

**INDEX OF SIGNALIZATION PLANS**

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**SIGNALIZATION PLANS**

**U.S. 441 (ORANGE BLOSSOM TRAIL)  
AT SPRING HARBOR BOULEVARD  
LAKE COUNTY**

THIS IS A METRIC UNIT PROJECT

SIGNALIZATION  
SHOP DRAWINGS TO BE SUBMITTED  
TO:  
DANTE A. GABRIEL, P.E.  
GMB ENGINEERS & PLANNERS, INC.  
3751 MAGUIRE BLVD., SUITE III  
ORLANDO, FLORIDA 32803

PLANS PREPARED BY:



GMB ENGINEERS & PLANNERS, INC.  
3751 MAGUIRE BLVD., SUITE III  
ORLANDO, FLORIDA 32803  
PHONE: 407-898-5424  
FAX: 407-898-5425

NOTE: THE SCALE OF THESE PLANS MAY  
HAVE CHANGED DUE TO REPRODUCTION.

**NOT FOR  
CONSTRUCTION**

GOVERNING STANDARDS AND SPECIFICATIONS:  
FLORIDA DEPARTMENT OF TRANSPORTATION,  
DESIGN STANDARDS DATED JANUARY 2004,  
AND STANDARD SPECIFICATIONS FOR ROAD  
AND BRIDGE CONSTRUCTION DATED 2004,  
AS AMENDED BY CONTRACT DOCUMENTS.

KEY SHEET REVISIONS		
DATE	BY	DESCRIPTION

SIGNALIZATION PLANS  
ENGINEER OF RECORD: DANTE A. GABRIEL, P.E.  
P.E. NO. # 37271

**MAR 11 2005**

SHEET  
NO.  
T-1

## TABULATION OF QUANTITIES

BID ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBER								TOTAL THIS SHEET	GRAND TOTAL	REFERENCE SHEET
			T-4		T-5		T-6		ORIGINAL	FINAL			
			ORIGINAL	FINAL	ORIGINAL	FINAL	ORIGINAL	FINAL					
2630-1-12	CONDUIT (F&I) (UNDERGROUND)	MI	10		71		360					441	
2630-1-14	CONDUIT (F&I) (DIRECTIONAL BORE)	MI	-		-		60					60	
2632-7-1	CABLE (SIGNAL) (F&I)	PI	3		1		-					4	
2633-4-112	FIBER OPTIC CABLE (F&I) (UNDERGROUND) (24 SM/12 MM)	MI	-		-		420					420	
2634-4-112	SPAN WIRE ASSEMBLY	PI	1		-		-					1	
2635-1-11	PULL AND JUNCTION BOXES (F&I) (PULL BOX)	EA	3		3		-					6	
2635-1-15	PULL AND JUNCTION BOXES (F&I) (FIBER OPTICS)	EA	-		-		8					8	
2639-1-22	ELECTRICAL POWER SERVICE (UNDERGROUND)	AS	1		-		-					1	
2639-2-1	ELECTRICAL SERVICE WIRE (F&I)	MI	30		-		-					30	
2641-16-16	PRESTRESSED CONCRETE STRAIN POLES (F & I, WITH FOUNDATION, TYPE VII)	EA	2		-		-					2	
2650-51-312	TRAFFIC SIGNAL (F&I - 3 SEC - 1WAY - LED - LIGHTWEIGHT)	AS	-		4		-					4	
2650-51-322	TRAFFIC SIGNAL (F&I - 3 SEC - 2 WAY - LED - LIGHTWEIGHT)	AS	-		2		-					2	
2650-54-312	TRAFFIC SIGNAL (RELOCATE - 3 SEC)	AS	8		-		-					8	
2653-181	PEDESTRIAN SIGNALS (F&I) (LED) (1WAY)	AS	-		4		-					4	
2659-109	SIGNAL HEAD AUXILIARIES (F&I) (CONCRETE PEDESTAL)	EA	1		1		-					2	
2663-74-11	VEHICLE DETECTOR ASSEMBLIES (OPTICAL VIDEO DETECTOR)	EA	3		-		-					3	
2665-11	PEDESTRIAN DETECTOR (F&I) (POLE MOUNTED)	EA	-		4		-					4	
2670-5-111	ACTUATED SOLID STATE CONTROLLER ASSEMBLY	AS	-		1		-					1	
2671-2-41	TRAFFIC CONTROLLER (MODIFY)	EA	-		-		1					1	
2699-1-1	SIGN, INTERNALLY ILLUMINATED (STREET NAME)	EA	-		3		-					3	

PAY ITEM 2663-74-11 SHALL INCLUDE ALL THE HARDWARE REQUIRED TO MOUNT TO THE CONCRETE STRAIN POLE. THE CONTRACTOR SHALL MOUNT THE DETECTORS ALONG THE POLE AT A HEIGHT THAT WOULD OPTIMIZE THE DETECTION CAPABILITY OF THE EQUIPMENT.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION



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ROAD NO.	COUNTY	GMB PROJECT NO.
US 441	LAKE	04-065.02

**TABULATION OF QUANTITIES**  
**U.S. 441 (ORANGE BLOSSOM TRAIL)**  
**AT TARGET ENTRANCE**

SHEET NO.  
T-2

1. THESE PLANS REFLECT CONDITIONS KNOWN DURING PLAN DEVELOPMENT. IN THE EVENT ACTUAL PHYSICAL CONDITIONS PREVENT THE APPLICATION OR THE PROGRESSION OF ANY WORK SPECIFIED IN THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY AND PRIOR TO ANY FURTHER WORK ACTIVITY
2. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES FORTY-EIGHT (48) HOURS IN ADVANCE OF WORK COMMENCING.
3. WHENEVER SIGNAL WORK IS BEING PERFORMED AT AN INTERSECTION (INSTALLING CONDUIT IN THE STREET, REMOVING EXISTING SIGNAL EQUIPMENT, INSTALLING NEW SIGNAL EQUIPMENT, INSTALLING LOOPS AND RUNS, AND TURNING ON NEW SIGNALS) WHERE A LANE IS CLOSED A TRAFFIC CONTROL OFFICER SHALL DIRECT TRAFFIC. THE COST OF THE TRAFFIC CONTROL OFFICER SHALL BE INCIDENTAL TO THE WORK AND WILL NOT BE PAID SEPARATELY.
4. THE CONTRACTOR SHALL FURNISH ALL NECESSARY EQUIPMENT INCLUDING A BUCKET TRUCK FOR TESTING AND INSPECTION OF TRAFFIC SIGNALS.
5. AT THE TIME OF FINAL PROJECT INSPECTION THE CONTRACTOR SHALL FURNISH TO THE ENGINEER THREE COMPLETE SETS OF AS-BUILT PLANS. ONE SET SHALL BE LEFT IN THE CABINET FOR THE LOCAL MAINTAINING AGENCY, LAKE COUNTY.
6. THE CONTRACTOR SHALL HAVE AN IMSA LEVEL II CERTIFIED SIGNAL TECHNICIAN ON CALL WITHIN A MAXIMUM OF TWO HOURS RESPONSE TIME.
7. THE CONTRACTOR IS REQUIRED TO INSPECT THE INSTALLATION OF THE TRAFFIC SIGNALS IN ACCORDANCE WITH STANDARD SPECIFICATION 105-5.10. THE CONTRACTOR SHALL COORDINATE THE FINAL INSPECTION WITH THE ENGINEER AT LEAST TEN DAYS IN ADVANCE. THE MAINTAINING AGENCY (LAKE COUNTY) AND RAY MARLIN AT (386) 943-5318 SHOULD ALSO BE CONTACTED TEN DAYS BEFORE THE INSPECTION IS TO BE PERFORMED SO THEY MAY BE PRESENT.
8. IT SHOULD BE NOTED THAT NO TEST BORINGS WERE MADE WHERE CONDUIT RUNS ARE TO BE INSTALLED BY JACKING OR TRENCHING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE JOB SITE CONDITIONS BEFORE SUBMITTING BID PROPOSALS IN ACCORDANCE WITH SECTION 2-4 OF THE FDOT SPECIFICATIONS.
9. AS DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL ADJUST CONDUIT VERTICALLY TO AVOID ANY POSSIBLE CONFLICTS WITH UNDERGROUND UTILITIES.
10. PULL BOXES SHALL BE PLACED BEHIND CURB AND GUTTER. IF THERE IS NO CURB AND GUTTER, THEN PULL BOXES SHALL BE PLACED AT LEAST 3 M FROM THE EDGE OF THE PAVEMENT.
11. ALL PULL BOX COVERS TO BE FURNISHED AND INSTALLED SHALL BE NON-METALLIC.
12. ALL TRAFFIC SIGNAL HEADS ON THE EAST AND WEST APPROACHES SHALL HAVE BACKPLATES.
13. INTERNALLY ILLUMINATED SIGNS SHALL BE INSTALLED AND OPERATIONAL AT THE TIME OF THE SIGNAL TURN ON DATE.
14. SIGNAL HEADS SHALL BE ALUMINUM, ALL LED, WITH TUNNEL VISORS.
15. THE CONTRACTOR IS RESPONSIBLE FOR COMPLETING SOFT DIGS PRIOR TO ORDERING THE STRAIN POLES TO VERIFY THAT THE POLE LOCATIONS ARE CLEAR OF UNDERGROUND UTILITY CONFLICTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER SHOULD THE POLE LOCATIONS REQUIRE RE-LOCATION.
16. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING THE CONCRETE STRAIN POLES, CONTROLLER CABINET, ELECTRICAL POWER SERVICE, ELECTRICAL SERVICE WIRE AND ALUMINUM SERVICE PEDESTAL DURING CONSTRUCTION SO THAT THEY CAN BE RE-USED FOR THE FINAL SIGNAL INSTALLATION. IF THESE ITEMS ARE DAMAGED DURING CONSTRUCTION, IT IS THE CONTRACTORS RESPONSIBILITY TO REPLACE THEM IN LIKE KIND.

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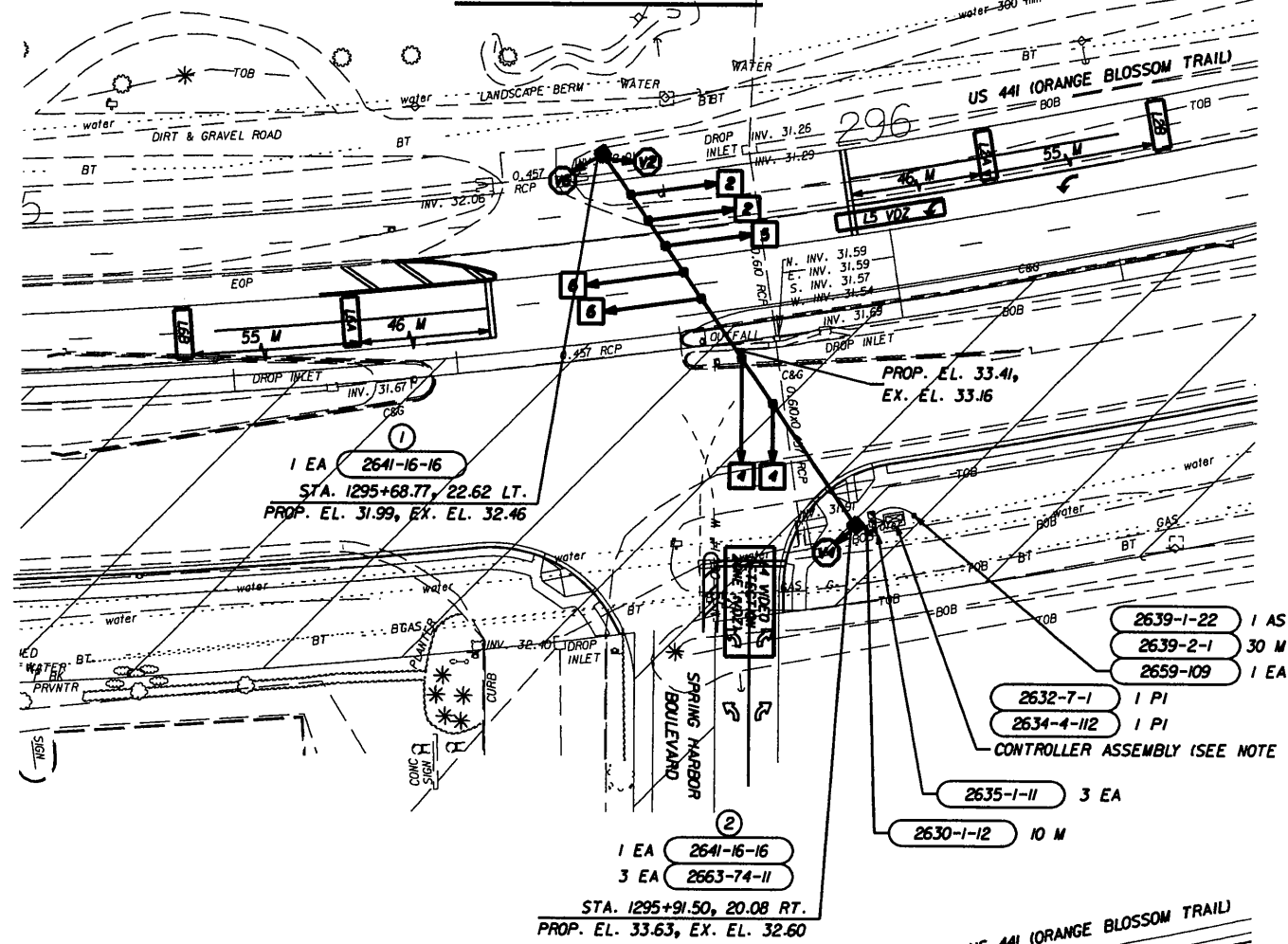


ROAD NO.	COUNTY	GMB PROJECT NO.
US 441	LAKE	04-065.02

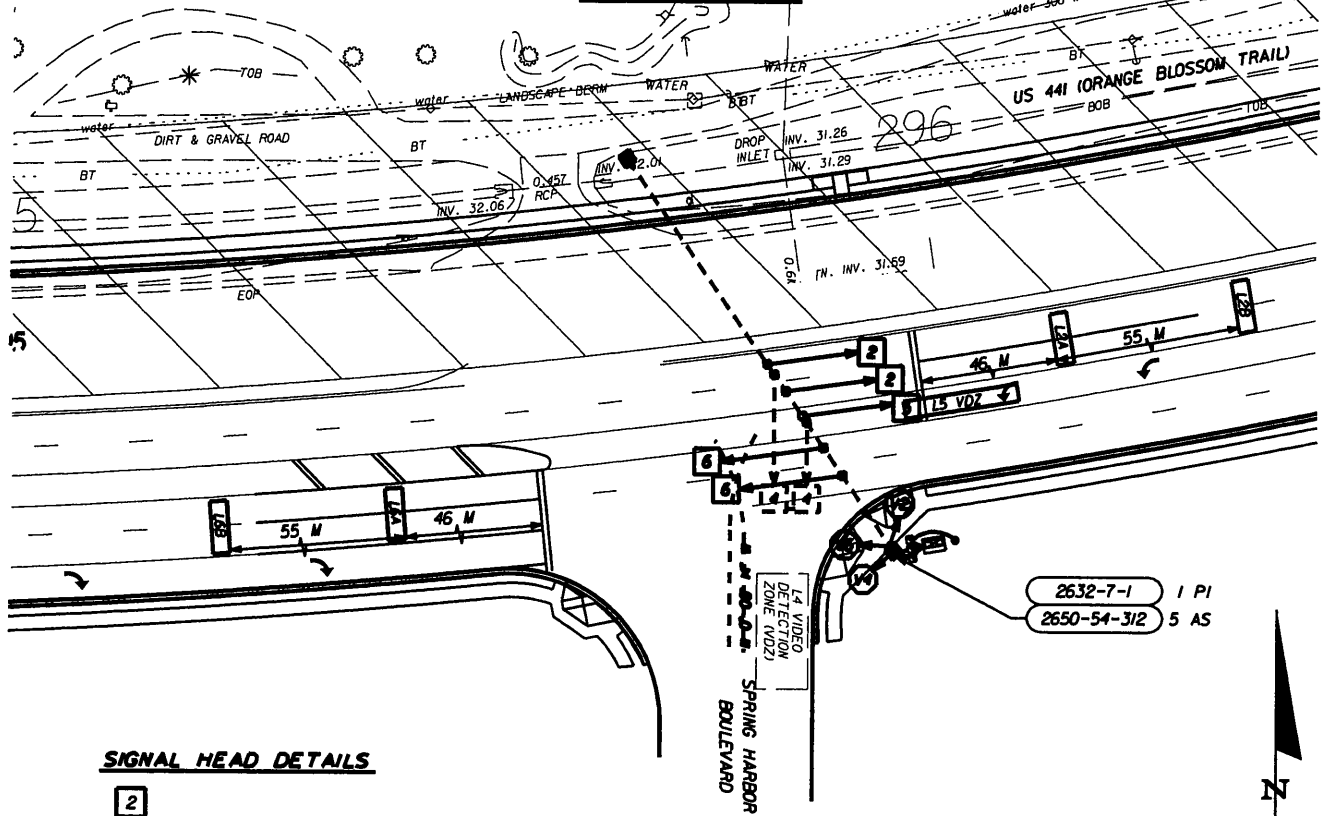
**GENERAL NOTES**  
**U.S. 441 (ORANGE BLOSSOM TRAIL)**  
**AT TARGET ENTRANCE**

SHEET NO.  
 T-3

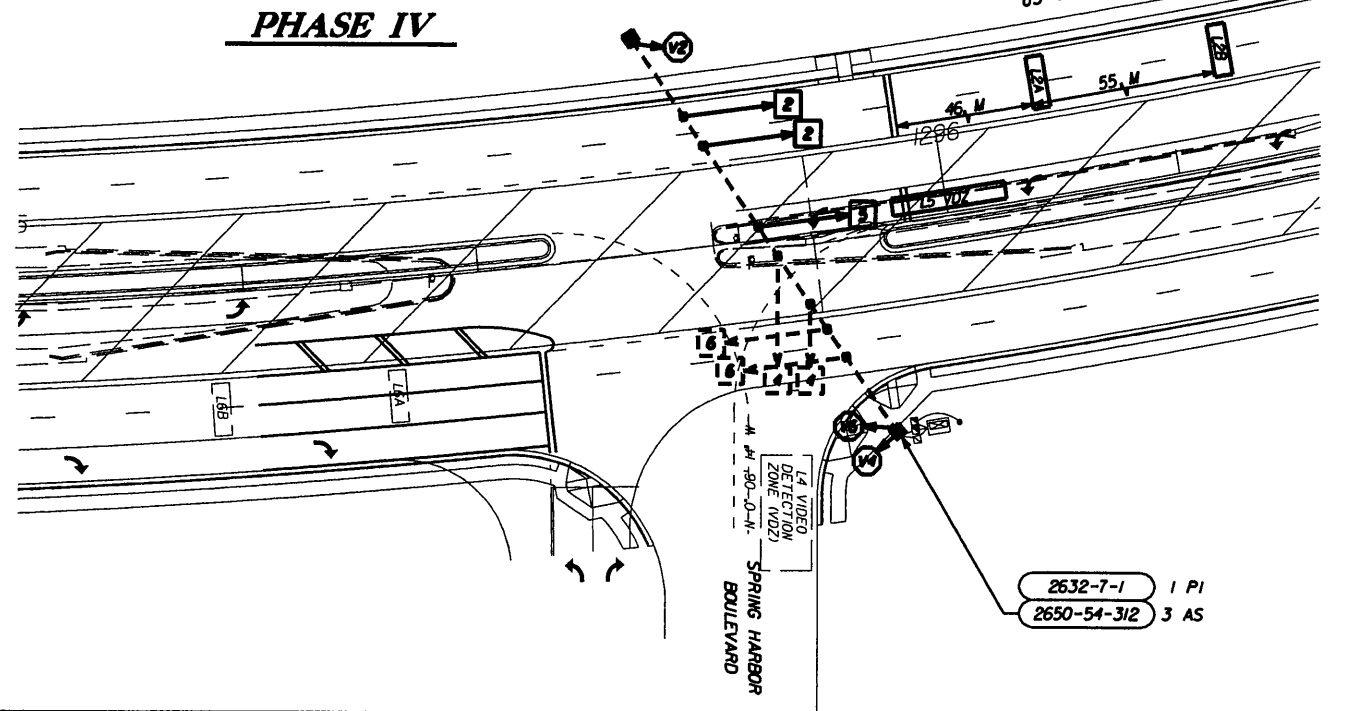
**PHASE I AND II**



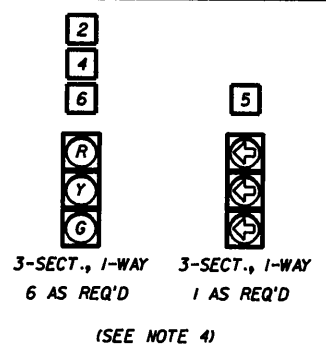
**PHASE III**



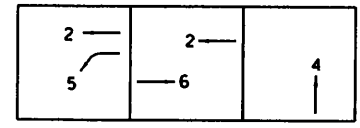
**PHASE IV**



**SIGNAL HEAD DETAILS**



**MOVEMENT DIAGRAM**  
(SOP 2)



CONTROLLER TIMINGS								
TIMING FUNCTION	1	2	3	4	5	6	7	8
MOVEMENT NUMBER	1	2	3	4	5	6	7	8
MINIMUM GREEN		15		5	5	15		
EXTENSION		3.0		2.5	2.5	3.0		
MAXIMUM GREEN 1		45		35	30	45		
MAXIMUM GREEN 2								
YELLOW CLEARANCE		4.5		4.5	4.5	4.5		
ALL RED		1.0		1.0	1.0	1.0		
PEDESTRIAN WALK								
PED. CLEARANCE								
DETECTOR FUNC.		L		NL	NL	L		
RECALL		MIN				MIN		
FLASH OPERATION		Y		R	R	Y		

**NOTES:**

- MAJOR STREET IS US 441 (ORANGE BLOSSOM TRAIL) (MOVEMENTS 2 & 6), AND MINOR STREET IS SPRING HARBOR BOULEVARD (MOVEMENT 4).
- SIGNAL OPERATING PLAN (SOP 2) FDOT INDEX 17870 WITH THE FOLLOWING FEATURES: DURING FLASH OPERATION, SIGNAL HEADS 2 & 6 WILL FLASH YELLOW AND ALL OTHER SIGNAL HEADS WILL FLASH RED.
- THE SIGNAL POLES AND SPAN SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE PROPOSED SIGNALIZATION PLAN SHOWN ON T-5, AND THE STRAIN POLE DETAILS SHOWN ON T-7. THE TOPS OF FOUNDATIONS SHALL BE INSTALLED TO MATCH THE PROPOSED ELEVATIONS SHOWN IN THE ROADWAY PLANS AND SHEET T-5.
- TEMPORARY SIGNAL HEADS AND CONTROLLER SHALL BE UTILIZED DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE TEMPORARY EQUIPMENT IS TO BE PROVIDED BY THE CONTRACTOR AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER INSTALLATION OF THE FINAL SIGNAL IS COMPLETE. PAYMENT FOR THE USE OF THE TEMPORARY EQUIPMENT SHALL BE INCLUDED IN PAY ITEMS 2650-51-312 AND 2670-5-III USED IN SHEET T-5.
- THE FINAL SIGNAL DESIGN SHALL BE INSTALLED IN PHASE IV (SEE SHT. T-5).
- PAY ITEM 2663-74-II SHALL INCLUDE THE RELOCATION OF ANY VIDEO DETECTORS DURING EACH CONSTRUCTION PHASE AND TO THEIR FINAL LOCATIONS.
- CATENARY WIRE SHALL BE 9.5 MM DIAMETER AND MESSENGER WIRE SHALL BE 12.7 MM DIAMETER.
- REFER TO THE TRAFFIC CONTROL PLANS FOR PAVEMENT MARKING DETAILS.
- THE ADVANCE DETECTION SPACING IS BASED ON A POSTED SPEED LIMIT OF 45 MPH.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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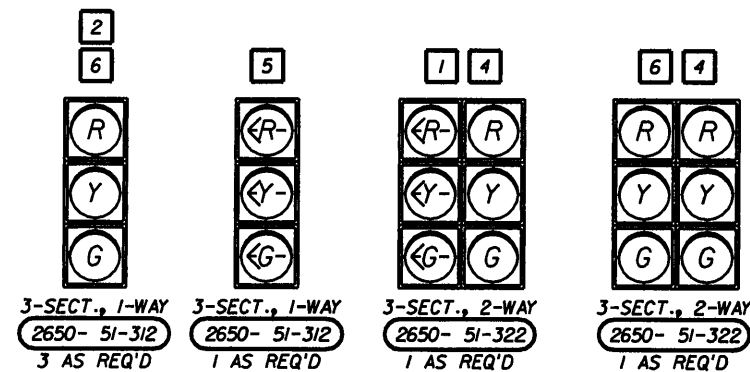
**TARGET**

ROAD NO.	COUNTY	GMB PROJECT NO.
US 441	LAKE	04-065.02

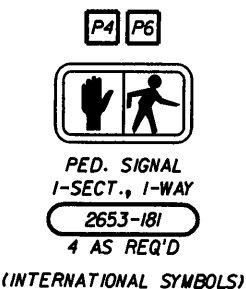
**SIGNALIZATION TRAFFIC CONTROL**  
**U.S. 441 (ORANGE BLOSSOM TRAIL)**  
**AT TARGET ENTRANCE**

SHEET NO.  
**T-4**

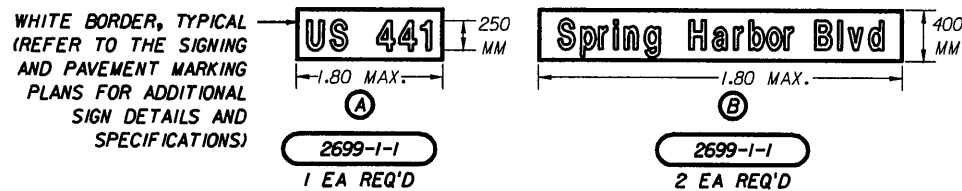
**SIGNAL HEAD DETAILS**



**PEDESTRIAN HEAD DETAILS**



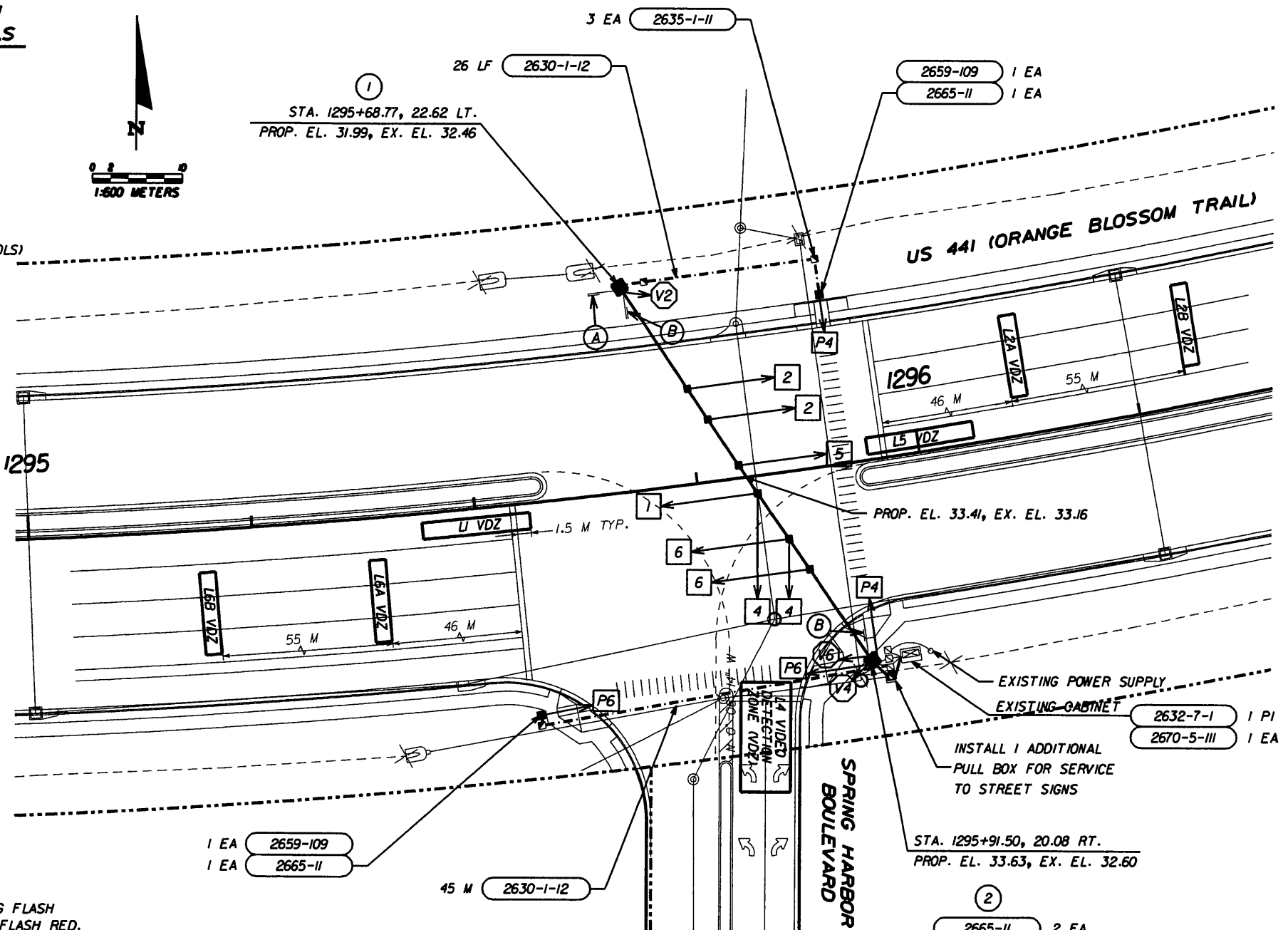
**OVERHEAD SIGNS**



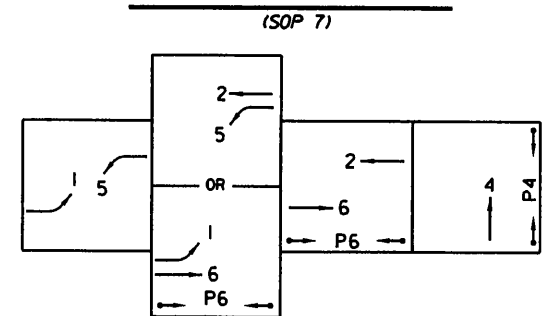
CONTROLLER TIMINGS		1	2	3	4	5	6	7	8
TIMING FUNCTION	MOVEMENT NUMBER								
MINIMUM GREEN		5	15		5	5	15		
EXTENSION		2.5	3.0		2.5	2.5	3.0		
MAXIMUM GREEN 1		20	45		35	20	45		
MAXIMUM GREEN 2		-	-		-	-	-		
YELLOW CLEARANCE		4.5	4.5		4.5	4.5	4.5		
ALL RED		1.0	1.0		1.0	1.0	1.0		
PEDESTRIAN WALK		-	7		5	-	-		
PED. CLEARANCE		-	25		30	-	-		
DETECTOR FUNC.		NL	LK		NL	NL	LK		
RECALL		-	MIN		-	-	MIN		
FLASH OPERATION		R	Y		R	R	Y		

**NOTES:**

- MAJOR STREET IS SR US 441 (ORANGE BLOSSOM TRAIL) (MOVEMENTS 2 & 6).
- SIGNAL OPERATING PLAN (SOP 7) FDOT INDEX 17870 WITH THE FOLLOWING FEATURES: DURING FLASH OPERATION, SIGNAL HEADS 2 & 6 WILL FLASH YELLOW AND SIGNAL HEADS 1, 4 AND 5 WILL FLASH RED.
- THE EXISTING CONCRETE STRAIN POLES AND THE EXISTING VIDEO DETECTION EQUIPMENT INSTALLED FOR TRAFFIC CONTROL DURING THE CONSTRUCTION PHASE OF THIS PROJECT SHALL BE RE-USED. PAY ITEM 2663-74-II (SHT. T-4) INCLUDES RELOCATION AND PROGRAMMING OF THE EXISTING VIDEO DETECTORS SHOWN IN THIS PLAN.
- PAY ITEM 2670-5-III SHALL INCLUDE ALL OF THE CONTROLLER EQUIPMENT NECESSARY TO INTERCONNECT BETWEEN EUDORA ROAD AND SPRING HARBOR BOULEVARD, AND THE PROGRAMMING AND INSTALLATION OF THE PEDESTRIAN FEATURES.
- THE TEMPORARY CONTROLLER SHALL BE REMOVED FROM THE CABINET AND REPLACED WITH A PERMANENT CONTROLLER. THE NEW CONTROLLER AND THE REMOVAL OF THE TEMPORARY CONTROLLER SHALL BE PAID FOR UNDER 2670-5-III.
- THE TEMPORARY SIGNAL HEADS SHALL BE REMOVED AND REPLACED WITH PERMANENT SIGNAL HEADS. THE TEMPORARY SIGNAL HEADS ARE THE PROPERTY OF THE CONTRACTOR AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE INSTALLATION OF THE FINAL SIGNAL HEADS IS COMPLETE. THE NEW SIGNAL HEADS AND THE USE AND REMOVAL OF THE TEMPORARY SIGNAL HEADS SHALL BE PAID FOR UNDER 2650-51-312 AND 2650-51-322.
- IN CASES OF MULTIPLE CONDUIT RUNS UNDER THE ROADWAY, THE FIRST RUN SHALL BE PAID FOR UNDER 2630-1-14 (UNDERGROUND-JACKED). SUBSEQUENT RUNS SHALL BE PAID FOR UNDER 2630-1-12 (UNDERGROUND).
- THIS FINAL DESIGN SHALL BE COMPLETED IN PHASE IV OF THE US 441 MOT PLAN.
- ADVANCE DETECTION SPACING IS BASED ON A POSTED SPEED LIMIT OF 45 MPH.



**MOVEMENT DIAGRAM**



DETECTORS FOR LOOPS				
LOOP	NO. OF LOOPS	NO. OF NEW DETS.	NO. OF EXIST. DETS.	DELAY TIME (SEC)
L-1/6	VIDEO	-	1	-
L-2/5	VIDEO	-	1	-
L-4	VIDEO	-	1	-

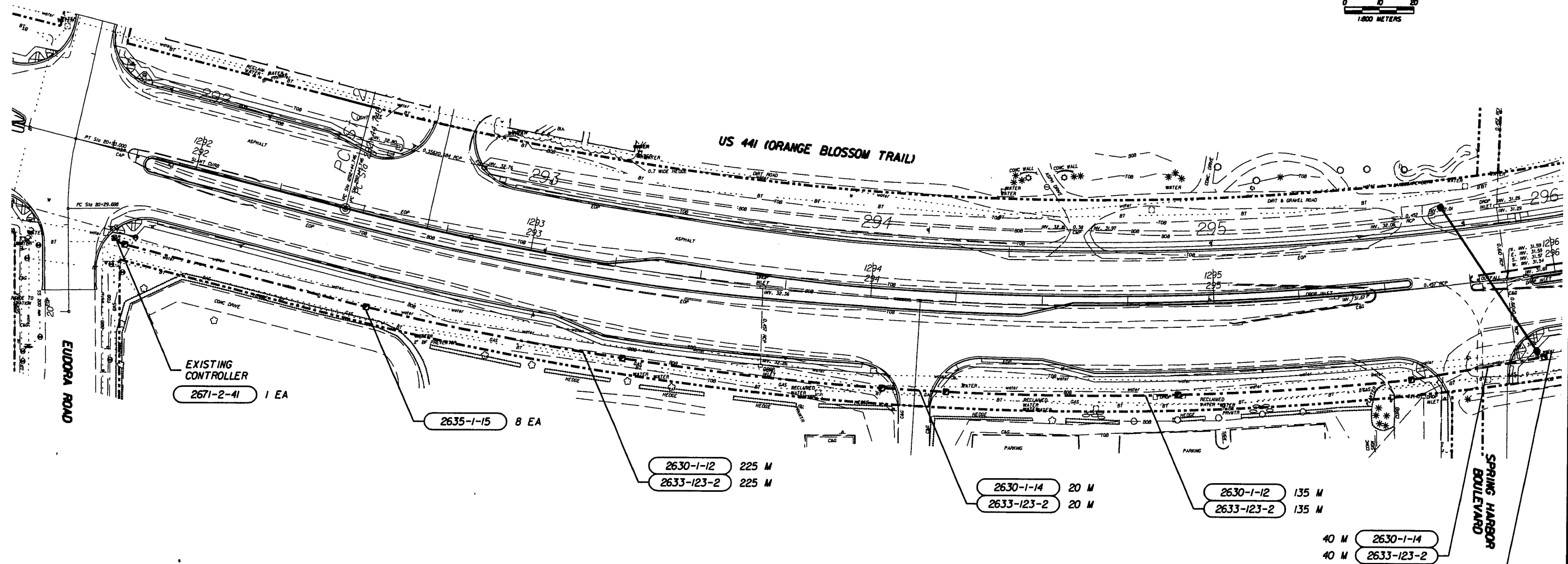
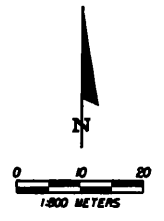
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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 Dante A. Gabriel, P.E., P.E.# 37271

ROAD NO.		
COUNTY	GMB PROJECT NO.	
US 441	LAKE	04-065.02

**SIGNALIZATION PLAN SHEET**  
**U.S. 441 (ORANGE BLOSSOM TRAIL)**  
**AT TARGET ENTRANCE**

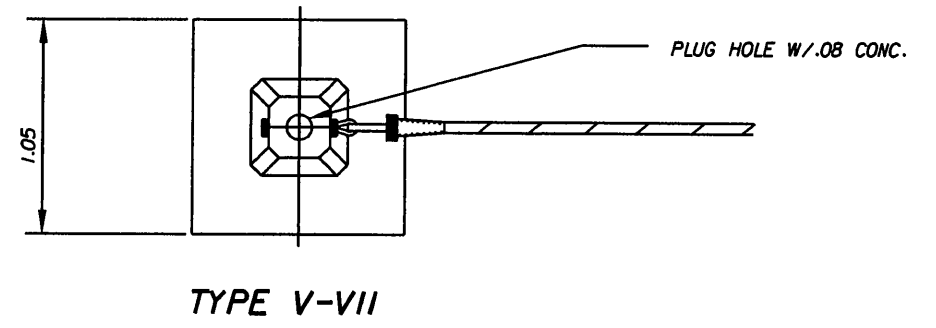
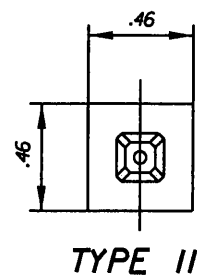
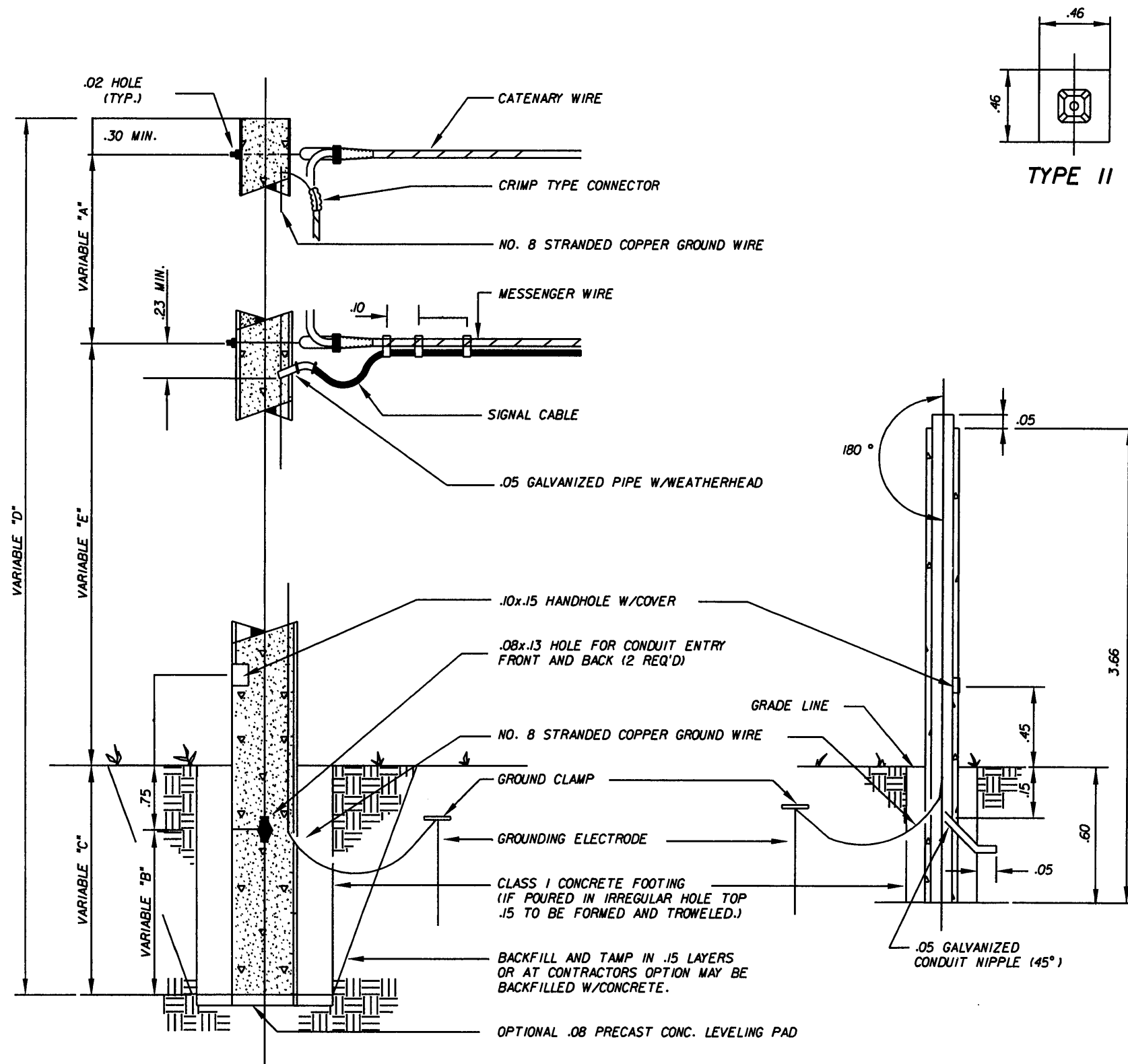
SHEET NO.  
 T-5



- NOTES:
1. NEW INTERCONNECT FIBER OPTIC CABLE SHALL BE RUN FROM SPRING HARBOR BOULEVARD TO EUDORA ROAD.
  2. A 14 GAUGE "LOCATE WIRE" SHALL BE PULLED IN WITH THE FIBER OPTIC CABLING.
  3. PULL BOX SPACING IS NOT TO EXCEED 76 METERS.
  4. PAY ITEM 2671-2-41 SHALL INCLUDE ANY CONTROLLER MODIFICATIONS REQUIRED IN ORDER TO ACCOMMODATE THE COORDINATION BETWEEN EUDORA ROAD AND SPRING HARBOR BOULEVARD.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	<b>GMB Engineers &amp; Planners, Inc.</b> 3751 Moquire Boulevard, Suite 111 Orlando, FL 32803 Phone: 407-898-5424 Fax: 407-898-5425 Dante A. Gabriel, P.E. P.E.# 37271			<b>INTERCONNECT PLAN SHEET</b> <b>U.S. 441 (ORANGE BLOSSOM TRAIL)</b> <b>AT TARGET ENTRANCE</b>	SHEET NO. <b>T-6</b>
	ROAD NO.	COUNTY	GMB PROJECT NO.		
US 441	LAKE	04-065.02			



**POLE SCHEDULE**

POLE NO.	TYPE	VARIABLE					NO. REQ'D	ITEM NO.
		A	B	C	D	E		
1	NVII	3.31	4.95	5.71	16	6.68	1	2641-16-16
2	NVII	3.31	3.28	4.04	16	8.35	1	2641-16-16

NOTE: THE CATENARY WIRE SHALL BE 9.5 MM DIAMETER AND THE MESSENGER WIRE SHALL BE 12.7 MM DIAMETER.

REVISIONS					
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**TARGET**

ROAD NO.	COUNTY	GMB PROJECT NO.
US 441	LAKE	04-065.02

**STRAIN POLE DETAILS**  
**U.S. 441 (ORANGE BLOSSOM TRAIL)**  
**AT TARGET ENTRANCE**

SHEET NO.  
 T-7



March 11, 2005

Mr. Thomas G. Lochrane, P.E.  
President  
Lochrane Consulting Engineers  
201 S. Bumby Avenue  
Orlando, FL 32803

RE: Draft Signalization Plans for US 441 at Spring Harbor Blvd. for Target in  
Mt. Dora, Lake County  
(GMB Project No. 04-065.02)

Dear Tom:

I am pleased to submit for your use three sets of the Traffic Signal Plans for US 441 at Spring Harbor Blvd. in Mt. Dora, Lake County. Please be advised that the plans are not for construction yet since it has not undergone review by FDOT and Lake County. The quantities may also change as a result FDOT review.

Please call if we can be of further assistance.

Sincerely,

GMB ENGINEERS & PLANNERS, INC.

A handwritten signature in black ink, appearing to read "Dante", is written over a large, stylized, handwritten flourish that extends to the left and loops back under the signature.

Dante A. Gabriel, P.E.

Enclosures

## Principals

**Dante A. Gabriel, P.E.**

**David W. Mulholland, P.E.**

**Babuji  
Ambikapathy, P.E., AICP**

**Andrew Ames, P.E.**

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