Minutes
Town of Lake Park, Florida
Virtual Regular Commission
Meeting Minutes
Wednesday, September 2, 2020, 7:00 PM
Via Zoom

The Town Commission met for the purpose of a Regular Commission Meeting on Wednesday, September 2, 2020 at p.m. Present were Mayor Michael O'Rourke, Vice-Mayor Kimberly Glas-Castro, Commissioners Erin Flaherty, John Linden, and Roger Michaud, Town Manager John O. D'Agostino, Attorney Thomas Baird, and Town Clerk Vivian Mendez.

Town Clerk Mendez performed the roll call; the pledge of allegiance was recited during the CRA Board Meeting.

SPECIAL PRESENTATION/REPORT:
None

PUBLIC COMMENT:
None

CONSENT AGENDA:

1. **August 19, 2020 Regular Commission Meeting Minutes.**

2. **Lake Park Public Library Long Range Strategic Plan for 2021 - 2024.**

3. **Lake Park Public Library Annual Plan of Services for 2021.**

4. **Resolution 58-09-20 Authorizing and Directing the Mayor to Sign the Grant Agreement with the University of Florida Board of Trustees for Funding Through its Florida Sea Grant College Program to Assess the Current Condition of the Southern Outfall Pipe System and Assess the Increasing Impact of Sea Level Rise and Other Factors on the Pipe.**

Motion: Vice-Mayor Glas-Castro moved to approve the consent agenda; Commissioner Linden seconded the motion.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Flaherty	X		
Commissioner Linden	X		
Commissioner Michaud	X		
Vice-Mayor Glas-Castro	X		
Mayor O'Rourke	X		

Motion passed 5-0.

PUBLIC HEARING – ORDINANCE ON FIRST READING: **None**

PUBLIC HEARING – ORDINANCE ON SECOND READING: **None**

NEW BUSINESS:

5. Notification of Priority Stormwater Pipe Issue: Analysis of the 72 inch "Southern Outfall" Condition and Criticality, and Old Lake Shore Bridge.

Town Manager D'Agostino provided a summary explanation of the agenda item. Raul Mercado presented to the Commission (see Exhibit "A"). Town Manager D'Agostino explained the importance of a financial contribution from the Florida Department of Transportation. Discussion ensued regarding a formal request of participation from the Florida Department of Transportation.

Motion: Commissioner Michaud moved to request the Florida Department of Transpiration be involved in the solution to this problem; Vice-Mayor Glas-Castro seconded the motion.

Commissioner Linden requested to review the letter that would be forwarded to the Florida Department of Transportation. Vice-Mayor Glas-Castro suggested that the item be brought before the Commission at a future Regular Commission Meeting as a Resolution. Town Manager D'Agostino agreed with the suggestion.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Flaherty	X		
Commissioner Linden	X		
Commissioner Michaud	X		
Vice-Mayor Glas-Castro	X		
Mayor O'Rourke	X		

Motion passed 5-0.

6. Resolution 59-09-20 Approve work Authorization to Water Resource Management Associates (WRMA) for Work Associated with Grant Agreement R2210 with the Department of Environmental Protection for Funding through Florida's Resilient Coastline Program (FRGP) for Seawall Survey and Assessment and Vulnerability Assessment of Infrastructure along the Lake Worth Lagoon Waterfront.

Town Manager D'Agostino and Raul Mercado explained that the Town of Lake Park had been awarded a grant of $75,000 from the Department of Environmental Protection's Resilient Coastline Program. Town Manager D'Agostino explained that the grant agreement is for a seawall survey and assessment and a vulnerability assessment of the infrastructure along the Lake Worth Lagoon waterfront.

Motion: Vice-Mayor Glas-Castro moved to approve Resolution 59-09-20; Commissioner Linden seconded the motion.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Flaherty	X		
Commissioner Linden	X		
Commissioner Michaud	X		
Vice-Mayor Glas-Castro	X		
Mayor O'Rourke	X		

Motion passed 5-0.

7. 16th Addendum to the Palm Beach County Sheriff's Office with the Town of Lake Park.

Town Manager D'Agostino provided a summary explanation of the agenda item.

Motion: Vice-Mayor Glas-Castro moved to approve the PBSO Addendum Sixteen for $3,047,056.00 ; Commissioner Michaud seconded the motion.

Mayor O'Rourke suggested a future agenda item to request additional mental health training hours for the Palm Beach County Sheriff's Officers.

Vote on Motion:

Commission Member	Aye	Nay	Other
Commissioner Flaherty	X		
Commissioner Linden	X		
Commissioner Michaud	X		
Vice-Mayor Glas-Castro	X		
Mayor O'Rourke	X		

Motion passed 5-0.

PUBLIC COMMENT: **None**

FUTURE AGENDA SUGGESTIONS: Mental Health Training for PBSO Officers.

TOWN ATTORNEY, TOWN MANAGER, COMMISSIONER COMMENTS:

Town Attorney Baird had no comments.

Town Manager D'Agostino announced comments within Exhibit "B".

Commissioner Linden had no comments.

Commissioner Michaud had no comments.

Commissioner Flaherty had no comments.

Vice-Mayor Glas-Castro questioned the anticipated schedule of the Lake Shore Drive Drainage Project. Town Manager D'Agostino explained that the schedule would be determined per the conclusion of the Request for Proposals process. He explained that the project might conclude over an eleven-month period. Vice-Mayor Glas-Castro requested

an update on Dover-Cole. Town Manager D'Agostino explained that the Town was in negotiations with Dover-Cole. Vice-Mayor Glas-Castro questioned if the Town Commission was ready to meet in-person as a result of Palm Beach County's Phase 2 transition. Town Manager D'Agostino explained that social distancing requirements would be adhered to and the in-person meetings would have limited seating. Per Consensus, the Commission agreed to meet in-person with social distancing requirements for the September 16, 2020 Regular Commission Meeting.

Mayor O'Rourke had no comments.

ADJOURNMENT

There being no further business to come before the Commission; the meeting adjourned at 8:17 p.m.

Mayor Michael O'Rourke

Town Clerk, Vivian Mendez, MMC

Deputy Town Clerk, Shaquita Edwards, MPA, MMC

Town Seal

TOWN OF LAKE PARK
SEAL
FLORIDA

Approved on this 16 of September, 2020

Exhibit "A"

Town of Lake Park Town Commission

Agenda Request Form

Meeting Date: September 2, 2020 **Agenda Item No.**

Agenda Title: Notification of Priority Stormwater Pipe Issue: Analysis of the 72inch "Southern Outfall" Condition and Criticality, and Old Lake Shore Bridge

[ ] SPECIAL PRESENTATION/REPORTS [ ] CONSENT AGENDA
[ ] BOARD APPOINTMENT [ ] OLD BUSINESS
[ ] PUBLIC HEARING ORDINANCE ON ____ READING
[X] NEW BUSINESS
[ ] OTHER: _____

Approved by Town Manager _____ **Date:** 8-25-2020

John D'Agostino, Town Manager

Originating Department: Public Works	**Costs: TBD** Funding Source: Stormwater Fund Acct. # TBD [ ] Finance _____	**Attachments:** 1. **Technical Memorandum Received from WRMA (Stormwater Engineering Consultants) Dated August 6, 2020** 2. **WRMA Presentation Stormwater Master Plan focused on the 72 inch Outfall Project**
Advertised: Date: _____ Paper: _____ **[X] Not Required**	All parties that have an interest in this agenda item will be notified of the meeting date and time. The following box must be filled out to be on agenda.	Yes I have notified everyone JDO or **Not applicable in this case** ____ **Please initial one.**

Summary Explanation/Background:

Last meeting, this agenda item was on consent. However, to provide critical information to the Commission staff has decided to bring this item back for discussion and a motion to approve that accomplishes what needs to be done to move this project forward.

On August 6, 2020, the Public Works Department received the attached technical memorandum from the Town's professional Stormwater engineering consultant – Water Resources Management Associates – as prepared by Raul Mercado, PE, CFM. The purpose of this agenda item is to provide notification to the Commission of the receipt of this technical memorandum, when reviewed in its entirety, will require the Commission to take necessary steps to advert failure of our drainage system should the bridge collapse. **Raul Mercado, PE, CFM, will be present to discuss the attached technical report, which he prepared, and to help the Commission consider the appropriate path forward towards rehabilitation of the critical infrastructure assets summarized below and within the attached report:**

The memorandum describes newly performed condition and criticality analyses of the "Southern Outfall" and old Lake Shore Bridge, which is located just north of the marina entryway. The analyses completed as part of the Town's new Stormwater Master Plan project, and presented new information that requires urgent attention. There are critical infrastructure components that are at "high-risk" of future failure, partially due to the age of these assets. These assets have high criticality in terms of the consequences of failure, discussed in more detail in the attached Technical Memorandum. As such, our engineers are recommending that the Town take immediate action to mitigate the known risk. The attached technical memorandum includes details on the analysis, with recommendations for an expedited design for rehabilitation.

It is important to note that the Florida Department of Transportation shares a percentage responsibility with respect to this infrastructure, because the outfall is shared by their Stormwater discharge system, which currently services the US1 corridor. This discharge system into a protected waterbody, Lake Worth Lagoon is untreated. Per the analysis performed by the Town's consultants, it has been determined to be reasonable and appropriate to apportion a 50% responsibility to FDOT on all costs related to the treatment and repair of the critical infrastructure. Communication with FDOT commenced immediately upon receipt of this technical memorandum. James Poole from FDOT is evaluating the cost sharing requirements between the municipality and the agency. FDOT completed an internal meeting regarding this issue on Monday August 24, 2020.

In FY2020-2021, the Town had planned to budget funds (approximately $360,000) to address upstream rehabilitation of the 60" trunk line that flows through the Southern Outfall. Our engineers are recommending that these funds be reallocated/re-budgeted to this new rehabilitation project, which is deemed to be rank a higher priority due to the recently completed condition and criticality assessment.

By virtue of this item on consent, the initial motion was to authorize emergency work to WRMA to begin the design of this project. Further, additional information was obtain that provides a better historical reference of when the bridge was constructed. The presentation by WRMA's Raul Mercado, PE, CFM will bring the Commission up to date on what steps are required to get this critical infrastructure repaired.

Recommended Motion: The Commission may wish to authorize emergency work to WRMA to begin design work, pending Commission discussion.

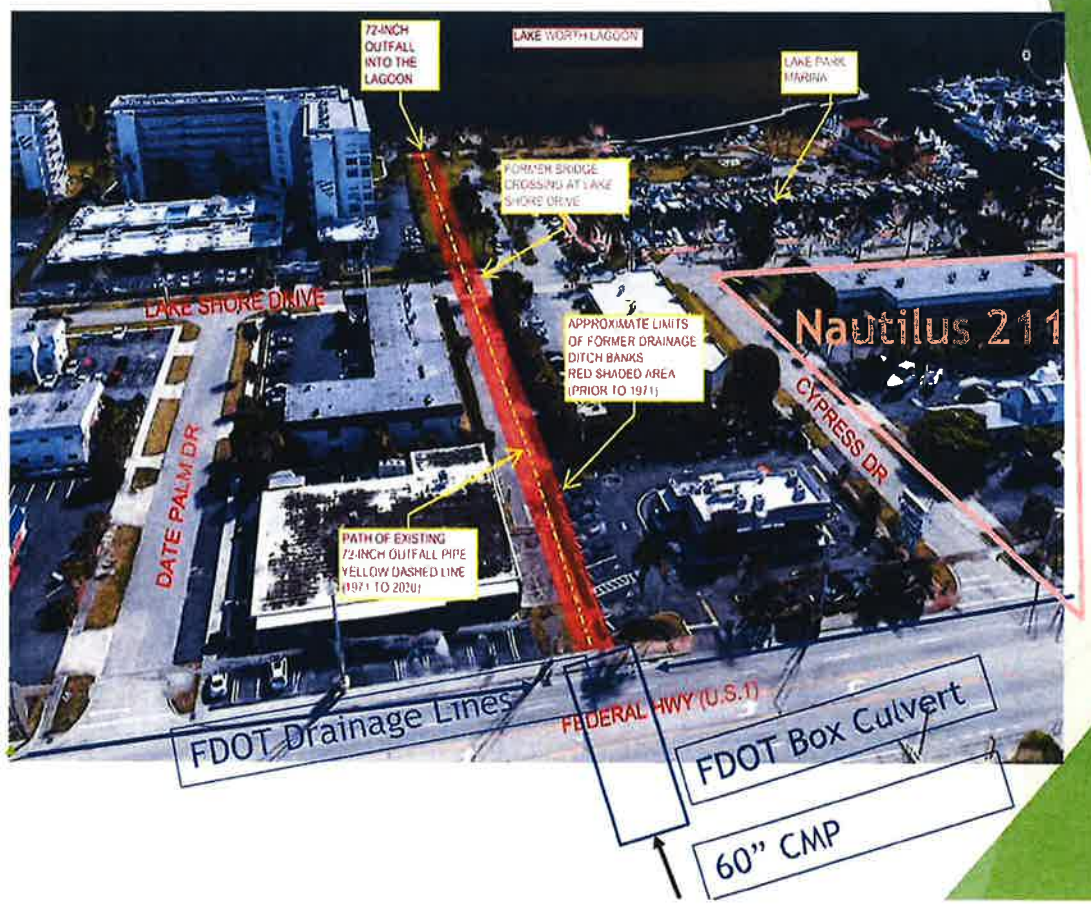
TOWN OF LAKE PARK
STORMWATER MASTERPLAN

72"CAP SOUTHERN OUTFALL
PRIORITY REHABILITATION PROJECT

Raul Mercado, PE, CFM
WRMA,INC.

September 2, 2020

72" CAP SOUTHERN OUTFALL AND FORMER DITCH ALIGNMENT



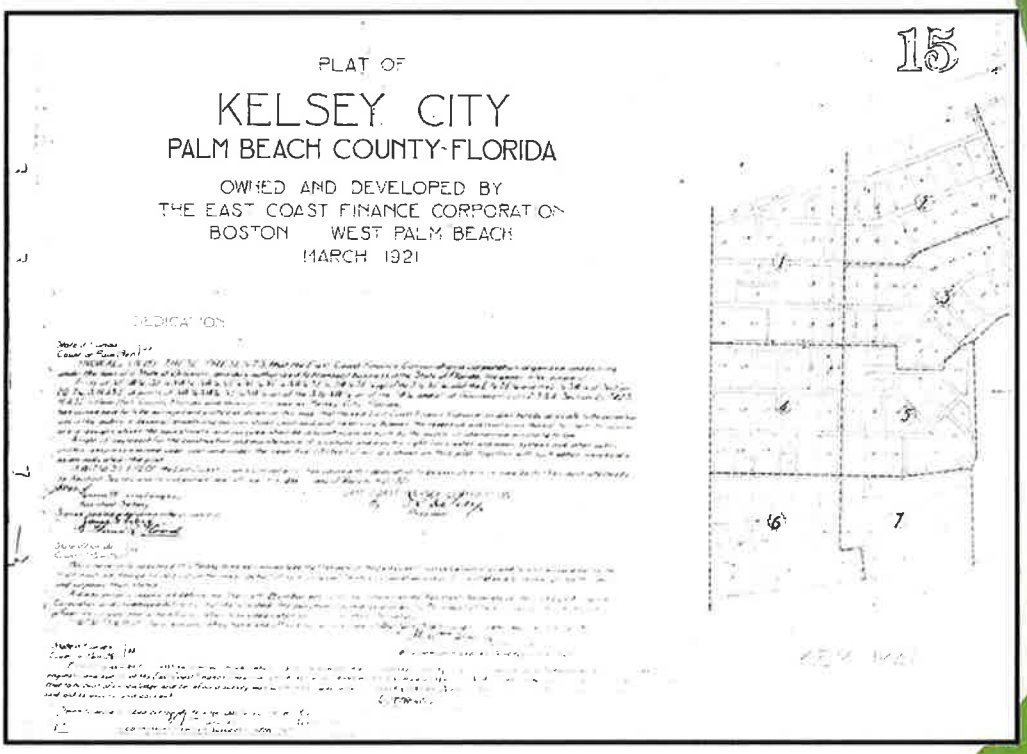
72" CAP SOUTHERN OUTFALL
30-FEET SEGMENT POINT REPAIR @ MARINA
(March - April 2020)

Cost: $57,700

OLD LAKE SHORE DRIVE BRIDGE RAILINGS

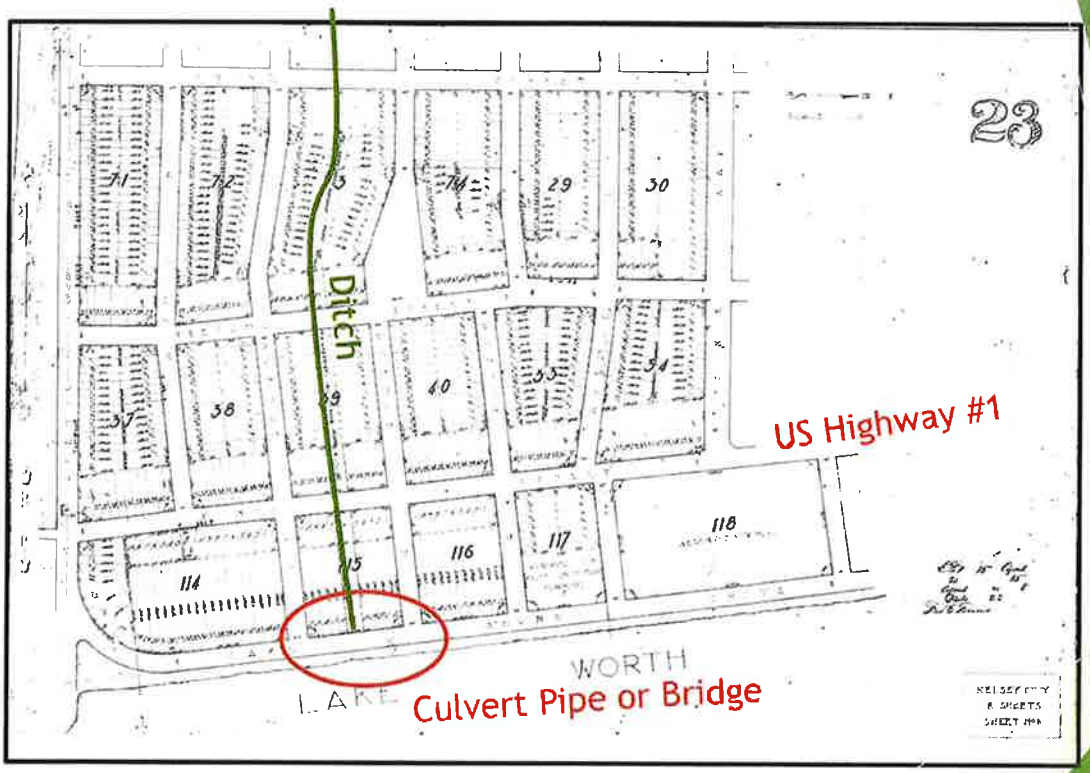
How Old is the Bridge?

HOW OLD IS THE BRIDGE?
KELSEY CITY PLAT OF MARCH 1921



Courtesy: L J Parker, Town Historian

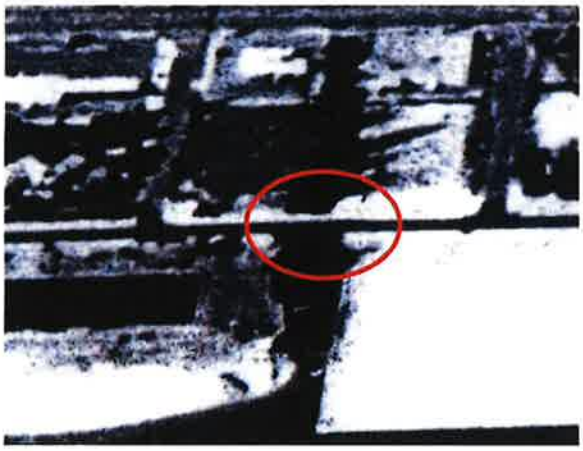
HOW OLD IS THE BRIDGE?
SHEET #6 OF 1921 PLAT
DITCH CROSSING & LAKE SHORE



HOW OLD IS THE BRIDGE?
72" CAP SOUTHERN OUTFALL
MARINA BACKFILLING (1950's -1960s)

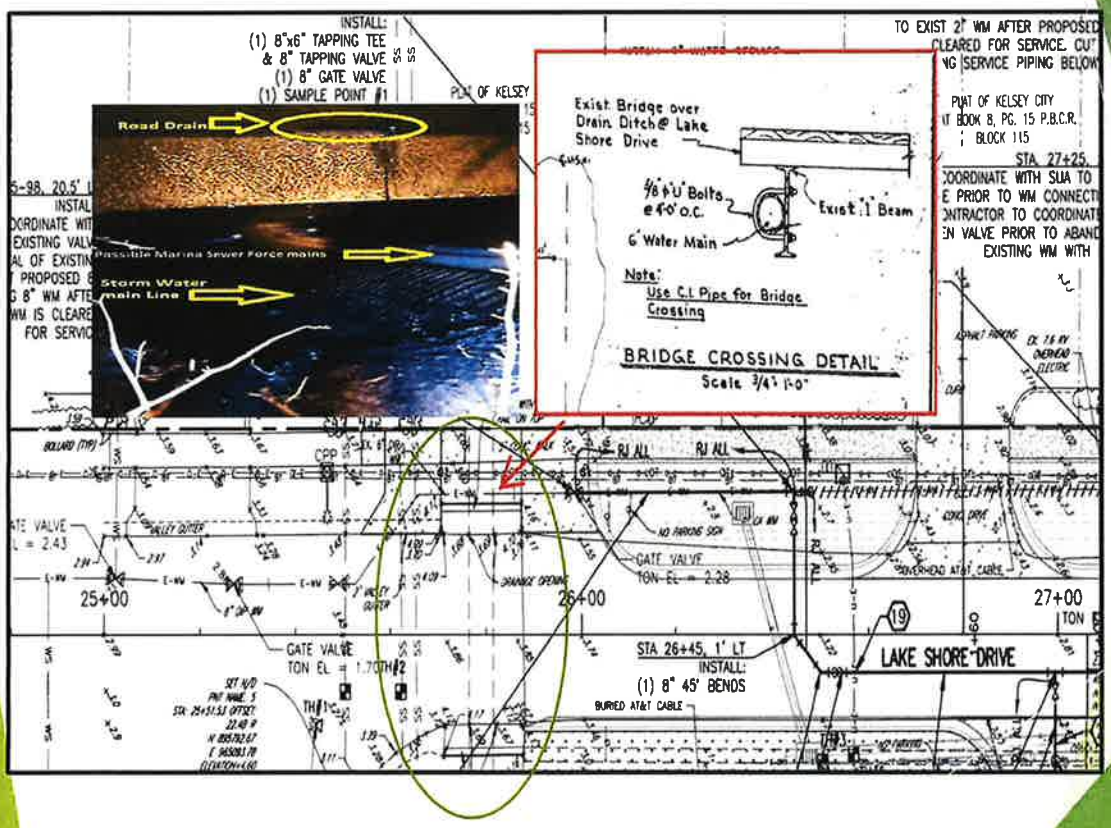
Lake Shore Drive Bridge

Ditch Crossing



KNOWN RISKS - LAKE SHORE DRIVE BRIDGE REMNANTS

6" WATERMAIN "U" BOLTED TO I-BEAM



KNOWN RISKS - 72" CAP SOUTHERN OUTFALL

ROUND TO ARCH/ARCH TO ROUND RIVETED TRANSITION

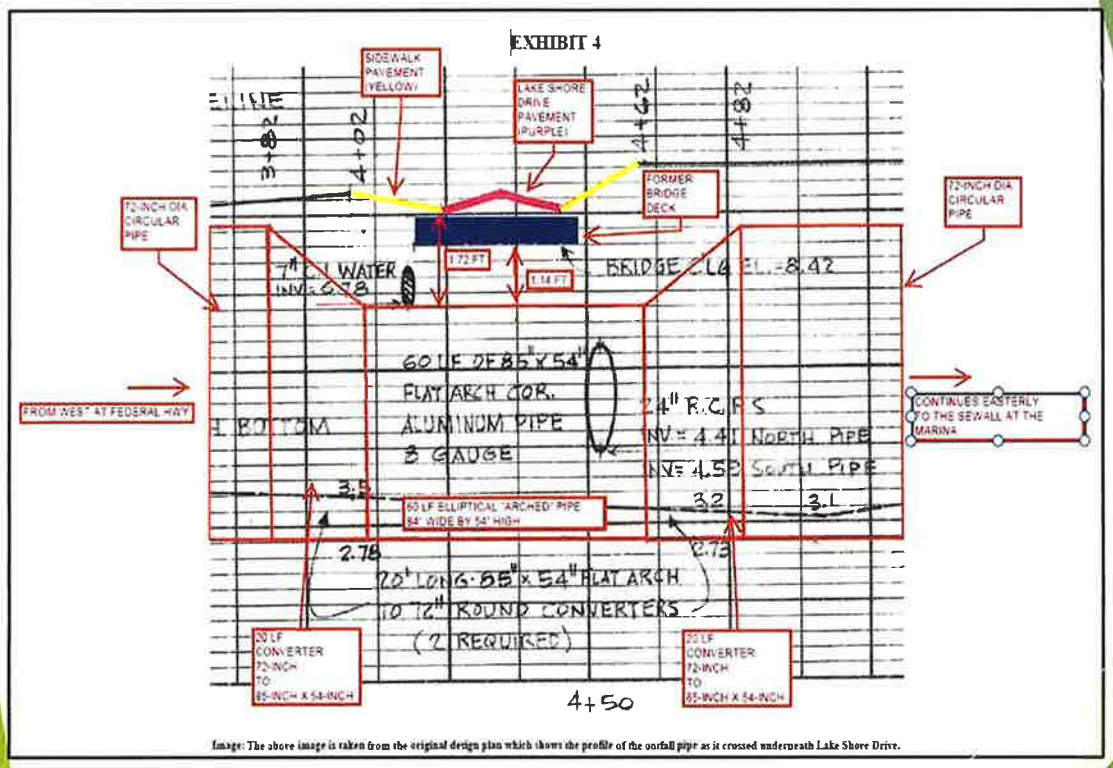
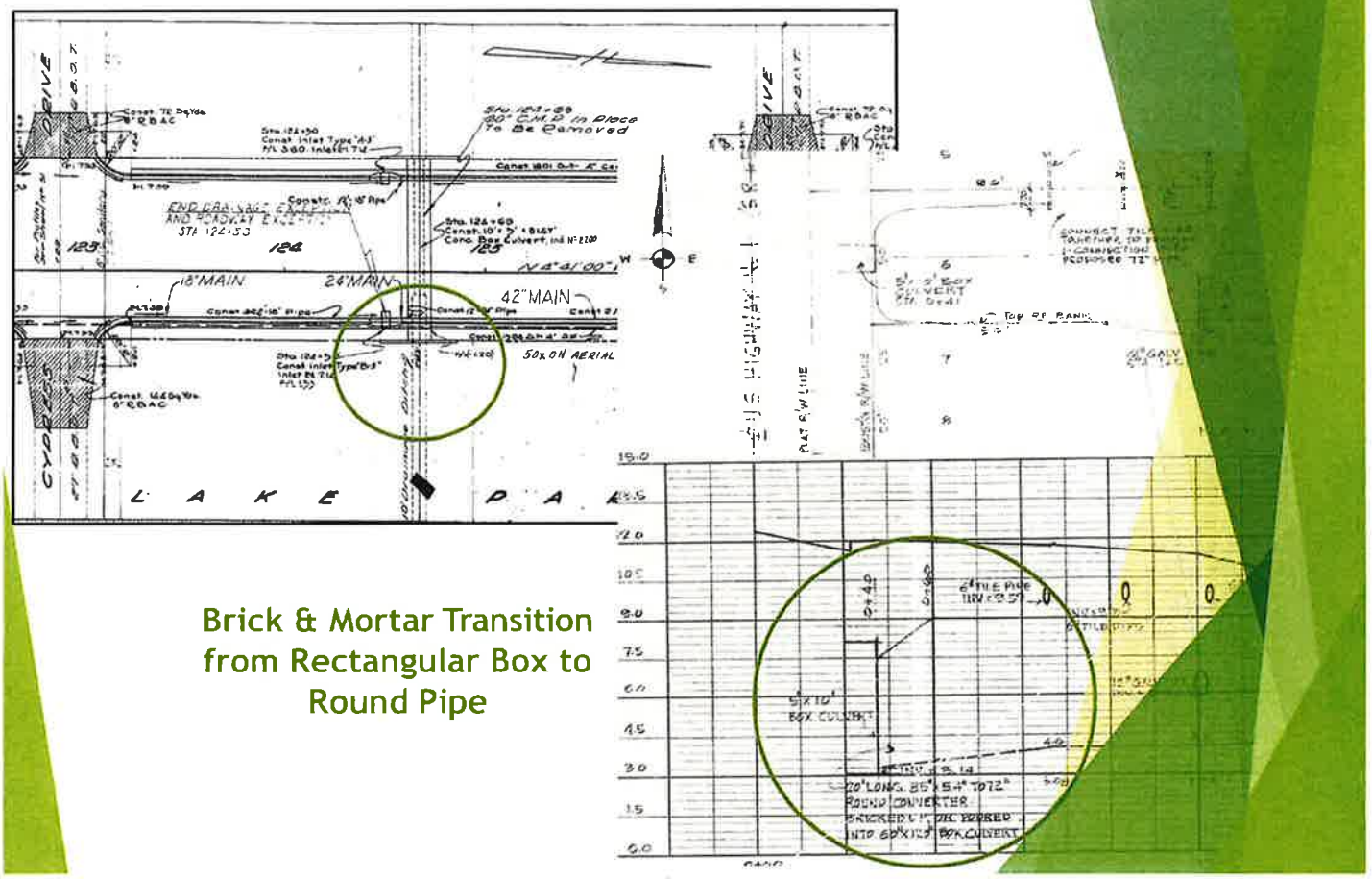


Image: The above image is taken from the original design plan which shows the profile of the outfall pipe as it crossed underneath Lake Shore Drive.

KNOWN RISKS - 72" CAP SOUTHERN OUTFALL

CONNECTION TO FDOT BOX CULVERT



Brick & Mortar Transition from Rectangular Box to Round Pipe

TECHNICAL MEMORANDUM
TOWN OF LAKE PARK
SOUTHERN 72-INCH OUTFALL PRIORITY REHABILITATION PROJECT

Subject:	**Analysis of the 72-inch Outfall Condition and Criticality**
Date:	**August 6, 2020**
To:	**Richard Scherle, Public Works Director**
From:	**Raul Mercado, PE, CFM (WRMA)**
Copy to:	**John Wylie, Stormwater Department**

Dear Mr. Scherle,

During a routine O&M inspection in 2019, a localized soil subsidence was observed at a grassy area near the seawall at the Town's marina and in the vicinity of the 72" CMP outfall discharging through the seawall. Further investigations indicated that the substance was aligned with the outfall pipe conduit and a visual inspection or CCTV was commissioned to a third party (Underwater inspection contractor). The Southern Outfall and its contributory drainage area is shown in **Figure 1.**

Figure 1. Southern Outfall and Drainage Area

Figure 1 indicates that the Southern Outfall discharges untreated runoff from a 445.82-acre catchment area. The 72" CAP outfall drains approximately 45% of the Town's watershed area to the Lake Worth Lagoon.

Results of the visual and camera condition assessment inspection indicated that the soil substance was found to occur proximately 50 feet from the seawall due to a 17-inch soffit pipe joint separation that

allowed the pipe to exfiltrate and create the wetness. This stormwater asset defect was considered to be a localized structural defect with medium risk that required a point repair. **Figure 2** is a WRMA plan sheet showing the location and extent of the of the 72" CAP point repair.

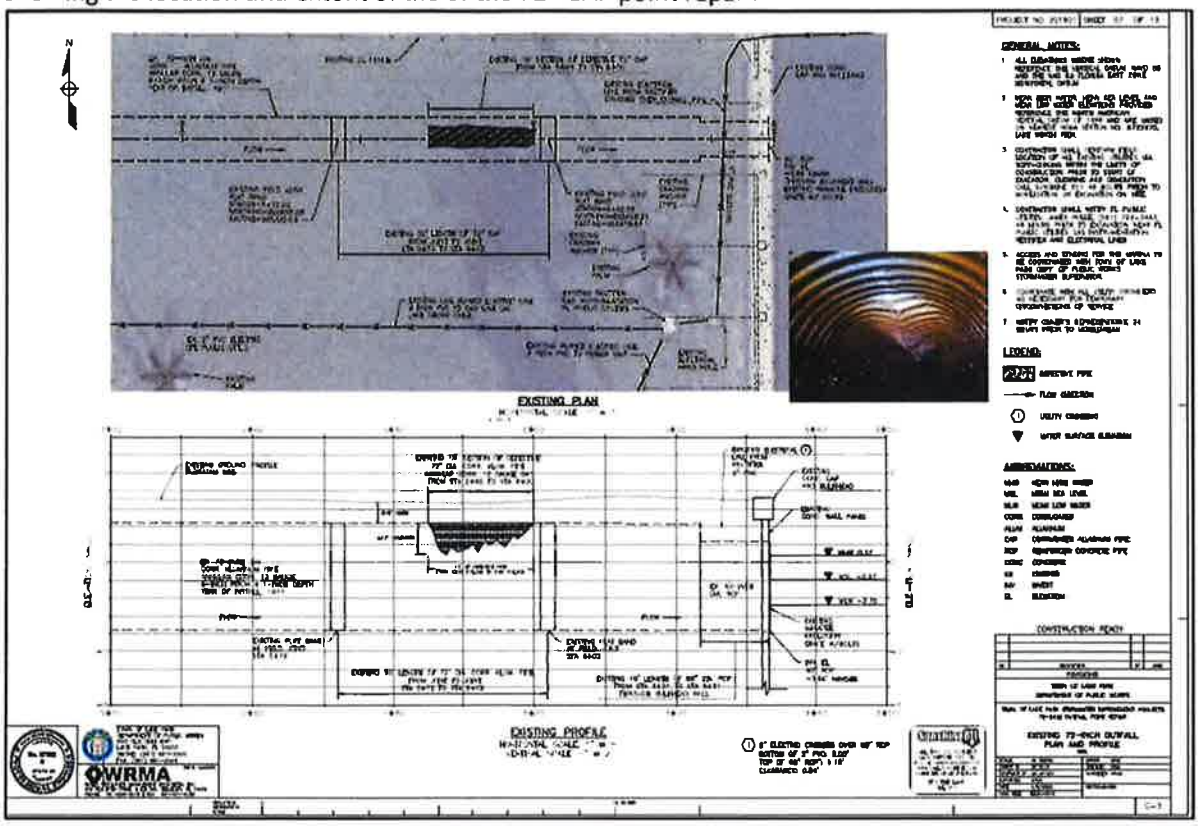


Figure 2. 72"CAP Point Repair Plans

The point repair was performed by replacement of the top quarter pipe with an in-kind corrugated metal pipe. The replacement section was bolted and welded to the existing pipe, overlaid with filter fabric, and backfilled to grade.

Further findings of the point repair condition assessment of the Southern Outfall required the preparation of a more detailed assessment of the outfall through the application of Asset Management-based Condition and Criticality methodology. As part of the Town's 2019 Stormwater Masterplan Update, WRMA is applying Asset Management principles for prioritization of Operations and Maintenance activities (O&M), and Capital Improvement Program (CIP) implementation of the Town's stormwater assets.

Asset Management Planning Approach for Operations & Maintenance of Stormwater Assets

Strategic Asset Management (AM) provides a framework for the Town of Lake Park to adopt a systematic planning approach for dealing with problems related to Operations & Maintenance. Asset Management also provides the tools and rationale for asset renewal (Repair, Rehabilitation, or Replacement) by a determination of Condition and Criticality (C & C). In determining C & C, two questions are important.

1. How likely the asset is it to fail (Condition)?
2. What is the consequence if the asset does fail (Criticality)?

Asset Condition is one of the most important factors in determining an asset's likelihood of failure. As the asset's condition deteriorates, it will become much more likely to fail. Therefore, it is important, to make the best attempt possible to give the assets a reasonable condition assessment. The condition assessment should also be updated over time so that criticality can likewise be updated. Assets given a poor or fair condition rating are more likely to fail than those given an excellent or good rating. When the asset condition is combined with other factors, the community can begin to make predictions regarding the likelihood of a given asset failing.

Establishing the likelihood of asset failure entails determining the probability that an asset will fail by considering these key factors:

1. Asset Condition
2. Asset Age
3. Size, Type, & Material
4. Operational History
5. Capacity

1. Condition Assessment of the Existing 72" CAP Southern Outfall

The CCTV Condition Assessment of the 72" CAP outfall was performed with a camera via CCTV and also via a walkthrough of the 72" outfall at low tide. The assessment indicated that that a 600 feet section of the outfall extending from just west of Lake Shore Drive to the seawall was found to have significant sub-structural and structural defects (Including the point repair above).

A more significant stormwater asset defect was located at the pipe crossing of Lake Shore Drive. The pipe was initially classified as having a 21-inch longitudinal deflection just before the Lake Shore Drive crossing. Further, As-Built investigations indicated that the longitudinal deflection was instead an arch transition prior to entering the remnants of a bridge at Lake Shore Drive (i.e. from round to arch). **Figure 3** shows the location of the buried bridge at Lake Shore Drive.

Figure 3. Old Bridge Railings at Buried Lake Shore Dr Bridge

Originally, the bridge was placed at the Lake Shore Drive crossing of a ditch discharging to the Lake Worth Lagoon in the 1940's. At some point in the early 1970's the ditch was filled and the 72- inch round outfall pipe was fitted through the bridge abutments and low chord which necessitated a transition from round to arch. A similar arch transition was found exiting the old bridge to a round 72- inch CAP. **Figure 4** shows the transitions found on plans (Circa 1970's).

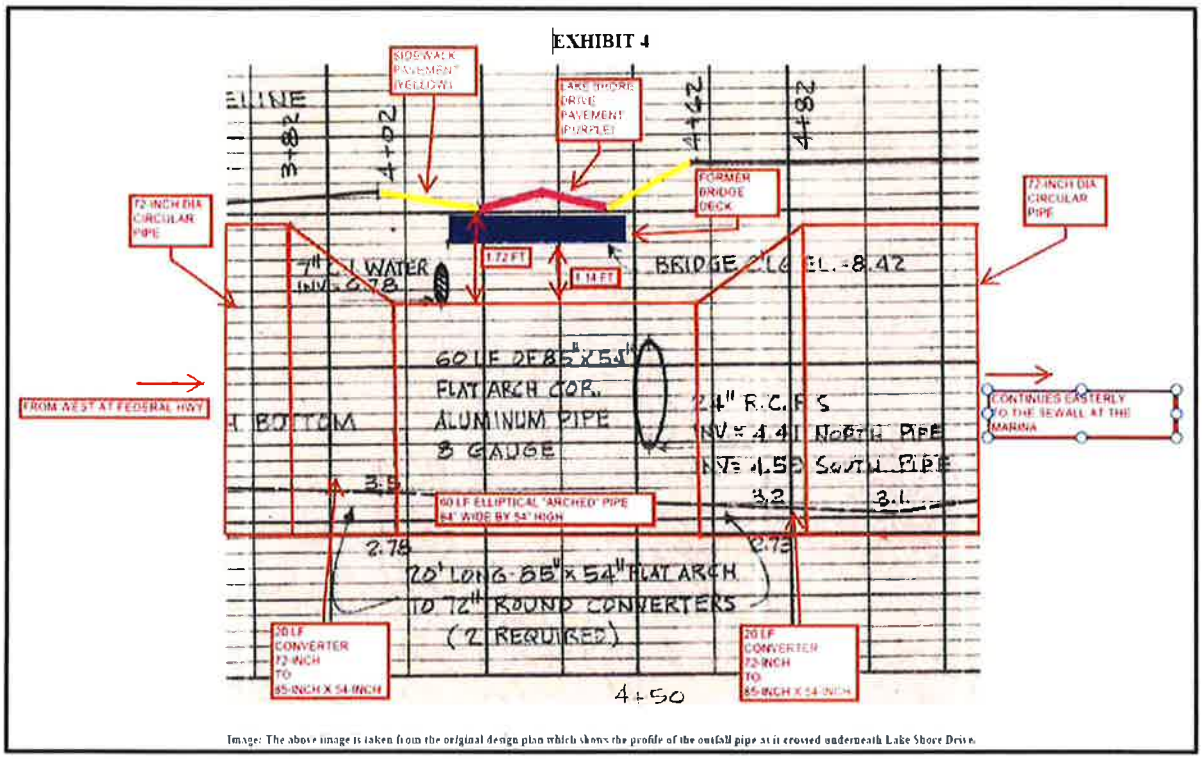


Image: The above image is taken from the original design plan which shows the profile of the outfall pipe as it crossed underneath Lake Shore Drive.

Figure 4. Round to Arch and Arch to Round Transitions at Lake Shore Drive Bridge Crossing

The bridge remnants being underground, inspection of the bridge have not been performed by either the Florida Department of Transportation, Palm Beach County or the Town of Lake Park. No records or plans were found for the bridge but historical records indicate the its was built when Lake Shore Drive was extended south across an existing ditch in the 1940's or 1950's.

WRMA requested that the Town O&M perform a dig at the southeastern corner of the bridge abutment to observe the condition of the abutments and the deck. Results from the dig indicated that there was an empty space between the CAP crown and the low chord of the bridge. A 6" water utility main was observed fastened to the bridge low chord I-beam. There is a minimal 1.0 feet cover between the top of Lake Shore Drive and the bridge deck. **Figure 5** shows the water line in the empty space between the bridge low cord and the crown of the 72" CAP.

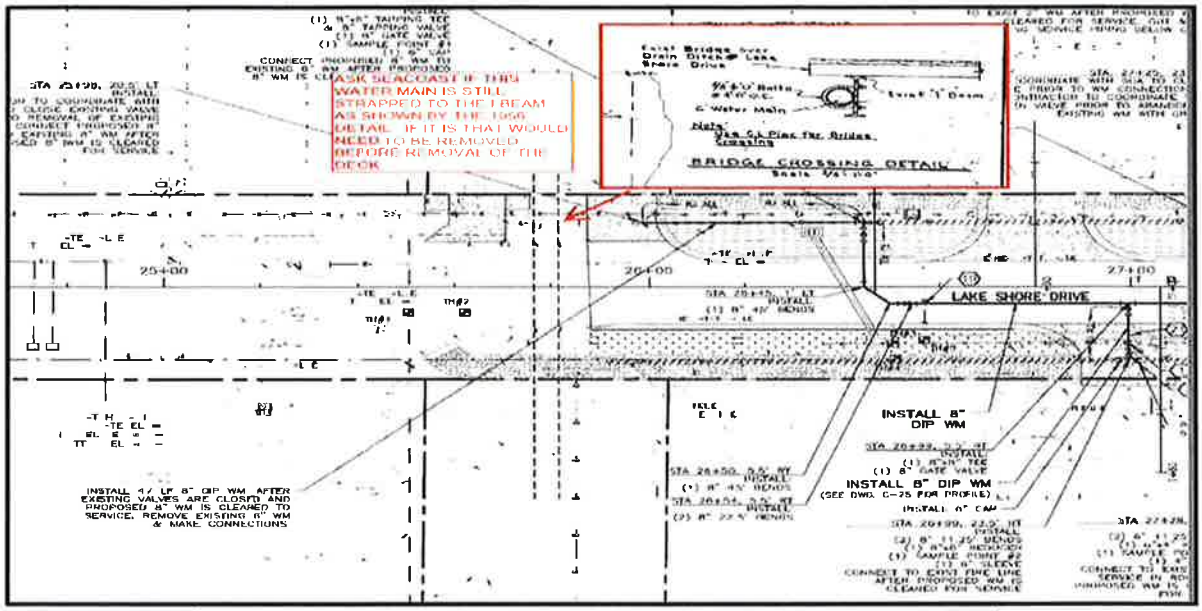


Figure 5. Undersize of old Lake Shore Drive Bridge

Another key factor that will affect the condition of the 72" CAP outfall is the proposed construction of the Nautilus 211 Highrise Condominium (23 story) building less than 200 feet south of the 72" CAP pipe. **Figures 6 and 7** shows the location and the type of building for the proposed Nautilus 211 project to be underway in the next 2-3 months.

Figure 6. Proposed Nautilus 211 Highrise Condominium Building

Figure 7. Site for the Proposed Nautilus 211 Highrise Condominium Building

WRMA will recommend that heavy truck traffic not be allowed along Lake Shore Drive at the crossing of the 72" CAP outfall. Even with the best proactive measures in place, it is expected that related Condo construction activities will impact the roadway and the linear sewer infrastructure in the area. Soil consolidation and vibration will have the potential of accelerating the 72" CAP Outfall condition structural degradation.

FDOT plans from 1969 indicate that the 72" CAP Outfall was connected to the then existing Box Culvert headwall with a brick and mortar transition (from rectangular to round). This is a 50-year old transition construction arrangement, highly exposed to nearby subsurface impacts of high-rise construction. The prefabricated round to arch metal transition and the old bridge deck, consisting of 75 year I-beans, could also be adversely affected by vibration from nearby high-rise construction activities.

2. Asset Age

The Southern Outfall segment was built at the time of enclosure of a ditch extending between US Highway 1 and the Lake Worth Lagoon (LWL) seawall in the early 1970's (Approximately 50 years). As best as it can be determined from historical records, the Lake Shore Drive Bridge was built between 1940 and 1950.

The oldest As Built plans record of the Town Marina, from the early 1970's, already show the buried Lake Shore Bridge over the ditch subsequently enclosed with the 72" CAP. Regardless, the bridge age is approximately 75 years (2020-1945), or at the end of the life of a steel I -beam with precast concrete deck bridge. **Figures 8 and 9** show the bridge and the ditch in the early 1970's.

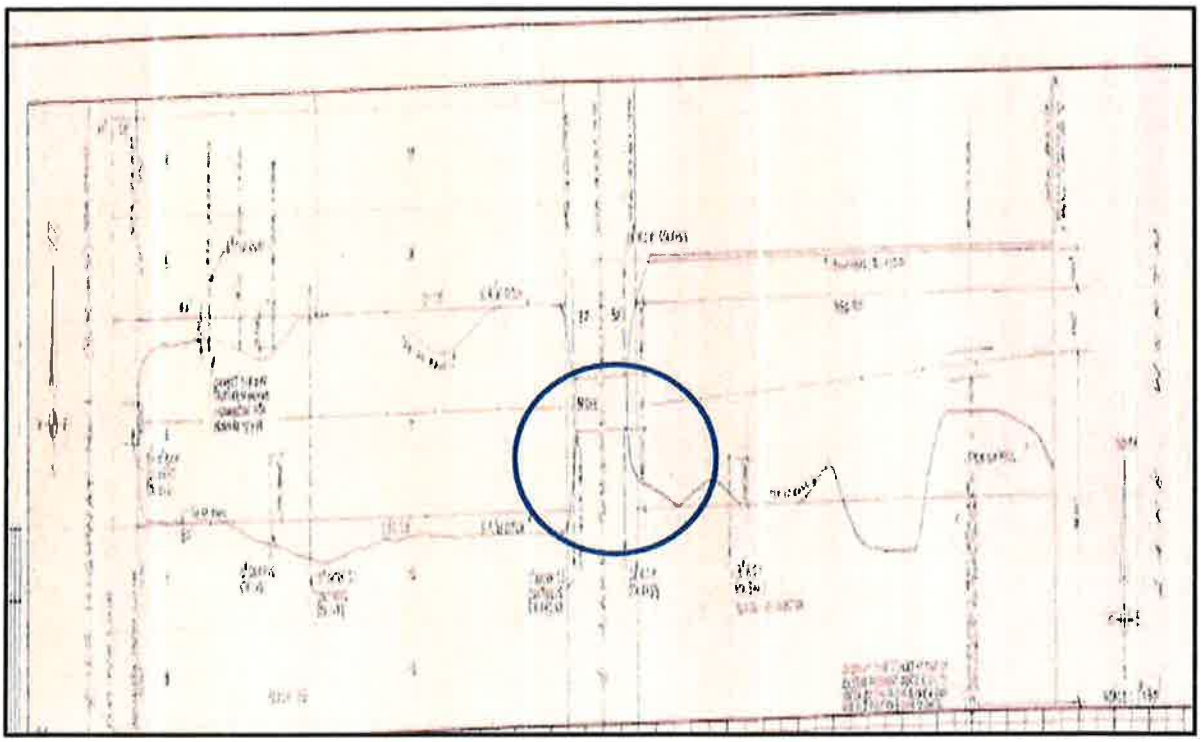


Figure 8. Bridge at Ditch Crossing of Lake Shore Drive

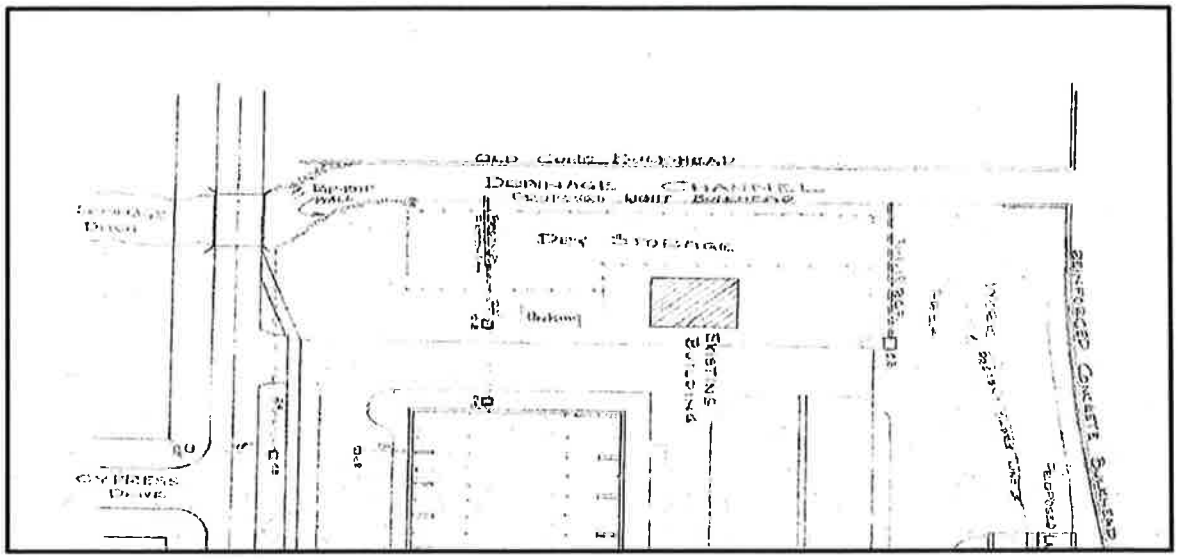


Figure 9. Drainage Channel at Lake Shore Drive Bridge

Further examination of Florida Department of Transportation (FDOT) As Built plans for US Highway#1 along the Town of Lake Park jurisdiction were requested to assess the crossing of the Southern Outfall through the US Highway 1 Right-of Way (ROW). Two sets were reviewed. A 2003 set of plans for resurfacing of the US Highway throughout the Town showed a 60" CMP outfall crossing the US Highway 1 ROW. However, a 1969 set of plans for the placement of stormsewers and inlets along US #1 along the Town of Lake Park jurisdiction indicates the removal of an existing 60" CMP and the construction of a 10' x 7 ' reinforced concrete box culvert with headwalls at the ditch location. **Figure 10** shows the notation for the box culvert installation.

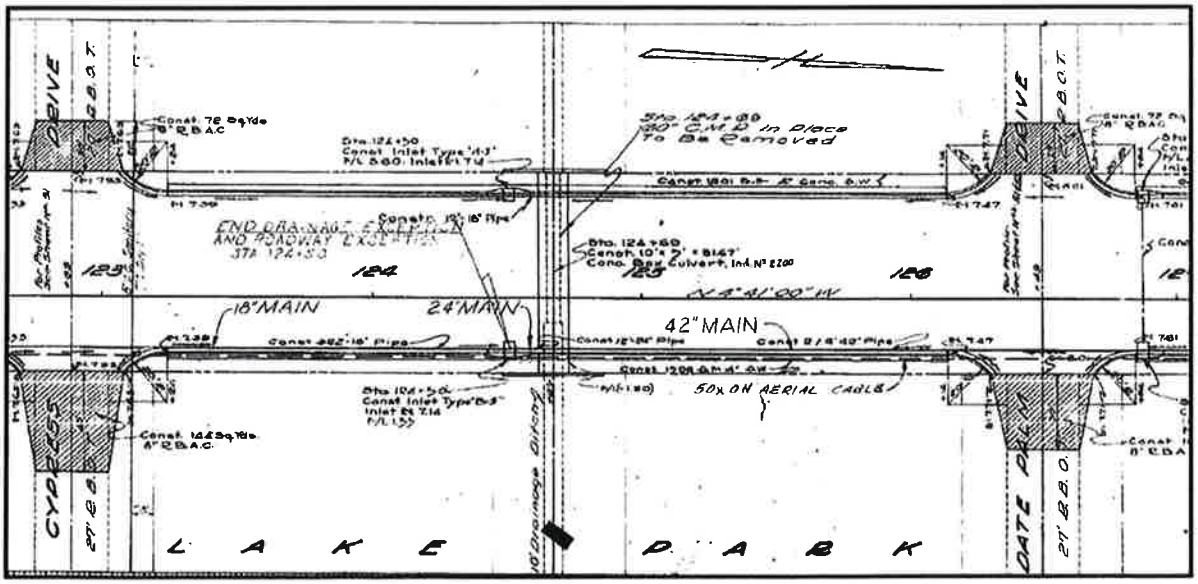


Figure 10. FDOT 1969 Plans for US Highway#1 Drainage Installation along Town of Lake Park

The FDOT 1969 plans confirmed that a box culvert was placed across US Highway #1 to discharge the Southern Outfall flows into an existing ditch. The age of the FDOT box culvert asset would be approximately 50 years (2020-1969).

3. Type (Size & Material)

Size is an important element of C & C analysis because the larger the pipe the more flow is carried. Failure of a large diameter pipe is typically associated with major flow bypass costs and associated repairs.

Type of material relates to the ability of the conduit to withstand weather and soil chemistry adverse impacts. From most resistant to less, the following pipe materials perform better over time: RCP, HDPE, CAP, CMP.

The Southern Outfall is a 72" Corrugated Aluminum Pipe (CAP) conduit.

4. Operational History

In C & C analysis, it is very important to know the number of repair work orders that have been issued to perform repairs of the stormwater asset under consideration. These are activities beyond the proactive inspections of the stormsewer system.

The Public Works Department is in the process of implementing a CIPP lining project for various segments of the Southern Outfall, upstream of the US Highway #1 right-of-way identified as having sub-structural defects. The PWD records indicate that the outfall portion east of the US Highway #1 right-of-way has undergone multiple unscheduled repairs mostly for illegal irrigation/stormwater connections as observed during the walkthrough inspection. The last incident involved the previously aforementioned point repair.

5. Capacity

Capacity relates to the ability of the stormwater asset to pass/discharge a small or large flow. The larger the flow/discharge, the more critical is the condition of the stormwater asset. Outfalls are usually designed with large pipe diameters that can discharge the bulk of the upstream watershed area peak discharge. The Southern 72" CAP Outfall has the largest diameter in the system.

The ICPR4 model recently developed for the SWMP indicates that the Southern Outfall 72" CAP flows almost full for even small storm events, and under pressure for major ones. WRMA will perform a detailed investigation of the effects of pipe area changes in the transitions from the 60" upstream of US Highway#1, through a 10' x 7' Box Culvert under US Highway #1, and at the a arch to round/round to arch Lake Shore Drive crossing. Initial H&H model results indicate significant head loss through these segments and the potential detrimental impact on the ability of the outfall to discharge the over 450 acres upstream watershed area

All the factors that have been addressed to establish the 72" CAP Southern Outfall condition have been included in a chart that represents the Condition side of the Condition & Criticality analysis matrix (**Table 1).** The Condition factors have been assigned a weight as some factors are more critical than others.

Table 1. Condition Analysis Matrix and Scores

CONDITION FACTORS					
Description	**Data Source**	**Levels**			
		Data Unit	**Range**	**Score**	**Weighed Score**
1. Age (From installation date) (weight = 0.3)	GIS Atlas Plan Records	Years of Remaining Life	1 >75 2 (60-75) 3 (45-60) 4 (20-45) 5 <20	5	1.5
2. Type (Size) (Outside Diameter) (weight = 0.05)	GIS Atlas Plan Records	Diameter (Inches)	0.5 <12-18 1 (18-30) 1.5 (30-42) 2 (42—60) 2.5 >72	2.5	0.125
Type (Material) (Outer Material) (weight = 0.05)	GIS Atlas Plan Records	Material	0.5 (RCP) 1 (HDPE) 1.5 (CMP) 2 (CAP) 2.5 (Other)	2.0	0.1
3. Condition (Structural) (weight = 0.3)	Visual & Camera Video	Based on Quick MACP/PACP O&M Rating	1= Good 2 = Fair 3 =Moderate 4 = Poor 5 = Failing	4	1.2
4. Operational History (Work Orders) (weight = 0.1)	Public Works Records	Based on Quick PACP O&M Rating	1 <2 2 (2-5) 3 (5-8) 4 (8-10) 5 >10	3	0.3
5. Capacity (Flow Conveyance) (weight = 0.2)	ICPR4 H&H Model Results	Cubic Feet Per Second (cfs)	1<25 2 (25-50) 3 (50-100) 4 (100-200 5 >200	5	1.0
Weighted Score					Total = 4.225

The Condition Matrix score for the 72" CAP stormwater asset is 4.225

Criticality Assessment of the Existing 72" CAP Southern Outfall

Criticality relates to the consequence of not addressing the condition of an asset as it ages and deteriorates. It has several important functions, such as allowing a community to manage its risk and in

aiding in determining where to spend operation and maintenance dollars and capital expenditures. In terms of the consequence of failure, it is important to consider all the possible costs of failure. These include:

1. Cost of repair or replacement and repair/replacement costs related to collateral damage caused by the failure
2. Social cost associated with the loss of the asset
3. Legal costs related to additional damage caused by the failure
4. Environmental costs created by the failure
5. Reduction in level of service (LOS) cost

The consequence of failure can be high if any of these costs are significant or if there are several of these costs that will occur concurrently with a failure. The assets that have the greatest likelihood of failure and the greatest consequences associated with the failure will be the assets that are the most critical.

1. Cost of repair or replacement & Collateral Cost

Cost of Replacement

Given the stormwater asset age and per its condition assessment, it has been established that the existing 72" CAP outfall is or has experienced sub-structural and structural defects that precludes the possibility of trenchless CIPP lining or similar techniques to restore its conveyance function. Additionally, the remaining asset life (the 72" CAP is approximately 50 years old), does not warrant a trenchless temporary CIPP fix. An open cut replacement cost will be necessary and will require the design of the following components:

- Approximately 780 feet of 72" RCP (or other applicable type) conduit from the US Highway #1 ROW to the Lake Worth Lagoon seawall.
- A water quality treatment Biodetention Facility at the Marina (i.e. The 72" will discharge into the Biodetention facility).
- A control structure with future pump station to offset projected Sea Level Rise.

The costs of the proposed 72" Outfall replacement (and associated water quality/SLR facilities) cannot accurately be calculated until design plans and specifications become available. For purposes of planning and grant funding an estimated cost is provided:

- 72" CAP replacement ($1.5 Million)
  - Includes demolition of existing outfall, 600 of RCP or equivalent with associated structures, mobilization, bypass pumping, etc.), Lake Shore Road reconstruction, conflict manholes, other control structures.
- Biodetention Facility ($1.2 Million)
  - Includes Biodetention facility construction, planting, and inflow and outflow hydraulic structures with provision for future pump station.
- Total (Approximated) Cost: $2.7 Million

Costs related to collateral damage caused by the failure

The collateral damage associated with the failure of the 72" CAP outfall due to a potential cave in of the existing lake Shore bridge deck and/or outfall conduit includes:

- Partial collapse of Lake Shore Drive road and interruption of water service to adjacent properties (i.e. an 6" water main is connected to the bridge-I-bean).
- Temporary loss of gas service as a gas line runs along the east side of the Lake Shore Drive ROW.
- Inundation of US Highway1 right-of-way and adjacent residential and commercial properties due to the inability of the Southern Outfall to discharge to the Lake Worth Lagoon (i.e. Precluding the discharge for a 486-acre upstream watershed area including the US Highway 1 ROW.)

The aggregated costs of all these elements are:

- Loss of business at the Marina from closure at its main entrance for a period of 3-6 months.
- Increased costs for emergency mobilization of contractor to perform demolition and removal of debris, restore water service, and install temporary culvert connection.
- The lack of Southern Outfall conveyance of upstream flows would require temporary bypass of flows to the south or to marina area via pumping operations. At a minimum, 92-percentile flow is required for daily bypass during emergency culvert repair work. This would translate to the use of pumps with large (Over 15") discharge capacity at thousands of dollars per week cost.
- As previously indicated, the 10' x7' Box Culvert under US Highway#1 is approximately 50 years and it has a hand-implemented brick and mortar connection to the 72" CAP conduit. The condition of this asset is unknown and WRMA is proposing to ascertain its condition by a CCTV/walkthrough as part of this project. A failure of this stormwater asset would present major challenges for bypass of upstream flows.

The combined effect of these losses would be in the hundreds of thousands of dollars as Lake Shore Drive and adjacent Marina areas would have to be closed for a minimum period of 3-6 months to perform emergency repairs.

2. Social cost associated with the loss of the asset

The social cost is related to the inability of Town residents to use Lake Shore Drive for transportation as well as the use of the Marina for recreation. Local residents would also suffer temporary loss of water service.

US Highway #1 traffic could also be affected by the temporary flooding of the ROW due to the lack of discharge from the collapsed 72" Outfall (until a flow bypass scheme is adopted). This would disrupt commercial activities along the US Highway #1 corridor with temporary financial loss.

3. Legal costs related to additional damage caused by the failure

Legal costs could be manifested in various ways:

- Harm to pedestrian and vehicular traffic (if travelling over Lake Shore Drive at the time of collapse)
- Loss of use of Marina, residential or commercial flooded property

The length of time of the temporary road (and business) closures would almost inevitably lead to lawsuits and engagement by Town attorneys.

4. Environmental costs created by the failure

Lake Shore Drive and the 72" CAP collapse could result in the discharge of soils, sediments and debris to the adjacent Lake Worth Lagoon. Furthermore, emergency operations and bypass of flows would add additional pollutants into the LWL.

The consequence of failure also includes the avoided environmental impact benefit opportunity loss to retrofit known and documented pollutants loads to the Lake Worth lagoon for the stormwater asset. The current 72" Outfall discharges untreated runoff to the LWL from the contributory catchment area. The US Highway#1 ROW, discharging through the 72" CAP outfall at four inlets 200 feet north of Cypress Drive also does not currently include any treatment facilities and none are proposed for the upcoming FDOT resurfacing plans. **Figure 11** shows the location of the US Highway #1 discharge into the Southern Outfall.

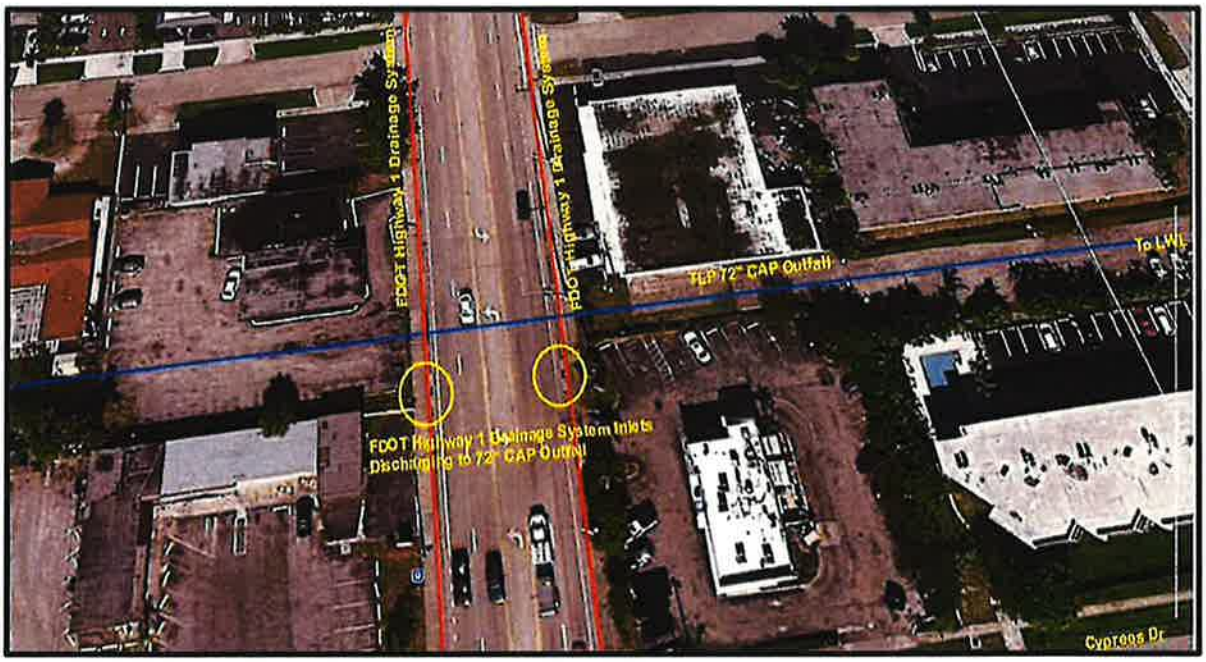


Figure 11. US Highway #1 Discharge Inlets at the 72" CAP Outfall

As a co-permittee of the Palm Beach County NPDES /MS4 permit program, where the Northern Palm Beach County Improvement District is the Lead Permittee, the Town of Lake Park collects quarterly ambient water quality data throughout the Town at four (4) designated sampling sites (**Figure 12**). Two of these sampling locations (#1 & #2) are located along the 72" CAP outfall to the LWI.

As required by the MS4 Permit, the Town utilizes a FDEP approved lab using NPDES-approved procedures to perform quarterly sampling at these locations for five test parameters, including Chlorophyll-A, Dissolved Oxygen (DO), Total Phosphorus (TP), Total Nitrogen (TN), and Total Suspended Solids (TSS). The four sampling locations where selected based on the type of water quality pollutant that could be generated by the land uses in the surrounding areas

Figure 12. Town of Lake Park NPDES Sampling Location Sites

- Location 1

148 Data Palm Drive – Basin 12, Structure #103. Google Earth: 26*47'41.25"N, 80*3"22.30W
(Samples pulled from 60" RCP outflow that leads to Lake Worth Lagoon). This sampling location is supposed to be representative of the residential district

- Location 2

301 Federal Hwy – Basin 12, Structure #131A. Google Earth: 26*47'41.93"N, 80*3'13.85"W
(Samples are pulled from 72" CAP outflow discharging to Lake Worth Lagoon). This sampling location is supposed to be representative of the US Highway #1 discharge to the LWL.

Monitoring data for these sampling locations indicates that the lack of any Best Management Practices (BMP's) in the form of detention/retention facilities for the 72" CAP 486 acre drainage area (including the US Highway #1 contributory drainage area), results in tons of pollutants reaching the Lake Worth lagoon.

The US Highway #1 drainage system discharging to the 72" CAP outfall flushes untreated runoff first as it is located the closest to the LW (Ie. Less than 800 feet). **Figure 13** shows the US Highway#1 drainage area discharging to the LWL via the 72" CAP outfall. FDOT relies on the Town of Lake Park NPDES to address pollutant discharges from its US Highway #1 ROW (Ie. The 72" CAP outfall is not part of the FDOT NPDES permit).

For these reasons, and to mitigate any avoided environmental opportunity loss as a consequence of failure, a Biodetention facility is proposed as part of this priority stormsewer asset rehabilitation project.

Figure 13. FDOT/US Highway 1 ROW Drainage Area Discharging to 72" CAP Outfall

A failure to address these pollutants loads in any retrofit design alternatives would lead to further discharge of pollutant loads to the LWL.

Lastly, Climate Change and Sea Level Rise will impact the ability of the outfall to discharge the watershed over time. The 72" CAP Outfall pipe invert is located at approximately -3.8 feet NAVD or significantly below the water. The outfall currently lacks a flap gate or valve to offset increasing SLR-induced tides and a retrofit design would have to address this situation by placement of a valve and pump station.

5. Cost Related to reduction in level of service

The failure of the 72" CAP Outfall would represent a maximum reduction in level of service flooding protection. Flooding of roadways and residential/commercial property would occur in the immediate vicinity of US Highway #1 and upstream at the location where tributary stormsewers join the main trunk line.

The impacts resulting from the Southern Outfall lack of discharge would propagate upstream as far as 6th or 7th Street.

All the factor that have been addressed to establish the 72" CAP Southern Outfall criticality have been included in a chart that represents the Criticality side of the Condition & Criticality analysis matrix. The Criticality factors have been assigned a weight as some factors are more critical than others. **Table 2** shows the Criticality Matrix analysis and scores.

Table 2. Criticality Matrix Analysis and Scores

CRITICALITY FACTORS					
Description	**Data Source**	**Levels**			
		Data Unit	**Range**	**Score**	**Weighed Score**
1. Cost (Weight =0.2)	Utility & Industry Average Trade	Design, Construction & Permits	0.5<$50,000 1 ($50k to $100k) 1.5 ($100k-$250k) 2 ($250k – $500k) 2.5>$500k	2.5	0.5
2. Collateral Cost (Weight =0.2)	Analysis	Probability Of Occurrence	0.5 < 25% 1 (25 - 50%) 1.5 (50 -75%) 2 (75 - 90%) 2.5 > 90%	2.5	0.5
3. Social Cost (Weight = 0.05)	Analysis	Probability Of Occurrence	1 < 25% 2 (25 - 50%) 3 (50 -75%) 4 (75 - 90%) 5 > 90%	4	0.2
4. Legal Cost (Weight = 0.3)	Analysis	Probability Of Occurrence)	1 < 25% 2 (25 - 50%) 3 (50 -75%) 4 (75 - 90%) 5 > 90%	5	1.5
5. Environmental Impact Cost (weight = 0.05)	Analysis	Proximity To Waterways	1>1000 Feet 2 (500-1000 Ft) 3 (100-500 Ft) 4 (50-100 Ft) 5 < 50 Feet	5	0.25
6. Reduction in Loss of Service Cost (weight: 0.2)	H&H Preliminary Analysis	Flooding Depth (inches)	1< 2 in 2 (2 to 4 in) 3 (4-6 in) 4 (6-8 in) 5 > 8 in	5	1.0
Weighted Score					**Total = 3.95**

The Criticality score for the 72" CAP stormwater asset is 3.95

Condition and Criticality Business Risk Exposure Matrix

Once the Condition and Criticality assessment factors have been determined, a Business Risk Exposure (BRE) Analysis can be performed to make a decision for asset repair, rehabilitation and/or replacement. **Figure 14** shows a classic Business Risk Exposure Matrix.

Multiplied		Consequence of Failure (Criticality)				
		1	2	3	4	5
Probability of Failure (Condition)	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Green: **Low Risk**
Tan: **Medium Risk**
Pink: **High Risk**

Figure 14. Business Risk Exposure Matrix

Asset Business Risk Exposure (BRE) = Condition x Criticality
Asset Risk = 4.225 x 3.95 = 16.69

The C vs. C BRE analysis Matrix indicate that the 72- inch outfall pipe asset has a high risk of failure and in need of immediate action (High Risk Zone). **Figure 15** is a criticality model that indicates the actions or strategy to be taken based on the BRE analysis results.

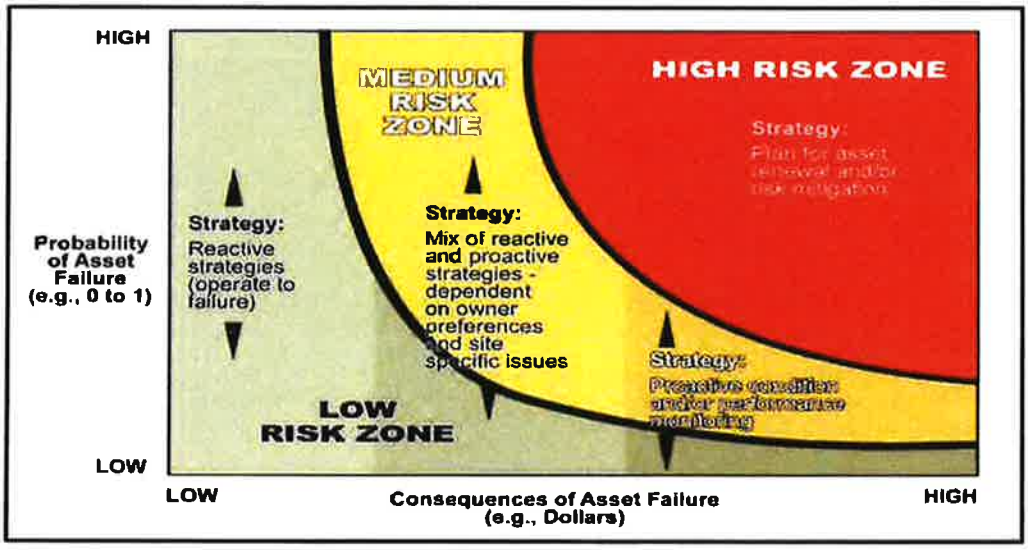


Figure 15. Criticality Strategy Model

Assets within the low risk zone can be maintained reactively (postponed), assets in the medium zone require more proactive maintenance, and assets in the red zone require immediate action (typically replacement).

Recommendation

Based on the Asset Management based BRE analysis, WRMA recommends that the Town Management take immediate action to mitigate the known risk from this critical stormwater asset with a quantifiable likelihood of failure and financial threat to the Town.

The high-risk determination does not mean that the asset is in immediate danger of failure. The buried Lake Shore Drive Bridge and the 72" CAP Outfall could last months. However, the analysis has identified that the original bridge I-bean precast deck placed just above or on top of the outfall pipe crown is at or beyond the useful (75 years) life of the steel and reinforced concrete material and presents a high risk of failure. Likewise, the 72" Corrugated Aluminum Pipe (CAP) is near its useful life and is experiencing rapid deterioration that could be accelerated by the construction of a multistory high rise immediately to the south. Then, there is the 50-year old 10'x7' Box Culvert under US Highway 1 that has not received any maintenance by FDOT since being connected to the outfall underground.

The Asset Management-based BRE analysis indicates that the consequence of inaction could result in the stormwater asset failure, with and great financial loss to the Town in the range of $0.25 to $0.5 million in emergency repairs.

Proposed Expedited Design for Rehabilitation of the 72" CAP Outfall

WRMA has completed the development of the Town Stormwater Masterplan (SWMP), and as part of the proposed 20 year Green Infrastructure/Low Impact Development (GI/LID) implementation phase, had already planned for the retrofit of the outfall and the placement of a Biodetention facility with Sea Level Rise pumps at the Town Marina. In fact, the Town has already prepared and submitted grants for the project implementation.

A FEMA/HMGP grant in the amount of $3.0 million was submitted in FY2019 but it received a low score as the H&H model of the Southern Outfall watershed area had not be completed at the time by WRMA. This grant is being resubmitted in September for FY 2021. A second grant for the construction of the Marina Biodetention facility in the amount of $700,000 was submitted successfully in FY2019 to the Lake Worth lagoon Initiative (LWLI). The grant award has been postponed until the FY2021 cycle due to Covid-19 and related Governor veto of State grant funding.

To address this newly identified BRE , and priority rehabilitation recommendation, WRMA has prepared a detailed cost estimate for the design of an alternative outfall and Biodetention water quality facility with pump station that will take into account future SLR conditions along the LWL. The total cost of the expedited design is $276,200 (a detailed breakdown of the cost is provided in Attachment 1). The following cost breakdown applies:

- WRMA Cost: $111,200
  - (Includes Data collection and site assessment, H&H detail modeling of alternatives, preliminary and final engineering design, plan preparation, and bidding assistance)

- Subcontractor Cost: $165,000
  - (Includes Survey, Geotechnical engineering, Subsurface Utility Locations, CCTV inspection, landscape architecture design, mechanical/electrical engineering). The CCTV inspection of the US Highway #1 Box Culvert condition is included.

Responsibility Costs

WRMA has previously indicated that the 72" CAP Outfall is shared by the Florida Department of Transportation (FDOT) for discharge of its US Highway 1 ROW and adjacent drainage contributory areas.

Figure 13 indicates that the FDOT/US Highway 1 drainage area discharging to the 72" CAP Outfall is a significant portion of the entire 72" CAP Outfall 445.82 acres watershed area. Furthermore, the US Highway #1 ROW does not include any water quality treatment facilities.

For these reasons, it reasonable and appropriate to apportion the responsibility cost of the 72" CAP stormsewer asset in an equal 50% basis. The responsibility costs will be as follows:

- **Total Design Cost: $276,200**
- **Town of Lake Park Responsibility: $138,500 (50 %)**
- **FDOT: $138,500 (50 %)**

FDOT would also be responsible for 50 % of applicable construction costs to be estimated at 60% design plans (Depending on the amount of grant funding received for the project implementation).

Request

Time is of the essence to expedite the preparation of engineering construction plans for the rehabilitation of the 72" CAP stormsewer asset identified as a quantifiable risk. Per this reason, WRMA requests that the Town allocate from its projected Stormwater Utility Funds the projected Town of Lake Park cost of the project (**$276,200**) as a priority FY2021 project, and recommends that 50% of this cost be recovered from FDOT as an equal responsibility share.

The expedited design would be completed in 6 months or by summer FY 2021 when grant funding would become available and FDOT would contribute its share of the construction cost to bid the project and initiate construction.

Vivian Mendez

From: Poole, James <James.Poole@dot.state.fl.us>
Sent: Friday, August 7, 2020 3:24 PM
To: Raul M. Mercado, PE, CFM
Cc: John D'Agostino; Richard Scherle; Michael R. Mercado, PE; Michel Abdelmessih
Subject: Re: 72" CAP Outfall Condition Assessment and Rehabilitation at the Town of Lake Park

Raul,
Thanks for emailing and sharing the Tech Memo.

I'll need to first book an internal meeting at FDOT to see what our options would be for supporting an effort like this. Does this become a JPA??? I really don't know what the process would look like for this. We may need to do our own assessment of the outfall pipe.

Perhaps this was already on the radar of our maintenance office. I'll let you know what I find out for you. Stay tuned.

Thanks!

James Poole, P.E.
District Drainage Engineer – District 4

Florida Department of Transportation
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309-3421
(954) 777-4204 (office phone)
(954) 609-4425 (cell phone)

From: Raul M. Mercado, PE, CFM <raul.mercado@wrmaeng.com>
Sent: Friday, August 7, 2020 2:32 PM
To: Poole, James <James.Poole@dot.state.fl.us>
Cc: John D'Agostino <jD'Agostino@lakeparkflorida.gov>; Richard Scherle <rscherle@lakeparkflorida.gov>; Michael R. Mercado, PE <mike.mercado@wrmaeng.com>; Michel Abdelmessih <mabdelmessih@lakeparkflorida.gov>
Subject: 72" CAP Outfall Condition Assessment and Rehabilitation at the Town of Lake Park

EXTERNAL SENDER: Use caution with links and attachments.

James:

Attached is a Technical Memorandum Report prepared by WRMA for the 72" CAP Southern Outfall Priority Rehabilitation Project at the Town of Lake Park. In the process of addressing a point repair WRMA uncovered additional issues that required a more detailed Asset Management-based Condition & Criticality Assessment of the stormwater asset.

The 72" CAP Outfall is also used to discharge the FDOT US Highway #1 ROW (and contributory area) to the Lake Worth Lagoon, and the findings and recommendation of the report will include FDOT District 4 involvement and/or participation.

Please review the Tech Memo Report and let me know a convenient time, at your earliest convenience, to discuss its finding and recommendations with the Town's Manager and Public Works Director. The report is being presented to the Town Commission in the next two week so your input would be greatly appreciated. Thanks.

Raul Mercado, PE, CFM
Principal Engineer

WRMA
WATER RESOURCES | ENGINEERING

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WRMA is an FDOT Pre-Qualified SBE/DBE Company

PROPOSED SCOPE OF SERVICES
FOR TOWN OF LAKE PARK
SOUTHERN OUTFALL REPLACEMENT & GREEN INFRASTRUCTURE PROJECT

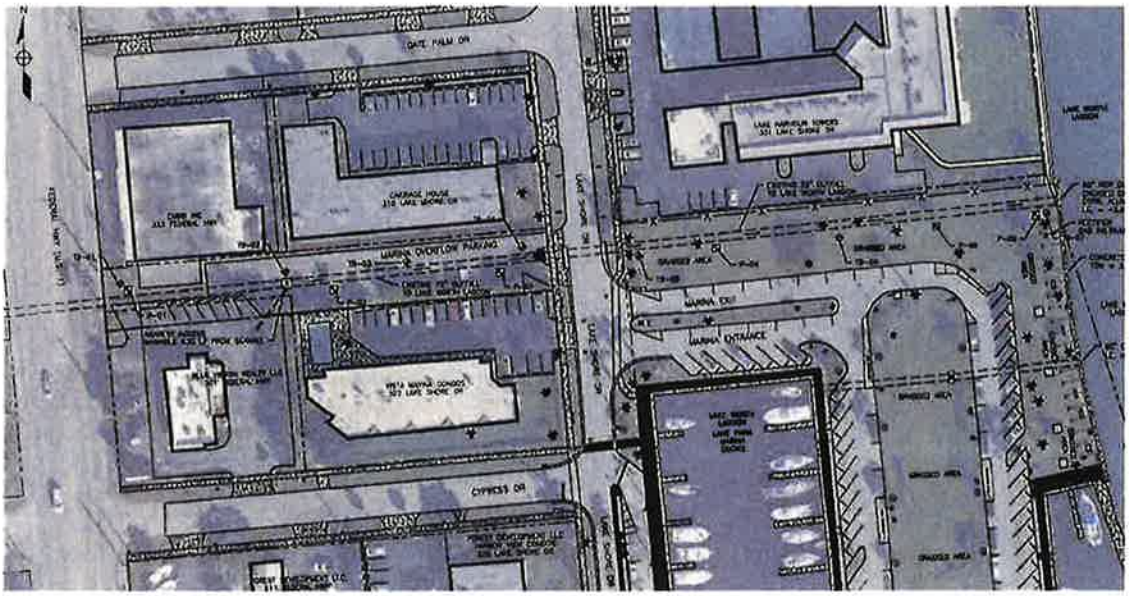
PART 1.0 PROJECT OVERVIEW

Background

The Town of Lake Park seeks to develop a scope of work to design a replacement of the existing 72-in Corrugated Aluminum Stormwater Outfall pipe, located near the Southern Boundary of the Town of Lake Park, between Federal Hwy (U.S. 1) and the Lake Worth Lagoon at the Lake Park Marina.

WRMA has previously performed a CCTV investigation and condition assessment of the southern outfall pipe which was is known to have been constructed in late 1971 (approx. 50 years old). Previous point repairs to the outfall have also been performed.

The existing 72-in CAP outfall pipe is a major outfall of the Town's drainage collection system, and provides conveyance of substantial discharges of stormwater runoff collected from a large drainage area on the western half of the Town, as well as a significant portion of drainage from Federal Hwy (U.S. 1) within the FDOT Right of Way, in the Town of Lake Park.



Southern Outfall Project Site

Currently stormwater runoff collected from a large drainage area west of U.S. 1, as well as a significant volume of runoff from U.S. 1, are discharged via the Town's outfall pipe, into the Lake Worth Lagoon untreated.

Southern Outfall Contributing Drainage Areas

The purpose of the Southern Outfall project, is to engineer a design plan, to open-cut (excavate) and replace the existing aged outfall pipe, and provide water quality treatment for the removal of pollutants and heavy metals prior to discharge into the Lake Worth Lagoon, which is a pristine water body. This will be accomplished through an open cut excavation along the existing pipe alignment, removal and replacement with new pipe materials, and in the installation of a bio-retention basin, prior to discharge into the Lake Worth Lagoon.

In addition to the replacement of the outfall pipe, there is an existing former bridge (circa 1930's) located on Lake Shore Drive, which is currently located on top of the outfall. The old bridge deck and guard railings will need to be removed during the construction of the replacement outfall.

Existing Former Bridge on Lake Shore Drive

Project Site Data Collection Requirements

Topographic, Boundary and Tree Survey of the project limits shall be required to prepare the final design plans. Additionally, due to the breadth and depth of the proposed excavation and the proposed bridge deck removal on Lake Shore Drive, Quality Level B subsurface utility location will be required within the proposed project limits. Geotechnical sampling and testing will be needed in the form of SPT borings and permeability tests which shall be taken at select locations to determine the existing soil profile characteristics, ground water table fluctuation, and soil bearing capacities. Internal CCTV inspection of a portion of the existing pipe shall also be required to identify any potential issues which may impact the removal of the existing pipe.

Regulatory Agency Coordination

FDEP

The Florida Department of the Environment has regulatory authority to review all site plans and construction drawings for projects where construction and clearing of disturbed areas are greater than one acre prior to any NPDES Construction discharge permit being granted to the Owner. WRMA shall prepare and submit required FDEP applications with accompanying site plans for proposed construction activities requiring review by the Florida Department of the Environment. FDEP may also have review authority if the final proposed plans indicate impacts from construction to the lagoon.

South Florida Water Management District

The Southern Outfall was built before the SFWMD began issuing surface water management permits and no current SFWMD permit exists, however, it is anticipated that a new SFWMD ERP permit may be required. As part of WRMA's due diligence, WRMA shall meet with SFWMD to ensure that all proposed modifications are in compliance.

FDOT

FDOT owns and maintains a 5' x 10' concrete box culvert underneath Federal Hwy which is a component of the Southern Outfall. Although the project does not propose to replace the existing box culvert (at this time), coordination with the FDOT District 4 drainage engineer may be required in order to coordinate design alternatives and construction sequencing. FDOT also is a major stakeholder in the maintenance and funding of the Southern Outfall Project.

FDOT would also be involved in the proposed maintenance of traffic plans. The proposed replacement of the 72-inch outfall may require temporary closure of Lake Shore Drive. Consequently, a site specific traffic control plan may be required, in order to provide a detour for vehicular and pedestrian traffic on Lake Shore Drive. Said traffic control plans may require comments from FDOT staff since any proposed detour may involve U.S. Hwy 1.

Army Corps of Engineers

At present, no construction is proposed within limits of the Lake Worth Lagoon. However, should the proposed construction plans evolve to indicate that construction on the water side of the sea wall is necessary or required, then a permit application to the ACOE might be necessary.

Palm Beach County
Although the existing 72-inch outfall pipe is entirely located within the limits of the Town of Lake Park, coordination with Palm Beach County DERM and emergency response services will be needed. Should the site specific traffic control plans propose a partial or full closure of Lake Shore Drive, coordination with Palm Beach County would be needed to provide advance notice for County emergency services.

Utility Coordination

The proposed outfall replacement project will require continual coordination with multiple above and below ground utility services including:

- Electric - Florida Power and Light
- Cable - Comcast Cable
- Water and Sewer - Seacoast Utility Authority
- Gas - Florida Public Utilities
- Stormwater - Town of Lake Park
- Telephone - AT&T

The following Scope of Services is proposed to design the replacement of the outfall pipe.

PART 2.0 SCOPE OF SERVICES TO BE PERFORMED BY WRMA ON THE PROJECT

Task 1 – Project Management

1.1 Project Management
The WRMA project manager shall serve at the point of contact for the Town and manage the day to day design engineering tasks associated with this scope of services. The Project Manager will prepare a schedule for all engineering tasks in the scope, and provide bi-weekly updates on the ongoing progress of each task.

1.2 Meetings and Inter-Agency Coordination
Coordination with federal and state agencies is necessary for the development and planning of this project. The Project Manager shall attend all scheduled meetings either by phone, virtual or in person meetings with Town staff and coordinate with other agencies as necessary in order to move the project towards completion.

Task 1 Deliverable
WRMA will provide bi-weekly progress updates on design progress and inter-agency coordination.

Task 2 – Site Analysis, Planning and Collection of As-Built Information

2.1 Collection and Analysis of Utility As-Built Data
WRMA shall communicate with the Town, FDOT, FP&L and other utilities as necessary to obtain as-built information for existing utilities in or around the 72-inch outfall pipe. As-Built information will be

analyzed during the preliminary planning process to locate potential utility conflicts which could affect construction or impact services to customers. A quality level B utility designation will be performed.

2.2 Coordination of Field Survey Data Collection

WRMA will coordinate with the surveyor, geotechnical engineer, and subsurface utility engineer in order to deploy and collect all pertinent field survey data in relation to above ground surface features and below ground soil characteristics and utility locations. Collection of field survey data will be necessary to create an accurate basemap of the existing conditions within the project limits, in order to provide information for detailed design engineering and for identifying the need for potential utility relocations or temporary service disruptions during construction. The survey shall establish control for the project.

2.3 Basemap Development

WRMA shall develop a project basemap of the project site displaying all information collected including topographic, boundaries, Right-of-Way, soil profiles and utility information. The basemap shall be used for preliminary and final detailed engineering design. Exhibits of design concepts and alternatives, temporary maintenance of traffic plans and other exhibits shall be prepared for the Town using the basemap as needed.

Task 2 Deliverable

WRMA will provide the Town with a basemap plan drawing of the project site existing conditions, showing the topographic, soils and utility information collected.

TASK 3.0 HYDROLOGIC & HYDRAULIC ANALYSIS

3.1 Hydrologic and Hydraulic Modeling

The ICPR4 model of the Lake Park drainage system will be updated by WRMA to assess hydrology systems, hydraulic networks, and functions of the proposed replacement outfall and green infrastructure facility. The ICPR4 H&H model shall be used for the development of flood control GI/LID based design alternatives. The project GIS database will be extensively applied to delineate sub-basin boundaries and process the selected model hydrologic parameters. Upon generation of final catchment boundaries links and nodes corresponding to hydraulic drainage conveyance elements, flood staging locations will be coded into the ICPR4 model. Stage storage will be provided at selected locations to assess the level of runoff impoundment for various flood levels of service, including the 10-yr/24-hr, 25-yr/72-hr, and the 100-yr/72-hr design storm events.

3.2 Hydrologic and Hydraulic Pump Station Design

WRMA shall perform H&H analysis and design to address the siting of a stormwater pump station that may be required to direct incoming flows from the outfall to the proposed GI water quality detention facility and to offset impacts from sea level rise.

3.3 SIMPLE Modeling and Pollutant Load Reduction

WRMA will code the SIMPLE land use-based pollutant loading model for existing and future land use conditions for the proposed design alternatives using the latest EMC's estimates available from the NPBCID. Future (alternative BMP design) pollutant loadings for this portion of the Town's MS4 contributing area to the LWL receiving water shall be determined. This load reduction information is essential to secure grant funding from the SFWMD/FDEP or FDOT permitting agencies. The Clean Water

Act (CWA) Section 303(d) requires both the USEPA and the FDEP to identify water segments that are currently unable to (or are not expected to) meet water quality standards through the use of technology-based effluent limitations (Lake Worth Lagoon). Pollutant load reductions will be estimated for the proposed LID facilities and pollutant loading reductions will be subtracted from the estimates provided by the NPBCID NPDES program group, thus enhancing the Town's NPDES co-permittee participation program.

3.4 Conceptual/Preliminary Drainage Design Alternatives Analysis

The objective of the conceptual drainage alternative analysis is to site and incorporate a green infrastructure bio-detention basin facility into the ICPR4 model, in order analyze the hydraulic affects of said facility. The GI facility will be designed to treat stormwater runoff from the outfall pipe prior to discharge into the Lake Worth Lagoon. Based on selected level of service criteria, WRMA shall evaluate preliminary drainage design alternatives including:

- Multiple Outfall Pipe Sizes
- Box Structure Configurations
- Outfall Structure Configurations
- Bio-Retention Based Configurations

As previously stated, the objective of the hydraulic modeling activity is to simulate the interception and treatment of a substantial amount of stormwater runoff in a proposed GI facility near the seawall at the Lake Worth Lagoon.

Task 3 Deliverable

WRMA will prepare a technical report for the proposed outfall replacement and GI facility, including all findings of the study and ICPR modeling information and data. The technical report shall provide the basis of design and proof-of-concept for final engineering design and/or development of grant applications in order to acquire funding for further project development, design engineering and construction implementation.

TASK 4.0 PRE-LIMINARY ENGINEERING

4.1 Conceptual Site Planning and Layout

Based on the results of the modeling activities, WRMA will design an engineering plan for the proposed open cut excavation and removal of the existing 72-inch outfall pipe. The concept plan will include plans, sections and profiles of the proposed outfall plan and GI facility. The plan will also identify potential impacts to vehicular and pedestrian traffic, utility relocations, as well as a temporary bypass pumping station. WRMA will prepare alternative site layouts showing the proposed temporary bypass, MOT plan alternatives, proposed pipe replacement and GI facility.

4.2 60% Plans Production

Based on the selected design concept, WRMA will coordinate with the Town of Lake Park, to prepare a set of 60% plans. The selected alternative shall be refined further, and optimized with the H&H model to provide maximum benefits and cost efficiencies. Engineering design of plans, profiles and cross sections shall be developed on plans. The 60% plans shall be used for acquisition of grant funding applications and any applicable permit applications.

4.3 InfraWorks Model Development and Planning Assessment
Following completion of the 60% site plans for the Southern Outfall Replacement Project, WRMA will produce a 3D model in Infraworks. The InfraWorks Model will provide Town Planning Staff and Officials with the ability to view a site rendering of the proposed project phases of construction.

4.4 Engineer's Opinion of Probable Cost
Following completion of the 60% plans, WRMA shall develop a cost estimate for the proposed construction of the replacement outfall pipe and proposed GI facility. The cost estimate will form the basis for grant funding requests from state or federal agencies.

4.5 Utility Coordination
WRMA will communicate and coordinate with existing utilities to determine or identify locations of existing utilities and/or potential utility conflicts with the proposed plans for construction of the outfall replacement project. Any conflicts identified will be explored and analyzed during final engineering.

Task 4 Deliverable
WRMA will provide a 60% plan set to the Town, a cost estimate for construction, and renderings of the proposed pipe replacement and GI facility, as well as a report on any potential utility conflicts, should any be identified. The 60% plans may also be use for acquiring permits or grant applications.

TASK 5.0 FINAL ENGINEERING

5.1 90% Plans
Following comments received from the Town, FDOT and other agencies, WRMA will refine the design plans with additional engineering detail. WRMA shall develop a sequence of construction and technical specifications for the project. Following detailed design, a 90% plan set will be developed. The 90% plans will include any identified utility conflicts, or relocations proposed, the final TTC plan, and temporary bypass plan. The 90% plans will provide, plans, sections and profiles of all proposed features and structures. The 90% plans will also provide a demolition and removal plan, for the former existing bridge located on top of the outfall pipe at Lake Shore Drive.

5.2 Engineer's Opinion of Probable Cost
Following completion of the 90% plans, WRMA shall develop a cost estimate for the proposed construction of the replacement outfall pipe and the GI facility.

5.3 Utility Coordination
WRMA will continue to communicate and coordinate with existing utilities during the final engineering phase to determine or identify locations of existing utilities and/or potential utility conflicts with the proposed plans for construction of the outfall replacement project. Any conflicts identified will be resolved during final engineering.

5.4 Permitting and Grant Applications
WRMA will submit all permit applications needed to construct the project. WRMA will assist with the development of grant applications to fund the construction of the project.

5.5 Final Ready to Advertise Plans and Project Manual

WRMA shall make any final revisions necessary to the construction plans, following a final comment period. All plans and technical specifications shall be compiled into a Project Manual, for inclusion into a bid package in preparation for advertisement during the contractor procurement phase.

5.6 Pre-Bid and Contractor Procurement Technical Support

WRMA will attend the pre-construction meeting for the project and address any contractor RFIs during the bidding process and if needed, assist in the evaluation of bids and determination of the lowest responsive bid. Construction phase services, while not included in this proposal, can be provided by WRMA, under separate proposal.

Task 5 Deliverable

WRMA will provide a Final Ready to Advertise Construction Plans and Technical Specifications, and the project Manual to the Town, including relevant permits, and a detailed cost estimate for construction.

END OF SCOPE OF SERVICES

PART 3.0 OWNER RESPONSIBILITIES

Provide WRMA, with any previous or current As-Built drawings for all areas within the project limits, as well other relevant property records, building permits and inspection documentation of any areas within the project limits. Provide Right-of-Entry to all Rights of Way, drainage, utility, maintenance, and Town owned easements and parcels.

PART 4.0 PERIODS OF SERVICE

August 21, 2020 through August 31, 2021 or until Notice of Final Completion of Services.

PART 5.0 SCHEDULE

Task 1 Deliverables	Deliverable Due
Project Manager's Bi-Weekly Progress Reports	Bi-Weekly
Task 2 Deliverables	**Deliverable Due**
Project Site Basemap of Existing Conditions	60 Days from NTP
Task 3 Deliverables	**Deliverable Due**
72-in Outfall Replacement and GI Facility H&H Study (Technical Report)	90 Days from NTP
Task 4 Deliverables	**Deliverable Due**
60% Plans, Engineers Opinion of Probable Cost, Renderings	150 Days from NTP
Task 5 Deliverables	**Deliverable Due**
Final RTA Plans and Specs, Engineers Opinion of Probable Cost, Permits	210 Days from NTP

PART 7.0 FEES

The proposed Not-to-Exceed fee for this project is **$276,200.00**. This fee includes all direct labor and direct expenses.

A detailed fee schedule and task by task breakdown is attached to this proposal.

WATER RESOURCES MANAGEMENT ASSOCIATES, INC.

TOWN OF LAKE PARK
PROPOSED FEE
SOUTHERN OUTFALL REPLACEMENT AND GREEN INFRASTRUCTURE PROJECT

AUGUST 2020

TASK ITEM AND DESCRIPTION	Sr Prj Mgr $ 125.00	Sr Engineer $ 115.00	Associate Engineer Prj Mgr $ 110.00	Staff Engineer $ 85.00	Engineering Design Technician $ 65.00	Field Inspector $ 80.00	Admin $ 65.00	Total Hours (hrs)	Total Labor Cost (hrs x rate)	Task Subtotal Fee
1.0 PROJECT MANAGEMENT										$ 17,640.00
1.1 Project Management	40		40					80	$ 9,400.00	
1.2 Meetings and Inter-Agency Coordination	24		24				40	88	$ 8,240.00	
2.0 SITE ANALYSIS, PLANNING & COLLECTION OF AS-BUILT INFORMATION										$ 31,680.00
2.1 Collection and Analysis of Utility As-Built Data		8	16	16	40	2		82	$ 6,800.00	
2.2 Coordination of Field Survey Data Collection		8	24	24		2		58	$ 5,760.00	
2.3 Basemap Development		8	40	40	160			248	$ 19,120.00	
3.0 HYDROLOGIC & HYDRAULIC ANALYSIS										$ 39,400.00
3.1 Hydrologic/Hydraulic Modeling		24	40	120				184	$ 17,360.00	
3.2 Hydrologic/Hydraulic Pump Station Design		24	24	40				88	$ 8,800.00	
3.3 SIMPLE Modeling and Pollutant Load Reduction		16	16					32	$ 3,600.00	
3.4 Conceptual/Preliminary Drainage Design Alternatives Analysis		16	40	40				96	$ 9,640.00	
4.0 PRE-LIMINARY ENGINEERING										$ 64,900.00
4.1 Conceptual Site Planning and Layout		16	40	80				136	$ 13,040.00	
4.2 60% Plans		24	40	120	160			344	$ 27,760.00	
4.3 InfraWorks Model Development and Planning Assessment		8	40	80				128	$ 12,120.00	
4.4 Engineers Opinion of Probable Cost		8	40	12				60	$ 6,340.00	
4.5 Utility Coordination		8	40			4		52	$ 5,640.00	
5.0 FINAL ENGINEERING DESIGN										$ 67,560.00
5.1 90% Plans and Technical Specifications		24	40	80	200			344	$ 26,980.00	
5.2 Engineers Opinion of Probable Cost		8	40	40				88	$ 8,720.00	
5.3 Utility Coordination		4	40			8		52	$ 5,500.00	
5.4 Permitting and Grant Application		24	40					64	$ 7,160.00	
5.5 Final Ready To Advertise Plans and Project Manual		8	40	40	40		40	168	$ 13,920.00	
5.6 Pre-Bid and Contractor Procurement Technical Support		8	40					48	$ 5,320.00	
SUBTOTAL DIRECT LABOR										$ 221,200.00
Subconsultant: Topographic, Boundary & Tree Survey									$ 10,000.00	
Subconsultant: Geotechnical Sampling and Testing									$ 12,000.00	
Subconsultant: Subsurface Utility Location									$ 11,000.00	
Subconsultant: Internal CCTV Inspection									$ 7,000.00	
Subconsultant: Landscape Architecture									$ 15,000.00	
SUBTOTAL DIRECT EXPENSES										$ 55,000.00
TOTAL COST										**$ 276,200.00**

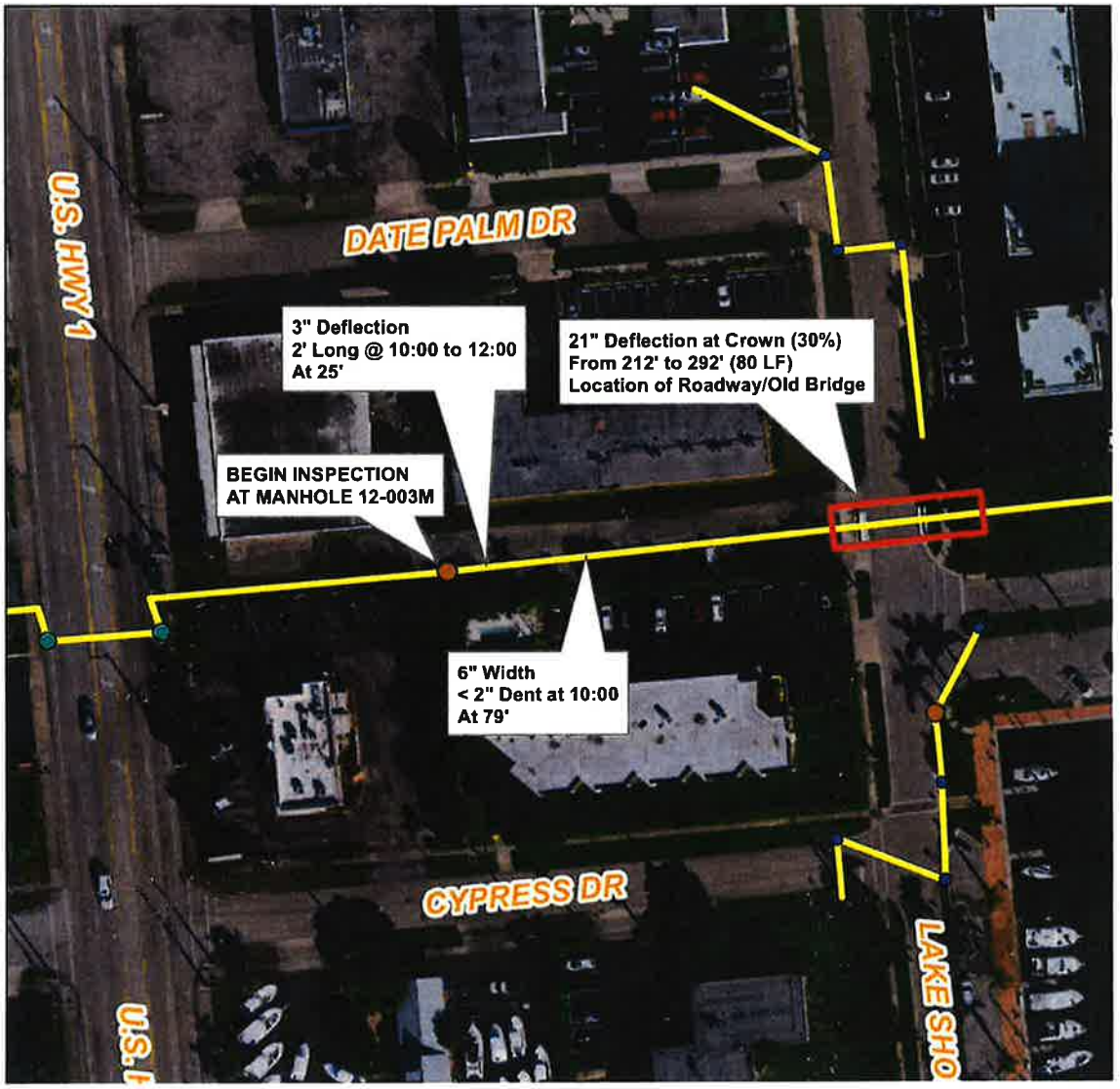

N
75 37.5 0 75 Feet
Legend
Lake Park Stormwater
Description
Headwall
Manhole
Curb Inlet
Gutter Inlet
Ditch Bottom Inlet
Straight Concrete Endwalls
Storm Pipe
U.S. HWY 1
DATE PALM DR
3" Deflection
2' Long @ 10:00 to 12:00
At 25'
21" Deflection at Crown (30%)
From 212' to 292' (80 LF)
Location of Roadway/Old Bridge
BEGIN INSPECTION
AT MANHOLE 12-003M
6" Width
< 2" Dent at 10:00
At 79'
CYPRESS DR
LAKE SHO

Exhibit "B"

TOWN MANAGER COMMENTS

SEPTEMBER 2, 2020 – TOWN COMMISSION MEETING

COVID-19 UPDATE

This is to let you know that according to the Florida Department of Health website there are 146 cases for the Town of Lake Park according to data through 9/1/2020 and as verified as of today at 1:15 a.m.

The Health Care District performed 34 COVID-19 tests at Lake Park Town Hall on Tuesday, September 1. While this number is significantly lower than the number of tests performed at Town Hall in July, it is in line with what the mobile unit has done recently (11 tests were performed on Monday, 55 were performed last Friday, 17 were performed last Thursday, 43 were performed last Wednesday, and 29 were performed last Tuesday; there were no tests performed by the mobile unit on Monday).

COMMUNITY DEVELOPMENT

754 Park Avenue (Dedicated IT/NOBO): On September 1, staff was informed that the contractor was paying the County impact fees and would have the plans back to us in a couple of days. Assuming this is so, the master permit can be issued at the end of this week and full build-out can commence.

Census: The Town has taken many steps to promote the Census. As of 08/31/20, Lake Park's response rate was 57.9%; Palm Beach County 62.2% and the State of Florida 61.6%. Town staff is working on a last push effort. This effort targets our single-family areas that represent the lowest response rates. A trilingual flyer will be mailed to each single-family household within the next week or so with important Census information. The same trilingual flyer will also be distributed to our local Schools, Churches and Non-profits that serve as Census Committee Members, so that they can distribute internally also. Gift cards are also being purchased from local merchants and those who complete the Census will be eligible to win. THE TIME IS NOW! The Census only comes around every TEN YEARS! Let's not miss our opportunity of being granted the necessary funding to support ALL our residents. RESPOND TO THE CENSUS TODAY! It's IMPORTANT, QUICK and completely CONFIDENTIAL!

Boat Sales along Northlake Boulevard: Following the last update provided to the Town Commission, Staff looked into our ability to provide flexibility in our underlying Code a little deeper per the desires to move this forward quickly. With the Northlake Boulevard Overlay in place, Staff has been unable to develop a mechanism that works in conjunction with the Overlay, rather than against it. Consequently, this change must be initiated through the Overlay and Staff is working through this process that will likely take around 3 months from initial scheduling of an Overlay TaskForce meeting to final approval by the Town Commission. The request will be to consider eliminating the minimum 3-acre lot size for boat sale uses. Staff is also working internally with the Town Attorney to determine if the existing 'vehicle sales' definition can be extended to the proposed boat

sales operator for 572 Northlake Boulevard in order to secure this deal and move this project forward quicker.

Nautilus: This landmark mixed-use project is moving forward on schedule. They already received demolition permits and this is in progress. Fencing and signage permits have also been issued. The barge/model is moving forward as well. The master permit for full build-out is still estimated for October or November 2020 however, just recently Staff has been informed that there is an overwhelmingly high demand for luxury mother-in-law suites,that would essentially be standalone units purchased in conjunction with regular units, for family members. Staff has always believed that 'extended units (*also referred to as accessory dwelling units*)' were (and are) in high demand. It has been confirmed by the Nautilus project team that they are also in demand at the higher price points for the luxury units. Consequently, the team will likely submit a site plan amendment soon that will aim to increase the number of units in the project, while keeping the overall square footage, design, heights, the same as originally approved. The units will simply be reconfigured to accommodate an additional 10-15, standalone, mother-in-law units. The parking counts will be updated as well. The overall project value will remain the same and is still estimated to be $180M.

Sewer Special Assessment: Staff is working with Seacoast on identifying the relevant data for all parcels located in our industrial areas that are still on Septic. Special assessments are 'assessed' on a parcel by parcel basis based on the linear feet of frontage of each parcel. There are 55 parcels currently on septic that are being analyzed for these calculations. Once this information is available (within the next two weeks or so), the adequate outreach process will be created and initiated. This is not a quick process, but it has endless economic development benefits once implemented and is long overdue.