

THE SEAWALL AT BOARDWALK CAPER -- TIME LINE

Some dates are approximate. Comments summarize general committee assumptions and conclusions, as presented in committee reports to CSA since 2001.

1955 +/- Siesta Isles project -- seawalls built, land/mangroves filled, canals dug, including BWC property up to San Carlos Blvd.

1956 First house on Cutlass Drive appears on tax rolls. Many follow in 1959

1978 +/- Walter Pancoe purchases the commercial strip along San Carlos Blvd. and commences Phase I of Boardwalk Caper (BWC).

1979/1980 At that time there exists 3,245 +/- feet of seawall on the Boardwalk Caper property. Finger Construction Co. rehabs the seawall by adding new tie backs through existing alternating drain holes in the slabs by Phase I&II and only two new tie backs near the end of the fish/pumpout dock by Phase III. Also they selectively rebuilt the seawall cap and installed "I" beams and tiebacks along the bottom of the seawall cap in the vicinity of slips 65-50 for about 225 feet and slip 85-82 for about 60 feet because of perceived weakness in that area. (Recently - 2009 - at least one section of the "I" beams appear to be detaching from the bolt/tieback system originally installed.)

1980/1983 Boardwalk and docks under construction. A secondary concrete support wall for the boardwalk was installed on properties now belonging to VI and III. It was built about 6 feet landward, 1 foot above the existing seawall, and at least 3 feet in depth below the level of the main seawall cap. The inboard edge of boardwalk support wood timbers rest in specially cast slots in that concrete wall.

1981 First townhouse on Tax rolls.

1983 Phase III highrise commenced. On Tax roles by 1987.

1988 Approximately 450 feet of the existing seawall along Cutlass Canal was removed and a Boat basin dredged to the east with 660 feet of new seawall installed around it, making the seawall 3,455 feet in total length

1989/1990 Boat basin was re-dredged deeper. The mud slope at the seawall toe was covered with filter fabric and 6" coral stones placed to hold it and the mud slope in place. New docks and boardwalk built around basin. State Department of Environmental Protection mandated that mangroves be planted behind the back docks and along the seawall. The inboard edge of the boardwalk around the boat basin in front of Phases IV, V, and part of VI is supported by heavy timbers which double as soil retainers. (Inboard edge of the boardwalk in Phase I&II rests on the seawall with plastic corrugated earth retainers positioned to hold the lawns in place.)

1995/96 Rebuilt the wooden supports and placed BrockDeck on the boardwalk and docks. Inspected and did extensive rebuild of the seawall cap and some tieback segments where found necessary. Placed filter fabric and gravel fill behind the seawall in many locations (Bruce Smith was hired to oversee the project). Those rebuilt caps can be identified by the bonding agent runs below the cap.

2001 Seawall collapse, November 3, vicinity of slip 5. Bottom of the slabs pushed outwards due to loss of bottom penetration. Costs were about \$30,000. for rebuild of 26 feet of seawall using vinyl sheet pile plus fill and infrastructure. Hence the "guesstimate" rule of \$1000. per foot of seawall to rebuild (at that time). Removed broken and cracked panels measured an original length of 7' 6" and 6' wide. Commenced a seawall inspection program. Measured height of seawall to mud line in 100 locations. Found slip 130 to

132 with a deep trench at the toe of the seawall. Those seawall panels measured about 8' long with only 21" remaining buried. Elsewhere the depths of burial appears to be on the order of 40-45"

At this time there was no designated Seawall Committee by CSA. Ron Kollmeyer was asked to help do something on an ad hoc basis. This was the first year of Seawall Reports for the records of CSA. Detailed files have since been maintained and this continuing time line following below reflects a summary of work carried out.

2002 Continued with annual seawall inspections. Determined leaking joints at both the north and south end of the Boat Basin where the new seawall joined the old one after the basin was dug. Boat basin panels were measured to be at least 10 feet long and well into the bottom. However, mud "bubbles" at the base of the seawall along the north and south side sections tends to indicate some form of earthen flow from under the panels. We continue to monitor the situation.

2003 Re-inspected the seawall near slips 130-132 and found further deepening. Filled in along 30 feet with piled up concrete bags to replace the missing mud. Suspected a fresh water spring/manatee wallowing or both. Appeared to have solved the problem. Made repairs to the north seawall joint in the boat basin, concrete and rebar connecting both separating slabs. Inspections noted fill leakage from ends of the rebuilt seawall near slips 3,4,5&6. Suggested fix to be a an installed form with concrete and rebar to seal off the ends. CSA was asked to establish a Seawall Committee so as give the unit owners involved with the seawall, Committee status and therefore liability protection. CSA established the Committee with Ron Kollmeyer as the Chairman and Jim Siegel and Bruce Smith as members.

2004 Completed forms/concrete fix of the seawall ends near slips 3,4,5&6. It stopped the land/lawn subsidence in front of the units 1-5. Hurricane Charley removed over 200 feet of boardwalk and docks near Phase III. During rebuild of the boardwalk and docks, seawall repairs were made and several new tiebacks installed along pool 4. Some seawall cap was also repaired where it was exposed due to the boardwalk being torn off. (Bruce Smith was hired to oversee the project) Areas of concern were also cited near the pumpout station and significant cap repairs were not attempted as the panels appeared to have shifted at some time in the past and it was not known if that shifting would continue so a cap rebuild was deferred as being ineffective. Concrete was placed behind the joint to stop fill leakage and some cap patches were made. The intent was to watch this area carefully as total rebuild of this section of the seawall had to be considered to correct the panel problems. A coral rock riprap toe reinforcement along with the planting of mangroves was suggested for the entire southern area as protection from storm waves, which would help to solve this problem. No action was taken due to question of "view" problems. An annual seawall inspection was again made with trouble areas noted. Several hundred feet of boardwalk was lifted up by the waves during Charlie, from the Boat Basin, north to pool 2. After the boardwalk was realigned, aluminum hold down clamps were designed, fabricated and install, fastening them to the inboard boardwalk stringer with a hook connection made to the seawall cap. These were placed every 100 feet along the uplifted zone.

2005 CSA commissioned an inspection of the seawall and pile connection bolts on the boardwalk. The date was 12/05 and the inspection was carried out in 2006

2006 The inspection of the seawall and boardwalk supports disclosed most of the support bolts for the boardwalk were rusted away. Further inspection of the docks showed the same problems with little metal holding things together. A program of boardwalk and dock refastening was commenced, adding new wooden support clamps. The seawall joint at the south corner of the boat basin was leaking and back fill behind the seawall had lowered several feet along an 11 foot long portion of the wall at the corner. Repairs were made using hydraulic cement and concrete support bags on both sides at the corner joint. The seawall repairs needed as noted in the above mentioned inspection report included sand leakage between the panels along the seawall at Association VI, as well as cap disintegration of the previous repairs done

when the boardwalk was rebuilt in 1996, and the continued concerns for the seawall near the pumpout station. Proposed repairs were scheduled for 2007, following the dock and boardwalk refastening repairs.

2007 The seawall cap, along approximately 120 feet, in numerous sections, by Association VI and III, was repaired by chipping out the loose and broken concrete and rusted rebar. Stainless steel threaded rod was used as rebar and epoxied in place with a sealer painted over any exposed old rebar. Forms were set in place and the concrete cap was poured and completed. The 12 foot section of seawall near the pumpout station which was of concern in 2004 continued to show signs of collapse in the form of sinking and a settling rotation of adjacent panels. The cap was cracked at several points and appeared to be rotating back off the top of the panels. We consulted with Stemic Marine and Durable Installations (the firm doing our dock and pile rebuild). The appearance was that wall section was showing signs of imminent collapse. Their suggested fix was a gravity wall built against the seawall panels. 400 sacks of concrete premix were placed along that section of the seawall forming a sloped gravity wall against the failing seawall panels.

Due to concerns voiced by Association VI and others that CSA Reserve funding for the seawall should be re-examined in the light of growing repair costs and a deteriorating seawall, it was suggested that a visual inspection again be conducted and documented of all parts of the seawall and that the Committee pursue obtaining a waterfront engineering design firm to evaluate the condition of the seawall and provide suggestions and guidance for the future repair, refurbishment or replacement of the seawall. The Seawall Committee was expanded to seven members. On February 17, 2007, Durable Installations carried out a seawall inspection and produced a written/photographic report at no cost to CSA. Following that inspection in March 2007, Hans Wilson & Associates, Inc. (HWA) were hired to commence an Engineering study of the entire seawall and produce a report on its condition and repair/replacement needs. "Proposal for Services - Boardwalk Caper, Seawall Repair Specifications", Total cost \$14,500. November 2007 received a report section: "Seawall Assessment for Boardwalk Caper" - existing conditions from HWA.

2008 January 2008 (front page dated 2007 in error) Received the report "Seawall Repair Recommendations for Boardwalk Caper". It was judged as being incomplete by the Committee and HWA was asked to provide more information. January 21, 2008 Seawall Committee prepared an independent analysis of total Rebuild Costs and submitted it to CSA. The enormous multimillion dollar rebuild cost for the entire 53 year old seawall resulted in re-thinking the idea of total rebuild of the seawall and the adoption of the philosophy of aggressive repair and maintain rather than rebuild after failure.

January 28 2008 Committee met with HWA and outlined in writing the deficiencies of the January 2008 Seawall Repair report Recommendations. February 18, 2008, the Committee conducted a seawall inspection, annotating those areas for masonry repairs as per the HWA January Recommendations. The Committee reported to CSA summarizing the masonry repairs being requested, submitting 3 bids for the work. CSA contracted with Durable Installations, Inc. for the masonry repairs as suggested by HWA. A sum of \$44,000. was authorized to complete this work. Most of the repairs occurred north of the boat basin, but one major cap rebuild, to twice its original size, was carried out over a length of 18 feet to secure the panels along the pumpout pier which presently lacked any top tieback support. Completed in April 2008.

April 15, 2008 Requested an update from HWA on progress towards completion of final recommendations and completion of the original March 2007 Proposal. Received email from HWA giving a basic outline for recommendations and setting up a meeting, May 10, 2008. Meeting was for the inspection of the masonry repairs already completed and to finalize repair and rebuild concepts in order to complete the "Proposal for Services - Boardwalk Caper, Seawall Repair Specifications" study project of March 2007.

August 11, 2008 An article about Mangrove Seedling/planting program appeared in the News-Press.

August 12, 2008 Seawall Committee met with representative Ingrid Sherzer, from the company Riley Encased Methodology to view BWC's potential for mangrove planting along certain seawall areas. Questions of ownership and rights or permission for planting were raised. The Committee turned the information over

to BWCVI for possible implementation and follow through. However, the thought remained that this protective planting along the seawall is consistent with and comparable to any CSA program for seawall maintenance and repair.

September 16, 2008 Received the Final Engineering Report from HWA "Proposal for Services - Boardwalk Caper, Seawall Repair Specifications" study project of March 2007. October 4, 2008 Received the Committee requested, four SEPARATE Permit/Repair proposals from HWA, including the General Permit for emergency rebuilds. They covered revetment replacement using sand/cement bags for the "H" beams by slips 65-50, 228' of seawall and slips 85-82, 68' of seawall, a similar revetment of 120' of seawall north of pumpout station, and 175' coral rock shelf/revetment with mangroves along pool 4. The SEPARATE proposals, one for each part of the project was rejected by the committee as too much duplication of effort and HWA was asked to prepare one combined proposal.

October 9, 2008 In an effort to answer the question of how much is this going to cost, the Seawall Committee requested and received email covering "rough estimates from several contractors for the four project components": \$200,000 plus engineering.

October 12, 2008 CSA accepted a proposal from Mangrove.org of Melbourne Beach, FL to plant two rows of encased mangrove seedlings along the 360 feet of seawall bordering Association VI's seawall, from the basin, south to the property line between VI and III. Cost at \$12,000 with multiple visits for future replanting to assure 100 percent sprouting.

October 13, 2008 Received a COMBINED Permit/Repair proposal from HWA. This proposal obtains the necessary permits for the repair projects. Once permits are in place, the separate proposed projects can be commenced as funds become available with engineering design already completed and expected engineering supervision as part of the proposal. Estimated cost \$33,900 and passed by CSA. However, by October 15, 2008 the Seawall Committee was not satisfied with the HWA Proposal for the Permit application work. Discussions centered around a cost more closely aligned with \$14,000 to \$15,000 with add-ons as needed.

2009 January 22, 2009 contracted with HWA for "Proposal of Services - Seawall Repair" with the goal of finishing the engineering design, obtaining the Federal and State permits, and the Bid and contractor selection process. Estimated cost \$14,000 with the caveat of Time and Material costs being additional. This was well within the \$33,900. already voted by CSA. The Permit Application was prepared and submitted to the State of Florida DEP and the U.S. Army Engineers dated 4/16/2009. Most of this year was spent waiting for the permitting process to run its course. A permit for the proposed seawall work was received dated December 12, 2009 from the South Florida Water Management District, in lieu of a permit from the DEP, and that permit was forwarded on to the Army Engineers.

2010 A permit for the work was approved by the Army Engineers dated July 1, 2010. A Bid package was prepared and sent out to prospective contractors with a return date of July 22, 2010. The selected firm was Florida Marine Construction for a bid of \$240,827. Added engineering costs from HWA are expected during the course of the construction. However, 5 site visits during construction at \$250 each were included in the January 22, 2009 outline of "Proposal of Services - Seawall Repair"

Upon recommendation by the Seawall Committee consisting of Ron Kollmeyer Chairman, Brew Smith, Jim Siegel, Rives McGinley, Leon Beaty, Al Bott and Jim Seabury, CSA voted to proceed with the seawall repair program on September 9, 2010 at a special meeting called by President Kent Olinger.

2011 During the months of December (2010) -January (2011), the stone riprap was placed along 175 feet of seawall, from the terminus of the existing mangroves by Pool 4 to the fish cleaning station at the end of the pumpout dock, as per the Permit drawings. The sand/cement bags were installed during February

2011, connecting up to the stone riprap and extending north for 120 feet to the finger pier between slips # 204 and 203. This part of the project was completed on 2/18/2011.

The final part of the project, that of using sand/cement bags as a gravity wall covering the "H" beams by slips 65-50, 228' of seawall and slips 85-82, 68' of seawall was completed on March 17, 2011. A detailed diver inspection of the remaining non-sequestered seawall was carried out during April. The remaining condition of the unprotected seawall reflects past normal conditions of random cracks and cap spalling. No specific location required immediate attention. However, random panel depth checks revealed that between slips 37 to 39, only 20 inches of panel bottom remains buried, where elsewhere 30 inches plus is the norm.

Seawall cap repairs, slips # 185 and 186 and one half of slip #188 (about 40 feet) was contracted for with Dependable Diving in December 2011. The work was completed during mid January 2012. Hans Wilson and Associates were contracted to pursue the obtaining of sand/cement bag placement permits along the remaining non-sequestered seawall along Association I&II on December 5, 2011. The cost of not to exceed \$15,000. was authorized by CSA.

The diver inspection of April 2011 was reviewed and the Seawall Committee carried out their own viewing of the listed problem areas on December 5, 2011 in order to prioritize repairs and identify first strike sand/cement bag placement when approved. The following are the conclusions of the Seawall Committee's inspection:

Priority slip locations for placement of sand/cement bags when Permitted:

- 16-17 32 ft
- 36-39 55 ft
- 67-71 70 ft
- 80-81 25 ft
- 86-87 25 ft
- 103-104 25 ft
- 112-125 175 ft
- 138-139 30 ft

ESTIMATED at a total 437 ft sand cement bags @ \$400 = \$174,800.

Slip locations for potential cap repairs: None were found to require immediate repair, however they will be inspected every 6 months and reevaluated. Note * means slip is also within priority sand/cement placement locations. Those cap fractures not included in the sand/cement priority placement locations are candidates for early repairs. The Committee's philosophy is that we do not want to spend money on any cap repairs that may be covered up by the priority placement of sand/cement bags in the near future.

- 28
- 71 *
- 77
- 106
- 116 *
- 120 *
- 122 *
- 124 *
- 129
- 136
- 139 *

2012

GENERAL COMMENTS Our bordering seawall supports and provides for the existence of our community. If we lost portions of the seawall along the canal, there could be serious foundation damage to those buildings closest to the seawall. If we loose the seawall along the south end of the property, we could loose the south wall of pool 4. At the very least, loss of any part of the seawall endangers the integrity to a greater or lesser extent of any of the several Association's docks, boardwalk and buildings.

As of the first quarter of 2011 we have sequestered 1,313 feet, 38% of our seawall which includes 300' mangrove protection at the south end, 175' coral riprap along pool 4, 22' adjacent to the pumpout station and 120' to the north of the pumpout using a sand/cement bag gravity wall, 10' at the south corner of the boat basin using sand/cement bags, 320' boat basin east wall by mangroves and bottom elevation along those mangroves due to siltation, 10' at the north corner of the boat basin with rebar reinforced poured concrete, plus 30' at slips 130-132, 68' at slips 86-81, 228' at slips 66-49 by sand/cement bags, and 30 feet at slips 3,4, 5, and 6 using vinyl sheet pile with tiebacks.

In addition, the seawall along Association VI, parallel to the canal, for a distance of 365 feet has been planted with mangrove seedlings which are anticipated to spread and proliferate to form a living barrier and protection for that part of the seawall. At present, they are healthy and growing.

The two side seawalls of the boat basin, totaling a length of 340 feet are of little concern at present. They are the newest, most recent built, 1988, of the seawall and appear to be in excellent condition. As previously noted herein, some soil bulging ("mud bubbles") is occurring from under the buried ends of the panels. However, little change in that situation has been noted over the last 9 years.

With the newly planted mangroves and the relatively new seawall in the boat basin, our sequestered 1,313 feet of seawall may be considered to be extended, at least temporarily, to 2,018 feet or 58% overall. That leaves 1,437 feet or 42% of seawall requiring short term scrutiny and maintenance plans.

As of September 2011, natural recruitment of mangrove seedlings is occurring along the riprap stone placed against the seawall at Pool 4, resulting in roots and sprouts being established. This was planned for and expected from the use of random stone revetment and a terrace/slope design at a tide level to promote mangrove establishment.