



City of Margate
DEVELOPMENT REVIEW COMMITTEE
Application for Site Plan

5790 Margate Blvd., Margate, FL 33063
954-972-6454

Submittal Date (official use):

RECEIVED
SEP 17 2015
BY: KR

Project Name Margate (SR7 & West Copans Rd.)		DRC # 10-15-01
Address 2000 N State Road 7, Margate FL 33063		
Acreage +/- 3.61	Folio Number 484230050010	Paid 737.72
Existing Use Commercial		
Legal Description Please see the attached legal description.		

Describe proposal/request in detail, including non-residential square footage and/or number of dwelling units
Proposed construction of a +/- 5,943 sf gas station with 16 fueling positions, with associated parking and utilities.

Agent/Contact Name Andrew J. Petersen	
Address 4450 West Eau Gallie Blvd., Suite 232	
Phone Number 321-255-5434	Fax Number 321-255-7751
Email Address apetersen@bowmanconsulting.com	

Property Owner Name VICJ Corporate Plaza LLC	
Address 2000 N State Road 7, Margate, FL 33063	
Phone Number	Fax Number
Email Address	

OWNER'S AFFIDAVIT: I certify that I am the owner of record for the above referenced property and give authorization to file this petition. I understand that I, or a representative on my behalf, must be present at the DRC meeting. I further understand that my petition will be subject to the regulations of Chapter 16 1/2 of the Margate City Code.

Property Owner's Signature

8/17/15
Date

City of Margate
*** CUSTOMER RECEIPT ***

Batch ID: RR0DI 10/14/15 00 Receipt no: 9268

Type	SvcCd	Description	Amount
EL		ECDV SITE PLAN NON RESID.	
	Qty	1.00	\$737.72

VELMEIR CO., LLC
5757 WEST MAPLE RD, STE 800
W. BLOOMFIELD, MI 48322
248-539-7997
APPLICATION FOR SITE PLAN
DRC 10-15-01
2000 N STATE RD 7
NEW GAS STATION
BY ANDREW J. PETERSEN
BOWMAN CONSULTING
4450 W EAU GALLIE BLVD, #232
MELBOURNE, FL 32934
321-255-5434
APETERSEN@BOWMANCONSULTING.COM

Tender detail
CK Ref#: 1615 \$737.72
Total tendered: \$737.72
Total payment: \$737.72

Trans date: 10/19/15 Time: 12:41:05

HAVE A GREAT DAY!

Margate Commercial Development

State Road 7 / US 441 & W. Copans Road
Margate, Florida

TRAFFIC STUDY

prepared for:
TVC Margate Co. LLC

KBP CONSULTING, INC.

June 2015

Margate Commercial Development

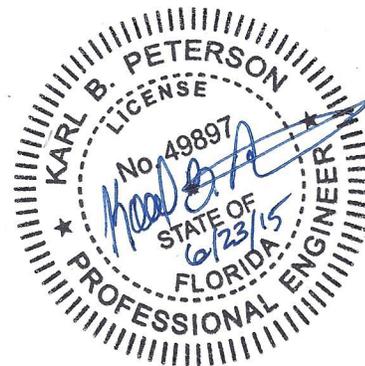
State Road 7 / US 441 & W. Copans Road
Margate, Florida

Traffic Study

June 2015

Prepared for:
TVC Margate Co. LLC

Prepared by:
KBP Consulting, Inc.
8400 N. University Drive, Suite 309
Tamarac, Florida 33321
Phone: (954) 560-7103



Karl B. Peterson, P.E.
Florida Registration Number 49897
KBP Consulting, Inc.
8400 N. University Drive, Suite 309
Tamarac, Florida 33321
CA # 29939

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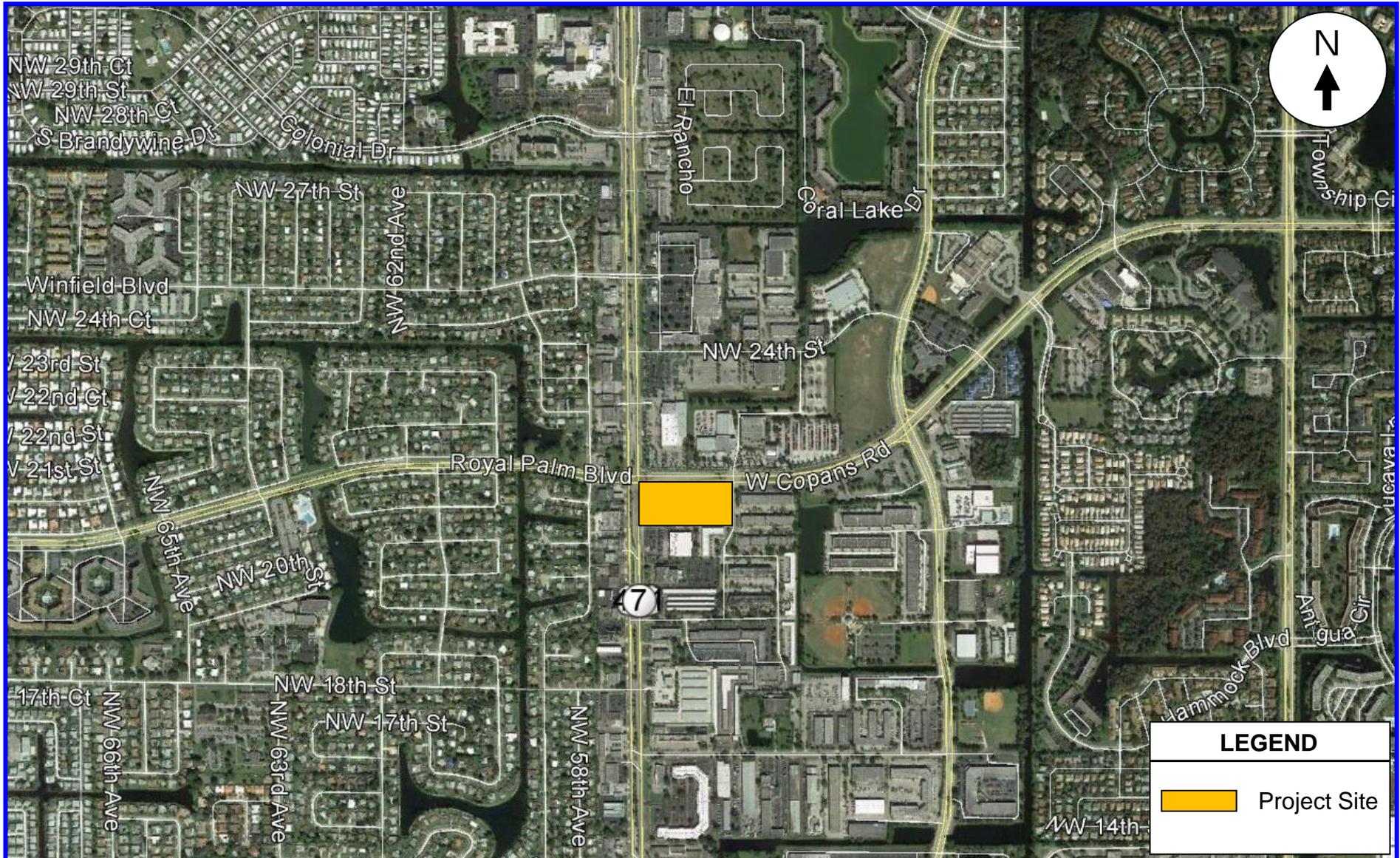
INTRODUCTION

There is a proposed commercial development to be located in the southeast quadrant of the intersection at State Road 7 / US 441 and W. Copans Road in Margate, Broward County, Florida. The location of this project site is illustrated in Figure 1 on the following page.

KBP Consulting, Inc. has been retained by TVC Margate Co. LLC to prepare a traffic study in connection with this proposed development. This study addresses the anticipated trip generation characteristics of the subject commercial development and the projected turning movement volumes at the project access driveways on State Road 7, W. Copans Road, and NW 55th Avenue.

This traffic study is divided into four (4) sections, as listed below:

1. Inventory
2. Trip Generation
3. Trip Distribution and Driveway Assignment
4. Summary & Conclusions



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Project Location Map

FIGURE 1
Margate Commercial
Development
Margate, Florida

INVENTORY

Existing Land Use and Access

The subject site currently consists of a two-story, 35,158 square foot office building. Access to this site is currently provided by two (2) right-turn in / right-turn out only driveways on State Road 7 / US 441 and one (1) full access driveway on NW 55th Avenue.

Proposed Land Uses and Access

The subject site will be redeveloped with a gasoline / service station with 16 fueling positions, a 6,119 square foot convenience market, and two (2) quick service restaurants (with drive-through lanes) totaling approximately 7,500 square feet. Access will be provided via one (1) right-turn in / right-turn out only driveway on State Road 7 / US 441, one (1) right-turn in / right-turn out only driveway on W. Copans Road, and one (1) full access driveway on NW 55th Avenue. One of the existing right-turn in / right-turn out only driveways on State Road 7 / US 441 (nearest W. Copans Road) will be eliminated. Appendix A contains the preliminary site plan for the project.

Roadway System

State Road 7 / US 441, located on the west side of the site, is a state-maintained six-lane divided arterial roadway oriented in the north-south direction. On the north side of the site is W. Copans Road. This roadway is a county-maintained four-lane divided arterial roadway oriented in the east-west direction. The east side of the site is bounded by NW 55th Avenue which is a two-lane local roadway oriented in the north-south direction.

TRIP GENERATION

A trip generation analysis was conducted for the existing and proposed development on the subject site. The analysis was performed using the trip generation rates and equations published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual (9th Edition)*. The trip generation analysis was undertaken for daily, AM peak hour, and PM peak hour conditions. According to the ITE report, the most appropriate "land use" categories for the existing and proposed development are as follows:

ITE Land Use #710 – General Office Building

- ❑ Weekday: $\text{Ln}(T) = 0.76 \text{Ln}(X) + 3.68$
where T = number of trips and X = 1,000 square feet of gross floor area
- ❑ AM Peak Hour: $\text{Ln}(T) = 0.80 \text{Ln}(X) + 1.57$ (88% in / 12% out)
- ❑ PM Peak Hour: $T = 1.12 (X) + 78.45$ (17% in / 83% out)

ITE Land Use #945 – Gasoline / Service Station with Convenience Market

- ❑ Weekday: $T = 162.78 (X)$
where T = number of trips and X = number of fueling positions
- ❑ AM Peak Hour: $T = 10.16 (X)$ (50% in / 50% out)
- ❑ PM Peak Hour: $T = 13.51 (X)$ (50% in / 50% out)
 - Pass-By: AM Peak = 62%, PM Peak = 56%

ITE Land Use #934 – Fast-Food Restaurant with Drive-Through Window

- ❑ Weekday: $T = 496.12 (X)$
where T = number of trips and X = 1,000 square feet of gross floor area
- ❑ AM Peak Hour: $T = 45.42 (X)$ (51% in / 49% out)
- ❑ PM Peak Hour: $T = 32.65 (X)$ (52% in / 48% out)
 - Pass-By = 49%

Utilizing the above-listed trip generation rates from the referenced ITE document, a trip generation analysis was undertaken for the existing office building and the proposed commercial development on the subject site at State Road 7 / US 441 and W. Copans Road in Margate. The results of this effort are documented in Table 1 on the following page.

Table 1 Trip Generation Summary Margate Commercial Development - Margate, Florida								
Land Use	Size	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
<i>Existing</i> General Office Building	35,158 SF	593	73	10	83	20	98	118
<i>Proposed</i> Service Station w/ Convenience Market - Pass-By	16 FP	2,604	82	81	163	108	108	216
		-1,536	-51	-50	-101	-60	-61	-121
	Sub-Total	1,068	31	31	62	48	47	95
Fast-Food Restaurants w/ Drive-Thrus - Pass-By	7,500 SF	3,721	174	167	341	127	118	245
		-1,823	-85	-82	-167	-62	-58	-120
	Sub-Total	1,898	89	85	174	65	60	125
Total Proposed External Trips		2,966	120	116	236	113	107	220
Difference (Proposed - Existing)		2,373	47	106	153	93	9	102

Compiled by: KBP Consulting, Inc. (June 2015).

Source: Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition).

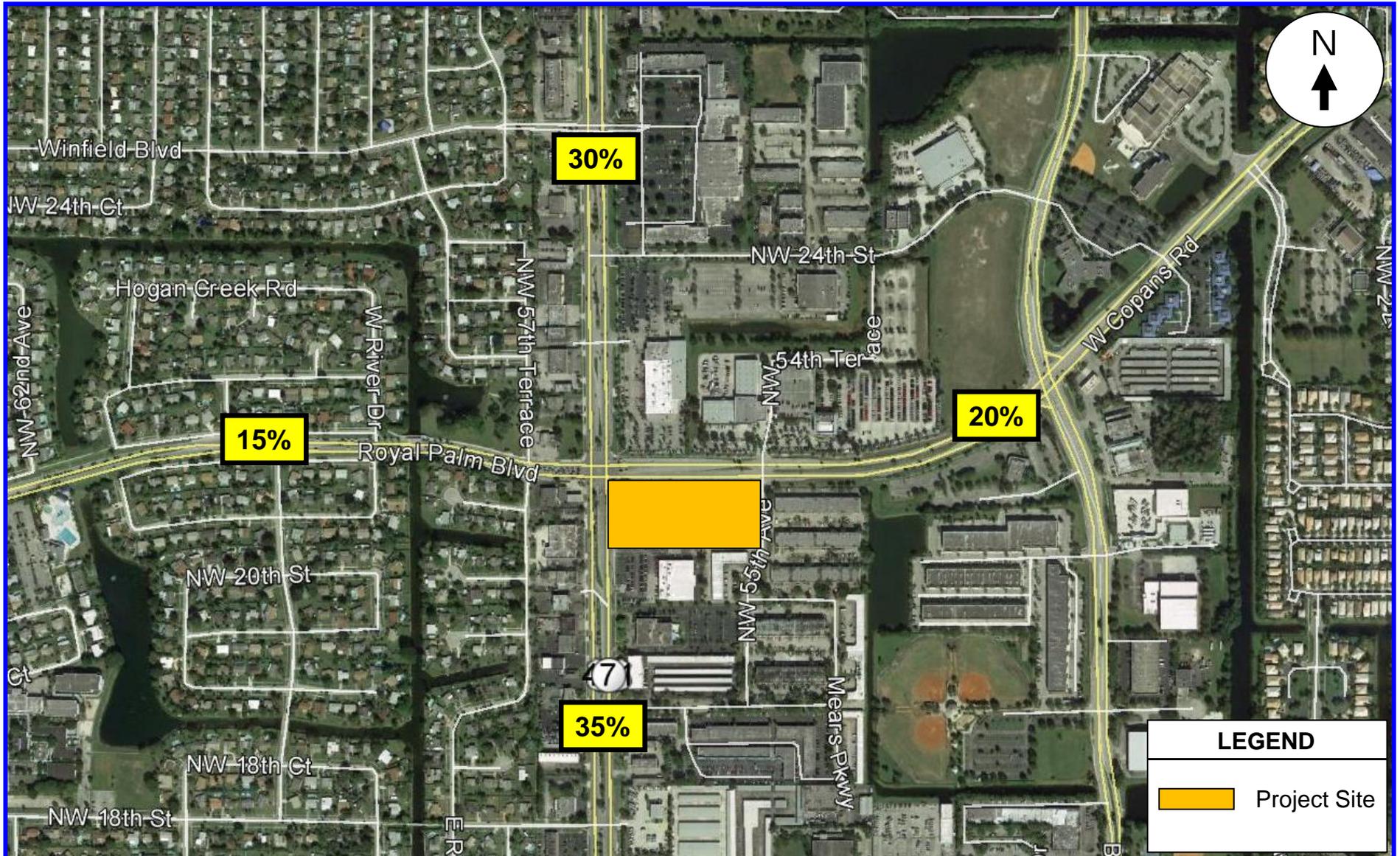
As indicated in Table 1, the proposed commercial development is anticipated to generate approximately 2,966 new daily vehicle trips, approximately 236 new AM peak hour vehicle trips (120 inbound and 116 outbound) and approximately 220 new vehicle trips (113 inbound and 107 outbound) during the typical afternoon peak hour.

When considering the existing office building on this site, the proposed commercial development is projected to generate an additional 2,373 net new daily vehicle trips, an additional 153 net new AM peak hour vehicle trips (47 inbound and 106 outbound), and an additional 102 net new PM peak hour vehicle trips (93 inbound and 9 outbound).

TRIP DISTRIBUTION AND DRIVEWAY ASSIGNMENT

The trip distribution and driveway assignment for the proposed commercial development at State Road 7 / US 441 and W. Copans Road was developed based upon knowledge of the study area, examination of the surrounding roadway network characteristics, review of current traffic volumes, and existing land use patterns. Figure 2 on the following page depicts the anticipated trip distribution for this project. The projected peak hour traffic generated by the proposed development was assigned to the project driveways using the traffic assignment documented in Figure 2. The resulting driveway assignment is presented in Figure 3.

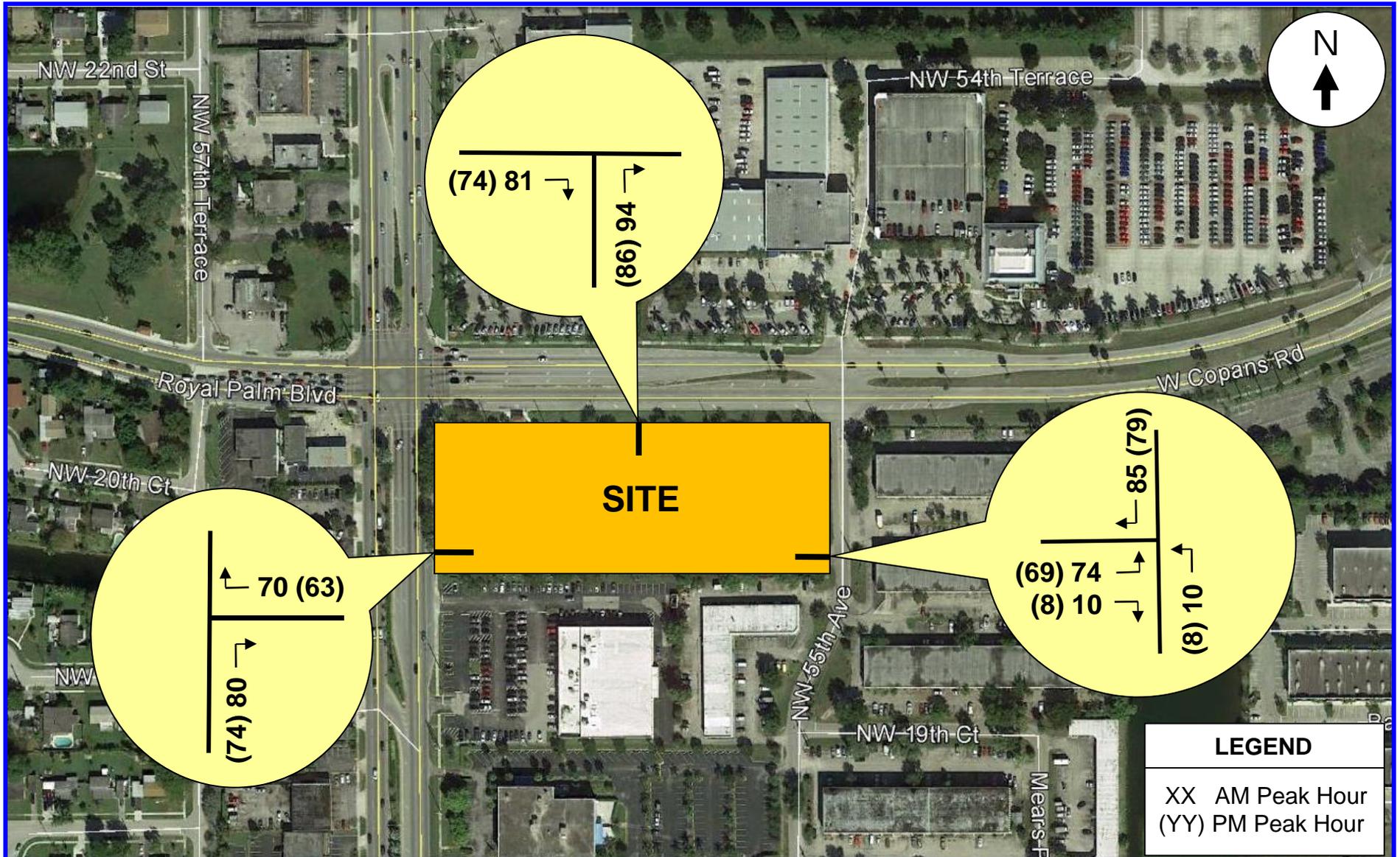
Concerning access to the site, there is an existing northbound right-turn lane on State Road 7 / US 441 and an existing eastbound right-turn lane on W. Copans Road. These dedicated turn lanes will serve the proposed right-turn in / right-turn out only driveways on State Road 7 and W. Copans Road, respectively. Along with the existing westbound left-turn lane on W. Copans Road at NW 55th Avenue, the appropriate turn lanes are already present to accommodate the anticipated traffic to be generated by the proposed commercial development.



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Trip Distribution

FIGURE 2
Margate Commercial
Development
Margate, Florida



SUMMARY & CONCLUSIONS

There is a proposed commercial development to be located in the southeast quadrant of the intersection at State Road 7 / US 441 and W. Copans Road in Margate, Broward County, Florida. The subject site currently consists of a two-story, 35,158 square foot office building. The subject site will be redeveloped with a gasoline / service station with 16 fueling positions, a 6,119 square foot convenience market, and two (2) quick service restaurants (with drive-through lanes) totaling approximately 7,500 square feet.

Access will be provided via one (1) right-turn in / right-turn out only driveway on State Road 7 / US 441, one (1) right-turn in / right-turn out only driveway on W. Copans Road, and one (1) full access driveway on NW 55th Avenue. One of the existing right-turn in / right-turn out only driveways on State Road 7 (nearest W. Copans Road) will be eliminated.

The proposed commercial development is anticipated to generate approximately 2,966 new daily vehicle trips, approximately 236 new AM peak hour vehicle trips (120 inbound and 116 outbound) and approximately 220 new vehicle trips (113 inbound and 107 outbound) during the typical afternoon peak hour.

When considering the existing office building on this site, the proposed commercial development is projected to generate an additional 2,373 net new daily vehicle trips, an additional 153 net new AM peak hour vehicle trips (47 inbound and 106 outbound), and an additional 102 net new PM peak hour vehicle trips (93 inbound and 9 outbound).

The appropriate turn lanes (a northbound right-turn lane on State Road 7 / US 441, an eastbound right-turn lane on W. Copans Road, and a westbound left-turn lane on W. Copans Road at NW 55th Avenue) are already present to accommodate the anticipated traffic to be generated by the proposed commercial development.

APPENDIX A

Margate Commercial Development Site Plan

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY BOWMAN CONSULTING SHALL BE WITHOUT LIABILITY TO BOWMAN CONSULTING.

STATE ROAD NO. 7 / U.S. HIGHWAY NO. 441
R/W VARIES

COPANS ROAD
R/W VARIES

SITE DATA

SITE ADDRESS: 2000 N. STATE ROAD 7, MARGATE, FL 33063
 PARCEL ID: 4842-30-05-0010
 TOTAL SITE AREA: 3.61 AC (TENANT 1.94 AC, FUTURE 1.67 AC)
 EXISTING USE: COMMERCIAL
 ZONING: TOC-G (TRANSIT ORIENTED CORRIDOR - GATEWAY)
 PROPOSED BUILDING AREA: 5,943 SF

SURROUNDING LAND USE:

DIRECTION	ZONED	EXISTING LAND USE
NORTH	TOC - C	COMMERCIAL RETAIL
SOUTH	TOC - C	BOWLING ALLEY
EAST	M1	COMMERCIAL
WEST	TOC - C	GAS STATION

LANDSCAPE BUFFER:

DIRECTION	REQUIRED	PROPOSED
NORTH	10'	10'
SOUTH	5'	9'
EAST	10'	14'
WEST	10'	10'

BUILDING SETBACKS:

DIRECTION	REQUIRED*	PROPOSED
NORTH	25'	138.42'
SOUTH	38'	38'
EAST	25'	154.97'
WEST	25'	75.7'

* MEASURED FROM EDGE OF PAVEMENT
 † 10' SIGN SETBACK

LAND COVERAGE SUMMARY:

CONVENIENCE STORE

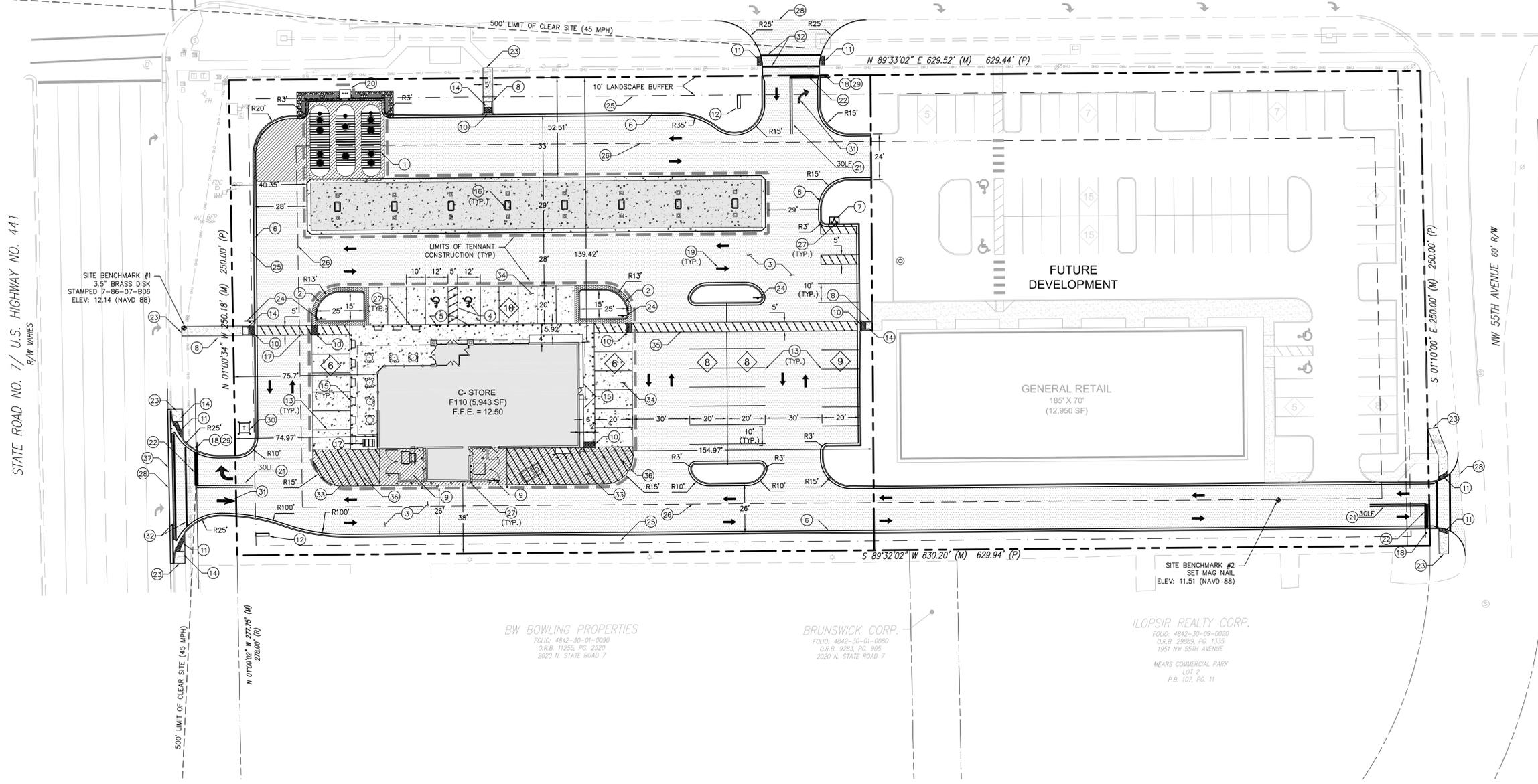
PERVIOUS AREA	IMPERVIOUS AREA	TOTAL	PERCENT
14,915 SF	69,557 SF	84,472 SF	17.7%
(0.34 AC)	(1.60 AC)	(1.94 AC)	82.3%

FUTURE

PERVIOUS AREA	IMPERVIOUS AREA	TOTAL	PERCENT
17,928 SF	55,111 SF	73,039 SF	24.5%
(0.41 AC)	(1.26 AC)	(1.67 AC)	75.5%

PARKING REQUIREMENTS:

REQUIRED	PROVIDED
C-STORE 30 SPACES 1 SPACE / 200 SF	C-STORE 47 SPACES 1 SPACES / 127 SF
FUTURE 65 SPACES 1 SPACE / 200 SF	FUTURE 69 SPACES 1 SPACES / 188 SF
TOTAL 95 SPACES 1 SPACE / 200 SF	TOTAL 116 SPACES 1 SPACES / 163 SF



LEGEND - EXISTING

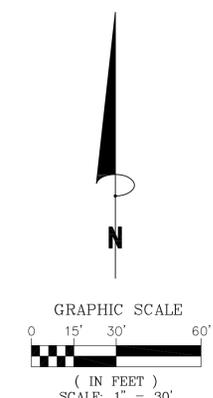
- SIGN
 - TRAFFIC SIGNAL HAND HOLE
 - FIBER OPTIC PULL BOX
 - ELECTRICAL CABINET
 - POWER POLE
 - LIGHT POLE
 - WATER VALVE
 - WATER METER
 - FIRE HYDRANT
 - SANITARY MANHOLE
 - CLEAN OUT
 - IRRIGATION CONTROL VALVE
 - BOLLARD
 - TRAFFIC SIGNAL POLE
 - IRP □ IRON ROD FOUND
 - IRP □ IRON PIPE FOUND
 - MON □ MONUMENT
 - ◆ BENCHMARK
 - R/W RIGHT OF WAY
 - WATER LINE
 - FENCE LINE
- A/C = AIR CONDITIONING
 - BFP = BACKFLOW PREVENTER
 - CO = CLEAN OUT
 - CONC = CONCRETE
 - CBS = CONCRETE BLOCK STRUCTURE
 - CM = CONCRETE MONUMENT
 - CMP = CORRUGATED METAL PIPE
 - CWP = CONCRETE POWER POLE
 - DIP = DUCTILE IRON PIPE
 - EHH = ELECTRIC HAND HOLE
 - ELEC = ELECTRIC
 - ELEV = ELEVATION
 - EO = ELECTRICAL OUTLET
 - ET = ELECTRICAL TRANSFORMER
 - EX = EXISTING
 - FDOT = FLORIDA DEPARTMENT OF TRANSPORTATION
 - FDC = FIRE DEPARTMENT CONNECTOR
 - FH = FIRE HYDRANT
 - FM = FORCE MAIN
 - FOC = FIBER OPTIC CONDUIT
 - GA = GUY ANCHOR
 - GEN = GENERATOR
 - HDPE = HIGH DENSITY POLYETHYLENE PIPE
 - ICV = IRRIGATION CONTROL VALVE
 - INV = INVERT
- LB = LICENSED BUSINESS
 - LP = LIGHT POLE
 - (M) = MEASURED DISTANCE
 - NAD = NORTH AMERICAN DATUM
 - NAV = NORTH AMERICAN VERTICAL DATUM
 - ORB = OFFICIAL RECORDS BOOK
 - OU = OVERHEAD UTILITY
 - (P) = PLAT DISTANCE
 - PB = PLAT BOOK
 - PG = PAGE
 - P.O.B. = POINT OF BEGINNING
 - P.O.C. = POINT OF COMMENCEMENT
 - PVC = POLYVINYL CHLORIDE PIPE
 - PRM = PERMANENT REFERENCE MONUMENT
 - (R) = RECORD DISTANCE
 - RCP = REINFORCED CONCRETE PIPE
 - R/W = RIGHT OF WAY
 - SR = STATE ROAD
 - SWK = SIDEWALK
 - TYP = TYPICAL
 - WM = WATER METER
 - WV = WATER VALVE
 - WPP = WOOD POWER POLE

PAVEMENT LEGEND

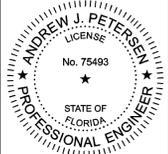
- PROPOSED STANDARD DUTY CONCRETE PAVEMENT
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- PROPOSED STAMPED CONCRETE

SITE LEGEND

1. UNDERGROUND FUEL TANKS BY TENANT
2. CORNER/PARKING ISLAND, SEE DETAIL SHEET D2.0
3. ASPHALT PAVING, SEE DETAIL SHEET D1.0
4. ACCESSIBLE STRIPING, SEE DETAIL SHEET D1.0
5. ACCESSIBLE PARKING SIGN, SEE DETAIL SHEET D1.0
6. TYPE "F" CURB, SEE DETAIL SHEET D2.0
7. AIR PUMP ON 4"x4" CONCRETE PAD W/ 2 BOLLARDS, SEE DETAIL SHEET D1.0
8. 5' CONCRETE SIDEWALK, SEE DETAIL SHEET D1.0
9. DUMPSTER ENCLOSURE, PER ARCHITECTURAL PLANS
10. TRUNCATED DOMES TO BE OVERLAY PAD, 3" DEEP
11. DETECTABLE WARNING PER FDOT INDEX NO. 304
12. SIGN TO BE PERMITTED UNDER SEPARATE COVER
13. 4" SINGLE YELLOW STRIPE LINE (SYSL4)
14. CONCRETE RAMP PER A.D.A. REQUIREMENTS AND FDOT INDEX NO. 304
15. LANDSCAPE PLANTER, SEE DETAIL SHEET D2.0
16. "3+1" GAS DISPENSER (MPD) BY TENANT
17. BIKE RACK, SEE DETAIL SHEET D1.0
18. 36" STOP SIGN (R1-1) PER FDOT INDEX NO. 11960
19. PAVEMENT MARKINGS, PER FDOT INDEX NO. 17346
20. VENT STACK ON 5' X 8' CONCRETE PAD W/ 2 BOLLARDS, BY TENANT
21. 6" DOUBLE YELLOW STRIPE LINE (DYSL6"), SEE LENGTH INDICATED AT SYMBOL
22. 24" WIDE WHITE STOP BAR, PER FDOT INDEX NO. 17346
23. MATCH EXISTING CONCRETE SIDEWALK
24. PEDESTRIAN CROSSING SIGN (WW11-2) PER FDOT INDEX NO. 17346
25. LANDSCAPE BUFFER
26. BUILDING SETBACK
27. PIPE BOLLARD, SEE DETAIL SHEET D1.0
28. SAW-CUT AND CONSTRUCT SMOOTH TRANSITION TO MATCH EXISTING CURB/PAVEMENT
29. RIGHT TURN ONLY SIGN (RS-SR) PER FDOT INDEX NO. 17346
30. TRANSFORMER PAD WITH (4) BOLLARDS, CONTRACTOR TO CONFIRM REQUIREMENTS AND COORDINATE ELECTRIC SERVICE WITH POWER COMPANY
31. PAVEMENT MARKINGS PER FDOT INDEX NO. 17346
32. CROSSWALK STRIPING PER FDOT INDEX NO. 17346
33. HEAVY DUTY CONCRETE PAVEMENT, SEE DETAIL SHEET D1.0
34. STANDARD DUTY CONCRETE PAVEMENT, SEE DETAIL SHEET D1.0
35. CROSS WALK STRIPING, SYSL6" SPACED AT 3.5' O.C. @ 60" BOUND BY DYSL6"
36. LOADING ZONE STRIPING, SYSL4" SPACED AT 2' O.C. @ 45" BOUND BY SYSL4"
37. DROP CURB, PER FDOT INDEX NO. 300
38. LIGHT POLE, SEE DETAIL SHEET D1.0



SITE PLAN
MARGATE HYBRID CONVENIENCE MARKET
 2000 STATE ROAD NO. 7
 MARGATE, FL 33063
 CITY OF MARGATE
 BROWARD COUNTY, FL



ANDREW J. PETERSEN
 LICENSE NO. 75493
 09/16/2015

PLAN STATUS		
DATE	DESIGNER	DESCRIPTION
	SW	AJP
	EC	CHKD
	DESIGN	CHKD
SCALE 1" = 30'		
JOB No. 010032-01-012		
DATE September, 2015		
FILE 010032-01-0-02-012-05-SIT		
SHEET		C1.0

KBP CONSULTING, INC.

July 11, 2015

Mr. Robert Grassman
Project Manager
Bowman Consulting
4450 W. Eau Gallie Boulevard, Suite 232
Melbourne, Florida 32934

**Re: Margate Commercial Development – Margate, Florida
Technical Memorandum**

Dear Robert:

There is a proposed commercial development to be located in the southeast quadrant of the intersection at State Road 7 / US 441 and W. Copans Road in Margate, Broward County, Florida. The subject site currently consists of a two-story, 35,158 square foot office building. The subject site will be redeveloped with a gasoline / service station with 16 fueling positions, a 6,119 square foot convenience market, and two (2) quick service restaurants (with drive-through lanes) totaling approximately 7,500 square feet. A project location map is presented in Attachment A to this memorandum.

Access to this site is currently provided by two (2) right-turn in / right-turn out only driveways on State Road 7 / US 441 and one (1) full access driveway on NW 55th Avenue. Access will be provided via one (1) right-turn in / right-turn out only driveway on State Road 7 / US 441, one (1) right-turn in / right-turn out only driveway on W. Copans Road, and one (1) full access driveway on NW 55th Avenue. One of the existing right-turn in / right-turn out only driveways on State Road 7 / US 441 (nearest W. Copans Road) will be eliminated.

The purpose of this Technical Memorandum is to document the operational characteristics of the intersection at State Road 7 / US 441 and W. Copans Road and, more specifically, the queuing characteristics of the northbound right-turn lane as it relates to the interaction with the planned (and current) driveway location on State Road 7 / US 441.

Intersection Geometry

The existing geometry associated with the study intersection is as follows:

- **Northbound:** Dual left-turn lanes (approx. 350 feet of storage), three through lanes and an exclusive right-turn lane (approx. 350 feet of storage)
- **Southbound:** Dual left-turn lanes (approx. 285 feet of storage) and three through lanes with a shared right-turn lane
- **Eastbound:** Dual left turn lanes (approx. 190 feet of storage), two through lanes, and an exclusive right-turn lane (approx. 210 feet of storage)
- **Westbound:** Dual left-turn lanes (approx. 350 feet of storage), two through lanes and an exclusive right-turn lane (approx. 350 feet of storage)

Signal Timing Information

The current signal timing plan for the intersection of State Road 7 and W. Copans Road was obtained from Broward County Traffic Engineering and is presented in Attachment B to this memorandum.

KBP CONSULTING, INC.

Traffic Data Collection

An intersection turning movement count was performed at the intersection of State Road 7 / US 441 and W. Copans Road / Royal Palm Boulevard on Thursday, June 25, 2015 during the AM peak period (7:00 – 9:00) and the PM peak period (4:00 – 6:00). This data is presented in Attachment C of this memorandum.

Trip Generation Analysis

A trip generation analysis was conducted for the existing and proposed development on the subject site. The analysis was performed using the trip generation rates and equations published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual (9th Edition)*. The trip generation analysis was undertaken for daily, AM peak hour, and PM peak hour conditions. According to the ITE report, the most appropriate "land use" categories for the existing and proposed development are as follows:

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- Weekday: $\text{Ln}(T) = 0.76 \text{Ln}(X) + 3.68$
where T = number of trips and X = 1,000 square feet of gross floor area
- AM Peak Hour: $\text{Ln}(T) = 0.80 \text{Ln}(X) + 1.57$ (88% in / 12% out)
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- Weekday: $T = 162.78 (X)$
where T = number of trips and X = number of fueling positions
- AM Peak Hour: $T = 10.16 (X)$ (50% in / 50% out)
- PM Peak Hour: $T = 13.51 (X)$ (50% in / 50% out)
 - Pass-By: AM Peak = 62%, PM Peak = 56%

ITE Land Use #934 – Fast-Food Restaurant with Drive-Through Window

- Weekday: $T = 496.12 (X)$
where T = number of trips and X = 1,000 square feet of gross floor area
- AM Peak Hour: $T = 45.42 (X)$ (51% in / 49% out)
- PM Peak Hour: $T = 32.65 (X)$ (52% in / 48% out)
 - Pass-By = 49%

Utilizing the above-listed trip generation rates from the referenced ITE document, a trip generation analysis was undertaken for the existing office building and the proposed commercial development on the subject site at State Road 7 / US 441 and W. Copans Road in Margate. The results of this effort are documented in Table 1 on the following page.

As indicated in Table 1, the proposed commercial development is anticipated to generate approximately 2,966 new daily vehicle trips, approximately 236 new AM peak hour vehicle trips (120 inbound and 116 outbound) and approximately 220 new vehicle trips (113 inbound and 107 outbound) during the typical afternoon peak hour.

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<i>Existing</i> General Office Building	35,158 SF	593	73	10	83	20	98	118
<i>Proposed</i> Service Station w/ Convenience Market - Pass-By	16 FP	2,604	82	81	163	108	108	216
		-1,536	-51	-50	-101	-60	-61	-121
Sub-Total		1,068	31	31	62	48	47	95
Fast-Food Restaurants w/ Drive-Thrus - Pass-By	7,500 SF	3,721	174	167	341	127	118	245
		-1,823	-85	-82	-167	-62	-58	-120
Sub-Total		1,898	89	85	174	65	60	125
Total Proposed External Trips		2,966	120	116	236	113	107	220
Difference (Proposed - Existing)		2,373	47	106	153	93	9	102

Compiled by: KBP Consulting, Inc. (June 2015).

Source: Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition).

Traffic Analyses

This section of this memorandum is divided into two (2) primary parts. The first part of this section involves the development of the future (2016) traffic volumes for the study area. The second part of this section includes intersection analyses for the future conditions.

Future Conditions Traffic Volumes

Future, build-out year (2016) traffic volumes were developed for the project study area in the following manner:

- **Average Peak Season Conversion Factor:** Traffic data collected on June 25, 2015 was reviewed with respect to average peak season conditions. Based on FDOT's Peak Season Factor Category report (see Attachment D), the adjustment factor for data collected during this time period is 1.08.
- **Historic Traffic Growth:** Research relative to the background traffic growth in the area was conducted. Historic traffic count data maintained by the FDOT was reviewed and is presented in Attachment E of this report. Generally speaking, the traffic volumes in the vicinity of the subject intersection have remained relatively steady over the years. As such, an annual growth rate of 1.0% was applied.

The future traffic calculations (peak season adjustments, background traffic growth, and the traffic associated with the proposed commercial development) for the study intersection is contained in Attachment F in tabular format.

Level of Service (LOS) Analyses – Intersections

Intersection capacity / level of service (LOS) analyses were conducted for the study intersection. These analyses were undertaken following the capacity / level of service procedures outlined in the Highway Capacity Manual (HCM) using the SYNCHRO software. The SYNCHRO output for the AM and PM peak hour analyses are presented in Attachment G.

KBP CONSULTING, INC.

Overall, the subject intersection reported to be operating at Level of Service (LOS) “E” during the AM peak hour and LOS “F” during the PM peak hour. As it relates to the northbound right-turn lane queueing characteristics, the traffic analysis software indicates the following:

- **AM Peak Hour**
 - 50th Percentile Queue Length: 150 feet
 - 95th Percentile Queue Length: 199 feet
- **PM Peak Hour**
 - 50th Percentile Queue Length: 112 feet
 - 95th Percentile Queue Length: 179 feet

Based upon preliminary discussions relative to the proposed (and current) driveway on State Road 7, it was noted that this driveway will be located (as it is today) within the limits of the existing northbound right-turn lane. A potential modification at this location involved discontinuing the northbound right-turn lane at the project driveway and resuming the turn lane immediately north of the project driveway. The result would be a northbound right-turn lane at State Road 7 and W. Copans Road with approximately 150 feet of storage and a 50 foot taper.

Based upon the results of the intersection analyses summarized above, it appears that this configuration would be marginally acceptable given the vehicular demand and resulting queues. As a result, it is our opinion that the current turn lane configuration with the proposed driveway location is preferable.

If you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

KBP CONSULTING, INC.



Karl B. Peterson, P.E.
Florida Registration Number 49897
Engineering Business Number 29939

Attachment A

Margate Commercial Development

Project Location Map

Attachment B

Signal Timing Plan

SR 7 & W. Copans Road

Station : 1161 - SR 7 & Royal Palm Blvd (Standard File)

Phase	1 (SL)	2 (NT)	3 (WL)	4 (ET)	5 (NL)	6 (ST)	7 (EL)	8 (WT)	9	10	11	12	13	14	15	16
Walk		7		5		7		5								
Ped Clearance		22		25		22		25								
Min Green	5	12	5	8	5	12	5	8								
Gap Ext	1.5	3	1.5	2.5	1.5	3	2	2.5								
Max1	20	35	20	40	20	35	20	40								
Max2																
Yellow Clr	5	5	4.5	4.5	5	5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clr	2	2	2	2	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Red Revert																
Added Initial																
Max Initial																
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap																
Dynamic Max Limit																
Dynamic Max Step																
Enable	ON	ON	ON	ON	ON	ON	ON	ON								
Auto Flash Entry				ON				ON								
Auto Flash Exit		ON				ON										
Non-Actuated 1																
Non-Actuated 2																
Lock Call	ON		ON		ON		ON		ON	ON	ON	ON	ON	ON	ON	ON
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry				ON				ON								
Sim Gap Enable									ON	ON	ON	ON	ON	ON	ON	ON
Guar Passage																
Rest In Walk		ON				ON										
Cond Service																
Add Init Calc																
Concurrent Ps	1	1	1	1	2	2	2	2								

Preemption

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Auto Flash						
Override Higher Preempt						
Flash in Dwell						
Link to Preempt						
Delay						
Min Duration						
Min Green	6	6	6	6	6	6
Min Walk						
Ped Clear						
Track Green						
Min Dwell	6	6	6	6	6	6
Max Presence	180	180	180	180	180	180
Track Veh 1						
Track Veh 2						
Track Veh 3						
Track Veh 4						
Dwell Cyc Veh 1	2	4	1	3	2	4
Dwell Cyc Veh 2	6	8	6	8	5	7
Dwell Cyc Veh 3						
Dwell Cyc Veh 4						
Dwell Cyc Veh 5						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Enable				
Lock Mode	MAX	MAX	MAX	MAX
Coord in Preempt				
No Skip				
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Lock				
Headway				
Group Lock				
Queue Jump				
Free Mode				
Alt Table				

Attachment C

Intersection Turning Movement Count

SR 7 & W. Copans Road

TRIDENT Engineering

62 Gables Boulevard
Fort Lauderdale, FL 33326
Tel.: 954-815-3265

File Name: 20150625 TMC VD
Site Code: -
Count Date: 6/25/2015 (Thu.)
Page No: 2 of 5

IENT: KBP
JOB No: 2015-00041
PROJECT: TMC
COUNTY: BROWARD

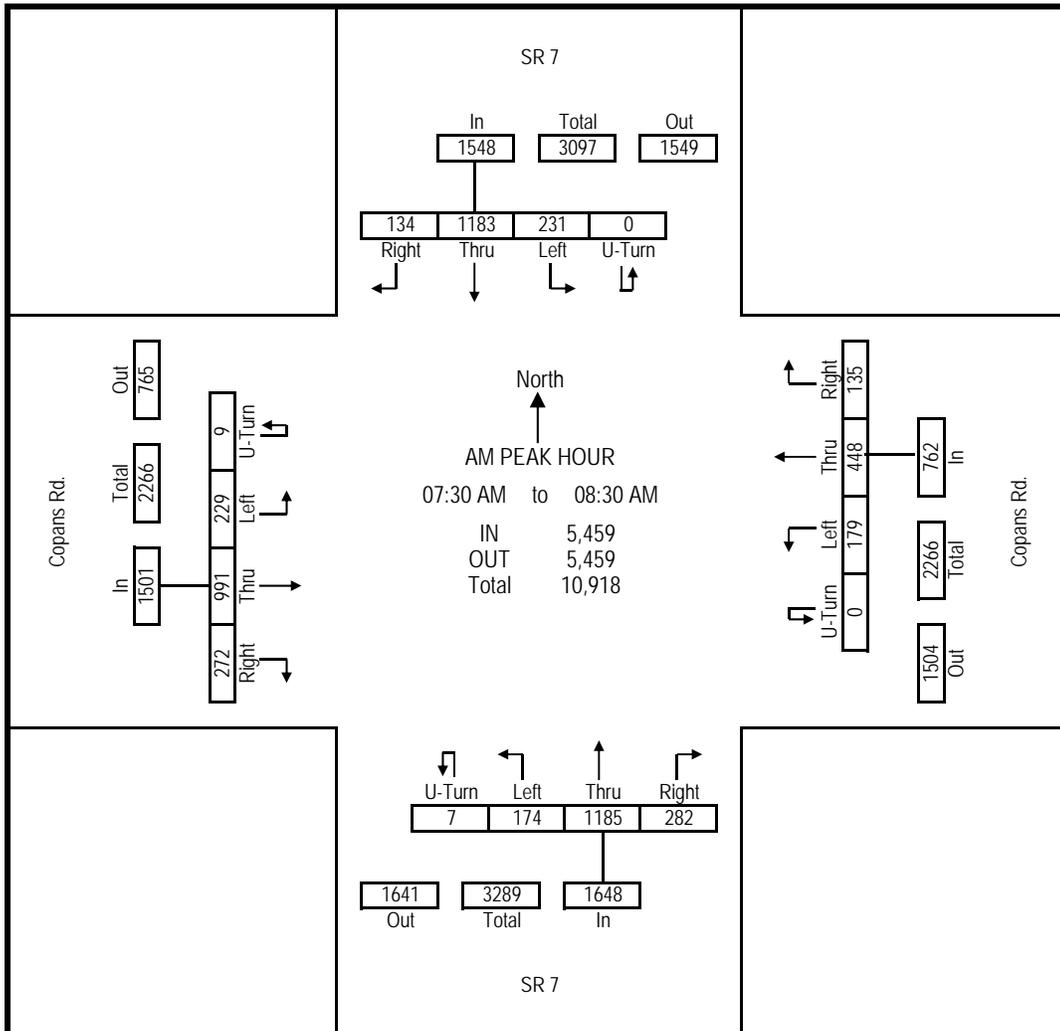
NW 10 Street

Groups Printed: Automobiles & Heavy Vehicles

Start Time	SR 7 Southbound				Copans Rd. Westbound				SR 7 Northbound				Copans Rd. Eastbound				Int Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
07:30 AM	0	67	330	37	0	51	102	30	2	40	299	78	1	61	238	59	1395
07:45 AM	0	59	251	24	0	38	117	40	3	51	276	88	4	63	274	73	1361
08:00 AM	0	45	262	39	0	59	117	36	0	42	297	65	2	48	240	72	1324
08:15 AM	0	60	340	34	0	31	112	29	2	41	313	51	2	57	239	68	1379
Total	0	231	1183	134	0	179	448	135	7	174	1185	282	9	229	991	272	5459
PHF	0.000	0.862	0.870	0.859	0.000	0.758	0.957	0.844	0.583	0.853	0.946	0.801	0.563	0.909	0.904	0.932	0.98
Heavy Veh %	0%	4%	2%	5%	0%	3%	5%	8%	0%	9%	3%	2%	0%	1%	2%	3%	3%
App Vol %	0%	15%	76%	9%	0%	23%	59%	18%	0%	11%	72%	17%	1%	15%	66%	18%	

Intersection Peak Hour Analysis From 07:00 AM to 9:00 AM

Peak Hour for Entire Intersection Begins at : 07:30 AM to 08:30 AM



TRIDENT Engineering

62 Gables Boulevard
Fort Lauderdale, FL 33326
Tel.: 954-815-3265

File Name: 20150625 TMC VD
Site Code: -
Count Date: 6/25/2015 (Thu.)
Page No: 3 of 5

IENT: KBP
JOB No: 2015-00041
PROJECT: TMC
COUNTY: BROWARD

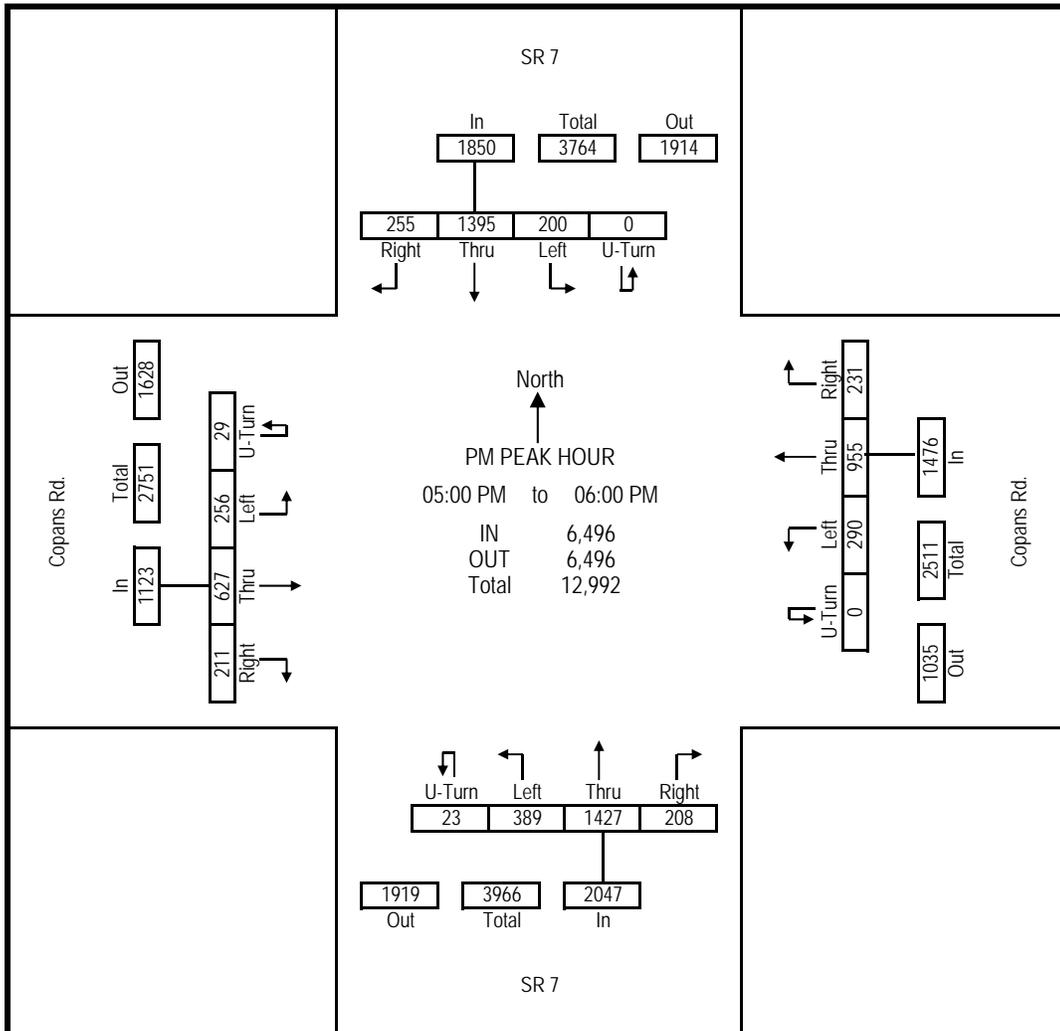
NW 10 Street

Groups Printed: Automobiles & Heavy Vehicles

Start Time	SR 7 Southbound				Copans Rd. Westbound				SR 7 Northbound				Copans Rd. Eastbound				Int Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
05:00 PM	0	58	395	82	0	81	206	78	8	104	343	53	5	60	143	52	1668
05:15 PM	0	52	330	55	0	83	271	60	6	87	353	43	8	66	193	49	1656
05:30 PM	0	41	333	57	0	78	242	40	5	86	391	61	7	73	147	57	1618
05:45 PM	0	49	337	61	0	48	236	53	4	112	340	51	9	57	144	53	1554
Total	0	200	1395	255	0	290	955	231	23	389	1427	208	29	256	627	211	6496
PHF	0.000	0.862	0.883	0.777	0.000	0.873	0.881	0.740	0.719	0.868	0.912	0.852	0.806	0.877	0.812	0.925	0.97
Heavy Veh %	0%	5%	2%	1%	0%	1%	2%	1%	0%	2%	2%	1%	0%	0%	3%	1%	2%
App Vol %	0%	11%	75%	14%	0%	20%	65%	16%	1%	19%	70%	10%	3%	23%	56%	19%	

Intersection Peak Hour Analysis From 04:00 PM to 06:00 PM

Peak Hour for Entire Intersection Begins at : 05:00 PM to 06:00 PM



TRIDENT Engineering

62 Gables Boulevard
Fort Lauderdale, FL 33326
TEL: 954-815-3265

CLIENT: KBP
JOB No: 2015-00041
PROJECT: TMC
COUNTY: BROWARD

File Name: 20150625 TMC VD
Site Code: -
Count Date: 6/25/2015 (Thu.)
Page No: 5 of 5

Groups Printed: Heavy Vehicles

Start Time	SR 7 Southbound				Copans Rd. Westbound				SR 7 Northbound				Copans Rd. Eastbound				Int Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
06:00 AM																	
06:15 AM																	
06:30 AM																	
06:45 AM																	
Total																	
07:00 AM	0	2	4	2	0	3	3	4	0	2	10	4	0	0	2	2	38
07:15 AM	0	1	4	0	0	4	3	0	0	2	7	3	0	2	4	2	32
07:30 AM	0	2	5	1	0	0	6	3	0	3	6	2	0	0	6	1	35
07:45 AM	0	1	5	0	0	1	7	3	0	7	9	1	0	0	4	3	41
Total	0	6	18	3	0	8	19	10	0	14	32	10	0	2	16	8	146
08:00 AM	0	3	4	3	0	2	5	3	0	5	10	1	0	1	3	3	43
08:15 AM	0	3	7	3	0	3	6	2	0	2	12	3	0	1	4	2	48
08:30 AM	0	1	8	2	0	2	3	4	0	4	10	3	0	2	3	4	46
08:45 AM	0	2	9	3	0	4	10	3	0	3	12	4	0	3	7	3	63
Total	0	9	28	11	0	11	24	12	0	14	44	11	0	7	17	12	200
09:00 AM																	
09:15 AM																	
09:30 AM																	
09:45 AM																	
Total																	
10:00 AM																	
10:15 AM																	
10:30 AM																	
10:45 AM																	
Total																	
11:00 AM																	
11:15 AM																	
11:30 AM																	
11:45 AM																	
Total																	
12:00 PM																	
12:15 PM																	
12:30 PM																	
12:45 PM																	
Total																	
01:00 PM																	
01:15 PM																	
01:30 PM																	
01:45 PM																	
Total																	
02:00 PM																	
02:15 PM																	
02:30 PM																	
02:45 PM																	
Total																	
03:00 PM																	
03:15 PM																	
03:30 PM																	
03:45 PM																	
Total																	
04:00 PM	0	2	8	1	0	2	6	2	0	1	7	2	0	1	5	5	42
04:15 PM	0	3	8	1	0	2	5	1	0	2	6	1	0	2	15	3	49
04:30 PM	0	2	12	0	0	2	10	0	0	1	9	1	0	2	8	1	48
04:45 PM	0	1	6	1	0	0	5	0	0	1	4	0	0	0	5	3	26
Total	0	8	34	3	0	6	26	3	0	5	26	4	0	5	33	12	165
05:00 PM	0	3	14	1	0	2	6	1	0	2	8	1	0	0	8	3	49
05:15 PM	0	2	4	0	0	1	3	0	0	1	3	1	0	0	9	0	24
05:30 PM	0	2	8	1	0	1	3	0	0	1	6	0	0	0	2	0	24
05:45 PM	0	4	8	1	0	0	4	1	0	2	7	1	0	1	2	0	31
Total	0	11	34	3	0	4	16	2	0	6	24	3	0	1	21	3	128
06:00 PM																	
06:15 PM																	
06:30 PM																	
06:45 PM																	
Total																	

.....BREAK.....

*****BREAK*****

Attachment D

Peak Season Factor Category Report

Broward County

2014 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
 CATEGORY: 8601 CEN.-W OF US1 TO SR7

WEEK	DATES	SF	MOCF: 0.97 PSCF
1	01/01/2014 - 01/04/2014	0.97	1.00
2	01/05/2014 - 01/11/2014	0.99	1.02
3	01/12/2014 - 01/18/2014	1.01	1.04
4	01/19/2014 - 01/25/2014	1.00	1.03
* 5	01/26/2014 - 02/01/2014	0.99	1.02
* 6	02/02/2014 - 02/08/2014	0.98	1.01
* 7	02/09/2014 - 02/15/2014	0.97	1.00
* 8	02/16/2014 - 02/22/2014	0.96	0.99
* 9	02/23/2014 - 03/01/2014	0.96	0.99
*10	03/02/2014 - 03/08/2014	0.96	0.99
*11	03/09/2014 - 03/15/2014	0.96	0.99
*12	03/16/2014 - 03/22/2014	0.96	0.99
*13	03/23/2014 - 03/29/2014	0.96	0.99
*14	03/30/2014 - 04/05/2014	0.97	1.00
*15	04/06/2014 - 04/12/2014	0.98	1.01
*16	04/13/2014 - 04/19/2014	0.98	1.01
*17	04/20/2014 - 04/26/2014	0.99	1.02
18	04/27/2014 - 05/03/2014	1.00	1.03
19	05/04/2014 - 05/10/2014	1.01	1.04
20	05/11/2014 - 05/17/2014	1.01	1.04
21	05/18/2014 - 05/24/2014	1.02	1.05
22	05/25/2014 - 05/31/2014	1.03	1.06
23	06/01/2014 - 06/07/2014	1.03	1.06
24	06/08/2014 - 06/14/2014	1.04	1.07
25	06/15/2014 - 06/21/2014	1.05	1.08
26	06/22/2014 - 06/28/2014	1.05	1.08
27	06/29/2014 - 07/05/2014	1.05	1.08
28	07/06/2014 - 07/12/2014	1.05	1.08
29	07/13/2014 - 07/19/2014	1.05	1.08
30	07/20/2014 - 07/26/2014	1.05	1.08
31	07/27/2014 - 08/02/2014	1.04	1.07
32	08/03/2014 - 08/09/2014	1.04	1.07
33	08/10/2014 - 08/16/2014	1.03	1.06
34	08/17/2014 - 08/23/2014	1.03	1.06
35	08/24/2014 - 08/30/2014	1.03	1.06
36	08/31/2014 - 09/06/2014	1.03	1.06
37	09/07/2014 - 09/13/2014	1.03	1.06
38	09/14/2014 - 09/20/2014	1.04	1.07
39	09/21/2014 - 09/27/2014	1.03	1.06
40	09/28/2014 - 10/04/2014	1.02	1.05
41	10/05/2014 - 10/11/2014	1.01	1.04
42	10/12/2014 - 10/18/2014	1.00	1.03
43	10/19/2014 - 10/25/2014	1.00	1.03
44	10/26/2014 - 11/01/2014	1.00	1.03
45	11/02/2014 - 11/08/2014	1.00	1.03
46	11/09/2014 - 11/15/2014	1.00	1.03
47	11/16/2014 - 11/22/2014	1.00	1.03
48	11/23/2014 - 11/29/2014	0.99	1.02
49	11/30/2014 - 12/06/2014	0.98	1.01
50	12/07/2014 - 12/13/2014	0.98	1.01
51	12/14/2014 - 12/20/2014	0.97	1.00
52	12/21/2014 - 12/27/2014	0.99	1.02
53	12/28/2014 - 12/31/2014	1.01	1.04

* PEAK SEASON

09-MAR-2015 16:07:53

830UPD

4_8601_PKSEASON.TXT

Attachment E

Historical Traffic Data

FLORIDA DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION STATISTICS OFFICE
 2014 HISTORICAL AADT REPORT

COUNTY: 86 - BROWARD

SITE: 0169 - SR 7/US 441 - S OF ROYAL PALM BLVD/COPANS RD

YEAR	AADT		DIRECTION 1		DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2014	53000	C	N 27500		S 25500	9.00	54.20	3.10
2013	51500	C	N 26000		S 25500	9.00	53.60	3.10
2012	52500	C	N 25500		S 27000	9.00	52.20	2.70
2011	45000	C	N 23000		S 22000	9.00	52.50	5.60
2010	48500	C	N 25000		S 23500	8.35	52.69	5.60
2009	47000	C	N 23500		S 23500	8.53	53.89	4.00
2008	55000	C	N 28000		S 27000	8.81	54.16	4.00
2007	50500	C	N 26000		S 24500	8.63	55.75	2.20
2006	51500	C	N 26500		S 25000	8.40	55.34	5.10
2005	52000	C	N 26500		S 25500	8.20	51.70	5.10
2004	52000	C	N 26000		S 26000	9.10	55.30	5.10
2003	52500	C	N 26000		S 26500	8.60	57.50	3.20
2002	52000	C	N 26500		S 25500	8.70	56.40	3.20
2001	51500	C	N 26000		S 25500	9.00	60.20	2.60
2000	50000	C	N 24500		S 25500	8.90	57.80	2.50
1999	49500	C	N 24500		S 25000	9.60	62.50	2.90

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN

*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION STATISTICS OFFICE
 2014 HISTORICAL AADT REPORT

COUNTY: 86 - BROWARD

SITE: 5294 - SR 7/US 441 - N OF ROYAL PALM BLVD/COPANS RD

YEAR	AADT		DIRECTION 1		DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2014	50000	C	N 25500		S 24500	9.00	54.20	2.40
2013	49500	C	N 24500		S 25000	9.00	53.60	2.60
2012	53000	C	N 26500		S 26500	9.00	52.20	5.60
2011	43000	C	N 21000		S 22000	9.00	52.50	5.60
2010	49000	C	N 25500		S 23500	8.35	52.69	5.60
2009	47500	C	N 23500		S 24000	8.53	53.89	4.80
2008	50500	C	N 26500		S 24000	8.81	54.16	4.80
2007	50000	C	N 25000		S 25000	8.63	55.75	2.20
2006	50000	C	N 25000		S 25000	8.40	55.34	5.20
2005	50500	C	N 25000		S 25500	8.20	51.70	5.20
2004	49000	C	N 24500		S 24500	9.10	55.30	5.20
2003	52000	C	N 26000		S 26000	8.60	57.50	4.10
2002	51500	C	N 25500		S 26000	8.70	56.40	4.10
2001	52000	C	N 26000		S 26000	9.00	60.20	2.60
2000	51500	C	N 25500		S 26000	8.90	57.80	2.50
1999	50500	C	N 25500		S 25000	9.60	62.50	2.90

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN

*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION STATISTICS OFFICE
 2014 HISTORICAL AADT REPORT

COUNTY: 86 - BROWARD

SITE: 7473 - ROYAL PALM BLVD, W OF SR 7

YEAR	AADT	DIRECTION 1		DIRECTION 2		*K FACTOR	D FACTOR	T FACTOR
2014	21500 R					9.00	56.80	7.40
2013	21000 T	0		0		9.00	56.20	7.60
2012	21000 S	0		0		9.00	57.00	5.90
2011	20500 F	0		0		9.00	59.10	6.30
2010	20400 C	E 9900		W 10500		9.60	57.92	9.30
2009	31000 F	E 15500		W 15500		9.71	58.42	5.30
2008	31000 C	E 15500		W 15500		9.67	56.67	6.50
2007	32000 C	E 16000		W 16000		10.19	60.63	4.80
2006	39500 C	E 17000		W 22500		9.61	59.08	2.90
2005	31500 C	E 16000		W 15500		10.00	58.10	0.00

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN

*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION STATISTICS OFFICE
 2014 HISTORICAL AADT REPORT

COUNTY: 86 - BROWARD

SITE: 8056 - COPANS ROAD, E OF SR 7

YEAR	AADT	DIRECTION 1		DIRECTION 2		*K FACTOR	D FACTOR	T FACTOR
2014	28500 X					9.00	54.20	7.40
2013	28500 X		0		0	9.00	53.60	7.60
2012	28500 T		0		0	9.00	52.20	5.90
2011	28500 S		0		0	9.00	52.50	6.30
2010	28500 F	E	14000	W	14500	8.35	52.69	9.30
2009	28500 C	E	14000	W	14500	8.53	53.89	5.30
2008	25500 C	E	14000	W	11500	8.81	54.16	6.50
2007	29500 C	E	15000	W	14500	8.63	55.75	4.80
2006	38000 C	E	19000	W	19000	8.40	55.34	2.90
2005	30000 C	E	15000	W	15000	8.20	51.70	0.00

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN

*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

Attachment F

Future Turning Movement Volumes

SR 7 & W. Copans Road

FUTURE TURNING MOVEMENT VOLUME ANALYSIS

State Road 7 and W. Copans Road AM Peak Hour

Description	SR 7 Northbound			SR 7 Southbound			W. Copans Rd Eastbound			W. Copans Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (6/25/2015)	181	1,185	282	231	1,183	134	238	991	272	179	448	135
Season Adjustment Factor	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2015 Peak Season Traffic	195	1,280	305	249	1,278	145	257	1,070	294	193	484	146
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
2016 Background Traffic	197	1,293	308	252	1,290	146	260	1,081	297	195	489	147
New Project Trips	6	20	10	36				18		41	9	15
2016 Total Traffic	203	1,313	318	288	1,290	146	260	1,099	297	236	498	162

FUTURE TURNING MOVEMENT VOLUME ANALYSIS

State Road 7 and W. Copans Road PM Peak Hour

Description	SR 7 Northbound			SR 7 Southbound			W. Copans Rd Eastbound			W. Copans Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing Traffic (6/25/2015)	412	1,427	208	200	1,395	255	285	627	211	290	955	231
Season Adjustment Factor	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2015 Peak Season Traffic	445	1,541	225	216	1,507	275	308	677	228	313	1,031	249
Annual Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
2016 Background Traffic	449	1,557	227	218	1,522	278	311	684	230	316	1,042	252
New Project Trips	8	10	5	34				17		37	8	22
2016 Total Traffic	457	1,567	232	252	1,522	278	311	701	230	353	1,050	274

Attachment G

SYNCHRO Analyses

SR 7 & W. Copans Road

Lanes, Volumes, Timings
3: SR 7 & Royal Palm Blvd/W. Copans Rd

7/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	1099	297	236	498	162	203	1313	318	288	1290	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		350	190		210	350		180	285		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	0.91
Frt			0.850			0.850			0.850		0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	3539	1568	3400	3438	1495	3213	5036	1583	3367	4994	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	3539	1568	3400	3438	1495	3213	5036	1583	3367	4994	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			200			183			221		13	
Link Speed (mph)		45			40			45			45	
Link Distance (ft)		592			605			475			423	
Travel Time (s)		9.0			10.3			7.2			6.4	
Peak Hour Factor	0.91	0.90	0.93	0.76	0.96	0.84	0.85	0.95	0.80	0.86	0.87	0.86
Heavy Vehicles (%)	1%	2%	3%	3%	5%	8%	9%	3%	2%	4%	2%	5%
Adj. Flow (vph)	286	1221	319	311	519	193	239	1382	398	335	1483	170
Shared Lane Traffic (%)												
Lane Group Flow (vph)	286	1221	319	311	519	193	239	1382	398	335	1653	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
 3: SR 7 & Royal Palm Blvd/W. Copans Rd

7/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	23.0	23.0	9.5	23.0	23.0	9.5	23.0	23.0	9.5	23.0	23.0
Total Split (s)	26.0	60.0	60.0	21.0	55.0	55.0	24.0	62.0	62.0	17.0	55.0	55.0
Total Split (%)	16.3%	37.5%	37.5%	13.1%	34.4%	34.4%	15.0%	38.8%	38.8%	10.6%	34.4%	34.4%
Maximum Green (s)	21.0	53.0	53.0	16.0	48.0	48.0	19.0	55.0	55.0	12.0	48.0	48.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	18.0	53.0	53.0	16.0	51.0	51.0	16.6	55.0	55.0	12.0	50.4	50.4
Actuated g/C Ratio	0.11	0.33	0.33	0.10	0.32	0.32	0.10	0.34	0.34	0.08	0.32	0.32
v/c Ratio	0.73	1.04	0.49	0.91	0.47	0.32	0.72	0.80	0.58	1.33	1.04	1.04
Control Delay	80.0	88.9	17.8	101.7	46.0	7.8	81.7	51.7	21.8	225.7	87.0	87.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.0	88.9	17.8	101.7	46.0	7.8	81.7	51.7	21.8	225.7	87.0	87.0
LOS	F	F	B	F	D	A	F	D	C	F	F	F
Approach Delay		75.1			55.7			49.4				110.3
Approach LOS		E			E			D				F
Queue Length 50th (ft)	151	~724	94	169	231	7	126	479	150	~232	~687	~687
Queue Length 95th (ft)	201	#865	191	#187	297	54	163	540	199	#318	#760	#760
Internal Link Dist (ft)		512			525			395				343
Turn Bay Length (ft)	350		350	190		210	350		180	285		
Base Capacity (vph)	455	1172	653	340	1096	601	381	1731	689	252	1582	1582
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	1.04	0.49	0.91	0.47	0.32	0.63	0.80	0.58	1.33	1.04	1.04

Intersection Summary

Area Type: Other

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 140 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 74.9

Intersection LOS: E

Intersection Capacity Utilization 91.1%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

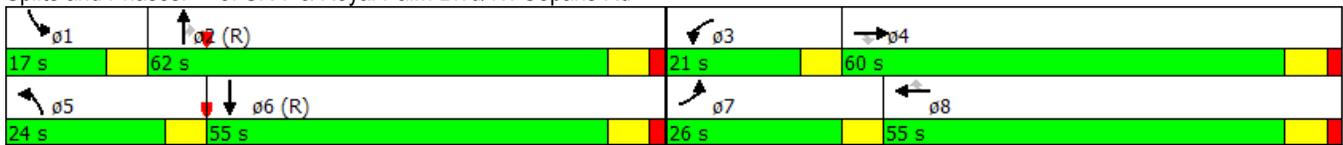
Lanes, Volumes, Timings

3: SR 7 & Royal Palm Blvd/W. Copans Rd

7/9/2015

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: SR 7 & Royal Palm Blvd/W. Copans Rd



Lanes, Volumes, Timings
3: SR 7 & Royal Palm Blvd/W. Copans Rd

7/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	311	701	230	353	1050	274	457	1567	232	252	1522	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		350	190		210	350		180	285		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	0.91
Frt			0.850			0.850			0.850		0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	3505	1599	3467	3539	1599	3433	5085	1599	3335	4961	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3502	3505	1599	3467	3539	1599	3433	5085	1599	3335	4961	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			221			176			130		30	
Link Speed (mph)		45			40			45			45	
Link Distance (ft)		592			605			475			423	
Travel Time (s)		9.0			10.3			7.2			6.4	
Peak Hour Factor	0.88	0.81	0.93	0.87	0.88	0.74	0.87	0.91	0.85	0.86	0.88	0.78
Heavy Vehicles (%)	0%	3%	1%	1%	2%	1%	2%	2%	1%	5%	2%	1%
Adj. Flow (vph)	353	865	247	406	1193	370	525	1722	273	293	1730	356
Shared Lane Traffic (%)												
Lane Group Flow (vph)	353	865	247	406	1193	370	525	1722	273	293	2086	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			

Lanes, Volumes, Timings
 3: SR 7 & Royal Palm Blvd/W. Copans Rd

7/9/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.5	23.0	23.0	9.5	23.0	23.0	9.5	23.0	23.0	9.5	23.0	23.0
Total Split (s)	21.0	47.0	47.0	28.0	54.0	54.0	23.0	62.0	62.0	23.0	62.0	62.0
Total Split (%)	13.1%	29.4%	29.4%	17.5%	33.8%	33.8%	14.4%	38.8%	38.8%	14.4%	38.8%	38.8%
Maximum Green (s)	16.0	40.0	40.0	23.0	47.0	47.0	18.0	55.0	55.0	18.0	55.0	55.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	16.0	41.1	41.1	21.9	47.0	47.0	18.0	55.8	55.8	17.2	55.0	55.0
Actuated g/C Ratio	0.10	0.26	0.26	0.14	0.29	0.29	0.11	0.35	0.35	0.11	0.34	0.34
v/c Ratio	1.01	0.96	0.43	0.85	1.15	0.62	1.36	0.97	0.43	0.82	1.21	1.21
Control Delay	120.0	80.1	10.7	84.9	127.6	29.8	228.1	66.7	22.5	88.0	143.7	143.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.0	80.1	10.7	84.9	127.6	29.8	228.1	66.7	22.5	88.0	143.7	143.7
LOS	F	F	B	F	F	C	F	E	C	F	F	F
Approach Delay		78.0			100.4			95.5				136.8
Approach LOS		E			F			F				F
Queue Length 50th (ft)	~195	478	21	215	~767	178	~370	656	112	156	~967	~967
Queue Length 95th (ft)	#295	#501	100	267	#875	195	#468	#767	179	201	#1017	#1017
Internal Link Dist (ft)		512			525			395				343
Turn Bay Length (ft)	350		350	190		210	350		180	285		
Base Capacity (vph)	350	900	574	498	1039	594	386	1772	641	375	1725	1725
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.96	0.43	0.82	1.15	0.62	1.36	0.97	0.43	0.78	1.21	1.21

Intersection Summary

Area Type: Other
 Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 102 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.36
 Intersection Signal Delay: 105.4
 Intersection Capacity Utilization 106.5%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings

3: SR 7 & Royal Palm Blvd/W. Copans Rd

7/9/2015

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: SR 7 & Royal Palm Blvd/W. Copans Rd





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February 3, 2015

Velmeir Companies
174 W Comstock Ave.
Suite 100
Winter Park, FL 32789

Attention: Mr. William A. White
Vice President of Real Estate/Business Development

Reference: **Report of Borehole Exfiltration Testing**
Proposed Retail Development
SEC SR 7 and Copans Road; Broward County, FL
UES Project No. 2130.1400011 (UES Report No. G00090)

Dear Mr. White:

Universal Engineering Sciences, Inc. (UES) has completed subsurface and exfiltration testing for the above-referenced project in Broward County, Florida. The scope of this project was conducted in general accordance with UES proposal dated December 9, 2014 and authorized by you on January 23, 2015. This project was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

Our scope of services included performing two (2) borehole exfiltration tests at depths of 10 feet below existing grades for use in drainage evaluation and design. A Standard Penetration Test (SPT) boring was performed at each exfiltration test location to a depth of 10 feet below existing grade. The SPT borings were performed in accordance with ASTM D-1586 with the use of an automatic hammer. The exfiltration testing was performed in general accordance with the usual open-hole constant head method promulgated by the South Florida Water Management District (SFWMD). The test locations were selected and marked in the field by a representative of our firm prior to mobilization. Refer to the Test Location Plan attached to this letter for approximate test locations.

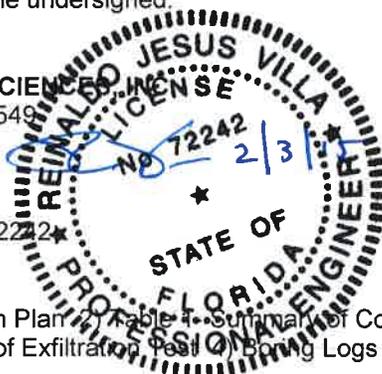
Exfiltration tests were completed by using hollow-stem augers to bore to the required test depth of 10 feet. The augers were then removed and a slotted casing was inserted to prevent the collapse of the sidewalls and to maintain the correct test dimensions. Water was then used to flush away loose soil cuttings and saturate the surrounding soils and the test was then performed according to the procedures outlined by the (SFWMD) guidelines for a constant-head exfiltration test. The data collected was then used in an empirical formula to determine the hydraulic conductivity value. The test results are included in Table 1 attached to this data report.

This data report only contains a test location plan and a table summary of constant head exfiltration test results from field testing. Engineering interpretation of the results with respect to the project characteristics and/or recommendations for groundwater considerations, foundation design, pavement design and site preparation recommendations were not part of our scope of services.

We appreciate the opportunity to work with you on this project and look forward to a continued association. If you have any questions, please contact the undersigned.

Respectfully submitted,
UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization No. 549

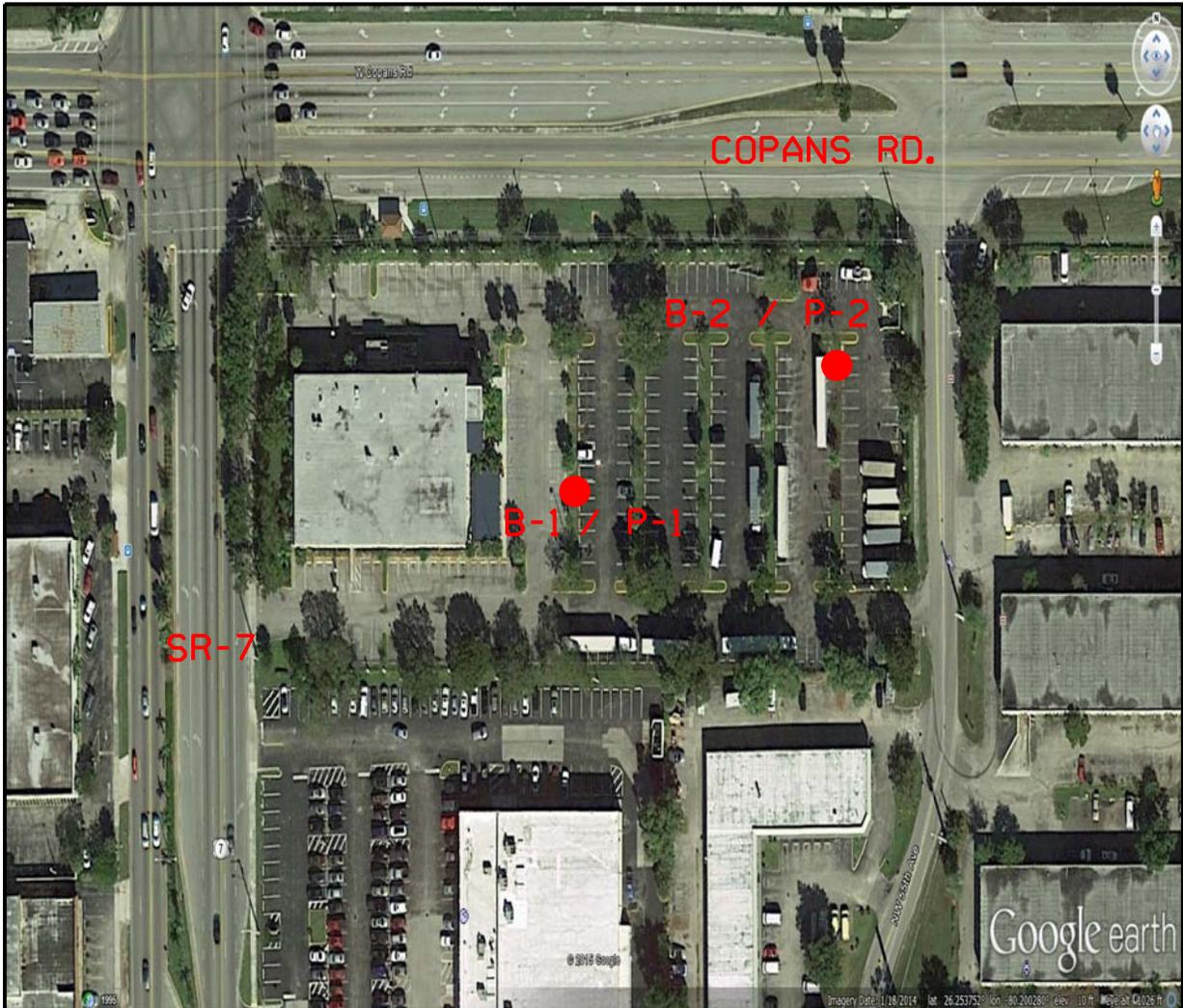
Reinaldo Villa, M.S., P.E.
Branch Manager
FL Professional Engineer No. 72242




Steve Jaime, E.I
Staff Engineer

Dist: Client (1); Files (1)

Attachments: 1) Test Location Plan 2) Table 1 - Summary of Constant Head Exfiltration Test Results
3) Schematics of Exfiltration Test 4) Boring Logs 5) Keys to Boring Logs



TEST LOCATION PLAN

LEGEND

● APPROXIMATE SPT BORING/EXFILTRATION TEST LOCATION

TEST LOCATION PLAN

PROPOSED RETAIL DEVELOPMENT
SEC OF SR 7 AND W. COPANS RD.
BROWARD COUNTY, FL

DRAWN	SJ	SCALE	N.T.S.	PROJ. No.	2130.15000II
CHECKED	RV	DATE	FEB., 2015	SHEET B-1	

TABLE 1 - SUMMARY OF CONSTANT HEAD EXFILTRATION TEST RESULTS

PROPOSED RETAIL DEVELOPMENT
SEC OF SR 7 AND COPANS RD.
BROWARD COUNTY, FL
UES PROJECT NO. 2130.1500011
UES REPORT NO. G00090

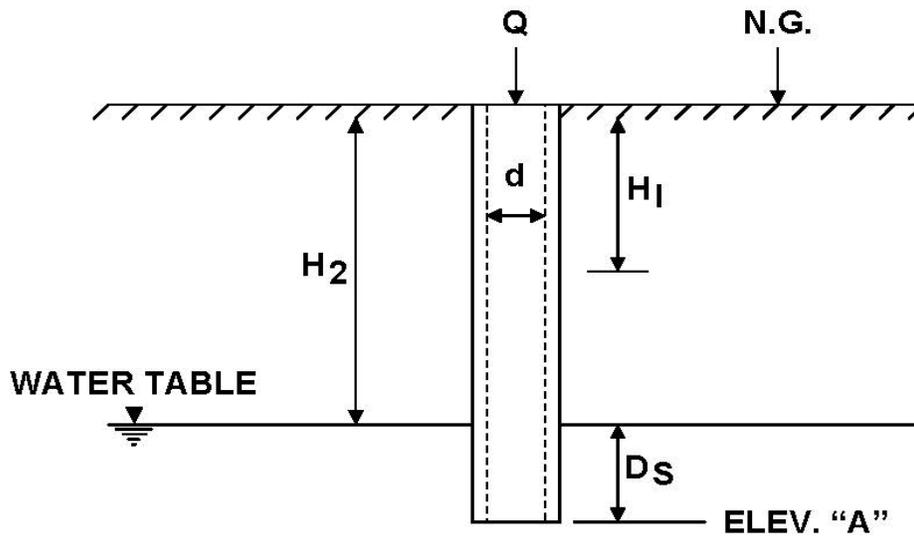


Test No.	Date Performed	Diameter		Depth of Hole (Feet)	Depth to Groundwater Level Below Ground Surface (Feet)		SATURATED HOLE DEPTH Ds (Feet)	Corrected Depth of Hole (Feet)	Average Flow Rate (gpm)	K, Hydraulic Conductivity (cfs/ft ² -Ft Head)
		Casing (Inches)	Hole (Inches)		Prior to Test	During Test				
P-1	02/02/15	2	4	10	2.3	0.00	7.70	10.00	6.0	1.25E-03
P-2	02/02/15	2	4	10	2.2	0.00	7.80	10.00	2.0	4.33E-04

NOTES:

- (1) The above hydraulic conductivity values are for a French drain installed to the same depth as the borehole tests. The values represent an ultimate value. The designer should decide on the required factor of safety.
- (2) The hydraulic conductivity values were calculated based on the South Florida Water Management Districts's USUAL OPEN HOLE CONSTANT HEAD exfiltration test procedure as shown on the following page.
- (3) The diameter of the CASING was used in the computation of the hydraulic conductivity values presented in the above table.
- (4) Please refer to test boring records for subsurface stratification.

USUAL OPEN – HOLE TEST



$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2D_S + H_2d)}$$

K= HYDRAULIC CONDUCTIVITY (CFS/FT.² - FT.HEAD)

Q= "STABILIZED" FLOW RATE (CFS)

d= DIAMETER OF TEST HOLE (FEET)

H₂ = DEPTH TO WATER TABLE (FEET)

D_S = SATURATED HOLE DEPTH (FEET)

ELEV. "A" = PROPOSED TRENCH BOTTOM ELEV.

H₁ = AVERAGE HEAD ON UNSATURATED HOLE SURFACE (FT.HEAD)

NOTES RELATED TO BORING LOGS

General Notes

- The Groundwater level was encountered and recorded (if shown) following the completion of the soil test borings on the date indicated. Fluctuations in groundwater levels are common; refer to report text for a discussion.
- The boring location on land was identified in the field utilizing standard taping procedures and existing land marks.
- The Boring Logs represent our interpretation of field conditions based on engineering examination of the soil/rock samples.
- The Boring Logs are subject to limitations, conclusions and recommendations presented in the report text.
- The N-values shown in the Boring Logs indicated as 50/1" refers to the Standard Penetration Test (SPT) and means 50 blows per 1 inch of sampler penetration. The SPT uses a 140-pound hammer falling 30 inches (ASTM D-1583).
- The N-value from the SPT is the sum of the hammer blows required to drive the sampler the second and third 6-inch increments.
- The soil/rock strata interfaces shown on the Boring Logs are approximate and may vary from those shown. The soil/rock conditions shown on the Boring Logs refer to conditions at the specific location tested; soil/rock conditions may vary between test locations.
- W.O.H. denotes fell under weight of hammer.

General Descriptors

- The grain-size descriptions are as follows:

Name

Size Limits

Boulder	12 inches or more
Cobbles	3 to 12 inches
Coarse Gravel	$\frac{3}{4}$ to 3 inches
Fine Gravel	No. 4 sieve to $\frac{3}{4}$ 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	Smaller than No. 200 sieve

- Definitions related to adjectives used in soil/rock descriptions:

Proportion

Adjective

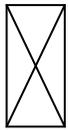
About 0 to 10 %	trace
About 10% to 25%	little
About 25% to 35%	some
About 35% to 50%	and

NOTES RELATED TO BORING LOGS

- Relative density of sands/gravels and consistency of silts/clays:

Granular Soils		
Relative Density	Safety Hammer SPT (Blows/Foot)	Automatic Hammer SPT (Blows/Foot)
Very Loose	0-4	0-3
Loose	4-10	3-8
Medium Dense	10-30	8-24
Dense	30-50	24-40
Very Dense	Greater than 50	Greater than 40
Silts and Clays		
Consistency	Safety Hammer SPT (Blows/Foot)	Automatic Hammer SPT (Blows/Foot)
Very Soft	0-2	0-1
Soft	3-4	1-3
Firm	5-8	3-6
Stiff	9-15	6-12
Very Stiff	16-30	12-24
Hard	Greater than 30	Greater than 24

- Boring Log Symbols



Split spoon sample



Rock core specimen



Groundwater table

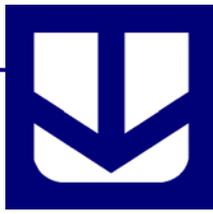
NOTES RELATED TO BORING LOGS

Soil Classification Chart

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
					SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
			SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
					CH	INORGANIC CLAYS OF HIGH PLASTICITY
					OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

USCS, LEGEND 7/18/14

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



UNIVERSAL ENGINEERING SCIENCES

**GEOTECHNICAL ENGINEERING REPORT
PROPOSED MARGATE HYBRID
CONVENIENCE MARKET
SEC SR 7 AND WEST COPANS ROAD
MARGATE, FLORIDA**

**UES PROJECT NO. 0630.1500072
UES REPORT NO. 13171**

Prepared For:

Mr. Wayne Shores
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- Panama City, FL
- Pensacola, FL
- Rockledge, FL
- Sarasota, FL
- Tampa, FL
- Tifton, GA
- West Palm Beach, FL

September 15, 2015

Mr. Wayne Shores
Senior Director of Construction
TVC Margate Co., LLC
5757 West Maple Road, Suite 800
West Bloomfield, MI 48322

Reference: Geotechnical Engineering Report
Proposed Margate Hybrid Convenience Market
SEC SR 7 & West Copans Road
Margate, Broward County, Florida
UES Project No. 0630.1500072
UES Report No. 13171

Dear Mr. Shores:

Universal Engineering Sciences, Inc. (UES) has completed a subsurface exploration for the above referenced project in Margate, Broward County, Florida. The scope of this exploration was conducted in general accordance with the UES Opportunity No. 0630.0715.00015 authorized July 28, 2015. This exploration was performed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The following report presents the results of the field exploration, with a geotechnical engineering interpretation of those results with respect to the project characteristics provided. Recommendations have been included for site preparation procedures, pavement and foundation design parameters, groundwater considerations, and other concerns as appropriate.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please contact us if you have any questions, or if we may further assist you as your plans proceed.

Respectfully submitted,
UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization No. 549


Allan G. Abubakar, P.E.
Project Engineer
Florida Professional Engineer No. 69952
Dist: Client (2), PDF



Peter G. Read, P.E.
Regional Manager
Florida Professional Engineer No. 35604

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1.0 INTRODUCTION

1.1 GENERAL

This report contains the results of a geotechnical exploration conducted for the proposed Margate Hybrid Convenience Market in Margate, Broward County, Florida. This report includes the following sections:

- SCOPE OF SERVICES - Defines what services were completed
- FINDINGS - Describes what was encountered
- RECOMMENDATIONS - Describes what we encourage you to do
- LIMITATIONS - Describes the restrictions inherent in this report
- SUMMARY - Reviews the material in this report
- APPENDICES - Presents support materials referenced in this report.

1.2 PROJECT DESCRIPTION

The subject site is located at the southeast quadrant of the intersection of SR 7 and W Copans Road in Margate, Broward County, Florida. A copy of a concept plan was provided by TVC Margate Co., LLC dated June 26, 2015. This plan was used in preparing the subsurface exploration. A general location map of the project area appears in Appendix A: Site Location Map.

The project will consist of the planning and design of the Margate Hybrid Convenience Market with paved areas on the subject site. We understand that the proposed construction consists of a single-story convenience store totaling 5,943 square feet, a fuel canopy, underground storage tank, parking and drive areas, and one (1) 12,950 square-foot retail building. The supplied site plan shows the approximate location of the site improvements in relation to site boundaries. Currently, the site is occupied by a two-story building with paved areas which will be demolished prior to construction.

Specific structural loading information was not available at the time this report was prepared. We have assumed that the column and wall loads will not exceed 50 kips and 3 kips per linear foot, respectively. It is assumed that no more than two feet of fill is required to bring the site to finished grade. We expect that the proposed building can be supported by a shallow foundation.

The recommendations contained herein are based upon the above considerations. If any of this information is incorrect or if you anticipate any changes, UES should be notified immediately to review and possibly amend the recommendations contained in this report.



2.0 SCOPE OF SERVICES

2.1 PURPOSE

The purposes of this exploration were:

- to explore and evaluate the subsurface conditions at the site with special attention to potential geotechnical considerations that may affect the proposed design, construction, or serviceability of the proposed improvements, and;
- to provide geotechnical engineering recommendations for groundwater considerations, foundation design, pavement design, and site preparation procedures.

This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards. UES would be pleased to perform these services, if you desire.

2.2 FIELD EXPLORATION

The subsurface conditions within the proposed convenience store and canopy area were explored with four (4) Standard Penetration Tests (SPT) borings (designated B-1 through B-4) advanced to a depth of 20 feet below existing grade. One (1) boring (designated B-5) was drilled to a depth of 25 feet in the tank field. Four (4) borings (designated B-6 through B-9) were drilled to a depth of 20 feet in the retail building area, and ten (10) soil borings (designated B-10 through B-19) were drilled to a depth of 10 feet in the pavement area. The approximate locations of the soil borings are presented in Appendix B. Boring Location Plan.

Our drilling crew located the borings based upon estimated distances and relationships to obvious landmarks. Consider the indicated locations and depths to be approximate. Further, the boring locations are based on the site plan provided.

The SPT borings were performed in general accordance with the procedures outlined by ASTM D-1586 (Standard Method for Penetration Test and Split-Barrel Sampling of Soils with continuous sampling from 0 to 10 feet, and then at 5-foot sampling intervals. The SPT drilling technique involves driving a standard split-barrel sampler into the soil by a 140-pound hammer, free falling 30 inches. The number of blows required to drive the sampler one foot, after an initial seating of 6 inches, is designated the penetration resistance, or N-value, an index to soil strength and consistency.



The soil samples recovered from the soil test borings were placed in clean sample containers and transported to our laboratory where a member of our geotechnical staff visually classified and reviewed the field descriptions in general accordance with ASTM D-2488. These soils will be held in our laboratory for your inspection for 90 days, after which time they will be discarded unless we are otherwise notified.

2.3 LABORATORY TESTING

The soil samples recovered from the soil test borings were returned to the laboratory where a member of our geotechnical staff visually classified them, reviewed the field descriptions, and selected representative samples for laboratory tests.

Tests were performed to aid in classifying the soils and to help evaluate the general engineering characteristics of the site soils. The tests performed included a total of five (5) No. 200 wash analyses and five (5) moisture content tests. Wash 200 results are shown on the respective boring logs in Appendix B. See Appendix B: Boring Logs, Key to Boring Logs, for further data and explanations.

3.0 FINDINGS

3.1 SURFACE CONDITIONS

At the time of the exploration, subject site was occupied by a two-story building with paved areas. Based on information obtained from Google Earth, the ground surface elevation on site is about +10 feet.

Based on the 1984 Soil Survey for Broward County, Florida, as prepared by the US Department of Agriculture, Natural Resources Conservation Service (NRCS), the predominant soil type at the site are Margate fine sand and Pompano fine sand.

Margate fine sand is nearly level, poorly drained, sandy soil that is underlain by limestone at a depth of 20 to 40 inches but has a solution holes as deep as 60 inches. It is on nearly level, low terraces between the Everglades and the low, sandy Atlantic Coastal Ridge.

Pompano fine sand is a nearly level, deep, poorly drained, sandy soil in sloughs and broad flats. Typically, the surface layer is gray fine sand about 7 inches thick. Below this is gray and light gray fine sand to a depth of 43 inches. Brown fine sand is at a depth of 43 to 80 inches.

3.2 SUBSURFACE CONDITIONS

The results of our field exploration together with pertinent information obtained from the SPT borings, such as soil profiles, penetration resistance and groundwater levels are shown on the boring logs included in Appendix B. The Key to Boring Logs is also included in Appendix B. The stratification lines shown on the boring logs represent the approximate



boundaries between soil types, and may not depict exact subsurface soil conditions. The actual soil boundaries may be more transitional than depicted. A generalized profile of the soils found at our boring locations is presented in Table 1. The soil profile was prepared from field logs after the recovered soil samples were visually classified by a member of our geotechnical staff.

TABLE 1: GENERAL SOIL PROFILE	
Typical Depths Below Grade* (feet)	Soil Description
0 – 4	Loose to very dense, tan to dark brown sand, sand with rocks, silty sand with rocks [SP, SM]
4 – 18	Very loose to medium dense, tan to gray sand with rocks, cemented sand, and sand with shell fragments, silty sand, and sand with silt [SP, SM, SP-SM]
18 – 25**	Loose to medium dense, tan to gray sand, sand with shell fragments [SP]
* Depth measured in feet below existing grade ** Boring Termination	

The groundwater table was measured at depths ranging from 4 to 6 feet below land surface (bls) in the test borings.

4.0 RECOMMENDATIONS

4.1 GENERAL

In this section of the report, detailed recommendations are presented for groundwater considerations, building foundations, pavement design, site preparation, and construction related services. The following recommendations are based upon the attached soil test data, our stated understanding of the proposed construction, and experience with similar projects and subsurface conditions. UES should be retained to observe the proposed construction, and provide updated recommendations as required.

4.2 GROUNDWATER CONSIDERATIONS

The groundwater table will fluctuate seasonally depending upon local rainfall. The rainy season in South Florida is normally between May and October. Based upon the test boring data, a reasonable estimate for the seasonal high groundwater table is 2 to 4 feet below the existing grade. The existing and estimated seasonal high groundwater table at each location appears in Appendix B: Boring Logs. Based on previous experiences, it should be



noted that the actual depth to groundwater in developed areas greatly depends on established drainage patterns.

Please note that the estimated seasonal high groundwater levels do not provide any assurance that groundwater levels will not exceed these estimated levels during any given year in the future. If the rainfall intensity and duration, or total rainfall quantities, exceed the normally anticipated rainfall quantities, groundwater levels may exceed our seasonal high estimates.

The estimate of seasonal high groundwater level is made for the site at the present time. Future development of adjoining or nearby properties and development of a regional scale may affect the local seasonal high groundwater table. Universal makes no warranty on the estimate of the seasonal high groundwater table.

UES recommends that all foundation and pavement designs incorporate assumption of the seasonal high groundwater condition. We recommend that positive drainage be established and maintained on the site during construction. UES further recommends that permanent measures be implemented to maintain positive drainage throughout the life of the project.

4.3 BUILDING FOUNDATIONS

4.3.1 SHALLOW FOUNDATIONS

Based on the soils encountered and the anticipated structural loads, the proposed structures can most likely be supported on conventional, shallow spread foundations or a thickened edge monolithic slab sized to exert a maximum allowable soil bearing pressure of 2,500 pounds per square foot (psf) after site has been prepared as recommended in Section 4.8 of this report.

All foundations should be embedded at least 18 inches below lowest adjacent grade (finished surrounding grade, for example), with the exception of a thickened-edge slab foundation system for which a minimum depth of 12 inches is acceptable. Soils to a depth of one foot below footing founding depth and the building slabs must be compacted and tested demonstrating at a minimum 95 percent of the maximum dry density as determined by the modified proctor method (ASTM D-1557).

Further, maintain minimum foundation widths of 18 and 24 inches for strip and square footings, respectively, even though the maximum allowable soil bearing pressure may not be developed in all cases. We estimate the foundations will have a minimum factor of safety of two against bearing capacity failure.

For the foundations designed as recommended and the site prepared according to the recommendations provided later in this report, we estimate that post construction settlements of 1 inch or less will occur. A differential settlement of less than ½ inch should be expected.



4.3.2 STANDARD FLOOR SLAB

For the floor slab, it is recommended that a standard concrete slab-on-grade, reinforced with welded wire mesh to control cracking be used. Normal weight concrete having a 28-day compressive strength (f'_c) of a least 3,000 psi should be used. A modulus of subgrade reaction of 150 pci can be used beneath the proposed floor slab, assuming the slab is supported on compacted structural fill or compacted existing subgrade soils. Further, the floor slab must be isolated from the building column foundations.

4.3.3 FLOOR SLAB MOISTURE CONTROL

The Florida Building Code requires the use of a vapor barrier beneath the floor slab to control moisture. It is recommended that a minimum 6-mil, rolled plastic (Visqueen) vapor barrier be used between the bottom of the floor slab and the top of the subgrade. This will help to minimize floor dampness and moisture intrusion into the structure through the slab. Care must be exercised during construction to prevent tearing or punching of the vapor barrier prior to slab placement. Any tears must be repaired immediately.

4.4 PAVEMENTS

4.4.1 GENERAL

We recommend using either a flexible or rigid pavement section on this project. Flexible pavements combine the strength and durability of several layer components to produce an appropriate and cost-effective combination of available materials. Concrete pavement has the advantage of the ability to “bridge” over isolated soft areas, it requires less security lighting, and typically has a longer service life than asphalt pavement.

At the time of this exploration, specific traffic loading information was not provided to us. We have assumed the following conditions for our recommended minimum pavement design.

- the subgrade soils are prepared as described in Section 4.8 of this report
- a twenty (20) year design life
- terminal serviceability index (P_t) of 2.5
- reliability of 85 percent
- total equivalent 18 kip single axle loads (E_{18SAL}) up to 50,000 for light duty pavements - car and pickup truck traffic (parking stalls, etc.)
- total equivalent 18 kip single axle loads (E_{18SAL}) up to 150,000 for heavy duty pavements – occasional heavy truck traffic (delivery, trash collection, service lanes, etc.)



4.4.2 FLEXIBLE PAVEMENT OPTION

For preliminary pavement designs, we recommend using a three-layer pavement section consisting of stabilized subgrade, base course, and surface course placed on top of existing subgrade or a compacted embankment.

Based on the results of our soil borings, the assumed traffic loading information and review of the 2015 FDOT Flexible Pavement Design Manual, our minimum recommended pavement component thicknesses are presented in the table below.

TABLE 2: Flexible Pavement Component Recommendations

Traffic Group	Maximum Traffic Loading	Provided Structural Number	Component Thickness (inches)		
			Stabilized Subgrade	Base Course	Surface Course
Light-duty	up to 50,000 E ₁₈ SAL	2.1	6	6	1.5
Heavy-duty	up to 150,000 E ₁₈ SAL	2.8	8	8	2.0

For loading conditions greater than those presented in Table 2, we recommend that you have a complete pavement design performed based on projected traffic data.

4.4.3 STABILIZED SUBGRADE

We recommend that subgrade materials be compacted to at least 98% modified Proctor maximum dry density according to the requirements in the "Site Preparation" section of this report. Further, stabilize the subgrade materials to a minimum Limerock Bearing Ratio (LBR) of 40. The stabilized subgrade should be "free draining" when overlain by crushed concrete base. The stabilized subgrade can be imported material or a blend of on-site soils and imported materials. If a blend is proposed, we recommend that the contractor perform a mix design to find the optimum mix proportions. Compaction testing of the stabilized subgrade should be performed to full depth at a frequency of at least one (1) test per 10,000 square feet, or a minimum of 4 tests, whichever is greater.

4.4.4 BASE COURSE

We recommend the base course be crushed concrete or limerock base course (as long as adequate separation is provided from the seasonal high groundwater table). Since the final pavement area grades have not yet been established, we have provided the following guidelines concerning base course selection:



- 1) If the final grades will include fill sufficient to provide a minimum separation of 12-inches between the bottom of the base course and the seasonal high groundwater level, either a soil-cement or crushed concrete base course should be suitable for the proposed construction. Limerock base course may be used if a separation of at least 18 inches is available between the bottom of the base course and seasonal high groundwater table.
- 2) If underdrains are used in the pavement areas to lower the seasonal high groundwater conditions and to provide the recommended 12-inches of separation between the bottom of the base course and the seasonal high groundwater conditions, we recommend the use of a soil-cement base course or crushed concrete.

Please refer to later paragraphs in this section for discussions concerning the recommended separation between the seasonal high groundwater levels and pavement base courses.

Perform compliance testing for either limerock or crushed concrete for full depth at a frequency of one test per 10,000 square feet, or at a minimum of two test locations, whichever is greater.

Crushed concrete is another alternative. If crushed concrete is selected as the base course material for flexible pavement sections, we recommend the material meet the following requirements:

1. Crushed concrete should be supplied by an approved plant with quality control procedures. The crushed concrete stockpile should be free of sandy pockets, foreign materials or uncrushed particles.
2. Crushed concrete shall not contain extremely hard pieces, lumps, balls or pockets of sand or clay-sized material in sufficient quantity as to be detrimental to the proper binding, finishing or strength of the crushed concrete base.
3. Samples of the base course materials shall be supplied to the engineer for testing prior to use in the work. Additional samples shall be furnished during construction, as necessary.
4. At least 97 percent (by weight) of the material shall pass a 2½-inch sieve and the material shall be graded uniformly down to dust. The fine material shall consist entirely of dust or fracture. All crushing or breaking-up which might be necessary in order to meet such size requirements shall be done before the material is placed on the site.



5. The base shall be bladed and shaped to conform to the typical sections shown on the plans. The aggregate base may be placed in a maximum 4-inch lift; each lift should be compacted and tested by rolling with a combination of steel wheel and rubber tire rollers to achieve a minimum density of 98 percent of the Modified Proctor maximum dry density according to AASHTO, T-180. The finished in-place product shall provide a Limerock Bearing Ratio (LBR) of 100 or greater.
6. Compliance tests for density should be performed on the compacted base material at a frequency of not less than one test per 10,000 square feet, or a minimum of two test locations, whichever is greater. Additionally, LBR tests should be performed on the material at a minimum frequency of one test per 15,000 square feet, and for each visual change in material.
7. A Universal Engineering Sciences engineer or his representative should perform a final visual inspection of the completed base course prior to the application of the prime coat or tack coat and paving.

If using a limerock base course, the limerock should have a minimum LBR of 100 percent and should be mined from an FDOT approved source. Place limerock in maximum 6-inch lifts and compact each lift to a minimum density of 98 percent of the Modified Proctor maximum dry density.

4.4.5 FLEXIBLE SURFACE COURSE

In light duty areas where there is occasional truck traffic, but primarily passenger cars, we recommend using an asphaltic concrete, FDOT Type S-III, which has a minimum stability of 1,200 pounds. In heavy duty pavement areas, we recommend FDOT Type S-1 asphaltic concrete, which has a minimum stability of 1,500 pounds. Asphaltic concrete mixes should be a current FDOT approved design of the materials actually used. Test samples of the materials delivered to the project to verify that the aggregate gradation and asphalt content satisfies the mix design requirements. Compact the asphalt to a minimum of 95 percent of the Marshall design density.

After placement and field compaction, core the wearing surface to evaluate material thickness and to perform laboratory densities. Obtain cores at frequencies of at least one core per 3,000 square feet of placed pavement or a minimum of two cores per day's production.

In parking lots, for extended life expectancy of the surface course, we recommend applying a coal tar emulsion sealer at least six months after placement of the surface course. The seal coat will help to patch cracks and voids, and protect the surface from damaging ultraviolet light and automobile liquid spillage. Please note that applying the seal coat prior to six months after placement may hinder the "curing" of the surface course, leading to its early deterioration.



4.4.6 RIGID PAVEMENT OPTION

In heavily loaded and/or high traffic areas such as aprons, pump islands and garbage corrals we recommend a rigid pavement system be used for increased strength and durability and for longer life. Portland cement concrete pavement is a rigid system that distributes wheel loads to the subgrade soils over a larger area than a flexible asphalt pavement. This results in reduced localized stress to the subgrade soil. We recommend using a compacted subgrade below concrete pavement with the following stipulations:

1. Subgrade soils must be densified to at least 98% modified Proctor maximum dry density to a depth of at least 1-foot directly below the bottom of concrete slab.
2. The surface of the subgrade soils must be smooth, and any disturbances or wheel rutting corrected prior to placement of concrete.
3. The subgrade soils must be moistened prior to placement of concrete.
4. Concrete pavement thickness should be uniform throughout, with exception to the thickened edges (curb or footing).
5. The bottom of the pavement should be separated from the estimated seasonal high groundwater level by at least 12 inches.

Based on the assumed loading information and provided that the site is prepared as recommended in this report, our recommended minimum concrete pavement design is shown in the table below.

TABLE 3: Rigid Pavement Component Recommendations (Heavy Duty)

Minimum Pavement Thickness	Dowels	Recommended Sawcut Depth
6 inches (except above tanks)	18" o.c., smooth	1.5 inches
8 Inches (above tanks)	18" o.c., smooth	2.0 inches

For rigid pavement sections, we recommend using concrete with a minimum 28-day compressive strength of at least 4,000 pounds per square inch. We further recommend using concrete having a minimum 28-day flexural strength (modulus of rupture) of at least 550 psi (based on the 3 point flexural test of concrete beam samples). Layout of the sawcut control joints should form square panels, spaced no greater than 14 feet by 14 feet, and the depth of sawcut joints should be ¼ of the concrete slab thickness.



We recommend allowing Universal Engineering Sciences to review and comment on the final concrete pavement design, including section and joint details (type of joints, joint spacing, etc.), prior to the start of construction.

For further details on concrete pavement construction, please reference the "Guide to Jointing of Non-Reinforced Concrete Pavements" published by the Florida Concrete and Products Association, Inc., and "Building Quality Concrete Parking Areas," published by the Portland Cement Association.

4.4.7 EFFECTS OF GROUNDWATER

One of the most critical influences on pavement performance in Florida is the relationship between the pavement subgrade and the seasonal high groundwater level. It has been our experience that many roadways and parking areas have been damaged as a result of deterioration of the base and the base/surface course bond due to moisture intrusion. Regardless of the type of base selected, we recommend that the seasonal high groundwater and the bottom of the base course be separated by at least 18-inches.

4.4.8 CURBING

We recommend that curbing around any landscaped sections adjacent to the parking lots and driveways be constructed with full-depth curb sections. Using extruded curb sections which lie directly on top of the final asphalt level, or eliminating the curbing entirely, can allow migration of irrigation water from the landscape areas to the interface between the asphalt and the base. This migration often causes separation of the wearing surface from the base and subsequent rippling and pavement deterioration.

4.4.9 CONSTRUCTION TRAFFIC

Light duty roadways and incomplete pavement sections will not perform satisfactorily under construction traffic loadings. We recommend that construction traffic (construction equipment, concrete trucks, sod trucks, garbage trucks, dump trucks, etc.) be re-routed away from these roadways or that the pavement section be designed for these loadings.

4.5 RETAINING WALL PARAMETERS

The following values can be used for design of low retaining walls, such as for loading docks and landscape features, where sand is used as the backfill material, and where there are no surcharge loads from slopes or other sources behind the wall.

Angle of Internal Friction:	30°
K_a (coef. of active earth pressure):	0.333
K_p (coef. of passive earth pressure):	3.0
K_o (coef. of earth pressure at rest):	0.50
Coefficient of Friction (Soil/Concrete interface):	0.40
Unit weight of Soil (wet):	110 pounds per cubic foot
Unit weight of Soil (submerged):	47.6 pounds per cubic foot



Assuming hand compaction equipment will be utilized, we recommend below grade and retaining wall backfill be placed in 6 to 8-inch loose layers and compacted to 95% modified Proctor maximum dry density.

An appropriate factor of safety should be applied to these parameters. It should be noted that uplift and lateral hydrostatic pressures could be exerted on the structure any time the groundwater level is at or near its seasonal high level. These forces should also be included in the proposed design. Also, retaining walls with adjacent sloping earth embankments or subject to permanent or intermittent structural loadings may require special considerations.

4.6 UNDERGROUND STORAGE TANK EXCAVATIONS

One (1) boring designated B-5 was performed in the general location of the storage tanks. The general location of the storage tank boring can be found in Appendix B: Boring Location Plan. The soils encountered in the 25-foot deep boring B-5 consisted of loose to medium dense sand with traces of rocks and shell fragments and sand with silt [SP, SP-SM] from the ground surface to the boring termination depth of 25 feet.

We anticipate that the excavation for installation of the proposed fuel tanks would be on the order of 20 feet below the ground surface. Based on the subsurface conditions encountered, it is our opinion the subgrade soils are suitable for supporting the proposed underground tanks.

During the installation of the tanks, temporary dewatering will be required especially during the rainy season. We recommend temporary dewatering be performed in order to lower the groundwater at least 2 feet below the bottom of the excavation. We recommend that the excavation procedures conform to the OSHA regulations for Type C soils. Further, we recommend that the side slopes provided should not be steeper than 1.5:1 (Horizontal to Vertical). If necessary, adequate lateral bracing and shoring should be provided to prevent collapse of the side walls.

Foundation Preparation - Based on our evaluation of the soil conditions encountered in this area, we offer the following recommendations for the proposed underground construction.

1. The proposed construction should be dewatered as necessary and excavated to the required foundation depth. Excavation work will be required to meet OSHA Excavation Standard Subpart P regulations, Type C Soils. Either a braced sheet pile structure or an excavation with temporary side slopes cut back at 1.5 horizontal to 1.0 vertical can be implemented, depending on the specific project requirements. The side slope of 1.5 horizontal to 1.0 vertical is contingent upon the dewatering system adequately controlling slope seepage. Sheet piling should be designed according to OSHA sheeting and bracing requirements. We recommend a Florida registered Professional Engineer design the sheeting/bracing system.
2. A dewatering system will be required for the project. The water table should be maintained at least 2.0 feet below the proposed bottom of the tank excavation. The dewatering system should not be decommissioned until sufficient deadweight exists on the structure to prevent uplift or the uplift protection system as described below, if necessary, is in place.



3. The excavation bottom should be densified using hand-operated compaction equipment. Compaction should continue until a minimum density of 95 percent of the soils Modified Proctor maximum dry density (ASTM D 1557) has been achieved as tested for a depth of 1.0 foot below tank bottoms. If limestone is encountered, it should be undercut at least 12 inches, the sides and bottom of the undercut lined with geo-textile filter fabric and backfilled with compacted sand comparable in composition to the native sands. Compaction in confined areas can probably be achieved using jumping jacks or light weight walk-behind vibratory sleds and/or rollers.
4. Backfill which will be required around buried tanks should be compacted with a light hand-operated compactor to a density of 95 percent of the soils Modified Proctor maximum dry density. All backfill should be placed in level lifts not exceeding six inches loose thickness. Care should be taken not to over compact the backfill (i.e., limit compaction to a maximum of 98 percent of the maximum density) in order to limit the lateral loads applied to the proposed tanks. The sands excavated for the structure may be used as backfill.
5. A representative of Universal Engineering Sciences, Inc. should be retained to provide on-site inspection and testing of compaction/filling operations so that proper documentation of the required minimum compaction and compliance with the recommendations contained herein can be provided.

Uplift Protection - When the fluid level within below-grade structures is maintained at or above the surrounding groundwater level, no net buoyancy will occur to the structure. However, when these structures are drained for maintenance or as fluid levels fluctuate within the tanks, a positive means of uplift protection may be necessary. Hydrostatic uplift forces can be resisted in several ways including:

1. Addition of dead weight to the structure.
2. Mobilizing the dead weight of the soil surrounding the structure through extension of footings outside the perimeter of the structure.
3. Use of a permanent gravity or mechanical dewatering system that is operated only when the structure is to be drained.

It is anticipated that use of one or more of the above methods may be necessary for uplift for protection.

4.7 BORROW SUITABILITY

The boring (B-5) was performed, in part, to provide an indication of the suitability of excavated soils from proposed storage tank as suitable fill soil. Based on the boring results and classification of the soil samples, the sand materials found throughout the 25-foot depth of the boring are considered suitable for fill.



It should be anticipated the soils in the proposed storage tank area that are below the groundwater level will have moisture contents in excess of the Modified Proctor optimum moisture content and will require stockpiling or spreading to bring the moisture within 2 percent of the soil's optimum moisture content corresponding to the required degree of compaction. Conversely, the near-surface soils may be relatively dry during dry weather conditions and may require addition of water to bring the moisture content within the recommended range.

4.8 SITE PREPARATION

The existing building and foundations, and existing utilities scheduled for abandonment should be completely removed by a qualified contractor as per the requirements of an approved demolition plan.

Following the completion of demolition, we recommend normal, good practice site preparation procedures for the building and pavement areas. These procedures include: stripping the site of asphalt, topsoil, deleterious material, proof-rolling, and proof-compacting the subgrade, and filling to grade with engineered fill. A general outline of the anticipated earthwork is as follows:

1. If required, perform remedial dewatering prior to any earthwork operations.
2. Prior to construction, any existing underground utility lines within the construction area should be located. Provisions should be made to relocate interfering utilities. Note that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion which may lead to excessive settlement of overlying structures.
3. Strip the proposed construction limits of all asphalt, topsoil, construction debris, and other deleterious materials within and 5-feet beyond the perimeter of the proposed building and pavement areas.
4. The site should be graded to direct surface water runoff away from the construction areas. Positive drainage must be maintained throughout the design life of the project.
5. After clearing and stripping of the site is completed, the prepared subgrade soils outside the building area should be observed by a qualified geotechnical engineer or his representative to locate any surficial deposits of organic soils, sandy silt, vegetation, excessive roots or debris. Organic soils, vegetation, or deleterious material should be undercut until clean natural soils are encountered, and the resulting excavations backfilled according to the fill placement procedures provided later in this section.



6. In the areas to receive fill, the subgrade should be compacted using a smooth drum vibratory roller ***in the static mode***, having a minimum static, at-drum weight on the order of 10 tons and a drum diameter on the order of 3 to 4 feet making a minimum of eight overlapping passes with the second set of 4 passes perpendicular to the first set of 4 passes. Typically, the material should exhibit moisture content within +/- 2 percent of the Modified Proctor optimum moisture content (ASTM D-1557) during the compaction operations. Compaction should continue until densities of at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557) have been uniformly achieved within the upper 12 inches of the compacted natural soil surface.

Care should be exercised to avoid damaging any nearby structures while the compaction operation is underway. Compaction should cease if deemed detrimental to adjacent structures and the geotechnical engineer should be contacted immediately. It is recommended that heavy vibratory equipment ***in the vibratory mode*** remain a minimum of 50 feet from existing structures. Within this zone, use of a track-mounted bulldozer, a heavy vibratory roller operating in the static mode, or a smaller vibratory roller is recommended.

7. Place fill material, as required. The fill should consist of sand with less than 10 percent soil fines. Place fill in uniform 10- to 12-inch loose lifts and compact each lift to a minimum density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). The last 6 inches of fill beneath pavement areas should be compacted to 98 percent of the Modified Proctor maximum dry density. Stabilize this zone with shell or limerock as required to meet the subgrade recommendations contained in the Pavements Section of this report.
8. Complete in-situ density tests on the subgrade and each lift of fill at a frequency of not less than one test per 2,500 square feet in the building area and one test per 10,000 square feet in paved areas.
9. In the building area, test compaction to a depth of 1 foot at the bottom of all column footings. We recommend conduct one test for every 50 lineal feet of wall footing.

If difficult compaction conditions are encountered during the site work operations, the compaction efforts should stop and the geotechnical engineer should be contacted. The geotechnical engineer or his representative should observe proof-rolling of the exposed subgrade to determine if additional compaction is warranted or if any material needs to be over-excavated and replaced.



4.9 CONSTRUCTION RELATED SERVICES

It is recommended the owner retain UES to perform construction materials tests and observations on this project. Field tests and observations could include items such as verification of foundation and pavement subgrades by monitoring, “de-mucking”, proof-rolling operations and performing quality assurance tests on the placement of compacted structural fill and pavement courses.

The geotechnical engineering design does not end with the advertisement of the construction documents. The design is an on-going process throughout construction. Because of our familiarity with the site conditions and the intent of the engineering design, we are most qualified to address problems that might arise during construction in a timely and cost-effective manner.

5.0 LIMITATIONS

Our field exploration did not find unsuitable or unexpected materials at the time of occurrence. The test borings completed for this report were widely spaced and are not considered sufficient for reliability detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, UES does not recommend relying on our boring information to negate the presence of anomalous materials or for estimation of material quantities. Therefore, UES will not be responsible for any extrapolation or use of our data by others beyond the purpose(s) for which it is applicable or intended.

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible problems. An Association of Engineering Firms Practicing in the Geosciences (ASFE) publication, "Important Information About Your Geotechnical Engineering Report" appears in Appendix C, and will help explain the nature of geotechnical issues.

Further, we present documents in Appendix C: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.



6.0 SUMMARY

In summary, we understand you propose to construct a new Margate Hybrid Convenience Market facility with paved areas and retail building on the subject site. Field tests have been performed to provide geotechnical engineering recommendations for foundation design, pavement design, and site preparation.

The soils at this site are loose to very dense, tan to dark brown sand, sand with rocks, silty sand with rocks [SP, SM] within the upper 4 feet below land surface followed by very loose to medium dense, tan to gray sand with rocks, cemented sand, and sand with shell fragments, silty sand, and sand with silt [SP, SM, SP-SM] to a depth of 18 feet below grade underlain by loose to medium dense, tan to gray sand, sand with shell fragments [SP] to the maximum explored depth of 25 feet bls.

Groundwater was measured at depths ranging from 4 to 6 feet below the existing land surface at the time of exploration. A reasonable estimate for an average wet seasonal high groundwater table is 2 to 4 feet below the existing ground surface.

After the site has been prepared as recommended, the proposed buildings can be most likely be supported on conventional, shallow spread foundations with allowable soil bearing pressure of 2,500 psf.

Normal, good practice site preparation procedures have been recommended to prepare the subgrade to support the structures and pavement.

We hope this report meets your needs, discusses all of the recognized problems for development and answers questions regarding the suitability of this site from a geotechnical aspect. Please contact us to discuss any geotechnical engineering aspects of this project or if we can offer further assistance as construction plans proceed.

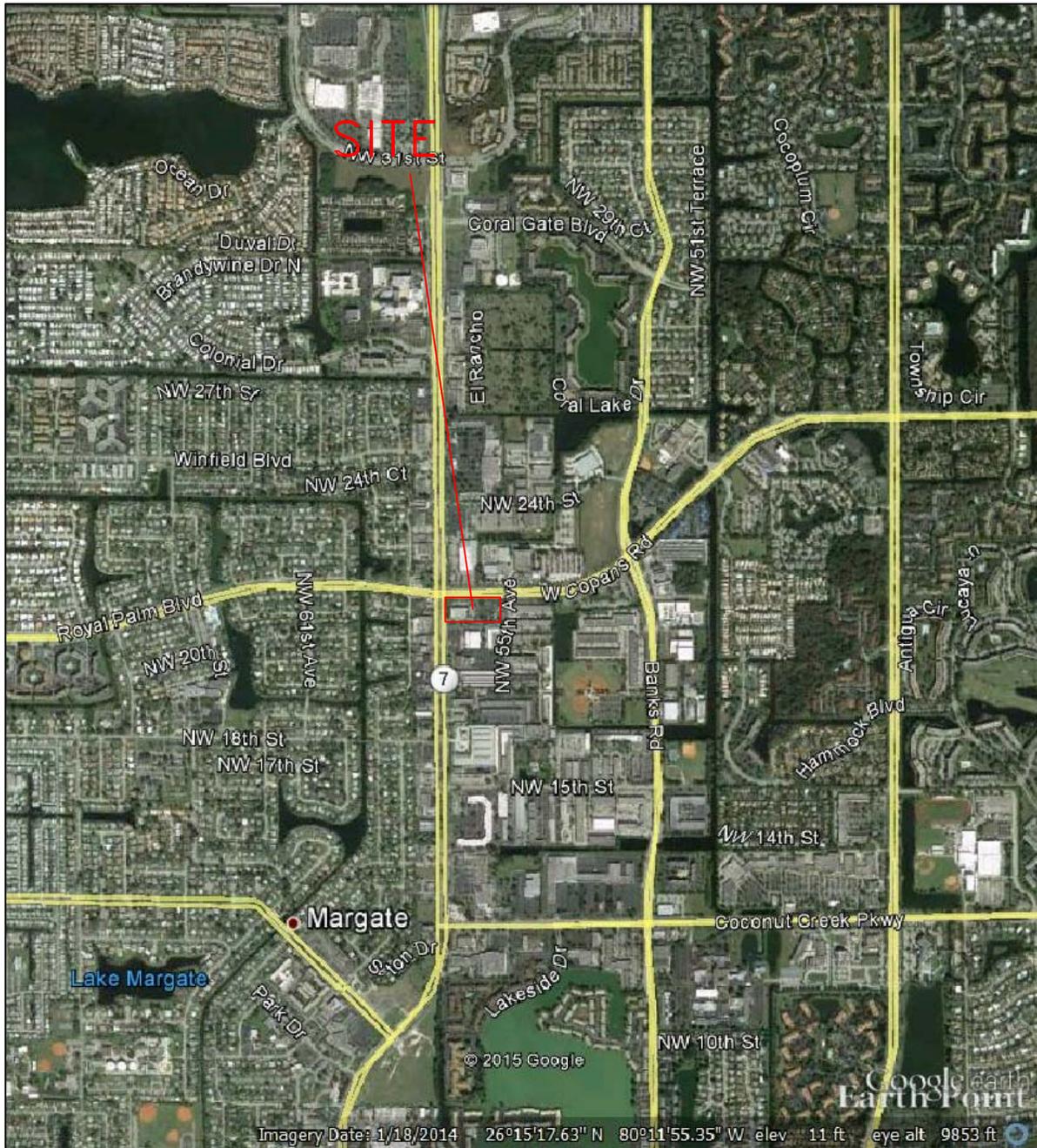


APPENDIX A



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1#



GEOTECHNICAL EXPLORATION SERVICES
 PROPOSED MARGATE HYBRID CONVENIENCE MARKET
 MARGATE, BROWARD COUNTY, FLORIDA

SITE LOCATION MAP

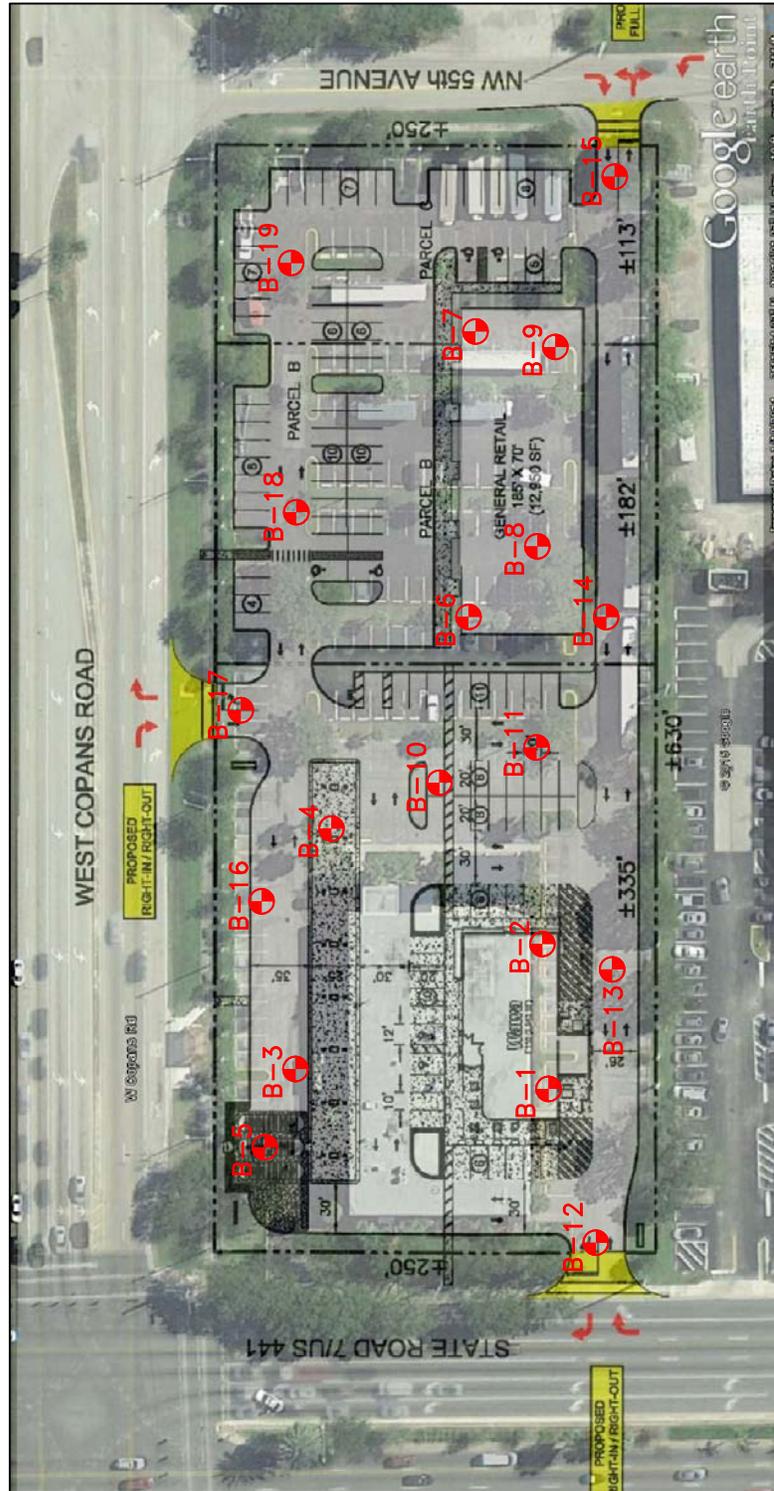


DRAWN BY:	A.G.A.	DATE:	08/12/15	CHECKED BY:	P.G.R.	DATE:	08/12/15
SCALE:	NTS	PROJECT NO:	0630.1500072	REPORT NO:	13171	PAGE NO:	B-1

APPENDIX B



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GEOTECHNICAL EXPLORATION SERVICES
PROPOSED MARGATE HYBRID CONVENIENCE MARKET
MARGATE, BROWARD COUNTY, FLORIDA

BORING LOCATION PLAN

DRAWN BY:	A.G.A.	DATE:	08/12/15	CHECKED BY:	P.G.R.	DATE:	08/12/15
SCALE:	NTS	PROJECT NO:	0630.1500072	REPORT NO:	13171	PAGE NO:	B-1



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-2

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-1**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/5/15
WATER TABLE (ft): 6.0 DATE FINISHED: 8/5/15
DATE OF READING: 8/5/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 4.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		20-10-6-5	16			Medium dense to loose, brown silty sand with rocks [SM]	22	16				
		4-4-5-5	9	▽								
5		3-5-5-5	10	▼		Loose to very loose, brown sand [SP]						
		3-3-2-1	5									
10		3-2-2-1	4									
15		11-10-6-6	16			Medium dense, tan sand with rocks [SP]						
20		4-4-8-8	12			Medium dense, tan sand [SP]						
						Boring terminated @ 20 feet						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-3

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-2**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft):
WATER TABLE (ft): 6.0
DATE STARTED: 8/5/15
DATE FINISHED: 8/5/15
DATE OF READING: 8/5/15
DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 4.0
TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		31-25-16-15	41			Dense to medium dense, tan sand with rocks [SP]						
		8-5-6-7	11	▽								
5		3-3-4-3	7	▽		Loose to very loose, brown sand [SP]						
		3-2-2-3	4									
10		3-4-4-4	8			..... loose						
		8-8-7-6	16			Medium dense tan sand with rocks [SP]						
15		4-5-4-4	9			Loose, tan sand [SP]						
20						Boring terminated @ 20 feet						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-4

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-3**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/5/15
WATER TABLE (ft): 4.5 DATE FINISHED: 8/5/15
DATE OF READING: 8/5/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 2.5 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick) Base material (5 inches thick)						
		31-10-6-4	16	▽		Medium dense, tan sand with rocks [SP]						
		5-8-8-9	16	▽		Medium dense, brown sand [SP]						
5		7-4-4-7	8			Loose to medium dense, tan cemented sands with shell fragments [SP]						
		10-5-3-8	8									
10		5-4-4-3	8									
		6-7-6-6	13									
15												
20		12-28-32-32	60			Very dense, gray sand [SP] Boring terminated @ 20 feet						



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-5

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-4**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/5/15
WATER TABLE (ft): 4.0 DATE FINISHED: 8/5/15
DATE OF READING: 8/5/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 2.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		44-16-10-7	27	▽		Medium dense, brown sand with rocks [SP]						
		4-5-6-7	11	▽		Medium dense to loose, brown sand with large roots [SP]						
5		6-6-3-3	9									
		2-4-4-5	8									
		3-3-2-3	5			Loose, tan sand with rocks [SP]						
10												
		3-3-8-10	11			Medium dense to loose, gray sand [SP]						
15												
		3-4-6-7	10			Boring terminated @ 20 feet						
20												



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-6

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-5**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/5/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/5/15
DATE OF READING: 8/5/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick) Base material (5 inches thick)						
		27-9-6-5	15			Medium dense, dark brown sand with traces of rocks [SP]						
		7-7-9-6	16			Medium dense, tan sand [SP]						
5		2-3-3-8	6			Loose, tan sand with traces of rocks [SP]						
		8-6-5-4	11			Medium dense to loose, gray sand with silt and traces of rocks and shell fragments [SP-SM]						
10		4-5-5-6	10									
15		3-3-3-4	6				7	18				
20		9-23-24-29	47			Dense, gray sand [SP]						
25		4-5-7-7	10			Medium dense, gray sand with shell fragments [SP]						
						Boring terminated @ 25 feet						

BL.3



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-7

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-6**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0												
		2-4-4-3	8			Loose, brown sand with roots [SP]						
		3-3-3-1	6	▽								
5		3-2-3-3	5	▼								
		6-5-4-4	9			Loose, light gray sand with rocks [SP]						
10		3-5-5-6	10									
		3-6-6-7	12			Medium dense, light gray sand with rock and shell fragments [SP]						
15												
		6-5-9-9	14			Medium dense, light gray sand [SP]						
20						Boring terminated @ 20 feet						



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PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-8

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-7**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/4/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/4/15
DATE OF READING: 8/4/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		38-18-13-16	31			Dense to loose, dark brown sand with rocks [SP]						
		10-7-3-3	10	▽								
5				▼								
		3-10-10-10	20			Medium dense to loose, tan cemented sands with shell fragments [SP]						
		3-5-4-6	9									
10												
		3-2-3-7	5									
15												
		2-4-4-4	8			Loose, tan sand with shell fragments [SP]						
20												
		4-9-11-9	20			Medium dense, tan sand [SP]						
						Boring terminated @ 20 feet						

BL3



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REPORT NO.: 13171

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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-8**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/4/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/4/15
DATE OF READING: 8/4/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		26-20-14-8	34			Dense, tan sand with rocks [SP]						
				▽								
		5-6-6-7	12			Medium dense to very loose, brown sand [SP]						
5				▼								
		4-1-2-2	3									
		3-3-3-3	6			Loose, gray sand with rocks [SP]						
		2-2-2-3	4			Very loose to medium dense, gray sand [SP]						
10												
		4-5-6-7	11									
15												
		3-3-6-8	9			Loose, tan sand [SP]						
20						Boring terminated @ 20 feet						



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PAGE: B-10

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-9**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/4/15
WATER TABLE (ft): 6.0 DATE FINISHED: 8/4/15
DATE OF READING: 8/4/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 4.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		21-9-6-6	15			Medium dense, brown sand with rocks [SP]						
		5-5-3-2	8	▽		Loose, brown sand [SP]						
5		2-8-8-7	16	▼		Medium dense, tan cemented sands [SP]						
		3-5-3-3	8									
10		2-2-3-3	5			Loose to medium dense, tan sand with shell fragments and trace rocks [SP]						
		4-5-7-8	12									
15												
		7-12-13-18	25			Medium dense, gray sand [SP]						
20						Boring terminated @ 20 feet						



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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-10**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 4.4 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 2.4 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		22-9-8-5	17	▽		Medium dense, light tan sand with rocks [SP]						
		6-10-9-6	19	▼		Medium dense, brown sand [SP]						
5		4-3-2-2	5			Loose, brown sand with silt and roots [SP-SM]						
		4-2-1-2	3		very loose	9	21				
10		3-5-5-5	10			Loose, gray sand with rocks [SP]						
						Boring terminated @ 10 feet						



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PROJECT NO.: 0630.1500072

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PAGE: B-12

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-11** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 4.4 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 2.4 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		20-8-15-10	23	▽		Medium dense, tan sand with rocks [SP]						
		5-5-7-6	12	▼		Medium dense, brown sand [SP]						
5		4-5-4-4	9			....loose						
		3-2-2-2	4			....very loose						
10		3-2-1-2	3			Very loose, brown sand with silt and roots [SP-SM]	7	24				
						Boring terminated @ 10 feet						



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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-12** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/5/15
WATER TABLE (ft): 6.0 DATE FINISHED: 8/5/15
DATE OF READING: 8/5/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 4.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		45-18-15-10	33			Dense, brown sand with rocks [SP]						
		4-5-6-4	11	▽		Medium dense to very loose, yellowish orange sand with rocks [SP]						
5		4-2-1-1	3	▼								
		2-3-4-4	7			Loose, gray sand with rocks [SP]						
10		3-3-3-4	6			Boring terminated @ 10 feet						



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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-13**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 4.0 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 2.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		17-12-9-5	21	▽		Medium dense, tan sand with rocks [SP]						
		4-2-3-2	5	▽		Loose, brown sand [SP]						
5		10-17-5-20	22			Medium dense, light gray sand with rocks [SP]						
		10-10-5-5	15									
10		4-4-3-3	7		loose						
						Boring terminated @ 10 feet						



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REPORT NO.: 13171

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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-14**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		16-12-14-14	26			Medium dense, brown sand with rocks [SP]						
		8-7-7-6	14									
5		3-2-2-2	4			Very loose, light gray silty sand with rocks [SM]	17	24				
		4-3-4-5	7			....loose						
10		3-4-6-5	10			Loose, light gray sand with rock and shell fragments [SP]						
						Boring terminated @ 10 feet						



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PROJECT NO.: 0630.1500072

REPORT NO.: 13171

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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-15** SHEET: **1 of 1**
SECTION: TOWNSHIP: RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/4/15
WATER TABLE (ft): 6.0 DATE FINISHED: 8/4/15
DATE OF READING: 8/4/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 4.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		40-30-8-9	38			Dense to medium dense, brown sand with rocks [SP]						
		6-8-8-5	16	▽								
5		5-5-5-5	10	▼		..... loose						
		8-7-6-6	13			Medium dense, brown sand with shell fragments and rocks [SP]						
10		9-7-9-8	16			Boring terminated @ 10 feet						



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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-16**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		20-10-5-7	15			Medium dense, brown sand with rocks [SP]						
		8-5-6-4	11									
5		6-12-11-14	23			Medium dense, light gray sand with rocks [SP]						
		4-3-3-3	6			.....loose						
10		4-4-5-5	9			Loose, light gray sand with rock and shell fragments [SP]						
						Boring terminated @ 10 feet						



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PROJECT NO.: 0630.1500072

REPORT NO.: 13171

PAGE: B-18

PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-17**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/10/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/10/15
DATE OF READING: 8/10/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		22-7-5-7	12			Medium dense, brown sand with rocks [SP]						
				▽								
		9-11-22-13	33			Dense, light brown sand [SP]						
5				▼								
		14-22-15-12	37			Dense, light gray sand with rocks [SP]						
		4-4-2-2	6			.....loose						
		3-4-4-5	8			Loose, light gray sand with rock and shell fragments [SP]						
10						Boring terminated @ 10 feet						



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PROJECT NO.: 0630.1500072

REPORT NO.: 13171

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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-18**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/4/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/4/15
DATE OF READING: 8/4/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		48-30-22-16	52			Very dense to medium dense, tan sand with rocks [SP]						
		12-14-12-6	26									
5		2-2-5-6	7			Loose, brown sand with roots [SP]						
		4-5-6-4	11			Medium dense to loose, gray sand with roots [SP]						
10		4-3-2-4	5			Boring terminated @ 10 feet						



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PROJECT: Proposed Margate Hybrid Convenience Market
2000 North State Road 7
Margate, Florida

BORING DESIGNATION: **B-19**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: TVC Margate Co. LLC
LOCATION: See Boring Location Plan
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 8/4/15
WATER TABLE (ft): 5.0 DATE FINISHED: 8/4/15
DATE OF READING: 8/4/15 DRILLED BY: JR/WC
EST. W.S.W.T. (ft): 3.0 TYPE OF SAMPLING: SPT

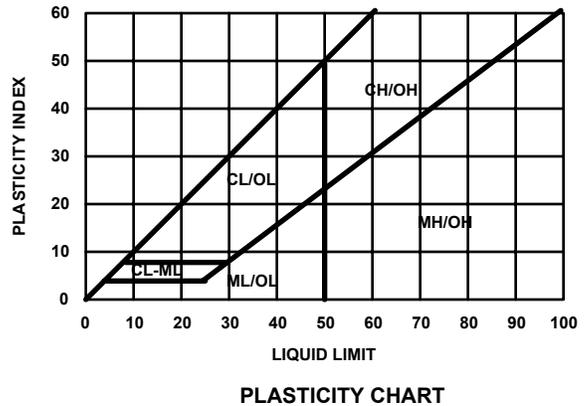
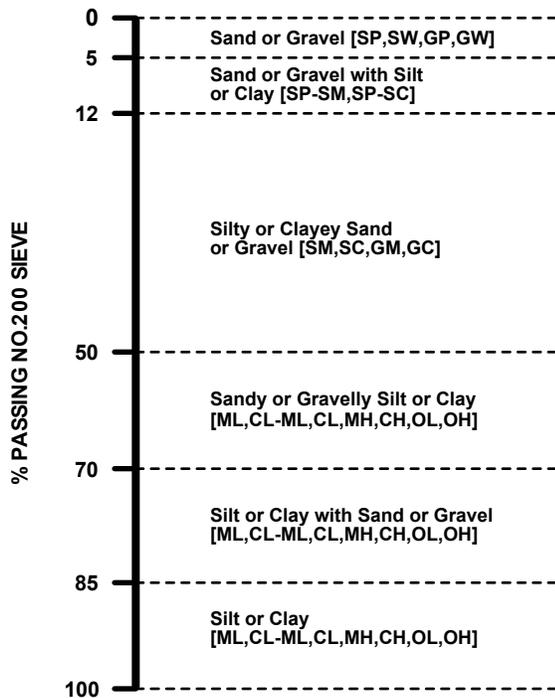
DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%) (Term)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Asphalt (1 inch thick)						
						Base material (5 inches thick)						
		43-24-16-17	40			Dense, brown sand with rocks [SP]						
				▽								
		16-19-16-14	35			Dense, yellowish orange sand [SP]						
5				▼								
		6-6-6-8	12			Medium dense, brown sand with rocks [SP]						
		6-5-1-2	6			Loose to very loose gray sand with rocks and shell fragments [SP]						
10		3-2-1-2	3			Boring terminated @ 10 feet						

KEY TO BORING LOGS

SOIL CLASSIFICATION CHART*



UNIVERSAL
ENGINEERING
SCIENCES, INC.



GROUP NAME AND SYMBOL

COARSE GRAINED SOILS

	WELL-GRADED SANDS [SW]		WELL-GRADED GRAVELS [GW]
	POORLY-GRADED SANDS [SP]		POORLY-GRADED GRAVELS [GP]
	POORLY-GRADED SANDS WITH SILT [SP-SM]		POORLY-GRADED GRAVELS WITH SILT [GP-GM]
	POORLY-GRADED SANDS WITH CLAY [SP-SC]		POORLY-GRADED GRAVELS WITH CLAY [GP-GC]
	SILTY SANDS [SM]		SILTY GRAVELS [GM]
	CLAYEY SANDS [SC]		CLAYEY GRAVELS [GC]
	SILTY CLAYEY SANDS [SC-SM]		

FINE GRAINED SOILS

	INORGANIC SILTS SLIGHT PLASTICITY [ML]
	INORGANIC SILTY CLAY LOW PLASTICITY [CL-ML]
	INORGANIC CLAYS LOW TO MEDIUM PLASTICITY [CL]
	INORGANIC SILTS HIGH PLASTICITY [MH]
	INORGANIC CLAYS HIGH PLASTICITY [CH]

HIGHLY ORGANIC SOILS

	ORGANIC SILTS/CLAYS LOW PLASTICITY [OL]**
	ORGANIC SILTS/CLAYS MEDIUM TO HIGH PLASTICITY [OH]**
	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS [PT]**

RELATIVE DENSITY (SAND AND GRAVEL)

VERY LOOSE - 0 to 4 Blows/ft.
 LOOSE - 5 to 10 Blows/ft.
 MEDIUM DENSE - 11 to 30 Blows/ft.
 DENSE - 31 to 50 Blows/ft.
 VERY DENSE - more than 50 Blows/ft.

CONSISTENCY (SILT AND CLAY)

VERY SOFT - 0 to 2 Blows/ft.
 SOFT - 3 to 4 Blows/ft.
 FIRM - 5 to 8 Blows/ft.
 STIFF - 9 to 16 Blows/ft.
 VERY STIFF - 17 to 30 Blows/ft.
 HARD - more than 30 Blows/ft.

* IN ACCORDANCE WITH ASTM D 2487 - UNIFIED SOIL CLASSIFICATION SYSTEM.

** LOCALLY MAY BE KNOWN AS MUCK.

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
<p>COARSE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p>GRAVEL AND GRAVELLY SOILS</p> <p>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE</p>	<p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p>		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	<p>SAND AND SANDY SOILS</p> <p>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SM	SILTY SANDS, SAND - SILT MIXTURES
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
	<p>FINE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p>	<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT LESS THAN 50</p>		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
			CH	INORGANIC CLAYS OF HIGH PLASTICITY	
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
<p>HIGHLY ORGANIC SOILS</p>				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

USCS LEGEND 10/02/07

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

APPENDIX C



UNIVERSAL
ENGINEERING SCIENCES

Important Information about Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE THE GEOPROFESSIONAL BUSINESS ASSOCIATION

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CONSTRAINTS AND RESTRICTIONS

WARRANTY

UES has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and UES of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of UES to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

UES is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of UES.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by UES.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations. Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. UES cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for UES to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by UES to locate any such buried objects. UES cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of investigation. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

APPENDIX D



UNIVERSAL
ENGINEERING SCIENCES

Universal Engineering Sciences, Inc.
GENERAL CONDITIONS

SECTION 1: RESPONSIBILITIES

- 1.1 *Universal Engineering Sciences, Inc.*, ("UES"), has the responsibility for providing the services described under the Scope of Services section. The work is to be performed according to accepted standards of care and is to be completed in a timely manner. The term "UES" as used herein includes all of *Universal Engineering Sciences, Inc.*'s agents, employees, professional staff, and subcontractors.
- 1.2 The Client or a duly authorized representative is responsible for providing UES with a clear understanding of the project nature and scope. The Client shall supply UES with sufficient and adequate information, including, but not limited to, maps, site plans, reports, surveys and designs, to allow UES to properly complete the specified services. The Client shall also communicate changes in the nature and scope of the project as soon as possible during performance of the work so that the changes can be incorporated into the work product.
- 1.3 The Client acknowledges that UES's responsibilities in providing the services described under the Scope of Services section is limited to those services described therein, and the Client hereby assumes any collateral or affiliated duties necessitated by or for those services. Such duties may include, but are not limited to, reporting requirements imposed by any third party such as federal, state, or local entities, the provision of any required notices to any third party, or the securing of necessary permits or permissions from any third parties required for UES's provision of the services so described, unless otherwise agreed upon by both parties.
- 1.4 **PURSUANT TO FLORIDA STATUTES §558.0035, ANY INDIVIDUAL EMPLOYEE OR AGENT OF UES MAY NOT BE HELD INDIVIDUALLY LIABLE FOR NEGLIGENCE.**

SECTION 2: STANDARD OF CARE

- 2.1 Services performed by UES under this Agreement will be conducted in a manner consistent with the level of care and skill ordinarily exercised by members of UES's profession practicing contemporaneously under similar conditions in the locality of the project. No other warranty, express or implied, is made.
- 2.2 The Client recognizes that subsurface conditions may vary from those observed at locations where borings, surveys, or other explorations are made, and that site conditions may change with time. Data, interpretations, and recommendations by UES will be based solely on information available to UES at the time of service. UES is responsible for those data, interpretations, and recommendations, but will not be responsible for other parties' interpretations or use of the information developed.
- 2.3 Execution of this document by UES is not a representation that UES has visited the site, become generally familiar with local conditions under which the services are to be performed, or correlated personal observations with the requirements of the Scope of Services. It is the Client's responsibility to provide UES with all information necessary for UES to provide the services described under the Scope of Services, and the Client assumes all liability for information not provided to UES that may affect the quality or sufficiency of the services so described.
- 2.4 Should UES be retained to provide threshold inspection services under Florida Statutes §553.79, Client acknowledges that UES's services thereunder do not constitute a guarantee that the construction in question has been properly designed or constructed, and UES's services do not replace any of the obligations or liabilities associated with any architect, contractor, or structural engineer. Therefore it is explicitly agreed that the Client will not hold UES responsible for the proper performance of service by any architect, contractor, structural engineer or any other entity associated with the project.

SECTION 3: SITE ACCESS AND SITE CONDITIONS

- 3.1 Client will grant or obtain free access to the site for all equipment and personnel necessary for UES to perform the work set forth in this Agreement. The Client will notify any and all possessors of the project site that Client has granted UES free access to the site. UES will take reasonable precautions to minimize damage to the site, but it is understood by Client that, in the normal course of work, some damage may occur, and the correction of such damage is not part of this Agreement unless so specified in the Proposal.
- 3.2 The Client is responsible for the accuracy of locations for all subterranean structures and utilities. UES will take reasonable precautions to avoid known subterranean structures, and the Client waives any claim against UES, and agrees to defend, indemnify, and hold UES harmless from any claim or liability for injury or loss, including costs of defense, arising from damage done to subterranean structures and utilities not identified or accurately located. In addition, Client agrees to compensate UES for any time spent or expenses incurred by UES in defense of any such claim with compensation to be based upon UES's prevailing fee schedule and expense reimbursement policy.

SECTION 4: SAMPLE OWNERSHIP AND DISPOSAL

- 4.1 Soil or water samples obtained from the project during performance of the work shall remain the property of the Client.
- 4.2 UES will dispose of or return to Client all remaining soils and rock samples 60 days after submission of report covering those samples. Further storage or transfer of samples can be made at Client's expense upon Client's prior written request.
- 4.3 Samples which are contaminated by petroleum products or other chemical waste will be returned to Client for treatment or disposal, consistent with all appropriate federal, state, or local regulations.

SECTION 5: BILLING AND PAYMENT

- 5.1 UES will submit invoices to Client monthly or upon completion of services. Invoices will show charges for different personnel and expense classifications.
- 5.2 Payment is due 30 days after presentation of invoice and is past due 31 days from invoice date. Client agrees to pay a finance charge of one and one-half percent (1 ½ %) per month, or the maximum rate allowed by law, on past due accounts.
- 5.3 If UES incurs any expenses to collect overdue billings on invoices, the sums paid by UES for reasonable attorneys' fees, court costs, UES's time, UES's expenses, and interest will be due and owing by the Client.

SECTION 6: OWNERSHIP AND USE OF DOCUMENTS

- 6.1 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by UES, as instruments of service, shall remain the property of UES.
- 6.2 Client agrees that all reports and other work furnished to the Client or his agents, which are not paid for, will be returned upon demand and will not be used by the Client for any purpose.
- 6.3 UES will retain all pertinent records relating to the services performed for a period of five years following submission of the report, during which period the records will be made available to the Client at all reasonable times.
- 6.4 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by UES, are prepared for the sole and exclusive use of Client, and may not be given to any other party or used or relied upon by any such party without the express written consent of UES.

SECTION 7: DISCOVERY OF UNANTICIPATED HAZARDOUS MATERIALS

- 7.1 Client warrants that a reasonable effort has been made to inform UES of known or suspected hazardous materials on or near the project site.
- 7.2 Under this agreement, the term hazardous materials include hazardous materials (40 CFR 172.01), hazardous wastes (40 CFR 261.2), hazardous substances (40 CFR 300.6), petroleum products, polychlorinated biphenyls, and asbestos.
- 7.3 Hazardous materials may exist at a site where there is no reason to believe they could or should be present. UES and Client agree that the discovery of unanticipated hazardous materials constitutes a changed condition mandating a renegotiation of the scope of work. UES and Client also agree that the discovery of unanticipated hazardous materials may make it necessary for UES to take immediate measures to protect health and safety. Client agrees to compensate UES for any equipment decontamination or other costs incident to the discovery of unanticipated hazardous waste.
- 7.4 UES agrees to notify Client when unanticipated hazardous materials or suspected hazardous materials are encountered. Client agrees to make any disclosures required by law to the appropriate governing agencies. Client also agrees to hold UES harmless for any and all consequences of disclosures made by UES which are required by governing law. In the event the project site is not owned by Client, Client recognizes that it is the Client's responsibility to inform the property owner of the discovery of unanticipated hazardous materials or suspected hazardous materials.
- 7.5 Notwithstanding any other provision of the Agreement, Client waives any claim against UES, and to the maximum extent permitted by law, agrees to defend, indemnify, and save UES harmless from any claim, liability, and/or defense costs for injury or loss arising from UES's discovery of unanticipated hazardous materials or suspected hazardous materials including any costs created by delay of the project and any cost associated with possible reduction of the property's value. Client will be responsible for ultimate disposal of any samples secured by UES which are found to be contaminated.

SECTION 8: RISK ALLOCATION

- 8.1 Client agrees that UES's liability for any damage on account of any breach of contract, error, omission or other professional negligence will be limited to a sum not to exceed \$50,000 or UES's fee, whichever is greater. If Client prefers to have higher limits on contractual or professional liability, UES agrees to increase the limits up to a maximum of \$1,000,000.00 upon Client's written request at the time of accepting our proposal provided that Client agrees to pay an additional consideration of four percent of the total fee, or \$400.00, whichever is greater. The additional charge for the higher liability limits is because of the greater risk assumed and is not strictly a charge for additional professional liability insurance.

SECTION 9: INSURANCE

- 9.1 UES represents and warrants that it and its agents, staff and consultants employed by it, is and are protected by worker's compensation insurance and that UES has such coverage under public liability and property damage insurance policies which UES deems to be adequate. Certificates for all such policies of insurance shall be provided to Client upon request in writing. Within the limits and conditions of such insurance, UES agrees to indemnify and save Client harmless from and against loss, damage, or liability arising from negligent acts by UES, its agents, staff, and consultants employed by it. UES shall not be responsible for any loss, damage or liability beyond the amounts, limits, and conditions of such insurance or the limits described in Section 8, whichever is less. The Client agrees to defend, indemnify and save UES harmless for loss, damage or liability arising from acts by Client, Client's agent, staff, and other UESs employed by Client.

SECTION 10: DISPUTE RESOLUTION

- 10.1 All claims, disputes, and other matters in controversy between UES and Client arising out of or in any way related to this Agreement will be submitted to alternative dispute resolution (ADR) such as mediation or arbitration, before and as a condition precedent to other remedies provided by law, including the commencement of litigation.
- 10.2 If a dispute arises related to the services provided under this Agreement and that dispute requires litigation instead of ADR as provided above, then:
- (a) the claim will be brought and tried in judicial jurisdiction of the court of the county where UES's principal place of business is located and Client waives the right to remove the action to any other county or judicial jurisdiction, and
 - (b) The prevailing party will be entitled to recovery of all reasonable costs incurred, including staff time, court costs, attorneys' fees, and other claim related expenses.

SECTION 11: TERMINATION

- 11.1 This agreement may be terminated by either party upon seven (7) days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if that substantial failure has been remedied before expiration of the period specified in the written notice. In the event of termination, UES shall be paid for services performed to the termination notice date plus reasonable termination expenses.
- 11.2 In the event of termination, or suspension for more than three (3) months, prior to completion of all reports contemplated by the Agreement, UES may complete such analyses and records as are necessary to complete its files and may also complete a report on the services performed to the date of notice of termination or suspension. The expense of termination or suspension shall include all direct costs of UES in completing such analyses, records and reports.

SECTION 12: ASSIGNS

- 12.1 Neither the Client nor UES may delegate, assign, sublet or transfer their duties or interest in this Agreement without the written consent of the other party.

SECTION 13. GOVERNING LAW AND SURVIVAL

- 13.1 The laws of the State of Florida will govern the validity of these Terms, their interpretation and performance.
- 13.2 If any of the provisions contained in this Agreement are held illegal, invalid, or unenforceable, the enforceability of the remaining provisions will not be impaired. Limitations of liability and indemnities will survive termination of this Agreement for any cause.

SECTION 14. INTEGRATION CLAUSE

- 14.1 This Agreement represents and contains the entire and only agreement and understanding among the parties with respect to the subject matter of this Agreement, and supersedes any and all prior and contemporaneous oral and written agreements, understandings, representations, inducements, promises, warranties, and conditions among the parties. No agreement, understanding, representation, inducement, promise, warranty, or condition of any kind with respect to the subject matter of this Agreement shall be relied upon by the parties unless expressly incorporated herein.
- 14.2 This Agreement may not be amended or modified except by an agreement in writing signed by the party against whom the enforcement of any modification or amendment is sought.



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Margate Hybrid Convenience Market & Retail Development

Margate, Florida

STORMWATER MANAGEMENT REPORT

SR 7 & Copans Rd.
Parcel ID: 4842 30 05 0010
Margate, Florida 33063

Issued: 9/15/2015

Revised: -

Project Number: 010032-01-008

Prepared by:

Bowman Consulting Group

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1. Introduction

The intent of this report is to demonstrate that the proposed project complies with the requirements of the permitting agencies having jurisdiction over the development of this site located within the Broward County (BC), and South Florida Water Management District (SFWMD) found within the State of Florida. On 3/2/2015, a meeting with Broward County was made to discuss our proposed design and the required stormwater design conditions.

2. Site Conditions

2.1 Existing Conditions

The proposed project is located on an existing developed site that currently contains an office building with associated parking, and utilities. The existing facilities directly contribute to and are directly connected to a stormwater system which is part of the southwest basin of the Cocomar Water Control District.

2.2 Proposed Conditions

The proposed site improvements with this application include the removal of all of the existing parking, structures and utilities. The proposed construction will be of a 5,943 SF convenience store/gas station along and 12,950 SF general retail building and the associated parking, and utilities. The general retail store and associated parking will be constructed in a future phase. The proposed new project will sheet flow into a proposed stormwater catchment system that will provide water quality treatment and attenuation through exfiltration trench and swale. The proposed drainage system will then discharge into the existing drainage system along Copans road via an existing piped connection. The proposed developed site outfall will be controlled by a weir in a manhole with its control elevation set at 10.00 (NAVD88) before discharging to the existing W. Copans Road system.

3. Post-Development Land Use Calculations

Area Description	Square Feet	Acreage	% of Total Area	CN
On-Site Contributing Areas				
Buildings	18,893	0.43	12.0%	98
Pavement / Sidewalks	105,775	2.43	67.2%	98
Open Green Space	32,843	0.75	20.9%	61
Subtotal On-Site	157,511	3.62	100%	90.3
Total Contributing Areas:				
		3.62	-%	90.3
Total Project Site:				
		3.62	100%	
Total Project Impervious Areas:				
		2.86	79.1%	
Total Project Pervious Areas:				
		0.75	20.9%	

In the Post-development condition the CN is calculated at 90.3 using the TR55 manual and the developed Tc is 10 minutes Minimum.

4. Objective / Methodology

4.1 Design Criteria

The following design criteria has been utilized for the proposed project stormwater analysis and modeling, using Interconnecting Pond Routing (ICPR) software.

Broward County:

- Analysis for the 10-Year, 24-Hour Storm Event.
- Analysis for the 25-Year, 72-Hour Storm Event.
- Analysis for the 100-Year, 24-Hour Storm Event.

- Water Quality Treatment Volume:
 - 0.5-inch times the entire site

5. Procedures and Analysis

5.1 Design

The stormwater analysis/design is accounting for the project area that is within southwest Cocomar Water Control District. An inlet is located on site which will connect to the existing drainage system right-of-way.

The proposed exfiltration trenches and control structure are designed to meet the peak storm attenuation for Broward County and SFWMD critical storm criteria as defined by the southwest Cocomar Water Control District.

5.2 Water Quality

The calculations use Broward County design criteria for southwest Concomar Water Control District. Water quality treatment is being provided for 1/2-inch times the total basin area. The required water quality volume of 0.40 ac-ft will be met within the proposed exfiltration trench behind the Outfall Control Structure Discharge Elevation of +10.00 NAVD88.

Water Quality	Volume
Water Quality Required	0.40 ac-ft
Water Quality Provided	0.50 ac-ft

6. Conclusions and Results

6.1 Stormwater Management Recovery Analysis

The proposed stormwater management facility provides for water quality pre-treatment. The proposed improvements provide for on-site stage storage volume incorporating exfiltration trenches.

6.2 Surface Waters

There are no existing surface water bodies or wetlands found on the property or directly adjacent to the development site.

6.3 Groundwater Elevation

According to the design parameters in Section II: Water Management Plan attached in appendix A, the groundwater elevation from Broward County is +8.50 NGVD88 and the Seasonal High Water Elevation (SHWE) is about 3.0 feet below the existing lowland ground elevation. For the design of this project the groundwater table is set at the SHWE of +8.50 NGVD88.

6.4 Vertical Datum

All Elevations are based on North American Vertical Datum of 1988 (NAVD88).

6.5 Discharge Rate

The proposed improvements meet all current permit criteria. There is significant capacity exfiltration system to support this project, and all required design elevations have been met. Once the water quality amount is met, the project's stormwater discharge is unregulated.

APPENDIX A

Broward County Design Requirements

SECTION II: WATER MANAGEMENT PLAN

DESIGN PARAMETERS

Table "B" below shows storm rainfall to be expected, on an average, once in ten years, once in twenty-five years, and once in one hundred years, for periods of one and three days. This data corresponds to design storm frequencies suggested by the South Florida Water Management District.

The data of Table "B" is based upon detailed rainfall studies by the South Florida Water Management District.

TABLE B

Ten, Twenty-five and One Hundred Year Storm Rainfall

<u>Duration</u>	<u>10-Year Rainfall (Inches)</u>	<u>25-Year Rainfall (Inches)</u>	<u>100-Year Rainfall (Inches)</u>
24 Hours	10.0	13.0	18.0
3 Days	13.6	17.7	24.5

The 10-year, 24-hour sustained flood stage is normally used as the minimum road crown. The 25-year, 3-day flood stage is normally used to determine the structure crest elevation for the allowable discharge to the South Florida Water Management District primary canals. The 100-year, 3-day flood elevation is used to determine the minimum finished floor elevation.

DESIGN CRITERIA

The Coccomar Water Control District has been divided into four sub-basins, the Northeast basin, the Northwest basin, the Southwest basin and the Southeast basin (see Plate 2). The Southwest basin is also known as the Margate Eastern Tier. The majority of the southeast basin was master planned as the Tartan Property (now known as the Township Development).

The acreage and design water surface for the four sub-basins are listed in Table "C" below:

TABLE C
SUB-BASIN DATA

NGVD

<u>SUB-BASIN</u>	<u>ACREAGE</u>	<u>DESIGN WATER SURFACE</u>		<u>SFWMD BASIN</u>
		<u>Wet</u>	<u>Dry</u>	
NORTHEAST	2224	11.0'	11.0'	HILLSBORO CANAL
NORTHWEST	2260	11.0'	11.0'	HILLSBORO CANAL
SOUTHWEST	2020	8.5'	9.5'	C-14 CANAL
SOUTHEAST	1866	9.5'	9.5'	C-14 CANAL

Plate 2 shows the four sub basins and plates 4A and 4B show where the control structures are located within the sub-basins along with their control elevation. Plates 6 through 11 are detailed sketches of the water control structures. Some of the structures were designed with a variable crest weir in order to provide a higher dry season control elevation and a lower control elevation during the wet season.

Table "D" lists the adopted maximum design elevations of the three storms for the four sub-basins. These elevations are consistent with South Florida Water Management District and Broward County Water Resources Management Division criteria.

TABLE D

Maximum Allowable Design Stages

<u>Sub Basin</u>	<u>10-Year 1-Day</u>	<u>25-Year 3-Day</u>	<u>100-Year 3-Day</u>
Northeast	14.0' NGVD	14.6' NGVD	15.5' NGVD
Northwest	14.0' NGVD	14.7' NGVD	15.6' NGVD
Southwest	11.9' NGVD	12.3' NGVD	14.0' NGVD
Southeast	12.1' NGVD	12.6' NGVD	14.0' NGVD

All non-residential developments are required to pre-treat at least the first 1/2" of rainfall prior to connection into the water management system. All development in the Cocomar Water Control District must also meet the South Florida Water Management District retention/detention criteria.

All developments in the northeast and northwest basin can do flood routing using the fixed design parameters or may wish to use the land use breakdowns and average grade elevation formulas similar to those in Appendix "A" or Appendix "B".

COCOMAR WATER CONTROL DISTRICT

NORTHEAST BASIN

GRADING ANALYSIS

Fixed Design Parameters:

Design Water Surface	11.0 feet NGVD
Maximum 10-year Flood Stage	14.0 feet NGVD ✓
25-year, 3-day Flood Stage	14.6 feet NGVD
100-year, 3-day Flood Stage	15.5 feet NGVD
Minimum Floor Elevation	16.0 feet NGVD
Allowable Discharge From Sites	35 CSM

Additional Assumption:

Minimum Waterways Area 15% of Site

Grading Concept:

The total area of the Northeast basin is 2224 acres.

Minimum area of waterways is 15% of 2224 acres or 334 acres

From Tables 1 and 2 the area for the buildings is the weighted average percentage of the basin which is 35% of 2224 acres or 778 acres.

Remaining area is 1446 acres of which 334 acres is waterways at elevation 11 feet NGVD:

$$\frac{334 \text{ acres}}{1446 \text{ acres}} = 23\% \text{ of remaining acreage is to be waterways (same as 15\% of entire basin) elevation 11 feet NGVD.}$$

1112 acres or 77% of the remaining 1446 acres can have an average finished grade elevation which keeps the design parameters intact. Try elevation 12.7 feet NGVD

$$\begin{aligned} \text{Average Finish} &= .23 \times 11.0 = 2.53 \\ \text{Grade Formula} &= \underline{.77 \times 12.7 = +9.78} \end{aligned}$$

$$\begin{aligned} &\text{average} \\ \text{elevation} &= 12.31 \text{ including lake} \end{aligned}$$

From Table B of Section II on page 11 the design rainfalls are:

10-year, 24-hour rainfall =	10 inches
25-year, 3-day rainfall =	17.7 inches
100-year, 3-day rainfall =	24.5 inches

Storage required below elevation 14 feet msl for road protection:

10"/12 x 2224 acres = 1853 ac-ft

10-year, 24-hour at elevation 14 feet msl must store 1853 ac.-ft.

Storage required below elevation 14.6 feet msl for Hillsboro Canal Allowable discharge:

17.7"/12 x 2224 acres = 3280 ac-ft.

25-year, 3-day at elevation 14.6 must store 3280 ac-ft.

Storage required below elevation 15.5 feet msl for building protection:

24.5"/12 x 2224 acres = 4540 ac-ft.

100-year, 3-day at elevation 15.5 must store 4540 ac-ft.

<u>ELEVATION</u> (ft)	<u>REQUIRED</u> <u>STORAGE (ac-ft)</u>	<u>ACTUAL</u> <u>STORAGE (ac-ft)</u>
14.0 (14.0 - 12.3)	1853 ac-ft	2458 ac-ft
14.6 (14.6 - 12.3)	3280 ac-ft	3326 ac-ft
15.5 (15.5 - 12.3)	4540 ac-ft	4627 ac-ft

Property owners can change the average finish grade formula to fit the individual site plans by creating more storage (i.e., more waterways or retention areas).

TABLE 1

RESIDENTIAL N. E. BASIN
ELEVATION 16

<u>LAND USE</u>	<u>ACREAGE</u>	<u>% OF TOTAL</u>	<u>% BUILDING</u>	<u>WEIGHTED "C"</u>
R-1	301	16.1	10	0.0161
R-3	213	11.4	42	0.0477
R-4 & R-5	1013	54.1	45	0.243
R-10	22	1.2	40	0.0048
RC8	319	17.0	40	0.0680
TOTAL	1868	100		0.3796

Use 38% building coverage for residential land use.

TABLE 2

**N.E. BASIN
ELEVATION 16**

<u>LAND USE</u>	<u>ACREAGE</u>	<u>% OF TOTAL</u>	<u>% BUILDING</u>	<u>WEIGHTED "C"</u>
RESIDENTIAL	1868	84	38	0.3182
COMMERCIAL	76	3.4	35	0.0119
OFFICE PARK	22	1.0	35	0.0035
INDUSTRIAL	73	3.3	0	0.01485
PARKS	33	1.49	10	0.00149
TRAFFICWAYS	152	6.81	0	0.00
TOTAL	2224	100		0.34994

Use 35% building coverage for storage calculation.

COCOMAR WATER CONTROL DISTRICT

NORTHWEST BASIN

GRADING ANALYSIS

Fixed Design Parameters:

Design Water Surface	11.0 feet NGVD
Maximum 10-year Flood Stage	14.0 feet NGVD
25-year, 3-day Flood Stage	14.6 feet NGVD
100-year, 3-day Flood Stage	15.5 feet NGVD ? or 15.6'
Minimum Floor Elevation	16.0 feet NGVD
Allowable Discharge From Sites	35 CSM

Additional Assumption:

Minimum Waterways Area

15% of Site

Grading Concept:

The total area of the Northwest basin is 2260 acres.

Minimum area of waterways is 15% of 2260 acres or 339 acres

From Tables 1 and 2 the area for the buildings is the weighted average percentage of the basin which is 35% of 2260 acres or 791 acres.

Remaining area is 1469 acres of which 339 acres is waterways at elevation 11 feet NGVD:

$$\frac{339 \text{ acres}}{1469 \text{ acres}} = 23\% \text{ of remaining acreage is to be waterways (same as 15\% of entire basin) elevation 11 feet NGVD.}$$

1130 acres or 77% of the remaining 1469 acres can have an average finished grade elevation which keeps the design parameters intact. Try elevation 12.7 feet NGVD

$$\begin{aligned} \text{Average Finish} &= .23 \times 11.0 = 2.53 \\ \text{Grade Formula} &= \underline{.77 \times 12.7 = +9.78} \end{aligned}$$

$$\begin{aligned} &\text{average} \\ \text{elevation} &= 12.31 \text{ including lake} \end{aligned}$$

From Table B of Section II on page 11 the design rainfalls are:

10-year, 24-hour rainfall =	10 inches
25-year, 3-day rainfall =	17.7 inches
100-year, 3-day rainfall =	24.5 inches

Storage required below elevation 14 feet msl for road protection:

10"/12 x 2260 acres = 1883 ac-ft

10-year, 24-hour at elevation 14 feet msl must store 1883 ac.-ft.

Storage required below elevation 14.6 feet msl for Hillsboro Canal Allowable discharge:

17.7"/12 x 2260 acres = 3334 ac-ft.

25-year, 3-day at elevation 14.6 must store 3334 ac-ft.

Storage required below elevation 15.5 feet msl for building protection:

24.5"/12 x 2260 acres = 4614 ac-ft.

100-year, 3-day at elevation 15.5 must store 4614 ac-ft.

<u>ELEVATION</u> (ft)	<u>REQUIRED</u> <u>STORAGE (ac-ft)</u>	<u>ACTUAL</u> <u>STORAGE (ac-ft)</u>
14.0 (14.0 - 12.3)	1883 ac-ft	2497 ac-ft
14.6 (14.6 - 12.3)	3334 ac-ft	3378 ac-ft
15.5 (15.5 - 12.3)	4614 ac-ft	4700 ac-ft

Property owners can change the average finish grade formula to fit the individual site plans by creating more storage (i.e., more waterways or retention areas).

TABLE 1

RESIDENTIAL N. W. BASIN
ELEVATION 16

<u>LAND USE</u>	<u>ACREAGE</u>	<u>% OF TOTAL</u>	<u>% BUILDING</u>	<u>WEIGHTED "C"</u>
R-1	111	13	10	0.013
R-3	462	52	42	0.218
R-4 & R-5	178	20	45	0.090
R-10	97	11	40	0.044
RC8	31	4	40	0.016
TOTAL	881	100		0.381

Use 39% building coverage for residential land use.

TABLE 2

**N.W. BASIN
ELEVATION 16**

<u>LAND USE</u>	<u>ACREAGE</u>	<u>% OF TOTAL</u>	<u>% BUILDING</u>	<u>WEIGHTED "C"</u>
RESIDENTIAL	881	39	35	0.1365
COMMERCIAL	226	10	35	0.0350
OFFICE PARK	254	11	30	0.0330
INDUSTRIAL	746	33	45	0.1485
PARKS	40	2	10	0.0020
TRAFFICWAYS	113	5	0	0.00
TOTAL	2260	100		0.3550

Use 35% building coverage for storage calculation.

SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION 16.0 FEET NGVD.
2. MINIMUM ROAD CROWN ELEVATION 14.0 FEET NGVD.
3. DISCHARGE FACILITIES: NORTHWEST BASIN

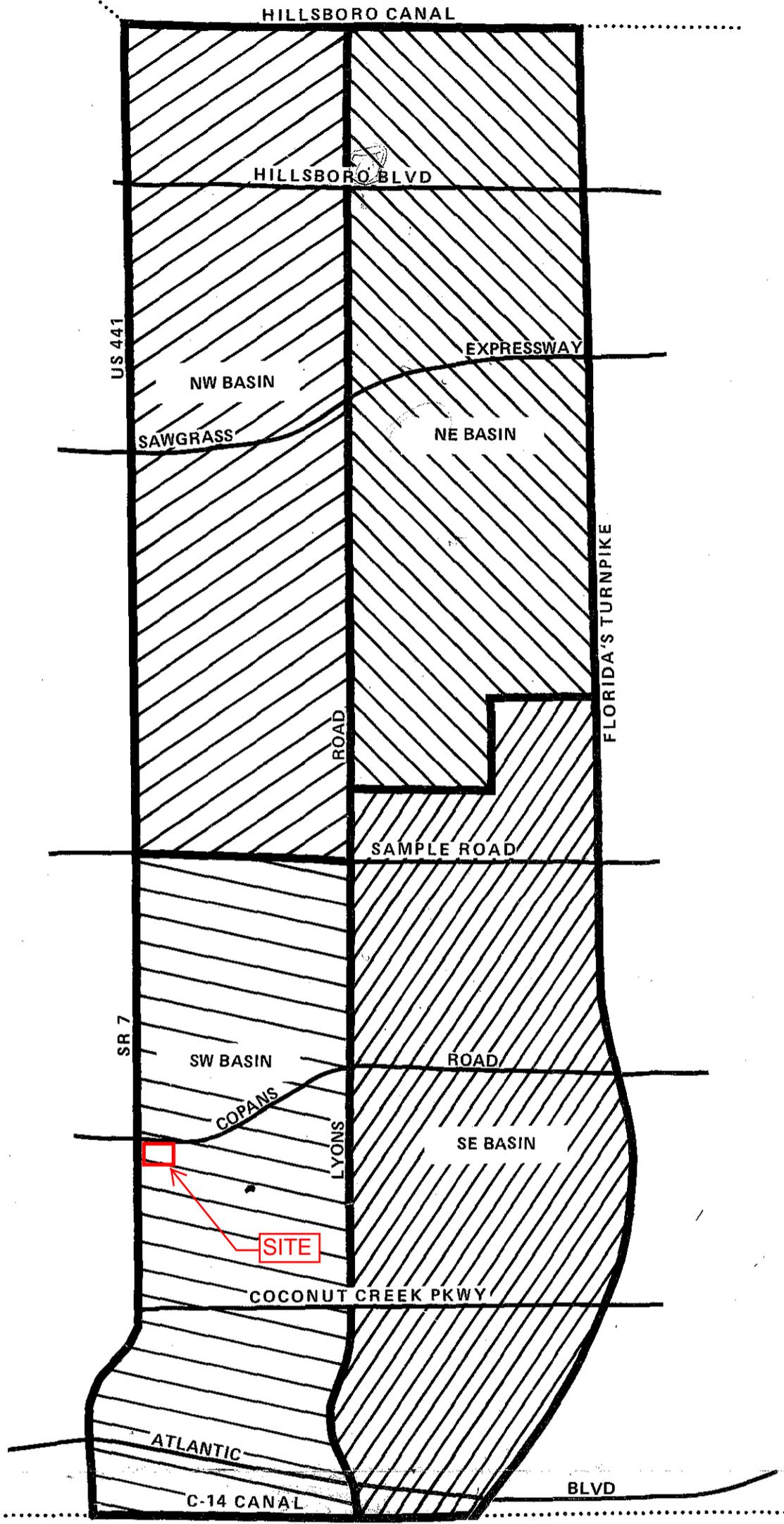
DESCRIPTION: APPROXIMATELY 19,300 LF OF CONVEYANCE CANAL AND LAKES RUNNING NORTH FROM SAMPLE ROAD DISCHARGING TO THE HILLSBORO CANAL THROUGH ONE CONTROL STRUCTURE CONSISTING 2-6 FOOT WIDE SCREWGATE WEIRS, 1-6 FOOT WIDE WEIR CREST IS AT ELEVATION 14.65 FEET NGVD AND 3 FEET OF THE OTHER WEIR CREST IS AT ELEVATION 11.0 FEET NGVD AND THE REMAINING 3 FEET IS AT ELEVATION 11.6 FEET NGVD.

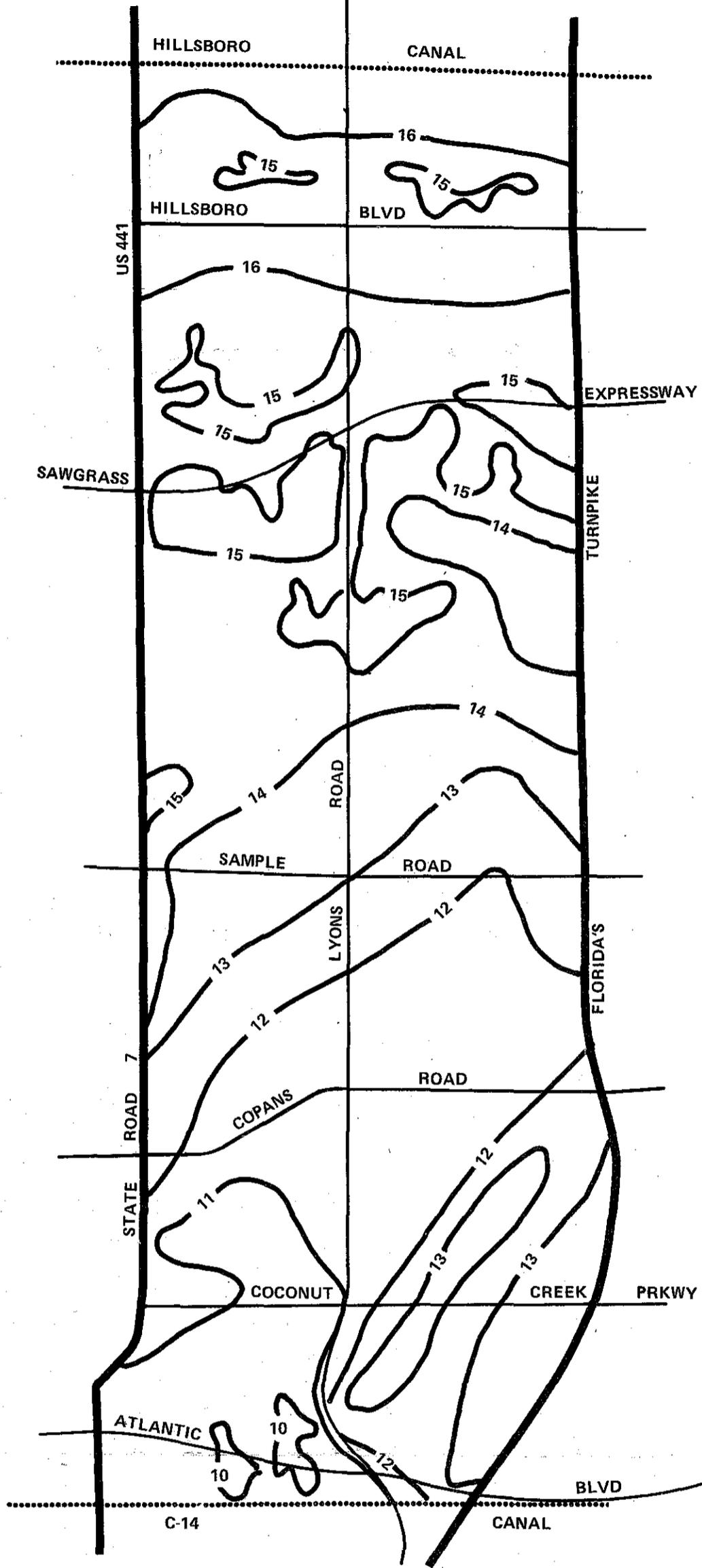
RECEIVING WATER: HILLSBORO CANAL.

CONTROL ELEVATION: 11.0 FEET NGVD.

4. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION OR SHOALING 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 PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.
7. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.
8. OPERATION OF THE MASTER SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF COCOMAR WATER CONTROL DISTRICT.
9. 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 PERMITTEE IS CAUTIONED THAT THE ISSUANCE OF A SURFACE WATER MANAGEMENT PERMIT SHALL NOT BE CONSTRUED TO BE A GUARANTEE THAT WATER WILL BE AVAILABLE.
10. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF FUTURE PHASES, DETAILED PAVING, GRADING, AND DRAINAGE PLANS AND CALCULATIONS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
11. FUTURE COMMERCIAL/INDUSTRIAL DEVELOPMENT SHALL PROVIDE 1/2 INCH DRY PRETREATMENT PRIOR TO DISCHARGING INTO THE MASTER SURFACE WATER MANAGEMENT SYSTEM.

12. 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.
13. ALL SITES WILL BE REQUIRED TO DESIGNATE FIFTEEN PERCENT OF THE SITE TO WATERWAY AREAS (I.E. LAKES OR EQUIVALENT).
14. FUTURE CONSTRUCTION PHASES WHICH CONTAIN CYPRESS WETLANDS SHALL BE EVALUATED USING GUIDELINES OUTLINED IN APPENDIX 7, BASIS OF REVIEW (ISOLATED WETLANDS). WETLANDS DETERMINED TO BE VIABLE MAY BE UTILIZED AS PART OF THE SURFACE WATER MANAGEMENT SYSTEM AND SHALL BE DEDICATED AS CONSERVATION AREAS.





NOTE:
 DATA COLLECTED AND INTERPOLATED
 FROM USGS QUAD SHEETS.
 CONTOURS ARE IN FEET (NGVD).

APPENDIX B

I. Exfiltration Calculations

II. Post Development Calculations

EXFILTRATION TRENCH DESIGN CALCULATIONS

for
Margate, FL

K Value

$$K_1 = 0.001250 \text{ cfs/sq ft - ft head} \quad \text{Average K} = 0.000842 \text{ cfs/sq ft - ft head}$$
$$K_2 = 0.000433 \text{ cfs/sq ft - ft head}$$

To Determine Volume Actually Exfiltrated (V) compared to Required

$$L = \frac{V}{(K * (H_2 * W + 2 * H_2 * D_u - D_u^2 + 2 * H_2 * D_s)) + ((1.39 \times 10^{-4}) * (W * D_u))}$$

L	=	Length of Trench Provided	=	400	feet
P	=	Pipe Size	=	15	in
W	=	Trench Width	=	5	feet
K	=	Hydraulic Conductivity	=	0.000842	cfs/sq ft - ft head
H ₂	=	Depth to Water Table	=	2.00	feet
D _u	=	Non-saturated trench depth	=	2.00	feet
D _s	=	Saturated Trench Depth	=	0.50	feet

Volume Exfiltrated, V	=	5.94	ac-in
	=	0.50	ac-ft

Stormwater Management Report

Post Development - Margate

PROPOSED PROJECT AREAS

Total Drainage Area	=	157,511 sf	=	3.62 acres	<u>100.0%</u>
Total Impervious Area	=	124,668 sf	=	2.86 acres	<u>79.1%</u>
On-Site Impervious Area	=	124,668 sf	=	2.86 acres	<u>79.1%</u>
Building Area	=	18,893 sf	=	0.43 acres	<u>12.0%</u>
Pavement / Sidewalk Area	=	105,775 sf	=	2.43 acres	<u>67.2%</u>
Off-Site Impervious Area	=	0 sf	=	0.00 acres	<u>0.0%</u>
Total Pervious Area	=	32,843 sf	=	0.75 acres	<u>20.9%</u>
On-Site Pervious Area	=	32,843 sf	=	0.75 acres	<u>20.9%</u>
Open Area	=	32,843 sf	=	0.75 acres	<u>20.9%</u>
Dry Retention	=	0 sf	=	0.00 acres	<u>0.0%</u>

DCIA CALCULATIONS

DCIA Area = Pavement Area + Wet Retention + Wetland Area
 = (2.43 + 0.00+ 0)
 = 2.43 acres

DCIA % = DCIA Area / Total Basin Area
 = (2.43 / 3.62) x 100
 = 67.2 %

Soil Type	Area	Soil Class	NRCS CN	Product
Wet Retention Surface	0		100	0
Green Area / Pervious	32,843	B	61	2003423
Pavement / SW/ Impervious	124,668		98	12217464
Sum	157,511		259	14,220,887

Weighted CN		90.29
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Stormwater Management Report

Post Development - Margate

SFWMD WATER QUALITY CALCULATIONS

First Inch of Runoff Over the Project Site:

$$V_1 = \frac{1 \text{ inch} \times 3.62 \text{ acres} \times 1 \text{ foot}}{12 \text{ inches}}$$

= 0.30 ac-ft

Stormwater Management Report

Post Development - Margate

WATER QUALITY CALCULATIONS

0.5 Inches Times Percent Impervious	=	0.40 ac-ft 4.75 ac-in
Provided Treatment Volume	=	0.50 ac-ft
From Stage - Storage Table, Water Quality Elevation	=	9.48 ft, NAVD88

Soil Storage Calculations

Average Finished Grade	=	12.75 ft, NAVD 88
Average Ground Water Level	=	9 ft
Percent of Project Impervious	=	79.1%
Flatwood Soil Type (compacted)		
Depth to Water Table	=	2.5 ft
Flatwood Com. Soil (SFWMD SERP)	=	6.09 in
Soil Storage	=	2.10 in

d1 =	3	s1 =	4
d2 =	4	s2 =	7
dx =	3.74		

Stormwater Management Report

Post Development - Margate

RUNOFF (ZERO DISCHARGE) CALCULATIONS

$$\begin{aligned} \text{Average Depth to Water Table} &= 2.50 \text{ feet} \\ \text{Developed Available Storage} &= 6.09 \text{ inches} \end{aligned}$$

$$S = \underline{\hspace{2cm}} = 2.10 \text{ inches}$$

$$CN = \frac{1000}{(2.10+10)} = 82.6$$

For the 5 year - 1 hour storm event, with zero discharge:

$$P = 3.28 \text{ inches}$$

$$\begin{aligned} \text{Vol} &= \frac{(3.3 - (0.2 \times 2.10))^2 \text{ in}^2}{(3.3 + (0.8 \times 2.10)) \text{ in}} \Big| \frac{3.62 \text{ acres}}{1} \Big| \frac{\text{foot}}{12 \text{ inches}} \\ &= 0.50 \text{ ac-ft} \end{aligned}$$

$$\text{From Total Stage - Storage Table, elevation} = 9.48 \text{ ft, NAVD88}$$

For the 10 year - 1 day storm event, with zero discharge:

$$P = 10 \text{ inches}$$

$$\begin{aligned} \text{Vol} &= \frac{(10.0 - (0.2 \times 2.10))^2 \text{ in}^2}{(10.0 + (0.8 \times 2.10)) \text{ in}} \Big| \frac{3.62 \text{ acres}}{1} \Big| \frac{\text{foot}}{12 \text{ inches}} \\ &= 2.37 \text{ ac-ft} \end{aligned}$$

$$\text{From Total Stage - Storage Table, elevation} = 12.11 \text{ ft, NAVD88}$$

Stormwater Management Report

Post Development - Margate

For the 25 year - 3 day storm event, with zero discharge:

$$P = 13.5 \text{ inches}$$

$$\text{Vol} = \frac{(13.5 - (0.2 \times 2.10))^2 \text{ in}^2 \mid 3.62 \text{ acres} \mid 1 \text{ foot}}{(13.5 + (0.8 \times 2.10)) \text{ in} \mid \mid 12 \text{ inches}}$$
$$= 3.40 \text{ ac-ft}$$

$$\text{From Total Stage - Storage Table, elevation} = 12.48 \text{ ft, NAVD88}$$

For the 100 year - 3 day storm event, with zero discharge:

$$P = 18 \text{ inches}$$

$$\text{Vol} = \frac{(18.0 - (0.2 \times 2.10))^2 \text{ in}^2 \mid 3.62 \text{ acres} \mid 1 \text{ foot}}{(18.0 + (0.8 \times 2.10)) \text{ in} \mid \mid 12 \text{ inches}}$$
$$= 4.73 \text{ ac-ft}$$

$$\text{From Total Stage - Storage Table, elevation} = 12.90 \text{ ft, NAVD88}$$

For the 100 year - 1 day storm event, with zero discharge:

$$P = 18 \text{ inches}$$

$$\text{Vol} = \frac{(18.0 - (0.2 \times 2.10))^2 \text{ in}^2 \mid 3.62 \text{ acres} \mid 1 \text{ foot}}{(18.0 + (0.8 \times 2.10)) \text{ in} \mid \mid 12 \text{ inches}}$$
$$= 4.73 \text{ ac-ft}$$

$$\text{From Total Stage - Storage Table, elevation} = 12.90 \text{ ft, NAVD88}$$

Stormwater Management Report

Post Development - Margate

onsite onsite onsite onsite onsite

Component	Pav/Sw	Green	Building	Exfil	Trench		
Area (acre)	2.43	0.75	0.43			Total Site Area =	3.62 ac
Type (L/V)	L	L	V	V			
Starting Elevation (ft)	11.00	10.00	14.00	7.50		Min Starting Elevation (ft)	7.5
Ending Elevation (ft)	12.50	12.00	14.00	10.00		Max Ending Elevation (ft)	19

Stage (ft)							Total Storage (acre-ft)	Stage (ft)
8.00	0.00	0.00	0.00	0.00	0.10		0.10	8.00
8.50	0.00	0.00	0.00	0.00	0.20		0.20	8.50
9.00	0.00	0.00	0.00	0.00	0.30		0.30	9.00
9.50	0.00	0.00	0.00	0.00	0.40		0.40	9.50
10.00	0.00	0.00	0.00	0.00	0.50		0.50	10.00
10.50	0.00	0.05	0.00	0.00	0.50		0.55	10.50
11.00	0.00	0.19	0.00	0.00	0.50		0.69	11.00
11.50	0.20	0.42	0.00	0.00	0.50		1.13	11.50
12.00	0.81	0.75	0.00	0.00	0.50		2.06	12.00
12.50	1.82	1.13	0.00	0.00	0.50		3.45	12.50
13.00	3.04	1.51	0.00	0.00	0.50		5.04	13.00
13.50	4.25	1.88	0.00	0.00	0.50		6.63	13.50
14.00	5.46	2.26	0.00	0.00	0.50		8.23	14.00
14.50	6.68	2.64	0.00	0.22	0.50		10.03	14.50
15.00	7.89	3.02	0.00	0.43	0.50		11.84	15.00
15.50	9.11	3.39	0.00	0.65	0.50		13.65	15.50
16.00	10.32	3.77	0.00	0.87	0.50		15.46	16.00
16.50	11.53	4.15	0.00	1.08	0.50		17.27	16.50
17.00	12.75	4.52	0.00	1.30	0.50		19.07	17.00
17.50	13.96	4.90	0.00	1.52	0.50		20.88	17.50
18.00	15.18	5.28	0.00	1.73	0.50		22.69	18.00
18.50	16.39	5.65	0.00	1.95	0.50		24.50	18.50
19.00	17.60	6.03	0.00	2.17	0.50		26.31	19.00

SITE DEVELOPMENT PLANS FOR: MARGATE HYBRID CONVENIENCE MARKET

2000 N. STATE ROAD NO. 7
MARGATE, FL 33063

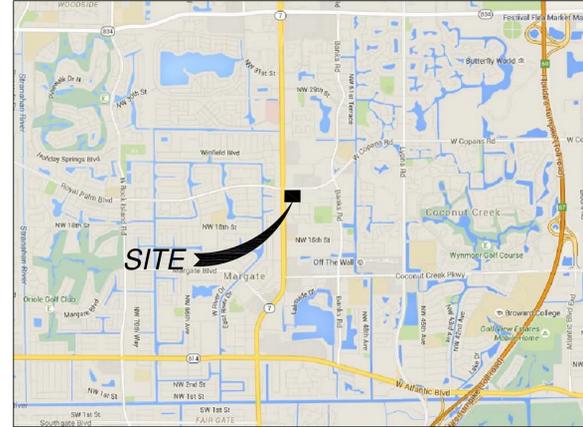
PARCEL ID# 4842-30-05-0010

PERMIT LIST	
PERMIT	PERMIT #
-	-
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-	-
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-	-
-	-
-	-

LEGAL DESCRIPTION

TRACT A, OF MARGATE DISTRICT HEADQUARTERS, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 88, PAGE 14 OF THE PUBLIC RECORDS OF BROWARD COUNTY, FLORIDA.

Section 30, Township 48 South, Range 42 East, Broward County, Florida

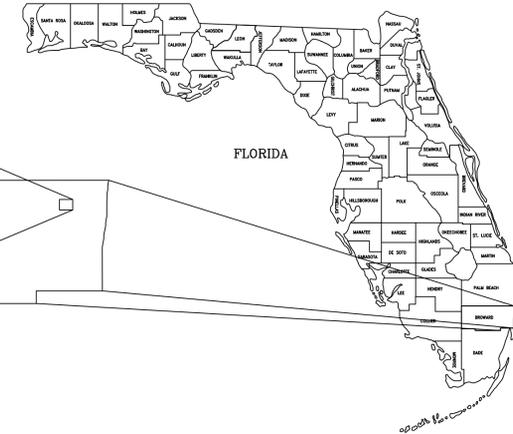


SITE LOCATION MAP

NOT TO SCALE

DIRECTIONS TO PROJECT SITE:

FROM THE FLORIDA TURNPIKE (SR-91) TAKE EXIT 67 COCONUT CREEK PARKWAY WEST 2.3 MILES. TURN NORTH ON US-441 / SR-7 FOR 0.5 MILES. SITE IS ON THE RIGHT AT THE INTERSECTION WITH W. COPANS ROAD.



BROWARD COUNTY

LAND USE DATA:

BUILDING STRUCTURE: 1 CONCRETE BLOCK BUILDING, FUEL CANOPY
 FUTURE LAND USE CLASSIFICATION: TRANSIT ORIENTED CORRIDOR
 ZONING CLASSIFICATION: TRANSIT ORIENTED CORRIDOR - GATEWAY
 LOCAL JURISDICTION: CITY OF MARGATE

GENERAL STATEMENT:

THE PROJECT CONSISTS OF DEMOLITION OF AN EXISTING BUILDING, PARKING LOT AND UTILITIES ON A TOTAL SITE AREA OF 3.6 ACRES. THE PROPOSED IMPROVEMENTS INCLUDE, BUT ARE NOT LIMITED TO THE CONSTRUCTION OF A 5,943 SF CONVENIENCE STORE WITH ASSOCIATED FUEL CANOPY, UTILITIES, AND PARKING.

UTILITY PROVIDERS:

SEWER	CITY OF MARGATE JOHN SHELTON 901 NW 68TH AVENUE, SUITE A MARGATE, FL 33063 PHONE: (954) 797-5000	ELECTRIC	FLORIDA POWER AND LIGHT SHAVONTI ARCHER PHONE: (954) 956-2036
STORM WATER	SFWMD 3301 GUN CLUB ROAD WEST PALM BEACH, FL 33406 PHONE: (561) 686-8800	TELEPHONE	AT&T BRANDON EDMUNDSON PHONE: (214) 527-0457
WATER	CITY OF MARGATE JOHN SHELTON 901 NW 68TH AVENUE, SUITE A MARGATE, FL 33063 PHONE: (954) 797-5000	NATURAL GAS	TECO PEOPLES GAS COMPANY 702 NORTH FRANKLIN STREET PO BOX 2562 TAMPA, FL 33601 PHONE: (954) 931-9742

OWNER / DEVELOPER

OWNER:
VICJ CORPORATE PLAZA LLC
2000 N. STATE ROAD 7
MARGATE, FL 33063

DEVELOPER:
TVC MARGATE CO. LLC
5757 W. MAPLE RD., STE 800
W. BLOOMFIELD, MI 48322

FLOOD NOTE

THE PROPERTY SHOWN HEREON APPEARS TO FALL WITHIN FLOOD ZONE "AE", B.F.E.=11'; AS SHOWN ON THE FLOOD INSURANCE RATE MAP, 12011C0165H, MAP REVISED 08/18/2014, NATIONAL FLOOD INSURANCE PROGRAM, FEDERAL EMERGENCY MANAGEMENT AGENCY.

BENCHMARK

THE ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND ARE BASED UPON THE FOLLOWING BENCHMARKS AS SHOWN ON THE FLORIDA DEPARTMENT OF TRANSPORTATION SPECIFIC PURPOSE SURVEY FOR SECTION 36, TOWNSHIP 48 SOUTH, RANGE 41 EAST, PROJECT No. 416878-1-52-01:

- #1 A 3.5" BRASS DISK IN CONCRETE STAMPED 7-86-07-B06
ELEVATION 12.14 FEET NAVD 88.
- #2 SET MAG NAIL ELEVATION 11.51 FEET NAVD 88.

SURVEYOR
BOWMAN CONSULTING GROUP
KURT STAFLINGER
4450 W. EAU GALLIE BLVD., STE 232
MELBOURNE, FL 32934
PHONE: (321) 255-5434
FAX: (321) 255-7751

CIVIL ENGINEER
BOWMAN CONSULTING GROUP
ANDREW J. PETERSEN
PROJECT MANAGER
4450 W. EAU GALLIE BLVD., STE 232
MELBOURNE, FL 32934
PHONE: (321) 255-5434
FAX: (321) 255-7751

LANDSCAPE ARCHITECT
JAMES SANTIAGO
612 NE 14TH AVE.
FT. LAUDERDALE, FL 33304
PHONE: (305) 791-3156

Sheet List Table

Sheet Number	Sheet Title
C0	COVER SHEET
SU-1	SURVEY
SU-2	SURVEY
ES1.0	EROSION CONTROL PLAN
ES2.0	EROSION CONTROL DETAILS
DM1.0	DEMOLITION PLAN
C1.0	SITE PLAN
C2.0	PAVING, GRADING & DRAINAGE PLAN
C3.0	DRAINAGE PROFILES & SECTIONS
C4.0	UTILITY PLAN
D1.0	STANDARD SITE DETAILS
D2.0	STANDARD GENERAL DETAILS
D3.0	WATER DETAILS
D4.0	SEWER DETAILS
D5.0	FDOT DETAILS
D6.0	MAINTENANCE OF TRAFFIC DETAILS
L-1	LANDSCAPE PLAN
L-2	LANDSCAPE DETAILS
TD-1	TREE DISPOSITION PLAN
TD-2	TREE DISPOSITION LEGEND
IR-1	IRRIGATION PLAN
IR-2	IRRIGATION DETAILS

Bowman
CONSULTING

VELMEIR
COMPANIES

COVER SHEET
MARGATE HYBRID CONVENIENCE MARKET
2000 STATE ROAD NO. 7
MARGATE, FL 33063
CITY OF MARGATE
BROWARD COUNTY, FL



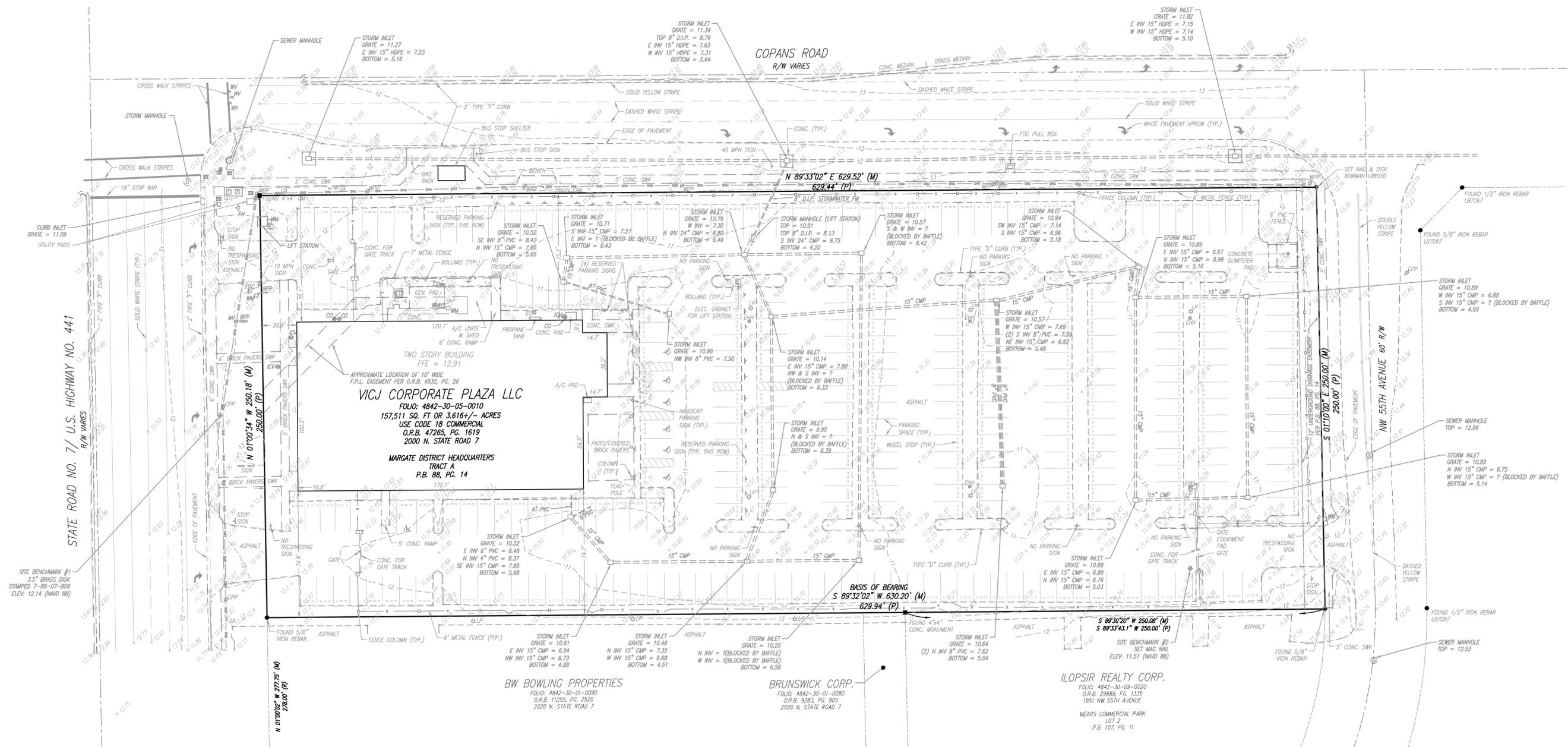
ANDREW J. PETERSEN
LICENSE NO. 75493
09/15/2015

PLAN STATUS		
DATE	DESCRIPTION	
DESIGN	EC	AJP
	DRAWN	CHKD
SCALE	NONE	
JOB No.	010032-01-012	
DATE	September, 2015	
FILE	010032-01-0-09-012-01-C0V	
SHEET	C0	

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY BOWMAN CONSULTING SHALL BE WITHOUT LIABILITY TO BOWMAN CONSULTING.



BOUNDARY AND TOPOGRAPHIC SURVEY



FLORIDA STATE GRID
NAD 83 (EAST ZONE)

Bowman

CONSULTING

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Melbourne, FL 32934
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Fax: (321) 255-7751
www.bowmanconsulting.com
© Bowman Consulting Group, Ltd.

MARGATE HYBRID
CONVENIENCE MARKET
2000 N. STATE ROAD NO. 7
MARGATE BROWARD COUNTY, FLORIDA

PROJECT NO
8536-01-001

PLAN STATUS
XX/XX/XXXX

DATE	DESCRIPTION
DESIGN	RT KS
DRAWN	CHKD
SCALE: 1" = 30'	
JOB No. 8536-01-001	
DATE: 06/26/2015	
FILE 8536-01-001 xbse	

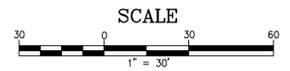
SHEET **SU-2**

ABBREVIATIONS

- A/C = AIR CONDITIONING
- BFP = BACKFLOW PREVENTER
- CO = CLEAN OUT
- CONC = CONCRETE
- CBS = CONCRETE BLOCK STRUCTURE
- CM = CONCRETE MONUMENT
- CMP = CORRUGATED METAL PIPE
- CPP = CONCRETE POWER POLE
- DIP = DUCTILE IRON PIPE
- EHH = ELECTRIC HAND HOLE
- ELEC = ELECTRIC
- ELEV = ELEVATION
- EO = ELECTRICAL OUTLET
- ET = ELECTRICAL TRANSFORMER
- EX = EXISTING
- FDOT = FLORIDA DEPARTMENT OF TRANSPORTATION
- FDC = FIRE DEPARTMENT CONNECTOR
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- GA = GUY ANCHOR
- GEN = GENERATOR
- HDPE = HIGH DENSITY POLYETHYLENE PIPE
- ICV = IRRIGATION CONTROL VALVE
- INV = INVERT
- LB = LICENSED BUSINESS
- LP = LIGHT POLE
- (M) = MEASURED DISTANCE
- NAD = NORTH AMERICAN DATUM
- NAVD = NORTH AMERICAN VERTICAL DATUM
- ORB = OFFICIAL RECORDS BOOK
- OU = OVERHEAD UTILITY
- (P) = PLAT DISTANCE
- PB = PLAT BOOK
- PG = PAGE
- P.O.B. = POINT OF BEGINNING
- P.O.C. = POINT OF COMMENCEMENT
- PVC = POLYVINYL CHLORIDE PIPE
- PRM = PERMANENT REFERENCE MONUMENT
- (R) = RECORD DISTANCE
- RCP = REINFORCED CONCRETE PIPE
- R/W = RIGHT OF WAY
- SR = STATE ROAD
- SWK = SIDEWALK
- TYP = TYPICAL
- WM = WATER METER
- WV = WATER VALVE
- WPP = WOOD POWER POLE

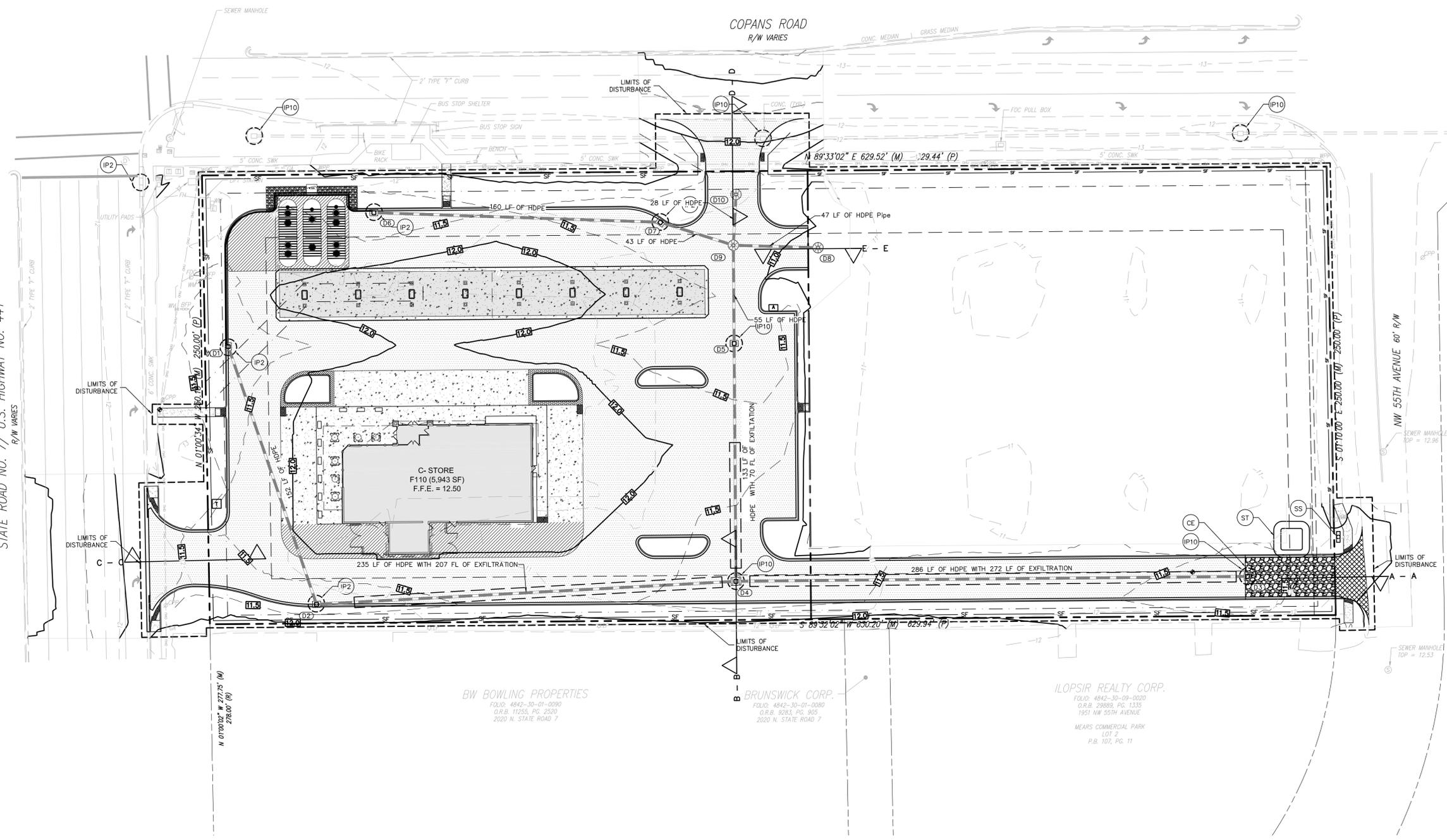
LEGEND

- T — SIGN
- TRAFFIC SIGNAL HAND HOLE
- F — FIBER OPTIC PULL BOX
- ELECTRICAL CABINET
- ⊕ POWER POLE
- ⊙ LIGHT POLE
- ⊕ WATER VALVE
- ⊕ WATER METER
- ⊕ FIRE HYDRANT
- ⊕ SANITARY MANHOLE
- CLEAN OUT
- IRRIGATION CONTROL VALVE
- BOLLARD
- TRAFFIC SIGNAL POLE
- IRF ● IRON ROD FOUND
- IPF ● IRON PIPE FOUND
- MON ● MONUMENT
- ⊕ BENCHMARK
- ⊕ BENCHMARK
- R/W — RIGHT OF WAY
- — — WATER LINE
- — — FENCE LINE



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STATE ROAD NO. 7 / U.S. HIGHWAY NO. 441
R/W VARIES



GENERAL EROSION CONTROL NOTES

- CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES AS REQUIRED BY THE SWPPP AND THAT CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS. ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DIRECTED BY PERMITTING AGENCY AND OWNER OR AS DICTATED BY CONDITIONS AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.
- PERMIT FOR ANY CONSTRUCTION ACTIVITY MUST BE MAINTAINED ON SITE AT ALL TIMES.
- CONTRACTOR SHALL MINIMIZE CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT.
- GENERAL CONTRACTOR SHALL DENOTE ON PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
- ALL WASH WATER SHALL BE DETAINED AND PROPERLY TREATED OR DISPOSED.
- SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
- DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
- RUBBISH TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
- ALL STORM WATER POLLUTION PREVENTION MEASURES PRESENTED ON THIS PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN, SHALL BE INITIATED AS SOON AS PRACTICABLE.
- DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS STOPPED FOR AT LEAST 7 DAYS, SHALL BE TEMPORARILY SEEDED. THESE AREAS SHALL BE SEEDED NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS.
- DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY STOPPED SHALL BE SODDED/LANDSCAPED PER PLANS. THESE AREA SHALL BE SEEDED NO LATER THAN 7 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS, REFER TO THE GRADING PLAN AND/OR LANDSCAPE PLAN.
- IF THE ACTION OF VEHICLES TRAVELING OVER THE GRAVEL CONSTRUCTION ENTRANCES IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF DIRT OR MUD, THEN THE TIRES MUST BE WASHED BEFORE THE VEHICLES ENTER A PUBLIC ROAD. IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF THE SITE.
- ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
- CONTRACTORS OR SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING ANY SEDIMENT THAT MAY HAVE COLLECTED IN THE STORM SEWER DRAINAGE SYSTEMS IN CONJUNCTION WITH THE STABILIZATION OF THE SITE.
- ON-SITE AND OFFSITE SOIL, STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION THROUGH IMPLEMENTATION OF BEST MANAGEMENT PRACTICES. STOCKPILE AND BORROW AREA LOCATIONS SHALL BE NOTED ON THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS.
- SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.
- DUE TO THE GRADE CHANGES DURING THE DEVELOPMENT OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION AND SEDIMENT CONTROL MEASURES TO PREVENT EROSION AND SEDIMENTATION.
- CONTRACTOR SHALL DESIGNATE IDENTIFY AREAS INSIDE THE LIMITS OF DISTURBANCE, FOR WASTE DISPOSAL AND DELIVERY AND MATERIAL STORAGE.
- CONTRACTOR TO LIMIT DISTURBANCE OF SITE IN STRICT ACCORDANCE WITH THE EROSION CONTROL, SEQUENCING SHOWN ON THIS PLAN, NO UNNECESSARY OR IMPROPERLY SEQUENCED CLEARING AND/OR GRADING SHALL BE PERMITTED.
- AN INSPECTOR, CERTIFIED BY THE STATE OF FLORIDA OR EXPERIENCED IN THE INSTALLATION AND MAINTENANCE OF EROSION CONTROLS, IS REQUIRED TO INSPECT THE EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE APPROVED STORMWATER POLLUTION PREVENTION PLAN. INSPECTION REPORTS ARE TO BE COMPLETED ON THE CITY OF SANFORD'S FORM ONCE EVERY WEEK AND AFTER EVERY RAINFALL EVENT OF 0.50" OR MORE DURING THE CONSTRUCTION PHASE. THESE REPORTS SHALL BE MADE AVAILABLE TO THE CITY AT ANY TIME AND COPIES OF ALL OF THE INSPECTIONS SHALL BE SUBMITTED TO THE CITY PRIOR TO THE ISSUANCE OF A CERTIFICATE OF COMPLETION OR OCCUPANCY.

LEGEND - EXISTING

- | | | | |
|---|--------------------------|--|-------------------------------------|
| 4 | SIGN | A/C = AIR CONDITIONING | LB = LICENSED BUSINESS |
| ⊠ | TRAFFIC SIGNAL HAND HOLE | BFP = BACKFLOW PREVENTER | LP = LIGHT POLE |
| ⊠ | FIBER OPTIC PULL BOX | CO = CLEAN OUT | (M) = MEASURED DISTANCE |
| ⊠ | ELECTRICAL CABINET | CONC = CONCRETE | NAD = NORTH AMERICAN DATUM |
| ⊠ | POWER POLE | GBS = CONCRETE BLOCK STRUCTURE | NAV = NORTH AMERICAN VERTICAL DATUM |
| ⊠ | LIGHT POLE | CM = CONCRETE MONUMENT | ORB = OFFICIAL RECORDS BOOK |
| ⊠ | WATER VALVE | CMP = CORRUGATED METAL PIPE | OU = OVERHEAD UTILITY |
| ⊠ | WATER METER | COP = CONCRETE POWER POLE | (P) = PLAT DISTANCE |
| ⊠ | FIRE HYDRANT | DIP = DUCTILE IRON PIPE | PB = PLAT BOOK |
| ⊠ | CLEAN OUT | EHH = ELECTRIC HAND HOLE | PG = PAGE |
| ⊠ | TRAFFIC SIGNAL POLE | ELEC = ELECTRIC | P.O.B. = POINT OF BEGINNING |
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| ⊠ | IRON PIPE FOUND | EO = ELECTRICAL OUTLET | PVC = POLYVINYL CHLORIDE PIPE |
| ⊠ | MONUMENT | ET = ELECTRICAL TRANSFORMER | PRM = PERMANENT REFERENCE MONUMENT |
| ⊠ | BENCHMARK | EX = EXISTING | (R) = RECORD DISTANCE |
| ⊠ | RIGHT OF WAY | FDT = FLORIDA DEPARTMENT OF TRANSPORTATION | RCP = REINFORCED CONCRETE PIPE |
| ⊠ | WATER LINE | FDC = FIRE DEPARTMENT CONNECTOR | R/W = RIGHT OF WAY |
| ⊠ | FENCE LINE | FH = FIRE HYDRANT | SR = STATE ROAD |
| | | FM = FORCE MAIN | SWK = SIDEWALK |
| | | FOC = FIBER OPTIC CONDUIT | TYP = TYPICAL |
| | | GA = GUY ANCHOR | WM = WATER METER |
| | | GEN = GENERATOR | WV = WATER VALVE |
| | | HDPE = HIGH DENSITY POLYETHYLENE PIPE | WPP = WOOD POWER POLE |
| | | ICV = IRRIGATION CONTROL VALVE | |
| | | INV = INVERT | |

LEGEND

- | | |
|-----|---|
| --- | BOUNDARY LINE |
| --- | PROPOSED STORM PIPE |
| ▨ | HEAVY-DUTY CONCRETE PAVEMENT |
| ▩ | STANDARD-DUTY CONCRETE PAVEMENT |
| ▧ | 6" THICK CONCRETE SIDEWALK |
| ▦ | STANDARD-DUTY ASPHALT |
| ▤ | CONSTRUCTION ENTRANCE |
| ▣ | ASPHALT APRON FOR CONSTRUCTION ENTRANCE |
| ⊙ | CURB INLET SEDIMENT CONTROL |
| ⊙ | SILT FENCE INLET PROTECTION |
| ⊙ | FILTER SACKS |
| ⊙ | SILT DIKE |
| ⊙ | TEMPORARY CONSTRUCTION EXIT/ENTRANCE |
| ⊙ | TEMPORARY SEDIMENT TRAP |
| ⊙ | SWPPP SIGN |
| ⊙ | TEMPORARY SILT FENCE |
| --- | LIMITS OF DISTURBANCE |

CONSTRUCTION SEQUENCE

- CONDUCT PRE-CONSTRUCTION MEETING WITH THE CITY TO DISCUSS EROSION AND SEDIMENT CONTROLS AND CONSTRUCTION PHASING.
 - INSTALL STABILIZED CONSTRUCTION EXIT AND POST SWPPP AND SITE COMPLIANCE SIGNAGE PUBLICLY VISIBLE.
 - INSTALL CONSTRUCTION FENCES AND TEMPORARY TRAFFIC AND PEDESTRIAN CONTROL DEVICES.
 - PREPARE TEMPORARY PARKING AND STORAGE AREAS.
 - INSTALL INLET PROTECTION, SILT DIKES, AND SILT FENCE ON THE SITE AS SHOWN WITHIN THE CONSTRUCTION LIMITS.
 - DEMO EXISTING STRUCTURES, PAVEMENT, AND SPECIFIED UTILITIES.
 - BEGIN GRADING THE SITE.
 - BEGIN CONSTRUCTION OF UTILITIES.
 - BEGIN SUBGRADE PREPARATION AND CONSTRUCTION OF STRUCTURES.
 - BEGIN INSTALLATION OF CURB, GUTTER, AND PAVING.
 - COMPLETE PERMANENT STABILIZATION ON AREAS WHERE CONSTRUCTION HAS COMPLETED.
 - COMPLETE FINAL GRADING AND INSTALLATION OF PERMANENT STABILIZATION OVER ALL AREAS.
 - OBTAIN CONCURRENCE FROM THE OWNER AND THE CITY THAT THE SITE HAS BEEN FULLY STABILIZED.
 - REMOVE ALL REMAINING TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES.
 - STABILIZE ALL AREAS DISTURBED BY BMP REMOVAL.
- CONTRACTOR MAY COMPLETE CONSTRUCTION RELATED ACTIVITIES CONCURRENTLY ONLY IF ALL PRECEDING BMPs HAVE BEEN COMPLETELY INSTALLED.
- THE ACTUAL SCHEDULE FOR IMPLEMENTING POLLUTANT CONTROL MEASURES WILL BE DETERMINED BY THE PROJECT CONSTRUCTION PROGRESS AND RECORDED BY THE GENERAL CONTRACTOR ON THESE PLANS.

BMP MAINTENANCE NOTES

- ALL MEASURES STATED ON THESE PLANS SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT, AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:
- INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF DETERIORATION.
 - ALL SEEDED/SODDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE FERTILIZED, WATERED AND REPAIRED AS NEEDED.
 - SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCE WHEN IT REACHES ONE-HALF THE HEIGHT OF THE FENCE.
 - THE CONSTRUCTION EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF SEDIMENT FROM THE SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE EXIT AS CONDITIONS DEMAND.
 - THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN A GOOD CONDITION. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE AREA AS CONDITIONS DEMAND.
 - PRIOR TO LEAVING THE SITE, ALL VEHICLES SHALL BE CLEANED OF DEBRIS. ANY DEBRIS AND/OR SEDIMENT LEAVING THE SITE SHALL BE CLEANED IMMEDIATELY.
 - ALL INLETS AND STORM DRAINS SHALL BE KEPT CLEAN OF DEBRIS AND SEDIMENT. ANY DEBRIS AND/OR SEDIMENT THAT ENTERS ANY INLET OR STORM DRAIN SHALL BE CLEANED IMMEDIATELY. FLUSHING SHALL NOT BE USED TO CLEAN DEBRIS AND/OR SEDIMENT FROM STORM DRAINS.



EROSION CONTROL PLAN
MARGATE HYBRID CONVENIENCE MARKET
 2000 STATE ROAD NO. 7
 MARGATE, FL 33063
 CITY OF MARGATE
 BROWARD COUNTY, FL

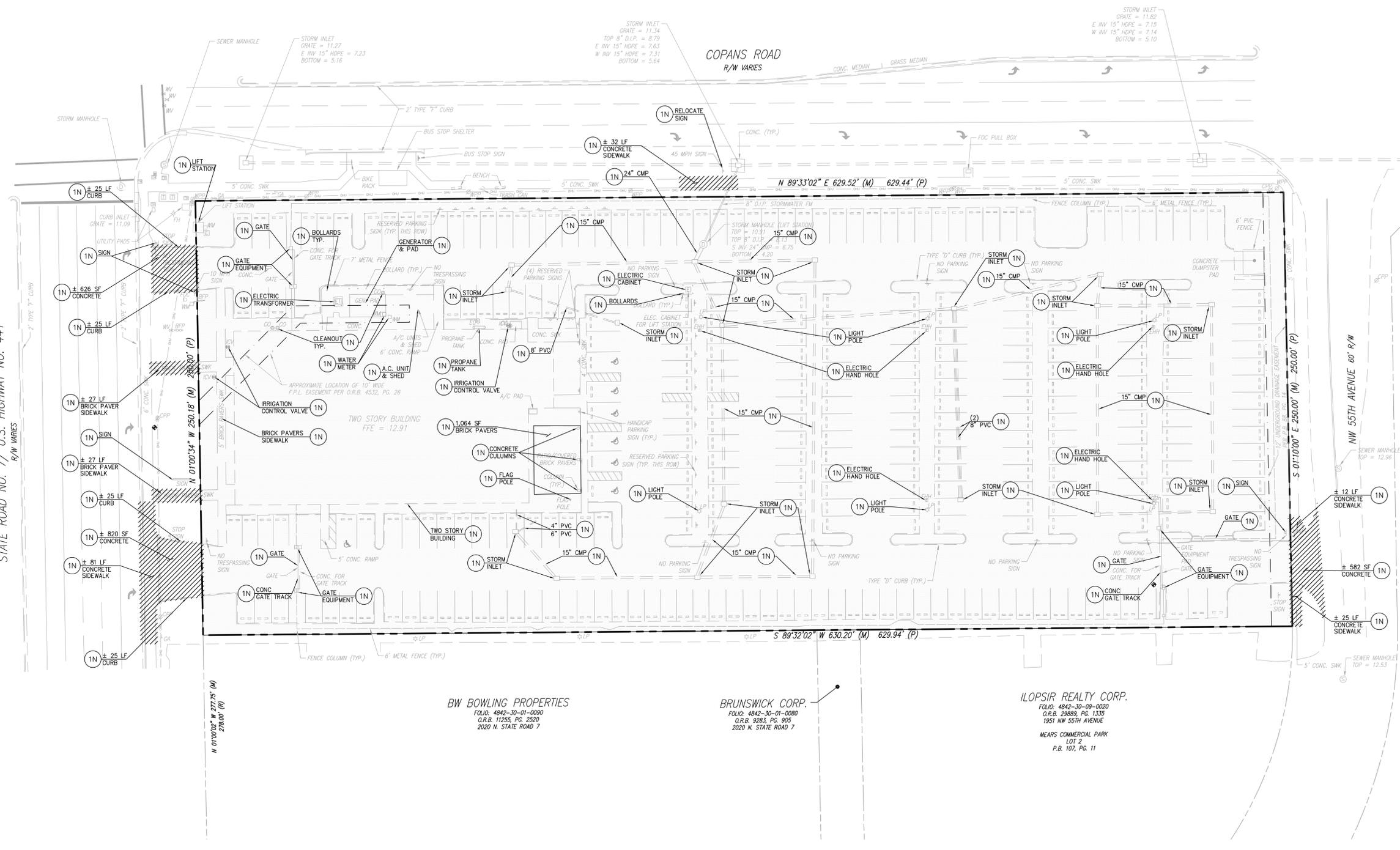


ANDREW J. PETERSEN
LICENSE NO. 75493
09/16/2015

PLAN STATUS		
DATE	DESCRIPTION	
SW DESIGN	EC DRAWN	AJP CHKD
SCALE NONE		
JOB No. 010032-01-012		
DATE September, 2015		
FILE 010032-01-0-02-03-ESP		
SHEET		ES1.0

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STATE ROAD NO. 7 / U.S. HIGHWAY NO. 441
R/W VARIES



DEMOLITION NOTES

- THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL, AND DISPOSAL IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES) OF ALL MATERIALS, SUCH THAT THE IMPROVEMENTS SHOWN ON THE REMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE SPECIFICATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SERVICES TO ANY NECESSARY UTILITIES DURING CONSTRUCTION.
- THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
- THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ONSITE LOCATIONS OF EXISTING UTILITIES.
- ALL EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH THE WORK.
- ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC CABLE AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN THE ANY ROAD RIGHT OF WAY DURING CONSTRUCTION.
- CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC., (AND OTHER APPROPRIATE BEST MANAGEMENT PRACTICES) AS APPROVED BY CONSTRUCTION MANAGER.
- CONTINUOUS ACCESS SHALL BE MAINTAINED FOR THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
- PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED.
- CONTRACTOR MAY LIMIT SAW-CUT & PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC., THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
- THE CONTRACTOR SHALL COORDINATE WATER MAIN WORK WITH THE FIRE DEPT. AND THE CITY/COUNTY UTILITY DEPARTMENT TO PLAN PROPOSED IMPROVEMENTS AND TO ENSURE ADEQUATE FIRE PROTECTION IS CONSTANTLY AVAILABLE TO THE STORE AND SITE THROUGHOUT THIS SPECIFIC WORK AND THROUGH ALL PHASES OF CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR ARRANGING/PROVIDING ANY REQUIRED WATER MAIN SHUT OFFS WITH THE CITY/COUNTY DURING CONSTRUCTION. ANY COSTS ASSOCIATED WITH WATER MAIN SHUT OFFS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO EXTRA COMPENSATION WILL BE PROVIDED.
- DAMAGE TO ALL EXISTING FACILITIES AND IMPROVEMENTS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
- FOR ALL ITEMS NOTED TO BE REMOVED, REMOVE NOT ONLY THE ABOVE GROUND ELEMENTS, BUT ALSO REMOVE ALL UNDERGROUND ELEMENTS AS WELL INCLUDING, BUT NOT LIMITED TO: FOUNDATIONS, GRAVEL FILLS, TREE ROOTS, PIPES, TANKS, ETC.
- BACKFILL ALL EXCAVATIONS RESULTING FROM THE DEMOLITION WORK MEETING THE REQUIREMENTS FOR FILL OUTLINED IN THE GEOTECHNICAL INVESTIGATION REPORT FOR THIS SITE.
- ASBESTOS AND ANY OTHER HAZARDOUS MATERIAL SHALL BE PROPERLY PERMITTED AND REMOVED BY THE CONTRACTOR. CONTRACTOR SHALL SECURE ALL PERMITS FOR DEMOLITION AND REMOVAL OF MATERIALS FROM THE SITE.
- EXISTING PERIMETER TREES & LANDSCAPING TO REMAIN WHEREVER POSSIBLE.

ALERT TO CONTRACTOR:
PRIOR TO THE CONSTRUCTION OF OR CONNECTION TO ANY STORM DRAIN, SANITARY SEWER, WATER MAIN OR ANY OF THE DRY UTILITIES, THE CONTRACTOR SHALL EXCAVATE, VERIFY AND CALCULATE ALL POINTS OF CONNECTION AND ALL UTILITY CROSSINGS AND INFORM CEC AND THE OWNER/DEVELOPER OF ANY CONFLICT OR REQUIRED DEVIATIONS FROM THE PLAN. NOTIFICATION SHALL BE MADE A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION. CEC AND ITS CLIENTS SHALL BE HELD HARMLESS IN THE EVENT THAT THE CONTRACTOR FAILS TO MAKE SUCH NOTIFICATION.

DISTURBED AREA
41,103 SF
(0.94 AC)

LEGEND - EXISTING

- 1N SIGN
 - 2N TRAFFIC SIGNAL HAND HOLE
 - 3N FIBER OPTIC PULL BOX
 - 4N ELECTRICAL CABINET
 - 5N POWER POLE
 - 6N LIGHT POLE
 - 7N WATER VALVE
 - 8N WATER METER
 - 9N FIRE HYDRANT
 - 10N SANITARY MANHOLE
 - 11N CLEAN OUT
 - 12N IRRIGATION CONTROL VALVE
 - 13N BOLLARD
 - 14N TRAFFIC SIGNAL POLE
 - 15N IRON ROD FOUND
 - 16N IRON PIPE FOUND
 - 17N MONUMENT
 - 18N BENCHMARK
 - 19N RIGHT OF WAY
 - 20N WATER LINE
 - 21N FENCE LINE
- A/C = AIR CONDITIONING
 - CO = CLEAN OUT
 - CONC = CONCRETE
 - CBS = CONCRETE BLOCK STRUCTURE
 - CM = CONCRETE MONUMENT
 - CMP = CORRUGATED METAL PIPE
 - CMP = CONCRETE POWER POLE
 - DIP = DUCTILE IRON PIPE
 - EHH = ELECTRIC HAND HOLE
 - ELEC = ELECTRIC
 - ELEV = ELEVATION
 - EO = ELECTRICAL OUTLET
 - ET = ELECTRICAL TRANSFORMER
 - EX = EXISTING
 - FDOT = FLORIDA DEPARTMENT OF TRANSPORTATION
 - FDC = FIRE DEPARTMENT CONNECTOR
 - FH = FIRE HYDRANT
 - FM = FORCE MAIN
 - SWK = SIDEWALK
 - FOC = FIBER OPTIC CONDUIT
 - GA = GUY ANCHOR
 - GEN = GENERATOR
 - HDPPE = HIGH DENSITY POLYETHYLENE PIPE
 - ICV = IRRIGATION CONTROL VALVE
 - INV = INVERT
- LB = LICENSED BUSINESS
 - LP = LIGHT POLE
 - (M) = MEASURED DISTANCE
 - NAD = NORTH AMERICAN DATUM
 - NAVD = NORTH AMERICAN VERTICAL DATUM
 - ORB = OFFICIAL RECORDS BOOK
 - OU = OVERHEAD UTILITY
 - (P) = PLAT DISTANCE
 - PB = PLAT BOOK
 - PG = PAGE
 - P.O.B. = POINT OF BEGINNING
 - P.O.C. = POINT OF COMMENCEMENT
 - PVC = POLYVINYL CHLORIDE PIPE
 - PRM = PERMANENT REFERENCE MONUMENT
 - (R) = RECORD DISTANCE
 - RCP = REINFORCED CONCRETE PIPE
 - R/W = RIGHT OF WAY
 - SR = STATE ROAD
 - SWK = SIDEWALK
 - TYP = TYPICAL
 - WM = WATER METER
 - WV = WATER VALVE
 - WPP = WOOD POWER POLE

LEGEND - PROPOSED

- PROPERTY LINE
 - ⊗ TREE REMOVAL - REFER TO LANDSCAPE PLANS
 - REMOVE ALL ASPHALT PAVEMENT, CONCRETE CURB, CONCRETE TIRE STOPS, CONCRETE SIDEWALKS AND PADS, FENCING AND SIGNS
 - REMOVAL
- NOTES**
- 1N EXISTING TO BE REMOVED
 - 2N PROTECT EXISTING TREES TO REMAIN
 - 3N PROTECT EXISTING UTILITIES TO REMAIN
 - 4N SAWCUT LINE
 - 5N EXISTING TO REMAIN

REFER TO TREE SURVEY FOR TREE REMOVAL / PROTECTION

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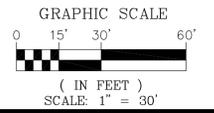
DEMOLITION PLAN
MARGATE HYBRID CONVENIENCE MARKET
2000 STATE ROAD NO. 7
MARGATE, FL 33063
CITY OF MARGATE

ANDREW J. PETERSEN
LICENSE
No. 75493
STATE OF FLORIDA
PROFESSIONAL ENGINEER

ANDREW J. PETERSEN
LICENSE NO. 75493
09/16/2015

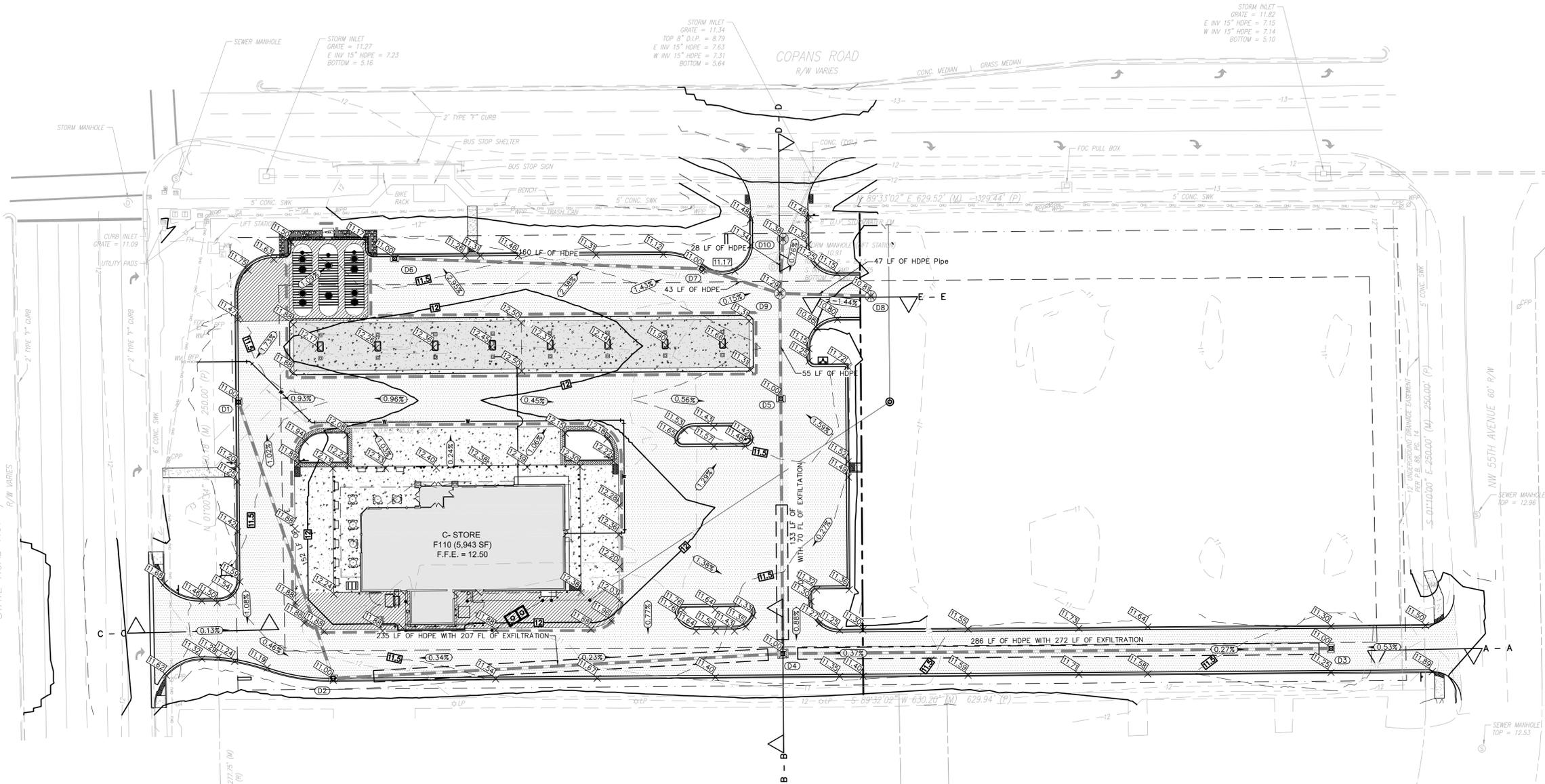
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SW	EC
DESIGN	DRAWN
AJP	CHKD
SCALE 1" = 30'	
JOB No. 010032-01-012	
DATE September, 2015	
FILE 010032-01-01-02-04-DMC	

DM1.0
SHEET



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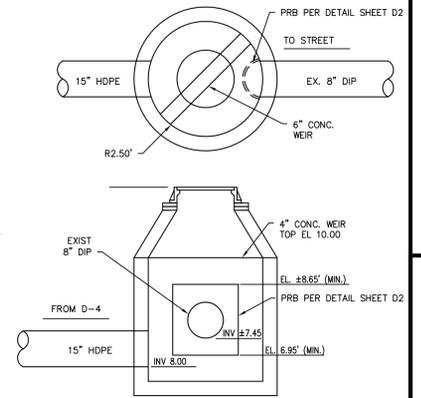
STATE ROAD NO. 7 / U.S. HIGHWAY NO. 441
R/W VARIES



LEGEND - PROPOSED

- PROPERTY LINE
- DRAINAGE BASIN AREAS
- CURBING
- × 88.00 GRADE
- GRATE INLET
- MANHOLE
- ▨ HEAVY DUTY CONCRETE PAVEMENT
- ▩ STANDARD DUTY ASPHALT PAVEMENT
- ▧ CONCRETE SIDEWALK
- ▦ STANDARD DUTY CONCRETE PAVEMENT

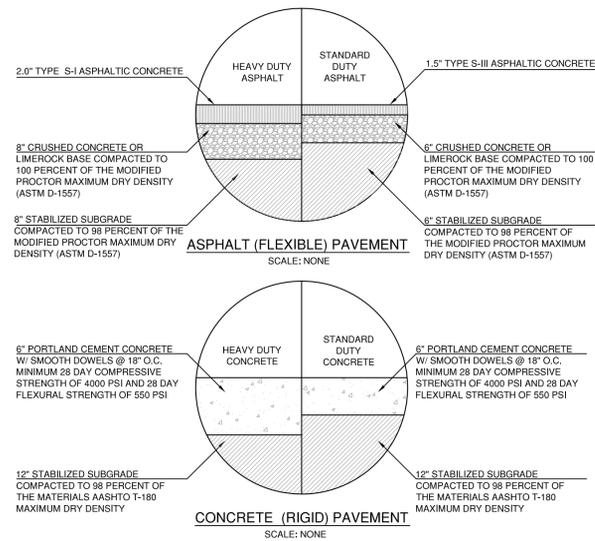
STORM PROFILES ARE LOCATED ON SHEET C4.0



MANHOLE STRUCTURE (D-7) (PIPE ROTATED FOR CLARITY)
N.T.S.

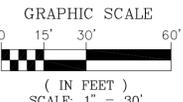
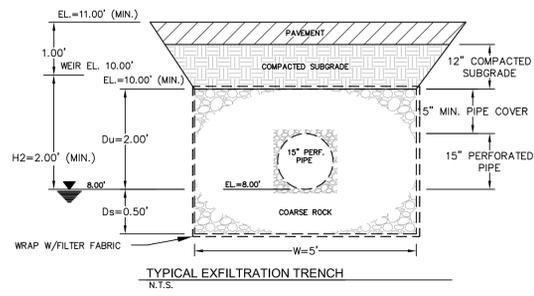
LEGEND - EXISTING

- ⊕ SIGN
 - ⊕ TRAFFIC SIGNAL HAND HOLE
 - ⊕ FIBER OPTIC PULL BOX
 - ⊕ ELECTRICAL CABINET
 - ⊕ POWER POLE
 - ⊕ LIGHT POLE
 - ⊕ WATER VALVE
 - ⊕ WATER METER
 - ⊕ FIRE HYDRANT
 - ⊕ SANITARY MANHOLE
 - ⊕ CLEAN OUT
 - ⊕ IRRIGATION CONTROL VALVE
 - ⊕ BOLLARD
 - ⊕ TRAFFIC SIGNAL POLE
 - ⊕ IRP IRON ROD FOUND
 - ⊕ IPF IRON PIPE FOUND
 - ⊕ MON MONUMENT
 - ⊕ BENCHMARK
 - ⊕ RW RIGHT OF WAY
 - WATER LINE
 - FENCE LINE
- A/C = AIR CONDITIONING
 - B/P = BACKFLOW PREVENTER
 - CO = CLEAN OUT
 - CONC = CONCRETE
 - CBS = CONCRETE BLOCK STRUCTURE
 - CM = CONCRETE MONUMENT
 - CMP = CORRUGATED METAL PIPE
 - CPP = CONCRETE POWER POLE
 - DIP = DUCTILE IRON PIPE
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 - ELEC = ELECTRIC
 - ELEV = ELEVATION
 - EO = ELECTRICAL OUTLET
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 - EX = EXISTING
 - FDOT = FLORIDA DEPARTMENT OF TRANSPORTATION
 - FDC = FIRE DEPARTMENT CONNECTOR
 - FH = FIRE HYDRANT
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 - PVC = POLYVINYL CHLORIDE PIPE
 - PRM = PERMANENT REFERENCE MONUMENT
 - (R) = RECORD DISTANCE
 - RCF = REINFORCED CONCRETE PIPE
 - R/W = RIGHT OF WAY
 - SR = STATE ROAD
 - SWK = SIDEWALK
 - TYP = TYPICAL
 - WM = WATER METER
 - WV = WATER VALVE
 - WPP = WOOD POWER POLE



STORM CHART

#	STRUCTURE TYPE	TOP ELEV.	PIPE INVERTS	PIPE INFORMATION
D1	TYPE "C" INLET, PER FDOT INEXT 232	RIM = 11.00	S = 8.00	D1 - D2 = 152 LF, 15" HDPE
D2	TYPE "C" INLET, PER FDOT INEXT 232	RIM = 11.00	E = 8.00 N = 8.00	D2 - D4 = 235 LF, 15" HDPE WITH 207 FL OF EXFILTRATION D1 - D2 = 152 LF, 15" HDPE
D3	TYPE "C" INLET, PER FDOT INEXT 232	RIM = 11.00	W = 8.00	D4 - D3 = 286 LF, 15" HDPE WITH 272 LF OF EXFILTRATION
D4	TYPE "F" INLET, PER FDOT INEXT 232	RIM = 11.00	W = 8.00 E = 8.00 N = 8.00	D2 - D4 = 235 LF, 15" HDPE WITH 207 FL OF EXFILTRATION D4 - D3 = 286 LF, 15" HDPE WITH 272 LF OF EXFILTRATION D4 - D5 = 133 LF, 15" HDPE WITH 70 FL OF EXFILTRATION
D5	TYPE "C" INLET, PER FDOT INEXT 232	RIM = 11.00	N = 8.00 S = 8.00	D5 - D9 = 55 LF, 15" HDPE D4 - D5 = 133 LF, 15" HDPE WITH 70 FL OF EXFILTRATION
D6	TYPE "C" INLET, PER FDOT INEXT 232	RIM = 11.00	E = 8.00	D6 - D7 = 160 LF, 15" HDPE
D7	TYPE "C" INLET, PER FDOT INEXT 232	RIM = 11.00	W = 8.00 E = 8.00	D6 - D7 = 160 LF, 15" HDPE D7 - D9 = 43 LF, 15" HDPE
D8	4" M.H., PER FDOT INDEX 201	RIM = 11.12	W = 8.00	D9 - D8 = 47 LF, 15" HDPE PIPE
D9	5" M.H., PER FDOT INDEX 201	RIM = 11.36	W = 8.00 S = 8.00 E = 8.00 N = 8.00	D7 - D9 = 43 LF, 15" HDPE D5 - D9 = 55 LF, 15" HDPE D9 - D8 = 47 LF, 15" HDPE PIPE D9 - D10 = 28 LF, 15" HDPE
D10	5" M.H., PER FDOT INDEX 201	RIM = 11.38	S = 8.00	D9 - D10 = 28 LF, 15" HDPE



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PAVING, GRADING & DRAINAGE PLAN
MARGATE HYBRID CONVENIENCE MARKET
2000 STATE ROAD NO. 7
MARGATE, FL 33063
CITY OF MARGATE
BROWARD COUNTY, FL

ANDREW J. PETERSEN
LICENSE
No. 75493
STATE OF FLORIDA
PROFESSIONAL ENGINEER

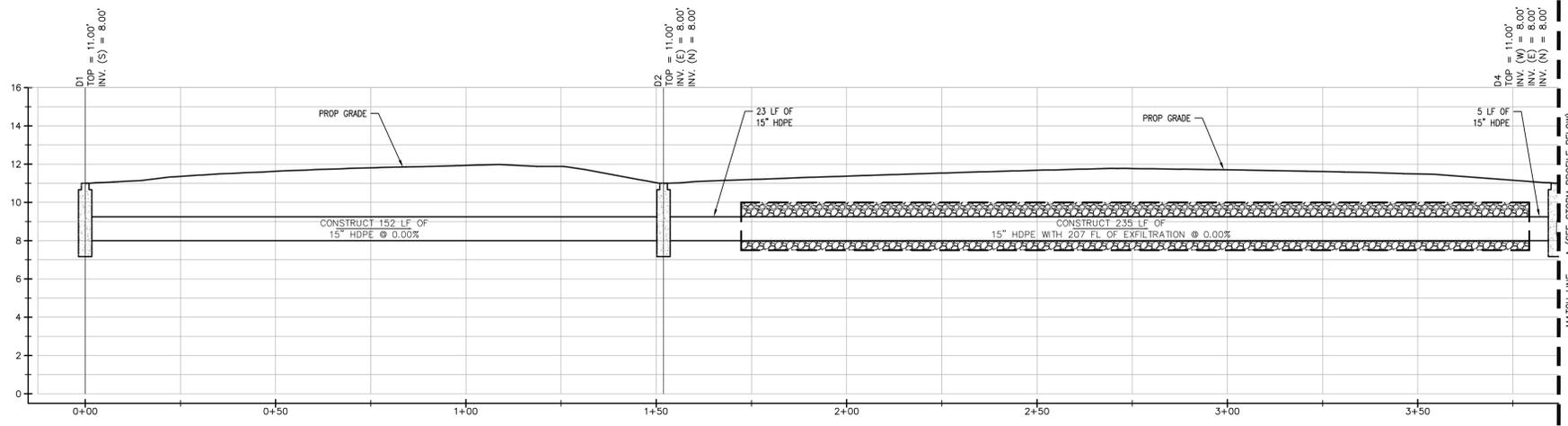
ANDREW J. PETERSEN
LICENSE No. 75493
09/16/2015

PLAN STATUS

DATE	DESCRIPTION	
SW	EC	AJP
DESIGN	DRAWN	CHKD
SCALE	1" = 30'	
JOB No.	010032-01-012	
DATE	September, 2015	
FILE	010032-01-01-02-06-P00	
SHEET	C2.0	

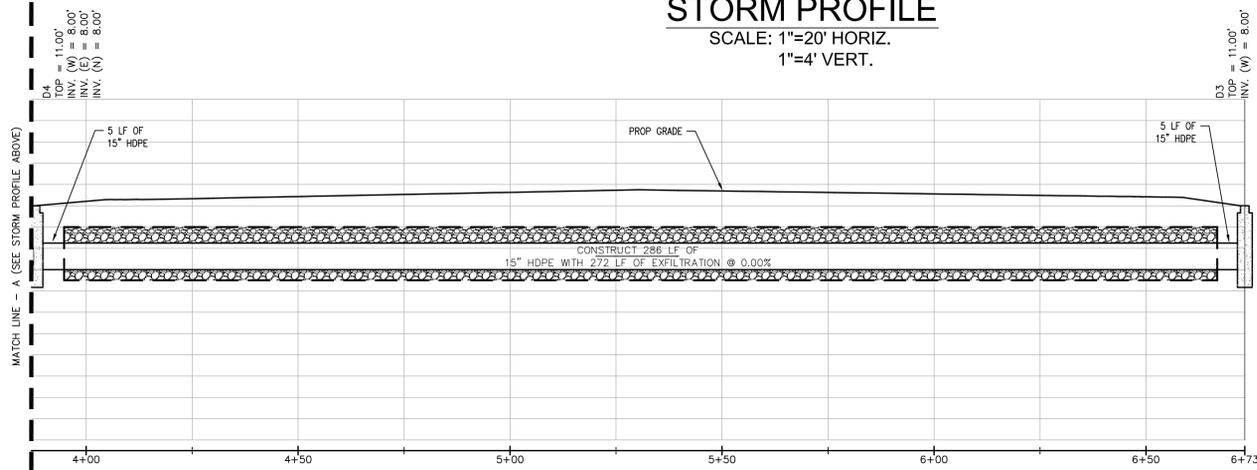


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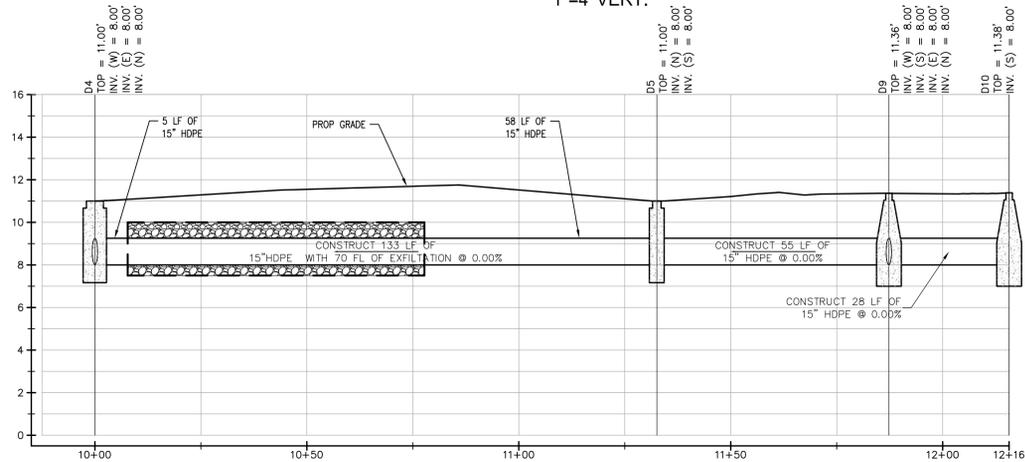
STORM PROFILE

SCALE: 1"=20' HORIZ.
1"=4' VERT.



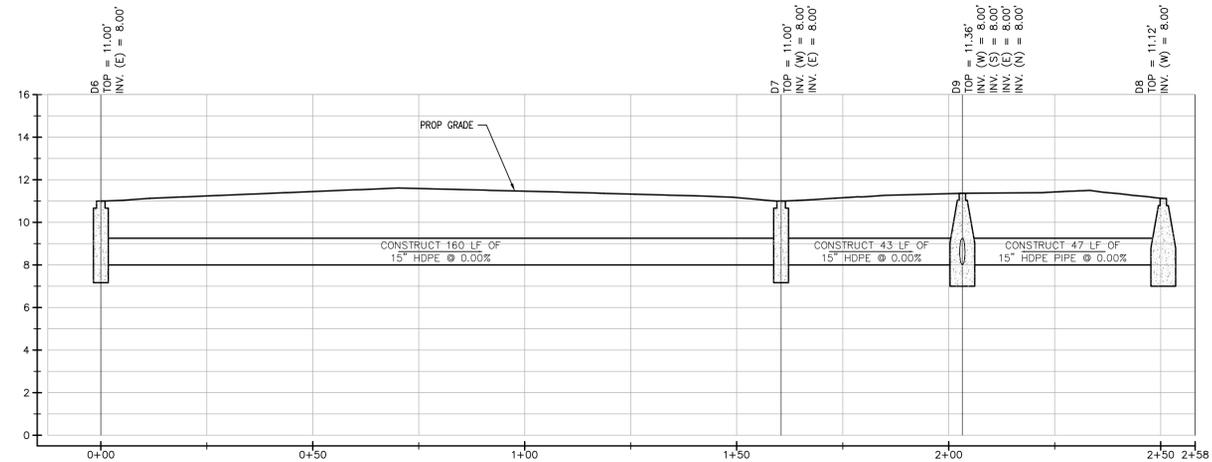
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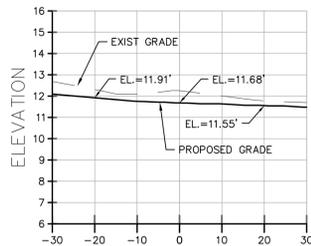
STORM PROFILE

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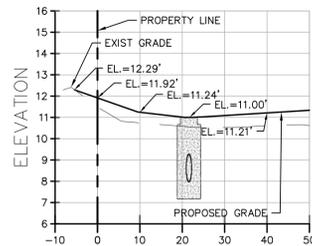
STORM PROFILE

SCALE: 1"=20' HORIZ.
1"=4' VERT.



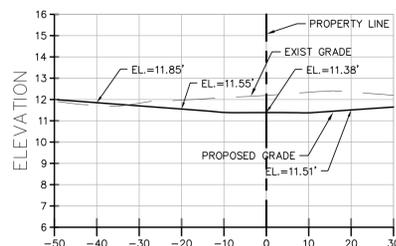
SECTION A - A

SCALE: 1"=20' HORIZ.
1"=2' VERT.



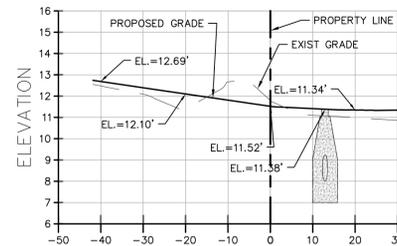
SECTION B - B

SCALE: 1"=20' HORIZ.
1"=2' VERT.



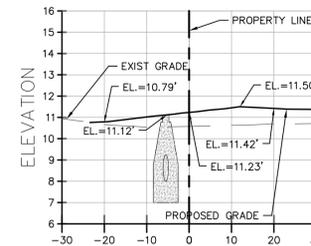
SECTION C - C

SCALE: 1"=20' HORIZ.
1"=2' VERT.



SECTION D - D

SCALE: 1"=20' HORIZ.
1"=2' VERT.



SECTION E - E

SCALE: 1"=20' HORIZ.
1"=2' VERT.



ANDREW J. PETERSEN
LICENSE NO. 75493
09/16/2015

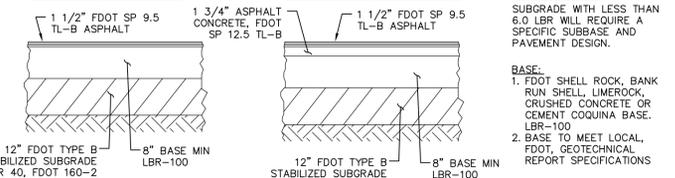
PLAN STATUS		
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	DESIGN	DRAWN
		CHKD
	SCALE	AS SHOWN
	JOB No.	010032-01-012
	DATE	September, 2015
	FILE	010032-01-0-02-012-08-PROF
SHEET	C3.0	

PAVEMENT DETAILS

REV. JULY 26, 2012

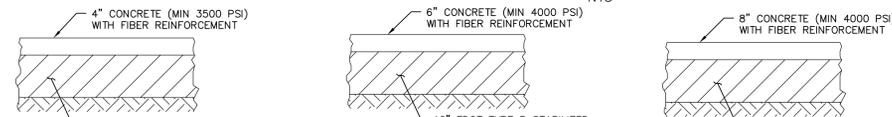
STANDARD DUTY ASPHALT PAVEMENT OPTIONS: SELECT ONE. TO BE DETERMINED BY SITE GEOTECHNICAL ENGINEER

- FOR SANDY AND GRAVEL SUB-GRADES CAPABLE OF ACHIEVING A LBR OF 10 OR GREATER (SN OF 2.60)
- FOR CLAY AND SILTY SUB-GRADES CAPABLE OF ACHIEVING A LBR VALUE OF 6 TO 10 (SN OF 3.04)
- FOR SUB-GRADES CAPABLE OF ACHIEVING A LBR OF LESS THAN 6 (SN OF 3.30)



NOTE: TO BE CONSTRUCTED PER FDOT SPECIFICATIONS (SECTIONS 330, 351, 200, & 160), GEOTECHNICAL ENGINEERING REPORT AND SPECIFICATIONS

STANDARD DUTY ASPHALT PAVEMENT TYPICAL CROSS SECTION



NOTE: TO BE CONSTRUCTED PER FDOT SPECIFICATIONS (SECTIONS 350) AND GEOTECHNICAL ENGINEERING REPORT

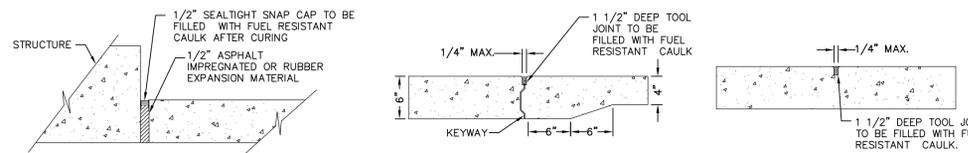
CONCRETE SIDEWALK TYPICAL CROSS SECTION

NOTE: TO BE CONSTRUCTED PER FDOT SPECIFICATIONS (SECTIONS 350) AND GEOTECHNICAL ENGINEERING REPORT

STANDARD DUTY CONCRETE PAVEMENT TYPICAL CROSS SECTION

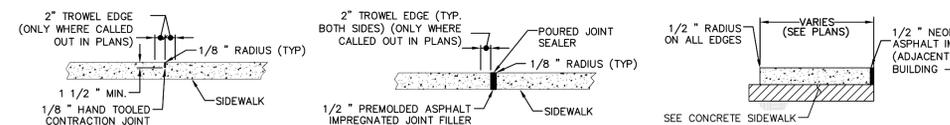
NOTE: TO BE CONSTRUCTED PER FDOT SPECIFICATIONS (SECTIONS 350) AND GEOTECHNICAL ENGINEERING REPORT

HEAVY DUTY CONCRETE PAVEMENT TYPICAL CROSS SECTION



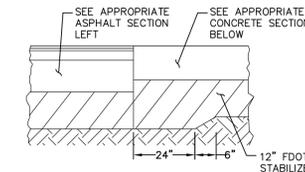
NOTE: SEE ARCHITECT SPECIFICATIONS FOR COMPLETE CONCRETE DETAILS.

CONCRETE JOINT DETAILS

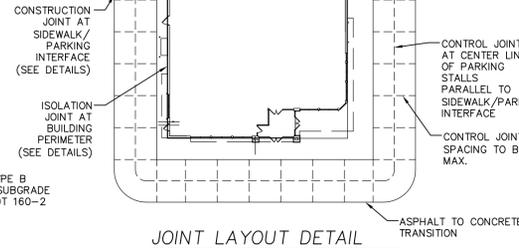


NOTE: EXPANSION JOINTS TO BE SPACED AT A MAX. OF 30'.

SIDEWALK DETAILS



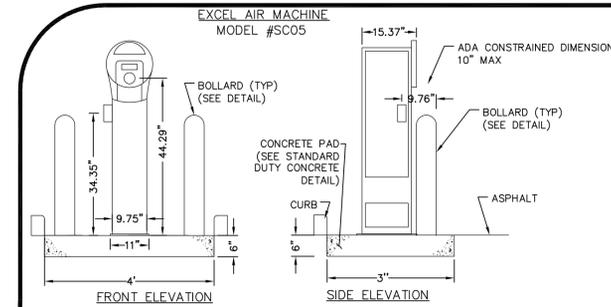
ASPHALT TO CONCRETE TRANSITION DETAIL



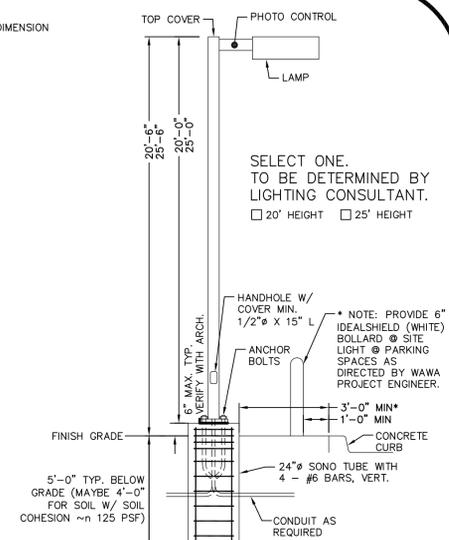
JOINT LAYOUT DETAIL

GENERAL DETAILS

REV. FEBRUARY 7, 2014

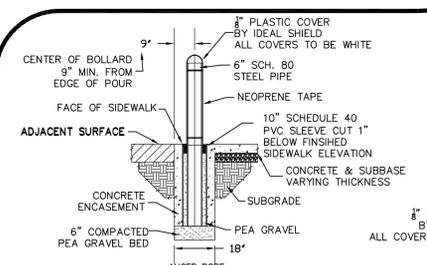


AIR PUMP STAND

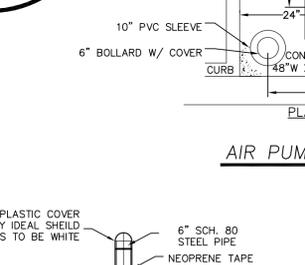


NOTE: THIS DETAIL IS NOT CERTIFIED. FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR TO PROVIDE SHOP DRAWINGS CERTIFIED BY STRUCTURAL ENGINEER.

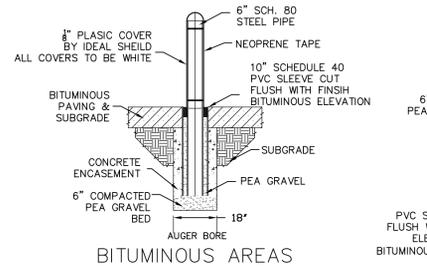
LIGHT POLE WITH STANDARD ANCHORING DETAIL



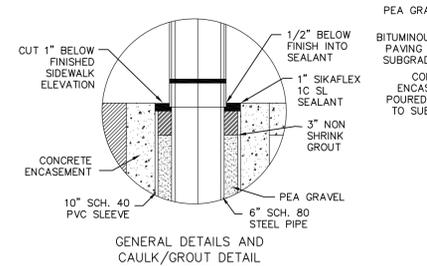
CONCRETE AREAS



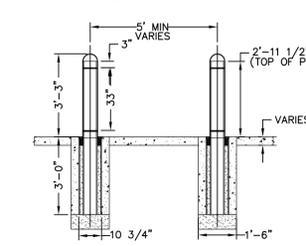
LANDSCAPED AREAS



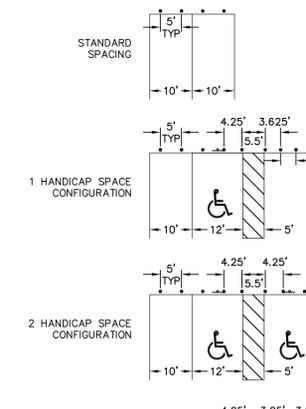
BITUMINOUS AREAS



GENERAL DETAILS AND CAULK/GROUT DETAIL FOR CONCRETE AREAS



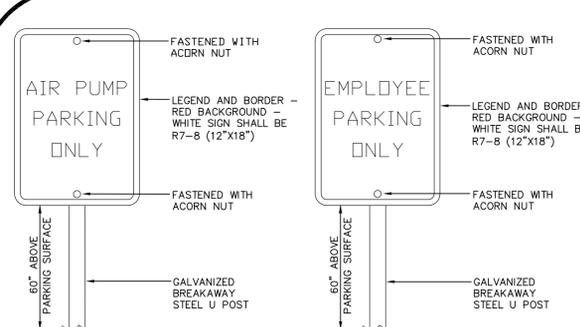
BOLLARD DETAIL



BOLLARD SPACING DETAIL

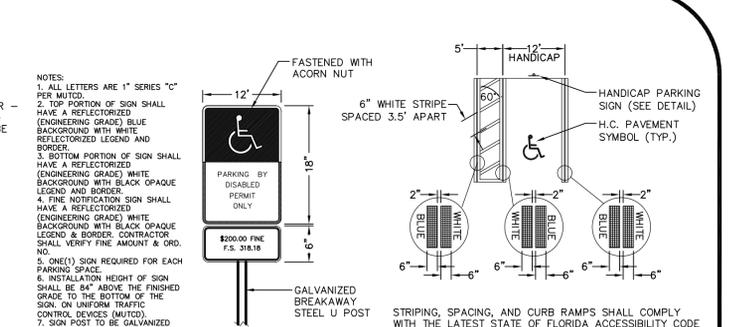
SIGNAGE/STRIPING DETAILS

REV. OCTOBER 16, 2012



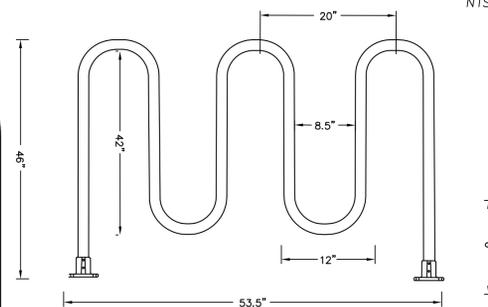
AIR PUMP PARKING SIGN

EMPLOYEE PARKING SIGN

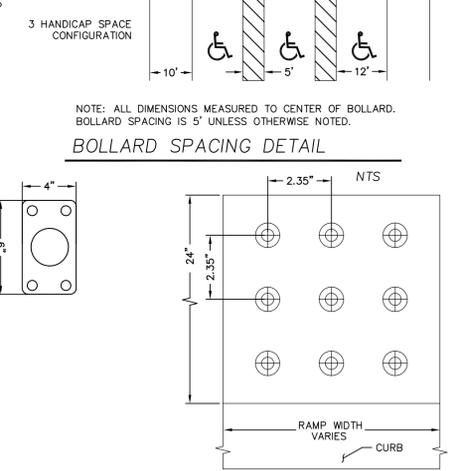


HANDICAP PARKING SIGN

HANDICAP STRIPING DETAIL



STANDARD BICYCLE RACK DETAIL



ADA DETECTABLE CURB WARNING DETAIL

Bowman
CORPORATION

VELMEIR
COMPANIES

STANDARD SITE DETAILS
MARGATE HYBRID CONVENIENCE MARKET
2000 STATE ROAD NO. 7
MARGATE, FL 33063
CITY OF MARGATE
BROWARD COUNTY, FL

ANDREW J. PETERSEN
LICENSE
No. 75493
STATE OF FLORIDA
PROFESSIONAL ENGINEER

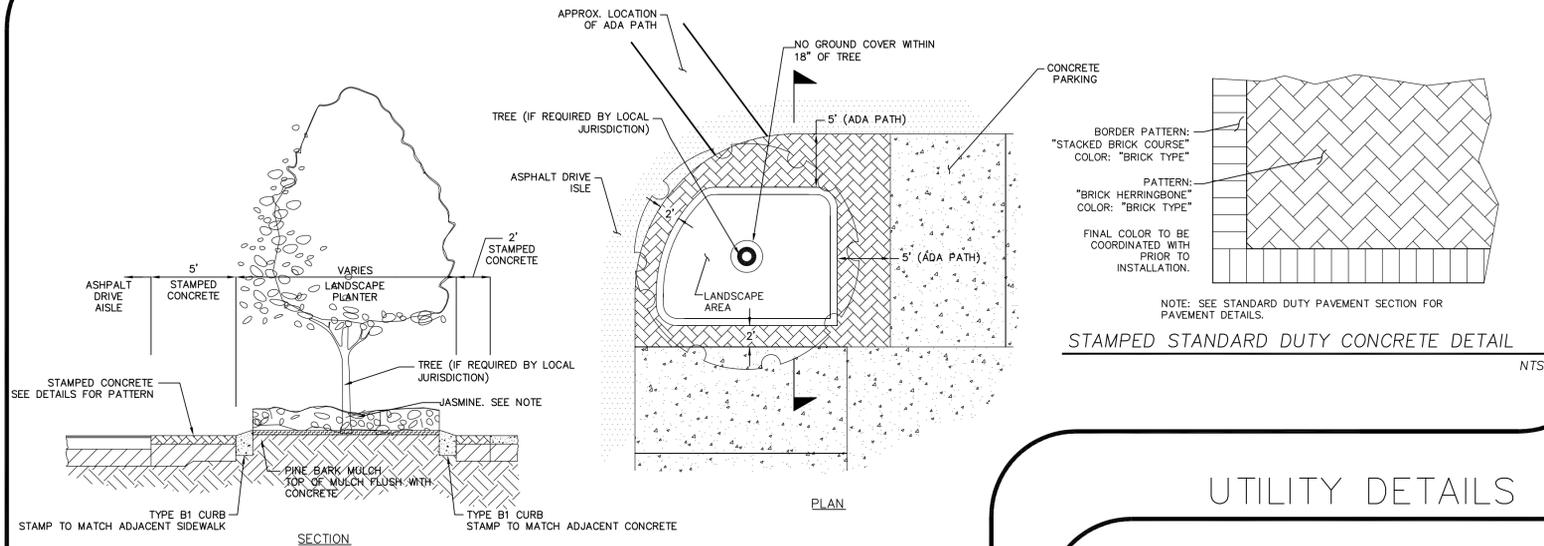
ANDREW J. PETERSEN
LICENSE No. 75493
09/15/2015
PLAN STATUS

DATE	DESCRIPTION
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EC	DRAWN
AJP	CHKD
SCALE	AS SHOWN
JOB No.	010032-01-012
DATE	August, 2015
FILE	010032-01-01-CP-012-10-MWD

SHEET **D1.0**

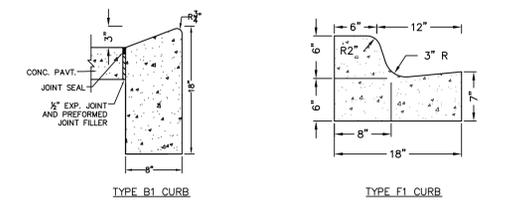
GENERAL DETAILS

REV. FEBRUARY 7, 2014



CURB DETAILS

REV. FEBRUARY 7, 2014

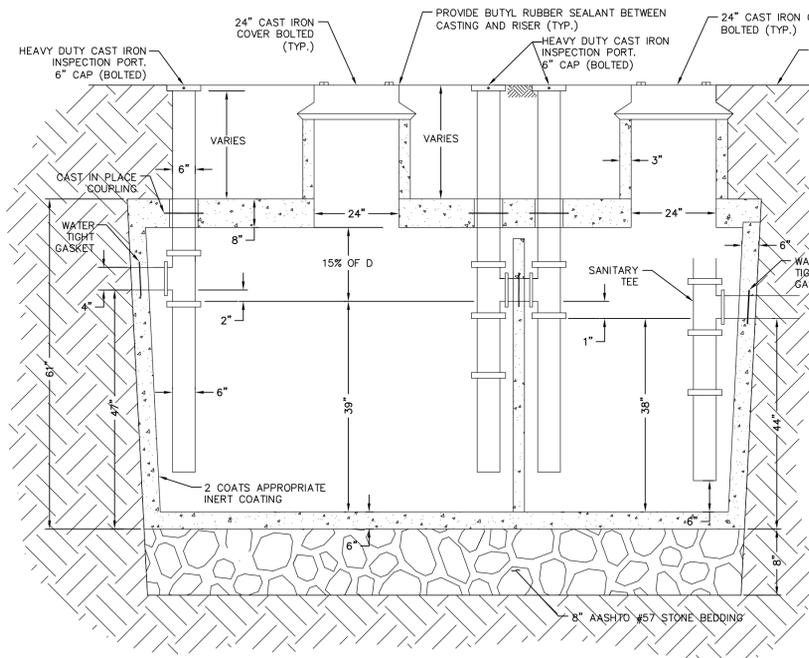


CURB DETAILS

NTS

UTILITY DETAILS

REV. DECEMBER 26, 2012



NOTE: 1250 GALLON (2 COMPARTMENT) TANK

GREASE TRAP DETAIL

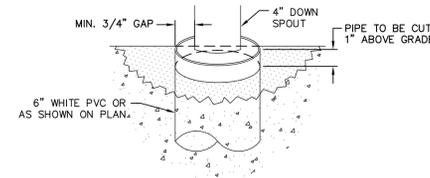
NTS

ALL INLET AND OUTLET PIPES SHALL BE INSTALLED NO MORE THAN 6" FROM THE BOTTOM OF THE GREASE TRAP. TANK TAPERS TOP TO BOTTOM AND IS TRAPEZOIDAL IN CROSS SECTION. TANK IS 5000 PSI CONCRETE-STEEL REINFORCED (28 DAYS) CONCRETE CONFORMS TO ACI 318-16-4.5.1 AND 318-16-4.5.2, ASTM A615 AND A185

-DIMENSION: 10'7" INTERIOR/ 11'7" EXTERIOR LENGTH x 5'2" INTERIOR/ 6'2" EXTERIOR WIDTH

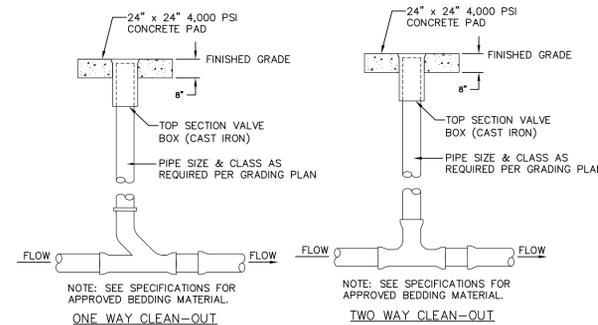
NOTES:

- 1) WHEN LOCATED IN DRIVEWAYS OR PAVED AREAS, GREASE TRAP TO BE DESIGNED FOR APPROPRIATE LOAD BEARING CONDITIONS. GREASE TRAP SHALL BE CAPABLE OF WITHSTANDING HS-20 LOADING.
- 2) ALL PIPE PENETRATIONS SHALL BE WATERTIGHT.
- 3) GREASE TRAP SHALL BE PROVIDED WITH GAS-TIGHT MANHOLE COVERS, IN ACCORDANCE WITH TOWNSHIP STANDARD SPECIFICATIONS.
- 4) PRECAST CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH 5000 PSI.
- 5) EXTERIOR CONCRETE SURFACES BELOW GRADE SHALL HAVE 2 COATS OF COAL TAR EPOXY.
- 6) SPECIFIC SEALANT DETAIL AT CONCRETE RISER TO CONCRETE VAULT INTERFACE SHALL BE WATERTIGHT. AT A MINIMUM, THE JOINT SHALL BE SEALED WITH BUTYL RUBBER SEALANT (KENT SEAL #2 OR APPROVED EQUIVALENT) AND THE EXTERIOR OF THE JOINT SHALL BE SEALED WITH NON-SHRINK GROUT IN CONFORMANCE WITH THE TOWNSHIP STANDARD GREASE TRAP DETAIL.
- 7) TANK SHALL BE TESTED FOR WATER TIGHTNESS BY FILLING FOR 24 HRS. TO SOAK, THEN TOPPED OFF, AND THEN WATCHED FOR 24 HRS. NO DROP IN WATER IS ALLOWED.
- 8) CAST IRON SHALL BE BOLTED TO CONCRETE WITH MASTIC TAPE (KENT SEAL OR APPROVED EQUIVALENT) SEALANT.
- 9) MAXIMUM EARTH COVER=5.0'; HS-20 LOADING.
- 10) INLET AND OUTLET EQUIPPED WITH PIPE SEALS.



ROOF DRAIN CONNECTION DETAIL

NTS

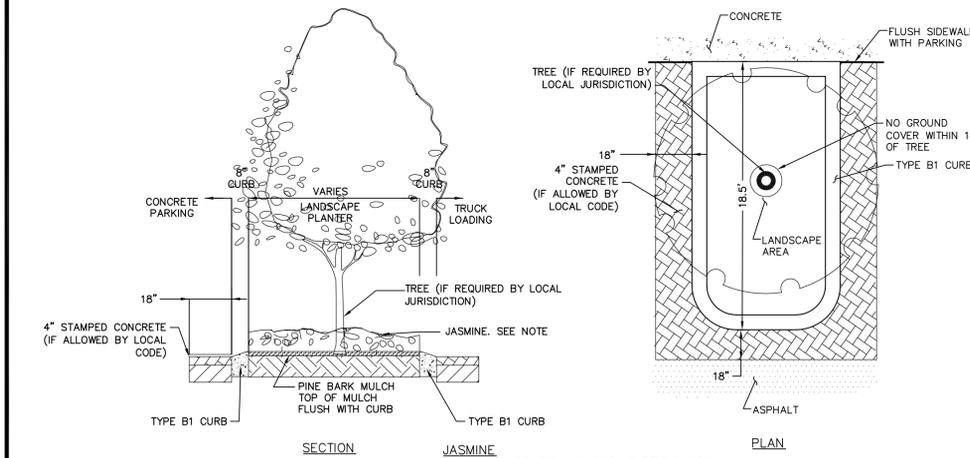


CLEAN OUT DETAIL

NTS

CORNER ISLAND LANDSCAPE DETAIL

NTS



PARKING ISLAND LANDSCAPE DETAIL

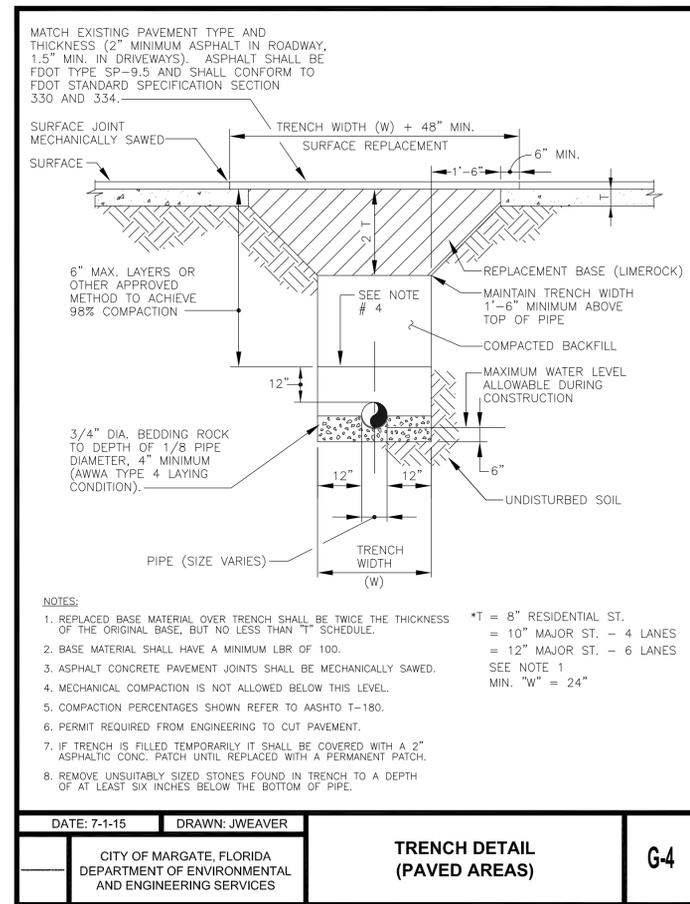
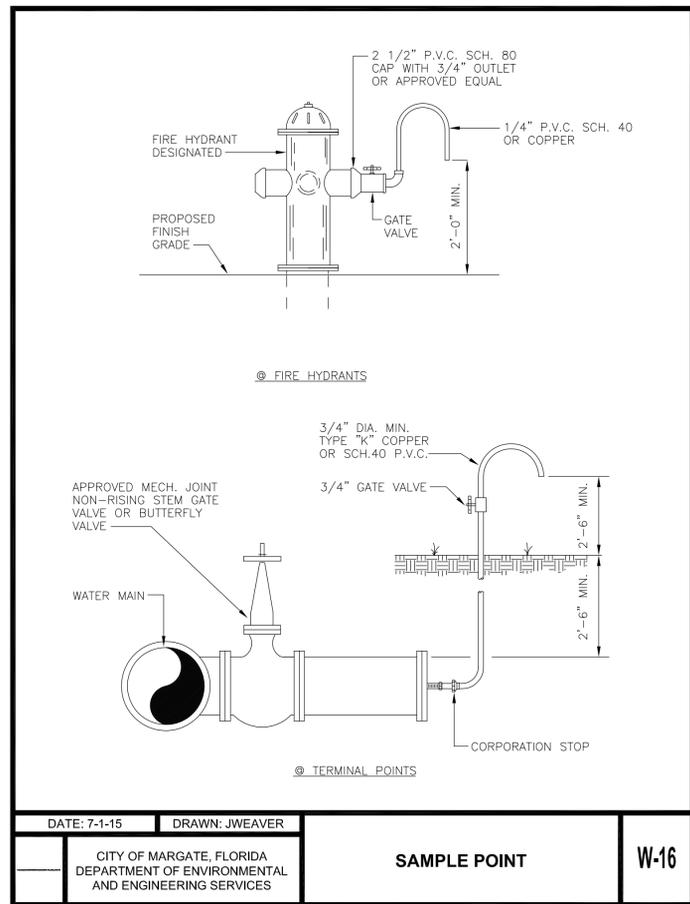
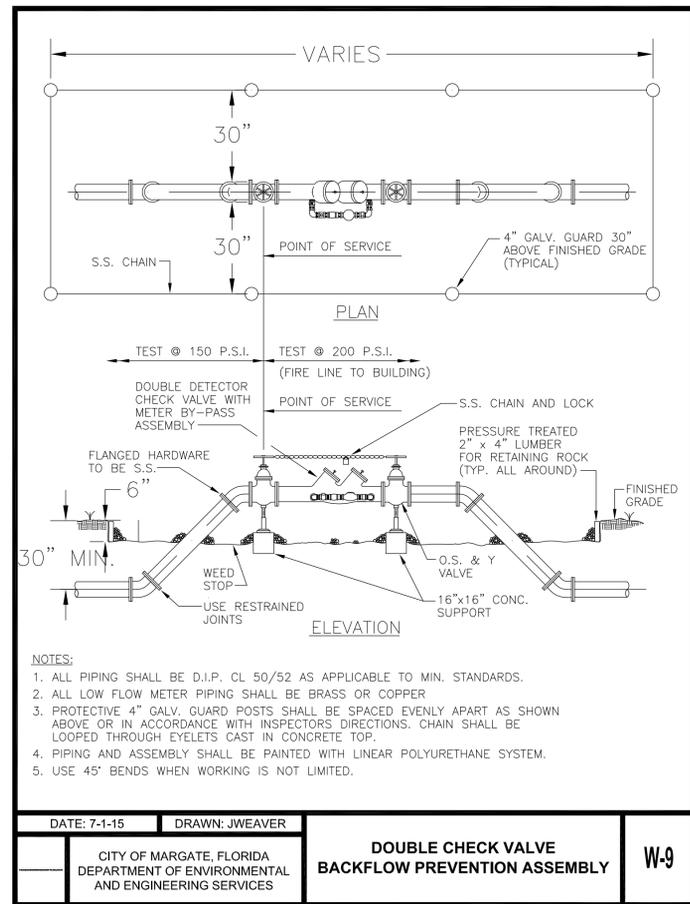
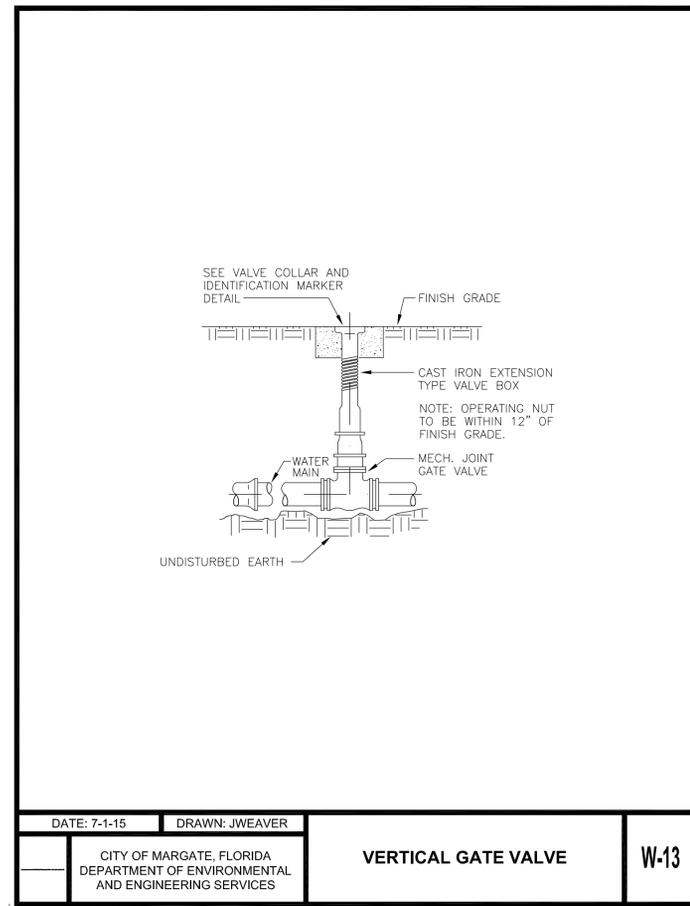
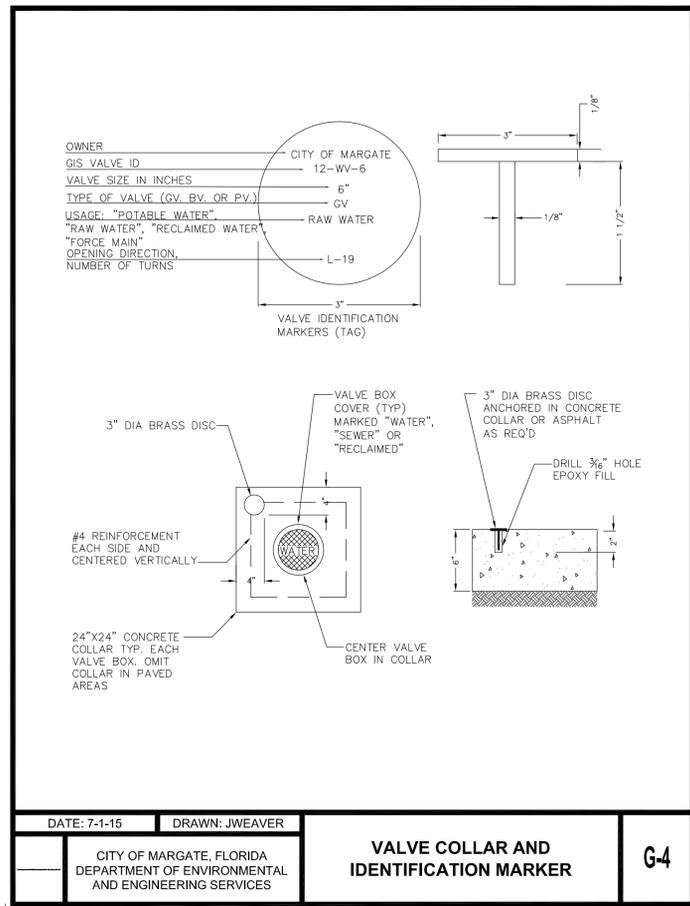
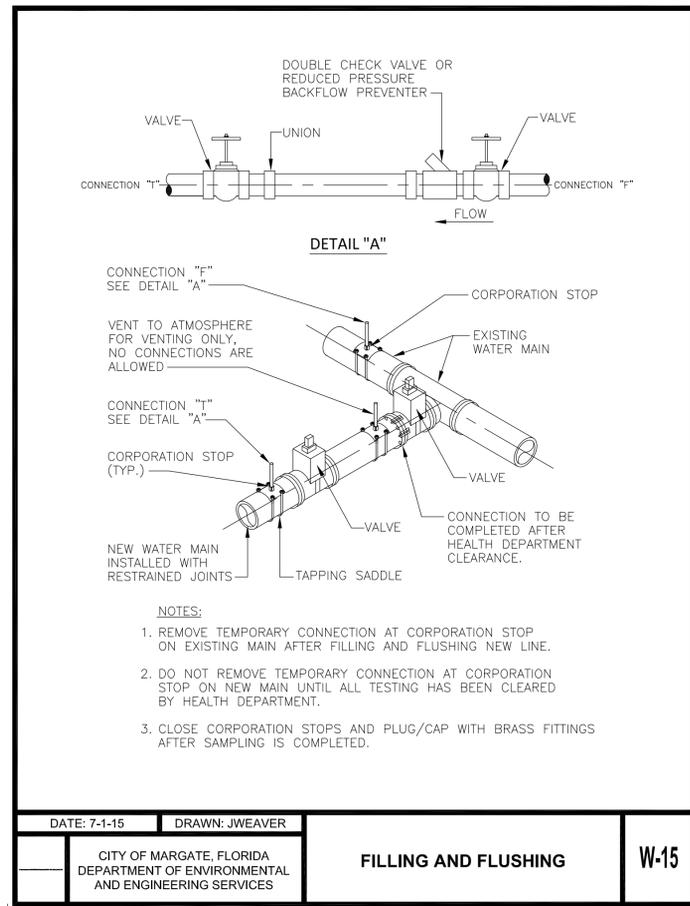
NTS

- JASMINE
1. TO BE FULL PLANT, FLORIDA NO.1 GRADE OR BETTER, 1 GALLON CONTAINERS
 2. PLANT 9" ON CENTER SPACING, 6" MINIMUM LENGTH RUNNERS

- JASMINE
1. TO BE FULL PLANT, FLORIDA NO.1 GRADE OR BETTER, 1 GALLON CONTAINERS
 2. PLANT 9" ON CENTER SPACING, 6" MINIMUM LENGTH RUNNERS.

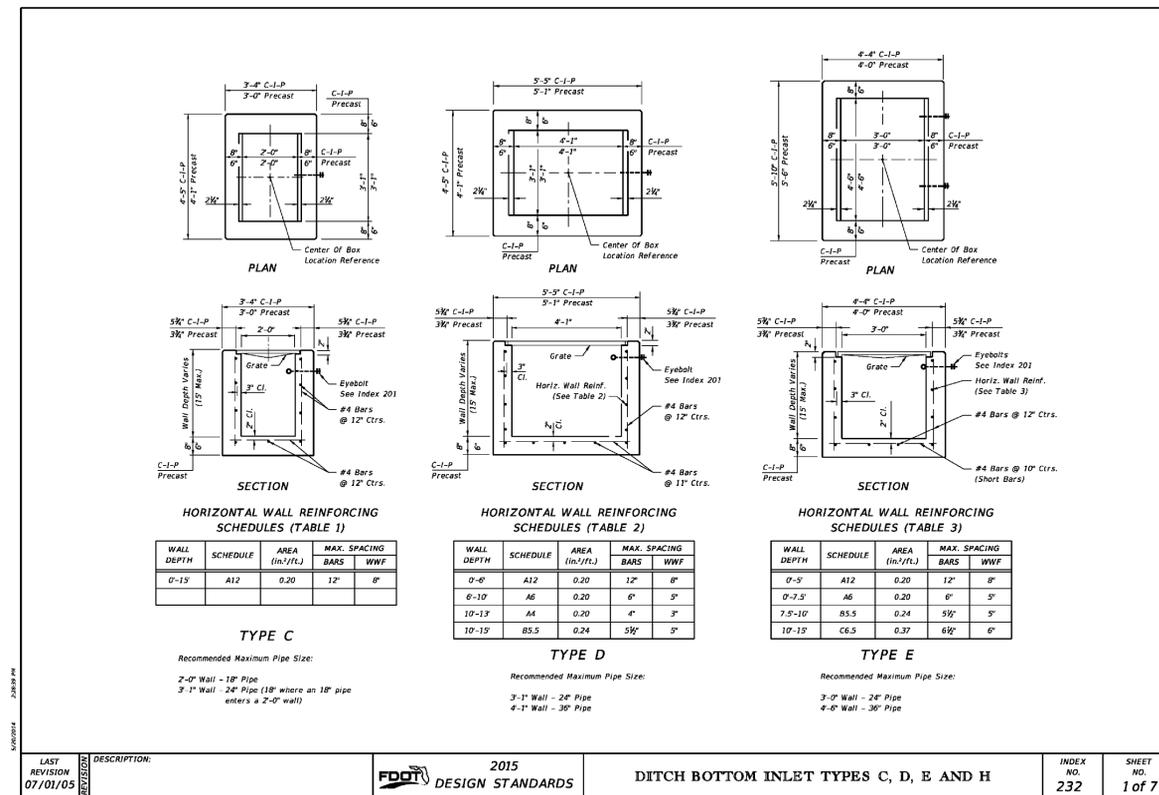
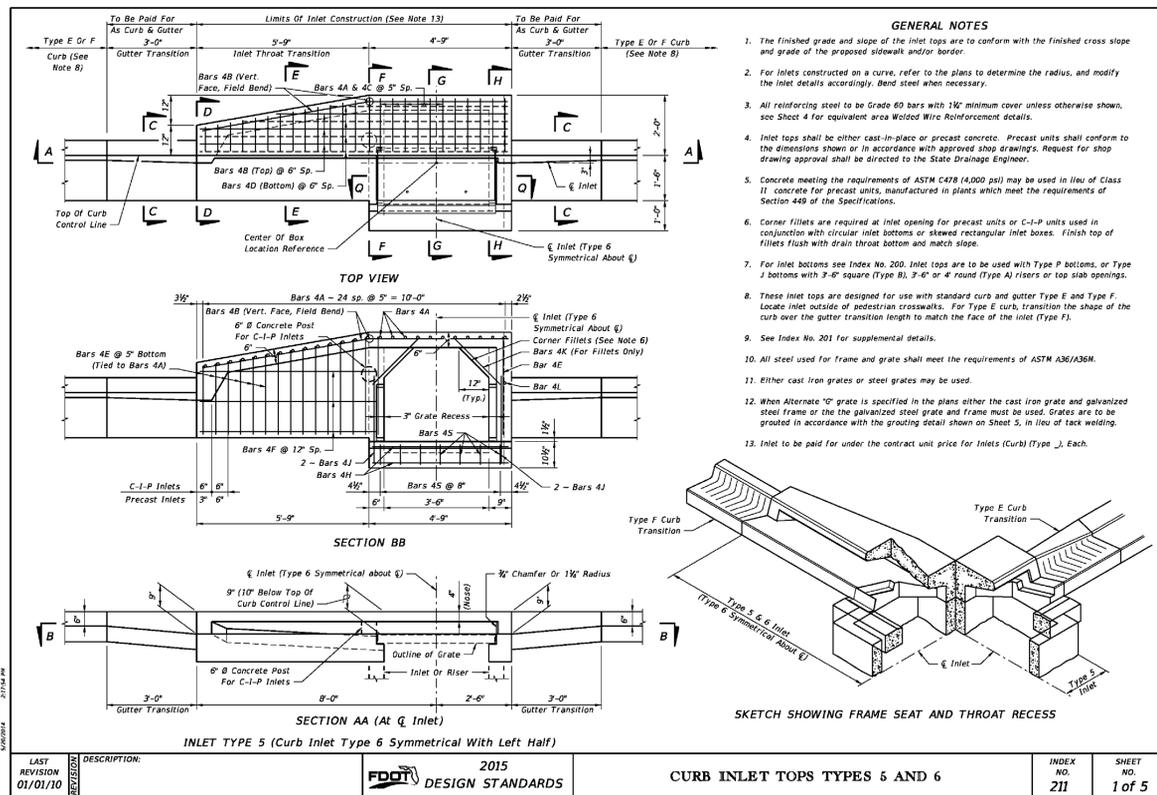
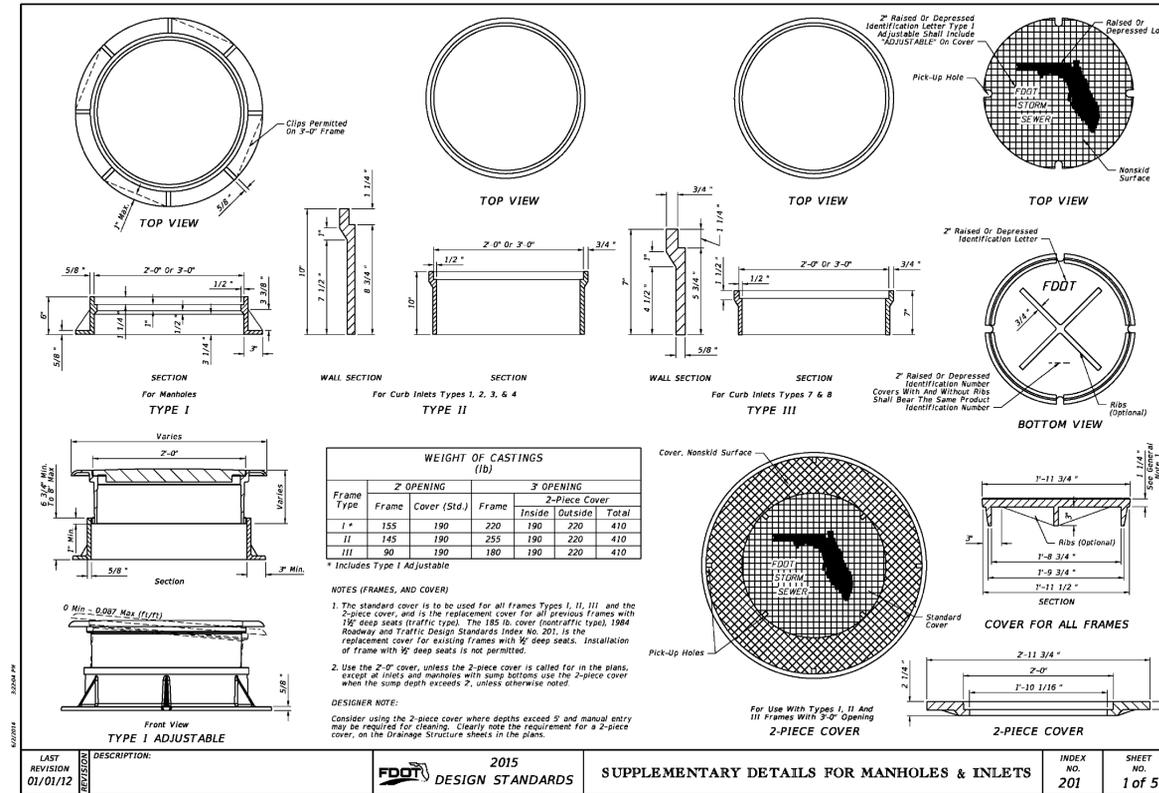
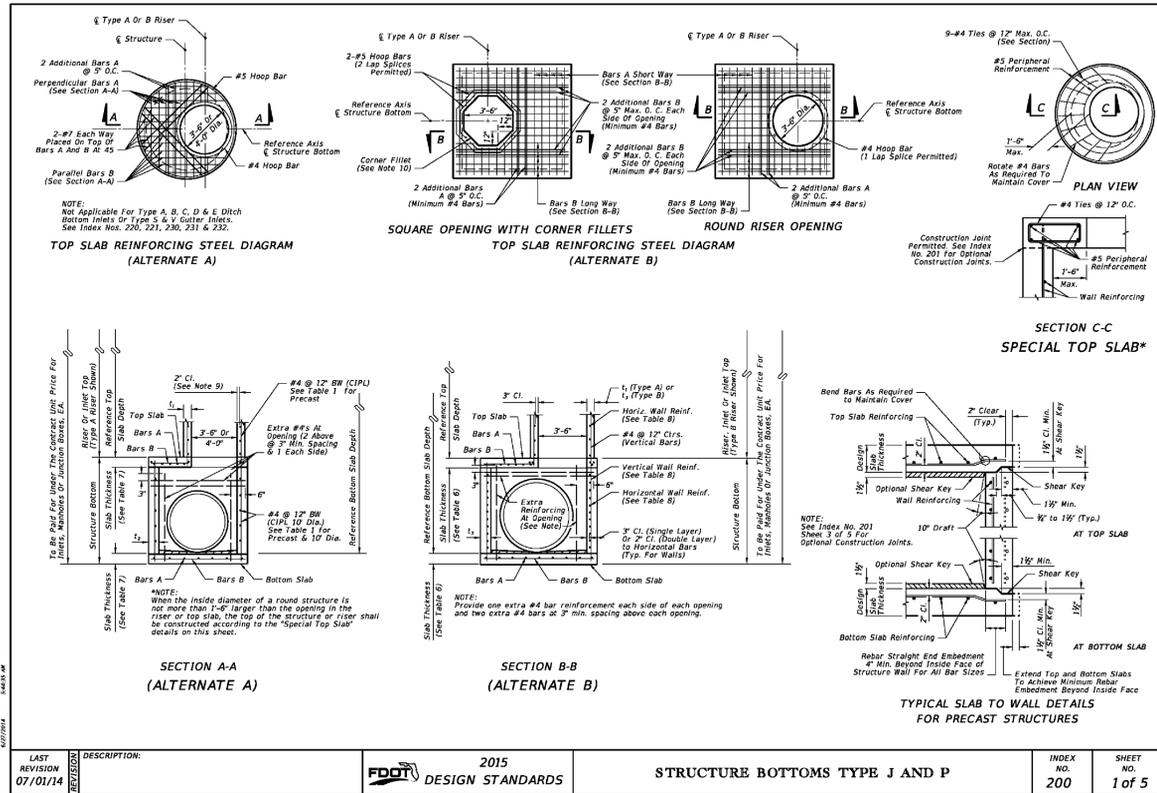
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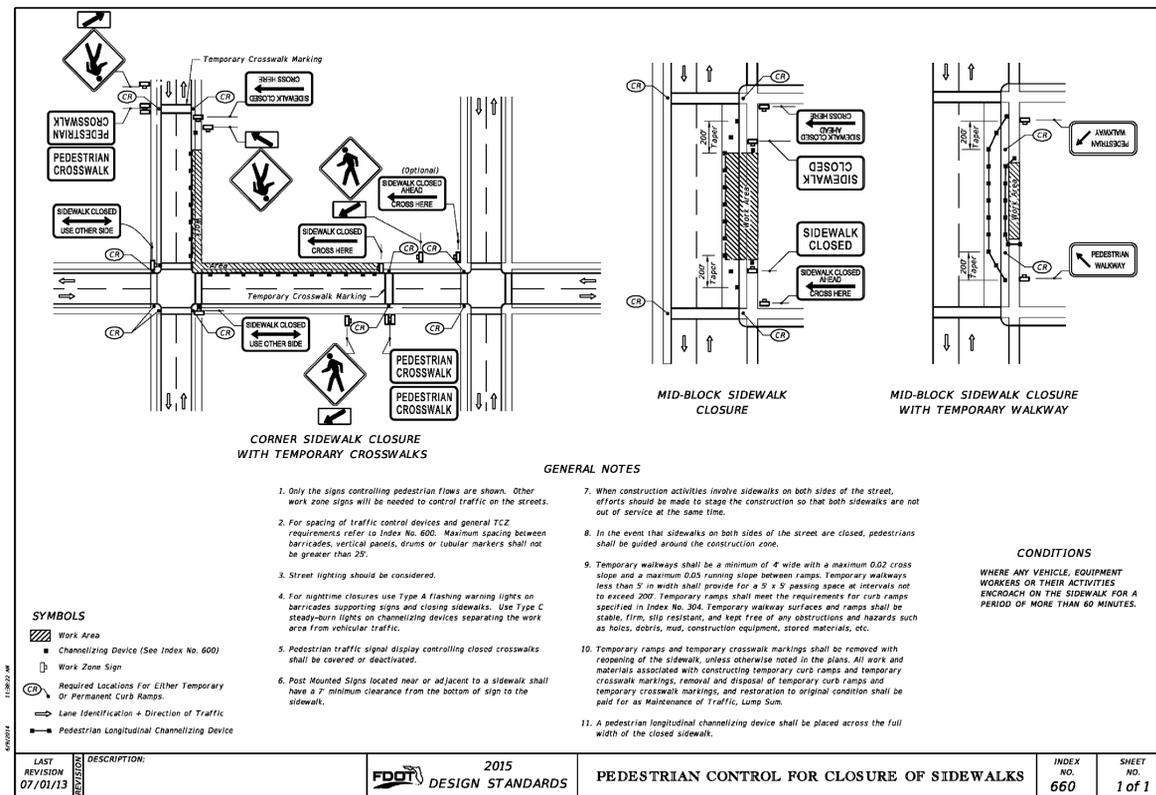
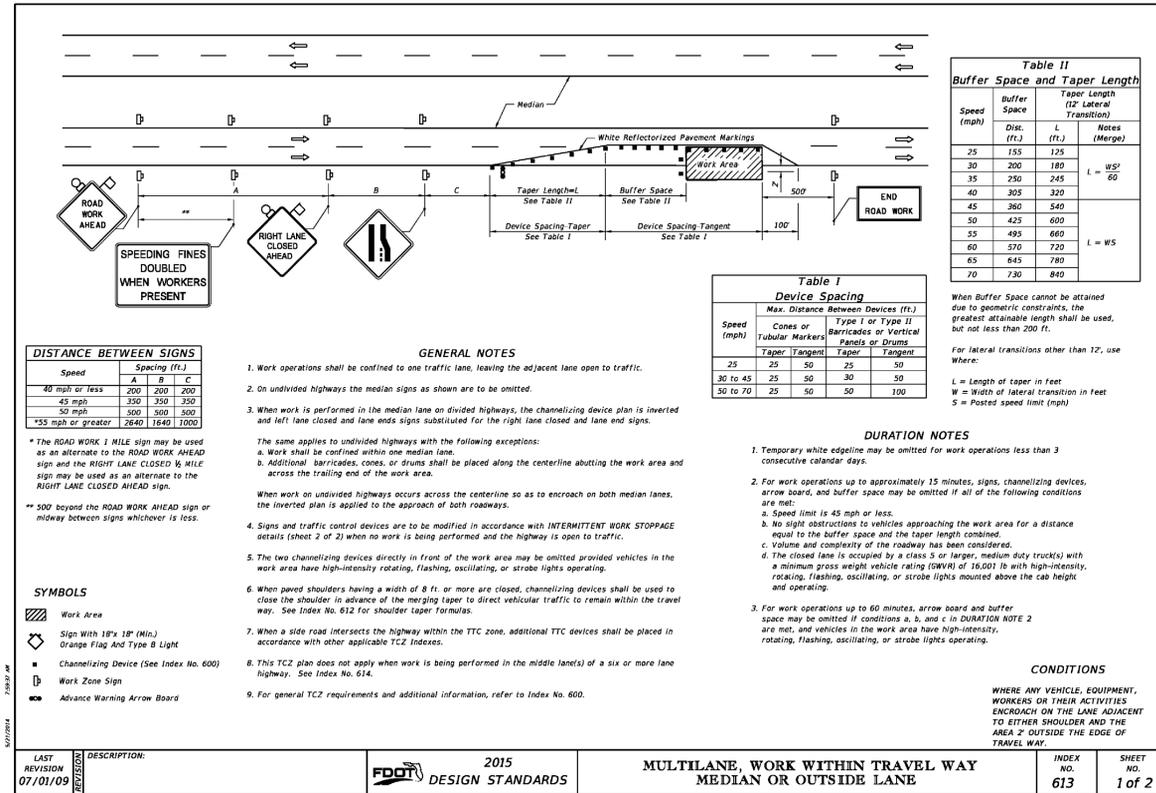
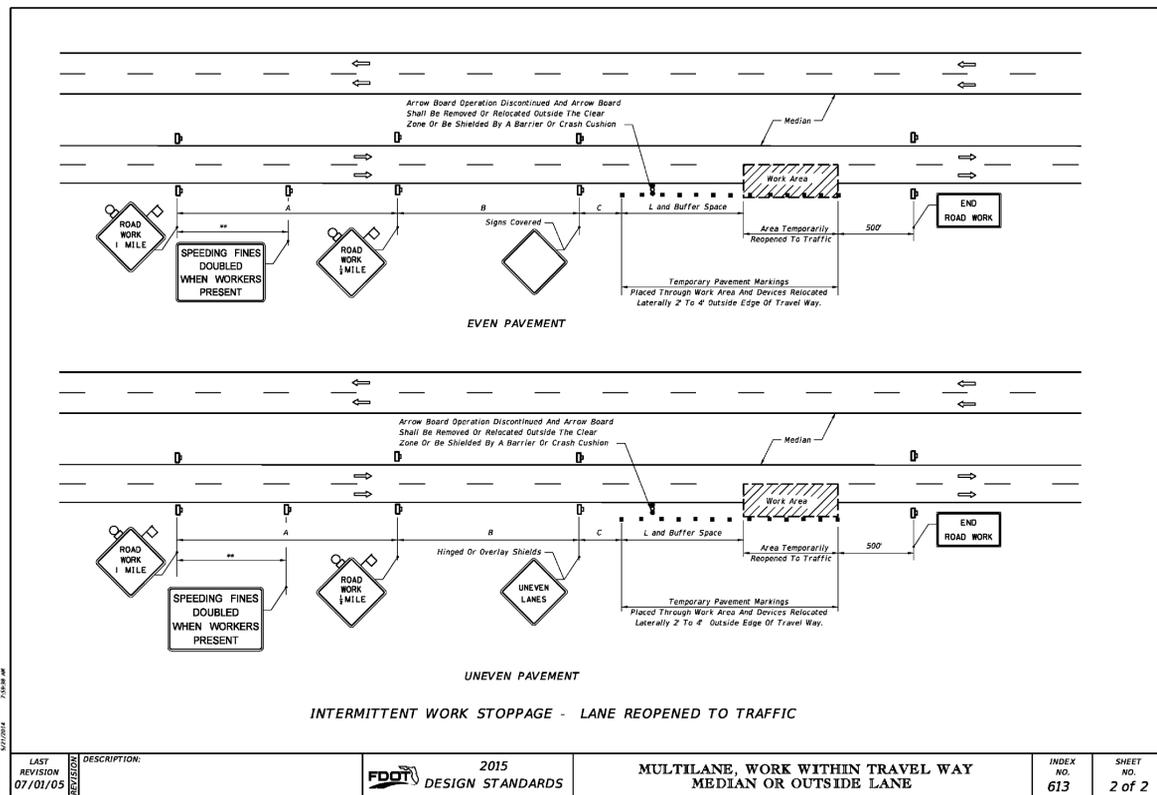
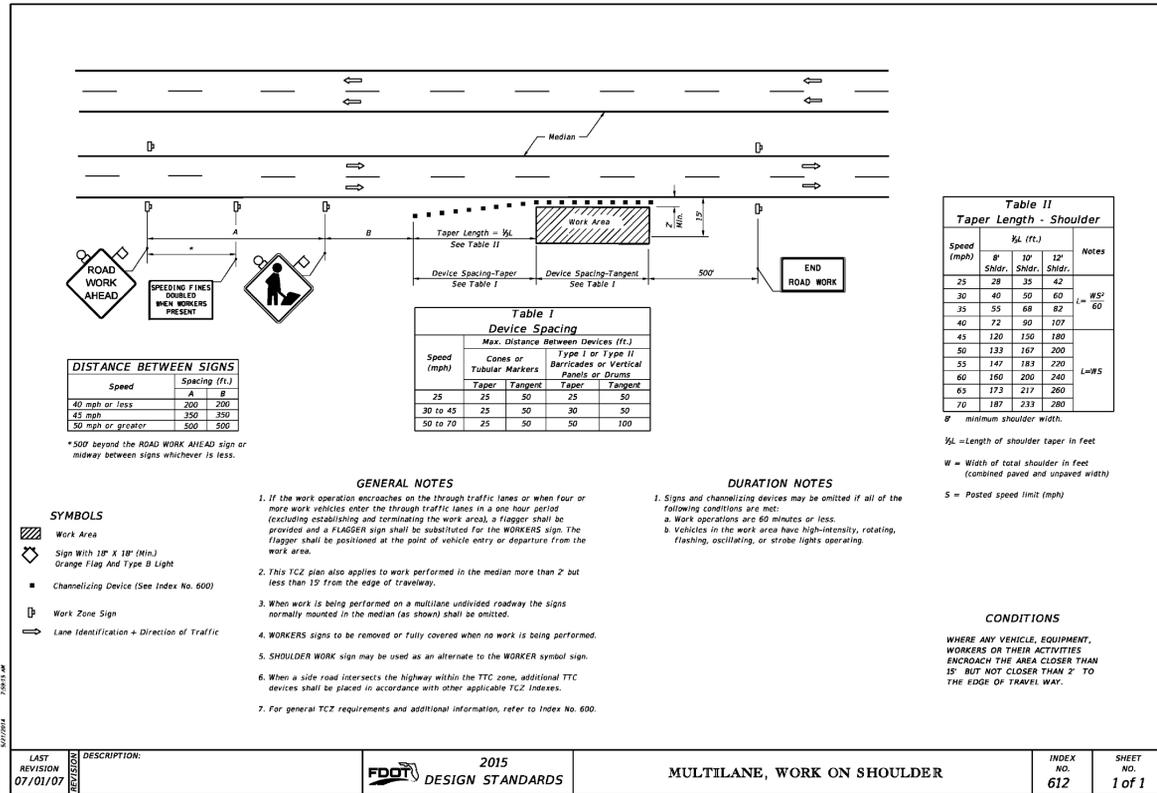


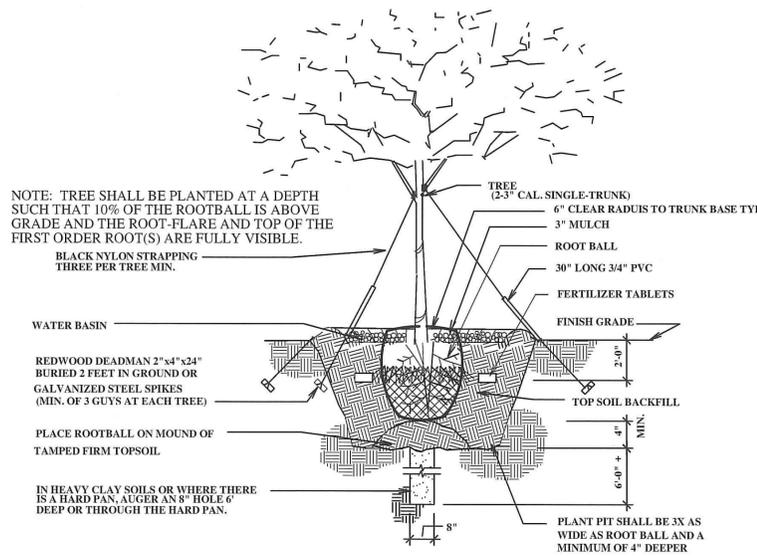
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JOB No. 010032-01-012	
DATE August, 2015	
FILE 010032-01-0-02-012-11-DET	

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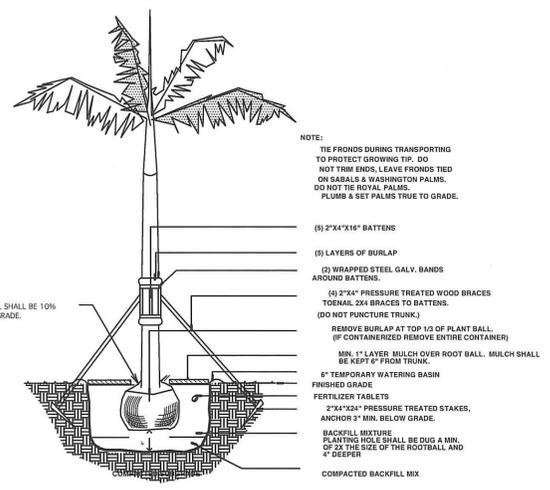


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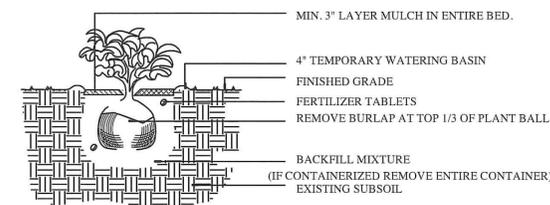




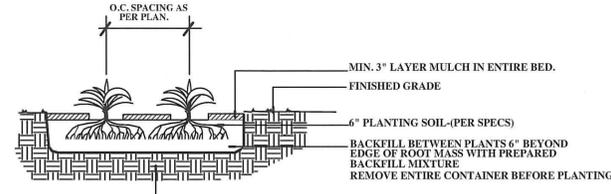
SINGLE TRUNK GUYING AND PLANTING DETAIL
NOT TO SCALE



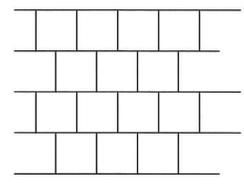
PALM PLANTING DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE



GROUNDCOVER/ANNUALS PLANTING DETAIL
NOT TO SCALE



SOD PLANTING DETAIL
NOT TO SCALE

CITY OF Margate LANDSCAPE CALCULATIONS

BASIS INFORMATION

GROSS SITE 423,906 SQ.FT.
IMPERVIOUS 339,065 SQ.FT.
VUA 138,311 SQ.FT.

REQUIRED LOT GREENSPACE
(.15 X 138,311) = 20,746.65 SQ.FT.

Green area = 84,841 SQ.FT.
Maximum sodded area = 50% = 42,420 SQ.FT.
Sodded area provided = 41,000 SQ.FT.s

TREES

PARKING AREA GREEN REQ. (15% OF VUA = 20,746.65), PROVIDED 26,889 SF.

1. PARKING LOT TREES: 1/ 200SF OF REQ PARKING ISLAND,
20 ISLANDS = 20 TREES REQUIRED TREES PROVIDED 20

2. ON LOT TREES FOR GROSS LOT AREA:
TOTAL LOT TREES REQUIRED = 45 TOTAL PROVIDED = 45

4 PER 1ST 20,000 S.F. = 4 TREES
1 PER ADD'T 10,000 S.F. (of 403,906/10,000) = 41 trees

PROVIDED AS PALMS: XXX OF EXISTING = 14
20% MAX PALM COUNT

3. TOTAL PERIMETER TREES REQUIRED = 65 PERIMETER TREES PROVIDED = 65
ADJ. TO RESIDENTIAL TO R.O.W. AND INDUSTRIAL ZONING

(1) 14'-16' HT. TREE PER 40 L.F. + 1ACCENT PER 100 L.F. = 91

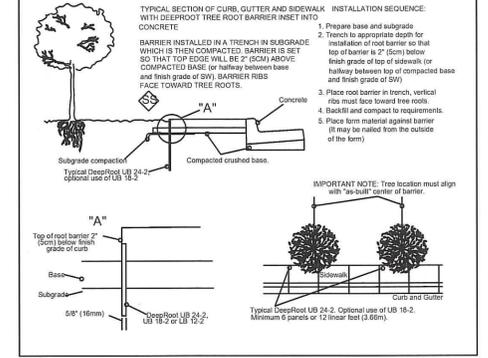
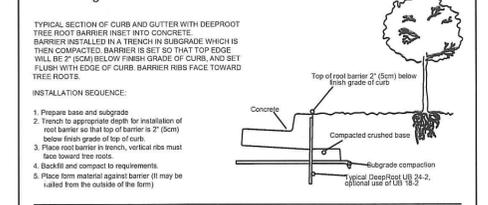
TOTAL TREES REQ @ 14-16' HT. (2565 LF/ 40) = 65
ACCENTS REQ = 26 ACCENTS PROVIDED: 27

2' HT. HEDGE PROVIDED ALONG ALL PERIMETERS

SHRUBS
20 PER 1ST 20,000 S.F. OF GROSS LOT AREA REQ. = 408 SHRUBS
5 SHRUBS FOR EACH ADDITIONAL 1,000 S.F.
TOTAL REQ. = 225 TOTAL PROVIDED: 470

GROUNDCOVER = 225 TOTAL PROVIDED: 11,498

Linear Application of "DeepRoot Tree Root Barriers" at Time of Installing Concrete Sidewalks and Curbs



Tree Protection Detail

NOT TO SCALE

Note
Rootbarrier, (see sheet L-2), shall be installed whenever a tree is less than 10feet from any sidewalk or curb.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING LANDSCAPE MATERIAL AND ROOTS WITHIN THE SCOPE AREA.

ROOT BARRIER WILL BE PLACED ALONG ANY PAVEMENT WITHIN 5' OF ANY NEWLY SUPPLIED OR TRANSPORTED TREE OR PALM, SEE SHEET TD-1 FOR SPECIFICATIONS.

Planting Notes

In case of conflict the notes on this sheet by the City of Davie, take precedence over all others found in these plans.

- ALL SIZES SHOWN FOR PLANT MATERIAL ON PLAN ARE TO BE CONSIDERED AS MINIMUMS. ALL PLANT MATERIAL MUST MEET OR EXCEED THESE MINIMUM REQUIREMENTS FOR BOTH HEIGHT AND SPREAD. ANY OTHER REQUIREMENTS FOR SPECIFIC SHAPE OR EFFECT AS NOTED ON THE PLAN WILL ALSO BE REQUIRED FOR FINAL ACCEPTANCE.
- ALL PLANT MATERIAL FURNISHED BY THE LANDSCAPE CONTRACTOR UNLESS OTHERWISE SPECIFIED SHALL BE FLORIDA NO.1 OR BETTER, AND SHALL BE INSTALLED AS SPECIFIED IN GRADES AND STANDARDS FOR NURSERY PLANTS, PART 1 & II, STATE PLANT BOARD OF FLORIDA, LATEST EDITION
- IN ADDITION TO THESE REQUIREMENTS ALL LOCAL LANDSCAPE CODES AND REQUIREMENTS SHALL BE MET IN ORDER TO SATISFY THE REVIEW AND APPROVAL OF THE GOVERNING MUNICIPALITY.
- ALL LANDSCAPING SCHEDULED TO OCCUR IN VEHICULAR USE AREAS SHALL BE PROTECTED FROM VEHICULAR ENCROACHMENT BY CURBING OR OTHER DURABLE BARRIERS.
- ALL PLANTING HOLES SHALL BE A MINIMUM OF 2 1/2 TIMES THE DIAMETER OF THE PLANT BALL. ALL PLANTING HOLES AND GROUND COVER PLANTING BEDS SHALL BE EXCAVATED TO A DEPTH OF 30" TO REMOVE ALL OBJECTIONABLE MATERIALS, SUCH AS ROAD ROCK, ASPHALT, SUB-BASE, CONCRETE, ROCK, CAUSTIC MATERIALS WITH AN EXCESSIVE SOIL PH, OR SIMILAR MATERIALS NOT SUITED FOR LANDSCAPE PLANTING.
- ALL PLANT MATERIALS SHALL BE PLANTED IN PLANTING SOIL THAT IS DELIVERED TO THE SITE IN A CLEAN, LOOSE AND FRIABLE CONDITION. ALL SOIL SHALL HAVE A WELL DRAINED CHARACTERISTIC. SOIL MUST BE FREE OF ALL ROCKS, STICKS, OBJECTIONABLE DEBRIS INCLUDING WEEDS AND WEED SEED. PLANTING MIX BACKFILL SHALL BE PROVIDED TO A MINIMUM DEPTH OF 30" IN ALL SHRUB HOLES AND GROUNDCOVER PLANTING AREAS.
- ALL PLANT MATERIALS SHALL BE THOROUGHLY WATERED IN AT THE TIME OF PLANTING. NO DRY PLANTING SHALL BE PERMITTED. ALL PLANT MATERIALS SHALL BE PLANTED SUCH THAT THE TOP OF THE PLANT BALL IS FLUSH WITH THE SURROUNDING GRADE.
- ALL PLANT MATERIALS SHALL BE INSTALLED WITH FERTILIZER WHICH SHALL BE STATE APPROVED AS A COMPLETE FERTILIZER CONTAINING THE REQUIRED MINIMUM OF TRACE MINOR ELEMENTS IN ADDITION TO N-P-K, OF WHICH 50% OF THE NITROGEN SHALL BE DERIVED FROM AN ORGANIC SOURCE.
- ALL LANDSCAPE AREAS NOT COVERED BY SHRUBS OR GROUND COVERED SHALL BE COVERED BY SOD AND ALL AREAS NOT COVERED BY SOD SHALL BE COVERED WITH MALELUCA MULCH, TO A MINIMUM DEPTH OF THREE (3) INCHES OF COVER WHEN SETTLED. MULCH SHALL BE EUCALYPTUS OR STERILIZED MELALEUCA ONLY. MULCH IS TO BE HELD BACK 6 INCHES FROM THE TRUNK OF ANY TREE.
- SOD SHALL BE (AS NOTED) SOLID SOD, AND SHALL BE LAID ON A SMOOTH PLANTING BASE WHICH HAS BEEN GRADED TO MEET THE DRAINAGE CHARACTERISTICS OF THE SITE. ALL SOD SHALL BE LAID WITH CLOSELY FITTED JOINTS, AND SHALL BE IN A GREEN AND HEALTHY GROWING CONDITION AT PLANTING. SOD SHALL BE PLACED ON A BED OF TOP SOIL 2" IN DEPTH. SOD SHALL BE ST. AUGUSTINE FLORATAM UNLESS NOTED OTHERWISE IN PLANTING NOTES OR ON THE PLANTING PLAN. RETENTION AREAS MAY REQUIRE BAHIA SOD.
- ALL LANDSCAPE AREAS SHALL BE IRRIGATED BY A FULLY AUTOMATIC SYSTEM ADJUSTED TO PROVIDE 150% COVERAGE OF ALL LANDSCAPE AREAS. ALL HEADS SHALL BE ADJUSTED TO MIN. 50% OVERLAP. IRRIGATION WATER SHALL COME FROM A RUST FREE SOURCE THERE AN AUTOMATIC SHUTOFF/RAIN SENSOR ATTACHED TO THE SYSTEM.
- ANY SUBSTITUTIONS TO PLANT MATERIALS FOR AREAS AND ITEMS ADDRESSED BY LOCAL CODES SHALL BE APPROVED BY THE GOVERNING MUNICIPALITY PRIOR TO WORK PERFORMED.
- ALL LANDSCAPE AREAS SHALL BE FINISH GRADED SUCH THAT THEY ARE FLUSH AND LEVEL WITH SURROUNDING PAVED SURFACES AS NOT TO IMPEDE THE FLOW OF DRAINAGE INTO LANDSCAPE AREAS AND TO PREVENT THE BACKWASH OF MULCH AND DEBRIS INTO PAVED AREAS.
- ALL NEW LANDSCAPED ISLANDS ADJACENT TO EXISTING PAVEMENT SHALL BE EXCAVATED DOWN TO 24" DEPTH BELOW PAVEMENT, AND BACKFILLED WITH APPROVED SOIL.
- PLANTING PLAN TAKES PRECEDENT OVER PLANT LIST.
- MULCH SHALL BE STERILIZED MELALEUCA MULCH.
- FOR LANDSCAPE WITHIN THE SITE TRIANGLES,
 - HEDGES AND ANY OTHER LOW-GROWING VEGETATION SHALL BE MAINTAINED TO A MAXIMUM HEIGHT OF TWENTY-FOUR (24) INCHES.
 - TREES LIMBS SHALL BE PRUNED TO PROVIDE A MINIMUM OF EIGHT (8) FEET OF VERTICAL CLEARANCE.

NO.	DATE	REVISION	BY

Drawn: JS 8-19-15
Checked: JS

SCALE
1" = 20'

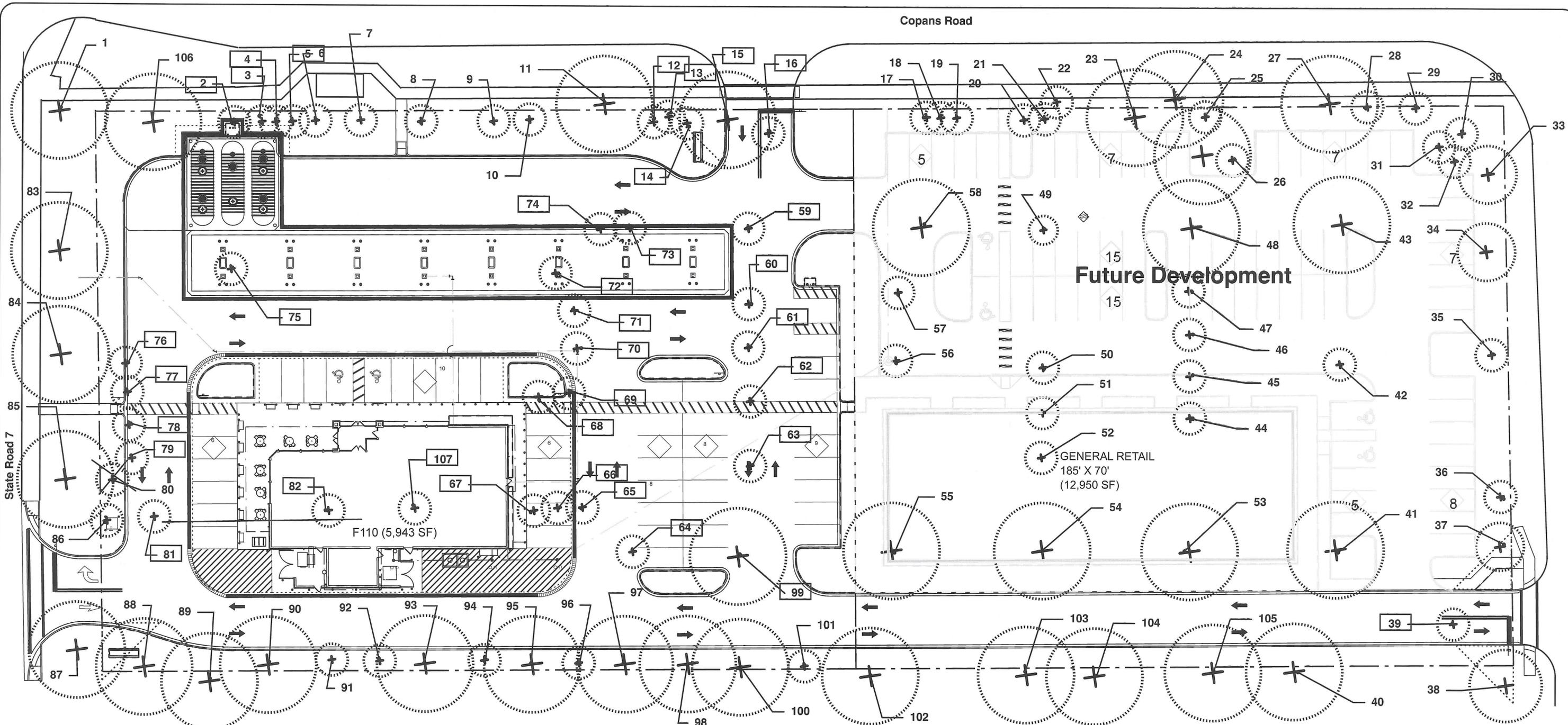
FILE NO.
PROJECT 213057
ISSUE

james santiago
landscape architecture and design
612 NE 14th Ave. Unit A, Fort Lauderdale, Fl. 33304
Tel. 954-560-1695
Email, Jsantiagolaine@gmail.com

Landscape Details

Convenience Store
Margate, Fl

SHEET L-2 OF 2
9/15/15
SEAL #795, DATE



Future Development

GENERAL RETAIL
185' X 70'
(12,950 SF)

F110 (5,943 SF)

LANDSCAPE BID CONDITIONS

- The quantities on the plant list are for the convenience of the contractor only and not to be considered as the final quantity for installation. The callouts and entities drawn on these plans take precedence over the plant list.
- The contractor shall be responsible for his own takeoffs of the plantings drawn.
- The contractor shall be expected to visit the site prior to bid. The contractor shall have an understanding of the on site conditions to prepare his bid. Any questions concerning conditions are to be brought to the owners attention prior to bid.
- Any discrepancies concerning the materials or conditions of the site that shall inhibit the installation as drawn shall be brought to the attention of the owners representatives. Issues found prior to bid will become a condition of the bid after the award of the contract.
- After the award of the contract, any discrepancies in the plans or additional materials and costs because of pre-existing conditions at the site shall not be a reason for any additional charges to the owners.
- These bid conditions are not to be considered all inclusive. There may be additional conditions included in other documents of the construction agreement. It is the contractors responsibility to make himself and his subcontractors aware of any other such conditions.

TREE DISPOSITION LEGEND

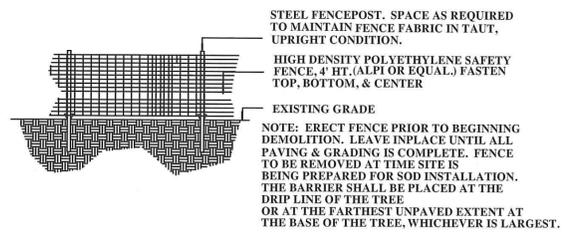
- XX EXISTING TREE TO REMAIN AND BE PROTECTED DURING CONSTRUCTION
 - XX EXISTING TREES TO REMOVE
 - XX EXISTING TREES TO RELOCATE
- See sheet TD-2 for the Master list of trees

Mitigation Quantities

TOTAL DBH INCHES OF TREES TO BE REMOVED = 1,696"
THIS QUANTITY DOES NOT INCLUDE ANY EXOTICS

48 HOURS BEFORE YOU DIG
CALL SUNSHINE
1-800-432-4770
IT'S THE LAW IN FLORIDA

Tree Protection Detail



STEEL FENCEPOST. SPACE AS REQUIRED TO MAINTAIN FENCE FABRIC IN TAUT, UPRIGHT CONDITION.
HIGH DENSITY POLYETHYLENE SAFETY FENCE, 4' HT. (ALF OR EQUAL), FASTEN TOP, BOTTOM, & CENTER.
EXISTING GRADE
NOTE: ERECT FENCE PRIOR TO BEGINNING DEMOLITION. LEAVE IN PLACE UNTIL ALL PAVING & GRADING IS COMPLETE. FENCE TO BE REMOVED AT TIME SITE IS BEING PREPARED FOR SOD INSTALLATION. THE BARRIER SHALL BE PLACED AT THE DRIP LINE OF THE TREE OR AT THE FARTHEST UNPAVED EXTENT AT THE BASE OF THE TREE, WHICHEVER IS LARGEST.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING LANDSCAPE MATERIAL AND ROOTS WITHIN THE SCOPE AREA.
ROOT BARRIER WILL BE PLACED ALONG ANY PAVEMENT WITHIN 5' OF ANY NEWLY SUPPLIED OR TRANSPLANTED TREE OR PALM. SEE SHEET TD-1 FOR SPECIFICATIONS.

NO.	DATE	REVISION	BY

Drawn: JS 8-19-15
Checked: JS

SCALE
1"= 20'

FILE NO.
PROJECT
213057
ISSUE

james santiago
landscape architecture and design
612 NE 14th Ave. Unit A, Fort Lauderdale, FL 33304
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Tree Disposition Plan

Convenience Store
Margate, FL

SEAL #795, DATE 9.15.15

Tree Inventory

Number	Tree Name	Caliper"	Spread / Ft.	Ht./ft.	Disposition	Canopy in sq.ft.
001	Mahogany Tree	48	50	45	Remain	1963
002	Pigeon Plum Tree	12	8	10	Remove	50
003	Sabal Palm	12	8	12	Remain	50
004	Sabal Palm	12	8	12	Remain	50
005	Sabal Palm	12	8	12	Remain	50
006	Sabal Palm	12	8	12	Remain	50
007	Sabal Palm	12	8	12	Remain	50
008	Mahogany Tree	6	24	24	Remain	452
009	Mahogany Tree	6	24	24	Remain	452
010	Mahogany Tree	8	22	20	Remain	380
011	Mahogany Tree	8	24	30	Remain	452
012	Sabal Palm	12	8	12	Remove	50
013	Sabal Palm	12	8	12	Remove	50
014	Sabal Palm	12	8	12	Remove	50
015	Mahogany Tree	8	8	14	Remove	50
016	Pigeon Plum Tree	12	8	10	Remove	50
017	Sabal Palm	12	8	12	Remain	50
018	Sabal Palm	12	8	12	Remain	50
019	Sabal Palm	12	8	12	Remain	50
020	Sabal Palm	12	8	12	Remain	50
021	Gumbo Limbo Tree	4"	12	24	Remain	113
022	Mahogany Tree	14	40	28	Remain	1257
023	Mahogany Tree	24	28	28	Remain	616
024	Mahogany Tree	12	30	14	Remain	707
025	Pigeon Plumb Tree	3	6	14	Remain	28

Tree Inventory

Number	Tree Name	Caliper"	Spread / Ft.	Ht./ft.	Disposition	Canopy in sq.ft.
026	Sabal Palm	12	8	12	Remain	50
027	Sabal Palm	12	30	24	Remain	707
028	Mahogany Tree	12	24	24	Remain	452
029	Mahogany Tree	12	24	24	Remain	452
030	Sabal Palm	12	8	12	Remain	50
031	Sabal Palm	12	8	12	Remain	50
032	Sabal Palm	12	8	12	Remain	50
033	Mahogany Tree	24	35	35	Remain	962
034	Live Oak Tree	5	10	22	Remain	79
035	Sabal Palm	5		28	Remain	0
036	Live Oak Tree	4	8	14	Remain	50
037	Mahogany Tree	14	30	34	Remain	707
038	Mahogany Tree	35	49	34	Remain	1886
039	Sabal Palm	8		28	Remain	0
040	Acacia Tree	14	30	34	Remain	707
041	Mahogany Tree	14	25	30	Remain	491
042	Sabal Palm	12		8	Remain	0
043	Mahogany Tree	20	24	24	Remain	452
044	Sabal Palm	12		12	Remain	0
045	Gumbo Limbo Tree	4	12	10	Remain	113
046	Sabal Palm	12		12	Remain	0
047	Mahogany Tree	4	8	24	Remain	50
048	Mahogany Tree	8	20	28	Remain	314
049	Gumbo Limbo Tree	4	12	10	Remain	113
050	Gumbo Limbo Tree	4	12	10	Remain	113

Tree Inventory

Number	Tree Name	Caliper"	Spread / Ft.	Ht./ft.	Disposition	Canopy in sq.ft.
051	Sabal Palm	12		10	Remain	0
052	Gumbo Limbo Tree	4	10	8	Remain	79
053	Mahogany Tree	14	20	40	Remain	314
054	Mahogany Tree	20	35	33	Remain	962
055	Mahogany Tree	40	30	50	Remain	707
056	Gumbo Limbo Tree	6	14	10	Remain	154
057	Sabal Palm	12		10	Remain	0
058	Mahogany Tree	60	50	50	Remain	1963
059	Mahogany Tree	24	45	35	Remove	1590
060	Sabal Palm	12		10	Remove	0
061	Sabal Palm	12		10	Remove	0
062	Sabal Palm	12		10	Remove	0
063	Sabal Palm	12		10	Remove	0
064	Sabal Palm	12		10	Remove	0
065	Sabal Palm	12		10	Remove	0
066	Sabal Palm	12		10	Remove	0
067	Sabal Palm	12		10	Remove	0
068	Royal Palm DBL	24	12	24	Remove	113
069	Royal Palm Triple	36	14	24	Remove	154
070	Royal Palm Triple	36	14	24	Remove	154
071	Royal Palm Triple		14	24	Remove	154
072	Sabal Palm	12		10	Remove	0
073	Sabal Palm	12		10	Remove	0
074	Sabal Palm	12		10	Remove	0
075	Sabal Palm	12		10	Remove	0

Tree Inventory

Number	Tree Name	Caliper"	Spread / Ft.	Ht./ft.	Disposition	Canopy in sq.ft.
076	Royal Palm	12		28	Remove	0
077	Royal Palm	12		28	Remove	0
078	Royal Palm	12		28	Remove	0
079	Royal Palm	12		28	Remove	0
080	Montgomery Palm, Dbl	12		28	Remove	0
081	Sabal Palm	12		10	Remove	0
082	Phoenix Roebelenii Palm, Dbl	6	6	7	Remove	28
083	Mahogany Tree	60	50	50	Remain	1963
084	Mahogany Tree	64	50	50	Remain	1963
085	Mahogany Tree	66	60	50	Remain	2827
086	Montgomery Palm, Dbl	12	8	30	Remain	50
087	Mahogany Tree	8	22	24	Remain	380
088	Live Oak Tree	3	10	20	Remain	79
089	Mahogany Tree	16	30	30	Remain	707
090	Live Oak Tree	4	10	20	Remain	79
091	Live Oak Tree	4	10	20	Remain	79
092	Live Oak Tree	4	10	20	Remain	79
093	Mahogany Tree	16	30	30	Remain	707
094	Live Oak Tree	3	6	12	Remain	28
095	Mahogany Tree	16	30	30	Remain	707
096	Live Oak Tree	2	18	12	Remain	254
097	Mahogany Tree	18	40	30	Remain	1257
098	Live Oak Tree	4	8	24	Remain	50
099	Mahogany Tree	20	35	55	Remove	962
100	Mahogany Tree	50	50	30	Remain	1963
101	Live Oak Tree	4	8	12	Remain	50
102	Mahogany Tree	40	30	35	Remain	707
103	Earleaf Accacia Tree	40	35	30	Remain	962
104	Earleaf Accacia Tree	40	35	30	Remain	962
105	Earleaf Accacia Tree	40	35	30	Remain	962
106	Mahogany Tree	50	50	35	Remove	1963
107	Phoenix Roebelenii Palm, Dbl	6			Remove	0

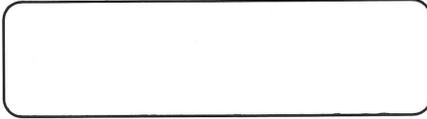
NO.	DATE	REVISION	BY

Drawn: JS 8-19-15
 Checked: JS

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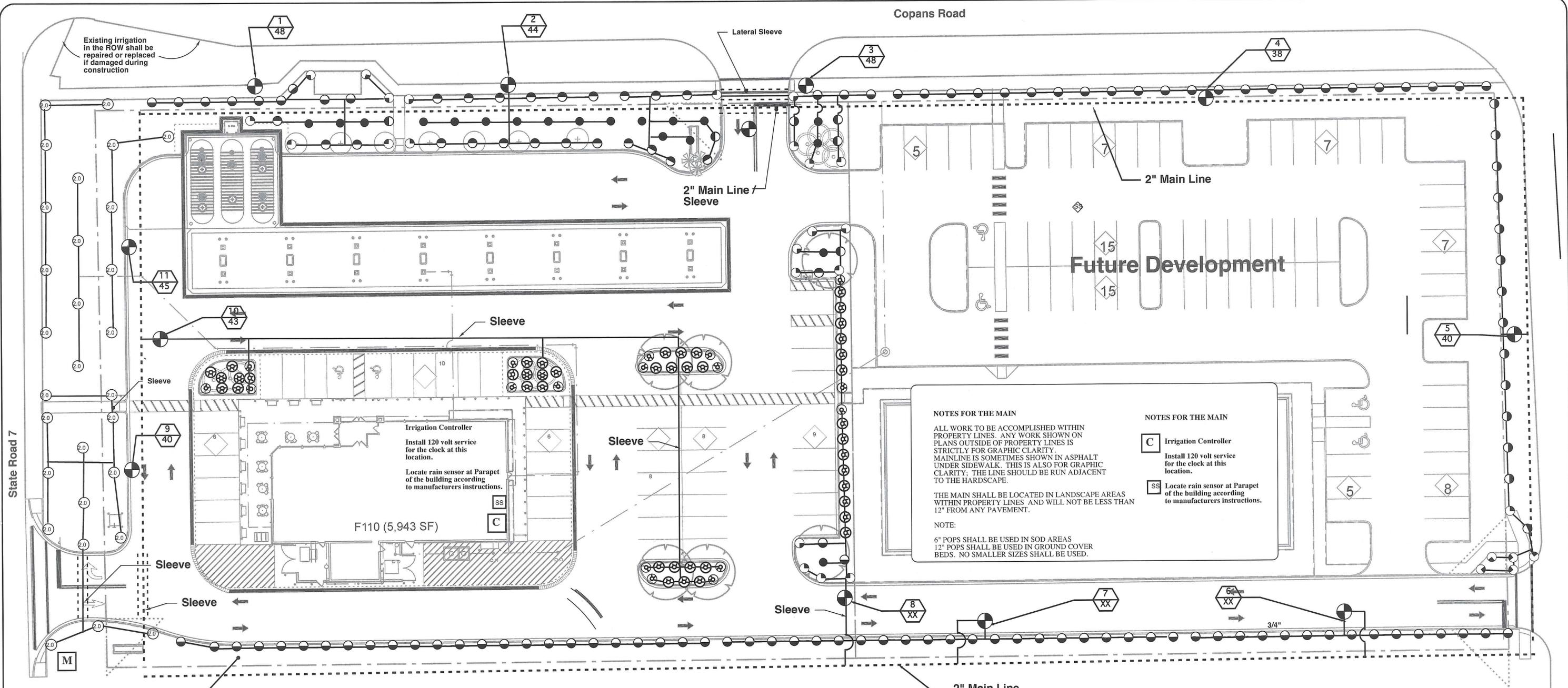
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**Tree Disposition
Existing Tree List**

**Convenience Store
Margate, FL**

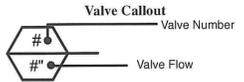




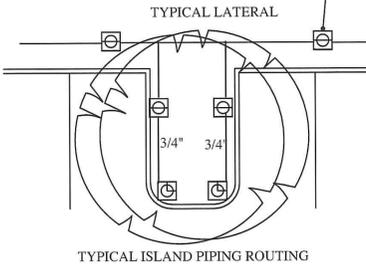
NOTES FOR THE MAIN
 ALL WORK TO BE ACCOMPLISHED WITHIN PROPERTY LINES. ANY WORK SHOWN ON PLANS OUTSIDE OF PROPERTY LINES IS STRICTLY FOR GRAPHIC CLARITY. MAINLINE IS SOMETIMES SHOWN IN ASPHALT UNDER SIDEWALK. THIS IS ALSO FOR GRAPHIC CLARITY. THE LINE SHOULD BE RUN ADJACENT TO THE HARDSCAPE.
 THE MAIN SHALL BE LOCATED IN LANDSCAPE AREAS WITHIN PROPERTY LINES AND WILL NOT BE LESS THAN 12" FROM ANY PAVEMENT.
 NOTE:
 6" POPS SHALL BE USED IN SOD AREAS
 12" POPS SHALL BE USED IN GROUND COVER BEDS. NO SMALLER SIZES SHALL BE USED.

NOTES FOR THE MAIN
C Irrigation Controller
 Install 120 volt service for the clock at this location.
SS Locate rain sensor at Parapet of the building according to manufacturers instructions.

The location of the main is schematic. The main should be located within the landscape buffer a minimum of 4' off any pavement.



Locate the heads 2' off the front of curb typical



SYSTEM DESIGN NOTE

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE THE HEADS SHOWN AS A MINIMUM. HE SHALL PROVIDE ANY ADDITIONAL HEADS REQUIRED FOR THE SPECIFIED COVERAGE AND SIZE THE PIPE ACCORDING TO THE SPECIFICATIONS FOR PIPE SIZING AND SLEEVING PROVIDED ON THIS SHEET AND SHALL PROVIDE 100% COVERAGE WITH A 100% OVERLAP.
- THE DESIGN SHALL PROVIDE SUFFICIENT PRESSURE AND FLOW TO SATISFY THE MANUFACTURERS SPECIFICATIONS FOR THE EQUIPMENT SPECIFIED.
- WHERE AN EXISTING SYSTEM IS DEMOLISHED THE CONTRACTOR SHALL SUPPLY TEMPORARY WATER TO ALL LANDSCAPE NOT EFFECTED BY DEMOLITION FOR THE PERIOD OF CONSTRUCTION AND UNTIL THE SYSTEM IS IN PLACE AND OPERATIONAL.
- WHERE POSSIBLE THE ZONES SHOWN ARE TO BE RESPECTED IN THE DESIGN SEE SHEET EP 1 FOR ELECTRICAL COORDINATION AND CONTINUATION OF INSTALLATION SPECIFICATIONS.
- PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL SUPPLY HIS DESIGN TO THE ARCHITECT FOR APPROVAL. THE LANDSCAPE ARCHITECT SHALL SIGN AND SEAL THE IRRIGATION DOCUMENTS FOR PERMIT.
- THE CONTRACTOR SHALL SUPPLY TO THE OWNER AN ASBUILT OF THE SYSTEM.

LANDSCAPE AND IRRIGATION BID CONDITIONS

- The quantities on the plan are for the convenience of the contractor only and not to be considered as the final quantity for installation. The callouts and entitles drawn on the plans take precedence over the Spec list.
- The contractor shall be responsible for his own takeoffs of the materials drawn.
- The contractor shall be expected to visit the site prior to bid. the contractor shall have an understanding of the on site conditions to prepare his bid. Any questions concerning conditions are to be brought to the owners attention prior to bid.
- Any discrepancies concerning the materials or conditions of the site that shall inhibit the installation as drawn shall be brought to the attention of the owners representatives. Issues found prior to bid will become a condition of the bid after submission.
- After the award of the contract, any discrepancies in the plans or additional materials and costs because of pre-existing conditions at the site shall not be a reason for any additional charges to the owners.
- These bid conditions are not to be considered all inclusive. There may be additional conditions included in other documents of the construction agreement. It is the contractors responsibility to make himself and his subcontractors aware of any other such conditions.

48 HOURS BEFORE YOU DIG
 CALL SUNSHINE
 1-800-432-4770
 IT'S THE LAW IN FLORIDA

KEY	NO.	CODE	ITEM DESCRIPTION
2.0		Head	Hunter I-20-ADV, 36V Turf Rotor, 6" popup, adjustable and full circle, with check valve
●	78	Head	RAINBIRD 1806 or 1812-PRS Turf or Shrub Spray with 6" or 12" popup with pressure regulator Radius as required on the plans-plan
●			3/4 HDS
●			1/2 HDS
●			1/4 HDS
●			15 STRIP SERIES
●			15RCS OR 15LCS
●			15SST
⊗			RAINBIRD 1800 SERIES STREAM BUBBLER 16H-SLA, 5Q-B, & 5HB PCS-040 PCS-060 PCS-090
⊗			12" POP-UP, 30 PSI HEADS TO BE PRESSURE COMPENSATING



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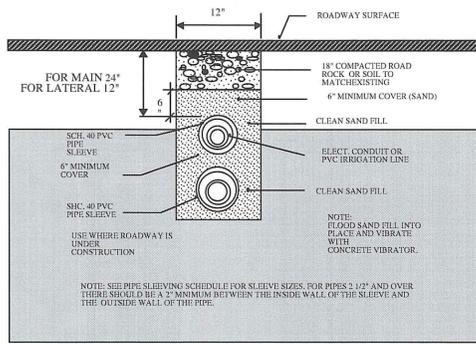
Irrigation Plan

Convenience Store
 Margate, FL

SHEET
 IR-1
 of 2
 9/15/15
 SEAL 7/95, DATE

IRRIGATION MASTER KEY

KEY	NO.	CODE	ITEM DESCRIPTION	INSTALLATION SPEC.
20		Head	Hunter I-20-ADV, 36V Turf Rotor, 6" pop-up, adjustable and full circle, with check valve	"All heads in open grass areas to be mounted on poly pipe swing joints. Height of heads adjusted to finish grade and sod. Heads on risers in shrub areas to be installed 6" above plant height, with risers on rigid pvc swing joints."
	78	Head	RAINBIRD 1806 or 1812-PRS Turf or Shrub Spray with 6" or 12" pop-up with pressure regulator Radius as shown on plan 3/4 HDS 1/2 HDS 1/4 HDS 15 STRIP SERIES 1SRCS OR 1SLCS 1SSST	"All heads in open grass areas to be mounted on poly pipe swing joints. Height of heads adjusted to finish grade and sod. Heads on risers in shrub areas to be installed 6" above plant height, with risers on rigid pvc swing joints."
	00C26	CON	SEE SHEET IR-1 FOR THE LOCATION OF THE CLOCK AND METER.	
	11	PIPE GEN NOTE	LATERAL PIPE All New Pipe and Fittings. NOTE: ALL MAINLINE PIPE SHALL BE SCH 40	3/4" Pipe to be Class 200. All other lateral pipe to be Class 160, except where ground is rocky; in rocky ground, SCH 40 pipe will be used or Class 200 will be protected on all sides with at least 6" of clean, debris-free builders sand. All laterals to be placed 12" minimum below grade. All lateral pipe under pavement to be sleeved. No lateral installed shall be less than 3/4".
	56.5	Head	RAINBIRD 1800 SERIES STREAM BUBBLER 16H-SLA, 5Q-B, & 5HB PCS-040 PCS-060 PCS-090 6" POP-UP, 30 PSI HEADS TO BE PRESSURE COMPENSATING	Height of heads adjusted to finish grade.
	13	PIPE GEN NOTE	PIPES NEAR EXISTING TREES EXISTING TREES TAKE PRIORITY OVER PROPOSED IRRIGATION LINES. CONTRACTOR SHALL MAKE ADJUSTMENTS WHERE NECESSARY TO ACCOMMODATE EXISTING TREES.	Particular care shall be taken while installing pipe in the vicinity of existing or newly planted trees. Laterals shall run clear of rootballs and heads set to throw back toward trees.
	10	MAIN LINE NOTE	MAIN LINE NOTE ALL MAINLINE PIPE SHALL BE SCH 40 MAINLINE SHOWN ON PLANS AS SCHEMATIC ONLY. MAINLINE SHALL BE INSTALLED WITHIN PROPERTY LINES AT ALL TIMES.	Main lines location is shown schematically. Where ever possible, lateral lines are to be buried in common trench with main line. All wires shall be run under mains for protection. All Mains shall be buried at minimum 24" depth. Mains should run deeper at road crossings. All pipe and fitting materials shall be new. All pipe to be cut squarely and burrs removed. All P.V.C. Mainline 4" and larger to be assembled with use of HARCO Gasketed fittings and poured concrete thrust blocks as per manf. specifications.
	01	CODE REQ.	Contractor shall comply w/ all Local Codes & include any and all code requirements in their Base Bid. Extras shall be awarded the Contractor for materials work that are a basic requirement of codes whether or details are shown in schematic plans or not. ALL CONSTRUCTION MINIMUMS SHALL BE EQUAL TO OR GREATER THAN THE STANDARDS AS SET FORTH BY THE FLORIDA IRRIGATION SOCIETY INC. (FIS)	Contractor to supply and install all check valves, back flow preventers, and supply in the bid the cost for all permits, etc., as required by these codes even if those items are not shown on drawings. Each municipality making inspections for a job C.O., shall have its own list of requirements which shall be included in the base bid and provided as part of the installation. It is the sole responsibility of the General Contractor to assure compliance with all local codes.
	02	CONTR NOTE	IRRIGATION CONTRACTOR UTILITIES ABOVE AND BELOW GROUND.	Contractors shall be responsible for the location and verification of all overhead and underground utilities. Contractor shall coordinate with all of the appropriate agencies to verify utilities in the field. Contractor shall be responsible for the protection and maintenance and any damage to existing utilities and structures that may occur in the implementation of the scope of this project. CONTRACTORS MUST USE THE NEW STANDARD SCHEDULE OF COLORS DESIGNATED FOR MARKINGS ON THE GROUND, 1994 edition or better.
	00V1	WIRE LOW VOLT	Control wires for 24V Automatic Valves, shall be installed by Irrigation Contractor. Where required wire shall be sleeved in minimum 1" SCH 40 pipe electrical conduit buried beneath the mainline, where not possible wire shall be sleeved and at no less than 12" depth Contractor shall run two spare control wires to the furthest ends of system in each direction. Common wire shall be white, while the control wires shall each be a different color, and be different from spares...	All irrigation control wires shall be U. L. approved 24V solid copper wire. Wires shall operate 24V automatic sprinkler valves and enter the box from below. Individual control wires to be AWG size 14 gauge and common wires to be AWG white size 12 gauge. All BE APPROVED BY THE LAND. ARCH. ALL VALVE BOXES SET LEVEL W/GRADE Loop up spare wires at each control valve ALL SPLICING SHALL BE DONE IN VALVE BOXES ONLY.
	00V11	VALV BOX	VALVE COVER BOX - AMETEK Heavy Duty Box Locking Covers, JV8-12 Box 12" d with 14"x20" Cover	All valve assemblies to be installed below grade shall include AMETEK valve boxes with a 2" layer of drainage gravel as clean dry ballast for a bottom. Install top of box flush with surrounding grade, grass or mulch depending on location. Group valve assemblies so they are accessible with the correct size box. Any substitutions must be approved by landscape architect by providing sample or product information for review and written approval.
	00V1A	VALVE	PGV-101 to 201G - S - DC = 1" Globe valve, with flow control, slip x slip, and DC latching solenoid Electric w/ 24V Solenoid - SIZE OF VALVE TO ACCOMMODATE SYSTEM 2-20 GPM 1" 20-50 GPM 1.5" 50-100 GPM 2"	"All Valves shall be installed in a separate AMETEK valve box. All valve boxes to be placed upon a 2" layer of gravel. All valves assembled with IPS threaded nipples and then to PVC adapters. Top stem of valve assembly to be 6" below cap of valve cover box. This valve shall be used as the job standard Valve controlling each Zone as well as use as the Master Control Valve for applicable plans. All valve box locations to be approved by the Landscape Architect. All boxes to be set level with grade.
			Rain Bird PGA-PRS-D- Globe 1", 1-1/2", 2" Electric Remote Control Valve, Globe, With Pressure Regulator Module.	



ALSO FOR PIPE AND CONDUIT ACROSS ROADWAYS

PIPE SIZING SCHEDULE 40

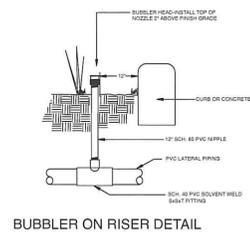
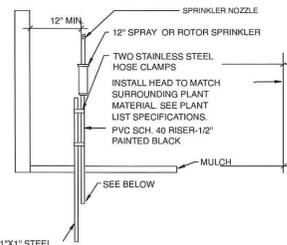
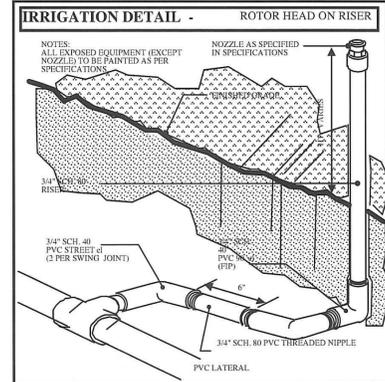
0-7 GPM	= 3/4"
8-12	= 1"
13-22	= 1 1/4"
23-30	= 1 1/2"
31-50	= 2"
51-70	= 2 1/2"
71-110	= 3"

SLEEVE UNDER ALL PAVEMENT ACCORDING TO THE SCHEDULE BELOW.

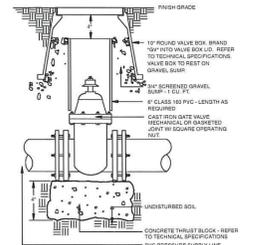
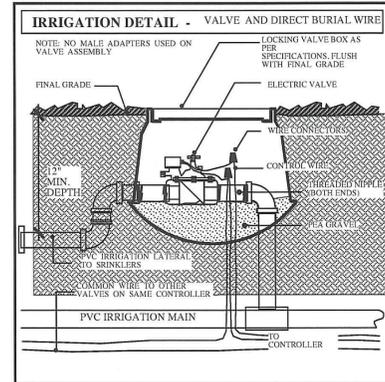
PIPE SLEEVING SCHEDULE

PIPE SIZE	SLEEVE SIZE
1"	2"
1 1/4"	2"
1 1/2"	3"
2"	4"
2 1/2"+	6"

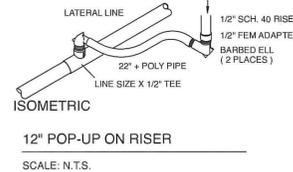
NOTE THAT NO SLEEVE SHALL BE LESS THAN 2"



BUBBLER ON RISER DETAIL
SCALE: N.T.S.



GATE VALVE 3" AND UP
SCALE: N.T.S.



12" POP-UP ON RISER
SCALE: N.T.S.

INSTALLATION NOTE:

- IRRIGATION CONTRACTOR SHALL NOT BE ALLOWED TO USE A MECHANICAL TRENCHER WHEN INSTALLING LATERALS, MAINS, AND/OR WIRING OR ANY OTHER MATERIAL NECESSARY FOR THE IRRIGATION SYSTEM WITHIN 10' FROM THE FACE OF AN EXISTING TREE. ALL TRENCHES WITHIN THE 10' OF THE TREE SHALL BE HAND DUG. ALL ROOTS EXPOSED SHALL BE CUT CLEANLY WITH NO JAGGED EDGES AND/OR TEARS.
- THE WATER SOURCE SHALL BE FROM THE EXISTING LAKE
- ALL IRRIGATION EQUIPMENT SHALL BE INSTALLED PER THE SOUTH FLORIDA BUILDING CODE LATEST EDITION.
- THE LOCATION OF THE MAIN IS SCHEMATIC.
- THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY AND CONSTRUCTION DOCUMENTS.
- THESE PLANS ARE NOT COMPLETE WITHOUT THE COMPLETE SET OF LANDSCAPE PLANS, SHEET L-1 AND L-2
- THE LAYOUT AND ZONING ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE ACTUAL LAYOUT AND WATER LOADS MAY BE REVISED BY THE CONTRACTOR TO ACCOMMODATE CONSTRUCTION.

THRUST BLOCK NOTES

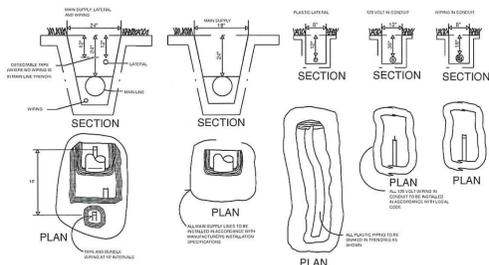
- Thrust block bearing areas shall be poured against undisturbed material. Where trench wall has been disturbed, excavate all loose material and extend to undisturbed material.
- Extend thrust block for full length of fittings. Put board in front of plug before pouring concrete. Joints shall not be covered by thrust block.
- Rough blocking forms shall be used along sides of thrust blocks.
- Thrust blocks shall be used in combination, as required, to suit the specific fitting arrangement.
- Alternate designed restraining systems shall be provided where standard thrust blocking is not suitable.
- All wood blocking shall be pressure treated with preservative.
- Install a plastic barrier (Visaquine) between fittings and thrust block.

SCHEDULE FOR THRUST BLOCK AREAS

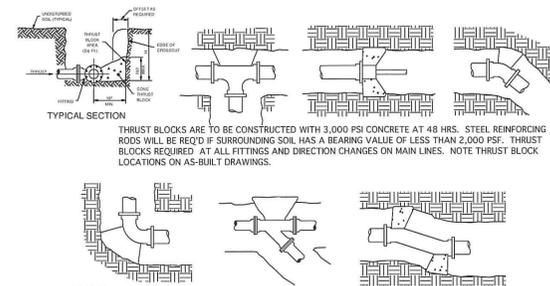
PIPE SIZE (INCH)	PIPE SCHED (SCH)	PIPE DIA (INCH)	PIPE WALL THICK (INCH)	PIPE WEIGHT (LBS/FT)	PIPE LENGTH (FT)	PIPE VOLUME (CU FT)	PIPE WEIGHT (LBS)	PIPE PRESSURE (PSI)
2	5	2.375	0.156	2.2	1	0.1	0.22	150
2.5	1.5	2.875	0.156	2.2	1	0.1	0.22	150
3	1.5	3.375	0.156	2.2	1	0.1	0.22	150
4	2.0	4.500	0.156	2.2	1	0.1	0.22	150

NOTE: Thrust block areas are based on basis of 3000 lbs. per sq. ft. wet residential loading.

SCHEDULE OF TYPICAL THRUST BLOCK AREAS
SCALE: N.T.S.



TYPICAL TRENCHING DETAILS
SCALE: N.T.S.



TYPICAL THRUST BLOCK DETAIL
SCALE: N.T.S.

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