STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

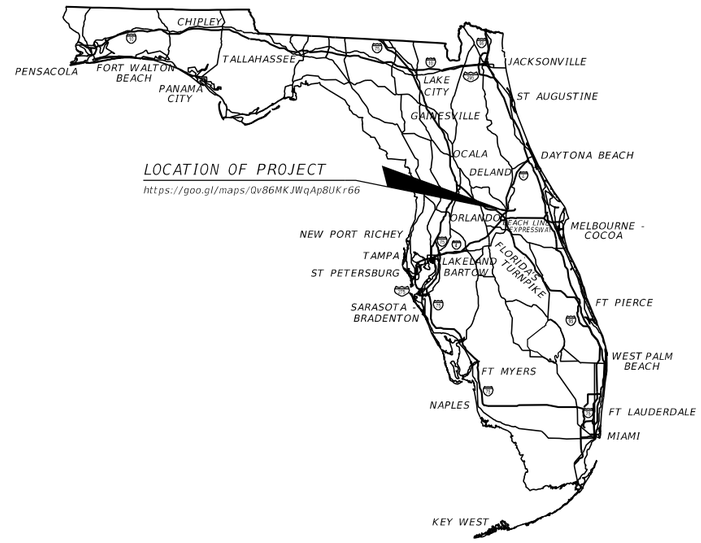
FINANCIAL PROJECT ID 441113-1-52-01

(FEDERAL FUNDS)

ORANGE COUNTY (75280)

STATE ROAD NO. 400 (I-4)

SIGNALIZATION PLANS



INDEX OF SIGNALIZATION PLANS

SIGNALIZATION PLANS
ENGINEER OF RECORD:

SUSANNE S. WILLIAMS, P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713
(386) 753-0558
CONTRACT NO.: C9I76
VENDOR NO.: F208375642002

FDOT PROJECT MANAGER:

SU HAO, P.E.

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
TBD	21	T-1

SUSANNE S. WILLIAMS
LICENSE
No 49486
STATE OF FLORIDA
PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713
SUSANNE S. WILLIAMS, P.E. NO. 49486

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-1	KEY SHEET
T-2	SIGNATURE SHEET
T-3	TABULATION OF QUANTITIES
T-4	GENERAL NOTES
T-5 - T-6	SIGNALIZATION PLANS
T-7	SIGNAL DETAILS
T-8 - T-9	QUADRANT DETAILS
T-10	STANDARD MAST ARM TABULATION
T-13	GUIDE SIGN WORK SHEET

BRIAN T. CHUNN
LICENSE
No 56769
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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ON THE DATE ADJACENT TO THE SEAL

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AECOM TECHNICAL SERVICES, INC.
150 N. ORANGE AVENUE, SUITE 200
ORLANDO, FL 32801-1949
BRIAN T. CHUNN, P.E. NO. 56769

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-2	SIGNATURE SHEET
T-11	STANDARD MAST ARM ASSEMBLIES DATA TABLE
T-12	MAST ARM FOUNDATION DETAILS

ZAN C. BATES
LICENSE
No 49917
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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ON THE DATE ADJACENT TO THE SEAL

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ARDAMAN AND ASSOCIATES
3331 BARTLETT BOULEVARD
ORLANDO, FL 32811
ZAN C. BATES, P.E. NO. 49917

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-2	SIGNATURE SHEET
T-14 - T-15	REPORT OF SPT BORINGS FOR SIGNALS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

SIGNATURE SHEET

SHEET NO.
T-2

TABULATION OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBERS														TOTAL THIS SHEET		GRAND TOTAL	
			T-5		T-6															
			PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL	PLAN	FINAL
455-107-6	DRILLED SHAFT CASING, 60" DIAMETER	LF	40		40												80		80	
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	313		274												587		587	
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	250		272												522		522	
632-7-1	SIGNAL CABLE - NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1		1												2		2	
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24" COVER SIZE	EA	15		17												32		32	
635-3-13	JUNCTION BOX, FURNISH & INSTALL, EMBEDDED	EA	2		1												3		3	
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER PURCHASED BY CONTRACTOR	AS	1		1												2		2	
639-2-1	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF																		
641-2-11	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II PEDESTAL	EA	1		1												2		2	
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	5		5												10		10	
649-21-3	STEEL MAST ARM ASSEMBLY, FURNISH & INSTALL, SINGLE ARM 40'	EA	1														1		1	
649-21-6	STEEL MAST ARM ASSEMBLY, FURNISH & INSTALL, SINGLE ARM 50'	EA	1		2												3		3	
649-21-15	STEEL MAST ARM ASSEMBLY, FURNISH & INSTALL, SINGLE ARM 70'	EA	2		2												4		4	
650-1-14	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 3 SECTION, 1 WAY	AS	10		10												20		20	
653-1-11	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN, 1 WAY	AS	4		4												8		8	
653-1-12	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN, 2 WAY	AS	1		1												2		2	
660-4-11	VEHICLE DETECTION SYSTEM - VIDEO, FURNISH & INSTALL CABINET EQUIPMENT	EA	1		1												2		2	
660-4-12	VEHICLE DETECTION SYSTEM - VIDEO, FURNISH & INSTALL ABOVE GROUND EQUIPMENT	EA	4		4												8		8	
665-1-11	PEDESTRIAN DETECTOR, FURNISH & INSTALL, STANDARD	EA	6		6												12		12	
670-5-111	TRAFFIC CONTROLLER ASSEMBLY, F&I, NEMA, 1 PREEMPTION	AS	1		1												2		2	
685-1-13	UNINTERRUPTIBLE POWER SUPPLY, FURNISH & INSTALL, LINE INTERACTIVE WITH CABINET	EA	1		1												2		2	
700-3-201	SIGN PANEL, FURNISH & INSTALL OVERHEAD MOUNT, UP TO 12 SF	EA	6		6												12		12	
700-5-22	INTERNALLY ILLUMINATED SIGN, FURNISH & INSTALL, OVERHEAD MOUNT, 12-18 SF	EA	4		4												8		8	
715-5-31	LUMINAIRE & BRACKET ARM-ALUMINUM, FURNISH & INSTALL-NEW LUMINAIRE AND ARM ON MAST ARM	EA	2		1												3		3	

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

TABULATION OF QUANTITIES

SHEET NO. T-3

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GENERAL:

1. MAINTAINING AGENCY CONTACT:
   ORANGE COUNTY TRAFFIC ENGINEERING 4200 S. JOHN YOUNG PARKWAY, ORLANDO, FL

2. TRAFFIC SIGNAL CONTACT:
   ORANGE COUNTY TRAFFIC ENGINEERING – (407) 836-7890
   FDOT TRAFFIC SIGNAL QUALITY ASSURANCE MANAGER – (386) 943-5318

CONTROLLER:

1. THE CONTROLLER ASSEMBLY SHALL CONSIST OF A NEMA TS2 CABINET TYPE 6 WITH A TS 2 TYPE 1 CONTROLLER. THE CONTROLLER ASSEMBLY SHALL HAVE ALL NECESSARY HARDWARE TO COMMUNICATE WITH ORANGE COUNTY TRAFFIC ENGINEERING SIGNAL SYSTEM. THE UPS CABINET AND EQUIPMENT SHALL BE COMPATIBLE WITH ORANGE COUNTY'S SYSTEM.

2. CONTROLLER SHALL BE ORIENTED SO THAT THE DOOR OPENS AWAY FROM THE INTERSECTION.

MAST ARMS:

1. STRUCTURES CONTACTS:
   DISTRICT FIVE STRUCTURES MAINTENANCE OFFICE – (386) 740-3463

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

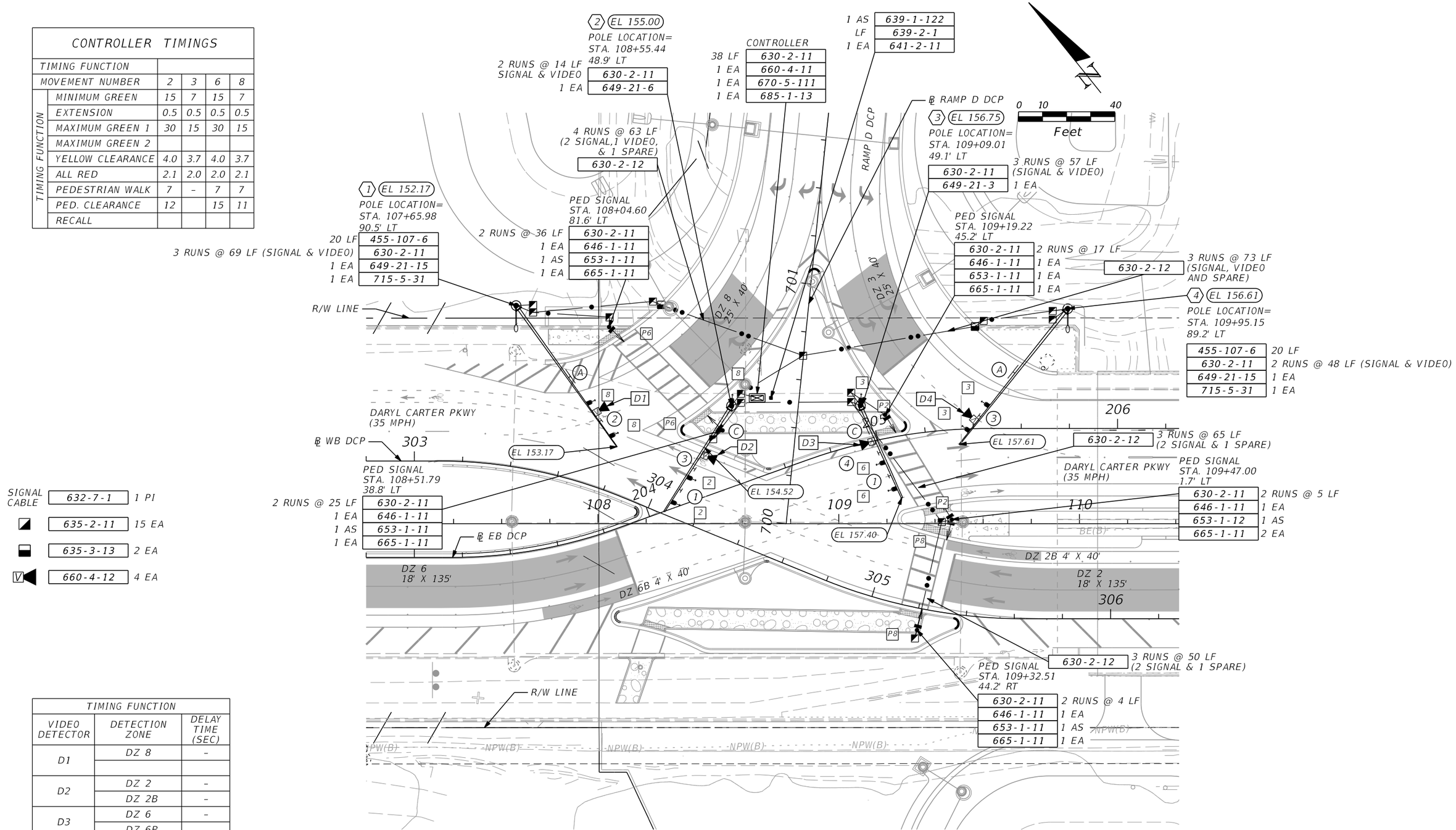
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

GENERAL NOTES

SHEET NO.
T-4

CONTROLLER TIMINGS				
TIMING FUNCTION				
MOVEMENT NUMBER	2	3	6	8
TIMING FUNCTION: MINIMUM GREEN	15	7	15	7
TIMING FUNCTION: EXTENSION	0.5	0.5	0.5	0.5
TIMING FUNCTION: MAXIMUM GREEN 1	30	15	30	15
TIMING FUNCTION: MAXIMUM GREEN 2				
TIMING FUNCTION: YELLOW CLEARANCE	4.0	3.7	4.0	3.7
TIMING FUNCTION: ALL RED	2.1	2.0	2.0	2.1
TIMING FUNCTION: PEDESTRIAN WALK	7	-	7	7
TIMING FUNCTION: PED. CLEARANCE	12		15	11
TIMING FUNCTION: RECALL				



SIGNAL CABLE	632-7-1	1 PI
	635-2-11	15 EA
	635-3-13	2 EA
	660-4-12	4 EA

TIMING FUNCTION		
VIDEO DETECTOR	DETECTION ZONE	DELAY TIME (SEC)
D1	DZ 8	-
D2	DZ 2	-
	DZ 2B	-
D3	DZ 6	-
	DZ 6B	-
D4	DZ 3	-

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

SIGNALIZATION PLAN

DARYL CARTER PKWY @ I-4 WB RAMP

SHEET NO. T-5

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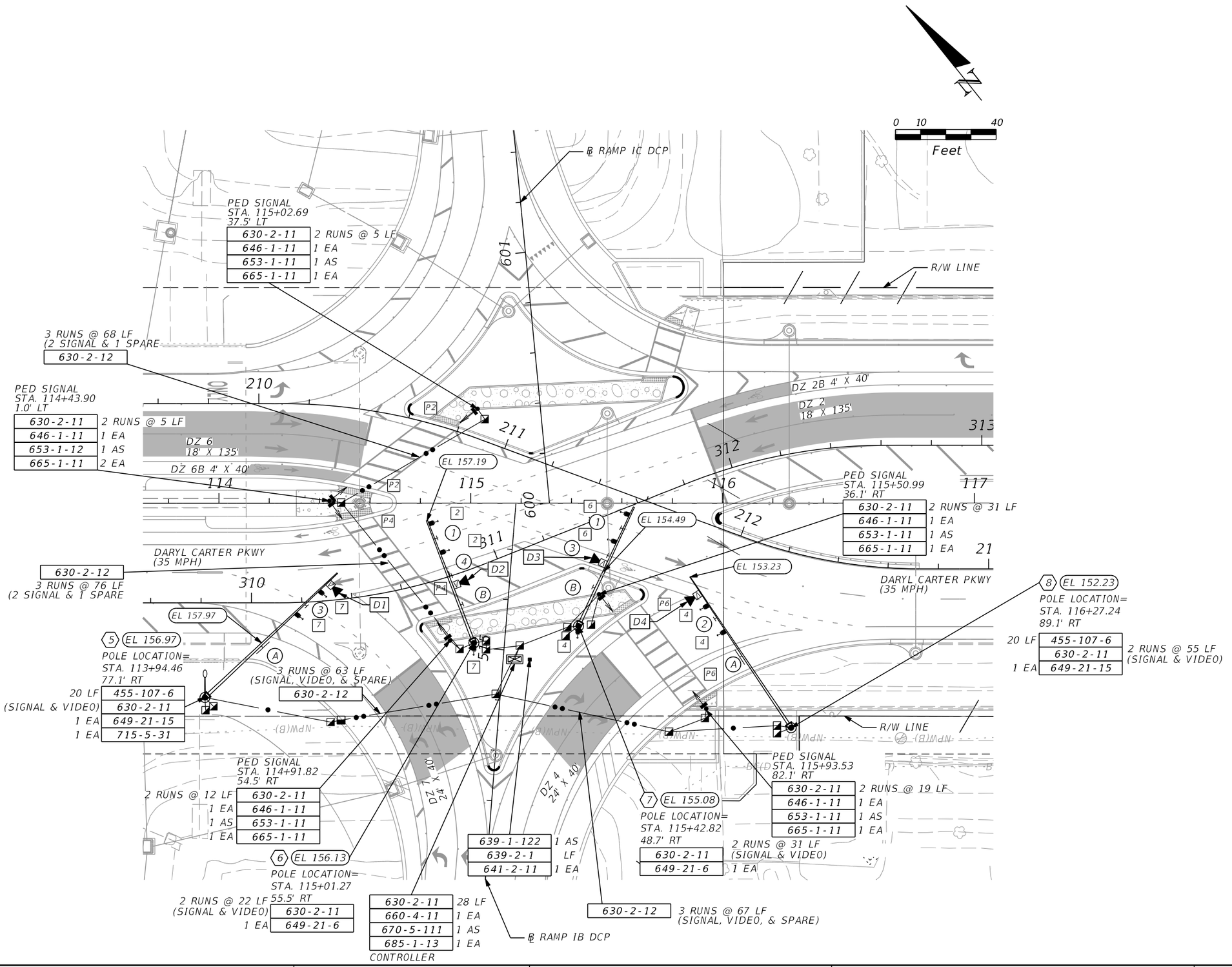
CONTROLLER TIMINGS					
TIMING FUNCTION					
MOVEMENT NUMBER		2	4	6	7
TIMING FUNCTION	MINIMUM GREEN	15	7	15	7
	EXTENSION	0.5	0.5	0.5	0.5
	MAXIMUM GREEN 1	30	30	30	15
	MAXIMUM GREEN 2				
	YELLOW CLEARANCE	4.0	3.7	4.0	3.7
	ALL RED	2.0	2.0	2.0	2.0
	PEDESTRIAN WALK	7	7	7	7
	PED. CLEARANCE	12	15	13	–
	RECALL				

SIGNAL CABLE	632-7-1	1 PI
◪	635-2-11	17 EA
◨	635-3-13	2 EA
V◤	660-4-12	4 EA

TIMING FUNCTION		
VIDEO DETECTOR	DETECTION ZONE	DELAY TIME (SEC)
D1	DZ 7	–
D2	DZ 2	–
	DZ 2B	–
D3	DZ 6	–
	DZ 6B	–
D4	DZ 4	–



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
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TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

SIGNALIZATION PLAN
DARYL CARTER PKWY @ I-4 EB RAMPS

SHEET NO. T-6

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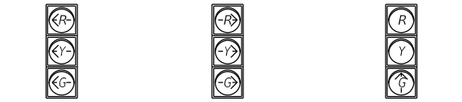
I-4 WESTBOUND RAMP



3-SECT., 1-WAY
3 AS
650-1-14
3

3-SECT., 1-WAY
3 AS
650-1-14
8

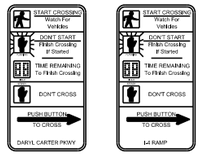
3-SECT., 1-WAY
4 AS
650-1-14
2 6

WEST SIGNAL PEDESTRIAN DETAIL

PED. SIGNAL
COUNT-DOWN
1-SECT., 1-WAY
4 AS
653-1-11
P2 P6 P8

PED. SIGNAL
COUNT-DOWN
1-SECT., 2-WAY
1 AS
653-1-12
P2 P8

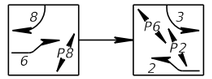
WEST SIGNAL PEDESTRIAN SIGN DETAIL



R10-3i
4 AS

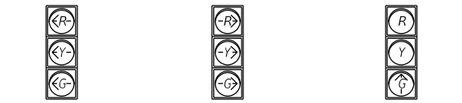
R10-3i
2 AS

WEST SIGNAL MOVEMENT CHART



PHASE 1 PHASE 2

I-4 EASTBOUND RAMP



3-SECT., 1-WAY
3 AS
650-1-14
7

3-SECT., 1-WAY
3 AS
650-1-14
4

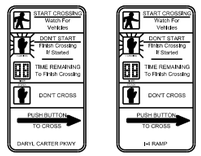
3-SECT., 1-WAY
4 AS
650-1-14
2 6

EAST SIGNAL PEDESTRIAN DETAIL

PED. SIGNAL
COUNT-DOWN
1-SECT., 1-WAY
4 AS
653-1-11
P2 P4 P6

PED. SIGNAL
COUNT-DOWN
1-SECT., 2-WAY
1 AS
653-1-12
P4 P2

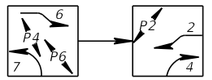
EAST SIGNAL PEDESTRIAN SIGN DETAIL



R10-3i
4 AS

R10-3i
2 AS

EAST SIGNAL MOVEMENT CHART



PHASE 1 PHASE 2

SIGN LEGEND

① ONLY
R3-5a 30" X 36"
700-3-201
4 EA

② NO TURN ON RED
R10-11a 30" X 36"
700-3-201
2 EA

③

R3-1 36" X 36"
700-3-201
4 EA

④

R3-2 36" X 36"
700-3-201
2 EA

SIGN ASSEMBLIES SHALL BE SINGLE-PANEL, ONE-WAY.
FOR DETAILS SEE GUIDE SIGN WORKSHEET

Ⓐ LOGO Daryl Carter Pkwy
4 EA

Ⓑ I-4 EB
2 EA

Ⓒ I-4 WB
2 EA

700-5-22

CONTROLLER OPERATIONS

1. THE MAJOR STREET IS DARYL CARTER PKWY, AND THE MINOR STREETS ARE THE SR 400 (I-4) RAMPS.
2. DURING FLASHING OPERATION, ALL MOVEMENTS SHALL FLASH RED.
3. CONTROLLER CABINETS SHALL BE WIRED AND OPERATED WITH SPECIAL S.O.P. AS SHOWN.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

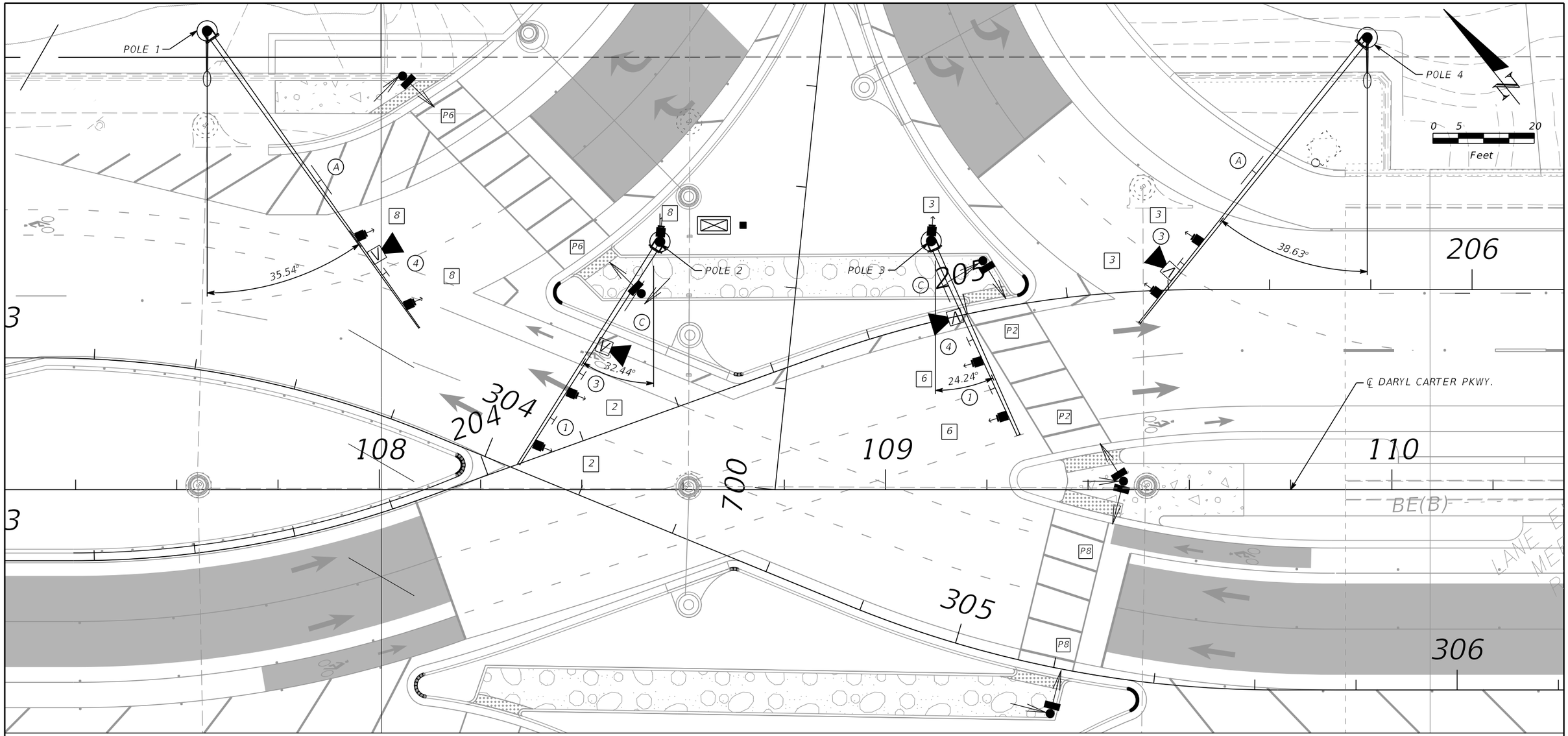
SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

SIGNAL DETAILS

SHEET NO.
T-7



NOTE:
MAST ARM ANGLES BASED OFF ℄ OF DARYL CARTER PKWY.

LUMINAIRE ANGLES	
POLE #	ANGLE FROM ARM CENTER
1	35°37'37"
2	N/A
3	N/A
4	38°37'42"

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

QUADRANT DETAILS

DARYL CARTER PKWY @ I-4 WB RAMP

SHEET NO.
T-8

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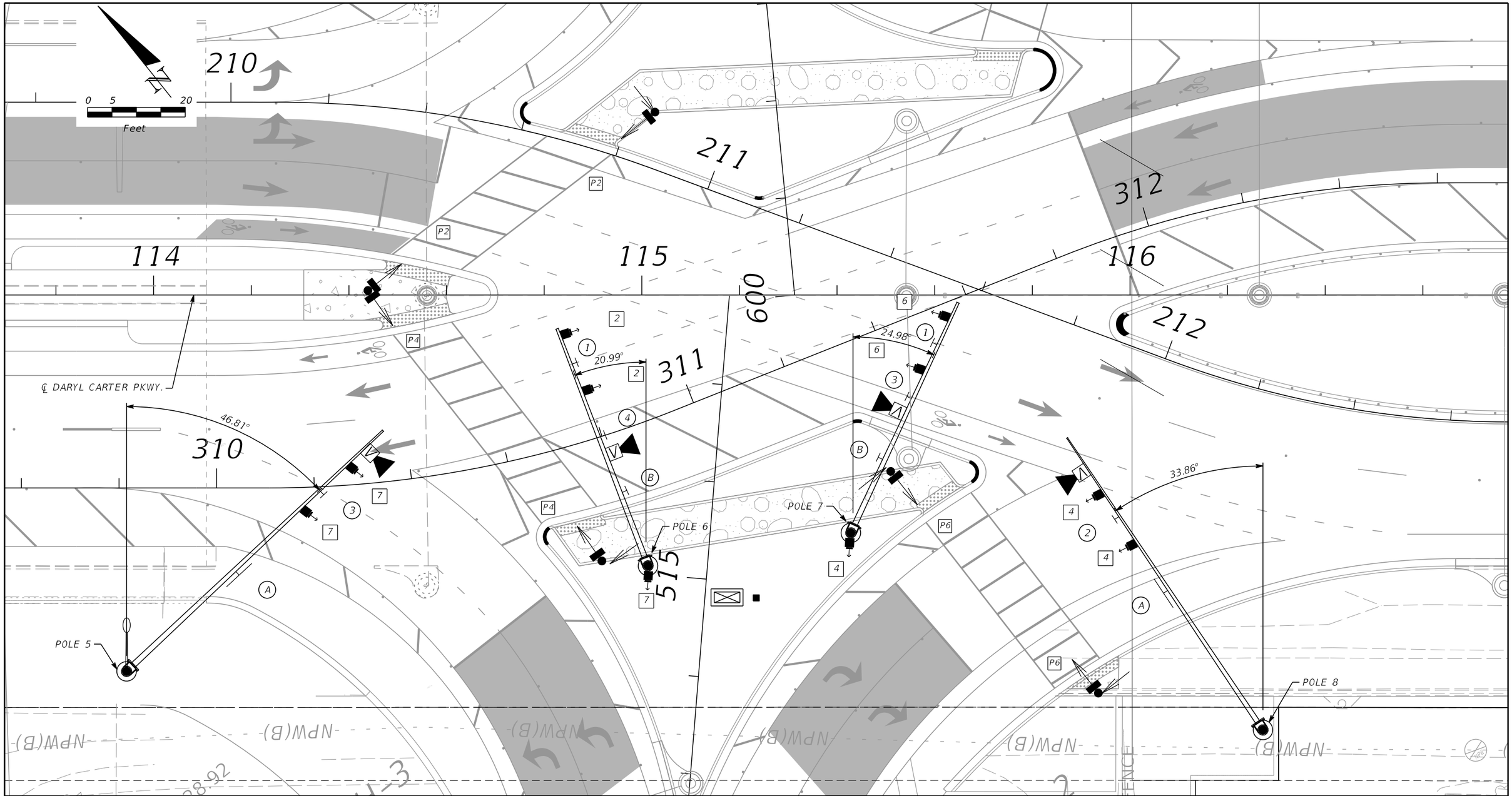

NOTE:
MAST ARM ANGLES BASED OFF ℄ OF DARYL CARTER PKWY.

LUMINAIRE ANGLES	
POLE #	ANGLE FROM ARM CENTER
5	46°48'35"
6	N/A
7	N/A
8	N/A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

QUADRANT DETAILS

DARYL CARTER PKWY @ I-4 EB RAMP

SHEET NO. T-9

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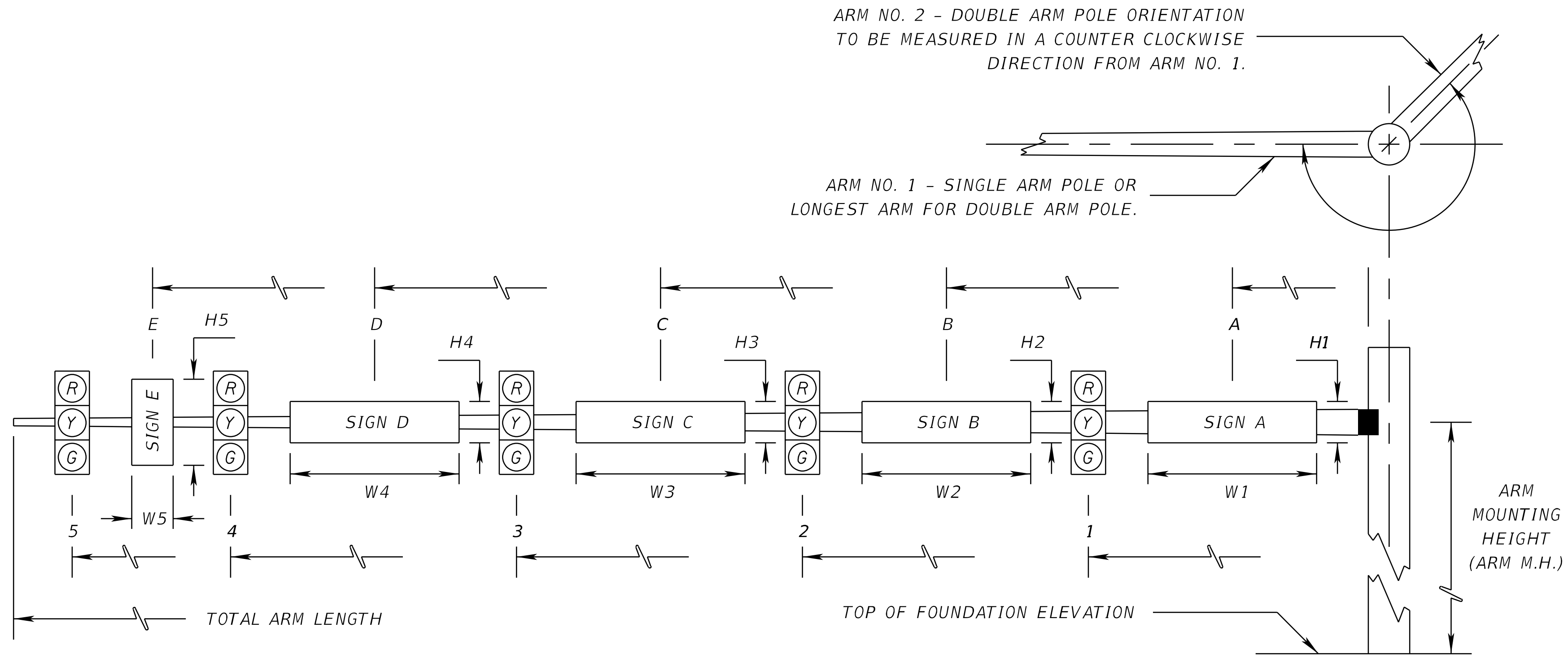
SPECIAL INSTRUCTIONS					
ID NO.	PED. BUTTON		PED. SIGNALS		HANDHOLE LOCATION



* DENOTES NUMBER OF SECTIONS IN SIGNAL HEAD ASSEMBLY

ID NO.	SHEET NO.	LOCATION BY STA.	TOP OF FOUND. ELEVATION	RDWY ARM NO.	CROWN ELEV.	SIGNAL DATA: SIGNAL V/H	BACK PLATES Y/N	PED. SIGNAL Y/N	DISTANCE FROM POLE: 1	*	2	*	3	*	4	*	5	*	TOTAL ARM LENGTH	ARM M.H.	ANGLE BETWEEN DUAL ARMS 90/270	SIGN DATA: DISTANCE FROM POLE / HEIGHT AND WIDTH OF SIGN: A	H1	W1	B	H2	W2	C	H3	W3	D	H4	W4	E	H5	W5	PAINT COLOR
1	T-6	107+65.98	152.17	1	153.17	V	Y	N	48.5	3	65.0	3							70	21.0		35	2	9	57.5	3	2.5										
---	-----	--------------	-------	2																	-----																
2	T-6	108+55.44	155.00	1	154.52	V	Y	N	0.0	3	33.0	3	45.0	3					50	19.5		9.5	2	5	28.5	3	3	39	3	2.5							
---	-----	--------------	-------	2																	-----																
3	T-6	109+09.01	156.75	1	157.40	V	Y	N	0.0	3	23.5	3	35.5	3					40	21.0		7	2	5	19.0	3	3	30	3	2.5							
---	-----	--------------	-------	2																	-----																
4	T-6	109+95.15	156.61	1	157.61	V	Y	N	50.0	3	63.5	3							70	21.0		32.5	2	9	56	3	3										
---	-----	--------------	-------	2																	-----																
5	T-7	113+94.46	156.97	1	157.97	V	Y	N	47.0	3	60.0	3							70	21.0		28.5	2	9	52	3	3										
---	-----	--------------	-------	2																	-----																
6	T-7	115+01.27	156.13	1	157.19	V	Y	N	0.0	3	36.0	3	48.5	3					50	21.0		14	2	5	26.0	3	3	42	3	2.5							
---	-----	--------------	-------	2																	-----																
7	T-7	115+42.82	155.08	1	154.49	V	Y	N	0.0	3	35.0	3	46.5	3					50	19.5		14.5	2	5	28	3	3	40.5	3	2.5							
---	-----	--------------	-------	2																	-----																
8	T-7	116+27.24	152.23	1	153.23	V	Y	N	44.5	3	57.0	3							70	21.0		32.5	2	9	50.5	3	2.5										
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				1																																	
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THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

STANDARD MAST ARM TABULATION

SHEET NO.
T-10

STANDARD MAST ARM ASSEMBLIES DATA TABLE

Table Date 11-01-16

STRUCTURE ID NUMBERS	DESIGNATION	FIRST ARM		SECOND ARM		UF (deg)	LL (deg)	POLE			DRILLED SHAFT ID
		ARM ID	FAA (ft.)	ARM ID	SAA (ft.)			POLE ID	UAA (ft.)	UB (ft.)	
Pole 1*	A70/S-P5/S/L	A70/S	–	–	–	–	324.37	P5/S/L	–	21	**
Pole 2	A50/S-P3/S	A50/S	–	–	–	–	–	P3/S	–	19.5	DS/16/4.5
Pole 3	A40/S-P2/S	A40/S	–	–	–	–	–	P2/S	–	21	DS/14/4.5
Pole 4*	A70/S-P5/S/L	A70/S	–	–	–	–	38.63	P5/S/L	–	21	**
Pole 5*	A70/S-P5/S/L	A70/S	–	–	–	–	46.81	P5/S/L	–	21	**
Pole 6	A50/S-P3/S	A50/S	–	–	–	–	–	P3/S	–	21	DS/16/4.5
Pole 7	A50/S-P3/S	A50/S	–	–	–	–	–	P3/S	–	19.5	DS/16/4.5
Pole 8*	A70/S-P5/S	A70/S	–	–	–	–	–	P5/S	–	21	**

*Note that the Mast Arm Poles 1, 4, 5 and 8 will be installed adjacent to an existing MSE wall supporting Daryl Carter Parkway. To ensure that construction of the drilled shaft foundations at these locations do not compromise the stability of the MSE wall, permanent steel casing shall be installed as shown in the drilled shaft details provided in the plans.

**Drilled Shaft Length and Stirrup Spacing varies from Standard Mast Arm Assembly due to extended shaft. See Drilled Shaft Data Table this sheet.

DRILLED SHAFT DATA TABLE

STRUCTURE ID NUMBERS	DA (ft.)	DB (ft.)	RA	RB	RC	RD (in.)	RE	RF (in.)
Pole 1	60	5	11	19	***	***	***	***
Pole 4	65	5	11	19	***	***	***	***
Pole 5	70	5	11	19	***	***	***	***
Pole 8	67	5	11	19	***	***	***	***

***Above grade drilled shaft extension column required for foundations for Poles 1, 4, 5 & 8. For stirrup spacing and other details, see Sheet "Mast Arm Foundation Details" (Poles 1, 4, 5 & 8)

NOTES:

1. If an entry appears in column FAA, a shorter arm is required. This is obtained by removing length from the arm tip and the arm length shortened from FA to FAA. SAA Similar.

2. If an entry appears in column UAA, a shorter pole is required. This is obtained by removing length from the pole tip and the pole height shortened from UA to UAA.

3. Arm mounting height UB must be between 18-22 feet.

4. Pole types P2 and larger require a minimum 4.5 foot diameter drilled shaft. Pole types P5 and larger require a minimum 5.0 foot diameter drilled shaft.

5. Work this sheet with the Signal Designer's "Standard Mast Arm Tabulation". See "Mast Arm Tabulation" for special instructions that include non-standard Handhole location, paint color, terminal compartment requirement, and pedestrian features.

6. Work with Index 649-030 and 649-031.

FOUNDATION NOTES:

1. Design based on Borings taken sealed by
   Ardaman & Associates, Inc. Dated: 04-06-2020
2. Assumptions and Values used in design:
   - Soil Type: Sand
   - Soil Layer Thickness = Full Depth of Shaft
   - Soil Friction Angle = Varies. See Geotech Report.
   - Soil Weight = Varies. See Geotech Report.
   - Design Water Table is 0 ft. below surface

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

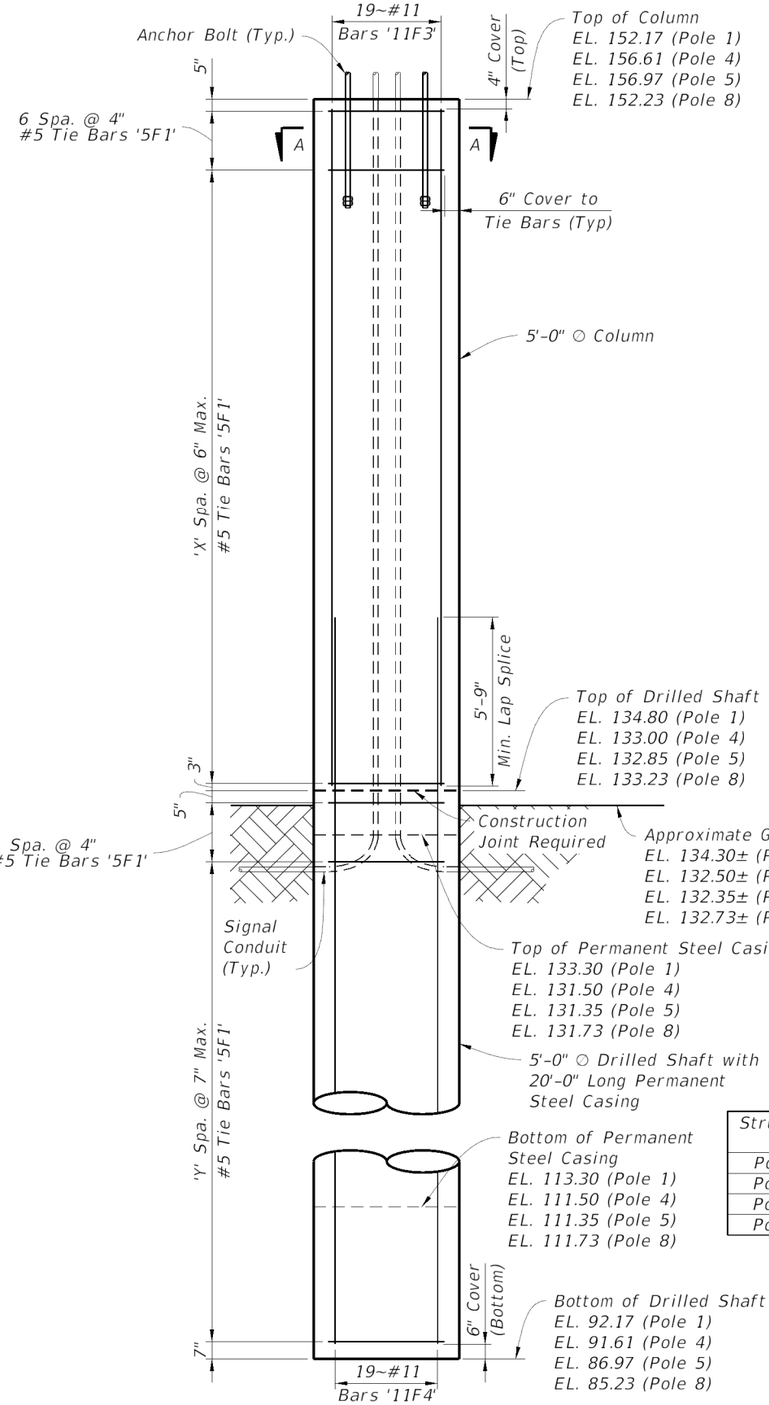
AECOM Technical Services, Inc.
150 North Orange Avenue
Suite 200
Orlando, FL 32801
Brian T. Chunn, P.E. No. 56769

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

STANDARD MAST ARM ASSEMBLIES DATA TABLE

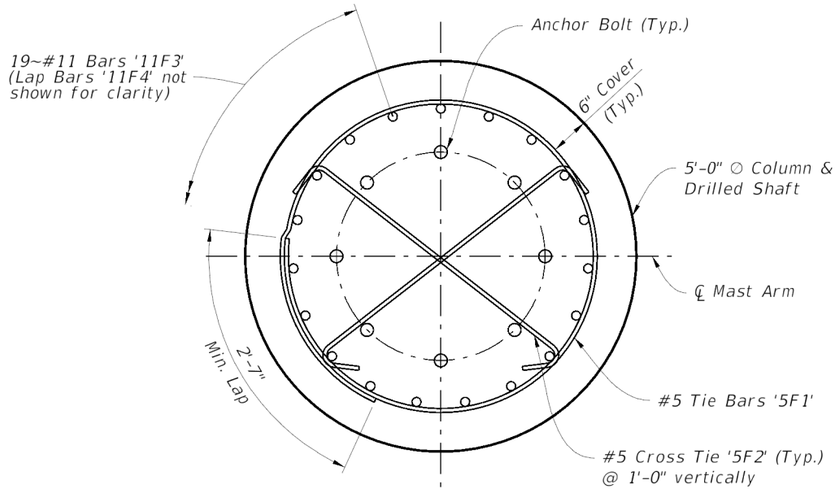
SHEET NO. T-11



Structure No.	'X'	'Y'
Pole 1	30	68
Pole 4	42	66
Pole 5	43	74
Pole 8	33	78

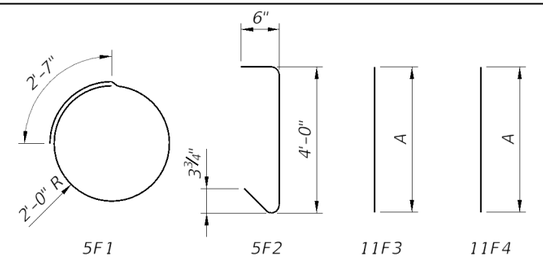
ELEVATION MAST ARM POLES 1, 4, 5 & 8 COLUMN & DRILLED SHAFT

(#5 Cross Tie '5F2' Bars Not Shown for Clarity)



SECTION A-A

BAR BENDING DIAGRAM



Structure No.	'A' 11F3	'A' 11F4
Pole 1	16'-10½"	48'-1"
Pole 4	23'-1½"	46'-10"
Pole 5	23'-7½"	51'-4"
Pole 8	18'-6"	53'-5"

Notes:

1. For Mast Arm, Drilled Shaft, and Anchor Bolt Details refer to Sheet "Standard Mast Arm Assemblies Data Table" and Standard Index 649-030 & 649-031.
2. The top surface of the Drilled Shaft shall be intentionally roughened to a ¼" minimum amplitude.
3. Two #5 Cross Tie Bars shall be placed only in the Column and in the same plane as the #5 Ties as shown in Plan View. The lap location of the #5 Tie shall be varied along the Column.
4. The Contractor has the option of using staggered mechanical couplers from the QPL, capable of developing 125% of the specified yield strength of the Drilled Shaft longitudinal bar, rather than providing 5'-9" min. lap splice as shown. Couplers and layout shall be submitted and approved prior to construction. Clear cover shall be maintained.
5. The exposed Column and Drilled Shaft shall receive a Class 5 Finish. See "Surface Finish Details" and "Aesthetic Details," sheets B-7 & B-8 located in the Bridge Plans.
6. The Contractor shall utilize Class IV (Drilled Shaft) concrete for construction of the Mast Arm Columns and Drilled Shaft.
7. Reinforcing Steel shall meet the requirements of ASTM A615, Grade 60.
8. Contractor shall construct the Drilled Shaft with a permanent steel casing. Permanent steel casing shall be installed before drilling or excavation for the drilled shaft.
9. CSL access tubes are only intended for the Drill Shafts. Install CSL tubes to a point high enough above the top of the top of drilled shaft to allow for cross-hole-sonic-logging testing, but not less than 30 inches above the top of the drilled shaft.
10. Prior to constructing the drilled shaft, the Contractor shall coordinate with the CSL testing agency to ensure that neither vertical reinforcing lap splices nor possible mechanical couplers at the bottom of the Column will interfere with the CSL testing. Column Ties may need to be temporarily moved for CSL Testing.
11. The concrete Columns shall not be erected until any related cross-hole-sonic-logging testing is completed and accepted by the Owner. The concrete Columns shall not be erected until the concrete Drilled Shaft has been allowed to cure for a minimum of seven days, and concrete has achieved at least 75% if its 28-day compressive strength.
12. Payment for the concrete Column, Drilled Shaft, and other incidental related items shall be included in the pay item for the complete Cantilever Sign Structure.
13. Layers of very dense materials were encountered in the borings performed at this site. Such materials may make shaft excavations and/or casing installation difficult. Specialized equipment and/or procedures may be needed to facilitate shaft excavation and/or casing installation. Where casing is used, the casing tip should be reinforced and the casing thickness adequate to prevent casing damage/deformation during installation through hard layers.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

AECOM Technical Services, Inc.
150 North Orange Avenue
Suite 200
Orlando, FL 32801
Brian T. Chunn, P.E. No. 56769

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

MAST ARM FOUNDATION DETAILS

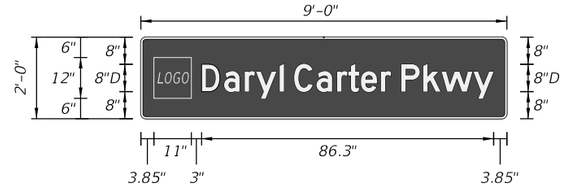
SHEET NO. T-12

Travis 4/20/2020 1:03:11 PM c:\pwworking\aecom_na\hil6828\d0206957\MiscStrMastArm02.dgn

SIGN NAME	A			QTY	1	SIGN NUMBER	STATION(S)
PANEL		BORDER					none
WIDTH	9'-0"	WIDTH	1"				
HEIGHT	2'-0"	RADII	0"				
LEGEND	White	COLOR	White				
COLOR	Green						

SYMBOL(S)	ANGLE	X	Y	WID	HT
	0	3.9	6	11	12

SIGN NUMBER		CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

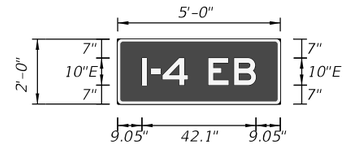


NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

SIGN NAME	B			QTY	1	SIGN NUMBER	STATION(S)
PANEL		BORDER					none
WIDTH	5'-0"	WIDTH	1"				
HEIGHT	2'-0"	RADII	0"				
LEGEND	White	COLOR	White				
COLOR	Green						

SYMBOL(S)	ANGLE	X	Y	WID	HT

SIGN NUMBER		CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH



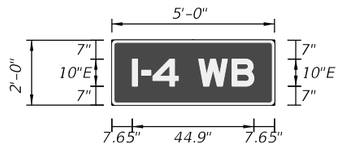
NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

COPY		D	a	r	y	l		C	a	r	t	e	r		P	k	w	y		L			
SPACE	17.9	6.6	6.1	3.4	7	1.3	3	6.6	6.1	3.3	3.8	5.8	3	3	6.5	5.4	9.4	6	3.9	86.2			
COPY																							
SPACE																							
COPY																							
SPACE																							
COPY																							
SPACE																							
COPY																							
SPACE																							
COPY																							
SPACE																							

SIGN NAME	C			QTY	1	SIGN NUMBER	STATION(S)
PANEL		BORDER					none
WIDTH	5'-0"	WIDTH	1"				
HEIGHT	2'-0"	RADII	0"				
LEGEND	White	COLOR	White				
COLOR	Green						

SYMBOL(S)	ANGLE	X	Y	WID	HT

SIGN NUMBER		CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH



NO. OF LIGHT FIXTURES | FIXTURE SPACING | PHOTOMETRIC CURVE | WATT | VOLTAGE

COPY		I	–	4		W	B		L													
SPACE	7.6	3.4	4.2	9.4	7.5	12.3	8.1	7.5	44.9													
COPY																						
SPACE																						
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SPACE																						

COPY		I	–	4		E	B		L													
SPACE	9	3.4	4.2	9.4	7.5	9.5	8.1	8.9	42.1													
COPY																						
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REVISIONS			
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SUSANNE S. WILLIAMS, P.E.
P.E. NO.: 49486
TRAFFIC ENGINEERING DATA SOLUTIONS, INC.
80 SPRING VISTA DRIVE
DEBARY, FL 32713

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

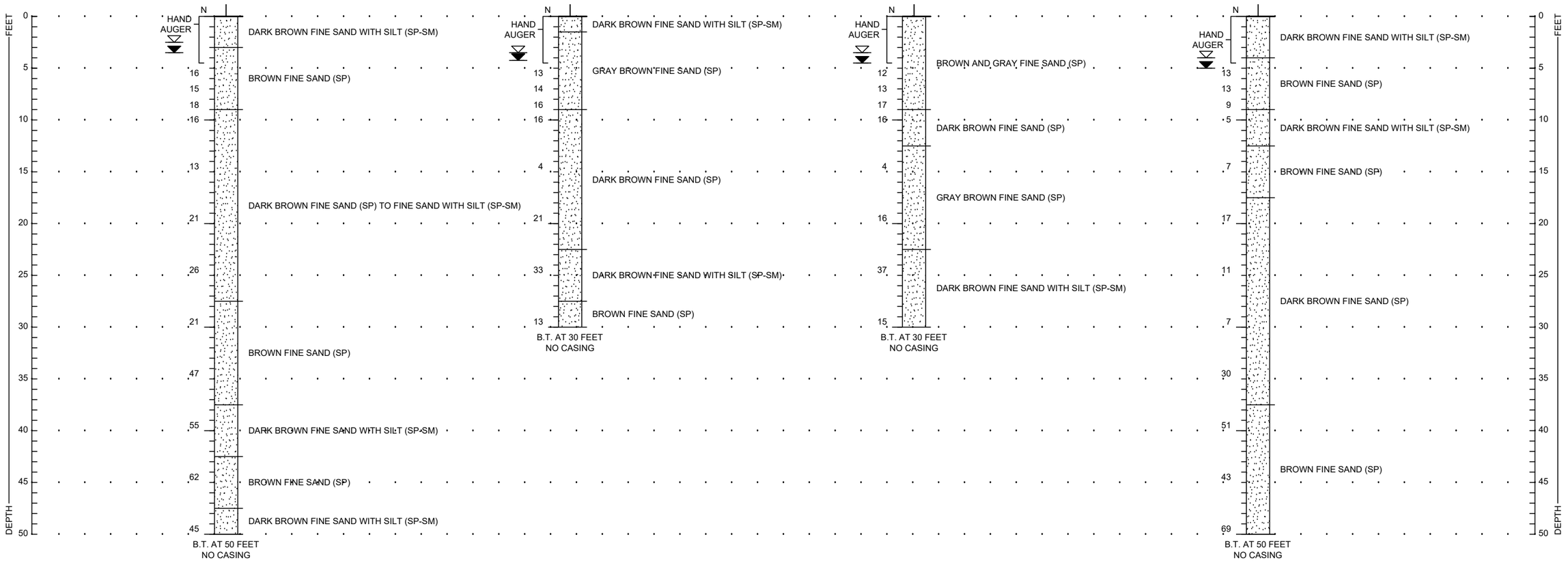
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	441113-1-52-01

GUIDE SIGN WORK SHEET

SHEET NO. T-13

FIGURE 3

BORING:	MA-1	MA-2	MA-3	MA-4
DATE:	08/26/19	09/03/19	09/03/19	08/26/19
STATION:	108+00	108+55	109+10	109+85
OFFSET:	91L	90L	90L	90L
LATITUDE/LONGITUDE:	28.397477°/-81.488297°	28.397380°/-81.488169°	28.397287°/-81.488033°	28.397159°/-81.487850°



LEGEND

FINE SAND

MA	STANDARD PENETRATION TEST (SPT) BORING
N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
▼	GROUNDWATER LEVEL MEASURED ON DATE DRILLED
▽	ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL
GNE	GROUNDWATER NOT ENCOUNTERED ON DATE DRILLED
50/3	50 BLOWS FOR 3-INCHES PENETRATION INTO SOIL
SP,SP-SM SM,SC,CH	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

NOTES:

1) UPON COMPLETION OF EACH BORING, THE BOREHOLE WAS GROUTED WITH PORTLAND CEMENT GROUT.
2) BORING TERMINATION DEPTH BELOW GROUND SURFACE.
3) BORING LATITUDE AND LONGITUDE OBTAINED USING HANDHELD GPS.
4) BORING STATION/OFFSET REFERENCED TO BASELINE SURVEY SR 400.
5) ARTESIAN CONDITIONS WERE NOT NOTED BY THE DRILLERS DURING BOREHOLE DRILLING. HOWEVER, BASED ON REVIEW OF THE POTENTIOMETRIC MAPS OF THE AREA, IF THE CONTRACTOR SHOULD ENCOUNTERED ARTESIAN CONDITIONS DURING CONSTRUCTION, THE ESTIMATED ELEVATION OF THE ARTESIAN HEAD IS APPROXIMATELY +50 FEET NGVD 29. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN WATER LEVELS UP TO +50 FEET NGVD 29.
6) LAYERS OF VERY HARD MATERIALS MAY BE ENCOUNTERED AT THIS SITE. SUCH MATERIALS MAY MAKE SHAFT EXCAVATIONS AND/OR CASING INSTALLATION DIFFICULT. THE CONTRACTOR SHALL EXPECT TO ENCOUNTER THESE TYPE MATERIALS AT ALL SHAFT LOCATIONS AND SHALL USE SPECIALIZED EQUIPMENT AND/OR PROCEDURES AS NECESSARY TO FACILITATE SHAFT EXCAVATION AND/OR CASING INSTALLATION. WHEN CASING IS USED; THE CASING TIP SHALL BE REINFORCED AND THE CASING THICKNESS SHALL BE ADEQUATE TO PREVENT CASING DAMAGE/DEFORMATION DURING INSTALLATION THROUGH HARD LAYERS.

ENGINEERING CLASSIFICATION

I GRANULAR MATERIALS

RELATIVE DENSITY	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY LOOSE	<3
LOOSE	3 TO 8
MEDIUM	8 TO 24
DENSE	24 TO 40
VERY DENSE	>40

II SILTS AND CLAYS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY SOFT	<1/4	<1
SOFT	1/4 TO 1/2	1 TO 3
FIRM	1/2 TO 1	3 TO 6
STIFF	1 TO 2	6 TO 12
VERY STIFF	2 TO 4	12 TO 24
HARD	>4	>24

STANDARD PENETRATION TEST DATA:
SPOON I.D.= 1.375"
SPOON O.D.= 2.0"
HAMMER DROP= 30"
HAMMER WEIGHT= 140 lbs.
HAMMER TYPE= AUTOMATIC

WHILE THIS BORING IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THIS RESPECTIVE LOCATION AND FOR THIS RESPECTIVE VERTICAL REACH, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTER. THE BORING LOG AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOG IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATION ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTER ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, Fl. 32809
E.O.R.-Zan C. Bates, P.E. NO. 49917
Certificate of Authorization: 5950

DRAWN BY:
CHECKED BY:
DESIGNED BY:
CHECKED BY:

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

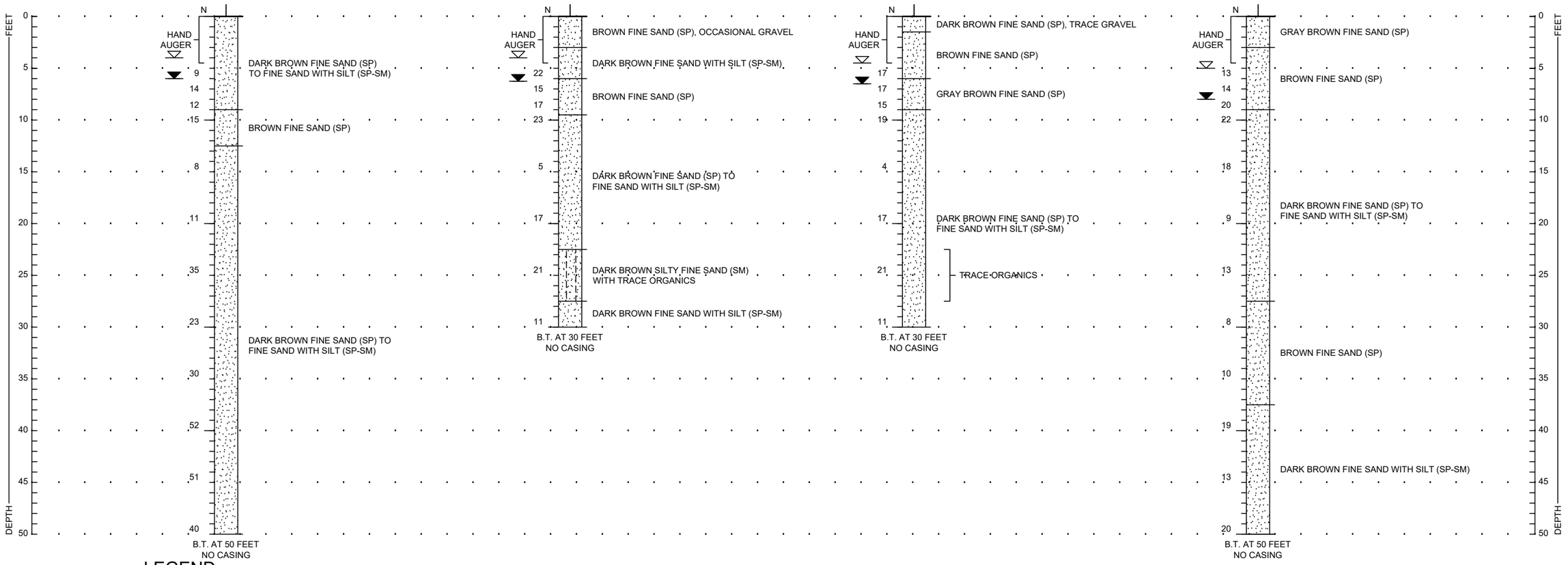
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	441113-1-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR SIGNALS
REF. DWG. NO.:
PROJECT NAME: I-4 BEYOND THE ULTIMATE DARYL CARTER INTERCHANGE
SHEET NO.: T-14

T:\Orlando\16\16-6338\Daryl Carter\Mast Arms\166338-MAST ARMS-03.dwg 4/07/2020 2:43:54 PM, Chris.Drew

FIGURE 4

BORING:	**MA-5**	**MA-6**	**MA-7**	**MA-8**
DATE:	08/28/19	09/03/19	09/03/19	08/27/19
STATION:	113+85	115+00	115+45	115+95
OFFSET:	85R	85R	85R	92R
LATITUDE/LONGITUDE:	28.396117°/-81.487199°	28.395900°/-81.486939°	28.395824°/-81.486826°	28.395731°/-81.486718°



LEGEND

FINE SAND

SILTY FINE SAND

MA	STANDARD PENETRATION TEST (SPT) BORING
N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
▼	GROUNDWATER LEVEL MEASURED ON DATE DRILLED
▽	ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL
GNE	GROUNDWATER NOT ENCOUNTERED ON DATE DRILLED
50/3	50 BLOWS FOR 3-INCHES PENETRATION INTO SOIL
SP,SP-SM SM,SC,CH	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

NOTES:

1) UPON COMPLETION OF EACH BORING, THE BOREHOLE WAS GROUTED WITH PORTLAND CEMENT GROUT.
2) BORING TERMINATION DEPTH BELOW GROUND SURFACE.
3) BORING LATITUDE AND LONGITUDE OBTAINED USING HANDHELD GPS.
4) BORING STATION/OFFSET REFERENCED TO BASELINE SURVEY SR 400.
5) ARTESIAN CONDITIONS WERE NOT NOTED BY THE DRILLERS DURING BOREHOLE DRILLING. HOWEVER, BASED ON REVIEW OF THE POTENTIOMETRIC MAPS OF THE AREA, IF THE CONTRACTOR SHOULD ENCOUNTERED ARTESIAN CONDITIONS DURING CONSTRUCTION, THE ESTIMATED ELEVATION OF THE ARTESIAN HEAD IS APPROXIMATELY +50 FEET NGVD 29. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN WATER LEVELS UP TO +50 FEET NGVD 29.
6) LAYERS OF VERY HARD MATERIALS MAY BE ENCOUNTERED AT THIS SITE. SUCH MATERIALS MAY MAKE SHAFT EXCAVATIONS AND/OR CASING INSTALLATION DIFFICULT. THE CONTRACTOR SHALL EXPECT TO ENCOUNTER THESE TYPE MATERIALS AT ALL SHAFT LOCATIONS AND SHALL USE SPECIALIZED EQUIPMENT AND/OR PROCEDURES AS NECESSARY TO FACILITATE SHAFT EXCAVATION AND/OR CASING INSTALLATION. WHEN CASING IS USED; THE CASING TIP SHALL BE REINFORCED AND THE CASING THICKNESS SHALL BE ADEQUATE TO PREVENT CASING DAMAGE/DEFORMATION DURING INSTALLATION THROUGH HARD LAYERS.

ENGINEERING CLASSIFICATION

I GRANULAR MATERIALS

RELATIVE DENSITY	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY LOOSE	<3
LOOSE	3 TO 8
MEDIUM	8 TO 24
DENSE	24 TO 40
VERY DENSE	>40

II SILTS AND CLAYS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY SOFT	<1/4	<1
SOFT	1/4 TO 1/2	1 TO 3
FIRM	1/2 TO 1	3 TO 6
STIFF	1 TO 2	6 TO 12
VERY STIFF	2 TO 4	12 TO 24
HARD	>4	>24

STANDARD PENETRATION TEST DATA:

SPOON I.D.= 1.375"
SPOON O.D.= 2.0"
HAMMER DROP= 30"
HAMMER WEIGHT= 140 lbs.
HAMMER TYPE= AUTOMATIC

WHILE THIS BORING IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THIS RESPECTIVE LOCATION AND FOR THIS RESPECTIVE VERTICAL REACH, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTER. THE BORING LOG AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOG IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATION ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTER ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

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REVISIONS

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Ardaman & Associates, Inc.
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E.O.R.-Zan C. Bates, P.E. NO. 49917
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	441113-1-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR SIGNALS

REF. DWG. NO.:

PROJECT NAME: I-4 BEYOND THE ULTIMATE DARYL CARTER INTERCHANGE

SHEET NO.: T-15

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