



THE SUNRISE CITY

FORT PIERCE
PLANNING DEPARTMENT
Florida

TO: Technical Review Committee

THROUGH: Kevin Freeman, Planning Director

FROM: Ryan Altizer, Planner

RE: **Bev Smith Kia – Site Plan and Conditional Use - 22-07000015**
5560 S US Highway 1

BOARD DATE: September 15, 2022

Site Plan and Conditional Use at 5560 S US Highway 1

The above referenced project is being submitted for your review and comments. The applicant is requesting a Site Plan and Conditional Use for 5560 S US Highway 1 for the construction of asphalt pavement parking to provide vehicle storage for automotive dealership.

Please send all comments to planning@cityoffortpierce.com and/or through interoffice mail to the Planning Department

If you have comments, please respond prior to Tuesday, September 13, 2022. If you have any questions, please contact the Planning Department at 772-467-3737.

Thank you



Design Review

Property address or Location 5560 South U.S. Hwy 1

Parcel ID #(s) 3403-502-0302-000-4

Project Description The project consists of construction of asphalt pavement parking to provide vehicle storage for automotive dealership, and two dry stormwater ponds.

Nicholas Smith

Property Owner(s)

7845 SW Ellipse Way

Street Address

Stuart FL 34997

City State Zip

561-818-2847

Phone Number

Mike Smith <msmith@bevsmithtoyota.com>

Email Address

Michael Smith

Applicant/Representative, Title, Company

7845 SW Ellipse Way

Street Address

Stuart FL 34997

City State Zip

561-818-2847

Phone Number

Mike Smith <msmith@bevsmithtoyota.com>

Email Address

Property Owner(s) Acknowledgements: - This application will not be considered complete without the signature of all property owners of record, which shall serve as an acknowledgement of the submission of this application. The property owner's signature below shall also authorize the Application (if other than the property owner) and/or Representative to act in his/her behalf for the purposes of seeking approval for the application described herein.

Michael Smith

Property Owner(s) Signature(s)

STATE OF FLORIDA -- COUNTY

The foregoing instrument was acknowledged before me this 21st day of July, 2022, by

Michael Smith

who is personally known to me or has produced

as identification.

K Marie McKisset

Signature of Notary



TO BE COMPLETED BY STAFF

Zoning	Future Land Use	Total Acres	Historic Districts	Historic Designation

Pre-Application Meeting Date _____

Fees _____ Control # _____ B. Permit _____

Intake Planner _____

Planner Assigned _____

Approved _____ Date _____

Comments _____

Intake Date Stamp

Design Review Application Checklist

(City Code of Ordinances 22-59)

Submittal for Administrative Approval

- a. A survey (1" = 30' minimum scale) of property lines, existing topography and the location of trees meeting the tree protection regulations of section 22-194, location of bordering streets and, if applicable, wetlands and beaches.
- b. A site analysis study to include a discussion of specimen trees and other natural vegetation, access, significant topography, wetlands, buffers, setbacks, views, orientation, the surrounding built environment and other site features that may influence design elements.
- c. A draft written narrative describing the design intent of the project, its goals and objectives and how it reflects the site analysis study results.
- d. Context photographs of neighboring uses and architectural styles.
- e. Photographs and/or drawings of architectural buildings or objects that serve as a precedent for the proposed building design. Models should be taken from local exemplary buildings, either existing or demolished. Documentation of such buildings is available in the city's planning department.
- f. Photographs of all existing structures located on the property. If existing structures on the property are more than fifty (50) years of age, documentation of these structures with data from the Florida Master Site File form is also required.
- g. Conceptual site plan (to scale) showing proposed location of all buildings, structures, parking areas, signs and landscaping.
- h. Landscape plan, at the same scale as the site plan. The planning director or designee may request enlarged plans of detailed planting areas. Planting schedule with sizes of proposed plantings must be included.
- i. Accurate color rendering of proposed signs showing dimensions, type of lettering, materials and actual color samples that demonstrates cohesiveness with the project design.
- j. Exterior elevations showing architectural character, external architectural features and streetscape of the proposed development, including materials, colors, shadow lines and landscaping. The street elevation shall encompass the entire proposed project and generally identify the major elements of the adjacent two (2) properties on either side of the site. If the adjacent properties are vacant or underutilized, a diagram shall be provided that identifies the mass and form that is allowable under current zoning. If the street elevation must be drawn at such a scale as to render architectural details of the building unreadable, drawings of individual buildings at a larger scale should be provided as well.
- k. Design review concurrent with conceptual development plan procedure according to subsection 22-58(e) is also available.

Submittal for Board Approval

- a. A written narrative describing how the project conforms to administrative approval and design review guidelines of this section.
- b. A final site plan meeting the requirements of section 22-58
- c. A final site lighting plan that meets the requirements of subsection 22-58(d)(8).
- d. A final landscape plan that meets the requirements of Article XII, Landscaping and Trees.
- e. Final floor plans and elevation drawings (1/8" = 1'-0" minimum scale), as detailed under administrative approval, showing exterior building materials and colors with architectural sections and details to adequately describe the project.
- f. A color board (11"x17" maximum) containing actual color samples of all exterior finishes, keyed to the elevations, and indicating the manufacturer's name and color designation.



DEVELOPMENT REVIEW

Property Information

Property address or Location 5560 South U.S. Hwy 1

Parcel ID #(s) 3403-502-0302-000-4

Project description The project consists of construction of asphalt pavement parking to provide vehicle storage for automotive dealership, and two dry stormwater ponds.

Application Type

- ☐ Site Plan ☒ Conditional Use w/New Construction ☐ Conceptual Development Plan
☐ Minor Amendment ☐ Major Amendment

Site Information

Non-Residential: Proposed Sq. Ft.: 419,485 sf Site Acreage: 9.63 ac

Residential: Proposed Units: _____ Proposed Sq. Ft.: _____ Site Acreage: _____

Nicholas Smith

Property Owner(s)

7845 SW Ellipse Way

Street Address

Stuart FL 34997

City

State

Zip

561-818-2847

Phone Number

msmith@bevsmithtoyota.com

Email Address

Michael Smith

Applicant/Representative, Title, Company

7845 SW Ellipse Way

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Phone Number

msmith@bevsmithtoyota.com

Email Address

Property Owner(s) Acknowledgements: - This application will not be considered complete without the signature of all property owners of record, which shall serve as an acknowledgement of the submission of this application. The property owner's signature below shall also authorize the Applicant (if other than the property owner) and/or Representative to act in his/her behalf for the purposes of seeking approval for the application described herein. The undersigned consents to inspection and photographing of the subject property by the Planning staff for purposes of consideration of this Application and/or presentation to the Planning Board and City Commission.

Michael Smith

Property Owner(s) Signature(s)

APPOINTMENTS ARE REQUIRED FOR APPLICATION SUBMITTALS

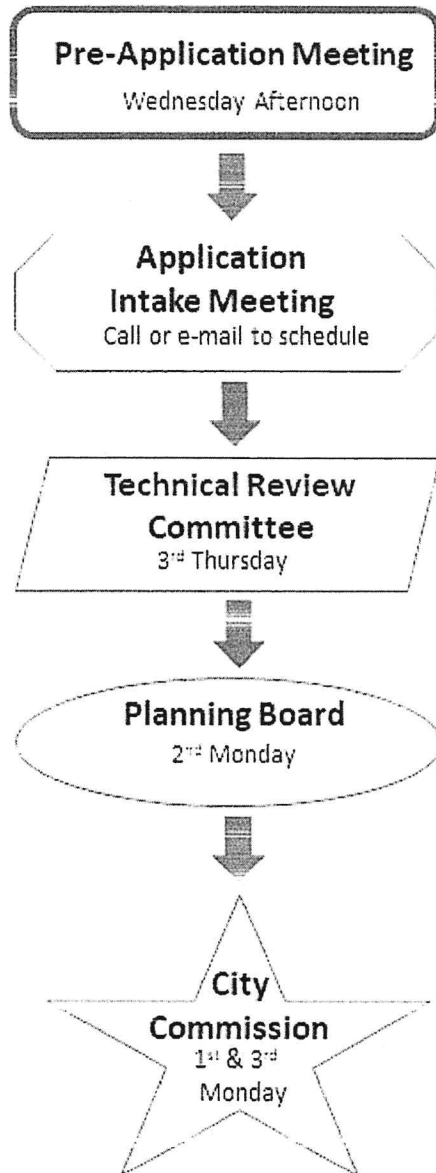
CALL 772.467.3737 OR E-MAIL PLANNING_DL@CITYOFFORTPIERCE.COM

For more information, please refer to the website:

<https://www.cityoffortpierce.com/971/Application-Submittal-for-Technical-Review>

General Information

- **Incomplete application packets will not be accepted.**
- In-take meetings are required for application submittals.
- Site plan approval is valid for one (1) year following City Commission approval. To maintain site plan approval, vertical improvements, permitted by the Building Department must commence prior to the 12-month expiration date.
- Fee Schedule - <https://www.cityoffortpierce.com/DocumentCenter/View/2620/Fee-Schedule->
- Public Notice Fees - <https://www.cityoffortpierce.com/DocumentCenter/View/8818/Public-Notice-Fees->



Site Plan submittal requirements:

Submit one (1) original & three (3) hard copies and one (1) CD or Flash Drive of the following. Additional copies will be required of subsequent submittals.

- ☒ Complete application
- ☒ Warranty Deed
- ☒ SLC Property Record Card
- ☒ Detailed project description
- ☒ General location map (see Section 125-313)
- ☒ Survey (see Section 125-313)
- ☒ Site Plan (see Section 125-313)
- ☒ Landscaping Plan (see Section 123-37)
- ☒ Conceptual Drainage Plan (see Section 125-313)
- ☒ Environmental Impact Report
- ☐ Beach/Dune System protection plan, if applicable (see Section 125-313)
- ☒ Lighting Plan (see Section 125-313)
- ☒ Design Review submittals (see Design Review application)
- ☒ Traffic Impact Report
- ☒ Concurrency Review submittals (see Concurrency Review application)

Bev Smith Automotive Group
7845 S.E. Ellipse Way
Stuart, Florida 34997
Office: 561-718-2933
Fax: 772-781-8573

November 14, 2018

Re: Letter of Authorization for Michael Smith

I have authorized Michael Smith to act and sign on behalf of the company for all agency permitting and processing of applications for the Bev Smith Kia development projects located at 5560 S. US Hwy1, Ft. Pierce, Florida, 34982.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas S. Smith", with a long horizontal stroke extending to the right.

Nicholas S. Smith
President

NSS/cc



THE SUNRISE CITY

FORT PIERCE
PLANNING DEPARTMENT
Florida

CONCURRENCY CAPACITY ANALYSIS

I. Site Data:

	Existing Use	Future Land Use	Zoning
North	Medical	GC	C-3
South	Residential Home	CG (SLC)	CG (SLC)
East	Single-family	PUD (SLC)	PUD/ RM-5 (SLC)
West	Automotive retail	CG	C-3

	Future Land Use	Zoning Classification	Maximum Intensity Residential: Dwelling Units per Acre Other: Square Footage	Total Acreage	Flood Zone
Current	GC	C-3	5,274	9.63	X
**Proposed	GC	C-3	0	9.63	N/A

II. Public Facilities Information:

A. Potable Water:	
Average Use	Residential: 100 gallons per day per person (du x 2.6= persons x 100 gpd = demand) Other: 0.125 gallons per day per square foot 659 gpd
Demand Analysis	Maximum 659 gpd x 4 = 2,636 gpd
Current Zoning/FLU	Total gallons per day 659 gpd
**Proposed Zoning/FLU	Total gallons per day 659 gpd
**Change in Demand	Total gallons per day 0.0

B. Wastewater:	
Average Use	Residential: 100 gallons per day per person (du x 2.6= persons x 100 gpd = demand) Other: 0.1 gallons per day per square foot 659 gpd
Demand Analysis	Maximum 2,636 gpd
Current Zoning/FLU	Total gallons per day 659 gpd
**Proposed Zoning/FLU	Total gallons per day 659 gpd
**Change in Demand	Total gallons per day 0.0

C. Parks and Recreation (Residential Classifications Only): N/A (Du x 2.6 = persons + 44,227 = population /LOS)				
Park Type	LOS	Existing Population Park Demand	Proposed Population Park Demand	Change in Demand
Regional	20 acres per 1,000 people			
Urban District	5 acres per 1,000 people			
Community	2.5 acres per 1,000 people			
Neighborhood	1.36 acres per 1,000 people			

D. Public Schools (Residential Classifications Only): N/A Single Family: (du x 0.405 = students/70% K-8/30% High) Multi-family: (du x 0.207 = students/70% K-8/30% High)		
	K-8	High
School Name		
City		
Distance		
Current Zoning/FLU Enrollment Demand		
**Proposed Zoning/FLU Enrollment Demand		
**Change in Demand		

E. Solid Waste: Residential (2 yard serves 15 units, 4 yard serves 30 units, 6 yard serves 45 units, 8 yard serves 60 units)	
Demand Analysis	Maximum
Current Zoning/FLU	N/A
**Proposed Zoning/FLU	
*Change in Demand	

F. Stormwater:
Potential increase in volume discharged due to increased impervious coverage, reduced groundwater seepage or loss of surface water storage impacting Adopted LOS of 25-year 3-day storm Pre vs. Post Runoff (Storm sewers to convey 5 year- 1 day storm event; Canals to convey 3 year – 1 day storm event)

Impact	Impervious area increases with the proposed development. The site/ stormwater design complies with SFWMD requirements to provide less discharge in 25-yr post-development conditions versus pre-development.
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III. Transportation Analysis: *Complete ITE Trip Generation Form (Attached)*

G. Transportation Analysis: Complete ITE Trip Generation Data Form		
Most recent ITE Code for use; HCM Roadway Capacity		
	AADT	AM/PM Peak Hour Trips
Demand Analysis	Maximum	Maximum
Current Zoning/FLU		
**Proposed Zoning/FLU		
*Change in Demand	Trips	Trips
Impact to Capacity	N/A - SITE IS NOT OPEN TO PUBLIC AND IS AN ACCESSORY TO DEALERSHIP ACROSS THE STREET.	

IV. Project Description

PHASING	
Is this project (phase) part of a larger project?	☐ Yes ☒ No
If yes, enumerate each phase, the number of units or square footage in each phase and beginning/completion date.	
Total Project: Residential Units:	Single Family: Multifamily:
Non-residential (square footage):	
Mixed-use (describe use):	
(If this is a single phase project, name it Phase I – Total)	

RESIDENTIAL DATA					
Type	Phase	Number of Units	Acres	Expected beginning date	Expected completion date
Single-family, detached					
Single-family, attached					
Multi-family					
Other (specify)					

NON-RESIDENTIAL DATA					
Type(s) specify	Phase	Square footage	Acres	Expecting beginning date	Expected completion date
No NEW building proposed.					

A. Indicate whether the proposed project will be eliminating any existing recreational facilities. If yes, detail the number and type being eliminated. ☐ Yes ☒ No

- B. 1. Does this application involve demolition or re-use of any structure(s)? ☒ Yes ☐ No
If yes, what is the size of the structure(s) to be demolished or re-used? 5,274 SF RE-USE
2. What is the current use of the structure to be demolished or re-used? AUTOMOTIVE DETAILING
3. Are you claiming trip credits for the demolition or re-use of a structure(s) at the site? ☐ Yes ☒ No
If yes, provide estimates of credits for each previous use at the site. (Attach sheet with calculations)

C. Exemptions Requested:

** Complete section if requesting a change in zoning, future land use, or expanding



THE SUNRISE CITY

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PLANNING DEPARTMENT
Florida

GENERAL ADDRESS REQUEST

Residential \$25.00 per address

Commercial - \$50.00 per address

E-mail Address request form to planning_dl@cityoffortpierce.com

☒ Assigned

☐ Corrected

☐ Changed

Residential subdivisions or apartment complexes of three or more units require a site plan showing each unit's address and a spreadsheet with the address and corresponding parcel ID #.

Property Owner(s): Nicholas Smith

Parcel Identification(s): 3403-502-0302-000-4

Legal Description:

THE SOUTH ONE-HALF (1/2) OF LOT 234, IN SECTION 10, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ACCORDING TO THE PLAT OF WHITE CITY SUBDIVISION, RECORDED IN PLAT BOOK 1, PAGE 23, OF THE F

Current Address: 5560 South U.S. Hwy 1

Use of Property: Auto Service

Applicants Signature:

Michael Smith

Date:

7/21/22

Printed Name:

Mike Smith



I am not the owner of the described property; however, the owner(s) authorizes me to act as agent for the owner(s) of record. (Provide copy of authorization).

Contact Information: Phone: 561-818-2847

Email: Mike Smith msmith@bevsmithtoyota.com

Office Use Only

PROPOSED NEW ADDRESS: _____

Signature of City Representative: _____

This instrument prepared by:

Name: Burt Bruton, Esq.
Address: Greenberg Traurig, P.A.
1221 Brickell Avenue
Miami, FL 33131

Property Appraiser's Parcel ID#:
3403-502-0302-000/4

(Space reserved for Clerk of Court)

WARRANTY DEED

THIS INDENTURE, made this ^{9th}~~90th~~ day of January, A.D. 2006 between **BEAN FAMILY INVESTMENTS, LTD.**, a Florida limited partnership (the "**Grantor**"), and **NICHOLAS S. SMITH** (the "**Grantee**"), whose mailing address is 1210 Northlake Boulevard, Lake Park, FL 33403;

WITNESSETH, that the Grantor, for and in consideration of the sum of TEN DOLLARS (\$10.00), to the Grantor in hand paid by the Grantee and other good and valuable consideration, the receipt whereof is hereby acknowledged, has granted, bargained and sold to the Grantee and the Grantee's heirs and assigns forever, the following described land situate, lying and being in St. Lucie County, Florida, to-wit:

SEE EXHIBIT "A" ATTACHED HERETO AND INCORPORATED HEREIN

SUBJECT TO zoning and other governmental regulations; any recorded easements, covenants, restrictions and limitations; and real property taxes for the year 2006 and subsequent years.

AND THE GRANTOR DOES HEREBY FULLY WARRANT the title to said land, and will defend the same against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor has caused this instrument to be signed by its duly authorized sole general partner the day and year first above written.

Property Identification

Site Address: 5560 S US HIGHWAY 1
Sec/Town/Range: 10/36S/40E
Parcel ID: 3403-502-0302-000-4
Jurisdiction: Fort Pierce

Use Type: 2700
Account #: 39301
Map ID: 34/10N
Zoning: General Co

Ownership

Nicholas S Smith
7845 SW Ellipse Way
Stuart, FL 34997

Legal Description

WHITE CITY S/D 10 36 40 S 1/2 OF LOT 234 AND N 300 FT OF LOT 241 LYG E OF US #1 AND S 175 FT OF N 475 FT OF W 425 FT OF LOT 241 LYG E OF US #1-LESS RD AND CANAL RS/W- (9.63 AC) (MAP 34/10N) (REFERENCE DB 223-268)

Current Values

Just/Market Value: \$1,548,400
Assessed Value: \$1,548,400
Exemptions: \$0
Taxable Value: \$1,548,400

Property taxes are subject to change upon change of ownership.

- Past taxes are not a reliable projection of future taxes.
- The sale of a property will prompt the removal of all exemptions, assessment caps, and special classifications.

Taxes for this parcel: SLC Tax Collector's Office [📄](#)

Download TRIM for this parcel: [Download PDF 📄](#)



Total Areas

Finished/Under Air (SF): 5,200
Gross Sketched Area (SF): 6,000
Land Size (acres): 9.63
Land Size (SF): 419,482.8

Building Design Wind Speed

Occupancy Category	I	II	III & IV
Speed	140	160	170

Sources/links:

Sale History

Date	Book/Page	Sale Code	Deed	Grantor	Price
Jan 9, 2006	2471 / 2370	XX00	WD	Bean Family Investments Ltd	\$3,000,000
Feb 25, 1997	1063 / 0778	XX01	WD	R AND B HOLDING CO INC	\$900,000
Sep 1, 1984	0480 / 1512	XX01	CV		\$0
Nov 1, 1977	0277 / 1685	XX00	CV		\$203,500
Oct 1, 1977	0276 / 0908	XX00	CV		\$203,500
Jan 1, 1973	0210 / 0449	XX01	CV		\$70,000

Building Information (1 of 1)

Finished Area: 5,200 SF

Gross Sketched Area: 6,000 SF

Special Features and Yard Items

Exterior Data

View:
Building Type: SRCT
Grade: Y_D-
Story Height: 1 Story

Roof Cover: Metal
Year Built: 1989
Effective Year: 1989
No. Units: 1

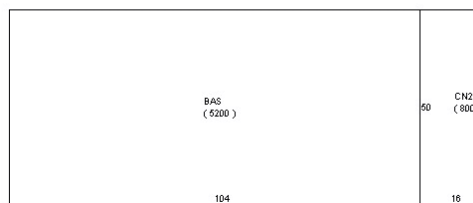
Roof Structure: Steel Truss
Frame:
Primary Wall: Corr Metal
Secondary Wall: Conc Block

Interior Data

Bedrooms: 0
Full Baths: 0
Half Baths: 0
A/C %: 26%

Electric: MAXIMUM
Heat Type: FrdHotAir
Heat Fuel: ELEC
Heated %: 26%

Primary Int Wall:
Avg Hgt/Floor: 0
Primary Floors: CONC GRD
Sprinkled %: 0%



Sketch Area Legend

Sub Area	Description	Area	Fin. Area	Perimeter
BAS	BASE AREA	5200	5200	308
CN2	CANOPY	800	0	132

Type	Qty	Units	Year Blt
ASP1 HIGH	1	42000	1977
CHAINLINK 4'	1	620	1977

Current Year Values

Current Values Breakdown

Building:	\$206,100
Land:	\$1,342,300
Just/Market:	\$1,548,400
Ag Credit:	\$0
Save Our Homes or 10% Cap:	\$0
Assessed:	\$1,548,400
Exemption(s):	\$0
Taxable:	\$1,548,400

Current Year Exemption Value Breakdown

Current Year Special Assessment Breakdown

Start Year	AssessCode	Units	Description	Amount
2013	0054	9.63	North St. Lucie Water Management District	\$207.05
Start Year	AssessCode	Units	Description	Amount
2022	0041	51.4	Fort Pierce Stormwater Charge	\$3,546.60

This does not necessarily represent the total Special Assessments that could be charged against this property. The total amount charged for special assessments is reflected on the most current tax statement and information is available with the SLC Tax Collector's Office .

Historical Values

Year	Just/Market	Assessed	Exemptions	Taxable
2021	\$1,548,400	\$1,548,400	\$0	\$1,548,400
2020	\$1,460,200	\$1,460,200	\$0	\$1,460,200
2019	\$1,457,000	\$1,457,000	\$0	\$1,457,000
2018	\$1,459,000	\$1,459,000	\$0	\$1,459,000

Permits

Number	Issue Date	Description	Amount	Fee
C47038	Aug 1, 1988	Commercial New Construction	\$66,000	\$66,000
C24090228	Sep 17, 2004	Unknown	\$14,000	\$252
C24113125	Nov 24, 2004	Demolition	\$2,450	\$77
C11110065	Nov 7, 2011	Electric	\$0	\$0
C1802-0055	Feb 2, 2018	Electric	\$0	\$0
C2007-0625	Jul 29, 2020	Garage Door	\$2,317	\$0

Notice: This does not necessarily represent all the permits for this property.

[Click the following link to check for additional permit data in Fort Pierce](#)

All information is believed to be correct at this time, but is subject to change and is provided without any warranty.
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Project Narrative

This project has current permit approvals under St. Lucie County, PDC Order 2019-031. The project received approval to construct asphalt pavement parking and an associated pond with outfall to NSLRWCD canal to the East. The current approvals have not been constructed to date, as the owner was seeking to modify and expand the site parking and relocate the approved pond. There is an existing building on-site and is operating as a vehicle reconditioning facility. Public customers are currently not entering the premises. All customer service and sales are located at the main KIA store located across the highway.

Proposed site modifications with this plan include two separate asphalt-paved parking areas and two separate stormwater ponds. All existing paved area and adjacent proposed paved area to the East of site, shall discharge stormwater flows via sheet flow to the proposed dry stormwater pond in the NE corner. The proposed new paved parking area to the South of existing development, along the US-1 corridor, shall discharge stormwater flows via sheet flow to a proposed swale for stormwater storage and treatment. An outfall was not required per stormwater calculations.

When this project was started in 2018 and approved in 2019, there were no wetlands present on the site. While the project was placed on hold, wetlands have developed over a couple years and have been flagged and identified by SFWMD. The wetlands coincidentally developed in the location of the proposed pond. The site has also received a full Environmental Impact Report and no concerns have been identified.

There are no new access points proposed with this project.

There are no utilities proposed with this project.

There is no building or building modifications proposed with this project.

The site has a current FPUA/ FDOT utilities permit to construct a sanitary sewer lift station.

ABBREVIATIONS:

(C) = CALCULATED
CBS = CONCRETE BLOCK STRUCTURE
CONC = CONCRETE
CLF = CHAIN LINK FENCE
(D) = DEED
FFE = FINISHED FLOOR ELEVATION
FND = FOUND
IP = IRON PIPE
INW = INVERT
IR = IRON ROD
IRC = IRON ROD WITH PLASTIC CAP
LB = LICENSE BUSINESS
LS = LICENSE SURVEY
(M) = MEASURED
MON = MONUMENT
NSLRWCD = NORTH ST. LUCIE RIVER WATER CONTROL DISTRICT
ORB = OFFICIAL RECORD BOOK
(P) = PLAT
PB = PLAT BOOK
PG = PAGE
PCOR = PROPERTY CORNER
PL = PROPERTY LINE
POB = POINT OF BEGINNING
POC = POINT OF COMMENCEMENT
R/W = RIGHT-OF-WAY
RCP = REINFORCED CONCRETE PIPE
RGE = RANGE
SEC = SECTION
TWP = TOWNSHIP
UE = UTILITY EASEMENT
PUDE = PUBLIC UTILITY & DRAINAGE EASEMENT

SYMBOLS:

- GUY WIRE ANCHOR
— CABLE TELEVISION BOX
— CATCH BASIN
— CATCH BASIN INLET
— CLEANOUT
— INVERT
— ELECTRIC BOX
— TELEPHONE BOX
— SIGN
— SANITARY MANHOLE
— STORM MANHOLE
— NUMBER OF PARKING SPACES
— FIRE HYDRANT
— LIGHT POLE
— CONCRETE POWER POLE
— BACKFLOW PREVENTOR
— MAIL BOX
— IRRIGATION VALVE
— GAS VALVE
— SEWER VALVE
— WATER VALVE
— WELL
— WATER METER
— WOOD POWER POLE
— SET 5/8" IRON ROD WITH PLASTIC CAP PSM#6330

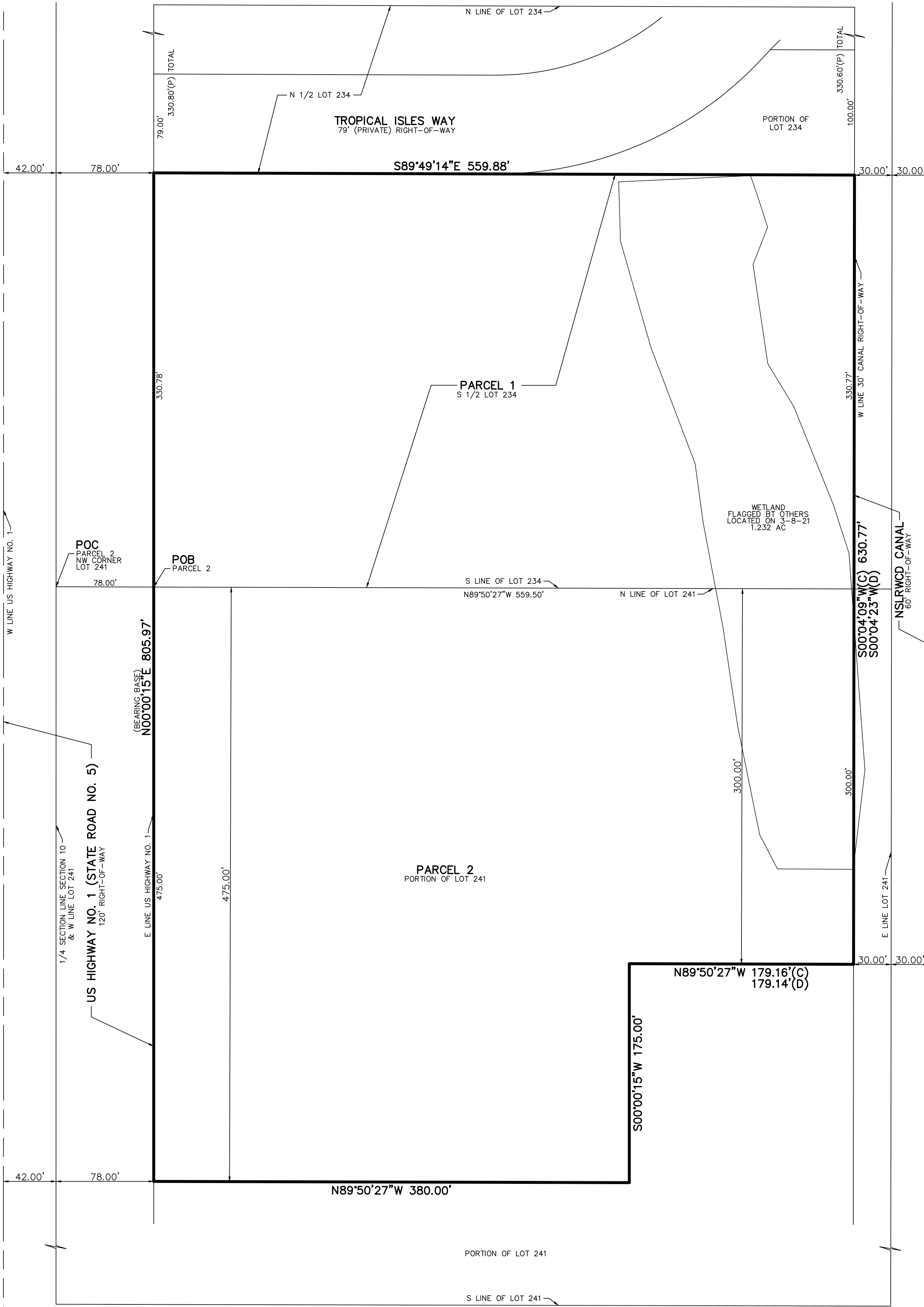
2-04-22	ADD ADDITIONAL TOPO	AJP
3-17-21	ADD WETLAND	AJP
6-27-19	REVISE PER COUNTY COMMENTS	AJP
5-23-19	REVISE PER COUNTY COMMENTS	AJP
3-29-19	ADD TREES WITHIN PROPOSED DRAINAGE EASEMENT	AJP
DATE:	REVISIONS:	BY:

ALEXANDER J. PIAZZA PSM, INC.
Surveying • Mapping • Consulting
619 SW Biltmore Street
Port St. Lucie, Florida 34983
Phone: (772) 340-7770
Fax: (772) 340-2250

LB#7280

BOUNDARY & TOPOGRAPHIC SURVEY
5560 S. US HIGHWAY NO.1
AS PREPARED FOR
BEV SMITH OF FORT PIERCE II, INC.

CAD K:\BUILDERS\ DWG2018\18-4187.DWG			
REF K:\			
FLD	CJM / RP	FB.	PG.
OFF	CJM		
CKD	AJP	SHEET 1 OF 5	DWG D-832
		JOB 18-4187	DATE 9-25-18



LEGAL DESCRIPTION:

PARCEL 1:

THE SOUTH ONE-HALF (1/2) OF LOT 234, IN SECTION 10, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ACCORDING TO THE PLAT OF WHITE CITY SUBDIVISION, RECORDED IN PLAT BOOK 1, PAGE 23, OF THE PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA, LESS AND EXCEPTING THEREFROM THE EAST 30 FEET DEEDED TO THE STATE OF FLORIDA.

TOGETHER WITH:

PARCEL 2:

A PARCEL OF LAND LYING AND BEING IN THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 10, TOWNSHIP 36 SOUTH, RANGE 40 EAST, ST. LUCIE COUNTY, FLORIDA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF LOT 241 OF WHITE CITY, ACCORDING TO SHEEN'S SURVEY THEREOF RECORDED IN PLAT BOOK 1, PAGE 23 OF THE PUBLIC RECORDS OF ST. LUCIE COUNTY, FLORIDA, RUN SOUTH 89°50'27" EAST ALONG THE NORTH LINE OF SAID LOT 241 A DISTANCE OF 78 FEET TO THE POINT OF INTERSECTION OF SAID NORTH LINE WITH THE EAST RIGHT-OF-WAY LINE OF U.S. HIGHWAY NO. 1 (STATE ROAD NO. 5)(A 120-FOOT RIGHT-OF-WAY, THE EAST LINE OF WHICH LIES 78 FEET EAST OF THE QUARTER-SECTION LINE OF SAID SECTION 10), SAID POINT OF INTERSECTION BEING THE POINT OF BEGINNING; THENCE RUN SOUTH 00°00'15" WEST ALONG THE EAST RIGHT-OF-WAY LINE OF SAID HIGHWAY A DISTANCE OF 475 FEET; THENCE RUN SOUTH 89°50'27" EAST ALONG A LINE PARALLEL WITH AND 475 FEET SOUTH OF THE NORTH LINE OF SAID LOT 241, A DISTANCE OF 380 FEET; THENCE RUN NORTH 00°00'15" EAST A DISTANCE OF 175 FEET TO A POINT 300 FEET SOUTH OF THE NORTH LINE OF SAID LOT 241; THENCE RUN SOUTH 89°50'27" EAST ALONG A LINE PARALLEL WITH AND 300 FEET SOUTH OF SAID NORTH LINE OF LOT 241 A DISTANCE OF 179.14 FEET MORE OR LESS TO A POINT ON THE WEST LINE OF A 60-FOOT CANAL RIGHT-OF-WAY (SAID WEST LINE LIES 30 FEET WEST OF THE EAST LINE OF LOT 241); THENCE RUN NORTH 00°04'23" EAST ALONG SAID WEST CANAL RIGHT-OF-WAY LINE A DISTANCE OF 300 FEET TO THE NORTH LINE OF SAID LOT 241; THENCE RUN NORTH 89°50'27" WEST ALONG THE NORTH LINE OF SAID LOT 241 A DISTANCE OF 559.50 FEET TO THE POINT OF BEGINNING.

CONTAINING 419,485 SQUARE FEET OR 9.630 ACRES, MORE OR LESS.

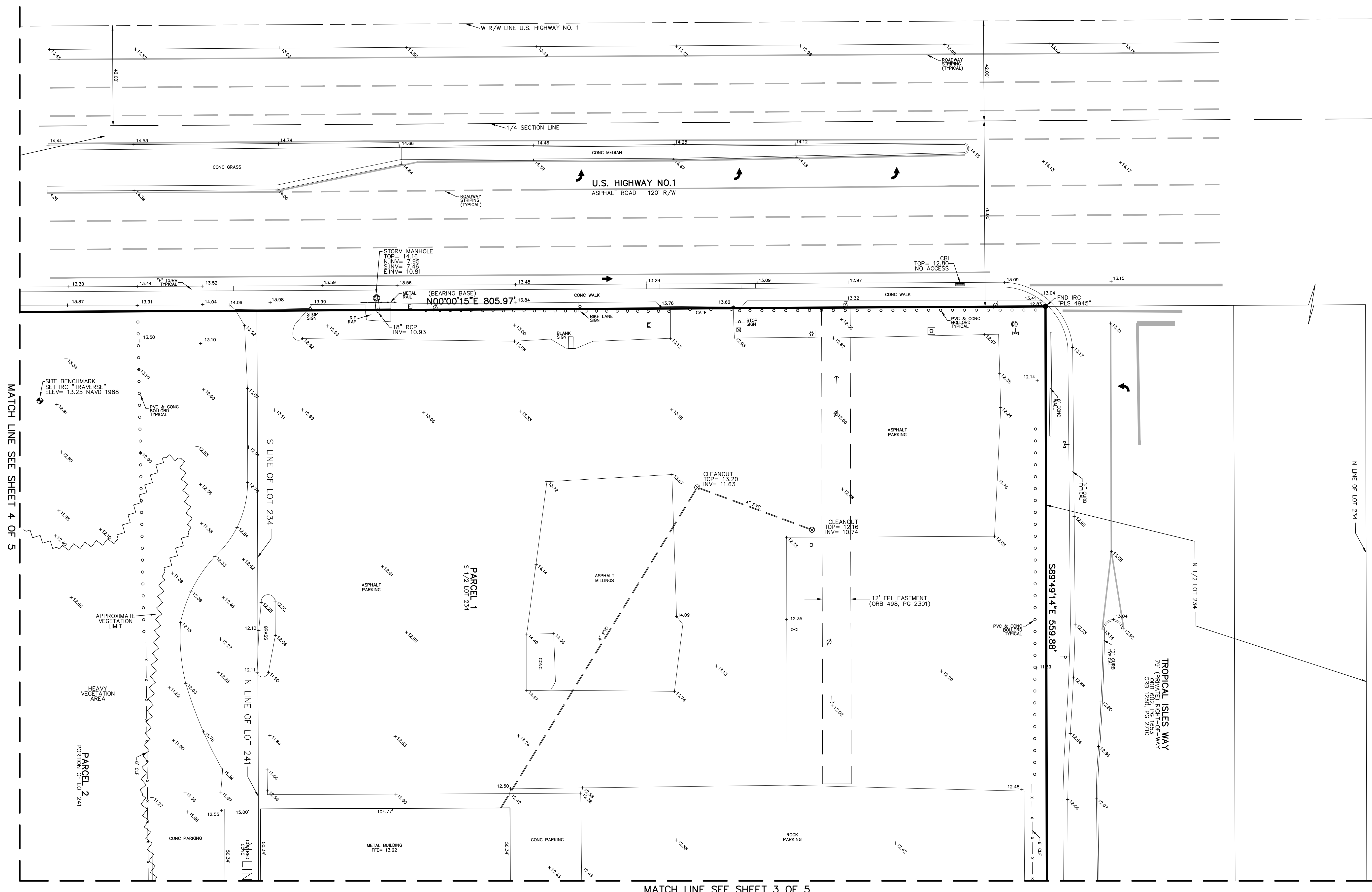
SURVEY REPORT:

- THIS IS A BOUNDARY & TOPOGRAPHIC SURVEY AS DEFINED IN CHAPTER 5J-17.050(11), FLORIDA ADMINISTRATIVE CODE.
- SURVEY BASED ON A BOUNDARY SURVEY PERFORMED BY DONALD D. DANIELS, INC., JOB NUMBER: 05-087, DATED 9-28-05.
- BEARING BASIS: A DEED BEARING OF N00°00'15"E ALONG THE MONUMENTED WEST PROPERTY LINE.
- NO UNDERGROUND UTILITIES OR IMPROVEMENTS WERE LOCATED UNLESS OTHERWISE SHOWN.
- THIS SITE LIES WITHIN FLOOD ZONE "X", ACCORDING TO THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 12111C0277 J, EFFECTIVE DATE 2-16-12.
- FLOOD ZONE SHOWN HEREON IS AN INTERPRETATION BY THE SURVEYOR AND IS PROVIDED AS A COURTESY. THE FLOOD ZONE SHOULD BE VERIFIED BY A DETERMINATION AGENCY.
- THERE MAY BE ADDITIONAL EASEMENTS AND/OR RESTRICTIONS NOT SHOWN ON THIS SURVEY THAT MAY BE FOUND IN THE PUBLIC RECORDS OF ST. LUCIE COUNTY. NO SEARCH OF THE PUBLIC RECORDS HAS BEEN PERFORMED BY ALEXANDER J. PIAZZA PSM, INC.
- THE EXPECTED USE OF THE SUBJECT PROPERTY IS FOR FUTURE CONSTRUCTION AND ENGINEERING DESIGN OF A PARKING LOT AND LIFT STATION AND FALLS WITHIN THE COMMERCIAL HIGH RISK CATEGORY AS CLASSIFIED IN CHAPTER 5J-17.051(2), FLORIDA ADMINISTRATIVE CODE. ALL FIELD-MEASURED CONTROL MEASUREMENTS EXCEEDED 1:10,000 FEET ACCURACY REQUIREMENTS FOR THIS CLASSIFICATION. ALL SURVEY MEASUREMENTS ARE IN ACCORDANCE WITH THE UNITED STATES STANDARD IN FEET.
- ALL MAPPED FEATURES SHOWN HEREON ARE UNDER THE DIRECT SUPERVISION AND RESPONSIBILITY OF ALEXANDER J. PIAZZA PSM, INC.
- SURVEY MAP AND REPORT OR THE COPIES THEREOF ARE NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
- ADDITIONS OR DELETIONS TO THE SURVEY MAP OR REPORT BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.
- THE BEARINGS SHOWN HEREON ARE RELATIVE TO THE STATE PLANE COORDINATE SYSTEM OF THE NORTH AMERICAN DATUM OF 1983 (2007 ADJUSTMENT) AND THE ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 AND ARE REFERENCED TO THE LENSEMANN OF FLORIDA'S L-NET GPS NETWORK DEVELOPED WHICH MEETS OR EXCEEDS THE FEDERAL GEODETIC CONTROL COMMITTEE (FGCC) GUIDELINES FOR "GEOMETRIC GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATIVE POSITIONING TECHNIQUES" AS WELL AS THE STANDARDS OF PRACTICE SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17.051 FLORIDA ADMINISTRATIVE CODE, PURSUANT TO CHAPTER 472.027 FLORIDA STATUTES. PRIMARY BENCHMARK: NGS "W 403" NAVD88 ELEVATION = 13.40, LOCATED AT THE NW CORNER OF THE INTERSECTION OF US HIGHWAY NO. 1 AND ULRICH ROAD, 1.5' EAST OF UTILITY POLE #6 6370 7124 05. BENCHMARKS SET OR FOUND FOR THIS SURVEY ARE NOTED ON THE SKETCH.
- THIS SURVEY IS PREPARED ONLY FOR THE PARTIES LISTED BELOW AND IS NOT ASSIGNABLE. CERTIFIED TO: BEV SMITH OF FORT PIERCE II, INC.
- © COPYRIGHT 2018 BY ALEXANDER J. PIAZZA PSM, INC. THE SKETCH OF SURVEY AND SURVEY REPORT COMPRISE THE COMPLETE SURVEY. THIS SURVEY IS NOT VALID UNLESS THE SKETCH AND REPORT ACCOMPANY EACH OTHER. REPRODUCTIONS OF THIS SURVEY ARE NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER EMPLOYED BY ALEXANDER J. PIAZZA PSM, INC.

DATE OF FIELD SURVEY: 1-27-22
3-08-21
10-31-18
9-19-18
DATE OF SURVEY: 9-25-18

ALEXANDER J. PIAZZA PSM, INC.

ALEXANDER J. PIAZZA
PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA CERTIFICATE NO. 6330



- ABBREVIATIONS:**
- (C) = CALCULATED
 - CBS = CONCRETE BLOCK STRUCTURE
 - CONC = CONCRETE
 - CLF = CHAIN LINK FENCE
 - (D) = DEED
 - F.F.E. = FINISHED FLOOR ELEVATION
 - FND = FOUND
 - IP = IRON PIPE
 - INV = INVERT
 - IR = IRON ROD
 - IRC = IRON ROD WITH PLASTIC CAP
 - LB = LICENSE BUSINESS
 - LS = LICENSE SURVEY
 - (M) = MEASURED
 - MON = MONUMENT
 - NSLRWCD = NORTH ST. LUCIE RIVER WATER CONTROL DISTRICT
 - ORB = OFFICIAL RECORD BOOK
 - (P) = PLAT
 - PB = PLAT BOOK
 - PC = PAGE
 - PCOR = PROPERTY CORNER
 - PL = PROPERTY LINE
 - POB = POINT OF BEGINNING
 - POC = POINT OF COMMENCEMENT
 - R/W = RIGHT-OF-WAY
 - RCP = REINFORCED CONCRETE PIPE
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 - TWP = TOWNSHIP
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 - PUE = PUBLIC UTILITY & DRAINAGE EASEMENT

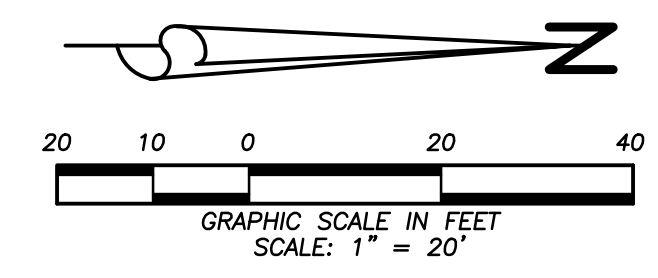
- SYMBOLS:**
- = GUY WIRE ANCHOR
 - = CABLE TELEVISION BOX
 - = CATCH BASIN
 - = CATCH BASIN INLET
 - = CLEANOUT
 - = ELECTRIC BOX
 - = TELEPHONE BOX
 - = SIGN
 - = SANITARY MANHOLE
 - = STORM MANHOLE
 - = NUMBER OF PARKING SPACES
 - = FIRE HYDRANT
 - = LIGHT POLE
 - = CONCRETE POWER POLE
 - = BACKFLOW PREVENTOR
 - = MAIL BOX
 - = IRRIGATION VALVE
 - = GAS VALVE
 - = SEWER VALVE
 - = WATER VALVE
 - = WELL
 - = WATER METER
 - = WOOD POWER POLE
 - = SET 5/8" IRON ROD WITH PLASTIC CAP PSM#6330

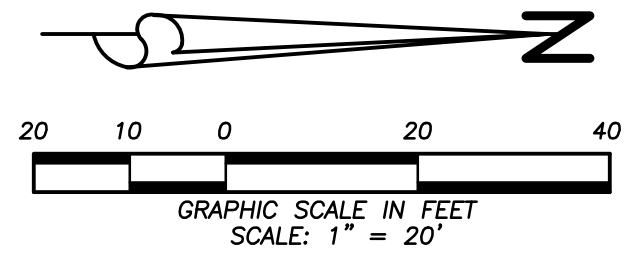
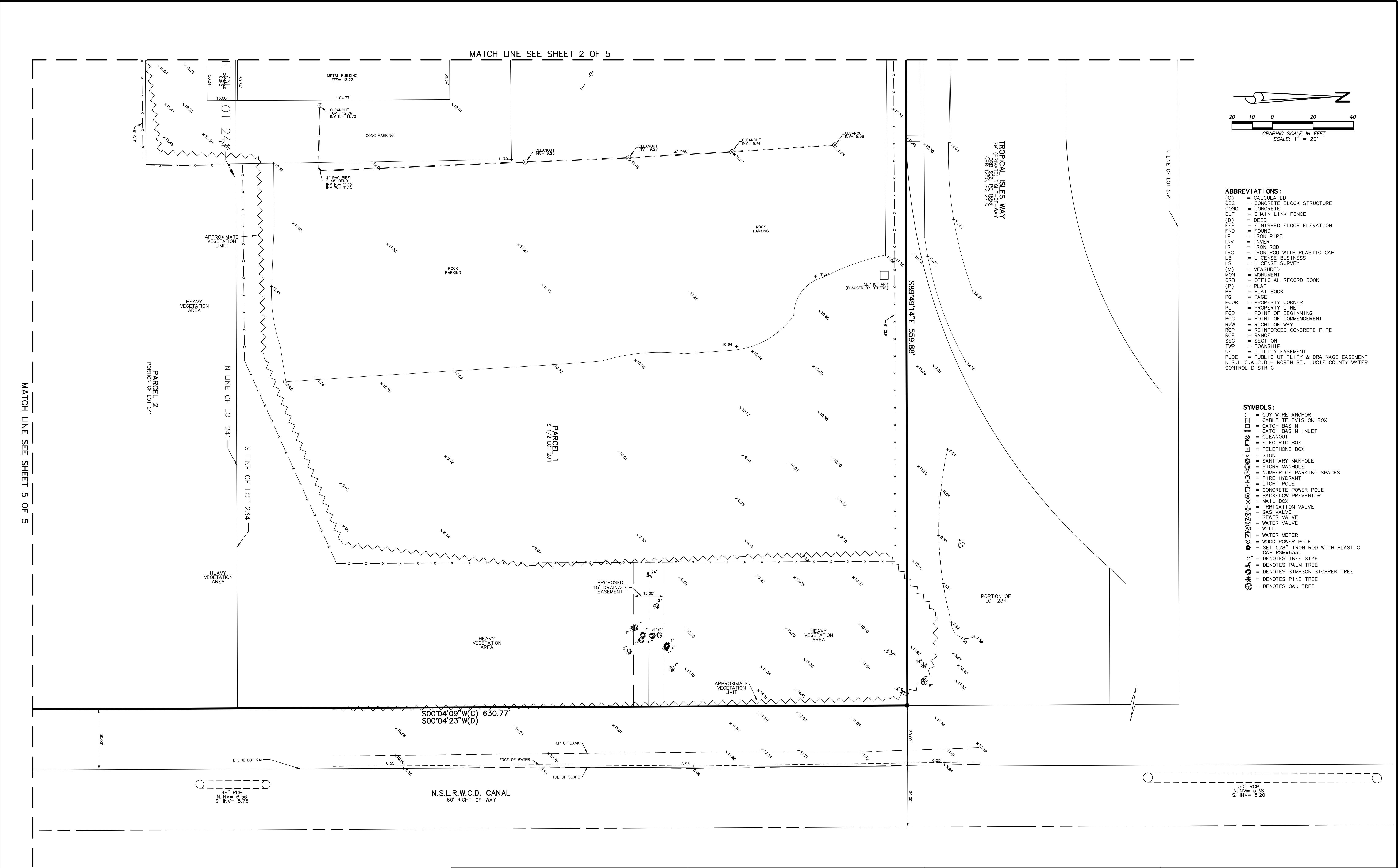
2-04-22	ADD ADDITIONAL TOPO	AJP
6-27-19	REVISE PER COUNTY COMMENTS	AJP
5-23-19	REVISE PER COUNTY COMMENTS	AJP
3-29-19	ADD TREES WITHIN PROPOSED DRAINAGE EASEMENT	AJP
DATE:	REVISIONS:	BY:

ALEXANDER J. PIAZZA PSM, INC.
Surveying • Mapping • Consulting
619 SW Biltmore Street
Port St. Lucie, Florida 34983
Phone: (772) 340-7770
Fax: (772) 340-2250
LB#7280

BOUNDARY & TOPOGRAPHIC SURVEY
5560 S. US HIGHWAY NO.1
AS PREPARED FOR
BEV SMITH OF FORT PIERCE II, INC.

CAD K:\BUILDERS\DWG2018\18-4187.DWG			
REF K:\			
FLD	CJM / RP	FB.	PG.
OFF	CJM		
CKD	AJP	SHEET 2 OF 5	DWG D-832
JOB	18-4187	DATE	9-25-18





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 - PUDE = PUBLIC UTILITY & DRAINAGE EASEMENT
 - N.S.L.R.W.C.D. = NORTH ST. LUCIE COUNTY WATER CONTROL DISTRICT

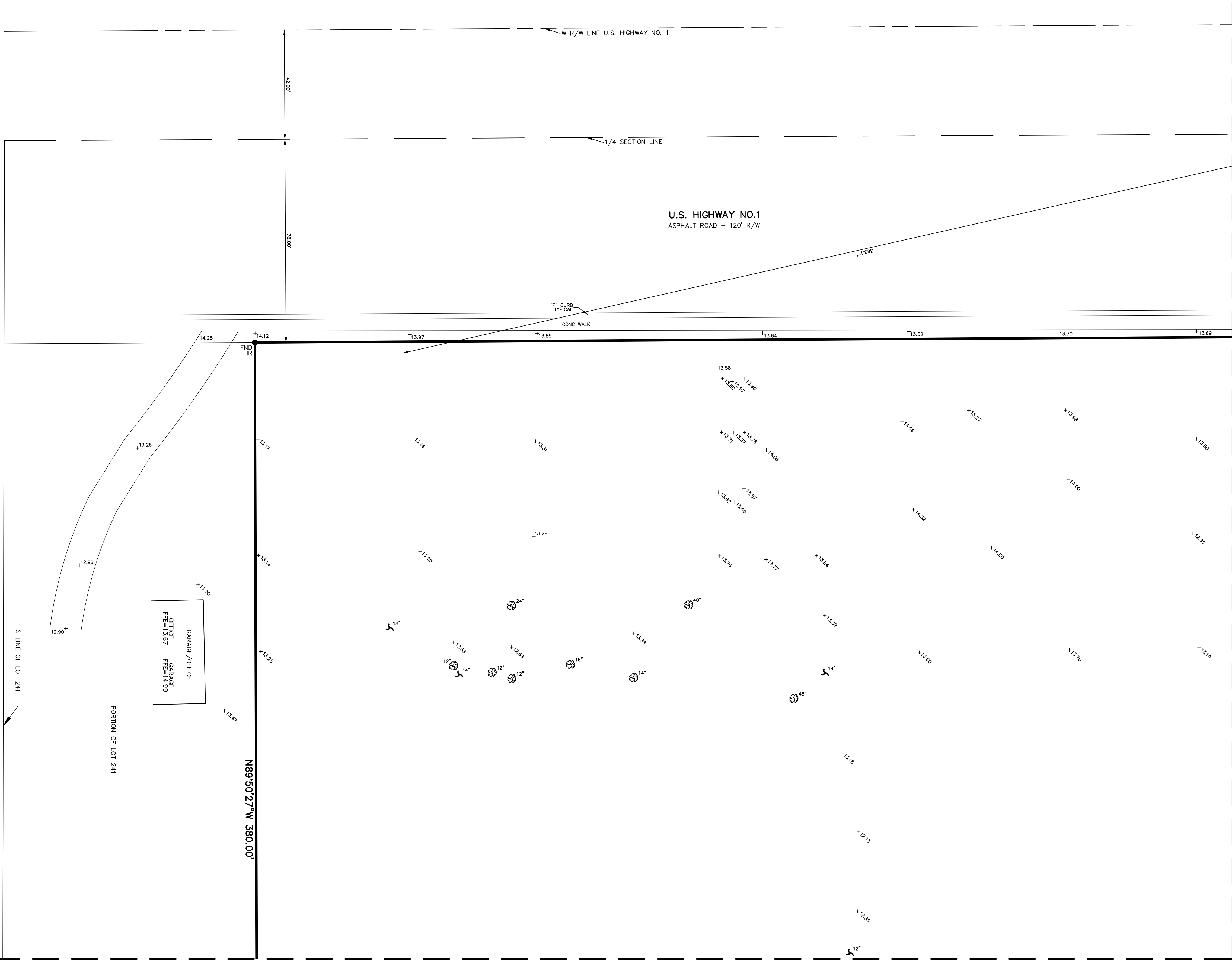
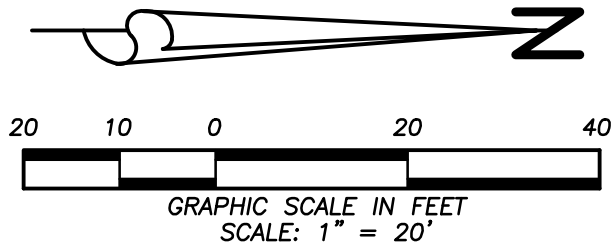
- SYMBOLS:**
- [Symbol] = GUY WIRE ANCHOR
 - [Symbol] = CABLE TELEVISION BOX
 - [Symbol] = CATCH BASIN
 - [Symbol] = CATCH BASIN INLET
 - [Symbol] = CLEANOUT
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 - [Symbol] = GAS VALVE
 - [Symbol] = SEWER VALVE
 - [Symbol] = WATER VALVE
 - [Symbol] = WELL
 - [Symbol] = WATER METER
 - [Symbol] = WOOD POWER POLE
 - [Symbol] = SET 5/8" IRON ROD WITH PLASTIC CAP PSM#6330
 - 2" = DENOTES TREE SIZE
 - [Symbol] = DENOTES PALM TREE
 - [Symbol] = DENOTES SIMPSON STOPPER TREE
 - [Symbol] = DENOTES PINE TREE
 - [Symbol] = DENOTES OAK TREE

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5-23-19	REVISE PER COUNTY COMMENTS	AJP
3-29-19	ADD TREES WITHIN PROPOSED DRAINAGE EASEMENT	AJP
DATE:	REVISIONS:	BY:

ALEXANDER J. PIAZZA PSM, INC.
Surveying • Mapping • Consulting
619 SW Biltmore Street
Port St. Lucie, Florida 34983
Phone: (772) 340-7770
Fax: (772) 340-2250

BOUNDARY & TOPOGRAPHIC SURVEY
5560 S. US HIGHWAY NO.1
AS PREPARED FOR
BEV SMITH OF FORT PIERCE II, INC.

CAD	K:\BUILDERS\ DWG2018\18-4187.DWG				
REF	K:\				
FLD	CJM / RP	FB.	PG.	JOB	18-4187
OFF	CJM			DATE	9-25-18
CKD	AJP	SHEET	3 OF 5	DWG	D-832



SYMBOLS:

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3-29-19	ADD TREES WITHIN PROPOSED DRAINAGE EASEMENT	AJP
DATE:	REVISIONS:	BY:

ALEXANDER J. PIAZZA PSM, INC.
Surveying • Mapping • Consulting
619 SW Biltmore Street
Port St. Lucie, Florida 34983
Phone: (772) 340-7770
Fax: (772) 340-2250
LB#7280

BOUNDARY & TOPOGRAPHIC SURVEY
5560 S. US HIGHWAY NO.1
AS PREPARED FOR
BEV SMITH OF FORT PIERCE II, INC.

CAD	K:\BUILDERS, DWG2018\18-4187.DWG				
REF	K:\				
FLD	CJM	/	RP	FB.	PG.
OFF	CJM				JOB 18-4187
CKD	AJP	SHEET 4 OF 5			DATE 9-25-18
					DWG D-832

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- TOWNSHIP = TOWNSHIP
- UE = UTILITY EASEMENT
- UTL = PUBLIC UTILITY & DRAINAGE EASEMENT
- PUDE = U.S. C.W. & L. NORTH ST. LUCIE COUNTY WATER
- CONTROL DISTRICT

SYMBOLS:

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- ☐ = DENOTES PALM TREE
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- ☐ = DENOTES PINE TREE
- ☐ = DENOTES OAK TREE

N89°50'27"W 179.16'(C)
179.14'(D)

N.S.L.R.W.C.D. CANAL
60' RIGHT-OF-WAY

2-04-22	ADD ADDITIONAL TOPO	AJP
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BOUNDARY & TOPOGRAPHIC SURVEY
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REF K:\				
FLD	CJM / RP	FB.	PG.	JOB 18-4187
OFF	CJM			DATE 9-25-18
CKD	AJP	SHEET 5	OF 5	DWG D-832

Plot date:

File name:

45 HOURS BEFORE DIGGING
CALL TOLL FREE
8-1-1
888-828-1100
NOTIFICATION CENTER

■ pcunningham.llc@gmail.com ■

Landscape Calculations

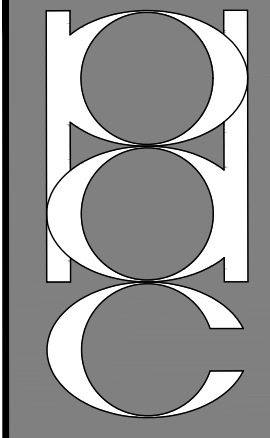
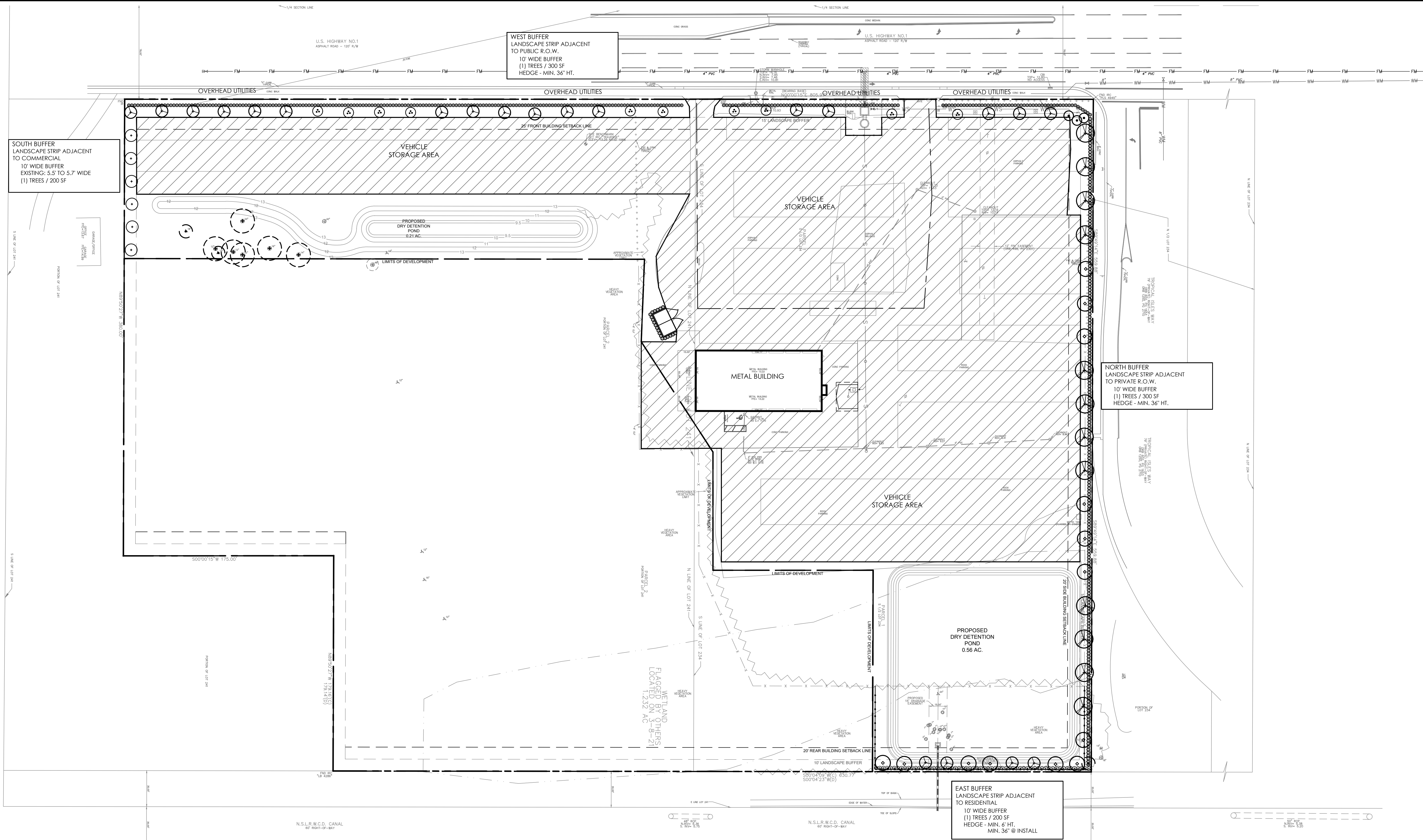
REQUIRED/ PERMITTED	PROVIDED
LANDSCAPE STRIPS ADJACENT TO PUBLIC R.O.W. WEST - U.S. HWY. ONE - 760 LF (80% LESS 4% DRIVEWAY) 10' WIDE LANDSCAPE STRIP (760 X 10 = 7,600 SF.) PROPOSED: 15' WIDE OVERHEAD POWERLINES TREES: 1 / 300 SF INCLUDES: (10) HOLLY TREES = 16 TREES (10) CRAPE MYRTLES = 10 TREES PLUS 36" HT. HEDGE	26 TREES
NORTH TROPICAL ISLES WAY - 860 LF 10' WIDE LANDSCAPE STRIP (860 X 10 = 8,600 SF.) TREES: 1 / 300 SF INCLUDES: (12) OAKS = 12 TREES (7) MAGNOLIAS = 7 TREES PLUS 36" HT. HEDGE	19 TREES
LANDSCAPE STRIPS ADJACENT TO RESIDENTIAL EAST SIDE - 182 LF 10' WIDE LANDSCAPE STRIP (182 X 10 = 1,820 SF.) TREES: 1 / 200 SF INCLUDES: (6) MAGNOLIAS = 6 TREES (4) HOLLY TREES = 4 TREES PLUS 6" HT. HEDGE INSTALLED AT 24"	10 TREES
LANDSCAPE STRIPS ADJACENT TO COMMERCIAL SOUTH SIDE - 133 LF 10' WIDE LANDSCAPE STRIP (133 X 10 = 1,330 SF.) TREES: 1 / 200 SF INCLUDES: (6) GREEN BUTTWOOD = 6 TREES (1) HOLLY TREE = 1 TREE	7 TREES

Plant List

SYM	KEY	BOTANICAL NAME/ COMMON NAME	HEIGHT/ SPREAD	SPECIFICATION	NATIVE	DROUGHT TOLERANT	TOTAL
TREES	CE	CONOCARPUS ERECTUS GREEN BUTTWOOD	12' HT. 5' SPR.	FIELD GROWN B&B 2.5" CAL. 5' CT. MIN.	Y	H	6
	IA	ILEX 'ATTENUATA' EAST PALATKA HOLLY	12' HT. 5' SPR.	45 GAL. MIN. 2.5 CAL. TREE FORM, 5' CT. MIN.	Y	M	21
	MG	MAGNOLIA GRANDIFLORA 'LITTLE GEM' LITTLE GEM MAGNOLIA	12' HT. 5' SPR.	FIELD GROWN B&B 2.5" CAL., 5' CT. MIN.	Y	H	13
	LI	LAGERSTROEMIA INDICA CHAIPE MYRTLE	12' HT. 5' SPR.	FIELD GROWN B&B 2.5" CAL. 5' CT. MIN.	N	M	10
	QV	QUERCUS VIRGINIANA LIVE OAK	12' HT. 5' SPR.	FIELD GROWN B&B 2.5" CAL. 5' CT. MIN.	Y	H	12
	SP	SABAL PALMETTO SABAL PALMETTO	10 CT.		Y	H	3
SHRUBS	CLU	CLUSIA GUTTIFERA CLUSIA	36" HT. 24" SPR.	36" O.C. FULL TO BASE	Y	H	40
	CHR	CHRYSOBALANUS ICACO COCOPLUM	24" X 16"	3 GAL., 30" O.C.	Y	H	295
	VIB	VIBURNUM ODORATISSIMUM SWEET VIBURNUM	24" X 16"	3 GAL., 30" O.C.	N	H	236
	SOD	STENOCLADUM SECUNDATUM ST. AUGUSTINE SOD		DISEASE FREE, LAID TIGHTLY, EVEN UNIFORM	N	M	T.B.D.

Existing Landscaping

SYM	KEY	BOTANICAL NAME/ COMMON NAME	HEIGHT/ SPREAD	SPECIFICATION	NATIVE	DROUGHT TOLERANT	TOTAL
QV	SP	QUERCUS VIRGINIANA SABAL PALMETTO		LIVE OAK	Y	H	6
				SABAL PALM	Y	H	3



Patrick D.
Cunningham, LLC
land planning
landscape architecture

519 Sapphire Drive
Sarasota, FL 34234
o: 941.351.8915

Conceptual
Landscape Plan

Bev Smith Kia
5560 US Highway One
Ft. Pierce, Florida

DATE: 07.28.2022
REV:
SCALE: 1"=40'-0"

PATRICK D. CUNNINGHAM
FL REG. # LC 0001667



80

40

0

NORTH



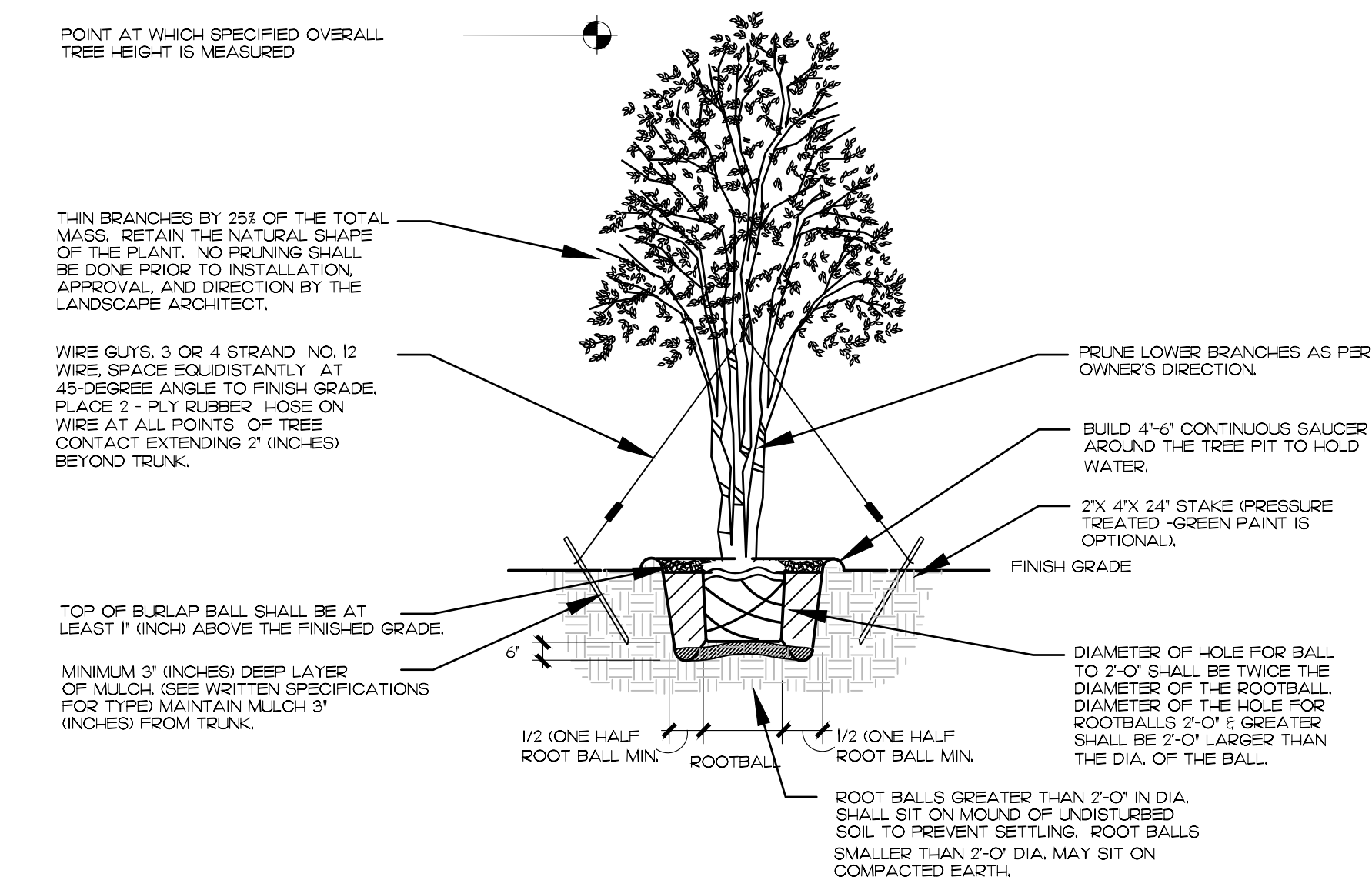
L-1

SHEET

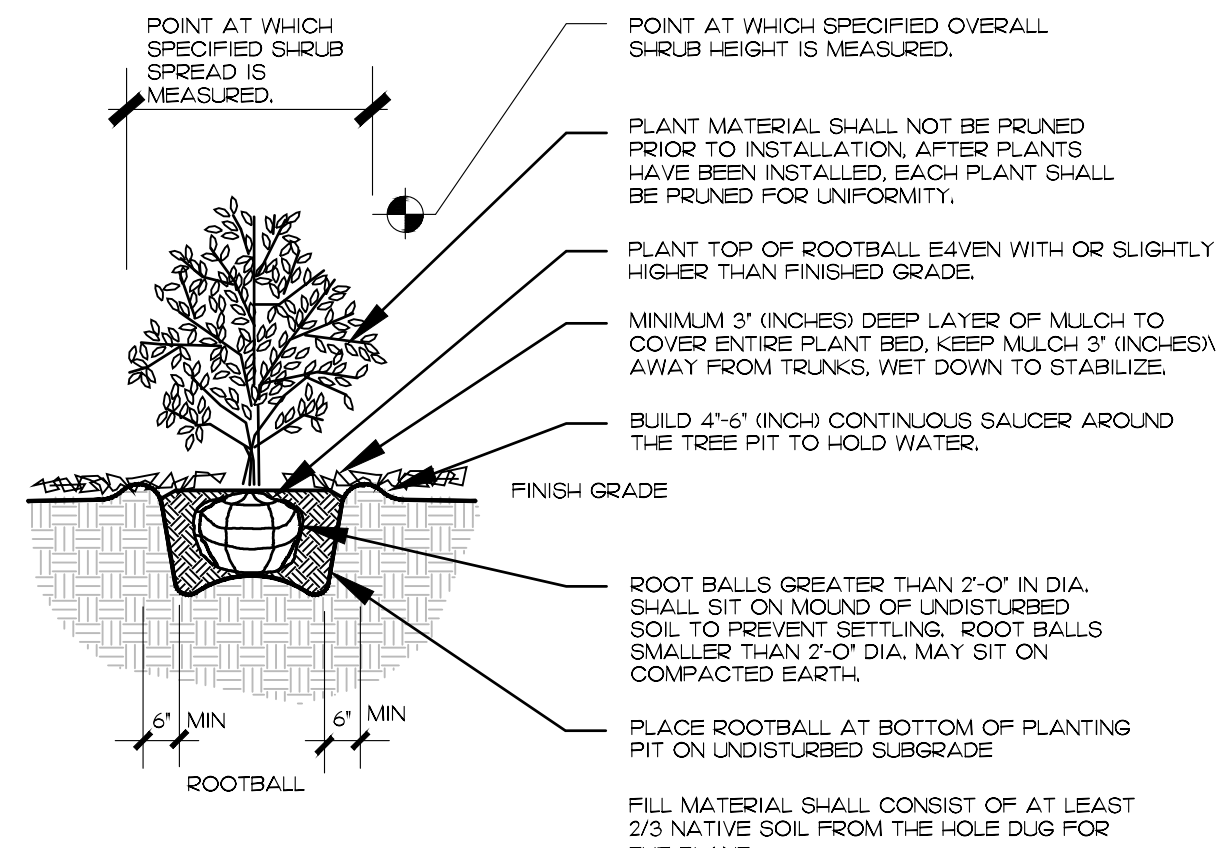
■ COPYRIGHT © ■ PATRICK D. CUNNINGHAM, LLC ■ 519 Sapphire Drive ■ Sarasota, Florida 34243 ■ 941.351.8915 ■ ALL RIGHTS RESERVED ■

Additional Notes

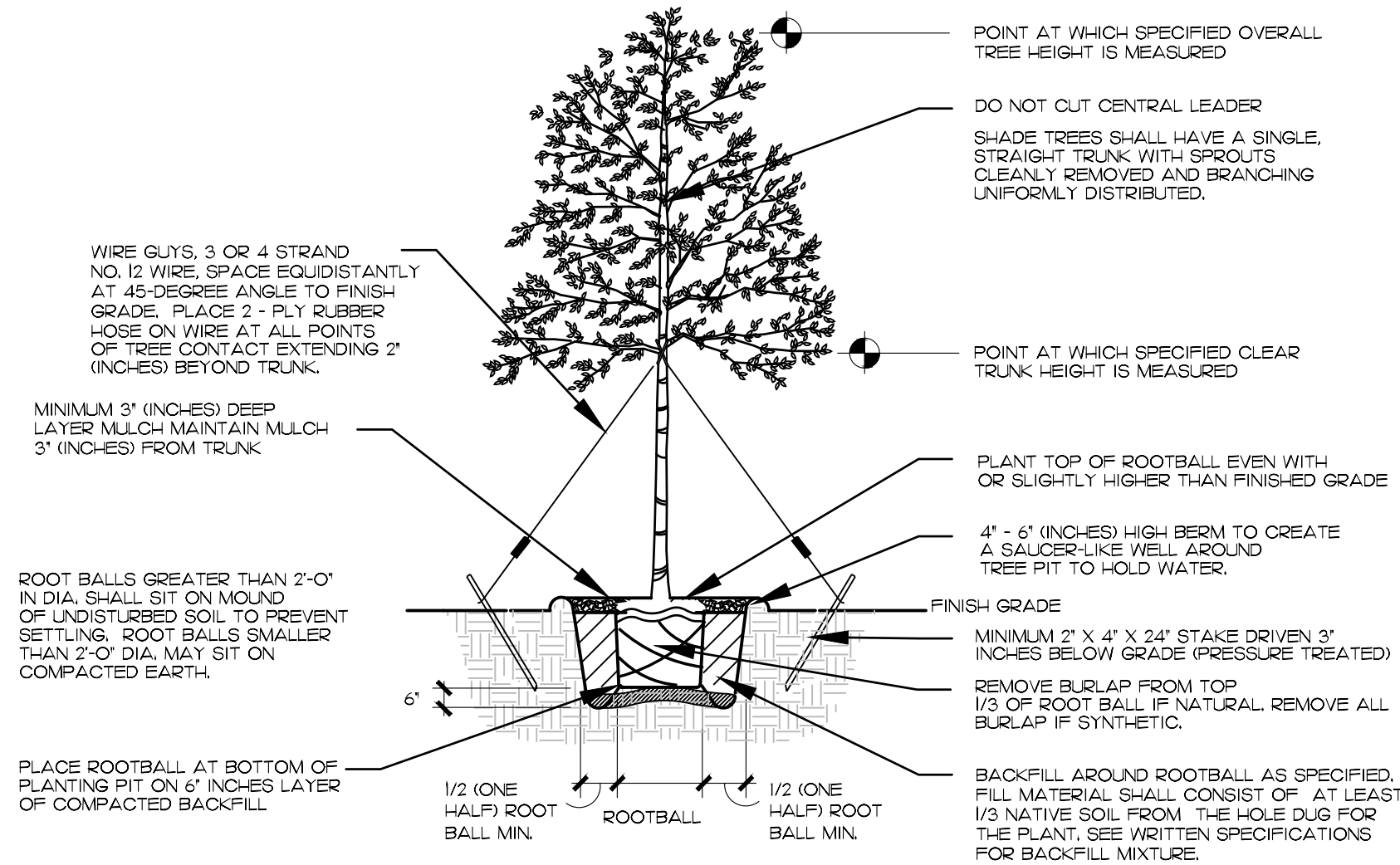
1. QUALITY
PLANT MATERIALS USED SHALL CONFORM TO THE STANDARDS FOR FLORIDA NO. 1 OR BETTER, AS GIVEN IN THE MOST CURRENT EDITION OF 'GRADES AND STANDARDS FOR NURSERY PLANTS' PART I AND PART II, STATE OF FLORIDA.
2. DROUGHT-TOLERANCE REQUIREMENTS
A. MINIMUM OF 75% TO 100% OF TOTAL CUMULATIVE LANDSCAPE PLANT MATERIAL USED TO MEET THE PROVISIONS OF THE I.R.C. L.D.R., CHAPTER 926, SHALL BE "HIGH DROUGHT-TOLERANT," AS CLASSIFIED AND LISTED IN THE MOST RECENT EDITION OF THE "WATERWISE" - FLORIDA LANDSCAPES - LANDSCAPING TO PROMOTE WATER CONSERVATION USING PRINCIPLES OF XERISCAPE - FROM FLORIDA'S WATER MANAGEMENT DISTRICTS.
3. TREES
A. CANOPY TREES SHALL BE SPECIES HAVING AN AVERAGE MATURE SPREAD OF CROWN GREATER THAN FIFTEEN (15) FEET IN DIAMETER, AND HAVING A TRUNK WITH OVER FIVE (5) FEET OF CLEAR WOOD.
B. CANOPY TREES SHALL HAVE A 2" DIAMETER AT 0.5' ABOVE GRADE AND BE A MIN. 12" IN HEIGHT WITH A MINIMUM CROWN SPREAD OF 4.5' AT TIME OF PLANTING.
C. PALMS SHALL BE CONSIDERED 1/3 OF A TREE AND, IF USED, THEY SHALL CONSIST OF NO MORE THAN ONE-THIRD OF THE TOTAL NEW TREE REQUIREMENT. ADDITIONALLY, 3 PALMS + 1 CANOPY TREE, SINGLE DATE PALMS (NOT PYGMY DATE PALMS) MAY BE SUBSTITUTED FOR A CANOPY TREE.
D. AT LEAST 50% OF ALL NEW REQUIRED TREES SHALL BE OF A NATIVE SPECIES, AND AT LEAST 75% - 100% OF ALL TREES SHALL BE RATED "DROUGHT-TOLERANT."
E. REQUIRED UNDERSTORY TREES SHALL BE A MINIMUM OF SIX (6) FEET OVERALL IN HEIGHT AND ONE- AND ONE-HALF (1.5) INCHES DIAMETER AT ONE-HALF (0.5) FEET ABOVE GRADE AT THE TIME OF PLANTING. MULTI-TRUNK TREES SHALL HAVE A COMBINED ONE- AND ONE-HALF-INCH CALIPER FOR ALL TRUNKS AT SIX (6) INCHES ABOVE GRADE. PALM TREES USED AS UNDERSTORY TREES SHALL HAVE A MINIMUM OVERALL HEIGHT OF SIX (6) FEET AND SHALL NOT COMPRISE MORE THAN ONE-THIRD (1/3) OF THE TOTAL UNDERSTORY TREE REQUIREMENT.
F. A ROOT BARRIER IS REQUIRED FOR CANOPY TREES WITHIN 5-FT. OF A SIDEWALK, PAVED AREA, BUILDING, OR UNDERGROUND UTILITY.
4. SHRUBS/ HEDGES
A. SHRUBS SHALL BE A MINIMUM OF EIGHTEEN (18) INCHES IN HEIGHT WHEN MEASURED IMMEDIATELY AFTER PLANTING, EXCEPT THAT SHRUBS OF NON-NATIVE VIBURNUM AND LIGUSTRUM SPECIES SHALL BE A MINIMUM OF TWENTY-FOUR (24) INCHES IN HEIGHT IMMEDIATELY AFTER PLANTING.
B. SHRUBS, WHERE REQUIRED, SHALL BE PLANTED IN AN OFFSET DOUBLE ROW AND MAINTAINED SO AS TO FORM A CONTINUOUS UNBROKEN SOLID SCREEN WHERE REQUIRED TO FORM A CONTINUOUS SCREEN TO SATISFY A BUFFER OR OPAQUE FEATURE REQUIREMENT. SHRUBS SHALL BE PLANTED ON TWENTY-FOUR (24)-TO-THIRTY (30) INCH CENTERS, UNLESS A GREATER SPACING IS NECESSARY TO ACCOMMODATE LARGER SHRUBS AND IS APPROVED BY PLANNING DIVISION STAFF.
C. EXCLUDING SHRUBS USED IN OPAQUE FEATURES, AT LEAST 50% OF THE REQUIRED NUMBER OF SHRUBS SHALL BE OF NATIVE SPECIES.
5. MULCH AND GROUND COVERS
THE USE OF CYPRESS MULCH IS PROHIBITED. MULCH THAT IS NOT CYPRESS MAY BE USED. GROUND COVERS (NOT INCLUDING SOO GRASS) SHALL BE PLANTED IN SUCH A MANNER AS TO PRESENT A FINISHED APPEARANCE AND REASONABLY COMPLETE COVERAGE WITHIN ONE YEAR AFTER PLANTING. AT LEAST 50% OF THE AREA COVERED BY LIVING MATERIAL SHALL BE OF NATIVE SPECIES. REFER TO I.R.C. LDC FOR A LIST OF NATIVE GROUND COVERS AND FLOWERS. THE COMPLETE COVERAGE OF AN AREA BY GROUND COVERS PRECLUDES THE USE OF MULCH THEREAFTER.
6. TURF GRASS
TURF GRASS AREAS SHALL BE IDENTIFIED ON THE LANDSCAPE PLAN AND SHALL BE LIMITED TO A MAXIMUM OF 50% OF THE TOTAL IRRIGATED, LANDSCAPED AND VEGETATED PROJECT AREA, EXCLUDING RIGHTS-OF-WAY, ACTIVE RECREATION AREAS (E.G. PLAYFIELDS), AND SLOPES WITHIN DRY RETENTION AREAS. TURF GRASS SHALL BE PLACED SO THAT IT CAN BE IRRIGATED IN A SEPARATE ZONE. PREFERRED TURF GRASSES ARE THOSE QUALIFYING AS NATIVE.
7. IRRIGATION USAGE ZONES SHALL BE AS FOLLOWS:
A. GRASS AREA SHALL BE IN HIGH USAGE ZONES.
B. TREES & SHRUBS SHALL BE IN LOW USAGE ZONES.
8. THERE SHALL BE (6) DIFFERENT SPECIES OF TREES USED, AND (9) DIFFERENT SPECIES OF SHRUBS WITH (4) BEING NATIVE PER I.R.C. ORDINANCE, CHAPTER 926.
9. THE CONTRACTOR SHALL ATTEMPT TO PRESERVE AS MANY EXISTING TREES AS POSSIBLE AND FEASIBLE. TREES THAT ARE PRESERVED MAY BE CREDITED TOWARDS THE SITE TREE REQUIREMENT IF THEY MEET THE SPECIFICATIONS.
10. THE CONTRACTOR SHALL COORDINATE THE PLACEMENT OF TREES, SIGNS AND LIGHTS SUCH THAT ALL SIGNAGE IS EASILY SEEN AND LIGHTING WORKS FOR ITS INTENDED PURPOSE. TREE PLACEMENT MAY VARY FROM THIS PLAN TO ACHIEVE THIS REQUIREMENT.
11. LANDSCAPE ISLANDS SHALL BE BACKFILLED AT LEAST TO TOP OF CURB, AND MAY BE BERMED TO A MAXIMUM HEIGHT OF 24" ABOVE ADJACENT PARKING LOT GRADE.
12. ALL LANDSCAPE MATERIAL IN SHOCK WILL BE REPLACED PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY.
- LAND CLEARING NOTES
A. ALL NATIVE UPLAND VEGETATION CONTRIBUTING TO THE STABILIZATION OF BANKS OR EXISTING CANALS, DITCHES OR NATURAL WATERCOURSES SHALL BE RETAINED.
B. ALL NUISANCE EXOTIC VEGETATION EXISTING ON SITE SHALL BE REMOVED IN CONJUNCTION WITH ANY SITE DEVELOPMENT.
C. ANY ABANDONED FLOW WELLS EXISTING ON SITE SHALL BE PLUGGED IN CONJUNCTION WITH SITE DEVELOPMENT.



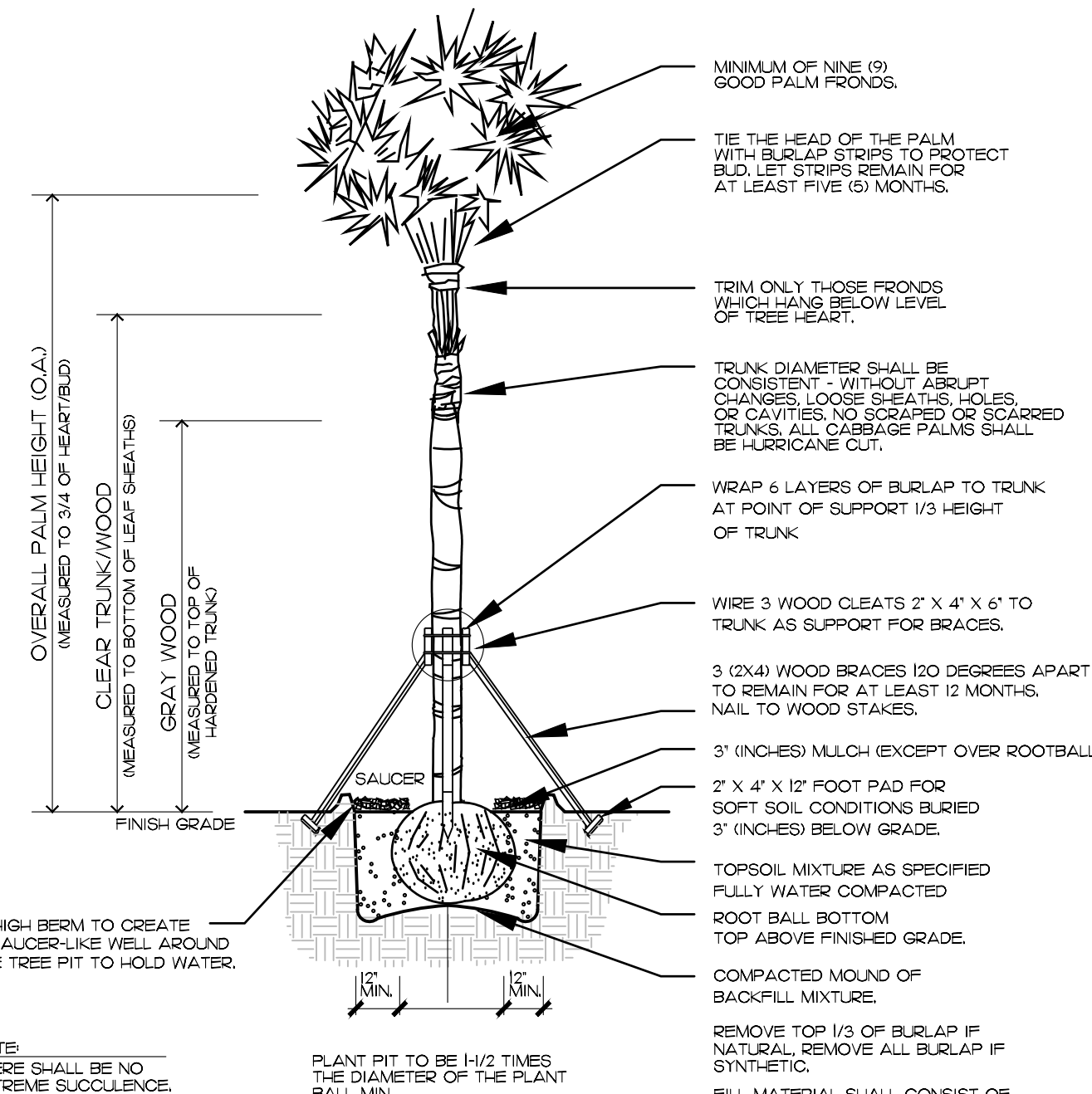
TYPICAL IRRIGULAR/MULTI-TRUNK TREE PLANTING DETAIL
NOT TO SCALE



TYPICAL SHRUB/ GROUNDCOVER PLANTING DETAIL
NOT TO SCALE



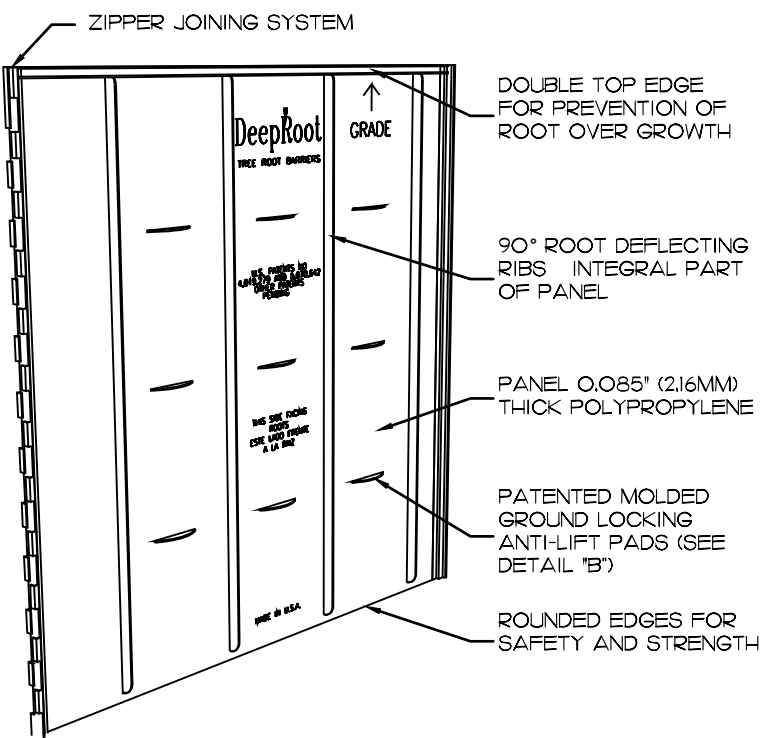
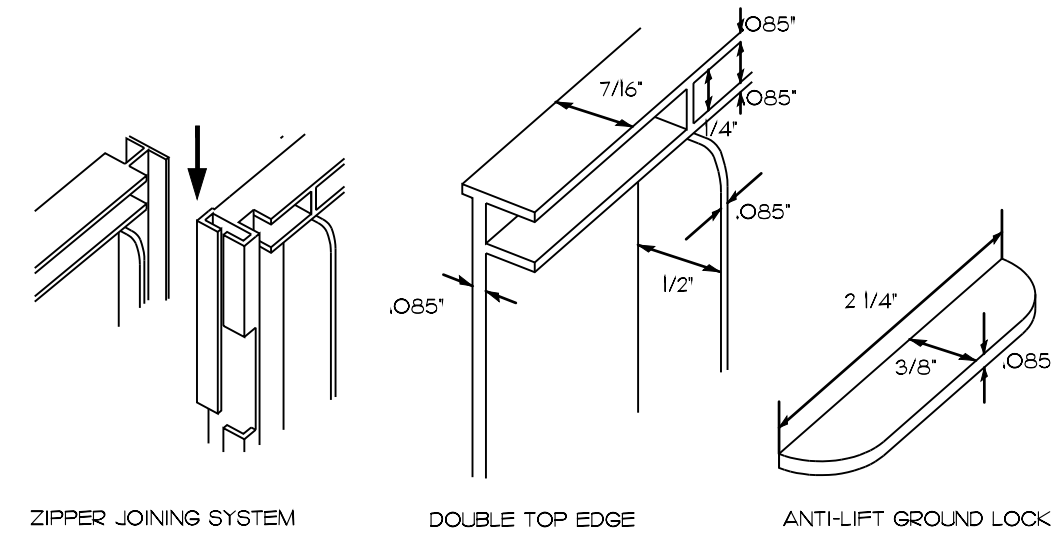
TYPICAL TREE PLANTING DETAIL
NOT TO SCALE



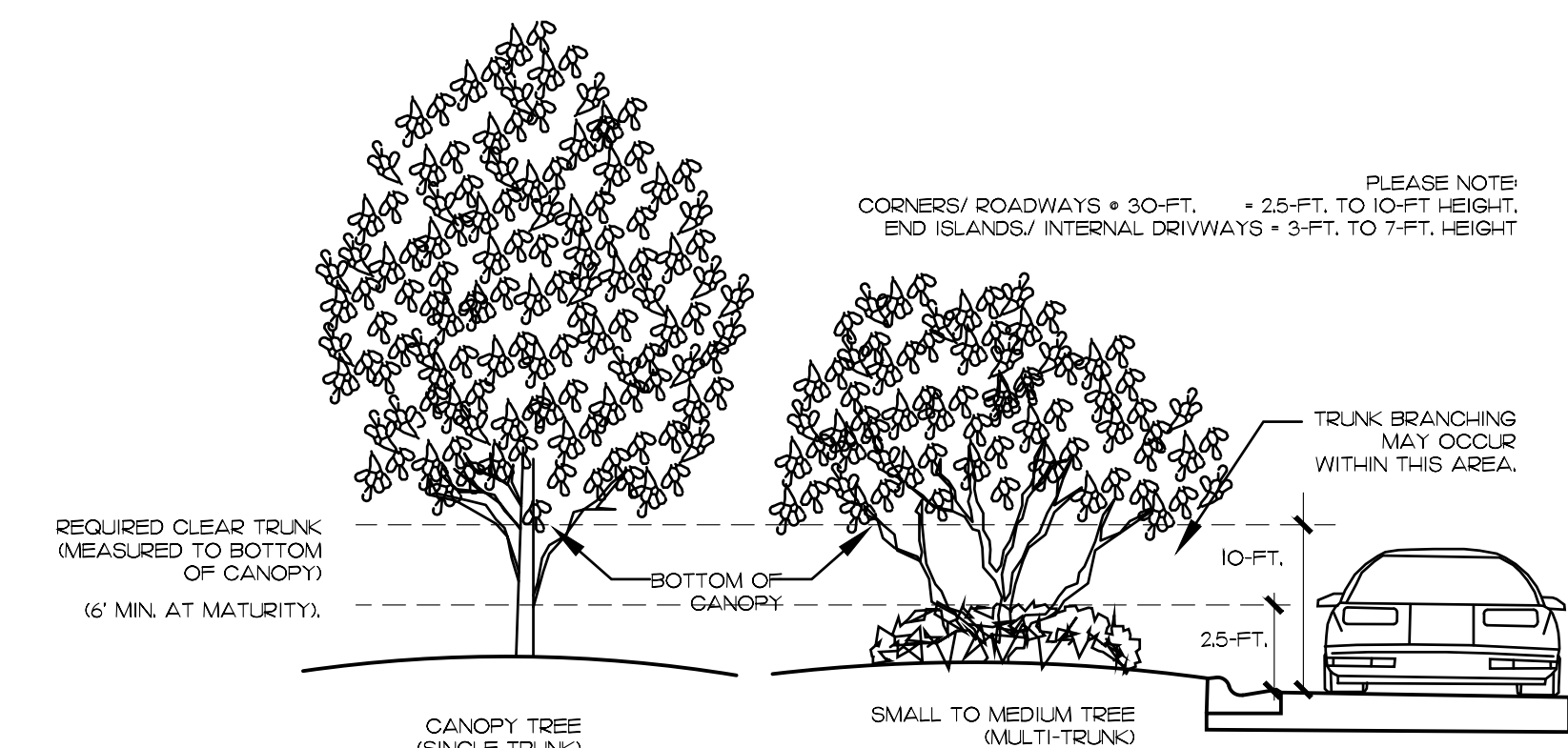
TYPICAL PALM PLANTING DETAIL
NOT TO SCALE

NOTES:
SPECIFIED TREE ROOT BARRIERS ARE A MECHANICAL BARRIER AND ROOT DEFLECTOR TO PREVENT TREE ROOTS FROM DAMAGING HARDSCAPES AND LANDSCAPES. ASSEMBLED IN 2' LONG MODULES TO CREATE VARYING SIZES OF CYLINDERS FOR SURROUNDING ROOT BALLS (SURROUND PLANTING STYLE) OR FOR LINEAR APPLICATIONS DIRECTLY BESIDE A HARDSCAPE ADJACENT TO ONE SIDE OF THE TREES (LINEAR PLANTING STYLE).

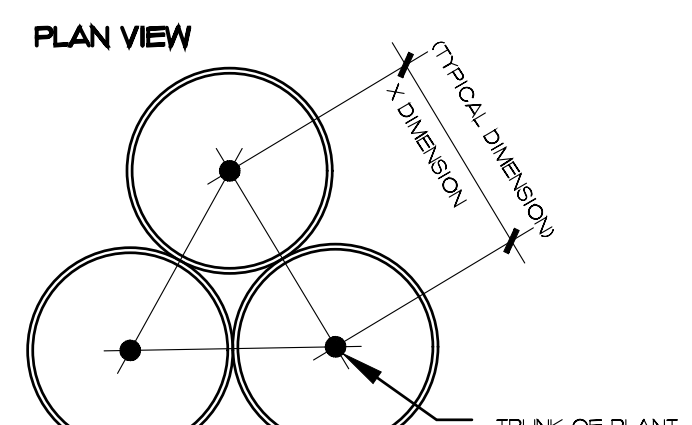
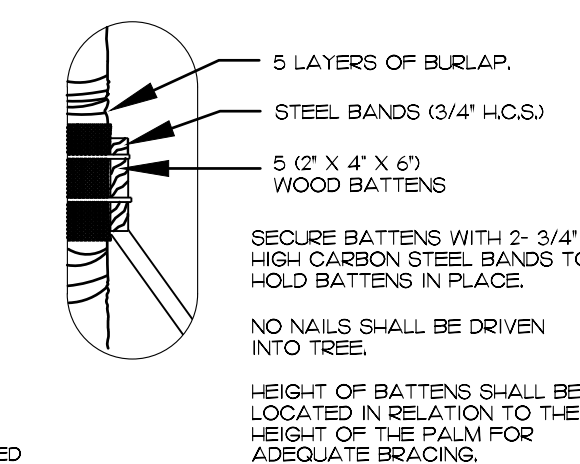
- A. MATERIALS
1. THE CONTRACTOR SHALL FURNISH AND INSTALL TREE ROOT BARRIERS AS SPECIFIED. THE TREE ROOT BARRIERS SHALL BE PRODUCT # UB 24-2, # UB 36-2 AND # UB 48-2 AS MANUFACTURED BY DEEP ROOT PARTNERS, LP, 345 LORTON AVE. HIOX, BURLINGAME, CA (800-458-7668), OR APPROVED EQUAL. THE BARRIER SHALL BE BLACK, INJECTION MOLDED PANELS, OF 0.085" WALL THICKNESS IN MODULES 24" LONG BY 24" X 48" DEEP, MANUFACTURED WITH A MINIMUM 50% POST CONSUMER RECYCLED POLYPROPYLENE PLASTIC WITH ADDED ULTRAVIOLET INHIBITORS. RECYCLABLE. EACH PANEL SHALL HAVE:
- B. CONSTRUCTION AND INSTALLATION
1. THE CONTRACTOR SHALL INSTALL THE TREE ROOT BARRIERS WITH THE NUMBER OF PANELS AND IN THE MANNER SHOWN ON THE DRAWINGS. THE VERTICAL ROOT DEFLECTING RIBS SHALL BE FACING INWARDS TO THE ROOT BALL AND THE TOP OF THE DOUBLE EDGE SHALL BE 1/2" ABOVE GRADE. EACH OF THE REQUIRED NUMBER OF PANELS SHALL BE CONNECTED TO FORM A CIRCLE AROUND THE ROOT BALL OR WHERE SPECIFIED JOINED IN A LINEAR FASHION AND PLACED ALONG THE ADJACENT HARDSCAPE. ALL STREET TREES WITH TRUNKS CLOSER THAN 4 FT. TO PAVED SURFACES SHALL BE PLANTED WITH ROOT BARRIER BETWEEN THE ROOT BALL AND PAVING. PLANTINGS WITHIN TREE WELLS REQUIRE ROOT BARRIERS ALONG ALL SIDES OF THE TREE WELL.
2. EXCAVATION AND SOIL PREPARATION SHALL CONFORM TO THE DRAWINGS.
3. THE TREE ROOT BARRIERS SHALL BE BACKFILLED ON THE OUTSIDE WITH 3/4" TO 1 1/2" GRAVEL OR CRUSHED ROCK, AS SHOWN ON THE DRAWINGS. NO GRAVEL BACKFILL IS REQUIRED FOR A LINEAR PLANTING.



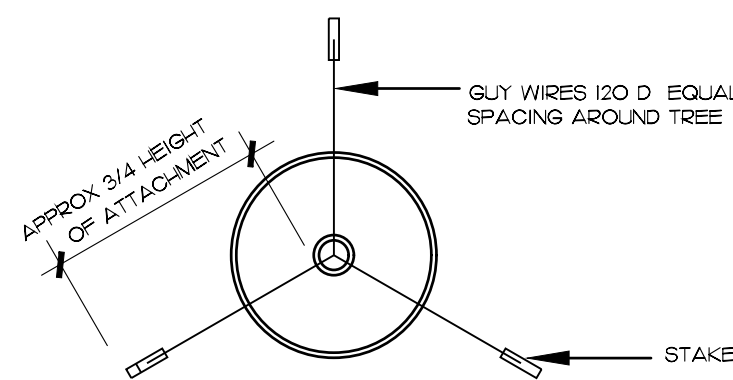
24" DEEPROOT TREE ROOT BARRIERS
NOT TO SCALE



CLEAR TRUNK WITHIN SIGHT TRIANGLE DETAIL
NOT TO SCALE



TYPICAL PLANT SPACING DETAIL
NOT TO SCALE



(UNDER 16'-0" HT.)
TYPICAL TREE GUYING DETAIL
NOT TO SCALE



Advanced Restoration Ecology

5560 S US HWY 1

St Lucie County, FL

Environmental Assessment

Prepared For:
Bev Smith Kia

Prepared By:
Drew Gatewood, MS, PWS
2593 NE Roberta St
Jensen Beach, FL 34957
772-242-7200
813-784-8891

©ARE, Inc. September 2020

The environmental assessment report below has been compiled in accordance with the St Lucie County Development Review Division and provisions set forth by the state of Florida. The parcel is listed by the St Lucie County Property Appraiser as Parcel ID number 3403-502-0302-000-4 and is a total of 9.63 acres. The property is located at 5560 S US Hwy 1 in Ft Pierce, Florida. The following report describes the findings of our recent on site review and database research as it pertains to St Lucie County and the State of Florida.

LAND USE RECORDS

The St Lucie County Property Appraiser's Report lists this property as 2700 Auto Sales.

SOIL COMPOSITION:

Based on a review of the United State Department of Agriculture's Web Soil Survey database the site's soils are comprised of the following:

Riviera Fine Sand - This poorly drained, nearly level soil is found in hammocks and along drainageways. The surface layer is dark gray brown fine sand about 5 inches thick. The soil has a water table at a depth of less than 10 inches for 2 to 4 months in most years and at a depth of 10 to 30 inches for most of the rest of the year. Permeability is rapid in the surface and subsurface layers, slow to very slow in the subsoil, and rapid in the substratum. Natural vegetation includes cabbage palms, and scattered longleaf pine and slash pine and an understory of wax myrtle and saw palmetto. The most common native grasses are pineland threeawn and blue maidencane. Broomsedges, creeping bluestem, paspalum, sand cordgrass and panicums are typical grasses for this soil.

Pineda Sand – *This is a nearly level poorly drained soil found in grassy flats. The natural vegetation associated with this soil type includes slash pine, cabbage palm, wax myrtle, gallberry, fetterbush, and brooms sedge. The surface layer typically is dark gray and dark grayish brown sand. The subsurface layer is brown fine sand with yellow and brownish mottles.*

Susanna and Wauchula - This poorly drained soil is found typically in broad areas in the flatwoods. Typically the surface layer is black fine sand about 5 inches thick. The water table is at a depth of less than 10 inches for 2 to 4 months during the wet season and within a depth of 40 inches for more than 6 months. Natural vegetation consists of slash pine, saw palmetto, inkberry, rusty lyonia, black root, penny royal, pineland threeawn, chalky bluestem, panicum and various grasses. The soil is well suited for pasture and hay crops.

Wabasso Sand - This soil is a nearly level, poorly drained soil in broad open areas of the flatwoods. The surface layer is sand about 8 inches thick. The upper 4 inches is black and the lower 4 inches is dark grey. The water table is typically at a depth of less than 10 inches for 1 to 4 months during the wet season, and at a depth of 10 to 40 inches for 6 to 9 months in most years. Natural vegetation is slash pine, cabbage palm, saw palmetto, running oak, inkberry and fetterbush. Common grasses are threeawn and bluestem. The soil has severe limitations for cultivated crops and citrus due to wetness. The soil has high potential for dwellings without basements, small commercial buildings, local roads and streets.

Nettles Sand is a poorly drained, nearly level soil found in areas of broad flatwoods. Typically the surface layer is 11 inches thick. Black sand comprises the upper 5 inches, very dark gray sand in the next three inches and dark gray sand in the lower 3 inches. Subsurface layer is light gray sand 22 inches thick. The water table is typically at a depth of 10 inches for 2 to 4 months during wet seasons, and at a depth of 10 to 40 inches for 6 months or longer in most years. Natural vegetation includes slash pine, cabbage palm, saw palmetto, wax myrtle, inkberry, fetterbush, creeping bluestem, chalky bluestem, Florida threeawn, and pineland threeawn. This soil has severe limitations for cultivated crops unless water control and other food management practices are provided. This soil has potential for improved pasture grasses and high potential for dwellings without basements, small commercial buildings, and roads.

WILDLIFE EVALUATION:

On September 25, 2020, ARE conducted pedestrian transects across 100% of property looking for local, state and federally listed or endangered species present on the site. This survey primarily focused on the presence of gopher tortoise burrows or recent activity. During the pedestrian transects of the property, no gopher tortoise activity was observed on site. No other listed plant or animal species were observed on site during the site visit.

NATIVE HABITAT

The site investigation conducted by ARE, Inc. did not find native upland habitat on the site. The site has been previously cleared and has dense exotic content throughout the understory. Species observed during the site reconnaissance included the following,

Muscadine Grape (<i>Vitis rotundifolia</i>)	Brazilian pepper (<i>Schinus terbinthifolius</i>)
Cabbage palm (<i>Sabal palmetto</i>)	Mahoe (<i>Hibiscus tiliaceus</i>)
Guava (<i>Psidium guajava</i>)	Old World Climbing Fern (<i>Lygodium</i> sp)
Slash Pine (<i>Pinus densa</i>)	Laurel Oak (<i>Quercus laurifolia</i>)

WETLAND DELINEATION:

Based on the State definition of a wetland in 62-340 FAC, there are three components: hydric soils, wetland plants, and hydrologic indicators. These factors listed were present during the site investigation. ARE concludes this property does include state and possibly federally jurisdictional wetlands on site in its current configuration. A wetland delineation and verification by the State and possibly the USCAOE will be needed prior to any site clearing.

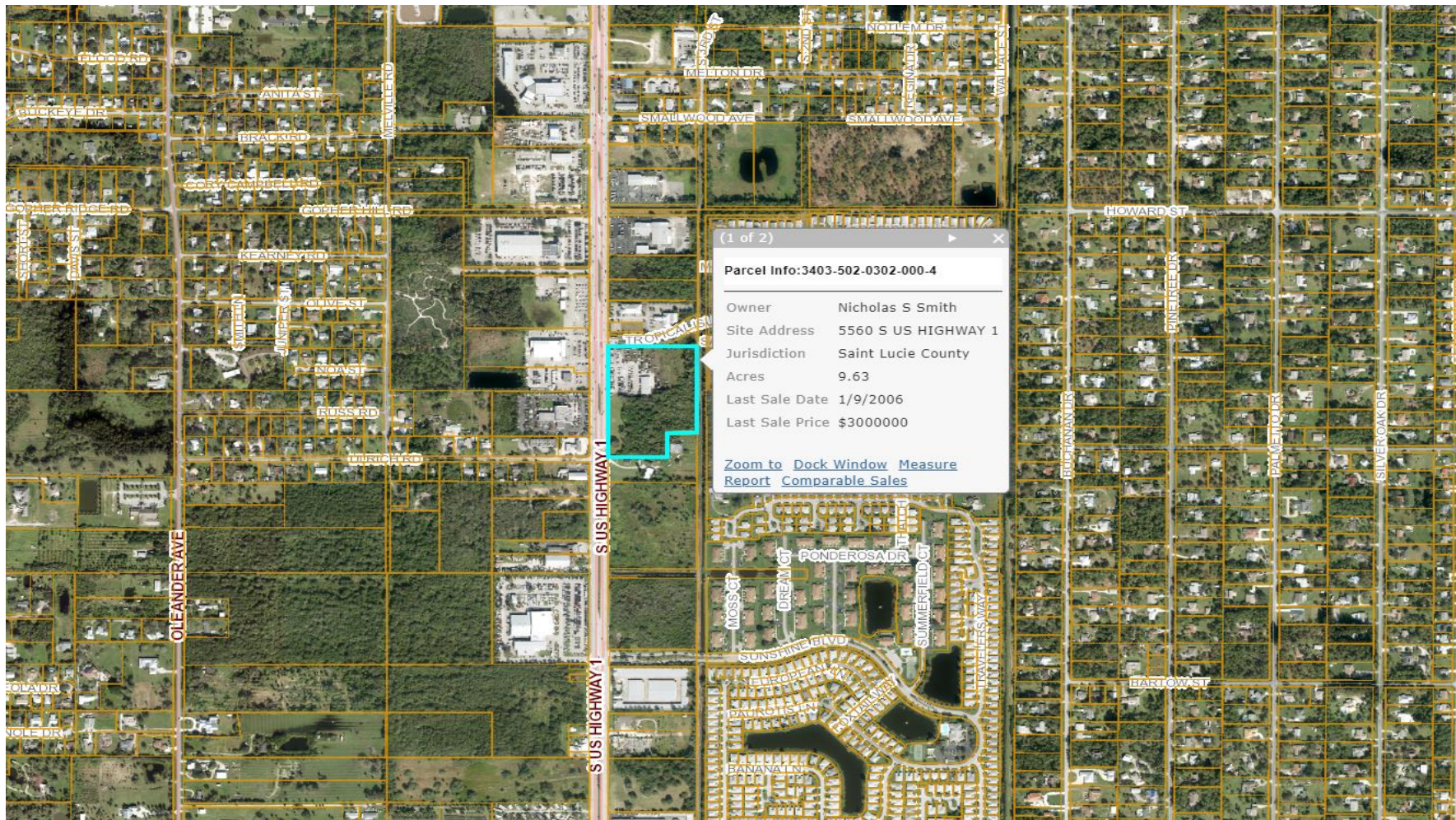
COUNTY REQUIREMENTS

The County will require proof of a completed gopher tortoise survey by a licensed agent. Please submit this document with any applications to use as the needed verification of a 100% gopher tortoise survey has been completed on the site. Per FWC regulations a gopher tortoise survey is good for 90 days, and any clearing must have a valid survey prior to commencement. The County will not authorize/issue any permitting without a current gopher tortoise survey. There are trees meeting the County's protection standards (Please see tree data table and map). A site plan will be needed to determine possible needs for mitigation to offset any impacts to these trees.

CONCLUSION:

Based on County requirements, ARE, Inc. conducted a site investigation throughout the property to survey for the presence of any listed plant or animal species. No Gopher Tortoise burrows were observed on site, nor were any other State or Federally listed species observed on the property during the site visit. A 100% gopher tortoise survey of

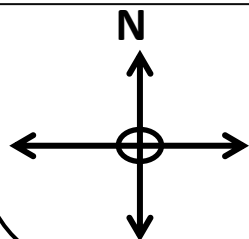
the property was conducted and completed by an FWC licensed gopher tortoise agent during the site investigation. Native habitat was not determined to be on site due to the dense exotic content in the understory of the site. It is the professional opinion of ARE, Inc. that there are State and possibly Federally jurisdictional wetlands on the site as the site's characteristics did meet the minimum thresholds required for wetland classification. These wetland limits need to be delineated and verified by the State and possibly the USACOE prior to clearing. There are trees meeting the protection standards for St Lucie County. A site plan/ clearing plan will be needed to determine if mitigation is needed to offset impacts to these trees.



9/26/2020

Location Map

Map Source: St Lucie County



5560 S US HWY 1
Ft. Pierce, FL

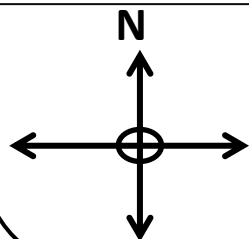




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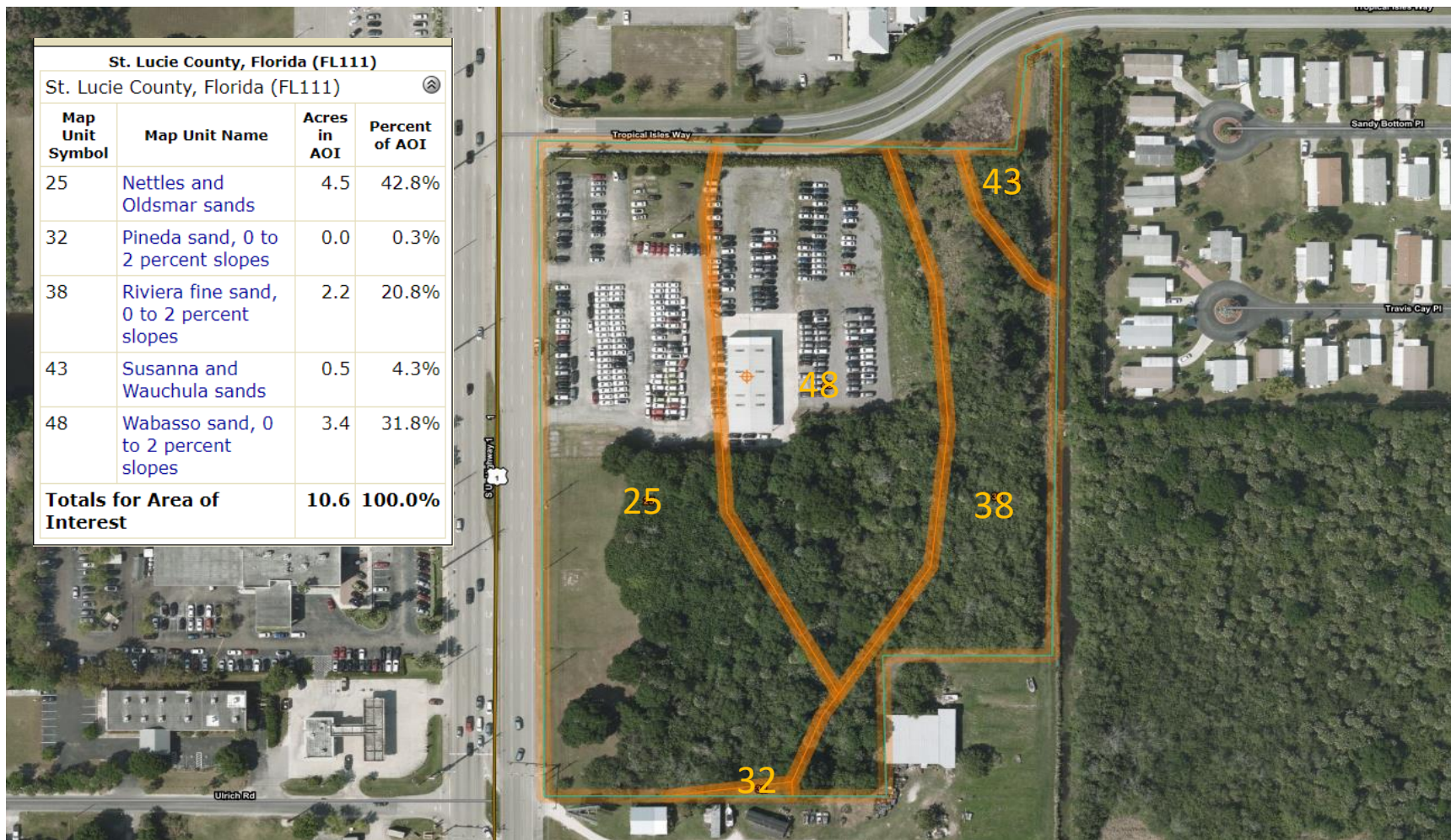
FLUCCS Map

Map Source: Google Earth



**5560 S US HWY 1
 Ft. Pierce, FL**

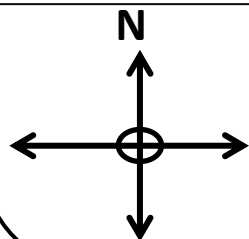




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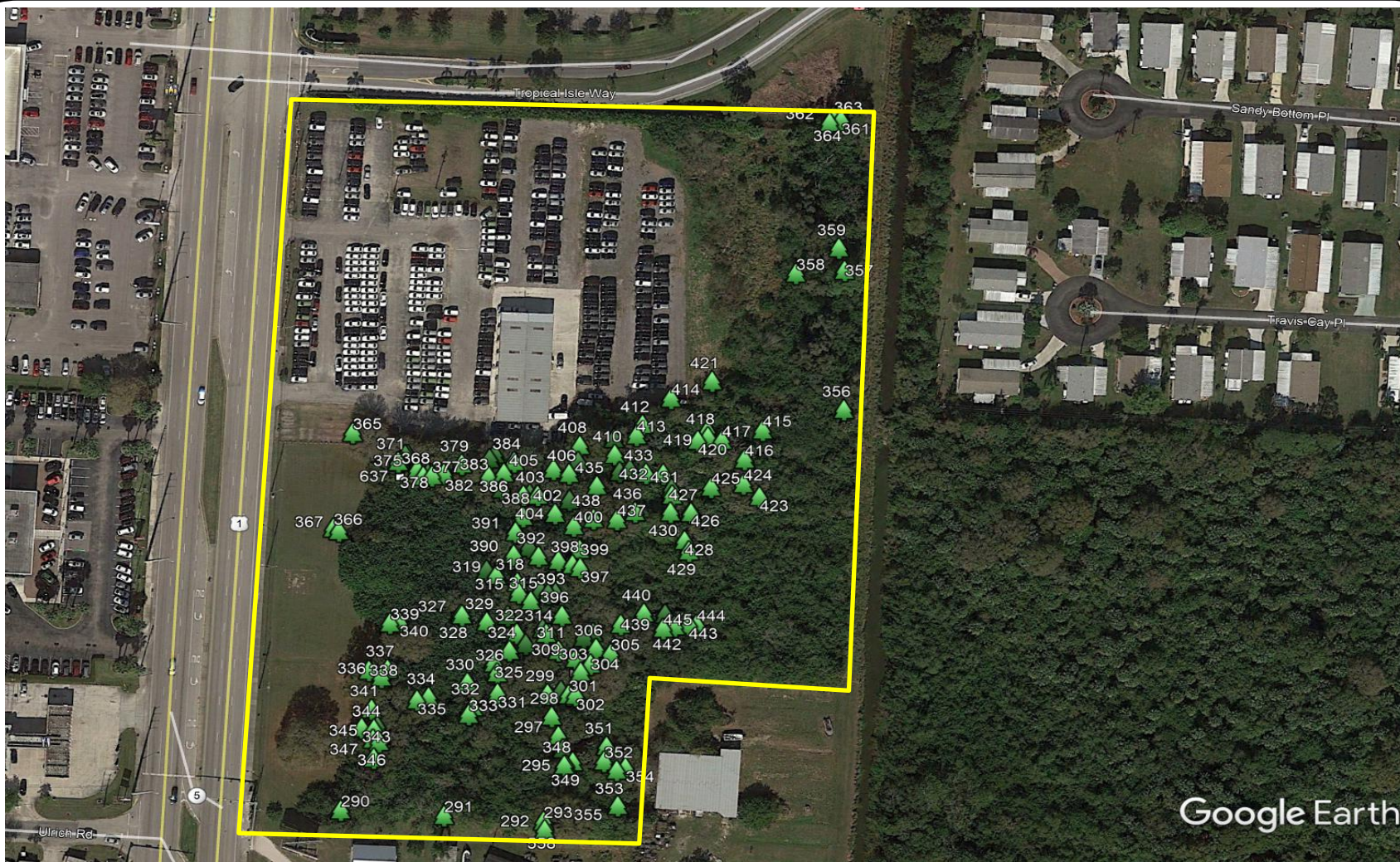
Soil Map

Map Source: Google Earth



**5560 S US HWY 1
Ft. Pierce, FL**

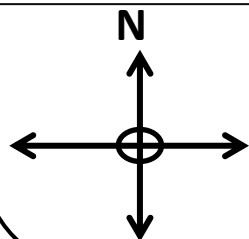




9/26/2020

Tree Survey Map

Map Source: Google Earth



5560 S US HWY 1
Ft. Pierce, FL





Tag No	Species	Size
290	Cabbage Palm	12'
291	Laurel Oak	28"
292	Cabbage Palm	10'
293	Laurel Oak	60"
294	Cabbage Palm	22'
295	Laurel Oak	16"
296	Cabbage Palm	13'
297	Laurel Oak	30"
298	Cabbage Palm	14'
299	Cabbage Palm	15'
300	Cabbage Palm	13'
301	Cabbage Palm	12'
302	Laurel Oak	28"
303	Laurel Oak	13"
304	Cabbage Palm	15'
305	Cabbage Palm	14'
306	Cabbage Palm	10'
307	Cabbage Palm	15'
308	Laurel Oak	14"
309	Laurel Oak	12"
310	Cabbage Palm	15'
311	Cabbage Palm	16'
312	Cabbage Palm	18'
313	Laurel Oak	24"
314	Cabbage Palm	18'
315	Cabbage Palm	18'
316	Cabbage Palm	16'
317	Laurel Oak	13"
318	Laurel Oak	18"
319	Cabbage Palm	20'
320	Cabbage Palm	22'
321	Cabbage Palm	11'
322	Laurel Oak	15"
323	Laurel Oak	12"
324	Laurel Oak	20"
325	Cabbage Palm	22'
326	Cabbage Palm	24'
327	Cabbage Palm	20'
328	Cabbage Palm	16'
329	Cabbage Palm	20'
330	Cabbage Palm	12'
331	Laurel Oak	12"
332	Cabbage Palm	21'
333	Cabbage Palm	23'
334	Cabbage Palm	23'
335	Laurel Oak	14"

336	Cabbage Palm	15'
337	Laurel Oak	40"
338	Cabbage Palm	14'
339	Laurel Oak	40"
340	Laurel Oak	20"
341	Laurel Oak	13"
342	Laurel Oak	30"
343	Laurel Oak	12"
344	Cabbage Palm	16'
345	Laurel Oak	12"
346	Cabbage Palm	18'
347	Cabbage Palm	22'
348	Cabbage Palm	17'
349	Cabbage Palm	16'
350	Cabbage Palm	16'
351	Laurel Oak	12"
352	Cabbage Palm	12'
353	Laurel Oak	14"
354	Laurel Oak	24"
355	Cabbage Palm	16'
356	Slash Pine	28"
357	Laurel Oak	12"
358	Cabbage Palm	14'
359	Cabbage Palm	17'
360	Cabbage Palm	18'
361	Slash Pine	18"
362	Slash Pine	15"
363	Laurel Oak	24"
364	Laurel Oak	30"
365	Cabbage Palm	18'
366	Cabbage Palm	20'
367	Cabbage Palm	17'
368	Laurel Oak	14"
369	Laurel Oak	32"
370	Cabbage Palm	14'
371	Cabbage Palm	14'
372	Laurel Oak	14"
373	Laurel Oak	16"
374	Laurel Oak	14"
375	Cabbage Palm	15'
376	Laurel Oak	14"
377	Cabbage Palm	16'
378	Laurel Oak	18"
379	Laurel Oak	12"
380	Laurel Oak	15"
381	Laurel Oak	14"
382	Laurel Oak	21"

383	Laurel Oak	44"
384	Laurel Oak	14"
385	Laurel Oak	14"
386	Cabbage Palm	18'
387	Cabbage Palm	16'
388	Laurel Oak	18"
389	Laurel Oak	16"
390	Laurel Oak	32"
391	Cabbage Palm	22'
392	Cabbage Palm	20'
393	Cabbage Palm	16'
394	Cabbage Palm	18'
395	Laurel Oak	14"
396	Laurel Oak	25"
397	Laurel Oak	16"
398	Cabbage Palm	23'
399	Cabbage Palm	21'
400	Cabbage Palm	18'
401	Cabbage Palm	18'
402	Cabbage Palm	20'
403	Cabbage Palm	17'
404	Laurel Oak	14"
405	Laurel Oak	22"
406	Laurel Oak	17"
407	Laurel Oak	48"
408	Laurel Oak	30"
409	Cabbage Palm	22'
410	Cabbage Palm	17'
411	Laurel Oak	24"
412	Cabbage Palm	17'
413	Laurel Oak	12"
414	Cabbage Palm	20'
415	Cabbage Palm	18'
416	Laurel Oak	34"
417	Cabbage Palm	23'
418	Cabbage Palm	21'
419	Cabbage Palm	20'
420	Cabbage Palm	16'
421	Cabbage Palm	22'
422	Cabbage Palm	16'
423	Laurel Oak	40"
424	Cabbage Palm	14'
425	Laurel Oak	13'
426	Cabbage Palm	16'
427	Cabbage Palm	17'
428	Cabbage Palm	17'
429	Cabbage Palm	15'

430	Cabbage Palm	15'
431	Cabbage Palm	1'
432	Cabbage Palm	15'
433	Cabbage Palm	10'
434	Laurel Oak	82"
435	Laurel Oak	14"
436	Laurel Oak	16"
437	Cabbage Palm	13'
438	Laurel Oak	36"
439	Cabbage Palm	17'
440	Cabbage Palm	17'
441	Cabbage Palm	18'
442	Cabbage Palm	18'
443	Cabbage Palm	15;
444	Cabbage Palm	18'
445	Live Oak Cluster	103"



Advanced Restoration Ecology

MEMORANDUM

TO: Bev Smith Kia

FROM: Drew Gatewood

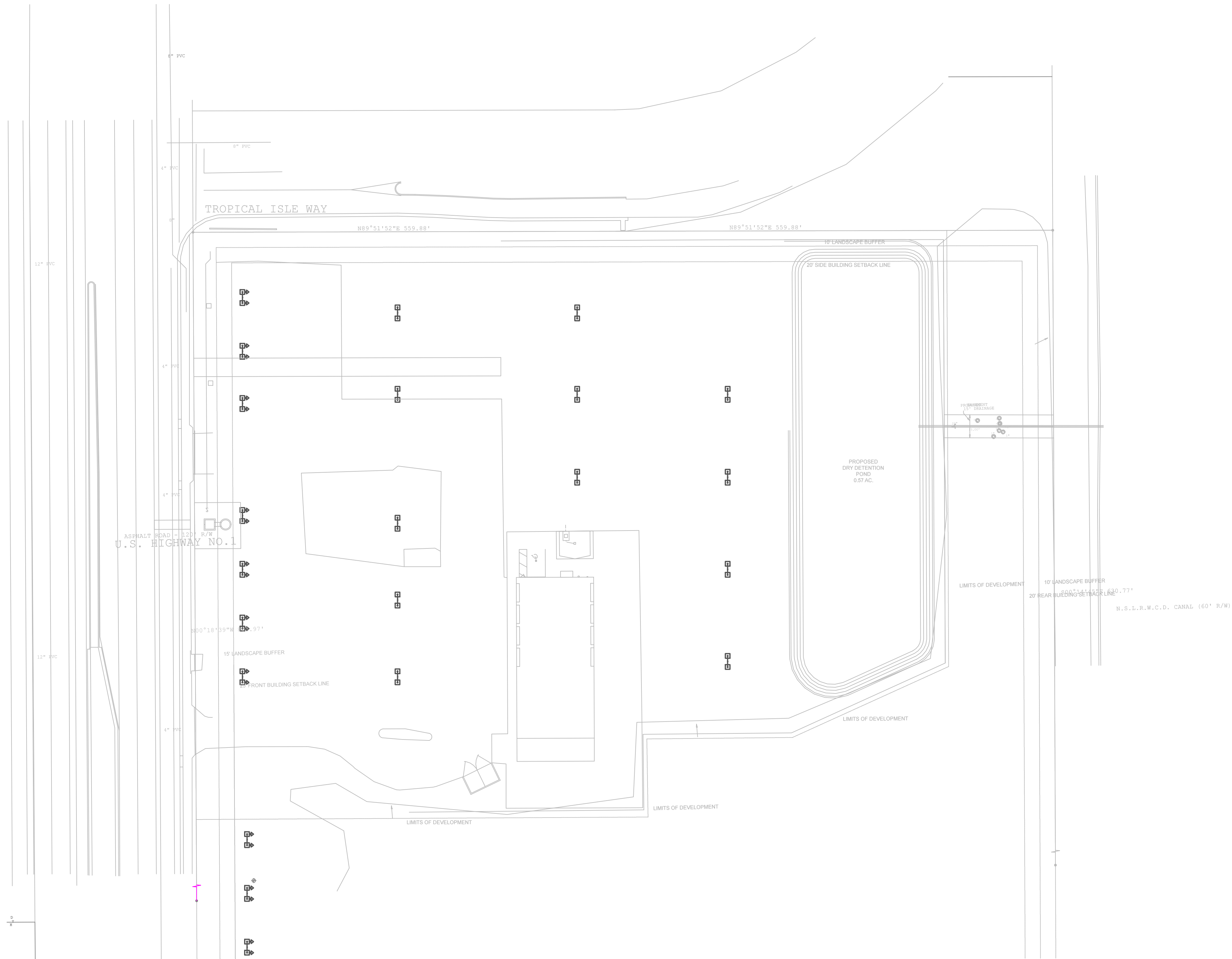
CC: File

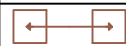
DATE: 12/16/2021

RE: 5560 S US Hwy 1

On December 16, 2021, Drew Gatewood, a Florida Fish and Wildlife Conservation Commission (FFWCC) Authorized Gopher Tortoise Agent with ARE performed a 100% gopher tortoise survey on the above referenced parcel. Pedestrian transects were completed in compliance with FFWCC requirements. The site is currently vacant land with proposed commercial construction planned. ARE did not find any evidence gopher tortoise burrows during the 100% survey on the parcel. The site has dense exotic content throughout it, preventing viable forage and habitat to support gopher tortoise populations. This survey is good for 90 days and should be submitted with your building and clearing application. Please be aware that any activity within 25' of a gopher tortoise burrow will require FFWCC authorization, and ARE should be notified if during the clearing or the property a gopher tortoise is observed. No other state or federally listed species were observed during the site visit.

Drew Gatewood, MS, PWS



Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Lumens	LLF	Description
	12	D	BACK-BACK	40566.1	1.000	GL3-40H-SRM-750
	14	A	D180	40566.1	1.000	GL3-40H-SRM-750

Calculation Summary							
Label	Calc Type	Units	Avg	Max	Min	Avg/Min	Max/Min
ADDED LOT	Illuminance	Fc	36.71	65.1	9.9	3.71	6.58
MAIN LOT	Illuminance	Fc	13.13	61.0	0.2	65.65	305.00

- DUE TO CHANGING LIGHTING ORDINANCES IT IS THE CONTRACTORS RESPONSIBILITY TO SUBMIT THE SITE PHOTOMETRICS AND LUMINAIRE SPECS TO THE LOCAL INSPECTOR BEFORE ORDERING TO ENSURE THIS PLAN COMPLIES WITH LOCAL LIGHTING ORDINANCES.

- THIS LIGHTING DESIGN IS BASED ON INFORMATION SUPPLIED BY OTHERS. CHANGES IN ELECTRICAL SUPPLY, AREA GEOMETRY AND OBJECTS WITHIN THE LIGHTED AREA MAY PRODUCE ILLUMINATION VALUES DIFFERENT FROM THE PREDICTED RESULTS SHOWN ON THIS LAYOUT.

- THIS LAYOUT IS BASED ON .IES FILES THAT WERE LAB TESTED OR COMPUTER GENERATED. ACTUAL RESULTS MAY VARY.

Project: Bev Smith KIA - Added Lot
Scale: 1" = 30'
Drawing Date: January 16, 2022

Wampler Lighting Group
83 High Avenue
Valley Head, AL 35989
256.996.2560

STORMWATER MANAGEMENT CALCULATIONS

for

BEV SMITH KIA - SITE IMPROVEMENTS

ST. LUCIE COUNTY, FLORIDA

December 2018

Revised January 2019

Revised July 2022

This item has been digitally signed & sealed by Aaron Stanton, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed & sealed and the signature must be verified on any electronic copies.

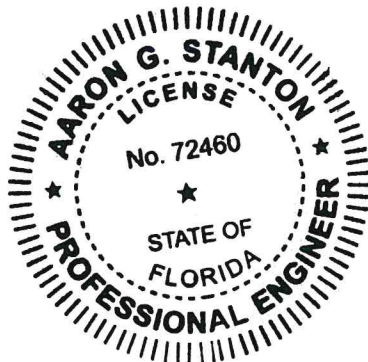
Prepared by: MBV Engineering, Inc.

1835 20th Street

Vero Beach, Florida 32960

772-569-0035

Certificate of Authorization #: 3728



Engineers Project #: 18-0251

Designed By: AGS

Mr. Aaron G. Stanton, P.E. #72460



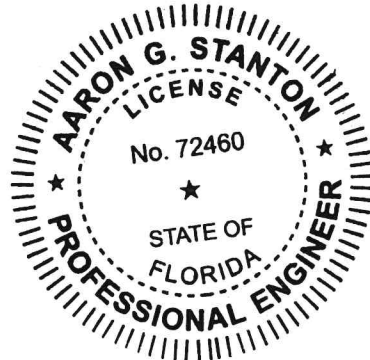
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A.2	Node Diagram
A.3	Input Report
A.4	Volumetric Drawdown from 10YR-72HR Storm Event
Attachment B	Nutrient Tables
B.1	Table 11.7-3
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Attachment E	Soils Map
Attachment F	FEMA Flood Zone Map
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Attachment H	Historical SFWMD ERP (The Groves of Fort Pierce, ERP # 56-00410-S)
Attachment I	Geotechnical Report by GFA

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Mr. Aaron G. Stanton, P.E. #72460

I. PURPOSE

The site has been used as an existing car storage lot for Bev Smith Kia. This project will proposed to add drainage improvements to bring the site into complaince with stormwater regulations. The purpose of this report is to provide St. Lucie County, SFWMD and the North St. Lucie River Water Control District (NSLRWCD) with calculations and documentation which demonstrates the proposed surface water management system complies with state and local criteria.

II. PROPOSED SYSTEM

The proposed surface water management system will consist of a dry detention basin with a retention component as required for nutrient and discharge control requirements. The site will be graded to flow to the detention basin via overland flow. The detention basin is designed to retain the required treatment volume and to provide attenuation for the 25 year - 24 hour storm and provide the required treatment volume drawdown per NSLRWCD criteria.

III. SITE DATA

Site Area	419,485 s.f.	9.630 acres												
Site Location:	5560 U.S. Highway 1 Fort Pierce, FL													
Site Soils:	<table><tr><th>Soil</th><th>Map Unit Sym</th><th>Class</th><th>Percentage</th></tr><tr><td>Nettles & Oldsmar</td><td>25</td><td>B/D</td><td>50%</td></tr><tr><td>Wabasso</td><td>48</td><td>B/D</td><td>50%</td></tr></table>	Soil	Map Unit Sym	Class	Percentage	Nettles & Oldsmar	25	B/D	50%	Wabasso	48	B/D	50%	
Soil	Map Unit Sym	Class	Percentage											
Nettles & Oldsmar	25	B/D	50%											
Wabasso	48	B/D	50%											
Flood Zone:	The subject property is located in Flood Zone 'X' per Flood Insurance Rate Map No. 12111C0277 J dated February 16, 2012. See Attachment F.													
Wet Season Water Table:	Based on a previously approved water table, under a SFWMD ERP for The Grove of Ft. Pierce, the water table is taken as 8.0 NGVD, which would convert to 6.5 NAVD. An excerpt of the permit can be found under Attachment H. The geotechnical report by GFA International, dated October 26, 2018 and included as Attachment I, estimated the wet season water table to be approximately 2 - 2.5 ft above the existing groundwater elevations taken. This would put the WSWT at approximately 8.7 NAVD on average for the site. Based on this information and using sound engineering practice, the WSWT for this design was taken as 8.0 NAVD . This was also the WSWT approved for Jeep-Alfa Romeo-Maserati dealership, directly to the south, that was approved by SFWMD on 4/10/18.													
Hydraulic Conductivity:	Two (2) exfiltration tests were taken and are listed in the geotechnical report dated October 26, 2018 done by GFA. The average of these two tests resulted in a K value of 1.66×10^{-4} cfs/ft² - ft head.													

IV. PRE-DEVELOPMENT CONDITIONS

Site Area	419,485 s.f.	9.630 acres	
Drainage Area	236,931 s.f.	5.439 acres	100.0%
Building Area	5,274 s.f.	.121 acres	2.2%
Parking, Asphalt	47,468 s.f.	1.090 acres	20.0%
Parking, Concrete	10,167 s.f.	.233 acres	4.3%
Covered Concrete Area	755 s.f.	.017 acres	0.3%
Parking, Millings	5,031 s.f.	.115 acres	2.1%
Parking, Stab. (rock & millings)	44,669 s.f.	1.025 acres	18.9%
Green Areas	123,567 s.f.	2.837 acres	52.2%
Total, Impervious	68,695 s.f.	1.577 acres	29.0%
Total Semi-Impervious	44,669 s.f.	1.025 acres	18.9%
Total Pervious	123,567 s.f.	2.837 acres	52.2%
			100.0%

Weighted Curve Number

% Impervious	29.0%
% Semi-Pervious	18.9%
% Pervious	52.2%
CN = [(% Impervious)(CN1) + (% Pervious)(CN2)]	

CN1 = 98	Type B Brush-Fair
CN2 = 88	
CN3 = 56	

TOTAL CN = 74.2

Time of Concentration

$$T_c = [0.007 (N \times L)^{0.8}] / [P^{0.5} \times S^{0.4}]$$

Sheet Flow

N = Mannings Roughness Coeff. =
L = Length of Flow (ft) =
Change in elevation =
P = Rainfall Intensity (in/hr)=
S = slope (ft/ft) =

0.400
300
1
5
0.0033

$$t_1 = \underline{\quad 84.7 \text{ min.} \quad}$$

$$T_c = [L] / [3600 \times V]$$

Shallow Concentrated Flow

Slope (ft/ft) =
L = Length of Flow (ft) =
V = Velocity (ft/s) (Fig 3-1) =

0.004
325
1.0

$$t_2 = \underline{\quad 5.3 \text{ min.} \quad}$$

Total Time of Concentration (Tc) 90.0 min.

V. POST-DEVELOPMENT CONDITIONS

A. NORTH BASIN

Site Area	419,485 s.f.	9.630 acres	
Drainage Area	174,855 s.f.	4.014 acres	100.0%
Building Area	5,274 s.f.	.121 acres	3.0%
Parking, Asphalt	102,684 s.f.	2.357 acres	58.7%
Parking, Concrete	10,167 s.f.	.233 acres	5.8%
Covered Concrete Area	755 s.f.	.017 acres	0.4%
Parking, Millings	5,031 s.f.	.115 acres	2.9%
Parking, Stab. (rock & millings)	s.f.	.000 acres	0.0%
Green Areas	50,944 s.f.	1.170 acres	29.1%
Total Impervious	123,911 s.f.	2.845 acres	70.9%
Total Semi.-Impervious	s.f.	.000 acres	0.0%
Total Pervious	50,944 s.f.	1.170 acres	29.1%
			100.0%

Weighted Curve Number

% Impervious	70.9%
% Semi-Pervious	0.0%
% Pervious	29.1%
CN = [(% Impervious)(CN1) + (% Pervious)(CN2)]	

CN1 = 98
CN2 = 88
CN3 = 56

Type B Brush-Fair

TOTAL CN = 85.8

Time of Concentration

$$T_c = [0.007 (N \times L)^{0.8}] / [P^{0.5} \times S^{0.4}]$$

Sheet Flow

N = Mannings Roughness Coeff. =
 L = Length of Flow (ft) =
 Change in elevation =
 P = Rainfall Intensity (in/hr)=
 S = slope (ft/ft) =

0.400
300
1
5

$$t_1 = \frac{0.0033}{84.7 \text{ min.}}$$

$$T_c = [L] / [3600 \times V]$$

Shallow Concentrated Flow

Slope (ft/ft) =
 L = Length of Flow (ft) =
 V = Velocity (ft/s) (Fig 3-1) =

0.004
325
1.0

$$t_2 = \frac{5.3 \text{ min.}}$$

Total Time of Concentration (Tc)

90.0 min.

B. SOUTH BASIN

Site Area	419,485 s.f.	9.630 acres	
Drainage Area	62,076 s.f.	1.425 acres	100.0%
Parking, Asphalt	29,484 s.f.	.677 acres	47.5%
Green Areas	32,592 s.f.	.748 acres	52.5%
Total Impervious	29,484 s.f.	.677 acres	47.5%
Total Semi.-Impervious	s.f.	.000 acres	0.0%
Total Pervious	32,592 s.f.	.748 acres	52.5%
			100.0%

Weighted Curve Number

% Impervious	47.5%
% Semi-Pervious	0.0%
% Pervious	52.5%

CN1 = 98
CN2 = 88
CN3 = 56

Type B Brush-Fair

$$CN = [(\% \text{ Impervious})(CN1) + (\% \text{ Pervious})(CN2)]$$

$$TOTAL \text{ CN} = 75.9$$

Time of Concentration

$$T_c = [0.007 (N \times L)^{0.8}] / [P^{0.5} \times S^{0.4}]$$

Sheet Flow

N = Mannings Roughness Coeff. =

L = Length of Flow (ft) =

Change in elevation =

P = Rainfall Intensity (in/hr)=

S = slope (ft/ft) =

0.013
120
0.8
5
0.0067

$$t_1 = \underline{\quad 2.0 \text{ min.} \quad}$$

Total Time of Concentration (Tc)

2.0 min. <-- (If <10min., use 10 min.)

VI. REQUIRED TREATMENT VOLUME

A. NORTH DRY POND BASIN

Total Contributing Area (ac) = 4.014 ac
Total Impervious Area (ac) = 2.845 ac
(impervious + 70% of semi-pervious)

		Vol.	
Required Treatment over site (in) =	1.0	0.335	ac-ft
Required Treatment over impervious area (in) =	2.50	0.593	ac-ft

Required Treatment Volume (Greater of 2 above) = 0.593 ac-ft
On-line Retention: Additional 0.5" over drainage area = 0.000 ac-ft
Additional 0.5" pretreatment for commercial/industrial sites = 0.167 ac-ft
Additional 50% for Discharge to OFW (*St. Lucie River*) = 0.296 ac-ft

Treatment Volume 1.056 ac-ft = 46,008 cf
If dry retention used, apply 50% reduction 0.528 ac-ft
Required Treatment Volume 0.528 ac-ft

Provided Treatment Volume 0.785 ac-ft

B. SOUTH DRY POND BASIN

Total Contributing Area (ac) = 1.425 ac
Total Impervious Area (ac) = 0.677 ac
(impervious + 70% of semi-pervious)

		Vol.	
Required Treatment over site (in) =	1.0	0.119	ac-ft
Required Treatment over impervious area (in) =	2.50	0.141	ac-ft

Required Treatment Volume (Greater of 2 above) = 0.141 ac-ft
On-line Retention: Additional 0.5" over drainage area = 0.000 ac-ft
Additional 0.5" pretreatment for commercial/industrial sites = 0.059 ac-ft
Additional 50% for Discharge to OFW (*St. Lucie River*) = 0.071 ac-ft

Treatment Volume 0.271 ac-ft = 11,800 cf
If dry retention used, apply 50% reduction 0.135 ac-ft
Required Treatment Volume 0.135 ac-ft

Provided Treatment Volume 0.224 ac-ft

VII. NUTRIENT CALCULATIONS

Pre-Development Mean Annual Loading of Total Phosphorus

Land Use Category	Mean Annual Total Phosphorus Load (kg/ac-yr) HSG B
Commercial (max. 80% imp.)	0.916
Open Land	0.017

Basin Impervious Area = 2.295 ac (semi-pervious counts as 70% of area towards impervious)
Basin Pervious Area = 3.144 ac

Pre-Development Total Phosphorus Load = 2.156 kg/yr

Post-Development Mean Annual Loading of Total Phosphorus

Land Use Category	Mean Annual Total Phosphorus Load (kg/ac-yr) HSG B
Commercial (max. 80% imp.)	0.916
Open Land	0.017

A. NORTH DRY POND BASIN

Basin Impervious Area = 2.845 ac
Basin Pervious Area = 1.170 ac

Post-Development Total Phosphorus Load = 2.626 kg/yr

B. SOUTH BASIN

Basin Impervious Area = 0.677 ac
Basin Pervious Area = 0.748 ac

Post-Development Total Phosphorus Load = 0.633 kg/yr

Required Removal Efficiency for Total Phosphorus

$$\frac{\text{Post Phosphorus} - \text{Pre Phosphorus}}{\text{Post Phosphorus}} = 34\%$$

Proposed Removal Efficiency for Total Phosphorus

Total Site Development Area = 5.439 ac
Total Pond Volume = 1.009 ac-ft
Inches of Retention for Site = 2.23 inches
$$\text{Proposed Dry Detention Pond w/ 2.25" retention Depth (Table 11.7-23)} = 94\%$$

VIII. PROPOSED TREATMENT VOLUME

A. NORTH DRY POND BASIN

Stage (ft)	Area (s.f.) Area (ac)		Incremental		Cumulative	
			Incremental Volume (c.f.)	Volume (ac-ft)	Cumulative Volume (c.f.)	Volume (ac-ft)
bot. of pond = 9.00	21,063	0.484	0	0.000	0	0.000
9.50	22,207	0.510	10,817	0.248	10,817	0.248
10.00	23,377	0.537	11,396	0.262	22,214	0.510
top of bank = 10.50	24,572	0.564	11,987	0.275	34,201	0.785
perimeter berm = 11.00	26,370	0.605	12,736	0.292	46,936	1.078

TV Vol = 10.03	0.528
----------------	-------

B. SOUTH BASIN

Stage (ft)	Area (s.f.) Area (ac)		Incremental		Cumulative	
			Incremental Volume (c.f.)	Volume (ac-ft)	Cumulative Volume (c.f.)	Volume (ac-ft)
bot. of pond = 9.50	1,742	0.040	0	0.000	0	0.000
10.00	2,483	0.057	1,056	0.024	1,056	0.024
11.00	4,040	0.093	3,262	0.075	4,318	0.099
top of bank = 12.00	6,827	0.157	5,434	0.125	9,751	0.224
perimeter berm = 13.00	17,500	0.402	12,164	0.279	21,915	0.503

TV Vol = 11.01	0.135
----------------	-------

IX. ALLOWABLE VOLUME TO DRAW DOWN

North St. Lucie River Water Control District (NSLRWCD) allows 2" over 24 hours to be discharged into its canals from a site.

Allowable Discharge Rate (2"/day) = 0.91 ac-ft
Actual Discharge Volume =

0.99

 cf (over greatest 24 hr period)

The ICPR model for NSLRWCD drainage system indicates Basin SE-260 is 18.31 acres. According to the ICPR model provided by the District, the existing peak discharge for a 10-year 72-hour storm is 66.36 cfs. Therefore, the pre-development pro-rated discharge for the 4.014 acres is 14.55 cfs. See Attachment H for basin map for NSLRWCD drainage system.

X. SUMMARY

The controlling discharge event is NSLRWCD's rule of 2" of discharge over a 24 period for the 10yr-72hr storm event, which yields a maximum allowable discharge volume of 29, 143 cf into their canal over any given 24 hour period. Therefore, the mean annual and 25yr-24hr pre-development discharges were not summarized here.

The post-development stages and discharges summarized below are in compliance with SFWMD and St. Lucie County regulations for stormwater systems.

STORM EVENTS

MEAN ANNUAL (5.0")

Basin-Site	Peak Discharge (CFS)	Peak Stage (NAVD)
PRE	--	--
POST-N. Pond	0.09	10.19
POST-S. Pond	0	11.27

10YR-24HR (6.0")

Basin-Site	Peak Discharge (CFS)	Peak Stage (NAVD)
PRE	--	--
POST-N. Pond	0.24	10.49
POST-S. Pond	0	11.57

10YR-72HR (9.0")

Basin-Site	Peak Discharge (CFS)	Peak Stage (NAVD)
PRE	14.55**	--
POST-N. Pond	1.76	11.02
POST-S. Pond	0	12.09

25YR-72HR (10.0")

Basin-Site	Peak Discharge (CFS)	Peak Stage (NAVD)
PRE	--	--
POST-N. Pond	2.65	11.07
POST-S. Pond	0	12.29

100YR-72HR (12.0")

Basin-Site	Peak Discharge (CFS)	Peak Stage (NAVD)
PRE	--	--
POST-N. Pond	4.5	11.15
POST-S. Pond	0	12.65

** pro-rated discharge from NSLRWCD model

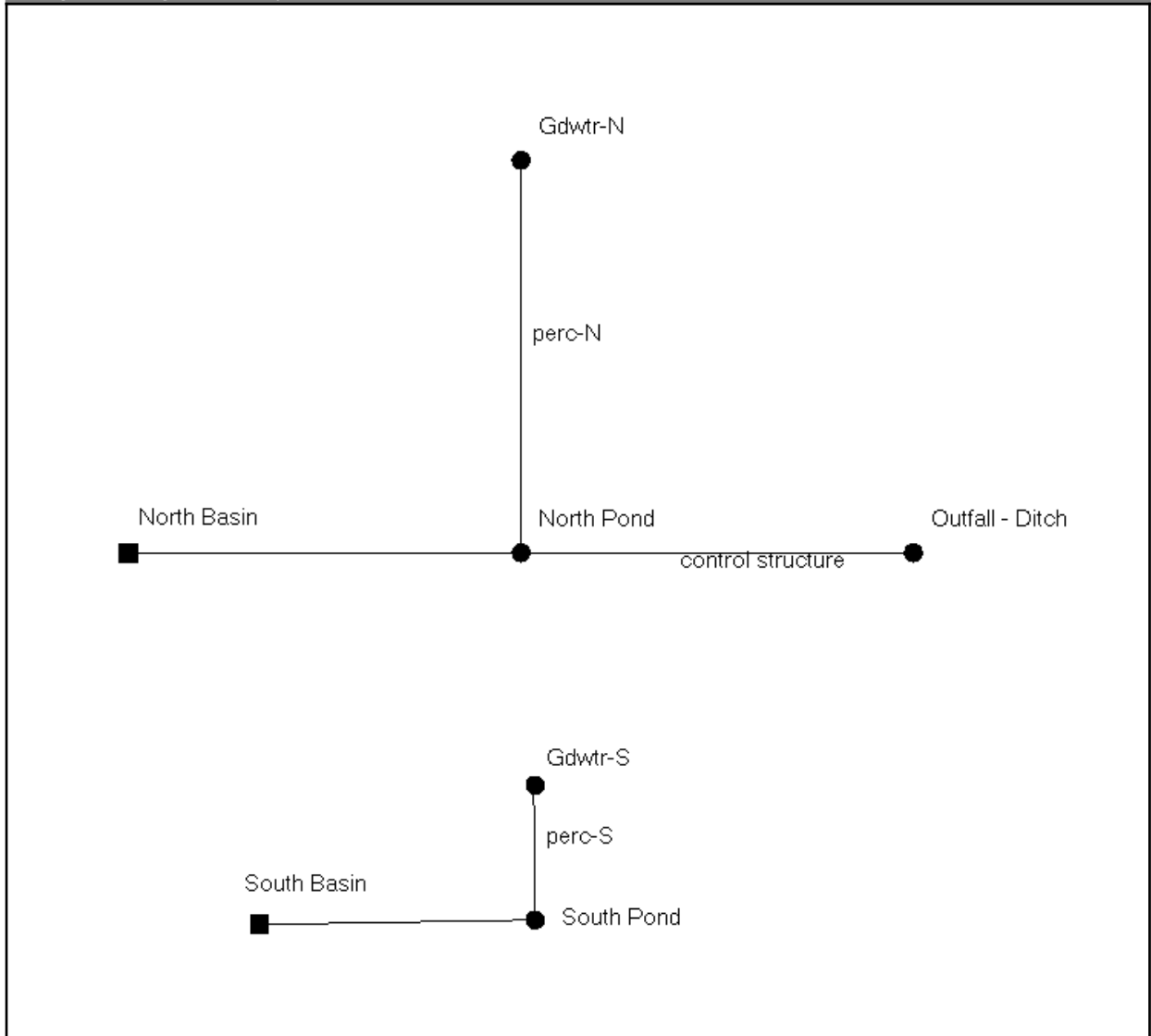
Attachment A

- A.1 Node Max Report
- A.2 Node Diagram
- A.3 Input Report
- A.4 Volumetric Drawdown from 10YR-72HR Storm Event

Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Gdwtr-N	100yr-72hr	8.10	8.00	0.0000	0.48	0.00	0
Gdwtr-S	100yr-72hr	8.10	8.00	0.0000	1.38	0.00	0
North Pond	100yr-72hr	11.00	11.15	0.0010	6.35	4.88	26310
Outfall - Ditch	100yr-72hr	10.00	8.00	0.0000	4.50	0.00	0
South Pond	100yr-72hr	13.00	12.65	0.0010	7.28	1.38	13172
Gdwtr-N	10yr-24hr	8.10	8.00	0.0000	2.82	0.00	0
Gdwtr-S	10yr-24hr	8.10	8.00	0.0000	1.14	0.00	0
North Pond	10yr-24hr	11.00	10.49	0.0010	3.58	2.82	24533
Outfall - Ditch	10yr-24hr	10.00	8.00	0.0000	0.24	0.00	0
South Pond	10yr-24hr	13.00	11.57	0.0010	4.26	1.14	6896
Gdwtr-N	10yr-72hr	8.10	8.00	0.0000	0.42	0.00	0
Gdwtr-S	10yr-72hr	8.10	8.00	0.0000	1.30	0.00	0
North Pond	10yr-72hr	11.00	11.02	0.0010	4.63	2.09	26310
Outfall - Ditch	10yr-72hr	10.00	8.00	0.0000	1.76	0.00	0
South Pond	10yr-72hr	13.00	12.09	0.0010	5.33	1.30	9375
Gdwtr-N	25yr-72hr	8.10	8.00	0.0000	0.46	0.00	0
Gdwtr-S	25yr-72hr	8.10	8.00	0.0000	1.30	0.00	0
North Pond	25yr-72hr	11.00	11.07	0.0010	5.20	3.01	26310
Outfall - Ditch	25yr-72hr	10.00	8.00	0.0000	2.65	0.00	0
South Pond	25yr-72hr	13.00	12.29	0.0010	5.98	1.30	10739
Gdwtr-N	mean annual	8.10	8.00	0.0000	2.70	0.00	0
Gdwtr-S	mean annual	8.10	8.00	0.0000	0.92	0.00	0
North Pond	mean annual	11.00	10.19	0.0010	2.80	2.70	23813
Outfall - Ditch	mean annual	10.00	8.00	0.0000	0.09	0.00	0
South Pond	mean annual	13.00	11.27	0.0010	3.36	0.92	5535

Background Image: Nodal Map



Manual Basin: North Basin

Scenario: Scenario1
 Node: North Pond
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 90.0000 min
 Max Allowable Q: 999999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: Uh256
 Peaking Factor: 256.0
 Area: 4.0140 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
4.0140	Site	B	

Comment:

Manual Basin: South Basin

Scenario: Scenario1
 Node: South Pond
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 999999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 1.4250 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
1.4250	Site	B	

Comment:

Node: Gdwtr-N

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 8.00 ft
 Warning Stage: 8.10 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	8.00
0	0	0	24.0000	8.00
0	0	0	360.0000	8.00

Comment:

Node: Gdwtr-S

Scenario: Scenario1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 8.00 ft
Warning Stage: 8.10 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	8.00
0	0	0	24.0000	8.00
0	0	0	360.0000	8.00

Comment:

Node: North Pond

Scenario: Scenario1
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 9.00 ft
Warning Stage: 11.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
9.00	0.00	0
9.50	0.25	10890
10.00	0.51	22390
10.50	0.79	34238
11.00	1.08	46958

Comment:

Node: Outfall - Ditch

Scenario: Scenario1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 8.00 ft
Warning Stage: 10.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	8.00
0	0	0	24.0000	8.00
0	0	0	360.0000	8.00

Comment:

Node: South Pond

Scenario: Scenario1
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 9.50 ft
 Warning Stage: 13.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
9.50	0.00	0
10.00	0.02	1045
11.00	0.10	4312
12.00	0.22	9757
13.00	0.50	21911

Comment:

Drop Structure Link: control structure		Upstream Pipe	Downstream Pipe
Scenario:	Scenario1	Invert: 7.40 ft	Invert: 7.00 ft
From Node:	North Pond	Manning's N: 0.0120	Manning's N: 0.0120
To Node:	Outfall - Ditch	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 1.25 ft	Max Depth: 1.25 ft
Flow Direction:	Both	Bottom Clip	
Solution:	Combine	Default: 0.00 ft	Default: 0.00 ft
Increments:	10	Op Table:	Op Table:
Pipe Count:	1	Ref Node:	Ref Node:
Damping:	0.0000 ft	Manning's N: 0.0000	Manning's N: 0.0000
Length:	120.00 ft	Top Clip	
FHWA Code:	29	Default: 0.00 ft	Default: 0.00 ft
Entr Loss Coef:	0.70	Op Table:	Op Table:
Exit Loss Coef:	1.00	Ref Node:	Ref Node:
Bend Loss Coef:	0.00	Manning's N: 0.0000	Manning's N: 0.0000
Bend Location:	0.00 dec		
Energy Switch:	Energy		

Pipe Comment:

Weir Component

Weir: 1
 Weir Count: 1
 Bottom Clip
 Default: 0.00 ft

Weir Flow Direction: Both
 Damping: 0.0000 ft
 Weir Type: Sharp Crested Vertical
 Geometry Type: Rectangular
 Invert: 10.00 ft
 Control Elevation: 10.00 ft
 Max Depth: 0.25 ft
 Max Width: 0.33 ft
 Fillet: 0.00 ft

Op Table:

Ref Node:

Top Clip

Default: 0.00 ft

Op Table:

Ref Node:

Discharge Coefficients

Weir Default: 3.200

Weir Table:

Orifice Default: 0.600

Orifice Table:

Weir Comment:

Weir Component

Weir: 2
 Weir Count: 1
 Weir Flow Direction: Both
 Damping: 0.0000 ft
 Weir Type: Horizontal
 Geometry Type: Rectangular
 Invert: 10.90 ft
 Control Elevation: 10.90 ft
 Max Depth: 3.08 ft
 Max Width: 2.00 ft
 Fillet: 0.00 ft

Bottom Clip

Default: 0.00 ft

Op Table:

Ref Node:

Top Clip

Default: 0.00 ft

Op Table:

Ref Node:

Discharge Coefficients

Weir Default: 3.200

Weir Table:

Orifice Default: 0.600

Orifice Table:

Weir Comment:

Drop Structure Comment:

Percolation Link: perc-N

Scenario: Scenario1
 From Node: North Pond
 To Node: Gdwtr-N
 Link Count: 1
 Flow Direction: Both
 Aquifer Base Elevation: 0.00 ft
 Water Table Elevation: 8.00 ft
 Annual Recharge Rate: 0 ipy
 Horizontal Conductivity: 28.680 fpd
 Vertical Conductivity: 14.340 fpd
 Fillable Porosity: 0.400
 Layer Thickness: 1.00 ft

Surface Area Option: User Specified

Bottom Elevation: 9.00 ft

Surface Area: 0.4850 ac

Vertical Flow Termination: Horizontal Flow Algorithm

Perimeter 1: 604.00 ft

Perimeter 2: 836.00 ft

Perimeter 3: 1814.00 ft

Distance P1 to P2: 50.00 ft

Distance P2 to P3: 250.00 ft

of Cells P1 to P2: 10

of Cells P2 to P3: 25

Comment:

Percolation Link: perc-S

Scenario:	Scenario1	Surface Area Option:	Vary Based on Stage/Area Table
From Node:	South Pond	Vertical Flow Termination:	Horizontal Flow Algorithm
To Node:	Gdwtr-S	Perimeter 1:	807.00 ft
Link Count:	1	Perimeter 2:	1083.00 ft
Flow Direction:	Both	Perimeter 3:	1791.00 ft
Aquifer Base Elevation:	0.00 ft	Distance P1 to P2:	50.00 ft
Water Table Elevation:	8.00 ft	Distance P2 to P3:	250.00 ft
Annual Recharge Rate:	0 ipy	# of Cells P1 to P2:	10
Horizontal Conductivity:	28.680 fpd	# of Cells P2 to P3:	250
Vertical Conductivity:	14.340 fpd		
Fillable Porosity:	0.400		
Layer Thickness:	1.50 ft		

Comment:

Simulation: 100yr-72hr

Scenario: Scenario1
Run Date/Time: 7/28/2022 9:41:53 PM
Program Version: ICPR4 4.07.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set: Site

Green-Ampt Set:

Vertical Layers Set:

Impervious Set: Site

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight 0.5 dec

Fact:

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Global
Opt:

Rainfall Name: ~SFWMD-72

Rainfall Amount: 12.00 in

Storm Duration: 72.0000 hr

Dflt Damping (1D): 0.0050 ft

Min Node Srf Area 100 ft2

(1D):

Energy Switch (1D): Energy

Comment:

Simulation: 10yr-24hr

Scenario: Scenario1

Run Date/Time: 7/28/2022 9:42:35 PM

Program Version: ICPR4 4.07.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set: Site

Green-Ampt Set:

Vertical Layers Set:

Impervious Set: Site

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight 0.5 dec

Fact:

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Global
Opt:

Rainfall Name: ~FLMOD

Rainfall Amount: 6.00 in

Storm Duration: 24.0000 hr

Dflt Damping (1D): 0.0050 ft

Min Node Srf Area 100 ft2

(1D):

Energy Switch (1D): Energy

Comment:

Simulation: 10yr-72hr

Scenario: Scenario1
 Run Date/Time: 7/28/2022 9:42:48 PM
 Program Version: ICPR4 4.07.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:
 Extern Hydrograph Set:
 Curve Number Set: Site

 Green-Ampt Set:
 Vertical Layers Set:
 Impervious Set: Site

Tolerances & Options

Time Marching: SAOR
 Max Iterations: 6
 Over-Relax Weight 0.5 dec
 Fact:
 dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr

 Smp/Man Basin Rain Global

Max dZ: 1.0000 ft
 Link Optimizer Tol: 0.0001 ft
 Edge Length Option: Automatic

Opt:

Rainfall Name: ~SFWMD-72
 Rainfall Amount: 9.00 in
 Storm Duration: 72.0000 hr
 Dflt Damping (1D): 0.0050 ft
 Min Node Srf Area 100 ft2
 (1D):
 Energy Switch (1D): Energy

Comment:

Simulation: 25yr-72hr

Scenario: Scenario1
 Run Date/Time: 7/28/2022 9:43:03 PM
 Program Version: ICPR4 4.07.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000
	Hydrology [sec]	Surface Hydraulics [sec]		
Min Calculation Time:	60.0000	0.1000		
Max Calculation Time:		30.0000		

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources	Lookup Tables
Rainfall Folder:	Boundary Stage Set:
Unit Hydrograph Folder:	Extern Hydrograph Set:
	Curve Number Set: Site
	Green-Ampt Set:
	Vertical Layers Set:
	Impervious Set: Site

Tolerances & Options			
Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight	0.5 dec		
Fact:			
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain	Global
		Opt:	
Max dZ:	1.0000 ft	Rainfall Name:	~SFWMD-72
Link Optimizer Tol:	0.0001 ft	Rainfall Amount:	10.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area	100 ft2
		(1D):	
		Energy Switch (1D):	Energy

Comment:

Simulation: mean annual

Scenario: Scenario1
Run Date/Time: 7/28/2022 9:43:45 PM
Program Version: ICPR4 4.07.00

General				
Run Mode:	Normal			
	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000
	Hydrology [sec]	Surface Hydraulics [sec]		
Min Calculation Time:	60.0000	0.1000		
Max Calculation Time:		30.0000		

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Site

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Site

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight 0.5 dec
Fact:
dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Global
Opt:

Rainfall Name: ~FLMOD
Rainfall Amount: 5.00 in
Storm Duration: 24.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 100 ft2
(1D):
Energy Switch (1D): Energy

Comment:

2"/ac/24hrs

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]	Total Inflow Volume [ft3]
Scenario1	10yr-72hr	Outfall - Ditch	0.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	1.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	2.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	3.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	4.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	5.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	6.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	7.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	8.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	9.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	10.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	11.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	12.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	13.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	14.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	15.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	16.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	17.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	18.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	19.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	20.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	21.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	22.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	23.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	24.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	25.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	26.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	27.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	28.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	29.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	30.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	31.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	32.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	33.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	34.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	35.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	36.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	37.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	38.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	39.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	40.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	41.0027	8.00	0

2"/ac/24hrs

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]	Total Inflow Volume [ft3]
Scenario1	10yr-72hr	Outfall - Ditch	42.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	43.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	44.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	45.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	46.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	47.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	48.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	49.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	50.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	51.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	52.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	53.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	54.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	55.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	56.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	57.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	58.0015	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	59.0027	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	60.0001	8.00	0
Scenario1	10yr-72hr	Outfall - Ditch	61.0012	8.00	88
Scenario1	10yr-72hr	Outfall - Ditch	62.0006	8.00	985
Scenario1	10yr-72hr	Outfall - Ditch	63.0067	8.00	3517
Scenario1	10yr-72hr	Outfall - Ditch	64.0067	8.00	9638
Scenario1	10yr-72hr	Outfall - Ditch	65.0067	8.00	15065
Scenario1	10yr-72hr	Outfall - Ditch	66.0067	8.00	19378
Scenario1	10yr-72hr	Outfall - Ditch	67.0067	8.00	22627
Scenario1	10yr-72hr	Outfall - Ditch	68.0067	8.00	25038
Scenario1	10yr-72hr	Outfall - Ditch	69.0067	8.00	26872
Scenario1	10yr-72hr	Outfall - Ditch	70.0067	8.00	28279
Scenario1	10yr-72hr	Outfall - Ditch	71.0067	8.00	29533
Scenario1	10yr-72hr	Outfall - Ditch	72.0067	8.00	30770
Scenario1	10yr-72hr	Outfall - Ditch	73.0067	8.00	31988
Scenario1	10yr-72hr	Outfall - Ditch	74.0067	8.00	33182
Scenario1	10yr-72hr	Outfall - Ditch	75.0067	8.00	34340
Scenario1	10yr-72hr	Outfall - Ditch	76.0067	8.00	35454
Scenario1	10yr-72hr	Outfall - Ditch	77.0067	8.00	36522
Scenario1	10yr-72hr	Outfall - Ditch	78.0067	8.00	37541
Scenario1	10yr-72hr	Outfall - Ditch	79.0067	8.00	38508
Scenario1	10yr-72hr	Outfall - Ditch	80.0067	8.00	39422
Scenario1	10yr-72hr	Outfall - Ditch	81.0067	8.00	40282
Scenario1	10yr-72hr	Outfall - Ditch	82.0067	8.00	41088
Scenario1	10yr-72hr	Outfall - Ditch	83.0067	8.00	41840

2"/ac/24hrs

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]	Total Inflow Volume [ft3]
Scenario1	10yr-72hr	Outfall - Ditch	84.0067	8.00	42536
Scenario1	10yr-72hr	Outfall - Ditch	85.0067	8.00	43177
Scenario1	10yr-72hr	Outfall - Ditch	86.0067	8.00	43756
Scenario1	10yr-72hr	Outfall - Ditch	87.0067	8.00	44260
Scenario1	10yr-72hr	Outfall - Ditch	88.0067	8.00	44691
Scenario1	10yr-72hr	Outfall - Ditch	89.0067	8.00	45057
Scenario1	10yr-72hr	Outfall - Ditch	90.0067	8.00	45367
Scenario1	10yr-72hr	Outfall - Ditch	91.0067	8.00	45630
Scenario1	10yr-72hr	Outfall - Ditch	92.0067	8.00	45852
Scenario1	10yr-72hr	Outfall - Ditch	93.0067	8.00	46040
Scenario1	10yr-72hr	Outfall - Ditch	94.0067	8.00	46198
Scenario1	10yr-72hr	Outfall - Ditch	95.0067	8.00	46329
Scenario1	10yr-72hr	Outfall - Ditch	96.0067	8.00	46439
Scenario1	10yr-72hr	Outfall - Ditch	97.0067	8.00	46528
Scenario1	10yr-72hr	Outfall - Ditch	98.0067	8.00	46601
Scenario1	10yr-72hr	Outfall - Ditch	99.0067	8.00	46659

Allowable Discharge - 2"/ac/24-hr for NSLRWCD

Post			
Time	Cumulative CF	Cumulative Acre-Feet	24 Hour Volume Discharge Acre-Feet
0	0	0.00	
1	0	0.00	
2	0	0.00	
3	0	0.00	
4	0	0.00	
5	0	0.00	
6	0	0.00	
7	0	0.00	
8	0	0.00	
9	0	0.00	
10	0	0.00	
11	0	0.00	
12	0	0.00	
13	0	0.00	
14	0	0.00	
15	0	0.00	
16	0	0.00	
17	0	0.00	
18	0	0.00	
19	0	0.00	
20	0	0.00	
21	0	0.00	
22	0	0.00	
23	0	0.00	
24	0	0.00	0.00
25	0	0.00	0.00
26	0	0.00	0.00
27	0	0.00	0.00
28	0	0.00	0.00
29	0	0.00	0.00
30	0	0.00	0.00
31	0	0.00	0.00
32	0	0.00	0.00
33	0	0.00	0.00
34	0	0.00	0.00
35	0	0.00	0.00
36	0	0.00	0.00
37	0	0.00	0.00

5.44 (ac) development area
0.91 (ac-ft) max allow. discharge
0.99 (ac-ft) max discharge

Allowable Discharge - 2"/ac/24-hr for NSLRWCD

38	0	0.00	0.00
39	0	0.00	0.00
40	0	0.00	0.00
41	0	0.00	0.00
42	0	0.00	0.00
43	0	0.00	0.00
44	0	0.00	0.00
45	0	0.00	0.00
46	0	0.00	0.00
47	0	0.00	0.00
48	0	0.00	0.00
49	0	0.00	0.00
50	0	0.00	0.00
51	0	0.00	0.00
52	0	0.00	0.00
53	0	0.00	0.00
54	0	0.00	0.00
55	0	0.00	0.00
56	0	0.00	0.00
57	0	0.00	0.00
58	0	0.00	0.00
59	0	0.00	0.00
60	0	0.00	0.00
61	88	0.00	0.00
62	985	0.02	0.02
63	3517	0.08	0.08
64	9638	0.22	0.22
65	15065	0.35	0.35
66	19378	0.44	0.44
67	22627	0.52	0.52
68	25038	0.57	0.57
69	26872	0.62	0.62
70	28279	0.65	0.65
71	29533	0.68	0.68
72	30770	0.71	0.71
73	31988	0.73	0.73
74	33182	0.76	0.76
75	34340	0.79	0.79
76	35454	0.81	0.81
77	36522	0.84	0.84
78	37541	0.86	0.86
79	38508	0.88	0.88
80	39422	0.91	0.91
81	40282	0.92	0.92

Allowable Discharge - 2"/ac/24-hr for NSLRWCD

82	41088	0.94	0.94
83	41840	0.96	0.96
84	42536	0.98	0.98
85	43177	0.99	0.99
86	43756	1.00	0.98
87	44260	1.02	0.94
88	44691	1.03	0.80
89	45057	1.03	0.69
90	45367	1.04	0.60
91	45630	1.05	0.53
92	45852	1.05	0.48
93	46040	1.06	0.44
94	46198	1.06	0.41
95	46329	1.06	0.39
96	46439	1.07	0.36
97	46528	1.07	0.33
98	46601	1.07	0.31
99	46659	1.07	0.28

0.99

Appendix B

Nutrient Tables

B.1 Table 11.7-3

B.2 Table 11.7-23

Attachment B.1

TABLE 11.7-3

MEAN ANNUAL LOADINGS OF TOTAL PHOSPHORUS FOR LAND USE TYPES IN THE LAKE APOPKA HYDROLOGIC BASIN

LAND USE CATEGORY	MEAN ANNUAL TOTAL PHOSPHORUS LOAD (kg/ac-yr)			
	HSG A	HSG B	HSG C	HSG D
Low-Density Residential (max. 15% impervious)	0.069	0.135	0.215	0.284
Single-Family Residential (max. 25% impervious)	0.227	0.286	0.383	0.465
Single-Family Residential (max. 40% impervious)	0.250	0.333	0.446	0.536
Multi-Family Residential (max. 65% impervious)	1.082	1.156	1.257	1.336
Commercial (max. 80% impervious)	0.899	0.916	0.943	0.964
Highway – max. 50% impervious	0.710	0.756	0.817	0.871
Highway – max. 75% impervious	1.053	1.076	1.106	1.133
Agriculture – Pasture	0.026	0.118	0.239	0.347
Agriculture – Crops, Ornamentals, Nurseries	0.040	0.180	0.366	0.531
Agriculture – Groves	0.007	0.036	0.079	0.123
Open Land/Recreational/Fallow Groves and Cropland	0.004	0.017	0.035	0.051
Forests/Abandoned Tree Crops	0.004	0.021	0.045	0.070

HSG = Hydrologic Soil Group

Attachment B.2

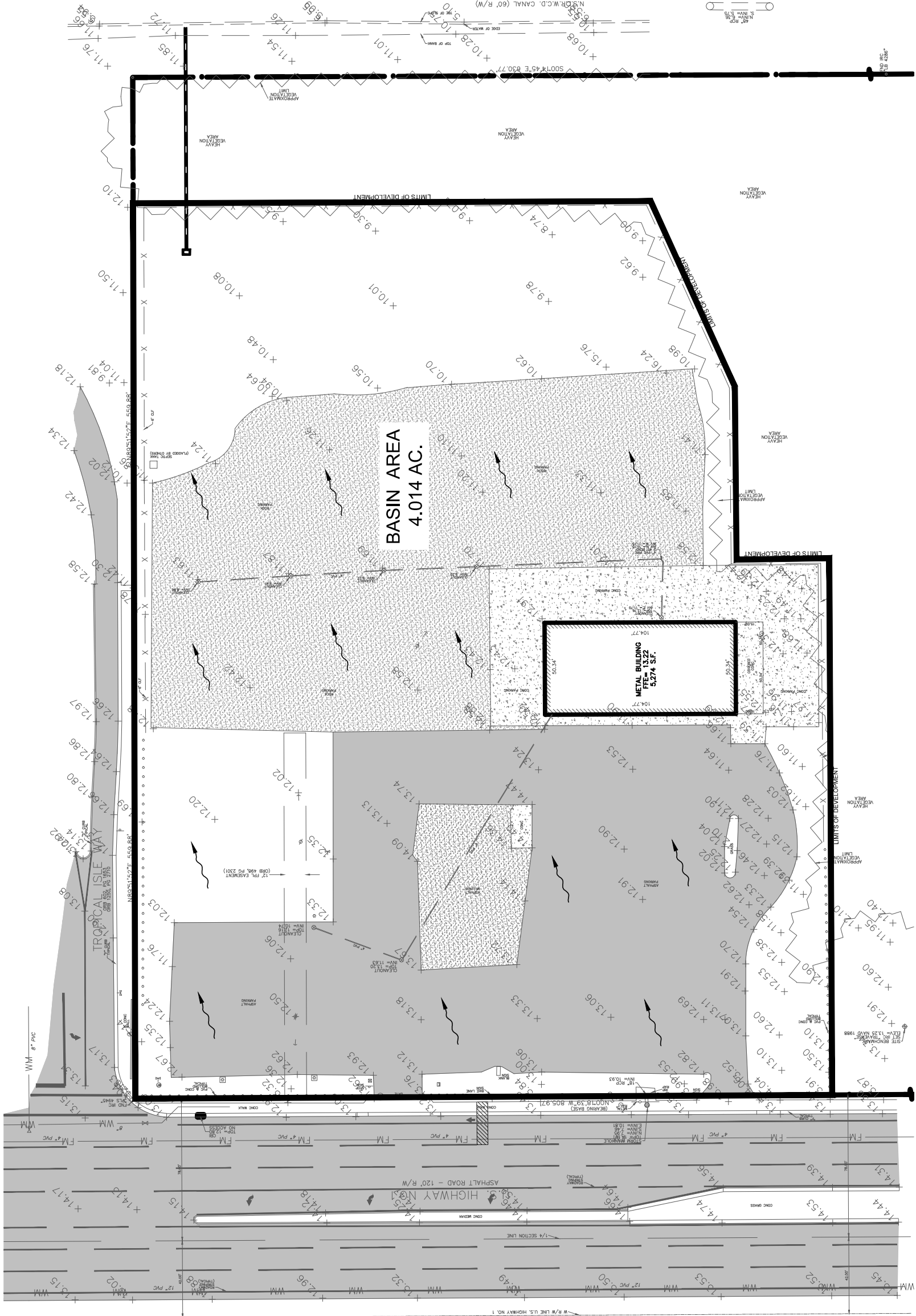
Table 11.7-23

**Removal Efficiencies for Total Phosphorus Using Various
Treatment Options in Commercial (max. 80% impervious)
for Hydrologic Soil Group B**

Retention Depth (inches)	Annual Total P Removal (%)			
	Dry Retention ¹	Retention / Wet Detention ²		
		t _d =7 days	t _d =14 days	t _d =21 days
0.25	41	73	77	79
0.50	63	83	86	87
0.75	74	88	90	91
1.00	81	92	93	93
1.25	87	94	95	95
1.50	89	95	96	96
1.75	92	96	97	97
2.00	93	97	97	98
2.25	94	97	98	98
2.50	95	98	98	98
2.75	96	98	98	99
3.00	97	98	99	99
3.25	97	99	99	99
3.50	97	99	99	99
3.75	98	99	99	99
4.00	98	99	99	99

1. Dry retention alone.
2. Dry retention followed by wet detention with various residence times.

Attachment C
Pre-Development Basin Map



LEGEND

- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING ASPHALT MILLINGS
- PROPOSED ASPHALT

SITE DATA

SITE ADDRESS

5560 SOUTH U.S. HIGHWAY #1
FORT PIERCE, FLORIDA 34982

TAX PARCEL I.D. NUMBER(S)

3403-502-0302-000-4

ZONING

CG

LAND USE

COM

GRAPHIC SCALE



(IN FEET)
1 inch = 60 ft.



PRE-DEVELOPMENT BASIN MAP

SCALE: 1" = 60'



1835 20TH STREET
VERO BEACH, FL 32960
PH. (772) 569-0035
FX. (772) 778-3617
MELBOURNE FL - PH (321) 253-1510
FT. PIERCE, FL - PH (772) 468-9055

NOVA BOWLES VILLAMIZAR & ASSOCIATES
CONSULTING ENGINEERING CA 45728

ST. LUCIE COUNTY

FLORIDA

PRE-DEVELOPMENT
BASIN MAP

BEV SMITH KIA

SHEET

C

DATE

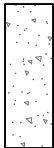
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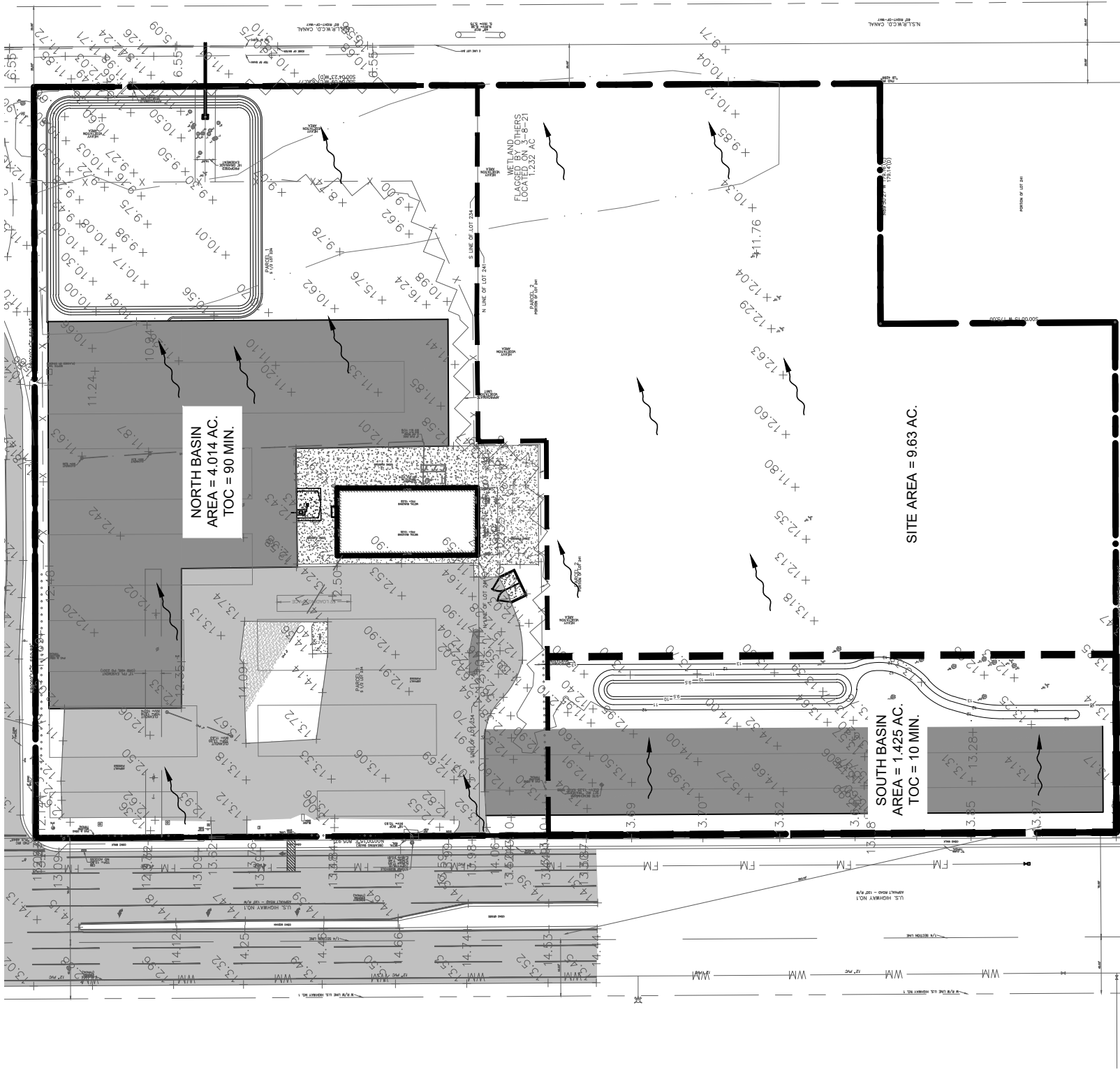
REVISIONS

DATE	JOB NO.	18-0251
DESIGNED	AS	
DRAWN	GWR	
DATE	12/4/2018	
CHECKED	AS	
DATE ISSUED	12-4-2018	

Attachment D
Post-Development Basin Map

LEGEND

-  EXISTING CONCRETE
-  EXISTING ASPHALT
-  EXISTING ASPHALT MILLINGS
-  PROPOSED ASPHALT
-  PROPERTY BOUNDARY
-  BASIN BOUNDARY
-  STORMWATER FLOW DIRECTION



POST-DEVELOPMENT BASIN MAP

GRAPHIC SCALE

0

100

200

(IN FEET)

1 inch = 100 ft.

REVISIONS		DATE

MBV

ENGINEERING INC.

MOA BOWLES WILLIAMS & ASSOCIATES

CONSULTING ENGINEERING CA 93728

1835 20TH STREET

VERO BEACH, FL 32960

PH. (772) 569-0035

F.X. (772) 778-3617

MELBOURNE, FL - PH (321) 253-1510

FT. PIERCE, FL - PH (772) 468-9055

JOB NO.	18-0251
DESIGNED	AS
DRAWN	GWR
DATE	7/29/2022
CHECKED	AS
DATE ISSUED	12-4-2018

ST. LUCIE COUNTY

BEV SMITH KIA

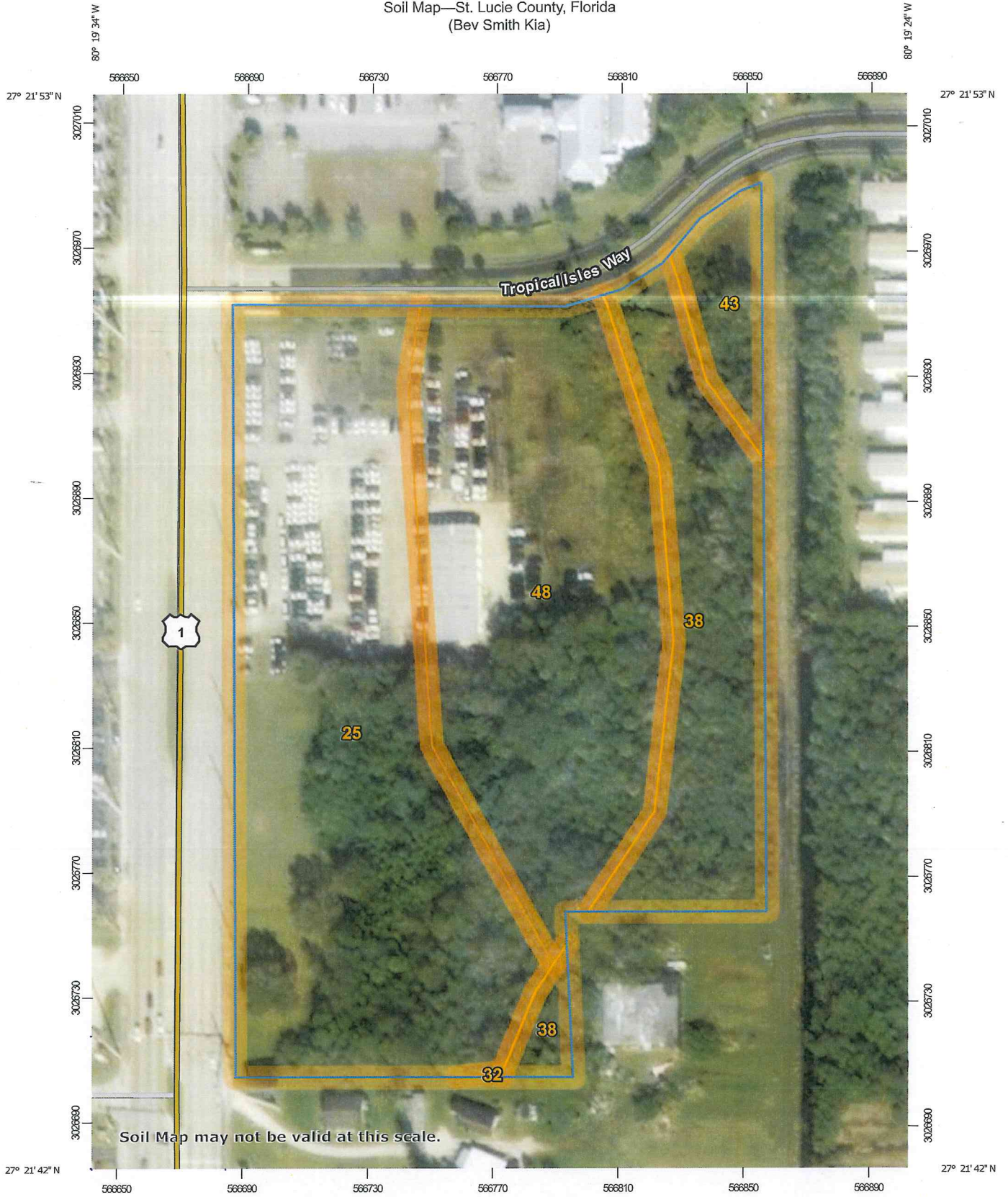
FLORIDA

POST-DEVELOPMENT BASIN MAP		SHEET
		D
		DATE
		18-0251

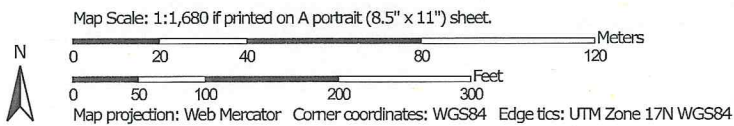
Attachment E
Soils Map

Attachment E

Soil Map—St. Lucie County, Florida
(Bev Smith Kia)



Soil Map may not be valid at this scale.



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

11/20/2018
Page 1 of 3

Soil Map—St. Lucie County, Florida
(Bev Smith Kia)

MAP LEGEND

Area of Interest (AOI)		Spoil Area
Area of Interest (AOI)		Stony Spot
Soils		Very Stony Spot
Soil Map Unit Polygons		Wet Spot
Soil Map Unit Lines		Other
Soil Map Unit Points		Special Line Features
Special Point Features		
Blowout	Water Features	Streams and Canals
Borrow Pit	Transportation	
Clay Spot	Rails	
Closed Depression	Interstate Highways	
Gravel Pit	US Routes	
Gravelly Spot	Major Roads	
Landfill	Local Roads	
Lava Flow	Background	
Marsh or swamp	Aerial Photography	
Mine or Quarry		
Miscellaneous Water		
Perennial Water		
Rock Outcrop		
Saline Spot		
Sandy Spot		
Severely Eroded Spot		
Sinkhole		
Slide or Slip		
Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: St. Lucie County, Florida
Survey Area Data: Version 11, Sep 17, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Dec 15, 2017

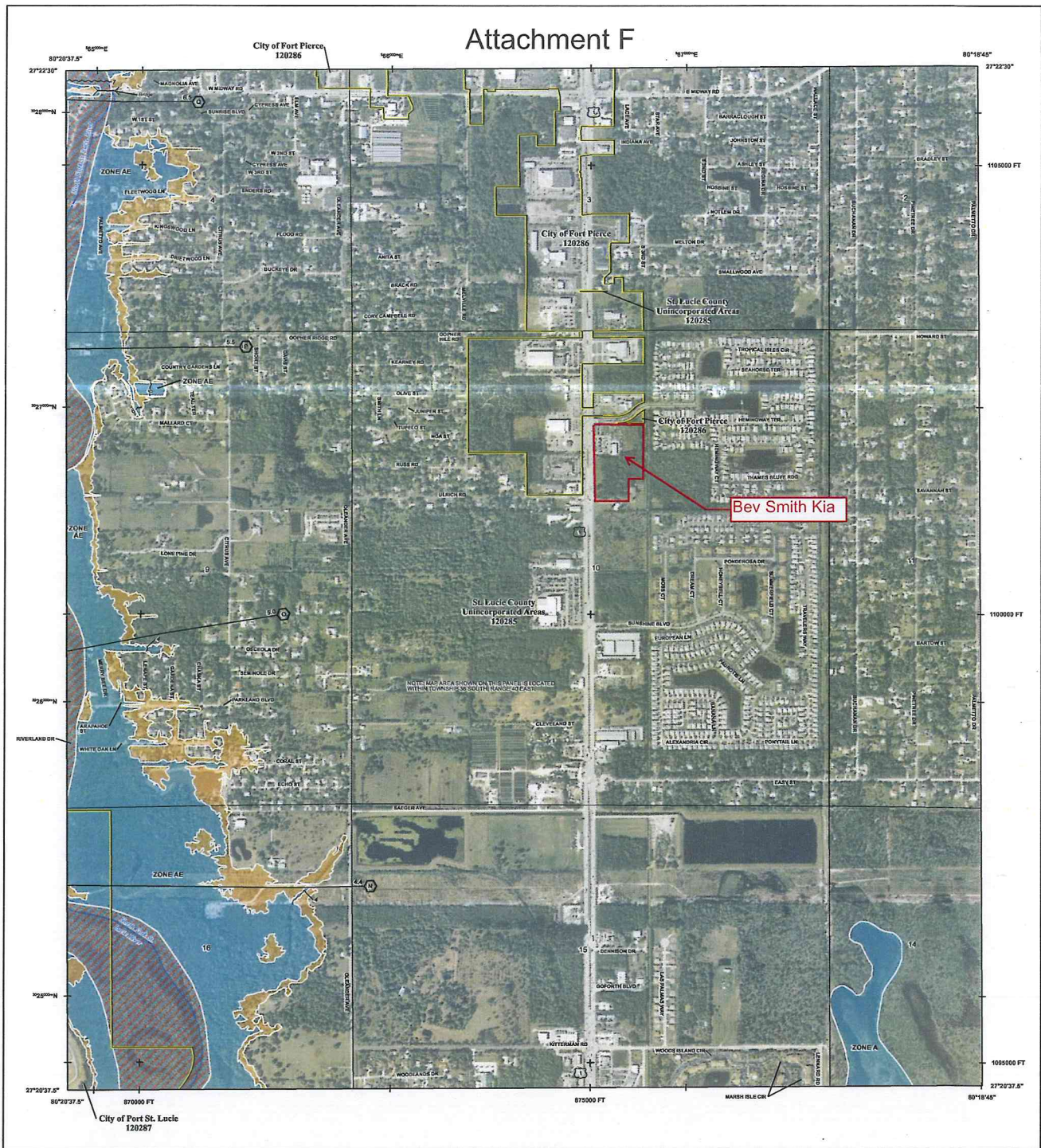
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
25	Nettles and Oldsmar sands	4.3	43.9%
32	Pineda sand, 0 to 2 percent slopes	0.0	0.0%
38	Riviera fine sand, 0 to 2 percent slopes	1.8	18.1%
43	Susanna and Wauchula sands	0.4	4.0%
48	Wabasso sand, 0 to 2 percent slopes	3.3	33.9%
Totals for Area of Interest		9.8	100.0%

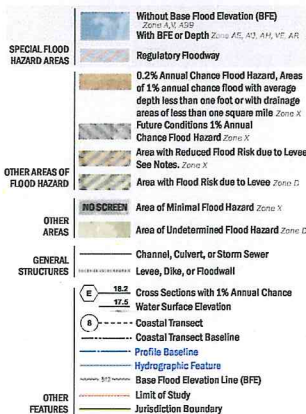
Attachment F
FEMA Flood Zone Map

Attachment F



FLOOD HAZARD INFORMATION

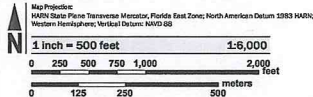
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)



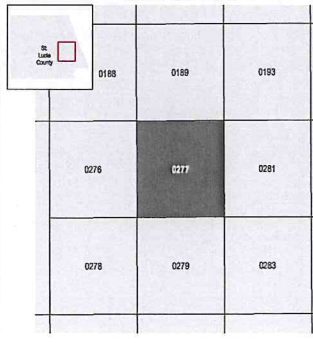
NOTES TO USERS

For information and questions about the Flood Insurance Rate Map (FIRM), available products associated with the FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please visit the FEMA Map Information Center at 1-877-FEMA-MAP (1-877-368-6277) or visit the FEMA Flood Map Service Center website at www.fema.gov/floodmap.
Flood Insurance Rate Map (FIRM) panels are available in digital format as well as in hard copy. The digital format is available in the form of a PDF file. The hard copy is available in the form of a map sheet. The digital format is available in the form of a PDF file. The hard copy is available in the form of a map sheet.
For community and countywide map data refer to 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 1-800-637-6622.
Base map information shown on the FIRM was provided in digital format by the St. Lucie County Planning and Development Services Department, dated 2016; the Florida Department of Transportation, dated 2016; the Bureau of Land Management, dated 2004; the U.S. Fish and Wildlife Service, dated 2010; and the U.S. Department of Agriculture Farm Service Agency, dated 2015.

SCALE



PANEL LOCATOR



FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ST. LUCIE COUNTY, FLORIDA

Unincorporated Areas

PANEL 277 of 420

COMMUNITY	NUMBER	PANEL	SUFFIX
PORT WICK, CITY OF	120186	0277	K
PORT ST. LUCIE, CITY OF	120187	0277	K
ST. LUCIE COUNTY	120188	0277	K

PRELIMINARY
6/22/2017

VERSION NUMBER
2.3.3.2
MAP NUMBER
12111C0277K
MAP REVISED

Attachment G
Rainfall Maps

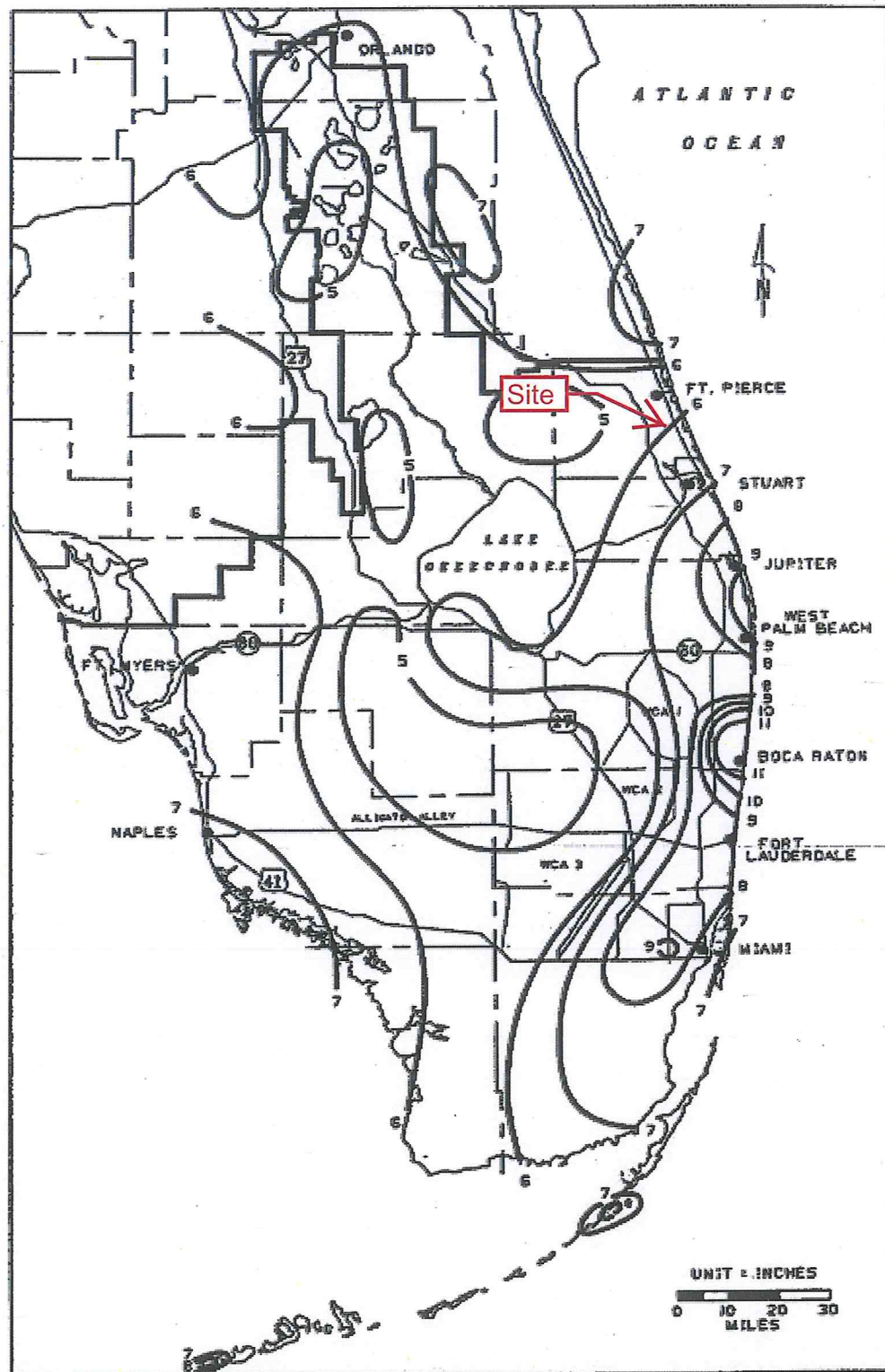


FIGURE C-4. 1-DAY RAINFALL: 10-YEAR RETURN PERIOD

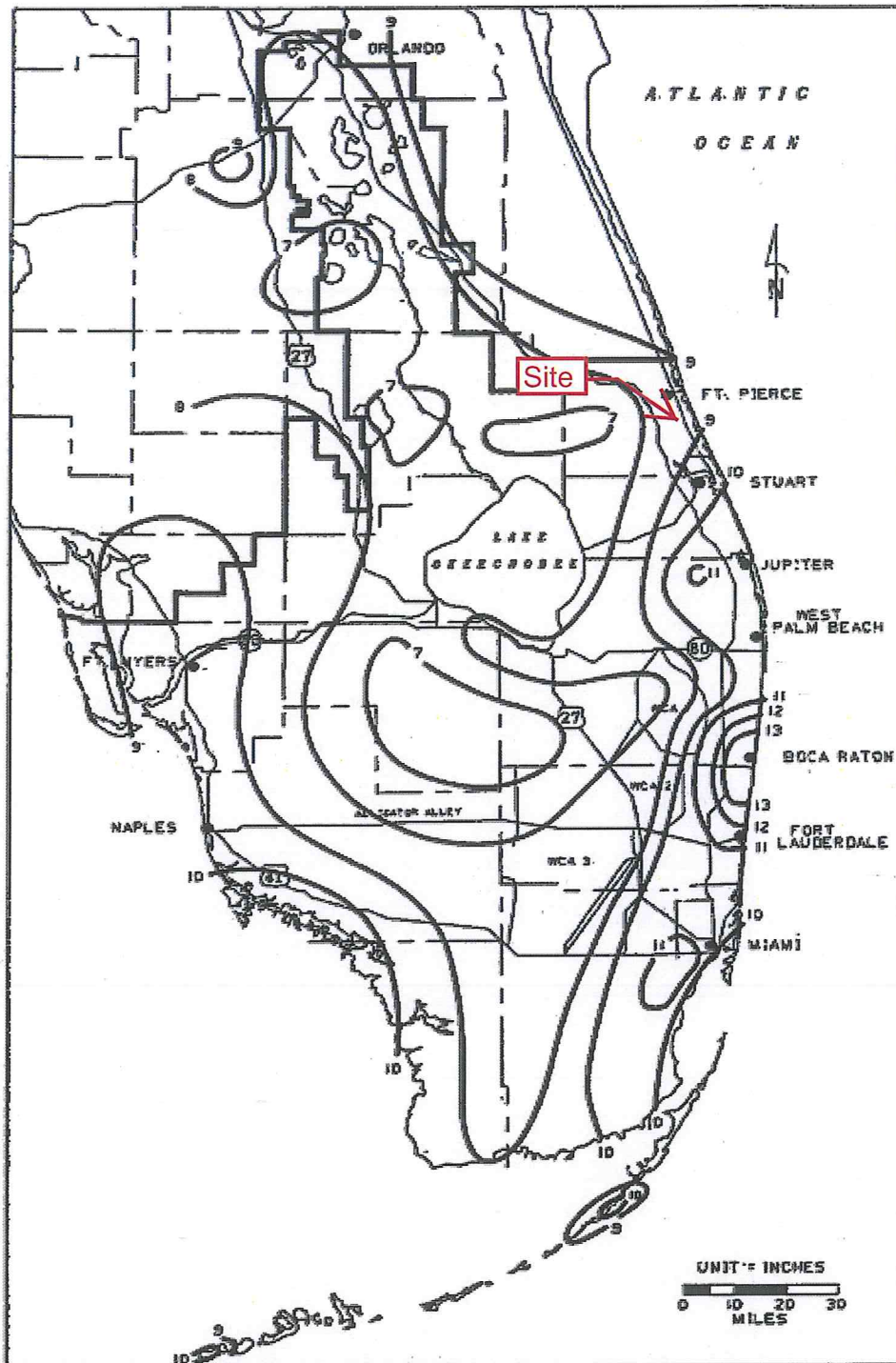


FIGURE C-7. 3-DAY RAINFALL: 10-YEAR RETURN PERIOD

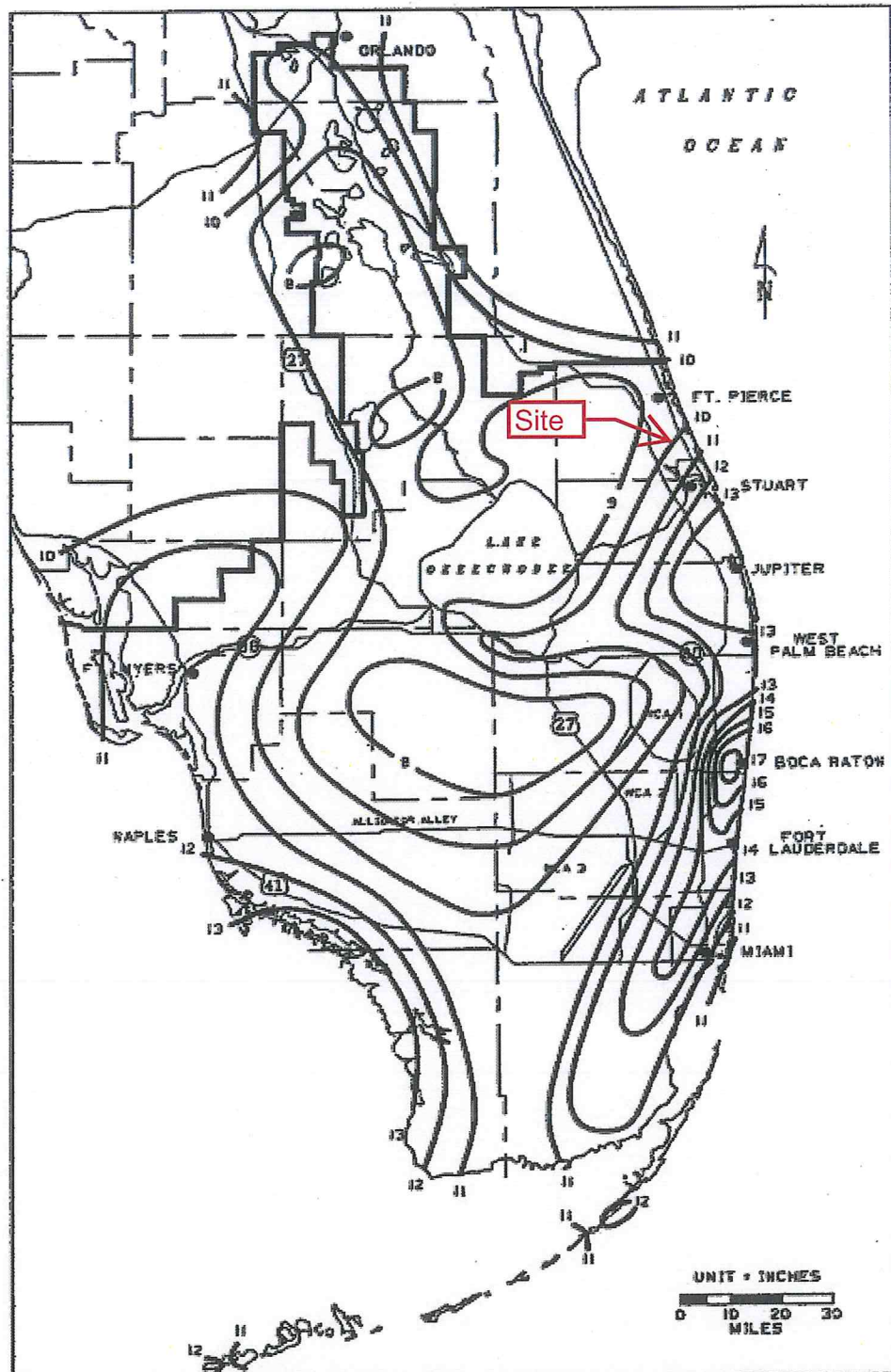


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

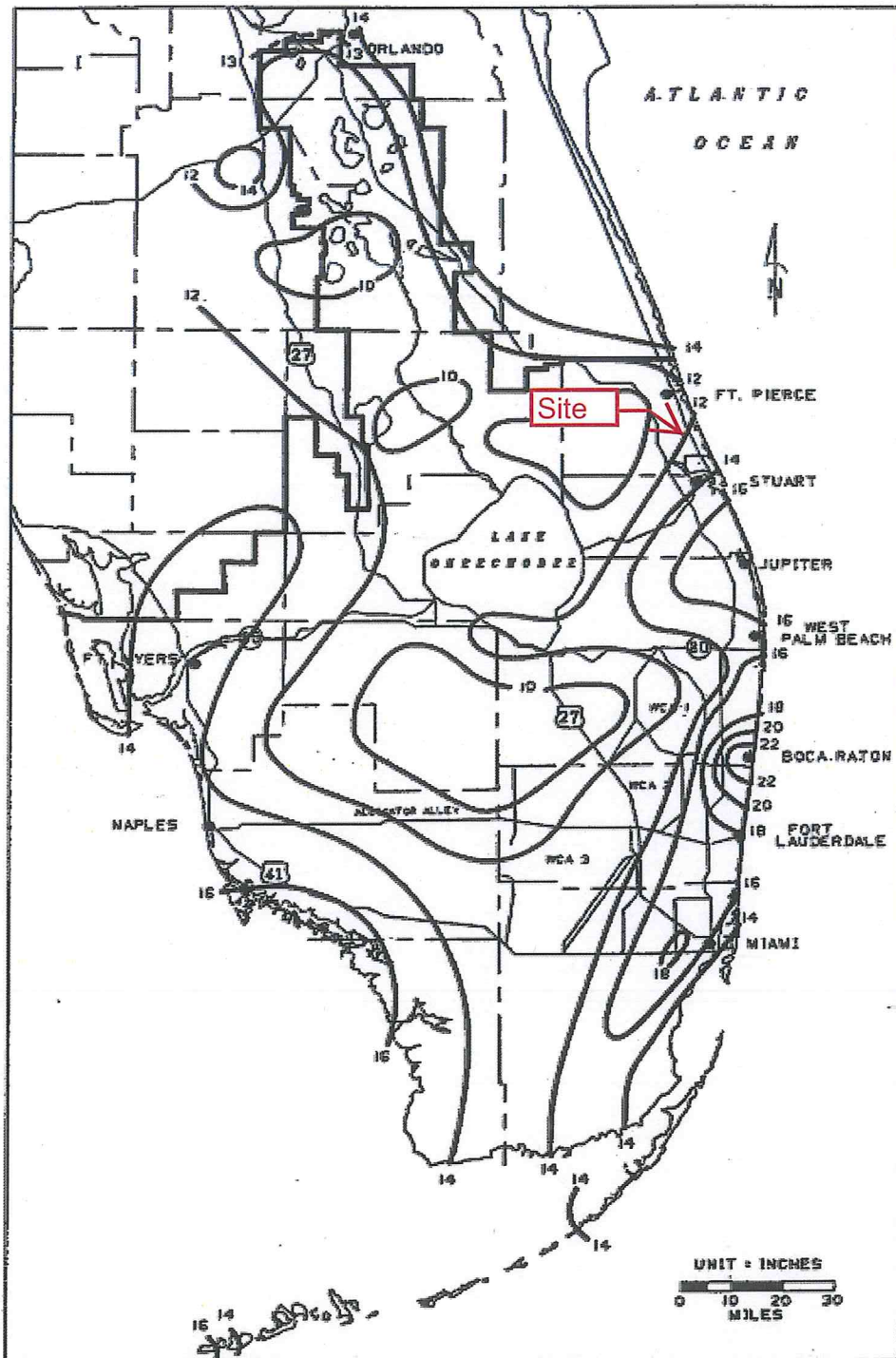


FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

Attachment H

Historical SFWMD ERP (The Groves of Fort Pierce, ERP # 56-00410-S)

BASINSUM.TXT			
BASIN	QMX (cfs)	TMX (hrs)	VOL (in) NOTES
SE-160	9.96	60.03	5.83
SE-170	19.47	60.48	4.47
SE-180	31.66	60.02	6.81 US1 FRONTAGE
SE-190	8.94	60.57	5.57
SE-200	11.36	60.24	4.59

BASIN NAME	SE-210	SE-220	SE-230	SE-240	SE-250
NODE NAME	SE-210	SE-220	SE-230	C17-60	C17-70S
UNIT HYDROGRAPH	UH256	UH256	UH256	UH256	UH256
PEAKING FACTOR	256.	256.	256.	256.	256.
RAINFALL FILE	SFWMD72	SFWMD72	SFWMD72	SFWMD72	SFWMD72
RAIN AMOUNT (in)	9.00	9.00	9.00	9.00	9.00
STORM DURATION (hrs)	72.00	72.00	72.00	72.00	72.00
AREA (ac)	123.87	4.81	5.41	9.30	6.22
CURVE NUMBER	65.00	76.00	77.00	77.00	70.00
DCIA (%)	.00	.00	.00	.00	.00
TC (mins)	60.00	10.00	23.30	13.40	15.20
LAG TIME (hrs)	.00	.00	.00	.00	.00
BASIN STATUS	ONS	ONS	ONS	ONS	ONS

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
SE-210	138.99	60.53	4.72	THE GROVE COMMUNITY 56-00410-S
SE-220	16.46	60.02	6.07	
SE-230	13.22	60.11	6.19	
SE-240	29.19	60.03	6.19	
SE-250	16.76	60.06	5.33	

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
Copyright 1989, Streamline Technologies, Inc.

C23 ADDITIONAL WEIR
5/19/09 P:\74-0901\US1 POND\VER-07B

BASIN NAME	SE-255	SE-260	SE-270	SE-280	SW-10
NODE NAME	SE-255	C21-10	SE-270	SE-280	SW-10
UNIT HYDROGRAPH	UH256	UH256	UH256	UH256	UH256
PEAKING FACTOR	256.	256.	256.	256.	256.
RAINFALL FILE	SFWMD72	SFWMD72	SFWMD72	SFWMD72	SFWMD72
RAIN AMOUNT (in)	9.00	9.00	9.00	9.00	9.00
STORM DURATION (hrs)	72.00	72.00	72.00	72.00	72.00
AREA (ac)	4.25	18.31	8.90	8.33	55.42
CURVE NUMBER	90.00	81.00	77.00	77.00	65.00
DCIA (%)	.00	.00	.00	.00	.00
TC (mins)	10.00	10.00	54.20	28.30	13.80
LAG TIME (hrs)	.00	.00	.00	.00	.00
BASIN STATUS	ONSITE	ONS	ONS	ONS	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
SE-255	16.52	60.02	7.79	CUTTING EDGE SELF STORAGE, 56-01815
SE-260	66.36	60.02	6.69	
SE-270	13.14	60.46	6.19	
SE-280	18.33	60.18	6.19	
SW-10	141.55	60.04	4.71	



Form #0154
Rev 10/89

Attachment H

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
MODIFICATION OF SURFACE WATER MANAGEMENT PERMIT NO. 56-00410-S
CERTIFICATION FOR STORMWATER DISCHARGE

ISSUED TO: WYNNE BUILDING CORP.
(PALM GROVE)
8000 SOUTH U.S. 1
PORT ST. LUCIE, FL 34952

DATE ISSUED: MARCH 12, 1992

LOCATION: ST. LUCIE COUNTY, SECTION 10 TWP. 36S RGE. 40E

ORIGINAL PERMIT AUTHORIZATION: CONSTRUCTION AND OPERATION OF A WATER MANAGEMENT SYSTEM SERVING 113.8 ACRES OF RESIDENTIAL LANDS BY A SYSTEM OF INLETS AND CULVERTS, ON-SITE LAKES, 1-1.08' WIDE WEIR AND 1-1960 LF EXFILTRATION TRENCH DISCHARGING INTO NORTH ST. LUCIE RIVER WATER MANAGEMENT DISTRICT'S C-21 AND THE NEW CANAL.

APPROVED MODIFICATION: CONSTRUCTION AND OPERATION OF A SURFACE WATER MANAGEMENT SYSTEM TO SERVE A 77.2 ACRE RESIDENTIAL PROJECT DISCHARGING VIA THE N.S.L.R.W.C.D. NEW CANAL TO N. FORK OF THE ST. LUCIE RIVER.

(911125-2)
This Permit Modification is approved pursuant to a request dated Nov. 25, 1991. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any work or structure involved in the Permit. The original Permit, including all plans and specifications attached thereto, as addressed by the staff report and those addressed by the Modification Staff Report are by reference made a part hereof.

All specifications and special and Limiting Conditions attendant to the original Permit, unless specifically recinded by this or previous Modifications, remain in effect.

SPECIAL CONDITIONS: SEE SHEETS 2, 3 & 4 OF 6 - 18 SPECIAL CONDITIONS.
SEE SHEETS 5 & 6 OF 6 - 12 LIMITING CONDITIONS.

ORIGINAL PERMIT ISSUED: November 12, 1981

PERMIT MODIFICATION APPROVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FILED WITH THE CLERK OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Original Signed

by

ANTHONY M. WATERHOUSE, P.E.,
DEPUTY DIRECTOR
WATER MANAGEMENT DIVISION
RESOURCE CONTROL DEPARTMENT

Original signed by:

ON Vern Kaiser

BY DEPUTY CLERK

POSTED

QUADRANGLES 1

ITEM NUMBER 34

DATE 3-12-92

SIGNED JK

SHEET 1 OF 6

SPECIAL CONDITIONS

- 1 . MINIMUM BUILDING FLOOR ELEVATION: 17.0 FEET NGVD FOR FINISHED FLOORS LOCATED ON THE NORTH AND EAST PROPERTY LINE AND 14.5 FEET NGVD FOR THE REMAINDER.

- 2 . MINIMUM ROAD CROWN ELEVATION: 12.5 FEET NGVD.

- 3 . DISCHARGE FACILITIES:

BASIN: (EXISTING SITE)

1-1.1' WIDE SHARP CRESTED WEIR WITH CREST AT ELEV. 10.44' NGVD,
1-.2' W X 2.28' H RECTANGULAR NOTCH WITH INVERT AT ELEV. 8.16' NGVD,
AND 28 LF OF 3' DIA. CMP CULVERT.

RECEIVING BODY : THE N.S.L.R.W.C.D. NEW CANAL

CONTROL ELEV : 8' NGVD. 6.5' NAVD

BASIN: (PROPOSED SITE)

1-1.17' WIDE SHARP CRESTED WEIR WITH CREST AT ELEV. 9.3' NGVD,
1-.87' W X 1.3' H X 37 DEG. V-NOTCH WITH INVERT AT ELEV. 8' NGVD, AND
30 LF OF 3.5' WIDE X 2.42' HIGH ARCH CAP CULVERT.

RECEIVING BODY : THE N.S.L.R.W.C.D. NEW CANAL

CONTROL ELEV : 8' NGVD. 6.5' NAVD

- 4 . THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.
- 5 . MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.
- 6 . THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.
- 7 . LAKE SIDE SLOPES SHALL BE 4:1 (HORIZONTAL:VERTICAL) TO A DEPTH OF TWO FEET BELOW THE CONTROL ELEVATION. SIDE SLOPES SHALL BE NURTURED OR PLANTED FROM 2 FEET BELOW TO 1 FOOT ABOVE CONTROL ELEVATION TO INSURE VEGETATIVE GROWTH.
- 8 . PRIOR TO THE INITIATION OF ANY WITHDRAWAL OF WATER (IRRIGATION, DEWATERING, PUBLIC WATER SUPPLY, ETC.), IT WILL BE NECESSARY TO APPLY FOR A WATER USE PERMIT. THE PERMITTEE IS CAUTIONED THAT A MINIMUM OF 90 DAYS IS REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION. THE

Attachment I
Geotechnical Report by GFA



**UNIVERSAL
ENGINEERING SCIENCES**

GEOTECHNICAL EXPLORATION

BEV SMITH KIA EXPANSION
5660 US HIGHWAY 1
FORT PIERCE, FLORIDA

UES PROJECT NO. 3330.2100346.0000

PREPARED FOR:

Bev Smith Toyota
3350 US Highway 1
Fort Peirce, Florida

Attn: Mr. Michael Smith

PREPARED BY:

Universal Engineering Sciences
607 NW Commodity Cove
Port St. Lucie, Florida 34986
(772) 924-3575

January 26, 2022

Consultants in: Geotechnical Engineering • Environmental Sciences
• Construction Materials Testing • Threshold Inspection



UNIVERSAL ENGINEERING SCIENCES

Consultants In: Geotechnical Engineering • Environmental Sciences
Geophysical Services • Construction Materials Testing • Threshold Inspection
Building Inspection • Plan Review • Building Code Administration

January 26, 2022

Mr. Michael Smith
Bev Smith Toyota
3350 US Highway 1
Fort Peirce, Florida
Phone: (772) 464-8440
Email: msmith@bevsmithtoyota.com

**Subject: Report of Geotechnical Exploration
Bev Smith Kia Expansion
5660 US Highway 1, Fort Pierce, Florida
UES Project No. 3330.2100346.0000**

Dear Mr. Smith:

Universal Engineering Sciences (UES) has completed the subsurface exploration and geotechnical engineering evaluation for the above referenced project in accordance with the geotechnical and engineering service agreement for this project. The scope of services was completed in general accordance with our Geotechnical Engineering Proposal No. 18-9647.02 Rev #1 dated January 4, 2022, planned in conjunction with and authorized by you.

EXECUTIVE SUMMARY

The purpose of our subsurface exploration was to classify the nature of the subsurface soils and general geomorphic conditions at the site and evaluate their impact upon the proposed construction. This report contains the results of our subsurface exploration and our engineering interpretations of these with respect to the project characteristics described to us, including providing recommendations for foundation design, pavement design, site preparation, and earthwork construction.

Per our recent telephone discussions and email correspondence with you, UES understands that you plan to expand the parking area at Bev Smith Kia located at 5660 US Highway 1 in Fort Pierce, Florida. Testing was completed previously by GFA International, although the design of the proposed expansion has changed, and additional testing is needed. UES has been provided a picture of a concept plan showing the layout of the proposed swale, paved parking area, and the dry retention pond on the property.

The recommendations provided herein are based upon the above considerations. If the stated conditions are incorrect or if the project description is revised, please inform UES so that we may review our recommendations with respect to any modifications.

Three (3) hand auger borings with hand cone penetrometer (HCP) testing (AB-1, AB-2, and AB-5), advanced to a depth of approximately 10 feet below the existing ground surface, were performed within the planned paved parking and the dry retention pond areas. Additionally, two (2) hand auger borings with hand cone penetrometer (HCP) testing (AB-3 and AB-4) advanced to an approximate depth of 10 feet below ground surface and two (2) Shelby tube samples (SH-1 and SH-2) were tested for their horizontal and vertical permeability were performed within the proposed swale. Furthermore, an exfiltration test was also performed in a 6-feet deep auger boring for the proposed dry retention pond. The locations of the borings, Shelby tubes, and exfiltration test are illustrated on the Test Location Plan in Appendix B.

The subsurface soil conditions encountered at the boring locations generally consisted of loose to medium dense fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), and clayey fine sand (SC) to termination depths.

The results of the soil borings and exfiltration and falling head permeability tests were considered to develop pavement design for the project.

We appreciate the opportunity to be of service during this phase of the project and look forward to a continued association. Please do not hesitate to contact us if you have any questions or comments, or if we may further assist you as your plans proceed.

Respectfully Submitted,
Universal Engineering Sciences
Florida Registry No. 4930



Digitally signed
by Allan Abubakar
Date: 2022.01.26
15:31:53 -05'00'

This item has been digitally signed and sealed by Allan G. Abubakar, P.E. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Allan G. Abubakar, P.E.
Sr. Project Engineer
Florida Registration No. 69952

Khaled Abdelli
Project Manager

Distribution: Mr. Michael Smith - Bev Smith Toyota

1 pdf

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1.0 INTRODUCTION

1.1 Scope of Services

The objective of our geotechnical services was to collect subsurface data for the subject project, summarize the test results, and discuss any apparent site conditions that may have geotechnical significance for the proposed construction. The following scope of services is provided within this report:

1. Prepare boring logs depicting the subsurface soil conditions encountered during our field exploration.
2. Review the soil samples obtained during our field exploration for classification and additional testing if necessary.
3. Evaluate the existing soil conditions found during our exploration with respect to the proposed expansion.
4. Provide recommendations for pavement design and subgrade preparation.
5. Provide site preparation criteria for the proposed construction.
6. Provide results and design parameters for stormwater management testing conducted.

1.2 Project Description

Per our recent telephone discussions and email correspondence with you, UES understands that you plan to expand the parking area at Bev Smith Kia located at 5660 US Highway 1 in Fort Pierce, Florida. Testing was completed previously by GFA International, although the design of the proposed expansion has changed, and additional testing is needed. UES has been provided a picture of a concept plan showing the layout of the proposed swale, paved parking area, and the dry retention pond on the property.

The recommendations provided herein are based upon the above considerations. If the stated conditions are incorrect or if the project description is revised, please inform UES so that we may review our recommendations with respect to any modifications.

2.0 OBSERVATIONS

2.1 Site Description

The project site is located at 5660 US Highway 1 in Fort Pierce, Florida as illustrated on the Site Vicinity Map in Appendix A. At the time of our field exploration, the site was developed with existing structure and associated parking area.

2.2 Field Exploration

Three (3) hand auger borings with hand cone penetrometer (HCP) testing (AB-1, AB-2, and AB-5), advanced to a depth of approximately 10 feet below the existing ground surface, were performed within the planned paved parking and the dry retention pond areas. Additionally, two (2) hand auger borings with hand cone penetrometer (HCP) testing (AB-3 and AB-4) advanced to an approximate depth of 10 feet below ground surface and two (2) Shelby tube samples (SH-1 and SH-2) were tested for their horizontal and vertical permeability were performed within the proposed swale. Furthermore, an exfiltration test was also performed in a 6-feet deep auger boring for the proposed dry retention pond. The locations of the borings, Shelby tubes, and exfiltration test are illustrated on the Test Location Plan in Appendix B.

The auger borings were performed in substantial accordance with ASTM D 1452, "Standard Practice for Soil Exploration and Sampling by Auger Borings." Hand Cone Penetrometer (HCP) tests were conducted at one-foot depth intervals in the auger borings. The HCP test, in conjunction with information about the soil type, is empirically correlated to the relative density of subsurface soils.

Site specific survey staking of the borings, Shelby tubes, and exfiltration test were not provided for our field exploration. The indicated depth and location of each boring were approximated based upon existing grade, the provided Conceptual Site Plan, and estimated distances and relationships to existing landmarks at the site.

2.3 Laboratory Testing

Soil samples recovered from our field exploration were returned to our laboratory where they were visually classified by a geotechnical engineer in general accordance with the Unified Soil Classification System (ASTM D 2488). Selected sample was tested for organic content (AASHTO T-267). The laboratory test results are summarized in Table 3.3.1 below and are also contained on the boring logs.

Table 2.3.1 - Laboratory Test Results			
Boring No.	Strata Depth (feet)	Sample Description	Organic Content (%)
AB-4	2 - 3	Dark brown organically stained fine sand, trace roots (SP)	3.0

The recovered samples were not evaluated, either visually or analytically, for chemical composition or environmental hazards. UES will be pleased to perform these services for an additional fee, if required

2.4 Geomorphic Conditions

The geology of the site as mapped on the USDA Soil Survey website consists of Nettles and Oldsmar sands (25) Riviera fine sand, 0 to 2 percent slopes (38) and, Susanna and Wauchula sands (43). **These are sand and loamy sand soils and organic soils are not indicated.**

Note that the Soil Survey generally extends to a maximum depth of 80 inches below ground surface and is not indicative of deeper soil conditions.

Boring logs resulting from our field exploration are presented in Appendix D - Log of Boring Records. The logs contain the soil descriptions, the hand cone penetrometer (HCP) values logged during the drilling and sampling activities. Note that the soil boring data reflect information from the specific test locations only and the soil conditions may vary between the strata interfaces indicated on the logs. The soil classifications and descriptions shown on the logs are generally based upon visual characterizations of the recovered samples using the Unified Soil Classification System. See Appendix F - Discussion of Soil Groups, for a detailed description of various soil groups.

The subsurface soil conditions encountered at the boring locations generally consisted of loose to medium dense fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), and clayey fine sand (SC) to termination depths.

2.5 Hydrogeological Conditions

On the dates of our field exploration (January 15, 2022), groundwater was encountered in the auger borings ranging from depths of 5.8 to 9.2 feet below ground surface. The groundwater table typically fluctuates seasonally depending upon local rainfall and other site specific and/or local influences. Brief ponding of stormwater may occur across the site after heavy or extended rainfall events.

Falling head permeability tests were performed on the shelly tube samples to obtain horizontal (k_h) and vertical (k_v) permeability values of the soils. The permeability test results are summarized in the following Table 2.5.1.

Table 2.5.1 – Permeability Test Results				
Test Location	Sample Depth (feet)	Sample Description	Coefficient of Permeability, k (ft/day)	
			k_v	k_h
SH-1 (AB-3)	1.5 - 2.0	Gray fine sand (SP)	9.135	2.436
SH-2 (AB-4)	1.5 - 2.0	Dark gray fine sand (SP)	10.747	1.729

During our field exploration, we performed one (1) auger boring and exfiltration test (EX-1) in accordance with the South Florida Water Management District method for open hole constant head field testing. The test was conducted at the approximate location indicated on the Test Location Plan in Appendix B. The hydraulic conductivity (K-value) determined at EX-1 was **1.84 X 10⁻⁰⁷ (cfs/ft²-ft)**. The test results are also presented in Appendix E - Hydraulic Conductivity Results.

2.6 Seasonal High Groundwater Table

The normal seasonal high groundwater level each year is the level that typically occurs in the August to September period at the end of the rainy season during a year of normal or average rainfall. During periods of above normal rainfall and in extreme cases of flooding, the water table elevations typically exceed the normal seasonal high groundwater level. Under this scenario, normal high groundwater levels approach the normal seasonal high groundwater levels.

The normal seasonal high groundwater level is affected by several factors. The drainage characteristics of the soils, the land surface elevation, relief points such as drainage ditches, lakes, rivers, canals, swamp areas, etc., and distance to relief points are some of the more important factors influencing the seasonal high groundwater level.

In order to better interpret the groundwater data, we reviewed available monthly precipitation data from several stations in the Fort Pierce area from June 2021 through December 2021 utilizing the Community Collaborative Rain, Hail & Snow Network website, which corresponds to the six (6) months prior to the time of our field exploration. The data indicated that the recorded rainfall during this period was relatively normal compared to the 30-year recorded average rainfall.

Based on our interpretations of the site conditions, the groundwater levels recorded in our soil borings at the time of drilling, and the data obtained from the various sources referenced herein, we estimate the normal seasonal high groundwater level to be approximately 1 to 1.5 feet above the water levels recorded in the borings. As previously noted, it is possible that higher groundwater levels may exceed the estimated normal seasonal high groundwater level as a result of significant or prolonged rainfall events. However, design for normal seasonal high groundwater conditions, instead of the extreme conditions, generally is more appropriate.

3.0 PAVEMENT AREA DESIGN AND CONSTRUCTION CONSIDERATIONS

3.1 Pavement Design Sections

The pavement sections were designed considering assumed traffic loading and previous experience with similar projects. Flexible pavement sections in the geographic area typically consist of an asphaltic wearing course, a base course, and a stabilized subgrade layer. Rigid pavements are constructed either directly upon prepared soil subgrades or upon a base course and stabilized subgrade for heavier loads.

Based on our prior experience and the assumed traffic loading criteria, recommended pavement section thicknesses are provided in Table 3.1.1 below.

Table 3.1.1 - Design Pavement Sections				
Pavement Type	Layer	Material Description	Layer Thickness	
			Light Duty	Heavy Duty
Flexible	(A)	Asphalt Wearing Surface FDOT SP-9.5 or SP-12.5	1.5	2.5
	(B)	Base rock (minimum LBR of 100), compacted to 98 percent of modified Proctor maximum dry density	6	8
	(SSG)	Stabilized subgrade (minimum LBR of 40), compacted to 98 percent of modified Proctor maximum dry density	12	12
	STRUCTURAL NUMBER (SN)		2.7	3.5
Rigid	(C)	FDOT Portland Cement Concrete	NA	8
	(B)	Base rock (minimum LBR of 100), compacted to 98 percent of modified Proctor maximum dry density	NA	-
	(CSG)	Soil subgrade compacted to 98 percent of modified Proctor maximum dry density	NA	12

3.2 Compacted Subgrade or Embankment Fill

The subgrade or embankment fill is the layer that supports the structural pavement section. Subgrade and embankment fill should be constructed following the criteria and procedures presented in Section 3.9 of this report.

3.3 Stabilized Subgrade

The stabilized subgrade is the portion of the pavement section between the compacted subgrade or embankment fill and the base course. We recommend that subgrade material be compacted to at least 98 percent of modified Proctor maximum dry density (AASHTO T-180). The stabilized subgrade material should have a minimum Limerock Bearing Ratio (LBR) value of 40. Compliance tests should be performed upon the stabilized subgrade for full depth at a frequency of one test per 5,000 square feet, or at a minimum of two test locations, whichever is greater.

3.4 Base Course

The base course is the portion of the pavement section between the surface course and stabilized subgrade. In areas where separation of at least 1.5 feet between the estimated wet seasonal high groundwater table and the bottom of the base material occurs, we recommend the base course be limerock or cemented coquina having a minimum Limerock Bearing Ratio (LBR) value of 100. The base material should be obtained from an approved source. The base material should be placed in maximum 6-inch-thick lifts and compacted to at least 98 percent of modified Proctor maximum dry density (AASHTO T-180).

If the separation between the estimated wet seasonal high groundwater table and the bottom of the base material is less than 1.5 feet, we recommend that asphaltic concrete base (FDOT SP-12.5) be used in lieu of limerock or cemented coquina. The subgrade should be mechanically stabilized (compacted) to a minimum of 98 percent of modified Proctor maximum dry density (AASHTO T-180). Compliance tests should be performed on the base course at a frequency of one test per 5,000 square feet, or a minimum of two test locations, whichever is greater.

3.5 Flexible (Asphalt) Pavement

Asphalt pavement should consist of either FDOT SP-9.5 or SP-12.5 asphaltic concrete. The mixes should be a current FDOT approved design for the materials used for the project. Samples of the materials delivered to the project should be tested to verify that the aggregate gradation and asphalt content satisfies the mix design specifications.

The asphalt should be compacted to meet the requirements of the latest edition of the FDOT *Standard Specifications for Road and Bridge Construction*. Compliance tests should be performed by obtaining cores to evaluate material thickness and density at a frequency of one test per 10,000 square feet, or a minimum of two test locations, whichever is greater.

3.6 Rigid (Concrete) Pavement

Rigid pavements should be constructed using concrete having a minimum 28-day compressive strength of 4,000 psi. Fill required to raise grades in pavement areas should be compacted to at least 98 percent of modified Proctor maximum dry density (AASHTO T-180).

The pavement slabs should be reinforced to make them as rigid as practical. Proper joints should be provided at the junctions of slabs so that a small amount of independent movement can without causing structural damage. Construction and control joints should be accordance with current American Concrete Institute (ACI) and industry practices.

The pavement sections presented in this report are minimum pavement section thicknesses typically used for similar type projects. The pavement materials and construction procedures should conform to FDOT, ACI, or appropriate city/county requirements.

3.7 Effects of Water

Premature pavement section deterioration can occur due to intrusion of the wet season high groundwater table and/or improper surface water runoff management. We recommend the pavement areas be constructed to have a minimum separation of 1.5 feet between the wet season high groundwater table and the bottom of base course, regardless of the type of base material. In addition, we recommend that full-depth curb sections be designed and constructed. Using either extruded curb sections, which lie directly on top of the final surface course, or eliminating the curbing entirely, may allow runoff and/or irrigation water to migrate between the base and surface course. This condition can result in the separation of the surface course from the base course, causing a rippling effect, which results in premature deterioration of the pavement.

3.8 Construction Traffic

Incomplete pavement sections or pavement areas designed for light duty traffic will not perform satisfactorily under typical construction traffic loading. We recommend that all construction traffic (i.e., construction equipment, vehicles, etc.) either be re-routed away from these areas or the pavement sections be designed to support construction phase loading conditions.

3.9 Pavement Site Preparation

Our recommendations for preparation of the site for pavement construction are noted below. This approach to improving and maintaining site soils has been found to be successful with similar soil conditions.

1. The proposed construction limits should be cleared, stripped, and grubbed of all surface vegetation, topsoil, and associated root systems to depths of their vertical reaches. This should be performed within and to a distance of 5 feet beyond the limits of the pavement areas.
2. Prior to initiating fill operations, the existing ground surface should be compacted (proof rolled) using a steel drum vibratory roller having sufficient static weight and vibratory impact energy to achieve the required compaction. After completing the proof rolling, density tests should be performed at a frequency of one test per 5,000 square feet, or at a minimum of two test locations, whichever is greater, to confirm a minimum compaction compliance of 98 percent of modified Proctor maximum dry density (AASHTO T-180).
3. Fill material should be inorganic (classified as SP/GW) containing not more than 5 percent (by weight) fibrous organic materials. **Fill material having silt/clay-size fines contents greater than 5 percent should not be used, including cyclone sand material.** The fill should be placed in maximum 12-inch-thick lifts. Each lift should be compacted to a minimum density of 98 percent of modified Proctor maximum dry density (AASHTO T-180).
4. Compliance density tests should be performed within the fill at a frequency of not less than one test per 5,000 square feet per lift, or at a minimum of two test locations, whichever is greater.
5. Representative samples of both on-site and import materials proposed for use as fill should be obtained and tested to determine compliance with the project specifications. The testing should include moisture-density relations (AASHTO T-180) and particle size analysis.
6. The contractor should consider the contours contained on the final grading, paving, and drainage plans when executing backfilling and compaction operations.

4.0 REPORT LIMITATIONS

This consulting report has been prepared for the exclusive use of Bev Smith Toyota and other members of the design team for the proposed Bev Smith Kia Expansion project located at 5660 US Highway 1 in Fort Pierce, Florida. This report has been prepared in accordance with generally accepted local geotechnical engineering practices; no other warranty, either express or implied, is made.

The evaluation submitted in this report is based in part upon the data collected during a field exploration. However, the nature and extent of variations throughout the subsurface profile may not become evident until construction. If variations then appear evident, it may be necessary to reevaluate information and professional opinions provided in this report. In the event changes are made in the nature, design, or location of the proposed swale, pavement and pond areas, the evaluation and opinions contained in this report should not be considered valid unless the changes are reviewed, and our conclusions modified or verified in writing by UES.

UES should be provided the opportunity to review the final civil plans, structural plans, and project specifications to determine if UES's recommendations have been properly interpreted, communicated, and implemented. If UES is not afforded the opportunity to participate in construction related aspects of foundation installation and pavement construction as recommended in this report or any report addendum, UES cannot accept responsibility for the interpretation of our recommendations made in this report or in a report addendum for foundation or pavement performance.

5.0 BASIS FOR RECOMMENDATIONS

The recommendations presented in this report are based on the data obtained from the borings and exfiltration and falling head permeability tests performed at the locations indicated on the Test Location Plan in Appendix B. This report does not reflect variations which may occur between borings. While the borings are representative of the subsurface conditions at their respective locations and for their vertical reaches, local variations characteristic of the subsurface soils of the region are anticipated and may be encountered. The delineation between soil types shown on the boring logs is approximate and the descriptions represent our interpretation of the subsurface conditions at the designated boring locations on the specific dates drilled.

Any third-party reliance of our geotechnical report or parts thereof is strictly prohibited without the express written consent of Universal Engineering Sciences. The applicable auger boring methodology (ASTM D 1452) used in performing our borings, and for determining penetration resistance and soil relative density, is specific to the sampling tools utilized and does not reflect the ease or difficulty to advance other tools or materials.

Appendix A - Vicinity Map

Site Vicinity Map

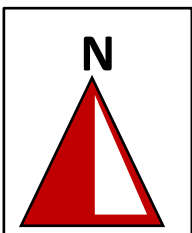
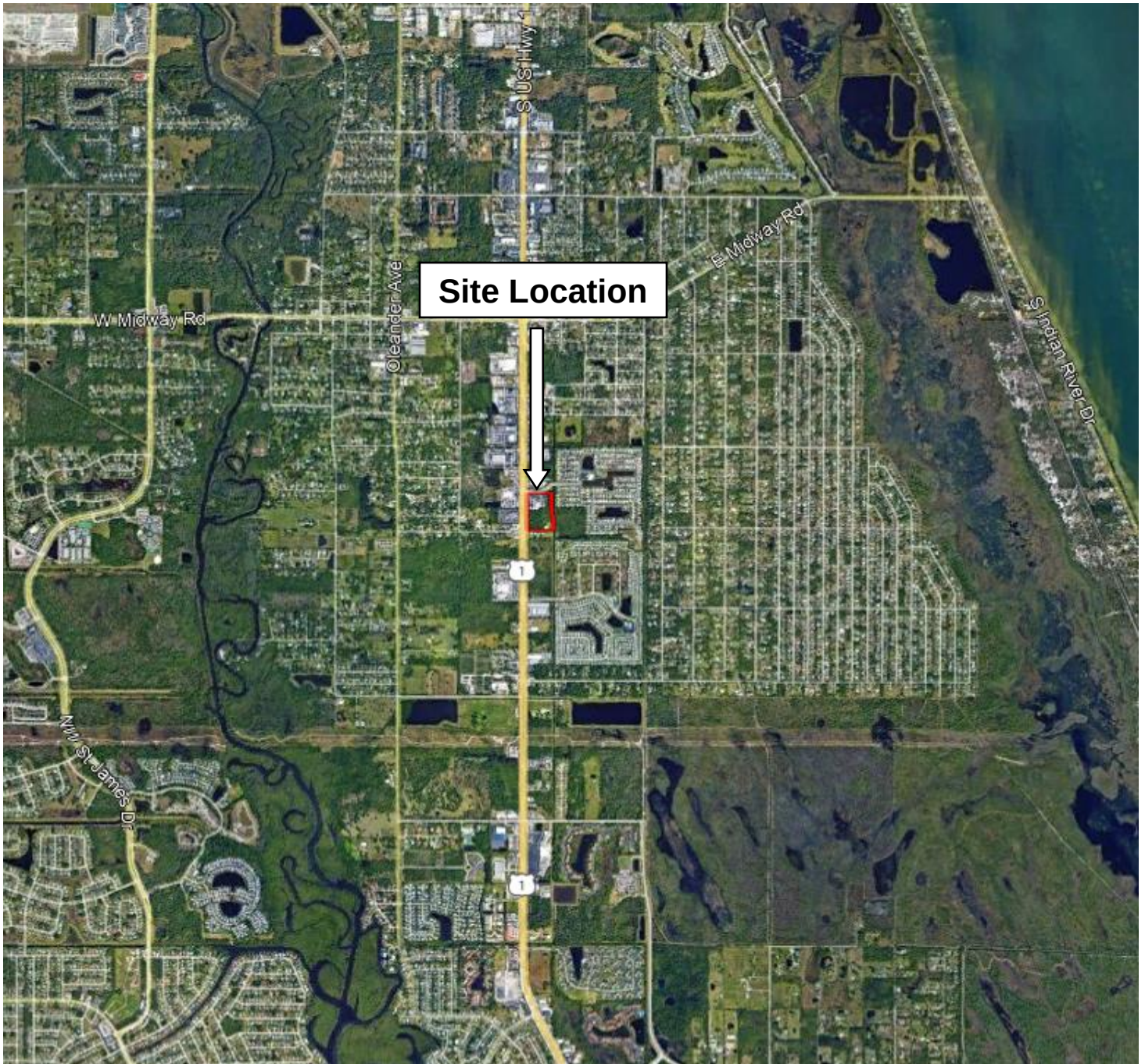
Bev Smith Kia Expansion
5660 US Highway 1, Fort Pierce, Florida

Project No. 3330.2100346.0000

Drafted by: JR

Reviewed By: AA

Date: 1/25/2022



Appendix B - Test Location Plan

Test Location Plan

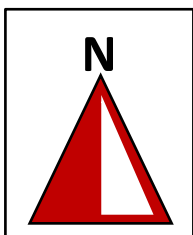
Bev Smith Kia Expansion
5660 US Highway 1, Fort Pierce, Florida

Project No. 3330.2100346.0000

Drafted by: JR

Reviewed By: AA

Date: 1/26/2022



Legend

-  Approximate 10' Auger Boring Test Locations
-  Approximate Exfiltration Test Location
-  Approximate Shelby Tube Locations

Appendix C - Notes Related to Borings

NOTES RELATED TO BORING RECORDS AND GENERALIZED SUBSURFACE PROFILES

1. Groundwater levels (if encountered) were recorded either during or following the boring completion on the date indicated. Fluctuations in groundwater levels are common - see the report text for a discussion.
2. The boring locations were identified in the field by estimated distances and offsets from existing reference marks and/or other site landmarks.
3. The completed boreholes were backfilled to adjacent site grade using drilling spoils and patched with asphalt cold mix in pavement areas.
4. The Log of Boring records represent our interpretation of soil conditions based on visual classification of the soil samples recovered from the borings.
5. The Log of Boring records are subject to the limitations, conclusions, and recommendations presented in the report text.
6. The Standard Penetration Test (SPT) N-values contained on the Log of Boring records refer to the total blow counts of a 140-pound drop hammer falling 30 inches required to drive a split-barrel sampler a total distance of 12 inches into soil strata at specific depth intervals.
7. The Hand Cone Penetrometer (HCP) values contained on Log of Boring records and the Cone Penetration Test (CPT) values contained on the Cone Penetration Sounding logs refer to the cone tip resistance recorded when pushing the cone tip into the soil strata at specific depth intervals.
8. The soil and/or rock strata interfaces shown on the Log of Boring records are approximate and may vary from those shown on the logs. The soil and/or rock descriptions shown on the Log of Boring records refer to conditions at the specific location tested. Soil/rock conditions may vary between test locations.
9. Relative density for coarse-grained soils (sands/gravels) and consistency for fine-grained soils (silts/clays) are described as follows:

Coarse Grained Soils (Sands and Gravels)				Fine Grained Soils (Silts and Clays)			
SPT N-Value	HCP Value (kg/cm ²)	CPT Value (tsf)	Relative Density	SPT N-Value	HCP Value (kg/cm ²)	CPT Value (tsf)	Consistency
0-4	0-16	0-20	Very Loose	0-2	0-20	0-3	Very Soft
5-10	17-36	21-40	Loose	3-4	21-35	4-6	Soft
11-30	37-116	41-120	Med. Dense	5-8	>35	7-12	Firm
31-50	117-196	121-200	Dense	9-15		13-25	Stiff
>50	> 196	>200	Very Dense	16-30		26-50	Very Stiff
				>30		>50	Hard

10. Grain size descriptions are as follows:

Description	Particle Size Limits
Boulder	Greater than 12 inches
Cobble	3 to 12 inches
Coarse Gravel	³ / ₄ to 3 inches
Fine Gravel	No. 4 sieve to ³ / ₄ inch
Coarse Sand	No. 10 to No. 4 sieve
Medium Sand	No. 40 to No. 10 sieve
Fine Sand	No. 200 to No. 40 sieve
Fines (Silt/Clay)	Smaller than No. 200 sieve

11. Definitions for modifiers used in soil/rock descriptions:

Proportion	Modifier	Approximate Root Diameter	Modifier
<5%	Trace	Less than ¹ / ₃₂ "	Fine roots
5% to 12%	Little	¹ / ₃₂ " to ¹ / ₄ "	Small roots
12% to 30%	Some	¹ / ₄ " to 1"	Medium roots
30% to 50%	And	Greater than 1"	Large roots

Organic Soils: Soils containing vegetative tissue in various stages of decomposition having a fibrous to amorphous texture. Usually having a dark brown to black color and an organic odor.

Organic Content Modifiers: <25%: Slightly to Highly Organic; 25% to 75%: Muck; >75%: Peat

Appendix D - Log of Boring Records

HAND AUGER WITH HCP - GFA DATA TEMPLATE.GDT - 1/25/22 11:38 - Y:\PROJECTS\UES PROJECT SETUP\2021 UES PROJECTS\3330.2100346.0000 - BEV SMITH KIA EXPANSION - FORT PIERCE - GEO18-9647.02 - BEV SMITH KIA EXPANSION - FT. PIERCE - GEI

Universal Engineering Sciences
607 NW Commodity Cove
Port Saint Lucie, Florida 34986
(772) 924-3575

LOG OF BORING AB-1

CLIENT Bev Smith Toyota

PROJECT NUMBER 3330.2100346.0000

DATE STARTED 1/15/22 COMPLETED 1/15/22

DRILLING CONTRACTOR Universal Engineering Sciences

DRILLING METHOD Auger Boring

DRILLER Lo

NOTES

PROJECT NAME Bev Smith Kia Expansion

PROJECT LOCATION 5660 US Highway 1, Fort Pierce, Florida

LATITUDE LONGITUDE

GROUND WATER LEVELS:
▽ AT TIME OF DRILLING 5.80 ft

AT END OF ---

ESHGT

DEPTH (ft)	HAND CONE PENETROMETER (HCP) (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)
0.0						
80			Dark gray fine sand (SP)			
80						
2.0			Dark brown organically stained fine sand, trace roots (SP)			
2.5						
80			Brown fine sand (SP)			
80						
4.0			Gray silty fine sand (SM)			
80						
5.0						
70						
70						
7.5						
80						
80						
80						
10.0						

Bottom of borehole at 10.0 feet.

HAND AUGER WITH HCP - GFA DATA TEMPLATE.GDT - 1/25/22 11:38 - Y:\PROJECTS\UES PROJECT SETUP\2021 UES PROJECTS\3330.2100346.0000 - BEV SMITH KIA EXPANSION - FORT PIERCE - GEO18-9647.02 - BEV SMITH KIA EXPANSION - FT. PIERCE - GEI

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607 NW Commodity Cove
Port Saint Lucie, Florida 34986
(772) 924-3575

LOG OF BORING AB-2

CLIENT Bev Smith Toyota

PROJECT NUMBER 3330.2100346.0000

DATE STARTED 1/15/22 COMPLETED 1/15/22

DRILLING CONTRACTOR Universal Engineering Sciences

DRILLING METHOD Auger Boring

DRILLER Lo

NOTES

PROJECT NAME Bev Smith Kia Expansion

PROJECT LOCATION 5660 US Highway 1, Fort Pierce, Florida

LATITUDE LONGITUDE

GROUND WATER LEVELS:
▽ AT TIME OF DRILLING 7.00 ft

AT END OF ---

ESHGT

DEPTH (ft)	HAND CONE PENETROMETER (HCP) (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)
0.0						
80			Gray fine sand (SP)			
80						
80			2.0 Dark brown organically stained fine sand (SP)			
2.5			80			
80			3.0 Brown fine sand (SP)			
80						
80			4.0 Light gray fine sand with silt (SP-SM)			
5.0			80			
80						
80						
80						
80			7.0 ▽ Gray clayey fine sand (SC)			
7.5						
80						
80						
80						
10.0						

Bottom of borehole at 10.0 feet.

HAND AUGER WITH HCP - GFA DATA TEMPLATE.GDT - 1/25/22 11:38 - Y:\PROJECTS\ UES PROJECT SETUP\2021 UES PROJECTS\3330.2100346.0000 - BEV SMITH KIA EXPANSION - FORT PIERCE - GEO18-9647.02 - BEV SMITH KIA EXPANSION - FT. PIERCE - GEI

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607 NW Commodity Cove
Port Saint Lucie, Florida 34986
(772) 924-3575

LOG OF BORING AB-3

CLIENT Bev Smith Toyota

PROJECT NUMBER 3330.2100346.0000

DATE STARTED 1/15/22 COMPLETED 1/15/22

DRILLING CONTRACTOR Universal Engineering Sciences

DRILLING METHOD Auger Boring

DRILLER Lo

NOTES

PROJECT NAME Bev Smith Kia Expansion

PROJECT LOCATION 5660 US Highway 1, Fort Pierce, Florida

LATITUDE LONGITUDE

GROUND WATER LEVELS:
▽ AT TIME OF DRILLING 8.00 ft

AT END OF ---

ESHGT

DEPTH (ft)	HAND CONE PENETROMETER (HCP) (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)
0.0						
80			Gray fine sand (SP)			
80						
80			2.0 Dark brown organically stained fine sand, trace roots (SP)			
2.5			80 3.0 Brown fine sand (SP)			
80			4.0 Dark gray fine sand (SP)			
80						
5.0			6.0 Light gray clayey fine sand, trace roots (SC)			
80						
7.5			8.0 ▽ Gray silty fine sand (SM)			
70						
70						
10.0						

Bottom of borehole at 10.0 feet.

HAND AUGER WITH HCP - GFA DATA TEMPLATE.GDT - 1/25/22 11:38 - Y:\PROJECTS\UES PROJECT SETUP\2021 UES PROJECTS\3330.2100346.0000 - BEV SMITH KIA EXPANSION - FORT PIERCE - GEO18-9647.02 - BEV SMITH KIA EXPANSION - FT. PIERCE - GEI

Universal Engineering Sciences
607 NW Commodity Cove
Port Saint Lucie, Florida 34986
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LOG OF BORING AB-4

CLIENT Bev Smith Toyota

PROJECT NUMBER 3330.2100346.0000

DATE STARTED 1/15/22 COMPLETED 1/15/22

DRILLING CONTRACTOR Universal Engineering Sciences

DRILLING METHOD Auger Boring

DRILLER Lo

NOTES

PROJECT NAME Bev Smith Kia Expansion

PROJECT LOCATION 5660 US Highway 1, Fort Pierce, Florida

LATITUDE LONGITUDE

GROUND WATER LEVELS:
▽ AT TIME OF DRILLING 6.00 ft

AT END OF ---

ESHGT

DEPTH (ft)	HAND CONE PENETROMETER (HCP) (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)
0.0						
80			Dark gray fine sand (SP)			
80						
2.0			Dark brown organically stained fine sand, trace roots (SP)			3.0
2.5						
80			Brown fine sand (SP)			
80						
4.0			Light brown silty fine sand (SM)			
80						
5.0						
70						
6.0			Gray silty fine sand (SM)			
70						
7.5						
80						
80						
80						
10.0						

Bottom of borehole at 10.0 feet.

HAND AUGER WITH HCP - GFA DATA TEMPLATE.GDT - 1/25/22 11:38 - Y:\PROJECTS\UES PROJECT SETUP\2021 UES PROJECTS\3330.2100346.0000 - BEV SMITH KIA EXPANSION - FORT PIERCE - GEO18-9647.02 - BEV SMITH KIA EXPANSION - FT. PIERCE - GEI

Universal Engineering Sciences
607 NW Commodity Cove
Port Saint Lucie, Florida 34986
(772) 924-3575

LOG OF BORING AB-5

CLIENT Bev Smith Toyota

PROJECT NUMBER 3330.2100346.0000

DATE STARTED 1/15/22 COMPLETED 1/15/22

DRILLING CONTRACTOR Universal Engineering Sciences

DRILLING METHOD Auger Boring

DRILLER Lo

NOTES

PROJECT NAME Bev Smith Kia Expansion

PROJECT LOCATION 5660 US Highway 1, Fort Pierce, Florida

LATITUDE LONGITUDE

GROUND WATER LEVELS:
▽ AT TIME OF DRILLING 9.20 ft

AT END OF ---

ESHGT

DEPTH (ft)	HAND CONE PENETROMETER (HCP) (tsf)	GRAPHIC LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	FINES CONTENT (%)	ORGANIC CONTENT (%)
0.0						
80			Gray fine sand (SP)			
80						
2.0			Light gray fine sand (SP)			
2.5						
80			Gray silty fine sand, trace roots (SM)			
80						
80						
5.0						
80						
80						
7.5						
80						
8.0			Gray fine sand (SP)			
80						
▽						
70						
10.0						
10.0						

Bottom of borehole at 10.0 feet.

Appendix E - Hydraulic Conductivity Results



UNIVERSAL ENGINEERING SCIENCES

Consultants In: Geotechnical Engineering • Environmental Sciences
Geophysical Services • Construction Materials Testing • Threshold Inspection
Building Inspection • Plan Review • Building Code Administration

EXFILTRATION TEST REPORT

South Florida Water Management District - Usual Open Hole Test

Client: Bev Smith Toyota

Project No: 3330.2100346.0000

Project: Bev Smith Kia Expansion
5660 US Highway 1, Fort Pierce, Florida

Test Date: 1/15/2022

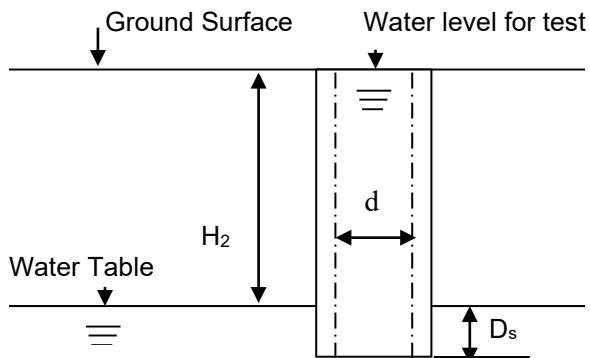
Technician: LO

SOIL PROFILE

Test Location: EX-1	Depth (feet)	Soil Description	HCP
	0 – 1	Dark gray fine sand (SP)	80+
	1 – 3	Light gray fine sand (SP)	80+
	3 – 6	Gray silty fine sand, trace roots (SM)	80+
			80+
			80+
			80+
	Depth to Water Table from Ground Surface (feet)		NE*

* Not Encountered

CALCULATION OF HYDRAULIC CONDUCTIVITY



K	Hydraulic Conductivity (cfs/ ft ² – ft head)	1.84 x 10⁻⁰⁷
Q	Stabilized Flow Rate (cubic ft per second)	3.57 x 10⁻⁰⁶
d	Diameter of Test Hole (feet)	0.33
H₂	Depth to Water Table (feet)	6.0
D_s	Saturated Hole Depth (feet)	0

Notes:

$$K = \frac{4Q}{\pi d(2H_2^2 + 4H_2D_s + H_2d)}$$

Appendix F - Discussion of Soil Groups

DISCUSSION OF SOIL GROUPS

COARSE GRAINED SOILS

General. A soil is classified as coarse-grained if more than 50 percent of a representative sample of the material is retained on the No. 200 sieve.

GW and SW Groups. These groups comprise well-graded gravelly and sandy soils containing little or no plastic fines (less than 5 percent passing the No. 200 sieve). The low fines content does not noticeably change the shear strength characteristics of these soils and does not interfere with their free-draining characteristics.

GP and SP Groups. Poorly graded gravels and sands containing little or no plastic fines (less than 5 percent passing the No. 200 sieve) are in the GP and SP groups. The materials can be called uniform gravels, uniform sands, or non-uniform mixtures of very coarse materials and very fine sand, with intermediate sizes lacking (sometimes called skip-graded, gap-graded, or step-graded). This last group often results from borrow pit excavation in which gravel and sand layers are mixed.

GM and SM Groups. In general, the GM and SM groups comprise gravels or sands with fines (more than 12 percent passing the No. 200 sieve) having little or no plasticity. The plasticity index and liquid limit of soils in these groups plot below the “A” line on the plasticity chart. The gradation of the material is not considered significant and both well and poorly graded materials are included.

GC and SC Groups. In general, the GC and SC groups comprise gravelly or sandy soils containing fines (more than 12 percent passing the No. 200 sieve) having plasticity characteristics. The plasticity index and liquid limit of soils in these groups plot above the “A” line on the plasticity chart.

FINE GRAINED SOILS

General. A soil is classified as fine-grained if more than 50 percent of a representative sample of the material passes the No. 200 sieve.

ML and MH Groups. These groups comprise inorganic silts (ML) and elastic silts (MH) having either low (L) or high (H) liquid limits, respectively. ML soils have a liquid limit of less than 50 while MH soils have a liquid limit of 50 and greater. Silts and elastic silts can also contain varying amounts of sand and gravel. Also included in this group are loess sediments and rock flours.

CL and CH Groups. These groups comprise low plasticity (lean) clays (CL) and medium to high plasticity (fat) clays (CH) having either low (L) or high (H) liquid limits, respectively. CL soils have a liquid limit of less than 50 while CH soils have a liquid limit of 50 and greater. The low plasticity clays can also be sandy clays or silty clays. The moderate to high plasticity clays can also be sandy clays and include some volcanic clays.

OL and OH Groups. These groups comprise organic silts and clays. The soils are characterized by the presence of organic odor and/or dark color. The OL and OH soils are differentiated by determining and comparing their liquid limit values before and after oven drying representative soil samples.

HIGHLY ORGANIC SOILS

The highly organic soils are usually very soft and compressible and have undesirable construction characteristics. Particles of leaves, grasses, branches, or other fibrous vegetative matter are common components of these soils. They are not subdivided and are classified into one group with the symbol PT. Peat humus and swamp soils with a highly organic texture are typical soils of the group.