

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
INDIVIDUAL SWERP APPLICATION

FOR THE

EMORY AVENUE STORMWATER POND

(LOCATED BETWEEN MLK JR. BLVD. AND MABBETTE STREET)

CITY OF KISSIMMEE, FLORIDA

PREPARED FOR



City of Kissimmee
Public Works & Engineering Department
101 Church Street
Kissimmee, Florida 34741

PREPARED BY



July 2015

CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER

PROJECT NAME: **EMORY AVENUE STORMWATER POND**

I HEREBY CERTIFY THAT THE MATERIAL AND DATA CONTAINED IN THIS DOCUMENT WAS PREPARED UNDER THE SUPERVISION AND DIRECTION OF THE UNDERSIGNED, WHOSE SEAL AS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA IS AFFIXED BELOW.

NAME (PLEASE PRINT): **JOHN ERIC MOODY, P.E.**

COMPANY NAME: **OSCEOLA ENGINEERING, INC.**

ADDRESS: **1003 FLORIDA AVENUE**

ST. CLOUD, FLORIDA 34769

TELEPHONE NUMBER: **(407) 891-0452**



SIGNATURE OF
PROFESSIONAL:

FLORIDA REGISTRATION
NUMBER:

**John E
Moody**

DATE:

Digitally signed by John E
Moody
DN: c=US, o=IdenTrust ACES
Business Representative,
ou=OSCEOLA ENGINEERING,
cn=John E Moody,
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City of Kissimmee, Florida
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SECTION 1

EMORY AVENUE STORMWATER POND

PROJECT NARRATIVE

1.0 Introduction

Background

The Emory Avenue Ditch, also referred to as the West City Ditch, conveys storm water runoff from over 6 square miles of highly developed basin area to Lake Tohopekaliga. The Emory Avenue Ditch begins at the intersection of U.S. Highway 192 and North Emory Avenue. From that location, the ditch runs generally south for approximately 1.3 miles to its confluence with the Kissimmee Gateway Airport Ditch. The ditch then runs an additional 1/2 mile further to its ultimate outfall with Lake Tohopekaliga. Please refer to **Figure 1** in Tab 1 for a Location Map.

As the Emory Avenue Ditch basin is primarily urbanized, the majority of the runoff is conveyed to the ditch via closed secondary stormwater systems. In 2010, efforts were made to prevent erosion in the ditch. These improvements consisted of the installation of articulating concrete block lining, rubble rip-rap, and grading of uniform 2:1 side slopes to maximize the conveyance of the ditch while providing needed bank stabilization.



Photo1: Emory Avenue Ditch

Purpose

The purpose of this project is to provide water quality treatment volume and 100-year compensating storage volume to attribute to future municipal projects within the City of Kissimmee, and Lake Tohopekaliga Basin, that cannot provide water quality treatment and/or 100-year compensating storage due to various constraints and/or limitations. The proposed stormwater facility will be located on a vacant lot (Parcel ID:21-25-29-1402-0001-0010) between Martin Luther King Jr. Boulevard and Mabbette Street along Emory Avenue and will feature a two (2) acre offline stormwater pond. Please refer to **Figure 2** in Tab 1 for an aerial photograph showing the location of the proposed improvements.

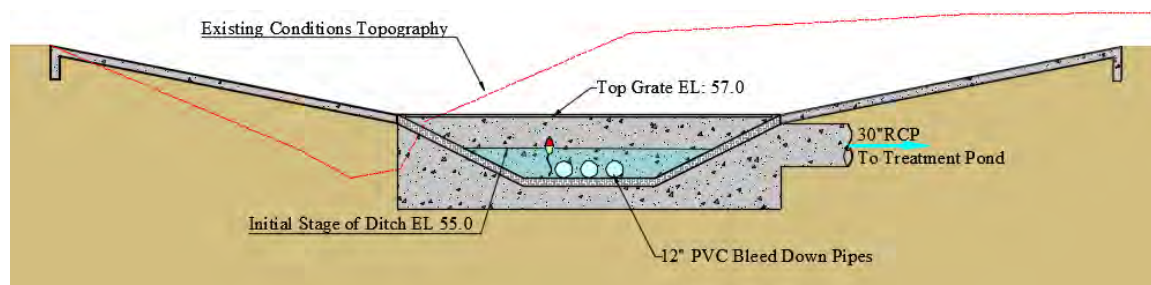
2.0 Design Information

As a part of the initial design and analysis process, several options were reviewed to include wet and dry detention and retention facilities, as well as online and offline pond systems. Based on our analysis, it was determined that an offline wet detention pond would best serve to meet the project goals. Refer to the following paragraphs for a detailed explanations outlining why an offline wet detention facility was recommended as the best method for meeting the water quality treatment goals of this project.

Water Quality

The water quality treatment methods considered were dry retention, wet retention, dry detention, and wet detention. Given the elevations of the ditch and the encountered water table elevation from the geotechnical report (refer to **Tab 5**), it is not feasible to utilize a dry pond for this on this site. Section 14-2-136 (B)(1) of the City of Kissimmee LDC requires three (3) foot of separation between the normal wet weather water table and the pond bottom (unless underdrain is used). Both the wet retention and detention systems could be designed to function on this site however, the detention system would provide more water quality treatment in the likely occurrence of back to back storms events during the rainy season.

Therefore it is recommended that an offline wet detention pond be utilized. Water quality will be provided by the offline stormwater pond and a drainage control structure. The proposed control structure consists of a modified FDOT Type E and H structures will be set in the Emory Avenue Ditch with a 30-inch reinforced concrete pipe connecting the structure to the proposed pond (Please refer to **Figure 7** in Tab 1 for a plan view of the proposed design with an aerial background). This structure will span the width of the existing ditch forcing water flow up and into the top grate of the structure. Please refer to the following sketch of the proposed structure.



The decrease in conveyance attributed to the placement of the diversion structure in the ditch will be offset by an increase in the cross sectional area of the ditch, within the limits of the proposed pond, by shifting the west bank to the west. The benefit of placing the structure in the ditch is that water quality is provided for all storm events that produce runoff from the basin located upstream of the proposed pond. The other pond options that were considered did not provide this level of treatment capability.

As the stage of Emory Avenue Ditch returns to its normal water level the stormwater captured in the proposed water quality pond will slowly be released via a separate control structure, located near south side of the pond, with a "V" notched metal weir plate back into the Emory Avenue ditch. This design will allow for 1.65 ac-ft of water quality to

be provided. Please refer to **Tab 2** for the water quality calculation and the drawdown calculation showing the recovery of the pond to its control water level.

Siltation

Minimal siltation can be expected as a result of the construction of the control structure in the Emory Avenue Ditch as a result of the drop in velocity. The minimal siltation however can be removed from the ditch using standard City maintenance equipment operating from N. Emory Avenue.

3.0 Modeling Methodology

In order to be show that the proposed improvements will function without adversely impacting upstream or downstream stages or flow rates, existing conditions and proposed conditions flood routing analyses was performed utilizing the adICPR Version 3.0 computer modeling software. The existing and proposed conditions stormwater models for the Emory Avenue ditch were created utilizing data from several sources identified as follows:

- 1981 FEMA Study HEC 2 input data (10 and 100-year flow rates);
- 2013 FEMA Study Update (Profiles and Stages);
- SFWMD Permit No. 49-02090-P (cross drain sizes, inverts and roadway profiles at Mabbette and Patrick Streets).

The data/model begins at upstream end of the Martin Luther King JR Boulevard cross drain. The geometric parameters for the existing cross drain were obtained from the construction plans for the roadway. Flow rates in the ditch were obtained from FEMA's 1981 Flood Insurance Study of the West City Canal. The model ends at the downstream end of the cross drain under West Mabbette Street. The ditch geometric parameters were obtained from the West City Ditch Embankment Stabilization Project (SFWMD Permit No. 49-02090-P). The tailwater elevations were obtained from the peak stages shown on the profile for the West City Ditch in FEMA's 2013 Flood Insurance Study of the West City Canal.

Some of the input data to create the computer model was not directly obtainable from the sources listed above. Refer to the following paragraphs which discuss how additional information was extrapolated from the available data.

Flow Rate Selection

The 2013 FEMA Flood Insurance Study model identifies a single flow rate modeled to determine the peak stages in the ditch. The peak flow rate used is indicated as the flow rate at the mouth of the canal. The 1981 FEMA study utilized a HEC -2 model showing the flow rates at various locations throughout the channel including flow rates at Martin Luther King Jr. Boulevard and Mabbette Street. The flow rate at Mabbette Street from the 1981 FEMA HEC 2 model was selected to use in the adICPR flood routing model for the Emory Avenue Stormwater Pond project because it provides a more accurate localized flow rate, within the vicinity of the project, as opposed to the flow rate at the confluence with Lake Tohopekaliga. Please refer to Tab 5 for a copy of data from the 1981 and 2013 FEMA Flood Insurance Studies. Also refer to Table 1 below for a summary of the peak flows utilized for the various storm frequencies modeled.



Photo 1: Downstream view of the crossing of the Emory Avenue Ditch and MLK Jr. BLVD



Photo 2: Upstream view of the Emory Avenue Ditch crossing of MLK Jr. Blvd

As can be seen from Photos 1 and 2 above, the structure at Martin Luther King Jr. Boulevard has silted to the inverts of the ditch that existed prior to its installation. This obstruction is included in both the existing and proposed conditions models as a bottom clip to the inverts shown on the construction plans.

Tailwater Determination

The adCPR model for this project ends at Mabbette Street (refer to Photo 3 below).



Photo 3: Upstream view of Emory Avenue Ditch crossing of Mabbette Street

Tailwater relationships for the 10 and 100-year/72-hour storm event were established by using the peak stages shown on the profile for the West City Canal in FEMA's 2013 Flood Insurance Study Update of Osceola County. Due to the proximity of Mabbette Street to Lake Tohopekaliga it is expected that the ditch will recover to its initial stage 24 hours after the storm event. The tailwater relationships at Mabbette Street and flow rates at Martin Luther King Jr. Boulevard for the mean annual storm event and the 1-Inch storm event were developed by assuming proportionality between inches of rainfall and peak stage/flow rate. Please refer to Table 1 below for the time vs. stage relationships, and flow rates, used in the existing and proposed conditions models.

Table 1
Flow Rate and Tailwater Peak Stage Summary

Storm Event	Inches of Rainfall	Flow Rate at MLK Jr. BLVD (cfs)	Peak Stage of Tailwater at Mabbette St. (ft NAVD88)
1-Inch Storm	1	45	56.6
Mean Annual	4.5	202	58.7
10 year 24 hour	5.5	246	59.3
10 year 72 hour	9.51	426	61.7
100 year 72 hour	14.95	663	63

4.0 Modeling Results

A proposed conditions model was created by modifying the existing conditions model. The proposed pond, modified Types E and H structures, pond control structure, and their interconnectivity with the existing ditch are incorporated into the model. Please refer to Tabs 3 and 4 for the adICPR model input and output data for the existing and proposed conditions analyses. Also refer to Table 2 below for the existing and proposed conditions flood routing results for the various storm events modeled.

Table 2
Summary of Flood Routing Results

Location	Storm Event	Existing Conditions Peak Stage (ft NAVD88)	Post-Development Peak Stage (ft NAVD88)
MLK Jr BLVD (Upstream)	1-Inch	57.44	57.75
	Mean Annual	60.24	60.38
	10-year/24-hour	60.82	60.97
	10-year/72-hour	63.06	63.06
	100-year/72-hour	65.07	65.05
W. King Street	1-Inch	57.09	57.54
	Mean Annual	59.56	59.77
	10-year/24-hour	60.09	60.32
	10-year/72-hour	62.15	62.15
	100-year/72-hour	63.45	63.43
Mabbette Street (Upstream)	1-Inch	56.62	56.61
	Mean Annual	58.83	58.81
	10-year/24-hour	59.44	59.43
	10-year/72-hour	61.75	61.75
	100-year/72-hour	63.05	63.05

5.0 Flood Protection

Due to the limited size and volume of the proposed pond, no reduction in 100-year flood stages in the Emory Avenue Ditch would be realized as a result of its construction/implementation. One benefit that would be realized is that 100-year compensating storage volume would be created to offset unavoidable floodplain encroachment for future City projects within the basin.

The 100-year compensating storage volume being created is 9.72 ac-ft. This volume is between the ditch influenced seasonal high elevation of 55.0 feet NAVD and the average elevation of the existing ground within the footprint of the proposed pond at elevation 63.0 feet NAVD.

Furthermore the calculations show that the introduction of the structure within the channel cross section will not increase 100-year flood stages of the ditch.

6.0 Summary of Results and Conclusion

The recommended improvements, as demonstrated in this report, will cause no net rise to the 100-year flood stages upstream of the Martin Luther King Jr. Boulevard crossing while provided water quality treatment for all storm events producing runoff from the contributing basin located upstream of the proposed diversion structure. The proposed improvements are in compliance with the requirements set forth by SFWMD and the City of Kissimmee. The stormwater improvements will provide 1.32 acre-ft of water quality to accommodate future improvements in the Emory Avenue Ditch basin. Furthermore the pond provides 9.72 ac-ft of 100-year compensating storage volume for future municipal

projects within the basin where 100-year compensating storage volume cannot be provided.

Furthermore, Table 3 below provides a comparison of the peak stage for the 100-year storm event at upstream end of the cross drain under MLK, Jr. Blvd. demonstrating no-net rise as a result of the proposed improvements.

Table 3
100-Year Storm Event Peak Stage Summary

100 Year Storm Event		
Location	Existing Conditions Peak Stage (ft NAVD88)	Post-Development Peak Stage (ft NAVD 88)
MLK Jr BLVD	65.07	65.05

JOINT APPLICATION FOR INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT/ AUTHORIZATION TO USE STATE-OWNED SUBMERGED LANDS/ FEDERAL DREDGE AND FILL PERMIT

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION/
WATER MANAGEMENT DISTRICTS/
U.S. ARMY CORPS OF ENGINEERS

Effective October 1, 2013



**US Army Corps
of Engineers®**

INSTRUCTIONS FOR USE OF THIS FORM:

This form is designed to assist you in submitting a complete application. All applications must include Section A- General Information for All Activities. Sections B through H list typical information that is needed based on the proposed activities, and are only required as applicable. Part 1-C of Section A will guide you to the correct sections needed based on your proposed activities. Applicants are advised to consult Chapter 62-330, F.A.C., and the Environmental Resource Permit Applicant's Handbook Volumes I and II for information regarding the ERP permitting process and requirements while preparing their application. Internet addresses for Chapter 62-330, F.A.C. and the Applicant's Handbook, Agency contact information, and additional instructions for this form can be found in Attachment 1.

What Sections of the Application Must I Fill Out?

	A- General Information	B- Single Family Projects	C- Wetlands and other Surface Waters	D- Structures or Works in Surface Waters	E- Stormwater Management System	F- State-owned Submerged Lands	G- Mitigation Banks	H- Mines

Note- if you are required to provide Section B, then you do not have to provide any other Sections, unless the activities are on state-owned submerged lands. In that case, Section F will also be required.

If you have any questions, or would like assistance completing this form, please contact the staff of the nearest office of either the Florida Department of Environmental Protection (DEP) or a Water Management District (WMD) (see Attachment 2).

Section A: General Information for All Activities

PART 1: NAME, APPLICATION TYPE, LOCATION, AND DESCRIPTION OF ACTIVITY

A. Name of project, including phase if applicable: **Emory Avenue Stormwater Pond**

This is for (check all that apply):

- ☐ Construction or operation of **new** works, activities and/ or a stormwater management system
- ☐ **Conceptual Approval** of proposed works, activities and/ or a stormwater management system
- ☒ Modification or Alteration of **existing** works activities and / or a stormwater management system. Provide the existing DEP or WMD permit #, if known: 49-01210-P. Note: Minor modifications do not require completion of this form, and may instead be requested by letter.
- ☐ **Maintenance or repair** of works, activities and/ or stormwater management system previously permitted by the DEP or WMD Provide existing permit #, if known:
- ☐ Abandonment or removal of works, activities and/ or stormwater management system Provide existing DEP or WMD permit #, if known:
- ☐ Operation of an **existing unpermitted** stormwater management system.
- ☐ Construction of additional phases of a permitted work, activity and/ or stormwater management system.

Provide the existing DEP or WMD permit #, if known:

C. **List the type of activities proposed. Check all that apply, and provide the supplemental information requested in each of the referenced application sections. Please also reference Applicant's Handbooks I and II for the type of information that may be needed.**

- ☐ Activities associated with one single-family residence, duplex, triplex, or quadruplex that do not qualify for an exemption or a General Permit: **Provide the information requested in Section B. Do not complete Section C.**
- ☒ Activities within wetlands or surface waters, or within 25 feet of a wetland or surface water, (not including the activities associated with an individual residence). *Examples include dredging, filling, outfall structures, docks, piers, over-water structures, shoreline stabilization, mitigation, reclamation, restoration/enhancement.* **Provide the information requested in Section C.**
- ☒ Activities within navigable or flowing surface waters such as a multi-slip dock or marina, dry storage facility, dredging, bridge, breakwaters, reefs, or other offshore structures: **In addition to Section C, also provide the information requested in Section D.**
- ☐ Activities that are (or may be) located within, on or over state-owned submerged lands (See Chapter 18-21, F.A.C. <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=18-21>): **In addition to Section B or C, also provide the information requested in Section F**

- ☒ Construction or alteration of a stormwater management system serving residential, commercial, transportation, industrial, agricultural, or other land uses, or a solid waste facility (excluding mines that are regulated by DEP). **Provide the information requested in Section E.**
- ☐ Creation or modification of Mitigation Bank (refer to Chapter 62-342, F.A.C. <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-342>): **Provide the information requested in Section G.**
- ☐ Mines (as defined in Section 2.0 of Applicant's Handbook Volume I) that are regulated by the DEP: **Provide the information requested in Section H.**
- ☐ Other, describe:
Please contact the Agency to determine which additional sections of the application are needed. See Attachment 1 for Agency contacts.

D. Describe in general terms the proposed project, system, works, or other activities. For permit modifications, please briefly describe the changes requested to the permit:

Construction of a water quality treatment pond to serve other future, municipal projects within the basin where water quality treatment cannot be provided due to physical or other constraints.

E. For activities in, on, or over wetlands or other surface waters, check the type of federal dredge and fill permit requested (if known): ☐ Individual ☐ Programmatic General permit #: SAJ
☐ General ☒ Nationwide permit #:29 ☐ Not Applicable ☐ Not sure

F. Project/Activity Street/Road Address or other location (if applicable): **West side of Emory Street between MLK Jr. Blvd. and Mabbette Street.**
City: **Kissimmee** County(ies): **Osceola** Zip: **34741**

Note: For utility, road, or ditch/canal activities, provide a starting and ending point using street names and nearest house numbers or provide length of project in miles along named streets or highways.

G. Project location map and Section, Township, and Range information (use additional sheets if needed):
Please attach a location map showing the location and boundaries of the proposed activity in relation to major intersections or other landmarks. The map should also contain a north arrow and a graphic scale; show Section(s), Township(s), and Range(s); and must be of sufficient detail to allow a person unfamiliar with the site to find it.

Section(s): **21** Township: **25S** Range: **29E** Land Grant name, if applicable:
Section(s): Township: Range:
Section(s): Township: Range:

H. Latitude (DMS) **28° 17' 41" N** Longitude (DMS) **81° 25' 15" W** (Taken from central location of the activity). Explain source for obtaining latitude and longitude (i.e. U.S.G.S. Quadrangle Map, GPS, online resource): **Google Earth**

I. Tax Parcel Identification Number(s): **21-25-29-1402-0001-0010.**

J. Directions to Site (from major roads; include distances and landmarks as applicable):
US 441 (OBT) to US 192. West on US 192 to JYP. JYP South to MLK Jr. Blvd. West on MLK Jr. Blvd. to N. Emory Street. South on N. Emory Street to project site. Project site is located on the west side of the Emory Street Ditch.

K. Project area or phase area: **2.98 acres**

L. Name of waterbody(ies) (if known) in which activities will occur or into which the system will discharge:
The outfall for the project is Lake Tohopekaliga via the Emory Street Ditch.

The following questions (M-O) are not applicable to activities related to a single-family residence, including private single-family residential docks, piers, seawalls or boat ramps.

M. Is it part of a larger plan of development or sale? ☐ yes ☒ no

N. Impervious or semi-impervious area excluding wetlands and other surface waters (if applicable):
0.00 acres or 0.00 square feet

O. Volume of water the system is capable of impounding (if applicable): **N/A** acre-feet.

PART 2: SUPPLEMENTAL INFORMATION, AND PERMIT HISTORY

- A. Is this an application to modify an existing Environmental Resource Permit, or to construct or implement part of a multi-phase project, such as a project with a Conceptual Approval permit? ☒ Yes ☐ No *If you answered "yes", please provide permit numbers below:*

AGENCY	DATE	PERMIT/APPLICATION NO.	PROJECT NAME
SFWMD	8/30/2002	49-01210-P	Emory Street Ditch Project

- B. Indicate if there have been any **pre-application meeting(s)** or other discussions about the proposed project, system or activity. If so, please provide the date(s), location(s) of the meeting, and the name(s) of Agency staff that attended the meeting(s):

AGENCY	DATE	LOCATION	MEETING ATTENDEES

- C. **Attach a depiction (plan and section views), which clearly shows the works or other activities proposed to be constructed.** Use multiple sheets, if necessary, a scale sufficient to show the location and type of works, and include a north arrow and a key to any symbols used. **Specific information to be included in the plans is based on the activities proposed and is further described in Sections B-H.** However, supplemental information may be required based on the specific circumstances or location of the proposed works or other activities.

Please refer to the construction plans submitted with this application

- D. Processing Fee: **Please submit the application processing fee along with this application form and supplemental information.** Processing fees vary based on the size of the activity, the type of permit applied for, and the reviewing Agency. Please reference Attachment 3 to determine the appropriate fee.

The appropriate processing fee is attached to this application

PART 3: APPLICANT AND ASSOCIATED PARTIES INFORMATION

Instructions: Permits are only issued to entities having sufficient real property interest as described in Section 4.2.3 (d) of Applicant's Handbook Volume I. Please attach evidence of sufficient real property interest over the land upon which the activities subject to the application will be conducted, including mitigation (if applicable). Refer to Section 4.2.3 (d) for acceptable ownership or real property interest documentation. For corporations, list a person who is a registered agent or officer of the corporation who has the legal authority to bind the corporation.

A. APPLICANT (ENTITY MUST HAVE SUFFICIENT REAL PROPERTY INTEREST) THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION				
Name: Last: Arsenault		First: James		Middle:
Title: City Engineer		Company: City of Kissimmee		
Address: 101 N. Church Street, Suite 301				
City: Kissimmee		State: Florida		Zip: 34741
Home Telephone:		Work Telephone: 407-518-2279		
Cell Phone:		Fax: 407-518-2165		
E-mail Address: jarsenault@kissimmee.org				
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐				
B. LAND OWNER(S) (IF DIFFERENT OR IN ADDITION TO APPLICANT) CHECK HERE IF LAND OWNER IS ALSO A CO-APPLICANT				
Name: Last: Same as applicant		First:		Middle:
Title:		Company:		
Address:				
City:		State: FI		Zip:
Home Telephone:		Work Telephone:		
Cell Phone:		Fax:		
E-mail Address:				
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐				
C. OPERATION AND MAINTENANCE ENTITY (see Applicant's Handbook I, Section 12.3)				
Entity Name: Same as applicant		Contact: Last:		First: Middle:
Title:		Company:		
Address:				
City:		State:		Zip:
Home Telephone:		Work Telephone:		
Cell Phone:		Fax:		
E-mail Address:				
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐				

D. CO-APPLICANT (IF DIFFERENT OR IN ADDITION TO APPLICANT AND OWNER)		
Name: Last:	First:	Middle:
Title:	Company:	
Address:		
City:	State:	Zip:
Home Telephone:	Work Telephone:	
Cell Phone:	Fax:	
E-mail Address:		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐		
E. ENGINEERING CONSULTANT THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION		
Name: Last: Moody	First: John	Middle: Eric
Title: Project Manager	Company: Osceola Engineering, Inc.	
Address: 1003 Florida Avenue		
City: St. Cloud	State: FL	Zip: 34769
Home Telephone:	Work Telephone: (407)-891-0452	
Cell Phone: (407) 709-0969	Fax: (407) 891-9173	
E-mail Address: jmoody@osc-eng.com		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐		
F. ENVIRONMENTAL CONSULTANT THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION		
Name: Last: Chambers	First: Nathan	Middle: E.
Title: Senior Biologist	Company: Austin Environmental Consultants, Inc.	
Address: 316 Church Street		
City: Kissimmee	State: FL	Zip: 34769
Home Telephone:	Work Telephone: (407)935-0535	
Cell Phone:	Fax:	
E-mail Address: nathan@austinec.com		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐		
G. AGENT AUTHORIZED TO SECURE PERMIT (IF DIFFERENT FROM CONSULTANT) THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION		
Name: Last:	First:	Middle:
Title:	Company:	
Address:		
City:	State:	Zip:
Home Telephone:	Work Telephone:	
Cell Phone:	Fax:	
E-mail Address:		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: ☐		

If necessary, please add additional pages for other contacts and property owners related to this project.

PART 4: SIGNATURES AND AUTHORIZATION TO ACCESS PROPERTY

Instructions: For multiple applicants please provide a separate Part 4 for each applicant. For corporations, the application must be signed by a person authorized to bind the corporation. A person who has sufficient real property interest (see Section 4.2.3 (d) of Applicant's Handbook Volume I) is required in (B) to authorize access to the property, except when the applicant has the power of eminent domain.

A. By signing this application form, I am applying for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application and represent that such information is true, complete and accurate. I understand this is an application and not a permit, and that work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto, does not relieve of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a different responsible operation and maintenance entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

James Arsenault, P.E.

Typed/Printed Name of Applicant or
Applicant's Authorized Agent

Signature of Applicant or Applicant's
Authorized Agent

Date

City Engineer

(Corporate Title if applicable)

B. CERTIFICATION OF SUFFICIENT REAL PROPERTY INTEREST AND AUTHORIZATION FOR STAFF TO ACCESS THE PROPERTY:

I certify that:

☐ I possess sufficient real property interest in or control, as defined in Section 4.2.3 (d) of Applicant's Handbook Volume I, over the land upon which the activities described in this application are proposed and I have legal authority to grant permission to access those lands. I hereby grant permission, evidenced by my signature below, for staff of the Agency and the U.S. Army Corps of Engineers to access, inspect, and sample the lands and waters of the property as necessary for the review of the proposed works and other activities specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review, inspection, and/ or sampling. Further, I agree to provide entry to the project site for such agents or personnel to monitor and inspect permitted work if a permit is granted.

OR

☐ I represent an entity having **the power of eminent domain and condemnation authority**, and I/we shall make appropriate arrangements to enable staff of the Agency and the U.S. Army Corps of Engineers to access, inspect, and sample the property as described above.

James Arsenault, P.E.

Typed/Printed Name

Signature

Date

City Engineer

(Corporate Title if applicable)

C. DESIGNATION OF AUTHORIZED AGENT (IF APPLICABLE):

I hereby designate and authorize _____ to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I authorize the above-listed agent to bind me, or my corporation, to perform any requirements which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Typed/Printed Name of Applicant

Signature of Applicant

Date

(Corporate Title if applicable)

SECTION E: SUPPLEMENTAL INFORMATION REQUIRED FOR WORKS OR OTHER ACTIVITIES INVOLVING A STORMWATER MANAGEMENT SYSTEM (OTHER THAN A SINGLE-FAMILY PROJECT)

Instructions: The information listed in the checklists below represents the level of information that is usually required to evaluate an application. Information can be provided within reports, plans and documents. The level of information required for a specific project will vary depending on the nature and location of the site and the activity proposed. Conceptual approvals generally do not require the same level of detail as a construction permit. However, providing a greater level of detail will reduce the need to submit additional information at a later date. If an item does not apply to your project, proceed to the next item. The supplemental information required by this section is in addition to the information required by Section A of the ERP application.

PART 1: STORMWATER MANAGEMENT SYSTEM SUMMARY

Provide drainage calculations, signed and sealed by an appropriate registered professional, and supporting documentation demonstrating that the proposed project meets the conditions for issuance under 62-330.301(1)(a),(b),(c),(e), F.A.C. The drainage calculations should include, but not necessarily be limited to, the following:

1. General Site Information:

- a. ☐ Provide pre-development and post-development drainage map(s), as appropriate, that include drainage patterns and basin boundaries with acreage served by each hydraulically separate system, showing the direction of flows, including any off-site runoff being routed through or around the system; topographic information; and connections between wetlands and other surface waters. **Please refer to Figures 6 and 7 of Tab 1 for the Existing and Proposed Conditions Drainage Maps.**
- b. ☐ Provide the results of any percolation tests, where appropriate, and soil borings that are representative of the actual site conditions. Identify the wet season high water table elevations, soil profiles, and hydraulic conductivity. Include dates, datum, and methods used to determine these soil parameters. **A Geotechnical Engineering Investigation prepared by Geotechnical and Environmental Consultants, Inc. is included in Tab 5.**
- c. ☐ Identify the onsite hydrologic soil classification (e.g. Type A, B/D, D). Reference the source, such as the USDA/NRCS Soil Survey, used in estimating the onsite hydrologic soil classification. Provide maps, as appropriate, with the project limits delineated. **Please refer to Figure 3 in Tab 1 for the existing soil data.**
- d. ☐ Identify the seasonal high water or mean high tide elevation for receiving waters/wetlands into which runoff will be discharged. Include dates, datum, and methods used to determine these elevations. **Discharge from the project will occur to the existing Emory Avenue Ditch. The seasonal high is estimated to be elevation 55.0 NAVD based on the invert of the existing ditch, the invert of downstream culverts influencing stages in the ditch and the regulation of the receiving facility Lake Tohopekaliga.**
- e. ☐ Identify the name of each receiving waterbody to which the proposed stormwater management system will discharge: **Lake Tohopekaliga.**
- f. ☐ Indicate the existing land use and land cover. **Please refer to the ecological site assessment prepared by Austin Environmental, Inc. included in Tab 5.**

- g. ☐ Provide the acreage, and percentages of the total project, of the following:
1. Impervious surfaces, excluding buildings, wetlands and other surface waters;
 2. Buildings;
 3. Pervious surfaces (green areas not including wetlands);
 4. Lakes, canals, retention areas, other open water areas; and
 5. Wetlands (Please refer to Section C to ensure consistency in wetland acreages).
- Please refer to the existing and proposed conditions curve number calculations in Tabs 3 and 4.**
- h. ☐ Provide the location and description of any nearby existing offsite features (such as wetland and other surface waters, stormwater management ponds, and building or other structures) which might be affected by or affect the proposed construction or development.
- No existing onsite, nor offsite, features are anticipated to be affected by this project.**

2. Water Quality Analysis:

- a. ☐ Provide a description of the proposed stormwater treatment methodology that addresses the type of treatment, pollution abatement volumes, and recovery analysis.
- Water quality treatment for the improvements will be provided in the proposed wet detention pond. Water quality volume requirements are addressed in Table 5 in Tab 2.**
- b. ☐ Is the receiving waterbody known to be impaired, and/or has an established Total Maximum Daily Load (TMDL) or Basin Management Action Plan (BMAP)? If so, please provide specific descriptions of all water quality parameters for which the waterbody is known to be impaired? For more information about water quality, impaired waters, and to determine whether a TMDL has been adopted in your project area, refer to: <http://waterwebprod.dep.state.fl.us/basin411/downloads/Florida-Adopted-TMDLs.pdf>. To determine whether a BMAP exists, or is being developed in your project area, refer to: <http://www.dep.state.fl.us/water/watersheds/bmap.htm#rad>.
- ☐ Yes ☒ no ☐ don't know
- If yes, provide calculations demonstrating that the proposed project will not contribute to violations of state water quality standards in accordance with the applicable Applicant's Handbook, Vol. II.
- c. ☐ Does the project have a direct discharge to a Class I, Class II, Outstanding Florida Waters or Class III waters, which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting? *To determine whether your project is within, or will discharge to an OFW, or for more information about OFWs in general, refer to:* <http://www.dep.state.fl.us/water/wqssp/ofw.htm>.
- ☐ yes ☒ no ☐ don't know
- If yes, additional treatment in accordance with the applicable Applicant's Handbook, Vol. II, may be required.
- Not Applicable.**
- d. ☐ Provide construction plans and calculations that address the required treatment volume and recovery, as well as stage-storage and design elevations, which demonstrate compliance with the appropriate water quality treatment criteria in the applicable Applicant's Handbook, Vol. II.
- Please refer to the Tables 3 and 5 in Tab 2.**

Provide a description of the engineering methodology, assumptions and references for the parameters listed above, and a copy of all such computations, engineering plans, and specifications used to analyze the system. If a computer program is used for the analysis, provide the name of the program, a description of the program, input and output data, and justification for model selection.

Refer to the Exhibits in Tab 2 and calculations including pre and post-development adICPR flood routing analyses, in Tabs 3 and 4.

3. Water Quantity Analysis:

Provide calculations and documentations demonstrating that the project, as proposed, meets the applicable design criteria as indicated in the applicable Applicant's Handbook, Vol. II. Typically, the information would include, at a minimum, but is not necessarily be limited to, the following:

- ☐ a. For projects requiring pre-development analysis, provide an analysis of the pre-development peak rate of discharge and / or volume of runoff, for all design storm events. Account for all onsite depressional storage and offsite contributing area. Please refer to the applicable Applicant's Handbook, Vol. II for the design storm event(s) that apply to your project. **See Tab 3 for the pre-development analysis and the calculated peak discharge rates from the project.**
- ☐ b. Provide an analysis of the post-development peak rate of discharge and / or volume of runoff for all applicable design storm events. Account for all onsite storage and offsite contributing area. Please refer to the applicable Applicant's Handbook, Vol. II for the design storm event(s) and criteria that apply to your project.
See Tab 4 for the post-development analysis and the calculated peak discharge rates from the project.

These analyses should include:

- ☐ Runoff characteristics, including area, runoff curve number or runoff coefficient, and time of concentration for each drainage basins in the pre-development and post-development condition;
- ☐ Design storms used including rainfall depth, duration, frequency, and distribution;
- ☐ Runoff hydrograph(s) for each drainage basin, for all required design storm event(s);
- ☐ Stage-storage computations for any area such as a reservoir, closed basin, detention area, or channel, used in storage routing;
- ☐ Stage-discharge computations for any storage areas at a selected control point, such as control structure or natural restriction;
- ☐ Flood routings through on-site conveyance and storage areas;
- ☐ Water surface profiles in the primary drainage system for each required design storm event(s);
- ☐ Runoff peak rates and volumes discharged from the site for each required design storm event(s);
- ☐ Design tailwater elevation(s) for each storm event at all points of discharge (include source or method of estimate); and
- ☐ Pump specifications and operating curves for range of possible operating conditions (if used in system).

Provide a description of the engineering methodology, assumptions and references for the parameters listed above, and a copy of all such computations, engineering plans, and specifications

used to analyze the system. If a computer program is used for the analysis, provide the name of the program, input and output data, justification for model selection, and, if necessary, a description of the program.

Please refer to Tabs 1, 2 & 4.

4. Floodplain Analysis (where applicable).

- a. ☐ If the project is in a known floodplain of a stream or other water course, identify the appropriate floodplain boundary and approximate flooding elevations of any lake, stream or other watercourse located on or adjacent to the site.
- b. ☐ For traversing works, in accordance with the applicable Applicant's Handbook, Vol. II, provide:
 - ☐ Hydraulic calculations for all proposed traversing works; and
 - ☐ Water surface profiles showing upstream impact of traversing works.
- c. ☐ For impacts to regulated floodplains, in accordance with the applicable Applicant's Handbook, Vol. II, provide:
 - ☐ Location and volume of encroachment within regulated floodplain(s); and
 - ☐ Plans and calculations for compensating floodplain storage, if necessary, and calculations required for determining minimum building and road flood elevations.

PART 2: CONSTRUCTION PLANS

- 1. Provide clear, construction level detailed plans for the system. The plans must be signed and sealed by an appropriate registered professional as required by law. These plans should include cumulative information from all applicable sections; as well as the following:
 - a. ☐ Project area boundary and total area, including distances and orientation from roads or other landmark.
 - b. ☐ Existing topography extending at least 100 feet off the project area. All topography shall include location and description of benchmarks, reference to NGVD 1929 or NAVD 1988 along with the conversion factor.
 - c. ☐ Proposed site plan with acreage, including the following:
 - ☐ plan view of proposed development, including impervious surfaces and water management areas;
 - ☐ land cover and natural communities*;
 - ☐ wetlands and other surface waters*;
 - ☐ undisturbed uplands*;
 - ☐ aquatic communities*;
 - ☐ proposed buffers*;
 - ☐ proposed impacts to wetlands and other surface waters, and any proposed connections/outfalls to other surface waters or wetlands, (if applicable); and

☐ onsite wetland mitigation areas*.

*Please refer to Section C.

☐ For phased projects, provide a master development plan clearing delineating the limits of each phase of construction.

- d. ☐ Paving, Grading, and Drainage Information, which includes, but not necessarily limited to, the following:
- ☐ Existing topography;
 - ☐ Boundaries of wetlands and other surface waters and upland buffers (see Section C);
 - ☐ Plan view of proposed development;
 - ☐ Proposed elevations and/or profiles, including:
 - ☐ roadway, parking, and pavement grades;
 - ☐ floor slabs, walkways, and other paved surfaces;
 - ☐ earthwork grades for pervious landscaped areas; and
 - ☐ perimeter site grading, tying back into existing grades. Location of all water management areas, including elevations, dimensions, side slopes, and design water depths;
 - ☐ Location, size, and invert elevations of existing and proposed stormwater conveyance systems;
 - ☐ Vegetative cover plan for all on-site and off-site earth surfaces disturbed by construction; and
 - ☐ Rights-of-way and easements for the system, including all on-site and off-site areas to be reserved for water management purposes (including access), and rights-of-way and easements for the existing drainage system, if any.
- e. ☐ Stormwater detail information, including but not necessarily limited to, the following:
- ☐ Cross section of all stormwater management areas, including elevations, dimensions, side slopes, and proposed stabilization measures (with location of the cross section(s) shown on the corresponding plan view);
 - ☐ Detail of all proposed control structures, including elevations, dimensions, and skimmer, where applicable; and
 - ☐ Details of proposed stormwater management systems, such as underdrains, exfiltration trenches, vaults, and other proposed Best Management Practices (BMPs).
- f. ☐ Location and description of any nearby existing offsite features (such as wetland and other surface waters, stormwater management ponds, and building or other structures) which might be affected by or affect the proposed construction or development.

PART 3: CONSTRUCTION SCHEDULE AND TECHNIQUES

Provide a construction schedule, and a description of construction techniques, sequencing and equipment. This information should include, as applicable, the following.

- a. ☐ Access and staging of equipment;
Access via Emory Avenue, equipment will be staged on site.
- b. ☐ Location and details of the erosion, sediment and turbidity control measures to be implemented during each phase of construction and all permanent control measures to be implemented in post-development conditions.
Please refer to the Paving, Grading, and Drainage Plan & SWPPP Plan.
- c. ☐ The location of disposal site(s) for any excavated material, including temporary and permanent disposal sites. **Any excess excavated material will be properly disposed of offsite in an approved, legal disposal area.**

- d. ☐ A demolition plan for any existing structures to be removed. **A demolition plan is included in the construction plans.**
- e. ☐ Dewatering plan details. If dewatering is required, detail the dewatering proposal including the methods that are proposed to contain the discharge, methods of isolating dewatering areas, and indicate the period dewatering structures will be in place; **Note: a Consumptive Use or Water Use permit may be required for dewatering. A dewatering permit application will be submitted after receipt of initial comments from the SFWMD on the SWERP application.**
- f. ☐ Methods for transporting equipment and materials to and from the work site. If barges are required for access, provide the low water depths and draft of the fully loaded barge; **Equipment will be transported via Emory Avenue.**

PART 4: OPERATION AND MAINTENANCE AND LEGAL DOCUMENTATION:

- a. ☐ Describe the overall maintenance and operation schedule for the proposed system. **All maintenance and operation for the proposed improvements will be performed by the City of Kissimmee. The ponds will be mowed on a weekly or bi-weekly basis and the control structure and outfall system will be cleared of debris on a weekly or bi-weekly basis when the ponds are mowed.**
- b. ☐ Identify the entity (or entities) that will be responsible for operating and maintaining the system (or parts of the system) to demonstrate that the entity (or entities) meet(s) the requirements of section 12.3 of the Applicant's Handbook, Vol. I. **All maintenance and operation for the proposed improvements will be performed by the City of Kissimmee.**
- ☐ If different from the permittee, provide a draft document enumerating the enforceable affirmative obligations on the entity to properly operate and maintain the system for its expected life, and documentation of the entity's financial responsibility for long-term maintenance.
- ☐ If the proposed operation and maintenance entity is not a property owner's association, provide proof of the existence of an entity, or the future acceptance of the system by an entity which will operate and maintain the system.
- c. ☐ Provide drafts of all proposed conservation easements, stormwater management system easements, draft property owner's association documents, and plats for the property containing the proposed system. **Not applicable.**
- d. ☐ Provide legal reservations for access to the treatment system for maintenance and operation by future maintenance entities for subdivided projects. **Not applicable.**
- e. ☐ Provide indication of how water and wastewater service will be supplied. **Water and wastewater service will not be required for this project.**
- f. ☐ Provide a copy of the boundary survey and/or legal description and acreage of the total land area of contiguous property owned/controlled the applicant. **Please refer to the construction plans and Tab 5.**

PART 5: WATER USE

- a. ☐ Describe how irrigation will be provided to the project. Will the surface water system be

used for water supply, including landscape irrigation, or recreation?

No irrigation is proposed for this project.

- b. ☐ If a Consumptive Use or Water Use permit has been issued for the project, state the permit number:

No consumptive use or Water Use permit has been issued.

- c. ☐ If a Consumptive Use or Water Use permit has not been issued for the project, indicate if such a permit will be required. ☐ **yes** ☐ no ☐ don't know

If yes, please indicate when the application for a permit will be submitted:

A consumptive use permit application is not required for this project.

- d. ☐ Indicate how any existing wells located within the project site will be utilized or abandoned. **There are no known existing wells within the project limits.**

PART 6: SPECIAL BASIN INFORMATION

Is your project within a special basin as described in the applicable Applicant's Handbook, Vol. II?

☐ yes ☐ **no** ☐ don't know

If yes, please demonstrate that the project will meet the applicable special basin criteria.

See Table 5 in Tab 2 for the water quality volume calculations.

SECTION C: SUPPLEMENTAL INFORMATION FOR WORKS OR OTHER ACTIVITIES IN, ON, OR OVER WETLANDS AND/OR OTHER SURFACE WATERS

(Note: This section is not required if all the proposed activities are covered in Section B.)

Instructions: This section is for ERP applications that do not involve activities associated with an individual single-family residence, duplex, triplex or quadruplex. For those activities, please use Section B. This form is to be completed if the proposed work or activity will occur in, on, over, or within 25 feet of a wetland or other surface water. The supplemental information required by this section is in addition to the information required by Section A of the ERP application.

PART 1: WETLAND OR OTHER SURFACE WATER IMPACT SUMMARY

1. Describe the basic purpose of the project or activity: Construction of a stormwater improvement project for the City of Kissimmee
2. Total area of work (dredging, filling, construction, alteration, or removal) in, on, or over wetlands or other surface waters: **626** sq. ft.; **0.01** ac.
3. Total volume of material in wetlands or other surface waters:
 - a. to be dredged: cubic yards,
 - b. to be filled: cubic yards.
4. Identify the seasonal high water level (SHWL) and wetland normal pool elevations for each wetland or surface water within the project site. For tidal wetlands and/or surface waters provide the elevation of mean high and mean low water. Include an aerial photograph showing the location of each sampling location, dates, datum, and methods used to determine these elevations. **See Geotech Report**
5. Name of waterbody(ies) (if applicable & if known) in which work will occur? **Emory Ave. Ditch**
6. Is the activity proposed in an Outstanding Florida Water or Aquatic Preserve?
☐ yes, name: ☒ no ☐ I don't know
7. Has there ever been a formal or informal wetland determination for the project site? If yes, provide the identifying number and/ or a copy of the jurisdictional map. **No**
8. Provide a map(s) of the project area and vicinity delineating USDA/NRCS soil types. **See Env. Rpt.**
9. Provide recent aerials, legible for photointerpretation (no photocopies) with a scale of 1" = 400 ft, or more detailed, with project boundaries and wetland boundaries delineated on the aerial. **See Env. Rpt.**
10. Provide existing and proposed maps indicating vegetative community types based on Florida Land Use and Cover Classification System (FLUCCS) (FDOT 1999). For vegetated areas dominated by exotic vegetation, use the FLUCCS code representative of the native community type that was present prior to exotic infestation. **See Environmental Report.**



11. Provide existing and proposed maps indicating vegetative community types based on the Florida Natural Areas Inventory Guide to the Natural Communities of Florida. See Environmental Report.
12. Impact Summary Tables (located at the end of this section):
 - a. For all projects, complete Table 1, 2 and 3 as applicable. See below
 - b. For shoreline stabilization projects, provide the information requested in Table 4. N/a
13. Adjacent property owners. The following information is required only for projects proposed to occur in, on or over wetlands that need a federal dredge and fill permit and/or authorization to use state owned submerged lands and is not necessary when applying solely for an Environmental Resource Permit. If the activity is located on state owned submerged lands and requires a lease or easement, provide a list of names and addresses from the latest county tax assessment roll of all property owners located within a 500 ft. radius of the proposed lease or easement boundary in mailing label format, or you may elect to send notice to those persons by certified mail, with the return-receipt card addressed to the DEP or water management district, as applicable, in accordance with subsection 18-21.005(3), F.A.C., and Section 253.115, F.S. For projects that need a federal dredge and fill permit, please provide the names, addresses and zip codes of property owners whose property directly adjoins the project (excluding applicant). Attach additional sheets if necessary.

1. N/a	2.
3.	4.
5.	6.

PART 2: ENVIRONMENTAL CONSIDERATIONS

Note: for many questions, a state rule/Applicant's Handbook Volume I (AH I) section is cited to assist the applicant in addressing these questions. However, additional Federal criteria may apply.

1. Elimination or Reduction of Impacts (Avoidance and Minimization). Describe measures taken to eliminate or reduce impacts to wetlands and other surface waters (*Refer to AH I Section 10.2.1*).
See Environmental Report.
2. Fish, Wildlife, Listed Species and their Habitats. Provide results of any wildlife assessments that have been conducted on the project site and provide any comments pertaining to the project from the Florida Fish and Wildlife Conservation Commission and/or the U.S. Fish and Wildlife Service (*Refer to AH I Section 10.2.2*). **See Environmental Report.**
3. Water quantity impacts to wetlands and other surface waters (*Refer to AH I Section 10.2.2.4 and AH II*).

- a. Does the activity include a proposed stormwater water management system with a control elevation different than the wetland normal pool elevation(s) of existing or proposed created wetlands or other surface waters? **No.**
- b. If yes to (a), provide documentation (e.g. drawdown assessment or other methods) that shows the proposed surface water management system will not change the hydroperiod of the existing or created wetland or other surface water. **N/a**
4. Public Interest Test. Please describe how the proposed activity will ***not be contrary*** to the public interest, OR if such an activity significantly degrades or is located within an Outstanding Florida Water (OFW), that the regulated activity will be ***clearly in*** the public interest (*Refer to AH I Section 10.2.3*).
 - a. Please describe how the project will be designed to avoid adverse affects to public health, safety, or the welfare or the property of others. **Project is public facilities improvement.**
 - b. Please describe how the project will be designed to avoid adverse affects to the conservation of fish and wildlife, including endangered or threatened species, or their habitats.
See Environmental Report.
 - c. Please describe how the project will be designed to avoid adverse affects to navigation or the flow of water or cause harmful erosion or shoaling.
There are no navigable waters within project area.
 - d. Please describe how the project will be designed to avoid adverse affects to the fishing or recreational values or marine productivity in the vicinity of the activity.
Project will improve water quality to downstream receiving waters, including Lake Tohopekaliga.
 - e. Will the project be of a temporary or permanent nature?
Permanent.
 - f. Please describe how the project will be designed to avoid adverse impacts to significant historical and archaeological resources, under the provisions of section 267.061, F.S.
There are no known historical/archaeological resources within the project footprint.
 - g. Please describe how the project will be designed to avoid adverse affects to the current condition and relative value of functions being performed by areas affected by the proposed regulated activity. **The affected waterbody is a manmade, urban drainage ditch.**
5. Water Quality. Provide a description of how water quality will be maintained in wetlands and other surface waters that will be preserved or will remain undisturbed, both on and offsite. Please address both short-term (such as during construction) and long-term water quality considerations (*Refer to AH I Section 10.2.4*). **N/a**
6. Class II Waters; Waters approved for shellfish harvesting (*Refer to AH I Section 10.2.5*).
 - a. Will the project occur in Class II that are NOT approved for shellfish harvesting? If yes, please provide a plan or procedure detailing the measures to be taken to meet the requirements of *AH I Section 10.2.5(a)*. **No.**
 - b. Is the project located adjacent to or in close proximity to Class II waters? If yes, please provide a plan or procedure detailing the measures to be taken to meet the requirements of *AH I Section 10.2.5(b)*. **No.**

- c. Is the project located in Class II or Class III waters that are classified as “approved”, “restricted”, “conditionally approved”, or “conditionally restricted”? If yes, demonstrate that the project meets the requirements of *AH I Section 10.2.5(c)*. **No.**

7. Vertical seawalls. Are vertical seawalls proposed in an estuary or lagoon as part of the project? If yes, please describe how the project meets the requirements of *AH I Section 10.2.6*.

No.

8. Secondary Impacts (*AH I Section 10.2.7*).

- a. Will an upland buffer, with a minimum width of 15' and an average width of 25', be provided between the proposed activities and existing wetlands or wetlands to be preserved, enhanced, restored, or created? Provide the location and dimension of all buffers on the plans. **N/a** If not, demonstrate that secondary impacts will not occur or how they will be offset.

There are no wetlands on or adjacent to the project site.

- b. If listed species are present or may be present then coordination with wildlife agencies is needed. Have you coordinated with the FFWCC and/or USFWS? If so, please provide correspondence from the wildlife agencies indicating concurrence with the species management plan(s).

No coordination with FFWCC or USFWS has taken place. There are no state/federally-listed species within the project site.

- c. What measures will be taken to avoid impacts to wetland-dependent wildlife and/or listed species that use uplands for nesting or denning?

See Environmental Report.

- d. Describe whether there are any other relevant activities that are very closely linked and causally related to any proposed dredging or filling in wetlands or other surface waters that have the potential to cause impacts to significant historical and archaeological resources.

There are no known historical/archaeological resources within project footprint.

- e. Are there additional future phases or extensions of the proposed activities that are not shown? If yes, please describe.

No.

9. Cumulative Impacts. Is the proposed mitigation located within the same drainage basin (*Refer to AH I Figures 10.2.8.1 – 10.2.8.5*) as the proposed wetland impacts? **N/a** If not, please submit a Cumulative Impact Evaluation in accordance with *AH I Section 10.2.8*.

10. Mitigation Plan (*Refer to AH I Section 10.3*).

- a. If a mitigation bank is proposed to offset wetland/other surface water impacts, provide:

- i. the name of the bank: **N/a** . A letter of reservation from the banker will be required once the application has been evaluated.
- ii. If the mitigation bank was assessed using UMAM, provide UMAM worksheets for impact area(s). If the bank was assessed using a method other than UMAM, then prepare the impact assessment using the same method.

- b. If mitigation is proposed to offset wetland/other surface water impacts, please provide a mitigation plan that includes, at a minimum, the following:

- i. ☐ Proposed mitigation narrative:

- (1) ☐ Describe the current and proposed condition for each type of mitigation component (restoration, enhancement, creation, preservation), including:

- (a) ☐ Describe current and proposed vegetation

- (b) ☐ Describe current and proposed hydrologic conditions for the proposed mitigation.
 - (c) ☐ Describe the soil types from NRCS maps and confirm if actual soil conditions appear to match.
- (2) ☐ Provide details of the proposed construction/mitigation activities including phasing and timing, as appropriate.
- (3) ☐ Identify measures that will be implemented during and after construction to avoid adverse impacts related to the proposed activities.
- (4) ☐ A mitigation implementation and monitoring schedule with dates.
- (5) ☐ Identify the success criteria.
- (6) ☐ Describe the anticipated site conditions in and around the mitigation area after the mitigation plan is successfully implemented.
- (7) ☐ Provide a comparison of current fish and wildlife habitat to expected habitat after the mitigation plan is successfully implemented.
- ii. ☐ Provide a Management Plan that includes, as appropriate, aspects of operation and maintenance, including water management practices, vegetation establishment, exotic and nuisance species control, fire management, and control of access.
- iii. ☐ Maps:
 - (1) ☐ Soil map (include soil names/codes, hydrologic soil groups and hydric soil types).
 - (2) ☐ Topographic map of the mitigation area and adjacent contributing and receiving areas.
 - (3) ☐ Hydrologic features map of the mitigation area and adjacent contributing and receiving areas.
 - (4) ☐ Vegetative communities map (using FLUCCS or other appropriate classification system).
 - (5) ☐ For all maps, identify source.
- iv. Provide the necessary supporting information for the application of sections 62-345.400 - .600 (Uniform Mitigation Assessment Method (UMAM)). To meet this requirement, submittal of UMAM worksheets is acceptable for impact and mitigation areas.
- v. If onsite and/or offsite applicant-responsible mitigation is proposed, submit a draft Conservation Easement document or other form of restrictive covenant that provides for protection of the mitigation area in perpetuity. Standard forms, as described in subsection 62-330.301(6), F.A.C., are available from the Agency or on its website.
- vi. If onsite and/or offsite applicant-responsible mitigation is proposed, submit a cost estimate for completing the mitigation, including monitoring and maintenance.
- vii. If onsite and/or offsite applicant-responsible mitigation is proposed and the proposed mitigation exceeds \$25,000, please provide a draft financial assurance document.
- viii. Identify the entity responsible for monitoring, maintenance and long-term stewardship of the mitigation area (i.e. the landowner or homeowner association, not the consultant or contractor that will do the work).

PART 3: PLANS

PLANS: The information listed in the checklist below represent the typical information required on the submitted project plans. The Plans checklists in each application section are cumulative unless otherwise noted. Separate plans for each application section are not required.

1. ☒ Include the following on the construction plans and cross sections:
 - a. ☒ An Existing Conditions sheet showing the entire project and wetland/other surface water boundaries. Include the following: Acreage and type (herbaceous, forested or other surface water) of each wetland/other surface water.
 - b. ☒ A Proposed Conditions sheet showing the entire project and wetland/other surface water boundaries with construction plan overlay.
 - c. ☒ A Proposed Wetland Impact sheet that include the following:
 - i. ☒ Acreage and type (herbaceous, forested or other surface water) of each wetland/other surface water to be impacted.
 - ii. ☐ Proposed upland buffers with dimensions.
 - iii. ☒ Identify the seasonal high water and wetland normal pool elevations on the plans.
 - iv. ☒ Separately identify WMD/FDEP and USACE wetland/other surface water impacts if different.
 - d. ☐ Include wetland boundaries on all construction plan sheets.
2. ☐ If onsite and/or offsite applicant-responsible mitigation is proposed, submit mitigation permit plans and cross sections including, at a minimum:
 - a. ☐ existing conditions plan sheet identifying upland and wetland communities and acreage of each, topography, drainage patterns, and location of cross-section detail.
 - b. ☐ proposed conditions plan sheet identifying proposed improvements by type (restoration, enhancement, creation, preservation), acreage of each, topography, drainage patterns, and location of cross-section detail.
 - c. ☐ monitoring plan sheet including proposed improvements, monitoring transects, photostations, and mitigation signage (if applicable).
 - d. ☐ cross-section and/or profile detail(s) sheet(s) including representative section of each type of mitigation component. Include existing and proposed conditions and representative elevations.
 - e. ☐ planting schedule, plant species including common and scientific names divided into three sections (canopy, shrub, herbaceous) by mitigation component, quantity, spacing, size, and elevation range.

TABLE 1 - PROJECT WETLAND (WL) AND OTHER SURFACE WATER (SW) AND IMPACT SUMMARY

WL & SW ID	UMAM ASSESSMENT AREA NAME(S)	WL & SW TYPE	WL & SW SIZE (acres)	WL & SW NOT IMPACTED (acres)	TEMPORARY WL & SW IMPACTS		PERMANENT WL & SW IMPACTS		MITIGATION ID
					IMPACT SIZE (acres)	IMPACT TYPE	IMPACT SIZE (acres)	IMPACT TYPE	
SW1	N/a	510	0.26 ac	0.25 ac			0.01 ac	F/O	N/a
PROJECT TOTALS:			0.26 ac	0.25 ac			0.01 ac		

Comments:

Codes (multiple entries per cell not allowed):

- Wetland & Surface Water ID: Include ID on submitted wetland and surface water impact maps
- Wetland Type: from an established wetland classification system
- Impact Type: D=dredge; F=fill; H=change hydrology; S=shading; C=clearing; O=other

TABLE 2 - PROJECT ON-SITE MITIGATION SUMMARY

MITIGATION ID	UMAM ASSESSMENT AREA NAME(S)	TARGET TYPE	CREATION	RESTORATION	ENHANCEMENT	WETLAND PRESERVE	UPLAND PRESERVE	OTHER
			AREA (acres)	AREA (acres)	AREA (acres)	AREA (acres)	AREA (acres)	AREA (acres)
N/a								
PROJECT TOTALS								

COMMENTS:

Codes (multiple entries per cell not allowed):

- Target Type or Type=target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation

TABLE 3 - PROJECT OFF-SITE MITIGATION SUMMARY

MITIGATION ID	UMAM ASSESSMENT AREA NAME(S)	TARGET TYPE	CREATION	RESTORATION	ENHANCEMENT	WETLAND PRESERVE	UPLAND PRESERVE	OTHER
			AREA (acres)	AREA (acres)	AREA (acres)	AREA (acres)	AREA (acres)	AREA (acres)
N/a								
PROJECT TOTALS								

COMMENTS:

Codes (multiple entries per cell not allowed):

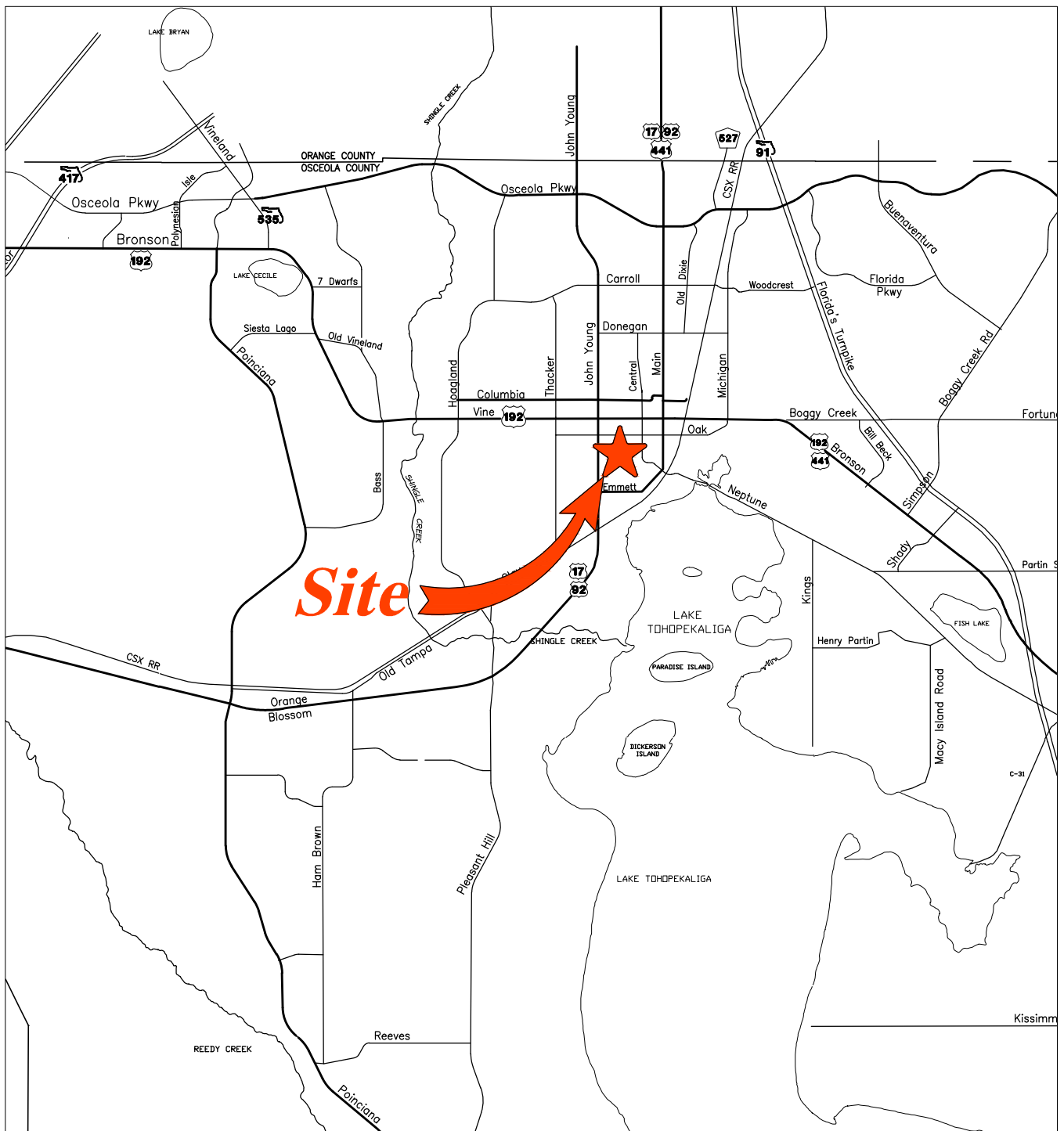
- Target Type or Type=target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation

TABLE 4 - SHORELINE STABILIZATION

Stabilization	Linear Ft. New	Linear Ft. Replaced	Linear Ft. Repaired	Linear Ft. Removed	Slope H: V:	Toe Width (Ft.)
Natural Vegetation (living shoreline)					N/A	N/A
Rip Rap + Vegetation						
Rip Rap						
Seawall + Rip Rap						
Vertical Seawall						
Other Shoreline Stabilization Type						

Size of Rip Rap

Type of Rip Rap



OSCEOLA
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INCORPORATED
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(407) 891-0462
Fax: (407) 891-9173

LOCATION MAP

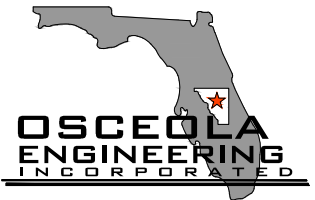
Emory Avenue Storm Water Pond

Section 21, Township 25 S.,
Range 29 E.
St. Cloud, Florida



SCALE: not to scale

FIGURE 1



Civil Engineers
Environmental Engineers
Landscape Architects
Land Planners &
Transportation Engineers

address:
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Certificate of Authorization
number# 00028265
1003 Florida Avenue
City of Saint Cloud
Florida 34769
telephone: (407) 891-0452
facsimile: (407) 891-9173

project:
**Emory Avenue
Storm Water
Pond**

drawing:
**Aerial
Photograph**

2011 Property Appraisers Aerials
location:
Sec 21, Twp 25 S, Rng 29 E.
Kissimmee, Florida

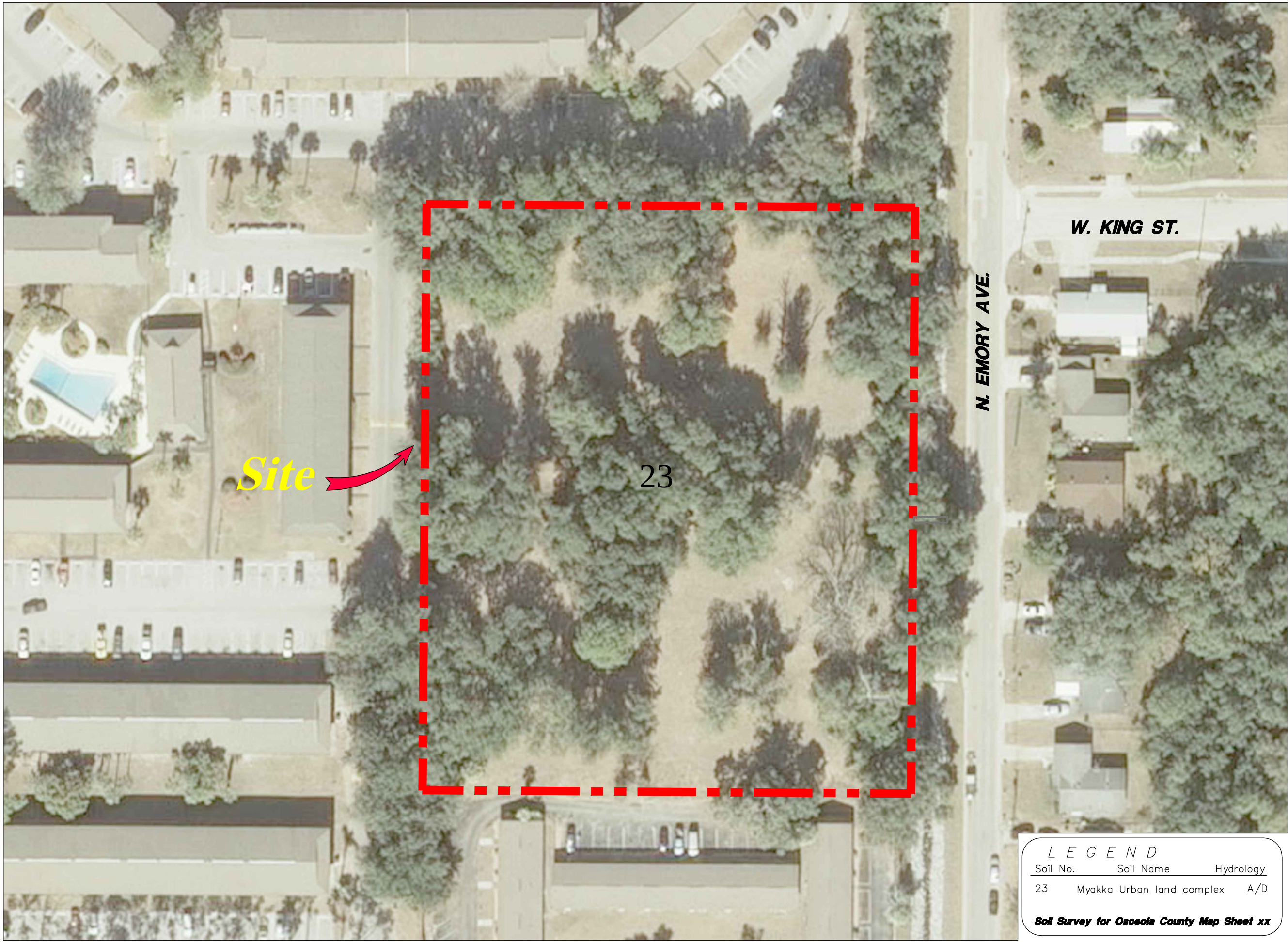


0 150' 300'

Scale: 1" = 300'
Date: August 8, 2014

FIGURE 2

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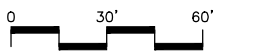
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Land Planners &
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City of Saint Cloud
Florida 34769
telephone: (407) 891-0452
facsimile: (407) 891-9173

project:
**Emory Avenue
Storm Water
Pond**

drawing:
**Soils
Classification
Map**

location:
**Sec 21, Twp 25 S, Rng 29 E.
Kissimmee, Florida**



Scale: 1" = 30'

Date: August 8, 2014

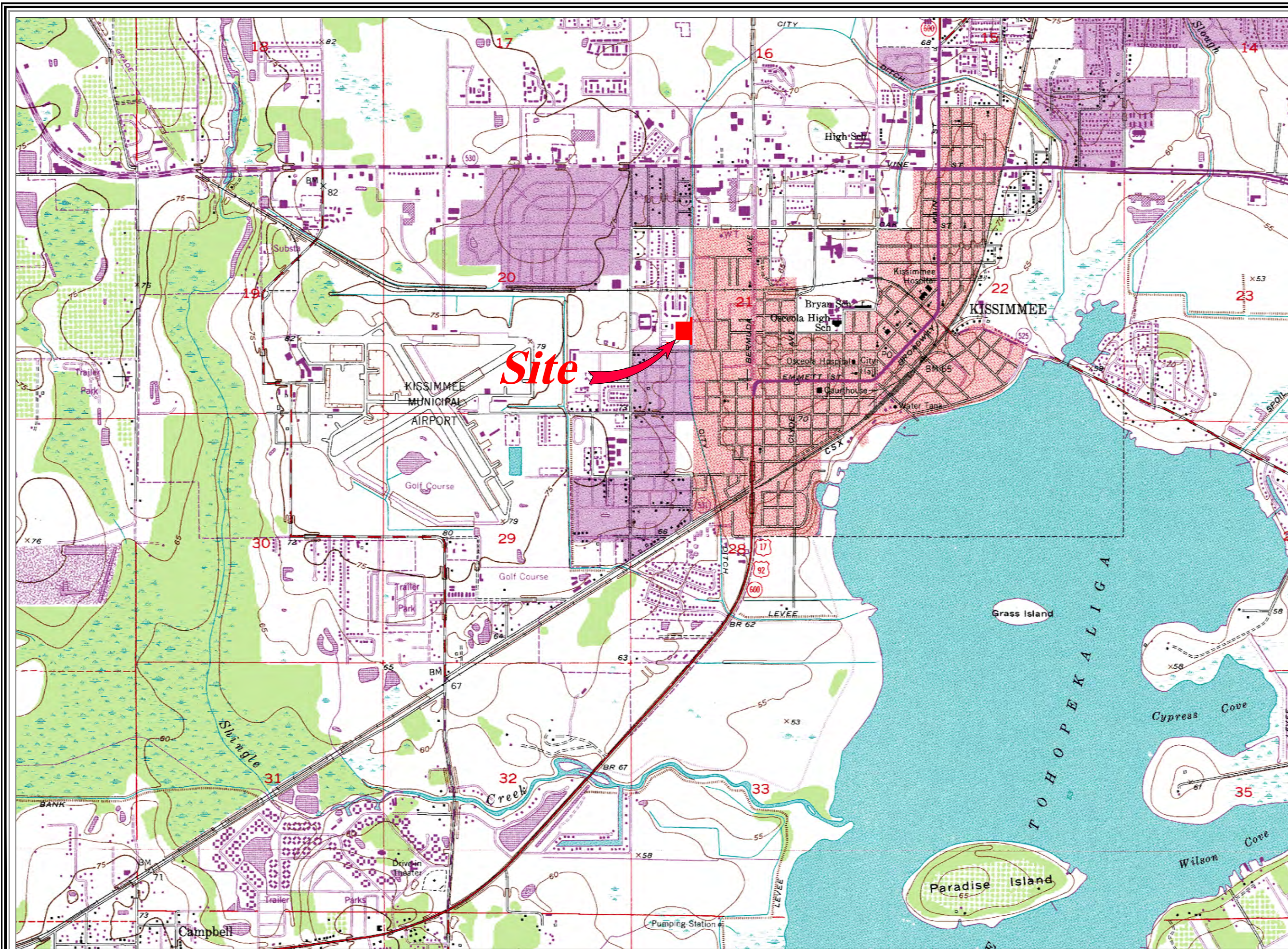
FIGURE 3

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LEGEND

Soil No.	Soil Name	Hydrology
23	Myakka Urban land complex	A/D

Soil Survey for Osceola County Map Sheet xx



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project:
**Emory Avenue
Storm Water
Pond**

drawing:
**USGS
Quadrangle
Map**

location:
**Sec 21, Twp 25 S, Rng 29 E.
Kissimmee, Florida**



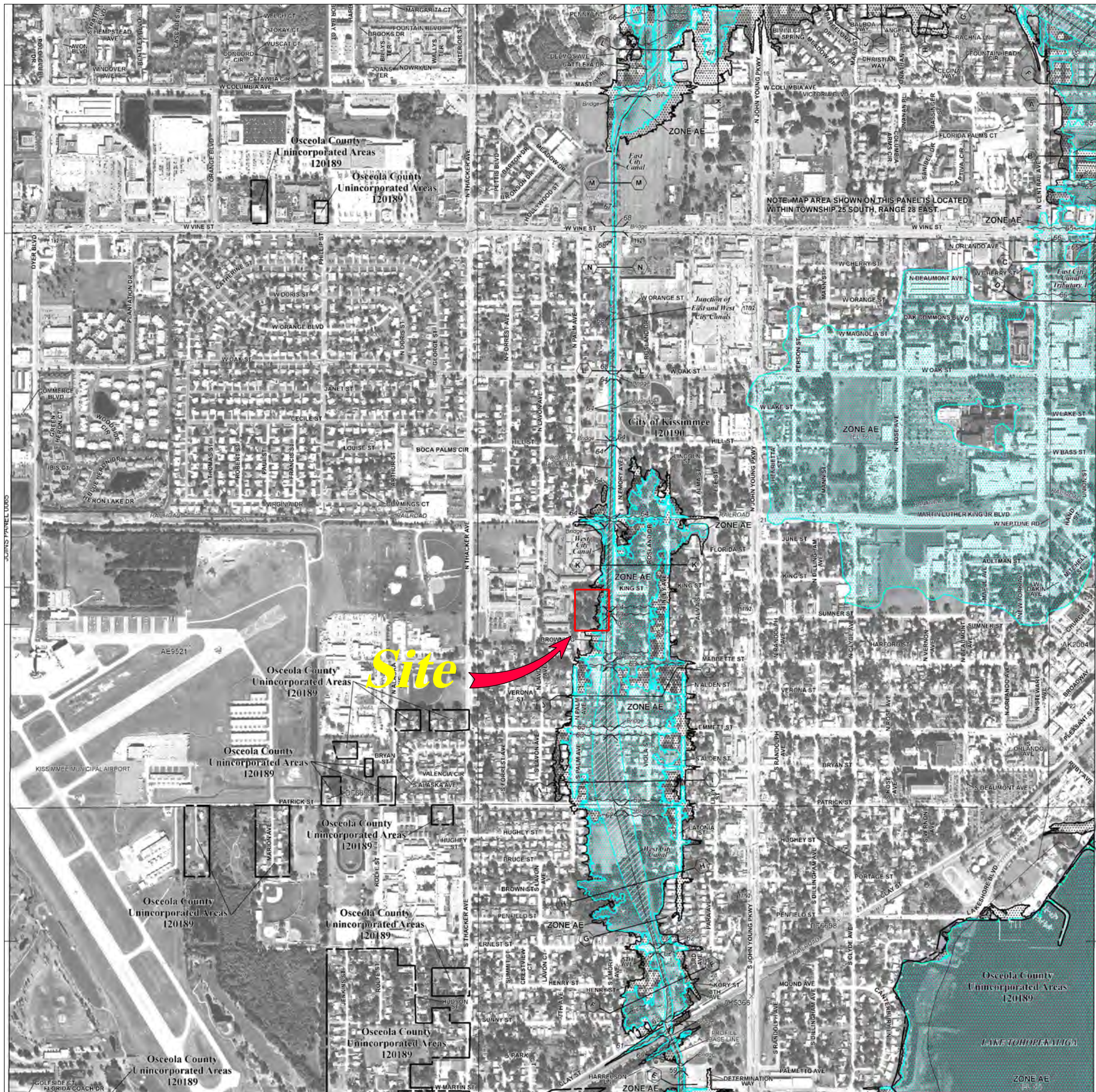
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Scale: 1" = 1000'

Date: August 8, 2014

FIGURE 4

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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different base flood elevations, flood depths, or flood velocities
Base Flood Elevation line and value, elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet

* Referenced to the North American Vertical Datum of 1988

(JEL 987)

Cross section line

Transverse line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
1000-meter Universal Transverse Mercator grid ticks, zone 17
5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 0501), Transverse Mercator projection
Bench mark (see explanation in Notes to Users section of this FIRM panel)
DX5510
M1.5
River Mile

MAP REPOSITORIES

Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTY-WIDE FLOOD INSURANCE RATE MAP
MAY 7, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
JUNE 6, 2001 - To correct datum reference note.

JUNE 18, 2013 - To update corporate limits, change Base Flood Elevations, add Base Flood Elevations, change Special Flood Hazard Areas, change zone designations, update maps and names, incorporate previously issued Letters of Map Revision, and reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1000
150 0 150 300
FEET
METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0066G

FIRM

FLOOD INSURANCE RATE MAP

OSCEOLA COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 66 OF 900

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KISSIMMEE, CITY OF	120190	0066	G
OSCEOLA COUNTY	120189	0066	G

Notice to User: The Map Number shown below should be used when showing map order. The Community Number shown above should be used on insurance applications for this subject community.

MAP NUMBER
12097C0066G

MAP REVISED
JUNE 18, 2013

Federal Emergency Management Agency

OSCEOLA ENGINEERING INCORPORATED

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City of Saint Cloud
Florida 34769
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facsimile: (407) 891-9173

project:

Emory Avenue Storm Water Pond

drawing:

FEMA Flood Map

location:

Sec 21, Twp 25 S, Rng 29 E.
Kissimmee, Florida

North

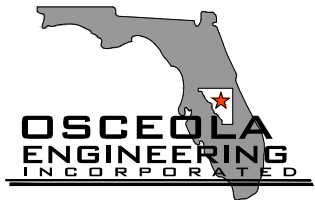
0 500' 1000'

Scale: 1" = 1000'

Date: August 8, 2014

FIGURE 5

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project:

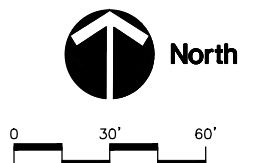
Emory Avenue Storm Water Pond

drawing:

Existing Conditions Drainage Map

location:

Sec 21, Twp 25 S, Rng 29 E.
Kissimmee, Florida

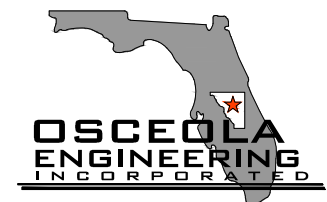
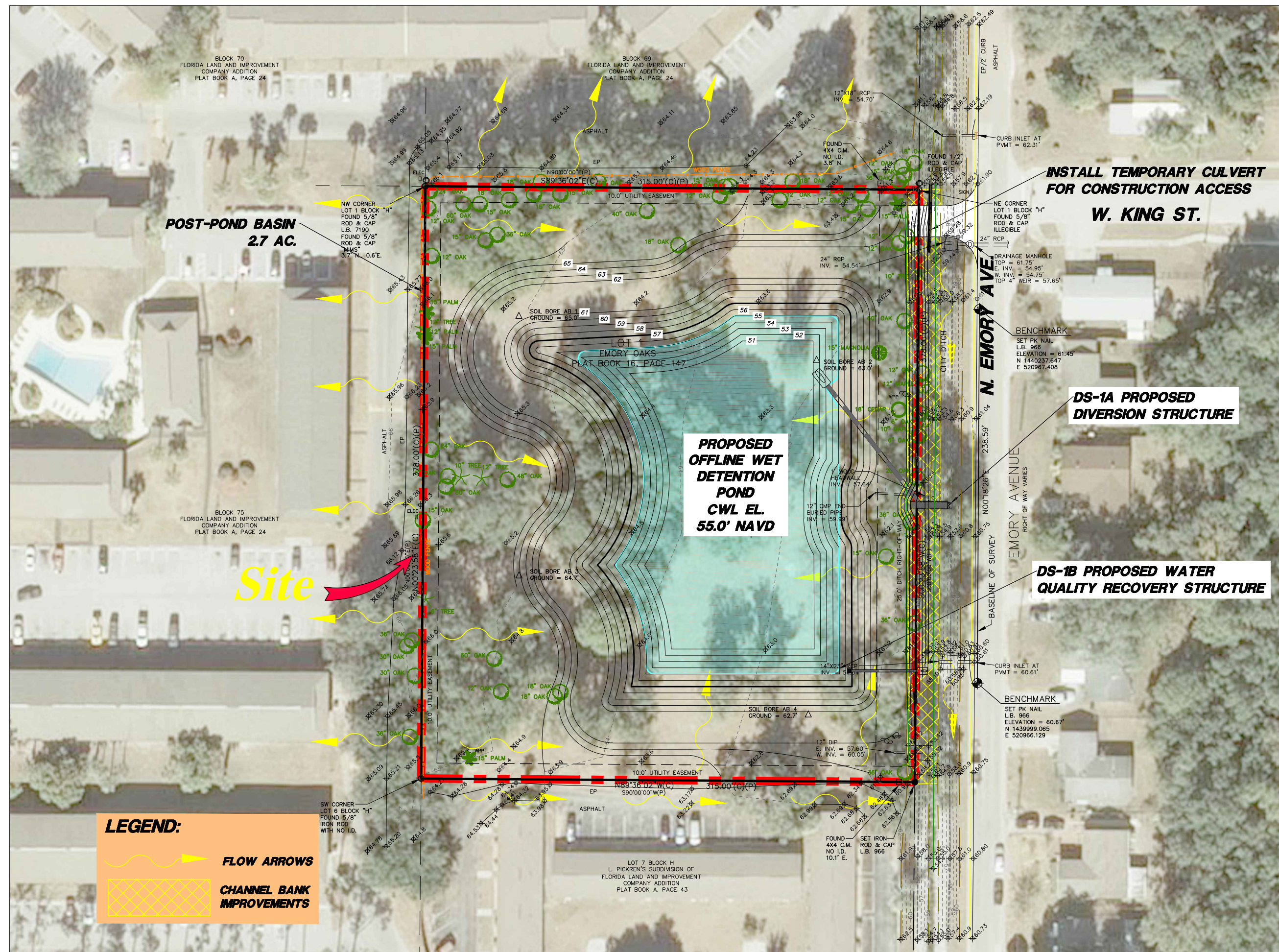


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FIGURE 6

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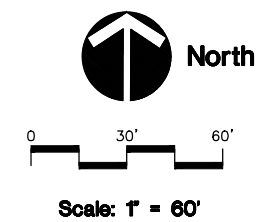
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Emory Avenue Storm Water Pond

Proposed Conditions Drainage Map

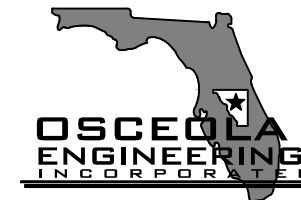
location:
Sec 21, Twp 25 S., Rng 29 E.
Kissimmee, Florida



Scale: 1" = 60'
Date: August 8, 2014

FIGURE 7

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City of Saint Cloud
Florida 34769
telephone: (407) 891-0452
facsimile: (407) 891-9173

project:

Emory Avenue Storm Water Pond

drawing:
**Proposed
Pond Typical
Cross Section**

location:
Sec 21, Twp 25 S, Rng 29 E.
Kissimmee, Florida

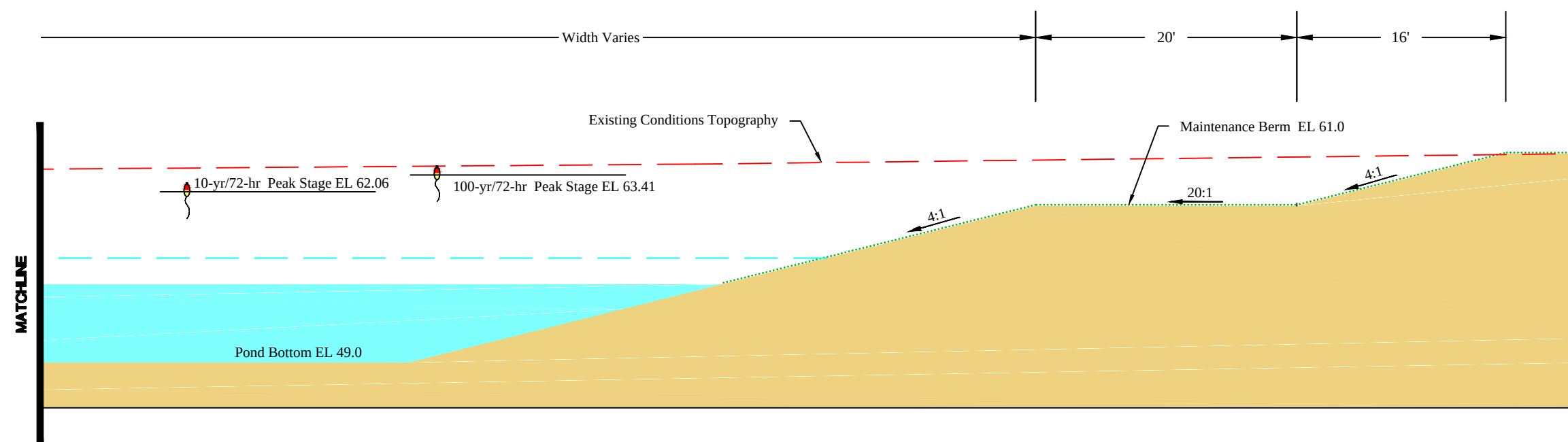
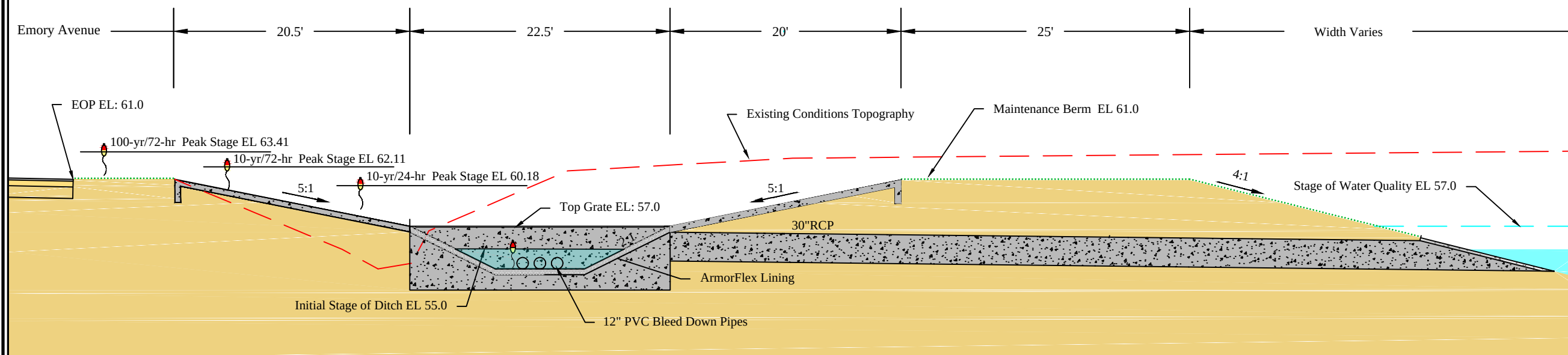


Scale: N/A

Date: August 8, 2014

FIGURE 8

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SECTION 2

TABLE 1
EMORY AVENUE STORMWATER POND
PERMIT SUMMARY SHEET

LOCATION: Kissimmee FL, S21/T25S/R29E

OWNER: The City of Kissimmee

APPLICANT: The City of Kissimmee

ENGINEER: OSCEOLA ENGINEERING, INC.

PROJECT AREA: 2.98 AC. **DRAINAGE AREA:** 2.98 AC.

1. **EXISTING:** In 2010 environmental resource permit no. 49-02090-P was issued for the construction of improvements to the West City Ditch (aka Emory Avenue Ditch). These improvements served to reshape and stabilize the ditch. The ditch is characterized by 2:1 side slopes with rubble riprap lining the bottom of the ditch to prevent erosion.
2. **PROPOSED:** The proposed improvements include the installation of a water quality structure, construction of an offline water quality pond, re-grading of the ditch, and installation of rubble riprap lining in areas of re-grading.

DRAINAGE BASIN AND RECEIVING FACILITY: LAKE TOHOPEKALIGA VIA EMORY AVENUE DITCH

LOCAL ROAD CRITERIA: 10 YR/ 24 HR STORM

BASIN DESIGN FREQUENCY: 10 YR/72 HR STORM

TABLE 2
EMORY AVENUE STORMWATER POND
DISCHARGE STRUCTURE TABLE

<u>STRUCTURE NO.</u>	DS-1A
<u>BLEEDDOWN DEVICE</u>	BYPASS PIPES
Diameter	12-inches
Quantity	3
Crest Elevation	54.00
<u>OVERFLOW DEVICE</u>	RECTANGULAR WEIR
'C' VALUE	3.2
Span	23.9-feet
Rise	4.0-feet
Crest Elevation	57.00
<u>OVERFLOW DEVICE</u>	RECTANGULAR WEIR (TYPE E)
'C' VALUE	3.2
Span	53.3-inches (47.2-inches equivalent due to grate)
Rise	40.0-inches (35.4-inches equivalent due to grate)
Crest Elevation	57.00
<u>OVERFLOW DEVICE</u>	RECTANGULAR WEIR (TYPE H-2)
'C' VALUE	3.2
Span	78.4-inches (68.9-inches equivalent due to grate)
Rise	40.5-inches (35.6-inches equivalent due to grate)
Crest Elevation	57.00
<u>OVERFLOW DEVICE</u>	RECTANGULAR WEIR (TYPE H-4)
'C' VALUE	3.2
Span	104.7-inches (91.9-inches equivalent due to grate)
Rise	40.5-inches (35.6-inches equivalent due to grate)
Crest Elevation	57.00

**TABLE 2 CONT.
EMORY AVENUE STORMWATER POND
DISCHARGE STRUCTURE TABLE**

<u>STRUCTURE NO.</u>	DS-1B
<u>BLEEDDOWN DEVICE</u>	CIRCULAR ORIFICE
'C' VALUE	3.0
Diameter	4-inches
Crest Elevation	56.00
<u>OVERFLOW DEVICE</u>	RECTANGULAR WEIR
'C' VALUE	3.2
Span	24-inches
Rise	37-inches
Crest Elevation	60.00
<u>DISCHARGE PIPE</u>	
Size	18-inches
Material	RCP
Length	42-feet
Invert Elevation Upstream	55.00
Invert Elevation Downstream	54.90

TABLE 3
EMORY AVENUE STORMWATER POND
POND STAGE VS. STORAGE RELATIONSHIPS

POND STAGE VS. STORAGE RELATIONSHIP			
Pond	Stage (ft-NAVD)	Area (ac.)	Cumulative Storage (ac-ft.)
Pond 1	55	0.75	0
	56	0.82	0.78
	57	0.90	1.65
	58	0.98	2.59
	59	1.07	3.62
	60	1.16	4.73
	61	1.64	6.13

Provided WQV from Table 5 = 1.65 ac-ft

Stage of provided WQV from the table above = EL. 57 NAVD88

TABLE 4
EMORY AVENUE STORMWATER POND
DRAINAGE BASIN TABLE

Basin ID	Impervious Area (ac.)	Pond Area (ac.)	Pervious Area (ac.)	Total Area (ac.)
Pre Pond Basin	0.00	0.00	2.73	2.73
Post Pond Basin	0.00	0.75	1.98	2.73

TABLE 5
EMORY AVENUE STORMWATER POND
WATER QUALITY CALCULATIONS

POST POND BASIN

- 1-inch Over Basin Area = 2.73 ac. x 1 inch x $\frac{1\text{ft}}{12}$ = 0.23 ac-ft
- 2.5-inch over percent impervious of site =

2.73 ac. – (1.61 acres of lakes) = 1.12 ac.

1.12 ac. – 0.37 ac. of pervious = 0.75 acres of impervious

 $\frac{.75}{1.12} = 0.67$

0.67 x 2.5 inches = 1.67 inches

1.67 inches x 1/12 (2.73 acres – 1.61 acres of lakes) = 0.16 ac-ft

Greater of Above = 0.23 ac-ft

50% Increase in Water Quality Volume = 0.34 ac-ft

Required Water Quality Volume = 0.34 ac-ft

Provided Water Quality Volume = 1.65 ac-ft

Excess Water Quality Volume = 1.65 - 0.34 = 1.31 ac-ft

PHOSPHORUS LOADING ANALYSIS

In the existing condition, the basin area is can be categorized as trees/woods. Based on that land use, the annual phosphorus loading rate is 0.19 kg/yr.

In the proposed condition, the basin area can be categorized as open space and stormwater pond. With the proposed use the annual phosphorus loading rate is expected to be 0.10 kg/yr.

TABLE 6
EMORY AVENUE STORMWATER POND
POST-DEVELOPMENT HYDROLOGIC DATA

Basin ID	Total Drainage Area (ac.)	Impervious Area (ac.) CN 98	Pond Area (ac.) CN 100	Pervious Area (ac.) CN 80	Weighted Runoff CN	Time of Concentration
Pre Pond Basin	2.73	0	0	2.73	80	15
Post Pond Basin	2.73	0	0.75	1.98	85.5	15

TABLE 7
EMORY AVENUE STORMWATER POND
BASIN LEVEL BREAKDOWN AND FLOOD PROTECTION

POST POND BASIN

	<u>Rainfall Amount (inches)</u>
Roads- Local Road Criteria: 10-year/24-hour Flood Contour: 60.17 ft-NAVD88 Minimum Pavement Grade: 60.75 ft-NAVD88	5.5
Basin Design – 10-year/72-hour storm event Flood Contour – 62.06 ft-NAVD88	9.51
Building Finish Floors – 100-year/72-hour storm event Flood Contour – 63.36 ft-NAVD88 Minimum Floor Elevation – No Existing or Proposed Building	14.95

**TABLE 8
EMORY AVENUE STORMWATER POND
LAND USE TABLE**

Type(s) and Acreage(s) of Land Use Proposed Within the Project or Present Phase:

	<u>Acres</u>	<u>Total Building Square Footage</u>
Agriculture (Type of Crop)		
Commercial		
Dewatering, Long Term		
Dewatering, Short Term		
Golf Course		
Highway (Public Funded)		
Industrial (Service Station)		
Institutional (School, Hospital Etc.)		<u>70,132 (Exist.)</u>
Landfill		
Mining		
Office		
Park/Greenspace	<u>2.73</u>	
Recreational		
Residential		<u>(Number of Dwellings)</u>
Buildings	<u>0.00 ac.</u>	
Impervious	<u>0.00 ac.</u>	
Pervious	<u>2.73 ac.</u>	
Other: Wetlands/Conservation Area		
TOTAL	<u>2.73 ac.</u>	

TABLE 9
EMORY AVENUE STORMWATER POND
ALLOWABLE DISCHARGE CALCULATIONS

A pre-development peak discharge rate analysis was performed for the 10-year/72-hour storm event. The existing site discharges via sheet flow into the Emory Avenue ditch and continues to Mabbette Street. Please refer to Figure 6 for a pre-development basin map showing the existing site topography and drainage characteristics. adICPR model was established using the existing site hydrologic characteristics as well as the characteristics of the Emory Avenue ditch. Please refer to Section 3 for all adICPR input and output data. The results of the model are summarized below.

10 year 72 Hour Storm - Peak Discharge Rate Summary		
Condition	Node ID	Peak Discharge Rate (cfs)
Existing	Mabbette D/S	469.96
Proposed	Mabbette D/S	469.33

In the post-development condition, control structure DS-1A (found within the Emory Avenue ditch) diverts water to the proposed off-line detention pond. DS-1B(found within the proposed pond) releases this water through a “V” notched weir plate . As summarized in the table above and demonstrated in Section 4, the proposed improvements decrease the peak discharge rate of the ditch system during the 10-yr/72-hr storm event.

Draw Down Calculations for Treatment Pond

Volume discharged in 24 hours = 49233.70 ft³
68.71%

$$Q=4.28C_e \tan(\theta/2)(H+k)^{5/2}$$

C _e =	0.592	Stage	Area	Volume(ac-ft)	Volume (ft3)
θ=	20 degrees	57.00	0.90	1.65	71656.20
h=	1.50 ft	56.00	0.82	0.79	34194.60
k=	0.009	55.00	0.75	0.00	0.00
WQ EL=	57.00				
Weir EL=	55.00				

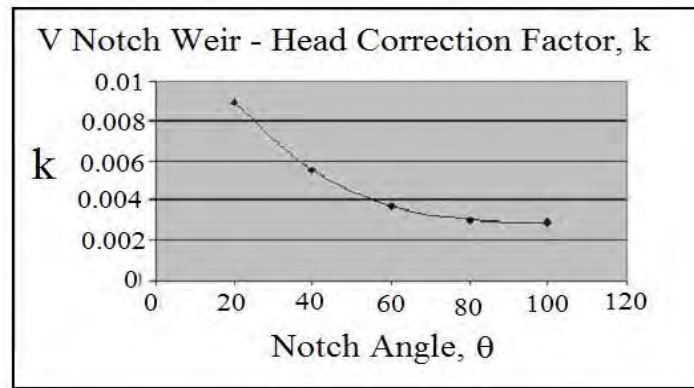
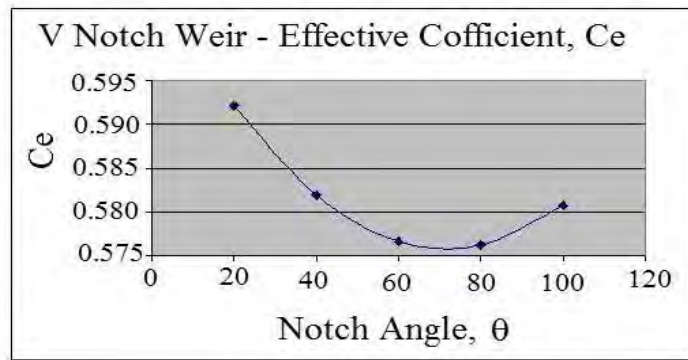
Time (hr)	Water EL	H (ft)	V (ft ³)	Q (ft ³ /s)
0.00	57.00	2.00	71656.20	2.56
0.10	56.97	1.97	70736.10	2.47
0.20	56.95	1.95	69845.12	2.40
0.30	56.93	1.93	68981.80	2.33
0.40	56.90	1.90	68144.80	2.26
0.50	56.88	1.88	67332.84	2.19

===== Break * =====

23.50	55.63	0.63	22685.22	0.15
23.60	55.63	0.63	22632.07	0.15
23.70	55.63	0.63	22579.22	0.15
23.80	55.63	0.63	22526.68	0.15
23.90	55.63	0.63	22474.44	0.14
24.00	55.63	0.63	22422.50	0.14

*See Appendix for full list of time steps

Draw Down Calculations for Treatment Pond



*See Appendix for full list of time steps

Draw Down Calculations for Treatment Pond

Time (hr)	Water EL	H (ft)	V (ft ³)	Q (ft ³ /s)
0.00	57.000	2.000	71656.20	2.5558
0.10	56.974	1.974	70736.10	2.4749
0.20	56.949	1.949	69845.12	2.3981
0.30	56.925	1.925	68981.80	2.3250
0.40	56.902	1.902	68144.80	2.2554
0.50	56.879	1.879	67332.84	2.1892
0.60	56.857	1.857	66544.74	2.1260
0.70	56.836	1.836	65779.39	2.0657
0.80	56.815	1.815	65035.75	2.0081
0.90	56.795	1.795	64312.85	1.9530
1.00	56.775	1.775	63609.78	1.9003
1.10	56.756	1.756	62925.67	1.8499
1.20	56.738	1.738	62259.71	1.8016
1.30	56.720	1.720	61611.14	1.7553
1.40	56.702	1.702	60979.25	1.7108
1.50	56.685	1.685	60363.35	1.6682
1.60	56.668	1.668	59762.81	1.6272
1.70	56.652	1.652	59177.01	1.5878
1.80	56.636	1.636	58605.39	1.5500
1.90	56.620	1.620	58047.40	1.5135
2.00	56.605	1.605	57502.52	1.4785
2.10	56.590	1.590	56970.27	1.4447
2.20	56.576	1.576	56450.18	1.4121
2.30	56.561	1.561	55941.82	1.3807
2.40	56.548	1.548	55444.76	1.3504
2.50	56.534	1.534	54958.60	1.3212
2.60	56.521	1.521	54482.97	1.2930
2.70	56.508	1.508	54017.51	1.2657
2.80	56.495	1.495	53561.87	1.2393
2.90	56.483	1.483	53115.71	1.2138
3.00	56.470	1.470	52678.74	1.1892
3.10	56.458	1.458	52250.64	1.1653
3.20	56.447	1.447	51831.14	1.1422
3.30	56.435	1.435	51419.95	1.1198

Draw Down Calculations for Treatment Pond

3.40	56.424	1.424	51016.82	1.0981
3.50	56.413	1.413	50621.50	1.0771
3.60	56.402	1.402	50233.74	1.0567
3.70	56.391	1.391	49853.32	1.0370
3.80	56.381	1.381	49480.02	1.0178
3.90	56.371	1.371	49113.62	0.9992
4.00	56.361	1.361	48753.92	0.9811
4.10	56.351	1.351	48400.73	0.9635
4.20	56.341	1.341	48053.86	0.9465
4.30	56.332	1.332	47713.14	0.9299
4.40	56.322	1.322	47378.37	0.9138
4.50	56.313	1.313	47049.41	0.8981
4.60	56.304	1.304	46726.10	0.8829
4.70	56.295	1.295	46408.27	0.8680
4.80	56.287	1.287	46095.78	0.8536
4.90	56.278	1.278	45788.49	0.8395
5.00	56.270	1.270	45486.26	0.8258
5.10	56.261	1.261	45188.96	0.8125
5.20	56.253	1.253	44896.46	0.7995
5.30	56.245	1.245	44608.63	0.7869
5.40	56.237	1.237	44325.37	0.7745
5.50	56.229	1.229	44046.54	0.7625
5.60	56.222	1.222	43772.05	0.7507
5.70	56.214	1.214	43501.79	0.7393
5.80	56.207	1.207	43235.65	0.7281
5.90	56.199	1.199	42973.53	0.7172
6.00	56.192	1.192	42715.33	0.7066
6.10	56.185	1.185	42460.97	0.6962
6.20	56.178	1.178	42210.35	0.6860
6.30	56.171	1.171	41963.39	0.6761
6.40	56.164	1.164	41719.99	0.6664
6.50	56.158	1.158	41480.08	0.6569
6.60	56.151	1.151	41243.58	0.6477
6.70	56.145	1.145	41010.41	0.6387
6.80	56.138	1.138	40780.49	0.6298

Draw Down Calculations for Treatment Pond

6.90	56.132	1.132	40553.76	0.6212
7.00	56.126	1.126	40330.15	0.6127
7.10	56.120	1.120	40109.58	0.6044
7.20	56.113	1.113	39891.99	0.5963
7.30	56.107	1.107	39677.31	0.5884
7.40	56.102	1.102	39465.49	0.5806
7.50	56.096	1.096	39256.46	0.5730
7.60	56.090	1.090	39050.16	0.5656
7.70	56.084	1.084	38846.55	0.5583
7.80	56.079	1.079	38645.55	0.5512
7.90	56.073	1.073	38447.13	0.5442
8.00	56.068	1.068	38251.22	0.5373
8.10	56.062	1.062	38057.78	0.5306
8.20	56.057	1.057	37866.75	0.5241
8.30	56.052	1.052	37678.09	0.5176
8.40	56.046	1.046	37491.75	0.5113
8.50	56.041	1.041	37307.69	0.5051
8.60	56.036	1.036	37125.86	0.4990
8.70	56.031	1.031	36946.22	0.4930
8.80	56.026	1.026	36768.72	0.4872
8.90	56.021	1.021	36593.33	0.4815
9.00	56.017	1.017	36420.01	0.4758
9.10	56.012	1.012	36248.71	0.4703
9.20	56.007	1.007	36079.40	0.4649
9.30	56.002	1.002	35912.05	0.4595
9.40	55.998	0.998	35746.61	0.4543
9.50	55.993	0.993	35583.06	0.4492
9.60	55.989	0.989	35421.35	0.4441
9.70	55.984	0.984	35261.46	0.4392
9.80	55.980	0.980	35103.35	0.4343
9.90	55.975	0.975	34946.99	0.4296
10.00	55.971	0.971	34792.35	0.4249
10.10	55.967	0.967	34639.39	0.4203
10.20	55.963	0.963	34488.10	0.4157
10.30	55.958	0.958	34338.44	0.4113

Draw Down Calculations for Treatment Pond

10.40	55.954	0.954	34190.39	0.4069
10.50	55.950	0.950	34043.91	0.4026
10.60	55.946	0.946	33898.98	0.3984
10.70	55.942	0.942	33755.57	0.3942
10.80	55.938	0.938	33613.66	0.3901
10.90	55.934	0.934	33473.22	0.3861
11.00	55.930	0.930	33334.23	0.3821
11.10	55.927	0.927	33196.67	0.3782
11.20	55.923	0.923	33060.50	0.3744
11.30	55.919	0.919	32925.72	0.3706
11.40	55.915	0.915	32792.29	0.3669
11.50	55.912	0.912	32660.20	0.3633
11.60	55.908	0.908	32529.42	0.3597
11.70	55.904	0.904	32399.93	0.3562
11.80	55.901	0.901	32271.72	0.3527
11.90	55.897	0.897	32144.75	0.3493
12.00	55.894	0.894	32019.02	0.3459
12.10	55.890	0.890	31894.51	0.3426
12.20	55.887	0.887	31771.19	0.3393
12.30	55.883	0.883	31649.04	0.3361
12.40	55.880	0.880	31528.05	0.3329
12.50	55.877	0.877	31408.21	0.3298
12.60	55.873	0.873	31289.49	0.3267
12.70	55.870	0.870	31171.88	0.3237
12.80	55.867	0.867	31055.35	0.3207
12.90	55.864	0.864	30939.91	0.3177
13.00	55.860	0.860	30825.52	0.3148
13.10	55.857	0.857	30712.17	0.3120
13.20	55.854	0.854	30599.86	0.3092
13.30	55.851	0.851	30488.55	0.3064
13.40	55.848	0.848	30378.25	0.3037
13.50	55.845	0.845	30268.93	0.3010
13.60	55.842	0.842	30160.58	0.2983
13.70	55.839	0.839	30053.19	0.2957
13.80	55.836	0.836	29946.74	0.2931

Draw Down Calculations for Treatment Pond

13.90	55.833	0.833	29841.22	0.2906
14.00	55.830	0.830	29736.62	0.2880
14.10	55.827	0.827	29632.92	0.2856
14.20	55.824	0.824	29530.12	0.2831
14.30	55.821	0.821	29428.19	0.2807
14.40	55.819	0.819	29327.14	0.2783
14.50	55.816	0.816	29226.93	0.2760
14.60	55.813	0.813	29127.58	0.2737
14.70	55.810	0.810	29029.05	0.2714
14.80	55.808	0.808	28931.35	0.2691
14.90	55.805	0.805	28834.46	0.2669
15.00	55.802	0.802	28738.37	0.2647
15.10	55.799	0.799	28643.07	0.2626
15.20	55.797	0.797	28548.55	0.2604
15.30	55.794	0.794	28454.80	0.2583
15.40	55.792	0.792	28361.80	0.2562
15.50	55.789	0.789	28269.56	0.2542
15.60	55.786	0.786	28178.05	0.2521
15.70	55.784	0.784	28087.28	0.2501
15.80	55.781	0.781	27997.23	0.2482
15.90	55.779	0.779	27907.89	0.2462
16.00	55.776	0.776	27819.25	0.2443
16.10	55.774	0.774	27731.31	0.2424
16.20	55.772	0.772	27644.05	0.2405
16.30	55.769	0.769	27557.47	0.2386
16.40	55.767	0.767	27471.56	0.2368
16.50	55.764	0.764	27386.30	0.2350
16.60	55.762	0.762	27301.70	0.2332
16.70	55.760	0.760	27217.75	0.2314
16.80	55.757	0.757	27134.43	0.2297
16.90	55.755	0.755	27051.74	0.2280
17.00	55.753	0.753	26969.67	0.2263
17.10	55.750	0.750	26888.21	0.2246
17.20	55.748	0.748	26807.36	0.2229
17.30	55.746	0.746	26727.12	0.2213

Draw Down Calculations for Treatment Pond

17.40	55.744	0.744	26647.46	0.2196
17.50	55.742	0.742	26568.38	0.2180
17.60	55.739	0.739	26489.89	0.2165
17.70	55.737	0.737	26411.97	0.2149
17.80	55.735	0.735	26334.61	0.2133
17.90	55.733	0.733	26257.81	0.2118
18.00	55.731	0.731	26181.56	0.2103
18.10	55.729	0.729	26105.86	0.2088
18.20	55.727	0.727	26030.70	0.2073
18.30	55.724	0.724	25956.07	0.2058
18.40	55.722	0.722	25881.97	0.2044
18.50	55.720	0.720	25808.39	0.2030
18.60	55.718	0.718	25735.32	0.2015
18.70	55.716	0.716	25662.77	0.2001
18.80	55.714	0.714	25590.71	0.1988
18.90	55.712	0.712	25519.16	0.1974
19.00	55.710	0.710	25448.10	0.1960
19.10	55.708	0.708	25377.53	0.1947
19.20	55.706	0.706	25307.44	0.1934
19.30	55.704	0.704	25237.82	0.1921
19.40	55.702	0.702	25168.68	0.1908
19.50	55.701	0.701	25100.01	0.1895
19.60	55.699	0.699	25031.79	0.1882
19.70	55.697	0.697	24964.04	0.1870
19.80	55.695	0.695	24896.73	0.1857
19.90	55.693	0.693	24829.87	0.1845
20.00	55.691	0.691	24763.46	0.1833
20.10	55.689	0.689	24697.48	0.1821
20.20	55.688	0.688	24631.93	0.1809
20.30	55.686	0.686	24566.82	0.1797
20.40	55.684	0.684	24502.12	0.1785
20.50	55.682	0.682	24437.85	0.1774
20.60	55.680	0.680	24373.99	0.1762
20.70	55.679	0.679	24310.54	0.1751
20.80	55.677	0.677	24247.50	0.1740

Draw Down Calculations for Treatment Pond

20.90	55.675	0.675	24184.87	0.1729
21.00	55.673	0.673	24122.63	0.1718
21.10	55.672	0.672	24060.78	0.1707
21.20	55.670	0.670	23999.33	0.1696
21.30	55.668	0.668	23938.26	0.1686
21.40	55.666	0.666	23877.57	0.1675
21.50	55.665	0.665	23817.27	0.1665
21.60	55.663	0.663	23757.33	0.1654
21.70	55.661	0.661	23697.77	0.1644
21.80	55.660	0.660	23638.58	0.1634
21.90	55.658	0.658	23579.75	0.1624
22.00	55.657	0.657	23521.28	0.1614
22.10	55.655	0.655	23463.17	0.1604
22.20	55.653	0.653	23405.41	0.1595
22.30	55.652	0.652	23348.00	0.1585
22.40	55.650	0.650	23290.94	0.1576
22.50	55.648	0.648	23234.22	0.1566
22.60	55.647	0.647	23177.85	0.1557
22.70	55.645	0.645	23121.80	0.1547
22.80	55.644	0.644	23066.10	0.1538
22.90	55.642	0.642	23010.72	0.1529
23.00	55.641	0.641	22955.67	0.1520
23.10	55.639	0.639	22900.94	0.1511
23.20	55.638	0.638	22846.54	0.1502
23.30	55.636	0.636	22792.45	0.1494
23.40	55.635	0.635	22738.68	0.1485
23.50	55.633	0.633	22685.22	0.1476
23.60	55.632	0.632	22632.07	0.1468
23.70	55.630	0.630	22579.22	0.1459
23.80	55.629	0.629	22526.68	0.1451
23.90	55.627	0.627	22474.44	0.1443
24.00	55.626	0.626	22422.50	0.1435

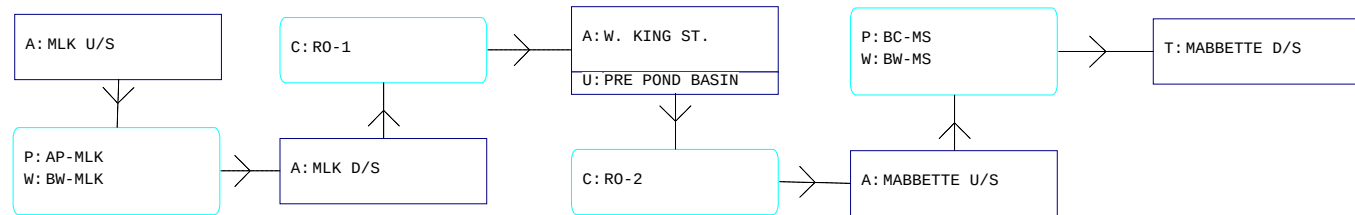
SECTION 3

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Nodal Diagram

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

==== Basins =====

Name: PRE POND BASIN Node: W. KING ST. Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Sfwmd72 Storm Duration(hrs): 72.00
Rainfall Amount(in): 4.500 Time of Conc(min): 15.00
Area(ac): 2.730 Time Shift(hrs): 0.00
Curve Number: 80.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Existing Pond Site Parcel

==== Nodes =====

Name: MABBETTE D/S Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 59.500
Type: Time/Stage

Assumed Time/Stage Relationship at the Downstream End of the Box Culverts under Mabbette Street. Peak Stage for the 10 and 100-Year Storm Events from

Time(hrs)	Stage(ft)
0.00	56.000
12.00	56.000
60.00	59.400
100.00	56.000

Name: MABBETTE U/S Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 62.000
Type: Stage/Area

Node located at Upstream End of Mabbette Street Box Culverts

Stage(ft)	Area(ac)
54.600	0.1000
61.900	0.1000

Name: MLK D/S Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 67.000
Type: Stage/Area

Node located at Downstream End of MLK Jr. Blvd. Arch Pipe

Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Stage(ft)	Area(ac)
50.500	0.1000
66.500	0.1000

Name: MLK U/S Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 67.000
Type: Stage/Area

Node Upstream of MLK Jr. Blvd. Boundary Flows for the 10 and 100-year Storm Events from the 1981 FEMA Study HEC2 Input Data.

Stage(ft)	Area(ac)
50.500	0.1000
66.500	0.1000

Name: W. KING ST. Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 66.100
Type: Stage/Area

Node located in Emory Avenue Ditch at W. King Street

Stage(ft)	Area(ac)
53.000	0.1000
66.000	0.1000

====
==== Cross Sections =====
=====

Name: MABBETTE PROFIL Group: BASE
Encroachment: No

Mabbette Street Roadway Profile

Station(ft)	Elevation(ft)	Manning's N
0.000	60.620	0.011000
0.025	60.620	0.011000
250.000	60.620	0.011000
420.000	60.620	0.011000

Name: MLK PROFILE Group: BASE
Encroachment: No

MLK Jr. Blvd. Roadway Profile

Station(ft)	Elevation(ft)	Manning's N
-------------	---------------	-------------

Osceola Engineering, Inc.

Station(ft)	Elevation(ft)	Manning's N
0.000	65.000	0.025000
33.400	61.480	0.025000
45.400	61.720	0.025000
57.400	61.480	0.025000
66.200	61.400	0.025000
73.100	58.200	0.035000
80.700	55.000	0.035000
83.800	53.300	0.035000
86.700	53.800	0.035000
88.200	56.600	0.035000
100.200	61.800	0.035000
119.700	62.900	0.025000
196.800	63.600	0.025000
274.700	64.200	0.025000
357.000	65.200	0.025000
411.000	66.100	0.025000
431.600	65.430	0.025000

Name: XS-2 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	65.000	0.025000
33.400	61.480	0.025000
45.400	61.720	0.025000
57.400	61.480	0.025000
66.200	61.400	0.025000
73.100	58.200	0.035000
80.700	55.000	0.035000
83.800	53.300	0.035000
86.700	53.800	0.035000
88.200	56.600	0.035000
100.200	61.800	0.035000
119.700	62.900	0.025000
196.800	63.600	0.025000
274.700	64.200	0.025000
357.000	65.200	0.025000
411.000	66.100	0.025000
431.600	65.430	0.025000

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

458.600 67.000 0.025000

Name: XS-3 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	66.000	0.025000
40.000	63.750	0.025000
52.000	64.000	0.025000
64.000	63.750	0.025000
71.000	62.710	0.025000
78.000	58.720	0.035000
86.000	54.730	0.035000
95.000	54.730	0.035000
101.000	57.870	0.035000
107.000	61.000	0.035000
116.000	63.000	0.035000
150.000	66.000	0.025000

==== Pipes =====

Name: AP-MLK	From Node: MLK U/S	Length(ft): 40.00
Group: BASE	To Node: MLK D/S	Count: 1
		Friction Equation: Automatic
		Solution Algorithm: Most Restrictive
		Flow: Both
UPSTREAM	DOWNSTREAM	Entrance Loss Coef: 0.50
Geometry: Arch	Arch	Exit Loss Coef: 1.00
Span(in): 432.00	432.00	Bend Loss Coef: 0.00
Rise(in): 108.00	108.00	Outlet Ctrl Spec: Use dc or tw
Invert(ft): 50.590	50.350	Inlet Ctrl Spec: Use dc
Manning's N: 0.011000	0.011000	Stabilizer Option: None
Top Clip(in): 0.000	0.000	
Bot Clip(in): 60.000	60.000	

Upstream FHWA Inlet Edge Description:
Pipe Arch 18" Corner Radius CM: 90° headwall

Downstream FHWA Inlet Edge Description:
Pipe Arch 18" Corner Radius CM: 90° headwall

Existing 9' x 36' Arch Pipe under MLK Jr. Blvd. 5 foot bottom clip modeled to simulate silted conditions.

Name: BC-MS From Node: MABBETTE U/S Length(ft): 54.00
Group: BASE To Node: MABBETTE D/S Count: 2
Friction Equation: Automatic

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Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Rectangular	Rectangular	Flow: Both
Span(in):	108.00	108.00	Entrance Loss Coef: 0.50
Rise(in):	60.00	60.00	Exit Loss Coef: 0.50
Invert(ft):	54.620	54.620	Bend Loss Coef: 0.00
Manning's N:	0.011000	0.011000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

=====
==== Channels =====
=====

Name: RO-1	From Node: MLK D/S	Length(ft): 640.00
Group: BASE	To Node: W. KING ST.	Count: 1
	UPSTREAM	DOWNSTREAM
Geometry:	Irregular	Irregular
Invert(ft):	54.660	53.300
TClpInitZ(ft):	9999.000	9999.000
Manning's N:		
Top Clip(ft):		
Bot Clip(ft):		
Main XSec:	XS-1	XS-2
AuxElev1(ft):	0.000	0.000
Aux XSec1:		
AuxElev2(ft):	0.000	0.000
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft):		
LtSdSlp(h/v):		
RtSdSlp(h/v):		

Friction Equation: Automatic
Solution Algorithm: Automatic
Flow: Both
Contraction Coef: 0.100
Expansion Coef: 0.300
Entrance Loss Coef: 0.000
Exit Loss Coef: 0.000
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dc
Stabilizer Option: None

Open Channel Reach between MLK Jr. Blvd. and W. King Street

Name: RO-2	From Node: W. KING ST.	Length(ft): 640.00
Group: BASE	To Node: MABBETTE U/S	Count: 1
	UPSTREAM	DOWNSTREAM
Geometry:	Irregular	Irregular
Invert(ft):	53.300	54.600

Friction Equation: Automatic
Solution Algorithm: Automatic
Flow: Both

Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	XS-2	XS-3	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Open Channel Reach between W. King Street and Mabbette Street

=====
==== Weirs =====
=====

Name: BW-MLK	From Node: MLK U/S
Group: BASE	To Node: MLK D/S
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Irregular

XSec: MLK PROFILE	
Invert(ft): 66.460	
Control Elevation(ft): 66.460	
Struct Opening Dim(ft): 9999.00	
	TABLE
Bottom Clip(ft): 0.000	
Top Clip(ft): 0.000	
Weir Discharge Coef: 2.800	
Orifice Discharge Coef: 0.600	

Overtopping of MLK Jr. Blvd.

Name: BW-MS	From Node: MABBETTE U/S
Group: BASE	To Node: MABBETTE D/S
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Irregular

XSec: MABBETTE PROFIL	
Invert(ft): 60.620	
Control Elevation(ft): 60.620	
Struct Opening Dim(ft): 9999.00	
	TABLE
Bottom Clip(ft): 0.000	
Top Clip(ft): 0.000	
Weir Discharge Coef: 2.800	
Orifice Discharge Coef: 0.600	

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Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Overtopping of Mabbette Street

==== Rating Curves =====

Name: From Node: Count: 1
Group: BASE To Node: Flow: Both

TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

==== Hydrology Simulations =====

Name: 1-Inch Storm
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\1-Inch Storm.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Flmod
Rainfall Amount(in): 1.00

Time(hrs)	Print Inc(min)
1.000	5.00
3.000	5.00
6.000	5.00
12.000	5.00

Name: 10-24
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\10-24.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 5.50

Time(hrs)	Print Inc(min)
6.000	5.00
12.000	5.00
36.000	5.00

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Name: 10-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\10-72.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.51

Time(hrs)	Print Inc(min)
50.000	15.00
70.000	5.00
100.000	15.00

Name: 100-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\100-72.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 14.95

Time(hrs)	Print Inc(min)
50.000	15.00
70.000	5.00
100.000	15.00

Name: Mean Annual
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\Mean Annual.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 4.50

Time(hrs)	Print Inc(min)
6.000	15.00
18.000	5.00
36.000	15.00

=====
==== Routing Simulations =====
=====

Name: 1-Inch Storm Hydrology Sim: 1-Inch Storm
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\1-Inch Storm.I32

Execute: No Restart: No Patch: No
Alternative: No

Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Max Delta Z(ft): 1.00
Time Step Optimizer: 10.000
Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages: 1-Inch Storm

Delta Z Factor: 0.00500
End Time(hrs): 12.00
Max Calc Time(sec): 60.0000
Boundary Flows: 1-Inch Storm

Time(hrs)	Print Inc(min)
1.000	5.000
3.000	5.000
6.000	5.000
12.000	5.000

Group	Run
BASE	Yes

Name: 100yr 72hr Hydrology Sim: 100-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\100yr 72hr.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00
Time Step Optimizer: 10.000
Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages: 100-72

Delta Z Factor: 0.00500
End Time(hrs): 100.00
Max Calc Time(sec): 60.0000
Boundary Flows: 100-72

Time(hrs)	Print Inc(min)
50.000	15.000
70.000	5.000
100.000	15.000

Group	Run
BASE	Yes

Name: 10yr 72hr Hydrology Sim: 10-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\10yr 72hr.I32

Execute: No Restart: No Patch: No
Alternative: No

Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Max Delta Z(ft): 1.00
Time Step Optimizer: 10.000
Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages: 10-72

Delta Z Factor: 0.00500
End Time(hrs): 100.00
Max Calc Time(sec): 60.0000
Boundary Flows: 10-72

Time(hrs)	Print Inc(min)
50.000	15.000
70.000	5.000
100.000	15.000

Group	Run
-----	-----
BASE	Yes

Name: 10yr-24hr Hydrology Sim: 10-24
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\10-24.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00
Time Step Optimizer: 10.000
Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages: 10-24

Delta Z Factor: 0.00500
End Time(hrs): 36.00
Max Calc Time(sec): 60.0000
Boundary Flows: 10-24

Time(hrs)	Print Inc(min)
6.000	5.000
12.000	5.000
36.000	5.000

Group	Run
-----	-----
BASE	Yes

Name: Mean Annual Hydrology Sim: Mean Annual
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Existing Conditions\Mean Annual.I32

Execute: No Restart: No Patch: No
Alternative: No

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Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 36.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages: Mean Annual	Boundary Flows: Mean Annual

Time(hrs)	Print Inc(min)
6.000	15.000
18.000	5.000
36.000	15.000

Group	Run
-----	----
BASE	Yes

=====
==== Boundary Conditions =====
=====

Name: 10-72 Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
12.000	56.000
60.000	61.700
100.000	56.000

Name: 100-72 Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
12.000	56.000
60.000	63.000
100.000	56.000

Name: Mean Annual Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
6.000	0.000
12.000	202.000
36.000	0.000

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Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

Name: 10-72 Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
12.000	0.000
60.000	426.000
100.000	0.000

Name: 100-72 Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
12.000	0.000
60.000	663.000
100.000	0.000

Name: Mean Annual Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
6.000	56.000
12.000	58.700
36.000	56.000

Name: 1-Inch Storm Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
3.000	56.000
6.000	56.600
12.000	56.000

Name: 1-Inch Storm Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
3.000	0.000
6.000	45.000
12.000	0.000

Name: 10-24 Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
-----------	-----------

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Emory Avenue Stormwater Pond
Existing Conditions Analysis
Input Data

0.000	56.000
6.000	56.000
12.000	59.300
36.000	56.000

Name: 10-24

Node: MLK U/S

Type: Flow

Time(hrs)	Flow(cfs)
-----------	-----------

0.000	0.000
6.000	0.000
12.000	246.000
36.000	0.000

Emory Avenue Stormwater Pond
Existing Conditions Analysis
Output Data

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
MABBETTE D/S	BASE	1-Inch Storm	6.00	56.60	59.50	0.0006	486	6.20	44.21	0.00	0.00
MABBETTE D/S	BASE	100yr 72hr	60.00	63.00	59.50	-0.0023	24	59.90	725.83	0.00	0.00
MABBETTE D/S	BASE	10yr 72hr	60.00	61.70	59.50	0.0013	24	60.10	469.96	0.00	0.00
MABBETTE D/S	BASE	10yr-24hr	12.00	59.30	59.50	0.0030	486	12.13	251.10	0.00	0.00
MABBETTE D/S	BASE	Mean Annual	12.00	58.70	59.50	0.0025	486	12.15	205.44	0.00	0.00
MABBETTE U/S	BASE	1-Inch Storm	6.00	56.62	62.00	0.0018	9983	6.20	43.94	6.20	44.21
MABBETTE U/S	BASE	100yr 72hr	60.00	63.05	62.00	-0.0050	29711	60.10	680.35	59.90	725.83
MABBETTE U/S	BASE	10yr 72hr	59.98	61.75	62.00	0.0050	19949	60.08	435.90	60.10	469.96
MABBETTE U/S	BASE	10yr-24hr	12.02	59.44	62.00	0.0050	13678	12.13	250.63	12.13	251.10
MABBETTE U/S	BASE	Mean Annual	12.01	58.83	62.00	0.0045	12945	12.16	205.07	12.15	205.44
MLK D/S	BASE	1-Inch Storm	6.14	57.42	67.00	-0.0037	9546	6.29	57.06	6.11	43.96
MLK D/S	BASE	100yr 72hr	60.03	63.80	67.00	-0.0048	31852	60.00	662.81	61.59	683.10
MLK D/S	BASE	10yr 72hr	60.03	62.54	67.00	-0.0043	17810	60.00	425.86	60.05	425.79
MLK D/S	BASE	10yr-24hr	12.10	60.65	67.00	-0.0045	12169	12.30	247.66	12.10	245.03
MLK D/S	BASE	Mean Annual	12.11	60.12	67.00	0.0039	11630	12.16	206.87	12.10	201.06
MLK U/S	BASE	1-Inch Storm	6.13	57.44	67.00	-0.0050	4865	6.00	45.00	6.29	57.06
MLK U/S	BASE	100yr 72hr	60.02	65.07	67.00	0.0050	4392	60.00	662.99	60.00	662.81
MLK U/S	BASE	10yr 72hr	60.02	63.06	67.00	-0.0050	4392	60.00	425.99	60.00	425.86
MLK U/S	BASE	10yr-24hr	12.13	60.82	67.00	-0.0050	4392	12.00	245.97	12.30	247.66
MLK U/S	BASE	Mean Annual	12.16	60.24	67.00	0.0050	4392	12.00	201.97	12.16	206.87
W. KING ST.	BASE	1-Inch Storm	6.16	57.09	66.10	0.0012	13434	6.11	43.96	6.20	43.94
W. KING ST.	BASE	100yr 72hr	60.03	63.45	66.10	-0.0022	92840	61.59	684.91	60.10	680.35
W. KING ST.	BASE	10yr 72hr	60.02	62.15	66.10	-0.0014	47828	60.05	434.70	60.08	435.90
W. KING ST.	BASE	10yr-24hr	12.10	60.09	66.10	0.0028	21506	12.08	250.41	12.13	250.63
W. KING ST.	BASE	Mean Annual	12.12	59.56	66.10	0.0025	20075	12.09	205.00	12.16	205.07

Table 1 - Runoff Curve Number

Project: Emory Avenue Stormwater Pond **By:** JRP **Date:** 7/21/2014

Location: Pre Pond Basin **Checked:** JEM **Date:** _____

Circle one: Present ~~Developed~~

Runoff Curve Number (CN)

Soil Name and Hydrologic group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN			Area acres mi %	Product of CN x area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
Myakka Fine Sand - A/D	Open Space Good Condition	80			2.73	218.4
Totals =					2.73	218.4

CN (weighted) = total product/total area

Use CN =

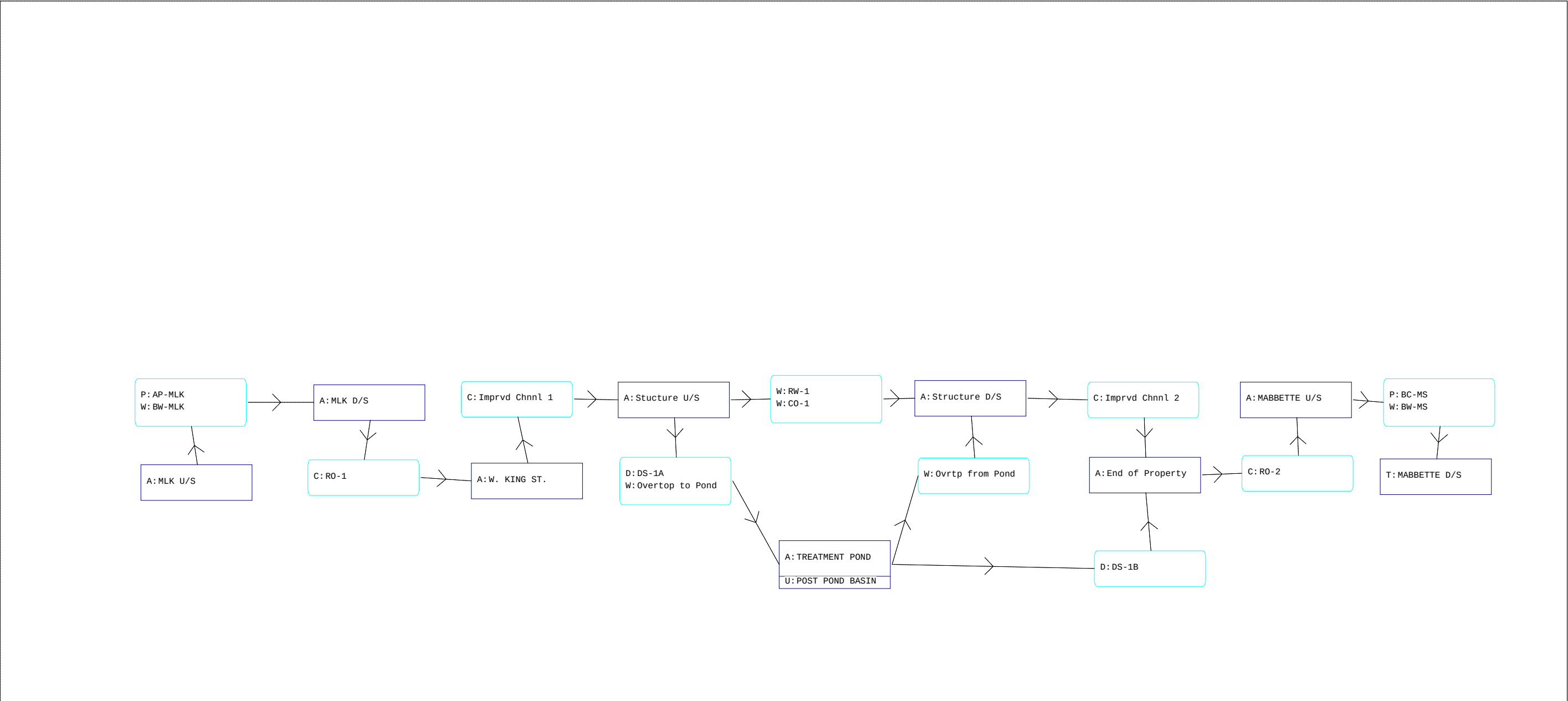
80

Reference: Urban Hydrology for Small Watersheds
Technical Release 55, Soil Conservation
Service, June 1986

SECTION 4

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Nodal Diagram

- Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole
- Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA
- Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

=====
==== Basins =====
=====

Name: POST POND BASIN	Node: TREATMENT POND	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh256	Peaking Factor: 256.0	
Rainfall File: Sfwmd72	Storm Duration(hrs): 72.00	
Rainfall Amount(in): 4.500	Time of Conc(min): 15.00	
Area(ac): 2.730	Time Shift(hrs): 0.00	
Curve Number: 85.50	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Basin to Proposed Water Quality Treatment Pond

=====
==== Nodes =====
=====

Name: End of Property	Base Flow(cfs): 0.000	Init Stage(ft): 56.000
Group: BASE		Warn Stage(ft): 67.000
Type: Stage/Area		

Node located at Southeast corner of Treatment Pond parcel in the Emory Street Ditch.

Stage(ft)	Area(ac)
53.300	0.1000
67.000	0.1000

Name: MABBETTE D/S Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 63.100
Type: Time/Stage

Assumed Time/Stage Relationship at the Downstream End of the Box Culverts under Mabbette Street. Peak Stage for the 10 and 100-Year Storm Events from

Time(hrs)	Stage(ft)
0.00	56.000
12.00	56.000
60.00	59.400
100.00	56.000

Name: MABBETTE U/S Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 63.100
Type: Stage/Area

Node located at Upstream End of Mabbette Street Box Culverts

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Stage(ft)	Area(ac)
54.600	0.1000
61.900	0.1000

Name: MLK D/S	Base Flow(cfs): 0.000	Init Stage(ft): 56.000
Group: BASE		Warn Stage(ft): 67.000
Type: Stage/Area		

Node located at Downstream End of MLK Jr. Blvd. Arch Pipe

Stage(ft)	Area(ac)
50.500	0.1000
66.500	0.1000

Name: MLK U/S	Base Flow(cfs): 0.000	Init Stage(ft): 56.000
Group: BASE		Warn Stage(ft): 67.000
Type: Stage/Area		

Node Upstream of MLK Jr. Blvd. Boundary Flows for the 10 and 100-year Storm Events from the 1981 FEMA Study HEC2 Input Data.

Stage(ft)	Area(ac)
50.500	0.1000
66.500	0.1000

Name: Structure D/S	Base Flow(cfs): 0.000	Init Stage(ft): 56.000
Group: BASE		Warn Stage(ft): 67.000
Type: Stage/Area		

Node located at downstream end of proposed water quality volume diversion structure.

Stage(ft)	Area(ac)
53.300	0.1000
67.000	0.1000

Name: Structure U/S	Base Flow(cfs): 0.000	Init Stage(ft): 56.000
Group: BASE		Warn Stage(ft): 67.000
Type: Stage/Area		

Node located at upstream end of proposed water quality volume diversion structure.

Stage(ft)	Area(ac)
53.300	0.1000
67.000	0.1000

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Name: TREATMENT POND Base Flow(cfs): 0.000 Init Stage(ft): 55.000
Group: BASE Warn Stage(ft): 57.000
Type: Stage/Area

Proposed Wet Detention Water Quality Treatment Pond

Stage(ft)	Area(ac)
55.000	0.7500
56.000	0.8200
57.000	0.9000
58.000	0.9800
59.000	1.0700
60.000	1.1600
61.000	1.6400
65.000	2.2800

Name: W. KING ST. Base Flow(cfs): 0.000 Init Stage(ft): 56.000
Group: BASE Warn Stage(ft): 66.100
Type: Stage/Area

Node located in Emory Avenue Ditch at W. King Street

Stage(ft)	Area(ac)
53.300	0.1000
66.000	0.1000

==== Cross Sections =====

Name: MABBETTE PROFIL Group: BASE
Encroachment: No

Mabbette Street Roadway Profile

Station(ft)	Elevation(ft)	Manning's N
0.000	60.620	0.011000
0.025	60.620	0.011000
250.000	60.620	0.011000
420.000	60.620	0.011000

Name: MLK PROFILE Group: BASE
Encroachment: No

MLK Jr. Blvd. Roadway Profile

Station(ft)	Elevation(ft)	Manning's N
-------------	---------------	-------------

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Emory Avenue Stormwater Pond Proposed Conditions Analysis Input Data

0.000	66.460	0.011000
280.000	66.460	0.011000
305.000	67.830	0.011000
385.000	67.830	0.011000
405.000	66.460	0.011000
600.000	66.460	0.011000

Name: XS-1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	67.000	0.025000
50.000	63.750	0.025000
62.000	64.000	0.025000
74.000	63.750	0.025000
95.000	63.260	0.025000
100.000	58.960	0.035000
105.000	54.660	0.035000
113.000	54.660	0.035000
121.000	60.470	0.035000
129.000	64.280	0.035000
160.000	66.000	0.025000
284.000	67.000	0.025000

Name: XS-2 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	65.000	0.025000
33.400	61.480	0.025000
45.400	61.720	0.025000
57.400	61.480	0.025000
66.200	61.400	0.025000
73.100	58.200	0.035000
80.700	55.000	0.035000
83.800	53.300	0.035000
86.700	53.800	0.035000
88.200	56.600	0.035000
100.200	61.800	0.035000
119.700	62.900	0.025000
196.800	63.600	0.025000
274.700	64.200	0.025000
357.000	65.200	0.025000
411.000	66.100	0.025000

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

431.600 65.430 0.025000
458.600 67.000 0.025000

Name: XS-3 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	66.000	0.025000
40.000	63.750	0.025000
52.000	64.000	0.025000
64.000	63.750	0.025000
71.000	62.710	0.025000
78.000	58.720	0.035000
86.000	54.730	0.035000
95.000	54.730	0.035000
101.000	57.870	0.035000
107.000	61.000	0.035000
116.000	63.000	0.035000
150.000	66.000	0.025000

Name: XS2 at Structur Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	65.000	0.025000
33.400	61.480	0.025000
45.400	61.720	0.025000
57.400	61.480	0.025000
66.200	61.400	0.025000
73.100	58.200	0.025000
79.100	57.000	0.025000
101.600	57.000	0.013000
121.600	61.000	0.025000

Name: XS2 Impr Chnnl Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	65.000	0.025000
33.400	61.480	0.025000
45.400	61.720	0.025000

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Emory Avenue Stormwater Pond
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57.400	61.480	0.025000
66.200	61.400	0.035000
73.100	58.200	0.035000
80.700	55.000	0.035000
83.800	53.300	0.035000
86.700	53.300	0.035000
102.100	61.000	0.035000
311.100	61.000	0.025000
323.100	64.000	0.025000
411.000	66.100	0.025000
431.600	65.430	0.025000
458.600	67.000	0.025000

=====
===== Pipes =====
=====

Name: AP-MLK	From Node: MLK U/S	Length(ft): 40.00
Group: BASE	To Node: MLK D/S	Count: 1
		Friction Equation: Automatic
		Solution Algorithm: Most Restrictive
UPSTREAM	DOWNSTREAM	Flow: Both
Geometry: Arch	Arch	Entrance Loss Coef: 0.50
Span(in): 432.00	432.00	Exit Loss Coef: 1.00
Rise(in): 108.00	108.00	Bend Loss Coef: 0.00
Invert(ft): 50.590	50.350	Outlet Ctrl Spec: Use dc or tw
Manning's N: 0.011000	0.011000	Inlet Ctrl Spec: Use dc
Top Clip(in): 0.000	0.000	Stabilizer Option: None
Bot Clip(in): 60.000	60.000	

Upstream FHWA Inlet Edge Description:
Pipe Arch 18" Corner Radius CM: 90° headwall

Downstream FHWA Inlet Edge Description:
Pipe Arch 18" Corner Radius CM: 90° headwall

Existing 9' x 36' Arch Pipe under MLK Jr. Blvd. 5 foot bottom clip modeled to simulate silted conditions.

Name: BC-MS	From Node: MABBETTE U/S	Length(ft): 54.00
Group: BASE	To Node: MABBETTE D/S	Count: 2
		Friction Equation: Automatic
		Solution Algorithm: Most Restrictive
UPSTREAM	DOWNSTREAM	Flow: Both
Geometry: Rectangular	Rectangular	Entrance Loss Coef: 0.50
Span(in): 108.00	108.00	Exit Loss Coef: 0.50
Rise(in): 60.00	60.00	Bend Loss Coef: 0.00
Invert(ft): 54.620	54.620	Outlet Ctrl Spec: Use dc or tw
Manning's N: 0.011000	0.011000	Inlet Ctrl Spec: Use dc
Top Clip(in): 0.000	0.000	Stabilizer Option: None
Bot Clip(in): 0.000	0.000	

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

=====
=== Channels =====
=====

Name: Imprvd Chnnl 1	From Node: W. KING ST.	Length(ft): 320.00
Group: BASE	To Node: Structure U/S	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Irregular	Irregular	Solution Algorithm: Automatic
Invert(ft): 53.300	53.300	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N:		Expansion Coef: 0.300
Top Clip(ft):		Entrance Loss Coef: 0.000
Bot Clip(ft):		Exit Loss Coef: 0.000
Main XSec: XS2 Impr Chnnl	XS2 Impr Chnnl	Outlet Ctrl Spec: Use dc or tw
AuxElev1(ft): 0.000	0.000	Inlet Ctrl Spec: Use dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft): 0.000	0.000	
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft):		
LtSdSlp(h/v):		
RtSdSlp(h/v):		

Name: Imprvd Chnnl 2	From Node: Structure D/S	Length(ft): 320.00
Group: BASE	To Node: End of Property	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Irregular	Irregular	Solution Algorithm: Automatic
Invert(ft): 53.300	53.300	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N:		Expansion Coef: 0.300
Top Clip(ft):		Entrance Loss Coef: 0.000
Bot Clip(ft):		Exit Loss Coef: 0.000
Main XSec: XS2 Impr Chnnl	XS2 Impr Chnnl	Outlet Ctrl Spec: Use dc or tw
AuxElev1(ft): 0.000	0.000	Inlet Ctrl Spec: Use dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft): 0.000	0.000	
Aux XSec2:		
Top Width(ft):		

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
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Depth(ft):
Bot Width(ft):
LtSdSlp(h/v):
RtSdSlp(h/v):

Name: RO-1	From Node: MLK D/S	Length(ft): 640.00
Group: BASE	To Node: W. KING ST.	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Irregular	Irregular	Solution Algorithm: Automatic
Invert(ft): 54.660	53.300	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N:		Expansion Coef: 0.300
Top Clip(ft):		Entrance Loss Coef: 0.000
Bot Clip(ft):		Exit Loss Coef: 0.000
Main XSec: XS-1	XS-2	Outlet Ctrl Spec: Use dc or tw
AuxElev1(ft): 0.000	0.000	Inlet Ctrl Spec: Use dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft): 0.000	0.000	
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft):		
LtSdSlp(h/v):		
RtSdSlp(h/v):		

Open Channel Reach between MLK Jr. Blvd. and W. King Street

Name: RO-2	From Node: End of Property	Length(ft): 320.00
Group: BASE	To Node: MABBETTE U/S	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Irregular	Irregular	Solution Algorithm: Automatic
Invert(ft): 53.300	54.600	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N:		Expansion Coef: 0.300
Top Clip(ft):		Entrance Loss Coef: 0.000
Bot Clip(ft):		Exit Loss Coef: 0.000
Main XSec: XS-2	XS-3	Outlet Ctrl Spec: Use dc or tw
AuxElev1(ft): 0.000	0.000	Inlet Ctrl Spec: Use dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft): 0.000	0.000	
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft):		
LtSdSlp(h/v):		
RtSdSlp(h/v):		

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Open Channel Reach between W. King Street and Mabbette Street

=====
=== Drop Structures ===
=====

Name: DS-1A	From Node: Structure U/S	Length(ft): 108.00
Group: BASE	To Node: TREATMENT POND	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 1.000
Invert(ft): 54.000	51.000	Exit Loss Coef: 1.000
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000	0.000	Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Proposed Water Quality Volume Diversion Structure
(grates are modeled)

*** Weir 1 of 3 for Drop Structure DS-1A ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 47.20	Invert(ft): 57.000	
Rise(in): 35.40	Control Elev(ft): 57.000	

*** Weir 2 of 3 for Drop Structure DS-1A ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	
Span(in): 68.90	Invert(ft): 57.000	
Rise(in): 35.60	Control Elev(ft): 57.000	

*** Weir 3 of 3 for Drop Structure DS-1A ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Horizontal	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Rectangular	Orifice Disc Coef: 0.600	

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Span(in): 91.90
Rise(in): 35.60

Invert(ft): 57.000
Control Elev(ft): 57.000

```
-----
Name: DS-1B          From Node: TREATMENT POND  Length(ft): 42.00
Group: BASE          To Node: End of Property    Count: 1

      UPSTREAM      DOWNSTREAM      Friction Equation: Automatic
Geometry: Circular  Circular        Solution Algorithm: Most Restrictive
Span(in): 18.00     18.00         Flow: Both
Rise(in): 18.00     18.00         Entrance Loss Coef: 1.000
Invert(ft): 55.000  54.900        Exit Loss Coef: 1.000
Manning's N: 0.013000 0.013000      Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000  0.000         Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000  0.000         Solution Incs: 10
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Proposed Water Quality Volume Recovery Structure

*** Weir 1 of 2 for Drop Structure DS-1B ***

```
Count: 1                Bottom Clip(in): 0.000
Type: Horizontal         Top Clip(in): 0.000
Flow: Both               Weir Disc Coef: 3.200
Geometry: Rectangular    Orifice Disc Coef: 0.600

Span(in): 37.00          Invert(ft): 60.000
Rise(in): 24.00          Control Elev(ft): 60.000
```

TABLE

*** Weir 2 of 2 for Drop Structure DS-1B ***

```
Count: 1                Bottom Clip(ft): 0.000
Type: Vertical: Mavis    Top Clip(ft): 0.000
Flow: Both               Weir Disc Coef: 3.200
Geometry: Trapezoidal    Orifice Disc Coef: 0.600

Bottom Width(ft): 0.00   Invert(ft): 55.000
Left Sd Slp(h/v): 0.18   Control Elev(ft): 55.000
Right Sd Slp(h/v): 0.18   Struct Opening Dim(ft): 5.00
```

TABLE

=====

==== Weirs =====

Name: BW-MLK

From Node: MLK U/S

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Group: BASE To Node: MLK D/S
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Irregular

 XSec: MLK PROFILE
 Invert(ft): 66.460
Control Elevation(ft): 66.460
Struct Opening Dim(ft): 9999.00

TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 2.800
 Orifice Discharge Coef: 0.600

Overtopping of MLK Jr. Blvd.

Name: BW-MS From Node: MABBETTE U/S
Group: BASE To Node: MABBETTE D/S
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Irregular

 XSec: MABBETTE PROFIL
 Invert(ft): 60.620
Control Elevation(ft): 60.620
Struct Opening Dim(ft): 9999.00

TABLE

 Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 2.800
 Orifice Discharge Coef: 0.600

Overtopping of Mabbette Street

Name: C0-1 From Node: Structure U/S
Group: BASE To Node: Structure D/S
Flow: Both Count: 3
Type: Vertical: Mavis Geometry: Circular

 Span(in): 12.00
 Rise(in): 12.00
 Invert(ft): 54.000
Control Elevation(ft): 54.000

TABLE

 Bottom Clip(in): 0.000
 Top Clip(in): 0.000
 Weir Discharge Coef: 3.000
 Orifice Discharge Coef: 0.600

Proposed Orifice to Recover Ditch Stage Upstream of Water Quality Diversion Structure

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Name: Overtop to Pond From Node: Structure U/S
Group: BASE To Node: TREATMENT POND
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Rectangular

Span(in): 2376.00
Rise(in): 999.00
Invert(ft): 61.000
Control Elevation(ft): 61.000

TABLE

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: Ovrtp from Pond From Node: TREATMENT POND
Group: BASE To Node: Structure D/S
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Rectangular

Span(in): 2088.00
Rise(in): 999.00
Invert(ft): 61.000
Control Elevation(ft): 61.000

TABLE

Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: RW-1 From Node: Structure U/S
Group: BASE To Node: Structure D/S
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Irregular

XSec: XS2 at Structur
Invert(ft): 57.000
Control Elevation(ft): 57.000
Struct Opening Dim(ft): 9999.00

TABLE

Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Top of Proposed Water Quality Diversion Structure as a Rectangular Weir

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

==== Rating Curves =====

Name:	From Node:	Count: 1
Group: BASE	To Node:	Flow: Both
TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

==== Hydrology Simulations =====

Name: 1-Inch Storm
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\1-Inch Storm.R3

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Flmod
Rainfall Amount(in): 1.00

Time(hrs)	Print Inc(min)
1.000	5.00
3.000	5.00
6.000	5.00
12.000	5.00

Name: 10-24
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\10-24.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 5.50

Time(hrs)	Print Inc(min)
6.000	5.00
12.000	5.00
36.000	5.00

Name: 10-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\10-72.R32

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 9.51

Time(hrs)	Print Inc(min)
50.000	15.00
70.000	5.00
100.000	15.00

Name: 100-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\100-72.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 14.95

Time(hrs)	Print Inc(min)
50.000	15.00
70.000	5.00
100.000	15.00

Name: Mean Annual
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\Mean Annual.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 4.50

Time(hrs)	Print Inc(min)
6.000	15.00
18.000	5.00
36.000	15.00

=====
==== Routing Simulations =====
=====

Name: 1-Inch Storm Hydrology Sim: 1-Inch Storm
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\1-Inch Storm.I3

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages: 1-Inch Storm

End Time(hrs): 12.00
Max Calc Time(sec): 60.0000
Boundary Flows: 1-Inch Storm

Time(hrs)	Print Inc(min)
1.000	5.000
3.000	5.000
6.000	5.000
12.000	5.000

Group	Run
BASE	Yes

Name: 10-24 Hydrology Sim: 10-24
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\10-24.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 36.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages: 10-24	Boundary Flows: 10-24

Time(hrs)	Print Inc(min)
6.000	5.000
12.000	5.000
36.000	5.000

Group	Run
BASE	Yes

Name: 100yr 72hr Hydrology Sim: 100-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\100yr 72hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Start Time(hrs): 0.000
Min Calc Time(sec): 0.5000
Boundary Stages: 100-72

End Time(hrs): 100.00
Max Calc Time(sec): 60.0000
Boundary Flows: 100-72

Time(hrs)	Print Inc(min)
50.000	15.000
70.000	5.000
100.000	15.000

Group	Run
BASE	Yes

Name: 10yr 72hr Hydrology Sim: 10-72
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\10yr 72hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 100.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages: 10-72	Boundary Flows: 10-72

Time(hrs)	Print Inc(min)
50.000	15.000
70.000	5.000
100.000	15.000

Group	Run
BASE	Yes

Name: Mean Annual Hydrology Sim: Mean Annual
Filename: M:\2014\14-022 Emory Avenue Stormwater Pond\Engineering\ICPR\Proposed Conditions\Control at 55 NAVD\Driveable Structure\Mean Annual.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00	Delta Z Factor: 0.00500
Time Step Optimizer: 10.000	
Start Time(hrs): 0.000	End Time(hrs): 36.00

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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

Min Calc Time(sec): 0.5000
Boundary Stages: Mean Annual

Max Calc Time(sec): 60.0000
Boundary Flows: Mean Annual

Time(hrs)	Print Inc(min)
6.000	15.000
18.000	5.000
36.000	15.000

Group	Run
BASE	Yes

=====
==== Boundary Conditions =====
=====

Name: 10-72 Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
12.000	56.000
60.000	61.700
100.000	56.000

Name: 100-72 Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
12.000	56.000
60.000	63.000
100.000	56.000

Name: Mean Annual Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
6.000	0.000
12.000	202.000
36.000	0.000

Name: 10-72 Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
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Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

0.000	0.000
12.000	0.000
60.000	426.000
100.000	0.000

Name: 100-72 Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
12.000	0.000
60.000	663.000
100.000	0.000

Name: Mean Annual Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
6.000	56.000
12.000	58.700
36.000	56.000

Name: 1-Inch Storm Node: MLK U/S Type: Flow

Time(hrs)	Flow(cfs)
0.000	0.000
3.000	0.000
6.000	45.000
12.000	0.000

Name: 1-Inch Storm Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
3.000	56.000
6.000	56.600
12.000	56.000

Name: 10-24 Node: MABBETTE D/S Type: Stage

Time(hrs)	Stage(ft)
0.000	56.000
6.000	56.000

Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Input Data

12.000	59.300
36.000	56.000

Name: 10-24

Node: MLK U/S

Type: Flow

Time(hrs)	Flow(cfs)
-----------	-----------

0.000	0.000
6.000	0.000
12.000	246.000
36.000	0.000

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Output Data

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
End of Property	BASE	1-Inch Storm	6.45	56.81	67.00	0.0043	9279	6.72	39.35	6.75	39.50
End of Property	BASE	10-24	12.22	59.75	67.00	0.0043	13353	12.62	248.64	12.51	246.83
End of Property	BASE	100yr 72hr	60.05	63.28	67.00	0.0043	72456	60.25	763.15	60.12	690.08
End of Property	BASE	10yr 72hr	60.05	61.95	67.00	0.0043	60528	60.21	438.22	60.22	443.16
End of Property	BASE	Mean Annual	12.24	59.19	67.00	0.0043	12593	12.51	201.72	12.53	201.94
MABBETTE D/S	BASE	1-Inch Storm	6.00	56.60	63.10	0.0004	486	6.75	39.70	0.00	0.00
MABBETTE D/S	BASE	10-24	12.00	59.30	63.10	0.0030	486	12.49	247.22	0.00	0.00
MABBETTE D/S	BASE	100yr 72hr	60.00	63.00	63.10	-0.0018	24	60.25	748.09	0.00	0.00
MABBETTE D/S	BASE	10yr 72hr	60.00	61.70	63.10	-0.0012	24	60.41	469.33	0.00	0.00
MABBETTE D/S	BASE	Mean Annual	12.00	58.70	63.10	0.0024	486	12.53	202.20	0.00	0.00
MABBETTE U/S	BASE	1-Inch Storm	6.00	56.61	63.10	-0.0027	7349	6.75	39.50	6.75	39.70
MABBETTE U/S	BASE	10-24	12.02	59.43	63.10	0.0042	9193	12.51	246.83	12.49	247.22
MABBETTE U/S	BASE	100yr 72hr	60.03	63.05	63.10	-0.0050	16225	60.12	690.08	60.25	748.09
MABBETTE U/S	BASE	10yr 72hr	59.98	61.75	63.10	0.0050	11947	60.22	443.16	60.41	469.33
MABBETTE U/S	BASE	Mean Annual	12.02	58.81	63.10	0.0049	8822	12.53	201.94	12.53	202.20
MLK D/S	BASE	1-Inch Storm	6.29	57.73	67.00	0.0034	9865	6.51	58.21	6.02	43.70
MLK D/S	BASE	10-24	12.18	60.79	67.00	0.0037	12365	12.01	245.35	12.09	244.58
MLK D/S	BASE	100yr 72hr	60.07	63.78	67.00	0.0045	31051	60.00	662.81	61.45	683.15
MLK D/S	BASE	10yr 72hr	60.07	62.54	67.00	-0.0030	17811	60.00	425.88	60.01	425.50
MLK D/S	BASE	Mean Annual	12.23	60.26	67.00	0.0032	11787	12.22	206.17	12.10	200.94
MLK U/S	BASE	1-Inch Storm	6.28	57.75	67.00	-0.0050	4832	6.00	45.00	6.51	58.21
MLK U/S	BASE	10-24	12.16	60.97	67.00	-0.0050	4392	12.00	245.98	12.01	245.35
MLK U/S	BASE	100yr 72hr	60.03	65.05	67.00	-0.0050	4392	60.00	663.00	60.00	662.81
MLK U/S	BASE	10yr 72hr	60.05	63.06	67.00	-0.0050	4392	60.00	426.00	60.00	425.88
MLK U/S	BASE	Mean Annual	12.22	60.38	67.00	-0.0050	4392	12.00	202.00	12.22	206.17
Structure D/S	BASE	1-Inch Storm	6.51	56.89	67.00	-0.0045	7166	6.66	36.20	6.69	36.28
Structure D/S	BASE	10-24	12.20	59.93	67.00	-0.0045	9222	12.28	243.94	12.62	243.28
Structure D/S	BASE	100yr 72hr	60.06	63.30	67.00	0.0050	53013	60.12	700.52	60.25	760.74
Structure D/S	BASE	10yr 72hr	60.07	62.00	67.00	0.0050	50185	60.19	434.03	60.21	435.36
Structure D/S	BASE	Mean Annual	12.32	59.38	67.00	-0.0045	8853	12.49	196.86	12.50	196.99
Structure U/S	BASE	1-Inch Storm	6.64	57.50	67.00	0.0022	7615	6.16	43.01	6.17	42.69
Structure U/S	BASE	10-24	12.28	60.18	67.00	0.0042	9439	12.62	244.95	12.28	247.82
Structure U/S	BASE	100yr 72hr	60.12	63.41	67.00	0.0049	53274	60.25	793.17	60.12	695.48
Structure U/S	BASE	10yr 72hr	60.08	62.11	67.00	0.0049	50476	60.19	425.99	60.22	427.33
Structure U/S	BASE	Mean Annual	12.37	59.63	67.00	0.0031	9074	12.15	200.16	12.17	199.95
TREATMENT POND	BASE	1-Inch Storm	6.91	57.47	57.00	0.0031	40832	5.37	17.07	7.12	3.13
TREATMENT POND	BASE	10-24	12.46	60.17	57.00	0.0044	54046	7.15	23.28	12.62	5.36
TREATMENT POND	BASE	100yr 72hr	60.06	63.36	57.00	0.0031	87907	60.12	323.64	60.12	316.77
TREATMENT POND	BASE	10yr 72hr	60.08	62.06	57.00	0.0022	78846	60.08	183.55	60.16	184.46
TREATMENT POND	BASE	Mean Annual	12.48	59.62	57.00	0.0033	49048	7.33	22.07	12.66	4.75
W. KING ST.	BASE	1-Inch Storm	6.57	57.54	66.10	0.0022	12662	6.02	43.70	6.16	43.01
W. KING ST.	BASE	10-24	12.27	60.32	66.10	0.0035	18167	12.09	244.58	12.62	244.95

Osceola Engineering, Inc.

Emory Avenue Stormwater Pond
Proposed Conditions Analysis
Output Data

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
W. KING ST.	BASE	100yr 72hr	60.07	63.43	66.10	-0.0026	96944	61.45	683.15	60.25	793.17
W. KING ST.	BASE	10yr 72hr	60.08	62.15	66.10	0.0015	71894	60.01	425.50	60.19	425.99
W. KING ST.	BASE	Mean Annual	12.33	59.77	66.10	0.0031	17090	12.10	200.94	12.15	200.16

Table 1 - Runoff Curve Number

Project: Emory Avenue Stormwater Pond **By:** JRP **Date:** 12/22/2014

Location: Post Pond Basin **Checked:** JEM **Date:** 12/22/2014

Circle one: Present Developed

Runoff Curve Number (CN)

Soil Name and Hydrologic group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN			Area acres mi %	Product of CN x area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
Myakka Fine Sand - A/D	Open Space Good Condition	80			1.98	158.4
	Pond @ Control Water Level	100			0.75	75.0
Totals =					2.73	233.4

CN (weighted) = total product/total area

Use CN =

85.5

Reference: Urban Hydrology for Small Watersheds
Technical Release 55, Soil Conservation
Service, June 1986

SECTION 5

Report of Geotechnical Engineering Investigation

EMORY AVENUE STORMWATER POND

Osceola County, Florida

GEC Project No. 3627G



Geotechnical
and
Environmental
Consultants, Inc.

At the very foundation of our community

June 24, 2014

City of Kissimmee - Public Works/Engineering
101 Church Street
Kissimmee, Florida 34741

Attention: Mr. James Arsenault, P.E.

Cc: Mr. Ray Stangle, P.E. – Osceola Engineering, Inc.

Subject: Report of Geotechnical Engineering Investigation
EMORY AVENUE STORMWATER POND
Osceola County, Florida
GEC Project No. 3627G

Dear Mr. Arsenault:

Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to present this Report of Geotechnical Engineering Investigation for the above-referenced project. This study was performed in general accordance with our Proposal No. 6877G dated April 20, 2011 and authorized May 7, 2014. The purpose of this study was to explore soil and groundwater conditions at the subject site and to use the information obtained to develop geotechnical engineering recommendations regarding site preparation and design and construction of the proposed stormwater pond. This report describes our exploration procedures, exhibits the data obtained and presents our conclusions and recommendations regarding the geotechnical engineering aspects of the project.

GEC appreciates the opportunity to be of service to you on this project and trusts that the information contained herein is sufficient for your current needs. Should you have any questions concerning the contents of this report, or if we may be of further assistance, please contact us.

Very truly yours,

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
Certificate of Authorization No. 5882


Kevin Baboolall, E.I.
Geotechnical Engineer

GPB/CPM/cew


Christopher P. Meyer, P.E.
Geotechnical Services Manager
Florida License No. 49328


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APPENDIX

Figure 1:	USGS Quadrangle and NRCS Soil Survey Maps
Figure 2:	Boring Location Plan
Figure 3:	Boring Results

1.0 SITE AND PROJECT DESCRIPTION

...plans...include...an
approximately 2-acre wet
stormwater pond...

The site is located just north of the northwest corner of Emory Avenue and Mabbette Street in Kissimmee, Florida. Project plans for this site include the construction of an approximately 2-acre wet stormwater pond that will provide flood storage and water quality treatment for the existing Emory Avenue ditch. This study is designed to obtain existing soil and groundwater conditions at the site and use this data to provide geotechnical engineering recommendations for the design of the proposed wet pond. We understand that the maximum pond depth for this pond will be 10 feet below the existing grade.

The approximate site vicinity is shown on an excerpt of the United States Geological Survey (USGS) Kissimmee, Florida Quadrangle map on **Figure 1** in the **Appendix**. Based on our review of the USGS Quadrangle map and survey data provided by Johnston's Surveying Inc. the ground surface elevation across the site ranged from approximately + 62 to + 65 feet NGVD. The site is currently undeveloped land vegetated with grass and some trees.

2.0 NRCS SOIL SURVEY

The Natural Resources Conservation Service (NRCS) Soil Survey of Osceola County, Florida was reviewed to obtain surficial soil and groundwater information in the vicinity of the subject site. An excerpt of the NRCS Soil Survey map showing the approximate site area is presented on **Figure 1** in the **Appendix**. The NRCS soils near the project site are summarized in the following **Table 1**:

Table 1
Osceola County NRCS Soil Unit Summary

Soil Unit	Soil Name	Depth (in)	Soil Description	AASHTO	Depth to Seasonal High Groundwater (ft)
23	Myakka-Urban Land Complex	0 - 6 6 - 80	Fine sand Fine sand	A-3 A-3, A-2-4	0.5 - 1.5

The soil unit listed above is generally classified as sands with varying amounts of silt fines (A-3, A-2-4). The NRCS predicts seasonal high groundwater levels within the site limits to typically range from 0.5 feet to 1.5 feet below the natural ground surface.

Information contained in the NRCS Soil Survey is very general and may be outdated. It may not, therefore, be reflective of actual soil and groundwater conditions, particularly if recent development in the site vicinity has modified soil conditions or surface/subsurface drainage. The information obtained from the soil borings provides a better characterization of actual site conditions.

3.0 SUBSURFACE EXPLORATION

In addition to consulting the sources of information previously discussed for regional and site-specific soils data, GEC conducted a subsurface exploration to evaluate soil and groundwater conditions. GEC explored subsurface conditions at the subject site by performing borings at the locations listed in the following **Table 2**.

Table 2
Summary of Field Investigation Program

Project Element	*Boring Type	Boring No.	Depth (ft)
Stormwater Pond	AB	AB-1 to AB-4	15

*AB = Auger Boring

The approximate locations of the borings performed for this study are shown on **Figure 2** in the **Appendix**. These locations were initially taped off and measured from existing features of the site, and were later surveyed for horizontal and vertical control by Johnston's Surveying, a registered Professional Land Surveyor.

3.1 Machine Auger Borings

Machine auger borings were performed in general accordance with ASTM Procedure D-4700. Machine auger borings were performed by hydraulically turning a 4-inch wide continuous flight, solid-stem, auger into the ground in 5-foot increments until the desired boring termination depth was achieved. The auger flights were retrieved in 5-foot increments and examined by our technician prior to collection of representative soil samples. The samples were placed in sealed jars and transported to GEC's laboratory for further examination and limited laboratory testing.

3.2 Groundwater Measurement

A GEC engineering technician measured the depth to groundwater in the boreholes at the time of drilling and again after approximately 24 hours. Once the 24-hour groundwater measurement was recorded, the boreholes were then backfilled with soil cuttings to prevailing ground surface.

4.0 LABORATORY TESTING

Selected soil samples retrieved from the borings were tested in accordance with Florida Standard Testing Methods (FM). Florida Standard Testing Methods are adaptations of recognized standard methods, e.g., ASTM and AASHTO, which have been modified to accommodate Florida's geological conditions. The GEC laboratory is reviewed annually by the Construction Materials Engineering Council, Inc. (CMEC) to verify compliance with FM. Our laboratory testing program is summarized on the following table:

Table 3
Summary of Laboratory Testing Program

Type of Test	Number of Tests
Percent Fines (FM 1 - T88)	3

The individual results of our laboratory tests are shown adjacent to the soil profiles at the approximate depths from which the tested samples were obtained on the Boring Results sheet (**Figure 3**) in the **Appendix**.

5.0 DESCRIPTION OF SUBSURFACE CONDITIONS

Detailed records of subsurface conditions encountered in our auger borings are shown on **Figure 3** in the **Appendix**. The boring logs describe the soil layers using the American Association of State Highway and Transportation Officials (AASHTO) symbol (e.g., A-3) and ASTM soil descriptions (e.g., sand with silt). We based our soil classifications and descriptions on visual examination and the limited laboratory soil classification testing shown on the Boring Results sheet in the **Appendix**.

The boring logs indicate subsurface conditions only at the specific boring locations at the time of our field exploration. Subsurface conditions, including groundwater levels, at other locations of the subject site may differ from conditions we encountered at the boring locations. Moreover, conditions at the boring locations can change over time. Groundwater levels fluctuate seasonally, and soil conditions can be altered by earthmoving operations.

The depths and thicknesses of the subsurface strata indicated on the boring logs were interpolated between samples obtained at different depths in the borings. The actual transition between soil layers may be different than indicated. *These stratification lines were used for our analytical purposes. Earthwork quantity estimates based on the results of the borings will vary from the actual quantities measured during construction.*

5.1 Boring Results

The auger borings performed for the proposed stormwater pond typically encountered fine sand and fine sand with silt (A-3) from the ground surface to depths of 4 to 6 feet below the ground surface underlain by fine sand with silt to silty fine sand (A-2-4) to the boring termination depth of 15 feet below existing ground surface.

Please refer to the Boring Results sheet (**Figure 3**) in the **Appendix** for the specific subsurface profiles at the boring locations.

5.2 Groundwater Levels

Groundwater levels were measured at least 24 hours after completion of the borings. Groundwater levels were encountered at the auger boring locations at depths ranging from approximately 5.2 to 5.5 feet below existing ground surface (or elevations +57.4 to +59.5 feet NAVD88). The encountered groundwater levels are presented on the Boring Results sheet in the **Appendix**.

Groundwater levels can vary seasonally and with changes in subsurface conditions between boring locations. Alterations in surface and/or subsurface drainage brought about by site development can also affect groundwater levels. *Therefore, groundwater depths measured at different times or at different locations on the site can be expected to vary from those measured by GEC during this investigation.*

For purposes of this report, estimated seasonal high groundwater levels are defined as groundwater levels that are anticipated at the end of the wet season during a “normal rainfall” year under pre-development site conditions. We define a “normal rainfall” year as a year in which rainfall quantity and distribution were at or near historical averages.

We estimate seasonal high water levels will range from 2.2 to 3 feet below the existing ground surface.

We estimate seasonal high water levels will range from 2.2 feet to 3 feet below the existing ground surface (or elevations +60.4 to +62 feet NAVD88). Our estimated seasonal high groundwater levels are presented on the Boring Results sheet in the **Appendix**.

6.0 ANALYSIS AND DESIGN RECOMMENDATIONS

The conclusions and recommendations contained in this report are based in part on the data obtained from a limited number of soil samples and the groundwater measurements obtained

from widely-spaced borings. The sampling methods used indicate subsurface conditions only at the specific boring locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. *Borings cannot be relied upon to accurately reflect the variations that usually exist between boring locations and these variations may not become evident until construction.*

If variations from the subsurface conditions described in this report do become evident during construction or if the project characteristics described in this report change, GEC should be retained to reevaluate this report's conclusions and recommendations in light of such changes.

6.1 Stormwater Pond

The borings performed for the proposed stormwater pond typically encountered sands with varying silt content along with silty fine sands (A-3, A-2-4) to the maximum boring termination depth of 15 feet below existing ground surface. These soils are suitable for use as fill soils. However, the silty fine sand (A-2-4) will be moisture sensitive and may be difficult to dry and compact. Sands excavated below the water table will need to be dried to moisture content near optimum to achieve the required degree of compaction.

Average wet season groundwater tables are estimated to be 12 inches below...	Based on the results of our subsurface exploration, Figure 3 in the Appendix summarizes the encountered and estimated seasonal high groundwater levels for the borings performed within the proposed pond site. Average wet season groundwater tables are estimated to be 12 inches below the seasonal high groundwater tables.
--	---

7.0 CONSTRUCTION ISSUES

The following sections of this report include comments on issues related to the geotechnical aspects of the proposed construction. *These recommendations are not intended to dictate construction methods or sequences.* Instead, they are furnished as an aid to design professionals and to identify important construction issues related to foundation and earthwork plans and specifications. These recommendations may also be useful to personnel who observe construction activity.

Prospective contractors for this project should evaluate potential construction problems on the basis of their review of the contract documents, their own knowledge and experience in the local area, and on the basis of similar projects in other localities, taking into account their own proposed means and methods.

7.1 Fill Selection, Placement and Compaction

The contractor should place and compact any fill required to bring the site to final grade. We recommend that all fill be selected, placed and compacted as follows:

- Use fill material comprised of non-plastic sands with less than about 12% fines content. The fill should not contain any significant amount of organic soil (less than 3% by weight) and should be substantially free from roots or other organic or deleterious materials.
- Sands excavated above the water table may have to be wetted to attain the moisture content needed to achieve the required degree of compaction.
- Place fill in level lifts no thicker than 12 inches. Thinner lifts may be needed to achieve compaction in the silty sand.
- Compact fill to a minimum of 95% of the soil's modified Proctor maximum dry density as determined by ASTM Standard D-1557 for each lift of fill placed.
- Allow an Engineering Technician, working under the direction of a registered Geotechnical Engineer, to perform in-place density tests to verify that the recommended degree of compaction has been achieved.
- All excavations should comply with the recommendations included in the **Temporary Excavations** section of this report.

7.2 Temporary Dewatering

Depending on groundwater levels at the time of construction, excavation depths and final design grades, temporary dewatering may be required to facilitate stable excavations and placement and compaction of fill. The contractor should be required to provide a dewatering system which maintains groundwater levels at least 2 feet below compaction surfaces, including the bottom of all excavations. A system of ditches and sumps may be sufficient in some instances to achieve adequate dewatering, but the contractor should be prepared to install wellpoint dewatering systems as necessary.

Additionally, the contractor must provide positive site drainage during the site preparation and fill placement. Surface runoff should not be allowed to accumulate. Temporary rim ditches may be required to facilitate site preparation.

7.3 Temporary Excavations

The owner and the contractor should be familiar with local, state and federal safety regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards. Construction site safety is the responsibility of the contractor. The contractor should also be responsible for the means, methods, techniques, sequences, and operations of the construction.

The contractor should be aware that slope height, slope inclination, and excavation depths (including utility trench excavations) should not exceed those specified in local, state, or federal safety regulations; e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926. *OSHA regulations are strictly enforced and, if not followed, the owner, contractor, earthwork subcontractor or utility subcontractor could be liable for substantial penalties.*

The soil encountered in the borings performed by GEC at this site is primarily sand with varying amounts of silt. We anticipate that OSHA will classify these materials as Type C. OSHA recommends a maximum temporary slope inclination of 1.5 horizontal to 1 vertical for this soil type. Soils encountered in the construction excavations may vary significantly across the site. Our soil classifications are based on the materials encountered in widely-spaced borings. The contractor should verify that similar conditions exist throughout the proposed excavation area. If different subsurface conditions are encountered at the time of construction, GEC should be contacted immediately to evaluate the conditions encountered.

8.0 USE OF THIS REPORT

GEC has prepared this report for the exclusive use of our client, City of Kissimmee - Public Works/ Engineering, and for specific application to our client's project. GEC will not be held responsible for any third party's interpretation or use of this report's subsurface data or engineering analysis without our written authorization.

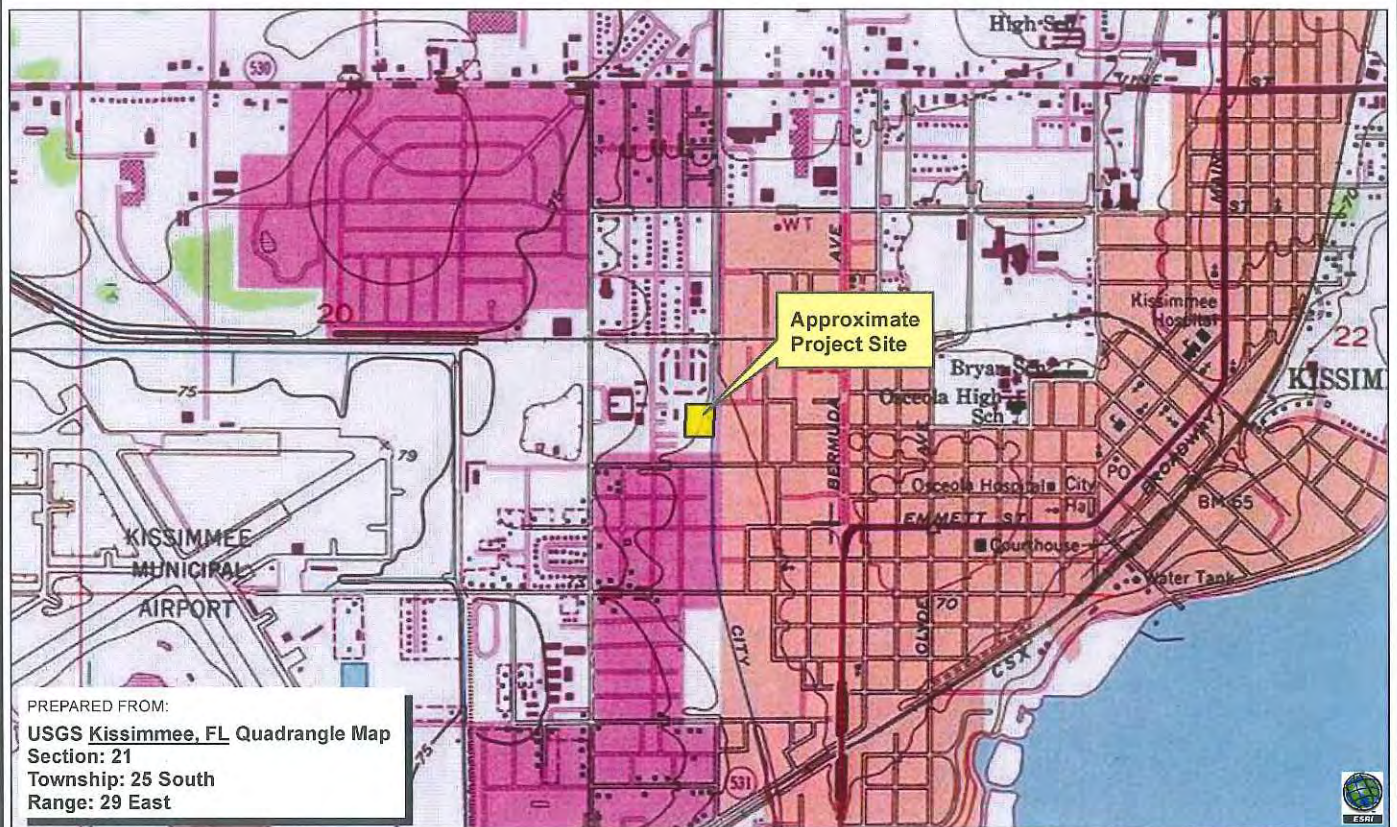
The sole purpose of the borings performed by GEC at this site was to obtain indications of subsurface conditions as part of a geotechnical exploration program. GEC has not subjected any soil samples to analysis for contaminants.

GEC has strived to provide the services described in this report in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in Central Florida. No other representation is made or implied in this document.

The conclusions or recommendations of this report should be disregarded if the nature, design, or location of the facilities is changed. If such changes are contemplated, GEC should be retained to review the new plans to assess the applicability of this report in light of proposed changes.

APPENDIX

**USGS QUADRANGLE AND
NRCS SOIL SURVEY MAPS**



Geotechnical and Environmental
 Consultants, Inc.

2510 Michigan Avenue, Suite D
 Kissimmee, FL 34744-1933
 PH (407) 483-1212 FAX (407) 932-2912
 Certificate of Authorization No. 00005882
 CHRISTOPHER P. MEYER P.E. NO. 49328

GEC

PROJECT NO.
 3627G
 DATE
 6-23-14
 DRAWN BY
 SKR
 CHECKED BY
 GPB
 CHECKED BY
 CPM 49328

USGS QUADRANGLE AND NRCS SOIL SURVEY MAPS

EMORY AVENUE STORMWATER POND

FIGURE
 NO.

1

BORING LOCATION PLAN



Geotechnical and Environmental
Consultants, Inc.

2510 Michigan Avenue, Suite D
Kissimmee, FL 34744-1933
PH (407) 483-1212 FAX (407) 932-2912
Certificate of Authorization No. 00005882

CHRISTOPHER P. MEYER P.E. NO. 49328

GEC

PROJECT NO.	3627G
DATE	6-23-14
DRAWN BY	SKR
CHECKED BY	GPB
CHECKED BY	CPM 49328

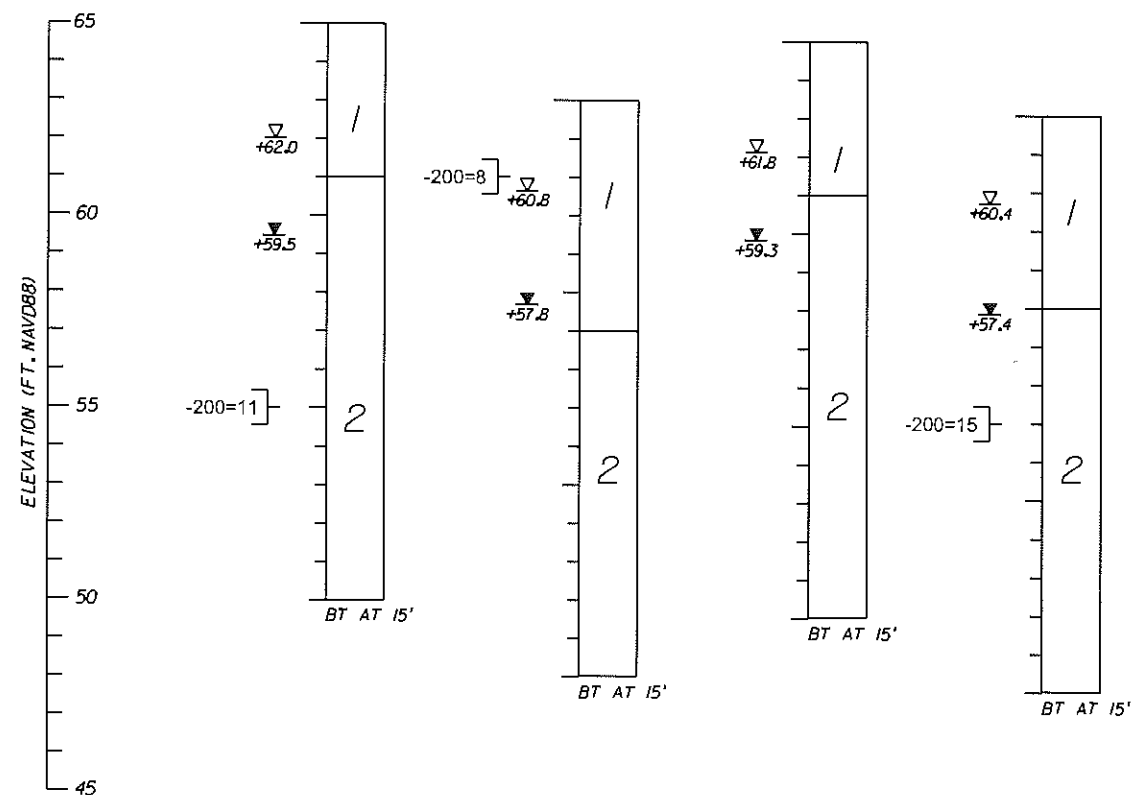
BORING LOCATION PLAN
EMORY AVENUE
STORMWATER POND

**FIGURE
NO.**

2

BORING RESULTS

BORING NO.	AB-1	AB-2	AB-3	AB-4
NORTHING	1440233.7682	1440205.7130	1440068.1390	1439979.4400
EASTING	520673.6430	520863.5500	520673.6730	520858.2610
GSE	+65.0	+63.0	+64.7	+62.7
DATE DRILLED	6-10-14	6-10-14	6-10-14	6-10-14



LEGEND

GSE GROUND SURFACE ELEVATION (FT. NAVD88)

▽ ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)

▽ ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DRILLING BORING

BT BORING TERMINATED AT SPECIFIED DEPTH (FEET) INDICATED

-200= PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

STRATUM NO.	AASHTO CLASSIFICATION	DESCRIPTION
1	A-3	GREY, BROWN AND LIGHT BROWN FINE SAND TO FINE SAND WITH SILT
2	A-2-4	BROWN FINE SAND WITH SILT, SILTY FINE SAND



Austin Environmental Consultants, Inc.

316 Church Street • Kissimmee, Florida • 34741 • Phone: 407.935.0535

December 9, 2014

John E. Moody, P.E.
President
Osceola Engineering, Inc.
1003 Florida Avenue
St. Cloud, Florida 34769

**RE: Emory Street Ditch Stormwater Improvements
Ecological Site Assessment
Section 21, Township 25 South, Range 29 East
Osceola County, Florida**

Mr. Moody:

The letter presents the results of a recent ecological site assessment that was conducted on the above referenced project site. More specifically, the purpose of the site review was to investigate the presence of state and federally-listed species and jurisdictional wetlands and surface waters within the boundaries of the property, and to provide information to support permitting efforts through the South Florida Water Management District (SFWMD) and the U.S. Army Corps of Engineers (USACOE). The following presents the results of the site investigation.

PROPERTY LOCATION

The subject property is located along the west side of Emory Street, South of Martin Luther King Boulevard and north of Mabbette Street, in Kissimmee; within Section 21, Township 25 South, Range 29 East. The property consists of one tax parcel (Parcel ID No. 21-25-29-1402-0001-0010), as well as a portion of the adjacent right-of-way for Emory Street and the Emory Street Ditch. A location map and an aerial photograph have been provided as Figures 1 and 2 respectively.

SURVEY METHODOLOGY

Prior to the site investigation, Austin Environmental Consultants, Inc. (AEC) conducted a review of available soil information, National Wetlands Inventory GIS layers, South Florida Water Management District (SFWMD) land use shapefiles, and available listed species locality records, including the Florida Fish and Wildlife Conservation Commission's (FWC) bald eagle nest database. Following the desktop review, on December 8, 2014 a professional biologist from AEC conducted a comprehensive review of the subject property to investigate the presence of jurisdictional wetlands as well as state and federally listed species. Pedestrian transects were established within

all onsite habitats, and covered 100% of the project area. The presence of wildlife was determined by direct observation or signs of their presence (burrows, tracks, etc.). In addition, onsite vegetation and soil characteristics were reviewed in order to determine whether jurisdictional wetlands occur onsite.

SOILS

The onsite soil type was classified according to the Soil Survey for Osceola County, Florida (USDA, 1976) and available USDA Natural Resource Conservation Service (NRCS) GIS layers. The soil survey identifies only one onsite soil type – Myakka-Urban Land Complex (ID# 23); see Figure 3. This soil type is described as poorly drained, with a depth to water table of 6-18 inches. No hydric soil types are identified onsite by the USDA Soil Survey.

VEGETATIVE COMMUNITIES

The onsite land use and vegetative community types were classified according to the Florida Land Use, Cover and Forms Classification System (FLUCFCS); see Figure 4. One upland land use/vegetative community and one surface water were identified onsite.

The majority of the property (approximately 2.66 acres) was classified as live oak (FLUCFCS 427). This area is characterized by a mature canopy of live oak (*Quercus virginiana*), ear tree (*Enterolobium cyclocarpum*), and camphor tree (*Cinnamomum camphora*); with a mowed/maintained groundcover dominated by bahia grass (*Paspalum notatum*), St. Augustine grass (*Stenotaphrum secundatum*), white beggar ticks (*Bidens alba*), creeping-oxeye (*Widelia trilobata*), and various other grasses and weedy species. There is a significant amount of domestic trash within this area particularly adjacent to the offsite apartment complexes.

A manmade drainage ditch (“Emory Street Ditch”) runs along the eastern project boundary, adjacent to Emory Street. The ditch contains rubble riprap along the majority of its banks, and contains no vegetation below the normal water line. Photographs of the subject property have been included as an Appendix to this letter report.

LISTED SPECIES

An Authorized Gopher Tortoise Agent from AEC conducted pedestrian surveys of the subject property to determine whether a tortoise (*Gopherus polyphemus*) population occurs onsite. Pedestrian transects covered 100% of suitable habitat within the subject property. No gopher tortoises or their burrows were observed during the representative survey. Due to the urban location of the subject property, and its mowed/maintained condition, the likelihood of occurrence of this state-listed species is low.

A review of the FWC bald eagle nest database revealed that there are no known bald eagle (*Haliaeetus leucocephalus*) nests with the potential to be affected by development of the subject property. No other state or federally listed species were observed or are known to occur onsite. Due to the location of the subject property within a highly urbanized area, and the maintained condition of the onsite habitats, the

potential for occurrence of listed species is low. Species observed during the December 9, 2014 site review are identified in the following table:

Table 1. Observed Wildlife Species

Common Name	Scientific Name	Notes
Northern mockingbird	<i>Mimus polyglottos</i>	Direct observation
Brown anole	<i>Anolis sagrei</i>	Direct observation
Eastern grey squirrel	<i>Sciurus carolinensis</i>	Direct observation

PROPOSED IMPROVEMENTS

The proposed project involves the construction of a stormwater treatment pond within the onsite uplands. A portion of the flow within the Emory Street Ditch will be diverted to the treatment pond by the installation of a structure, and minor grading of the west ditch top-of-bank. For details of the proposed improvements, please see the site plans provided by Osceola Engineering, Inc.

WETLAND & SURFACE WATER IMPACTS

The proposed treatment pond will be constructed entirely within uplands. The proposed structural impact to the Emory Street Ditch will not require compensatory mitigation, as the ditch is a manmade stormwater conveyance feature. No adverse direct, secondary, or cumulative wetland impacts will result from the proposed improvements.

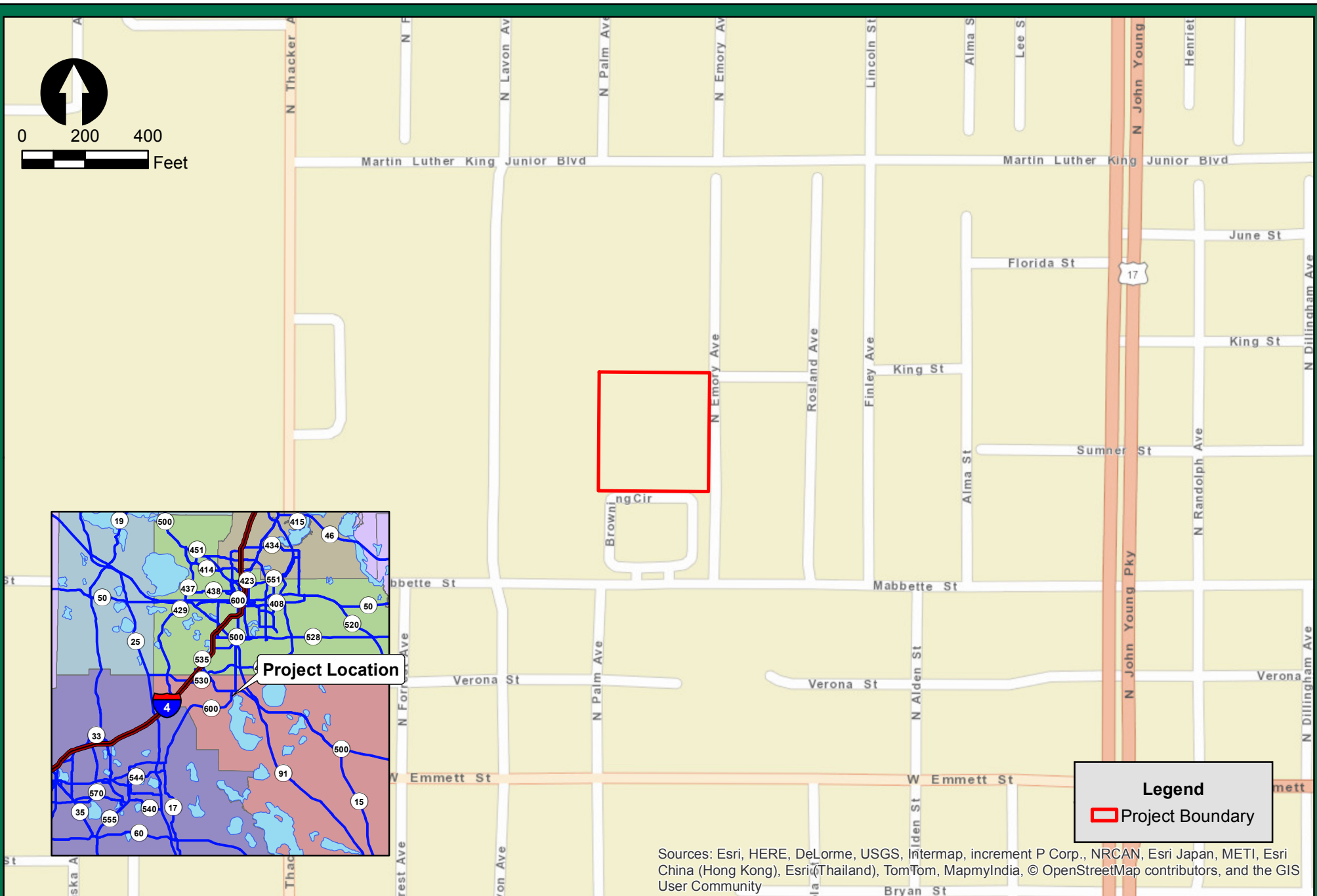
If you have any questions about the information contained in this report, please do not hesitate to contact me.

Sincerely,



Nathan E. Chambers
Biologist

FIGURES

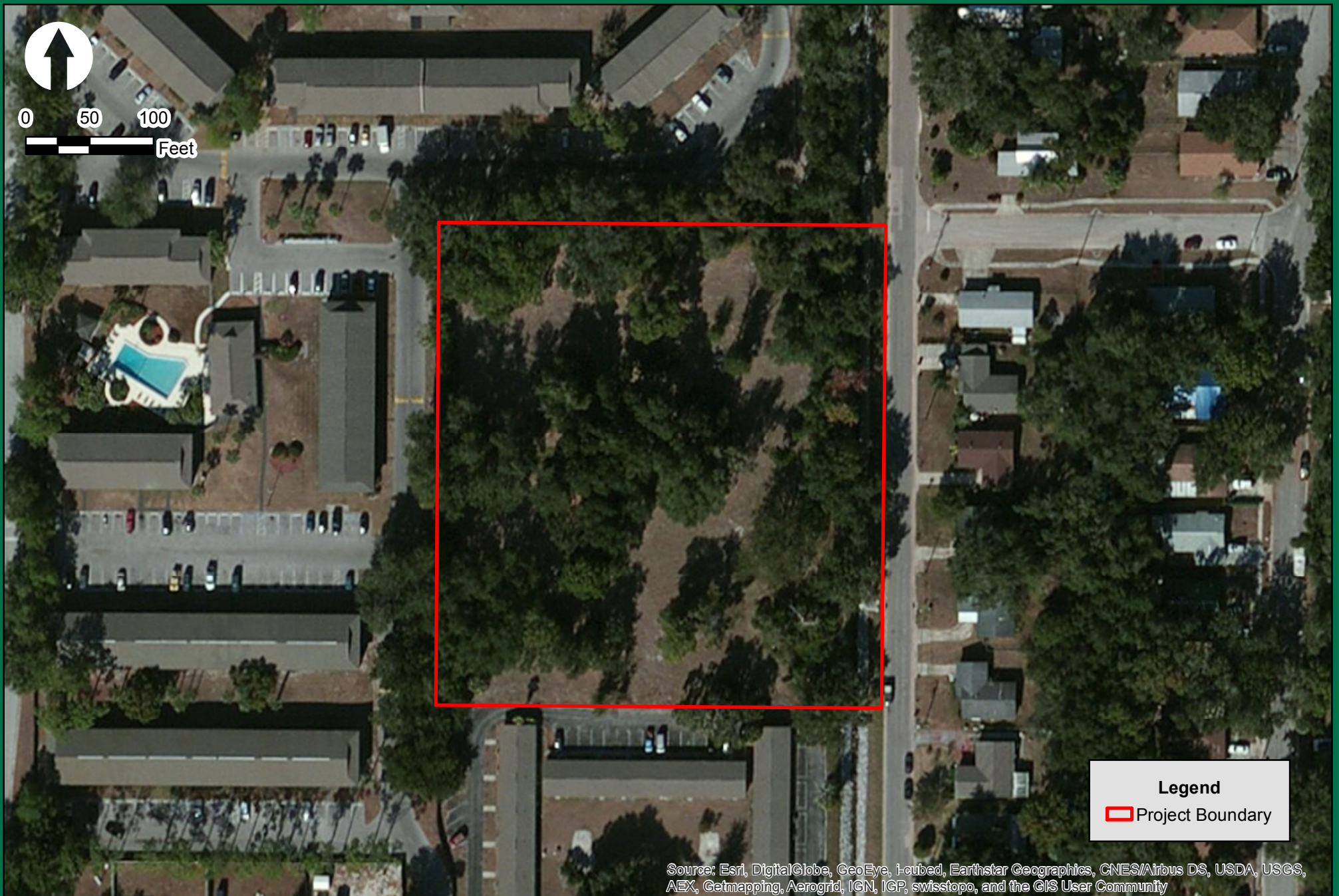


Austin Environmental Consultants, Inc.
 316 Church Street
 Kissimmee, Florida 34741
 407.935.0535

FIGURE
1

LOCATION MAP

Emory Street Ditch
Stormwater Improvements
 Kissimmee, Florida



Austin Environmental Consultants, Inc.
316 Church Street
Kissimmee, Florida 34741
407.935.0535

FIGURE
2

AERIAL PHOTOGRAPH

Emory Street Ditch
Stormwater Improvements
Kissimmee, Florida



Austin Environmental Consultants, Inc.
316 Church Street
Kissimmee, Florida 34741
407.935.0535

FIGURE
4

FLUCFCS MAP

Emory Street Ditch
Stormwater Improvements
Kissimmee, Florida

APPENDIX



Photo 1 - Representative photo of mowed uplands



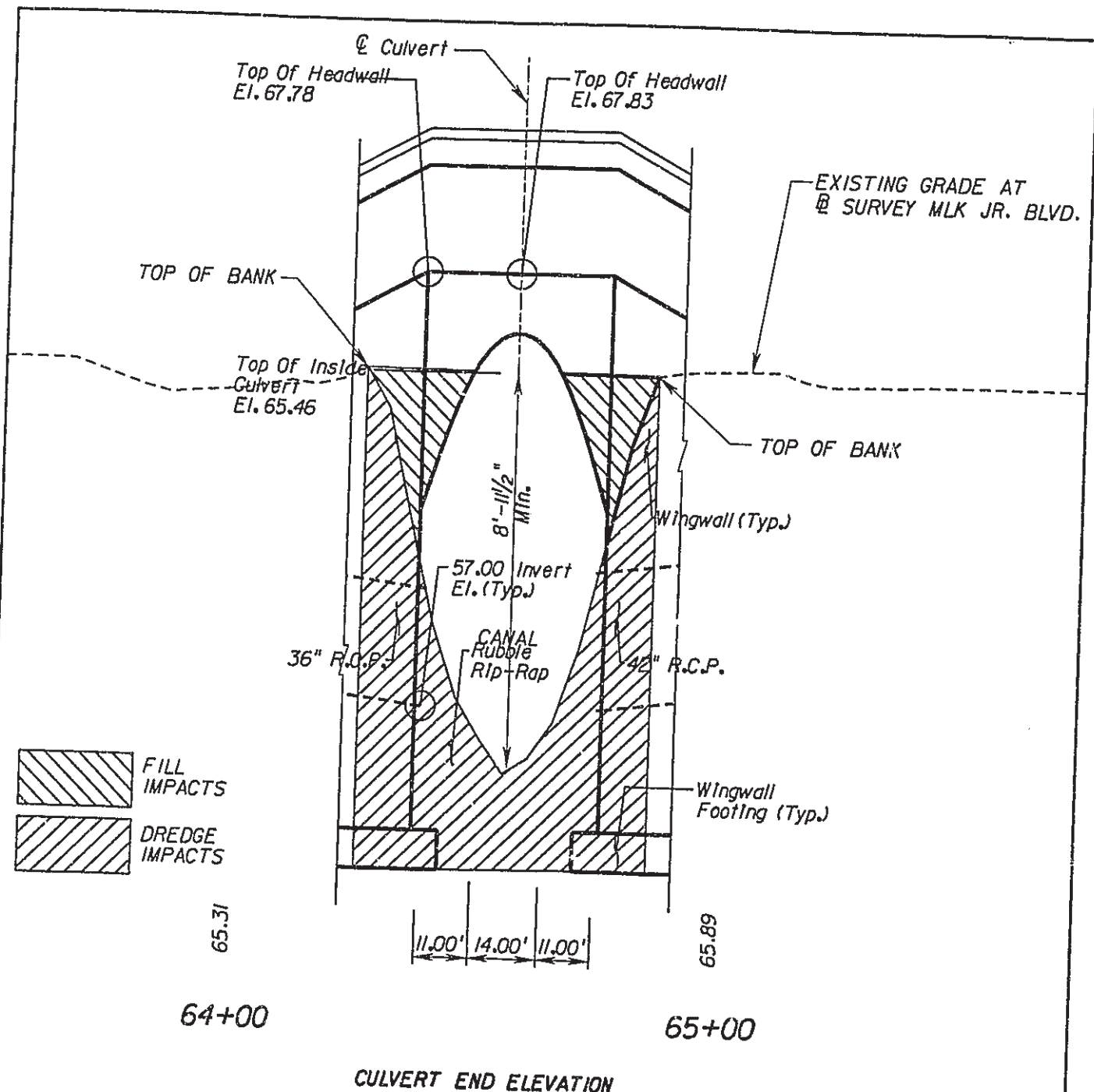
Photo 2 - Representative photo of mowed uplands



Photo 3 – Emory Street Ditch facing south from north end of project



Photo 4 – Emory Street Ditch facing north from south end of project



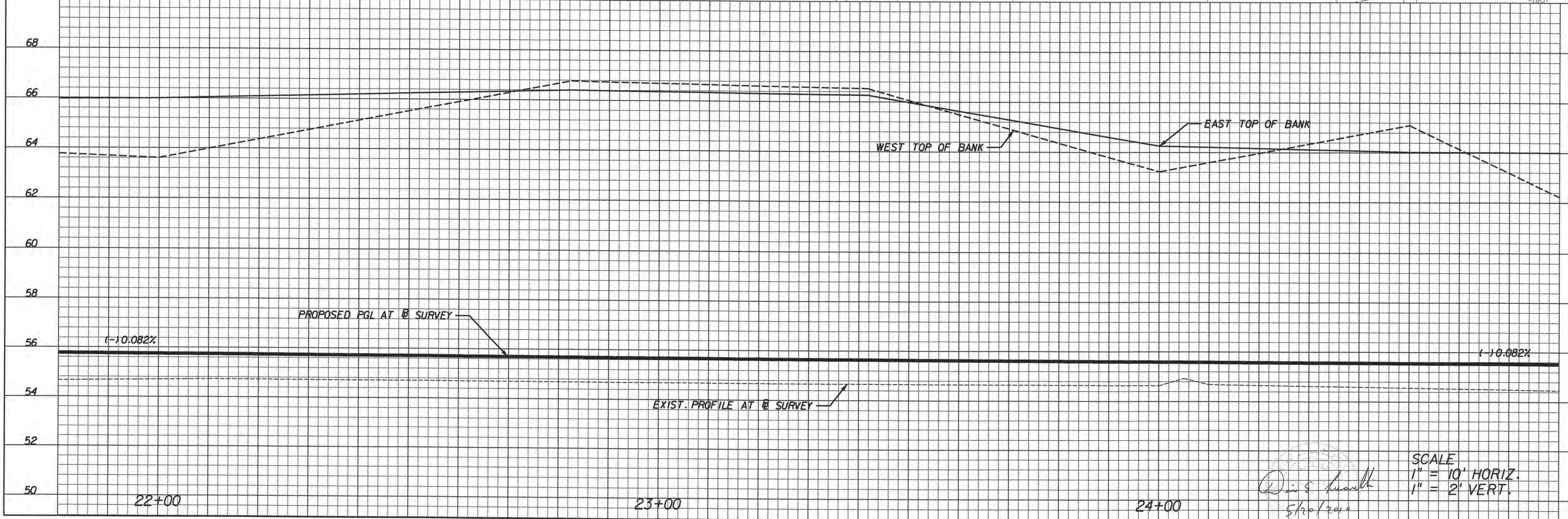
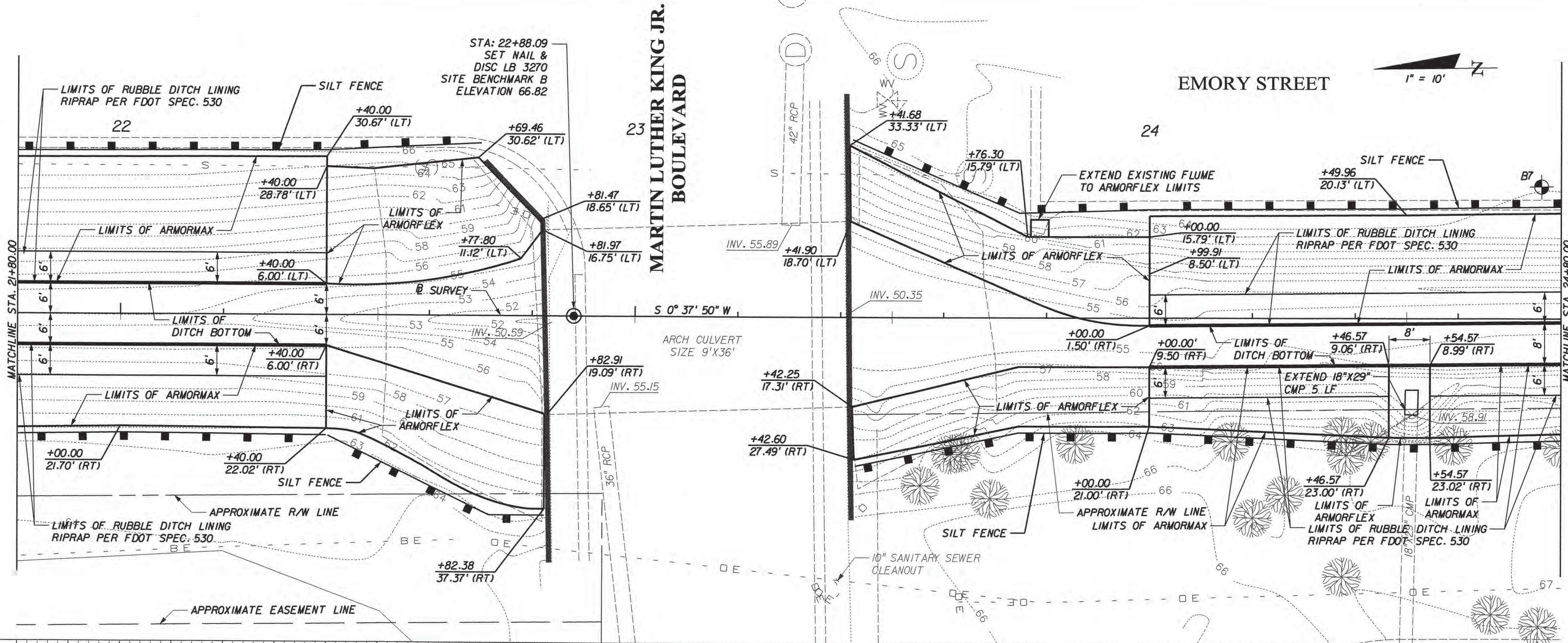
PROJECT:	ROADWAY AND UTILITY IMPROVEMENTS MARTIN LUTHER KING BLVD.	SECTION 21, TOWNSHIP 25 SOUTH, RANGE 29 EAST
WATER BODY:	OTHER SURFACE WATERS	
PURPOSE:	JURISDICTIONAL IMPACT	OSCEOLA COUNTY
DATUM:	NGVD	STATE OF FLORIDA
		SHEET 2 OF 2

DRMP
ENGINEERS - SURVEYORS - PLANNERS - SCIENTISTS
DYER, RIDOLE, MILLS & PRECOURT, INC.
1505 E. COLONIAL DRIVE
ORLANDO, FLORIDA 32003
(407) 896-0594

CITY OF KISSIMMEE
PUBLIC WORKS & ENGINEERING DEPARTMENT
101 NORTH CHURCH STREET
KISSIMMEE, FLORIDA 34741
(407) 518-2169 FAX (407) 518-2165



[Signature]
Signed
DATE 10/21/02
REG. FLA. ENG. NO. 54657



PROJECT NO. N/A

DESIGNED BY DL

CHECKED BY RM

SUPERVISED BY DINO E. LUCARELLI, P.E. #39556

NOT VALID UNLESS SIGNED AND SEALED

DESIGNED BY DL

CHECKED BY RM

SUPERVISED BY DINO E. LUCARELLI, P.E. #39556

CITY OF KISSIMMEE
DESIGN & ENGINEERING DEPARTMENT
101 NORTH CHURCH STREET
KISSIMMEE, FLORIDA 34741
(407) 518-2117 FAX (407) 518-2103

CITY OF KISSIMMEE
DESIGN & ENGINEERING DEPARTMENT
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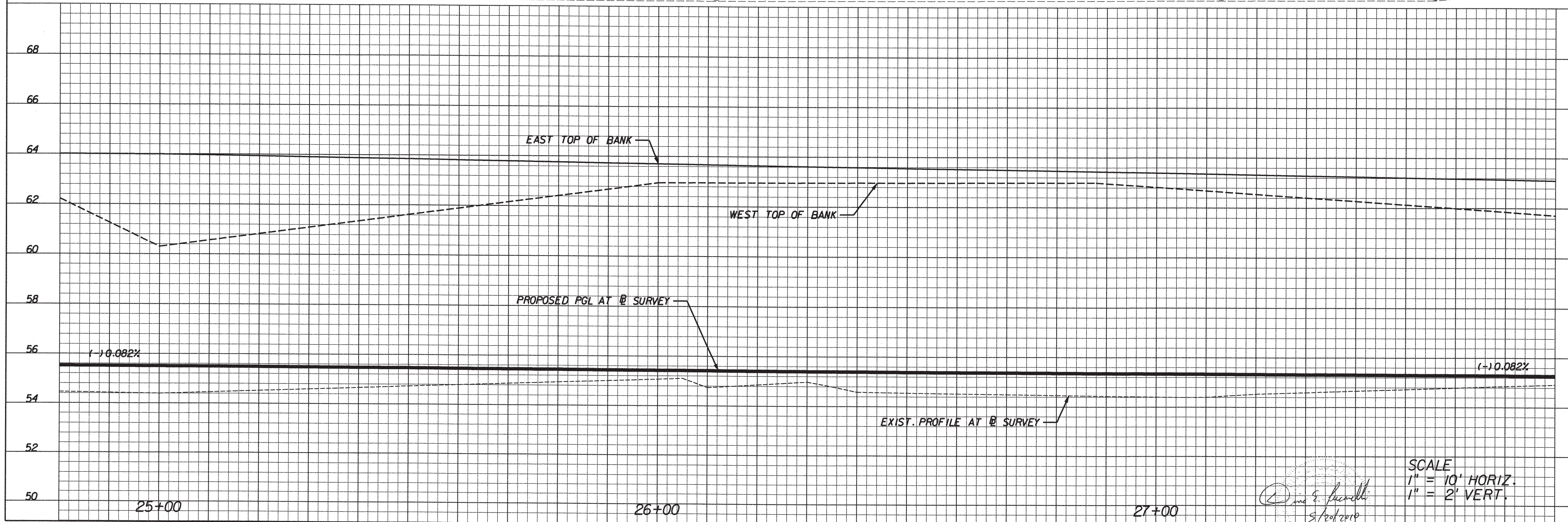
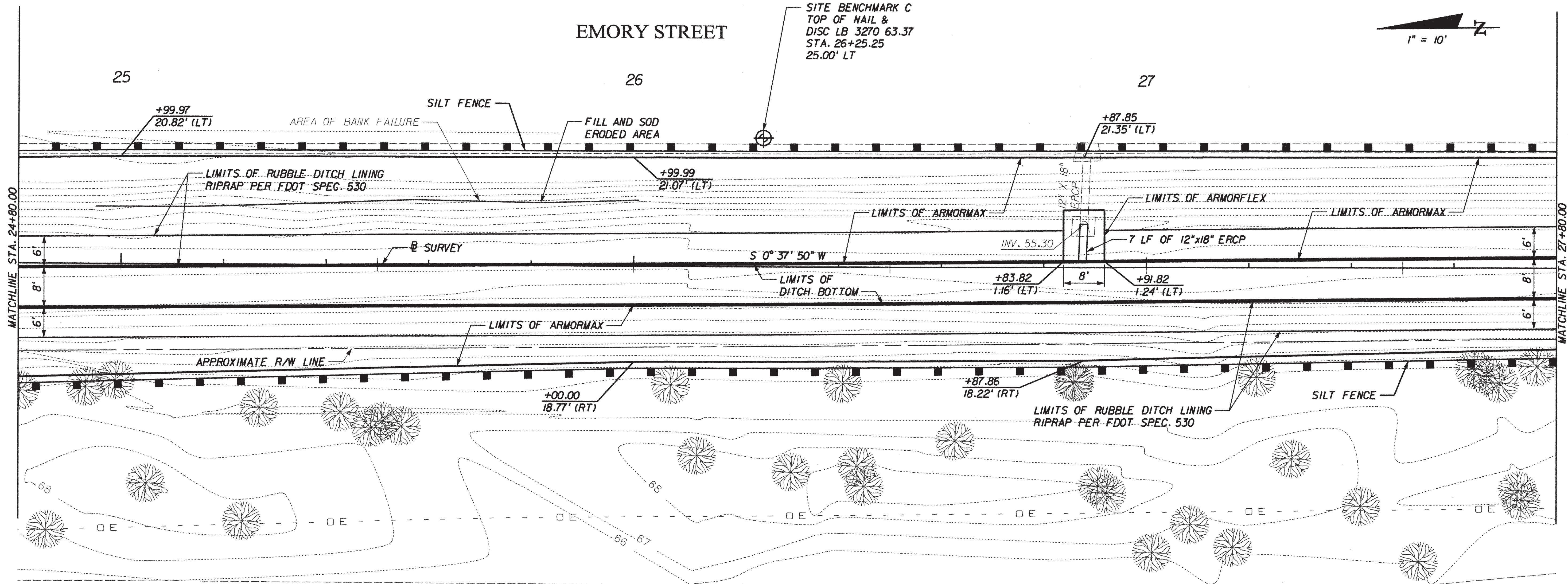
WEST CITY DITCH FROM OAK STREET
SOUTH TO MABBETTE STREET

PLAN AND PROFILE VIEW

SHEET 7

OF 28

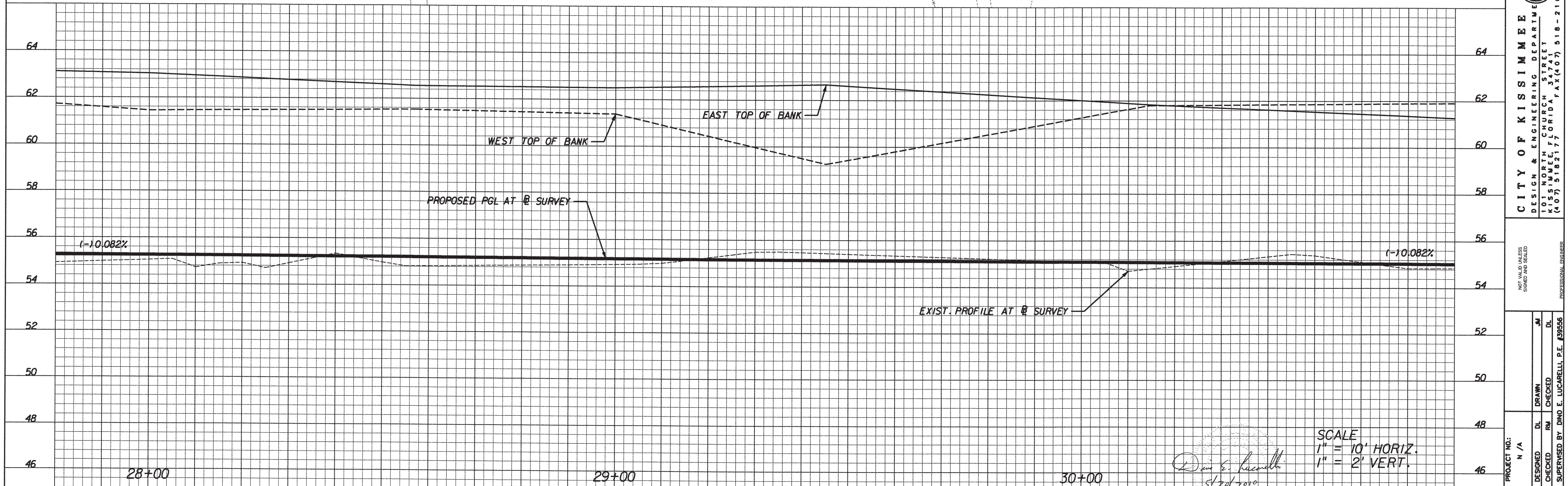
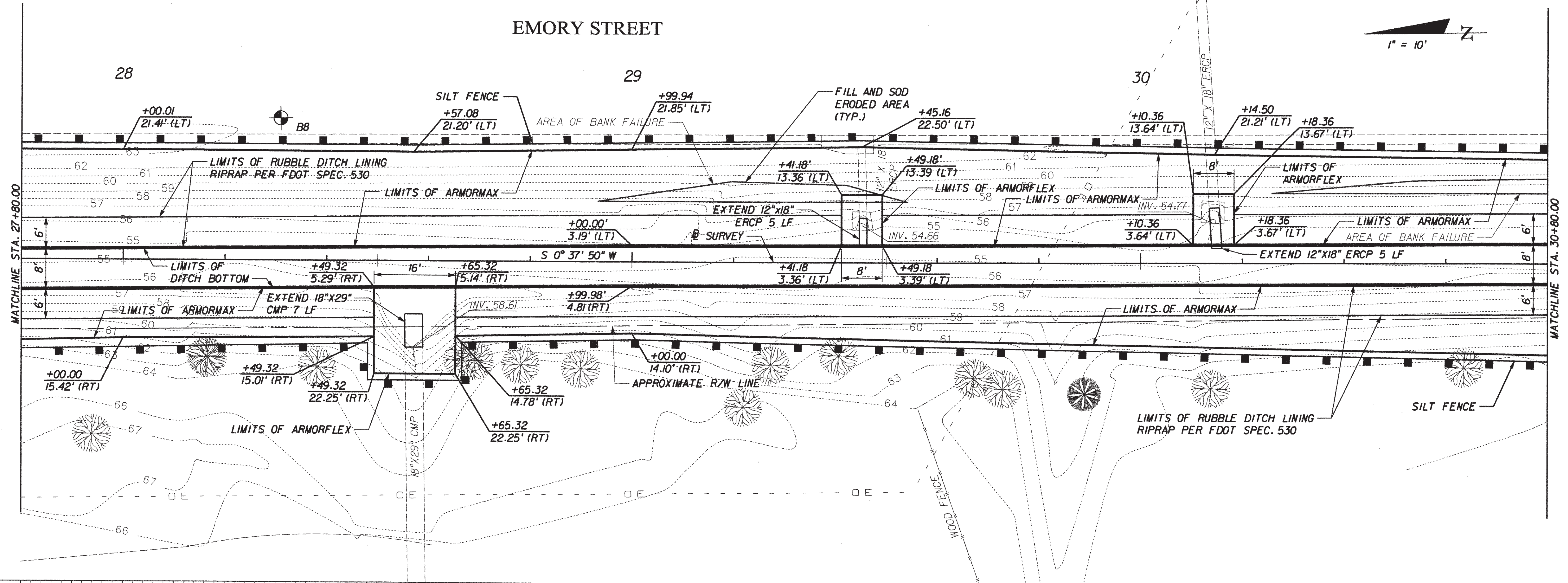
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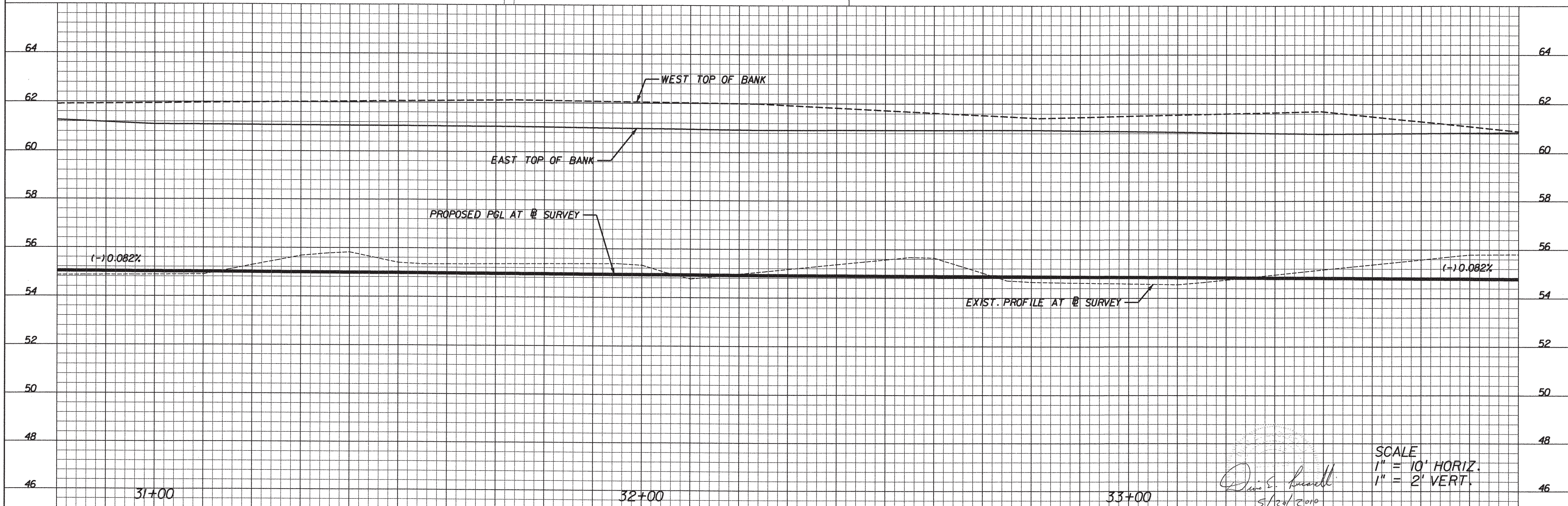
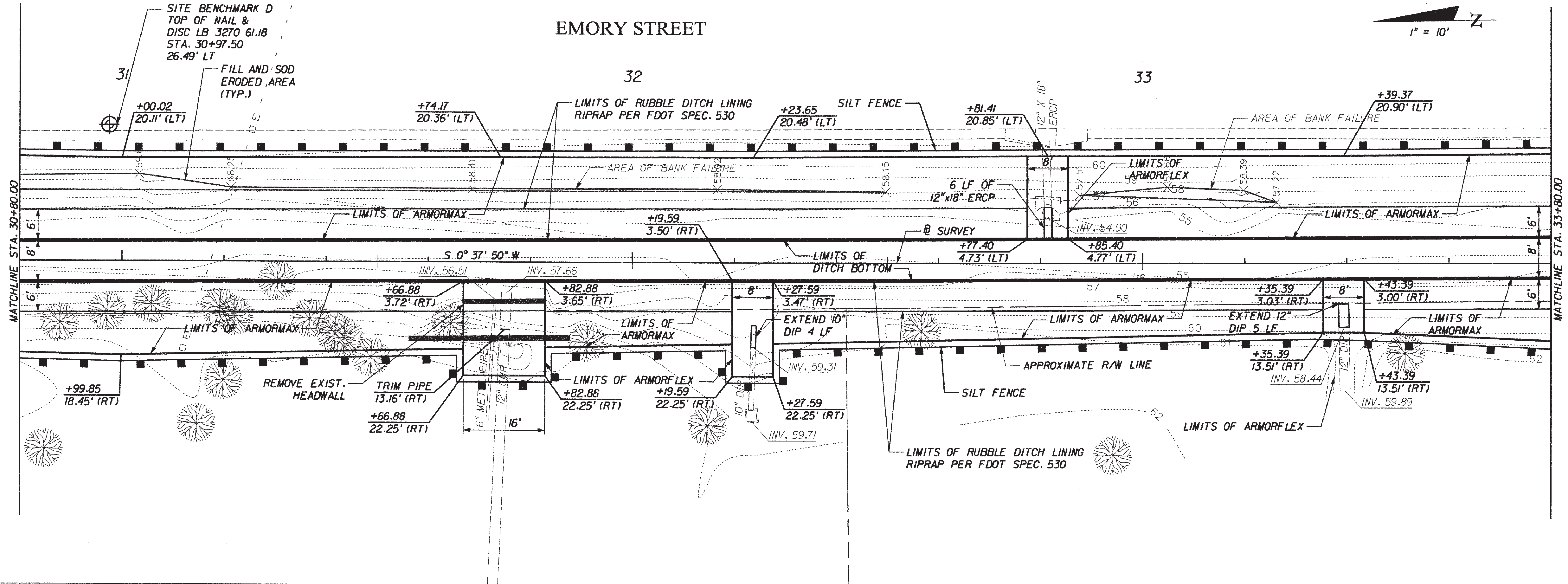
SCALE
1" = 10' HORIZ.
1" = 2' VERT.

Dino E. Lucarelli
5/20/2010

EMORY STREET



SCALE
1" = 10' HORIZ.
1" = 2' VERT.



CITY OF KISSIMMEE
DESIGN & ENGINEERING DEPARTMENT
101 NORTH CHURCH STREET
KISSIMMEE, FLORIDA 34741
(407) 518-2177 FAX (407) 518-2163

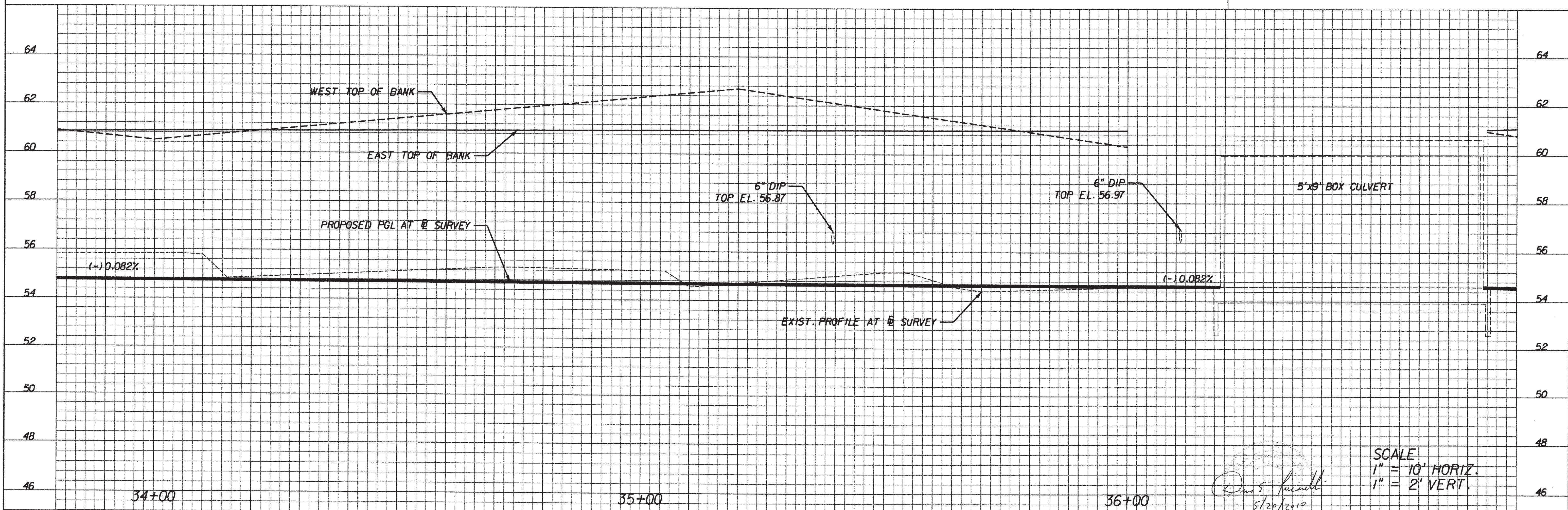
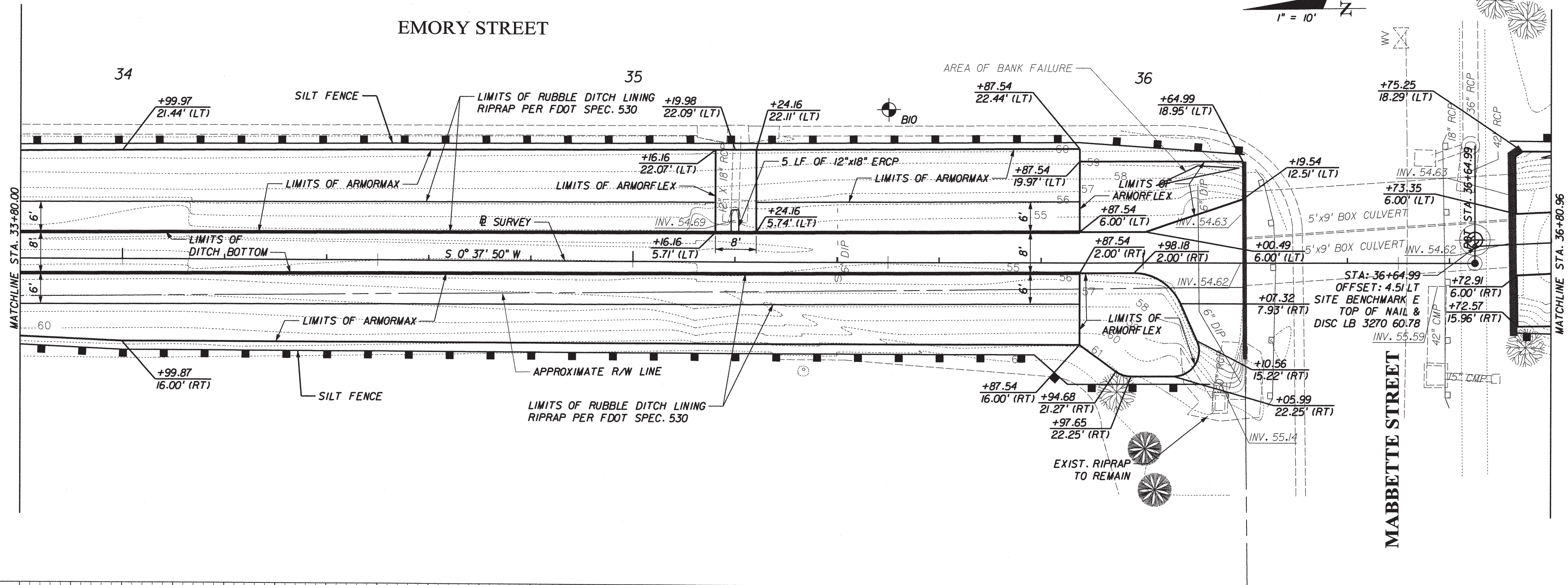
NOT VALID UNLESS
SIGNED AND SEALED
PROFESSIONAL ENGINEER

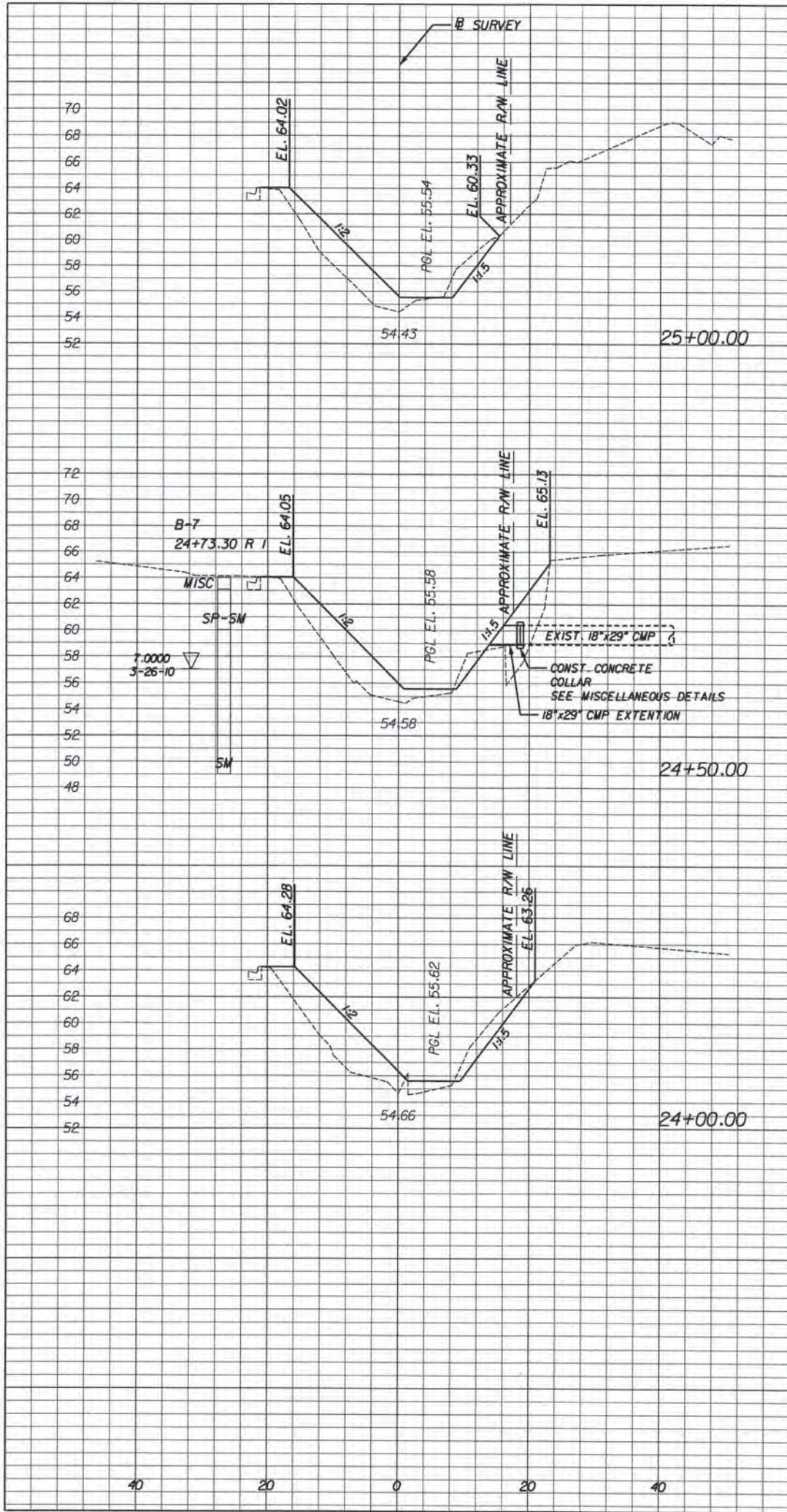
PROJECT NO:	N/A
DESIGNED	JM
CHECKED	DL
DRAWN	JM
CHECKED	DL
SUPERVISED BY DINO E. LUCARELLI, P.E. 139556	

WEST CITY DITCH FROM OAK STREET
SOUTH TO MABBETTE STREET

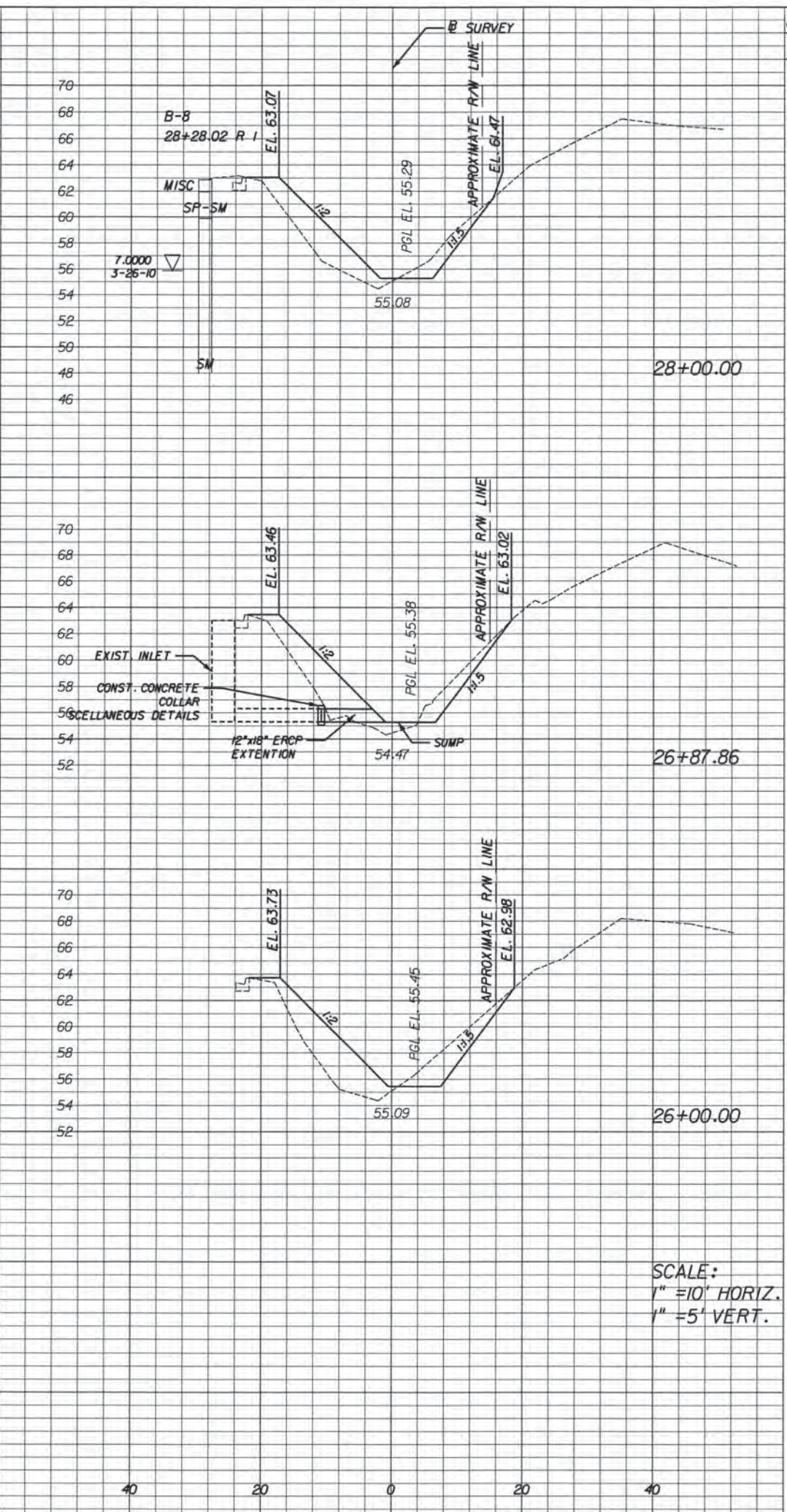
SHEET
10
OF
28

PLAN AND PROFILE VIEW





Regular		Exc.	Embankment	
A	V	A	V	
9.06	12	41.29	III	
4.00	15	78.31	125	
12.38	72	57.17	64	



Regular		Exc.	Embankment	
A	V	A	V	
13.12	56	39.85	177	
13.92	60	45.63	153	
22.80	59	48.30	166	

SCALE:
1" = 10' HORIZ.
1" = 5' VERT.

Don E. Lucarelli
5/20/2010

 HEC2 RELEASE DATED NOV 76 UPDATED AUG 77
 ERROR CORR - 01:02
 MODIFICATION - 50,51,52,53

C
 T: CITY OF MISSISSIPPEE -FIS
 T2 WEST DRAINAGE DITCH
 T3 10 YR FREQ LLK

J1	ICHECK	INC	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FR
	0.	2.	0.	0.	0.000000	0.00	0.0	0.	55.800	0.000
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBN	CHNIM	ITRACE
	1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	150.000	202.000	-106.000	126.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000
QT	4.000	1321.000	1831.000	2145.000	2570.000	0.000	0.000	0.000	0.000	0.000
X1	900.000	5.000	345.000	355.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	54.000	300.000	51.000	345.000	50.000	350.000	51.000	355.000	54.000	600.000
X1	2000.000	9.000	325.000	363.000	1100.000	1100.000	1100.000	0.000	0.000	0.000
GR	54.200	300.000	59.300	312.000	53.230	325.000	51.700	329.000	50.000	344.000
GR	51.000	359.000	53.230	363.000	59.900	375.000	60.500	394.000	0.000	0.000
X1	3375.000	0.000	0.000	0.000	1375.000	1375.000	1375.000	0.000	0.000	0.000
US17-92 (KA-1)										
X1	3322.000	9.000	1180.000	1220.000	7.000	7.000	7.000	0.000	0.000	0.000
GR	65.000	0.000	62.000	900.000	61.000	1165.000	52.300	1180.000	42.100	1200.000
GR	52.300	1220.000	60.100	1235.000	62.600	1500.000	65.000	4000.000	0.000	0.000
X1	3392.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	62.680	62.680	0.000
S8	1.250	1.500	2.700	2000.000	21.300	1.300	120.000	0.000	52.300	51.900
X1	3446.000	9.000	1180.000	1220.000	56.000	56.000	56.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	56.300	62.680	0.000	0.000	0.500	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	62.680	62.680	0.000
GP	65.000	0.000	62.000	900.000	61.400	1165.000	52.300	1180.000	50.680	1200.000
GR	52.300	1220.000	60.200	1235.000	62.600	1500.000	65.000	5000.000	0.000	0.000
X1	3458.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000

(1)

EMMETT STREET (KB-AB)

GT	4,000	843,000	1076,000	1237,000	1513,000	0,000	0,000	0,000	0,000	0,000
X1	4120,000	20,000	636,000	703,000	662,000	662,000	662,000	0,000	0,000	0,000
GR	65,000	0,000	62,700	100,000	62,140	113,000	58,000	150,000	59,300	200,000
GR	57,800	350,000	58,000	450,000	57,800	550,000	61,100	636,000	55,100	650,000
GR	52,560	675,000	50,660	678,000	50,920	687,000	58,800	703,000	59,500	750,000
GR	59,600	800,000	59,800	900,000	60,400	983,000	63,900	1014,000	65,000	2100,000

SEWER PLANT ROAD (KB-2A)

X1	5145,000	9,000	625,000	670,000	1025,000	1025,000	1025,000	0,000	0,000	0,000
GR	68,000	0,000	65,000	50,000	61,240	625,000	52,230	640,000	52,110	650,000
GR	52,230	660,000	60,920	670,000	65,000	1150,000	70,000	1200,000	0,000	0,000

X1	5160,000	0,000	0,000	0,000	15,000	15,000	15,000	0,000	0,000	0,000
X3	10,000	0,000	0,000	0,000	0,000	0,000	0,000	61,260	61,260	0,000
SB	1,250	1,500	2,500	600,000	22,000	1,000	125,000	0,000	52,300	52,100

X1	5200,000	9,000	630,000	670,000	40,000	40,000	40,000	0,000	0,000	0,000
X2	0,000	0,000	1,000	58,100	61,260	0,000	0,000	0,000	0,000	0,000
X3	10,000	0,000	0,000	0,000	0,000	0,000	0,000	61,260	61,260	0,000
GR	68,000	0,000	65,000	50,000	61,320	630,000	52,230	640,000	52,600	650,000
GR	52,230	660,000	61,290	670,000	65,000	1150,000	70,000	1200,000	0,000	0,000

X1	5215,000	0,000	0,000	0,000	15,000	15,000	15,000	0,000	0,000	0,000
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SCL PR (KB-2)

X1	5675,000	14,000	210,000	285,000	460,000	460,000	460,000	0,000	0,000	0,000
GR	68,000	0,000	64,500	185,000	62,500	200,000	63,100	210,000	54,600	222,000
GR	54,200	235,000	53,600	245,000	52,600	250,000	54,100	255,000	50,700	262,000
GR	63,300	265,000	63,400	300,000	64,600	350,000	66,000	400,000	0,000	0,000

X1	5685,000	0,000	0,000	0,000	10,000	10,000	10,000	0,000	0,000	0,000
X3	10,000	0,000	0,000	0,000	0,000	0,000	0,000	66,100	66,100	0,000
SB	1,250	1,500	2,700	400,000	50,000	6,000	670,000	1,500	53,700	52,600

X1	5715,000	15,000	165,000	232,000	30,000	30,000	30,000	0,000	0,000	0,000
X2	0,000	0,000	1,000	64,000	66,100	0,000	0,000	0,000	0,000	0,000
X3	10,000	0,000	0,000	0,000	0,000	0,000	0,000	66,100	66,100	0,000
GR	66,000	0,000	64,700	50,000	64,800	100,000	63,800	150,000	64,400	165,000
GR	55,200	165,000	54,200	195,000	53,700	200,000	54,200	205,000	56,300	215,000
GR	63,800	232,000	63,900	250,000	65,100	300,000	65,200	375,000	66,000	400,000

X1	5725,000	0,000	0,000	0,000	10,000	10,000	10,000	0,000	0,000	0,000
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CLAY STREET (KB-3)

X1	5756,000	14,000	578,000	625,000	31,000	31,000	31,000	0,000	0,000	0,000
GR	65,000	0,000	61,700	400,000	59,900	550,000	61,200	578,000	53,880	591,000
GR	53,000	594,000	52,800	600,000	53,000	600,000	53,850	609,000	58,700	625,000
GR	61,700	650,000	61,400	700,000	61,900	750,000	65,000	1450,000	0,000	0,000

X1	5766,000	0,000	0,000	0,000	10,000	10,000	10,000	0,000	0,000	0,000
X3	10,000	0,000	0,000	0,000	0,000	0,000	0,000	63,120	63,120	0,000

EMMETT STREET (KB-48)

SB	1.250	1.500	2.700	500.000	20.000	0.100	130.300	0.000	52.500	52.450
X1	5834.000	17.000	615.000	675.000	68.000	68.000	68.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	59.200	63.120	68.000	68.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	65.000	0.000	62.900	400.000	61.200	500.000	61.700	63.120	63.120	0.000
GR	53.500	635.000	51.900	644.000	52.200	650.000	62.600	655.000	53.650	615.000
GR	61.800	675.000	62.300	700.000	62.200	750.000	62.600	780.000	61.600	850.000
GR	62.400	900.000	65.000	1600.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5844.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000

ERNEST STREET (KH-3A)

X1	6455.000	9.000	880.000	920.000	621.000	621.000	621.000	0.000	0.000	0.000
GR	68.000	0.000	65.000	725.000	60.940	680.000	54.860	889.000	53.620	900.000
GR	54.860	911.000	61.920	920.000	65.000	1250.000	70.000	1800.000	0.000	0.000
X1	6480.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	1.250	1.500	2.500	600.000	20.000	0.000	0.000	61.320	61.320	0.000
X1	6520.000	9.000	880.000	920.000	40.000	40.000	40.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	58.900	61.230	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	66.000	0.000	65.000	725.000	61.390	880.000	54.860	889.000	54.030	900.000
GR	54.860	911.000	61.740	920.000	65.000	1250.000	70.000	1800.000	0.000	0.000
X1	6535.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
X1	7060.000	19.000	482.000	516.000	525.000	525.000	525.000	0.000	0.000	0.000
GR	69.000	0.000	63.500	100.000	51.700	250.000	61.500	300.000	60.000	400.000
GR	61.500	450.000	61.100	482.000	54.540	492.000	53.400	500.000	54.540	511.000
GR	59.800	518.000	60.100	550.000	60.100	600.000	62.400	650.000	63.100	700.000
GR	63.000	750.000	63.200	800.000	64.200	850.000	66.000	1100.000	0.000	0.000

PATRICK STREET (KB-4A)

X1	7613.000	9.000	1630.000	1870.000	753.000	753.000	753.000	0.000	0.000	0.000
GR	70.000	0.000	65.000	1050.000	61.700	1830.000	55.000	1830.000	53.920	1850.000
GR	55.000	1862.000	60.550	1870.000	65.000	2650.000	70.000	3000.000	0.000	0.000
X1	7625.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	1.250	1.500	2.500	600.000	22.600	1.000	105.000	0.000	54.100	53.940
X1	7672.000	9.000	1831.000	1869.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	58.940	62.230	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	70.000	0.000	65.000	1050.000	61.650	1831.000	55.000	1839.000	54.100	1850.000
GR	55.000	1861.000	61.300	1869.000	65.000	2650.000	70.000	3000.000	0.000	0.000
X1	7587.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000

EMMETT STREET (KB-4B)

X1	8511.000	9.000	1532.000	1570.000	624.000	624.000	624.000	0.000	0.000	0.000
GR	70.000	0.000	65.000	950.000	61.870	1532.000	55.400	1540.000	53.800	1550.000
GR	55.400	1562.000	61.280	1570.000	65.000	2300.000	70.000	2650.000	0.000	0.000

X1	8526.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	61.400	61.400	0.000
SB	1.250	1.500	2.500	600.000	20.800	0.800	100.000	0.000	54.570	54.370

X1	8574.000	9.000	1530.000	1570.000	48.000	48.000	48.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	59.370	61.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	61.400	61.400	0.000
GR	70.000	0.000	65.000	950.000	61.620	1530.000	55.400	1539.000	54.300	1550.000
GR	55.500	1561.000	61.680	1570.000	65.000	2050.000	70.000	2650.000	0.000	0.000

X1	8589.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
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X1	8650.000	18.000	350.000	422.000	261.000	261.000	261.000	0.000	0.000	0.000
GR	66.000	0.000	64.100	100.000	61.800	300.000	60.700	350.000	59.800	378.000
GR	55.240	390.000	54.560	392.000	53.900	400.000	58.800	408.000	58.240	410.000
GR	62.200	422.000	61.900	450.000	61.700	500.000	62.100	550.000	62.200	604.000
GR	62.600	700.000	65.000	800.000	66.000	850.000	0.000	0.000	0.000	0.000

MABBETT STREET (KB-4C)

X1	9119.000	9.000	2178.000	2222.000	269.000	269.000	269.000	0.000	0.000	0.000
GR	70.000	0.000	65.000	1750.000	62.770	2178.000	55.950	2193.000	55.130	2200.000
GR	55.950	2207.000	63.030	2222.000	65.000	3000.000	70.000	3400.000	0.000	0.000

X1	9134.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	62.650	62.650	0.000
SB	1.250	1.500	2.500	600.000	18.800	0.800	90.000	0.000	55.520	54.460

X1	9186.000	9.000	2182.000	2216.000	52.000	52.000	52.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	60.460	62.650	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	62.650	62.650	0.000
GR	70.000	0.000	65.000	1750.000	62.700	2182.000	56.030	2193.000	55.180	2200.000
GR	56.030	2208.000	61.580	2216.000	65.000	2750.000	70.000	3400.000	0.000	0.000

X1	9201.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
GR	4.000	428.000	594.000	663.000	782.000	0.000	0.000	0.000	0.000	0.000

X1	9592.000	17.000	920.000	960.000	391.000	391.000	391.000	0.000	0.000	0.000
GR	67.000	0.000	86.000	200.000	65.000	395.000	64.000	550.000	63.000	635.000
GR	62.000	740.000	61.000	897.000	60.000	920.000	59.000	928.000	55.300	940.000
GR	59.000	952.000	62.000	960.000	63.000	985.000	64.000	1021.000	65.000	1110.000
GR	66.000	1220.000	67.000	1335.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	9622.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	63.000	63.000	0.000
SB	1.250	1.500	2.700	900.000	24.000	0.800	149.000	0.000	55.300	55.300

X1	9638.000	0.000	0.000	0.000	16.000	16.000	16.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	62.200	63.000	0.000	0.000	0.000	0.000	0.000

GR	70.700	0.000	7.000	150.000	65.010	158.000	71.000	199.000	7.000	199.000
GR	65.010	142.000	63.750	150.000	65.010	158.000	71.000	199.000	7.000	199.000

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GR	68.600	205.000	68.300	250.000	68.900	300.000	71.400	310.000		
EJ	0.000	0.000	0.000	0.000	0.000					

X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	63.000	63.000	0.000
X1	9668.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000

SCL RR (KB-4)

X1	10497.000	14.000	625.000	675.000	1296.000	1296.000	1296.000	0.000	0.000	0.000
GR	68.000	0.000	65.500	450.000	65.200	500.000	65.500	600.000	61.300	625.000
GR	58.200	642.000	58.000	650.000	57.800	662.000	60.200	675.000	63.300	685.000
GR	64.800	700.000	64.200	750.000	64.500	850.000	70.000	1150.000	0.000	0.000

X1	10507.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	66.000	66.000	0.000
SB	1.250	1.500	2.700	400.000	12.000	6.000	150.000	2.000	57.900	56.000

X1	10533.000	14.000	575.000	622.000	26.000	26.000	26.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	64.000	66.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	66.000	66.000	0.000
GR	68.000	0.000	65.700	450.000	64.900	500.000	65.800	550.000	62.400	575.000
GR	59.400	585.000	58.200	595.000	57.300	600.000	58.000	610.000	60.100	622.000
GR	65.200	628.000	67.000	650.000	65.000	750.000	70.000	950.000	0.000	0.000

X1	10543.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
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X1	11220.000	17.000	1469.000	1550.000	677.000	677.000	677.000	0.000	0.000	0.000
GR	67.000	0.000	66.200	1200.000	66.100	1300.000	66.500	1350.000	66.300	1400.000
GR	67.600	1450.000	67.100	1469.000	59.100	1486.000	58.300	1496.000	57.600	1500.000
GR	57.200	1510.000	58.300	1512.000	66.900	1531.000	66.900	1550.000	66.000	1650.000
GR	66.100	1750.000	67.000	2750.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	4.000	250.000	325.000	410.000	525.000	0.000	0.000	0.000	0.000	0.000

DAR STREET (KB-5)

X1	11610.000	13.000	92.000	108.000	590.000	590.000	590.000	0.000	0.000	0.000
GR	70.000	0.000	66.100	50.000	67.000	75.000	60.600	92.000	58.700	93.000
GR	57.900	100.000	58.400	105.000	60.500	106.000	69.700	125.000	68.000	130.000
GR	66.100	150.000	69.000	160.000	70.000	300.000	0.000	0.000	0.000	0.000

X1	11820.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	68.310	68.310	0.000
SB	1.250	1.500	2.700	1000.000	4.000	0.100	16.000	0.000	57.600	59.800

X1	11920.000	8.000	42.000	56.000	100.000	100.000	100.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	62.100	68.310	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	68.310	68.310	0.000
GR	70.000	0.000	68.400	25.000	60.600	42.000	59.600	50.000	60.700	56.000
GR	68.800	75.000	68.200	100.000	70.000	250.000	0.000	0.000	0.000	0.000

X1	11930.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
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VINE STREET (KB-6)

X1	13113.000	15.000	132.000	168.000	1183.000	1183.000	1183.000	0.000	0.000	0.000
GR	70.750	0.000	70.110	35.800	67.200	50.000	67.100	100.000	66.420	132.000
GR	65.010	142.000	63.750	150.000	65.010	156.000	71.000	168.000	70.400	200.000

5

GR 68.600 205.000 68.300 250.000 68.900 300.000 71.400 310.000 71.700 335.000
 EU 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

*PROF 1

CCHV= 0.300 CEHV= 0.500

*SECNO 900.000

3280 CROSS SECTION

900.00 EXTENDED

1.80 FEET

SECNO	DEPTH	CASEL	CHINS	*SELK	EG	HV	HL	LOSS	BANK ELEV
Q	QLOB	GCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XAR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPAID	ENDST
900.00	5.80	55.80	0.00	55.80	55.25	0.05	0.00	0.00	51.00
1321.	171.	195.	955.	148.	53.	809.	0.	0.	51.00
0.00	1.15	3.67	1.18	0.080	0.035	0.080	0.000	50.00	300.00
0.000831	0.	0.	0.	0	0	0	0.00	300.00	600.00

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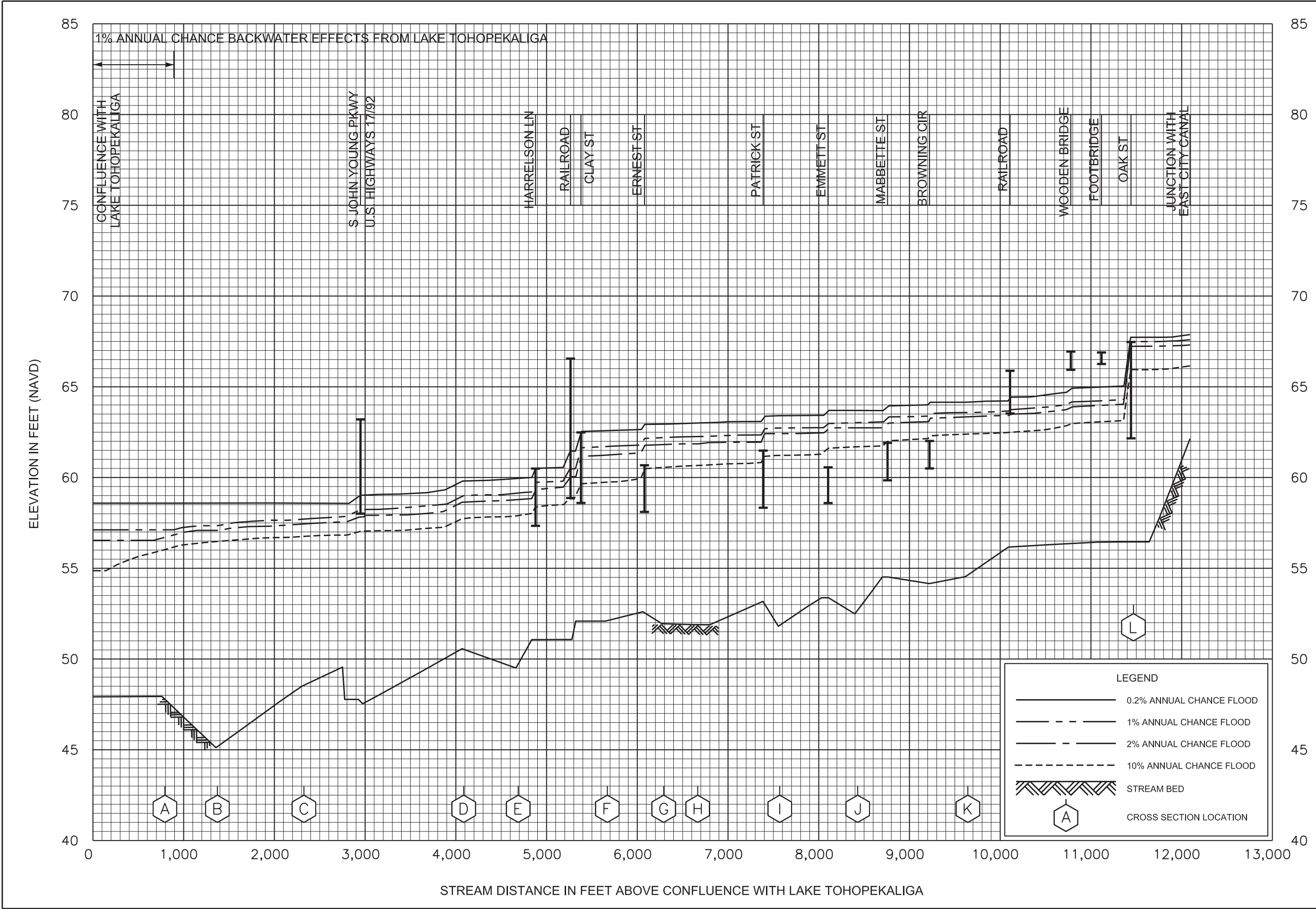
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FLOOD PROFILES

WEST CITY CANAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

OSCEOLA COUNTY, FL
AND INCORPORATED AREAS

TECHNICAL MEMORANDUM

**AN ATLAS OF THE UPPER KISSIMMEE
SURFACE WATER MANAGEMENT BASINS**

**by
Mariano Guardo**

February 1992

DRE 309

**Water Resources Engineering Division
Department of Research and Evaluation
South Florida Water Management District**

LAKE TOHOPEKALIGA BASIN

Description of the Basin

The Lake Tohopekaliga basin has an area of 131.4 square miles (Figure 11A). Most of this basin is located in Osceola County except for the northernmost part which is in Orange County. This basin occupies the central part of the UKRW (Figure 11B). The southernmost point of Lake Tohopekaliga is the outlet of this basin discharging into Cypress Lake through C-35.

Lake Tohopekaliga, which has an area of 30.2 square miles at a normal stage of 53.7 feet NGVD, receives inflows from two major sources: Shingle Creek and St. Cloud Canal (C-31) from East Lake Tohopekaliga. Lake Tohopekaliga is a shallow lake having a mean depth of 7.0 feet at the maximum regulation stage of 55.0 feet NGVD. This lake alone represents approximately 23 percent of the entire area of the basin. Fish Lake, a 220-acre lake located west of the St. Cloud Canal (C-31) and northeast of Lake Tohopekaliga, discharges into Lake Tohopekaliga through an excavated canal. Although it does not contribute flow to Lake Tohopekaliga, Brown Lake, a 140-acre lake located to the southwest of Lake Tohopekaliga, is also part of this basin. Discharges from Lake Tohopekaliga are conveyed by the South Port Canal (C-35) to Lake Cypress through S-61.

District Canals and Structures

The St. Cloud Canal (C-31) connecting East Lake Tohopekaliga to Lake Tohopekaliga is 3.9 miles long. S-59, which controls East Lake Tohopekaliga, is located on C-31, 1,100 feet downstream of this lake. Its design water surface elevation varies from 57.7 feet NGVD in East Lake Tohopekaliga to 54.8 feet NGVD in Lake Tohopekaliga. C-31 has a ground-surface slope of 0.84 feet per mile, and a bottom width of 20 feet.

S-61 controls Lake Tohopekaliga on the South Port Canal (C-35) at the outlet of Lake Tohopekaliga on its southern shore. This structure is a reinforced concrete-gated spillway controlled by a cable operated vertical lift gate. Operation of the spillway gate is manually controlled in accordance with seasonal operational criteria. This structure also includes a reinforced concrete lock with two pairs of sector gates. The purposes of S-61 are: (1) To maintain optimum upstream water control stages in Lake Tohopekaliga, (2) to pass the design flood without exceeding the upstream flood design stage, and to restrict downstream flood stages and channel velocities to nondamaging levels, (3) to prevent overtopping of the structure by wind tide from Lake Tohopekaliga, and (4) to pass sufficient discharge during low-flow periods to maintain downstream stages. The water level which will bypass this structure is 62.0 feet NGVD.

The lock structure is 30 feet wide by 90 feet long with the invert elevation at 43.0 feet NGVD. The lock has hydraulically operated sector gates which allows passage of vessels with a draft of less than 6 feet between the Kissimmee River (C-38) and Lake Tohopekaliga.

Comments on Historic Operation

S-61 is operated according with the Lake Tohopekaliga regulation schedule. This schedule ranges between elevations 52.0 and 55.0 feet NGVD and represents

the desirable water level throughout the year. If the level is above the prescribed level, flood operation is required. If the level is below the prescribed level, low-water operation is required. The operation is also dependent on hydraulic and structural limitations of the structure.

Flood Control Operation: When the water level in Lake Tohopekaliga is less than 0.5 feet above the prescribed level, a release schedule based on forecasted inflow is established to return the lake to that level within 15 days. When the lake stage is over 0.5 feet above the prescribed level, maximum releases subject to hydraulic and structural limitations are made.

Low-Water Operation: Whenever the lake level is below the prescribed level, minimum releases are made to satisfy downstream demands.

Structural Limitations: The maximum water level drop across the structure is 10 feet, if the upstream water elevation is below 55.0 feet NGVD; 6.0 feet if the upstream water elevation is between 55.0 and 59.9 feet MGVD; and less than 6.0 feet if the upstream water elevation is above 60.0 feet NGVD.

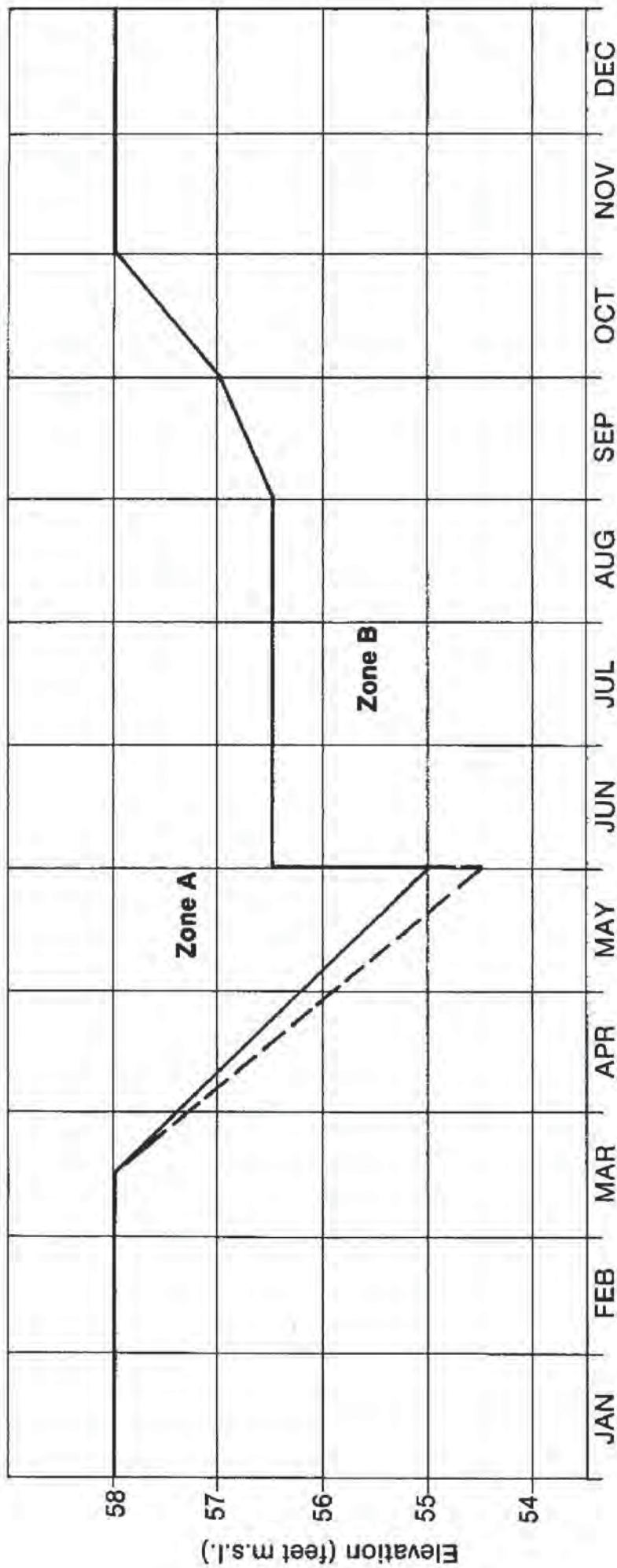
Hydraulic Limitations: The gate opening is limited in accordance with the "Maximum Allowable Gate Opening Curve," to prevent damage from high velocities. The gate also has to be opened gradually to allow tailwater stages to rise before large discharges are released.

The schedule of lock operation is based on the River and Harbor Act of August 8, 1917, established by the COE.

Construction of S-61 and C-35 was completed in October 1963 and regulation of Lake Tohopekaliga began in early 1964. Because of environmental considerations, the regulation schedules for East Lake Tohopekaliga, Lake Tohopekaliga, Cypress Lake, Lake Hatchineha, and Lake Kissimmee were modified in 1971 and in 1979. The current regulation schedule is shown in Figure 11C.

Preliminary investigations conducted on Lake Tohopekaliga in 1968-69 indicated that desirable aquatic habitat was deteriorating. Major factors contributing to this deterioration were water level stabilization and pollution associated with watershed development, compounded by rapid population growth. To completely eliminate these problems, alternate methods of maintaining desirable aquatic habitat was explored. An extreme drawdown of Lake Tohopekaliga was recommended in 1969 as an experimental management effort to reduce, moderate, or reverse symptoms of habitat degradation. The extreme drawdown would cause a temporary negative impact on residents, merchants, and recreational users of the lake, but long-term benefits to the lake would far outweigh any short-term inconvenience. By early 1970 a basic program had been developed, and was accepted by the community and controlling governmental agencies.

The drawdown consisted of a 7-foot vertical drop in water level from high regulation stage of 55.0 feet NGVD to a drawdown stage of 48.0 feet NGVD. The lake elevation remained low for six months, from March to September 1971, with approximately 50 percent of the lake bottom exposed. As a result of the drought, refilling to low regulation stage of 52.0 feet NGVD was delayed until March 1972. A high regulation stage of 55.0 feet NGVD was achieved in March 1973. Beneficial changes occurred as a result of the drawdown yielding a significant improvement in fish population. Two years after the 1971 Lake Tohopekaliga extreme drawdown,



Zone

A At design capacity (820 cfs) except when the lake is within 0.5 feet of desired stage. Forecasts will then be made and releases started to bring the lake back to schedule within 15 days.

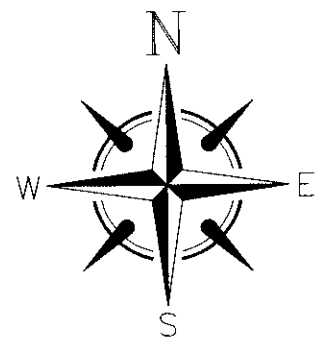
B To maintain minimum flows.

Note: --- Use this schedule one year in three.

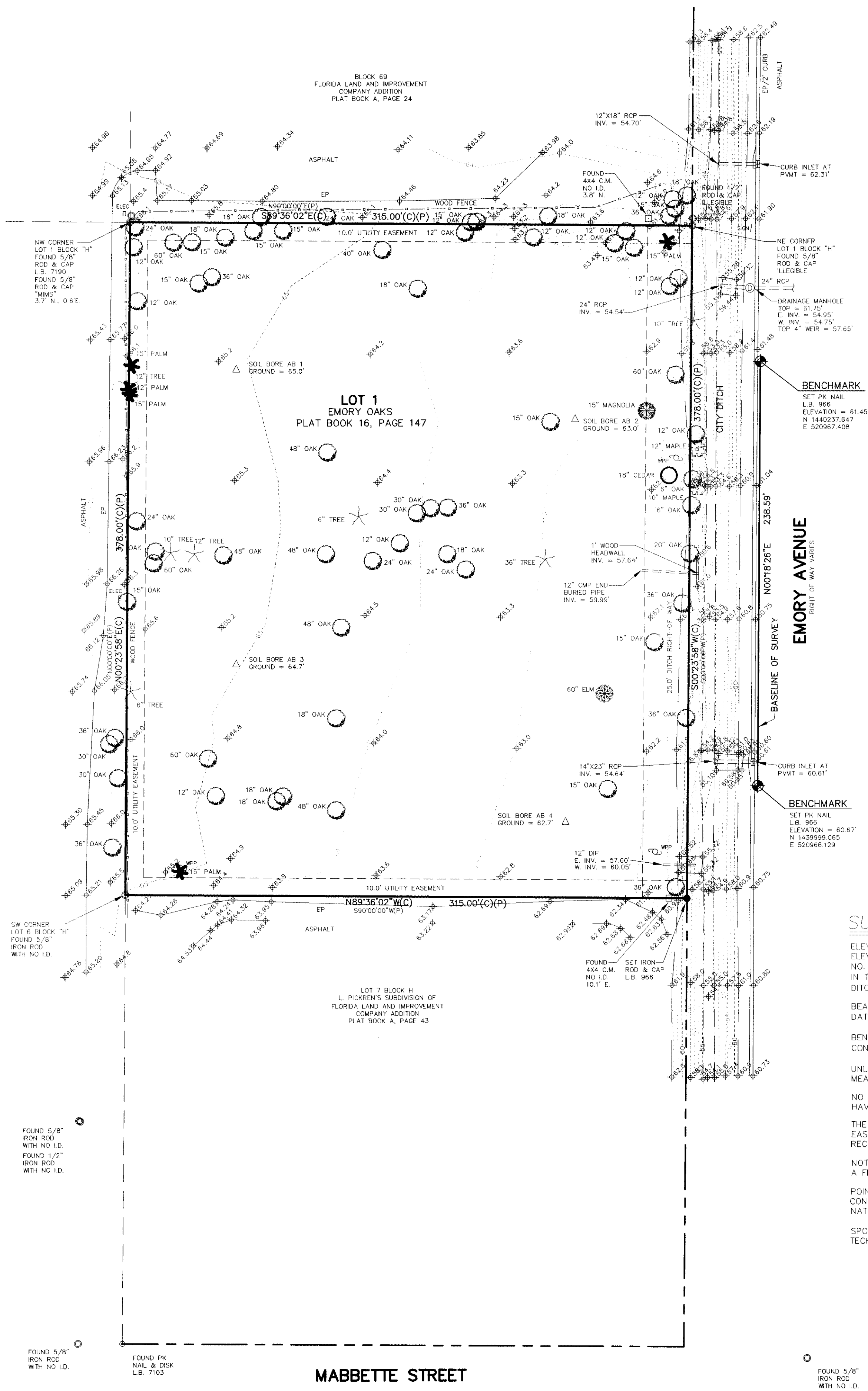
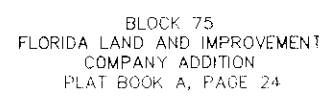
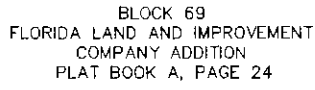
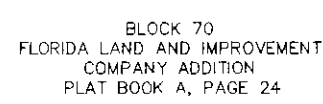
Releases S-59

FIGURE 9C. East Lake Tohopekaliga Regulation Schedule.

BENCHMARK	
	WOOD POWER POLE
	GUY WIRE ANCHOR
	SIGN
	FIRE HYDRANT
	WATER VALVE
	WATER METER
	ELECTRIC BOX
	SANITARY SEWER M.HOLE
	STORM SEWER M.HOLE



GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.



ELEVATIONS SHOWN HEREON ARE BASED ON BENCHMARK RM 66-3.
 ELEVATION = 63.73' N.A.D. 1988, AS SHOWN ON F.E.M.A. MAP
 NO. 12097C0066 F. DEPARTMENT OF TRANSPORTATION BRASS DISK
 IN THE TOP OF THE SOUTHERLY HEADWALL FOR THE WEST CITY
 DITCH CROSSING AT OAK STREET.

BEARINGS SHOWN HEREON ARE BASED ON STATE PLANE COORDINATE
 DATUM. REFERENCE DATUM = N.A.D. 83/90, FLORIDA EAST ZONE.

BENCHMARKS SHOWN HEREON REPRESENT HORIZONTAL AND VERTICAL
 CONTROL POINTS.

UNLESS OTHERWISE NOTED, PLAT INFORMATION IS EQUAL TO FIELD
 MEASURED DATA.

NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ROOF OVERHANGS
 HAVE BEEN LOCATED EXCEPTS AS NOTED HEREON.

THE SURVEYOR HAS NOT MADE A SEARCH OF THE PUBLIC RECORDS FOR
 EASEMENTS, RESTRICTIONS, RESERVATIONS AND/OR RIGHTS--OF--WAY OF
 RECORD.

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF
 A FLORIDA LICENSED SURVEYOR AND MAPPER.

POINT ELEVATIONS WITH TWO DECIMAL PRECISION DENOTE PAVEMENT,
 CONCRETE AND TOP OF WATER SHOTS. ONE DECIMAL PRECISION DENOTES
 NATURAL GROUND OR A SOFT SHOT, ALL OTHERS ARE NOTED.

SPOT ELEVATIONS SHOWN HEREON WERE GATHERED UTILIZING G.P.S.
 TECHNOLOGY.

LOT 1, EMORY OAKS AS FILED AND RECORDED IN PLAT BOOK 16,
PAGE 147 OF THE PUBLIC RECORDS OF OSCEOLA COUNTY, FLORIDA.

P.B. FLAT BOOK	(C) CALCULATED	# DEGREES	D.U.E. DRAINAGE AND
D. DEED BOOK	(P) PLAT	MINUTES	IDENTIFICATION
BK. PAGE	(D) DESCRIBED	#	PRO. PROPOSED
SEC. SECTION	M. MEASURED	SECONDS	P.O.B. POINT OF BEGINNING
TWP. TOWNSHIP	C.B. CHORD BEARING	OR MORE OR LESS	OR COMMENCEMENT
RNG. RANGE	C. CHORD	L. LICENSED SURVEYOR	F/F. FINISH ROAD ELEV.
COR. CORNER	E. END	H.W.F. HIGH WIRE FENCE	R/W. RIGHT OF WAY
C. ACRES	L. LENGTH	G. GLEAN LAND FENCE	O.R. ORIGINAL RECORDS
P.S.M. PROFESSIONAL SURVEYOR	T. TANGENT	W. WOOD FENCE	P.T. POINT OF TANGENCY
AND MAPPER	EP. EDGE OF PAVEMENT	N. NAIL AND TAG	P.C. POINT OF CURVE
			P.R.C. POINT OF REVERSE CURVE

@ DENOTES 5/8" IRON ROD FOUND @ DENOTES 4"x4" CONC. MONUMENT FOUND
 @ DENOTES 5/8" IRON ROD W/CAP LB #966 @ DENOTES 4"x4" CONC. MONUMENT SET W/CAP # LB. 966.
 @ DENOTES NAIL & DISK LB #966 SET @ DENOTES NAIL & DISK FOUND AS NOTED

ALL OTHER PROPERTY CORNERS ARE AS NOTED ON DRAWINGS.

I HEREBY CERTIFY TO:
CITY OF KISSIMMEE PUBLIC WORKS

W. Turner Wallis IV
W. TURNER WALLIS IV, P.S.M.
STATE OF FLORIDA
REGISTRATION NO. 3967
(NOT VALID WITHOUT EMBOSSED SEAL)
6-23-14
DATE

OSCEOLA COUNTY,		LOT 1, EMORY OAKS		FLORIDA	
JOB NO. 14-031				REVISIONS	
DATE OF SURVEY 06/03/14					
SCALE 1" = 40'					
F.B. 1114 PAGE 100-108					
SECTION 21					
TWP. 25 S., RNG. 29 E.		900 Shady Lane, Kissimmee, Florida 34744-8695 (407) 847-2179 • Fax (407) 847-6140		CAD FILE # 14-031.DWG	
DRAWN BY RDH CHKD BY WTW				DRAWING NO.	
				SHEET 1 OF 1	