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Marine & Environmental Consulting

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March 13, 2023

Venetian Bay Yacht Club South
C/O James Guidone
4060 Gulf Shore Blvd N
Naples, FL 34103

RE: Marina Assessment Report for Venetian Bay Yacht Club South

Turrell, Hall & Associates, (THA) was hired to conduct an existing conditions assessment of the Venetian Bay Yacht Club South Marina. Our initial site visit was complete on February 7, 2023 to assess damages caused by Hurricane Ian. This was a non-invasive, visual assessment conducted from walking along the seawall, and onto 5 separate fixed dock systems. The following report consists of recommendations for repairs to improve the docks with estimated budget numbers.

Existing Conditions

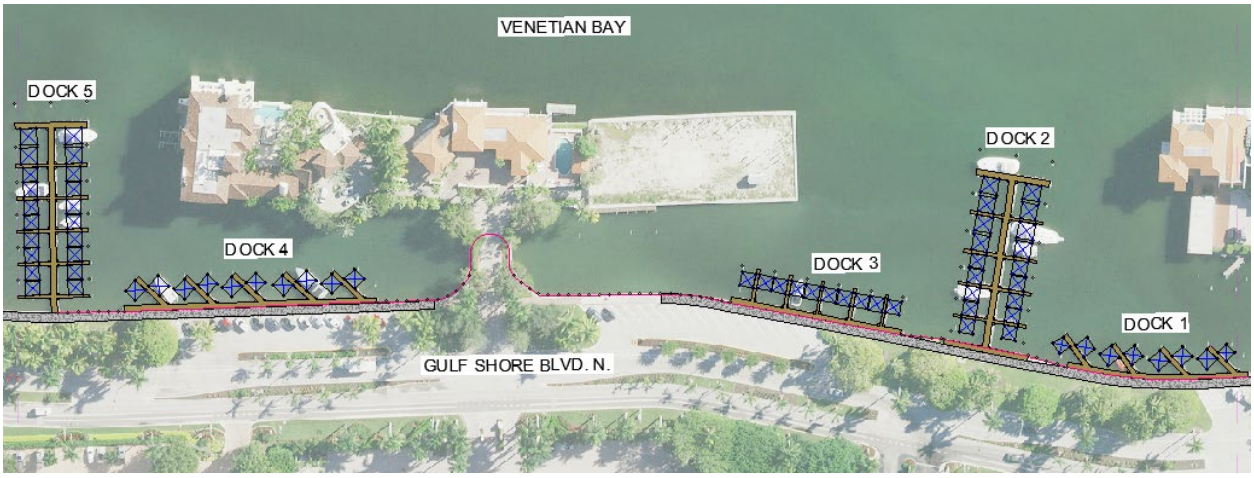

Figure 1: Existing Site Aerial (Pre- Storm)

The subject property is located along Venetian Bay, and has 5 separate docks sections of fixed dock consisting of 66 slips with boat lifts, as shown in figure 1. The docks form a private yacht club which spans roughly 1,200 linear feet of shoreline, consisitng of a public sidewalk and a city owned seawall.

Typical Dock Overview

Figure 2 shows a typical cross-section view of a finger pier spanning off a fixed dock system. The docks appear to be constructed from 2″ x 6″ synthetic decking, 10″ – 12″ piles, 2″ x 10″ and 2″ x 12″ cap timbers, and 2″ x 10″ stringers. "X" bracing provides extra strength to the finger piers and is constructed from 2″ x 10″ unwrapped wood. The boards immediately under the decking material are called stringers and run lengthwise along the dock. The stringers are then supported by the cap timbers, which run perpendicular to them and are typically double bolted to the piles to ensure additional structure support and increase the docks overall life span. Most of the piles are wrapped with vinyl to protect them from marine boring organisms that will otherwise eat away at the wood, but some piles will require new wraps if the existing wraps can't be repaired.

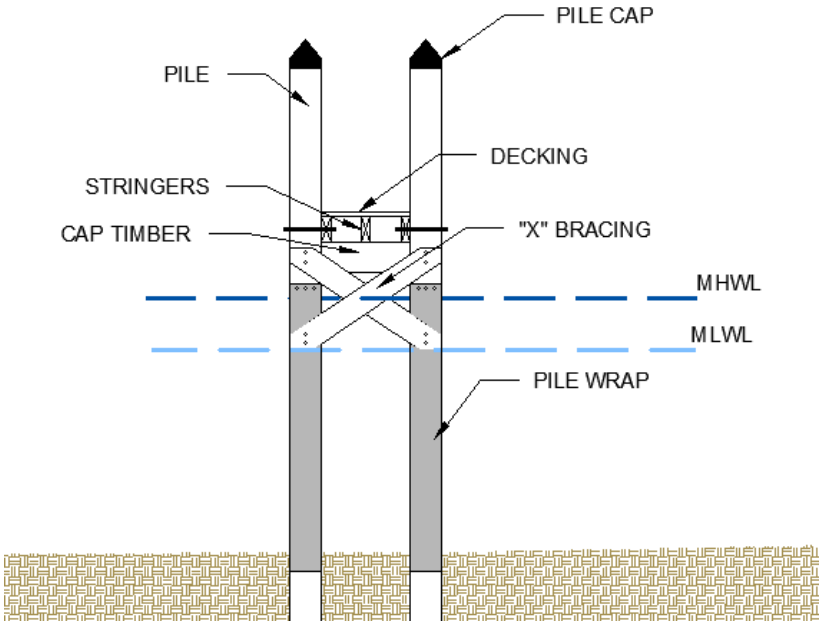

Figure 2: Typical Fixed Dock Cross-Section

Dock 1 Assessment

Dock 1 consists of 8 boat slips with 4 slanted finger piers. In this section it was apparent that many of the piles supporting the dock as well as the boat lifts have been lifted up or moved during the storm to cause them to lean to one side. This has caused the fingers in this section to not run straight. This is a potential hazardous condition where the walking surface is not even. Many of the thru bolts for the cap timbers in this section were corroded, shifted, or missing. They appear to be 304/305 stainless steel which tends to leave a rust-colored stain. The piles supporting the boat lift sit at an angle which adds stress and fatigue to the lift motors themselves. In this section it was also noted that the seawall cap has been chipped away and spray painted, likely to be repaired by the city of Naples. In this section, it was inconclusive that the "X" bracing between piles was attached properly, but this is something to be checked at every dock.

Figure 3: Leaning Pile

Figure 4: Shifted Cap Timber Thru-Bolts

Figure 5: Leaning Lift Pile

Dock 2 Assessment

Dock 2 is a "T" dock with 18 slips, which appeared to have more damage than the other dock sections. In this section there appeared to be the most significant damage to the outtermost fingers, however damage was apparent throughout the whole system. Figure 6 shows some of the decking was separated, with utility lines running through the gaps. Many of the fingers had piles that would sway side to side with minimal force applied. The pile movement either indicates the pile had been lifted or shifted during the storm, or could also have been due to the piles not having been driven deep enough to firm bearing during origional construction. When the piles supporting the fingers shifted, the decking also shifted, making the fingers not visually straight, and in some cases crooked and not level. Some of the finger piers had gaps in the decking or bolts pulled out of place, which is an indication of storm damage, however some of the other finger piers may have been built slightly crooked to begin with. Many of the lifts in this section appear to have had some rewiring done, in order to get boat lifts functional. If this is the case, all abandoned conduit should be removed. The North Eastern most finger had the most damage where the end piling appeared to be sinking into the mud. It was noted that there were multiple holes in the cap timber in this section indicating that the shift had occurred before, and it was rebolted in a different location to level the dock. Due to the poor construction during installation in this area, the damage was amplified due to hurricane Ian. This means that pilings need to be pulled and replaced with new. In other areas where the dock has visually shifted but the pilings are still straight, the framing just needs to be readjusted to bring the decking level.

Figure 6: Separated Decking

Figure 7: Non-Linear Finger Pier

Figure 8: Crooked Pile

Like most areas of the docks, it was found that the stainless hardware securing the cap timbers to the pilings was showing signs of corrosion, which is just an aesthetic issue. The split cap timber observed does raise a concern. This is likely from added stress from a weak spot in the wood when the hole was drilled for the hardware. A typical example of this is shown in Figure 9.

Figure 9: Split Timber

Figure 10 highlights a section of the main walkway to this T dock that was crooked and not level. During the storm, it was likely that boat owners secured their boats with dock lines to this section which were under major tension and applied additional force to the pilings. This then caused the pilings to then shift and bring the decking of several finger piers with them. It is also important to note that along with the storm surge wave action contributed to the shifting of the decking. At the end of the "T" it was also apparent the decking had shifted which again was a result of the piles moving. This is highlighted in Figure 11.

Figure 10: Dock 2 Main Walkway

Figure 11: Dock 2 Main End of "T"

Due to the pile movement the boat lifts in this section of the dock have also been compromised. In some areas it was noted that the lift beams had been rubbing up against the lift piles, further fatiguing the overall system. This could have been due to a shifted pile or poor initial installation.

Figure 12: Lift Beam Rubbing Pile

Additionally, many fingers in this section had separated decking. Figure 13 demonstrates that a pile has shifted and caused the decking to move.

Figure 13: Decking and Pile Shift

Dock 3 Assessment

Dock 3 consists of 10 boat slips, and associated pile supported boat lifts. These slips are angled along the seawall. The observations of the overall condition were consistent with the other docks. Some of the boat lifts were damaged from uplifted piles, which is a result of the docks being lifted due to storm surge. Some of the cross bracing between piles was noted to be snapped or completely missing. Unstable piles compromised the structural integrity of 2 finger piers in this section, being the northern most and 3rd northern most pier.

Figure 14: Snapped Cap Timber

Dock 4 Assessment

Dock 4 consists of 10 boat slips, with pile supported boat lifts. These slips are angled along the shoreline. The electric panel appeared to be tampered with and it is recommended that an electrician inspect all electrical feeds to verify replacement/repairs needed. Any wiring that is not being used is to be removed. This section appeared to be in the best shape when compared to the other sections, however the same issues of some piles being crooked were noted. Besides the uplifted pile, it is unclear whether crooked decking is an issue of hurricane Ian or a preexisting installation flaw.

Figure 15: Compromised Lift Pile

Figure 16: Compromised Lift Motor

Dock 5 Assessment

Dock 5 is another "T" dock composed of 20 slips. This entire dock showed failure in terms of crooked fingers, wobbly pilings, and broken utility lines. The most significant damage appeared to be at the end of the "T" where there were missing piles, broken stringers, broken lifts, and decking falling in the water. Many of the fingers were not level, creating an uneven walking surface. Some of the piles had a vissible "orange fuzz," which indicates initial deterioration. This happens when a pile ages and salt water wicks into the timber, and is seen in Figure 18. It is not something to be replaced right away, however it is something to be noted for future replacement. Similar to dock 2, any boat lifts that have been rewired need to fully remove previous wiring. Some "X" bracing in this section was noted as broken. All "X" bracing should be checked and securly fastened. Fingers that are crooked or not level should be reframed.

Figure 17: Unlevel Finger Pier

Figure 18: Deteriorated Pile (Orange Fuzz: Above the Bolts Shown)

Figure 19: Crooked Finger Pier

Figure 20: Uneven Lift Beam

Figure 21: Damaged Top of Pile (Not a Structural Issue)

Figure 22: Finger Pier Falling in Water

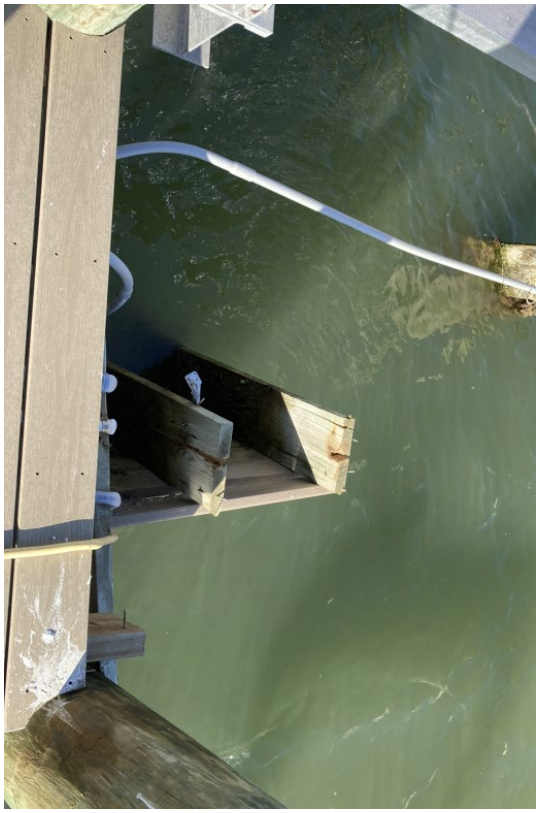

Figure 23: Compromised Utility Lines

Figure 24: Compromised Boat Lift

Figure 25: Snapped Guide Rails For Side of Lift

Figure 26: Broken Fire Extinguisher Cabinet

Based off the on-site observations completed by THA post Hurricane Ian, the existing conditions of the overall facility's docks and lift piles are all in fair to poor condition. In many areas it is unclear if the damage is due to Hurricane Ian, poor construction, or deterioration. It is our opinion the facility's responsible entity should strongly consider full replacement of most docks and pilings. At a minimum, the areas indicated in figure 27 should be addressed. These are issues concerning pilings, lifts, decking and their associated framing.

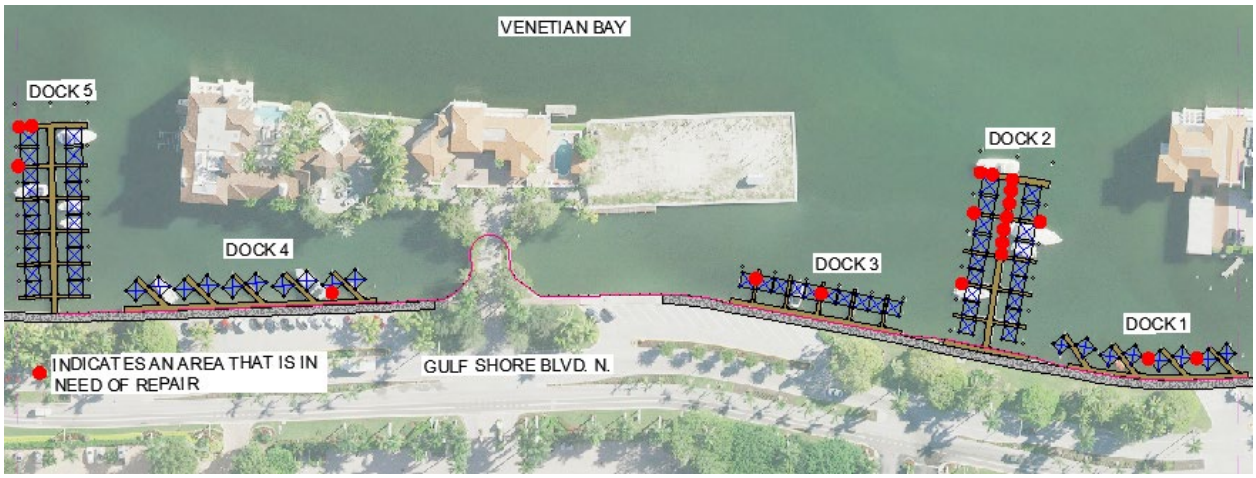

Figure 27: Site Map of Some of the Serious Damage (Red) to be Adressed

While a replacement plan and associated permitting is taking place there are minor structural repairs to be completed to the identified damaged areas to ensure the docks are structurally safe for use. Repairs are a cost-effective solution, but they are still insufficient to restore the docks to an ideal finished high spec marina.

Recommendations

- Make repairs to the existing docks including decking, cap timbers, stringers, and hardware to ensure structural integrity and safety.
- Remove abandoned conduit from lift repairs.
- Develop a plan for full repair of all docks.
- A plan for an all new dock system could also be created to produce a more durable marina including all docks with pilings driven to tighter specifications.
- Have a qualified electrician who is familiar with the marinas and the national code inspect all electrical feeds to verify replacement/repairs needed. After this is complete any related electrical repairs might be worked into the installation of your new power pedestals.
- The manufacturer of the lifts, Golden Boat lifts, should inspect boat lifts and make recommendations for repairs.
- All damaged piles to be pulled and replaced with new.
- Utility lines need to be tested through entire dock system.

Repairs can be made to the extent possible to make the docks safe and usable, but due to the combination of Hurricane damage and construction defects, the docks will never be perfect without complete replacement. To replace everything, it is estimated to be over 5 million. This is based on unit costs of docks and marinas we have done recently, including the ongoing Venetian Bay North marina. To repair what is structurally concerning is estimated at $400,000. For repairs to include aesthetic defects it is estimated to be around $800,000. The provided budget numbers are based on similar projects that have been completed but could easily change in the future. We suspect most contractors will bid time and materials.

This report expresses the opinions of Turrell, Hall & Associates, Inc. and does not imply any warranty regarding the condition of the seawall or docking facilities. If you have any questions, please do not hesitate to call or email Jake@thanaples.com.

The following page is an example of the bid scope and form that could be used to solicit bids for repairing the existing docks.

Scope Of Work to Repair Docks

Docks consisting of 5 separate fixed systems will be repaired to pre-storm function. Contractors will bid this as time + materials. Repairs will be made matching existing/original materials except for in water X-bracing. Any replaced X-bracing will be 2”X10” synthetic lumber WearDeck, which will not deteriorate underwater. The entire electrical system will be inspected by a qualified licensed electrician and repaired as needed. All utility lines will be inspected and repaired as needed. All abandoned conduits and wiring will be removed and disposed of. Any damaged boat lift pilings will be replaced using new pilings. Dock pilings will be redriven as needed. Docks will be aligned and leveled as needed. All boat lifts will be inspected by the boat lift manufacturer or a qualified lift technician and repaired as needed. Any dock framing and decking will be repaired as needed. Below is a preliminary schedule of values that would be used to repair the dock system.

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SCHEDULE OF VALUES

Venetian Bay Yacht Club South				TH #: 1612.01	
BIDDER: TO BE DETERMINED					
ITEM NO.	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**
1	Mobilization	LS			$ -
2	Demo & Disposal (fixed docks & boat lifts)	LS			$ -
3	Building Permit	LS			$ -
4	Surveys (layout, pre-existing, as-built)	LS			$ -
5	Demobilization	LS			$ -
6	Inspect / access electrical system	LS			$ -
7	Inspect / access utility system	LS			$ -
8	12”X 35’ marine piling installed with pile wrap	EA			$ -
9	10” X 35’ marine piling installed with pile wrap	EA			$ -
10	2” X 8” rough cut stringer installed including fasteners	EA			$ -
11	2” X 12” PT cap timber installed including fasteners	EA			$ -
12	2” X 6” WearDeck decking installed including fasteners	SF			$ -
13	2” X 10” WearDeck X bracing complete including fasteners	EA			$ -
14	Black Vinyl Piling cone cap	EA			$ -
WRITTEN COST $					
NOTE: ALL BOAT LIFT PILINGS MUST BE INCLUDED IN THE BID PROPOSAL. IF ANY ROCK PUNCHING/ DRILLING SHOULD BE REQUIRED **PERMITTEE** OR **ENGINEER** MUST BE NOTIFIED PRIOR TO COMENCEMENT.					

OPTIONS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
A					$ -

CONTRACTOR NOTES: Pricing based off these assumptions...