



GRAND HARBOR COMMUNITY ASSOCIATION

Property Condition Assessment Report of Findings

KHA No: 147699000

JANUARY 27, 2020

Prepared By:



TABLE OF CONTENTS

EXECUTIVE SUMMARY	6
1.0 INTRODUCTION	12
2.0 BACKGROUND	13
3.0 GRAND HARBOR SIDEWALKS, GUARDRAILS, AND BULKHEADS	14
Existing Conditions	14
Field Visit Observations	14
Discussion and Recommendations	14
4.0 GRAND HARBOR ROADWAYS, CURBS, AND GUTTERS	17
Existing Conditions	17
Field Visit Observations	17
Discussion and Recommendations	17
5.0 GRAND HARBOR SIGNAGE	19
Existing Conditions	19
Field Visit Observations	19
Discussion and Recommendations	19
6.0 GRAND HARBOR SITE LIGHTING	20
Existing Conditions	20
Field Visit Observations	20
Discussion and Recommendations	20
7.0 GRAND HARBOR SITE SECURITY	22
Existing Conditions	22
Field Visit Observations	22
Discussion and Recommendations	22
8.0 GRAND HARBOR STORMWATER MANAGEMENT PONDS	23
Existing Conditions	23
Field Visit Observations	24
Discussion and Recommendations	24

9.0 GRAND HARBOR 45th STREET PERIMETER BUFFER	35
Existing Conditions.....	35
Field Visit Observations.....	35
Discussion and Recommendations	35
10.0 GRAND HARBOR/ OAK HARBOR INDIAN RIVER BOULEVARD PERIMETER BUFFER	36
Existing Conditions.....	36
Field Visit Observations.....	36
Discussion and Recommendations	37
11.0 RIVER CLUB/ HARBOR VILLAGE R/W LANDSCAPE	38
Existing Conditions.....	38
Field Visit Observations.....	38
Discussion and Recommendations	38
12.0 GRAND HARBOR R/W LANDSCAPE	39
Existing Conditions.....	39
Field Visit Observations.....	39
Discussion and Recommendations	39
13.0 RIVER VILLAGE TRACT C STORMWATER BUFFER LANDSCAPE.....	40
Existing Conditions.....	40
Field Visit Observations.....	40
Discussion and Recommendations	40
14.0 THE FALLS AT GRAND HARBOR LANDSCAPE	41
Existing Conditions.....	41
Field Visit Observations.....	41
Discussion and Recommendations	42
15.0 CONSERVATION EASEMENT.....	43
Environmental Permit Review	43
Field Visit Observations.....	44
Discussion & Recommendations.....	45

16.0 GRAND HARBOR BRIDGE #1 AND #2.....	54
Bridge #1	54
Existing Conditions	54
Bridge #2	54
Existing Conditions	54
Field Visit Observations	54
Discussion and Recommendations	55
17.0 GRAND HARBOR GUARD HOUSES #1 AND #2	62
Existing Conditions	62
Field Visit Observations	62
Discussion and Recommendations	63
18.0 GRAND HARBOR RETAINING WALLS #1 THROUGH #4	68
Existing Conditions	68
Field Visit Observations	68
Discussion and Recommendations	71
19.0 GRAND HARBOR PEDESTRIAN TUNNELS #1 THROUGH #4	83
Existing Conditions	83
Field Visit Observations	83
Discussion and Recommendations	84
20.0 GRAND HARBOR MISCELLANEOUS STRUCTURES	94
Existing Conditions	94
Field Visit Observations	94
Discussion and Recommendations	95
21.0 GRAND HARBOR IRRIGATION PUMPS AND CONTROLLERS	102
Existing Conditions	102
Field Visit Observations	102
Discussion and Recommendations	103
22.0 ENVIRONMENTAL ASSESSMENT REPORT	108
Existing Conditions	108
Field Visit Observations	108
Discussion and Recommendations	108

SIDEWALK, GUARDRAIL, AND BULKHEAD PHOTOGRAPHSAPPENDIX A

ROADWAYS, CURBS, GUTTERS AND FOUNTAIN AREA PHOTOGRAPHSAPPENDIX B

SIGNAGE PHOTOGRAPHSAPPENDIX C

SITE LIGHTING PHOTOGRAPHSAPPENDIX D

SHENANDOAH PIPING REPORTAPPENDIX E

LANDSCAPING PHOTOGRAPHS AND MAPAPPENDIX F

FLUSHING CHANNEL AND WATERCOURSE EXHIBIT APPENDIX G

ENVIRONMENTAL ASSESSMENT REPORTAPPENDIX H

ATTACHMENTS

1.0 INTRODUCTION

In accordance with our agreement, Kimley-Horn and Associates, Inc. ("Kimley-Horn") conducted a Field Review of the common area facilities of the subject property. No destructive testing was performed. The required maintenance and replacement costs of the common areas were evaluated. Our assessment was limited to visual review of the readily visible and exposed elements of the existing facilities outlined in the agreement.

The opinions and conclusions expressed in this report were based upon information collected at the time of our investigation in June and July of 2019, and may be amended or supplemented should new information become available. No other warranties or guarantees, expressed or implied, are made or intended. This report has been prepared solely for Greenberg Traurig, LLC on behalf of Grand Harbor and Oak Harbor Transition, LLC and should not be relied upon by any other party or for any other purpose. Specifically, this report may not be used in connection with actual renovation or construction of any kind. Any reliance on this report by any party other than those named above shall be without liability to Kimley-Horn and Associates, Inc. or its employees.

Please call us at (772) 794-4078 if you have any questions.

Very Truly Yours,

KIMLEY-HORN AND ASSOCIATES, INC.

Chris Hollen, P.E.

2.0 BACKGROUND

Grand Harbor is a private community located in Vero Beach, Florida. It includes condominiums, single-family homes, two golf courses and a clubhouse. It is situated on the Indian River and along Indian River Boulevard. It is connected to the Oak Harbor private community which also includes both condos and single-family homes while sharing the golf course space.

The property owners are in the process of taking control of the Grand Harbor Community Association (GHCA) from the current developer. The GHCA has maintenance responsibility for various assets in Grand Harbor and Oak Harbor. Kimley-Horn and Associates, Inc. was asked by Grand Harbor and Oak Harbor Transition, LLC (GHOHT) to inspect all the real and related personal property assets that will be taken over by the Grand Harbor Community Association, Inc. and create an inspection report based on the findings. This report attests to the required maintenance and replacement costs or reserve amounts of the common area. GHOHT also desired to understand the obligations and conditions of applicable permits and authorizations for which the Association will be responsible, to be informed of any violations or noncompliance issues for which the Association may be responsible and to confirm that the property for which it will accept maintenance responsibility was constructed in accordance with approved permit, authorizations and plans, if possible.

Specifically, Kimley-Horn was tasked with the following:

- Research existing permits with the governing agencies.
- Conduct a field review of the following areas:
 - Sidewalks, Roadways and Roadway Signage
 - Site Lighting
 - Site Security Cameras
 - Landscaping and Fencing
 - Estuary and Preserve Areas
 - Bridges
 - Tunnels
 - Guard Houses
- Create a report discussing the above findings
- Provide cost and useful life estimations for repairs and assets

The limits of the field review consisted of all the common areas. This excludes the individual developments, land belonging to the Grand Harbor Golf and Beach Club, and any other areas the Association does not have maintenance responsibility for.

3.0 GRAND HARBOR SIDEWALKS, GUARDRAILS, AND BULKHEADS

Existing Conditions

Kimley-Horn has performed a visual inspection of all concrete and asphalt sidewalks within the street rights-of-way and access easements that will belong to the Grand Harbor Community Association in Vero Beach, Florida. Any sidewalk cracking, chipping and slab upheaval was observed and documented. The existing sidewalk throughout the Grand Harbor community varies in age and some areas seem to have been repaired in recent years. In areas of slab upheaval, the elevated areas have been sanded down to decrease the difference between adjoining slabs.

Field Visit Observations

In the months of June and July 2019, Tyler Wilson performed a site visit to assess the condition of the concrete and asphalt sidewalks within the street rights-of-way and access easements. The following was observed and documented:

Concrete

- Small and large concrete cracking.
- Small and large concrete chipping.
- Significant concrete slab upheaval.

Asphalt

- Small and large concrete cracking.
- Small and large concrete chipping.
- Significant concrete slab upheaval.

Wooden Guardrail

- Small and large cracking.
- Small and large chipping.
- Overall wood deterioration.

Bulkheads

- Small and large cracking.
- Small and large chipping.
- Overall wood deterioration.

Discussion and Recommendations

The observations listed in the previous section of this report vary from minor to significant disrepair. The severity of the disrepair was determined using professional opinion in conjunction with whether there were any code regulations violated by the disrepair. Each instance of disrepair was categorized into three conditions: good, fair, and poor. Good condition describes areas do not require attention at

this time. Fair condition describes areas that do not need immediate attention but are reaching the end of their useful life. Poor condition areas require immediate attention.

For the sidewalks, ADA code 303.2 specifies a maximum vertical change in level of 0.25 inches. For the purposes of this assessment, the cracking observed was held to the same 0.25-inch separation standard. A good condition describes areas that meet ADA code regulations and are not showing any signs of disrepair. These conditions should be evaluated every 10 years to reassess their condition. Fair condition describes areas that are within a 0.25-inch separation, are +/-0.5% of being out of ADA compliance or observed to be nearing the end of their useful life. In these areas, repairs are estimated to be required in 5 years. Poor condition areas are out of ADA compliance with greater than or equal to 0.25 inches of separation either in the horizontal or vertical directions and pose hazards to pedestrians.

For the guardrails along the sidewalks and estuaries, significant weathering and damage was observed and so is considered to be in poor condition. We recommend replacing the existing guardrails.

There were four wooden bulkheads observed. There are two bulkheads on S Harbor Drive beside the Indian River that were in fair condition. These should be reassessed every 5 years to ensure they are functioning properly or replaced in 10 years. There is a third and fourth bulkhead near the main fountain beside the fountain pump house. The third bulkhead on the east side of the pump house is beginning to rot and fall away. This bulkhead should be replaced. The fourth bulkhead on the west side of the pump house is in fair condition but should have its top board replaced. The board is weathered and splintered.

There were 305 areas of observed sidewalk disrepair. Areas that need immediate attention are described below and in Appendix A. It is our recommendation that these areas receive beveling at a minimum for the concrete sections or full replacement. Depending on the proximity to surrounding trees, root pruning may also be required to maximize the useful life of these areas.

Sidewalk

1. Sidewalk cracking on the north side of the first tunnel after entering Grand Harbor. These chips and cracks are greater than 0.25 inches. Image set #5. Appendix A page 111.
2. Concrete slabs show greater than 0.25 inches. Image #6. Appendix A page 112.
3. Sidewalk corner has cracked to greater than 0.25 inches. Image #10. Appendix A page 113.
4. Sidewalk corner and center has cracked to greater than 0.25 inches. Image #12. Appendix A page 114.
5. Sidewalk elevated corner greater than 0.25 inches. Image #15, 22, 24, 26, 28, and 30. Appendix A pages 114-119.
6. Sidewalk corners have cracked and is elevated to greater than 0.25 inches. Image #46-48. Appendix A page 124.
7. Sidewalk elevated corners greater than 0.25 inches. Image #53-54. Appendix A pages 126-127.
8. Sidewalk elevated corners greater than 0.25 inches. Image #64 and #67-71, 73, 77-78. Appendix A pages 133-140.
9. Sidewalk elevated slab greater than 0.25 inches. Image #91-97, 99, 100, 106-107, 110, 115, 118 and 119. Appendix A pages 148-164.

10. Sidewalk elevated slab and cracks greater than 0.25 inches. Image set #122, 123, set #126, 127, 135, 140, 142-145, 149, and 151-152. Appendix A pages 166-194.
11. Sidewalk elevated corners greater than 0.25 inches. Image #156, 158, 159, and set 160. Appendix A pages 196-200.
12. Sidewalk undermining and washout. Image #161. Appendix A page 200.
13. Sidewalk elevated slab and cracks greater than 0.25 inches. Image set #171, 188, set 191, 194, 195, 200, 201, 206, 210, set 217, 218, 221-224, set 228, 230, 233, 238-240, sets 242-243, 260-262, set 266-267, set 270-282, 289, set 291, 299, 302-303. Appendix A pages 204-289.
14. There is approximately 2,200 feet of 6-foot wide asphalt sidewalk along the northern roadway, Via Marbella Boulevard, between Sunset Cove and the security gate that allows access to Grand Harbor north of 53rd Street. This area of sidewalk is badly cracked throughout. It is our recommendation to replace the asphalt sidewalk in its entirety. Appendix A pages 290-292.

Note: This assessment of the sidewalk disrepair was based on the parameters described above.

Guardrail

1. The entire 4,400 linear feet of wooden guardrail along the sidewalks and estuaries is showing significant signs of termite damage and general weathering. It is our recommendation to replace the wooden guardrails in its entirety. Appendix A pages 293-296.

Bulkheads

1. There are two bulkheads near the main fountain beside the fountain pump house. The first bulkhead (bulkhead #3) on the east side of the pump house is beginning to rot and fall away. This bulkhead should be replaced. The second bulkhead (bulkhead #4) on the west side of the pump house is in fair condition but should have its top board replaced. The board is weathered and splintered. Appendix A pages 297-300.

Refer to the Sidewalk, Guardrail and Bulkhead Photographs in Appendix A for documentation of the disrepair.

4.0 GRAND HARBOR ROADWAYS, CURBS, AND GUTTERS

Existing Conditions

Kimley-Horn has performed a visual inspection of all roadways, curbs, gutters and the fountain pad within the street rights-of-way and access easements that will belong to the Grand Harbor Community Association in Vero Beach, Florida. Any asphalt or concrete cracking and chipping was observed and documented. The existing roadways, curb and gutter throughout the Grand Harbor community varies in age and some areas look to have been repaired in recent years.

Field Visit Observations

In the month of July 2019, Tyler Wilson performed a site visit to assess the condition of the roadways, curbs, and gutters within the street rights-of-way and access easements. The following was observed and documented:

Roadway

- Small and large asphalt cracking.
- Small and large asphalt chipping.
- Small and large concrete cracking.

Curbs and Gutters

- Small and large concrete cracking.
- Small and large concrete chipping.

Discussion and Recommendations

The observations listed in the previous section of this report vary from minor to significant disrepair. The severity of the disrepair was determined using professional opinion in conjunction with whether there were any code regulations violated by the disrepair. Each instance of disrepair was categorized into three conditions: good, fair, and poor. Good condition describes areas do not require attention at this time; however, they should be reassessed every 10 years. Fair condition describes areas that do not need immediate attention but are reaching the end of their useful life. They should be reassessed every 5 years. Poor condition areas require immediate attention as they are starting to exhibit structural failure. All common area roads, curbs and gutters were observed to be within 10-15 years old which places them within 10 years of their useful life. There were 59 road, 12 curb and gutter, and 4 fountain areas of observed disrepair.

All areas within the roadways are travelable; however, there are areas of significant bumps and dips that can be felt while driving. Most likely, these are due to underlying roots pushing up the asphalt. These areas could get worse and eventually crack the asphalt. Some locations have already had this occur. Therefore, it is our recommendation to prune the underlying roots and repair the asphalt in these areas.

Most curbs and gutters were in good condition but there are some sections of concrete that are significantly cracked or chipped. The areas of curbing described are experiencing significant cracking and chipping and are showing signs of failure, therefore, curb replacement is required at this time. For

the gutters, all areas of disrepair were observed to be in poor condition and need immediate replacement as they are restricting runoff flow to curb inlets.

Areas that need immediate attention are described below and in Appendix B. It is our recommendation that these areas receive resurfacing or full section replacement. Depending on the proximity to surrounding trees, root pruning may also be required to maximize the useful life of these areas.

Roadways

1. Roadway collapse due to asphalt failure. Image #3. Appendix B page 302.
2. Significant roadway cracking. Image #6, 7, and 9. Appendix B pages 303-304.
3. Area looks to have been recently (+/- 5 years) but area is continuing to crack significantly. Image #11. Appendix B page 304.
4. Large area demonstrating the beginning of asphalt failure. Image #14. Appendix B page 305.
5. Significant roadway cracking and dips due to asphalt failure. Image #15, 21, 22-23. Appendix B pages 4 and 305-308.
6. Large significant dips and cracking alongside of road. Image #24. Appendix B page 308.
7. Significant roadway cracking and dips due to asphalt failure. Image #32-34, 38, 40, 42-56 and 59. Appendix B pages 311-319.

The areas specified above can be repaired using a resurfacing strategy but the roadway, at its best, is within 10 years of its useful life. It is our recommendation that the Grand Harbor Community Association perform a full roadway replacement in 10 years for all common areas. A timeline and cost estimate has been provided as a part of this report. The replacement is advised to be done in sections deemed appropriate by the GHCA.

Curbs and Gutters

1. All curbs and gutters observed to be in disrepair are recommended to be replaced. Image set #1-12. Appendix B pages 320-324.

Refer to the Roadways, Curbs, Gutters and Fountain Area Photographs in Appendix B for documentation of the disrepair.

5.0 GRAND HARBOR SIGNAGE

Existing Conditions

Kimley-Horn has performed a visual inspection of all signage within the street rights-of-way and access easements that will belong to the Grand Harbor Community Association in Vero Beach, Florida. Any sign or signpost cracking and chipping was observed and documented. The signage observed consists of development entrance, wayfinding, and street signs all varying in age. Some signs look to have been repaired in recent years. There is also a directional mirror on E Harbor Village Drive that was documented. The mirror exists so oncoming traffic can be seen around a sharp corner.

Field Visit Observations

In the month July 2019, Tyler Wilson performed a site visit to assess the condition of the signage within the street rights-of-way and access easements. The following was observed and documented:

Signs

- Small and large cracking.
- Small and large chipping.
- Overall weathering.

Signposts

- Small and large cracking.
- Small and large chipping.
- Overall weathering.

Discussion and Recommendations

The observations listed in the previous section of this report vary from minor to significant disrepair but were in mostly good condition. The severity of the disrepair was determined using professional opinion in conjunction with whether there were any code regulations violated by the disrepair. The Grand Harbor and Oak Harbor monument signs/walls along Indian River Boulevard and the all appear to be in good condition. It is recommended that all signage be reassessed in 10 years and replaced every 20 years.

However, there are signs and signposts showing significant weathering. The signage documented in this report are considered to be in poor condition. Most of the signage documented show cracks that currently do not inhibit their function but does affect their structural integrity. Other signage observations included multiple faded or tilted signs. There is a directional mirror on E Harbor Village Drive shows significant weathering to the point where no traffic can be seen through it. It is our recommendation that all described above be removed and replaced as they are reaching the end of their useful life.

Refer to the Signage Photographs and Map in Appendix C for documentation of the disrepair.

6.0 GRAND HARBOR SITE LIGHTING

Existing Conditions

Kimley-Horn has performed a visual inspection of all site lighting within the street rights-of-way and access easements that will belong to the Grand Harbor Community Association in Vero Beach, Florida. Any external lighting disrepair was observed and documented. The light fixtures were observed both at night and during the day to verify that it functions properly and to inspect for any obvious disrepairs. No internal inspections (I.E. wiring, internal disrepair) were conducted as a part of this inspection.

Field Visit Observations

In the month July 2019, Tyler Wilson performed a site visit to assess the condition of the site lighting within the street rights-of-way and access easements. The following was observed and documented:

Site Lighting

- Nighttime functions
- Obvious signs of visual external disrepair

Discussion and Recommendations

The observations listed in the previous section of this report are mostly in good condition. The majority of the light fixtures/poles were working as intended with the exception of 12 locations. These locations had lights out during the time of the nighttime inspections. The guardhouses are lined with small lights and some of them were out as well. Since no inspection of the electrical wiring was conducted, it is unclear whether the light not functioning is an electrical issue or simply a bulb that needs replacement. Given that the fixtures near the non-functioning fixtures were functioning properly, it is our opinion that a bulb replacement is all that is likely required. In addition, many light fixtures/poles showed weathering through paint chipping. It is our recommendation that the recorded non-functioning light fixtures have their bulbs replaced due to the potential sight hazards for pedestrian and vehicle traffic. We recommend that the light fixtures and poles be monitored on a yearly basis and replace if necessary.

Additionally, there were three different exposed wires observed. Two were coming from the ground while the third was sticking out of an electrical box. The uses of these are unknown but the locations of these are as follows:

1. Exposed wire coming from the ground outside of Victoria's Island.
2. Exposed wire coming from the ground near Wood Duck. This wire has been cut and the inner wires have become exposed.
3. Exposed wire coming from the electrical box near Saint David's.

We recommend that these be repaired and placed back underground as originally intended.

Refer to the Site Lighting Photographs and Map in Appendix D for documentation of the disrepair. The images of the exposed wire are below.



Photos 6.1 and 6.2 - Exposed cut wire near Wood Duck.



Photo 6.3 - Exposed wire coming from the electrical box near Saint David's.

7.0 GRAND HARBOR SITE SECURITY

Existing Conditions

Kimley-Horn has performed an inspection of all 44 security cameras that will belong to the Grand Harbor Community Association in Vero Beach, Florida by visiting the head guard house, ran by Securitas, that monitors the cameras and their locations. We spoke with the head guard, and he mentioned how some cameras were currently being replaced/upgraded as some of the cameras were not functioning correctly. The guard house security system was set up with a large television that showed all cameras throughout the Grand Harbor Development. An inspection of the physical cameras that exist in the field has not been conducted.

Field Visit Observations

In the month August 2019, Chris Hollen and Tyler Wilson performed a site visit to assess the condition of the security cameras throughout the Grand Harbor Development. The following was observed and documented:

Security Cameras

- Visual inspection to see which are working and which are not.
- Understanding of how the cameras link to the security guard shack.

Discussion and Recommendations

At the time of the inspection, 15 out of the 44 cameras were nonfunctional while others went “in and out” as we observed them. Most were functioning correctly but according to the head guard the current configuration of how the cameras relayed back to the guard house was not always reliable. The most distant cameras relayed their recording through relay towers to get back to the guard house. These relay towers connect wirelessly and so also faced the problem of going “in and out” depending on weather and other factors. It is recommended that a physical inspection of the wiring be done on each nonfunctioning or “in and out” camera and relay tower. It is likely that the physical components of the cameras/relay towers are reaching the end of their useful life and require replacement. The camera system should be reevaluated once the ongoing replacements/upgrades that were mentioned by the head guard have been completed to ensure an accurate assessment of the existing security assets. We recommend that the cameras and associated parts be monitored every two years and replace if necessary. Additionally, the electric gates throughout Grand Harbor all seem to be functioning normally.

8.0 GRAND HARBOR STORMWATER MANAGEMENT PONDS

Existing Conditions

Kimley-Horn has performed a visual inspection of 26 ponds (73.4 total acres) that the Grand Harbor Community Association is responsible for. Many of these ponds are interconnected via a network of pipes that outfall into the estuaries and ultimately the Indian River. It was observed that serious silting and bank erosion has occurred due to natural causes combined with higher than approved water levels for a sustained period of time. Unauthorized weir structures were found near the Grand Harbor Club House and near the main fountain that allowed the operator to raise the water levels in the ponds above the control elevations approved by the SJRWMD permits. To better understand the ponds and their function, design plans for the ponds were obtained from Indian River County.

The top of all the pond banks have been eroded and no longer have the required swale and berm of the typical profile. That eroded soil plus silt from runoff has produced wide shallow shelves within the ponds, extensive silting around pipe outfalls within the ponds and completely silted in the narrower sections of most ponds reducing the pond's permanent pool volume. All of the control structures controlling flow and water levels were inspected as were all the pipes that interconnect the ponds in the system. Shenandoah Construction did all the pipe inspections and cleared out all major blockages found.

The St. John's River Water Management District permit was reviewed for compliance. The permit is as follows:

SJRWMD Environmental Resource Permit No. 18679 / Legacy Permit No. 4-061-0075

This permit authorized the construction of the initial phase of Grand Harbor, an 848-acre multiuse Development of Regional Impact (DRI). As additional phases of the project were designed, modifications to permit number 18679 were obtained from SJRWMD, each with their own specific conditions. The permit authorized the construction of an extensive freshwater lake wet detention system, and included a requirement to construct shallow, planted littoral zones around the perimeter of lakes.

- Specific Condition #17 of the original permit requires that 30% of the lake area be established as littoral zones, totaling 22.1 acres. Littoral zone planting areas are specified in the permitted plans provided to SJRWMD.
- Specific Condition #19 of the original permit requires vegetative monitoring of the survival of planted wetland species, with reports to be submitted annually to SJRWMD.
- Specific Condition #14 of the 9th permit modification requires that 80% aerial coverage of littoral zone vegetation must be maintained in the permitted littoral zones throughout operation of the stormwater management system.
- Specific Condition #7 of the original permit requires that a mechanical aeration system be designed and installed in the large Aqua Range Pond.

Field Visit Observations

In the Summer of 2019, Kimley-Horn performed site visits to assess the condition of the ponds and their components throughout the Grand Harbor Development. The following was observed and documented:

- Pond Bank Erosion
- Pond Siltation
- Pipe Deterioration
- Control Structures
- Littoral Zones
- Exfil Trench
- Aeration System in Pond #16, the Aqua Range Pond.

Littoral zones were observed to be present in most of the ponds. However, vegetative coverage of the littoral zones was sparse, and species composition was highly variable. Percent coverage of littoral zones in ponds on-site comprised approximately 5-10% of the total pond area. Vegetation observed within the littoral zones included fire flag (*Thalia geniculata*), pond cypress (*Taxodium ascendens*), giant bulrush (*Schoenoplectus californicus*), cordgrass (*Spartina bakeri*), crinum lily (*Crinum americanum*), rush (*Juncus spp.*), arrowhead (*Sagittaria lancifolia*), pickerelweed (*Pontederia cordata*), Mexican primrose willow (*Ludwigia octovalvis*), giant leather fern (*Acrostichum danaeifolium*), flat sedge (*Cyperus odoratus*), cattail (*Typha spp.*), red maple (*Acer rubrum*), cattail (*Typha spp.*), Brazilian pepper (*Schinus terebithifolius*), and dollarweed (*Hydrocotyl spp.*). Wildlife observed in and around the lake littoral zones included mottled duck (*Anas fulvigula*), tricolored heron (*Egretta tricolor*), white ibis (*Eudocimus albus*), little blue heron (*Egretta caerulea*), and purple martin (*Progne subis*). Representative photographs of lake littoral zones observed are provided in Photos 8.1-8.7.

Discussion and Recommendations

To best assess the ponds and their related components conditions, the design plans were compared to existing conditions. Upon analysis of these two, it was clear that the control level of the ponds was higher in the existing condition than specified in the design plans. These areas were inspected on multiple occasions and when the water levels were at the designed control elevations, it was clear that the sustained higher levels of the ponds had caused significant erosion of their banks. In some areas, such as along the rear property line of homes on Las Brisas Drive, the erosion is severe enough that it has started to encroach onto these properties. This is also occurring behind the condos between the 2nd hole of the River Course and the Oak Harbor Clubhouse. See the images below that describe the areas experiencing encroachment. For the aeration system in Pond #16, it was observed that no such system was present so it is recommended that a system be designed and installed as the permit dictates.



Photo 8.1 and 8.2– Bank erosion area encroaching onto properties

It is recommended that all pond areas experiencing erosion be repaired immediately to permitted design conditions and the ponds be kept at their design levels. Newland Erosion Control was consulted for their strategy in dealing with pond bank erosion. They install geotubes filled with silt along the pond banks to restore the shoreline to its original state and create a barrier against further erosion. The bags can be stacked on top of one another for areas with severe erosion. It is recommended to use technology such as this in restoring the pond banks back to permitted conditions.

Severe siltation was observed in most ponds. This siltation causes the ponds to have less storage volume which can cause flooding conditions for the homes in its surrounding area. Some of these areas are experiencing enough siltation and have for a sustained period of time that vegetation has started to grow. It is recommended that all areas experiencing siltation be desilted immediately to the pond's permitted design conditions by excavating the first 100 linear feet outside of the interconnecting pipes. The technique described above for the pond banks uses silt/sand to fill the geotubes and restore back to permitted conditions. According to Newland Erosion Control, the silt used for this can be taken from the areas experiencing siltation.

See the images below demonstrating the siltation and erosion below. The siltation and erosion of this pond specifically is so severe that the banks and available water volume is significantly reduced when the water levels are at the permitted control elevations. These images were taken when the water level was above the control elevation but well below the modified water level.



Photo 8.3 – Siltation in Pond #16



Photo 8.4 – Siltation in Pond #16

There were four interconnecting pipes that were observed with significant deterioration. Three of the pipes were crushed inhibiting flow and one is rusted with a hole in it. It is our recommendation that the three crushed pipes be replaced so that they function properly and that the one 80-foot pipe with a hole be lined. Refer to the Shenandoah report in Appendix E for locations of these pipes.

Many permitted control structures were inspected and observed to be in generally good condition. They have experienced the normal deterioration that is to be expected for their age. No remediation is required at this time. However, an un-permitted control structure was found. For this modification, it is recommended to either remove it or modify the existing permit to include it.



Photo 8.5 – Un-permitted control structure

The FDEP and SJRWMD permits require 30% of the lake area (22.1 acres) to be vegetated littoral shelf, with at least 80% coverage of desirable wetland species. However, based on field reconnaissance, the area of littoral shelf that currently meets the vegetation requirement is approximately 8.9 acres. In addition, the species composition and distribution present in the existing littoral shelf does not match the permitted plans. Exotic and noxious species, including cattail, Brazilian pepper, and Mexican primrose willow, were observed in around the littoral zones. It is our recommendation that the littoral zones be restored to permitted conditions. Consultation with SJRWMD and FDEP is recommended if any modifications to the permits are sought. Upon consultation with FDEP and/or SJRWMD, additional planting of littoral zone vegetation may be required to maintain permit compliance. Removal of exotic and noxious vegetation from the littoral zones is recommended.

St. Andrews

The stormwater management systems in the St. Andrews development were closely inspected due to the persistent flooding being experienced in the last few years. The existing condition was compared to the approved and certified plans from Masteller & Moler dated 09/1993. The system includes a wet

retention pond, and 890-foot exfiltration trench, and several dry retention areas. There are 4 control structures that have outfalls directly into the estuary. These structures were observed to have multiple deficiencies. The pond (#24) is a 0.48 ac wet retention pond that was completely silted in around its east inflow pipe. The control structure (#1) is not in the proper location, does not have the pond side drain connected to it, and has no outfall pipe into the estuary. The side drain is not functioning. There is extensive flooding and a portable electric pump was observed to be actively pumping standing water towards the estuary. On lot #10, control structure #4 was missing the top grate, is fully silted in, and the dry retention area drain could not be found. The 890-foot exfiltration trench on the west side does not seem to be functioning and all intake structures were completely silted in. All of these discrepancies are recommended to be remediated immediately. The consequences of these stormwater management systems being filled in is already being demonstrated by the persistent flooding occurring but will worsen if not remediated. With the severity of pond #21, it is recommended that this be completely rebuilt with a new control structure that properly conveys the runoff into the estuary and complies with permitted conditions. The west exfiltration trench needs to be rebuilt and the dry retention structure and control structure #4 need to be cleaned out or rebuilt.

Refer to the Pond photographs below and the Shenandoah report in Appendix E for more information.



Photo 8.6 – Littoral zone with fire flag and pond cypress



Photo 8.7 – Littoral zone with sparse coverage of arrowhead



Photo 8.8 – Littoral zone with arrowhead, pickerelweed, cordgrass, and Mexican primrose willow



Photo 8.9 – Maintenance crew removing cattail from littoral zone



Photo 8.10 – Littoral zone with dense coverage of Mexican primrose willow, arrowhead, cordgrass, giant leather fern, and other wetland plant species



Photo 8.11 – Littoral zone with giant bulrush



Photo 8.12 – Littoral zone with minimal coverage of arrowhead



Photo 8.13 – Pond siltation



Photo 8.14 – Pond siltation



Photo 8.15 – Pond siltation



Photo 8.16 – Pond siltation



Photo 8.17 - Pond siltation

9.0 GRAND HARBOR 45th STREET PERIMETER BUFFER

Existing Conditions

Kimley-Horn has performed a visual inspection of a perimeter buffer in the Grand Harbor Community in Vero Beach, Florida. The 45th Street Perimeter Buffer is in the southwest quadrant of the Grand Harbor Community in Vero Beach Florida. The buffer extends from the Oak Harbor 45th Street entrance west to the intersection with Indian River Boulevard (approximately 0.1 miles). The buffer is comprised primarily of a single row of Oleander planted to create an opaque screen.

Field Visit Observations

On May 24, 2019 and July 30, 2019, Kevin Barrett, FCLD performed site visits to assess the condition of the buffer. The following was observed and documented:

45th Street Entrance Feature

- (3) Ixora were observed to be dead or dying.

45th Street Buffer

- Several gaps in the Oleander were observed causing a break in the opaque feature .
- Several dead and dying Oleander were observed.
- A Strangler Fig has grown up and over the top of the buffer.
- An area of the buffer has been overgrown with vines threatening to cause the Oleander to die back.

Discussion and Recommendations

We recommend correcting all deficiencies listed previous section of this report. Dead and dying landscape material should be replaced in kind to achieve intended opaque buffer. Gaps in the buffer should be filled in. Replacement material should be Florida #1 or better and should be of the same species and variety as the existing material. Invasive species should be eradicated by appropriate means (chemical or mechanical) to restore the buffer to original conditions.

Refer to Landscape Exhibit LX-14.1 & LX-14.2 in Appendix F for illustration of observed conditions.

10.0 GRAND HARBOR/ OAK HARBOR INDIAN RIVER BOULEVARD PERIMETER BUFFER

Existing Conditions

Kimley-Horn has performed a visual inspection of a perimeter buffer in the Grand Harbor Community in Vero Beach, Florida. The Indian River Boulevard Perimeter Buffer runs along the East Right of Way line of Indian River Boulevard in Vero Beach Florida. The buffer extends from 45th Street in the south, north to 53rd Street (approximately 1.25 miles). The buffer is comprised of groundcover, low shrubs, tall shrubs, understory trees, palms, and canopy trees planted in an alternating undulating pattern to create an opaque screen.

Field Visit Observations

On May 24, 2019, May 31, 2019, June 7, 2019, and July 30, 2019, Kevin Barrett, FCLD performed site visits to assess the condition of the buffer. The following was observed and documented:

Main Grand Harbor Entrance North to 53RD Street

- (2) Queen Palms at the east side of the guard house are in poor health.
- A Ligustrum on the north side of the entrance is showing signs of stress and is in poor health.
- At the north side entrance feature a Date Palm has been removed, stump has been left above grade.
- There is evidence of broken irrigation equipment where the north entrance feature transitions to the Indian River Boulevard buffer, ponding was observed.
- There is a gap in the Oleander planting where the north entrance feature transitions to the Indian River Boulevard buffer.
- Vines are beginning to overgrow the buffer north of the main entrance.
- (4) Large DBH Oaks are in poor health and are in the process of dying off.
- (2) recently planted small DBH Oaks have died.
- There is a small gap in the shrub planting at the entrance feature at the intersection of Indian River Boulevard and 53rd Street.

Main Grand Harbor Entrance South to Oak Harbor Entrance

- A Date Palm on the south side of the entrance feature has a damaged trunk.
- In numerous locations the perimeter fence has been damaged by material growing thru the fence.
- (4) Queen Palms are in poor health.
- In several areas the Oleander is in poor health and does not provide the intended opaque screen.
- There are several small gaps in the Schefflera and Ilex low shrubs.
- (3) Ligustrum understory trees are thinning and showing signs of stress.
- The gate in the fence on the north side of the Oak Harbor Guard is broken and unsecured.

Oak Harbor Entrance South to 45th Street

- In numerous locations the perimeter fence has been damaged by material growing thru the fence.
- In several areas the Oleander is in poor health and does not provide the intended opaque screen.
- (2) Crape Myrtles are in poor health.

- (1) Sabal Palm is dead.
- There is a small gap in the Ilex low shrub.

Discussion and Recommendations

We recommend correcting all deficiencies listed previous section of this report. Dead and dying landscape material should be replaced in kind to achieve intended opaque buffer. Gaps in the buffer should be filled in. Replacement material should be Florida #1 or better and should be of the same species and variety as the existing material. Invasive species should be eradicated by appropriate means (chemical or mechanical) to restore the buffer to original conditions. Damage to the perimeter fence should be repaired to original condition.

Refer to Landscape Exhibit LX-1 thru LX-4 & LX-14 thru LX-19 in Appendix F for illustration of observed conditions.

11.0 RIVER CLUB/ HARBOR VILLAGE R/W LANDSCAPE

Existing Conditions

Kimley-Horn has performed a visual inspection of the right of way landscaping in the River Club and Harbor Village neighborhoods in the Grand Harbor Community in Vero Beach, Florida. The River Club right of way runs from the intersection with Indian River Boulevard and 53rd Street east along Via Mirabella Boulevard to the intersection with North Harbor Village Drive (approximately 0.8 miles). The Harbor Village right of way runs north along North Harbor Village Drive (approximately 0.35 miles) and south and then east along West Harbor Village Drive (approximately 0.3 miles) and then north along East Harbor Village Drive (approximately 0.4 miles). The landscaping is comprised primarily of large DBH canopy trees and palms planted as street trees with groundcover planted in Harbor Village to mask bridge guardrails.

Field Visit Observations

On June 7, 2019 Kevin Barrett, FCLD performed a site visit to assess the condition of the landscape. The following was observed and documented:

Via Mirabella Boulevard

- (5) large DBH Live Oaks were noted to have various health issues ranging from broken bark, broken limbs, thinning canopy, and signs of insect infestation.
- (1) Sabal Palm has died.

North Harbor Village Drive

- (1) Queen Palm has died.

East Harbor Village Drive

- An area of Jasmine groundcover along the guardrail is sparse.

Discussion and Recommendations

We recommend that an arborist assess the health of large DBH Oaks to see what, if any, corrective action should be taken. Dead and dying landscape material should be replaced in kind. Areas of sparse groundcover on the bridge guardrails should be augmented with additional planting. Replacement material should be Florida #1 or better and should be of the same species and variety as the existing material.

Refer to Landscape Exhibit LX-4 thru LX-8 in Appendix F for illustration of observed conditions.

12.0 GRAND HARBOR R/W LANDSCAPE

Existing Conditions

Kimley-Horn has performed a visual inspection of the right of way landscaping in the Grand Harbor Community in Vero Beach, Florida. The Grand Harbor Boulevard right of way runs from the main entrance at Indian River Boulevard and along with South Harbor Drive forms the main loop thru the Grand Harbor Community (approximately 2.5 miles). The portion of South Harbor Drive that runs thru the Oak Harbor Community (St. Ann's Lane to Coventry Circle) was not part of this survey and was not assessed (approximately 0.5 miles). The landscaping is comprised primarily of large DBH canopy trees and palms planted as street trees with groundcover planted to mask bridge guardrails.

Field Visit Observations

On June 7, 2019 and July 30, 2019 Kevin Barrett, FCLD performed site visits to assess the condition of the landscape. The following was observed and documented:

Grand Harbor Boulevard

- (2) Queen Palms near the tunnel beneath Grand Harbor Boulevard are in poor health.
- (1) large DBH Live Oak near the traffic circle with Harbor Village Drive and South Harbor Village Drive is in need of pruning.

South Harbor Drive

- Several areas of Jasmine groundcover along the guardrails are sparse.

Discussion and Recommendations

We recommend correcting all deficiencies listed previous section of this report. Dead and dying landscape material should be replaced in kind. Areas of sparse groundcover on the bridge guardrails should be augment with additional planting. Pruning should be conducted by a qualified arborist. Replacement material should be Florida #1 or better and should be of the same species and variety as the existing material.

Refer to Landscape Exhibit LX-1, LX-9 thru LX-11, and LX-13 in Appendix F for illustration of observed conditions.

13.0 RIVER VILLAGE TRACT C STORMWATER BUFFER LANDSCAPE

Existing Conditions

Kimley-Horn has performed a visual inspection of the stormwater buffer landscaping in Tract C of the River Village neighborhood of the Grand Harbor Community in Vero Beach, Florida. The buffer landscaping runs along the western edge of an approximately 4.65-acre stormwater management area in a 10' buffer strip. The landscaping is comprised primarily of canopy and understory trees planted to create "islands".

Field Visit Observations

On June 7, 2019 Kevin Barrett, FCLD performed a site visit to assess the condition of the landscape. The following was observed and documented:

Tract C

- (1) large DBH Oak tree has died.
- (3) small DBH Pines have died.

Discussion and Recommendations

Dead and dying landscape material should be replaced in kind. Replacement material should be Florida #1 or better and should be of the same species and variety as the existing material.

Refer to Landscape Exhibit LX-12 in Appendix F for illustration of observed conditions.

14.0 THE FALLS AT GRAND HARBOR LANDSCAPE

Existing Conditions

Kimley-Horn has performed a visual inspection of the right of way and perimeter buffer landscaping in the Falls neighborhood in Grand Harbor Community in Vero Beach, Florida. The Grand Harbor Boulevard right of way runs from the main entrance at Indian River Boulevard west to the entrance at US Highway 1 (approximately 0.3 miles). The right of way landscaping is comprised primarily of large DBH canopy trees and palms planted as street trees with “islands” of shrubs and groundcover. The perimeter buffer runs from the main entrance south along Indian River Boulevard to the south property line (approximately 0.3 miles) then west to the western property line at US Highway 1 (approximately 0.3 miles) then north to the intersection of US Highway 1 and Grand Harbor Boulevard (approximately 0.1 miles). The Indian River Boulevard and south perimeter buffers are comprised of groundcover, low shrubs, tall shrubs, understory trees, palms, and canopy trees planted in an alternating pattern to create an opaque screen. The US Highway 1 buffer is comprised of a large opaque hedgerow and large DBH Canopy trees.

Field Visit Observations

On May 24, 2019, June 14, 2019 and July 30, 2019 Kevin Barrett, FCLD performed site visits to assess the condition of the landscape. The following was observed and documented:

Grand Harbor Boulevard

- Several large DBH Laurel Oaks were noted to have various health issues ranging from broken bark, broken limbs, thinning canopy, fungus infestation, galls, large cavities and signs of insect infestation.
- (1) Sabal Palm is dead.
- (1) Wax Myrtle is dead
- An area of Philodendron is sparse
- (1) Palm has been cut down, stump was observed (likely a Date Palm).
- (1) Oak has been cut down, stump was observed (likely a Laurel Oak).
- (1) large DBH Live Oak has trunk damage and large cavities in the trunk.

Indian River Boulevard Perimeter Buffer

- Several bare areas with little to no ground cover or shrubs were observed.
- (1) Sabal Palm has been cut down, stump was observed.
- (1) Sabal Palm has trunk damage
- Several areas of dead or dying Coccoloba and Viburnum were observed.
- (4) small DBH Pine Trees have died.
- (1) Sabal Palm is overgrown with vines
- (1) Laurel Oak is in poor health with thinning canopy and broken branches.

South Perimeter Buffer

- A bare areas with little to no ground cover or shrubs were observed.

- (1) Sabal Palm has been cut down, stump was observed.
- (1) Queen Palm has been cut down, stump was observed.
- (1) Cypress tree is damaged with spilt and broken branches.
- (1) large DBH Laurel Oak is in poor health with trunk damage and signs of insect infestation.

US Highway 1 Perimeter Buffer

- Several areas of the perimeter hedgerow are in poor health or are dead creating the potential for gaps.
- (1) Gap in the hedgerow wide enough to walk thru was observed.
- (2) large DBH Laurel Oaks have trunk damage threatening the health of the tree.
- (3) large DBH Laurel Oaks have been cut down, stumps and gap in regular spacing were observed.

Discussion and Recommendations

We recommend correcting all deficiencies listed previous section of this report. An arborist should assess the health of large DBH Oaks to see what, if any, corrective action should be taken. Dead and dying landscape material should be replaced in kind to achieve intended opaque buffer. Gaps in the buffer should be filled in. Replacement material should be Florida #1 or better and should be of the same species and variety as the existing material. Invasive species should be eradicated by appropriate means (chemical or mechanical) to restore the buffer to original conditions.

Refer to Landscape Exhibit LX-20 thru LX-25 in Appendix F for illustration of observed conditions.

15.0 CONSERVATION EASEMENT

Kimley-Horn has conducted an evaluation of existing environmental conditions at Grand Harbor. This evaluation included a desktop review of existing environmental regulatory permits in effect for the site, and a field review of existing environmental conditions.

The objective of this environmental evaluation is to determine status of environmental regulatory compliance and identify any environmental maintenance and/or permit compliance issues at Grand Harbor. Evaluation of the on-site marina (including associated seawalls and navigation channels), as well as the stormwater management system, are not included in this analysis.

Environmental Permit Review

A review of existing environmental regulatory permits in effect for the site was conducted. The site has been issued environmental permits from the following agencies:

- St. Johns River Water Management District (SJRWMD) Environmental Resource Permit (Permit No. 18679, Legacy Permit No. 4-061-0075, initially issued 1986 and modified 17 times between 1986 and 1995)
- Florida Department of Environmental Protection (FDEP) Dredge and Fill Permit (Permit No. 311043029, issued 1986)

A summary of activities authorized by each permit, and relevant specific conditions, are summarized below.

SJRWMD Environmental Resource Permit No. 18679 / Legacy Permit No. 4-061-0075

This permit authorized the construction of the initial phase of Grand Harbor, an 848-acre multiuse Development of Regional Impact (DRI). As additional phases of the project were designed, modifications to permit number 18679 were obtained from SJRWMD, each with their own specific conditions. The permit authorized the construction of an extensive freshwater lake wet detention system, and included a requirement to construct shallow, planted littoral zones around the perimeter of lakes. This permit also authorized filling and excavation of estuarine marshes to construct golf courses and a marina basin. Restoration and creation of specified estuarine wetland areas on-site was required to offset permitted wetland impacts. As a part of this restoration, three flushing channels were excavated to connect the Indian River Lagoon and the on-site estuary. Permitted impact areas and required preservation/creation wetland area are illustrated in the original permit drawings.

- Specific Condition #16 of the 3rd permit modification requires that construction of the restored/created estuarine wetlands be according to the permit drawings, and maintenance of the excavated flushing channels included in the estuarine system.

FDEP Dredge and Fill Permit No. 311043029

This permit authorized the preparation of the 854-acre Grand Harbor site for development. This preparation included dredging and filling in impounded estuarine wetlands, including fill of 11.4 acres of high marsh and ditches for construction of golf courses, access roads and other upland construction. Restoration and creation of specified estuarine wetland areas on-site was required to offset permitted wetland impacts. This permit also authorized constructing a 3 to 4-foot deep network

of flushing channels through the existing wetlands, connecting the existing wetland system to the Indian River via four flushing inlets. Along the flushing channels, 30.4 acres of high marsh and 9.3 acres of low marsh were created along the flushing channels. Shoreline stabilization along the Indian River, including the planting of wetland vegetation along the shoreline, was also authorized by this permit.

- Specific Condition #8 of this permit required revegetation of the created wetlands to follow the “Grand Harbor Revegetation Plan” submitted as a part of the permit application, as well as submittal of quarterly wetland monitoring reports for three years or until desirable wetland species coverage achieved 85%.
- Specific Condition #9 requires that navigation barriers should be placed across the flushing channels south of the marina basin, in addition to the golf cart crossings to be placed across the channels.
- Specific Condition #29 requires creation of a permanent conservation easement over the 129.6 acre preserved and created wetland and estuarine flushing channel system. This conservation easement was recorded on December 9th, 1991 to FDEP. The conservation easement requires that the conservation area be maintained in natural vegetative and hydrologic condition in perpetuity. The conservation easement prohibits any future dredging, filling, or construction within the easement area. However, in 2011, authorization was granted by the Board of Trustees of the Internal Improvement Trust Fund for maintenance of the flushing channels.
- Specific condition #30 requires that the permittee maintain the flushing channels according to the permitted plans.
- Specific condition #32 requires the littoral zones of the freshwater lakes to be planted according to permitted plans and specifies that the area of vegetated littoral shelf will be at least 22.1 acres. This condition also required submittal of quarterly monitoring reports for three years or until desirable wetland species coverage achieved 85%.

Field Visit Observations

A site visit was conducted on June 27th, 2019 to evaluate condition of the estuarine wetlands and flushing channels.

The estuarine wetlands on-site were observed to be in good condition, with most of the wetlands being largely dominated by a mixture of red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa*). Other vegetation observed in the estuarine wetlands included seagrape (*Coccoloba uvifera*), sea ox-eye daisy (*Borrchia frutescens*), common glasswort (*Salicornia bigelovii*), saltgrass (*Distichlis spicata*), saltwort (*Batis maritima*), saltbush (*Baccharis halimifolia*), saltmarsh mallow (*Kosteletzkya virginica*), and smooth cordgrass (*Spartina alterniflora*). Some Brazilian pepper was observed growing along the edges of the wetlands, however little to no invasion of Brazilian pepper was observed in the interior of the estuary. Wildlife observed utilizing the estuarine wetlands included fiddler crabs (*Uca pugilator*), Mangrove tree crabs (*Aratus pisonii*), eastern oyster (*Crassostrea virginica*), green heron (*Butorides virescens*), great egret (*Ardea alba*), anhinga (*Anhinga anhinga*), and little blue heron. The planted area along the Indian River was in mostly good condition and was largely dominated by red mangroves. However, some Brazilian pepper trees were observed along the landward fringe of the Indian River shoreline on-site. Two of the four flushing channels were observed to be partially blocked

due to sediment accretion in the channel, limiting tidal exchange of water between the Indian River and the estuarine wetland areas. The other two flushing channels appeared to be functioning as intended, allowing tidal flushing of water into the estuarine system. Watercourse inspection was performed via interpretation of current and historical aerial photographs. The areas of the flushing channel and watercourse that were observed to be blocked are shown in Figure 1 in Appendix F. Photos 15.1-15.15 depict the estuarine wetlands, flushing channels, and the shoreline along the Indian River.

Discussion & Recommendations

Based on a review of the above-described permits and on-site observations, Grand Harbor appears to be in general compliance with the environmental permits, with several exceptions. These exceptions are described below.

Vegetative conditions in the estuarine wetlands appear to be in compliance with the FDEP and SJRWMD permits. Coverage of exotic vegetation, such as Brazilian pepper, was extensive but was limited to the landward edges of the system in most cases. Exotic vegetation must be removed as required by the Conservation Easement in effect for the estuarine area. The estuarine system was originally designed to function as a saltwater marsh, with a prevalence of herbaceous vegetation such as smooth cordgrass, saltwort, glasswort, saltgrass, and sea ox-eye daisy. However, the existing vegetative species composition is dominated largely by mangroves. Recruitment and proliferation of mangrove species in the wetlands was documented in the vegetation monitoring reports that were submitted to and accepted by FDEP and SJRWMD, indicating that the natural succession of vegetative communities is in compliance. However, the hydrologic condition appears to be inadequate based on aerial approximation and ground truthing. The watercourses appear to be experiencing siltation that does not allow for adequate tidal flushing of the estuarian system partly due to the growth of mangroves. Therefore, it is our recommendation to have these areas re-channelized to permitted design conditions as the upkeep of these areas is a maintenance obligation per a provision in the Conservation Easement. This process would include the removal of mangroves; therefore, it is also recommended to consult with FDEP before work has commenced to know if a mangrove removal permit or any additional permits are required.

Two of the four permitted flushing channels were observed to be blocked due to excessive sediment accretion. Similar to the estuarine wetlands, it is our recommendation that these channels be restored to their permitted conditions. Consultation with FDEP and SJRWMD is also recommended to determine whether any additional permits are required for the work to be done. The dredging of the flushing channel should be authorized as maintenance of the existing permit to restore the channel to the original permitted configuration. FDEP and SJRWMD will require information regarding the proposed dredging method, and how spoil material and turbid water will be managed to prevent water quality degradation. In addition, only one navigation barrier exists in one of the flushing channels. Consultation with FDEP is recommended regarding the placement of additional navigation barriers seaward of the existing golf cart crossings. Consultation with Indian River Mosquito Control District is recommended to maintain adequate mosquito control regarding maintenance of the estuary and flushing channels. Refer to Appendix G for more information on the flushing channels and watercourses.



Photo 15.1 – Estuarine wetland with white and red mangroves



Photo 15.2 – Estuarine wetland with black mangrove, white mangrove, sea ox-eye daisy, and Brazilian pepper



Photo 15.3 – Brazilian pepper observed growing next to red mangroves in the estuarine system



Photo 15.4 – Brazilian pepper, saltbush, and cabbage palm growing along estuarine wetland edge

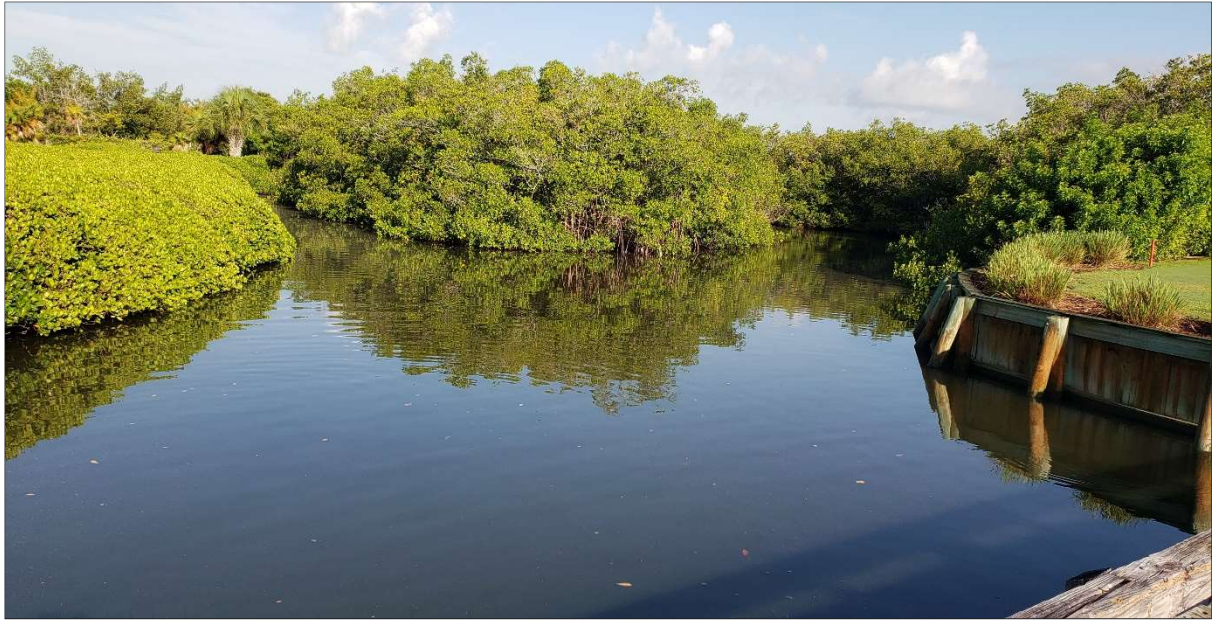


Photo 15.5 – Flushing channel with red mangroves



Photo 15.6 – Flushing channel with red mangroves



Photo 15.7 – Flushing channel with red mangrove, black mangrove, and navigation barrier



Photo 15.8 – Blocked flushing channel at high tide, with red mangrove and smooth cordgrass



Photo 15.9 – Blocked flushing channel at low tide, with red mangrove and smooth cordgrass



Photo 15.10 – Flushing channel at low tide with red mangrove, black mangrove, and smooth cordgrass



Photo 15.11 – Golf cart crossing with red mangrove, black mangrove, and Brazilian pepper



Photo 15.12 – Flushing channel with red mangrove and seagrass



Photo 15.13 – Flushing channel with red mangrove



Photo 15.14 – Shoreline along Indian River with red mangrove, black mangrove, and seagrass seaward of a seawall



Photo 15.15 – Red mangroves with eastern oysters growing on prop roots

16.0 GRAND HARBOR BRIDGE #1 AND #2

BRIDGE #1

Existing Conditions

Kimley-Horn performed a visual inspection of a vehicular bridge in the Grand Harbor Community in Vero Beach, Florida on June 19, 2019. The East Harbor Village Drive Bridge is located in the Northeastern quadrant of the Grand Harbor Community. This is the northern of the two bridges on East Harbor Village Drive and connects two residential barrier islands. On June 20, 2019 Kimley-Horn issued an email memorandum to Grand Harbor & Oak Harbor Transition, LLC and Greenberg Traurig, P.A. informing them this existing bridge has undergone significant structural deterioration and is a potentially imminent life safety issue. The memorandum recommended to immediately close the eastern half of the bridge to all vehicular and pedestrian traffic and prohibit heavy vehicles from crossing the bridge. On June 21, 2019 Grand Harbor & Oak Harbor Transition, LLC responded that the eastern half of the bridge had been blocked off. GH Vero Beach Development, LLC retained Atlas Engineering Group to provide structural engineering services to repair/replace the deteriorated elements of the existing bridge.

BRIDGE #2

Existing Conditions

Kimley-Horn has performed a visual inspection of a vehicular bridge in the Grand Harbor Community in Vero Beach, Florida. The East Harbor Village Drive bridge, spans over a waterway connecting the harbor to the Indian River, is located in the northeastern quadrant of the Grand Harbor Community in Vero Beach Florida. This is the southern of the two bridges on East Harbor Village Drive and connects a residential barrier islands to the mainland. (See Figure 3.1 on the following page). It is unknown when the bridge was constructed, and existing plans were not available for review prior the site visit. This bridge is a two-span structure that measures 75 feet in length and 38 feet wide. The bridge has a concrete barrier wall with tubular metal pedestrian railings on top and a raised 4.5-foot wide sidewalk on each side. The roadway curb-to-curb width was measured to be approximately 28 feet.

The bridge superstructure consists of five (5) Concrete Double-T beams. The Double-T beams are bearing on the bridge substructure which consists of a cast-in-place concrete cap supported on concrete piles.

Field Visit Observations

On June 19, 2019, Jerry Piccolo, P.E. and Jaime Ghitelman, P.E. performed a site visit to assess the condition of the bridge. Refer to the photos attached herein for typical conditions and deficiencies observed. The following was observed and documented:

Superstructure

- Transverse cracking in the South and North approach to the bridge as well as at mid-span on the bridge deck at the joint lines. Photo 16.1 and 16.2
- Settlement of the curb and gutter at the connection to bridge approaches (16.3).
- Cracking on the abutment wall, at the elevation of the sidewalk Photo 16.4.

- Cracking on the concrete barrier wall (Photo 16.5)

Substructure

- Corrosion and paint failure on the utility piping spanning the length of the bridge Photo 16.6
- Marine growth observed on the concrete cap and concrete piles (typical throughout)
- Cracking and delaminations on the concrete pile cap at the intermediate bent, both north and south sides (Photos 16.7 and 16.8).
- Concrete spalls on the underside of precast flange of the Double T-Beam along the west side of the bridge. Photo 16.9
- Concrete spalls observed on the fascia of the Double T-Beams at the transverse reinforcing post tensioning duct grout pockets Photo 16.10

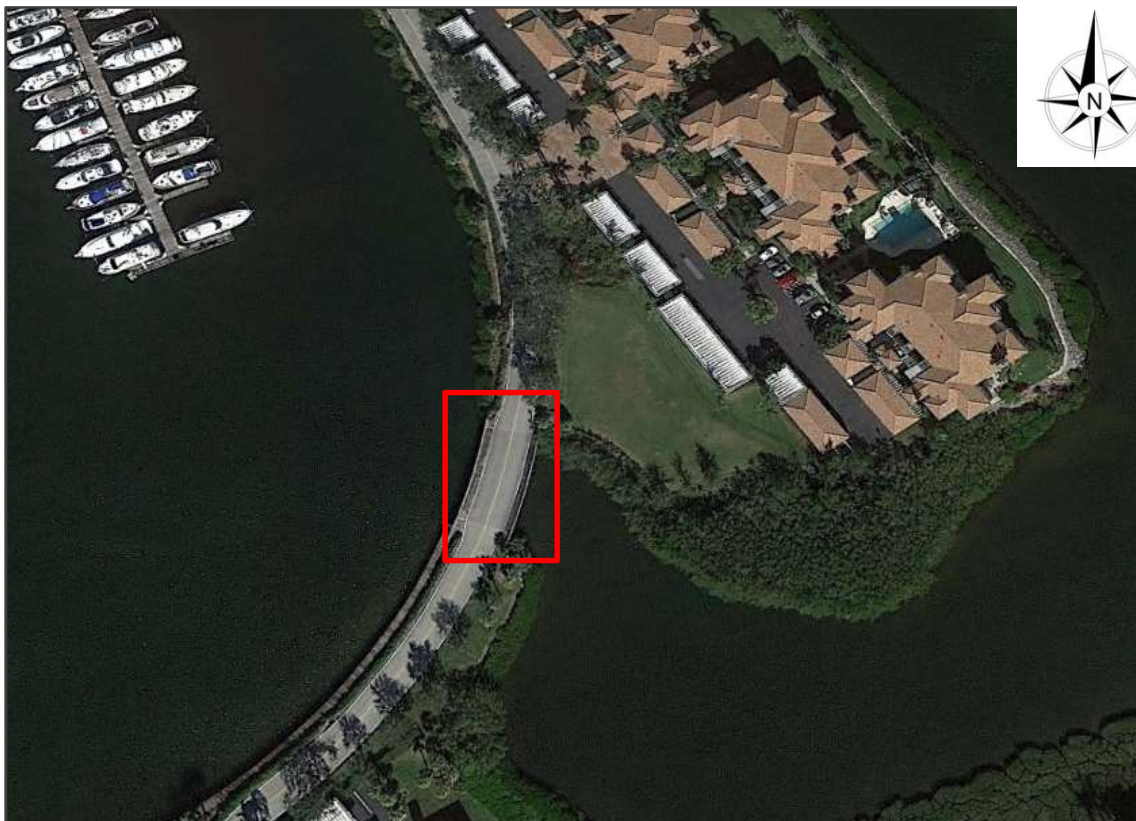


Figure 16.0 – Aerial Photograph of Bridge #2 (Source: Google Earth)

Discussion and Recommendations

We recommend repairing all deficiencies listed previous section of this report. The transverse shrinkage cracks found on the asphalt of the bridge are not indicative of any structural failure of the bridge as they align with the joints below. They are however, an avenue for water intrusion to occur and potentially corrode embedded steel in the concrete structure. Cracks greater than 0.08 inches exceed the ACI 318 crack width tolerances. Therefore, we recommend routing and sealing the transverse cracks in the bridge approach, at midspan of the bridge deck and in the concrete barrier walls. The deck of the concrete bridge was not able to be assessed due to the presence of the asphalt roadway.

The curb and gutter at the northeast section of the bridge was observed to have been deflected. This is likely due to the settlement and/or erosion of the soils around the bridge. It is recommended that the bridge embankments be monitored on both sides of the bridge to ensure no additional erosion is occurring. Should the erosion be observed to keep worsening, a geotechnical study will be warranted to discovering the underlying cause of the erosion. Additionally, it is recommended that the section of curb and gutter be removed and replaced.

Oxidation of the exposed reinforcing steel was evident in the substructure in the form of spalled concrete and staining on the concrete surface. Once rusting occurs, the condition will slowly migrate along the embedded section of steel causing the steel to rust and expand. Once the steel expands, there is potential for pieces of concrete to break loose. When concrete spalls, the clear cover of the concrete is reduced, and moisture can further infiltrate the structure and worsen the corrosion the embedded steel, thereby causing further damage to the bridge structure. Regarding the substructure, we recommend the following: sound the cracked and delaminated areas of the concrete cap, chip away cracked and spalled concrete until sound concrete and clean reinforcing is found, sandblast the existing reinforcing steel and measure the section loss. If the section is greater than 20%, new reinforcing steel will have to be installed. If section loss is less than 20%, apply a corrosion inhibitor to the reinforcing steel after cleaning and fill the area with a structural grout. Regarding the corroded utility pipe, we recommend abandoning the existing pipe, capping it at either end and installing a new pipe along the bridge to tie into the existing buried pipe. It is unknown whether the pipe carries potable water or waste water.

In addition to the repairs mentioned above, we recommend implementing a reoccurring bridge maintenance program as well as bi-annual bridge inspections by a Professional Engineer, registered in the state of Florida.

Refer to the Photographs 16.1 through 16.10 on the following pages for typical conditions of the bridge #2 structure.



Photo 16.1 – Cracking at bridge #2 approach



Photo 16.2 – Transverse crack at mid-span of bridge #2



Photo 16.3 – Deflection of the curb and gutter at approach to bridge #2



Photo 16.4 –Cracking in the abutment wall at the elevation of the sidewalk at bridge #2



Photo 16.5 – Cracks in the concrete barrier wall (typical throughout) at bridge #2



Photo 16.6 – Corrosion observed on the utility pipe spanning the length of the bridge under bridge #2



Photo 16.7 – Cracking on the intermediate bent on both north and south sides of bridge #2



Photo 16.8 – Cracking on intermediate bent of bridge #2. Note vegetative growth on bent and piles (typical throughout)



Photo 16.9 – Concrete spalls on the flange and fascia of the exterior Double-T beams at bridge #2



Photo 16.10 – Concrete spalls on the Double-T beam fascia at the post tension grout pockets at bridge #2

17.0 GRAND HARBOR GUARD HOUSES #1 AND #2

Existing Conditions

Kimley-Horn has performed visual inspections of the two existing Guard House Structures located at the east and west entrances to the Grand Harbor Community in Vero Beach, Florida. Both Guard Houses are located along Grand Harbor Boulevard on either side of the Indian River Boulevard intersection. We refer to the Guard House to the East of Indian River Boulevard as “Guard House #1” and the Guard House to the west of Indian River Boulevard as “Guard House #2” (See Figure 1 on the following page). It is unknown what year the Guard Houses were constructed, and existing plans were not available for review prior the site visit. Both Guard Houses are single story concrete masonry unit structures, with timber roof trusses, concrete tile roofs and a cupola. Both structures are built on concrete slab foundations and have stucco finish on the walls.

Guard House #1 has a drive thru, over hang structure with cylindrical concrete columns and a stone paver driving surface. Guard House #1 provides access to the East portion of the Grand Harbor community while Guard House #2 provides access to the west portion of the Grand Harbor community.

Field Visit Observations

On June 19, 2019, Jerry Piccolo, P.E. and Jaime Ghitelman, P.E. performed a site visit to assess the condition of the Guard Houses. Refer to the photos attached herein for typical conditions and deficiencies observed. The following was observed and documented:

Guard House #1

- Paint delamination and impact marks observed at the base of a concrete column for the overhang structure Photo 17.1
- Damage to the architectural features on the concrete column for the overhang structure Photo 17.2
- Paint delamination and exposed stucco lath at the overhead beam to the overhang drive-thru structure Photo 17.2
- Stucco cracks on the exterior envelope Photo 17.3
- Exposed PVC conduit encasing at the joint between the stone pavers and asphalt under the overhang structure Photo 17.4

Guard House #2

- Stucco cracks on the exterior envelope and at window sill ledges (typical throughout) Photos 17.5 and 17.6
- A crack in bathroom floor tiles Photo 17.7

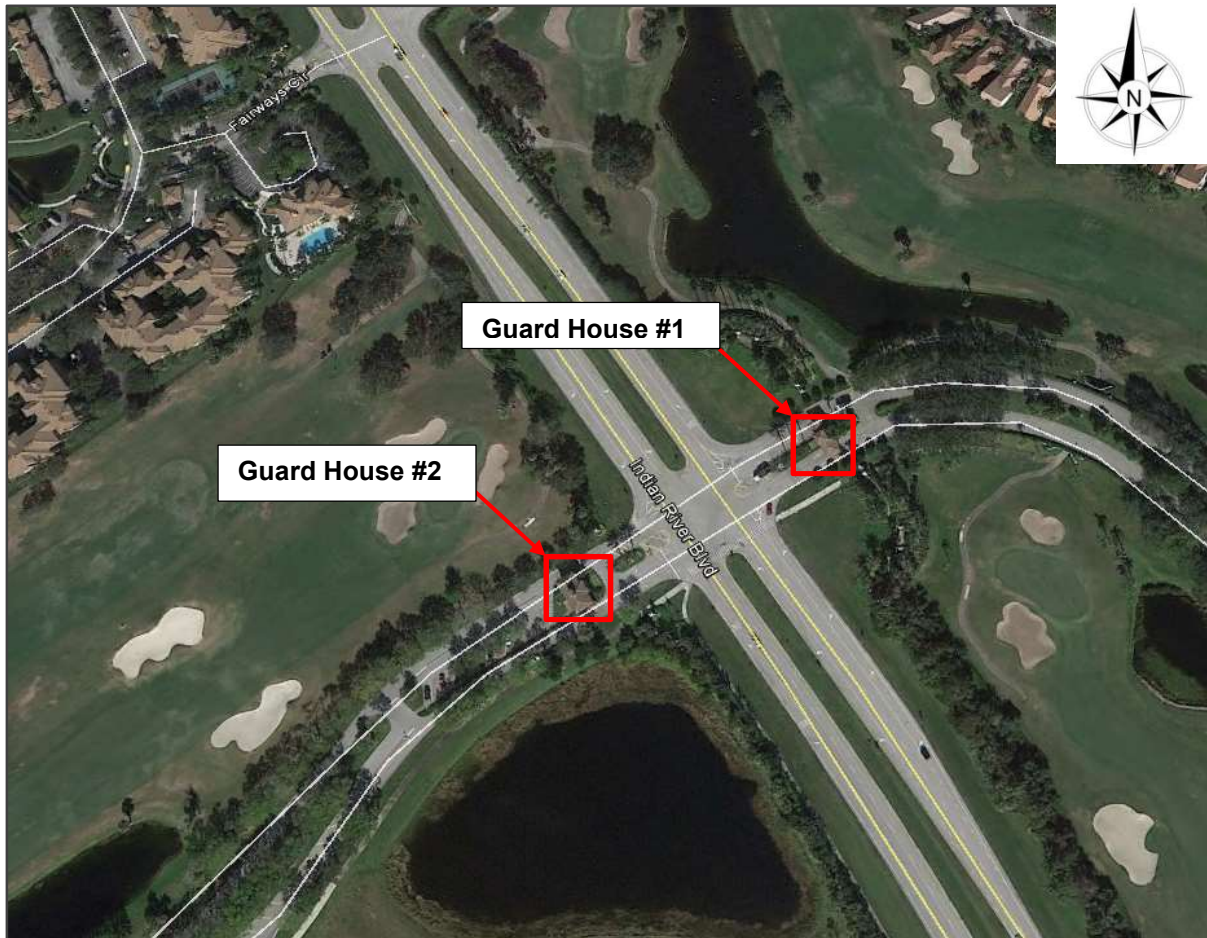


Figure 17.0 – Aerial Photograph of Guard Houses #1 and #2 (Source: Google Earth)

Discussion and Recommendations

The observations listed in the previous section of this report are mostly aesthetic in nature and do not affect the structural capacity or integrity of the Guard House buildings. However, stucco cracks allow an entry point for water to infiltrate behind the stucco and penetrate the waterproof barrier. When water gets behind the stucco, it can cause the stucco to delaminate from the substrate. It is recommended that the stucco cracks be routed and sealed. In addition, the exposed lath and damaged architectural features at the overhang structure should be patched. The bathroom floor tiles had a continuous crack spanning from one wall to the other. This is likely related to natural settlement of the building's foundation. No repairs are recommended to the bathroom floor at this time.

Refer to the Photographs 17.1 through 17.7 on the following pages for typical conditions of the Guard House structures.



Photo 17.1 – Delaminated paint and impact marks on overhang structure column at Guard House #1



Photo 17.2 – Exposed stucco lath on overhead beam; damage to architectural feature on column at Guard House #1



Photo 17.3 – Stucco crack on Guard House #1



Photo 17.4 – Exposed PVC conduit casing at Guard House #1



Photo 17.5 – Stucco crack on Guard House #2 (typical throughout)



Photo 17.6 – Stucco crack on window sill ledge at Guard House #2 (typical throughout)



Photo 17.7 – Cracking on bathroom floor tiles at Guard House #2

18.0 GRAND HARBOR RETAINING WALLS #1 THROUGH #4

Existing Conditions

In accordance with our agreement dated April 29, 2019, Kimley-Horn has performed visual inspections of three separate spans of existing retaining wall located on the northeastern quadrant of the Grand Harbor Community in Vero Beach, Florida. The first two retaining walls assessed were on the northern most barrier island along the on the north-west corner. Retaining wall #3 is located on the southeastern quadrant of the community and spans the perimeter of the retaining pond between River Village Drive and S. Harbor Drive. Retaining wall #4 is the recycled water reservoir and is located between Via Marbella Blvd and Victoria Circle. Refer to Figures 5.1 and 5.2 for the location and limits of retaining wall inspected. The retaining wall was inspected on the surface, no in-water investigation was performed.

Field Visit Observations

On June 19, 2019, Jerry Piccolo, P.E. and Jaime Ghitelman, P.E. performed a site visit to assess the condition of the four existing retaining walls shown in Figures 5.1 and 5.2. Refer to the photos attached herein. The following was observed and documented:

Retaining wall Span #1 (Photos 18.4-18.7)

- Retaining wall span #1 was a cast in place concrete wall, with rip-rap in front of portions of the wall and other portions exposed.
- A roughly 2-inch by 2-inch area of localized concrete damage to edge of retaining wall cap, at the edge of a joint.
- Vegetation was observed growing through the joints between sections of the wall.

Retaining wall Span #2 (Photos 18.8-18.10)

- The only exposed portion of retaining wall span #2 was the top (horizontal face) of the concrete cap. Rip-rap was built up to the top of the cap on the water side of the wall and mulch and vegetation covered landside of the wall. A palm tree was observed to be growing over the top of the cap.
- Transverse crack on the horizontal face of the concrete cap

Retaining wall Span #3 (Photos 18.11-18.14)

- Retaining wall span #3 is a tied back timber post and lagging wall
- The top planks on this wall need to be refastened in most areas and some areas need replaced
- At retaining wall #3 there is an area that has a 90-degree corner. At this corner the wall is starting to separate and a gap in the wall is developing and loosing material. The posts at the corner need to be re anchored to close the gap.
- Vegetation growing through wall
- Damaged, splintered, missing and displaced boards
- There is one location where the anchor block rod is bent.

Retaining wall Span #4 (Photos 18.15-18.25)

- Retaining wall span #4 is comprised of metal sheet piles with tie backs and covered by timber fascia boards on the water side of the wall and at the top of the wall, forming a cap.
- Damaged and missing timber boards as well as deterioration, cracking, splintering, displacement and rot were observed in the timber fascia covering the metal sheet piles.
- The landside of the sheet piles was exposed at some locations due to settlement
- Pitting of the metal was observed at the top an exposed portion of a metal panel
- While the pond was drained down, tears in the pond liner was observed.



Figure 18.1 – Aerial Photograph of Retaining Wall Spans #1 and #2 (Source: Google Earth)

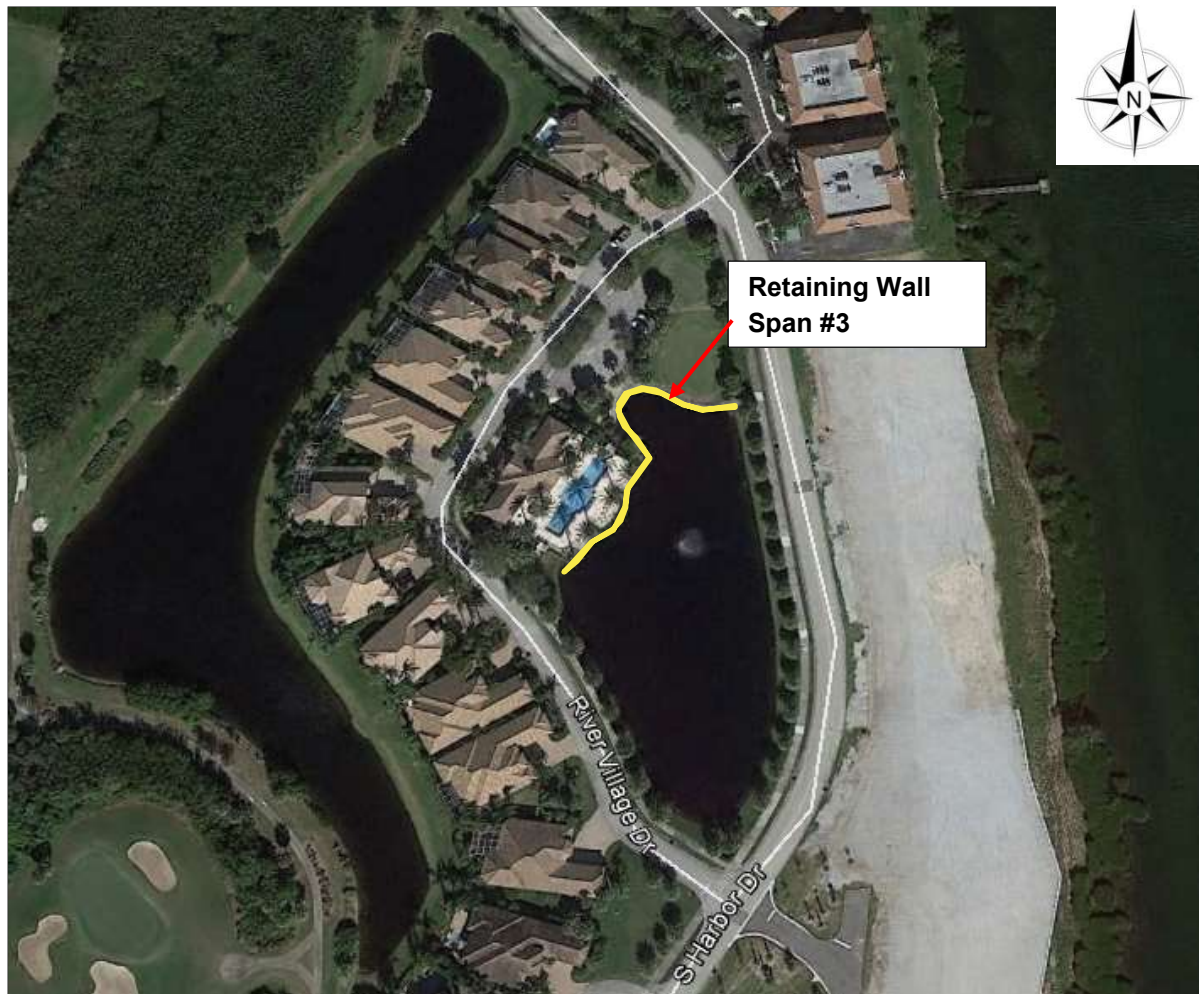


Figure 18.2 – Aerial Photograph of Retaining Wall Span #3 (Source: Google Earth)



Figure 18.3 – Aerial Photograph of Retaining Wall Spans #4 (Source: Google Earth)

Discussion and Recommendations

In regard to the cast in place concrete retaining walls (#1-#2), it is recommended removing vegetation from the joints and routing and sealing the transverse cracks in the concrete caps to prevent water from infiltrating into the wall.

Regarding the metal sheet pile retaining wall #3, with timber covering and cap, we recommend replacing the timber top surface board. The timber boards are missing at some locations and no longer properly connected at other locations. Due to continued exposure to the environmental elements, as well as long term submergence, the majority of the boards are splintered, cracked and rotted. The extent of the decay and deterioration observed in the timber boards deems them beyond repair. Because timber boards covered most of the metal sheet piles, the condition of the sheet piles is unknown. However, portions that were exposed did not exhibit any deficiencies. During replacement of the timber façade, we recommend a thorough inspection of the condition of the existing metal sheet piles.

Regarding the timber post and lagging retaining wall #4, the wood is rotting, damaged and/or missing. We anticipate the system is nearing the end of its service life needs to be replaced. There is one section of the wall where the anchor block is not at an appropriate angle. It is unknown what the size the anchor block is but the tie-back rod should be corrected to prevent future issues. Additionally, it is recommended that the pond liner be patched in the areas with tears.



Photo 18.4 – Overview of Retaining wall Span #1



Photo 18.5 –Localized concrete damage to edge of retaining wall cap at Retaining wall Span #1



Photo 18.6 –Overview of the water-side edge of Retaining wall Span #1



Photo 18.7 –Vegetation observed at joints in Retaining wall Span #1



Photo 18.8 –Palm encroaching on Retaining wall Span #2



Photo 18.9—Rock revetment covered the water-side; landscaping covered the land-side of Retaining wall Span #2



Photo 18.10 – Transverse crack on the cap of Retaining wall Span #2



Photo 18.11 – Overview of wood retaining wall



Photo 18.12 – Vegetation growing on retaining wall #3

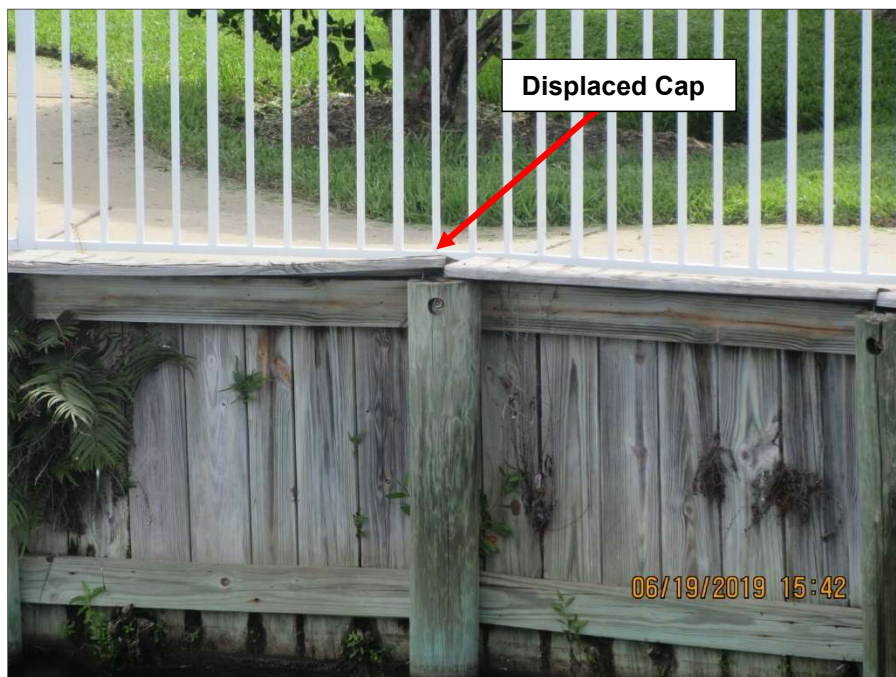


Photo 18.13 – Vegetation growing on retaining wall and displaced boards at wall #3



Photo 18.14 – Bent tie back rod at Wall #3



Photo 18.15 –Missing timber boards on Retaining wall Span #4



Photo 18.16 –Missing timber boards on Retaining wall Span #4



Photo 18.17 –Damaged and rotting timber boards on Retaining wall Span #4



Photo 18.18 –Exposed portion of landside of Retaining wall Span #4



Photo 18.19 –Cracking splintering and displacement of timber boards on Retaining wall Span #4



Photo 18.20 –Pond liner in the recycled water reservoir with Retaining wall Span #4



Photo 18.21 – Pond liner in the recycled water reservoir with Retaining wall Span #4



Photo 18.22 – Pond liner in the recycled water reservoir with Retaining wall Span #4



Photo 18.23 – Pond liner in the recycled water reservoir with tears.



Photo 18.24 – Pond liner in the recycled water reservoir with tears.



Photo 18.25 – Pond liner in the recycled water reservoir with tears

19.0 GRAND HARBOR PEDESTRIAN TUNNELS #1 THROUGH #4

Existing Conditions

In accordance with our agreement dated April 29, 2019, Kimley-Horn has performed visual inspections of four separate pedestrian tunnels aggregated longitudinally towards the middle and on the western half of the Grand Harbor Community in Vero Beach, Florida. Pedestrian Tunnel #1 spanned under Indian River Blvd, just north of Grand Harbor Blvd, while the remaining three tunnels spanned under Grand Harbor Blvd at three locations. The tunnels are intended for pedestrian and golf cart usage only. The tunnels are cast in place concrete structures with end walls and concrete slabs walking/driving surfaces. Tunnel #1 is a box shape while the remaining three tunnels have rounded, half circle openings. Refer to Figure 6.1 for the location of the tunnels assessed.

Field Visit Observations

On June 19, 2019, Jerry Piccolo, P.E. and Jaime Ghitelman, P.E. performed a site visit to assess the condition of the Guard Houses. Refer to the photos attached herein for typical conditions and deficiencies observed. The following was observed and documented:

Tunnel #1 (Photos 19.1-19.7)

- Approximately 169 feet in length
- Tunnel #1 included a steel pedestrian gate at the west entry
- Paint delamination was observed on the ceiling
- Transverse cracks with evidence of water intrusion, including rust stains and efflorescence, were observed on the ceiling at multiple locations
- Evidence of ponding (poor drainage) was observed at the perimeter walls of the tunnel
- Cracks spanning the full height of the tunnel walls and a transverse crack on the slab on grade
- Striping is deteriorated and faded

Tunnel #2 (Photos 19.8-19.10)

- Approximately 73 feet in length
- Evidence of slab modifications. Additional topping slab observed above the original elevation of the pedestrian pathway
- Cracks in the concrete topping-slab throughout
- Localized concrete spall was observed at one location

Tunnel #3 (Photos 19.11-19.14)

- Approximately 63 feet in length
- Cracks on the concrete slab on grade throughout
- Localized concrete spall with exposed reinforcing
- Evidence of ponding (poor drainage) was observed at the perimeter walls of the tunnel

Tunnel #4 (Photos 19.15-19.17)

- Approximately 102 feet in length
- Evidence of impact damage on the architectural finish at the entry to the tunnel

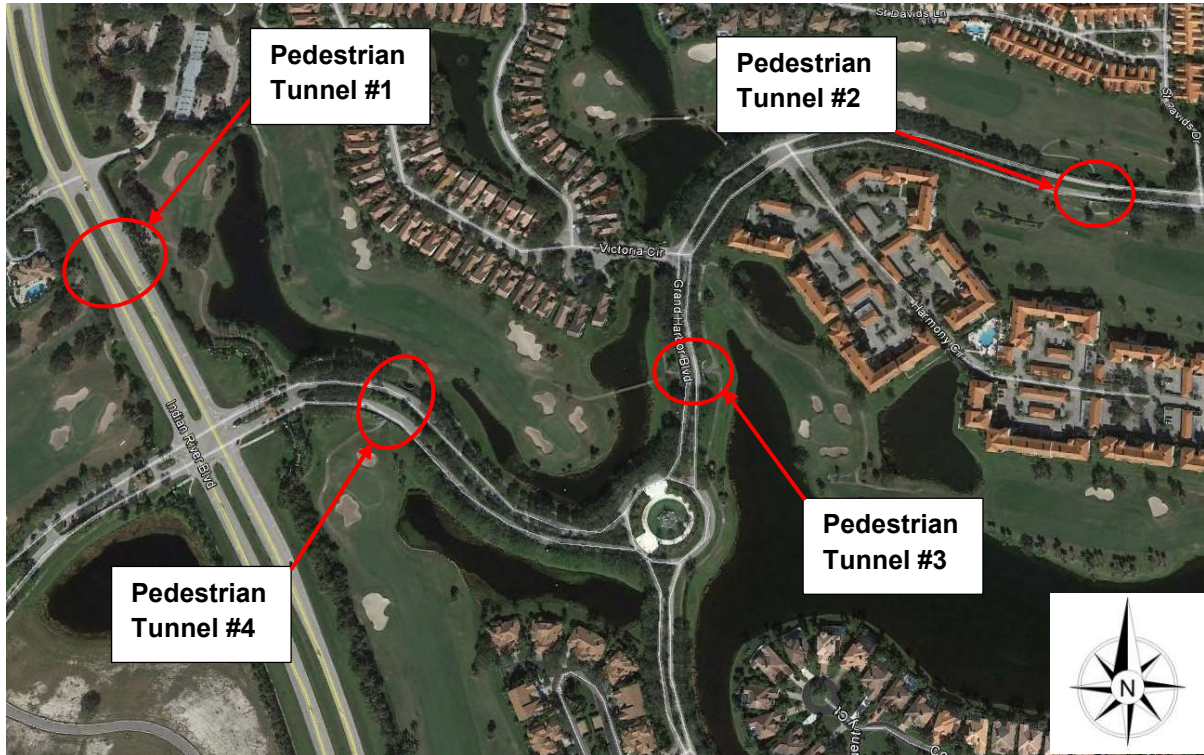


Figure 19.0 – Aerial Photograph of Tunnels #1, #2, #3 and #4 (Source: Google Earth)

Discussion and Recommendations

In regard to the cast in place concrete tunnels (#1 through #4), we recommend sealing the overhead concrete cracks and leaks with a polyurethane chemical grout, and routing and sealing the cracks on slab on grade and tunnel walls of all four tunnels. We also recommend correcting the poor drainage deficiency to allow water to properly run off the surface. The localized concrete spalling should be repaired by chipping around the damaged area, cleaning the reinforcing steel, and applying a quick set grout. The patch can then be painted to match the existing paint on the tunnels. Additionally, it is recommended that the impact damages to the finish be corrected and re-painted at the entry of tunnel #4.



Photo 19.1 –Steel Gate at entry of Tunnel #1. Note faded striping.



Photo 19.2 –Paint delamination of the ceiling of Tunnel #1



Photo 19.3 – Ceiling crack with rust stains and water intrusion at Tunnel #1.



Photo 19.4 – Ceiling crack with rust stains and water intrusion at Tunnel #1.



Photo 19.5 – Evidence of ponding/poor drainage and crack in slab in Tunnel #1



Photo 19.6 – Evidence of ponding/poor drainage at edges of Tunnel #1



Photo 19.7 – Crack in wall of Tunnel #1



Photo 19.8 – Post-modified topping slab at Tunnel #2



Photo 19.9 – Cracks in topping slab at Tunnel #2 (typical throughout)



Photo 19.10 – Localized concrete spall in wall of Tunnel #2



Photo 19.11 – Overview of Tunnel #3



Photo 19.12 – Cracks in slab on grade of Tunnel #3



Photo 19.13 – Exposed reinforcing in wall on Tunnel #3



Photo 19.14 – Evidence of ponding/poor drainage at Tunnel #3



Photo 19.15 – Overview of Tunnel #4



Photo 19.15 – Evidence of impact damage to the arch at the entry to the Tunnel #4



Photo 19.15 – Evidence of impact damage to the base of the arch at the entry to Tunnel #4

20.0 GRAND HARBOR MISCELLANEOUS STRUCTURES

Existing Conditions

In accordance with our agreement dated April 29, 2019, Kimley-Horn has performed visual inspections of various miscellaneous structures located throughout the Grand Harbor Community in Vero Beach, Florida. The following miscellaneous structures are discussed within this section: River Village Pier, the main fountain in the first circle on Grand Harbor Blvd., and the small guard shack at the Via Marbella gate (back gate). Refer to Figure 7.1 for the location of the miscellaneous structures that were assessed.

Field Visit Observations

On June 19, 2019, Jerry Piccolo, P.E. and Jaime Ghitelman, P.E. performed a site visit to assess the condition of the Miscellaneous Structures. Refer to the photos attached herein for typical conditions and deficiencies observed. The following was observed and documented:

River Village Pier (Photos 20.1-20.4)

- The pier is of timber construction with timber piles, handrail and decking. The timber decking and handrails are painted, and the piles are treated.
- Pile liners were installed on the piles up to the height of the timber decks beams.
- Corrosion stains (rust) were visible at the anchor bolts for the cross bracing.
- The 2x8 timber cross bracing was rotted, splintered, deteriorated, and in some cases missing, throughout.

Via Marbella Guard Shack (Photos 20.5-20.8)

- Corroded anchor at foundation
- Corroded door hinges
- Missing shingle on roof ridge

Main Fountain (Photos 20.9-20.12)

- Shrinkage cracks observed on the perimeter coping
- Bent skimmer plate
- Finish delamination on the walking surface surrounding the fountain
- Fountain lighting not working



Figure 20.0 – Aerial Photograph of Miscellaneous Structures (Source: Google Earth)

Discussion and Recommendations

It is recommended that on the River Village Pier, the cross bracing throughout be removed and replaced with new anchor attachments. The cross bracing is missing, damaged or rotting and no longer providing the intended structural capacity.

At the fountain, we recommend re-sealing the coping to prevent water infiltration and degradation of the coping and slab. The lighting within the fountain was also found to be non-functioning. We recommend replacing all light bulbs or fixtures. There are approximately 30 fixtures.

At the guard shack, we recommend it being removed and replaced.



Photo 20.1 –Overview of River Village Pier



Photo 20.2 – Corrosion stains (rust) were visible at the anchor bolts for the cross bracing of River Village Pier



Photo 20.3 – The 2x8 timber cross bracing was rotted, splintered & deteriorated throughout.



Photo 20.4 – The 2x8 timber cross bracing was rotted, splintered, deteriorated and/or missing throughout.



Photo 20.5 – Overview of Via Marbella Guard Shack



Photo 20.6 – Corroded anchor at Via Marbella Guard Shack



Photo 20.7 – Corroded door hinges at Guard Shack



Photo 20.8 – Missing shingle at Guard Shack



Photo 20.9 – Overview of Fountain



Photo 20.10 – Cracking on coping of Fountain



Photo 20.11 – Delamination of finish on sidewalk surrounding fountain



Photo 20.12 – Bent skimmer in fountain

21.0 GRAND HARBOR IRRIGATION PUMPS AND CONTROLLERS

Existing Conditions

Kimley-Horn has performed a visual inspection of two (2) 600 gpm irrigation pumps and eight (8) irrigation controllers.

Field Visit Observations

On October 22, 2019, Kevin Barrett, FCLD performed site visits to assess the condition of the pumps and controllers. The following was observed and documented:

(2) 600 gpm irrigation pumps

- Pumps were found to be in working order and are located in a pump house structure on South Harbor Drive, between St. Catherine Drive and St Anne's Lane.

(8) Irrigation Controllers

- #1 Located behind the North Oak Harbor Monument sign, controlling the buffer along Indian River Boulevard, from that point south. The Controller is a Hunter PRO-C and was observed to be in working order.
- #2 Located in the Indian River Boulevard buffer, controlling the buffer along Indian River Boulevard. The Controller is a Hunter PRO-C and was observed to be in working order.
- #3 Located on the East side of the main gate house and controls the area around the main entrance. The Controller is a Hunter PRO-C and was observed to be in working order.
- #4 Located west of the fountain on Grand Harbor Boulevard, controlling the area along Grand Harbor Boulevard to the fountain. The Controller is a Hunter PRO-C and was observed to be in working order. A rain sensor was observed mounted to a sign column at the southwest intersection of Grand Harbor Boulevard and South Harbor Drive.
- #5 Located in a pedestal box on Grand Harbor Boulevard, west of St. Davids Drive, controlling the area along Grand Harbor Boulevard from the fountain to the traffic circle with Harbor Village Drive and South Harbor Drive. The Controller is a Hunter PRO-C and was observed to be in working order.
- #6 Located in a pedestal box on Harbor Village Drive south of St. Josephs Island Lane, controlling the area along South Harbor Drive from the traffic circle with Grand Harbor Boulevard and Harbor Village Drive to the Clubhouse. The Controller is a Hunter PRO-C and was observed to be in working order. The pedestal box is a Toro and the Controller while enclosed from the elements is not properly seated.
- #7 Located on the rear of the restroom building on Via Mirabella Boulevard between Sol Rue Circle and North Harbor Village Drive controlling the common area along Via Mirabella to the north entrance gate. The Controller is a Hunter PRO-C and was observed to be in working order.
- #8 Located northwest of the north entrance gate guard house, controlling along Via Mirabella from that point out to the right of way with Indian River Boulevard. The Controller is a Hunter X-CORE and was observed to be in working order.

Discussion and Recommendations

Irrigation pumps and timers appear to be in good working order. Irrigation maintenance company should continue with this routine as part of regular irrigation maintenance. Clock #6 is a Hunter Controller in a Toro pedestal box, if swapping for a Hunter box will not adversely affect the operation of the controller, then it is suggested that this be done so that the controller can be properly seated inside the box as designed.

Refer to pictures attached below for illustration of observed conditions.



Figure 1 Pumps 1 through 3.



Figure 2 Pump Controls



Figure 3 Clock #1



Figure 4 Clock #2

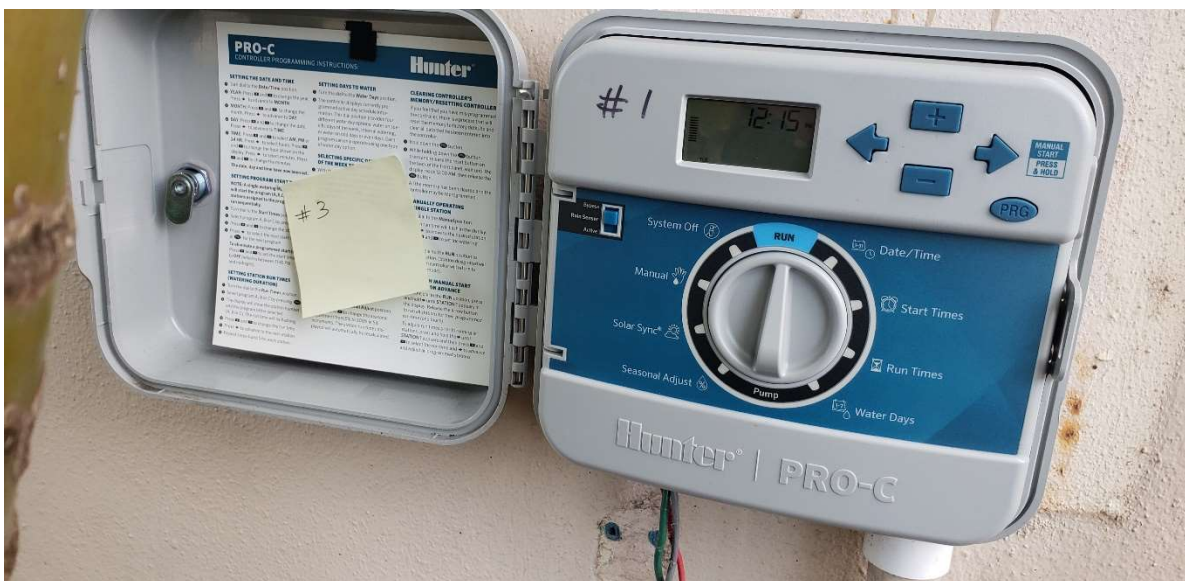


Figure 5 Clock #3



Figure 6 Clock #4



Figure 7 Clock #5



Figure 8 Clock #6



Figure 9 Clock #7



Figure 10 Clock #8

22.0 ENVIRONMENTAL ASSESSMENT REPORT

Existing Conditions

Kimley-Horn has performed a Limited Assessment Investigation along the approximate 900-foot, right-of-way (ROW) of Via Marbella Boulevard within the Grand Harbor development. The ROW historically lied adjacent to a golf course maintenance facility that may have used agrichemicals and/or petroleum products as a part of its daily operations.

Field Visit Observations

On September 5th, 2019, soil and ground water samples were collected along the route to evaluate if historical golf course maintenance operations have impacted the ROW. The following was observed and documented:

Samples Taken

- (8) Eight soil samples
- (5) Five groundwater samples

Discussion and Recommendations

It was found that the concentrations of arsenic detected in the soil samples and Organochlorinated Pesticides detected in groundwater were below their respective clean up target levels. As such, it appears that no further assessment is warranted.

Refer to the full Environmental Assessment Report in Appendix H for more information.