

TOWN OF GOLDEN BEACH, FLORIDA

RESOLUTION NO. 2582.18

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF GOLDEN BEACH, FLORIDA, ADOPTING A STORMWATER FACILITIES IMPROVEMENT PLAN FOR A STATE REVOLVING LOAN FUND PROGRAM; PROVIDING FOR IMPLEMENTATION AND AN EFFECTIVE DATE.

WHEREAS, the Florida Statutes provide for loans to local government agencies to finance the construction of stormwater facilities; and

WHEREAS, Florida Administrative Code requires the formal authorization and adoption of a facility plan outlining necessary stormwater facility improvements to comply with State of Florida funding requirements; and

WHEREAS, the Town of Golden Beach has prepared a proposed facility plan, attached to this Resolution as Exhibit "A" (the "Facility Plan"), as required for the Town to participate in the State Revolving Loan Fund Program; and

WHEREAS, the Town Council of the Town of Golden Beach, Florida agrees with the findings and summary of necessary improvements as outlined in the Facility Plan for the purpose of providing flood relief to the Center Island area of the Town.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF GOLDEN BEACH, FLORIDA AS FOLLOWS: Section

Section 1. Recitals Adopted. Each of the above-stated recitals are hereby adopted and confirmed.

Section 2. Approval of Facility Plan. The Facility Plan attached as Exhibit "A" to this Resolution is hereby approved and adopted.

Section 3. Implementation. The Town Manager and/or Town Mayor are hereby authorized to take all action necessary to implement the Facility Plan.

Section 4. Effective Date. This Resolution shall be effective immediately upon adoption.

The Motion to adopt the foregoing Resolution was offered by Councilmember Luskin, seconded by Vice Mayor Mendal, and on roll call the following vote ensued:


Mayor Glenn Singer	<u>Aye</u>
Vice Mayor Jaime Mendal	<u>Aye</u>
Councilmember Kenneth Bernstein	<u>Absent</u>
Councilmember Amy Isackson-Rojas	<u>Absent</u>
Councilmember Judy Luskin	<u>Aye</u>

PASSED AND ADOPTED by the Town Council of the Town of Golden Beach, Florida this 20th day of November, 2018.



MAYOR GLENN SINGER

ATTEST:



LISSETTE PEREZ
TOWN CLERK

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:



STEPHEN J. HELFMAN
TOWN ATTORNEY

Craig A. Smith & Associates

TOWN OF GOLDEN BEACH



STORMWATER MASTER PLAN

AMENDMENT NO. 1 (FACILITIES PLAN)

OCTOBER 2018

CAS PROJECT No. 17-1971

PREPARED BY



Corporate Office:

**21045 Commercial Trail
Boca Raton, FL
Tel : (561) 314-4445**

Branch Offices:

**Palm Beach County
Broward County
Miami-Dade County**

INTRODUCTION

On behalf of the Town of Golden Beach, Florida, Craig A. Smith & Associates (CAS) is pleased to provide the Florida Department of Environmental Protection (Department) an amendment to the Town's current Stormwater Master Plan (SWMP), otherwise known as the Facilities Plan (FP), to apply for State funding through the Clean Water State Revolving Fund program (CWSRF). Briefly, the intent of this amendment is to provide additional flood protection and provide water quality treatment for the Town's existing Center Island service area (refer to Exhibit A for location maps).

LOCATION

The Town is located within the northeast corner of Miami-Dade County and is bounded by Massina Ave. to the north, Terracina Ave. to the south, the Intracoastal Waterway (ICWW) to the west and the Atlantic Ocean to the east. This amendment to the Town's current Stormwater Master Plan focuses on improvements to Center Island (refer to Exhibit A for additional project location information).

EXISTING FACILITIES

The Town's current FP implemented improvements in six (6) phases and was executed in 2004. All proposed improvements, Phases 1 through 6, were completed by March of 2011 (see Exhibit B for reference to the original SWMP and existing facilities).

Center Island, which was part of Phase 6, is served by two gravity drainage systems with positive drainage to the ICWW. These systems discharge with two outfalls, both equipped with backflow prevention devices to keep high tide water from directly entering the drainage system and flooding the streets and yards.

NEED FOR PROJECT

Center Island is low in elevation (with an average street elevation of 2.5-ft NGVD) and has limited positive head to gravity outfall during a high tide condition. Tidal seepage (during periods of high tide) from the ICWW occurs and seeps through the ground which ultimately makes it way to the drainage system via overland flow. This occurrence cannot be deterred with the existing backflow prevention devices as the seepage bypasses the devices. To make matters worse during these high tide conditions, heavy rainfall can prolong street flooding until the tide recedes and the drainage system can outflow by gravity into the ICWW.

PROJECT ALTERNATIVES

CAS has explored three viable options to help remedy the flooding situation on Center Island. Cost breakdown for all three alternatives can be found in Exhibit C. An outline of these alternatives are as follows:

The first alternative is to reconstruct the roads at higher elevations for on the entire island by approximately 21.75-inches. Raising the roadway elevations to approximately 4.5-ft NVGD would bring them above peak high tide events thus limit flooding on all roadways. The additional work associated with this alternative includes importing of approved fill, reconstruction of valley gutters, adjustments to existing drainage structure inlets, adjustments to other surface utilities, grading of roadside green areas and driveway reconstruction/ harmonization. This alternative would have the least operating and maintenance costs. The probable construction cost for this alternative is estimated at approximately \$2,298,356 with the total project cost, including engineering design and construction services estimated at \$2,778,921.

The next alternative, which addresses the discharge of the existing gravity system directly, is to install a stormwater pump station at the system's outfall as a bypass mechanism to allow stormwater to be pumped into the ICWW. Planning document, Exhibit D, evaluates in detail two different pump station design capacities. The first pump station considered is a duplex submersible pump station with an 8,960 GPM (20 cfs) flow capacity. The additional work associated with this alternative includes the installation of two rectangular manholes (inserted into the existing system), additional gravity drainage piping, one water quality treatment device, valve vault, control panel, forcemain and roadway/landscape restoration. With the pumping scenario during this alternative, flood durations are lessened and begin later in the storm event with recovery within 1.5 hours of a 10-year 1-day rainfall event (as per the findings in Exhibit D). The probable cost of this alternative is estimated at \$2,009,045 which includes engineering design, construction costs and engineering services during construction.

The third alternative includes all the proposed improvements as the second alternative except the proposed duplex submersible pump station would have about half the flow capacity at 4,032 GPM (9 cfs). With the pumping scenario during this alternative, flood durations are lessened and begin later in the storm event with recovery within 2.5 hours of a 10-year 1-day rainfall event (as per the findings in Exhibit D). The probable cost of this alternative is estimated at \$915,773 which includes engineering design, construction costs and engineering services during construction.

SELECTION OF AN ALTERNATIVE

CAS recommends the third alternative (4,032 GPM duplex submersible pump station) as the most viable solution to the flooding problem for the Town of Golden Beach's Center Island. This alternative directly addresses the issues associated with the gravity collection system's discharge during high tide conditions, is less expensive (to build and maintain) than the higher capacity pump station. The Preliminary Site Plan for the proposed improvements for said alternative can be found in Exhibit E. Additional planning documents associated with this alternative can be found in Exhibit D.

PUBLIC PARTICIPATION

The Town of Golden Beach has been communicating with the current residents of Center Island and its potential solutions over the last year. This document is to be presented at the Towns Council Meeting of October 29th, 2018. At that point, the public will be officially informed of the proposed improvements and this document will be made available for viewing to the public. Additionally, the Town will be presenting a CWSRF resolution which will also be made public. A copy of said draft resolution is presented in Exhibit F.

FINANCIAL IMPACTS

The Town of Golden Beach is currently seeking financial assistance through the Florida Department of Environmental Protection (FDEP) Clean Water State Revolving Fund program (CWSRF) to construct the proposed project. Ultimately, the costs for said improvements will be shared amongst all Town residents and spread out over the repayment period of the anticipated loan. The Town's current Capital Financing Plan is now being revised and will be included, as required, with the submission of the CWSRF Request for Inclusion (RFI).

ADDITIONAL INFORMATION

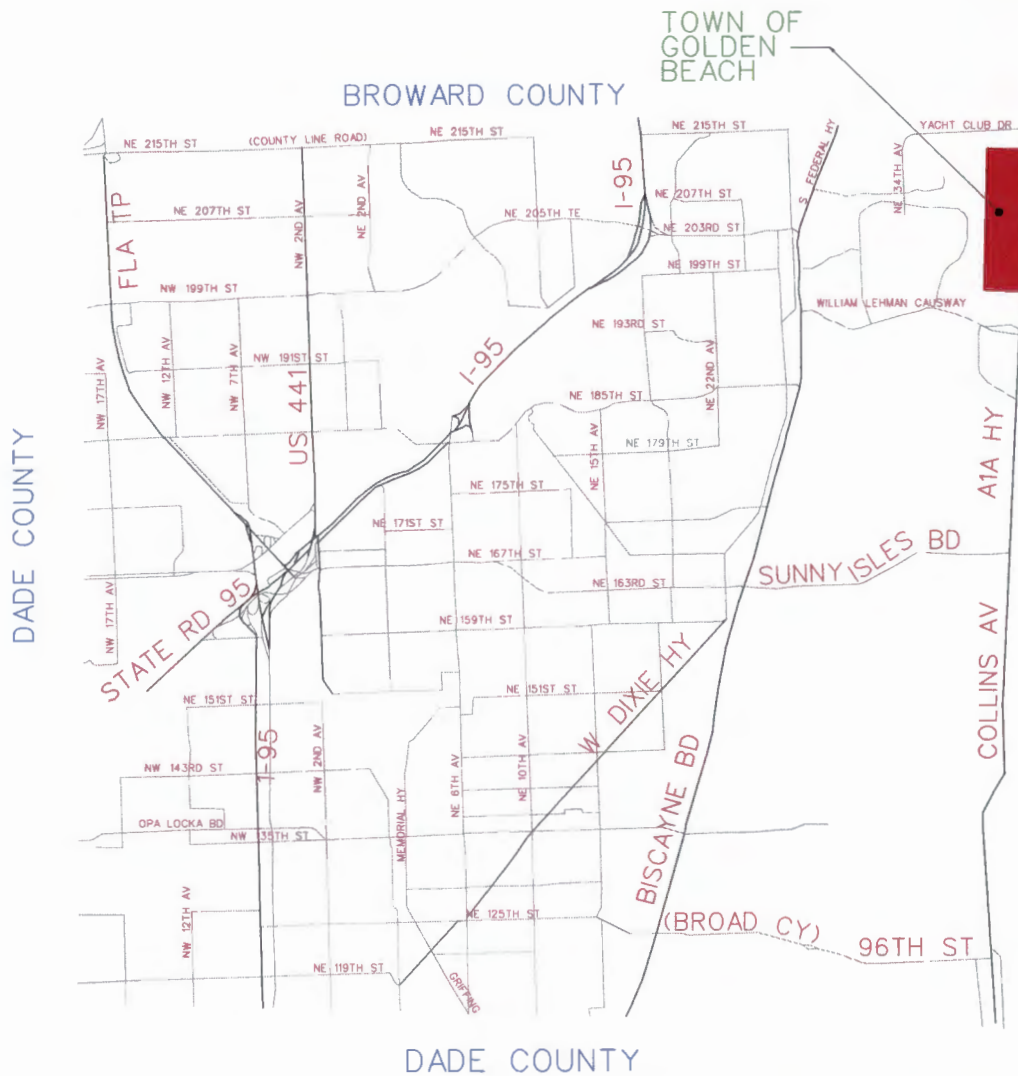
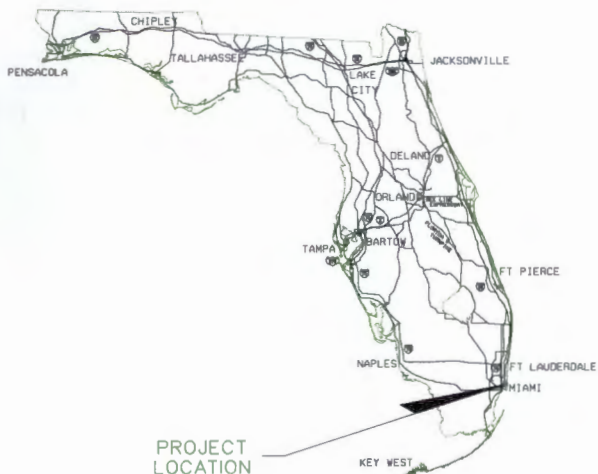
This document is a proposed amendment to the Town's current Stormwater Master Plan (SWMP). Please refer to Exhibits B and D for additional background information associated with the required design permit(s) (Miami-Dade County, Class II Permit is anticipated) existing facilities, proposed improvements, environmental benefits, environmental impacts (none anticipated), protection of endangered species (remains unchanged), impacts to wetlands (none anticipated) and impacts to low-income areas (none anticipated).

**TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN,
AMENDMENT NO. 1**



**EXHIBIT A
PROJECT LOCATION MAPS**

EXHIBIT A LOCATION MAP



DATE: 2-04-2004 11:22:41
FILE: I:/land/00-0984/cadd_master_plans/0984exo.dgn



\\university\projects\...Golden Beach\GIS\Map\Town Golden Beach 2014-05-08_DRAINAGE_CENTER_ISLAND_FINAL.dwg 1/17/2016 9:01 AM All measures 1:1



EXHIBIT A

PROJECT LOCATION



**TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN,
AMENDMENT NO. 1**



EXHIBIT B

**TOWN OF GOLDEN BEACH
2004 STORMWATER MASTER PLAN**

**THE 2004 TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN (ALSO
KNOWN AS THE FACILITIES PLAN) CAN
BE PROVIDED UPON REQUEST (DUE TO
THE LARGE SIZE OF THIS DOCUMENT)**

**TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN,
AMENDMENT NO. 1**



EXHIBIT C

**PROJECT ALTERNATIVES,
ENGINEER'S OPINION OF
PROBABLE COSTS**

**TOWN OF GOLDEN BEACH STORMWATER IMPROVEMENTS
CONCEPTUAL COST ESTIMATE FOR CENTER ISLAND
ALTERNATIVE NO. 1**

ITEM No.	DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization	5.0%	1	LS	\$ 82,260.42	\$ 82,260.42
2	Maintenance of Traffic	4.0%	1	LS	\$ 65,808.33	\$ 65,808.33
3	Survey Stakeout and As-Builts	3.0%	1	LS	\$ 49,356.25	\$ 49,356.25
4	Density Testing	2.0%	1	LS	\$ 32,904.17	\$ 32,904.17
5	Clearing and Stripping	8.0%	1	LS	\$ 131,616.67	\$ 131,616.67
6	Environmental Compliance	5.0%	1	LS	\$ 82,260.42	\$ 82,260.42
Project Alternative - Elevate Roads (avg - 21.75")						
7	1" of SP 12.5 Asphalt		3,000	SY	\$13.00	\$ 39,000.00
8	1" of SP 9.5 Asphalt		3,000	SY	\$15.00	\$ 45,000.00
9	8" Limerock Base		3,450	SY	\$ 19.00	\$ 65,550.00
10	Clean fill for compacted Subbase (~11.75")		3,968	SY	\$10	\$ 39,675.00
11	Valley Gutter		3,150	LF	\$31	\$ 97,650.00
12	Driveway Harmonizations		1	LS	\$525,000	\$ 525,000.00
Drainage Structures Adjustments						
13	Remove Existing Brick, install 12" Conc Risers with New Brick & Reinstall Grate/Rim		20	EA	\$ 2,500.00	\$ 50,000.00
Miscellaneous (Include Full Restoration)						
14	Adjustment of Existing Surface Utilities (Non-drainage)		1	LS	\$ 25,000.00	\$ 25,000.00
15	Roadside Green Area Grading & Drainage w/Landscape Adjustments & Sodding		21,666.67	SY	\$ 35.00	\$ 758,333.33
SUBTOTAL						\$ 2,089,414.58
10% CONTINGENCY						\$ 208,941.46
PROBABLE CONSTRUCTION COST TOTAL						\$ 2,298,356.04
Professional Surveying/Engineering Services						
	Surveying	2%				\$ 41,788.29
	Civil Engineering Design	4%				\$ 83,576.58
	Legal (Driveway Harmonization Agreements)	1%				\$ 20,894.15
	Geotechnical Engineering	3%				\$ 62,682.44
	Permitting (MDC-RER)	1%				\$ 20,894.15
	Quantities/Cost Est/Bid Docs & Bidding	2%				\$ 41,788.29
	Engineering Services During Construction	4%				\$ 83,576.58
	Construction Observation Services	6%				\$ 125,364.88
		23%				\$ 480,565.35
TOTAL PROJECT COST						\$ 2,778,921.40

**TOWN OF GOLDEN BEACH STORMWATER IMPROVEMENTS
CONCEPTUAL COST ESTIMATE FOR CENTER ISLAND 20 CFS PUMP STATION
ALTERNATIVE NO. 2**

ITEM No.	DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization	5.0%	1	LS	\$ 68,119.40	\$ 68,119.40
2	Maintenance of Traffic	2.0%	1	LS	\$ 27,247.76	\$ 27,247.76
3	Survey Stakeout and As-Builts	1.0%	1	LS	\$ 13,623.88	\$ 13,623.88
4	Density Testing	2.0%	1	LS	\$ 27,247.76	\$ 27,247.76
5	Clearing and Stripping	1.0%	1	LS	\$ 13,623.88	\$ 13,623.88
6	Environmental Compliance	2.0%	1	LS	\$ 27,247.76	\$ 27,247.76
Structures (Include Full Restoration)						
7	10' x 5' Weir Box			EA	\$ 8,500.00	\$ -
8	5' x 3' MH w/USF 580		2	EA	\$ 5,500.00	\$ 11,000.00
9	8' Diameter CDS Water Quality Structure		1	EA	\$ 58,500.00	\$ 58,500.00
10	Duplex Stormwater Pumping Station (10' x 10' x 10') & Vault with all piping & Electrical Components		1	EA	\$1,057,280	\$ 1,057,280.00
11	Generator		1	EA	\$90,000	\$ 90,000.00
Pipe (Include Full Restoration)						
12	18" PVC Pipe			LF	\$ 54.00	\$ -
13	24" A2000 PVC		65	LF	\$ 72.00	\$ 4,680.00
14	36" A2000 PVC			LF	\$ 90.00	\$ -
15	48" RCP Pipe		8	LF	\$ 175.00	\$ 1,400.00
16	10" DIP Force Main		80	LF	\$ 60.00	\$ 4,800.00
17	30" DIP Force Main			LF	\$ 175.00	\$ -
Miscellaneous (Include Full Restoration)						
18	Core Exist. Sea Wall & Connect FM			LS	\$ 15,000.00	\$ -
19	3-Phase Power/FPL		1	LS	\$ 105,728.00	\$ 105,728.00
20	Augered Piles (For Proposed Drainage Structures, Drainge Pipes & Force Main)		18	EA	\$ 1,500.00	\$ 27,000.00
21	Manatee Grate for FM			EA	\$ 5,000.00	\$ -
22	Remove Existing Pipe Sections and connect existing pipes to new structures (2)		1	LS	\$ 2,000.00	\$ 2,000.00
23	Core Exist. Structure and Connect Pipe			LS	\$ 500.00	\$ -
SUBTOTAL						\$ 1,539,498.44
10% CONTINGENCY						\$ 153,949.84
PROBABLE CONSTRUCTION COST TOTAL						\$ 1,693,448.28
Professional Surveying/Engineering Services						
	Surveying	0.50%				\$ 7,697.49
	Civil Engineering Design	6.00%				\$ 92,369.91
	Electrical Engineering Design	1.00%				\$ 15,394.98
	Geotechnical Engineering	1.00%				\$ 15,394.98
	Permitting (MDC-RER)	1.00%				\$ 15,394.98
	Quantities/Cost Est/Bid Docs & Bidding	1.00%				\$ 15,394.98
	Engineering Services During Construction	4.00%				\$ 61,579.94
	Construction Observation Services	6.00%				\$ 92,369.91
		21%				\$ 315,597.18
TOTAL PROJECT COST						\$ 2,009,045.46

TOWN OF GOLDEN BEACH STORMWATER IMPROVEMENTS
CONCEPTUAL COST ESTIMATE FOR CENTER ISLAND 9 CFS PUMP STATION - ROAD INSTALLATION
ALTERNATIVE NO. 3

ITEM No.	DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization	5.0%	1	LS	\$ 28,812.39	\$ 28,812.39
2	Maintenance of Traffic	3.0%	1	LS	\$ 17,287.44	\$ 17,287.44
3	Survey Stakeout and As-Builts	1.0%	1	LS	\$ 5,762.48	\$ 5,762.48
4	Density Testing	3.0%	1	LS	\$ 17,287.44	\$ 17,287.44
5	Clearing and Stripping	2.0%	1	LS	\$ 11,524.96	\$ 11,524.96
6	Environmental Compliance	2.0%	1	LS	\$ 11,524.96	\$ 11,524.96
Structures (Include Full Restoration)						
7	10' x 5' Weir Box			EA	\$ 8,500.00	\$ -
8	5' x 3' MH w/USF 580		2	EA	\$ 5,500.00	\$ 11,000.00
9	8' Diameter CDS Water Quality Structure		1	EA	\$ 58,500.00	\$ 58,500.00
10	Duplex Stormwater Pumping Station (10' x 10' x 10') & Vault with all piping & Electrical Components		1	EA	\$ 380,607	\$ 380,607.18
11	Generator		1	EA	\$ 50,000	\$ 50,000.00
Pipe (Include Full Restoration)						
12	18" PVC Pipe			LF	\$ 54.00	\$ -
13	24" A2000 PVC		65	LF	\$ 72.00	\$ 4,680.00
14	36" A2000 PVC			LF	\$ 90.00	\$ -
15	48" RCP Pipe		8	LF	\$ 175.00	\$ 1,400.00
16	10" DIP Force Main		50	LF	\$ 60.00	\$ 3,000.00
17	30" DIP Force Main			LF	\$ 175.00	\$ -
Miscellaneous (Include Full Restoration)						
18	Core Exist. Sea Wall & Connect FM			LS	\$ 15,000.00	\$ -
19	3-Phase Power/FPL		1	LS	\$ 38,060.72	\$ 38,060.72
20	Augered Piles (For Proposed Drainage Structures, Drainage Pipes & Force Main)		18	EA	\$ 1,500.00	\$ 27,000.00
21	Manatee Grate for FM			EA	\$ 5,000.00	\$ -
22	Remove Existing Pipe Sections and connect existing pipes to new structures (2)		1	LS	\$ 2,000.00	\$ 2,000.00
23	Core Exist. Structure and Connect Pipe			LS	\$ 500.00	\$ -
SUBTOTAL						\$ 668,447.56
10% CONTINGENCY						\$ 66,844.76
PROBABLE CONSTRUCTION COST TOTAL						\$ 735,292.32
Professional Surveying/Engineering Services						
	Surveying	1%				\$ 6,684.48
	Civil Engineering Design	8%				\$ 53,475.80
	Electrical Engineering Design	2%				\$ 13,368.95
	Geotechnical Engineering	2%				\$ 13,368.95
	Permitting (MDC-RER)	2%				\$ 13,368.95
	Quantities/Cost Est/Bid Docs & Bidding	2%				\$ 13,368.95
	Engineering Services During Construction	4%				\$ 26,737.90
	Construction Observation Services	6%				\$ 40,106.85
		27%				\$ 180,480.84
TOTAL PROJECT COST						\$ 915,773.16

**TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN,
AMENDMENT NO. 1**



EXHIBIT D

**PROPOSED IMPROVEMENTS
PRELIMINARY PLANNING
DOCUMENTS**

Center Island Project Summary

Craig A Smith & Associates (CAS) is pleased to present the Town of Golden Beach with a summary of the impacts from a 1-in-10 year storm event occurring during a Spring high tide event. Three scenarios were evaluated with this condition. The first scenario is the analysis with the existing drainage system which functions via gravity outfalls when tailwater conditions allow. The other two scenarios considered the inclusion of a stormwater pumping station; one with a discharge capacity of 4,032 GPM (9 cfs) and the other with a discharge capacity of 8,960 GPM (20 cfs). The opinion of probable cost estimates for the small and larger pump stations are \$864,688 and \$2,009,045, respectively.

Scope: Perform a hydrologic and hydraulic analysis of a 10-year rainfall event to the Town Golden Beach, FL Center Island with relative tide data correlating to the peak of the storm. Probable cost estimates of the potential solutions are made part of this scope.

Background: Center Island is served by water tight gravity drainage systems with positive drainage to the Intra Coastal Waterway (ICWW). Center Island has two outfalls with backflow prevention devices to keep high tide water from directly entering the drainage system and flooding the streets and yards. Center Island is low in elevation and has limited positive head to gravity outfall during a high tide condition with a moderate to severe rain event. The analysis showed that this is what occurred during the rainfall from Hurricane Irma of 2017.

Storm & Tide: A design 10-year 1-day rainfall value of 8 inches was used in the analysis along with an April tide with the peak of the tide occurring during the peak of the storm to show worst case scenario. The 8-inch rainfall is greater than the rainfall from the real time event under Hurricane Irma-2017. The rainfall from that real-time event had an estimated 36-hour period for which 7.05 inches of rainfall occurred.

Tide data was obtained from the Dumfoundling Bay Station (See Figure 1). Mean Sea Level (MSL) data relative to Mean Low-Low Water (MLLW) was used in the analysis as a tailwater condition for the storm event. All elevations in the analysis have a datum referenced of 1929 National Geodetic Vertical Datum.

Both Tide and Rainfall data were correlated and used in the analyses and can be seen graphically in (See Figure 2). The peak of the 24-hour design storm occurs at around hour 12.

Figure 1

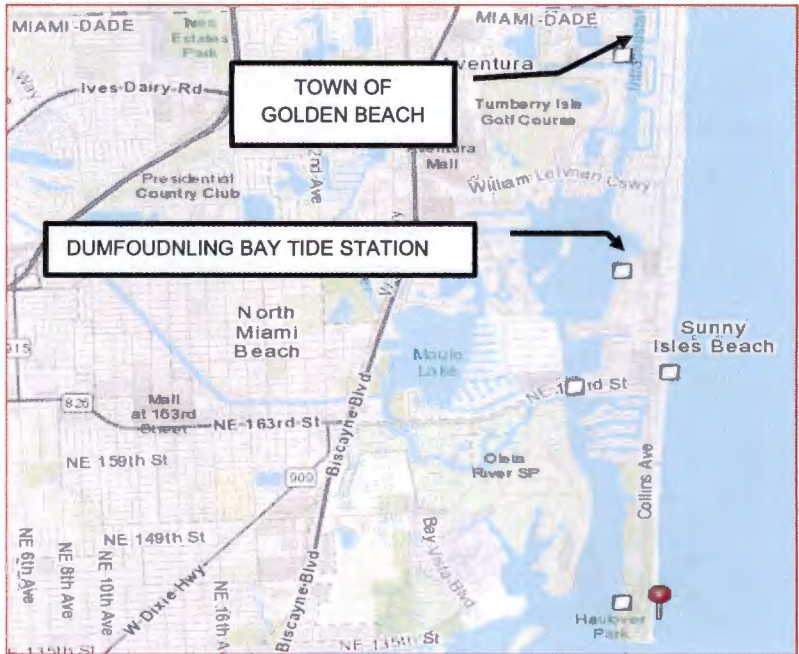
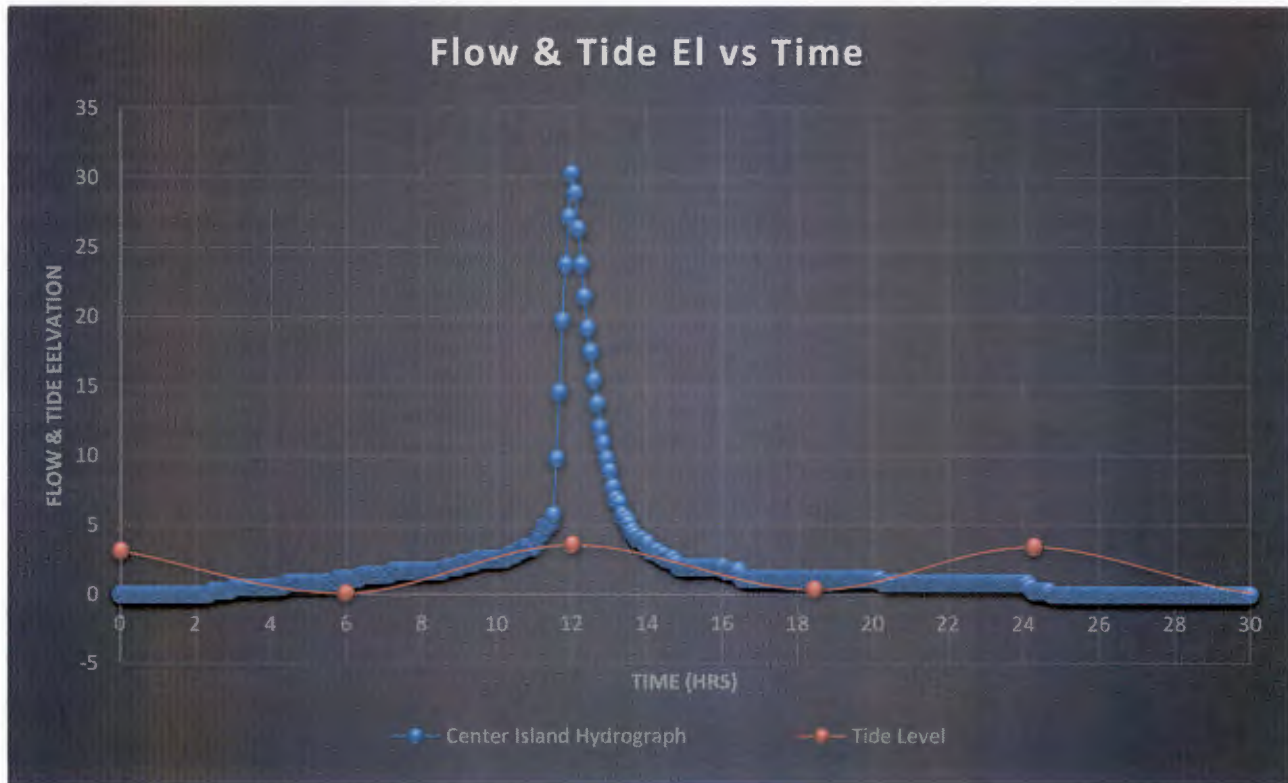
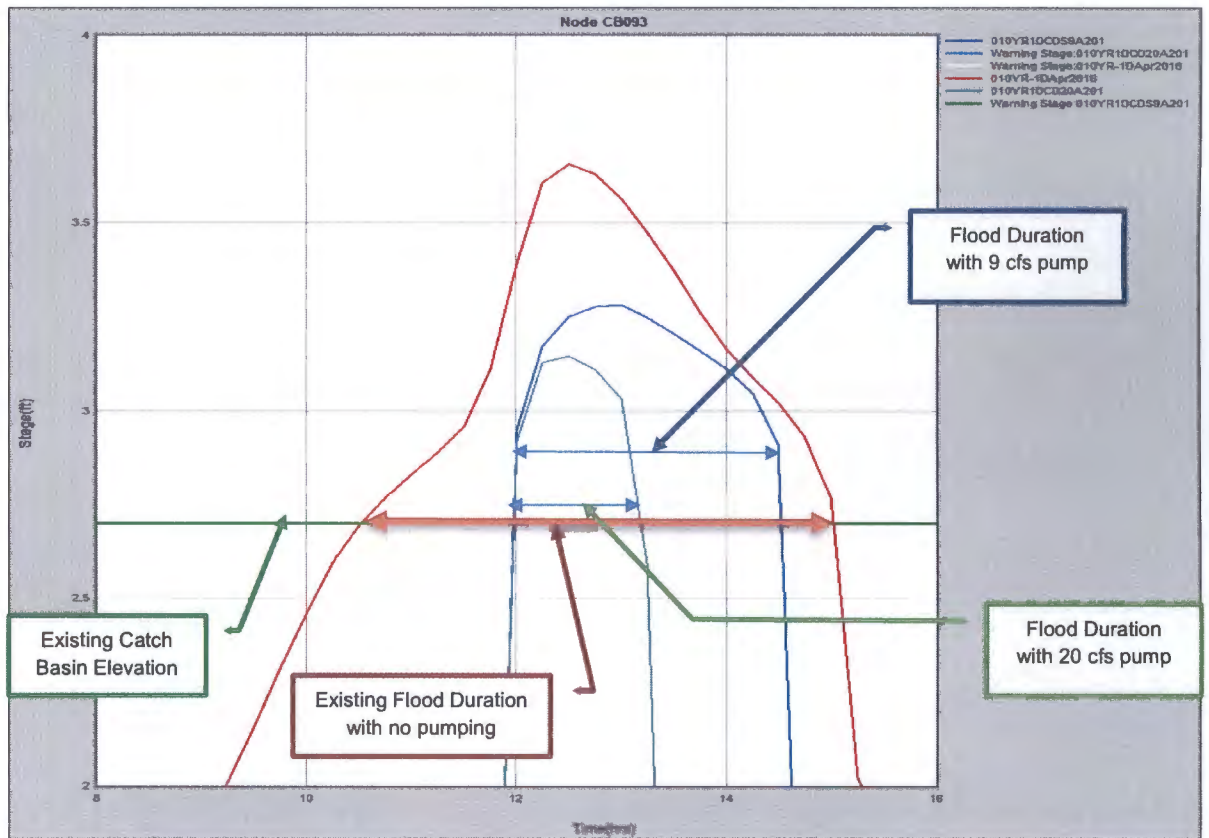


Figure 2



- Stormwater Modeling:** The flood routing calculations reflect Streamline Technologies' Advanced Inter-Connected Pond Routing (ICPR) model Ver. 3.10. The ICPR model is a hydrodynamic numerical model that approximates solutions to many equations governing flows. For comparison purposes, three scenarios were created to represent the existing condition and two proposed pumping scenarios. A model of the storm event was executed for each scenario and the results were compared. Basins (catch basin areas) were created for the systems and were assigned to a corresponding node, correlating to the structure number shown on the as-built plans. As-built grades and dimensions were used in the model. Other model input assumptions are as follows:
- Existing land use:** Right-of-way (ROW) area calculations were made with respect to pervious and impervious coverages. Basins were further subdivided into a road and residential basins and assigned to the respective catch basin numbered node.
- Existing Topography:** Road ROW survey data was used to establish stage-area curves. Existing catch basin or manhole rim elevations were used as reference points to quantify flood depths and duration above these elevations for the existing and proposed conditions. A sample graph of a structure reflecting the model results is provided in the following figure.

Figure 3Figure 4



for Catch Basin 96 in Center Island which reflects the three model simulations.

Time of concentration (Tc):

A Tc of 10 minutes was assumed for each road basin due to the small basin size and 15 minutes was assumed for each residential basin due to the small basin size.

Soil Conservation Service Curve Number (CN):

Depressional soil storage values were assumed in the models as identified in the District's Basis of Review permit manual.

Basin Surface Storage:

The Stage-vs-Area method was used as shown in the attached calculations.

Tailwater Assumptions and its impacts:

April 2016 tide data from the nearby Dumfounding Bay station was used. The 2016 data was utilized for no particular reason other than the fact that field measured-observations were made in January of that year. Peak tide elevations ranged from elevation 0' NGVD to 3.58'±. Note that the drivable pavement on Center Island is well below the peak tide elevations.

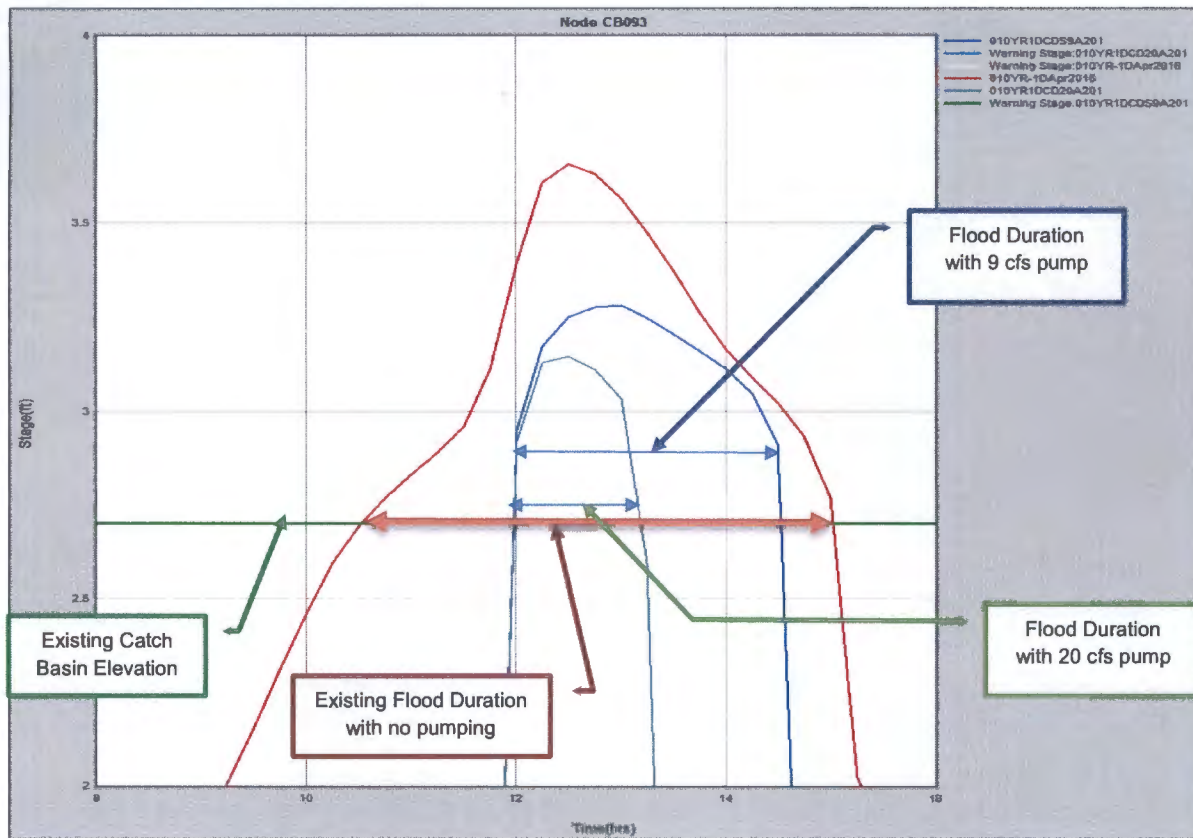
Proposed Improvements: The proposed improvements consist of a duplex stormwater pumping station that would be sized to reasonably handle an event when adverse tide conditions are prevalent. It is the intent of the proposed improvements to keep the existing gravity discharges to the ICWW as the primary outfalls for this island and to operate the station when tide conditions prevent gravity discharge during a storm event.

The gravity system would be connected to the station system containing a water quality treatment structure, a weir box, storm pipes, and pumping station with vault and force main. Pump station discharge capacities of 4,032 GPM (9 cfs) and 8,960 GPM (20 cfs) were analyzed under the two proposed scenarios. The latter station would be a duplicate of the stations serving South & North Park less one water quality treatment device. The results for each pumping scenario showed lowered peak flood stages and lowered flood durations. Flood durations are lowered because the pumps are not impeded by the tailwater to discharge stormwater.

Figure 4 illustrates the reduction in flood depths and duration below the existing catch basin elevation (Catch Basin no. 93) shown as a "Warning Stage." in the graph.

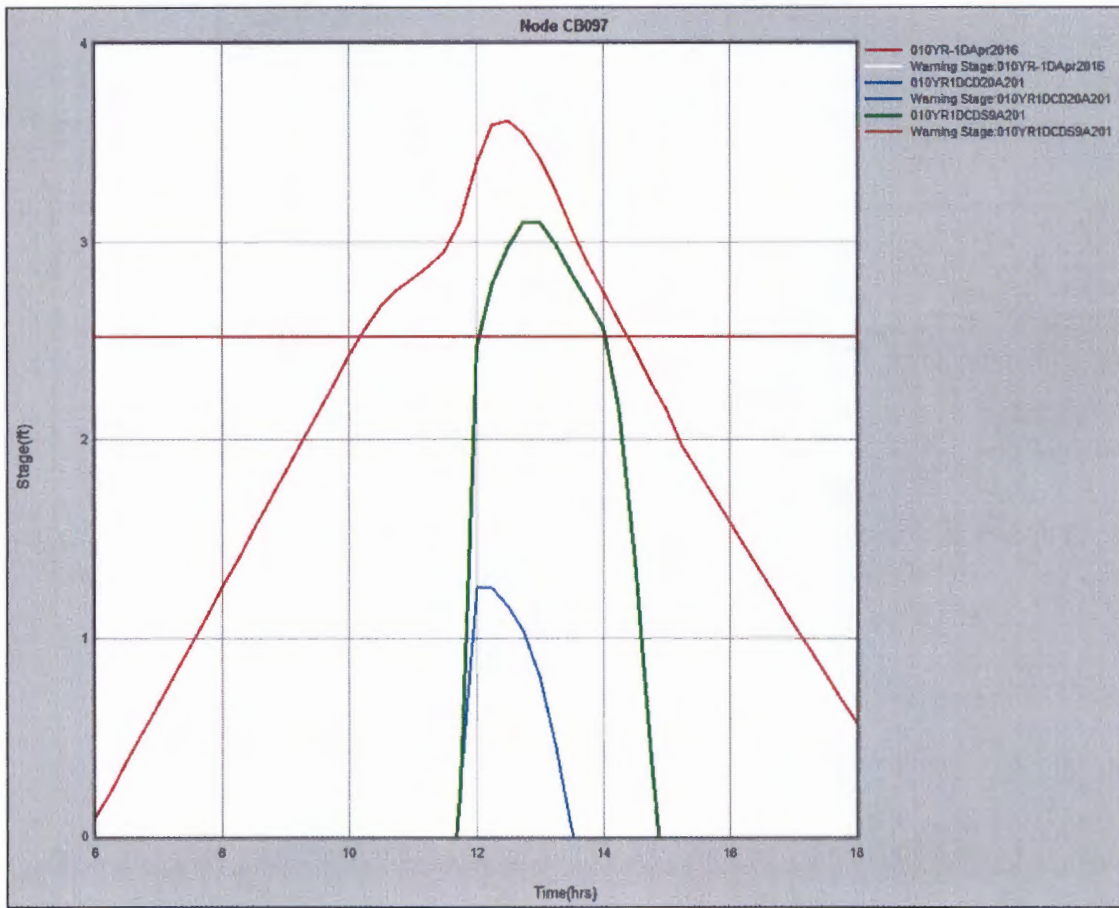
Under the existing gravity system, flooding above the catch basin may last up to ~5.5 hrs. and occurs sooner in the storm event. With the pumping scenarios, flood durations are lessened and begin later in the storm with recovery within 2.5 hrs and 1.5 hrs for the 9 cfs and 20 cfs pump stations, respectively. This occurs because the pumps can be turned on sooner when stormwater is in the drainage system to stay ahead of the storm. The red line represents the existing condition, the blue line represents the 9 cfs pump station, and the green represents the 20 cfs pump station. The horizontal line represents the catch basin elevation.

Figure 4



We will note that since the pump acts as a drawdown system, the areas closer to the pump station will fare better than areas on the upstream ends of the drainage system due to hydraulics of the system. For example, catch basin no. 97 is located nearly adjacent to the proposed pump station and flooding is shown to be removed for the 20 cfs station scenario. With the 9 cfs pump station, flood duration is within 2 hrs; about ½ hour less than upstream catch basins.

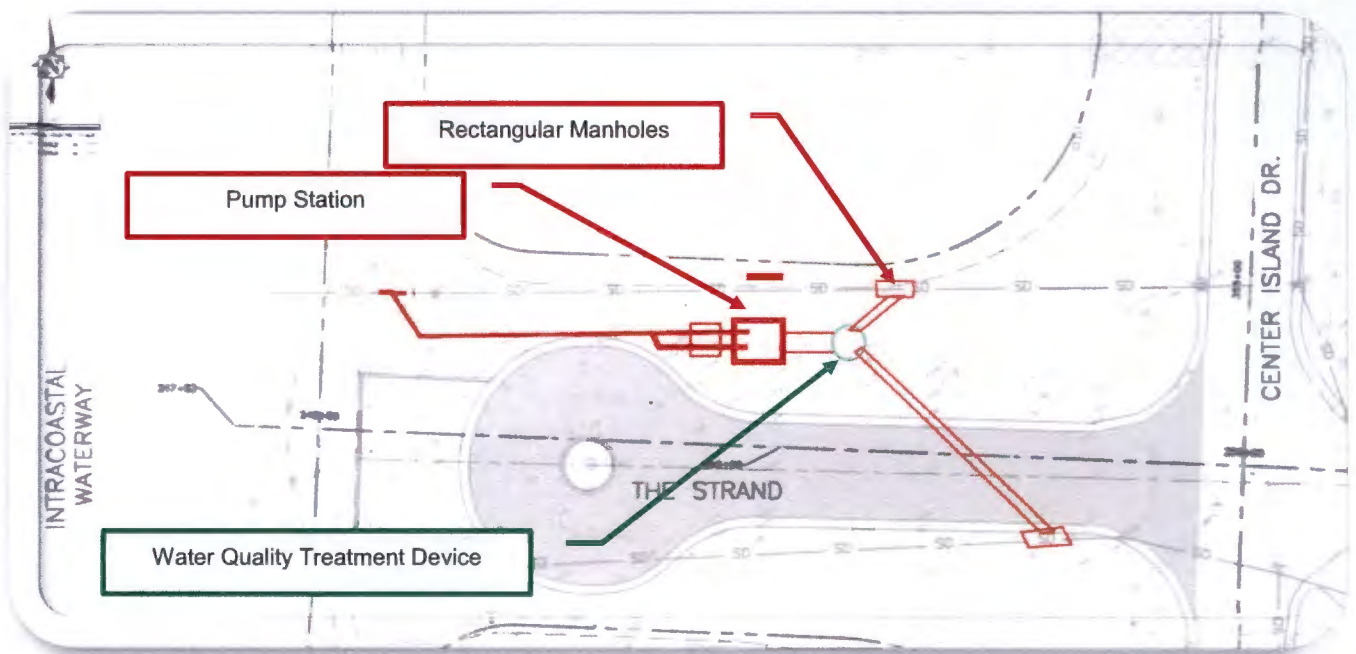
Figure 5



The anticipated modification to the existing drainage system is shown in the following schematic. The intent is to have the least amount of intrusive work performed on the project and this location appears to be better suited.

The proposed work will involve the installation of two rectangular manholes on the north and south side to intercept gravity flows from the existing drainage system when the tide is high. These manholes will be connected to a water quality treatment device which will discharge into the proposed pump station. The pump station force main will be connected to the existing northern outfall.

Figure 6



\\cas-depot\Projects\Cities_Villages_Towns\Golden_Beach\17-1971-1CP-Irma-Fema-Assistance\04-Engineering\Documents\Report\TGB-Center Island System Evaluation.docx

**TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN,
AMENDMENT NO. 1**



**EXHIBIT E
PRELIMINARY SITE PLAN**



0 (NORTH) 80' (N)
HORIZONTAL GRAPHIC SCALE
3/4" X 30" SCALE 1" = 80' (NORTH)
11" X 17" SCALE 1" = 80' (N)

EXIST. BACKFLOW PREVENTOR
(TO REMAIN)

PROP. STORMWATER
FORCE MAIN

PROP. STORMWATER
PUMP STATION & VAULT

PROP. STORM MH

PROP. STORM PIPE

EXIST. STORM PIPE
(TO REMAIN)

PROP. WATER QUALITY
TREATMENT DEVICE

CENTER ISLAND DR.

THE STRAND

PROP. STORM PIPE

EXIST. STORM PIPE
(TO REMAIN)

PROP. STORM PIPE

PROP. STORM MH

EXIST. BACKFLOW PREVENTOR
(TO REMAIN)

SECTION 1 OF GOLDEN BEACH
PLAT BOOK 9, PAGE 124, DISTRICT
BLOCK 10

TOWN OF GOLDEN BEACH

THE STRAND
PRELIMINARY SITE PLAN



**TOWN OF GOLDEN BEACH
STORMWATER MASTER PLAN,
AMENDMENT NO. 1**



EXHIBIT F

**PROPOSED IMPROVEMENT,
DRAFT RESOLUTION**

TOWN OF GOLDEN BEACH, FLORIDA

RESOLUTION NO. _____18

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF GOLDEN BEACH, FLORIDA, ADOPTING A STORMWATER FACILITIES IMPROVEMENT PLAN FOR A STATE REVOLVING LOAN FUND PROGRAM; PROVIDING FOR IMPLEMENTATION AND AN EFFECTIVE DATE.

WHEREAS, the Florida Statutes provide for loans to local government agencies to finance the construction of stormwater facilities; and

WHEREAS, Florida Administrative Code requires the formal authorization and adoption of a facility plan outlining necessary stormwater facility improvements to comply with State of Florida funding requirements; and

WHEREAS, the Town of Golden Beach has prepared a proposed facility plan, attached to this Resolution as Exhibit "A" (the "Facility Plan"), as required for the Town to participate in the State Revolving Loan Fund Program; and

WHEREAS, the Town Council of the Town of Golden Beach, Florida agrees with the findings and summary of necessary improvements as outlined in the Facility Plan for the purpose of providing flood relief to the Center Island area of the Town.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF GOLDEN BEACH, FLORIDA AS FOLLOWS: Section

Section 1. Recitals Adopted. Each of the above-stated recitals are hereby adopted and confirmed.

Section 2. Approval of Facility Plan. The Facility Plan attached as Exhibit "A" to this Resolution is hereby approved and adopted.

Section 3. Implementation. The Town Manager and/or Town Mayor are hereby authorized to take all action necessary to implement the Facility Plan.

Section 4. Effective Date. This Resolution shall be effective immediately upon adoption.

The Motion to adopt the foregoing Resolution was offered by Councilmember _____, seconded by _____, and on roll call the following vote ensued:

Mayor Glenn Singer	_____
Vice Mayor Judy Lusskin	_____
Councilmember Kenneth Bernstein	_____
Councilmember Amy Isackson-Rojas	_____
Councilmember Jaime Mendal	_____

PASSED AND ADOPTED by the Town Council of the Town of Golden Beach, Florida this _____ day of October 2018.

MAYOR GLENN SINGER

ATTEST:

LISSETTE PEREZ
TOWN CLERK

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

STEPHEN J. HELFMAN
TOWN ATTORNEY