

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 4

Project # 24IFB57

TABLE A: Force Account Work and Materials Placed into Stock

	LABOR	HOURLY RATE		HOURLY RATE

TABLE B: Contract Items:

ITEM	DESCRIPTION	UNIT	UNIT PRICE	ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		OVERRUN/ UNDERRUN
				QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	
686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA	\$12,500.00	1.00	\$12,500.00	(1.00)	0.00	\$0.00	(\$12,500.00)
686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	\$13,500.00	2.00	\$27,000.00	(2.00)	0.00	\$0.00	(\$27,000.00)
686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	\$15,000.00	4.00	\$60,000.00	(4.00)	0.00	\$0.00	(\$60,000.00)
686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA	\$16,250.00	1.00	\$16,250.00	(1.00)	0.00	\$0.00	(\$16,250.00)
686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	\$16,500.00	2.00	\$33,000.00	(2.00)	0.00	\$0.00	(\$33,000.00)
686-6115	INS TRF SIG PL AM (S) 2 ARM (36-24') LUM	EA	\$19,000.00	1.00	\$19,000.00	(1.00)	0.00	\$0.00	(\$19,000.00)
686-6147	INS TRF SIG PL AM(S)2 ARM(40-36')LUM	EA	\$22,000.00	1.00	\$22,000.00	(1.00)	0.00	\$0.00	(\$22,000.00)
686-6167	INS TRF SIG PL AM(S)2 ARM(44-36')LUM	EA	\$24,000.00	1.00	\$24,000.00	(1.00)	0.00	\$0.00	(\$24,000.00)
686-6215	INS TRF SIG PL AM(S)2 ARM(55-36')LUM	EA	\$46,000.00	1.00	\$46,000.00	(1.00)	0.00	\$0.00	(\$46,000.00)
686-6059	INS TRF SIG PL AM(S)1 ARM(55')LUM	EA	\$44,000.00	2.00	\$88,000.00	1.00	3.00	\$132,000.00	\$44,000.00
680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	\$2,800.00	0.00	\$0.00	1.00	1.00	\$2,800.00	\$2,800.00
686-6007	INS TRF SIG PL AM (S) STR (TY B)	EA	\$8,000.00	0.00	\$0.00	1.00	1.00	\$8,000.00	\$8,000.00
686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA	\$14,500.00	0.00	\$0.00	1.00	1.00	\$14,500.00	\$14,500.00
686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	\$16,250.00	0.00	\$0.00	2.00	2.00	\$32,500.00	\$32,500.00
686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	\$17,000.00	0.00	\$0.00	4.00	4.00	\$68,000.00	\$68,000.00
686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA	\$18,750.00	0.00	\$0.00	1.00	1.00	\$18,750.00	\$18,750.00
686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	\$19,500.00	0.00	\$0.00	2.00	2.00	\$39,000.00	\$39,000.00
686-6115	INS TRF SIG PL AM (S) 2 ARM (36-24') LUM	EA	\$23,000.00	0.00	\$0.00	1.00	1.00	\$23,000.00	\$23,000.00
686-6147	INS TRF SIG PL AM(S)2 ARM(40-36')LUM	EA	\$25,000.00	0.00	\$0.00	1.00	1.00	\$25,000.00	\$25,000.00
686-6167	INS TRF SIG PL AM(S)2 ARM(44-36')LUM	EA	\$27,500.00	0.00	\$0.00	1.00	1.00	\$27,500.00	\$27,500.00
TOTALS					\$347,750.00			\$391,050.00	\$43,300.00

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 4

Project # 24IFB57

TABLE B: Contract Items (Continued)[illegible]

CHANGE ORDER REASON(S) CODE CHART

1. Design Error or Omission	1A. Incorrect PS&E 1B. Other
2. Differing Site Conditions (unforeseeable)	2A. Dispute resolution (expense caused by conditions and/or resulting delay) 2B. Unavailable material 2C. New development (conditions changing after PS&E completed) 2D. Environmental remediation 2E. Miscellaneous difference in site conditions (unforeseeable)(Item 9) 2F. Site conditions altered by an act of nature 2G. Unadjusted utility (unforeseeable) 2H. Unacquired Right-of-Way (unforeseeable) 2I. Additional safety needs (unforeseeable) 2J. Other
3. County Convenience	3A. Dispute resolution (not resulting from error in plans or differing site conditions) 3B. Public relations improvement 3C. Implementation of a Value Engineering finding 3D. Achievement of an early project completion 3E. Reduction of future maintenance 3F. Additional work desired by the County 3G. Compliance requirements of new laws and/or policies 3H. Cost savings opportunity discovered during construction 3I. Implementation of improved technology or better process 3J. Price adjustment on finished work (price reduced in exchange for acceptance) 3K. Addition of stock account or material supplied by state provision 3L. Revising safety work/measures desired by the County 3M. Other
4. Third Party Accommodation	4A. Failure of a third party to meet commitment 4B. Third party requested work 4C. Compliance requirements of new laws and/or policies (impacting third party) 4D. Other
5. Contractor Convenience	5A. Contractor exercises option to change the traffic control plan 5B. Contractor requested change in the sequence and/or method of work 5C. Payment for Partnering workshop 5D. Additional safety work/measures desired by the contractor 5E. Other
6. Untimely ROW/Utilities	6A. Right-of-Way not clear (third party responsibility for ROW) 6B. Right-of-Way not clear (County responsibility for ROW) 6C. Utilities not clear 6D. Other

Williamson County Road Bond Program

Ronald Reagan Boulevard Widening Williamson County Project No. 24IFB57

Change Order No. 4

Reason for Change

This Change Order adds quantities and new items to match the traffic signal poles with the foundation types shown on the plans. In addition, it corrects traffic signal work quantities and missing items not included on the as-bid plan set.

Following is a summary of new items required for this Change Order.

ITEM	DESCRIPTION	QTY	UNIT
680-6011	INSTALL HWY TRF SIG (UPGRADE)	1	EA
686-6007	INS TRF SIG PL AM (S) STR (TY B)	1	EA
686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	1	EA
686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	2	EA
686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	4	EA
686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	1	EA
686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	2	EA
686-6115	INS TRF SIG PL AM (S) 2 ARM (36-24') LUM	1	EA
686-6147	INS TRF SIG PL AM(S)2 ARM(40-36')LUM	1	EA
686-6167	INS TRF SIG PL AM(S)2 ARM(44-36')LUM	1	EA
686-6215	INS TRF SIG PL AM(S)2 ARM(55-36')LUM	1	EA

This Change Order results in a net increase of \$90,550.00 to the Contract amount, for an adjusted Contract total of \$52,453,601.50. The original Contract amount was \$52,159,299.00. As a result of this and all Change Orders to-date, \$294,302.50 has been added to the Contract, resulting in a 0.56% net increase in the Contract cost. No additional days will be added to or deducted from the Contract as a result of this Change Order.

HNTB Corporation

Oscar Salazar-Bueno, P.E.

Change Order Worksheet

Contract Name	Ronald Reagan Blvd. Widening	Solicitation #	24IFB57	
Date awarded	7/16/2024			
Awarded Contract Amount		\$52,159,299.00		
			Percentage Change	
Change Order #1		\$145,428.00	0.28%	
Change Order #2		\$29,362.00	0.06%	
Change Order #3		\$28,962.50	0.06%	
Change Order #4		\$90,550.00	0.17%	
Total changes to date		\$294,302.50	0.56%	(Running totals here)
Adjusted contract amount		\$52,453,601.50		



REQUEST FOR INFORMATION FORM

RFI NO.: 14 DATE: 10/1/24
PROJECT: RONALD REAGAN BLVD WIDENING RESPONSE REQUESTED BY
DATE: 10/5/24
TO: HNTB: Eddie Church P.E.; Oscar Salazar-Bueno P.E.; Steven Shull; Joseph Jones

REFERENCE: TRAFFIC SIGNAL PLANS

PROBLEM:

1) It appears the Traffic Signal Designer used SMA100 calculations to describe and quantify the drill shaft sizes and lengths for the NON LMA Poles, however, the standard details provided are for NON LMA SMA80 poles. It is our understanding that SMA100 foundations could cause conflict with the anchor layout of SMA80 poles. Please confirm.

2) If SMA80 calculations are to be used for foundations, please provide updated sheets as required. Per the attached redlines, it appears Bid Item 0416 for a 42" Drill Shaft will not be used, however a Bid item for a 30" Drill Shaft will be required.

RECOMMENDED SOLUTION:

Garrett Williams
Originator

Supervisor

RESPONSE:

Maintain the current signal foundation design and replace SMA-80 standard with SMA-100 standard which designs for 100MPH wind load. In reviewing the original question, some errors were discovered. Attached are the revised standards and various sheets reflecting the error corrections.

Enrique Acevedo
Responder

10/17/2024
Date

Sign, Date & Return to HNTB via e-mail or fax.

Mail original to: HNTB Corporation
101 E Old Settlers Blvd, Ste 100
Round Rock, Texas 78664

Attachments to RFI:

Cc:

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GENERAL

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100		TCP(2-3)-23
101		TCP(2-6)-18
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174		ROADWAY PLAN & PROFILE - FIRE STATION
175		ROADWAY PLAN & PROFILE - ELIZABETH PARKWAY
176		ROADWAY PLAN & PROFILE - TOWER ROAD
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380		ABUTMENT NO. 1
381		ABUTMENT NO. 8
382		MISCELLANEOUS ABUTMENT DETAILS
382		INTERIOR BENT NOS. 2-4
383		INTERIOR BENT NO. 5
384		INTERIOR BENT NOS. 6 & 7
385		FRAMING PLAN (SPANS 1 & 2)
386		250.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 1 & 2)
387		FRAMING PLAN (SPANS 3 & 4)
388		250.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 3 & 4)
389		FRAMING PLAN (SPANS 5-7)
390		265.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 5-7)

SOWE'S BRANCH BRIDGE

391		BRIDGE LAYOUT
392		ESTIMATED QUANTITIES & BEARING SEAT ELEVATIONS
393		ABUTMENT NO. 1
394		ABUTMENT NO. 3
395		MISCELLANEOUS ABUTMENT DETAILS
396		INTERIOR BENT NO. 2
397		FRAMING PLAN (SPANS 1 & 2)

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

 , P.E. 10/29/2024
Signature of Registrant & Date

	RFI #3	CAS	10/24
	RFI #2	CAS	10/24
NO.	REVISION	BY	DATE
			
RONALD REAGAN BLVD.			
SUPPLEMENTAL INDEX			
Designed: ANK	FED. RD. DIV. NO. X	STATE TEXAS	PROJECT NO.
Checked: ANK			HIGHWAY NO.
Drawn: ANK	DIST.	COUNTY	CONTROL NO. SECTION NO. JOB NO.
Checked: ANK		WILLIAMSON	SHEET NO. 2

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BRIDGE PLANS (CONTINUED)

TRIBUTARY #2 TO SOWE'S BRANCH BRIDGE	
399	BRIDGE LAYOUT
400	ESTIMATED QUANTITIES & BEARING SEAT ELEVATIONS
401	ABUTMENT NO. 1
402	ABUTMENT NO. 6
403	MISCELLANEOUS ABUTMENT DETAILS
404	INTERIOR BENT NOS. 2-4
405	INTERIOR BENT NO. 5
406	FRAMING PLAN (SPANS 1-3)
407	222.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 1-3)
408	FRAMING PLAN (SPANS 4 & 5)
409 - 410	164.00' PRESTRESSED CONCRETE I-GIRDER UNTI (SPANS 4 & 5)
NORTH FORK SAN GABRIEL RIVER RELIEF BRIDGE	
411 - 412	BRIDGE LAYOUT
413	ESTIMATED QUANTITIES & BEARING SEAT ELEVATIONS
414	ABUTMENT NO. 1
415	ABUTMENT NO. 5
416	MISCELLANEOUS ABUTMENT DETAILS
417	INTERIOR BENT NO. 2
418	INTERIOR BENT NOS. 3 & 4
419	FRAMING PLAN (SPANS 1 & 2)
420 - 421	215.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 1 & 2)
422	FRAMING PLAN (SPANS 3 & 4)
423	250.00' PRESTRESSED CINCRETE I-GIRDER UNIT (SPANS 3 & 4)
NORTH FORK SAN GABRIEL RIVER BRIDGE	
424 - 425	BRIDGE LAYOUT
426	ESTIMATED QUANTITIES & BEARING SEAT ELEVATIONS
427	ABUTMENT NO. 1
428	ABUTMENT NO. 5
429	MISCELLANEOUS ABUTMENT DETAILS
430	INTERIOR BENT NOS. 2 & 5
431	INTERIOR BENT NOS. 3 & 4
432	FRAMING PLAN (SPANS 1 & 2)
433 - 434	190.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 1 & 2)
435	FRAMING PLAN (SPANS 3 - 5)
436 - 437	250.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 3 - 5)
TRIBUTARY TO MIDDLE FORK SAN GABRIEL RIVER	
438	BRIDGE LAYOUT
439	ESTIMATED QUANTITIES & BEARING SEAT ELEVATIONS
440	ABUTMENT NO. 1
441	ABUTMENT NO. 3
442	MISCELLANEOUS ABUTMENT DETAILS
443	INTERIOR BENT NO. 2
444	FRAMING PLAN (SPANS 1 & 2)
445	110.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 1 & 2)
MIDDLE FORK SAN GABRIEL RIVER	
446	BRIDGE LAYOUT
447	ESTIMATED QUANTITIES & BEARING SEAT ELEVATIONS
448	ABUTMENT NO. 1
449	ABUTMENT NO. 3
450	MISCELLANEOUS ABUTMENT DETAILS
451	INTERIOR BENT NO. 2
452	FRAMING PLAN (SPANS 1 & 2)
453	110.00' PRESTRESSED CONCRETE I-GIRDER UNIT (SPANS 1 & 2)

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454 - 455	BRIDGE DECK DRAIN DETAILS
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462	CRR
463 - 464	CSAB
465 - 466	FD
467 - 468	IGD
469 - 471	IGEB
472 - 473	IGMS
474	IGSK
475	IGTS
476 - 477	MEBR (C)
478 - 481	PCP
482	PCP-FAB
483 - 484	OMITTED
485 - 486	OMITTED
487 - 488	PMDF
489	SEJ-M
490 - 491	SSTR

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SH 29	
492 - 493	SIGNAL LAYOUT
494	SIGNAL DETAILS
KAUFFMAN LOOP	
495 - 496	SIGNAL LAYOUT
497 - 498	SIGNAL DETAILS
499	SIGN DETAILS
500 - 501	SIGNAL ELEVATIONS
SANTA RITA BLVD	
502 - 503	SIGNAL LAYOUT
504 - 505	SIGNAL DETAILS
506	SIGN DETAILS
507 - 508	SIGNAL ELEVATIONS
ELIZABETH PARKWAY	
509 - 510	SIGNAL LAYOUT
511 - 512	SIGNAL DETAILS
513	SIGN DETAILS
514 - 515	SIGNAL ELEVATIONS
TOWER ROAD	
516 - 517	SIGNAL LAYOUT
518 - 519	SIGNAL DETAILS
520	SIGNAL MOUNTED SIGN DETAILS
521	SIGNAL ELEVATIONS
FM 3405	
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549	LUM-A-12
550	CFA-12
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572	SIGNCAD DETAILS

PAVEMENT MARKING & SIGNING STANDARDS

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574	D&OM(VIA)-20
575	PM(1)-22
576	PM(2)-22
577	PM(3)-22
578	PM(4)-22A
579	SMD(GEN)-08
580	SMD(SLIP-1)-08
581	SMD(SLIP-2)-08
582	SMD(SLIP-3)-08
583	SMD(TWT)-08

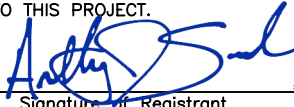
EROSION CONTROL PLANS

584	STORM WATER POLLUTION PREVENTION PLAN (SW3P)
585 - 618	EROSION CONTROL LAYOUT

EROSION CONTROL STANDARDS

619	EC(1)-16
620	EC(2)-16
621	EC(3)-16
622 - 624	EC(9)-16

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

 , P.E. 10/29/2024
Signature of Registrant & Date

			
RONALD REAGAN BLVD.			
SUPPLEMENTAL INDEX			
Designed: ANK	FED. RD. DIV. NO. X	STATE TEXAS	PROJECT NO.
Checked: ANK			HIGHWAY NO.
Drawn: ANK	DIST.	COUNTY	CONTROL NO. SECTION NO. JOB NO.
Checked: ANK		WILLIAMSON	SHEET NO. 3

needed to install RRBW traffic

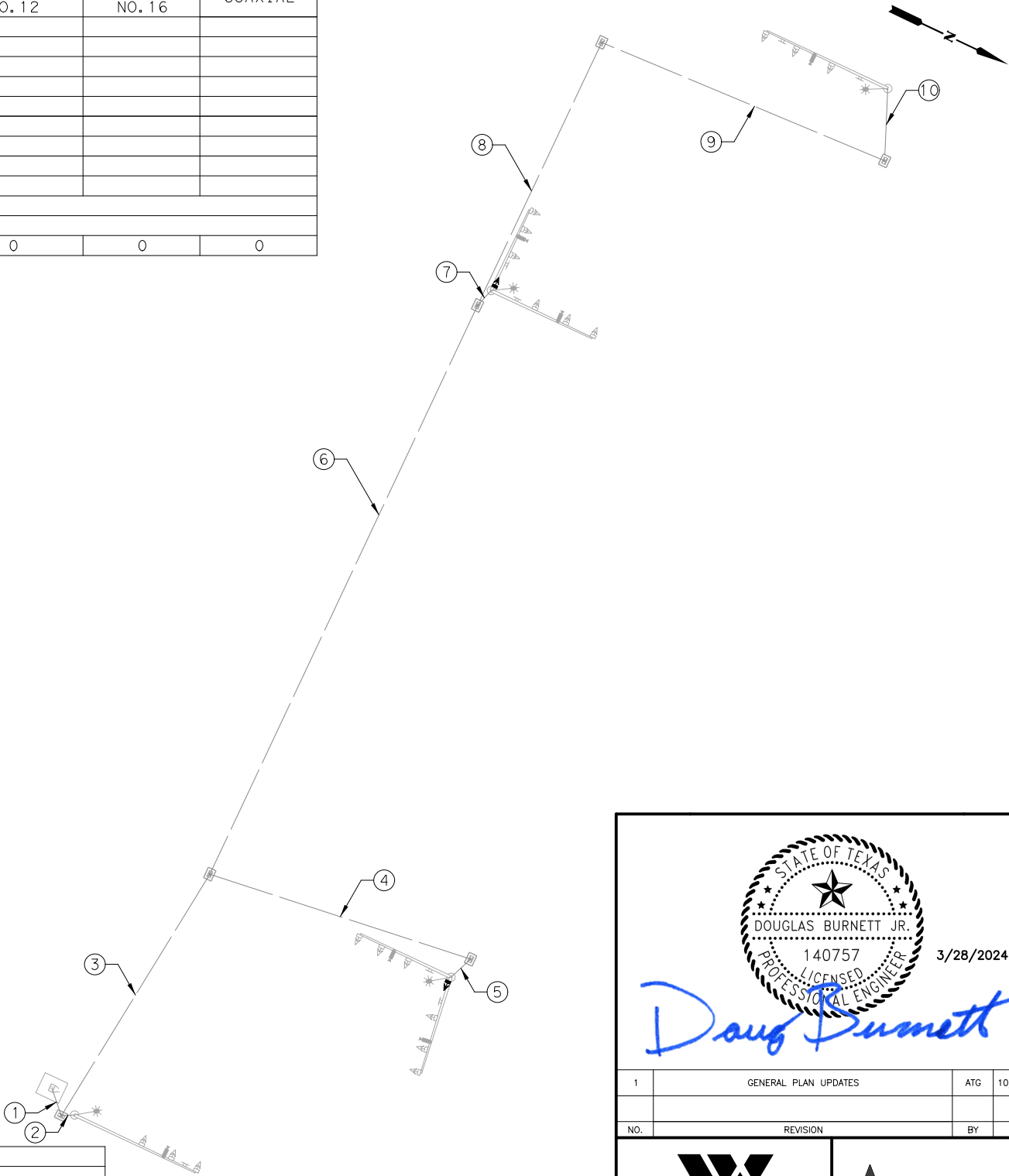
RONALD REAGAN BLVD.
QUANTITY SUMMARY
TRAFFIC SIGNALS

10/23/2024 9:23:05 AM ETyndall
pw:/Active Projects/WSM1900559.00/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.09 Signals/1900559_SIG_02_DTL.dgn

RONALD REAGAN @ SH 29 CONDUCTOR AND CONDUIT SCHEDULE											
RUN NO.	RUN LENGTH (FT)	CONDUIT SIZE AND TYPE		PWR CONDUCTOR		VEH SIGNAL		PED PUSH BUTTON & SIGNAL		VIVDS	
		(PVC) (SCHD 40) (3") (TRENCH)	(PVC) (SCHD 40) (3") (BORE)	NO. 8 BARE	NO. 8 XHHW	5/C NO. 12	7/C NO. 12	2/C NO. 12	5/C NO. 12	3/C NO. 16	COAXIAL
1	15	EXISTING				2					
2	10	EXISTING									
3	110		EXISTING			2					
4	105		EXISTING			1					
5	10	EXISTING				1					
6	230	EXISTING				1					
7	15	EXISTING				1					
8	110		EXISTING								
9	115		EXISTING								
10	35	EXISTING									
TOTALS		0	0	0	0	610	0	0	0	0	0

SHEET QUANTITY				
BID CODE		DESCRIPTION	UNIT	QTY
0680	6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1
0682	6002	VEH SIG SEC (12")LED (GRN ARW)	EA	2
0682	6004	VEH SIG SEC (12")LED (YEL ARW)	EA	2
0682	6006	VEH SIG SEC (12")LED (RED ARW)	EA	2
0682	6051	BACKPLATE W/REFL BRDR (3 SEC)ALUM	EA	2
0684	6010	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	610
6027	6003	CONDUIT (PREPARE)	LF	195
6027	6008	GROUND BOX (PREPARE)	EA	1

Existing conduit and ground boxes are deemed acceptable, these items not needed to install RRBW traffic



RONALD REAGAN @ KAUFFMAN LOOP CABLE TERMINATION CHART																						
CONDR	SIGNAL	SIGNAL INDICATION	POLE ID	A			B							C			D					
			PHASING																			
			WIRE COLOR	1*	2*	3*	4*	5*	6*	7*	8*	9*	20	10*	11*	12*	13*	14*	15*	16*	17*	18*
12 AWG 7 CONDR	3 SECTION (RT)	RED ARW	RED									X										
		YELLOW ARW	ORANGE									X										
		GREEN ARW	GREEN									X										
	SPARE	SPARE	BLACK																			
	COMMON	AC NEUTRAL	WHITE																			
	3 SECTION (LT)	RED ARW	RD/BLK STRIP																			
		YELLOW ARW	YEL/BLK STRIP																			
		GREEN ARW	GRN/BLK STRIP																			

* EXISTING SIGNAL HEAD AND CABLE TEMINATION TO REMAIN.



1	GENERAL PLAN UPDATES	ATG	10/22/24
NO.	REVISION	BY	DATE

TBPE Firm Registration No. F-812
11701 Stonehollow Dr | Suite 100 | Austin, TX 78758
Phone: 512-821-2081 | Fax: 512-821-2085

RONALD REAGAN BLVD.									
SIGNAL DETAILS RONALD REAGAN AND SH29									
Designed:	ATG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.	
Checked:	ATG	X	TEXAS	SEE TITLE SHEET				TITLE SHEET	
Drawn:	ATG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.	
Checked:	ATG		WILLIAMSON					494	

10/30/2024 9:14:21 AM ETyndall
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SHEET QUANTITY				
BID CODE	DESCRIPTION	UNIT	QTY	
0416	6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	36
0416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	44.5
0416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	66
0618	6029	CONDT (PVC) (SCH 40) (3")	LF	1200
0618	6030	CONDT (PVC) (SCH 40) (3") (BORE)	LF	1050
0620	6007	ELEC CONDR (NO.8) BARE	LF	775
0620	6008	ELEC CONDR (NO.8) INSULATED	LF	1550
0621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	180
0624	6010	GROUND BOX TY D (162922) W/APRON	EA	8
0680	6003	INSTALL HWY TRF SIG (SYSTEM)	EA	1
0682	6001	VEH SIG SEC (12") LED (GRN)	EA	14
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12") LED (YEL)	EA	14
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12") LED (RED)	EA	14
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6018	PED SIG SEC (LED) (COUNTDOWN)	EA	12
0682	6051	BACKPLATE W/REFL BRDR (3 SEC) ALUM	EA	18
0684	6007	TRF SIG CBL (TY A) (12 AWG) (2 CONDR)	LF	3102
0684	6010	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	8584
0686	6039	INS TRF SIG PL AM(S) 1 ARM (36') LUM	EA	1
0686	6043	INS TRF SIG PL AM(S) 1 ARM (40') LUM	EA	1
0686	6047	INS TRF SIG PL AM(S) 1 ARM (44') LUM	EA	1
0686	6055	INS TRF SIG PL AM(S) 1 ARM (50') LUM	EA	1
0686	6059	INS TRF SIG PL AM(S) 1 ARM (55') LUM	EA	1
0686	6063	INS TRF SIG PL AM(S) 1 ARM (60') LUM	EA	1
0687	6001	PED POLE ASSEMBLY	EA	6
0688	6001	PED DETECT PUSH BUTTON (APS)	EA	12
0688	6003	PED DETECTOR CONTROLLER UNIT	EA	1
0690	6137	VIVDS CABLE (INSTALL)	LF	1859.5
0627	6003	CONDUIT (PREPARE)	LF	35
0627	6000	GROUND BOX (PREPARE)	LF	1
6306	6001	VIVDS PROSR SYS	EA	1
6306	6002	VIVDS CAM ASSY FXD LNS	LF	6
6306	6007	VIVDS CABLING	LF	3409.5

Existing conduit and ground boxes are deemed acceptable, these items not needed to install RRBW traffic

RONALD REAGAN BLVD @ SANTA RITA BLVD APS MESSAGE CHART			
APS UNIT #	ACKNOWLEDGEMENT DEFAULT "WAIT"	EXTENDED PRESS MESSAGE	WALK PHASE MESSAGE
		"WAIT TO CROSS (STREET NAME) AT (CROSS STREET NAME)"	ZONE
W1	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W2	YES	SANTA RITA BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W3	YES	SANTA RITA BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W4	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W5	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W6	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W7	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W8	YES	SANTA RITA BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W9	YES	SANTA RITA BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W10	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W11	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE
W12	YES	RONALD REAGAN BLVD AT SANTA RITA BLVD	AUSTRALIAN TONE

POLE AND ARM WIRING SCHEDULE															
POLE NO.	ARM LENGTH (FT)	MOUNTING HEIGHTS (FT)				SIGNAL HEAD SPACING FROM POLE (FT)				VIVDS SPACING (FT)	SIGNAL POLE/ARM CONDUCTOR QUANTITIES (FT)				
		APS UNIT	PED HEAD	MAST ARM	LUM-A	1	2	3	4		PUSH BUTTON	PED HEAD	VEH HEADS	VIVDS	ILL
											2C#12	5C#12	5C#12	CABLE	4C#12 TRAY
A	50	3.5	8	19.5	30	14	26	38	50	32	3.5	8	167	51.5	30
B		3.5	8								3.5	8			
C	44	3.5	8	19.5	30	19	31	43		25	3.5	8	132	44.5	30
D		3.5	8								3.5	8			
E		3.5	8								3.5	8			
F	40	3.5	8	19.5	30	27.5	39.5			33.5	3.5	8	86.5	53	30
G	60	3.5	8	19.5	30	22.5	34.5	46.5	58.5	40.5	3.5	8	222	60	30
H		3.5	8								3.5	8			
I	36	3.5	8	19.5	30	10	22	34		16	3.5	8	105	35.5	30
J		3.5	8								3.5	8		0	
K		3.5	8								3.5	8		0	
L	55	3.5	8	19.5	30	39.5	51.5			45.5	3.5	8	110.5	65	30
TOTALS											42	96	823	309.5	180

STATE OF TEXAS

DOUGLAS BURNETT JR.

140757

LICENSED PROFESSIONAL ENGINEER

6/20/2024

1

GENERAL PLAN UPDATES

ATG

10/22/24

NO.

REVISION

BY

DATE

WILCO

TEXAS

ATG

ALLIANCE

TRANSPORTATION GROUP

TBPE Firm Registration No. F-812

11701 Stonehollow Dr | Suite 100 | Austin, TX 78758

Phone: 512-821-2081 | Fax: 512-821-2085

RONALD REAGAN BLVD.

SIGNAL DETAILS

RONALD REAGAN AND SANTA RITA BLVD

Designed: ATG

FED. AID DIV. NO. X

STATE TEXAS

FEDERAL AID PROJECT NO.

HIGHWAY NO.

Checked: ATG

COUNTY

CONTROL NO.

SECTION NO.

JOB NO.

SHEET NO.

Drawn: ATG

DIST.

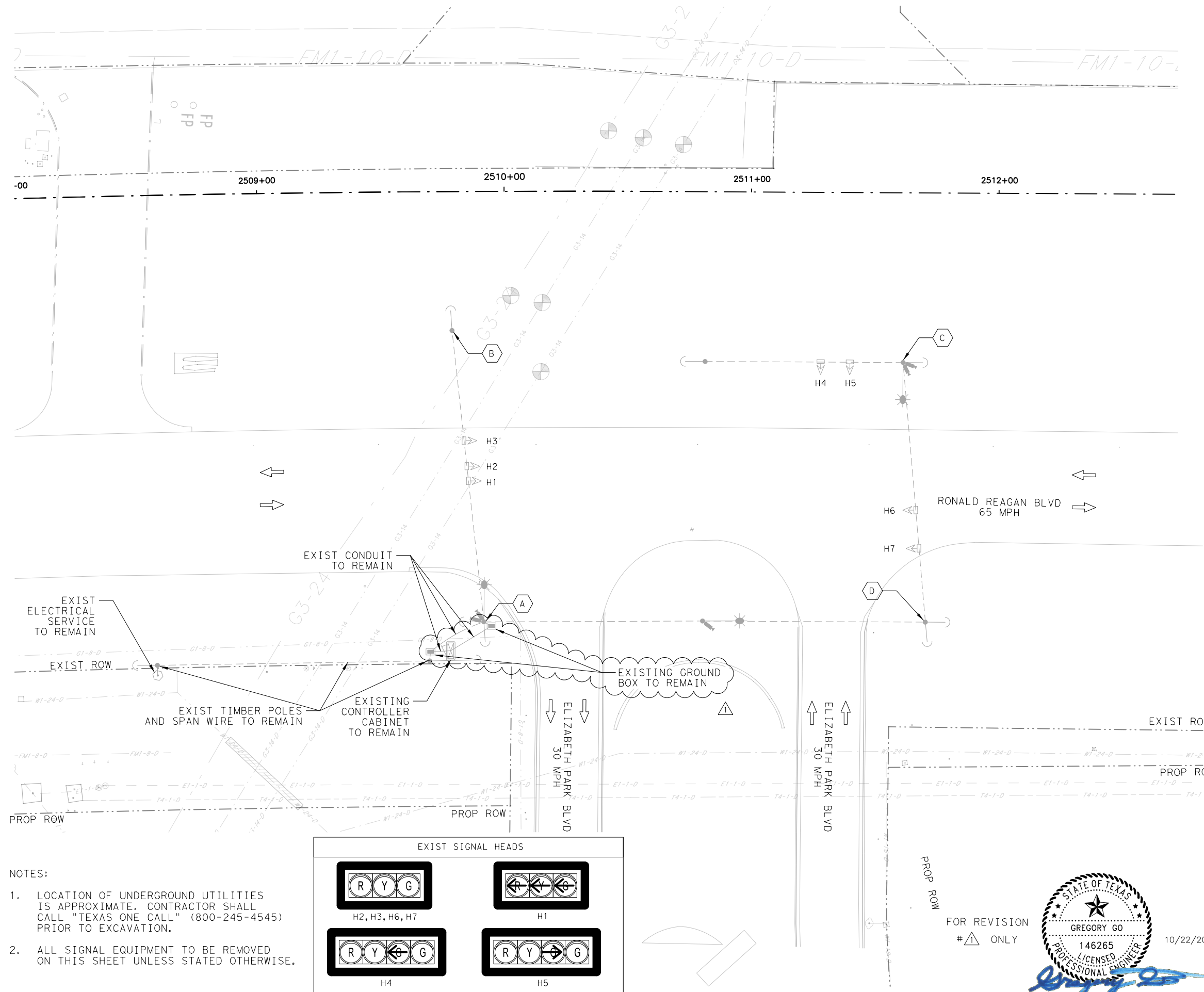
WILLIAMSON

Checked: ATG

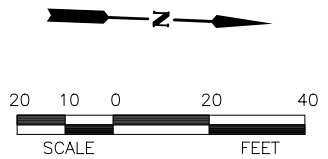
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- LEGEND**
- EXIST TRAFFIC FLOW
 - PROP TRAFFIC FLOW
 - MAST ARM AND POLE
 - TRAFFIC SIGNAL HEAD
 - PEDESTRIAN SIGNAL HEAD
 - CONDUIT (TRENCH)
 - CONDUIT (BORE)
 - AERIAL CABLE
 - ELECTRICAL SERVICE
 - CONTROLLER W/ CABINET
 - GROUND BOX
 - LUMINAIRE W/ 8' ARM
 - PEDESTAL POLE
 - SMALL SIGN
 - EXIST SIGN & POST
 - PEDESTRIAN PUSH BUTTON
 - VIVDS CAMERA
 - VIVDS DETECTION ZONE



EXIST ELECTRICAL SERVICE TO REMAIN

EXIST ROW

EXIST TIMBER POLES AND SPAN WIRE TO REMAIN

EXISTING CONTROLLER CABINET TO REMAIN

EXISTING GROUND BOX TO REMAIN

ELIZABETH PARK BLVD 30 MPH

ELIZABETH PARK BLVD 30 MPH

RONALD REAGAN BLVD 65 MPH

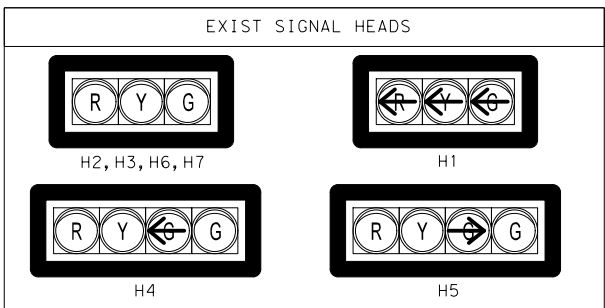
EXIST ROW

PROP ROW

EXIST ROW

PROP ROW

- NOTES:**
- LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE. CONTRACTOR SHALL CALL "TEXAS ONE CALL" (800-245-4545) PRIOR TO EXCAVATION.
 - ALL SIGNAL EQUIPMENT TO BE REMOVED ON THIS SHEET UNLESS STATED OTHERWISE.



FOR REVISION #1 ONLY

STATE OF TEXAS
GREGORY GO
146265
LICENSED PROFESSIONAL ENGINEER
10/22/2024

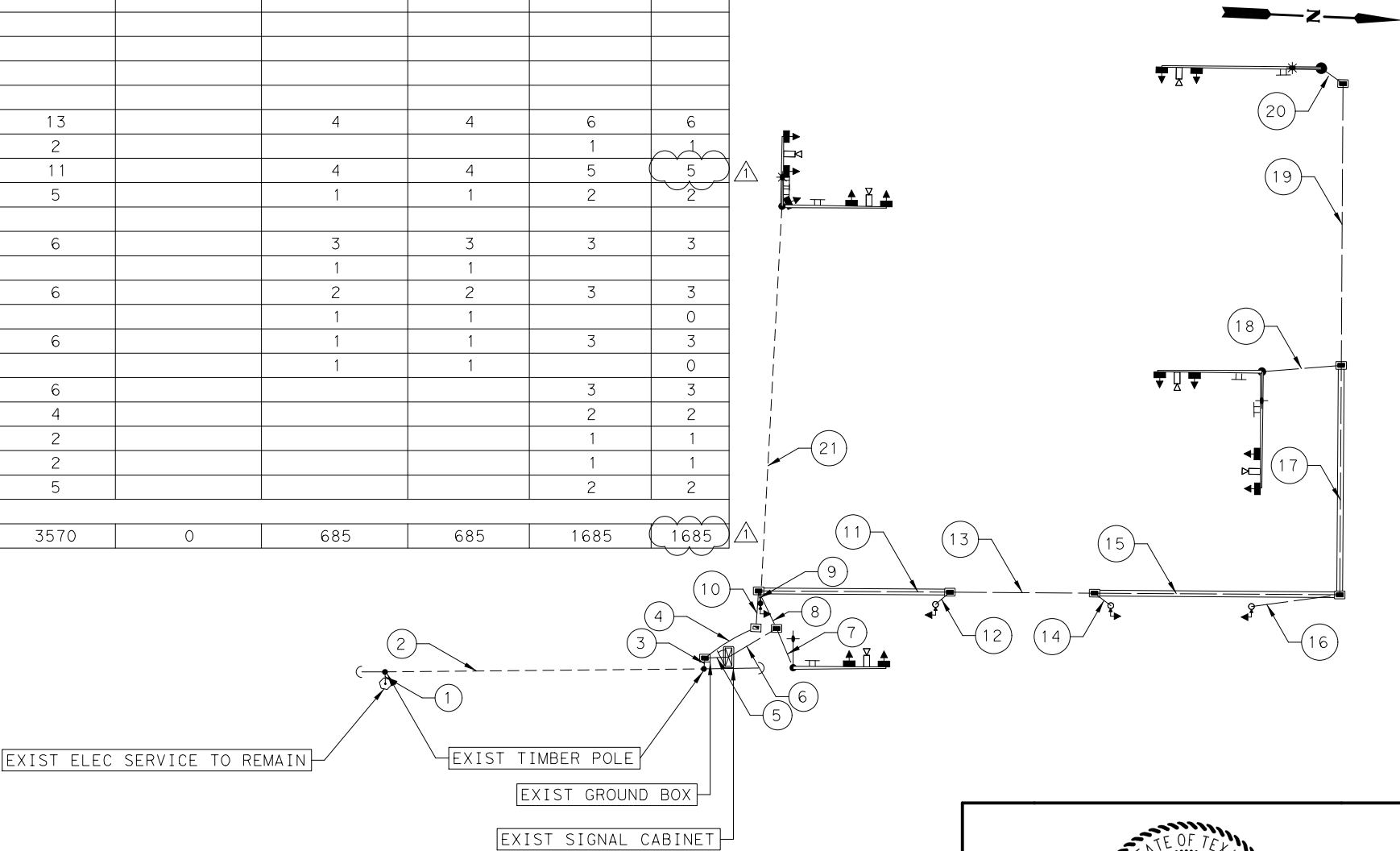
1	GENERAL PLAN UPDATES	ATG	10/22/24
NO.	REVISION	BY	DATE

RONALD REAGAN BLVD.
EXISTING SIGNAL LAYOUT
RONALD REAGAN AND
ELIZABETH PARK BLVD

Designed:	ATG	FED. RD. DIST. NO.	X	STATE	TEXAS	FEDERAL AID PROJECT NO.	SEE TITLE SHEET	HIGHWAY NO.	TITLE SHEET
Checked:	ATG	DIST.		COUNTY	WILLIAMSON	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	ATG								509
Checked:	ATG								

10/29/2024 12:05:22 PM ETyndall
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RONALD REAGAN @ ELIZABETH PARK BLVD CONDUCTOR AND CONDUIT SCHEDULE												
RUN NO.	RUN LENGTH (FT)	CONDUIT SIZE AND TYPE		AERIAL SWAY CABLE (3/16 STEEL)	PWR CONDUCTOR		VEH SIGNAL		PED PUSH BUTTON & SIGNAL		VIVDS	
		(PVC) (SCHD 40) (3") (TRENCH)	(PVC) (SCHD 40) (3") (BORE)		NO. 8 BARE	NO. 8 XHHW	5/C NO. 12	7/C NO. 12	2/C NO. 12	5/C NO. 12	3/C NO. 16	COAXIAL
1	10	EXISTING			2	4						
2	115	EXISTING			1	2						
3	10	EXISTING			1	2						
4	30	1			1	2						
5	15	EXISTING			1	2						
6	25	3			1	2	13		4	4	6	6
7	20	3			1	2	2				1	1
8	20	3			1	2	11		4	4	5	5
9	10	3			1	2	5		1	1	2	2
10	20	1			1	2						
11	75		3		1	2	6		3	3	3	3
12	15	1							1	1		
13	55	3			1	2	6		2	2	3	3
14	15	1							1	1		0
15	90		3		1	2	6		1	1	3	3
16	40	1							1	1		0
17	85		3		1	2	6				3	3
18	35	3			1	2	4				2	2
19	105	3			1	2	2				1	1
20	15	3			1	2	2				1	1
21	145			1	1	2	5				2	2
TOTALS		975	750	145	890	1780	3570	0	685	685	1685	1685



RONALD REAGAN @ ELIZABETH PARK BLVD CABLE TERMINATION CHART																						
CONDR	SIGNAL	SIGNAL INDICATION	POLE ID		H			A		B		B		C	D	E	F	G		H		
			PHASING		3	8		OL-B		2		4						OL-A		6		
			WIRE COLOR		1	2	3	4	5	6	7	8	9	W1	W2	W3	W4	10	11	12	13	
12 AWG 5 CONDR	3 SECTION (THRU)	RED BALL	RED			X	X			X	X		X	X					X	X	X	X
		YELLOW BALL	ORANGE			X	X			X	X		X	X					X	X	X	X
		GREEN BALL	GREEN			X	X			X	X		X	X					X	X	X	X
	SPARE	SPARE																				
	COMMON	AC NEUTRAL				X	X			X	X		X	X					X	X	X	X
12 AWG 5 CONDR	3 SECTION (LT)	RED ARW	RED		X				X	X												
		YELLOW ARW	ORANGE		X				X	X												
		GREEN ARW	GREEN		X				X	X												
	SPARE	SPARE																				
	COMMON	AC NEUTRAL							X	X												
12 AWG 5 CONDR	EB/WB PEDS	DON'T WALK	RED																			
		WALK	ORANGE																			
	NB/SB PEDS	DON'T WALK	GREEN										X	X	X	X						
		WALK	BLACK										X	X	X	X						
	COMMON	AC NEUTRAL											X	X	X	X						
12 AWG 2 CONDR	SPARE	SPARE																				
	PED COMMON	PUSH BUTTON											X	X	X	X						

FOR REVISION
1 ONLY



1	GENERAL PLAN UPDATES	ATG	10/22/24
NO.	REVISION	BY	DATE

RONALD REAGAN BLVD.
SIGNAL DETAILS
RONALD REAGAN AND
ELIZABETH PARK BLVD

Designed:	ATG	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	ATG	X	TEXAS	SEE TITLE SHEET	TITLE SHEET
Drawn:	ATG	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	ATG		WILLIAMSON		JOB NO.
					SHEET NO.
					511

10/30/2024 9:14:32 AM ETyndall
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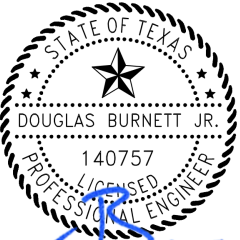
POLE AND ARM WIRING SCHEDULE																
POLE NO.	ARM LENGTH (FT)	MOUNTING HEIGHTS (FT)					SIGNAL HEAD SPACING FROM POLE (FT)				VIVDS SPACING (FT)	SIGNAL POLE/ARM CONDUCTOR QUANTITIES (FT)				
		APS UNIT	PED HEAD	MAST ARM	SPAN WIRE	LUM-A	1	2	3	4		PUSH BUTTON	PED HEAD	VEH HEADS	VIVDS	ILL
												2C#12	5C#12	5C#12	CABLE	4C#12 TRAY
A	55			19.5		30	43	55			49			117.5	68.5	30
B	40			19.5		30	28	40			34			87.5	53.5	30
	36			16.5			23	35			29			74.5	45.5	
C		3.5	8									3.5	8			
D		3.5	8									3.5	8			
E		3.5	8									3.5	8			
F		3.5	8		24							3.5	8	24		
G	32			19.5		30	19	31			25			69.5	44.5	30
H	36			19.5	7.5	30	24	36			30			67.5	37.5	30
	24			16.5			0	12	24		18			43.5	25.5	
TOTALS												14	32	484	275	120

RONALD REAGAN BLVD @ ELIZABETH PARK BLVD APS MESSAGE CHART			
APS UNIT #	ACKNOWLEDGEMENT DEFAULT "WAIT"	EXTENDED PRESS MESSAGE	WALK PHASE MESSAGE
		"WAIT TO CROSS (STREET NAME) AT (CROSS STREET NAME) "	TONE
W1	YES	ELIZABETH PARK BLVD BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W2	YES	ELIZABETH PARK BLVD BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W3	YES	ELIZABETH PARK BLVD BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE
W4	YES	ELIZABETH PARK BLVD BLVD AT RONALD REAGAN BLVD	AUSTRALIAN TONE

SHEET QUANTITY			
BID CODE	DESCRIPTION	UNIT	QTY
0416	6030 DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	18
0416	6032 DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	41
0416	6033 DRILL SHAFT (TRF SIG POLE) (42 IN)	LF	17.5
0416	6034 DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	22
0618	6029 CONDT (PVC) (SCH 40) (3")	LF	975
0618	6030 CONDT (PVC) (SCH 40) (3") (BORE)	LF	750
0620	6007 ELEC CONDR (NO.8) BARE	LF	890
0620	6008 ELEC CONDR (NO.8) INSULATED	LF	1780
0621	6005 TRAY CABLE (4 CONDR) (12 AWG)	LF	120
0624	6010 GROUND BOX TY D (162922)W/APRON	EA	7
0680	6003 INSTALL HWY TRF SIG (SYSTEM)	EA	1
0682	6001 VEH SIG SEC (12")LED (GRN)	EA	10
0682	6002 VEH SIG SEC (12")LED (GRN ARW)	EA	3
0682	6003 VEH SIG SEC (12")LED (YEL)	EA	10
0682	6004 VEH SIG SEC (12")LED (YEL ARW)	EA	3
0682	6005 VEH SIG SEC (12")LED (RED)	EA	10
0682	6006 VEH SIG SEC (12")LED (RED ARW)	EA	3
0682	6018 PED SIG SEC (LED) (COUNTDOWN)	EA	4
0682	6051 BACKPLATE W/REFL BRDR (3 SEC)ALUM	EA	13
0684	6007 TRF SIG CBL (TY A) (12 AWG) (2 CONDR)	LF	699
0684	6010 TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	471
0686	6007 INS TRF SIG PL AM (S)STR (TY B)	EA	1
0686	6035 INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	1
0686	6059 INS TRF SIG PL AM(S)1 ARM(55')LUM	EA	1
0686	6115 INS TRF SIG PL AM(S)2 ARM(36-24')LUM	EA	1
0686	6147 INS TRF SIG PL AM(S)2 ARM(40-36')LUM	EA	1
0687	6001 PED POLE ASSEMBLY	EA	3
0688	6001 PED DETECT PUSH BUTTON (APS)	EA	4
0688	6003 PED DETECTOR CONTROLLER UNIT	EA	1
0690	6137 VIVDS CABLE (INSTALL)	LF	1960
6027	6003 CONDUIT (PREPARE)	LF	175
6027	6000 GROUND BOX (PREPARE)	LF	2
6306	6001 VIVDS PROSR SYS	EA	1
6306	6002 VIVDS CAM ASSY FXD LNS	EA	6
6306	6007 VIVDS CABLING	LF	3645
XXXX	YYYY 3/16" GALV. STEEL SWAY CABLE	LF	145

Existing conduit and ground boxes are deemed acceptable, these items not needed to install RRBW traffic

STATE OF TEXAS



DOUGLAS BURNETT JR.

140757

LICENSED PROFESSIONAL ENGINEER

6/20/2024

1

GENERAL PLAN UPDATES

ATG

10/22/24

NO.

REVISION

BY

DATE

WILCO

TEXAS

ATG

ALLIANCE

TRANSPORTATION GROUP

TBPE Firm Registration No. F-812

11701 Stonehollow Dr | Suite 100 | Austin, TX 78758

Phone: 512-821-2081 | Fax: 512-821-2085

RONALD REAGAN BLVD.

SIGNAL DETAILS

RONALD REAGAN AND ELIZABETH PARK BLVD

Designed: ATG

FED. RD. DIV. NO. X

STATE TEXAS

FEDERAL AID PROJECT NO.

HIGHWAY NO.

Checked: ATG

DIST.

COUNTY

CONTROL NO.

SECTION NO.

JOB NO.

SHEET NO.

Drawn: ATG

WILLIAMSON

512

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10/22/2024

6/20/2024

RONALD REAGAN BLVD.

SIGNAL MOUNTED SIGN DETAILS
RONALD REAGAN AND TOWER ROAD

Designed:	ATG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	ATG	X	TEXAS	SEE TITLE SHEET			TITLE SHEET
Drawn:	ATG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ATG		WILLIAMSON				519

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SHEET QUANTITY				
BID CODE		DESCRIPTION	UNIT	QTY
0416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	27
0416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	44
0618	6029	CONDT (PVC) (SCH 40) (3")	LF	1320
0618	6030	CONDT (PVC) (SCH 40) (3") (BORE)	LF	1275
0620	6007	ELEC CONDR (NO.8) BARE	LF	870
0620	6008	ELEC CONDR (NO.8) INSULATED	LF	1740
0621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	120
0624	6010	GROUND BOX TY D (162922)W/APRON	EA	5
0628	6145	ELC SRV TY D 120/240 060(NS)SS(E)SP(O)	EA	1
0680	6003	INSTALL HWY TRF SIG (SYSTEM)	EA	1
0682	6001	VEH SIG SEC (12")LED (GRN)	EA	8
0682	6002	VEH SIG SEC (12")LED (GRN ARW)	EA	6
0682	6003	VEH SIG SEC (12")LED (YEL)	EA	8
0682	6004	VEH SIG SEC (12")LED (YEL ARW)	EA	8
0682	6005	VEH SIG SEC (12")LED (RED)	EA	8
0682	6006	VEH SIG SEC (12")LED (RED ARW)	EA	6
0682	6051	BACKPLATE W/REFL BRDR (3 SEC)ALUM	EA	12
0682	6052	BACKPLATE W/REFL BRDR (4 SEC)ALUM	EA	2
0684	6010	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	2206.5
0684	6012	TRF SIG CBL (TY A) (12 AWG) (7 CONDR)	LF	535.5
0686	6035	INS TRF SIG PL AM(S)1 ARM (32')LUM	EA	1
0686	6039	INS TRF SIG PL AM(S)1 ARM (36')LUM	EA	1
0686	6055	INS TRF SIG PL AM(S)1 ARM (50')LUM	EA	1
0686	6059	INS TRF SIG PL AM(S)1 ARM (55')LUM	EA	1
0690	6137	VIVDS CABLE (INSTALL)	LF	1002.5
6306	6001	VIVDS PROSR SYS	EA	1
6306	6002	VIVDS CAM ASSY FXD LNS	LF	4
6306	6007	VIVDS CABLING	LF	1802.5

RONALD REAGAN @ FM 3405 CABLE TERMINATION CHART														
CONDR	SIGNAL	SIGNAL INDICATION	POLE ID	A				B		C			D	
			PHASING	3	8			2		7		4		6
			WIRE COLOR	1	2	3	4	5	6	7		8	9	10
12 AWG 5 CONDR	3 SECTION (THRU)	RED ARW	RED		X	X	X	X	X			X	X	X
		YELLOW ARW	ORANGE		X	X	X	X	X			X	X	X
		GREEN ARW	GREEN		X	X	X	X	X			X	X	X
	SPARE	SPARE	BLACK											
	COMMON	AC NEUTRAL	WHITE		X	X	X	X	X			X	X	X
12 AWG 7 CONDR	3 SECTION (THRU)	RED BALL	RED											
		YELLOW BALL	ORANGE											
		GREEN BALL	GREEN											
	4 SECTION (LT)	RED ARW	RD/BLK STRIP	X						X				
		YELLOW ARW	YEL/BLK STRIP	X						X				
		GREEN ARW	GRN/BLK STRIP	X						X				
	SPARE	YELLOW FL ARW	BLACK	X						X				
COMMON	AC NEUTRAL	WHITE	X						X					

POLE AND ARM WIRING SCHEDULE																
POLE NO.	ARM LENGTH (FT)	MOUNTING HEIGHTS (FT)				SIGNAL HEAD SPACING FROM POLE (FT)				VIVDS SPACING (FT)	SIGNAL POLE/ARM CONDUCTOR QUANTITIES (FT)					
		APS UNIT	PED HEAD	MAST ARM	LUM-A	1	2	3	4		PUSH BUTTON	PED HEAD	VEH HEADS	VEH HEADS	VIVDS	ILL
											2C#12	5C#12	5C#12	7C#12	CABLE	4C#12 TRAY
A	55			19.5	30	16	28	40	52	34			123	71.5	53.5	30
B	32			19.5	30	8.5	17.5	29.5		23.5			75		43	30
C	50			19.5	30	10	20.5	32.5	44.5	38.5			102	64	58	30
D	36			19.5	30	10	22.5	34.5		28.5			86.5		48	30
TOTALS											0	0	386.5	135.5	202.5	120

STATE OF TEXAS

★

DOUGLAS BURNETT JR.

140757

PROFESSIONAL ENGINEER

6/20/2024

1

GENERAL PLAN UPDATES

ATG

10/22/24

NO.

REVISION

BY

DATE

WILCO

TEXAS

ATG

ALLIANCE

TRANSPORTATION GROUP

TBPE Firm Registration No. F-812

11701 Stonehollow Dr | Suite 100 | Austin, TX 78758

Phone: 512-821-2081 | Fax: 512-821-2085

RONALD REAGAN BLVD.

SIGNAL DETAILS

RONALD REAGAN AND FM 3405

Designed: ATG

FED. RD. DIV. NO. X

STATE TEXAS

FEDERAL AID PROJECT NO.

HIGHWAY NO.

Checked: ATG

DIST.

COUNTY

CONTROL NO.

SECTION NO.

JOB NO.

SHEET NO.

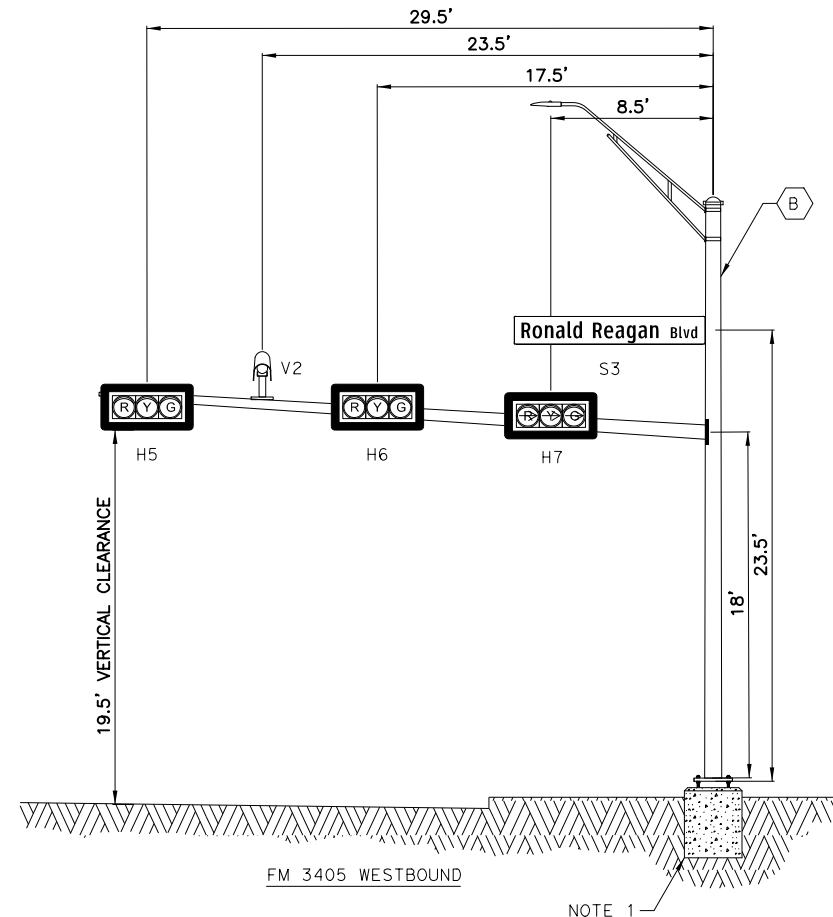
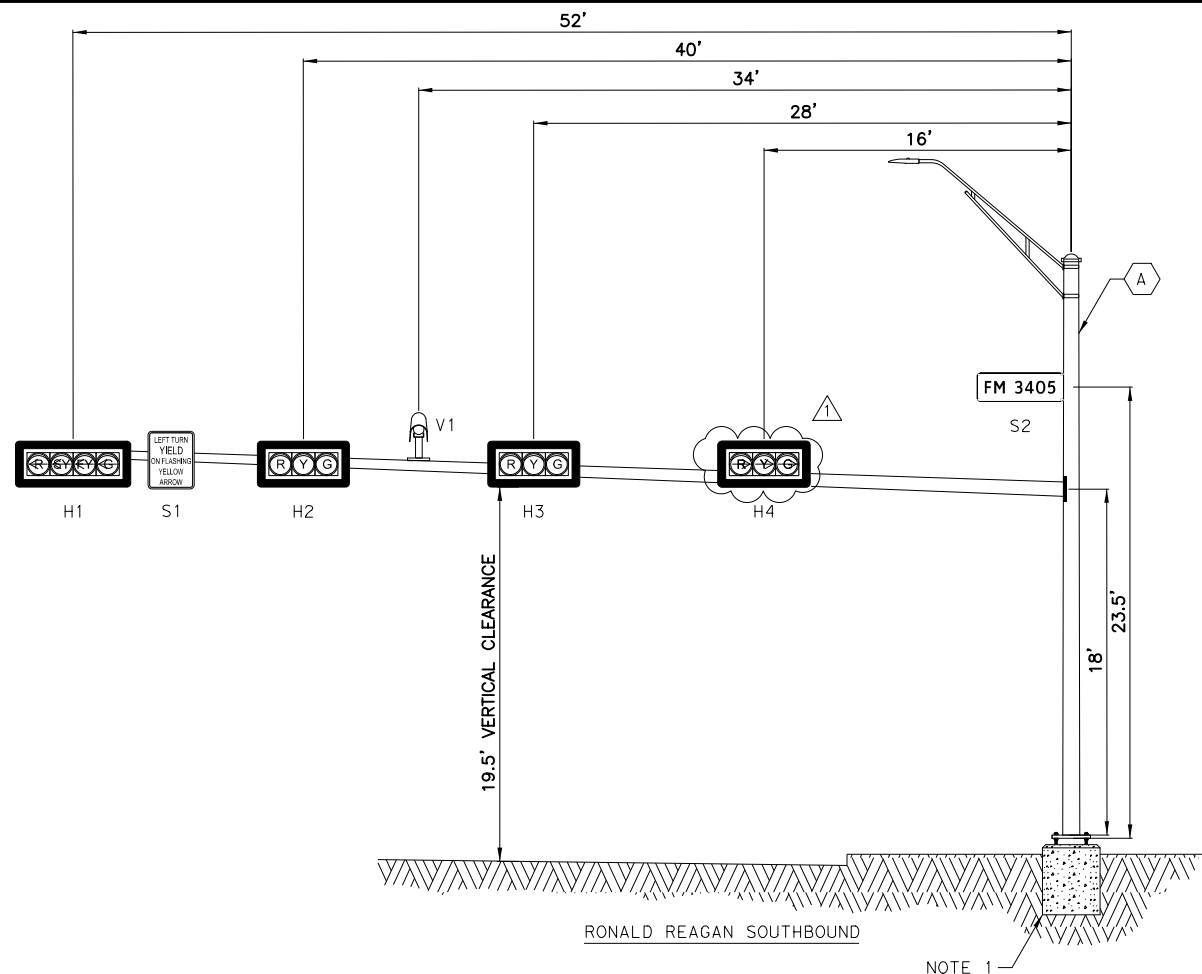
Checked: ATG

WILLIAMSON

525

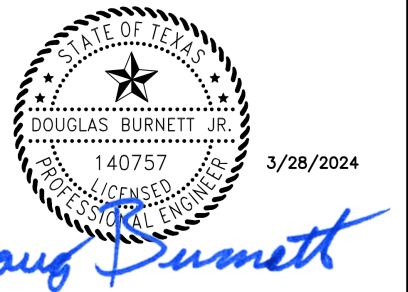
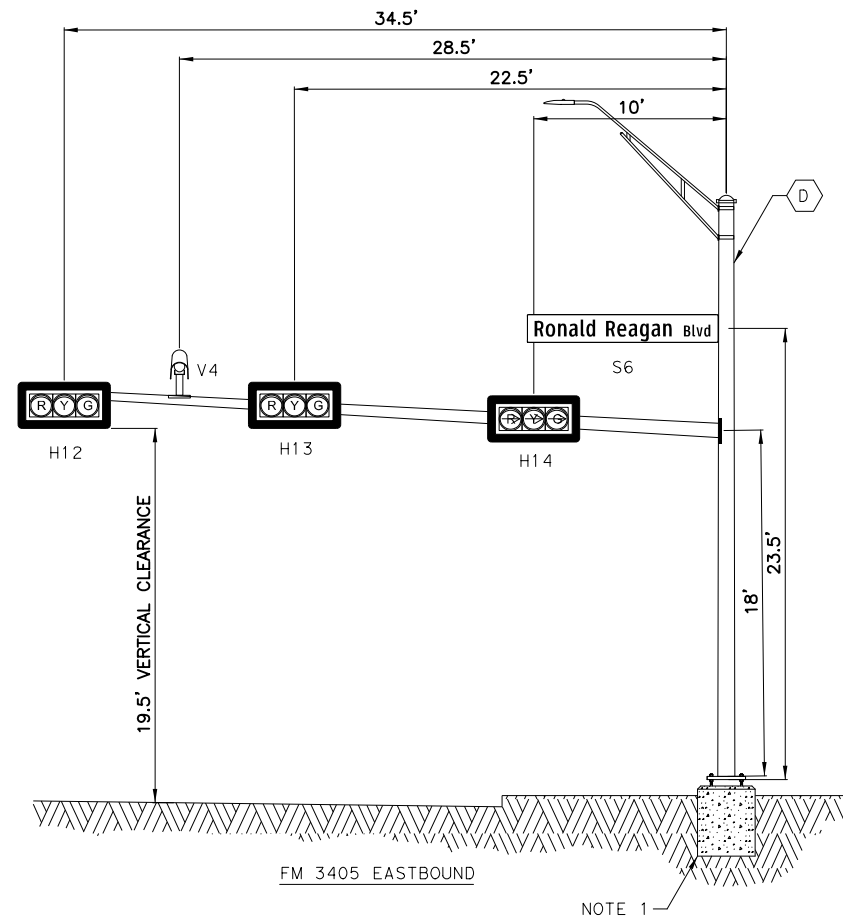
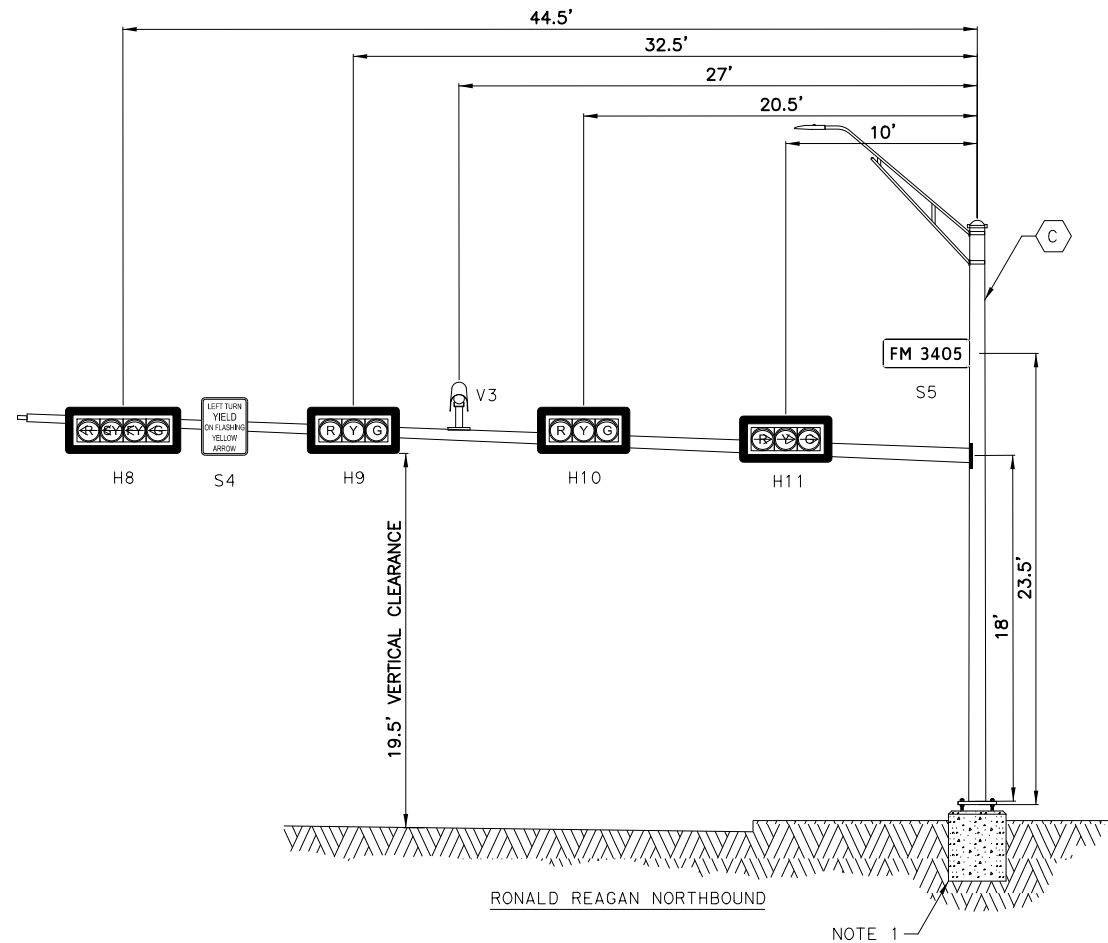
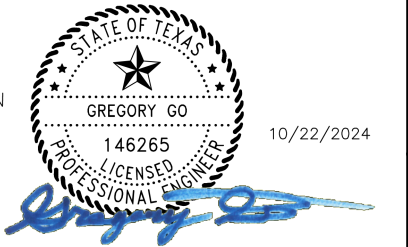
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GENERAL NOTE:
1. SEE PROPOSED SIGNAL LAYOUT SHEET FOR FOUNDATION DETAILS.

FOR REVISION
#1 ONLY



1	GENERAL PLAN UPDATES	ATG	10/22/24				
NO.	REVISION	BY	DATE				
		 TBPE Firm Registration No. F-612 11701 Stonehollow Dr Suite 100 Austin, TX 78758 Phone: 512-821-2081 Fax: 512-821-2085					
RONALD REAGAN BLVD.							
SIGNAL ELEVATIONS RONALD REAGAN AND FM 3405							
Designed:	ATG	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.		HIGHWAY NO.	
Checked:	ATG	X	TEXAS	SEE TITLE SHEET			TITLE SHEET
Drawn:	ATG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	ATG		WILLIAMSON				527

Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
32	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
40	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
44	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B

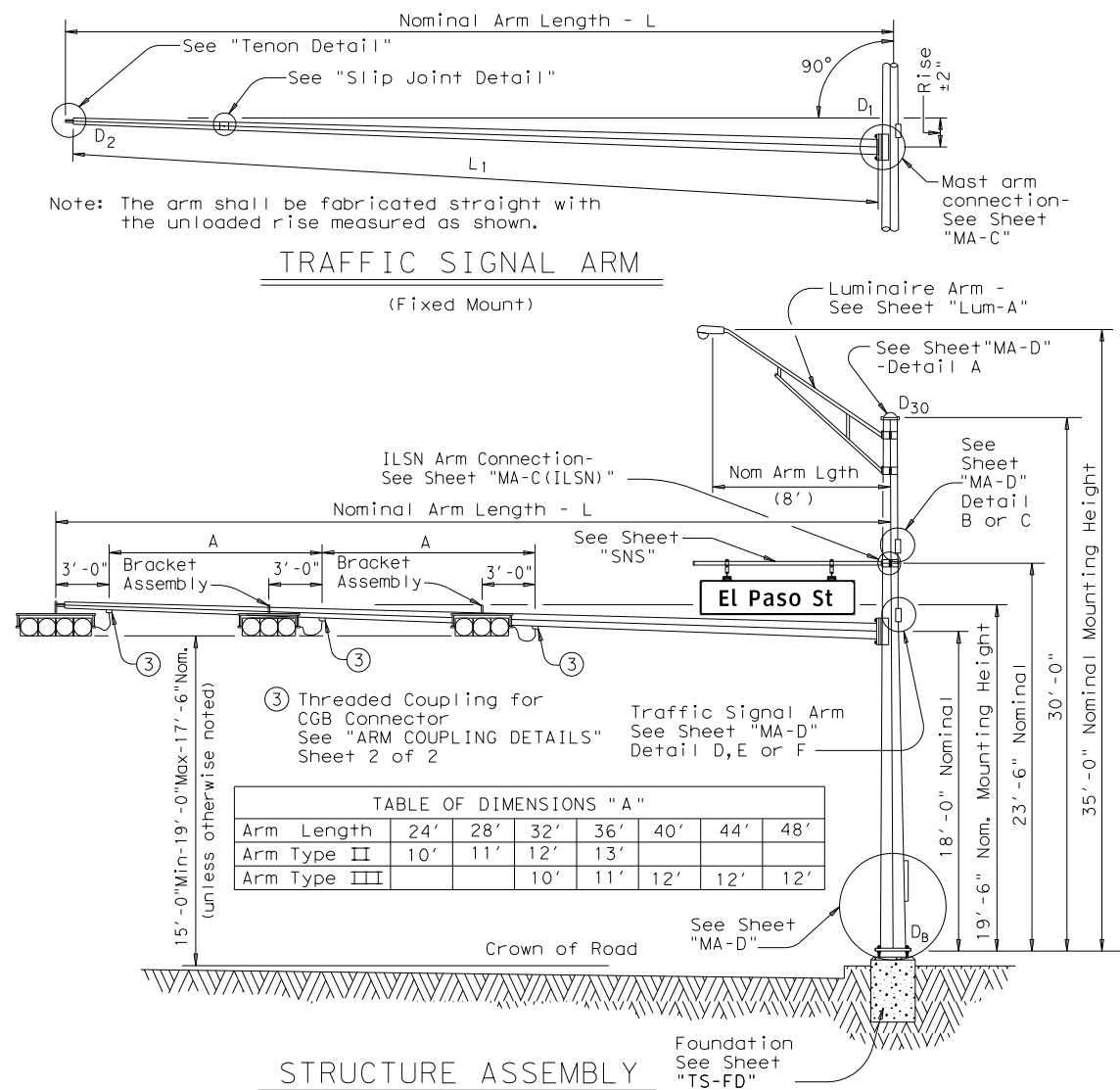
Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

D_B = Pole Base O.D.
D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire
D₁ = Arm Base O.D.

D₂ = Arm End O.D.
L₁ = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D₂ may be increased by up to 1" for polygonal arms.



SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-100		20S-100		20-100	
24	24L-100		24S-100		24-100	
28	28L-100	1	28S-100		28-100	
32	32L-100	2	32S-100		32-100	
36	36L-100	4	36S-100		36-100	
40	40L-100	1	40S-100		40-100	
44	44L-100	2	44S-100		44-100	

Traffic Signal Arms (1 per pole)

Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100	1		
32			32II-100	1	32III-100	1
36			36II-100	2	36III-100	2
40					40III-100	1
44					44III-100	2

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	10

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

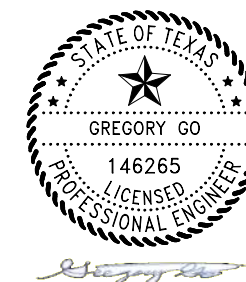
Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	7
2"	4'-3"	3

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

SHEET 1 OF 2



10/22/2024

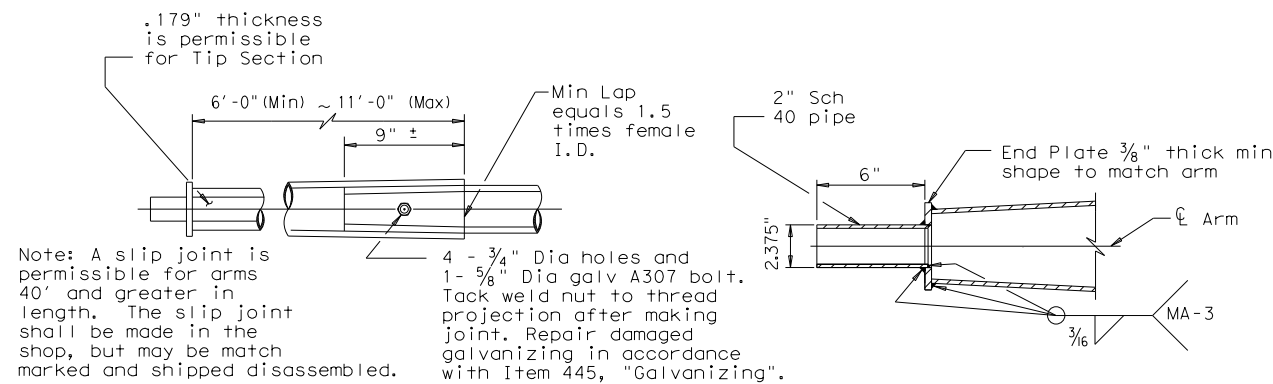
Texas Department of Transportation
Traffic Operations Division

**TRAFFIC SIGNAL
SUPPORT STRUCTURES**
SINGLE MAST ARM ASSEMBLY
(100 MPH WIND ZONE)
SMA-100(1)-12

© TxDOT August 1995		DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96					
11-99					
1-12					
		DIST	COUNTY		SHEET NO.
					535

123A

NO.	DATE	RFI #14	ATG
		REVISION	APPROV.



VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backplates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

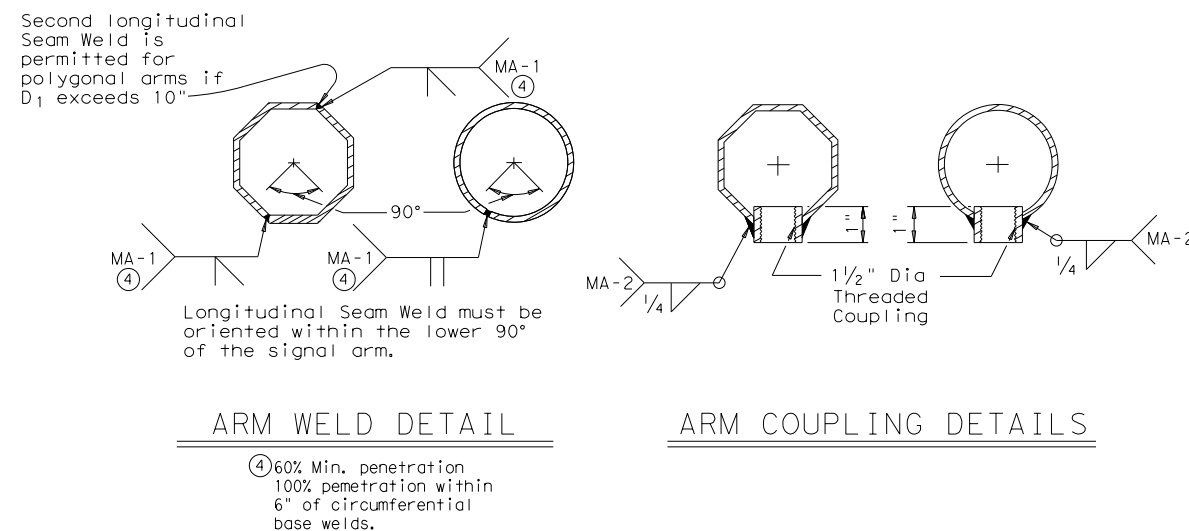
See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

SHEET 2 OF 2



TRAFFIC SIGNAL SUPPORT STRUCTURES SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(2)-12

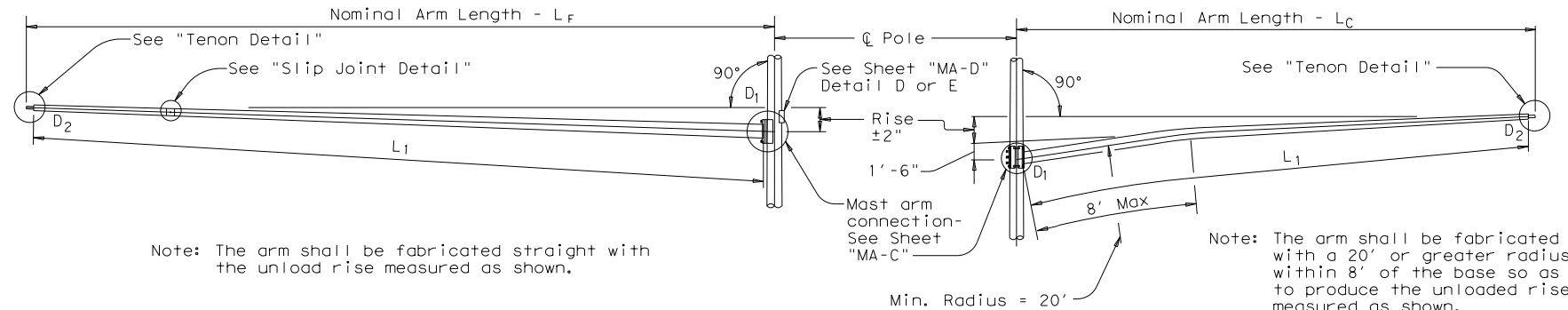
© TxDOT August 1995		DN: MS		CK: JSY		DW: MMF		CK: JSY			
5-96 1-12	REVISIONS		CONT		SECT		JOB		HIGHWAY		
			DIST		COUNTY				SHEET NO.		
								536			

△	10/22/24	RFI #14	ATG
NO.	DATE	REVISION	APPROV.

1

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DATE:
FILE:



FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor. Designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

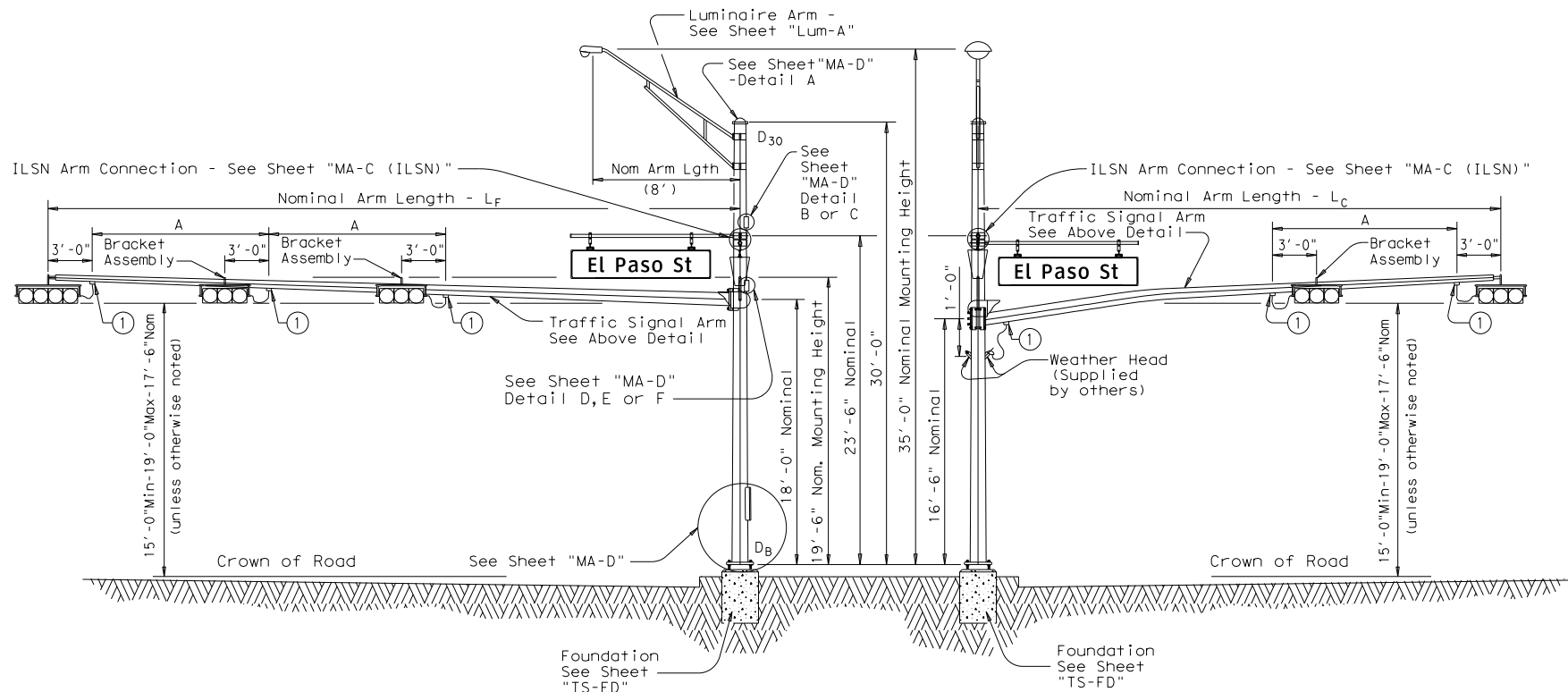
Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name signs and two traffic signal arms with length combinations as tabulated. The specified luminaire load applied at the end of luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign applied 4'-6" from the centerline of the pole equals 85 lbs vertical dead load plus the horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.



ELEVATION

(Showing fixed mount arm)

STRUCTURE ASSEMBLY

- ① Threaded Coupling for CGB Connector See "ARM COUPLING DETAILS" Sheet 2 of 3

ELEVATION

(Showing clamp mount arm)

TABLE OF DIMENSIONS "A"						
Arm Length	24'	28'	32'	36'	40'	44'
Arm Type I	10'	11'	12'	13'		
Arm Type III			10'	11'	12'	12'

SHEET 1 OF 3

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

DMA-100 (1)-12

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DN: MS CK: JSY DW: MMF CK: JSY

REVISIONS

CONT SECT JOB HIGHWAY

5-96
1-12

DIST COUNTY SHEET NO.

125A

537

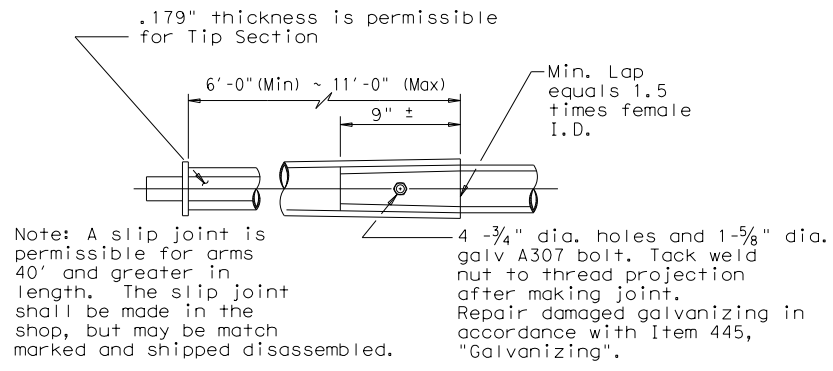
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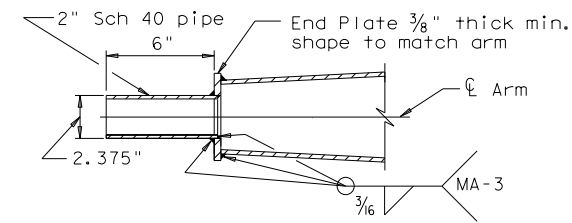
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FILE:



SLIP JOINT DETAIL



TENON DETAIL

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY

VIBRATION WARNING

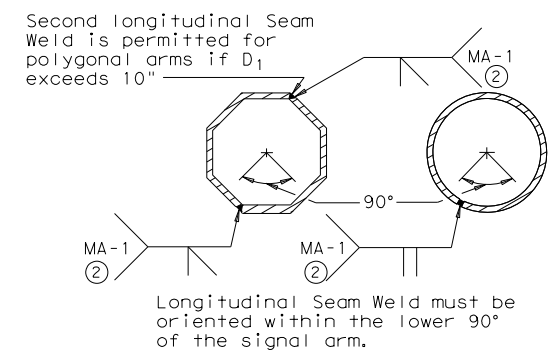
Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

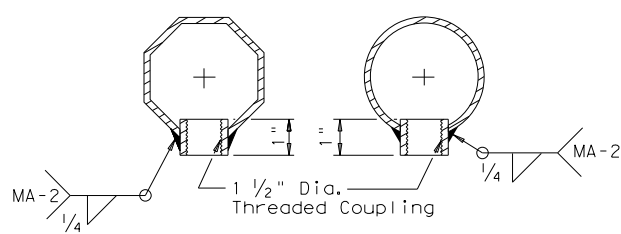
The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backplates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.



ARM WELD DETAIL

② 60% Min. penetration
100% penetration within
6" of circumferential
base welds.



ARM COUPLING DETAILS



Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT
STRUCTURES
DUAL MAST ARM ASSEMBLY
(100 MPH WIND ZONE)
DMA-100 (2)-12

© TxDOT August 1995		DN: MS	CK: JSY	DW: MMF	CK: JSY
05-96 1-12		CONT	SECT	JOB	HIGHWAY
		DIST	COUNTY		SHEET NO.
					538

NO.	10/22/24	RFI #14	ATG
	DATE	REVISION	APPROV.



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SHIPPING PARTS LIST							
Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers and any additional hardware listed in the table.							
Nominal Arm Length		30' Poles With Luminaire		24' Poles With ILSN		19' Poles With no Luminaire and no ILSN	
		See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole		See note above	
LF	Lc	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20	2020L-100		2020S-100		2020-100	
24	20	2420L-100		2420S-100		2420-100	
	24	2424L-100		2424S-100		2424-100	
28	20	2820L-100		2820S-100		2820-100	
	24	2824L-100		2824S-100		2824-100	
	28	2828L-100		2828S-100		2828-100	
32	20	3220L-100		3220S-100		3220-100	
	24	3224L-100		3224S-100		3224-100	
	28	3228L-100		3228S-100		3228-100	
	32	3232L-100		3232S-100		3232-100	
36	20	3620L-100		3620S-100		3620-100	
	24	3624L-100	1	3624S-100		3624-100	
	28	3628L-100		3628S-100		3628-100	
	32	3632L-100		3632S-100		3632-100	
	36	3636L-100		3636S-100		3636-100	
40	20	4020L-100		4020S-100		4020-100	
	24	4024L-100		4024S-100		4024-100	
	28	4028L-100		4028S-100		4028-100	
	32	4032L-100		4032S-100		4032-100	
	36	4036L-100	1	4036S-100		4036-100	
44	20	4420L-100		4420S-100		4420-100	
	24	4424L-100		4424S-100		4424-100	
	28	4428L-100		4428S-100		4428-100	
	32	4432L-100		4432S-100		4432-100	
	36	4436L-100	1	4436S-100		4436-100	

Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100	1	36III-100	
40					40III-100	1
44					44III-100	1

Traffic Signal Arms (Clamp-On Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	2 CGB connector and 1 clamp w/bolts and washers		1 Bracket Assembly, 3 CGB Connectors, and 1 clamp w/bolts and washers		2 Bracket Assembly, 4 CGB Connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100	1		
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100	2	36III-100	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

ILSN Arm (1 or 2 per pole) ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 3/4"	3'-10"	
2"	4'-3"	1
2 1/4"	4'-9"	2

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "IS-FD".

Templates may be removed for shipment.

ARMS		ROUND POLES					POLYGONAL POLES					Foundation Type
LF	Lc	D _B	D ₁₉	D ₂₄	D ₃₀	③ thk	D _B	D ₁₉	D ₂₄	D ₃₀	③ thk	
ft.	ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	20	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
24	20	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
	24	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
28	20	13.0	10.3	9.6	8.8	.239	14.5	11.5	10.7	9.8	.239	36-A
	24	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A
	28	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	24	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	28	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B
	32	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B
36	20	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B
	24	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
	28	14.5	11.8	11.1	10.3	.239	16.0	13.0	12.2	11.3	.239	36-B
	32	14.5	11.8	11.1	10.3	.239	16.0	13.0	12.2	11.3	.239	36-B
	36	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B
40	20	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B
	24	15.0	12.3	11.6	10.8	.239	16.5	13.5	12.7	11.8	.239	36-B
	28	15.0	12.3	11.6	10.8	.239	17.0	14.0	13.2	12.3	.239	42-A
	32	15.0	12.3	11.6	10.8	.239	17.0	14.0	13.2	12.3	.239	42-A
	36	15.5	12.8	12.1	11.3	.239	17.5	14.5	13.7	12.8	.239	42-A
44	20	15.5	12.8	12.1	11.3	.239	17.5	14.5	13.7	12.8	.239	42-A
	24	15.5	12.8	12.1	11.3	.239	17.5	14.5	13.7	12.8	.239	42-A
	28	16.0	13.3	12.6	11.8	.239	18.0	15.0	14.2	13.3	.239	42-A
	32	16.0	13.3	12.6	11.8	.239	18.0	15.0	14.2	13.3	.239	42-A
	36	16.0	13.3	12.6	11.8	.239	18.0	15.0	14.2	13.3	.239	42-A

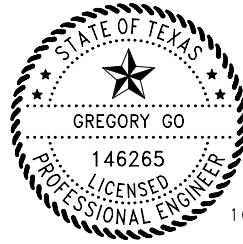
Arm L _F or L _C	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	③ thk	Rise	L ₁	D ₁	④ D ₂	③ thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

D_B = Pole Base O.D.
D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire

D₁ = Arm Base O.D.
D₂ = Arm End O.D.
L₁ = Shaft Length
L_F = Fixed Arm Length
L_C = Clamp-on Arm Length (36' Max)

③ Thickness shown are minimums, thicker materials may be used.

④ D₂ may be increased by up to 1.0" for polygonal arms.



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Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT
STRUCTURES

DUAL MAST ARM ASSEMBLY
(100 MPH WIND ZONE)
DMA-100 (3)-12

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5-96 1-12	CONT	SECT	JOB	HIGHWAY
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				539

125C

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Shipping Parts List							
Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.							
Nominal Arm Length	30' Poles with Luminaire		24' Poles with ILSN		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN		
	See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole		See note above		
Single Mast Arm							
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity	
50	50L	2	50S		50		
55	55L	3	55S		55		
60	60L	3	60S		60		
65	65L		65S		65		
Dual Mast Arm							
Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L	1	5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

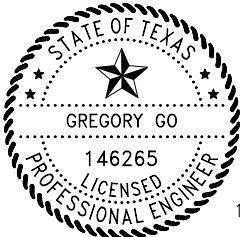
Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
KAUFFMANN POLE C	10	1	22
SANTA RITA POLES A, G, L	10	3	66
ELIZABETH PARK POLE A	10	1	22
TOWER POLES B, H	10	2	44
FM 3405 POLES A, C	10	2	44
Total Drill Shaft Length			198

Notes

- ** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
- *** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Abbreviations

Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)



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Shipping Parts List						
Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm with listed equipment attached						
Nominal Arm Length	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors		Luminaire Arms (1 per 30' pole)			
			Nominal Arm Length		Quantity	
ft.	Designation	Quantity	8' Arm			
50	50IV	2	ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers			
55	55IV	4				
60	60IV	3				
65	65IV		Nominal Arm Length		Quantity	
			7' Arm			
			9' Arm			
Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached						
Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers	
	ft.	Designation	Quantity	Designation	Quantity	Designation
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	
Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached						
Nominal Arm	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
	ft.	Designation	Quantity	Designation	Quantity	Designation
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	
Anchor Bolt Assemblies (1 per pole) Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.						
Anchor Bolt Diameter	Anchor Bolt Length	Quantity				
2 1/2 "	5' - 3"	9				



LONG MAST
ARM ASSEMBLY
PARTS LIST

LMA (5) - 12

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4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
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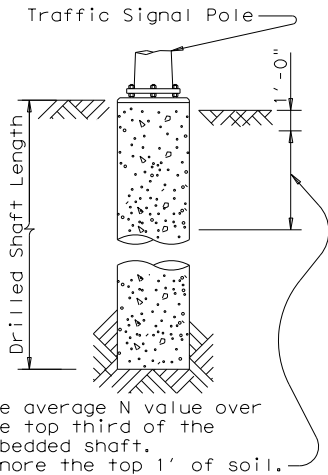
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FOUNDATION DESIGN TABLE													
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N Blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

- NOTES:
- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
 - Foundation Design Loads are the allowable moments and shears at the base of the structure.
 - Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
 - Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
 - If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
 - Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)					
		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
		44' X 28'	44' X 36'		
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
				44' x 36'	



ANCHOR BOLT & TEMPLATE SIZES						
BOLT DIA IN.	(7) BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	Rt
¾"	1'-6"	3"	—	12 ¾"	7 ⅞"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

(7) Min dimensions given, longer bolts are acceptable.

FOUNDATION SUMMARY TABLE ③									
LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET)					
				24-A	30-A	36-A	36-B	42-A	
KAUFFMANN									
POLE A	10	42-A	1					17	
POLE B	10	36-A	1			13			
POLE D	10	36-A	1			13			
SANTA RITA									
POLES B, D, E	10	24-A	3	18					
POLES H, J, K	10	24-A	3	18					
POLE C	10	36-B	1				15		
POLE F	10	36-B	1				15		
POLE I	10	36-A	1			13			
ELIZABETH PARK									
POLES C, D, E	10	24-A	3	18					
POLE B	10	42-A	1					17	
POLE F	10	36-A	1			13			
POLE G	10	36-A	1			13			
POLE H	10	36-B	1				15		
TOWER									
POLES A, C, D, F, G	10	24-A	5	30					
POLES I, J, L, M	10	24-A	4	24					
POLE E	10	36-B	1				15		
POLE K	10	36-A	1			13			
FM 3405									
POLE B	10	36-A	1			13			
POLE D	10	36-A	1			13			
TOTAL DRILLED SHAFT LENGTHS				108		104	60	34	

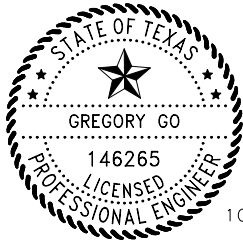
- GENERAL NOTES:
- Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminares and Traffic Signals and interim revisions thereto.
- Reinforcing steel shall conform to Item 440, "Reinforcing Steel".
- Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

NO.	DATE	RFI #14 REVISION	ATG APPROV.
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Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96 11-98 1-12		DIST		COUNTY	SHEET NO.
					545



Prices align with current TxDOT average bid costs.

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RFI 014

11/14/2024

BID ITEM	DESCRIPTION	PREVIOUS QTY	NEW QTY	UNIT	UNIT COST	NEW UNIT COST	PREVIOUS TOTAL	NEW TOTAL	DELTA
REVISIONS - 80 MPH TO 100 MPH STANDARDS									
686-6031	INS TRF SIG PL AM (S) 1 ARM (28') LUM	1	1	EA	\$12,500.00	\$14,500.00	\$12,500.00	\$ 14,500.00	\$ 2,000.00
686-6035	INS TRF SIG PL AM (S) 1 ARM (32') LUM	2	2	EA	\$13,500.00	\$16,250.00	\$27,000.00	\$ 32,500.00	\$ 5,500.00
686-6039	INS TRF SIG PL AM (S) 1 ARM (36') LUM	4	4	EA	\$15,000.00	\$17,000.00	\$60,000.00	\$ 68,000.00	\$ 8,000.00
686-6043	INS TRF SIG PL AM (S) 1 ARM (40') LUM	1	1	EA	\$16,250.00	\$18,750.00	\$16,250.00	\$ 18,750.00	\$ 2,500.00
686-6047	INS TRF SIG PL AM (S) 1 ARM (44') LUM	2	2	EA	\$16,500.00	\$19,500.00	\$33,000.00	\$ 39,000.00	\$ 6,000.00
686-6115	INS TRF SIG PL AM (S) 2 ARM (36-24') LUM	1	1	EA	\$19,000.00	\$23,000.00	\$19,000.00	\$ 23,000.00	\$ 4,000.00
686-6147	INS TRF SIG PL AM (S) 2 ARM (40-36') LUM	1	1	EA	\$22,000.00	\$25,000.00	\$22,000.00	\$ 25,000.00	\$ 3,000.00
686-6167	INS TRF SIG PL AM (S) 2 ARM (44-36') LUM	1	1	EA	\$24,000.00	\$27,500.00	\$24,000.00	\$ 27,500.00	\$ 3,500.00
686-6215	INS TRF SIG PL AM (S) 2 ARM (55-36') LUM	1	1	EA	\$46,000.00	\$47,250.00	\$46,000.00	\$ 47,250.00	\$ 1,250.00
QUANTITY REVISIONS									
686-6059	INS TRF SIG PL AM (S) 1 ARM (55') LUM	2	3	EA	\$44,000.00	N/A	\$88,000.00	\$132,000.00	\$44,000.00
NEW ITEMS									
680-6111	INSTALL HWY TRF SIG (UPGRADE)	0	1	EA	N/A	\$2,800.00	\$0.00	\$2,800.00	\$2,800.00
686-6007	INS TRF SIG PL AM (S) STR (TY B)	0	1	EA	N/A	\$8,000.00	\$0.00	\$8,000.00	\$8,000.00
0027-0003	CONDUIT (PREPARE)	0	095	LF	N/A	\$5.00	\$0.00	\$0,475.00	\$0,475.00
0027-0008	GROUND BOX (PREPARE)	0	7	EA	N/A	\$625.00	\$0.00	\$4,375.00	\$4,375.00
TOTAL PROPOSAL								\$ 98,400.00	

Current contract item quantity changes noted in RFI 014, which do not have product changes or pricing impacts, are to be handled as over/under runs. Ex: 0416-6030, 0416-6032, 0682-6001, etc.

Total: \$90,550.00