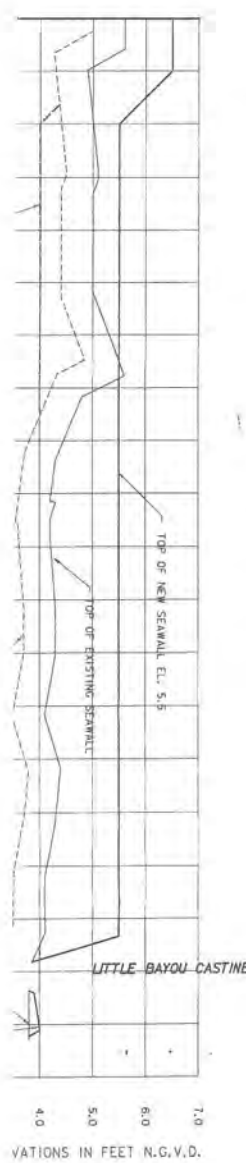
MATCH LINE STATION 64+00 W/L



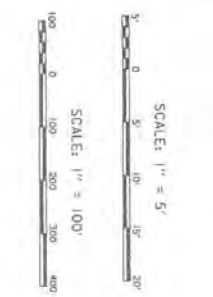
- NOTES:
1. THE TOP OF THE EXISTING SHEET PILING IS ESTIMATED TO BE APPROXIMATELY 6" BELOW THE TOP OF THE EXISTING WALL BUT MAY VARY. FIELD VERIFY.
 2. THE ESTIMATED SHEET PILE CUT LINE IS BASED ON PROVIDING A MINIMUM OF 6" FINISH ON THE EXISTING FINISHED GRADERS AND A FULL SCOPE OF 1" ON 12" FOR DRAINAGE.
 3. IN LOCALIZED AREAS AND AT WALL TERMINATIONS ADDITIONAL SHEETPILE REMOVAL MAY BE REQUIRED TO PROVIDE 6" OF FILL COVER.
 4. WALL REMOVAL SHALL BE ACCOMPLISHED IN A CONTROLLED MANNER.



SYMBOL	DESCRIPTION
	11. S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW ORLEANS, LOUISIANA
	Brown Cunningham Co.



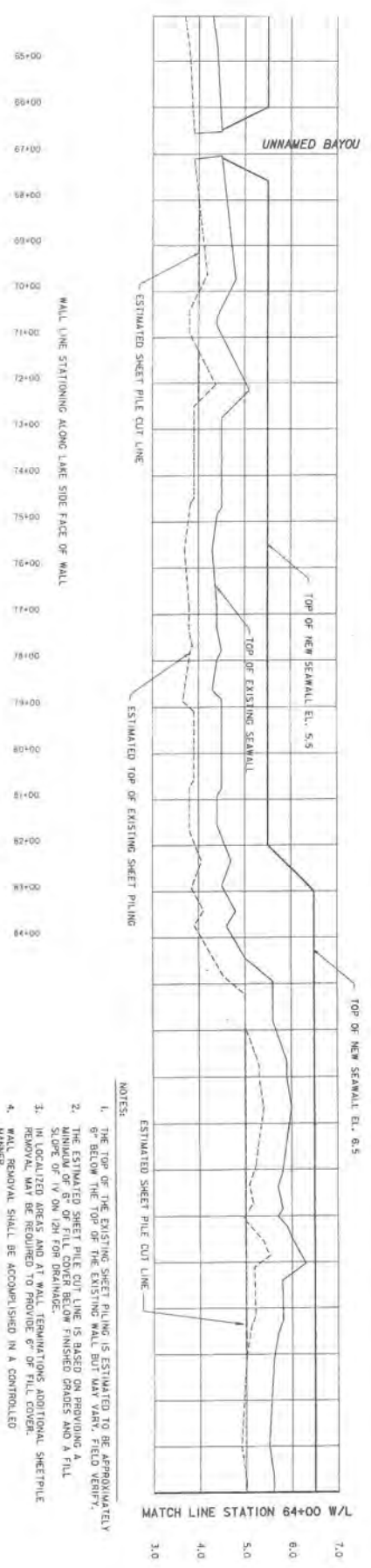
VARIATIONS IN FEET N.G.V.D.



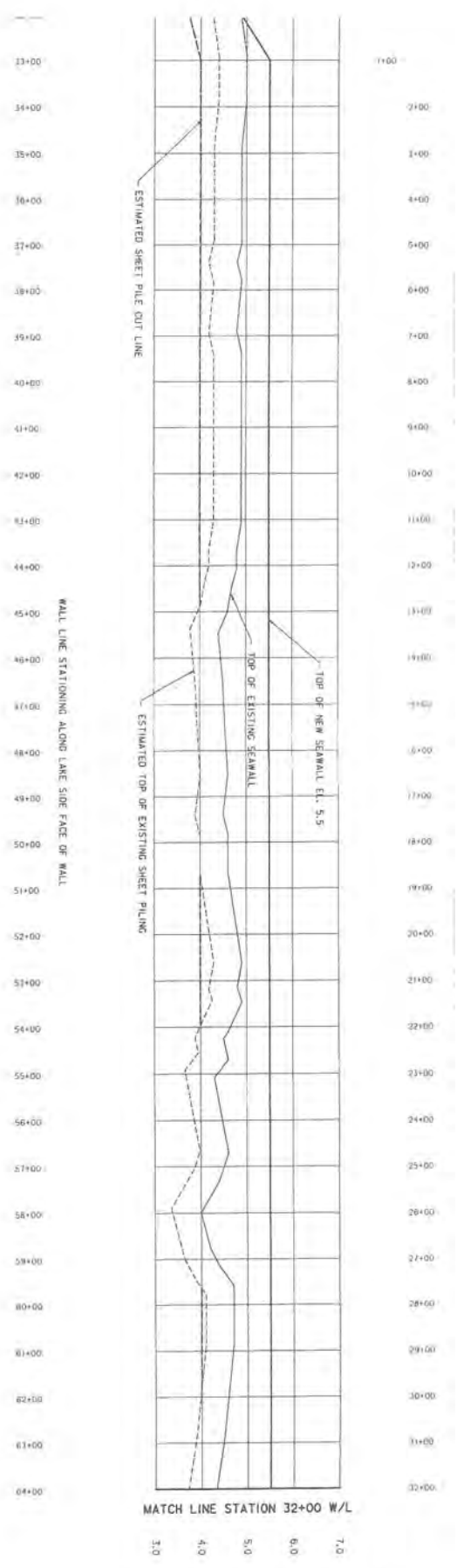
REPLACEMENT OF MANDEVILL
 ST. TAMMANY PARISH, LOU.

Brown, Cunningham & Associates, Inc.
 ENGINEERS - ARCHITECTS

11 S. JERRY ENGINEERS DISTRICT
 CORPUS OF ENGINEERS
 NEW ORLEANS, LA



- NOTES:
1. THE TOP OF THE EXISTING SHEET PILING IS ESTIMATED TO BE APPROXIMATELY 6" BELOW THE TOP OF THE EXISTING WALL, BUT MAY VARY. FIELD VERIFY.
 2. THE ESTIMATED SHEET PILE CUT LINE IS BASED ON PROVIDING A MINIMUM OF 6" OF FILL COVER BELOW FINISHED GRADES AND A FILL SLOPE OF 1V ON 12H FOR DRAINAGE.
 3. IN LOCALIZED AREAS AND AT WALL TERMINATIONS ADDITIONAL SHEETPILE REMOVAL MAY BE REQUIRED TO PROVIDE 6" OF FILL COVER.
 4. WALL REMOVAL SHALL BE ACCOMPLISHED IN A CONTROLLED MANNER.



MATCH LINE STATION 32+00 W/L

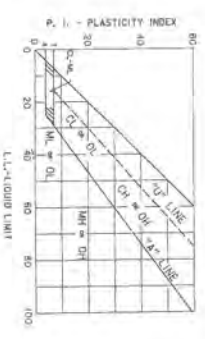
UNIFIED SOIL CLASSIFICATION

ALDR DIVISION	TYPE	TEST SYMBOL	TYPICAL NAMES
CLAY	GC	GC	GRAVEL, well-graded, gravel-in-sand mixtures, little or no fines
GRAVEL	GP	GP	GRAVEL, poorly-graded, gravel-in-sand mixtures, little or no fines
CLAY	GM	GM	SILTY GRAVEL, gravel-in-sand-silt mixtures
GRAVEL	GM	GM	CLAYEY GRAVEL, gravel-in-sand-silt mixtures
CLAY	GC	GC	SAND, well-graded, gravelly sands
GRAVEL	GP	GP	SAND, poorly-graded, gravelly sands
CLAY	GM	GM	SAND, poorly-graded-silt mixtures
GRAVEL	GP	GP	SAND, poorly-graded-silt mixtures
CLAY	GC	GC	CLAYEY SAND, sand-clay mixtures
GRAVEL	GP	GP	CLAYEY SAND, sand-clay mixtures
CLAY	ML	ML	SILT & very fine sand, silty or clayey fine sand or clayey silt with slight plasticity
GRAVEL	ML	ML	LEAN CLAY, sandy clay, silty clay, or loam to medium plasticity
CLAY	OL	OL	ORGANIC SILTS, and organic silty clays of low plasticity
GRAVEL	OL	OL	SILT, fine sandy or silty soil with high plasticity
CLAY	MH	MH	FAT CLAY, inorganic clay of high plasticity
GRAVEL	MH	MH	PEAT, and other highly organic soil
CLAY	CH	CH	ORGANIC CLAYS of medium to high plasticity, organic silts
GRAVEL	CH	CH	PEAT, and other highly organic soil
CLAY	OH	OH	PEAT, and other highly organic soil
GRAVEL	OH	OH	PEAT, and other highly organic soil
WOOD	WD	WD	WOOD
SHELLS	SI	SI	SHELLS
NO SAMPLE	NS	NS	No Sample Retrieved

NOTE: Soils possessing characteristics of two groups are designated by combinations of group symbols.

DESCRIPTIVE SYMBOLS

COLOR	SYMBOL	CONSISTENCY FOR COHESIVE SOILS	MODIFICATIONS
YELLOW	I	VEEY SOFT	Traces
RED	R	SOFT	Fine
BLACK	BR	MEDIUM	Medium coarse
GRAY	GR	STIFF	Coarse
LIGHT GRAY	GR	VERY STIFF	Concretions
DARK GRAY	GR	HARD	Blocks
BROWN	BR		Lumpy fragments
LIGHT BROWN	BR		Scale fragments
DARK BROWN	BR		Sandstone fragments
BROWNISH-GRAY	BR		Shell fragments
GRAYISH-BROWN	GR		Organic matter
REDDISH-GRAY	GR		Clay strata or lenses
GRAYISH-RED	GR		Silt strata or lenses
GREEN	GR		Sand strata or lenses
BLUE-GREEN	BL		Sandy
WHITE	WH		Gravelly
MOTTLED	MO		Boulder
			Siltstone
			Wood
			Others



PLASTICITY CHART
For classification of fine-grained soils in accordance with ASTM D 2887

FIGURES TO LEFT OF BORING UNDER COLUMN "W OR D₆"

Are natural water contents in percent dry weight
When underlined, denote σ_{at} at $m \times$
FIGURES TO LEFT OF BORING UNDER COLUMNS "LL" AND "PI"

Are liquid and plastic limits, respectively
SYMBOLS TO LEFT OF BORING

- 1. Ground-water surface and date observed
- 2. Denotes location of consolidation test **
- 3. Denotes location of consolidated-drained direct shear test **
- 4. Denotes location of consolidated-undrained triaxial compression test ***
- 5. Denotes location of unconsolidated-undrained triaxial compression test ***
- 6. Denotes location of sample subjected to consolidation test and each of the above three types of shear test ***
- 7. Denotes free water encountered in boring or sample

FIGURES TO RIGHT OF BORING
Are values of cohesion in lb./sq. ft., from unconfined compression tests
In parentheses are driving resistances in blows per foot determined with a standard SPT sampler (1 3/8" I.D., 2" D.O.) and a 140 lb. driving hammer with a 30" drop

Where underlined with a solid line denotes laboratory permeability in centimeters per second or undisturbed sample
Where underlined with a dashed line denotes laboratory permeability in centimeters per second of sample remolded to the estimated natural solid ratio
* The Dia. size of a soil is the grain diameter in millimeters of which 10% of the soil is finer, and 90% coarser than Dia.

Results of these tests are available for inspection in the U.S. Army Engineer District Office, if these symbols appear beside the boring logs on the drawings.

TYPICAL NOTES:

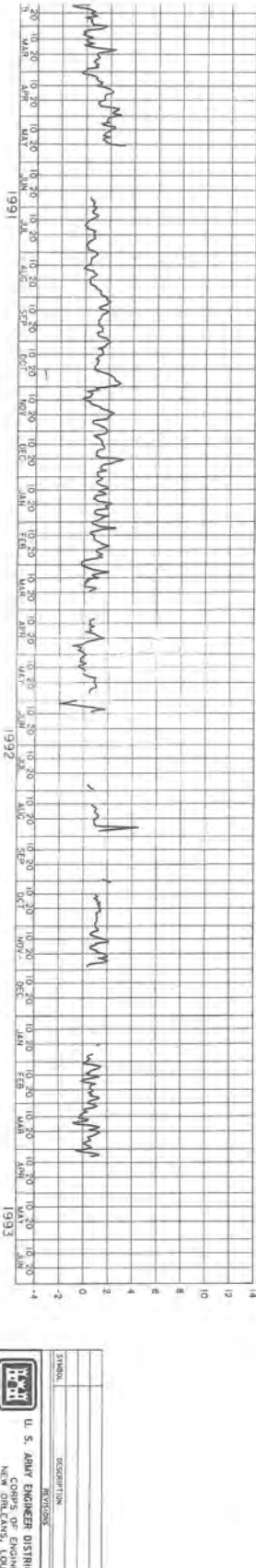
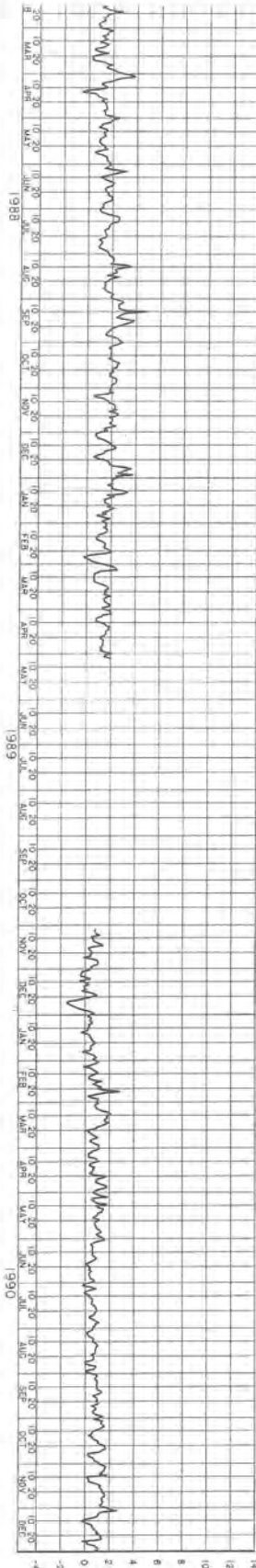
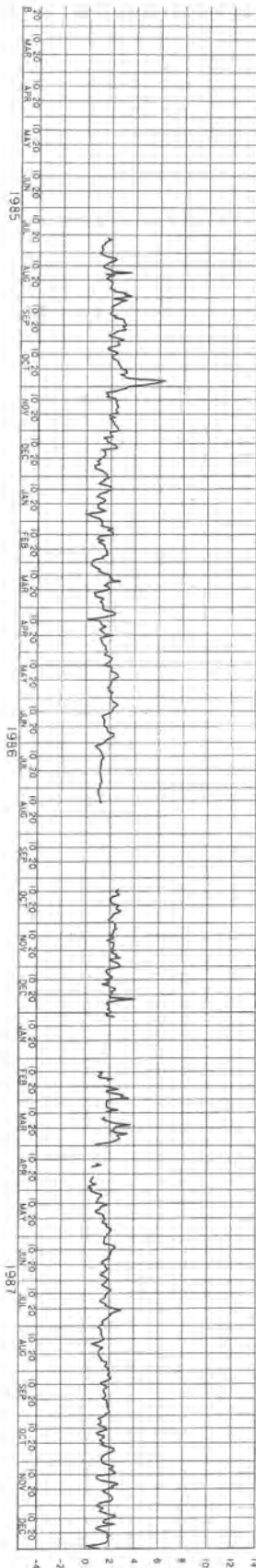
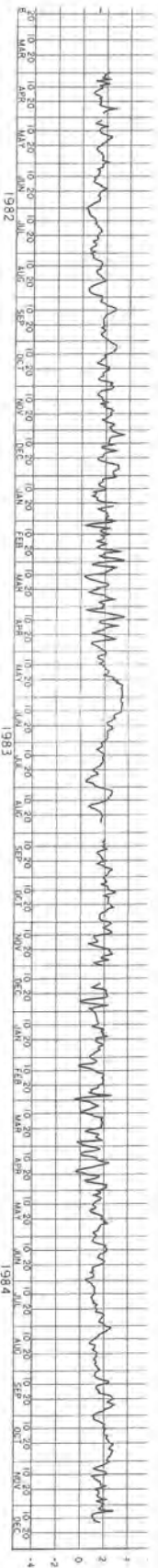
1. While the borings are representative of subsurface conditions of their respective locations and for the five vertical reaches, local variations characteristic of the subsurface materials of the region are not encountered, such variations will not be considered as differing materially within the purview of the clause entitled "Offering Site Conditions".
2. Ground-water elevations shown on the boring logs represent ground-water surfaces encountered in such cases shown. Absence of water surface data on certain borings indicates that no ground-water available from the boring but does not necessarily mean that ground-water will not be encountered at locations or within the vertical reaches of such borings.
3. Consistency of cohesive soils shown on the boring logs is based on driller's log and visual examination is approximate, except within those vertical reaches of the borings where shear strengths from unconfined compression tests are shown.
4. Unless otherwise noted:
 - a. Underlined borings, indicated by the letter "U", are taken with a 5" I.D. Piston Type Sampler.
 - b. General Type borings are taken with a 1 1/2" I.D. Tube Sampler.
 - c. and/or a 1 1/4" I.D. Split Spoon Sampler.



BROWN & CALDWELL
ENGINEERS
125 SOUTH MAIN ST.
ANN ARBOR, MICH.

TAMM
ENGINEERS
1000 W. WASHINGTON ST.
ANN ARBOR, MICH.

U. S. ARMY
ENGINEER DISTRICT
OFFICE
ST. TAMM



NOTE: MEAN DAILY HIGH TIDE E.L. (82 N.C.V.D. PERIOD OF RECORD 1967-1980) IS SHOWN AS A DASHED LINE. THE DATA CONTAINED ON THIS DRAWING IS FOR OPERATIONAL PURPOSES ONLY. WIND DRIVEN WAVES AND TIDES MAY SIGNIFICANTLY AFFECT LAKE PONTCHARTRAIN STAGES AT THE SITE OF THIS WORK.

LAKE PONTCHARTRAIN AT MANDEVILLE, LA. GAGE ZERO IS AT N.C.V.D. (1987 ADJ.)

Safety is a Part of Your Contract

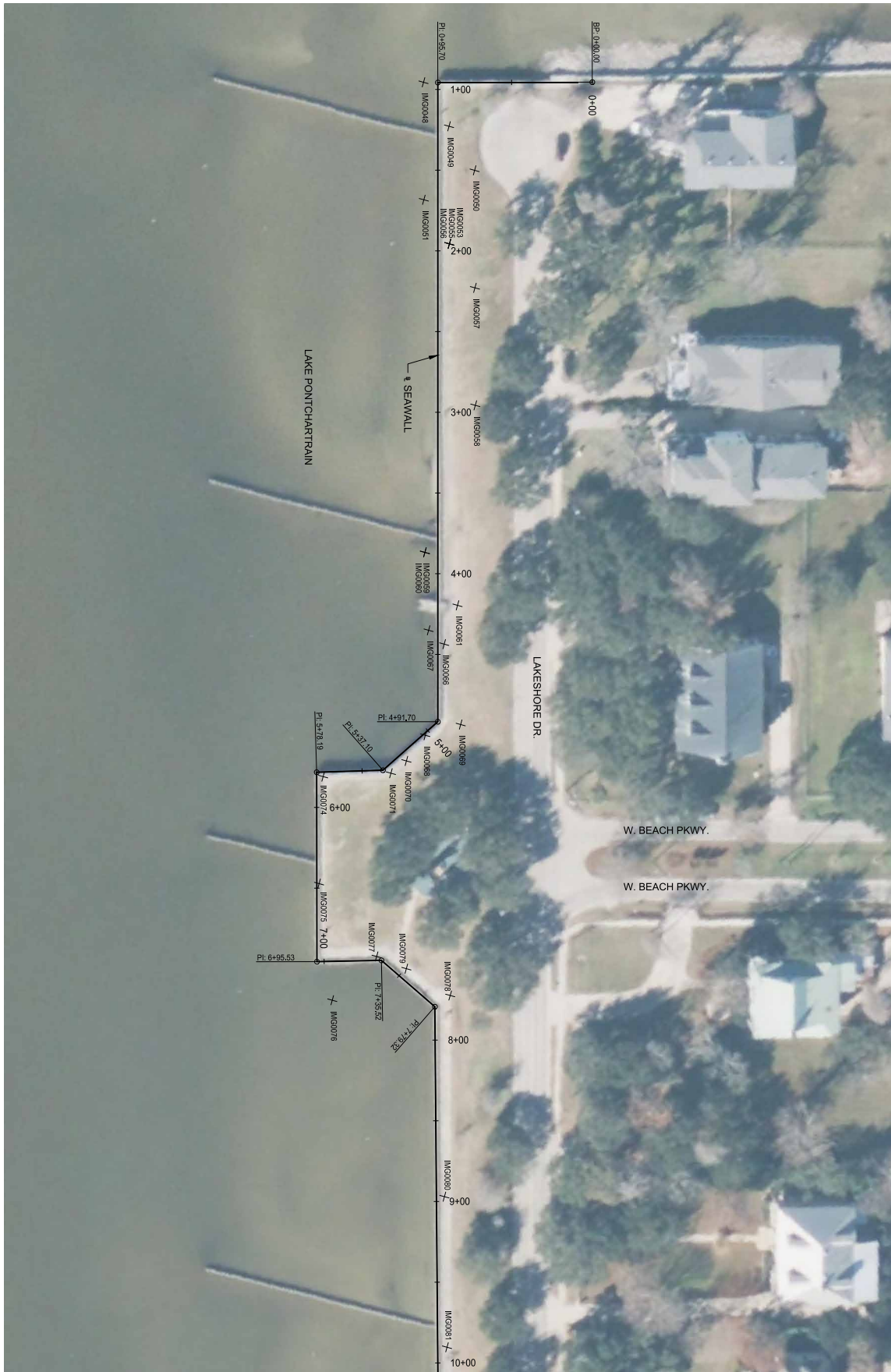


Brown Cunningham Group
 ENGINEERS - ARCHITECTS - CONSULTANTS
 MANDEVILLE SQUARE, L.A.
 REPLACEMENT OF MANDEVILLE SEAWALL
 ST. TAMMANY PARISH, LOUISIANA
 STAGE HYDROGRAPH

DATE: 1/19/94
 DRAWN BY: [Name]

Appendix E

Drawings



PLAN
SCALE: 1" = 30'



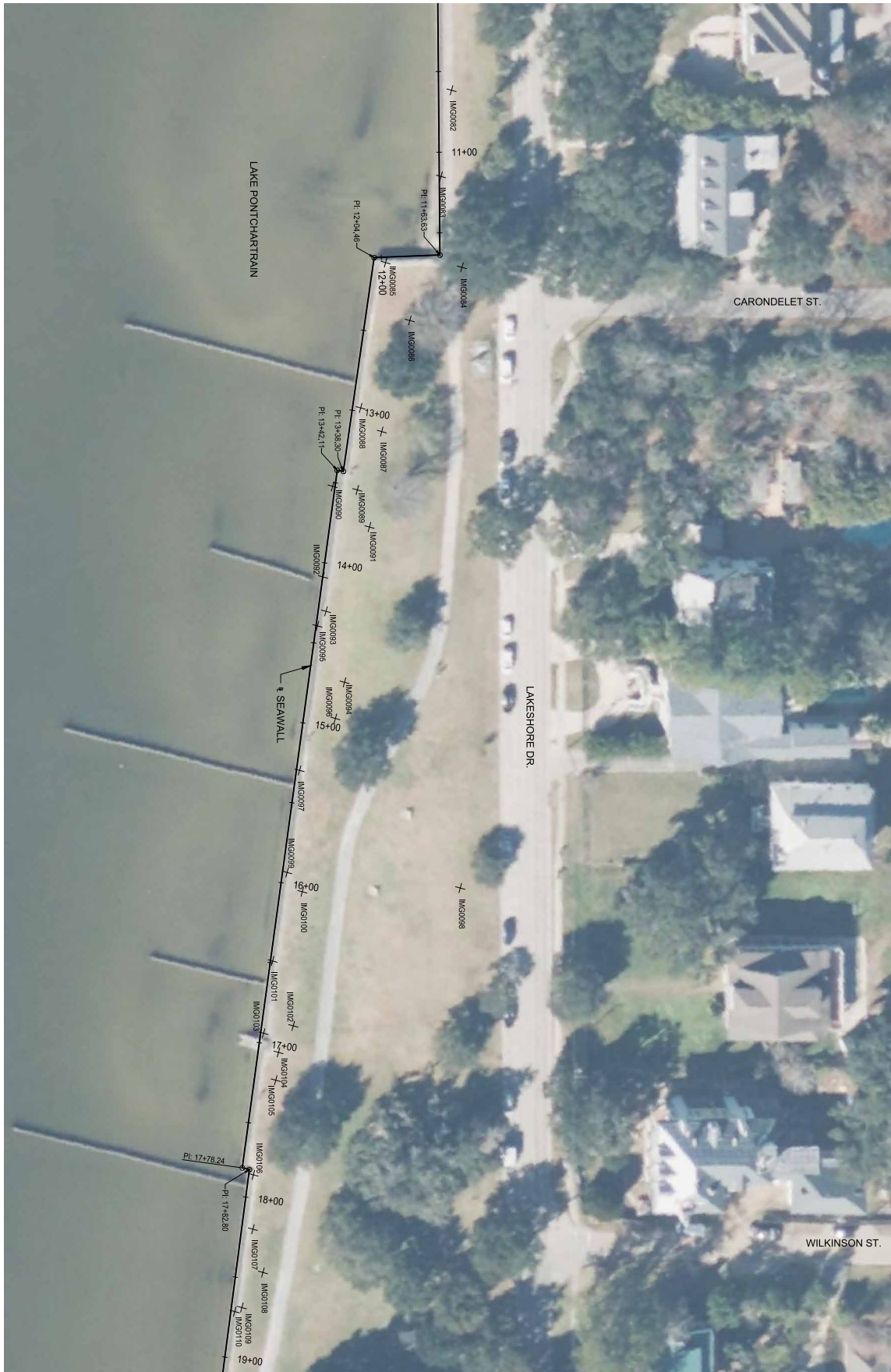
SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DATE	February, 2023
SHEET	1 OF 9

BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY

ISSUED TO: 44



PLAN
SCALE: 1" = 30'



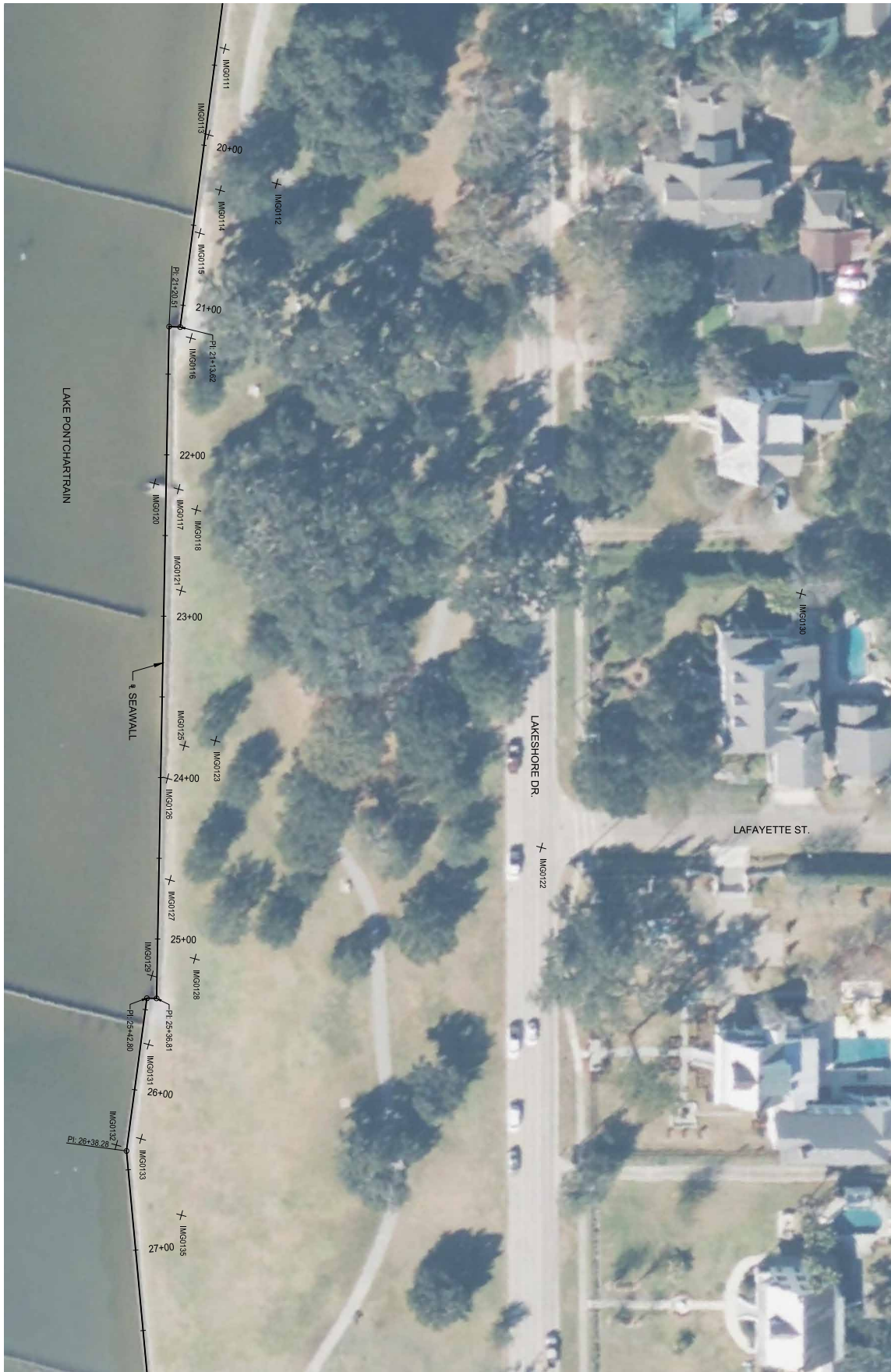
SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DATE	February, 2023
SHEET	2 OF 9

BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY

20



PLAN
SCALE: 1" = 30'



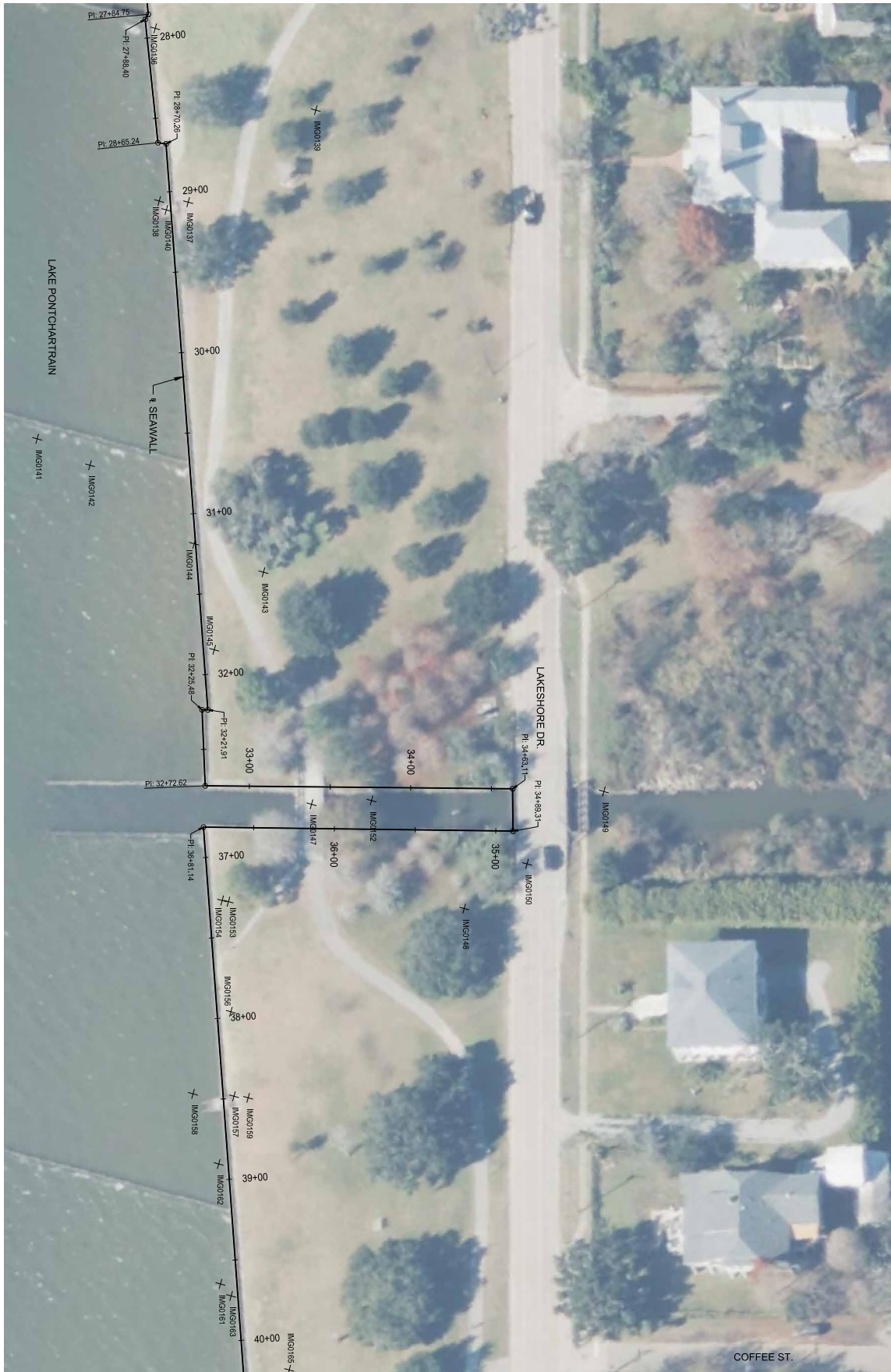
SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DETAILED	SG
CHECKED	RJC
DATE	February, 2023
SHEET	3 OF 9

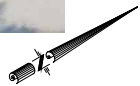
BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY

DATE
2/23/2023



PLAN
SCALE: 1" = 30'



SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DATE	February, 2023
SHEET	4 OF 9

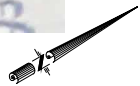
BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY

ISSUED FOR



PLAN
SCALE: 1" = 90'



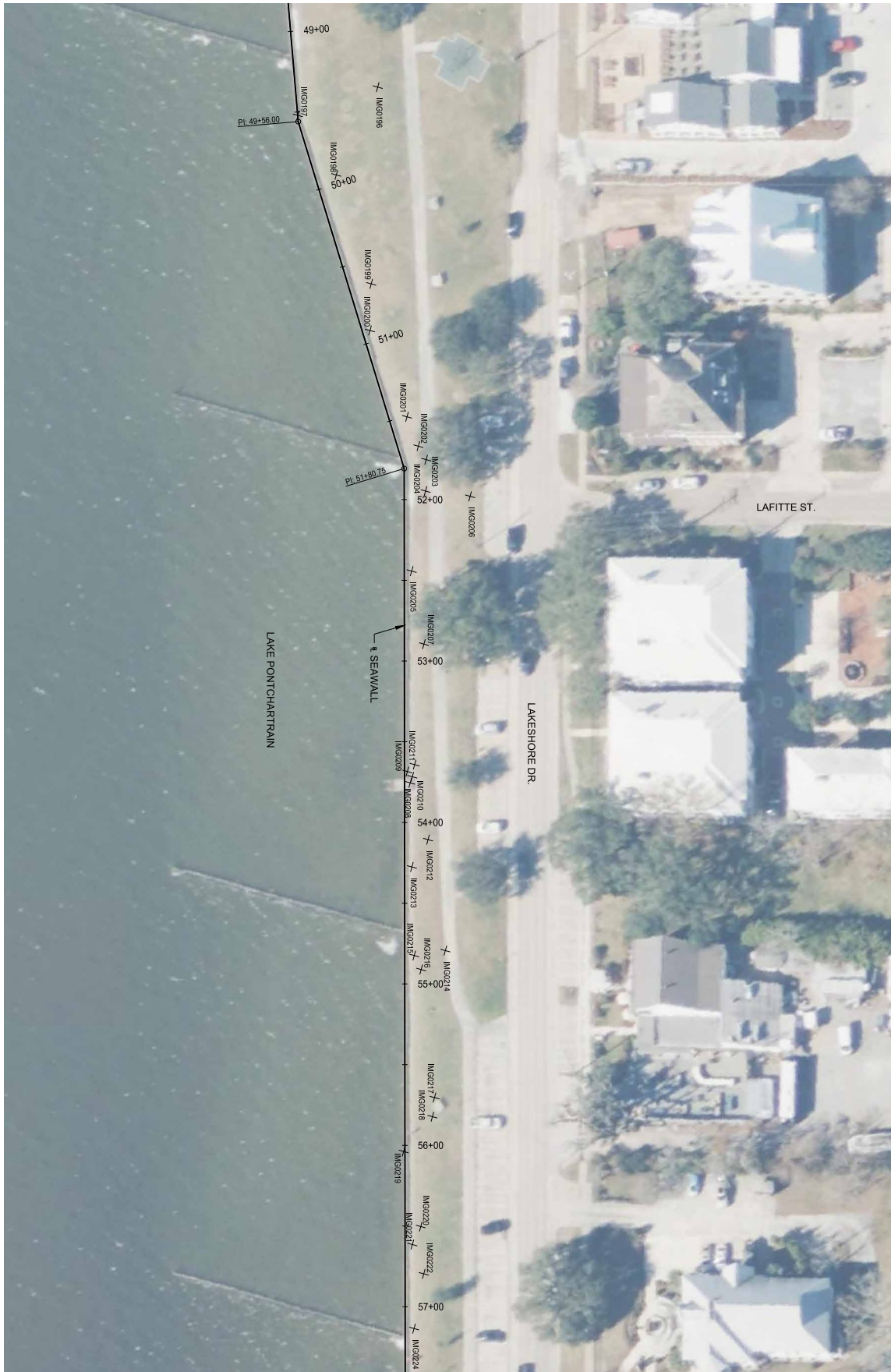
SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DATE	February, 2023
SHEET	5 OF 9

BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY

90
BY



PLAN
SCALE: 1" = 30'



SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DETAILED	SG
CHECKED	RJC
DATE	February, 2023
SHEET	6 OF 9

BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI #: NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY



PLAN
SCALE: 1" = 30'

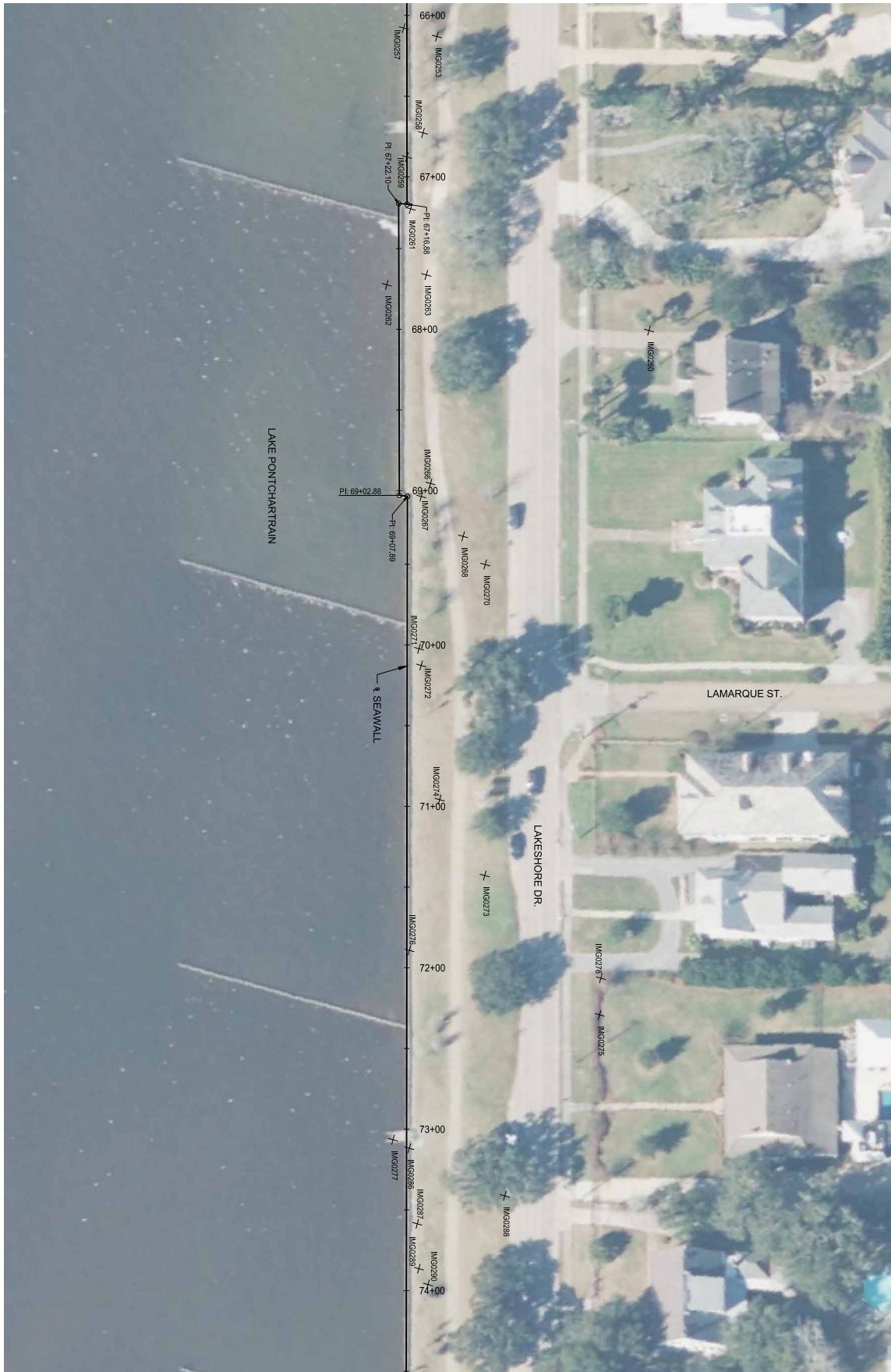


SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DETAILED	SG
CHECKED	RJC
DATE	February, 2023
SHEET	7 OF 9

BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
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NO.	DATE	REVISION DESCRIPTION	BY



PLAN
SCALE: 1" = 30'



SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DETAILED	SG
CHECKED	RJC
DATE	February, 2023
SHEET	8 OF 9

BK BURK-KLEINPETER, INC.
ENGINEERING PLANNING ENVIRONMENTAL
BKUSA.COM
COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY



PLAN
SCALE: 1" = 30'



SEAWALL REPAIR
(INSPECTION PROJECT)

DESIGNED	RJC
CHECKED	FT
DETAILED	SG
CHECKED	RJC
DATE	February, 2023
SHEET	9 OF 9

BK BURK-KLEINPETER, INC.
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COM PROJ. NO. 100,21,019 BKI # : NO.22,028

NO.	DATE	REVISION DESCRIPTION	BY

60