City of Jacksonville Beach

11 North Third Street
Jacksonville Beach, Florida

Agenda

Community Redevelopment Agency

Monday, May 22, 2017 **5:00 PM** **Council Chambers**

MEMORANDUM TO:

Members of the Community Redevelopment Agency
City of Jacksonville Beach, Florida

Board Members:

The following Agenda of Business has been prepared for consideration and action at the Regular Meeting of the Community Redevelopment Agency.

CALL TO ORDER

ROLL CALL

Art Graham (Chairperson), Frances Povloski (Vice-Chairperson), Scott Gay, Jeffrey Jones, Cory Nichols

APPROVAL OF MINUTES

a. Regular Community Redevelopment Agency Meeting Held April 24, 2017

OLD BUSINESS

NEW BUSINESS

a. **Resolution No. 2017-04** - Amending the South Beach Community Redevelopment District Capital Improvement Budget for the fiscal year beginning October 1, 2016 and ending September 30, 2017 to appropriate $440,936.04 (including 15% contingency) from South Beach Tax Increment Trust Funds for required stormwater repairs identified during the cleaning and televising of the underground piping components of the South Beach master stormwater system (Part A of Bid #1516-0) and providing an effective date.

INFORMATION ITEM

a. ***Jones Edmunds*** **Alternatives Analysis -** Canal Improvements Along Marsh Landing Parkway

COURTESY OF THE FLOOR TO VISITORS

ADJOURNMENT

NOTICE

In accordance with Section 286.0105, Florida Statutes, any person desirous of appealing any decision reached at this meeting may need a record of the proceedings. Such person may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based.

The public is encouraged to speak on issues on this Agenda that concern them. Anyone who wishes to speak should submit the request to the recording secretary prior to the beginning of the meeting. These forms are available at the entrance of the City Council Chambers for your convenience.

In accordance with the Americans with Disabilities Act and Section 286.26, Florida Statutes, persons with disabilities needing special accommodation to participate in this meeting should contact the City Clerk's Office at (904) 247-6299, extension 10, no later than one business day before the meeting.

cc: George D. Forbes, City Manager; Susan Erdelyi, City Attorney; Press

City of Jacksonville Beach

11 North Third Street
Jacksonville Beach, Florida

Draft Meeting Minutes

Community Redevelopment Agency

Monday, April 24, 2017 **5:00 PM** **Council Chambers**

CALL TO ORDER

Chairperson Graham called the meeting to order at 5:00 P.M.

ROLL CALL

Present: 5- Chairperson, Art Graham
Vice Chairperson, Frances Povloski
Mr. Scott Gay
Mr. Jeffrey Jones
Mr. Cory Nichols

Also present were CRA Administrator William Mann, Deputy City Manager Trish Roberts, Parks and Recreation Director Jason Phitides, and Recording Secretary Chandra Medford.

APPROVAL OF MINUTES

a. Special Community Redevelopment Agency Meeting Held November 28, 2016

It was moved by Mr. Nichols, and seconded by Mrs. Povloski, and passed unanimously by voice vote, to approve the November 28, 2016 meeting minutes as presented.

b. Regular Community Redevelopment Agency Meeting Held March 27, 2017

It was moved by Mrs. Povloski, and seconded by Mr. Nichols, and passed unanimously by voice vote, to approve the March 27, 2017 meeting minutes as presented.

OLD BUSINESS

There was no old business.

NEW BUSINESS

a. **Resolution No. 2017-02** - Amending the South Beach Community Redevelopment District Capital Improvement Budget for the fiscal year beginning October 1, 2016 and ending September 30, 2017 to appropriate $8,338 (including 15% contingency) from South Beach Tax Increment Trust Funds for the Aquatics Engineering Design and Construction Documents Production for the Splash Pad Modification project and providing an effective date.

It was moved by Mr. Nichols and seconded by Mrs. Povloski, to approve CRA Resolution No. 2017-02. After a brief discussion, the motion carried unanimously by roll call vote.

Mr. Mann stated this proposal was requested by a City Councilman who expressed desire to have an activity area suitable for smaller children as part of the water feature that is in the park now. He explained if approved, the project would cost in the range of $50,000 to $70,000, dependent upon the types of features and maintenance.

b. **Resolution No. 2017-03** - Amending the Downtown Community Redevelopment District Capital Improvement Budget for the fiscal year beginning October 1, 2016 and ending September 30, 2017 to appropriate $28,699 (including 10% contingency) from Downtown Tax Increment Trust Funds for the Engineering Design and Construction Documents Production for Three Replacement ADA Compliant Dune Walkover Structures.

It was moved by Mr. Jones, and seconded by Mr. Gay, to approve CRA Resolution No. 2017-03. After a short discussion, the motion carried unanimously by roll call vote.

Mr. Mann provided a brief explanation of the necessity of replacing three of the Downtown dune walkover structures following the Hurricane Mathew storm event. He stated that the balance of the damaged walkover structures have been repaired, but the three walkovers located at the Pier parking lot, Latham Plaza, and Oceanfront Park, all ADA accessible structures, were more significantly damaged following Hurricane Mathew, and are in need of re-design and rebuilding. Stephen Swan, of *Applied Technology Management, Inc*., 415 Pablo Avenue explained the walkover design includes complex geometry and handrail design to alleviate possible lawsuits for lack of compliance with ADA regulations.

INFORMATION ITEMS

COURTESY OF THE FLOOR TO VISITORS

No one wished to speak under Courtesy of the Floor.

ADJOURNMENT

There being no further business, Mr. Graham adjourned the meeting at 5:16 P.M.

Submitted by: Chandra Medford, Recording Secretary

Approval:

_____
Art Graham, Chairperson

Date: _____

City of
Jacksonville Beach
City Hall
11 North Third Street
Jacksonville Beach
FL 32250
Phone: 904.247.6231
Fax: 904.247.6107
Planning@jaxbchfl.net

www.jacksonvillebeach.org

MEMORANDUM

TO: Jacksonville Beach Community Redevelopment Agency Members

FROM: Bill Mann, Planning and Development Director, CRA Administrator

RE: May 22, 2017 Community Redevelopment Agency Meeting

DATE: May 15, 2017

Please consider the following information and staff recommendations relative to the following items to be discussed and/or acted upon at the upcoming May 22, 2017 meeting:

1. **Resolution No. 2017-04** – With this resolution the Community Redevelopment Agency (CRA) funds required repairs to the portions of the South Beach master stormwater system that were recently cleaned and televised by City contractors.

   One of the main objectives of the "Stormwater Pipe Cleaning, Alternatives Analysis, and Re-design of Channel Improvements" project approved last year by the CRA via Resolution 2016-09 was to determine whether or not any repairs were required to the newly cleaned and televised portions of the stormwater system. Attached to this memo, along with Resolution No. 2017-04, is a memo to the CRA Administrator from City Engineer Martin Martirone describing the required repairs and their associated cost in more detail.

   Staff recommends approval of Resolution No. 2017-04.

   Attachments: *CRA Resolution No. 2017-04*
   May 9, 2017 memo to CRA Administrator from Martin Martirone, Public Works Engineer

2. **Discussion Item**

   At the August 10, 2016 meeting, the CRA approved Resolution 2016-10, approving funding for the "Stormwater Pipe cleaning, Alternatives Analysis and Redesign of Channel Improvements" project. Part A of that project was the cleaning of certain components of the existing stormwater system, and Part B was the analysis of alternatives to the costly and rejected proposal to sheet pile the open channel portion of the stormwater system, along the north side of Marsh Landing Parkway, just east of South Beach Parkway.

The attached technical memorandum from *Jones Edmunds* engineers serves as the initial results of Part B of the work authorized by Resolution 2016-10. Martin Martirone, Public Works Engineer, and a representative from *Jones Edmunds* will be at the May 22, 2017 CRA meeting to review and discuss the results of their alternatives analysis, and the estimated cost of the preferred of the three studied alternatives.

CRA RESOLUTION NO. 2017-04

A RESOLUTION OF THE CITY OF JACKSONVILLE BEACH COMMUNITY REDEVELOPMENT AGENCY TO AMEND THE SOUTH BEACH CAPITAL IMPROVEMENT BUDGET FOR THE FISCAL YEAR BEGINNING OCTOBER 1, 2016 AND ENDING SEPTEMBER 30, 2017; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, contractors for the City of Jacksonville Beach have performed the required cleaning and televised inspection of twin 72-inch stormwater pipes running under the *South Beach Regional Shopping Center* property between Jacksonville Drive and J. Turner Butler Boulevard, an eight-foot by seven-foot box culvert running under J. Turner Butler Boulevard, and an eight-foot by six-foot box culvert running under the South Beach Parkway Shopping Center, have identified repairs necessary to maintain and improve the proper functioning of that stormwater system, and

WHEREAS, the City of Jacksonville Beach Community Redevelopment Agency (CRA) met in an open meeting on May 22, 2017 to review and consider a budget amendment to appropriate funds for the performance of the necessary repair work to the existing stormwater system identified in the course of completing Part A of the "Stormwater Pipe Cleaning, Sheet Pile Channel and Related Improvements in the South Beach Parkway/Jacksonville Drive Vicinity (Parts A and B)" project approved for funding by the CRA on July 11, 2016 via Resolution No. 2016-09, and

WHEREAS, the identified repair work to said existing stormwater system is deemed necessary by City engineers to ensure the integrity and positive drainage flow of that system and can most economically and expediently be performed by the City's contractors currently deployed and completing said Part A project work, and

WHEREAS, the CRA specified the use of South Beach Tax Increment Trust Funds for this project, and

WHEREAS, the City of Jacksonville Beach Community Redevelopment Agency has sufficient South Beach Community Redevelopment Tax Increment Trust Fund revenues to pay for the required construction and construction administration work:

NOW, THEREFORE, BE IT RESOLVED BY THE JACKSONVILLE BEACH COMMUNITY REDEVELOPMENT AGENCY THAT:

SECTION 1. The fiscal year 2016-2017 South Beach Community Redevelopment Capital Improvement Budget for the Jacksonville Beach Community Redevelopment Agency is amended to appropriate $440,936.04 ($383,422.64, plus $57,513.40 (15%) Contingency) for the "Stormwater Pipe Cleaning, Sheet Pile Channel and Related Improvements in the South Beach Parkway/Jacksonville Drive Vicinity (Parts A and B)" project.

SECTION 2. This resolution shall take effect upon its adoption.

DULY ADOPTED IN OPEN MEETING THIS 22nd Day of May, 2017.

Art Graham, CHAIRPERSON

William C. Mann, ADMINISTRATOR

JACKSONVILLE BEACH

City of
Jacksonville Beach
Operations &
Maintenance Facility
Department of Public
Works
1460-A Shetter Avenue
Jacksonville Beach
FL 32250
Phone: 904.247.6219
Fax: 904.247.6117

www.jacksonvillebeach.org

May 9, 2017

TO: Bill Mann, Administrator, Community Redevelopment Agency

FROM: Marty Martirone, City Engineer

SUBJECT: Appropriate South Beach Tax Increment Trust Funds for Additional Stormwater Repairs for Bid #1516-11, Part A Stormwater Pipe Cleaning Project in the vicinity of South Beach Parkway and Jacksonville Drive

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ACTION REQUESTED:

Appropriate funding for additional stormwater repairs for Unit Price Bid #1516-11, Part A, Stormwater Pipe Cleaning, in the vicinity of South Beach Parkway and Jacksonville Drive.

BACKGROUND:

This project is part of the South Beach Redevelopment District Improvements Program. On August 10, 2016, the Agency approved Resolution 2016-10 appropriating funding in the amount of $726,668 for the "Stormwater Pipe Cleaning, Alternatives Analysis and Re-design of Channel Improvements.

Part A of Bid # 1516-11**,** Stormwater Pipe Cleaning, was awarded to the lowest qualified bidder, *Jax Utilities Management, Inc*. in the amount of $540,533.40. With a 10% contingency, the total construction cost for Part A was $594,586.74.

Part A work included:

- Cleaning, televising and disposing of debris from 1,910 LF of 72-inch diameter concrete pipes under South Beach Regional Shopping Center
- Cleaning, televising and disposing of debris from 580 LF of 8 x 7 foot box culverts under J.T.B. Boulevard
- Cleaning, televising and disposing of debris from 1,480 LF of 8x6 foot box culverts under the South Beach Parkway Shopping Center

An objective of the Part A work was to review the condition of the existing stormwater piping system to determine whether any repairs are required. After completing the cleaning and televising of the existing stormwater piping, additional repairs of pipe leaks and ditch cleaning were determined to be necessary to ensure the integrity of the existing stormwater piping system and positive drainage flow. A breakdown of the additional repair costs is indicated in the table below.

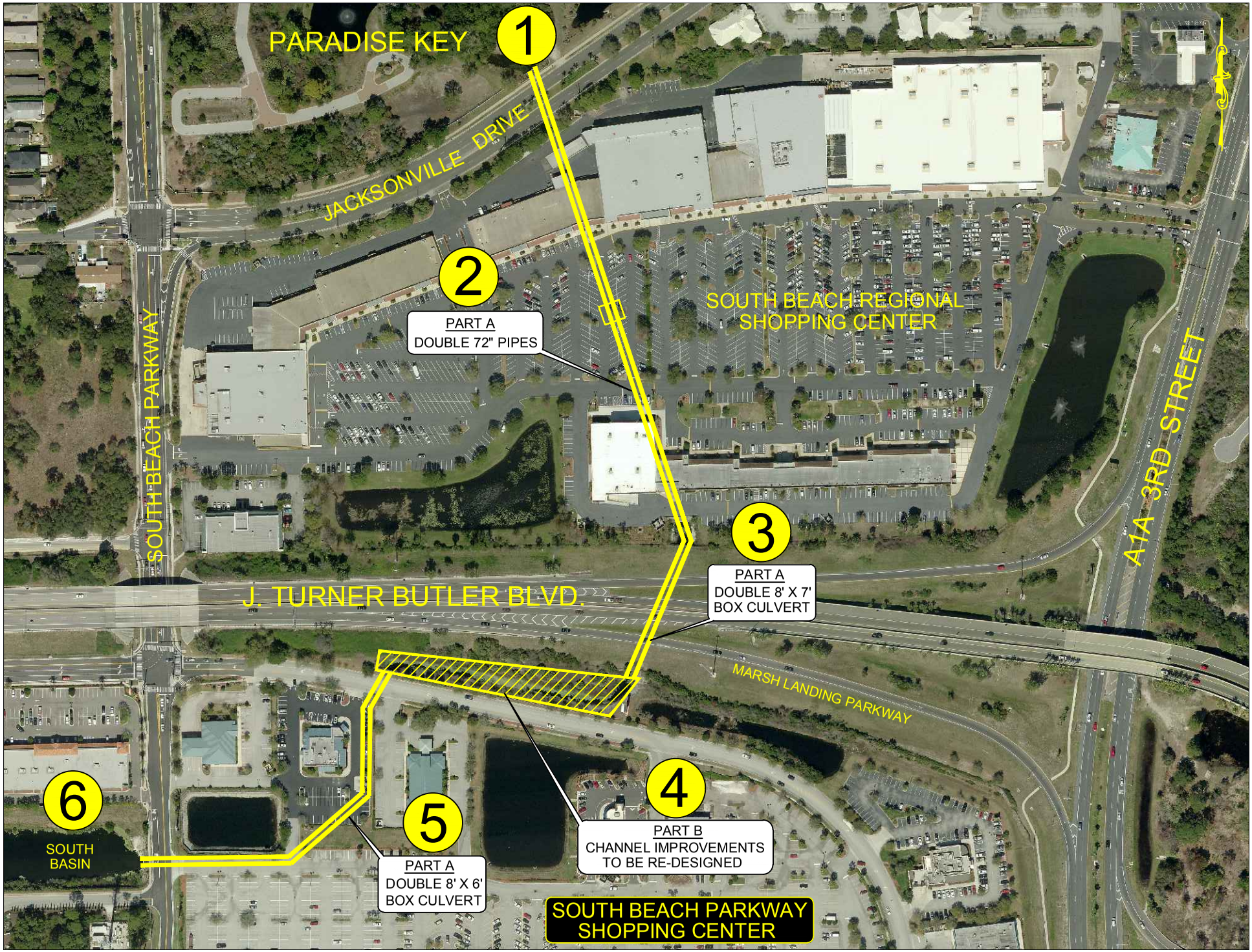
Unit Price Bid #1516-11 Additional Repair Costs for Part A, Stormwater Pipe Cleaning Project in the vicinity of South Beach Parkway and Jacksonville Drive		
DESCRIPTION	COST	RECOMMENDATION
1.North of Jacksonville Drive at Paradise Key: Excavate area, install filter fabric and concrete riprap and haul material to landfill (if necessary)	$36,393.00	
2. 72-Inch Concrete Pipes Under South Beach Regional Shopping Center: Repair leaking pipe joints, operating (pump/fuel) costs, air quality control	$137,477.50	
3. 8x7 foot Box Culverts under J.T.B. Blvd.: Additional cleaning due to the increased depth of debris material and operating (pump/fuel) costs	$53,282.93	
4. Outfall Ditch between J.T.B. Boulevard and Marsh Landing Parkway: Remove underbrush and trees, ditch cleaning, clean and remove existing fabriform lining and haul material to landfill	$97,311.50	
5. 8x6 Box Culverts under South Beach Parkway Shopping Center: Repair leaking joints, spalling pipes/joints, cracks, settled sections and air quality control	$103,053.05	
6. South Basin Access Ramp: Additional erosion fabric, #57 stone and concrete riprap at east side of basin	$9,958.00	
Subtotal Additional Costs	$437,475.98	
Existing Contingency	($54,053.34)	
Subtotal Additional Funds	$383,422.64	The Agency appropriate South Beach Tax Increment Trust funds for additional repairs for Part A work
15% Contingency	$57,513.40	
TOTAL ADDITIONAL FUNDS	**$440,936.04**	

With this memorandum, staff requests the Agency appropriate additional funding in the amount of $440,936.04 including a 15% contingency for additional piping and ditch repairs for Part A work related to Bid #1516-11.

Pending funding approval by the Agency, the City will change order the work to the existing contract for Part A of Bid # 1516-01**,** Stormwater Pipe Cleaning, with *Jax Utilities Management, Inc*. for $440,936.04.

RECOMMENDATON:

Appropriate additional South Beach Tax Increment Trust funds in the amount of $440,936.04 for additional piping and ditch repairs for Part A of Bid # 1516-01, Stormwater Pipe Cleaning, as described in the memorandum to the Agency Administrator from the City Engineer dated May 9, 2017.


PARADISE KEY
1
JACKSONVILLE DRIVE
2
PART A
DOUBLE 72" PIPES
SOUTH BEACH REGIONAL
SHOPPING CENTER
SOUTH BEACH PARKWAY
A1A 3RD STREET
3
PART A
DOUBLE 8' X 7'
BOX CULVERT
J. TURNER BUTLER BLVD.
MARSH LANDING PARKWAY
4
PART B
CHANNEL IMPROVEMENTS
TO BE RE-DESIGNED
5
PART A
DOUBLE 8' X 6'
BOX CULVERT
6
SOUTH
BASIN
SOUTH BEACH PARKWAY
SHOPPING CENTER

McVEIGH&MANGUM
ENGINEERING · INC

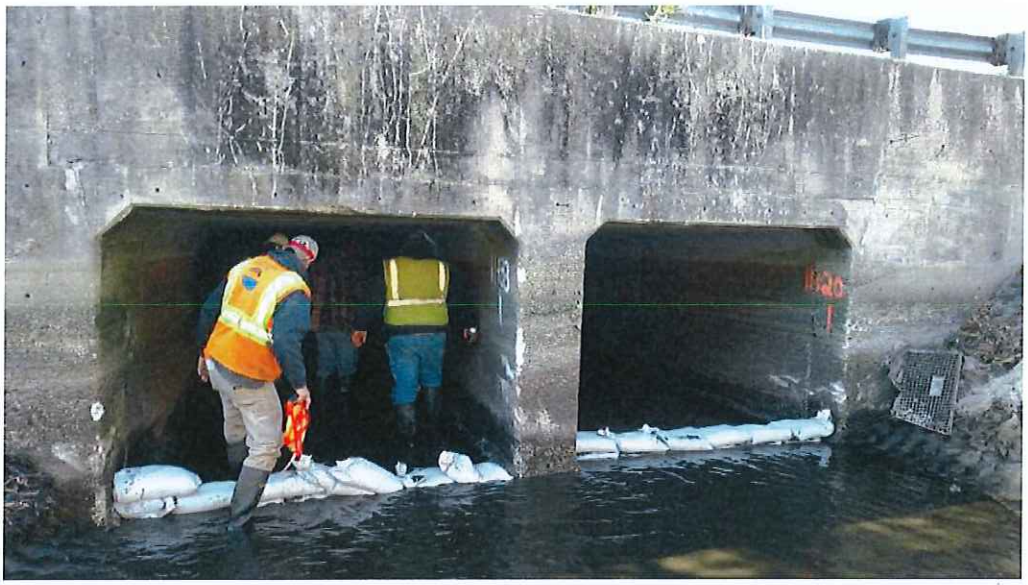
MARSH LANDING
BOX CULVERT
VISUAL OBSERVATION

Prepared for:

Jax Utilities Management, Inc
5465 Verna Blvd
Jacksonville, FL

May 5, 2017

MME # 17068



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I. EXECUTIVE SUMMARY

McVeigh & Mangum was tasked with performing a site observation of two double-box culverts. One of the culverts cuts the corner between South Beach Parkway and Marsh Landing below the parking lot of Longhorn's Steakhouse. The second culvert is below J Turner Butler Blvd. Our office also reviewed video that was taken of a 72 inch pipe below the South Beach Regional Shopping Center north of JTB Blvd. We were asked to observe the condition of the culverts and pipes and to help determine whether repairs were required.

A. Intent

This report is intended to document our observations of the conditions of the existing box culverts and pipes, and provide our professional opinions and recommendations for maintenance or repairs. Our findings are documented in this report.

Professional Structural Engineering Opinion

- Perform spall repairs at the joints in the culvert sections and at the intersecting pipes
- Remove and replace the spalled areas of cast-in-place concrete
- Perform grout sealing and spall repair at the locations where the culvert sections have settled. Install crack gauge to monitor for additional future settlement
- Perform grout sealing at the pipe joints that have opened
- Perform spall repairs at the joints in the pipes
- Provide a yearly observation program for the culverts and pipes

B. Summary

The culvert below Longhorn's had multiple locations where there was a spall at the joint between sections. There were other locations where it appeared that the section of culvert had settled. There was spalling of the culvert at two locations where pipes connected to the culvert. There were a couple areas where there was cast-in-place concrete that was heavily spalled. The culvert below JTB Blvd had cracks at multiple locations. The pipes below the shopping center have open joints that need to be sealed and a few concrete spalls.

C. Recommendations

Based on the visual observation, various recommended repairs and maintenance items have been identified in the report for the box culverts and pipes. These repair items include spall repair, removal and replacement of concrete, grout injection, epoxy injection, joint sealant, and monitoring for additional settlement. It is recommended that yearly visual inspections be performed by a registered Professional Engineer to assess the condition of the culvert and identify repair conditions.

Please feel free to contact our office if you have any questions regarding this report.

Sincerely,

Timothy Moore, P.E.
Structural Engineer
McVeigh & Mangum Engineering, Inc.

II. INTENT

This report is intended to document our observations of the conditions of two existing double-box culverts between South Beach Parkway and Marsh Landing below the parking lot of Longhorn's Steakhouse and below J Turner Butler Blvd and the 72 inch pipes below the South Beach Regional (SBR) Shopping Center, and provide our professional opinions and recommendations for maintenance or repairs.

III. SITE VISIT & VIDEO REVIEW

I performed the site visit on March 16, 2017 and on April 11, 2017 to perform visual observations of the two box culverts. It is our understanding that the culvert below Longhorn's was installed about 25 years ago in two phases. The first phase was the section under South Beach Parkway. This section is a double-box cast-in-place culvert and each side of the culvert was approximately 8' wide by 8' tall. The second phase was the section below the parking lot. This section is a double-box culvert constructed in 2 halves with 10' long sections of precast pieces with an upper and lower piece for each half. Each side of the culvert measured approximately 8' wide by 6' tall. The second double box culvert was installed in one phase. It is 7' wide by 8' tall and is monolithic cast-in-place concrete.

We received video, taken by a remotely operated vehicle, of the four sections of 72 inch pipe from Jax Utilities Management, Inc. on April 24, 2017. The pipes have a 72 inch inner diameter and are precast concrete and was built in sections of approximately 8 feet long. There are two pipes that run parallel to each other from a retention pond on the north side of JTB, north-northwest below the SBR Shopping Center to a retention pond north of Jacksonville Dr.

The observations have been separated between the two sections of culverts and the pipes.

A. South Beach Pkwy Culvert:

- The corners of the precast culvert pieces were spalled at the vertical joints of the precast pieces at multiple locations throughout (photo 1);
- There was spalling at the bottom and top horizontal joint of the precast pieces at the locations where the culvert settled (photo 2);
- There was spalled concrete at the locations where the pipes intersected the culvert (photo 3, 4);
- The cast-in-place concrete at the transition between the 8' tall and the 6' tall sections of culvert has spalled (photo 5);
- The cast-in-place concrete that was used to bridge/close gaps between sections of the culvert have spalled (photo 6);
- There is a leak below the pipe that intersects the culvert from the south (photo 7);
- There is water leaking at the one of the top horizontal joints between sections of culvert that have settled (photo 8);
- There are multiple cracks less than 1/8" wide in the cast-in-place section of the culvert that are leaking (photo 9)

B. JTB Culvert:

- There are multiple cracks less than 1/8" wide that are leaking (photo 9);

C. SBR Shopping Center Pipes:

- There are multiple joints that have widened (photo 10);
- There are multiple locations where there is a spall at the joint (photo 11);
- There are multiple joints where the sealer is loose or has fallen out (photo 12).

IV. RECOMMENDATIONS

McVeigh & Mangum was asked to document our observations of the existing conditions at the existing box culverts and pipes and provide our professional opinions and recommendations for maintenance or repairs. The recommended repair items are listed below.

For Culverts:					
General Description of Deficiency	**Repair Procedure and Products (See Note 1)**	**Remarks**	**Quantity**	**Unit cost**	**Total cost**
Spalling at the Joints	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar	Apply repair mortar in multiple lifts per the manufacturer's instructions	50		
Spalling at the Pipes	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar. Cut existing exposed rebar so that it will not be exposed when the concrete repair is complete.	Apply repair mortar in multiple lifts per the manufacturer's instructions	2		
Spalling of Cast-in-place Concrete	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar.	Apply repair mortar in multiple lifts per the manufacturer's instructions	10		
Settled Section of Culvert	Install MasterSeal 595 to seal the joint. Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar.	Apply joint filler material per the manufacturer's instructions. Install a crack gauge at the joint to monitor if settlement is ongoing.	6		
Leak Below Pipe	Install MasterSeal 595 to seal the joints of the pipe. Pressure inject Avanti AV-275 grout below the pipe.	Apply joint filler material per the manufacturer's instructions.	1		
Crack in Cast-in-Place Concrete	Pressure inject AV-202-LV Multigrout to seal the crack	Apply injection material per the manufacturer's instructions	34		
Leaking joint between precast sections	Pressure inject AV-248-LV Flexseal to seal the crack	Apply injection material per the manufacturer's instructions	8		
Widened joint between precast sections	Install MasterSeal 595 to seal the joints of the pipe	Apply joint filler material per the manufacturer's instructions.	4		

Spalling of bottom joint at precast sections	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar	Apply repair mortar in multiple lifts per the manufacturer's instructions	5		

For Pipes:					
General Description of Deficiency	**Repair Procedure and Products (See Note 1)**	**Remarks**	**Quantity**	**Unit cost**	**Total cost**
Leaking joint greater than 1/2"	Install MasterSeal 595 to seal the joints of the pipe	Apply joint filler material per the manufacturer's instructions.	100		
Leaking joint up to 1/2"	Pressure inject AV-248-LV Flexseal to seal the crack	Apply injection material per the manufacturer's instructions	70		
Spalling Concrete at joints	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar & install AV-248-LV Flexseal to seal the joint of the pipe	Apply repair mortar in multiple lifts per the manufacturer's instructions and apply joint filler material per the manufacturer's instructions.	16		

Repair Notes:

1) Contractor may propose an alternate repair product with accompanying manufacturer's literature showing that the proposed product exceeds the published properties of the product specified;
2) Application of crack filler and repair mortar shall be in strict accordance with the manufacturer's literature;
3) Crack sealer paste used in the pressure injection process shall be removed completely from the surface of the concrete upon completion of the crack repair;
4) Take precautions necessary to isolate area of repair during repair program;
5) Contractor to remove all corrosion for repairs with exposed steel without damaging steel in the process.
6) ¼" diameter dowels shall be drilled and epoxied into existing concrete at 6" on center at spalls that are larger than 4" deep. Min embedment is 2" using Hilti HY200. Maintain a 3" cover between the dowels and the edge of concrete;
7) The crack gauge can be either a "corner crack gauge" or a "displacement crack gauge" by Humboldt Manufacturing Co.

V. PHOTOS

Photo 1: Spall at joint in precast culvert sections

Photo 2: Spalling at bottom joint in precast culvert sections

Photo 3: Spalling at top of intersecting pipe

Photo 4: Spalling at top of intersecting pipe

Photo 5: Cast-in-place concrete joint at transition between 6' and 8' culvert sections

Photo 6: Spalled cast-in-place concrete at joint

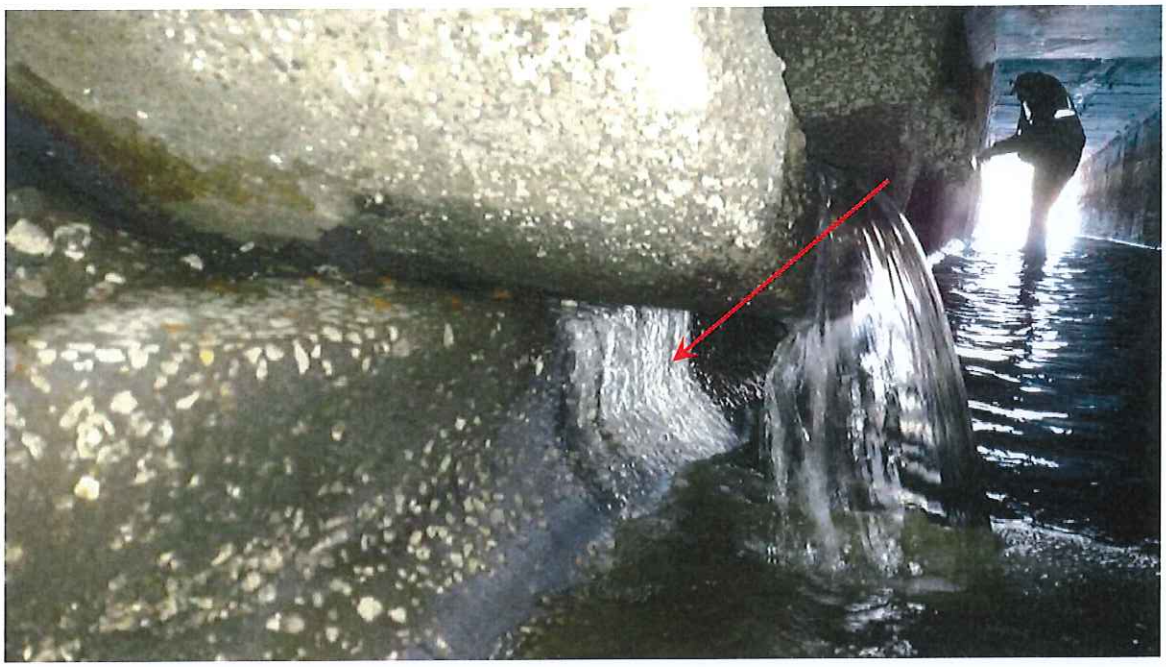

Photo 7: Existing leak below intersecting pipe

Photo 8: Joint with leak at location of settled section

Photo 9: Crack in cast-in-place culvert

Photo 10: Joint in pipe with silt

Photo 11: Spall at pipe joint

Photo 12: Loose and missing joint sealant between pipe sections

For Culverts:

General Description of Deficiency	Repair Procedure and Products (See Note 1)	Remarks	Unit	Est. Quantity	Cost per Unit	Total Cost
Spalling at the Joints - 50 Repairs @ 3' SqFt per Repair	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar	Apply repair mortar in multiple lifts per the manufacturer's instructions	SqFt	150	$165.00	$24,750.00
Spalling at the Pipes -2 Repairs @ 2' SqFt per Repair	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar. Cut existing exposed rebar so that it will not be exposed when the concrete repair is complete.	Apply repair mortar in multiple lifts per the manufacturer's instructions	SqFt	4	$275.00	$1,100.00
Spalling of Cast-in-place Concrete - 10 Repairs @ 3'SqFt per Repair	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar.	Apply repair mortar in multiple lifts per the manufacturer's instructions	SqFt	30	$165.00	$4,950.00
Settled Section of Culvert - 6 Repairs @ 28'LF per Repair	Install MasterSeal 595 to seal the joint. Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar.	Apply joint filler material per the manufacturer's instructions. Install a crack gauge at the joint to monitor if settlement is ongoing.	LF	168	$62.00	$10,416.00
Leak Below Pipe - 1 Repair @ .5' SqFt per Repair	Install MasterSeal 595 to seal the joints of the pipe. Pressure inject Avanti AV-275 grout below the pipe.	Apply joint filler material per the manufacturer's instructions.	SqFt	1	$2,729.00	$2,729.00
Crack in Cast-in-Place Concrete - 34 Repairs @ 16.21'LF per Repair	Pressure inject AV-202-LV Multigrout to seal the crack	Apply injection material per the manufacturer's instructions	LF	551.14	$37.01	$20,397.69
Leaking joint between precast sections - 8 Repairs @ 28'LF per Repair	Pressure inject AV-248-LV Flexseal to seal the crack	Apply injection material per the manufacturer's instructions	LF	224	$59.00	$13,216.00

Widened joint between precast sections - 4 Repairs @ 28'LF per Repair	Install MasterSeal 595 to seal the joints of the pipe	Apply joint filler material per the manufacturer's instructions.	LF	112	$49.28	$5,519.36
Spalling of bottom joint at precast sections - 5 Repairs @ 3' SqFt per Repair	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar	Apply repair mortar in multiple lifts per the manufacturer's instructions	SqFt	15	$165.00	$2,475.00
					Total	$85,553.05

For Pipes:						
General Description of Deficiency	**Repair Procedure and Products (See Note 1)**	**Remarks**	**Unit**	**Est. Quantity**	**Cost per Unit**	**Total Cost**
Leaking joint greater than 1/4" - 100 Repairs @ 18.84' LF per Repair	Install MasterSeal 595 to seal the joints of the pipe	Apply joint filler material per the manufacturer's instructions.	LF	1884	$23.88	$44,989.92
Leaking joint up to 1/4" - 20 Repairs @ 18.84'LF per Repair	Pressure inject AV-248-LV Flexseal to seal the crack	Apply injection material per the manufacturer's instructions	LF	376.8	$117.25	$44,179.80
Spalling Concrete at joints - 16 Repairs @ 3'SqFt per Repair	Remove cracked and/or spalled concrete and repair with Sikatop 123 Repair Mortar & install AV-248-LV Flexseal to seal the joint of the pipe	Apply repair mortar in multiple lifts per the manufacturer's instructions and apply joint filler material per the manufacturer's instructions.	SqFt	48	$483.33	$23,199.84
					Total	$112,369.56

**** Note - Bypass Pumping is NOT included in these prices; Ditch must be repaired so water can flow to south basin ****

There will be a $35,000 minimum required in order to honor these prices due to daily costs accrued for air quality control.

TECHNICAL MEMORANDUM

Canal Improvements Along Marsh Landing Parkway, Jacksonville Beach, FL

TO: Martin Martirone, PE, City Engineer, City of Jacksonville Beach

FROM: Abraham Chabab, PE, Engineer, Jones Edmunds

CC: Walter A. Nickel, PE, Project Manager, Vice President, Jones Edmunds
Brian F. Hepburn, MPA, Client Manager, Jones Edmunds
Brian Icerman, PE, Department Manager, Jones Edmunds

DATE: February 10, 2017

SUBJECT: Canal Improvements Along Marsh Landing Parkway, Jacksonville Beach, FL
Jones Edmunds Project No. 09803-031-04

1 INTRODUCTION

The objective of this Preliminary Engineering Report (PER) is to document the findings of the engineering assessment and to provide conceptual design plans and a summary of estimated construction cost for the City of Jacksonville Beach canal improvements along Marsh Landing Parkway. Jones Edmunds & Associates, Inc. conducted preliminary design analysis and prepared conceptual plans for three possible alternatives for the canal improvements. These alternatives will be reviewed by the City of Jacksonville Beach and subsequently by the Florida Department of Transportation (FDOT) and St. Johns River Water Management District (SJRWMD). The reviews will determine the most viable alternatives to be designed.

Each of the three alternatives, listed below, is discussed in detail in Section 3 of this report:

1. Fabriform Articulating Block (AB) Mat
2. Precast Modular Retaining Wall
3. Standard Precast Concrete Box Culvert

This report will also serve as the initial document of record to move this project forward into the engineering design and to support the subsequent engineering decisions as the project advances through design and into the construction phases.

2 EXISTING CONDITIONS

The canal is located at the southeast corner of J. Turner Butler Boulevard and South Beach Parkway, along Marsh Landing Parkway. Existing 8-foot-by-7-foot double box culverts lie to the north under J. Turner Butler Boulevard. To the south, the canal connects to existing 8-foot-by-6-foot double box culverts under Marsh Landing Parkway and continues under parking areas between LongHorn Steak House and Mayo Primary Care Center before eventually discharging into South Basin. Canal banks have Fabriform at both ends for a distance of about 100 feet; the Fabriform is covered with heavy vegetation.

Water level at the canal was observed at elevation 2.0 NGVD on September 16, 2016. Loosened and suspended soil has been accumulating in the downstream box culverts. This accumulation is due to a change of flow direction, which has increased the scour effects where the canal intersects with box culverts underneath Marsh Landing Parkway.

3 CONSTRUCTION ALTERNATIVES

Jones Edmunds has prepared preliminary plans and sections for each alternative, along with construction cost estimates and maintenance and life cycle cost evaluations, and included them with this report as Exhibits:

- Exhibit A – Fabriform AB Mat Plans
- Exhibit B – Precast Modular Retaining Wall Plans
- Exhibit C – Standard Precast Concrete Box Culvert Plans
- Exhibit D – Cost Estimates
- Exhibit E – Life-Cycle Cost Comparison

Our analyses of the three alternatives are presented in the sections that follow.

3.1 ALTERNATIVE 1 – FABRIFORM AB MAT

AB revetment fabric is a form for casting in place heavy-duty, rectangular concrete blocks in a staggered joint pattern. AB revetments are reinforced by cables inserted between the two layers of fabric before fine aggregate concrete (grout) injection. Reinforcing cables interlock the cast-in-place concrete blocks when the AB revetment articulates due to changing soil and water conditions. AB revetment fabrics are a woven, double-layered fabric of 100-percent high-tenacity, multifilament nylon, of which at least 50 percent by weight consists of textured fibers for optimum filtering characteristics and adhesion to the grout. Nylon yarns also provide a relatively high resistance to ultraviolet light and alkali degradation. Block thickness is controlled by spacer cords in the middle of each block. Lateral flow of grout is controlled by shop-installed bulkheads (grout stops) located at predetermined intervals as required. The AB revetment fabric is shop-assembled in predetermined panel sizes to fit site topography. The panels are convenient to handle and are joined together side-by-side at the job site by means of sewing or zipper closures attached to both the upper and lower layers of fabric. Reinforcing cables, which are installed perpendicular to block length, are referred to as “slope cables.” Transverse cables, parallel to block length, are also inserted.

Exhibit A shows plan view and sections of the Fabriform and sheet piling locations. Steel sheet piling was incorporated into the design due to a sharp turn connection where the Fabriform cannot meet the slope requirement of 2 to 1 and no additional right-of-way is available.

3.1.1 CONSTRUCTION COST

All unit prices are based on 12-month moving statewide averages and recent bids received by Jones Edmunds. The estimated construction cost for this alternative is $2.15 million. This cost estimate does not include engineering design services or permitting. A detailed cost estimate is included as Exhibit D.

3.1.2 PERMITTING

A pre-design meeting was held with FDOT Drainage Engineers and discussions with SJRWMD were held regarding permitting. Based on discussions with both agencies and model runs completed during this phase we believe a permit is obtainable by both agencies.

3.1.3 MAINTENANCE

Maintaining the Fabriform will present challenges due to limited available space on both sides of the canal. Under this alternative there will be no access on the north side of the canal due to the limited right-of-way and required slope of the Fabriform. We recommend closing one lane on Marsh Landing Parkway during the maintenance period. Recommended maintenance tasks include the following:

- Mechanically remove dirt or debris that accumulates on top of the Fabriform; this removal will prevent vegetation growth. (This maintenance should occur at a minimum, annually.)
- Inspect liner after a major storm event or hurricane.

3.1.4 LIFE-CYCLE COST (LCC)

LCC: Initial Construction Cost x (Longest Useful Life Alternative/Useful Life of that Alternative).

- Initial Construction Cost of Fabriform: $2,151,000.
- Longest Useful Life Alternative: (Box Culvert 50 years).
- Useful Life of Fabriform: (25 years).
- LCC = $2,151,000 x (50 years/25 years) = $4,302,000 (Present Value).
- Expected Life-Cycle Cost For 50 Years: $4,302,000.

For Life-Cycle Cost Comparison See Exhibit E.

3.2 ALTERNATIVE 2 – PRECAST MODULAR RETAINING WALL

A precast modular retaining wall is a precast concrete retaining wall block that increases gravity wall height with no tiebacks or geogrids. Blocks are engineered both structurally and geotechnically to meet

project requirements and manufactured to meet design specifications. Stone infill securely locks blocks

together without any mechanical assistance. Alignment loops ensure blocks interlock precisely and align units for consecutive level courses. Block is produced with air-entrained concrete of compressive strength 4000 psi to protect against most strenuous weather. Block size can be designed up to a width of 86 inches. The wall can be constructed within a compressed timeframe, eliminating the need for long forming and curing times before backfilling.

Exhibit B shows the plan view and sections of the channel. The width of the channel is 24 feet at the top and 20.67 feet at the bottom. Channel width is adequate to handle major storm events. This alternative will have limited access on both sides.

3.2.1 CONSTRUCTION COST

All unit prices are based on 12-month moving statewide averages and recent bids received by Jones Edmunds. The estimated construction cost for this alternative is $2.51 million. This cost estimate does not include engineering design services or permitting. A detailed cost estimate is included as Exhibit D.

3.2.2 PERMITTING

A pre-design meeting was held with FDOT Drainage Engineers and discussions with SJRWMD were held regarding permitting. Based on discussions with both agencies and the initial model runs completed during this phase we believe a permit is obtainable by both agencies.

3.2.3 MAINTENANCE

Constructing a precast modular retaining wall will allow limited access on both sides of canal for maintenance vehicles and crew to perform inspections, cleaning, and repairs.

3.2.4 LIFE-CYCLE COST (LCC)

LCC: Initial Construction Cost x (Longest Useful Life Alternative/Useful Life of that Alternative).

- Initial Construction Cost of Modular Wall: $2,507,000.
- Longest Useful Life Alternative: (Box Culvert 50 years).
- Useful Life of Modular Wall: (40 years).
- LCC = $2,507,000 x (50 years/40 years) = $3,133,750 (Present Value).
- Expected Life-Cycle Cost for 50 Years: $3,133,750.

For Life-Cycle Cost Comparison See Exhibit E.

3.3 ALTERNATIVE 3 – STANDARD PRECAST CONCRETE BOX CULVERT

Precast concrete box culverts can be manufactured in a wide range of sizes and configurations. These precast designs may be substituted for cast-in-place box culverts designed to AASHTO Bridge Specifications. Designs are based on the design criteria shown in FDOT Structures Design Guidelines. Plans and sections call for 8-foot-by-7-foot double box culverts with sheet piling at the connection point of the existing south box culverts.

Exhibit C shows plan views and sections of the box culverts and sheet piling locations. Swales with catch basins on top of the box culverts will collect stormwater runoff from the canal right-of-way and FDOT banks.

3.3.1 CONSTRUCTION COST

All unit prices are based on 12-month moving statewide averages and recent bids received by Jones Edmunds. The estimated construction cost for this alternative is $2.88 million. This cost estimate does not include engineering design services or permitting. This method of construction is widely used in Florida and considered to be the most reliable of the three alternatives. A detailed cost estimate is included as Exhibit D.

3.3.2 PERMITTING

A pre-design meeting was held with FDOT Drainage Engineers and discussions with SJRWMD were held regarding permitting. Based on discussions with both agencies and the initial model runs completed during this phase we believe a permit is obtainable by both agencies.

3.3.3 MAINTENANCE

Mowing should take place on a regular basis to keep the grass at acceptable heights. Access structures at 3 locations are provided to inspect, clean, or repair the box culverts.

3.3.4 LIFE-CYCLE COST (LCC)

LCC: Initial Construction Cost x (Longest Useful Life Alternative/Useful Life of that Alternative).

- Initial Construction Cost of Box Culvert: $2,878,000.
- Longest Useful Life Alternative: (Box Culvert 50 years).
- Useful Life of Box Culvert: (50 years).

- LCC = $2,864,000 x (50 years/50 years) = $2,878,000 (Present Value).
- Expected Life-Cycle Cost For 50 Years: $2,878,000.

For Life-Cycle Cost Comparison See Exhibit E.

4 UTILITY IMPACTS

Jones Edmunds will notify all utility companies to ensure that final design plans will accommodate any future utility adjustments in the affected area.

5 CONCLUSIONS

Jones Edmunds prepared and reviewed three alternatives. Based on preliminary design and cost information, the estimated life-cycle cost range from $4.30 million for Fabriform to $3.13 million for a Precast Modular Retaining Wall and $2.86 million for Box Culverts.

In addition to the initial construction cost, the City should consider maintenance requirements in determining which alternative will serve best. This area is heavily populated, and street closures should be minimized to a level acceptable by the citizens.

The third deciding factor is obtaining approval from SJRWMD and FDOT. Hydraulic modeling data and meetings with the agencies indicate that the three alternatives would be acceptable.

During construction, preparations regarding dewatering and flow diversion should be provided and will require a piping system to handle regular rainfall events (less than 1 inch of rainfall). The Contractor must have a contingency plan to prevent damage to materials or structures that are under construction should an unpredictable major storm event occur during the construction phase.

LIFE-CYCLE COST TABLE

Alternative	Initial Cost	Additional Cost For 50-Year LCC	Total
Fabriform	$2,151,000	$2,151,000	$4,302,000
Modular Wall	$2,507,000	$626,750	$3,133,750
Box Culvert	$2,878,000	$0	$2,878,000

6 RECOMMENDATIONS

Based on 50-Year Life-Cycle Construction Cost, construction schedule, traffic impact, and maintenance requirements, we offer the following recommendations:

1. Box Culvert will require the least amount of maintenance and cost less for the duration of its life cycle. It will reduce traffic impacts and provide added benefits of increased safety for both maintenance crew and traveling public. It is our recommended alternative when considering function, maintenance, and total LCC.
2. Precast Modular Retaining Wall is a viable alternative. Access for maintenance is limited but it meets the functional needs of the project. However, if the City can work with the maintenance access issues, it should also be considered.

3. Fabriform maintenance and resulting traffic interruptions will have its challenges. This is due to frequent cleaning activities with limited space on both sides. One lane of Marsh Landing will have to be closed during maintenance, resulting in additional costs for traffic control. This alternative should only be considered if FDOT and SJRWMD will not approve the Box Culvert or Precast Modular Retaining Wall.

Exhibit A

Fabriform AB Mat Plans

EXHIBIT A
□ABRI□ORM MAT

FDOT 4'ø MANHOLE

FURNISH & INSTALL 24" RCP

REMOVE 24" CMP

CONC. SLAB

STEEL SHEET PILING

FDOT 4'ø MANHOLE

J. TURNER BUTLER BOULEVARD (STATE ROAD NO. 202)

REMOVE 18" CMP

FURNISH & INSTALL 18" RCP

TOP OF BANK ELEV. 9.75

TOE OF BANK ELEV. -2

TOP OF BANK ELEV. 9.0

TOP OF BANK ELEV. 8.0

TOP OF BANK ELEV. 8.50

STEEL SHEET PILING

REMOVE EXIST. PIPE & INSTALL 36" RCP

5'ø M.H.

FABRIFORM MAT

DOUBLE 24" FDOT MES

FURNISH & INSTALL 2-24" RCP

MARSH LANDING PARKWAY (80' RIGHT-OF-WAY)

PI: 94+95.40

-N-

1" = 40'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=40'

JONES EDMUNDS

09803-031-01A

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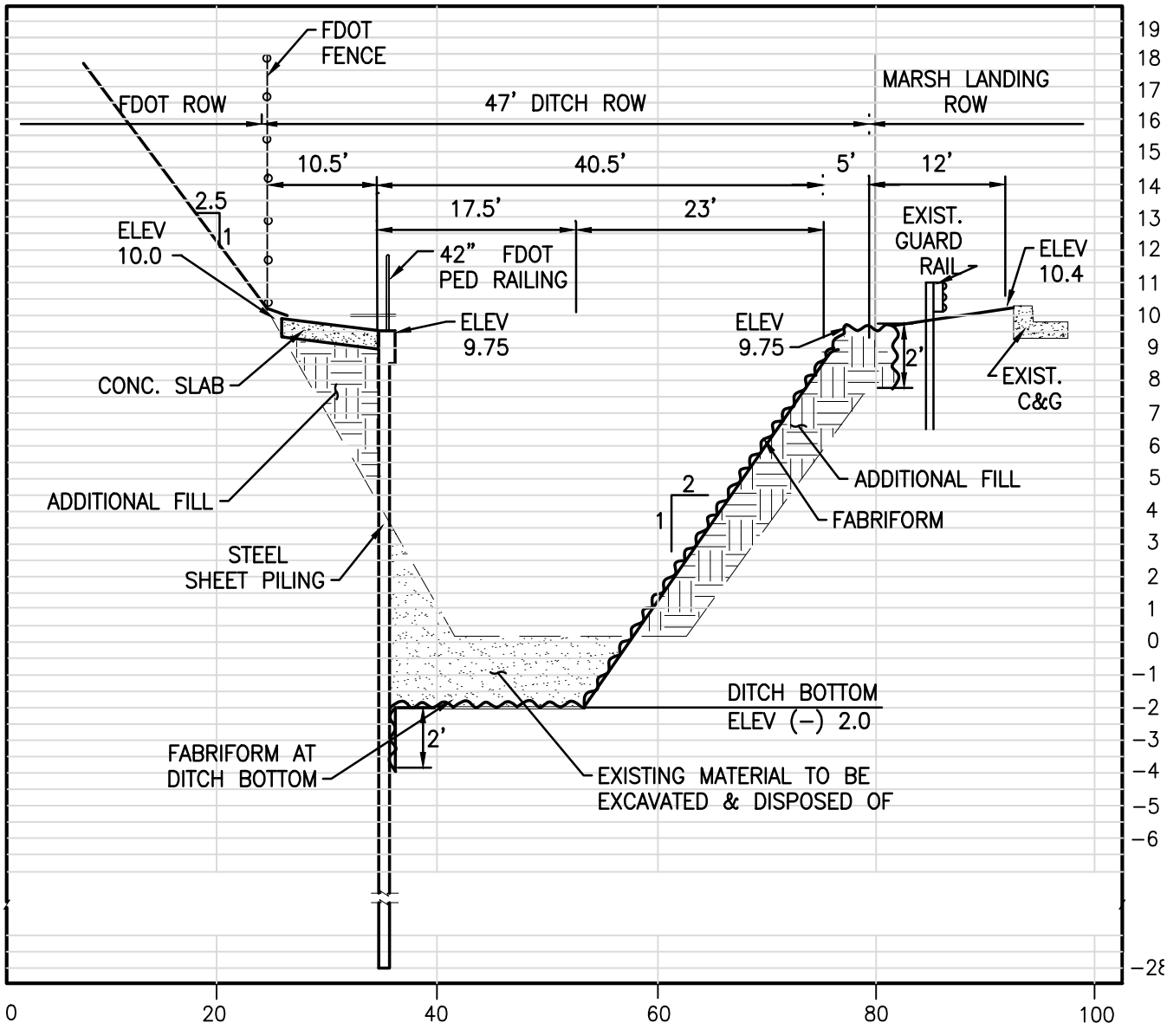
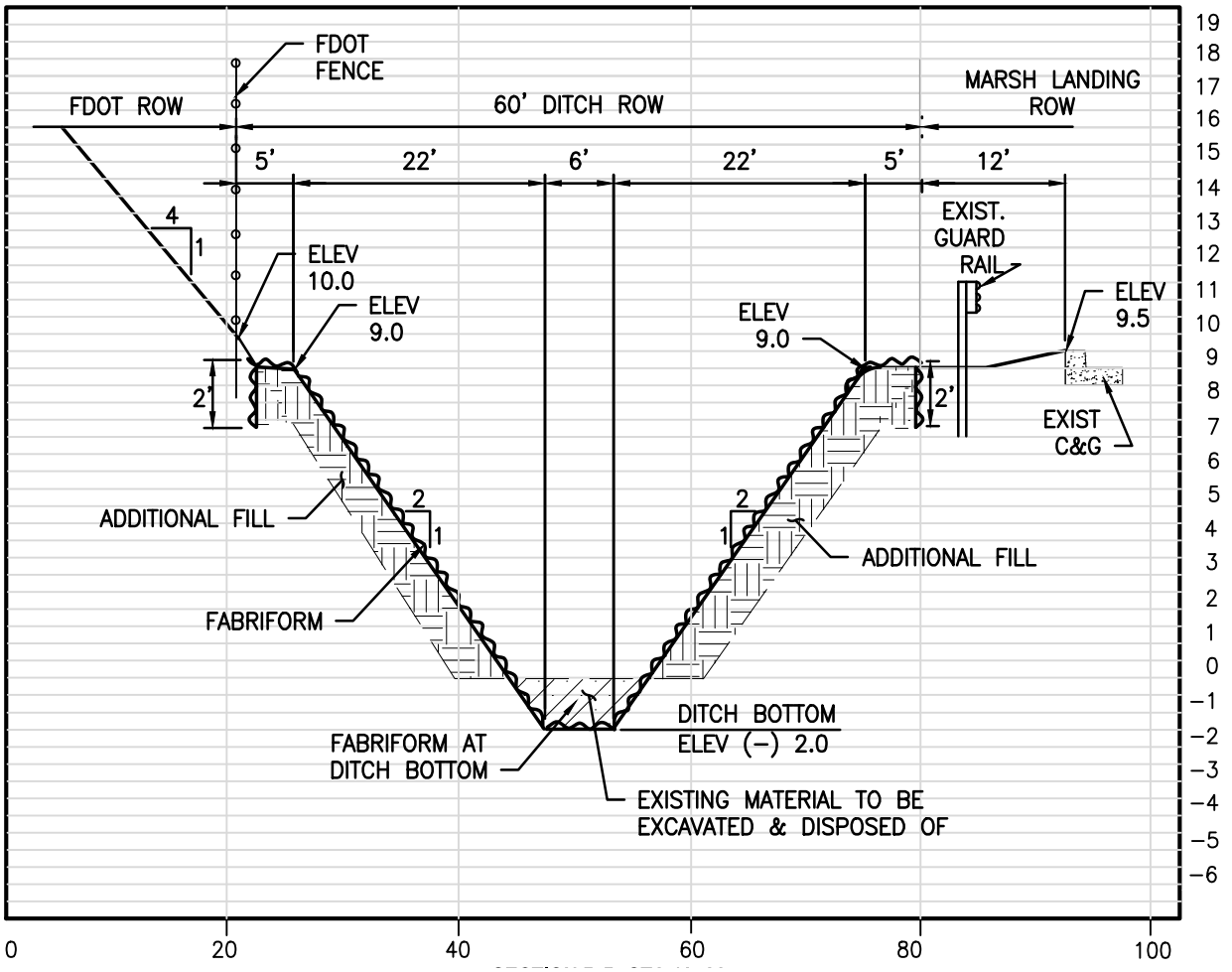


SECTION A

NTS

JONES EDMUNDS

EXHIBIT A



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JONES EDMUNDS

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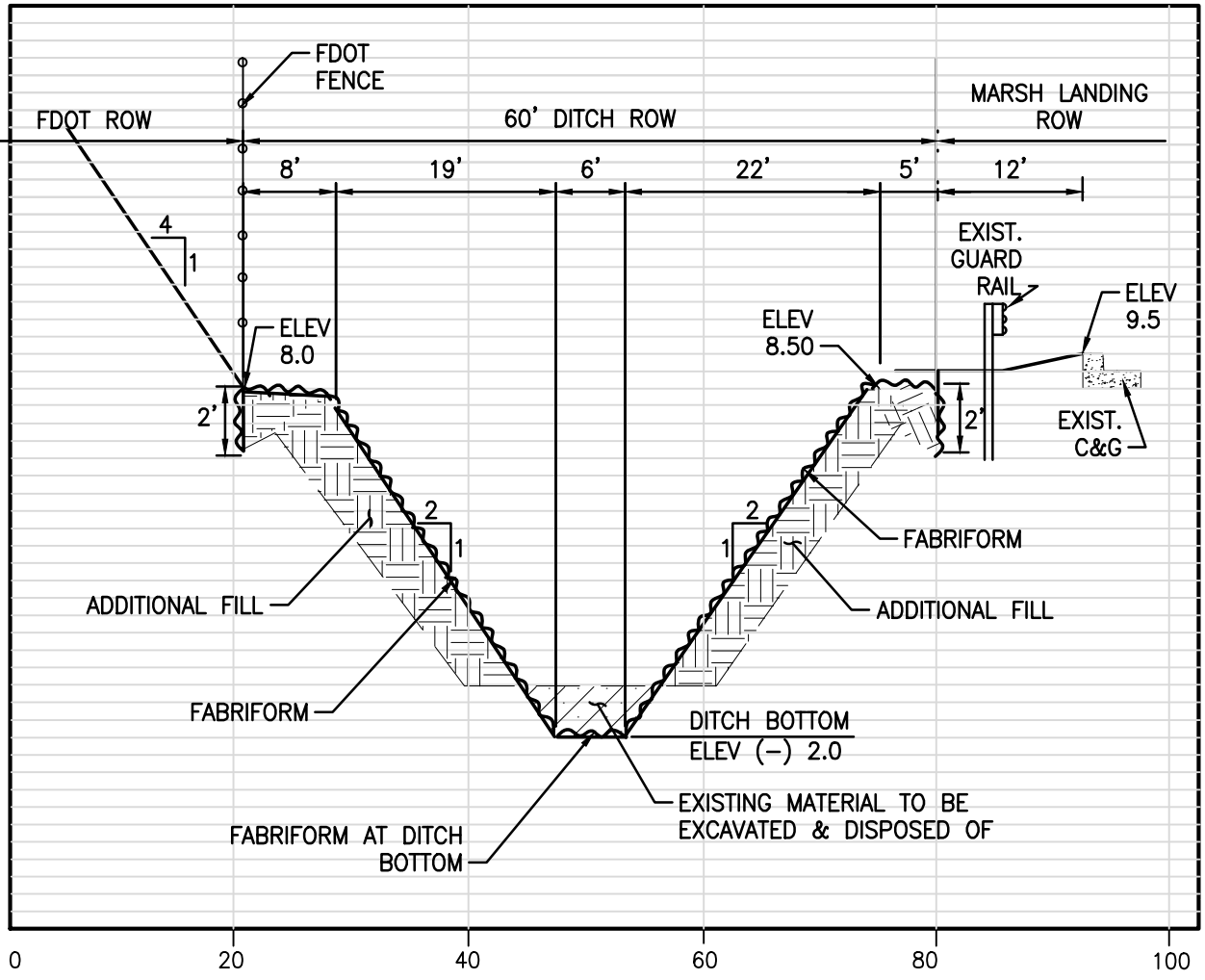

SECTION C

NTS

JONES EDMUNDS

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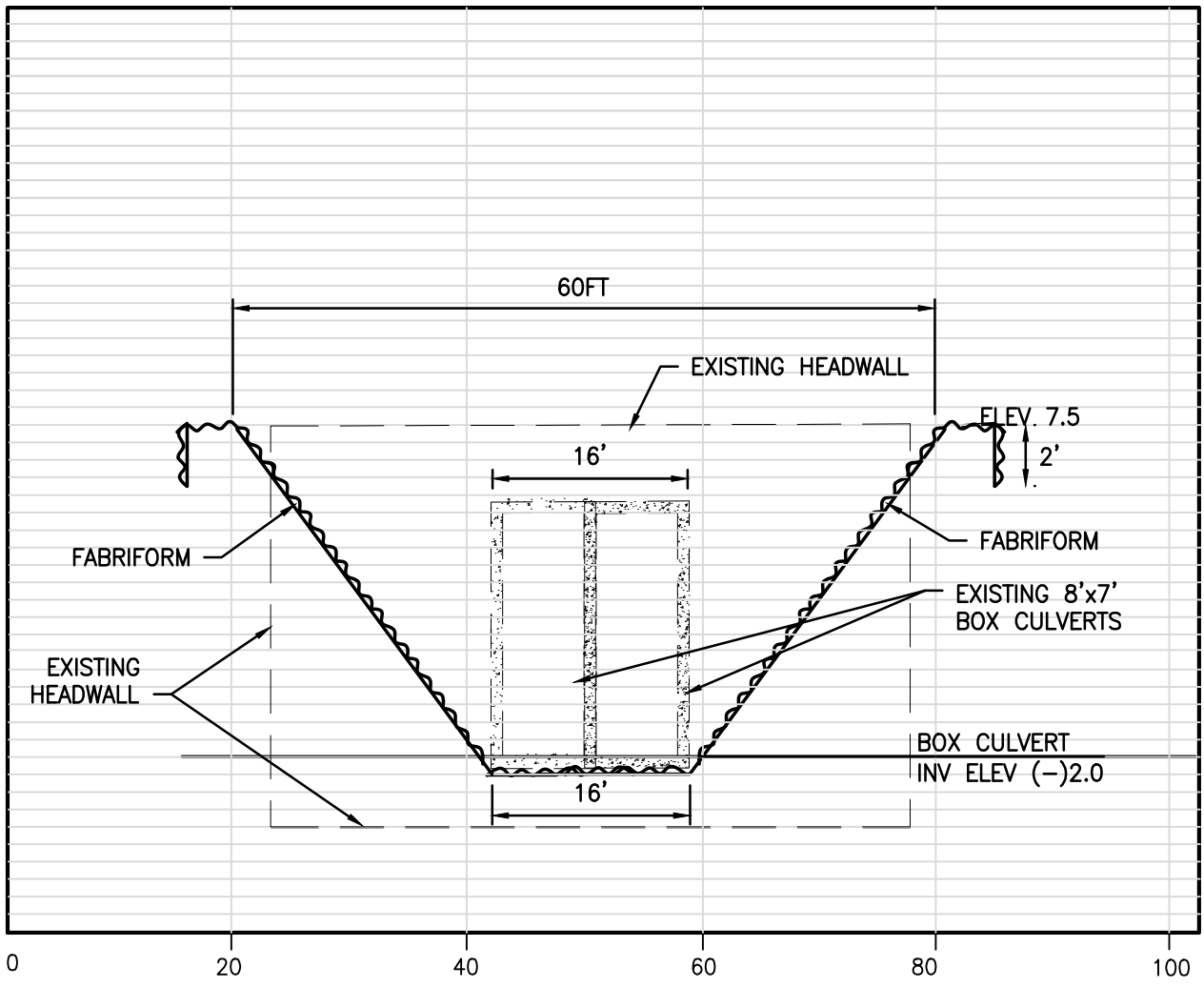

SECTION D

NTS

JONES EDMUNDS

Exhibit B

Precast Modular Retaining Wall Plans

EXHIBIT B
PRECAST MODULAR
RETAINING WALL

FURNISH & INSTALL 24" RCP

FDOT 4'ø MANHOLE
REMOVE 24" CMP

CONCRETE SLAB

STEEL SHEET PILING

FDOT 4'ø MANHOLE
REMOVE 18" CMP

FURNISH & INSTALL 18" RCP

FDOT TYPE C INLET

STEEL SHEET PILING

REMOVE EXIST. PIPE & INSTALL 36" RCP

5'ØM.H.

PRECAST MODULAR RETAINING WALL

DOUBLE 24" FDOT MES

FURNISH & INSTALL 2-24" RCP

J. TURNER BUTLER BOULEVARD (STATE ROAD NO. 202)

MARSH LANDING PARKWAY (80' RIGHT-OF-WAY)

PI: 94+95.40

1" = 40'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=40'

JONES EDMUNDS

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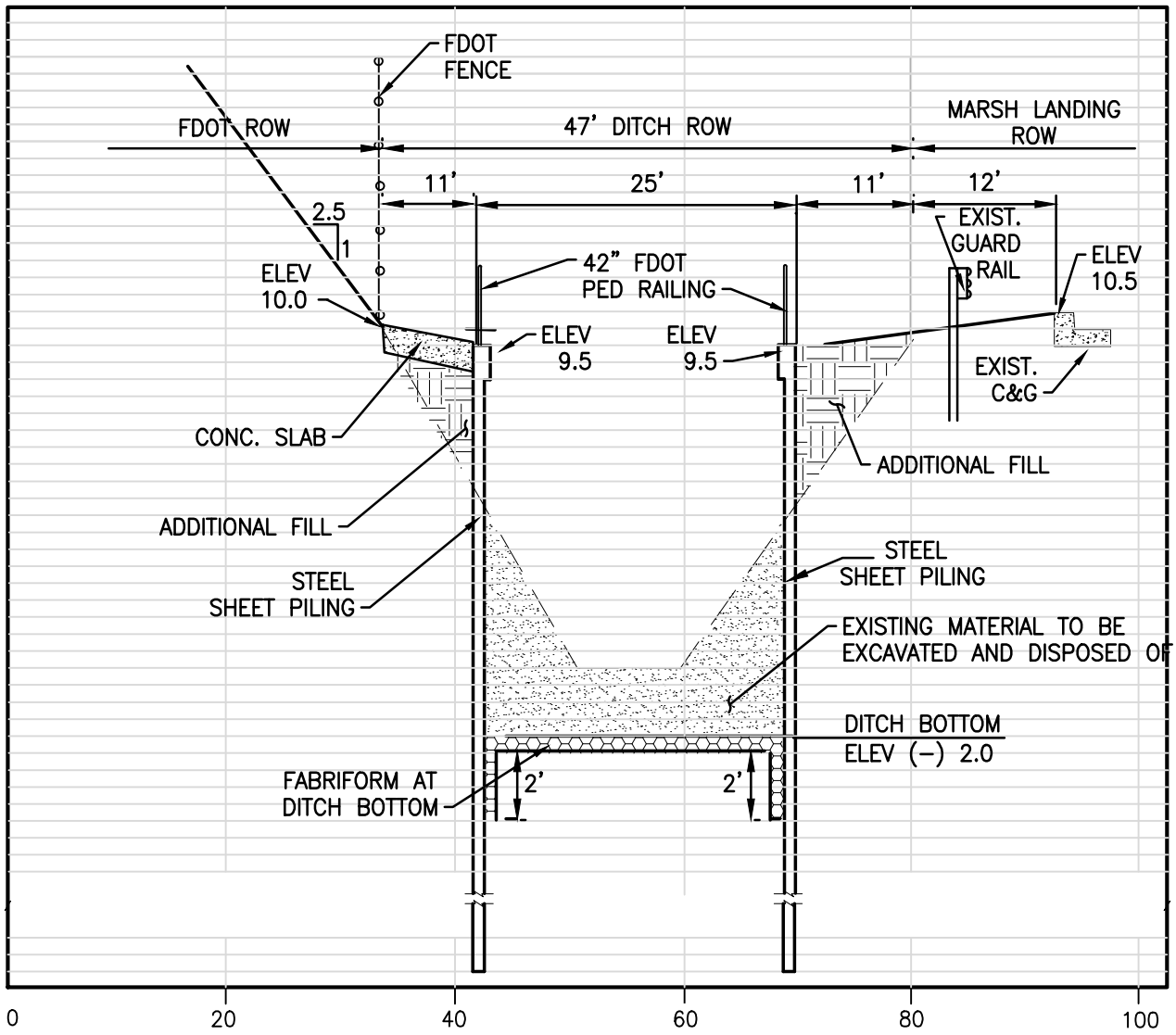
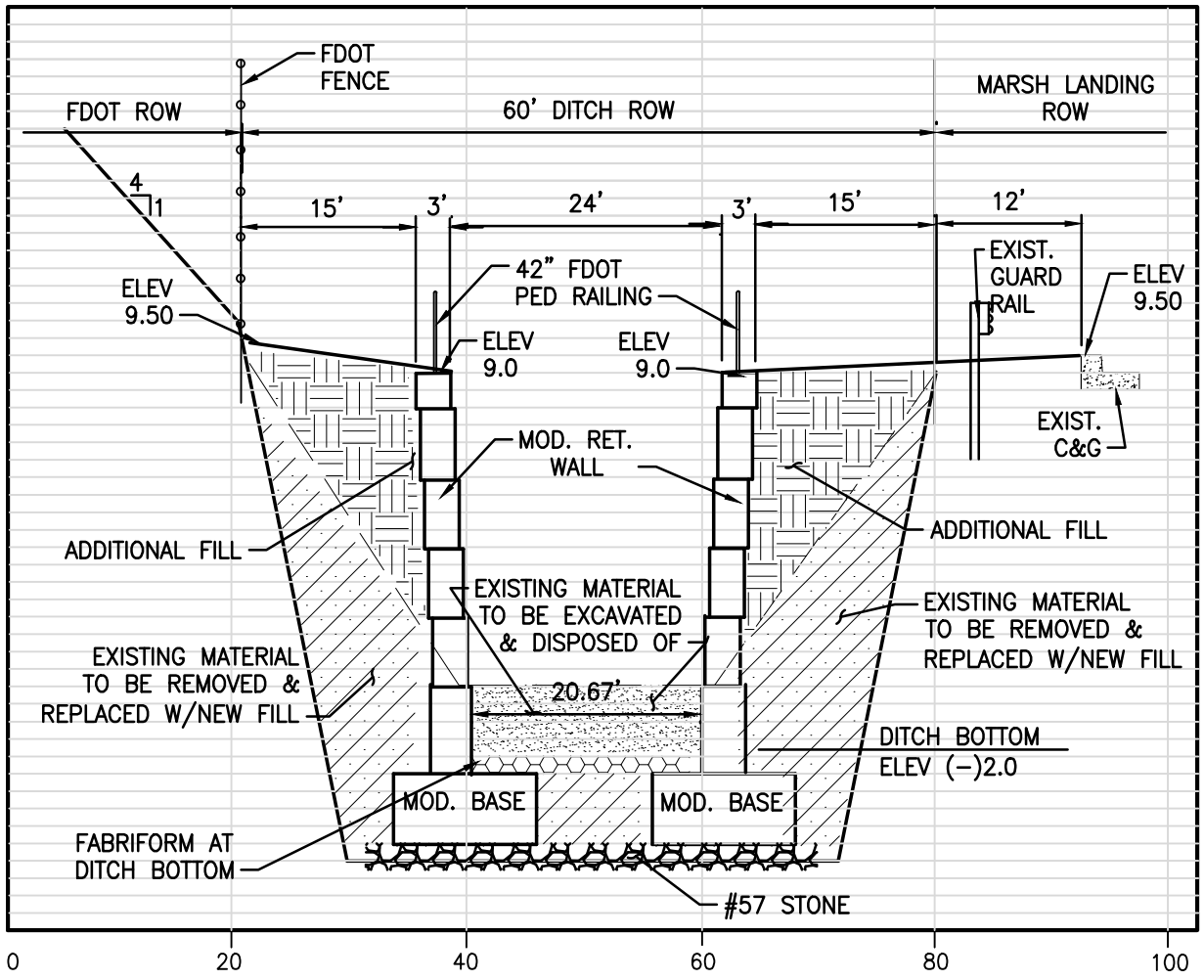


SECTION A

NTS

JONES EDMUNDS

EXHIBIT B



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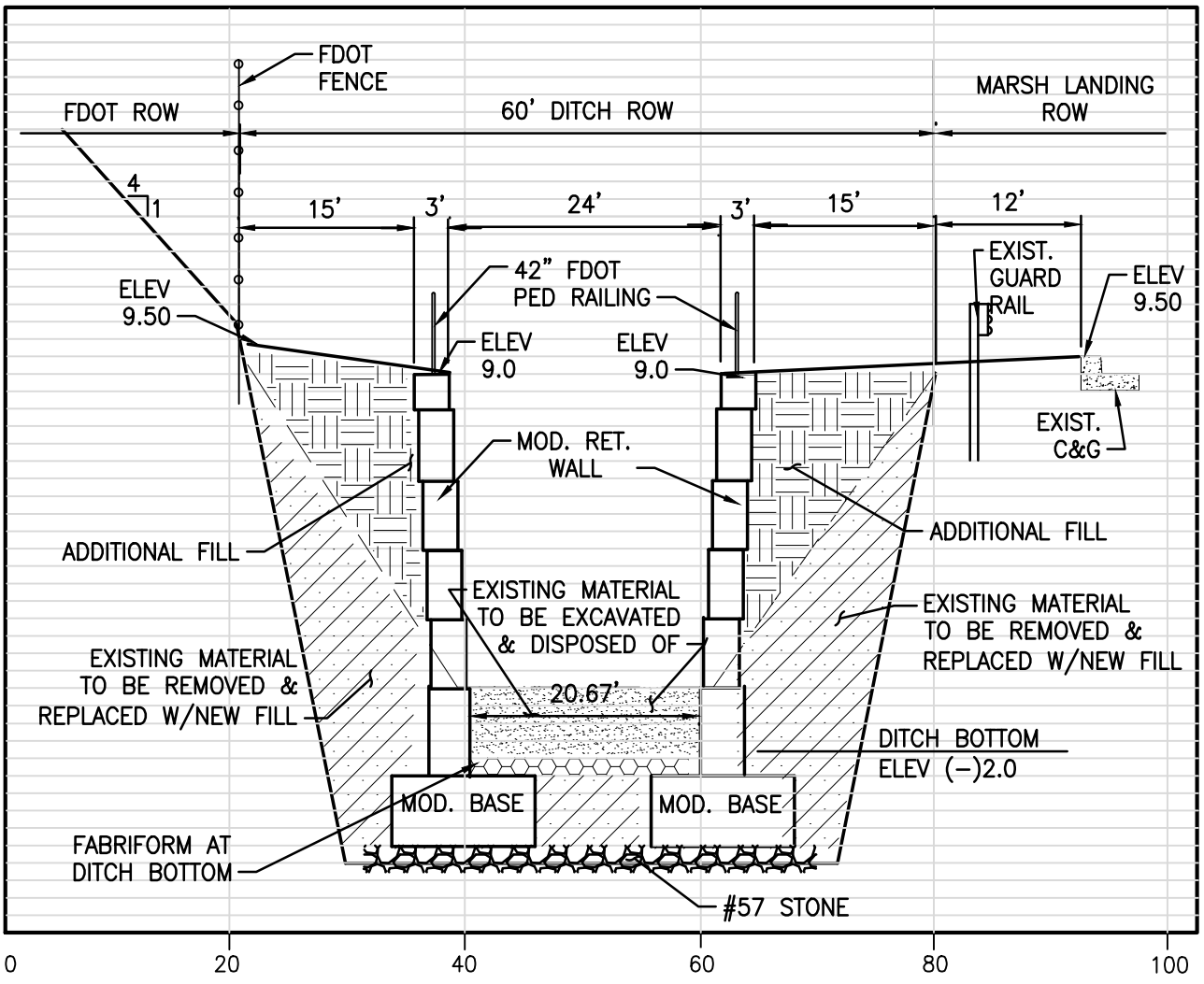
JONES EDMUNDS

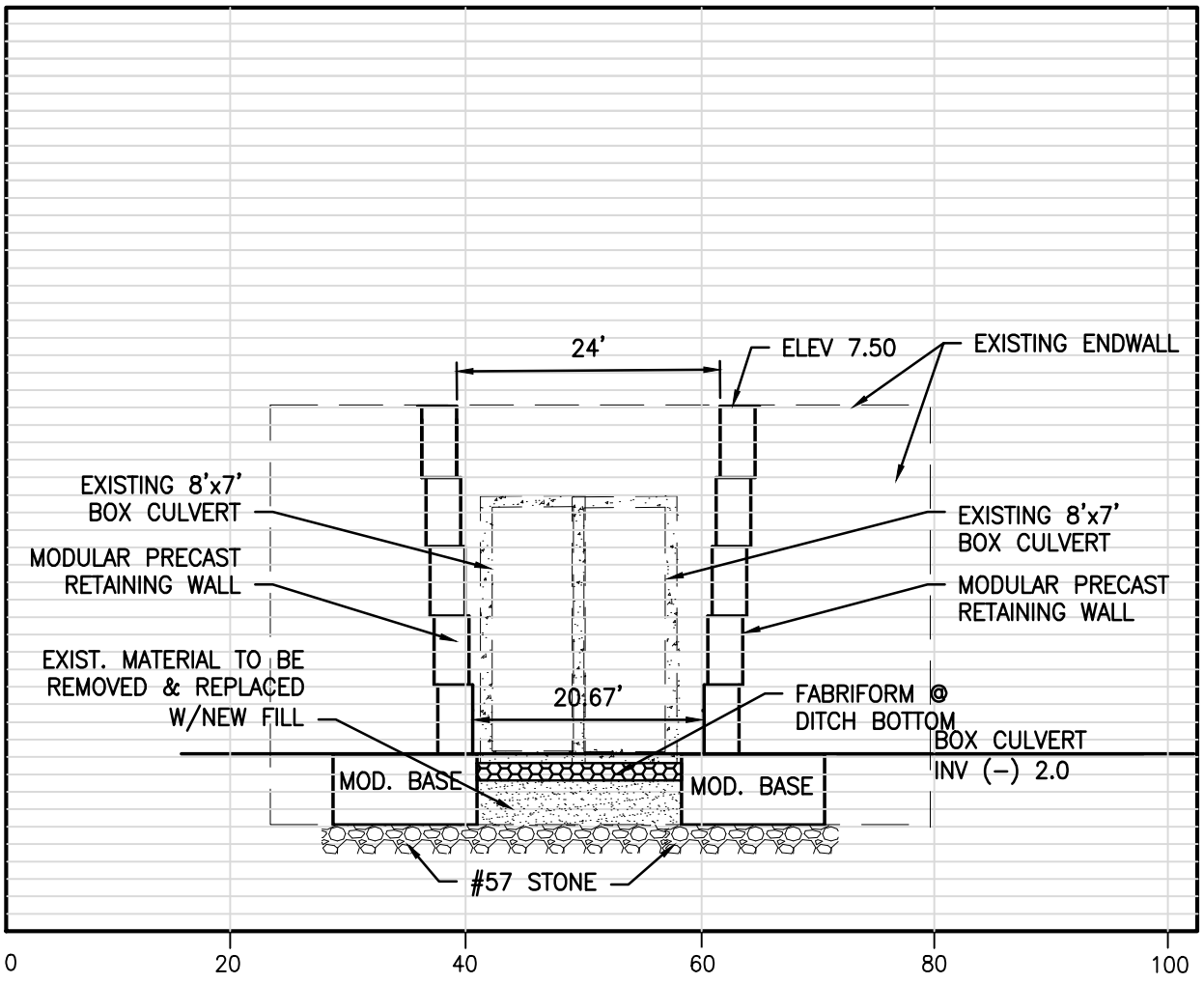


SECTION C

NTS

JONES EDMUNDS

EXHIBIT B



SECTION D

NTS

JONES EDMUNDS

Exhibit C

Standard Precast Concrete Box Culvert Plans

EXHIBIT C
BOX CULVERT PLAN

FDOT 4'ø MANHOLE
REMOVE 24" CMP
CONCRETE SLAB
FURNISH & INSTALL 24" RCP
FDOT HEADWALL
STEEL SHEET PILING
STEEL SHEET PILING
REMOVE EXIST. PIPE & INSTALL 36"RCP
5'ØM.H.
FDOT 4'ø MANHOLE
REMOVE 18" CMP
FURNISH & INSTALL 18" RCP
ACCESS STR. W/GRATING
ACCESS STR. W/GRATING
DOUBLE 8'x7' FDOT BOX CULVERT
TIE INTO EXISTING BOX CULVERT
ACCESS STR. W/GRATING
DOUBLE 24" FDOT MES
FURNISH & INSTALL 2-24" RCP

J. TURNER BUTLER BOULEVARD
(STATE ROAD NO. 202)
(A VARIABLE WIDTH RIGHT-OF-WAY)

MARSH LANDING PARKWAY
(80' Right-Of-Way)

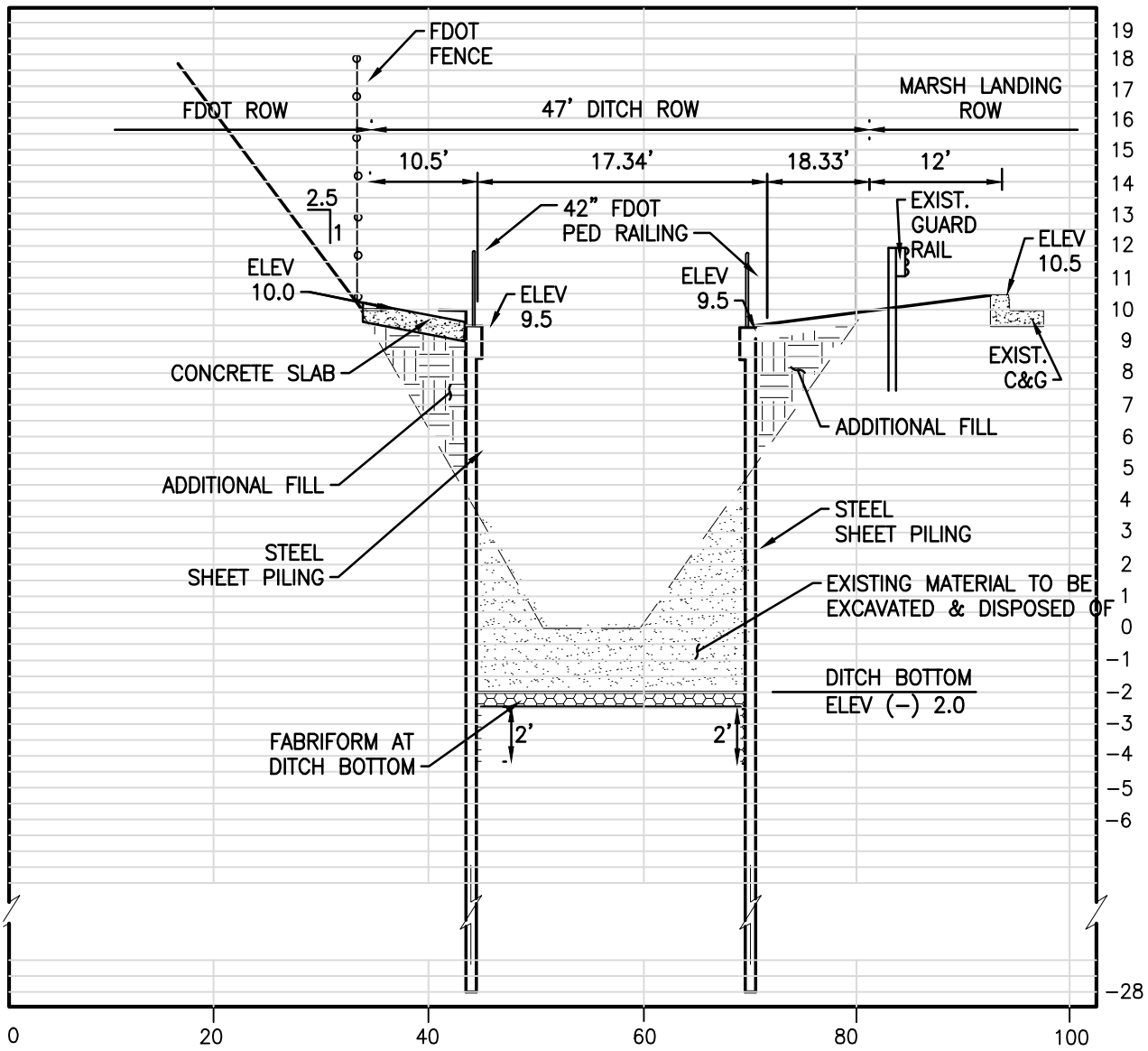
PI: 94+95.40

-N-
1" = 40'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=40'

JONES EDMUNDS

EXHIBIT C

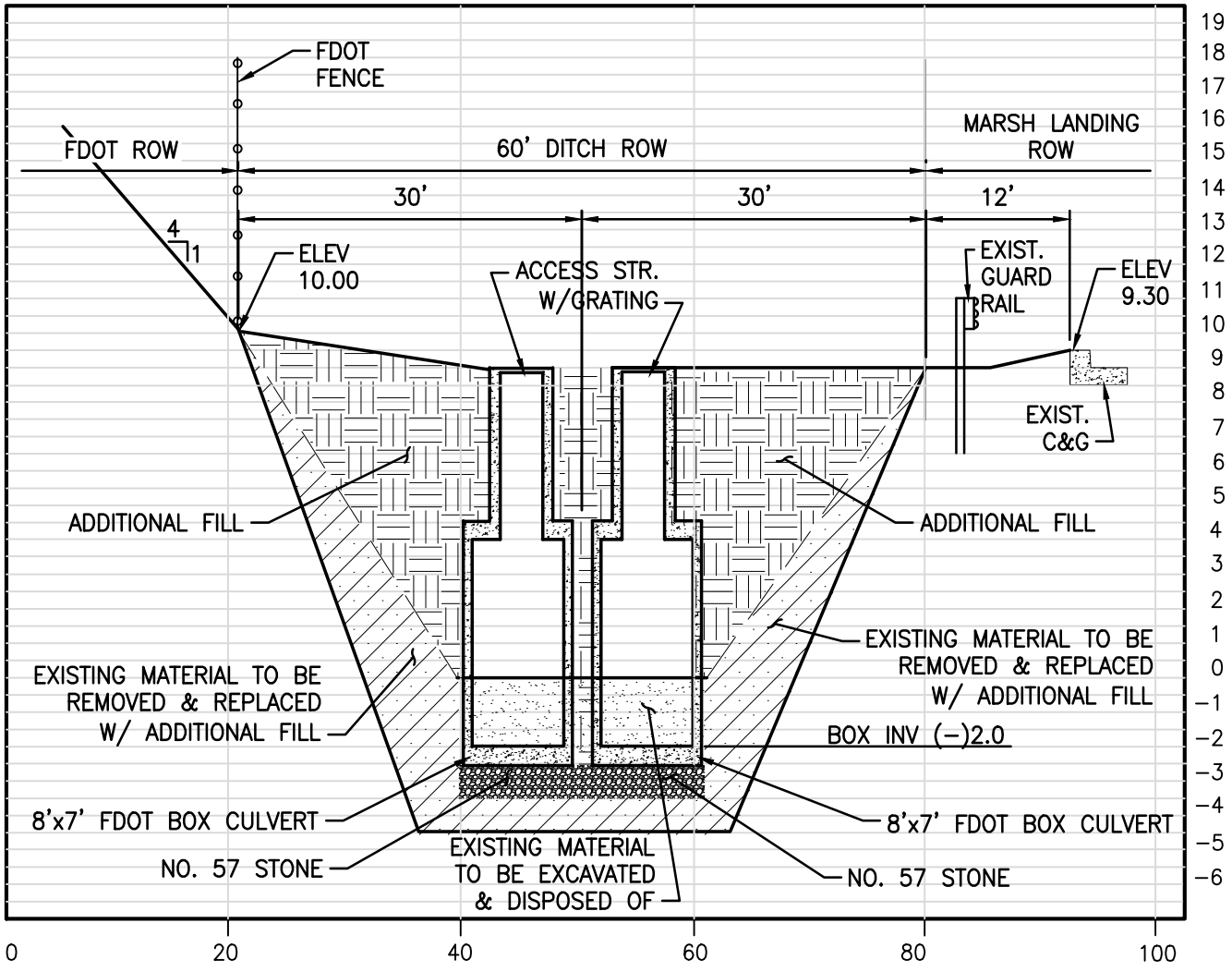


SECTION A

NTS

JONES EDMUNDS

EXHIBIT C

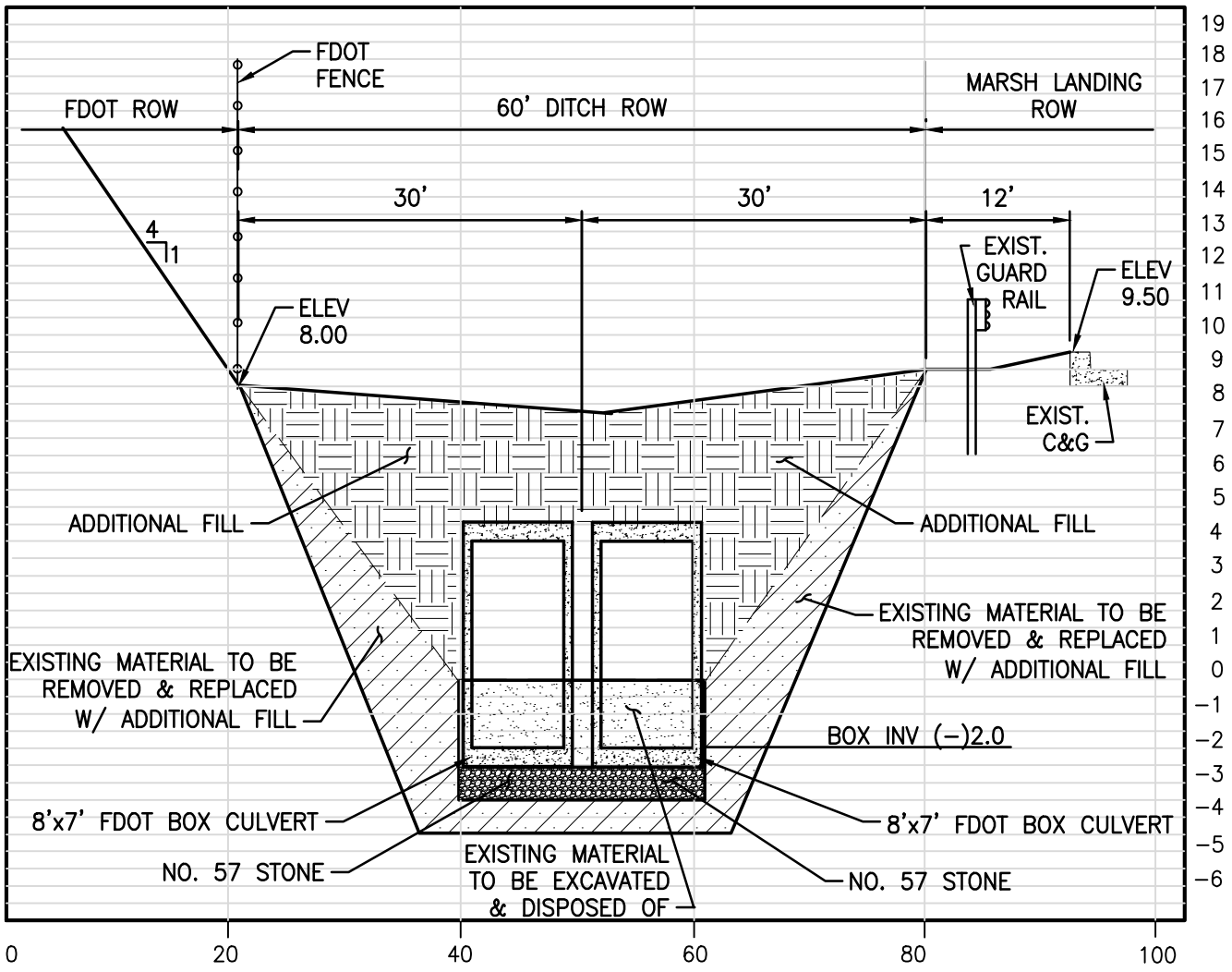


SECTION B

NTS

JONES EDMUNDS

EXHIBIT C



SECTION C

NTS

JONES EDMUNDS

Exhibit D

Cost Estimates

PROJECT NAME: Jax Beach Canal

PROJECT No.: 09803-031-03
DATE: 2.10.2017
SUBMITTAL: 30%

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

PROJECT SEGMENT:	Jax. Beach Canal Fabriform Option	CLIENT:	City of Jax. Beach
ESTIMATE TYPE:	CONSTRUCTION COST	PREPARED BY:	A. CHABAB
		CHECKED BY:	W. NICKEL

FDOT ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
101-1	MOBILIZATION (10%)	LS	1	$159,339.00	$159,339.00
102-1	MOT	LS	1	$25,000.00	$25,000.00
102-3	CONSTRUCTION ENTRANCE	CY	100	$27.15	$2,715.00
104-11	FLOATING TURBIDITY BARRIER	LF	500	$7.33	$3,665.00
104-10-3	SEDIMENT BARRIER	LF	3,500	$1.50	$5,250.00
110-2-1	CLEARING & GRUBBING	LS	1	$18,500.00	$18,500.00
110-3	REMOVE EXISTING STRUCTURES (HEADWALLS, PIPES & FABRIFORM)	LS	1	$75,000.00	$75,000.00
NA	REMOVE & DISPOSE OF EXISTING MATERIAL	CY	750	$55.00	$41,250.00
NA	FABRIFORM (Geogrid Liner, Mat, Grout & Installation)	SF	34200	$19.00	$649,800.00
455-133-3	STEEL SHEET PILING	SF	6825	$55.00	$375,375.00
NA	PILE CAP	LF	175	$123.40	$21,595.00
430-173-115	PIPE CULVERT (RCP, ROUND) 36-INCH W/ M.H.	LS	1	$15,500.00	$15,500.00
430-173-118	PIPE CULVERT (RCP, ROUND) 18-INCH W/ M.H.	LS	1	$12,500.00	$12,500.00
430-173-124	PIPE CULVERT (RCP, ROUND) 24-INCH W/ MITERED ENDS	LS	1	$8,750.00	$8,750.00
430-173-124	PIPE CULVERT (RCP, ROUND) 24-INCH W/ M.H.	LS	1	$14,500.00	$14,500.00
NA	CONCRETE SLAB	SY	125	$125.00	$15,625.00
0530-701	IMPORTED FILL	CY	5150	$22.50	$115,875.00
NA	DEWATERING (30 DAYS)	LS	1	$75,000.00	$75,000.00
NA	REGRADE BANKS	LS	1	$7,500.00	$7,500.00
530-3-4	RIPRAP, RUBBLE	TN	290	$87.55	$25,389.50
536-1-3	ALUMINUM PEDESTRIAN RAILING	LF	250	$95.00	$23,750.00
NA	SURVEY LAYOUT AND AS-BUILT	LS	1	$28,500.00	$28,500.00
570-1-1	PERFORMANCE TURF, SOD	SY	1600	$5.50	$8,800.00
NA	PERFORMANCE AND PAYMENT BOND @ 1.5%	LS	1	$23,548.00	$23,548.00
NA	CONTINGENCY (25%)	LS	1	$398,347.00	$398,347.00
				TOTAL	$2,151,000.00

Note: Unit prices are based on 12-month moving statewide averages and recent bids received by Jones Edmunds.

PROJECT NAME: Jax Beach Canal

PROJECT No.: 09803-031-03
DATE: 2.10.2017
SUBMITTAL:

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

PROJECT SEGMENT:	Jax. Beach Canal Modular Ret. Wall Option	CLIENT:	City of Jax. Beach
ESTIMATE TYPE:	CONSTRUCTION COST	PREPARED BY:	A. CHABAB
		CHECKED BY:	W. NICKEL

FDOT ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
101-1	MOBILIZATION (10%)	LS	1	$185,733.00	$185,733.00
102-2	MOT	LS	1	$25,000.00	$25,000.00
102-3	CONSTRUCTION ENTRANCE	CY	100	$27.15	$2,715.00
104-11	FLOATING TURBIDITY BARRIER	LF	500	$7.33	$3,665.00
104-10-3	SEDIMENT BARRIER	LF	3,500	$1.50	$5,250.00
110-2-1	CLEARING & GRUBBING	LS	1	$18,500.00	$18,500.00
110-3	REMOVE EXISTING STRUCTURES (HEADWALLS, PIPES & FABRIFORM)	LS	1	$75,000.00	$75,000.00
NA	REMOVE & DISPOSE OF EXISTING MATERIAL	CY	4,335	$55.00	$238,425.00
NA	MODULAR RETAINING WALL (Block, Aggregate, Geogrid & Installation)	LF	950	$500.00	$475,000.00
NA	#57 STONE BED	TN	220	$67.00	$14,740.00
334-1-14	STEEL SHEET PILING	SF	4680	$55.00	$257,400.00
NA	PILE CAP	LF	120	$123.40	$14,808.00
430-173-115	PIPE CULVERT (RCP, ROUND) 36-INCH W/ M.H.	LS	1	$15,500.00	$15,500.00
430-173-118	PIPE CULVERT (RCP, ROUND) 18-INCH W/M.H. & TYPE C INLET	LS	1	$16,500.00	$16,500.00
430-173-124	PIPE CULVERT (RCP, ROUND) 24-INCH W/ MITERED ENDS	LS	1	$8,750.00	$8,750.00
430-173-124	PIPE CULVERT (RCP, ROUND) 24-INCH W/ M.H.	LS	1	$14,500.00	$14,500.00
NA	CONCRETE SLAB	SY	125	$125.00	$15,625.00
530-3-4	RIPRAP, RUBBLE	TN	75	$87.55	$6,566.25
NA	FABRIFORM	SF	8,850	$19.00	$168,150.00
0530-701	IMPORTED FILL	CY	7563	$22.50	$170,167.50
NA	DEWATERING (45 DAYS)	LS	1	$130,000.00	$130,000.00
NA	REGRADE BANKS	LS	1	$7,500.00	$7,500.00
536-1-3	ALUMINUM PEDESTRIAN RAILING	LF	1,050	$95.00	$99,750.00
NA	SURVEY LAYOUT AND AS-BUILT	LS	1	$28,500.00	$28,500.00
570-1-1	PERFORMANCE TURF, SOD	SY	3250	$5.50	$17,875.00
NA	PERFORMANCE AND PAYMENT BOND @ 1.5%	LS	1	$27,448.00	$27,448.00
NA	CONTINGENCY (25%)	LS	1	$464,334.00	$464,334.00
				TOTAL	$2,507,000.00

Note: Unit prices are based on 12-month moving statewide averages and recent bids received by Jones Edmunds.

PROJECT NAME: Jax Beach Canal

PROJECT No.: 09803-031-03
DATE: 10 February 2017
SUBMITTAL:

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

PROJECT SEGMENT:	Jax. Beach Canal Box Culvert Option	CLIENT:	City of Jax. Beach
ESTIMATE TYPE:	CONSTRUCTION COST	PREPARED BY:	A. CHABAB
		CHECKED BY:	W. NICKEL

FDOT ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
101-1	MOBILIZATION (10%)	LS	1	$213,194.00	$213,194.00
102-2	MOT	LS	1	$25,000.00	$25,000.00
102-3	CONSTRUCTION ENTRANCE	CY	100	$27.15	$2,715.00
104-11	FLOATING TURBIDITY BARRIER	LF	500	$7.33	$3,665.00
104-10-3	SEDIMENT BARRIER	LF	3,500	$1.50	$5,250.00
110-2-1	CLEARING & GRUBBING	LS	1	$18,500.00	$18,500.00
110-3	REMOVE EXISTING STRUCTURES (HEADWALLS, PIPES & FABRIFORM)	LS	1	$75,000.00	$75,000.00
NA	REMOVE & DISPOSE OF EXISTING MATERIAL	CY	3,560	$55.00	$195,800.00
NA	BOX CULVERT (2) 8x7 FURNISHED & INSTALLED	LF	900	$975.00	$877,500.00
210-2	HEADWALL	LS	1	$13,500.00	$13,500.00
455-133-3	STEEL SHEET PILING	SF	4680	$55.00	$257,400.00
NA	PILE CAP	LF	120	$123.40	$14,808.00
430-173-115	PIPE CULVERT (RCP, ROUND) 36-INCH W/ M.H.	LS	1	$15,500.00	$15,500.00
430-173-118	PIPE CULVERT (RCP, ROUND) 18-INCH W/ M.H.	LS	1	$12,500.00	$12,500.00
430-173-124	PIPE CULVERT (RCP, ROUND) 24-INCH W/ MITERED ENDS	LS	1	$8,750.00	$8,750.00
430-173-124	PIPE CULVERT (RCP, ROUND) 24-INCH W/ M.H.	LS	1	$14,500.00	$14,500.00
NA	ACCESS STRUCTURE W/ GRATING	EA	6	$12,500.00	$75,000.00
NA	CONCRETE SLAB	SY	125	$125.00	$15,625.00
530-3-4	RIPRAP, RUBBLE	TN	75	$87.55	$6,566.25
NA	FABRIFORM	SF	3,125	$19.00	$59,375.00
0530-701	IMPORTED FILL	CY	7388	$22.50	$166,230.00
NA	DEWATERING (45 DAYS)	LS	1	$130,000.00	$130,000.00
NA	REGRADE BANKS	LS	1	$27,500.00	$27,500.00
536-1-3	ALUMINUM PEDESTRIAN RAILING	LF	250	$95.00	$23,750.00
NA	SURVEY LAYOUT AND AS-BUILT	LS	1	$28,500.00	$28,500.00
570-1-1	PERFORMANCE TURF, SOD	SY	5000	$5.50	$27,500.00
NA	PERFORMANCE AND PAYMENT BOND (1.5%)	LS	1	$31,507.00	$31,507.00
NA	CONTINGENCY (25%)	LS	1	$532,985.00	$532,985.00
				TOTAL	$2,878,000.00

Note: Unit prices are based on 12-month moving statewide averages and recent bids received by Jones Edmunds.

Exhibit E

Life Cycle Cost Comparison

JACKSONVILLE BEACH CANAL IMPROVEMENTS ALONG MARSH LANDING PARKWAY

50-YEAR LIFE-CYCLE COST COMPARISON

ALTERNATIVE	INITIAL COST	ADDITIONAL COST	TOTAL
FABRIFORM	2,151,000	2,151,000	4,302,000
MODULAR WALL	2,507,000	626,750	3,133,750
BOX CULVERT	2,878,000	0	2,878,000