

City of Clearwater Parks and Recreation 2025 Pier 60 Renovation/Conceptual Repairs



Submitted To:

The City of Clearwater Matthew J. Anderson Assistant Director Parks and Recreation City of Clearwater

Submitted By:

Pennoni Associates Inc. 5755 Rio Vista Dr. Clearwater, FL 33760



This item has been electronically signed and sealed byJames V Barnes PE using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

J. Vincent Barnes, III, P.E., SI-Limited FL #77754 Forensic Division Manager

Project No. CLWRC24023

Issue Date: May 8, 2025

Executive Summary

At your request, Pennoni Associates Inc. (Pennoni), performed a feasibility study to review repair concepts for renovations/ conceptual repairs to Pier 60 that as damaged during the 2023 and 2024 Hurricane season. Damages to the pier included:

- Expansion Joint Failures
- Hollow Core Displacement
- Failed MEP Systems

• Damaged Hardware at the Pavilions

The assessment included the following options for renovations:

- **Repair of the Pier in Kind** (Section 3.1)
 - Structural Repairs to Existing Joints
 - Isolated Pile Repairs
 - o New Catwalk
 - New Electrical
 - New Plumbing
 - New HVAC Timber Platform
 - Repairs to Existing Canopies
 - New Handrails
 - o Probable Construction Cost \$2,494,427
- Repair and Removal the End "T" (Section 3.2)
 - All items noted above plus the Removal of the End of the "T"
 - Probable Construction Cost **\$2,888,133**
- Repair and Renovation of the End "T" (Section 3.3)
 - All items noted in section 3.1 with Exertion of Repairs at End "T".
 - Removal of the End "T" Structural Deck and Precast Beams and Canopies.
 - New Precast Beams Placed on Existing Pile Caps
 - Repairs to Existing Pile Caps
 - New Frangible Deck
 - o (2) New Canopies
 - o New Handrails at End of Pier
 - Probable Construction Cost \$3,918,927

Budget Clarifications:

- All repairs to the existing Bait House except are excluded, except as noted
- All pier furniture is excluded.
- All pier deck repairs. finishes are excluded
- Above budget excludes Owner Contingency

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Exhibits:

- Exhibit A Architectural Narrative from Klar and Klar Architects
- Exhibit B Electrical Narrative from Gulf Coast Electrical Design
- Exhibit C Mechanical and Plumbing Narrative from Engineering Matrix
- Exhibit D Construction Cost Estimate from CC&A

1. Pier History

The original concrete Pier 60 opened in June 1962, replacing a smaller wood pier that became in disrepair in the 1950's. The name "Pier 60" is attributed to the extension of the 1960's extension SR-60 Memorial Causeway. In 1985 Hurricane Elena caused isolated major damage to the pier as sections of the pier were completely destroyed by uplift forces (FLDEP Pier guidance).



Photo 10. Elena caused isolated major wave damage to Big Pier 60, Clearwater Beach

Figure 1 – Reference Photo Excerpt

In 1994 a new, larger/longer pier was constructed with a series of concrete piles, concrete pile caps, and prestressed concrete slabs. This pier continues to be a main tourist attraction and economic driver.

2. General Project Information/ Summary of 2023 and 2024 Hurricane Damages

The approximate 31-year-old fishing Pier 60 between August 29-31, 2023, sustained damage from Hurricane Idalia and closed for any activity due to safety concerns. Pennoni was retained by the Client under P.O. 23001048 to conduct a structural assessment of the pier, identify and document the damage, and recommend repair concepts.

Idalia sent large wave action and storm surge to the coastline. Information was collected from the USACE WIS Station ST73263, which is approximately 10 miles west of the Pier 60. The data was reviewed, and it showed a significant wave height of approximately 13 ft. Additionally, the NOAA Tide Gauge Station 8726724, located near the terminal end of the pier, showed a peak still-water elevation of +4.81' NAVD. The combination of these two factors resulted in some waves crashing on to the deck of the pier.

A post-Idalia storm assessment was completed, and it revealed the previously restored joints were once again damaged, along with segments of railing and damage to the Bait House and canopies. A structural dive inspection of the piling was completed, and no major defects were observed, nor evidence that a significant scour event occurred. There was some minor debris impact damage that occurred near the shoreline. The wood pile-supported platform that housed AC condensers for the Bait House was damaged.

Temporary repairs were made to the end of the pier by the City of Clearwater to be reopened on September 22, 2023. Pennoni and Foster Consulting (Marine Engineer) issued a draft report to the City in October 2023 which identified damaged joints, pile caps, access decking and timber piles.

Pennoni issued a summary report dated November 3, 2023 summarizing our findings and recommendations.

Under PO 24000335-1 On December 21, 2023, Pennoni and Associates in conjunction with Foster Consulting began the development of repair drawings for the damages from Hurricane Idalia. Repair drawings were issued for pricing on July 12, 2024, several onsite meetings were then made to discuss the work. Preliminary pricing was then developed for the City of Clearwater by the general contractor, Bandes.

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Further damage to the pier occurred during the 2025 hurricane season from Hurricane Helene's impact on September 26, 2024. Based on records from AOML and NOAA's Pacific Marine Environmental Laboratory, gathered data measuring a maximum wind gust of 95 kt (109 mph) and a maximum significant wave height of 9.5 m (31 ft) within about 20 miles of the storm's center. While the storm path did not impact directly St. Pete, Clearwater land, record 4-6ft storm surge was recorded in the area. The end of the pier "T" and Bait House were found to be impacted by the storm surge and waves from the storm. Causing further damage. These storms caused additional damage to the pier and the fixed joints and damaged more of the railing. The damage was skewed more toward the "T"-head portion of the pier. The wave energy was strong enough during this events that it shifted the outside prestressed slabs approximately 1.5", which resulted in various cracks. Again, a dive inspection was completed, and no significant scour or structural damage was observed in the piles.

The structure inspected was Pier 60, including the exterior of the Bait House. These structures were inspected using a combination of hands-on and visual inspection methods where applicable. An Unmanned Aerial System (UAS) was utilized to extend the visual range of the inspector.

A summary of damages and site observations were documented in our October 19, 2024 report.

Short term repairs including replacement of sections of handrail were completed so that a portion of the pier could reopen for public access in March 2025.

3. Conceptual Repairs

The piles and pile caps performed well during the latest storm events. The joints connecting the piles caps to the deck portion historically have not been performing well. Wave uplift forces can be extreme. In order to eliminate uplift forces, the deck elevation would have to be raised to above the anticipated wave crest elevation. As noted in the previous report completed by JFC, the calculated wave crest elevation was near the current elevation of the pier. This was substantiated by pictures collected by the City during the event, so lateral loads from waves need to be accounted for in future designs. The original 1994 design documents do not indicate any design criteria for lateral loads, so it is unknown whether these are being exceeded and whether the lateral loads are the reason, and/or partially the reason, for the damage to the pile-cap-to-deck joint. In an effort to allow for movement within the structure to limit the stress cracks, a new expansion joint is recommended to be installed to allow 2" inches of movement. This was modeled through LPile, a special purpose software to analyze piles under lateral loading, with conditions similar to Hurricane Idalia.

Three (3) conceptual options have been developed for repairs/ renovations to the primary structure assessment included the following options for renovations:

- Repair of the Pier in Kind
- Repair and Removal the End "T Head"
- Repair and Renovation of the End "T Head"

This conceptual narrative has been developed in collaboration with:

- Structural Engineering and Survey Pennoni and Associates Inc.
- Architect and Conceptual Renderings Klar and Klar Architects (Exhibit A)
- Marine Engineer Foster Consulting
- Electrical Engineer Gulf Coast Electrical Design (Exhibit B)
- Mechanical Engineer Engineering Matrix (Exhibit C)

3.1 Repair of Pier in Kind

To address damages from the 2023 and 2024 the following will be required:

- Repair of (2) damaged precast piles
- Repair of Expansion Joints throughout major section of pier
- Add Expansion Joint at "T" SIKA SJS or similar system with cover plate



Figure 2 – Conceptual Replacement Joint with Cover Plate

- Replacement of Handrail systems along the full length of the pier with FDOT compliant system.
- Replacmenet of Catwalk surrounding the Bait House with new 4ft aluminum framed and composite decking.
- Replacement of all hardware at (6) Pavilions
- Replacement failed HVAC timber support platform that services the Bait House
- Replacement of failed signage and navigation buoys

• Replacement of HVAC / Plumbing Systems for the Bait House:

- Option 1: Relocate Outdoor Condensing Unit
- o Option 2: Replace Split System with Indoor, Vertical Packaged DX System
- Replace Water Heater and Upgrade Piping
- Replace Sanitary Force Main Piping for Storm-Resilience
- Replace Fire Protection Piping and Standpipes







Figure 3 – M&P System Replacement

Replacement of Electrical Systems:

- Power at the Pavilions.
 - Re-feed the existing turtle safe lights in each of the (6) pavilions. Demo all other existing lights and conduits. Run all new power from the Bait House.
 - Install (1) new 30-amp 208-volt twist lock receptacle at each pavilion for connection to a NEMA 3R temporary branch power distribution center for vendor use. Run all new power from the Bait House. Demo all other existing receptacles and conduits.
 - Replacement electrical conduit at the "T" expansion joint with flexible, non metallic conduit installed along the edge of the deck. The current system is embedded in the deck and will be removed or abandoned in place.



Figure 4 – Power Distribution Example

Pier Power Layout:



1. Pavilion A and B is roughly 460' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#8cu and (1)#8 EGC in 3/4" PVC. (1) New 30A plug for power distribution to be fed with (3)#4cu and (1)#4 EGC in 1 1/4" PVC to each pavilion.

2. Pavilion C is roughly 195' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#10cu and (1)#10 EGC in 3/4" PVC. New 30A plug for power distribution to be fed with (3)#6cu and (1)#6 EGC in 1" PVC.

3. Pavilion D is roughly 210' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#10cu. New 30A plug for power distribution to be fed with (3)#6cu and (1)#6 EGC in 1" PVC.

4. Pavilion E is roughly 420' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#8cu. New 30A plug for power distribution to be fed with (3)#4cu and (1)#4 EGC in 1 1/4" PVC.

5. Pavilion F is roughly 575' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#6cu. New 30A plug for power distribution to be fed with (3)#3cu and (1)#3 EGC in 1 1/4" PVC.

Figure 5 – Electrical Renovation Plan

It should be noted that future damage to the end of the pier may occur as it would be returned to it previous condition.

3.2 Repair of Super Structure and Removal of End of "T-Head"

Damage to the end of the T-Head occurred during Helene that included lateral movement from waves causing damage to the main expansion joint and end joints. See the below photo examples.



Figure 6 – T Connection Post Helene



Figure 7 – North View Post Helene

To address this area of localized damage, it was discussed that the removal of the 120' x 20' T' section, and supporting piles located at the west end of the pier could be addressed by developing a mitigation method to minimize future damage. Resulting in a 16' pier termination at the end of the Pier Deck Propper.

If the T-head of the pier is to be removed, a side scan/multibeam sonar survey should be completed to identify any submerged debris from previous artificial reef deployments, as a debris field was observed during previous dive inspections. Side scan & multibeam sonar surveys are primary tools in the industry that are used to locate submerged debris and other obstructions. If it is found that the debris could potentially be a navigational issue, then warning signage of submerged debris could be installed to warn boaters of the potential hazard. The additional cost of the signage could be partially offset by cutting down the existing support piles of the T-head and including them into the artificial reef. The City of St. Petersburg completed this at their pier. Unlike at the St. Pete pier where the piles are surrounded by the pier, the Pier 60 piles would have to be cut at a lower elevation. In order to deploy signage, authorization is required from the Florida Fish & Wildlife Conservation Commission (FWC) (Ch. 327.403 Florida Statues). Consent from the submerged landowner (the State) will be required, along with authorization from United States Army Corps of Engineers (USACE).



Figure 8 – Reference Photo Excerpt



Comparison of side scan (black and white) and multibeam sonar (colorful) images of the same shipwreck surveyed by NOAA Ship Rude using different methods and different kinds of equipment.

Figure 9 – Reference Photo Excerpt

Symbol	Meaning	Examples
\diamond	Danger A diamond shape alerts boaters to hazards	

Permitting T-Head Removal

The proposed modifications to Pier 60, including an expansion of the Bait Shop catwalk, and a reconfiguration of the terminal end of the pier, will be jurisdictional to permitting by the State (FDEP), Army Corps of Engineers, and Pinellas County Water & Navigation.

Figure 10 – Reference Photo Excerpt

- A permit from the FDEP will be obtained from the Beaches, Inlets, and Ports Program, by applying for a "De Minimis Exemption" and a "Lease Modification." The lease modification will be necessary to update the associated lease survey, depicting the new layout, and the modified lease boundary/area. JFC will assist in coordinating the completion of the modified submerged lands lease survey as needed. Permitting time is anticipated to be 60 90 days. The final modified submerged lands lease will be issued out of Tallahassee (Division of State Lands) approximately 30 45 days following issuance of the permit. The permit fee will be \$100, and the current lease modification processing fee is \$803.02.
- The selected contractor will be required to obtain a permit from Pinellas County. It is anticipated that the proposed pier modifications will qualify for delegated federal (Army Corps) approval through the County's SAJ-96 Agreement with the Corps. Therefore, a separate permit application to the Corps should not be required. County permits take an average of 90 180 days to obtain, and the associated fee should be \$824.17. JFC can assist the contractor with any RAI's (Requests for Additional Information), as needed.

Therefore, renovations outlined in section 3.1 would be required minus work at the end of the pier "T".

3.3 Repair Pier and T- Head Conversion

The material conversion from concrete slab to blow-out wood panels would entail the removal of the concrete slab on the outer T-section, then reinforced concrete beams would be used to span from pile cap to pile cap to support the blow-out panels.

Considering 40' span lengths as depicted on available existing drawings, a 18"x30" concrete beam can be expected for support. Four (4) #8 top reinforcing bars and (8) #8 bottom reinforcing bars were considered in design. Sizing and reinforcement may change when wave loading is provided and accounted for. Width of concrete beams may also be 24" wide to accommodate future canopy base attachments. The final design will be based on the selected configuration of the canopy.

The typical size of each panel is roughly 4' to 6'. The wood for the blow-out panels would consist of a sustainably sourced lpe decking for durability, or a composite deck material such as Moisture Shield. The Cities of Naples and Venice used lpe decking to rebuild their piers.

The frangible deck would be comprised of Marinee Grade Lumber faming members, stainless steel fasteners/ connectors, and synthetic decking per Clearwater Parks Department Standards.

The composite Material Shield can be used, but anti-static additive needs to be introduced to the material to reduce static shock.



Figure 11 – Breakaway Wood Deck at Pensacola Pier Courtesy of FLDEP Fishing Pier Design Guide Part – 2 Dated March 2011

Other communities in Florida (including, but not limited to, Lake Worth Pier, Panama City Beach Pier, Pensacola Beach Pier) have migrated to the blow-out panel pier system, and the piers overall have reduced potential structural damage. The Flagler Beach Pier, which had significant damage to the pier from a recent hurricane, is rebuilding their pier with a blowout panel system with a total rebuild cost of approximately 14 million dollars. Florida Administrative Code Rule 62B-33.077 requires that the minimum design shall withstand a 20-Year storm. The rule specifically omits this requirement for the decking surface:

Rule 62B-33.007 (4) (k), Florida Administrative Code, also states – Pier decking and rails may be designed to be an expendable structure.



Photo 30. Before and after aerial views of the Pensacola Beach Fishing Pier showing that Hurricane Dennis' wave uplift forces removed deck panels without major structural damage [BBCS Photo Files]

Permitting the T-Head Blow-Out Conversion:

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The City of Clearwater

- A permit from the FDEP will be obtained from the Beaches, Inlets, and Ports Program, by applying for a "De Minimis Exemption." Permitting time is anticipated to be 60 90 days. The permit fee will be \$100.
- The selected contractor will be required to obtain a permit from Pinellas County. It is anticipated that the proposed pier modifications will qualify for delegated federal (Army Corps) approval through the County's SAJ-96 Agreement with the Corps. Therefore, a separate permit application to the Corps should not be required. County permits take an average of 90 180 days to obtain, and the associated fee should be \$824.17. JFC can assist the contractor with any RAI's (Requests for Additional Information), as needed

A possible way to reduce construction costs is to cut the existing panels that make up the outside portions of the Thead to 6' sections and place them beneath the existing pier's footprint to create an artificial reef to promote fish habitat. The cut section should not have any protruding rebar, as this could present a safety hazard to the public. This is in line with the State's General Permit requirements of riprap.

The demolition of the pier could be completed through a top-shoring plan, where the temporary shoring is completed above the structure to allow the disassembly.



Figure 13 – Reference Photo Excerpt

Conceptual Replacement for Pier T Canopies:

As part of the reconfiguration of the 120' x 20' T' as described above with a replaced frangible wood framed deck, the "T-Head" the (2) existing timber framed, open gable end canopies would need to be removed allowing for additional renovations. The rejuvenated pier would also boast a new look pavilion on both the north and south ends of the 'T' Section. Constructed of steel members and decking with fluid bed powder coating, the pavilions robust design is intended to withstand the harsh conditions of the Environment. The pavilion is designed to beckon patrons to enjoy a sunset, fishing, and ocean life as a destination on the iconic Pier 60. The pavilion could be constructed of durable materials such as galvanized steel, with precast concrete canopies.

Conceptual renderings have been developed by Klar and Klar Architects. See the below Figures. These concepts will require further collaboration with the City of Clearwater before pricing can be developed.



Figure 14 – T- Head Conversion Conceptual View 1



Figure 15 – T- Head Conversion Conceptual View 2



Figure 16 – T- Head Conversion Conceptual View 3



Figure 17 – T- Head Conversion Conceptual View 4



Figure 18 – T- Head Conversion Conceptual View 6



Figure 19 - T- Head Conversion Conceptual View 7



Figure 20 – T- Head Conversion Conceptual View 8

3.3 NOAA Weather Station

It is our understanding that the existing NOAA weather located near the end pier "T" operates on a self contained electrical power system separate from the main pier. The replacement of reuses of this system has been excluded from review and is the responsibility of others.



Figure 21 – NOAA Weather Station

4. Closure

Pennoni is available to provide a detailed design drawings of repairs or replacement for permit as part of a separate scope of services if requested.

It shall be noted that the above listed issues do not include completed list of all identified items found during our visual inspection or unknown hidden damage. The sign and seal on this project indicate professional engineering responsibility for the structural portion only. General architecture, life safety, accessibility, electrical, mechanical, etc. are the responsibility of others.

Sincerely,

Pennoni Associates

Exhibit A

Architectural Narrative from Klar and Klar Architects





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727-799-5420

www.klarklar.com

@klarandklar



Kristing Novisk, NCARB

Pier 60 Architectural Repair Narrative

March 24th, 2025

Project # CLWRC23016 phase 03

Address: 7 Causeway Blvd, Clearwater, FL 33767

Clearwater Pier 60:

The pier is an existing 1,100 long hollow core structure which sustained damage from Hurricane Idalia in August 2023, Hurricane Helene in September 2024, hurricane Helene and Hurricane Milton in October 2024.

Architectural Repair Narrative:

The repair for the Clearwater Pier 60 can be achieved through a variety of options as noted below:

Option 1:

Removal of the 120' x 20' T' section, and supporting piles located at the west end of the Pier. Resulting in a 16' pier termination at the end of the Pier Deck Propper.

Option 2:

Repair the 120' x 20' T' section of the Pier, per structural recommendations, and associated (2) Pavilion's back to their original condition, made up of concrete columns, pressure treated roof members and deck, with a Metal roof.

Option 3:

Repair the 120' x 20' T' section of the pier per structural recommendations. In addition, proposed removal of the Concrete deck and replaced with a frangible wood framed deck. The Frangible deck is intended to minimize damage to the pier structure as a sacrificial element that would break free from the pier in the event of a storm surge. The frangible deck would be comprised of Marinee Grade Lumber faming members, stainless steel fasteners/ connectors, and synthetic decking per Clearwater Parks Department Standards.

The rejuvenated pier would also boast new look pavilion on both the north and south ends of the 'T' Section. Constructed of Steel members and decking with Fluid bed powder coating, the pavilions robust design is intended to withstand the harsh conditions of the Environment. The Pavillion is designed to beckon patrons to enjoy a sunset, fishing, and ocean life as a destination on the iconic Pier 60.

Railing Replacement:

All of the railings along the entirety of the pier will require replacement due to the damages sustained in the Hurricanes and non-code compliance outlined in the Pier 60 Assessment report.

Railing Option A:

Replace the Guardrail with a design that emulates the current railing composition. Constructed of Pressure treated members and stainless-steel fasteners. Guardrails to span from baluster to baluster with intermediate posts as required.

The baluster is intended to provide a rhythm to the guardrail to break-up the continuous run of railing providing a chase for utilities, lighting, and offer potential for wayfinding or local art installations. The Balusters could serve as a blank canvas for curated local artists to design each in a theme that would provide character to the Pier creating communal ties and a sense of cohesion.

Railing Option B:

Replace the Guardrail with a robust railing design that would minimize maintenance and better withstand the harsh conditions and any potential future Hurricane damage. This guardrail would make up an 'FDOT' style guard constructed of Galvanized aluminum circular rails and pickets. Monolithic fabrication would result in less connection points in comparison to 'Railing Option A' resulting in a more resilient railing system.

The Baluster design described above would apply to Railing Option B' as well.

Both Guardrails would be designed to Building Code standards with vertical pickets to minimize climbing and be mounted to the vertical edge of the pier to maximize the walking surface.

Images: (see separate documents)

Respectfully,

Jason Novisk, Project Manager, Klar and Klar Architects, Inc.

Exhibit B

Electrical Narrative from Gulf Coast Electrical Design



City of Clearwater Parks and Recreation Electrical Scope for Pier 60 Repairs

Coordination Walkthrough:

A site walk was conducted by Josh Wiswell on February 17th 2025. The walk was facilitated by a City of Clearwater representative.

Pier 60 Power Recommendations:

- Power at the pavilions.
 - Re-feed the existing turtle safe lights in each of the (6) pavilions. Demo all other existing lights and conduits. Run all new power from the bait house.
 - Install (1) new 30-amp 208-volt twist lock receptacle at each pavilion for connection to a NEMA 3R temporary branch power distribution center for vendor use. Run all new power from the bait house. Demo all other existing receptacles and conduits.

Sincerely, Gulf Coast Electrical Design 2150 Range Road Clearwater, FL 33765

Cory A. Glass 727-243-7023 FL-PE80467 FL-EC13008992



<u>Power Distribution Example:</u>



SOUTHWIRE Power Distribution Box: Single Phase, 125/250V AC, 30 A Inlet Current Rating, L14-30P

Item 4MZX6 Mfr. Model 6534UGSX

Roll over image to zoom,

Product Image Feedback

Compare

Product Details	Catalog Page 386	
Brand SOUTHWIRE	Inlet Voltage Rating 125/250V AC	
Manufacturer Part Number 6534UGSX	NEMA Enclosure Rating 3R	
Base Type Sled	Number of Outlets 4	
Cord Length 6 ft	Number of Poles 3	
For Environment Indoor/Outdoor	Number of Wires 4	
Housing Color Yellow	Outlets Included (4) 5-20R GFCI	
Housing Material Steel	Phase Single	
Housing Material Thickness 14 ga	Standards UL Listed	
Includes GFCI Automatic Reset GFCI	UNSPSC 39121406	
Inlet Current Rating 30 A	Country of Origin USA (subject to change)	
Inlet Receptacle L14-30P		



Pier Power Layout:



1. Pavilion A and B is roughly 460' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#8cu and (1)#8 EGC in 3/4" PVC. (1) New 30A plug for power distribution to be fed with (3)#4cu and (1)#4 EGC in 1 1/4" PVC to each pavilion.

2. Pavilion C is roughly 195' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#10cu and (1)#10 EGC in 3/4" PVC. New 30A plug for power distribution to be fed with (3)#6cu and (1)#6 EGC in 1" PVC.

3. Pavilion D is roughly 210' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#10cu. New 30A plug for power distribution to be fed with (3)#6cu and (1)#6 EGC in 1" PVC.

4. Pavilion E is roughly 420' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#8cu. New 30A plug for power distribution to be fed with (3)#4cu and (1)#4 EGC in 1 1/4" PVC.

5. Pavilion F is roughly 575' from the Bait House Panel. Existing Turtle safe lighting to be re-fed with (2)#6cu. New 30A plug for power distribution to be fed with (3)#3cu and (1)#3 EGC in 1 1/4" PVC.

Exhibit C

Mechanical and Plumbing Narrative from Engineering Matrix



City of Clearwater Pier 60

Limited Visual Assessment Report: Mechanical, Plumbing, and Fire Protection Systems

May 7, 2025





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I. EXECUTIVE SUMMARY

This report assesses the mechanical and plumbing systems serving the gift shop building at Pier 60, Clearwater, FL, as well as the hose bibbs and fire protection standpipes along the pier boardwalk, following damage from Hurricanes Helene (September 26, 2024) and Milton (October 9-10, 2024). The pier experienced significant storm-related damage, including destruction of the gift shop's outdoor HVAC condensing unit, exposure and damage to domestic water piping and hose bibbs, and loss or damage to fire protection standpipes, and deterioration of the gift shop's electric water heater. The indoor HVAC air handler and air distribution system, as well as restroom exhaust fans, remained operational and undamaged.

The report identifies deficiencies in the existing systems' resilience to hurricane-force winds, storm surge, and wave action, and provides recommendations to harden these systems against future storms. Key recommendations include relocating or replacing the HVAC condensing unit, replacing and protecting domestic water piping and hose bibbs with robust enclosures, and replacing and enhancing fire protection standpipes with durable, storm-resistant enclosures. This information is intended to assist the Owner in establishing overall budgetary figures to achieve their storm resiliency goals.

The report focuses solely on the mechanical and plumbing systems within the specified scope, excluding landside utilities and main distribution piping under the pier deck, which are addressed by others.

II. BACKGROUND

Pier 60, located on Clearwater Beach, is a prominent recreational structure that includes a gift shop, boardwalk, and associated amenities. The gift shop, measuring 1,485 square feet with men's and women's restrooms, relies on mechanical and plumbing systems critical to its operation. The pier and its facilities were severely impacted by two major hurricanes in 2024:

- Hurricane Helene (September 26, 2024): This storm brought maximum wind gusts of 95 kt (109 mph) and significant wave heights of 9.5 m (31 ft) within 20 miles of its center, with a storm surge of 4-6 ft recorded in Clearwater.
- Hurricane Milton (October 9-10, 2024): A Category 3 storm with winds up to 120 mph at landfall near Siesta Key, Sarasota County, it produced maximum gusting wind speeds of approximately 74 mph at Pier 60, as recorded by NOAA weather Station CWBF1.

The City of Clearwater has engaged Engineering Matrix, Inc (**Matrix**) to evaluate storm damage, recommend repairs, and propose hardening measures for the mechanical and plumbing systems to enhance resilience against future storms. This assessment is conducted in coordination with a structural engineering team, whose report (Pennoni Associates Inc., October 31, 2024) provides contextual structural and electrical observations that inform this analysis.

The scope of this report includes:

- The gift shop's HVAC system, consisting of a DX-split system with an indoor vertical air handling unit and an outdoor condensing unit.
- Domestic water systems, including hose bibbs west of the gift shop, associated PVC piping, and the gift shop's electric water heater.
- Fire protection standpipes along the pier boardwalk.

Landside utilities and main piping under the pier deck are outside this scope and addressed by others.

III. EXISTING M/P/F SYSTEM OBSERVATIONS

A site visit conducted on February 18, 2025, revealed the following conditions related to the mechanical, plumbing, and fire protection systems within the scope of work:

1. GIFT SHOP HVAC SYSTEM

- a. The existing DX-split system includes a vertical indoor air handling unit (AHU) and an outdoor condensing unit, previously mounted on the pier deck on the west side of the gift shop (Photos 1, 2).
- b. The outdoor condensing unit was destroyed during the hurricanes, likely due to hurricane-force winds and storm surge (Photo 3).
- c. The indoor AHU and associated air distribution system (ductwork, diffusers, and grilles) showed no visible storm damage and appeared in good condition (Photo 4, 5).
- d. Restroom exhaust fans were observed to be operational, with no apparent damage.

2. Domestic Water Systems (Water Heater, Hose Bibbs, and Piping)

- a. The gift shop's electric water heater, located indoors, showed significant corrosion on its exterior tank and associated copper piping, as well as signs of aging and potential water damage from storm infiltration (Photo 6). The unit appeared operational but exhibited rust, leaks at pipe connections, and general wear indicative of prolonged exposure to a harsh marine environment.
- Multiple hose bibbs are located west of the gift shop, connected to PVC piping secured to the north side of the pier railing, exposed above the deck (Photos 7, 8, 9).
- c. The hose bibbs and piping were unprotected and vulnerable, showing signs of wear, corrosion, and potential storm damage, including loose fittings and exposed sections.

d. Main domestic water piping under the pier deck is enclosed in a fiberglass shroud, but multiple sections of the shroud were missing, exposing the piping to environmental damage (Photos 13, 14). Exposed pipe sections exhibited sagging, damage, and complete loss in some areas.

3. SANITARY SYSTEM

- a. Wastewater from Gift Shop plumbing fixtures drain to a lift station within the building. A 3" sanitary force main extends from the lift station to landside utilities.
 Piping is secured on the underside of the pier deck.
- b. Multiple sections of sanitary piping were missing or damaged.

4. FIRE PROTECTION STANDPIPES

- c. Fire protection standpipes are located along the pier in boxed-out, wood enclosures integrated into the south railing.
- d. At least one standpipe was missing, likely due to storm damage, leaving an empty enclosure (Photos 10, 11).
- e. Remaining standpipes showed signs of wear but were intact, though the wooden enclosures appeared vulnerable to future hurricane impacts (Photo 12).

IV. IDENTIFIED DEFICIENCIES

Based on the observations, the following deficiencies were identified in the mechanical and plumbing systems, compromising their resilience to future storms:

1. HVAC SYSTEM

a. **Outdoor Condensing Unit Vulnerability**: The outdoor condensing unit's location on the exposed pier deck made it highly susceptible to hurricane-force winds, storm surge, and wave action, resulting in its destruction.

2. DOMESTIC WATER SYSTEMS

- a. **Exposed Piping and Hose Bibbs**: The PVC piping and hose bibbs, mounted above the pier deck and unprotected, are vulnerable to wind damage, debris impact, and storm surge, leading to potential leaks or failures.
- b. **Inadequate Shroud Protection**: The missing sections of the fiberglass shroud under the pier deck expose domestic water piping to corrosion, physical damage, and environmental degradation, increasing the risk of system failure.
- c. **Water Heater Deterioration**: The gift shop's electric water heater shows significant corrosion and aging piping making it vulnerable to failure due to prolonged exposure to the marine environment.

3. SANITARY SYSTEM

a. **Missing force main**: The Gift Shop's plumbing fixtures are out-of-service until the force main piping is repaired.

4. FIRE PROTECTION STANDPIPES

- b. **Missing Standpipe**: The loss of at least one standpipe compromises fire protection coverage along the pier, posing a safety risk.
- c. Vulnerable Enclosures: The wooden enclosures for standpipes are susceptible to hurricane damage, including wind, water intrusion, and structural failure, potentially leading to additional standpipe loss or damage.

V. RECOMMENDATIONS

The following recommendations are provided to address identified deficiencies and mitigate future storm damage to the mechanical and plumbing systems.

1. HVAC SYSTEM HARDENING

a. Option 1: Relocate Outdoor Condensing Unit

 Description: Relocate the replacement DX-split system condensing unit to a more protected location, such as a structurally reinforced area on the east side of the gift shop. Provide screened enclosure to shield from wind-borne debris. Install hurricane-rated mounting and anchoring systems to secure the unit.

b. Option 2: Replace Split System with Indoor, Vertical Packaged DX System

 Description: Replace the existing DX-split system with an indoor packaged DX system housed entirely within the gift shop, eliminating the need for an outdoor condensing unit. Provide hurricane-rated, outside air intake and exhaust louvers.

2. DOMESTIC WATER SYSTEM HARDENING

a. Replace Hose Bibbs and Piping for Storm-Resiliency

 Description: Install new, Schedule 80 PVC UVR piping from existing upland connection to hose bibbs along pier deck. Route distribution piping along north face of the concrete deck. Extend branch piping to hose bibbs within chases built into new handrail spaced 100-feet to 150feet apart.

b. Replace Water Heater and Upgrade Piping

 Description: Replace the existing 20-gallon, electric water heater and piping showing signs of deterioration.

3. SANITARY FORCE MAIN SYSTEM HARDENING

a. Replace Sanitary Force Main Piping for Storm-Resiliency

 Description: Install new, Schedule 80 PVC UVR sanitary force main piping from existing upland connection to existing Gift Shop lift station. Route piping along north face of the pier's concrete deck.

4. FIRE PROTECTION STANDPIPE HARDENING

a. Replace Fire Protection Piping and Standpipes.

- Description: Install new, ASTM A312 Type 316/316L Stainless Steel, Schedule 40 piping from existing upland connection to new fire protection stand pipes along pier deck. Route distribution piping along north face of the pier's concrete deck. Extend branch piping to standpipes within chases built into new handrail.
- Standpipes shall be spaced no more than 300-feet apart or 150-feet from a dead-end area in accordance with NFPA 307. Final location and spacing shall be in accordance with AHJ requirements.
- Test the entire fire protection system for functional integrity and repair any damaged parts. Completed work shall be subjected to a fire water pressure test of 200 psi for two hours, during which there shall be no reduction in test pressure. If a reduction should occur, leak(s) shall be located, repaired and the test repeated. In addition, all newly installed fire service lines must pass hydrostatic and hydrodynamic testing requirements as performed by the local fire marshall.

5. TYPICAL PIPING SUPPORT REQUIREMENTS (WATER, SANITARY, FIRE)

a. **Description:** Secure piping and enclosures with hurricane-rated supports and fasteners at intervals not to exceed 4'-0". Use stainless steel materials resistant to UV and saltwater corrosion, and ensure piping enclosures are designed to withstand Cat 4 hurricane winds and storm surge with drainage to prevent water accumulation. Refer to schematic plan for conceptual layouts.

VI. CONCEPTUAL LAYOUTS







General Note:

1. Images are not to scale and lineal feet distances are approximate. Distances shall be field verified, or appropriate safety factors shall be applied for budget pricing purposes.

VII. PHOTOGRAPHS



Photo 1. Gift Shop East Exterior



Photo 2. Gift Shop West Exterior



Photo 3. Condensing Unit Location – West Exterior



Photo 4. Gift Ship Interior



Photo 5. Indoor Air Handler



Photo 6. Electric Water Heater



Photo 7. Fish Cleaning Stations with Hose Bibbs.



Photo 8. Domestic Water Piping



Photo 9. Exterior Hose Bibb



Photo 10. Missing Fire Protection Standpipe



Photo 11. Missing Fire Protection Standpipe



Photo 12. Intact Fire Protection Standpipe



Photo 13. Under deck piping and fiberglass shroud



Photo 14. Under deck piping and supports

Exhibit D

Construction Cost Estimate from CC&A

C C & A CONSTRUCTION CONSULTANTS & ASSOCIATES, INC.

PROJECT : Clearwat LOCATION : Clearwat FILE NAME : Clw Pier		DATE : 4/14/25 PROJ # : 2025.104 PAGE : 1 OF 3			
DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	REMARKS
Conceptual Design Construction Budget					
Task 1 - Repair in Kind					
Architectural Repairs					
Replace conc pedestrian entry ramp	700	sf	35.00	24,500	
Replace guardrails at entry ramp	30	lf	200.00	6,000	
Replace guardrails at pier	2,375	lf	200.00	475,000	
Replace hardware at pavilions	6	ea	2,500.00	15,000	
Replace damaged Naval Markers	1	ls	40,000.00	40,000	
Structural Repairs					
Repair damaged precast piles	2	ea	10,000.00	20,000	
Repair conc deck cracks/spalls	1	ls	75,000.0	75,000	
Repair & new deck expansion joints	1	ls	150,000.0	150,000	
Replace catwalk platform/railings at bait ho	440	sf	200.00	88,000	
New composite piles at catwalk	4	ea	12,000.00	48,000	
Mechanical, Plumbing, Fire Protection Re	pairs				
Replace bait house outdoor DX-split sys	1	ls	20,000.00	20,000	
Replace pier hose bibbs & piping	1,100	lf	100.00	110,000	
Replace sanitary piping	750	lf	110.00	82,500	
Replace bait house water heater & piping	1	ea	2,500.00	2,500	
Replace fire water piping & standpipes	1,050	lf	310.00	325,500	
Electrical Repairs - Pavilions (6ea)					
Demo all receptacles/conduits at pavilions	6	ea	500.00	3,000	
New conduits/power to pavilions/bait house	1,860	lf	35.00	65,100	
Re-feed power to turtle lights	6	ea	1,500.00	9,000	
New twist lock receptacles	6	ea	1,500.00	9,000	

SubTotal	\$1,568,100	
Contractor General Conditions	20.0%	\$313,620
Contractor Insurance & Bonds	5.0%	\$94,086
Builder's Risk Insurance	1.5%	\$28,226
Estimate Contingency	10.0%	\$197,581
Escalation	3.0%	\$66,048
Permits - By Owner		
Contractor OH&P	10.0%	\$226,766

Probable Construction Cost

\$2,494,427

Budget Clarifications

Repairs are limited to items listed above in this budget, all other repairs are excluded.

All structural repairs to pier structure/deck are excluded, except as noted

All repairs to the existing bait house except are excluded, except as noted.

All pier furniture, canopy's, etc. are excluded.

All pier deck repairs. Finishes are excluded.

Above budget excludes Owner Contingency

This does not include professional design services.

C C & A CONSTRUCTION CONSULTANTS & ASSOCIATES, INC.

PROJECT : Clearw LOCATION : Clearw FILE NAME: Clw Pi	ater Pier ater, Flor er 60	60 Repairs ida			DATE : 04/14/25 PROJ # : 2025.104 PAGE : 2 OF 3
DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	REMARKS
Conceptual Design Construction Budge	ət				
Task 2 - Repair in Kind & Remove the W	/est End '	'T" Sectior	ı		
Architectural Repairs					
Replace conc pedestrian entry ramp	700	st	35.00	24,500	
Replace guardrails at entry ramp	30	lT V	200.00	6,000	
Replace guardrails at pier	2,115	IT	200.00	423,000	
Replace nardware at pavilions	6	ea	2,500.00	15,000	
Replace damaged Naval Markers	1	IS	40,000.00	40,000	
Structural Repairs	2	<u></u>	10 000 00	20,000	
Repair damaged precast piles	2	ea Ic	75,000.00	20,000	
Repair Conclueck cracks/spairs	1	ls le	150,000.0	150,000	
Replace catwalk platform/railings at bait b	י 440 ה	is ef	200.00	88,000	
New composite niles at catwalk	۲ ۸	51	12 000 00	48,000	
Mechanical Plumbing Fire Protection	Renairs	Ca	12,000.00	40,000	
Replace bait house outdoor DX-split svs	1	ls	20 000 00	20.000	
Replace pier hose bibbs & piping	1 100	lf	100.00	110,000	
Replace sanitary piping	750	lf	110 00	82 500	
Replace bait house water heater & piping	1	ea	2.500.00	2,500	
Replace fire water piping & standpipes	1.050	lf	310.00	325.500	
Electrical Repairs - Pavilions	,			,	
Demo all receptacles/conduits at pavilions	6	ea	500.00	3,000	
New conduits/power to pavilions/bait hous	e 1,860	lf	35.00	65,100	
Re-feed power to turtle lights	4	ea	1,500.00	6,000	
New twist lock receptacles	5	ea	1,500.00	7,500	
Remove West End "T" Section of Pier					
Demo conc pier	2,400	sf	125.00	300,000	
New guardrail at pier end	20	lf	200.00	4,000	
SubTotal				\$1,815,600	
Contractor General Conditions	20.0%)		\$363,120	
Contractor Insurance & Bonds	5.0%)		\$108,936	
Builder's Risk Insurance	1.5%)		\$32,681	
Estimate Contingency	10.0%)		\$228,766	
Escalation	3.0%)		\$76,473	
Permits - By Owner					
Contractor OH&P	10.0%)		\$262,558	
Probable Construction Cost				\$2,888,133	

Budget Clarifications

Repairs are limited to items listed above in this budget, all other repairs are excluded.

All structural repairs to pier structure/deck are excluded, except as noted

All repairs to the existing bait house except are excluded, except as noted.

All pier furniture, canopy's, etc. are excluded.

All pier deck repairs. Finishes are excluded.

Above budget excludes Owner Contingency

This does not include professional design services.

C C & A CONSTRUCTION CONSULTANTS & ASSOCIATES, INC.

PROJECT : Clearwater Pier 60 Repairs LOCATION : Clearwater, Florida FILE NAME : Clw Pier 60					DATE : 04/14/25 PROJ #: 2025.104 PAGE : 3 OF 3
DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	REMARKS
Conceptual Design Construction Budget					
Task 3 - Repair in Kind, Repair/Renovate	West Er	nd "T" Sec	tion		
Architectural Repairs					
Replace conc pedestrian entry ramp	700	sf	35.00	24,500	
Replace guardrails at entry ramp	30	lf	200.00	6,000	
Replace guardrails at pier	2,115	lf	200.00	423,000	
Replace hardware at pavilions	6	ea	2,500.00	15,000	
Replace damaged Naval Markers	1	ls	40,000.00	40,000	
Structural Repairs					
Repair damaged precast piles	2	ea	10,000.00	20,000	
Repair conc deck cracks/spalls	1	ls	75,000.0	75,000	
Repair & new deck expansion joints	1	ls	150,000.0	150,000	
Replace catwalk platform/railings at bait ho	440	sf	200.00	88,000	
New composite piles at catwalk	4	ea	12,000.00	48,000	
Mechanical, Plumbing, Fire Protection Re	pairs		,	- ,	
Replace bait house outdoor DX-split sys	. 1	ls	20,000.00	20,000	
Replace pier hose bibbs & piping	1.100	lf	100.00	110.000	
Replace sanitary piping	750	lf	110.00	82.500	
Replace bait house water heater & piping	1	ea	2.500.00	2.500	
Replace fire water piping & standpipes	1.050	lf	310.00	325,500	
Electrical Repairs - Pavilions	,			,	
Demo all receptacles/conduits at pavilions	6	ea	500.00	3.000	
New conduits/power to pavilions/bait house	1.860	lf	35.00	65,100	
Re-feed power to turtle lights	4	ea	1 500 00	6 000	
New twist lock receptacles	5	ea	1,500,00	7,500	
Renovate West End "T" Section of Pier	Ũ	0u	1,000.00	1,000	
Remove conc deck	2 400	sf	75.00	180 000	
New PIP conc beam structure	2 400	sf	150.00	360,000	
New blow-out wood papels	2,400	ef	100.00	240,000	
New quardrails at "T"	2,400	lf	200.00	52 000	
New metal canopies	800	sf	150.00	120.000	
SubTotal				\$2,463,600	
				* , - ,	
Contractor General Conditions	20.0%			\$492,720	
Contractor Insurance & Bonds	5.0%			\$147,816	
Builder's Risk Insurance	1.5%			\$44,345	
Estimate Contingency	10.0%			\$310,414	
Escalation	3.0%			\$103,767	
Permits - By Owner					
Contractor OH&P	10.0%			\$356,266	
Probable Construction Cost				\$3,918,927	

Budget Clarifications

Repairs are limited to items listed above in this budget, all other repairs are excluded.

All structural repairs to pier structure/deck are excluded, except as noted

All repairs to the existing bait house except are excluded, except as noted.

All pier furniture is excluded.

All pier deck repairs. finishes are excluded.

Above budget excludes Owner Contingency This does not include professional design services.