

**PELICAN BAY SERVICES DIVISION**  
**Municipal Services Taxing & Benefit Unit**

**NOTICE OF PUBLIC MEETING**

**FEBRUARY 1, 2021**

**THE WATER MANAGEMENT COMMITTEE OF THE PELICAN BAY SERVICES DIVISION WILL MEET AT 9:00 AM ON MONDAY, FEBRUARY 1 AT THE COMMUNITY CENTER AT PELICAN BAY, 8960 HAMMOCK OAK DR., NAPLES, FL 34108.**

**AGENDA**

1. Pledge of Allegiance
2. Roll call
3. Agenda approval
4. Approval of 01/23/20 meeting minutes
5. Audience comments
6. Current state and expected timing for Oakmont Lake 4-1 remediation project
  - a. Detailed plan able to be used for bidding
  - b. PBSB Board decision to proceed with Lake 4-1
  - c. Expected procurement elapsed time
  - d. Estimated timeline for construction
  - e. Methods of remediation, including mixed use of Rip Rap and Geotube
7. Criteria used to prioritize lake bank restoration
8. Incremental criteria including visibility, current functional or aesthetic problems
9. Staff progress report
10. Adjournment

*\*indicates possible action items*

ANY PERSON WISHING TO SPEAK ON AN AGENDA ITEM WILL RECEIVE UP TO THREE (3) MINUTES PER ITEM TO ADDRESS THE BOARD. THE BOARD WILL SOLICIT PUBLIC COMMENTS ON SUBJECTS NOT ON THIS AGENDA AND ANY PERSON WISHING TO SPEAK WILL RECEIVE UP TO THREE (3) MINUTES. THE BOARD ENCOURAGES YOU TO SUBMIT YOUR COMMENTS IN WRITING IN ADVANCE OF THE MEETING. ANY PERSON WHO DECIDES TO APPEAL A DECISION OF THIS BOARD WILL NEED A RECORD OF THE PROCEEDING PERTAINING THERETO, AND THEREFORE MAY NEED TO ENSURE THAT A VERBATIM RECORD IS MADE, WHICH INCLUDES THE TESTIMONY AND EVIDENCE UPON WHICH THE APPEAL IS TO BE BASED. IF YOU ARE A PERSON WITH A DISABILITY WHO NEEDS AN ACCOMMODATION IN ORDER TO PARTICIPATE IN THIS MEETING YOU ARE ENTITLED TO THE PROVISION OF CERTAIN ASSISTANCE. PLEASE CONTACT THE PELICAN BAY SERVICES DIVISION AT (239) 597-1749.

**PELICAN BAY SERVICES DIVISION  
WATER MANAGEMENT COMMITTEE MEETING  
JANUARY 23, 2020**

The Water Management Committee of the Pelican Bay Services Division met on Thursday, January 23 at 1:30 p.m. at the SunTrust Bank Building, 801 Laurel Oak Drive, Suite 302, Naples, FL 34108. The following members attended.

**Water Management Committee**

Denise McLaughlin, Chair  
Tom Cravens

Jacob Damouni (*absent*)

Michael Weir

**Pelican Bay Services Division Staff**

Neil Dorrill, Administrator  
Chad Coleman, Operations Manager  
Lisa Jacob, Project Manager

Alex Mumm, Sr. Field Supervisor (*absent*)

Barbara Shea, Interim Operations Analyst

**Also Present**

Jim Carr, Agnoli, Barber & Brundage  
Susan O'Brien, PBSB Board

**APPROVED AGENDA (AS PRESENTED)**

1. Pledge of Allegiance
2. Roll call
3. Agenda approval
4. Approval of 11/21/19 meeting minutes
5. Audience comments
6. Current projects
  - a. St. Maarten/St. Thomas Lake 2-9
  - b. Bay Colony Beach Dune Swale
  - c. Grosvenor/Dorchester drainage basin
7. Prioritizing lake bank restoration projects for next FY21 budget
8. Review of Pollution Control Report
9. Review of algae problem in target lakes
10. Other committee member comments
11. Adjournment

**ROLL CALL**

Mr. Damouni was absent and a quorum was established

**AGENDA APPROVAL**

**Mr. Cravens motioned, Mr. Weir seconded to approve the agenda as presented. The motion carried unanimously.**

**APPROVAL OF 11/21/19 MEETING MINUTES**

**Mr. Cravens motioned, Mr. Weir seconded to approve the 11/21/19 meeting minutes as presented. The motion carried unanimously.**

**AUDIENCE COMMENTS**

Ms. O'Brien requested that Mr. Dorrill provide the PBSB Board with an update on the Operations Analyst Position and "who's doing what" by the existing staff during this interim period.

**CURRENT PROJECTS**

**ST. MAARTEN/ST. THOMAS LAKE 2-9**

Ms. Jacob commented that the Lake 2-9 lake bank restoration project is scheduled to begin in April.

**BAY COLONY BEACH DUNE SWALE**

Ms. Jacob reported that the Bay Colony Beach Dune Swale project is out for bid; bids are due back on Feb. 12.

**GROSVENOR/DORCHESTER DRAINAGE BASIN**

Ms. Jacob commented that she expects our ABB engineer, Mr. Jim Carr, to finalize the design plans for the Grosvenor/Dorchester drainage basin project by tomorrow. Once received, she will put the project out for bid. Mr. Dorrill commented that the project will include mahoe removal only in areas affecting the re-alignment of the swale.

Ms. O'Brien asked for clarification on the length of time and complexity of this project. Ms. McLaughlin suggested that when the drainage pipes were unblocked, unnatural drainage flows were created, causing additional work to be needed.

**PRIORITIZING LAKE BANK RESTORATION PROJECTS FOR FY21 BUDGET**

The committee reviewed and discussed the prioritized list by critical need of lake bank remediation of our PB lakes, which was created by ABB a few years ago. Mr. Carr commented that he estimates costs of remediation have risen by approximately 40% since this list was created. The committee and staff tasked Mr. Carr to update the estimated cost of remediation for the top 7 lakes on the list (omitting Lake 2-9 for which a project is currently in process). Mr. Coleman noted that lakes 1-6, 4-1, and 2-5 are on our list of targeted algae lakes and in the top 10 of our prioritized lake bank remediation list. Mr. Carr suggested that it would be worthwhile to do a walk around all of our lakes to determine whether any of the lake bank conditions have changed.

Mr. Dorrill commented that he will contact Mr. Dave Mangan, General Manager of the Club Pelican Bay golf course, to determine whether he feels we should address lake bank remediation of lakes 2-8 and 4-11 (within the golf course) in light of the recent golf course restoration work.

**Pelican Bay Services Division Water Management Committee Meeting  
January 23, 2020**

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Ms. O'Brien suggested that we consider asking an engineer from the South Florida Water Management District to do a walk around at the top seven lakes that are under our consideration for lake bank remediation and share with us what they are expecting us to do relative to our permits. Mr. Dorrill commented that he is not interested in doing this.

Ms. O'Brien commented that the board has had discussions to bundle lake bank projects and include these into our upcoming large project financing package.

**REVIEW OF POLLUTION CONTROL REPORT**

Ms. McLaughlin reported that she recently had a meeting with Mr. Coleman, Mr. Mumm, and Ms. Jacob to discuss the report of recommendations to improve water quality, prepared by the County's Pollution Control Dept. A list of all the recommendations along with (1) priority, (2) staff required, (3) doing now?, (4) cost, (5) complexity, and (6) a proposed plan for each item was included in the agenda packet. The committee and staff discussed the first 11 items on the list, and follow up that was agreed upon is as follows:

- Mr. Dorrill will look into the feasibility of bagging grass clippings.
- The possibility of the PBF employing an inspector that safeguards against water quality impacts to the stormwater system could be included for discussion at a future PBF/PBSD workshop. The committee suggested that the PBF would be the more appropriate entity to take on this responsibility as they have enforcement capability.
- Mr. Dorrill will ask staff to identify a test lake to plant littoral plants to study whether these plants will cause a reduction in algae.
- Mr. Dorrill will contact the Grey Oaks community to obtain information on the device they are using to mechanically remove algae.
- Mr. Coleman will determine whether all of our lakes with algae problems have aerators installed.
- Ms. Jacob will contact our environmental consultant, Mr. Jeremy Sterk, to determine whether he would be able to systematically determine whether our aerators are causing algae reduction in our lakes.

**ADJOURNMENT**

**The meeting was adjourned at 2:59 p.m.**

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Denise McLaughlin, Chair

Minutes approved [ ] *as presented* OR [ ] *as amended* ON \_\_\_\_\_ ] *date*

**AGNOLI  
BARBER &  
BRUNDAGE, INC.**  
Professional Engineers, Planners, Surveyors & Landscape Architects

# PELICAN BAY



# Lake 4-1 Analysis

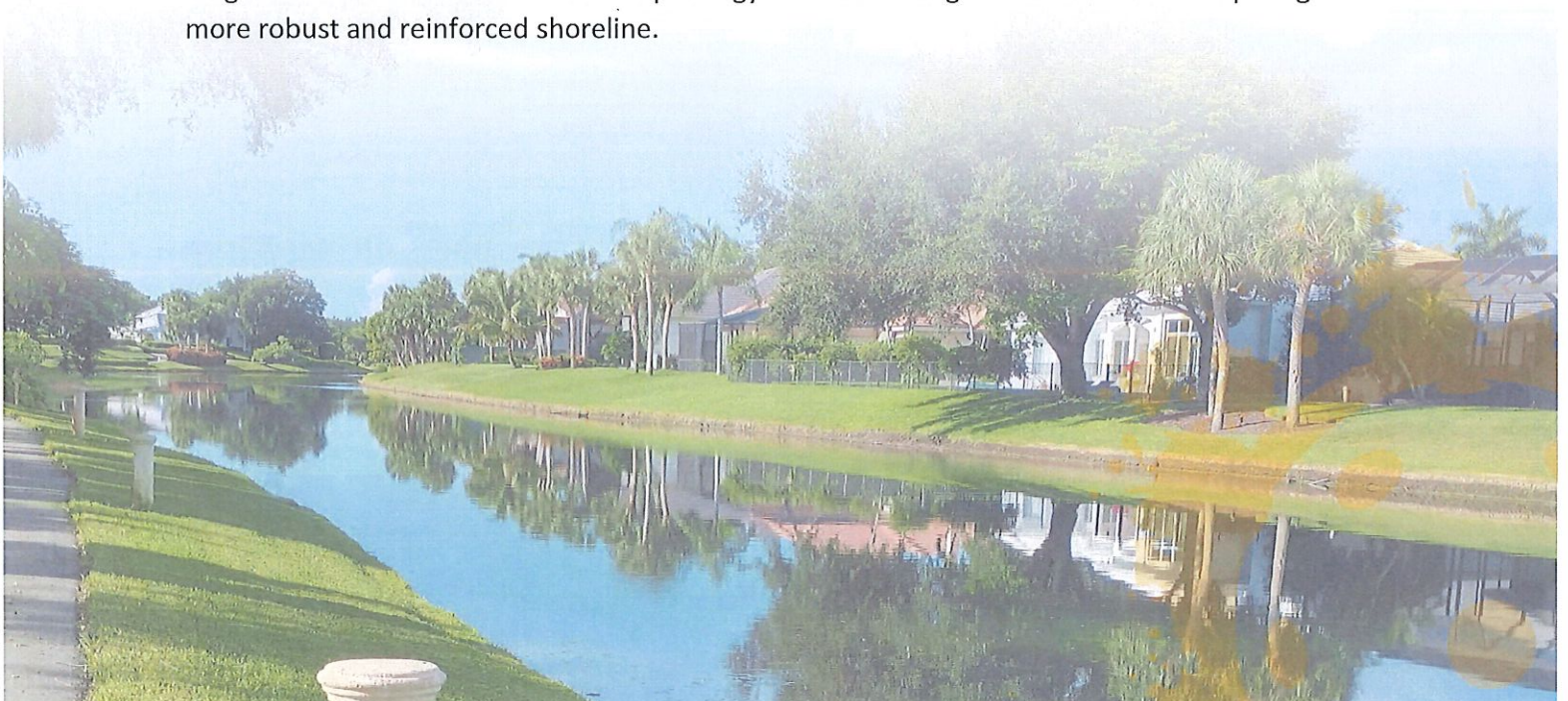


## Background

Erosion can be defined as the gradual removal or movement of soil from one area to another caused by water, wind, or other natural causes. Lake bank erosion is very common in southwest Florida due to the variance in seasons it faces. It can be caused by strong winds that damage the shoreline such as in events like Hurricane Irma and overland runoff.

A site visit was conducted on August 6<sup>th</sup>, 2020 for lake 4-1 at Pelican Bay to measure erosion and assess the condition of the lake banks. Even though all indications of erosion are noted when conducting site visit, the primary form of analytical data that is taken to determine the degree of erosion are measurements of both escarpment height and slope. Escarpment height can be defined as any sudden drop-off that separates the lake bank from the elevation just inside the water's edge. It is important to note that drop-offs are common for any lake however any drop-off over 9 inches exceeds the permitted threshold for the South Florida Water Management District (SFWMD) permit. The slope can be defined as the degree of inclination of the ground. The slope is an indicator of erosion because the slope determines the rate at which water flows over the top of lake banks, its action will accelerate the process of erosion. Like the escarpment height, there is a permitted limit of how steep the slope may be. Any slope greater than 4:1, meaning a length of four feet for every foot in depth, is considered out of compliance with the SFWMD permit.

Wind is a major factor in creating waves, fortunately for Lake 4-1 the longest distance from the east to the west side of the lake is about 260 linear feet however the length from north to south is quite significant. Approximately 2600 linear feet separates the north and south sides of the lake, leaving it prone to erosion. Incoming cold fronts and increased wind from storms can create waves that worsen the condition of the lake banks and create additional problems. The long fetch allows the waves to build up energy before crashing into the lake bank requiring a more robust and reinforced shoreline.



## Analysis

Lake 4-1 is bound by Green Tree Drive to the west and Oakmont Parkway to the east. The lake is surrounded by residential properties and a greenway on the east side of the lake bank. The rooftops, roads, and greenway along the lake banks act as impervious surfaces that prevent runoff from percolating into the ground, producing runoff directed to the lowest point of elevation which is the lake. To reduce erosion, the optimal solution is to have a drain or structure to collect and control the flow of the water, however in this case, majority of rainfall flows directly into Lake 4-1. The consistent flowing of water over the lake bank runs down the surface weakening and deteriorating the soil allowing ledges and steep slopes to form.

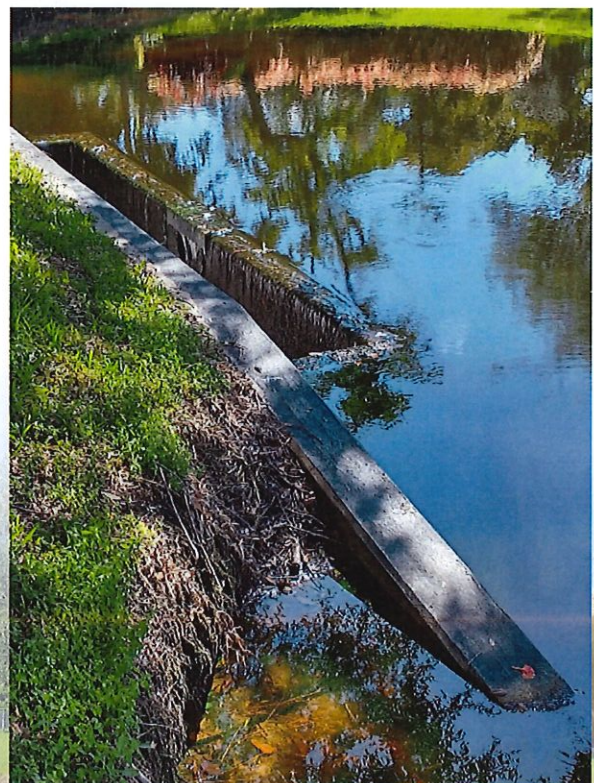
Some of the depth found around the lake banks during inspection can be attributed to geo-tube put in place from previous erosion prevention effort. This geo-tube anchors much of the soil to the bank and holds the soil in place as water runs over it. This allows the part of the bank not held in place by the fabric sock to be pushed farther into the lake. The geo-tube then begins to fail and slide into the lake itself, no longer serving its purpose.



The pedestrian side has some steep side slopes abutting the lake bank that need to be remediated to meet the 4:1 slope requirement. Excess runoff produced by the roofs of the homes may contribute to this issue however the homes on the east side, abutting the pathway, should have downspouts connected into the storm water system along the roads in front of the homes.

The escarpment height around much of the lake reaches depths of up to 30 inches in some places, falling out of compliance with the SFWMD permit. It was most critical along the east side of the lake where you can see exposed geo-tube from previous erosion prevention efforts. However, this fabric has begun to fail and is now sliding into the water no longer preventing erosion along the bank.

There is an outfall structure on the north side of the lake bank that showed signs of erosion behind the headwall. Typically, headwall is used to stabilize the soil around drainage structures to prevent the structure from falling into the water. In the picture below, the headwall has been exposed due to the receding lake bank. This presents not only a problem of erosion but may put the structure at risk in the long-term.







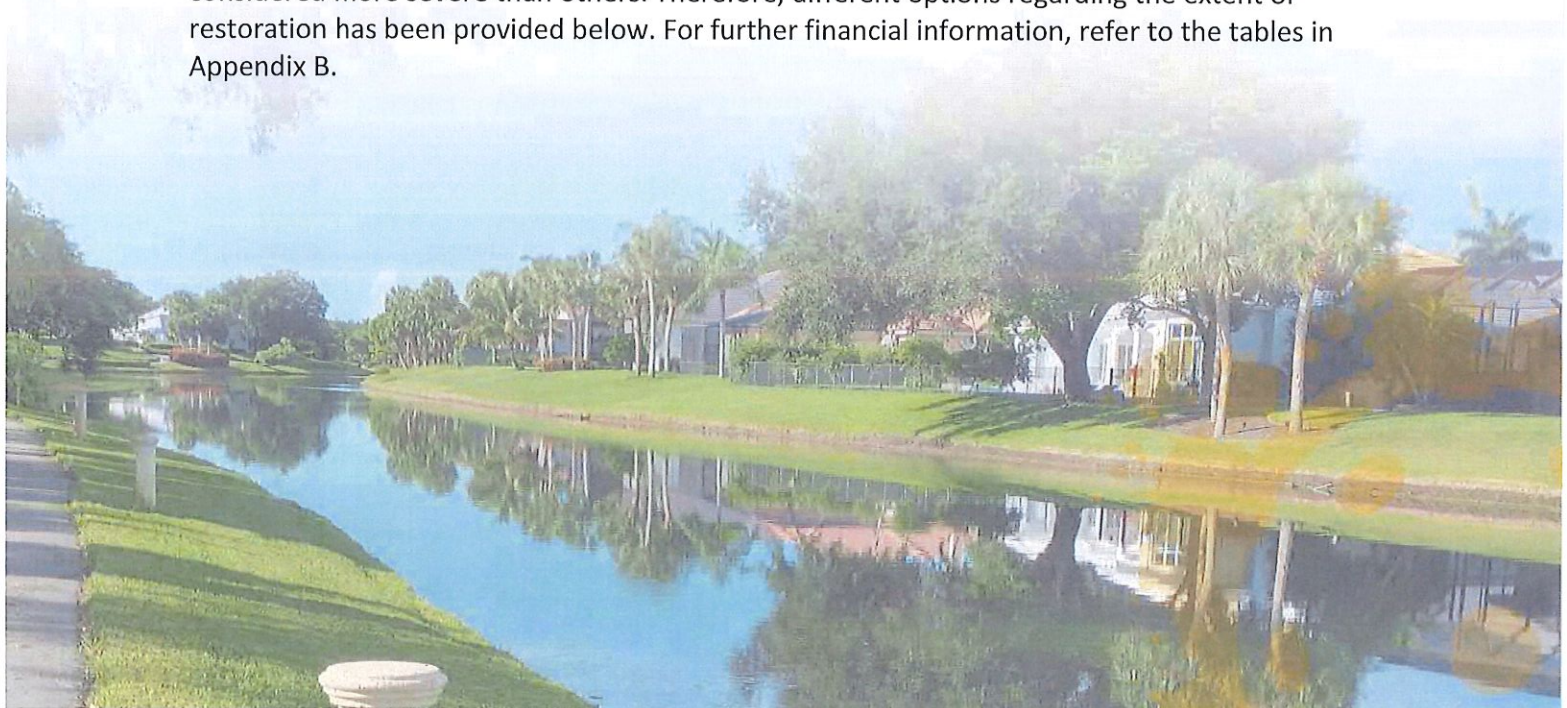
## Financial Summary

Given the amount of lake bank Lake 4-1 provides, there are different restoration options depending on expenses and degree of erosion. Generally, there are three methods of restoration, installing rip-rap, a geoweb system or simply regrading the existing lake bank to comply with the standards.

Rip-rap is primarily made-up of lime rock that have been sized to have a mass that resists manipulation due to wind and wave action. The rocks sit on top of a liner that allows water to slowly percolate into the soil rather than creating large divots in the lake bank caused by the overland runoff. It is important to note that SFWMD only permits a maximum of 40% of the lake bank to be hard cover (seawall or rip-rap). Lake banks exceeding 40%, if permitted, typically require additional mitigation such as increased littoral plantings.

Geoweb is a three-dimensional system made up of interconnected cells that reinforces the lake bank due to the infill inside of these cells. The type of infill selected depends on the extent of the erosion, however in this case, compacted soil would be used. This will allow vegetation to grow through the cells keeping the aesthetic view of a natural lake. This would require minimal maintenance however the additional maintenance would out-weigh the cost of long-term severe erosion. The third option is to re-grade the existing lake bank to restore it to the permitted conditions. However, it must be noted that only regrading the lake bank will provide a short-term solution rather than a longer term structural enforcement. The geoweb and regrading options may require additional costs regarding imported fill. Due to significant slopes and drops-offs, fill is required in some areas to satisfy SFWMD standards.

The field data collected in Appendix A determined that there are areas that are considered more severe than others. Therefore, different options regarding the extent of restoration has been provided below. For further financial information, refer to the tables in Appendix B.



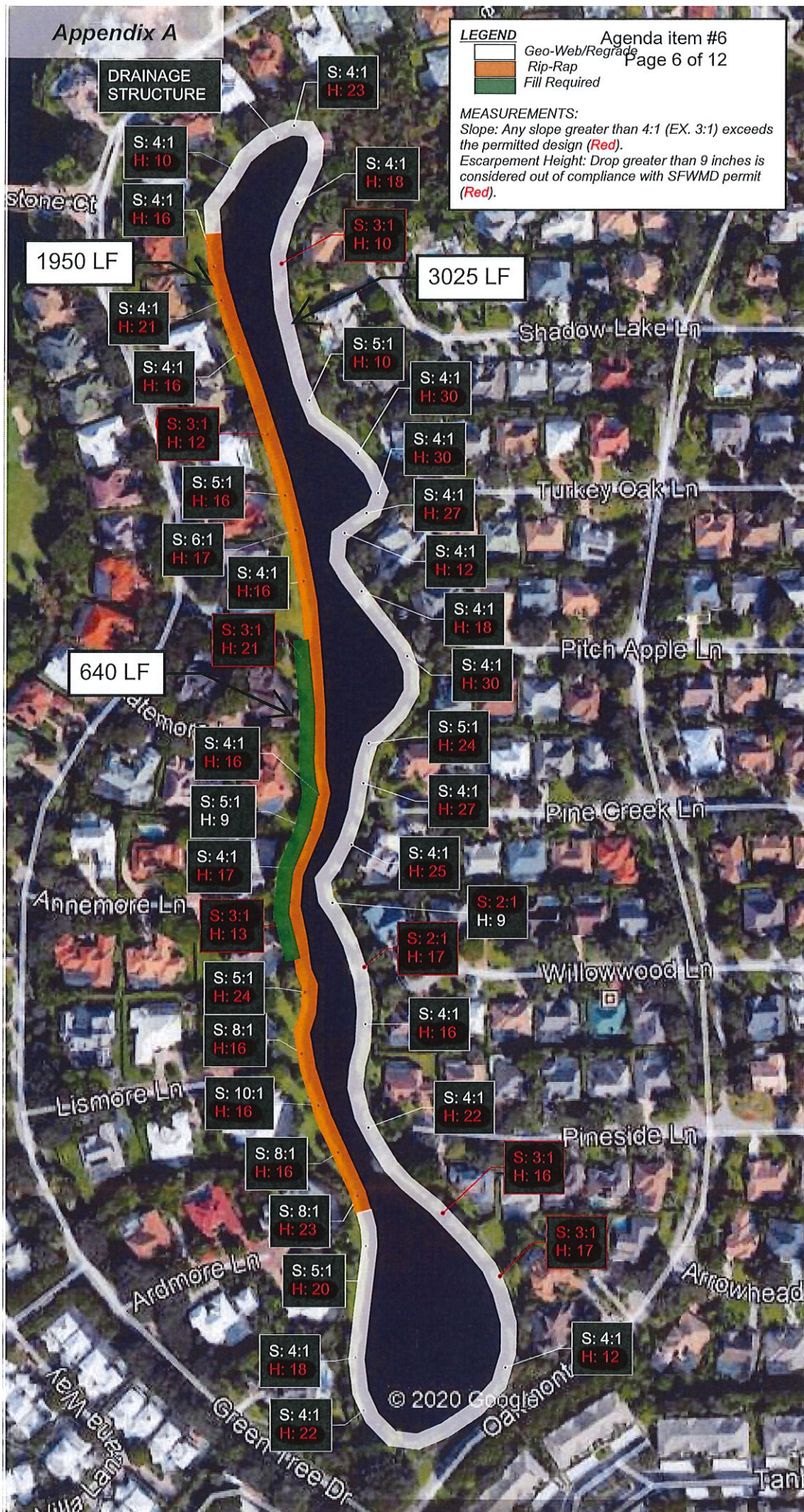
LEGEND

- Geo-Web/Regrade
- Rip-Rap
- Fill Required

MEASUREMENTS:

Slope: Any slope greater than 4:1 (EX. 3:1) exceeds the permitted design (Red).

Escarpement Height: Drop greater than 9 inches is considered out of compliance with SFWMD permit (Red).



Preliminary Budget Estimate

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
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**OPTION 1: GEO-WEB SYSTEM & RIP-RAP**

**GEO-WEB SYSTEM**

1	Mobilization	LS	1	\$ 125,000	\$ 125,000
2	Landscape Replacement (Sod, Native Vegetation) (10' wide x 3,025 LF)	SF	30,250	\$ 3	\$ 90,750
3	Irrigation Replacement in impacted areas (10' wide x 3,025 LF)	SF	30,250	\$ 2	\$ 60,500
4	Littoral Plantings @ 2 per linear foot of modified lake bank	EA	6,050	\$ 4	\$ 24,200
5	In Place Compacted, Imported Fill	CY	6,842	\$ 100	\$ 684,200
6	Silt Fence	LF	3,025	\$ 2	\$ 6,050
7	Turbidity Barrier	LF	100	\$ 30	\$ 3,000
8	Yard Drain Connections @ approx. 2 per lot/home (includes ADS 12" Yard Drain)	EA	27	\$ 1,000	\$ 27,000
9	Sandy Top Soil with 10%-12% Organics (3" deep over impacted areas) (3,025 LF x 8' x 3")	CY	224	\$ 100	\$ 22,407
10	GeoWeb - GW 30V3 (12' wide) (Includes backfill, 57 stone, anchors, non-woven fabric)	SF	36,300	\$ 15	\$ 544,500
<b>SUBTOTAL</b>				=	<b>\$ 1,587,607</b>

**RIP-RAP**

1	Rip-Rap 12" to 24" with Underlayment (4' wide x 1,950 LF)	SY	733	\$ 300	\$ 220,000
2	In Place Compacted, Imported Fill	CY	1,420	\$ 100	\$ 142,000
<b>SUBTOTAL</b>				=	<b>\$ 362,000</b>

<b>GRAND TOTAL</b>				=	<b>\$ 1,949,607</b>
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Note: Estimated costs are pre-survey and are approximate. Cost estimates do not include survey, site permitting or design plans.

Preliminary Budget Estimate

Item No.	Description	Unit	Quantity	Unit Cost	Total Cost
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OPTION 2: RE-GRADE & RIP-RAP

RE-GRADE

1	Mobilization	LS	1	\$ 125,000	\$ 125,000
2	Landscape Replacement (Sod, Native Vegetation) (10' wide x 3,025 LF)	SF	30,250	\$ 3	\$ 90,750
3	Irrigation Replacement in impacted areas (10' wide x 3,025 LF)	SF	30,250	\$ 2	\$ 60,500
4	Littoral Plantings @ 2 per linear foot of modified lake bank	EA	6,050	\$ 4	\$ 24,200
5	In Place Compacted, Imported Fill	CY	6,842	\$ 100	\$ 684,200
6	Silt Fence	LF	3,025	\$ 2	\$ 6,050
7	Turbidity Barrier	LF	100	\$ 30	\$ 3,000
8	Yard Drain Connections @ approx. 2 per lot/home (includes ADS 12" Yard Drain)	EA	27	\$ 1,000	\$ 27,000
SUBTOTAL				=	\$ 1,020,700

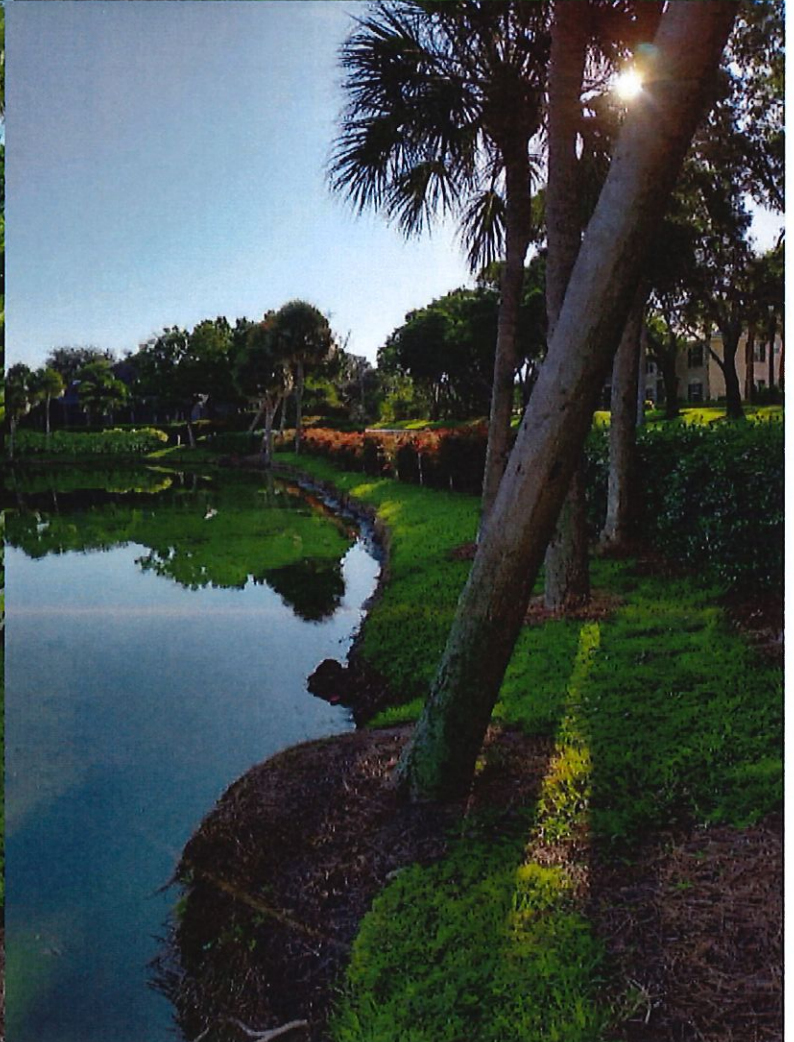
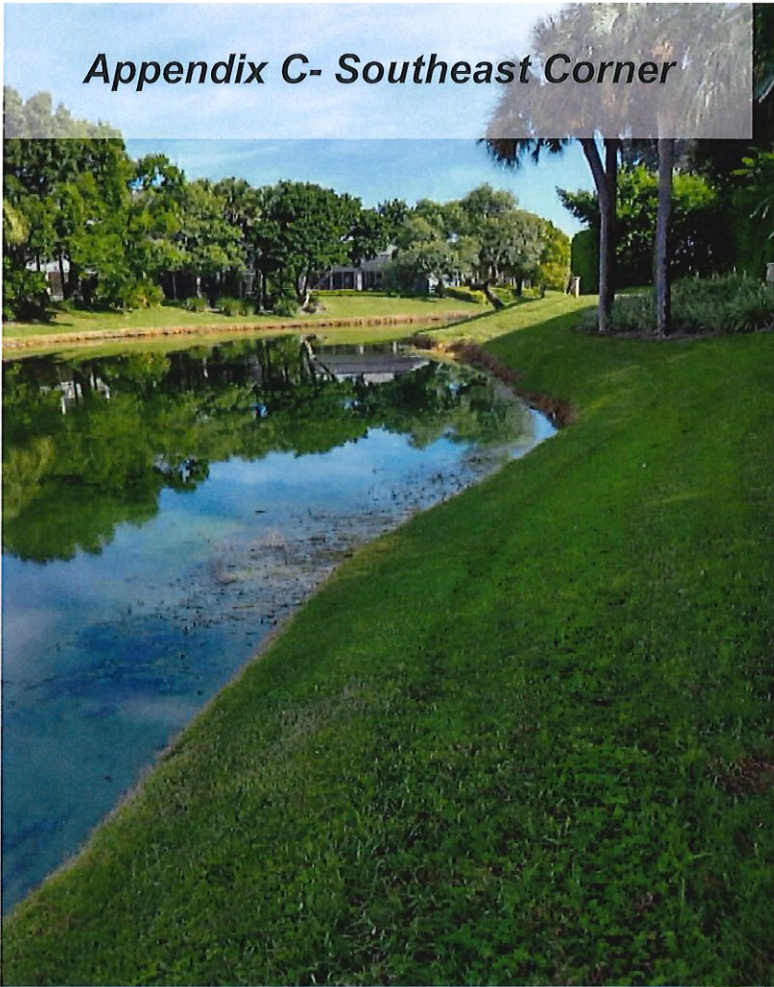
RIP-RAP

1	Rip-Rap 12" to 24" with Underlayment (4' wide x 1,950 LF)	SY	733	\$ 300	\$ 220,000
2	In Place Compacted, Imported Fill	CY	1,420	\$ 100	\$ 142,000
SUBTOTAL				=	\$ 362,000

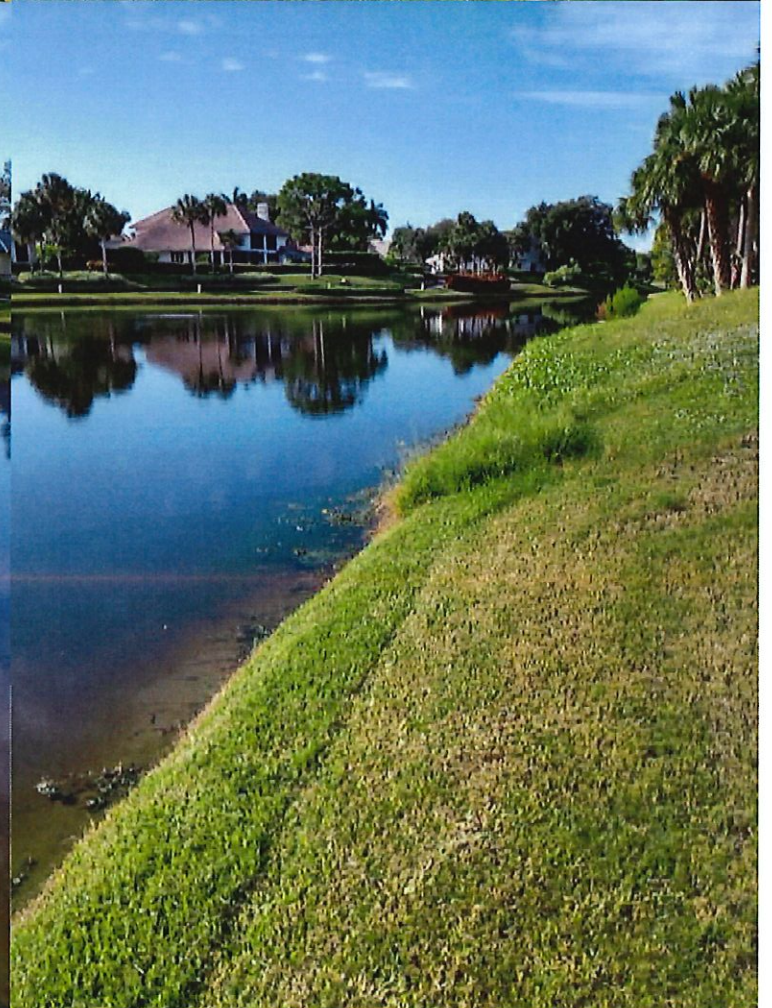
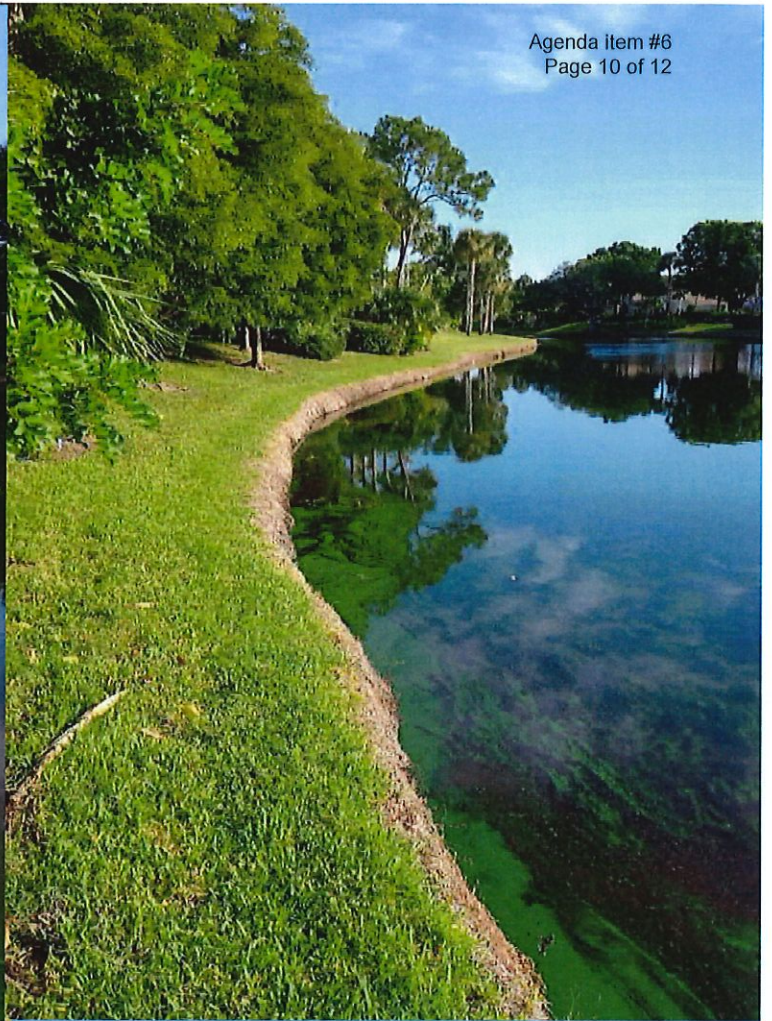
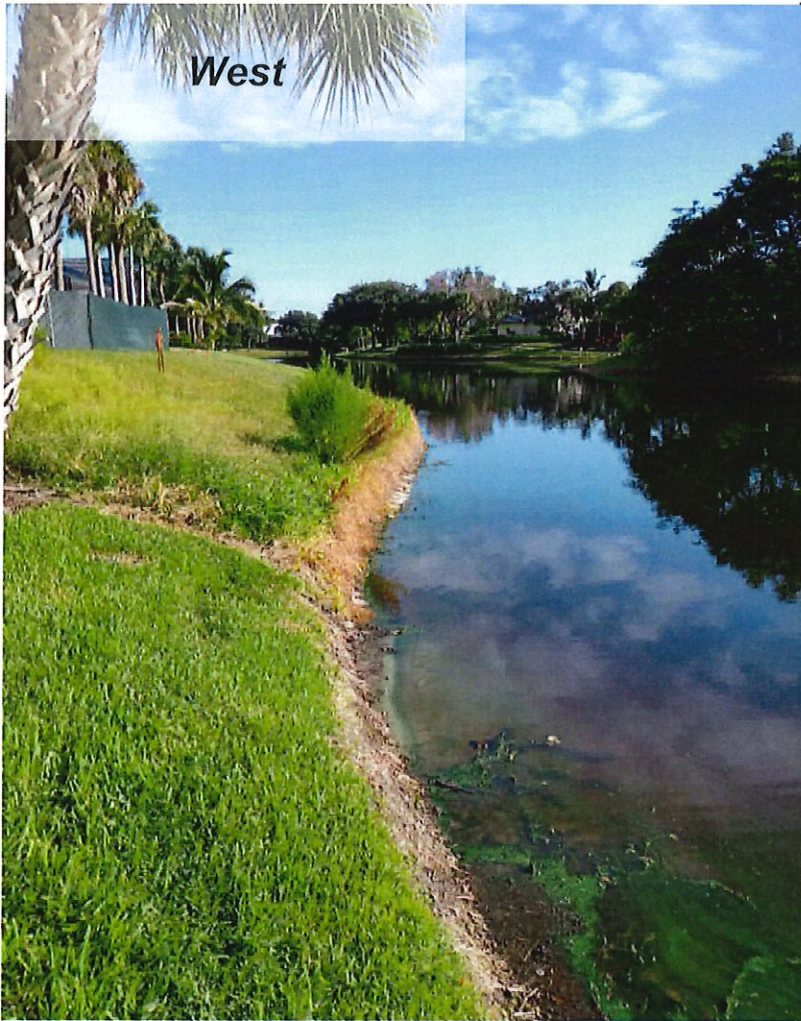
GRAND TOTAL				=	\$ 1,382,700
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Note: Estimated costs are pre-survey and are approximate. Cost estimates do not include survey, site permitting or design plans.

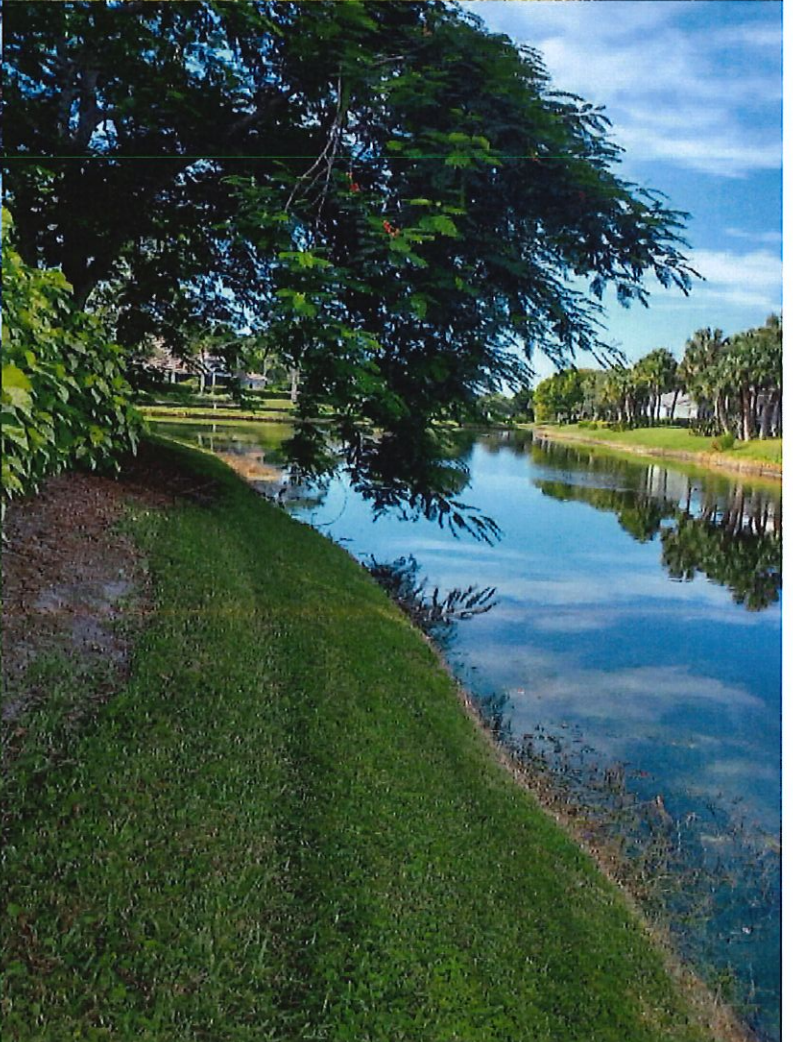
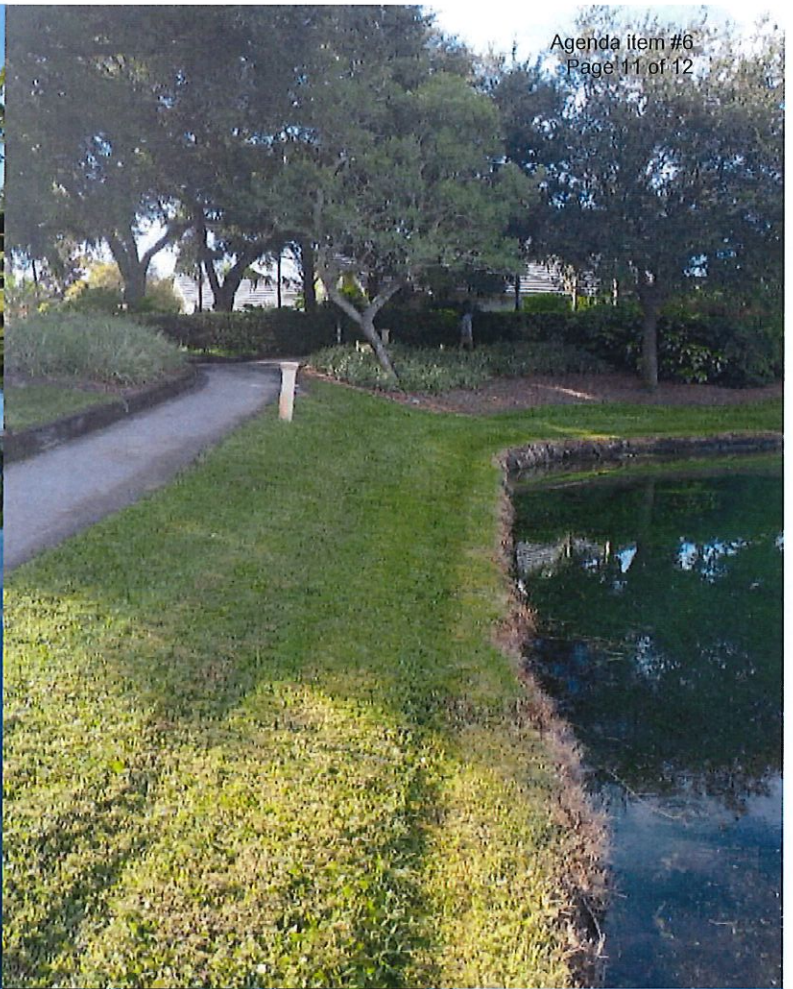
*Appendix C- Southeast Corner*



West



*East*

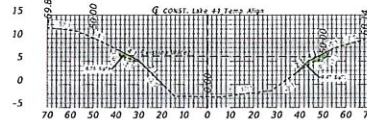
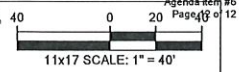




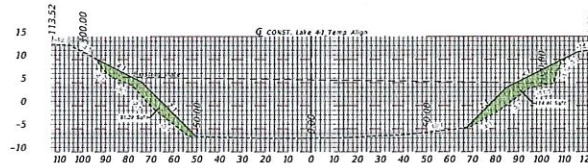
# Lake 4-1

## Appendix D - Cross Sections

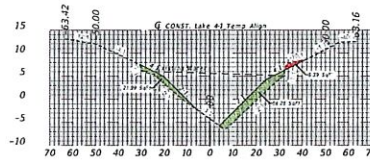
NOTE: The cross sections were used to come up with an estimation for the quantity of imported fill required, found in Appendix B.



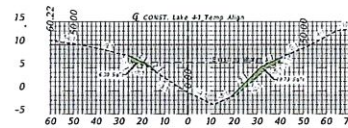
21+21.82



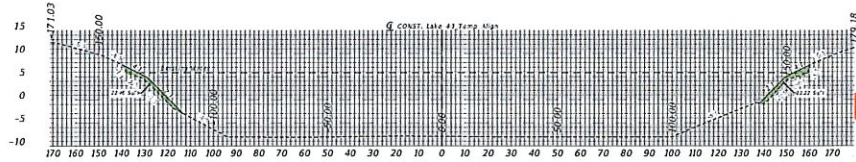
15+37.29



11+04.58



5+73.25



2+49.04



OAKMONT LAKE (4-1) DESIGN & PERMITTING SCHEDULE

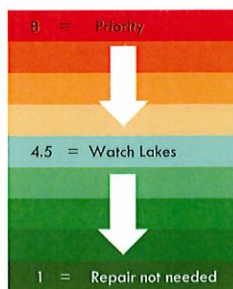
Task ID	Task Name	Duration	2020					2021					2022						
			December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April
1	Survey	60 Days	█																
2	Engineering Design	60 Days		█	█	█													
3	Design and Construction Plans	60 Days		█	█	█													
4	PBSD/PBF Coordination	60 Days		█	█	█													
6	Permitting	145 Days		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
7	Pre-Application Meeting with County	15 Days			█														
8	Prepare Quantities and Cost Estimate	30 Days			█	█													
9	Prepare Applications (ICP)	15 Days				█	█												
10	County Review	30 Days					█	█											
11	Revise Plans/Respond to Comments	30 Days						█	█										
12	SFWMID Permitting	60 Days							█	█	█	█	█	█	█	█	█	█	█
13	Final County Review	30 Days								█	█	█	█	█	█	█	█	█	█
14	Bidding and Construction	285 Days																	
15	Prepare Bid Documents	15 Days																	
16	Procurement Process & Contractor Selection	90 Days																	
17	BOCC Award & Start	30 Days																	
18	Construction Estimated Time	150 Days																	

Basin_Lake Number	Community	Average Escarpment rank	Maximum Escarpment Height (ft)	Maximum Escarpment rank	Quantitative	Structural Proximity (1-3)	Pedestrian/Resident Access (1-3)	Water Management (1-3)	Community Exposure (1-3)	Qualitative	Final Scores
2_9	St-Marten/St-Thomas	4	2.9	4	4.0	3	3	2	3	3.7	7.7
4_1	Oakmont Park	3	2.6	3	3.0	3	3	3	3	4.0	7.0
5_5	Community Park	2	2.5	3	2.5	3	3	3	3	4.0	6.5
1_6	Bridge Way / Tierra Mar	3	2.3	3	3.0	2	3	2	3	3.2	6.2
2_8	Georgetown / PB Golf	3	2.7	3	3.0	2	2	2	2	2.7	5.7
5_1	Pelican Bay Community Center	1	1.6	1	1.0	3	3	3	3	4.0	5.0
2_3	Ridgewood	2	3.0	4	3.0	2	1	1	1	1.9	4.9
4_3	Barrington / PB Golf	3	2.4	3	3.0	1	1	2	2	1.7	4.7
2_5	Georgetown	3	2.2	1	2.0	2	2	2	2	2.7	4.7
2_7	Chateauxmere / PB Golf	2	2.3	3	2.5	1	2	2	2	2.1	4.6
4_11	Calais / PB Golf	2	2.4	3	2.5	1	2	2	2	2.1	4.6
3_3	St. Andrews/Willow Brook/ Sand Pointe	2	2.3	3	2.5	1	2	2	1	2.0	4.5
4_10	Pelican Bay Golf	3	2.6	3	3.0	1	1	1	2	1.5	4.5
5_3	Avolon	2	1.8	1	1.5	2	1	2	2	2.3	3.8
1_3	Bridge Way / Tierra Mar	2	2.1	0	1.0	2	2	2	2	2.7	3.7
1_8	Waldorf Astoria	1	1.4	1	1.0	1	2	3	3	2.5	3.5
3_1	Oak-Lake-Sanctuary	4	4.5	4	4.0	2	2	2	3	2.5	3.5
3_5	Pelican Bay Golf	2	1.8	4	1.5	2	4	4	2	2.0	3.5
4_8	Pelican Bay Golf	2	2.0	0	1.0	1	3	1	3	2.4	3.4
2_2	Ridgewood Park	1	2.2	1	1.0	1	2	3	1	2.3	3.3
2_4	Georgetown	2	2.2	0	1.0	2	1	2	2	2.3	3.3
4_7	Calais / PB Golf	2	1.9	0	1.0	2	1	2	2	2.3	3.3
2_6	Pelican Bay Golf	2	1.8	1	1.5	1	1	2	2	1.7	3.2
4_2	Pelican Bay Golf	2	1.8	1	1.5	1	1	2	2	1.7	3.2
5_13	Bay Colony Shores	2	2.2	0	1.0	1	1	3	3	2.1	3.1
1_7	Waldorf Astoria	1	1.9	1	1.0	1	1	3	3	2.1	3.1
5_2	L'Ambiance of Pelican Bay	2	1.9	0	1.0	2	1	2	1	2.1	3.1
4_5	Pelican Bay Golf	2	2.1	1	1.5	1	1	2	1	1.6	3.1
5_12	Bay Colony Shores	2	1.8	1	1.5	1	1	1	3	1.6	3.1
5_14	Bay Colony Shores	2	1.4	0	1.0	1	1	3	2	2.0	3.0
2_10	Charredalr Maisonnets	1	1.8	1	1.0	1	2	1	3	2.0	3.0
3_7	Pelican Bay Golf	2	1.9	0	1.0	4	2	4	2	1.9	2.9
1_5	Bridge Way / Tierra Mar	0	0.7	1	0.5	2	1	2	2	2.3	2.8
4_4	Pelican Bay Golf	2	2.0	0	1.0	1	1	2	2	1.7	2.7
2_12	Pelican Bay Golf	2	1.8	0	1.0	1	1	2	2	1.7	2.7
5_9	Bay Colony Shores	2	1.7	0	1.0	1	1	2	2	1.7	2.7
5_11	Bay Colony Shores	2	1.7	0	1.0	1	1	2	2	1.7	2.7
4_6	Pelican Bay Golf	2	1.6	0	1.0	1	1	2	2	1.7	2.7
5_10	Bay Colony Shores	2	1.5	0	1.0	1	1	2	2	1.7	2.7
3_6	Pelican Bay Golf	2	2.1	0	1.0	1	1	1	3	1.6	2.6
2_1	Pelican Bay Woods	0	1.2	1	0.5	1	1	3	1	1.9	2.4
4_9	Pelican Bay Golf	2	2.0	0	1.0	1	1	1	1	1.3	2.3
1_4	Bridge Way / Tierra Mar	0	0.0	0	0.0	2	1	2	2	2.3	2.3
6_1	Trieste	0	0.0	4	0.5	4	4	4	3	1.6	2.1
6_2	Ritz-Carlton Hotel	0	0.0	0	0.0	1	1	1	3	1.6	1.6

**Legend:**

- Community Lake / Park
- Golf Course Lake

**Scores:**



# Pelican Bay Lake Ranking Equation

Quantitative + Qualitative

Avg. Esc. + Max Esc. + Structural + Access + Community + Water Mgmt

0-4

+

0-4

4	3	2	1	weighted multiplier
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$$\left( \frac{(E + M)}{2} \right) + \left( \frac{(Sx4 + Ax3 + Cx2 + W)}{7.5} \right)$$

avg. esc. max esc. Structural resident access community water management

Quantitative = Average of  
(average Escarpment +  
Maximum escarpment)

Qualitative = Average of  
(Structural proximity x 4,  
added to the resident Access x 3,  
plus the Community rank x 2,  
plus the Water management score)

number, the greater the prior  
would be given to the respective  
lake's repair. The range from 8  
will be colored red to green, 1  
and orange lakes should  
focus of the repair efforts w  
understanding that isolation  
of erosion may occur  
inside of the range of the  
priority lakes and should be  
addressed as needed.

Basin/Lake Number	Community				Average Escarpment		Maximum Escarpment		Maximum Escarpment Height (ft)		Quantitative Rank		Structural Proximity (1-3)			Pedestrian/Resident Access (1-3)			Water Management (1-3)		Community Exposure (1-3)		Final Scores		
	4	3	2	1	4	3	4	3	4	3	3	2	3	2	3	2	3	2	3	2	3	2		3	
6	St-Maarten/St-Thomas				29																			7.7	
1	Oldmont Park				26	3	3	3	3.0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4.0	7.0
5	Community Park				25	2	3	3	2.5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4.0	6.5
6	Bridge Way / Terra Mar				23	3	3	3	3.0	3	2	3	2	3	3	2	3	2	3	3	3	3	3	3.2	6.2
8	Georgetown / PS Golf				27	3	3	3	3.0	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2.7	5.7
1	Pelican Bay Community Center				16	1	1	3	1.0	1	3	3	3	3	3	3	3	3	3	3	3	3	3	4.0	5.0
3	Ridgewood				30	2	4	4	3.0	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1.9	4.9
3	Barrington / PS Golf				24	3	3	3	3.0	3	3	3	1	1	2	2	2	2	2	2	2	2	2	1.7	4.7
5	Georgetown				22	3	1	1	2.0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2.7	4.7
7	Charoumure / PS Golf				23	2	3	3	2.5	3	3	1	2	2	2	2	2	2	2	2	2	2	2	2.1	4.6
11	Calab / PS Golf				24	2	3	3	2.5	3	3	1	2	2	2	2	2	2	2	2	2	2	2	2.1	4.6
3	St.Andrews/Willow Brook/ Sand Pointe				23	2	3	3	2.5	3	3	1	2	2	2	2	2	2	2	2	2	2	2	2.0	4.5
10	Pelican Bay Golf				26	3	3	3	3.0	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1.5	4.5