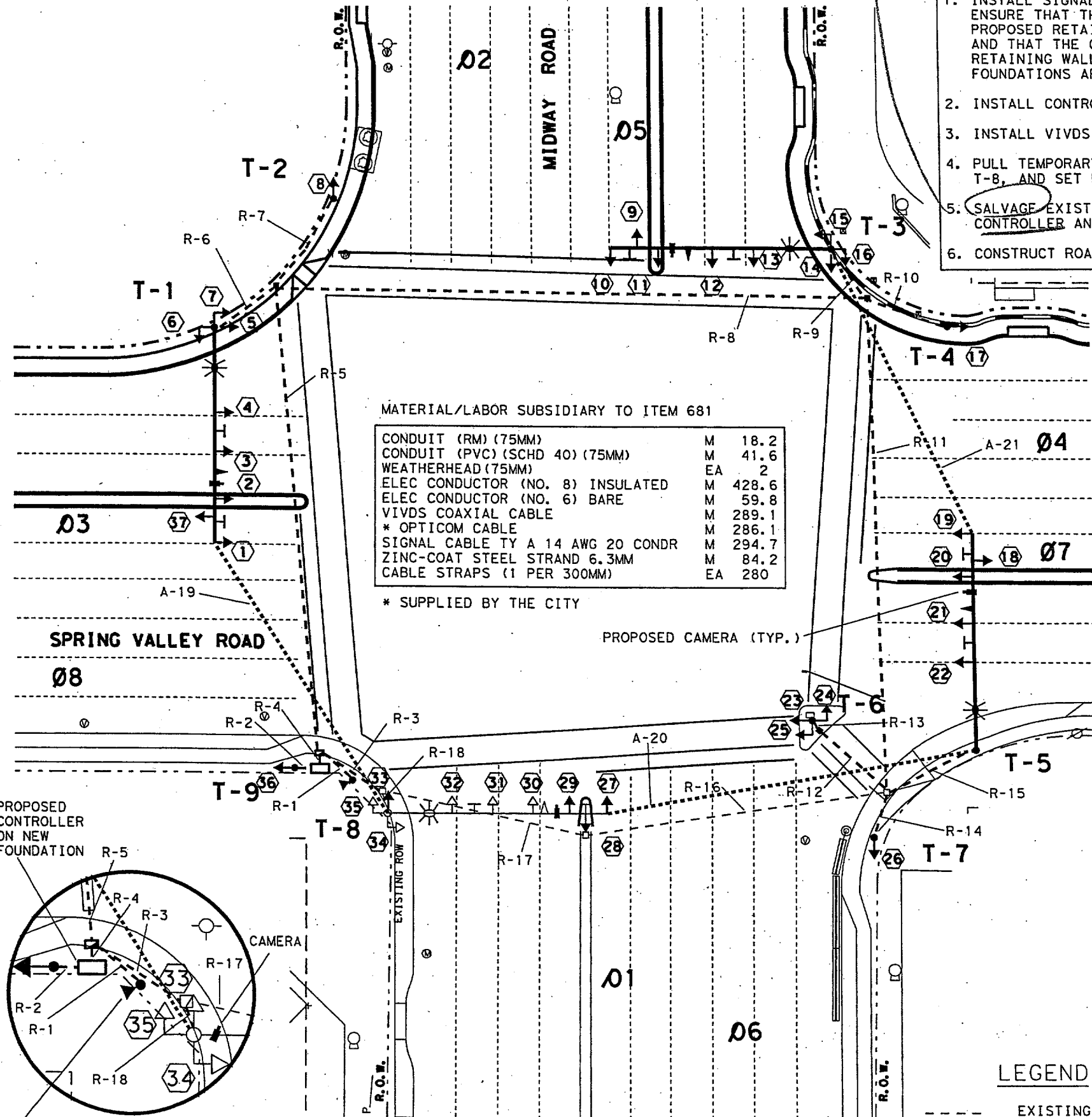
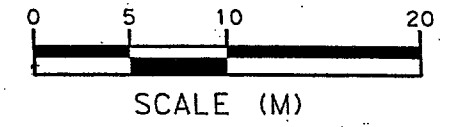


S2-4

SEQUENCE OF WORK

1. INSTALL SIGNAL POLE FOUNDATION AND SIGNAL POLES T-1, T-3, AND T-5. ENSURE THAT THE FOUNDATION FOR T-3 IS FLUSH WITH THE TOP OF THE PROPOSED RETAINING WALL, THAT THE EXPOSED SURFACES ARE FINISHED, AND THAT THE CONDUIT STUB-OUT IS NOT IN CONFLICT WITH THE PROPOSED RETAINING WALL. SEE MISCELLANEOUS DETAIL, SHEET ***. THE REMAINING FOUNDATIONS ARE TO BE FLUSH WITH THE PROPOSED GRADE.
2. INSTALL CONTROLLER AND FOUNDATION.
3. INSTALL VIVDS CAMERAS ON THE MAST ARMS AS SHOWN.
4. PULL TEMPORARY CABLES TO POLES T-1, T-3, AND T-5 OVERHEAD FROM POLE T-8, AND SET UP VIDEO DETECTION.
5. SALVAGE EXISTING SIGNALS (EXCEPT POLE T-8), INCLUDING EXISTING CONTROLLER AND CABLES.
6. CONSTRUCT ROADWAY AND RETAINING WALL.



MATERIAL/LABOR SUBSIDIARY TO ITEM 681

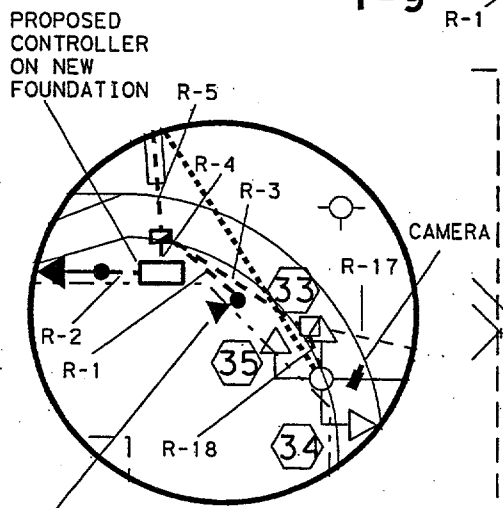
CONDUIT (RM) (75MM)	M	18.2
CONDUIT (PVC) (SCHD 40) (75MM)	M	41.6
WEATHERHEAD (75MM)	EA	2
ELEC CONDUCTOR (NO. 8) INSULATED	M	428.6
ELEC CONDUCTOR (NO. 6) BARE	M	59.8
VIVDS COAXIAL CABLE	M	289.1
* OPTICOM CABLE	M	286.1
SIGNAL CABLE TY A 14 AWG 20 CONDR	M	294.7
ZINC-COAT STEEL STRAND 6.3MM	M	84.2
CABLE STRAPS (1 PER 300MM)	EA	280

* SUPPLIED BY THE CITY

WIRING CHART FOR TEMPORARY CONNECTION

RUN NO.	POLE NO.	CONDUIT TYPE	NO. 6 XHHW	NO. 6 BARE	NO. 8 XHHW	NO. 12 XHHW	VIVDS COAX	OPTI-COM	TY A			LENGTH (M)
									5 CNDR CABLE	7 CNDR CABLE	20 CNDR CABLE	
1		2-50MM	2	2	8							30.0
3		1-100MM		1	*6,2		*3,1	*3,1			*3,1	3.0
4		2-75MM		2			*3,1	*3,1			*3,1	17.7
4		1-50MM	2	1								17.7
18		1-50MM		1	2		1	1			1	20.8
*18		*2-75MM		*2	*6		*3	*3			*3	20.8
*18A		*2-75MM RM		*2	*6		*3	*3			*3	9.1
*19		AERIAL			*2		*1	*1			*1	3.5
*20		AERIAL			*4		*2	*2			*2	5.7
*21		AERIAL			*2		*1	*1			*1	3.2
T-1						27.4	20.1	19.1	97.3	3.0		
*T-1					*48.8		*6.0	*7.0				*24.4
T-3						27.4	20.1	18.0	95.2	3.0		
*T-3					*18.2		*15.0	*12.0				*9.1
T-5						27.4	20.1	19.0	97.9			
*T-5					*54.8		*34.3	*33.3				*27.4
T-8						27.4	22.1	17.0	115.9			
*T-8					*73.2		*63.9	*63.9				*63.9
* TOTALS (M)					*59.8	*428.6		*289.1	*286.1			*294.7

* SUBSIDIARY TO ITEM 681, AND TO BE REMOVED FOR THE PERMANENT SIGNAL
 - RUN 18A IS STRAPPED TO POLE T-8, AND CONNECTS TO ONE CONDUIT OF RUN 18
 - QUANTITIES NOT TOTALED ARE PAID BY BID ITEM, SEE PERMANENT SIGNAL LAYOUT



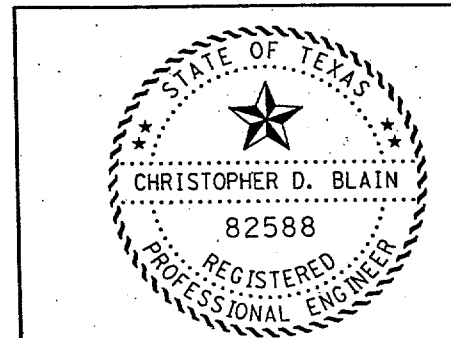
INSTALL ELECTRICAL SERVICE
 TY D 120/240 070 (NS)SS(E)GC(O)

LEVELS DISPLAYED

11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58
59	60	61	62				

LEGEND

- EXISTING CONDUIT RUN
- PROPOSED CONDUIT RUN
- PROPOSED AERIAL RUN



Christopher D. Blain P.E. 5/1/05
 Signature Date



TEMPORARY SIGNAL PLAN
 MIDWAY ROAD & SPRING VALLEY ROAD

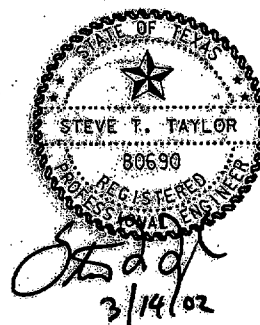
SCALE: 1 = 400 SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
BES	6	CM 97 (87)	CS
GRAPHICS	STATE	DISTRICT	COUNTY
BES	TEXAS	DALLAS	DALLAS
CHECK	CONTROL	SECTION	JOB
CDB	0918	45	344

58

S2-4

CABLE TERMINATION CHART										
CNDR NO.	CONDUCTOR COLOR	CABLE 1	CABLE 2	CABLE 3	CABLE 4	CABLE 5	CABLE 6	CABLE 7	CABLE 8	CABLE 9
		20 CNDR	5 CNDR	20 CNDR	5 CNDR	20 CNDR	5 CNDR	20 CNDR	5 CNDR	20 CNDR
		FROM T-1 TO CNTRL.	FROM T-2 TO CNTRL.	FROM T-3 TO CNTRL.	FROM T-4 TO CNTRL.	FROM T-5 TO CNTRL.	FROM T-6 TO CNTRL.	FROM T-7 TO CNTRL.	FROM T-8 TO CNTRL.	FROM T-9 TO CNTRL.
1	BLACK	PB COM	SPARE	PB COM	SPARE	PB COM	PB COM	SPARE	PB COM	SPARE
2	WHITE	SH COM	SH COM	SH COM	SH COM	SH COM	SH COM	SH COM	SH COM	SH COM
3	RED	SH 3, 4, 5 R	SH 8 R	SH 12, 13, 14 R	SH 17 R	SH 21, 22 R	SH 23 R	SH 26 R	SH 30, 31, 32 33 R	SH 36 R
4	GREEN	SH 3, 4, 5 G	SH 8 G	SH 12, 13, 14 G	SH 17 G	SH 21, 22 G	SH 23 G	SH 26 G	SH 30, 31, 32 33 G	SH 36 G
5	ORANGE	SH 3, 4, 5 Y	SH 8 Y	SH 12, 13, 14 Y	SH 17 Y	SH 21, 22 Y	SH 23 Y	SH 26 Y	SH 30, 31, 32 33 Y	SH 36 Y
6	BLUE	SH 5 → G		SH 14 → G			SH 23 → G		SH 33 → G	
7	WHITE/BLACK	SH 5 → Y		SH 14 → Y			SH 23 → Y		SH 33 → Y	
8	RED/BLACK	∅2 PED CALL		∅6 PED CALL			∅6 PED CALL		∅2 PED CALL	
9	GREEN/BLACK	SH 6 DW		SH 16 DW			SH 24 DW		SH 35 DW	
10	ORANGE/BLACK	SH 6 W		SH 16 W			SH 24 W		SH 35 W	
11	BLUE/BLACK	∅4 PED CALL		∅4 PED CALL			∅8 PED CALL		∅8 PED CALL	
12	BLACK/WHITE	SH 7 DW		SH 15 DW			SH 25 DW		SH 34 DW	
13	RED/WHITE	SH 7 W		SH 15 W		SPARE	SH 25 W		SH 34 W	
14	GREEN/WHITE	SPARE		SPARE		SPARE	SPARE		SPARE	
15	BLUE/WHITE	SH 1, 2 R		SH 10, 11 R		SH 19, 20 R	SPARE		SH 27, 29 R	
16	BLACK/RED	SH 1, 2 → G		SH 10, 11 → G		SH 19, 20 → G			SH 27, 29 → G	
17	WHITE/RED	SH 1, 2 → Y		SH 10, 11 → Y		SH 19, 20 → Y			SH 27, 29 → Y	
18	ORANGE/RED	SH 37 R		SH 9 R		SH 18 R			SH 28 R	
19	BLUE/RED	SH 37 → G		SH 9 → G		SH 18 → G			SH 28 → G	
20	RED/GREEN	SH 37 → Y		SH 9 → Y		SH 18 → Y			SH 28 → Y	



Carter-Burgess
Texas Department of Transportation

TRAFFIC SIGNAL CHARTS
MIDWAY ROAD & SPRING VALLEY ROAD

SHEET 3 OF 5

DESIGNED: RWA	FED. RD DIST. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
CHECKED: STT	6	TEXAS	CM 571 871	DB
DRAWN: RWA	COUNTY	CONTROL NO.	SECTION NO.	SHEET NO.
CHECKED: STT	DALLAS	DALLAS	908	45 342 59

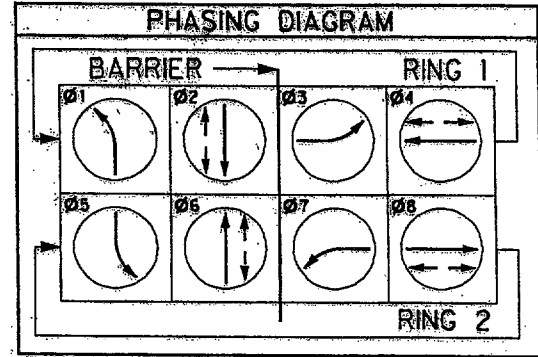
ITEM 688 DETECTOR DETAILS										
LOOP / PED BUTTON	STATUS	DIMENSIONS	TURNS	DETECTOR UNIT	CARD CHANNEL	DELAY INHIBIT	LOOP WIRE COLOR	SAM CUT (M)	ITEM 618 25mmPVC (M)	PED BUTTONS (EA)
#2-PED	INSTALL									2
#4-PED	INSTALL									2
#6-PED	INSTALL									2
#8-PED	INSTALL									2
ALL LOOPS SHALL BE LOOP WIRE										
TOTAL										8

ITEM 656 FOUNDATION SUMMARY		
SHEET	LOCATION MIDWAY RD. @ SPRING VALEY ROAD	TYPE CONTR. FND.
	PROJECT TOTALS	1.85
	SIGNAL FOUNDATIONS	m
	600-A	15.3
	SIGNAL FOUNDATIONS	12.0
		2.1

TRAFFIC SIGNAL PLANS SUMMARY SHEET				
ITEM	DESC CODE	DESCRIPTION	UNIT	QUANTITY
502	5001	BARRICADES, SIGNS, AND TRAFFIC HANDLING	WK	0
618	5011	CONDUIT (PVC) (SCH 40) (50MM)	M	63.4
618	5013	CONDUIT (PVC) (SCH40) (75MM)	M	4
618	5014	CONDUIT (PVC) (SCH40) (100MM)	M	6.2
618	5032	CONDUIT (PVC) (SCH40) (50MM) (BORE)	M	7.8
618	5034	CONDUIT (PVC) (SCH40) (75MM) (BORE)	M	132.2
618	5035	CONDUIT (PVC) (SCH40) (100MM) (BORE)	M	0
620	5004	ELECTRICAL CONDUCTOR (NO. 6 BARE)	M	255.4m
620	5009	ELECTRICAL CONDUCTOR (NO. 8XHHW)	M	4.56
620	5010	ELECTRICAL CONDUCTOR (NO. 6 XHHW)	M	21
624	5001	GROUND BOX TYPE A W/ APRON	EA	6
624	5003	GROUND BOX TYPE C W/ APRON	EA	1
628		ELEC SERV TY D 120V/200V/250V/300V/350V/400V/480V/500V/600V/720V/800V/900V/1000V	EA	1
656	5003	FND FOR TRAF SIG (600MM DRILL SHAFT)	M	3.5
656	5013	TRAFFIC SIG CNTRL FND	M3	1.85
656	5032	FND FOR TRAF SIG (TYA) (200MM DRILL SHAFT)	M	20.1
680	5001	INSTAL OF TRAF SIG (ISOLATED)	EA	1
		CONTROLLER FULL - ACTUATED	EA	1
		SIGN (STREET NAME) 'SPRING VALLEY RD'	EA	1
		SIGN (STREET NAME) 'MIDWAY RD'	EA	2
		SIGN 'LANE CONTROL' (750X750) (R3-8LL)	EA	4
		SIGN 'LEFT TURN SIGNAL' (625X750) (R10-10L)	EA	4
		OPTICOM DETECTOR	EA	3
		4 CNDR #22 AWG SHIELDED (OPTICOM CABLE)	M	284.1
		SIGN 'PUSH BUTTON FOR WALK SIGNAL' (225X300) (R10-4B)	EA	6
		VEH SIG SEC (300 MM W/ LENS & REF)	EA	78
		RED SIG SEC (2 INDICATION IN ISEC) W/ LENS & REF	EA	8
682	5009	BACK PLATE (3 SEC) (300 MM)	EA	22
682	5010	BACK PLATE (4 SEC) (300 MM)	EA	3
684	5061	TRAF SIG CBL (TY A) (5 COND) (14 AWG)	M	644.3
684	5067	TRAF SIG CBL (TY A) (7 COND) (14 AWG)	M	12
684	5069	TRAF SIG CBL (TY A) (10 COND) (14 AWG)	M	66
684	5071	TRAF SIG CBL (TY A) (20 COND) (14 AWG)	M	216
684	5046	TRAF SIG CBL (TY C) (2 COND) (18 AWG)	M	9.6
686		TRAF SIG ROLE ASM (STL) (ARM 118.3M) LUM	EA	3
688	5001	PED DETECT (PUSH BTN)	EA	8
6007	5001	PEDESTAL POLE ASSEM	EA	5
6008	5001	SALV TRAF SIGNALS	EA	1
		VIVDS DETECTOR SYSTEM COMPLETE WITH 4 CAMERAS	EA	1
		VIVDS COMMUNICATION CABLE (COAXIAL)	M	196.4

RUN NO.	POLE NO.	CONDUIT TYPE (ITEM 618)	WIRE SIZE AND TYPE										TOTAL	
			ELECTRICAL CONDUCTORS (ITEM 620)					SIGNAL CABLE (ITEM 684)						
			NO. 6 XHHW	NO. 8 XHHW	NO. 6 BARE	NO. 12 XHHW	OPTI-COM	6 CNDR CABLE	7 CNDR CABLE	10 CNDR CABLE	20 CNDR CABLE	2 CNDR CABLE		COAX CABLE
1		2-50mm	3-15m	8-40	2-10m								5m	TRENCHED
2		50mm			1-2m								2m	TRENCHED
3		100mm		6-37.2m	1-6.2m		3-18.6m	2-12.4	1-12.4m	3-18.6m		3-18.6m	6.2m	TRENCHED
4		2-75mm			1-2m		4-8m	3-6m	1-2m	4-8m		4-8m	2m	TRENCHED
4		50mm	3-6m		1-2m								2m	TRENCHED
5		75mm		2-80m	1-40m		1-40m	1-40m		1-40m		1-40m	1-40m	BORED
6		50mm		2-12.4m	1-6.2m		1-6.2m			1-6.2m		1-6.2m	6.2m	TRENCHED
7		50mm			1-9m								9m	TRENCHED
8		75mm			1-50m								50m	BORED
9		50mm		2-10m	1-5m					1-5m		1-5m	5m	TRENCHED
10		50mm			1-7.4m								7.4m	TRENCHED
11		75mm		2-84.4m	1-42.2m		1-42.2m	1-42.2m		1-42.2m		1-42.2m	42.2m	BORED
12		50mm			1-7.8m					1-7.8m		1-7.8m	7.8m	BORED
13		50mm			1-1m					1-1m		1-1m	1m	TRENCHED
14		50mm			1-4m					1-4m		1-4m	4m	TRENCHED
15		50mm		2-16.8m	1-8.4m		1-8.4m			1-8.4m		1-8.4m	8.4m	TRENCHED
16		75mm		4-101.6m	1-25.4m		2-50.8m	2-50.8m		1-25.4m	2-50.8m	2-50.8m	25.4m	EXISTING
17		100mm		4-69.6m	1-17.4m		2-34.8m	3-52.2		1-17.4m	2-34.8m	2-34.8m	17.4m	EXISTING
18		50mm		2-4m	1-2m		1-2m			1-2m		1-2m	2m	TRENCHED
T-1					27.8	19.1m	97.3m	3m		2.4m		2.4m	20.1	
T-2							3m							
T-3					27.8	18m	95.2m	3m		2.4m		2.4m	20.1	
T-4							3m							
T-5					27.8	19m	97.9m						20.1	
T-6							6m			2.4m		2.4m		
T-7							3m							
T-8					27.8	17m	85.9			2.4m		2.4m	20.1	
T-9							3m							
TOTAL			21m	456	255.4m	107.6	284.1m	141.5	12m	66m	216m	9.6m	276.4	

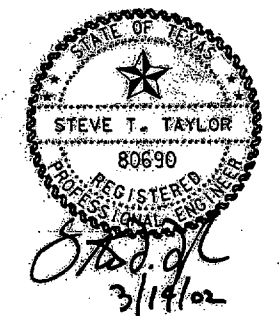
* COAX CABLE INCLUDES 5-C POWER CABLE.



EXISTING OPTICOM
 NEW CONDUIT FOR RELOCATED OPTICOM
 WE BUY SIGAL SECTIONS CONTRACTOR BUYS L.E.D.S
 WE BUY

- 620 ELECTRICAL CONDUCTOR (NO. 12 XHHW) M 109.6
- 6298 300MM LED TRAF SIG LAMP (RED) EA 25
- 6298 300MM LED TRAF SIG LAMP (YELLOW) EA 17
- 6298 300MM LED TRAF SIG LAMP (GREEN) EA 17
- 6298 300MM LED TRAF SIG LAMP (YELLOW) EA 8
- 6298 300MM LED TRAF SIG LAMP (GREEN) EA 11
- 6554 LED PED SIG LAMP (SYMB) (2 IND/SEC) EA 6

POLE CHART									
POLE NUMBER	T-1	T-2	T-3	T-4	T-5	T-6	T-7	T-8	T-9
MAST ARM LENGTH	18.3m		18.3m		18.3m			EXIST	
FOUNDATION TYPE	1200A	600A	1200A	600A	1200A	600A	600A	EXIST	600A
WITH LUMINAIRES	YES		YES						
SIZE OF LENS	300mm								
SIGNAL TYPE	B B B A A D C C A	B B B A A D C C A	B B B A A D C C A	B B B A A D C C A	B B B A A D C C A	B B B A A D C C A	B B B A A D C C A	B B B A A D C C A	A
SIGNAL FACE NO.	1 2 3 4 5 6 7 8	10 11 12 13 14 15 16 17	19 20 21 22 23 24 25 26	27 28 29 30 31 32 33 34 35	36				
SIGNAL INDICATIONS	R R R R R R R D W D W R	R R R R R R R D W D W R	R R R R R R R D W D W R	R R R R R R R D W D W R	R R R R R R R D W D W R	R R R R R R R D W D W R	R R R R R R R D W D W R	R	
	Y Y Y W W Y	Y Y Y W W Y	Y Y Y W W Y	Y Y Y W W Y	Y Y Y W W Y	Y Y Y W W Y	Y Y Y W W Y	Y	
	G G G G G	G G G G G	G G G G G	G G G G G	G G G G G	G G G G G	G G G G G	G	

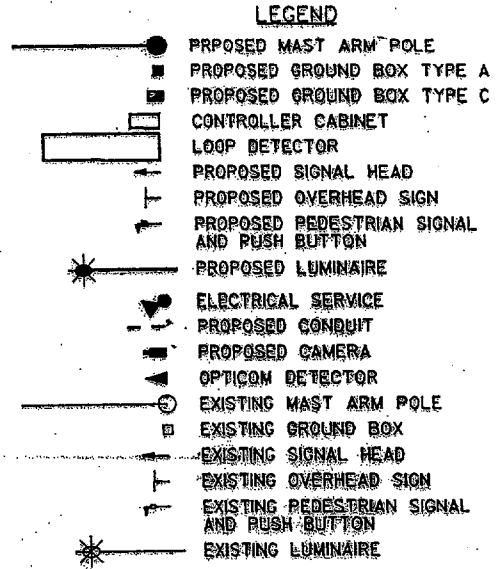
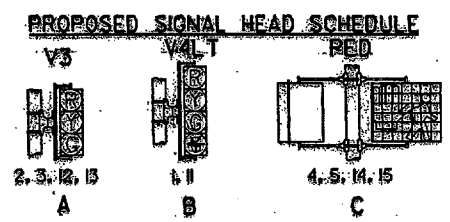
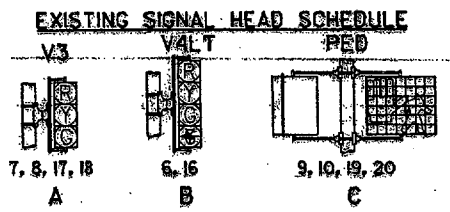


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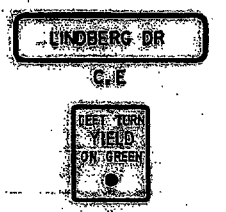
TRAFFIC SIGNAL CHARTS
 MIDWAY ROAD & SPRING VALLEY ROAD

SHEET 2 OF 3

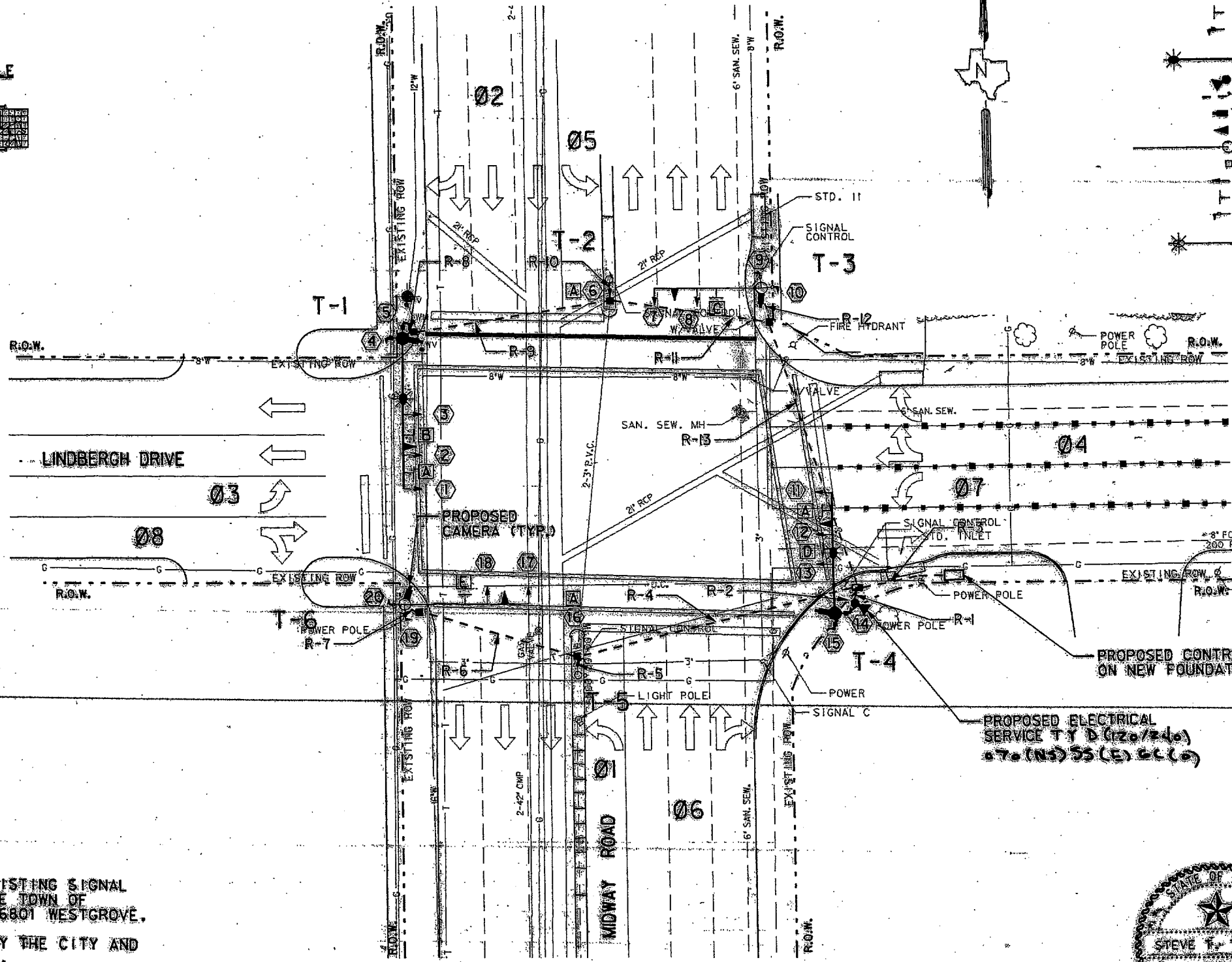
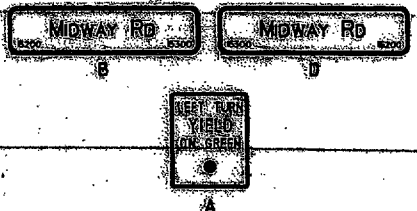
DESIGNED BY	REV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
DRAWN BY	DATE	COUNTY	CONTROL NO.	SECTION NO.
CHECKED BY	SCALE	DISTRICT	POST MILE	SHEET NO.



EXISTING SIGN DETAILS



PROPOSED SIGN DETAILS



NOTES:

- CONTRACTOR SHALL SALVAGE EXISTING SIGNAL EQUIPMENT AND DELIVER TO THE TOWN OF ADDISON SERVICE CENTER AT 16801 WESTGROVE.
- OPTICOM SHALL BE SUPPLIED BY THE CITY AND INSTALLED BY THE CONTRACTOR.

PROPOSED ELECTRICAL SERVICE TYPED (120/240) 570 (N) 55 (E) 66 (S)



Carter-Burgess
Texas Department of Transportation

TRAFFIC SIGNAL PLAN
MIDWAY ROAD & LINDBERGH DRIVE

SHEET 1 OF 2

DESIGNED	BY	DATE	STATE	RESIDENTIAL AID PROJECT NO.	HIGHWAY NO.
CHECKED	BY	DATE	STATE	OR 971.877	05
DRAWN	BY	DATE	COUNTY	SECTION NO.	SHEET NO.
CHECKED	BY	DATE	COUNTY	NO.	NO.

CNR NO.	CONDUCTOR COLOR	CABLE 1	CABLE 2	CABLE 3	CABLE 4	CABLE 5	CABLE 6
		7 CNDR	7 CNDR	15 CNDR	15 CNDR	7 CNDR	15 CNDR
		FROM T-1 TO CNTRL.	FROM T-2 TO CNTRL.	FROM T-3 TO CNTRL.	FROM T-4 TO CNTRL.	FROM T-5 TO CNTRL.	FROM T-6 TO CNTRL.
1	BLACK	PB COM	SPARE	PB COM	PB COM	SPARE	PB COM
2	WHITE	SH COM	SH COM	SH COM	SH COM	SH COM	SH COM
3	RED	SH 1, 2, 3 R	SH 6 R	SH 7, 8 R	SH 11, 12, 13 R	SH 16 R	SH 17, 18 R
4	GREEN	SH 1, 2, 3 G	SH 6 G	SH 7, 8 G	SH 11, 12, 13 G	SH 16 G	SH 17, 18 G
5	ORANGE	SH 1, 2, 3 Y	SH 6 Y	SH 7, 8 Y	SH 11, 12, 13 Y	SH 16 Y	SH 17, 18 Y
6	BLUE	SH 1 ← C	SH 6 ← C	SPARE	SH 11 ← C	SH 16 ← C	SPARE
7	WHITE/BLACK	SH 1 ← Y	SH 6 ← Y	SPARE	SH 11 ← Y	SH 16 ← Y	SPARE
8	RED/BLACK	#2 RED CALL		#6 PED CALL	#6 PED CALL		#2 PED CALL
9	GREEN/BLACK	SH 4 DW		SH 10 DW	SH 14 DW		SH 20 DW
10	ORANGE/BLACK	SH 4 W		SH 10 W	SH 14 W		SH 20 W
11	BLUE/BLACK	#4 PED CALL		#4 PED CALL	#6 PED CALL		#6 PED CALL
12	BLACK/WHITE	SH 5 DW		SH 9 DW	SH 15 DW		SH 19 DW
13	RED/WHITE	SH 5 W		SH 9 W	SH 15 W		SH 19 W
14	GREEN/WHITE	SPARE		SPARE	SPARE		SPARE
15	BLUE/WHITE	SPARE		SPARE	SPARE		SPARE
16	BLACK/RED						

POLE NUMBER	T-1	T-2	T-3	T-4	T-5	T-6
WAST ARM LENGTH	12.2m	EXIST	EXIST	9.8m	EXIST	EXIST
FOUNDATION TYPE	900-A			900-A		
WITH LUMINAIRES	YES			YES		
SIZE OF LENS	300mm					
SIGNAL TYPE	B	A	A	C	C	B
SIGNAL FACE NO.	1	2	3	4	5	6
SIGNAL INDICATIONS	R	R	R	D	D	W

SHEET	LOCATION	TYPE
	MIDWAY RD.	CNTR. FND.
	LINDBERGH DRIVE	M
	PROJECT TOTALS	1.85
	SIGNAL FOUNDATIONS	m
	900-A	8:0

SAME NOTES AS MIDWAY/S.V.

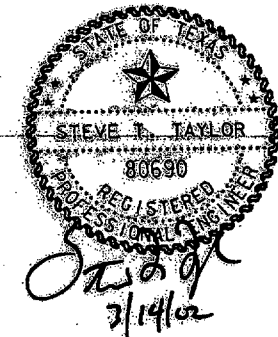
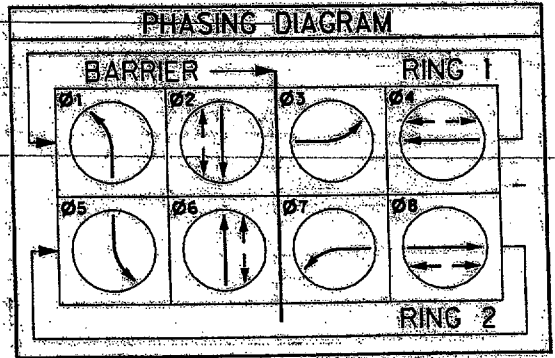
ITEM	DESC CODE	DESCRIPTION	UNIT	QUANTITY
502	5001	BARRICADES, SIGNS, AND TRAFFIC HANDLING	WK	
508	501	CONDUIT (PVC) (SCH 40) (50MM)	M	19
508	5013	CONDUIT (PVC) (SCH 40) (75MM)	M	11
508	5034	CONDUIT (PVC) (SCH 40) (75MM) (BORE)	M	88
520	5004	ELECTRICAL CONDUCTOR (NO. 6 BARE)	M	127.6
520	5009	ELECTRICAL CONDUCTOR (NO. 8 XHHW)	M	
520	5004	ELECTRICAL CONDUCTOR (NO. 6 XHHW)	M	28.8
524	5001	GROUND BOX TYPE A	EA	5
524	5003	GROUND BOX TYPE C	EA	1
528		ELEC SERV TY	EA	1
556	5005	FND FOR TRAF SIG (TYA) (900MM DRILL SHAFT)	M	8.0
556	5013	TRAF SIG CNTRL FND	M3	1.85
580	5001	INSTAL OF TRAF SIG (ISOLATED)	EA	1
		CONTROLLER FULL-ACTUATED	EA	1
		SIGN (STREET NAME) MIDWAY RD	EA	2
		SIGN "LEFT TURN YIELD ON GREEN BALL" (750X900) (R10-12)	EA	2
		OPTICOM DETECTOR	EA	2
		4 CNDR #22 AWG SHIELDED (OPTICOM CABLE)	M	15.2
		SIGN "PUSH BUTTON FOR WALK SIGNAL" (225X300) (R10-10)	EA	4
582	5002	VER SIG SEC (300 MM)	EA	20
582	5005	RED SIG SEC 12 INDICATION (M ISEC)	EA	4
582	5009	BACK PLATE (3 SEC) (300 MM)	EA	4
582	5010	BACK PLATE (4 SEC) (300 MM)	EA	2
584	5001	TRAF SIG GBL (TY A) (5 COND) (14 AWG)	M	105.2
584	5001	TRAF SIG GBL (TY A) (6 COND) (14 AWG)	M	120.4
584	5001	TRAF SIG GBL (TY A) (5 COND) (14 AWG)	M	151.4
584	5006	TRAF SIG GBL (TY C) (2 COND) (18 AWG)	M	9.6
586		TRAF SIG POLE ASM (STD) (HARK 114.6M LUM)	EA	1
586		TRAF SIG POLE ASM (STD) (HARK 112.2M LUM)	EA	1
588	5001	PED DETECT (PUSH BTN)	EA	4
5008	5001	SALV TRAF SIGNALS	EA	1
		VIDS DETECTOR SYSTEM COMPLETE WITH 4 CAMERAS	EA	1
		VIDS COMMUNICATION CABLE (COAXIAL)	M	212.6
520	5001	ELECTRICAL CONDUCTOR NO. 12 XHHW	M	51.3
524	5001	300MM LED TRAF SIG LAMP (RED)	EA	6
524	5002	300MM LED TRAF SIG LAMP (YELLOW)	EA	6
524	5003	300MM LED TRAF SIG LAMP (GREEN)	EA	6
524	5004	300MM LED TRAF SIG LAMP (RED/BLW)	EA	2
524	5005	300MM LED TRAF SIG LAMP (GRN/BLW)	EA	2
524	5001	LED PED SIG LAMP (5X10) (2"IND) (SEC)	EA	4

* EQUIPMENT SUPPLIED TO THE CONTRACTOR BY THE CITY

CONDUCTOR NO.	CONDUCTOR TYPE (ITEM 518)	ELECTRICAL CONDUCTORS (ITEM 520)					SIGNAL CABLE (ITEM 584)					TOTAL
		NO. 12 XHHW	NO. 10 XHHW	NO. 8 BARE	NO. 12 XHHW	OPTI-COM	TY-A	TY-B	TY-C	TY-D	COAX CABLE	
1	2-50mm	3-48m	1-67m	2-32m							10m	TRENCHED
2	50mm	2-6m	1-3m	1-3m							3m	TRENCHED
3	2-15mm	2-16m	1-16m	4-32m							8m	TRENCHED
4	1-50mm	3-24m	1-8m								8m	TRENCHED
5	1-50mm		1-23m	1-23m							23m	BORED
6	50mm		1-2m	1-2m							2m	TRENCHED
7	1-50mm		2-26m	1-15m	1-15m						15m	BORED
8	50mm		1-4m	1-4m							4m	TRENCHED
9	50mm		2-22m	1-1m	1-1m						1m	TRENCHED
10	1-50mm		2-52m	1-16m	1-16m						16m	BORED
11	50mm		1-2m	1-2m							2m	TRENCHED
12	1-50mm		2-28m	1-13m	1-13m						13m	BORED
13	1-50mm		2-46m	1-3m	1-3m						3m	TRENCHED
14	1-50mm		2-46m	1-23m	1-23m						23m	BORED
T-1		27.4m	13.1m	27.8m	18.2m	2.4m	15.3					
T-2					3.6m							
T-3					26m							
T-4		27.4m	13.1m	27.8m	18.2m	2.4m	15.3					
T-5					3.6m							
T-6					28.8m							
TOTAL		28.8m	199.2m	127.6m	34.3m	105.2m	120.4m	151.4m	9.6m	212.6		

* COAX CABLE INCLUDES E.C POWER CABLE

LOOP PED BUTTON	STATUS	DIMENSIONS	TURNS	DETECTOR UNIT	CARD CHANNEL	RELAY UNIT	LOOP WIRE COLOR	SAW CUT (M)	ITEM 518 25mm PVC (M)	PED BUTTONS (EA)	
#2-PED	INSTALL									1	
#4-PED	INSTALL									1	
#6-PED	INSTALL									1	
#8-PED	INSTALL									1	
ALL LOOPS SHALL BE LOOP WIRE										TOTAL	4



Carter-Burgess
Texas Department of Transportation

TRAFFIC SIGNAL CHARTS
MIDWAY ROAD & LINDBERGH DRIVE

SHEET 2 OF 2

DESIGNED: RMW
CHECKED: STT
DATE: 10/6
STATE: TEXAS
COUNTY: DALLAS
CITY: DALLAS

FEDERAL AID PROJ. EST. NO.: DM 971(87)
SECTION: 06
CONTRACT NO.: 918-05
SHEET NO.: 69

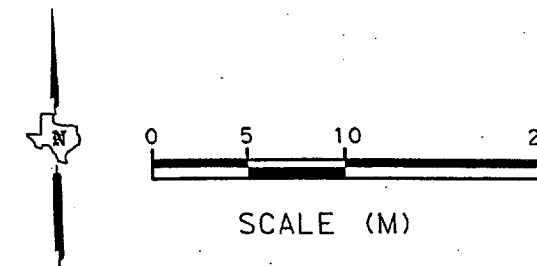
MATERIAL/LABOR SUBSIDIARY TO ITEM 681

CONDUIT (RM) (75MM)	M	9.1
CONDUIT (PVC) (SCHD 40) (75MM)	M	3.0
WEATHERHEAD (75MM)	EA	1
ELEC CONDUCTOR (NO. 8) INSULATED	M	264.0
ELEC CONDUCTOR (NO. 6) BARE	M	12.1
VIVDS COAXIAL CABLE	M	213.6
* OPTICOM CABLE	M	212.4
SIGNAL CABLE TY A 14 AWG 7 CNDR	M	163.3
SIGNAL CABLE TY A 14 AWG 15 CNDR	M	233.4
ZINC-COAT STEEL STRAND 6.3MM	M	41.7
CABLE STRAPS (1 PER 300MM)	EA	139

* SUPPLIED BY THE CITY

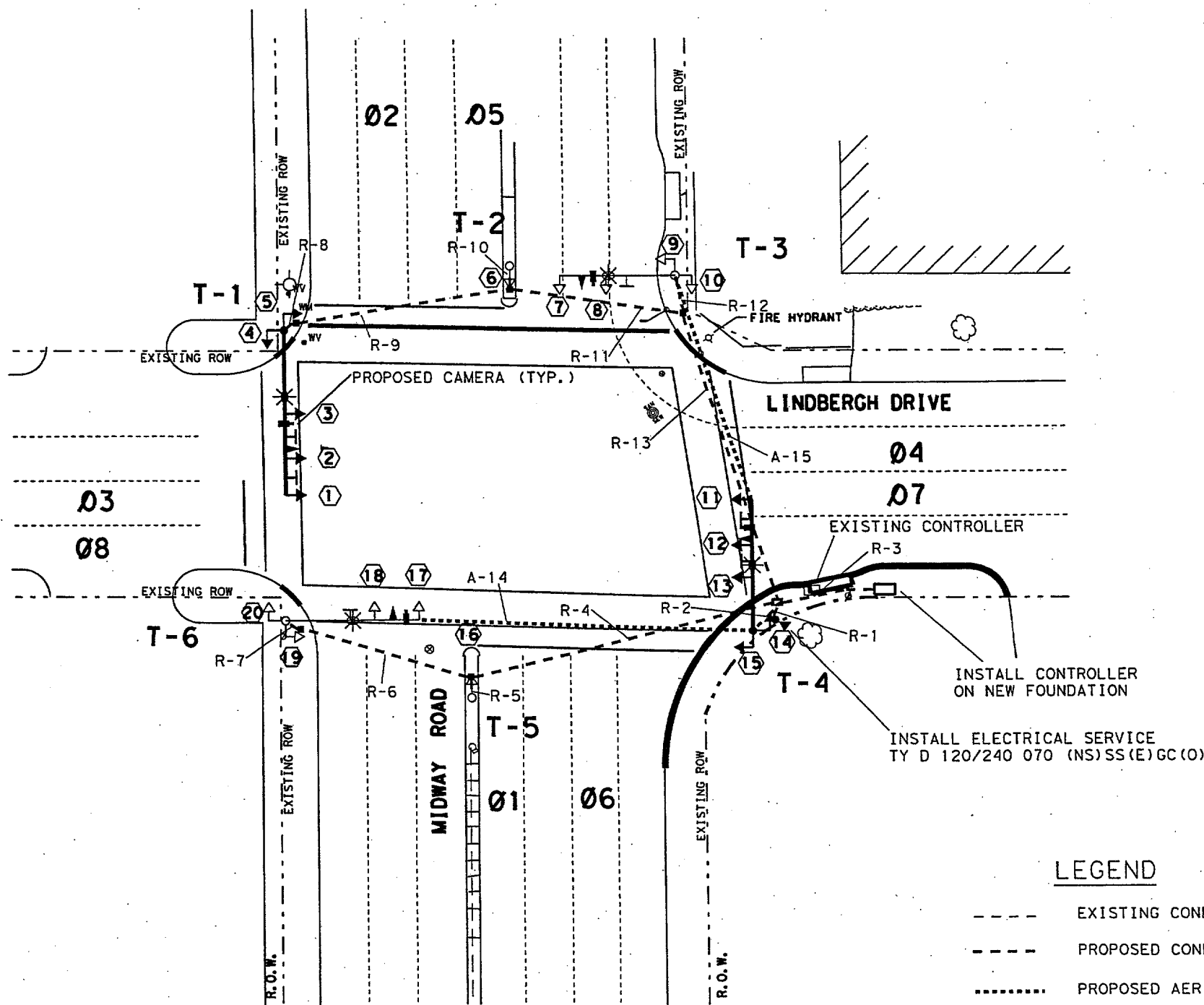
SEQUENCE OF WORK

1. INSTALL SIGNAL POLE FOUNDATION AND SIGNAL POLES T-1 AND T-4.
2. INSTALL CONDUIT RUNS 5 THROUGH 12, THE CONTROLLER FOUNDATION, AND THE CONTROLLER.
3. INSTALL CONDUIT RUNS 13 THROUGH 15, THE CONTROLLER FOUNDATION, AND THE CONTROLLER.
4. INSTALL VIVDS CAMERAS ON THE MAST ARMS AS SHOWN.
5. PULL TEMPORARY CABLES TO POLES T-1, T-2, T-3, T-5 AND T-6 OVERHEAD FROM POLE T-4, AND SET UP VIDEO DETECTION.
6. SALVAGE EXISTING SIGNALS (EXCEPT POLES T-2, T-3, T-5 AND T-6), INCLUDING EXISTING CONTROLLER AND CABLES.
7. CONSTRUCT ROADWAY.



RUN NO.	POLE NO.	CONDUIT TYPE	NO. 6 XHHW	NO. 6 BARE	NO. 8 XHHW	NO. 12 XHHW	VIVDS COAX	OPTI-COM	TY A			LENGTH (M)
									5 CNDR CABLE	7 CNDR CABLE	15 CNDR CABLE	
1		2-50MM	2	2	4							1.6
2		1-50MM		1	2		1	1			1	3.0
*2		1-75MM		*1	*2		*3	*3			*3	3.0
*2A		1-75MM RM		*1	*2		*3	*3			*2	9.1
3		2-75MM		2			*3,1	*3,1			*2	8.0
3		1-50MM	2	1								8.0
5		1-50MM		1							*1	2.0
6		1-75MM BORED		1							*1	13.0
7		1-50MM		1							*1	1.4
8		1-50MM		1	*2		*1	*1				1.0
9		1-75MM BORED		1	*2		*1	*1				16.0
10		1-50MM		1							*1	2.0
11		1-75MM BORED		1	*2		*1	*1			*1	13.0
12		1-75MM		1	*2		*1	*1			*1	3.0
*14		AERIAL			*2		*1	*1			*1	24.3
*15		AERIAL			*2		*2	*2			*1	17.4
T-1						27.4	15.3	13.1	27.8	18.3		
T-2										3.6		
T-3						27.4	15.3	13.1	26.0			
*T-3					*12.2		*17.3	*16.1		*9.1	*18.2	
T-4						27.4	15.3	13.1	22.6	15.9		
*T-4					*44.0		*40.9	*40.9		*22.0	*46.9	
T-5										3.6		
T-6						27.4	15.3	14.1	28.8			
*T-6					*34.2		*3.0	*3.0		*15.9	*15.9	
* TOTALS (M)				*12.1	*264.0		*213.6	*212.4		*163.3	*233.4	

* SUBSIDIARY TO ITEM 681, AND TO BE REMOVED FOR THE PERMANENT SIGNAL
 - RUN 2A IS STRAPPED TO POLE T-4, AND CONNECTS TO ONE CONDUIT OF RUN 2
 - QUANTITIES NOT TOTALED ARE PAID BY BID ITEM, SEE PERMANENT SIGNAL LAYOUT



LEGEND

- EXISTING CONDUIT RUN
- - - PROPOSED CONDUIT RUN
- PROPOSED AERIAL RUN

LEVELS DISPLAYED

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62		

Signature: *Christopher D. Blain* P.E. 5/11/05
Date

Texas Department of Transportation
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TEMPORARY SIGNAL PLAN
 MIDWAY ROAD & LINDBERGH DRIVE

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
BES	6	CM 97(87)	CS
GRAPHICS	STATE	DISTRICT	COUNTY
BES	TEXAS	DALLAS	DALLAS
CHECK	CONTROL	SECTION	JOB
CDB	0918	45	344

SCALE: 1 = 400 SHEET 1 OF 1

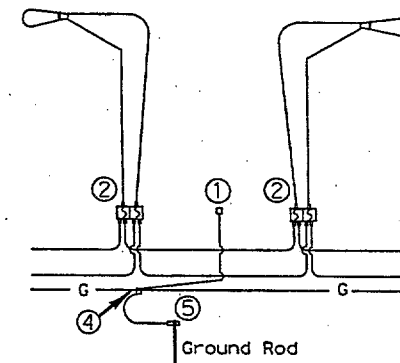
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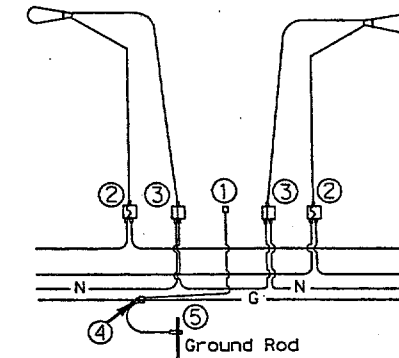
REVISIONS
LAYER
ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

2. Transformer base shall be approximately 15-20 inches high and shall have a door approximately 13 inches x 8 inches x 9 1/4 inches or as otherwise approved by the Engineer. Screw or bolts for attachment of door to base shall be stainless steel. Four machine bolts with four nuts, eight 1/2 inch flat washers and four lock washer, galvanized ASTM A-153 Class C or D, or B-695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A-563 grade DH galvanized. A 1/2-13 NC female threaded grounding lug shall be provided inside the transformer base near the bottom.
 3. The X-base shall be made from extruded aluminum channel and aluminum plate. The base breakaway features shall rely on bolt shear and not on bolt torque. Bolt shall have torque controlled break-off hex-head. Bolt shall be Aluminum Association type 2024-T4 aluminum. X-base channel shall be connected with aluminum bolts. Bolt shall be left hand thread and shall not be interchangeable with any other bolt not designed specifically for use with the X-base.
 4. All breakaway bases shall meet the breakaway requirements of the AASTHO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," latest edition, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to meet or exceed the full designed plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with shop drawings. Shop drawings shall show breakaway base model number and manufacturer's name or logo.
 5. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
 6. Doors for transformer bases shall be made of plastic, fiberglass or other non-aluminum material approved by the Engineer. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.
- C. Cobra Head Style Fixtures.
1. Fixture shall be UL listed for wet locations and shall be labeled IEC Standard 60529-IP 65 or better. Fixtures shall have UL label on the inside near the ballast. Fixture shall have a permanent label inside the fixture indicating the date of manufacture of the fixture. Fixture shall have wattage label per ANSI 136.15.
 2. Fixture housing, lens frame, and door (if any) shall be die cast aluminum. Aluminum for housing shall be 96% copper free. Fixture mounting means shall be to a two inch pipe arm. Fixture shall be equipped with a four bolt clamp capable of being adjusted plus or minus five degrees from level. Fixture shall meet 3G peak to peak vibration test per ANSI 136.31. Fixture shall meet IESNA cutoff requirements.
 3. Fixture shall have a level bubble attached to the housing. Level bubble shall be clearly visible from the ground (up to 50 ft mounting heights). Level bubble shall be sensitive to one degree (max) changes in position at any point within five degrees (min) of the level position. Photometric testing will be done with the fixture in the level position as indicated by level bubble. Fixture shall be installed in the level position.
 4. EPA shall not exceed 1.6 square feet.
 5. Fixture shall be equipped with a three prong photocell receptacle with shorting cap installed.
 6. For fixtures to be installed on galvanized poles, the fixture housing shall be painted light gray. All other fixtures shall be painted to match poles or as approved by the Engineer.
 7. Paint for fixtures shall be a thermoset powder coat system. Paint system must meet 1000 hour salt spray test per ASTM B117. Paint thickness shall be a nominal thickness of 2.5 mil and shall exhibit no pigment loss upon 50 double-rubs using Methyl Ethyl Ketone (MEK) solvent per ASTM D5402, Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs.
 8. All hardware, brackets, nuts, bolts, washers, ballast tray, and parts shall be made of Type 316 stainless steel, except that:
 - a. Hardware, brackets, and ballast tray may be made out of aluminum, of adequate thickness as approved by the Engineer.
 - b. 4 bolts, 4 flat washers, 4 lock washers, and clamp that attach the luminaire to the arm shall be galvanized to ASTM 123 or 153.
 - c. All stainless steel nuts shall have nylon throat locking means.
 - d. Glass lens retainer spring clips may be galvanized steel in accordance with ASTM A153.
 9. Lamp socket shall meet the following requirements.
 - a. Socket shall be porcelain insulated,
 - b. Socket shall have a nickel plated copper alloy screw shell,
 - c. Socket shall be equipped with a spring tensioned contact.
 - i. Contact shall be nickel plated copper alloy or stainless steel.
 - ii. Spring shall be nickel plated copper alloy or stainless steel.
 - d. Screws holding screw shell into socket, if any, shall be nickel plated copper alloy or stainless steel.
 - e. Socket electrical ratings shall meet or exceed the following
 - i. 600 Volt
 - ii. 1500 Watt
 - iii. 5000 Volt Pulse
 - iv. UL listed per UL 496.
 - v. Socket shall be mogul base.
 10. Optical assemblies shall meet the following requirements.
 - a. Reflectors shall be polished aluminum with Alzak or equal coating.
 - b. Reflectors shall not have any reflecting surface painted, except that, when approved by the Engineer, some surfaces may be painted with 92% reflective white paint.
 - c. Reflectors may be one piece or segmented as follows.
 - i. One piece reflectors:
 1. One piece reflectors shall be sealed directly to the glass lens forming an airtight envelope. The reflector to glass lens seal shall be closed cell silicone, either seamless or with a vulcanized seam.
 2. Lamp socket shall be non-adjustable and mounted to the reflector so that lamp center is consistent. Gasket between lamp support bracket and the reflector/lens assembly shall be a one piece seamless silicone gasket.
 - ii. Segmented reflectors:
 1. Segments shall attach at both ends (or opposite sides if segments are square) of the segment to a rigid aluminum base plate and side wall support assembly. Glass lens to lens frame shall be sealed with a one piece seamless silicone gasket or RTV sealant.
 - d. Optical assembly shall be equipped with a lamp support in addition to the lamp socket to ensure that the lamp center is positioned as intended.
 11. Lens shall be clear heat tempered or borosilicate sag or flat glass, minimum 3/16" thick.
 12. Luminaires for pole mounting shall not be fused. Luminaires for wall or underpass mounting shall be internally fused with a 10 amp time delay fuse.
 13. Fixture shall be equipped with a two position terminal block for landing supply wires. Terminal block shall meet the following requirements.
 - a. Insulation shall be porcelain or phenolic material. Phenolic terminal block will be of adequate construction as approved by the Engineer.
 - b. Terminals shall be made of nickel or tin plated brass, or of aluminum.
 14. Fixture shall be equipped with MOV surge protection in accordance with IEEE recommendations.
 - a. MOV shall be connected from line to neutral or from line to line.
 - b. MOV shall be installed on the terminal block.

Fabrication Tolerances Table		
Part	Dimension	Tolerance
Pole Assembly	Shaft length	± 1"
	I.D. of outside piece of slip fitting pieces	+ 1/8" - 1/16"
	O.D. of inside piece of slip fitting pieces	+ 1/32" - 1/8"
	Shaft diameter: other	+ 3/16"
	Out of "round"	1/4"
	Straightness of shaft	± 1/4" in 10 ft
	Twist in shaft	4° in 50 ft
	Perpendicular to baseplate	1/8" in 24"
	Pole centered on baseplate	± 1/4"
	Location of Attachments	± 1/4"
Arm Assembly	Arm Length	± 3"
	Arm Rise	± 1 3/4" in 10 ft
	Arm Diameter	± 3/16"
	Overall length or width	± 1/4"
	Thickness	+ 1/4" - 1/16"
	Deviation from flat	1/8" in 12"
	Spacing between holes	± 3/32"
Anchor Bolt	Anchor bolt hole size	± 1/16"
	Length	+ 1" - 1/4"
	Threaded length	+ 1 1/2" - 1/8"
	Galvanized length (if required)	+ 8" - 1/4"
Miscellaneous	Bolt hole spacing	± 1/16"
	Strut location in truss arms	± 1 1/2"



FOR THREE-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.



FOUR-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 240V (240/480 VOLT SERVICE)

NOTES:

- ① Pole Bonding Connector Blackburn TTC3 or Weaver TGC3 or equal.
- ② Fused Connector-All electrical connectors for breakaway poles shall be watertight and shall be designed as break-away (Buchanan 65U, Bussmann HEBW, Littelfuse LEB or equal). All fuses shall be time-delay types. 10 Amp (Littelfuse FLO, Bussman FNQ or equal).
- * ③ Un-fused Connector-All electrical connections for neutrals shall be watertight. For breakaway poles, connections shall be designed as breakaway, shall have a white color marking, and shall have a permanently installed solid neutral (Buchanan 20U, Bussmann HET, Littelfuse LET or equal). Dummy/Neutral fuse shall be Bussman NTS-R-3 or equal.
- ④ Split Bolt or other connector.
- ⑤ Ground Rod Clamp - Blackburn GG58H, Burndy GKP635, or equal.

*For Transformer Base Poles. On Shoe Base Poles omit un-fused connector for neutral conductor.

1/04 Revision
Modify fixture specifications

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

RID(2)-04

REVISIONS	DATE	BY	DESCRIPTION
5-93			
10-93			
10-98			
1-04			

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COUNTY	CONTROL	SECTION	JOB	REVISION
DALLAS	0918	US	344	05

172B

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ACC: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

15. Ballasts shall meet the following requirements and shall pass tests in accordance with Test Method Tex-1130-T, Ballasts of Lighting Assemblies.
 - a. Ballast and starter shall be mounted on a removable stainless steel or aluminum tray of adequate thickness as approved by the engineer.
 - b. A wiring diagram for the fixture shall be inside fixture on or near the ballast.
 - c. Ballast shall be copper winding magnetic regulating three isolated coil ballast.
 - d. Ballast shall have a ballast factor between .95 and 1.0.
 - e. When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of plus 10 percent and minus 10 percent shall not exceed the following:
 - i. 220 Watts for 150 watt nominal lamp rating
 - ii. 440 Watts for 250 watt nominal lamp rating
 - iii. 552 Watts for 400 watt nominal lamp rating
 - f. During fluctuation of the test voltage of plus 10 percent and minus 10 percent, the lamp wattage fluctuation shall not exceed a total of 20 percent and ballast shall maintain lamp wattage within the following limits.
 - i. 110 Watts minimum and 180 Watts maximum for 150 Watt nominal lamp rating
 - ii. 175 Watts minimum and 370 Watts maximum for 250 Watt nominal lamp rating
 - iii. 280 Watts minimum and 475 Watts maximum for 400 Watt nominal lamp rating
 - g. The power factor of any ballast, when tested at the circuit voltage indicated on the plans, shall not be less than 90 percent.
 - h. Ballasts shall be permanently and clearly marked to indicate following:
 - i. Lamp type
 - ii. Catalog number
 - iii. Voltage rating
 - iv. Connection diagram
 - v. Manufacturer
 - vi. UL listing
16. The electronic starting aid shall meet the following requirements and shall pass tests in accordance with Test Method Tex-1140-T, Electronic Starting Aids of High Pressure Sodium Vapor Lighting Assemblies.
 - a. Starting aid shall provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum.
 - b. The pulse width shall be a minimum of 0.8 microseconds at 2250 volts.
 - c. The pulse shall occur when the open circuit voltage is equal to or greater than 90 percent of peak open circuit voltage.
 - d. Pulse repetition rate shall be a minimum of one per cycle
 - e. Pulse current shall be a minimum of 0.18 amperes.
 - f. The starting aid shall discontinue to pulse when, either,
 - i. the lamp starts, or
 - ii. after a minimum of 3 minutes and a maximum of 10 minutes if the lamp fails to start.
17. Lamps shall meet the following specifications
 - a. Lamps shall be Osram Sylvania Lumalux Plus high pressure sodium (HPS) lamps of the wattages shown on the plans. No alternates will be allowed.
 - b. Lamps shall fully extinguish at end of usable lamp life and remain extinguished without cycling.
 - c. Lamps that burn at reduced output at end of life are not acceptable.
 - d. Lamps shall meet the Federal Toxic Characteristic Leachate Procedure (TCLP).
 - e. 150 watt lamps shall be 55 volt.
 - f. Lamp shall be supplied with the fixture.
18. Photometrics. Fixtures shall meet the following photometric requirements using published photometric data and photometric data obtained by testing sampled fixtures.
 - a. 150 Watt mast arm (underpass) mounted luminaire shall meet IESNA Medium Cutoff requirements. The fixtures shall provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 110.0 feet by 30.0 feet, when mounted 20.0 feet above the midpoint of either long side of the surface area.
 - i. The maximum to minimum horizontal illuminance uniformity ratio shall not exceed 50:1 within the above mentioned rectangular area.
 - b. The 250-watt mast arm mounted luminaire shall meet IESNA cutoff requirements and, when mounted 40.0 feet above the midpoint of either long side of a rectangular area 190 feet by 45 feet, shall provide a minimum intensity of 0.20 footcandle at any point on the surface of this area. Light intensities measured in footcandles along a line parallel to and 20.0 feet in from the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.50 footcandle in any 5.0 foot interval along the aforementioned line from 10.0 to 90.0 feet on both sides of the luminaire and shall not be less than 0.30 footcandle at any point along such a line.
 - i. The maximum to minimum horizontal illuminance uniformity ratio shall not exceed 20:1 within the above mentioned rectangular area.
 - c. The 400-watt mast arm mounted luminaire shall meet IESNA cutoff requirements and, when mounted 50.0 feet above the midpoint of either long side of a rectangular area 220.0 feet by 60.0 feet, shall provide a measured minimum intensity of 0.20 footcandle at any point on the surface of this area. Light intensities measured in footcandles along a line parallel to and 30.0 feet in from the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.75 footcandle in any 10.0 foot interval along the aforementioned line from 10.0 to 90.0 feet on both sides of the luminaire and shall not be less than 0.30 footcandle at any point along such a line.
 - i. The maximum to minimum horizontal illuminance uniformity ratio shall not exceed 20:1 within the above mentioned rectangular area.
19. Photometric data shall be consistent from fixture to fixture. Unless otherwise approved by the Engineer, the photometric performance shall match published data (or approved photometric reports submitted during the prequalification process as the typical photometric output in lieu of published data) as follows:
 - a. Point of maximum candela shall be within 5 degrees horizontally and vertically.
 - b. Maximum candela shall be within 20 percent of published maximum candela.
 - c. Fixture efficiency shall be within 10 percent of published efficiency.
20. All luminaires shall be pre-qualified. No alternates will be considered.
 - a. Only materials, with approved product codes or designations, from prequalified producers are accepted on bids. The Construction Division (CST) of the Texas Department of Transportation (TxDOT) maintains the material producers list of approved producer product codes or designations. Use the following website to view this list:
<http://www.dot.state.tx.us/business/materialproducerlist.htm>
 Use of prequalified material does not relieve the contractor of the responsibility to ensure that the material meets specifications. All materials, including those shown on the prequalified material list, may be inspected and tested at any time and may be rejected if not in compliance with the specifications.
 - b. Contractor shall notify the Engineer in writing as to which fixture from the list of approved fixtures will be supplied.

- c. A manufacturer desiring to have a fixture listed as a pre-qualified fixture shall:
 - i. Submit a sample of each type of luminaire and all pertinent data, including published photometric data and recently tested photometric data (IES format, both "averaged" and both sides of "un-averaged" data) to:

TxDOT- TRF
118 East Riverside Dr.
Austin, TX 78704
 - ii. Manufacturer must demonstrate a commitment to quality
 - iii. Manufacturer shall prepare and submit a QA/QC program documentation with the following minimum requirements.
 1. Written statement of the companies QA/QC policy
 2. QA/QC person is employed that has special QA/QC training and has QA/QC as their primary job responsibility
 3. A written procedure specifically for handling orders for fixtures built to TxDOT specifications.
 4. A written procedure for keeping track of fixtures built, certified, and tested for TxDOT orders.
 5. A check list of features for TxDOT fixtures with QA/QC person signature.
 - d. Prequalification samples, if approved, will not be returned to the manufacturer but will be retained by TxDOT for comparison testing. Once a fixture has been approved, no changes shall be made in any material or manufacturing methods without prior approval of the Department. Unapproved changes will result in rejection of fixtures.
 - e. In addition, luminaires will be tested for compliance with this specification. Luminaires that inconsistently pass testing or that are inconsistent with published photometric information will be removed from the pre-qualified list at the discretion of the engineer.
21. Sampling. Sample in accordance with Text Method Tex-1110-T, Sampling Lighting Assemblies.
22. Warranty. Any fixture failing within five years of installation will be replaced by the manufacturer with a fixture that passes all testing, delivered to the project location.
23. Testing. The manufacturer shall conduct electrical testing required in paragraphs 15 and 16, and all photometric testing shall be at the manufacturer's expense and at the following rates.
 - a. From each lot or manufacturing run, the manufacturer shall select one completed fixture of each 25, with a minimum of two and a maximum of 5, to be photometrically tested at an independent test lab approved by TxDOT.
 - i. Testing shall provide IES photometric report in two formats:
 1. Standard averaged format for asymmetric fixtures
 2. Un-averaged format showing both sides, un-averaged data may be supplied in two files or as otherwise approved by the Engineer.
 - ii. Test data shall be supplied directly to TRF-TE electronically for evaluation prior to shipping fixtures to the project.
 - iii. Test reports shall include:
 1. TxDOT's Control-Section-Job number, maintenance contract number, or purchase order number that the fixtures are assigned to,
 2. a unique fixture test number per fixture,
 3. date of manufacture, and
 4. quantities supplied and lot number per fixture type.
 - iv. Unique lab report number shall be written on the top of the fixture housing with permanent marker. Test lab shall keep results for 5 years and shall make all documentation available to TxDOT.
 - v. Manufacturer shall keep records of manufacturing lots, test reports, lot quantities, and other pertinent details. Such records shall be submitted to the Department upon request.
 - vi. Manufacturer shall make available to TxDOT inspectors upon request, all manufacturing facilities involved in the production of fixtures intended to be used on TxDOT projects, inventories of fixtures produced to TxDOT specifications, and records of fixture testing and tracking.
 - b. Departmental Test Reporting. Departmental test reports will be issued as follows:
 - i. For projects requiring 1-15 fixtures of a particular wattage, TRF will authorize a passing test report when the following steps have been completed.
 1. a review of the submittal letter from the contractor to the Engineer identifying the fixture to be supplied,
 2. a review of test reports supplied by the manufacturer shows that the fixtures meet the photometric requirements of this specification, and
 3. a review of the history of testing from that manufacturer shows consistent passing of the electrical, photometric, and fixture construction quality requirements.
 - ii. For projects with 16 or more fixtures of a particular wattage, TRF will authorize a passing test report when the following steps have been completed.
 1. a review of the submittal letter from the contractor to the Engineer identifying the fixture to be supplied,
 2. a review of test reports supplied by the manufacturer shows that the fixtures meet the photometric requirements of this specification, and
 3. a review of the history of testing from that manufacturer shows consistent passing of the photometric and fixture construction quality requirements.
 4. Fixtures are shipped to the project and two fixtures are sampled and tested by the Engineer in accordance with Texas Test Method Tex 1110-T.
 5. A review of the photometric test reports from the Departments lab show compliance with this specification and comparison to photometric reports supplied by the manufacturer are within the tolerances allowed by this specification.

1/04 Revision
Modify fixture specifications

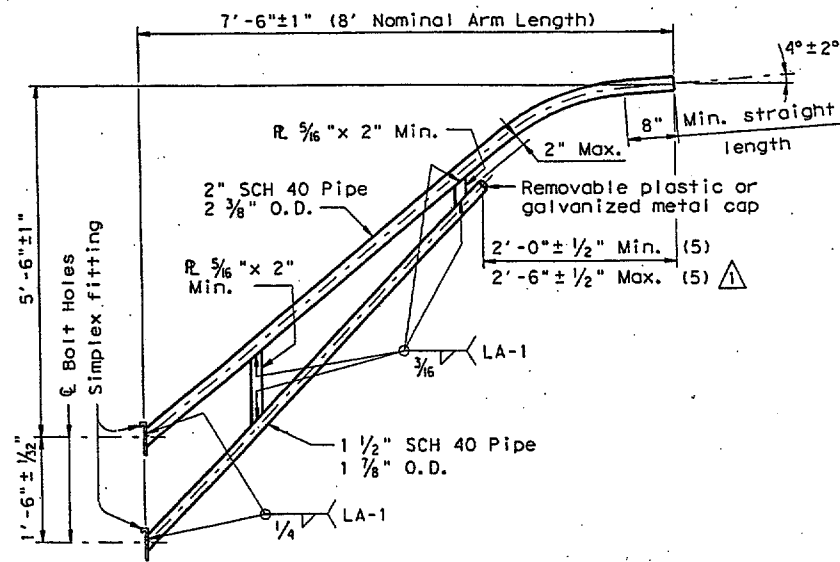
STANDARD PLANS		Texas Department of Transportation	
<i>Traffic Operations Division</i>			
ROADWAY ILLUMINATION DETAILS			
RID(3)-04			
© TxDOT January 1992		DRG - KB	CRG - KB
REVISED	STATE DISTRICT	FEDERAL RECTOR	FEDERAL AID PROJECT
5-93	6		CM 97(87)
10-93			
10-98			
1-04	COUNTY	CONTROL	SECTION
	DALLAS	0918	45 344
			JOB
			REMARK
			147

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for other formats or for incorrect results or damages resulting from its use.

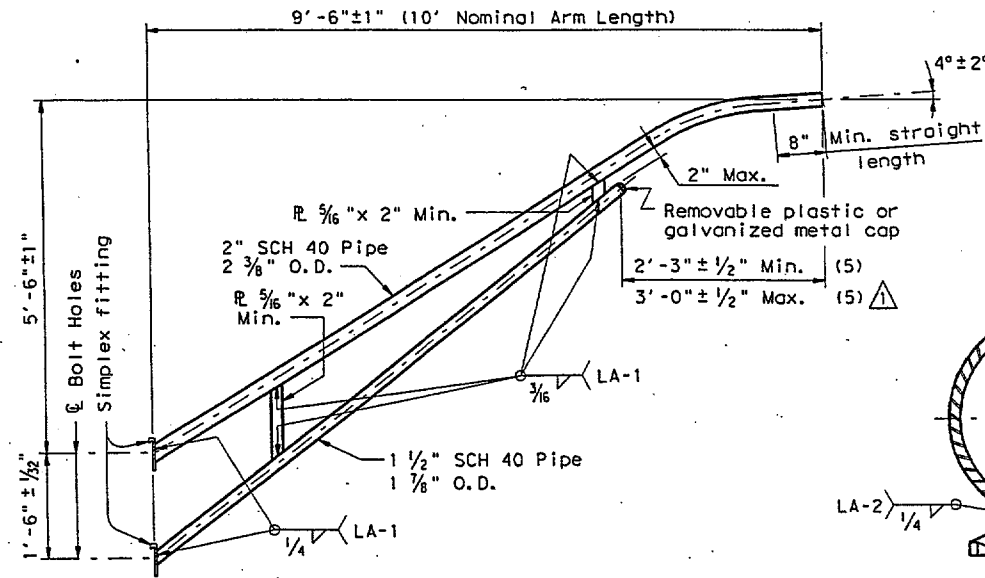
ACC: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

LEVELS DISPLAYED: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

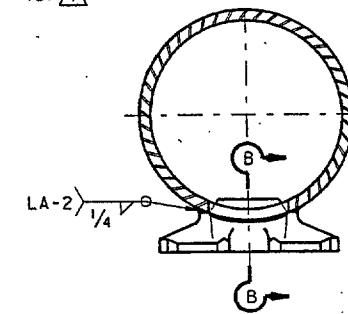
(LV-1,2 for English; 1,3 for Metric)



8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



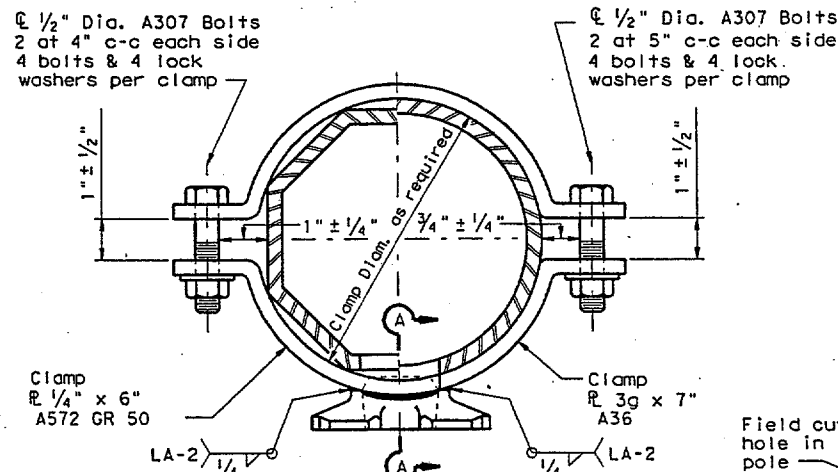
DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 GR 65-35 or A148 GR 80-50 or A576 GR 1021 (4) or A36 (Arm only)
Arm Pipes	ASTM A53 GR A or B or A500 GR B or A501 or A595 (2) or A715 GR 50
Arm Plates (3)	ASTM A36 or A572 GR50 (1) or A595 GR A or A588
Misc.	ASTM designations as noted

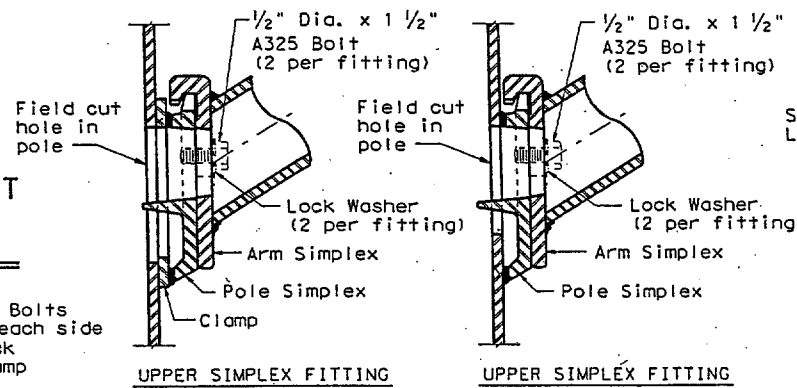
- (1) ASTM A36M50 steel as described in Item 442 "Metal for Structures" may be used in lieu of A 572 GR 50.
- (2) If A595 GR A material is used, arm need not be cold worked to A595 requirements, but material must have 40 ksi minimum yield prior to fabrication.
- (3) Either of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- (4) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- (5) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

GENERAL NOTES:

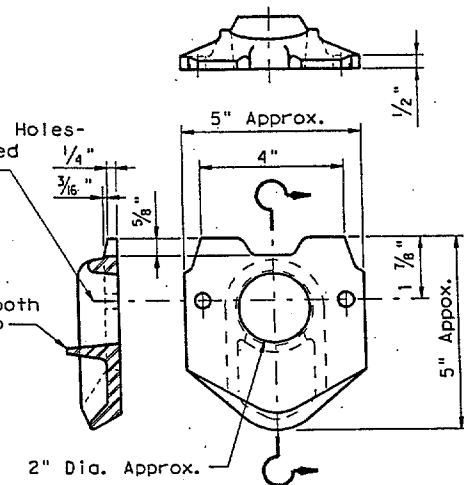
Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 75 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.5 sq. ft. Materials and fabrication shall be in accordance with the Specifications 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. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice. Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with the Specifications. Special designs require submission of shop drawings in accordance with the item "Steel Structures". Each pole simplex fitting shall be supplied with 2 A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans. If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



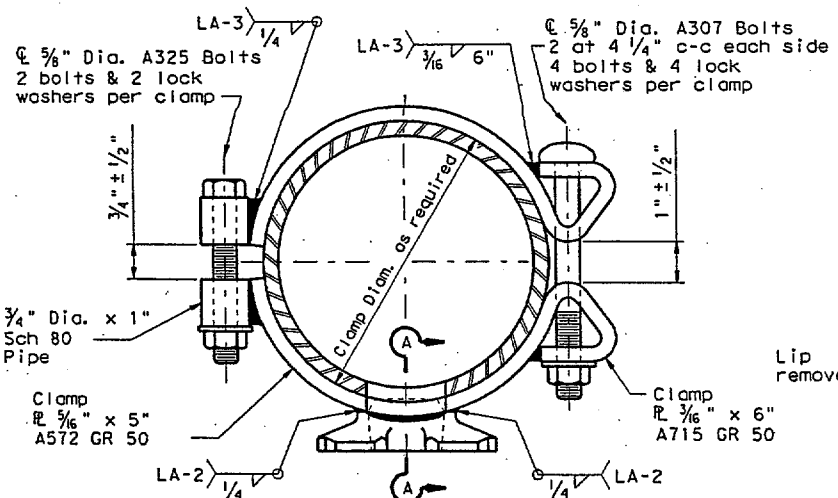
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION) CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



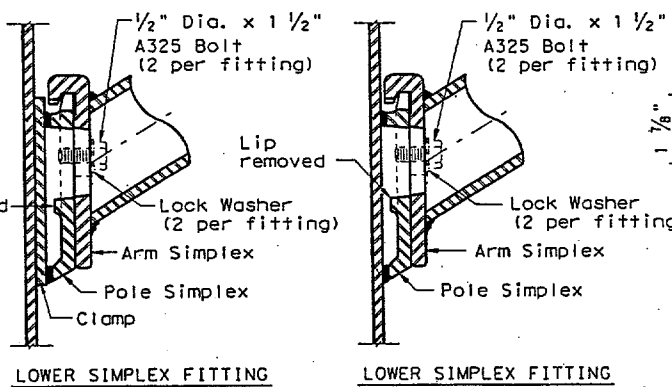
UPPER SIMPLEX FITTING UPPER SIMPLEX FITTING



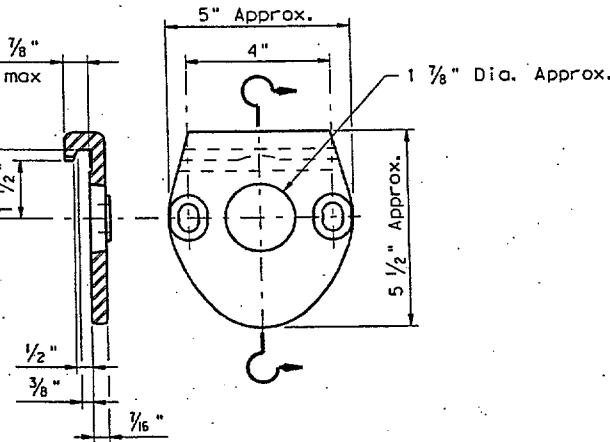
POLE SIMPLEX DETAIL



CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION) CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



LOWER SIMPLEX FITTING LOWER SIMPLEX FITTING



ARM SIMPLEX DETAIL

SECTION A-A

SECTION B-B

1-99 - minor typo correction

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

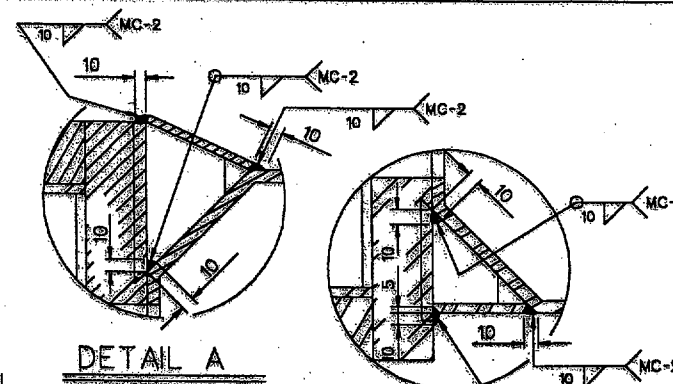
LUM-A-99

FILE: lum-a.dgn	DR: LEH	CHK: JSY	DR: LIT	CHK: TEB	STD:
© TxDOT August 1995	DIST	FED REG	FEDERAL AID PROJECT	SHEET	
REVISIONS		6	CM 97(87)	IAB	
5-96	COUNTY	CONTROL	SECT	JOB	HIGHWAY
1-99	DAL	091845	244	CS	

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ARM SIZE		A	B	C	D	E	CONN. BOLT DIA
D ₁	#	mm	mm	mm	mm	mm	in.
165	4.55	305	229	229	152	25	1
180	4.55	330	229	254	152	25	1
205	4.55	356	254	279	178	32	1 1/4
230	4.55	406	279	330	203	32	1 1/4
240	4.55	432	305	356	229	32	1 1/4
240	6.07	457	305	381	229	32	1 1/4
255	6.07	457	305	381	229	32	1 1/4
265	6.07	457	330	381	254	38	1 1/2
280	6.07	457	330	381	254	38	1 1/2

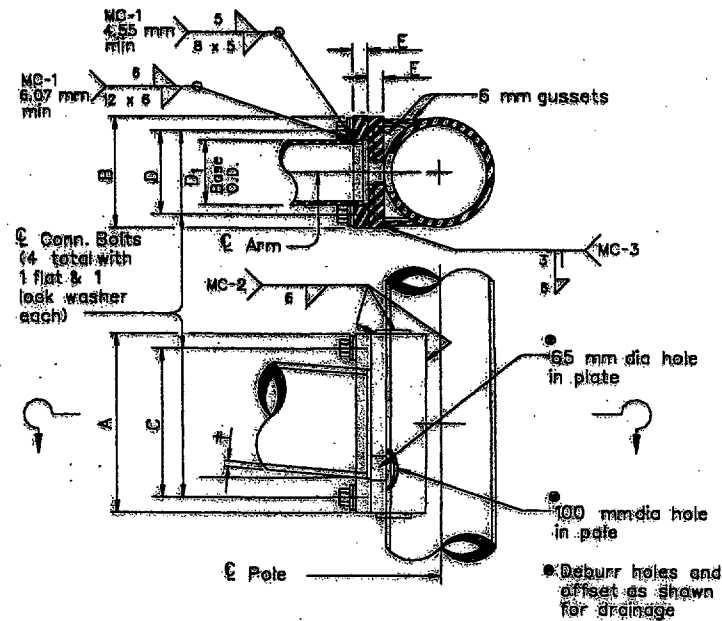
ARM SIZE		A	B	C	D	E	CONN. BOLT DIA
D ₁	#	mm	mm	mm	mm	mm	in.
180	4.55	279	279	203	203	32	1 1/4
190	4.55	279	279	203	203	32	1 1/4
205	4.55	279	279	203	203	32	1 1/4
230	4.55	330	330	254	254	32	1 1/4
255	4.55	330	330	254	254	32	1 1/4
240	6.07	330	330	254	254	32	1 1/4
255	6.07	356	356	279	279	38	1 1/2
260	6.07	356	356	279	279	38	1 1/2
280	6.07	356	356	279	279	38	1 1/2



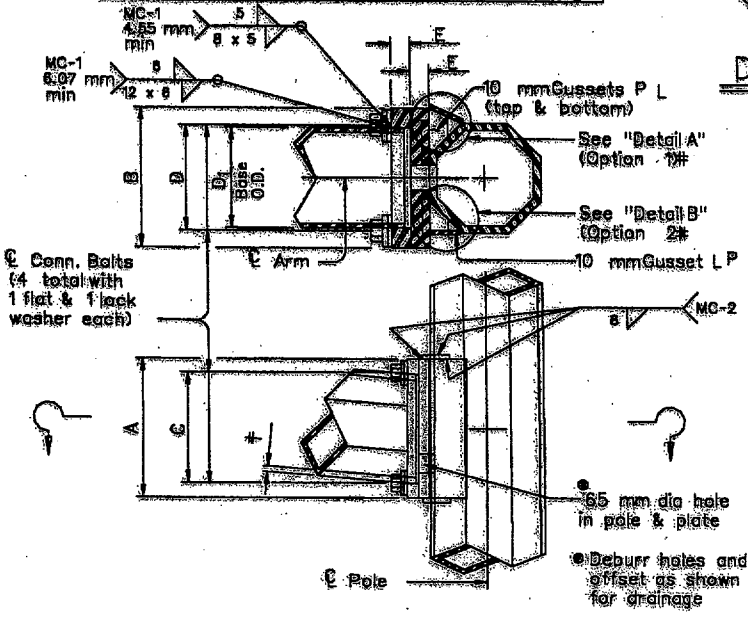
MATERIALS	
Round Shafts or Polygonal Shafts	ASTM A595 GR A, ASTM A570M GR 345, ASTM A607 GR 50, ASTM A572M GR 345 or A36M MOD345
Plates (1)	ASTM A36M OR A572M GR345 OR A595(2) OR A36M MOD345
Connection Bolts	ASTM A325M except where noted
Pin Bolts	ASTM A325M
Pipe	ASTM A53 GR A or B, OR A501
Misc. Hardware	Galvanized steel or stainless steel or as noted

(1) Any of the materials listed for plates may be used where the drawings do not specify a particular Grade designation.

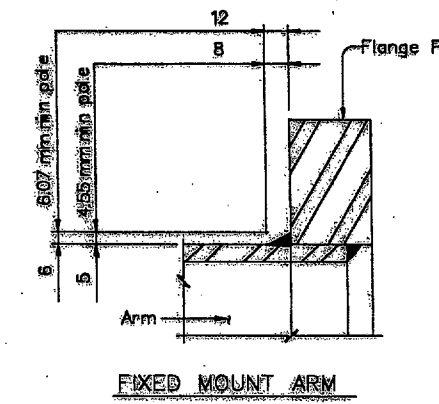
(2) If A 595 materials used, it need not be cold worked to A 595 requirements, but material must have 276 MPa minimum yield prior to fabrication.



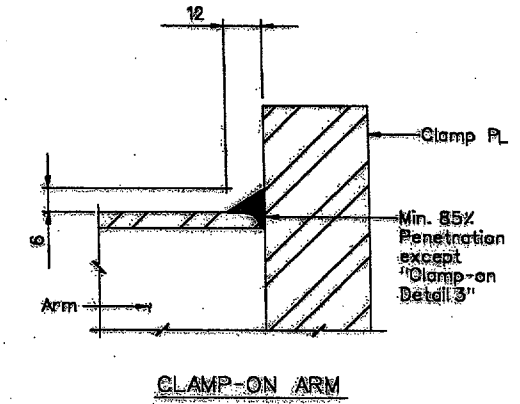
FIXED MOUNT DETAIL 1



FIXED MOUNT DETAIL 2



FIXED MOUNT ARM



CLAMP-ON ARM

ARM BASE WELD DETAILS

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	#	mm	mm	No.	Dia.	No.	Dia.
165	4.55	305	203	4	1	2	3/8
180	4.55	356	203	4	1	2	3/8
205	4.55	356	203	4	1	2	3/8
230	4.55	406	254	4	1	2	3/8
240	4.55	457	305	4	1 1/4	3	3/8
240	6.07	457	305	4	1 1/4	3	3/8
255	6.07	457	305	4	1 1/4	3	3/8

*1" Dia connection bolts are permissible

ARM SIZE		A	F	T	CONN. BOLTS		PIN BOLTS	
D ₁	#	mm	mm	mm	No.	Dia.	No.	Dia.
180	4.55	305	203	19	4	3/4	2	3/8
190	4.55	356	203	19	4	3/4	2	3/8
205	4.55	356	203	19	4	3/4	2	3/8
230	4.55	406	254	22	4	1	2	3/8
235	4.55	457	254	22	4	1	2	3/8
240	6.07	457	254	25	6	1	3	3/8
255	6.07	457	254	25	6	1	3	3/8

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	#	mm	mm	No.	Dia.	No.	Dia.
165	4.55	305	203	4	1	2	3/8
180	4.55	356	203	4	1	2	3/8
205	4.55	356	203	4	1	2	3/8
230	4.55	406	254	4	1	2	3/8
240	4.55	457	305	4	1 1/4	3	3/8
240	6.07	457	305	4	1 1/4	3	3/8
255	6.07	457	305	4	1 1/4	3	3/8

GENERAL NOTES:

Clamp-on details are used for the second arm on dual arm assemblies. A Maximum 38 mm vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 25 mm.

Fixed mount details are used for single mast arm assemblies and for the first arm on dual arm assemblies.

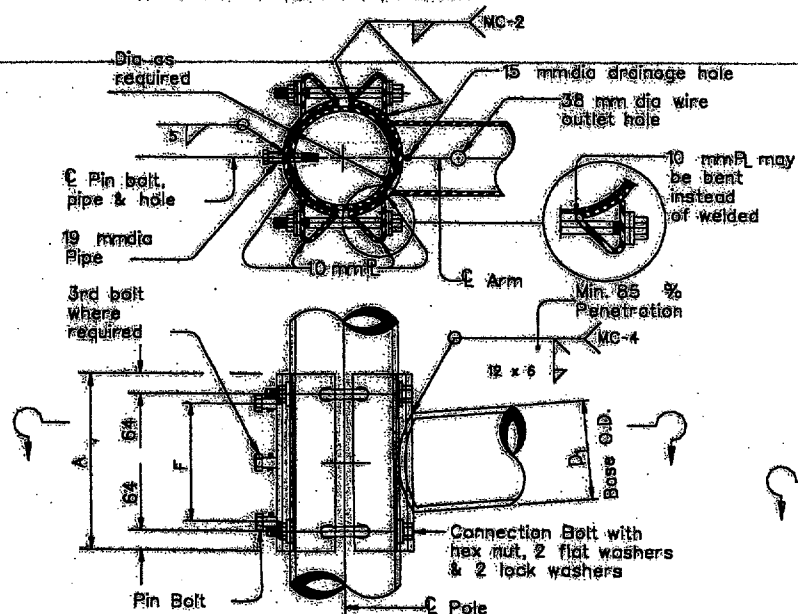
Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

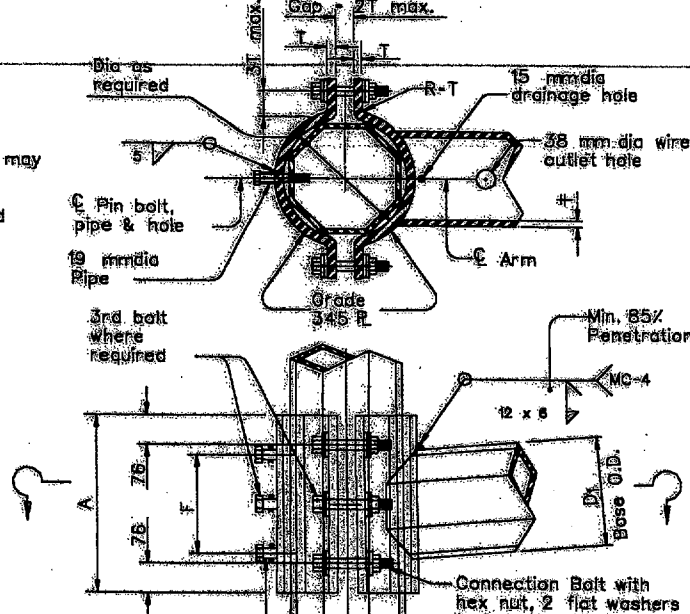
NOTE:

Pin bolts shall be A325M with threads excluded from the shear plane. Pin bolt and 19 mm dia pipe shall have 5 mm holes for a 3 mm dia galvanized cotter pin. Back clamp plate shall be furnished with a 7/8" dia hole for each pin bolt. An 7/8" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

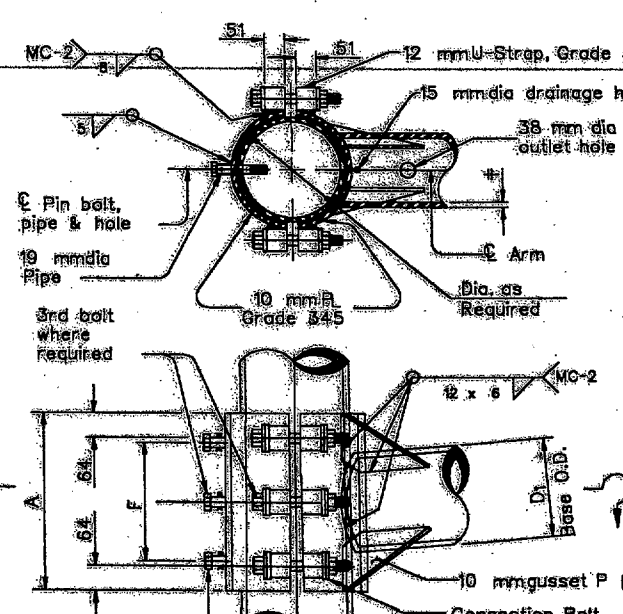
NOTE: All dimensions are in millimeters () mm except as noted.



CLAMP-ON DETAIL 1



CLAMP-ON DETAIL 2



CLAMP-ON DETAIL 3

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY
FOR TRAFFIC SIGNAL
SUPPORT STRUCTURES
MAST ARM CONNECTIONS

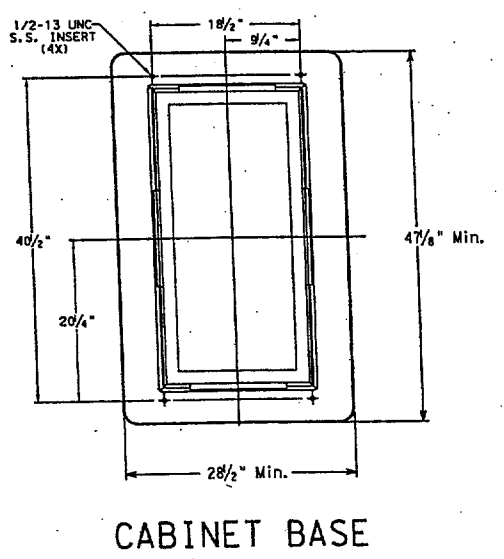
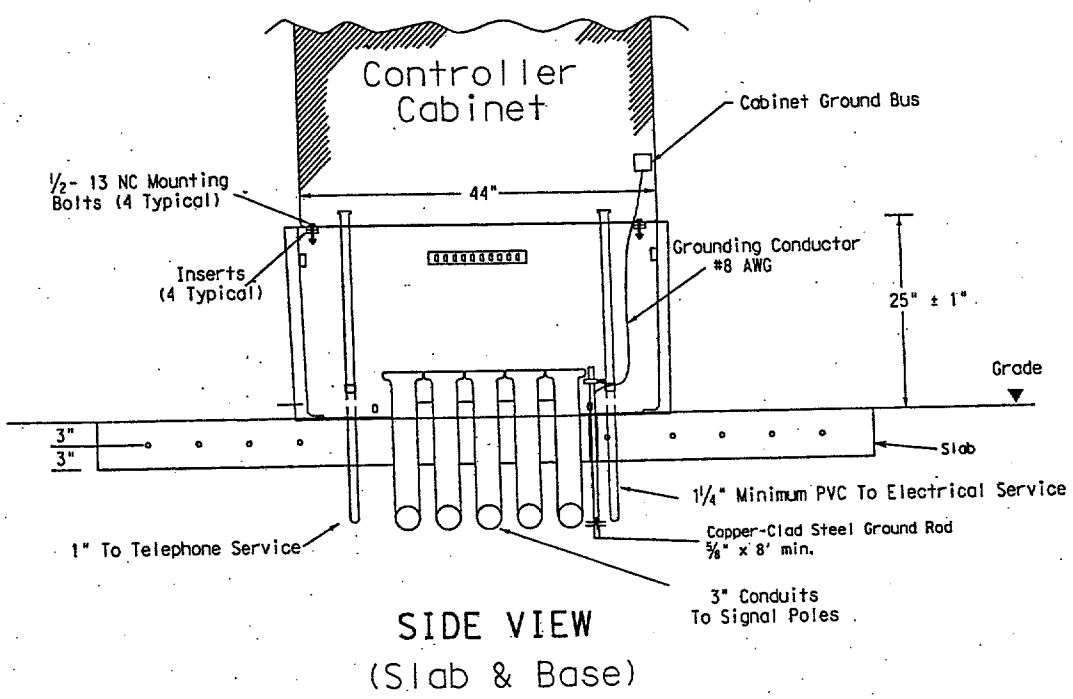
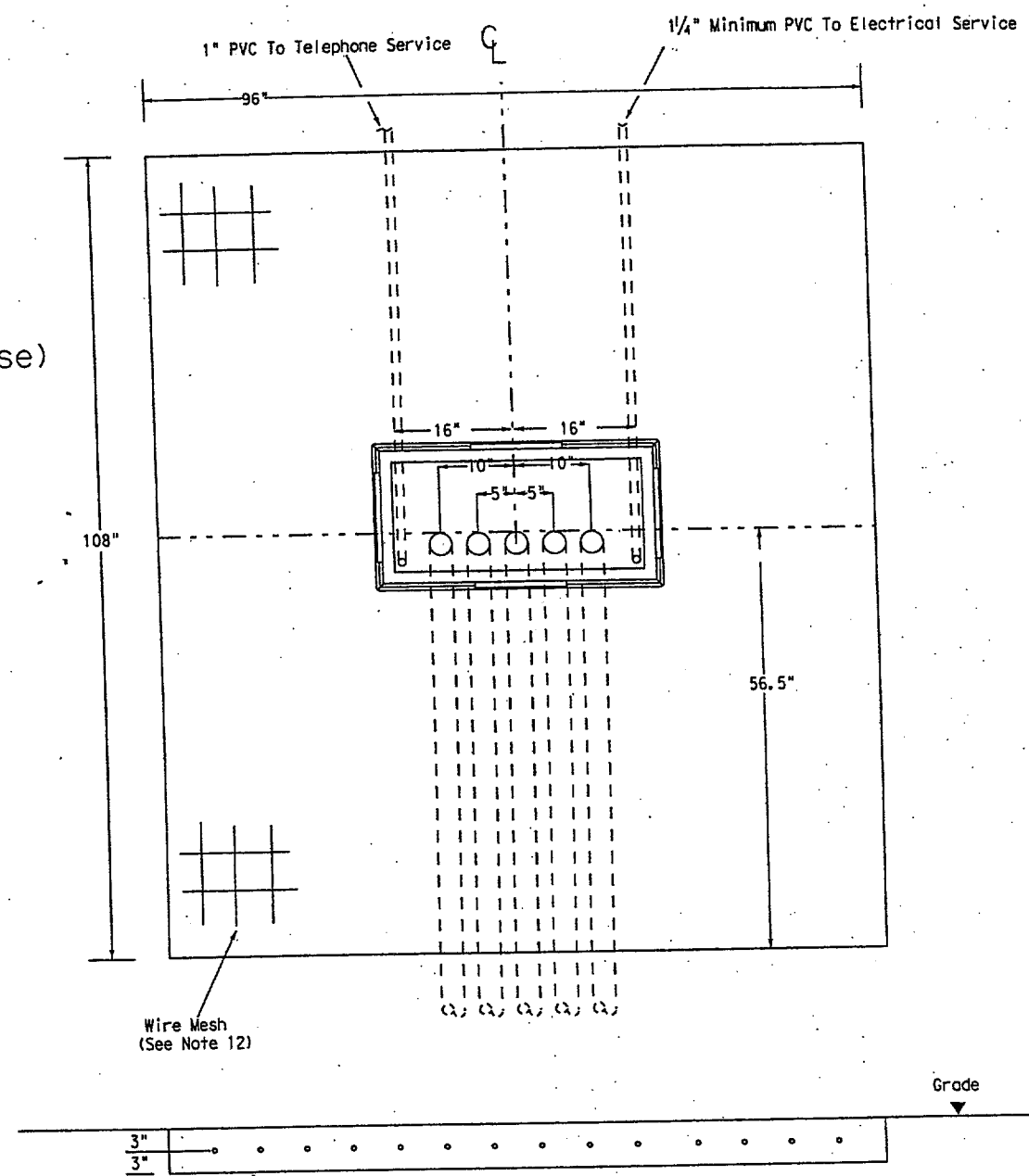
MA-C-96(M)

REV	DATE	BY	CHK	APP	PROJECT	SHEET
01	AUGUST, 1995	DAZ	CM	97 (87)	151	
REVISIONS		DAZ	CM	97 (87)	151	
COUNTY	CONTROL SECT	JOB	HIGHWAY			

Design of this assembly is based on the Texas Engineering Practice Act, Chapter 1301, Section 1301.001, which requires that the engineer or architect responsible for the design of this assembly is responsible for the safety of the assembly. The engineer or architect shall be held liable for any damages resulting from its use.

DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

TOP VIEW
(Slab & Base)



TRAFFIC SIGNAL CONTROLLER BASE:

- Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armocast Part # A6001848X24, Quazite Model # PG30482709, or other as approved by TxDOT Traffic Operation Division.
- The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.
- The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.
- Supply the cabinet base with four 1/2"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.
- Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7" from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x 3/4 x 3/8 inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using 1/2"-13 UNC stainless steel screws and inserts.
- The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.
- The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
- Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

- Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.

- Bond a #8 AWG copper ground wire and on an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.
- Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.
- Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.
- Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

- Stub up and run 3-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.
- Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.
- Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.
- Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

- Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.

PAYMENT:

- Bid TS-CF as subsidiary to Item 680.

LEVELS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACC:																

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-04

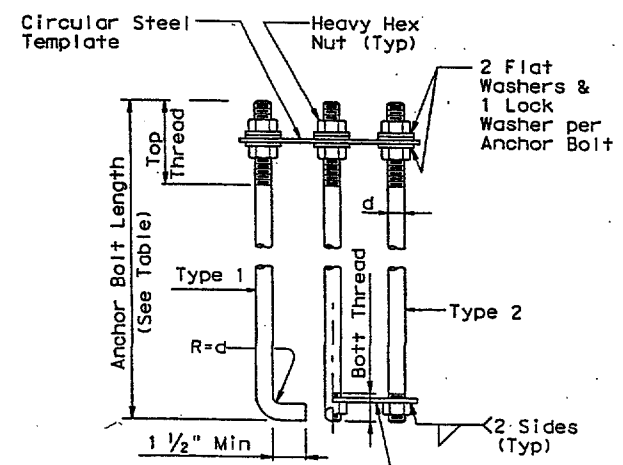
© TxDOT October 2000	DR - HW	CD -	DR - CJ	CD - CAL
REVISIONS 12-04	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
	DAL	6	CM 97(87)	152
COUNTY	CONTROL	SECTION	JOB	MOBILITY
DALLAS	0918	45	344	CS

⑧ Oversized Drilled Shafts may be used to accommodate existing equipment.

FDN TYPE	⑧ DRILLED SHAFT DIA	REINFORCING STEEL		DRILL SHAFT LENGTH-m (4, 5, 6)			ANCHOR BOLT DESIGN (1)				FOUNDATION DESIGN LOAD (2)		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TX CONE PENETROMETER N Blows/300 mm			ANCHOR BOLT DIA	Fy (MPa)	BOLT CIR DIA	ANCHOR TYPE	MOMENT KN-m	SHEAR KN	
				10	15	40							
600-A	600	4- #5	#2 at 300	1.7	1.6	1.4	3/4"	250	324	1	14	4	Pedestal pole, pedestal mounted controller.
750-A	750	8- #9	#3 at 150	3.4	3.1	2.4	1 1/2"	380	432	2	118	13	Mast arm assembly. (see Selection Table)
900-A	900	10- #9	#3 at 150	4.0	3.7	2.9	1 3/4"	380	483	2	178	22	Mast arm assembly. (see Selection Table) 9150 mm strain pole with or w/out luminaire.
900-B	900	12- #9	#3 at 150	4.6	4.1	3.2	2"	380	533	2	258	31	Mast arm assembly. (see Selection Table) Strain pole taller than 9150 mm & strain pole with mast arm
1050-A	1050	14- #9	#3 at 150	5.3	4.8	3.6	2 1/4"	380	584	2	367	40	Mast arm assembly. (see Selection Table)

WIND SPEED	MAX SINGLE ARM LENGTH	FDN 750-A	FDN 900-A	FDN 900-B	FDN 1050-A
		130 km/h DESIGN WIND SPEED	9,750	14,600	
130 km/h DESIGN WIND SPEED	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	7,300 X 7,300			
		8,500 X 8,500			
		9,800 X 8,500	9,800 X 9,800		
			11,000 X 11,000		
160 km/h DESIGN WIND SPEED	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		12,200 X 11,000		
			13,400 X 8,500	13,400 X 11,000	
			11,000	13,400	
			7,300 X 7,300		
160 km/h DESIGN WIND SPEED	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		8,500 X 8,500		
			9,800 X 7,300	9,800 X 9,800	
				11,000 X 11,000	
				12,200 X 7,300	12,200 X 11,000
			13,400 X 11,000		

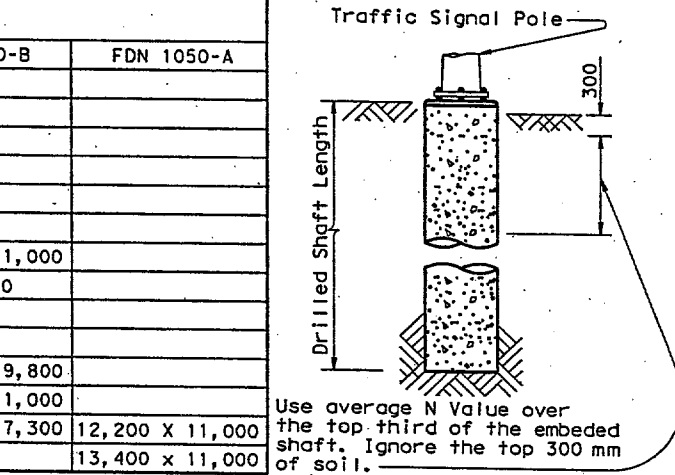
EXAMPLE:
For 130 km/h design wind speed, foundation 750-A can support up to a 9750 mm arm with another arm up to 8530 mm.
For 160 km/h design wind speed, foundation 900-A can support a single 10,970 mm mast arm.



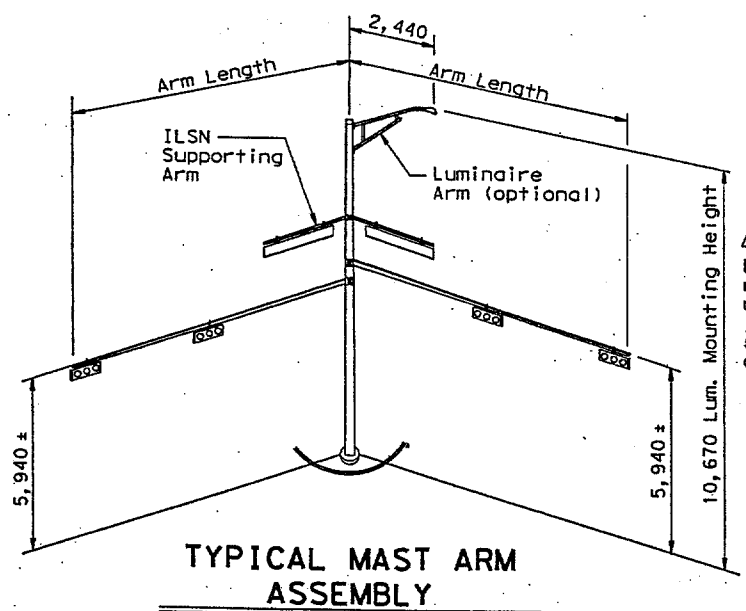
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

INSTALLATION PROCEDURE:
Threads of anchor bolts shall be coated with pipe joint compound prior to installation of upper nuts when erecting pole. After pole is plumbed and in permanent alignment, the exposed threads of painted bolts shall be cleaned and an additional coating of zinc-rich paint applied to seal the bolt thread-nut joint.



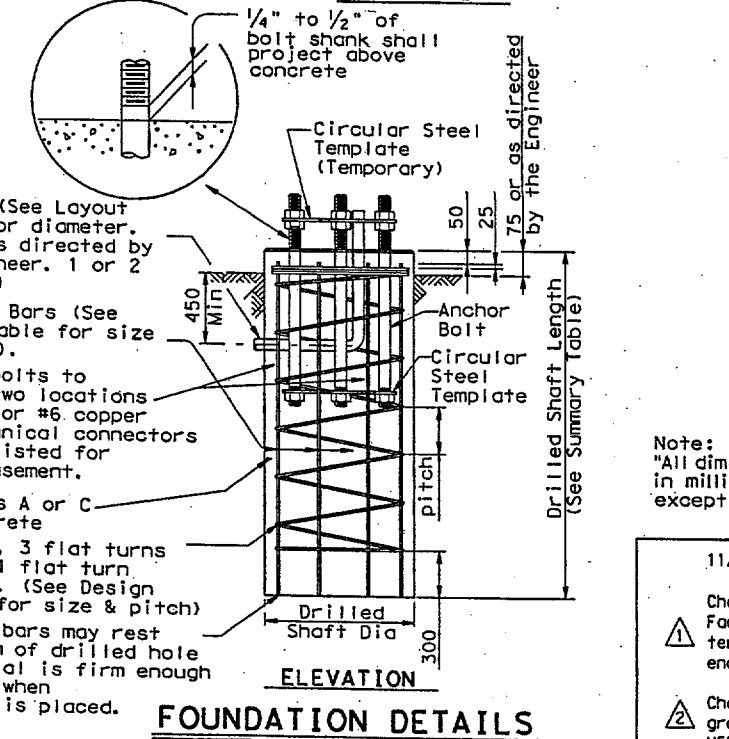
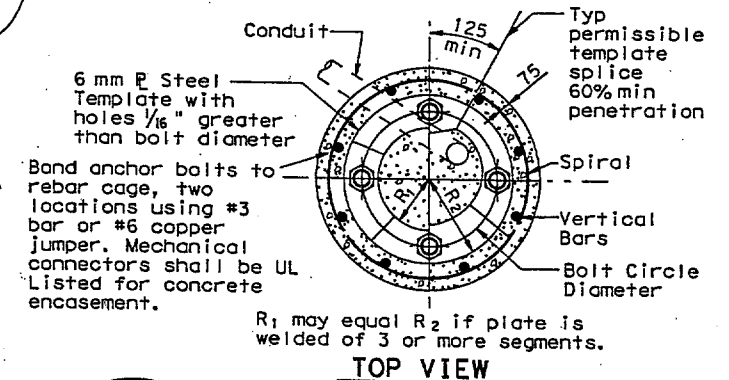
TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY

BOLT DIA	⑦ BOLT LENGTH	TOP THREAD	BOTT THREAD	BOLT CIRCLE	Rz	Rt
3/4"	1'-6"	3"	—	324	181	143
1 1/2"	3'-4"	6"	2"	432	254	178
1 3/4"	3'-10"	7"	2 1/4"	483	286	197
2"	4'-3"	8"	2 1/2"	533	318	216
2 1/4"	4'-9"	9"	3"	584	349	235

⑦ Min dimensions given, longer bolts are acceptable.



FOUNDATION DETAILS

- 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 900 to 1500 mm 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 0.1 m for entry into Summary Table.

LOCATION IDENTIFICATION	AVG. N BLOW (per 300 mm)	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (6) (m)				
				600-A	750-A	900-A	900-B	1050-A
MIDWAY								
AT MCEWEN								
T-4	10	900A	1			5.2		
MIDWAY								
AT SPRING VALLEY								
T-2, -4, -6, -7, -9	10	600A	5	8.5				
MIDWAY								
AT LINDBERGH								
T-1	10	900A	1			4.0		
T-4	10	900A	1			4.0		
MIDWAY								
AT KELLER SPRINGS								
T-4	10	900A	1			4.0		
MIDWAY								
AT SOJOURN								
T-1	10	900A	1			4.0		
T-3	10	900A	1			4.0		
TOTAL DRILLED SHAFT LENGTHS				8.5		25.2		

GENERAL NOTES:
Design conforms to 1994 AASHTO Standard Spec. for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto. Reinforcing steel shall conform to Item 440. Concrete shall be Class A or C. Threads for anchor bolts and nuts shall be rolled or cut threads of unified national coarse thread series except for A193M B7 bolts which shall have 8 pitch thread series. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing. Anchor bolts that are 1" in diameter or less shall conform to ASTM A36M. Anchor bolts larger than 1" in diameter shall conform to A36M Mod380 in accordance with the item, "Anchor Bolts" or ASTM A193M B7 or A687. Galvanize or coat with zinc-rich paint a minimum of the upper 14 inches of all anchor bolts unless otherwise noted. Exposed nuts shall be galvanized or coated with zinc-rich paint. Washers shall be galvanized. Templates and embedded nuts need not be galvanized.

Note: "All dimensions are in millimeters (mm) except as noted"

- 11/99 Revision
- Changed to Facilitate new terminal strip enclosure
 - Changed from ground rod to UFER ground

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-99 (M)

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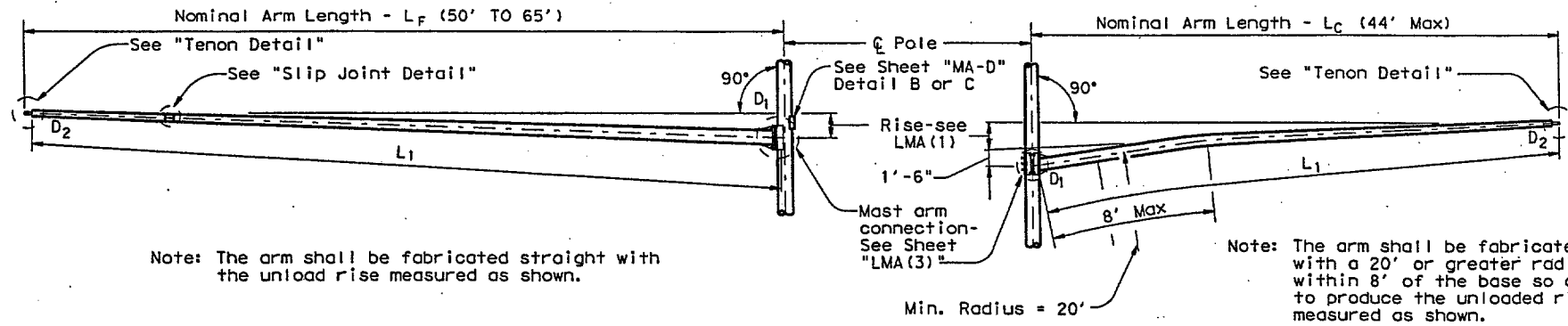
REVISED	STATE DISTRICT	FEDERAL AID PROJECT	DATE
5-96	DAL 6	CM 97 (87)	153
11-99			

DALLAS 0918 45 344

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ACC: d48hplq:usr/d482517
LEVELS LAYED
1 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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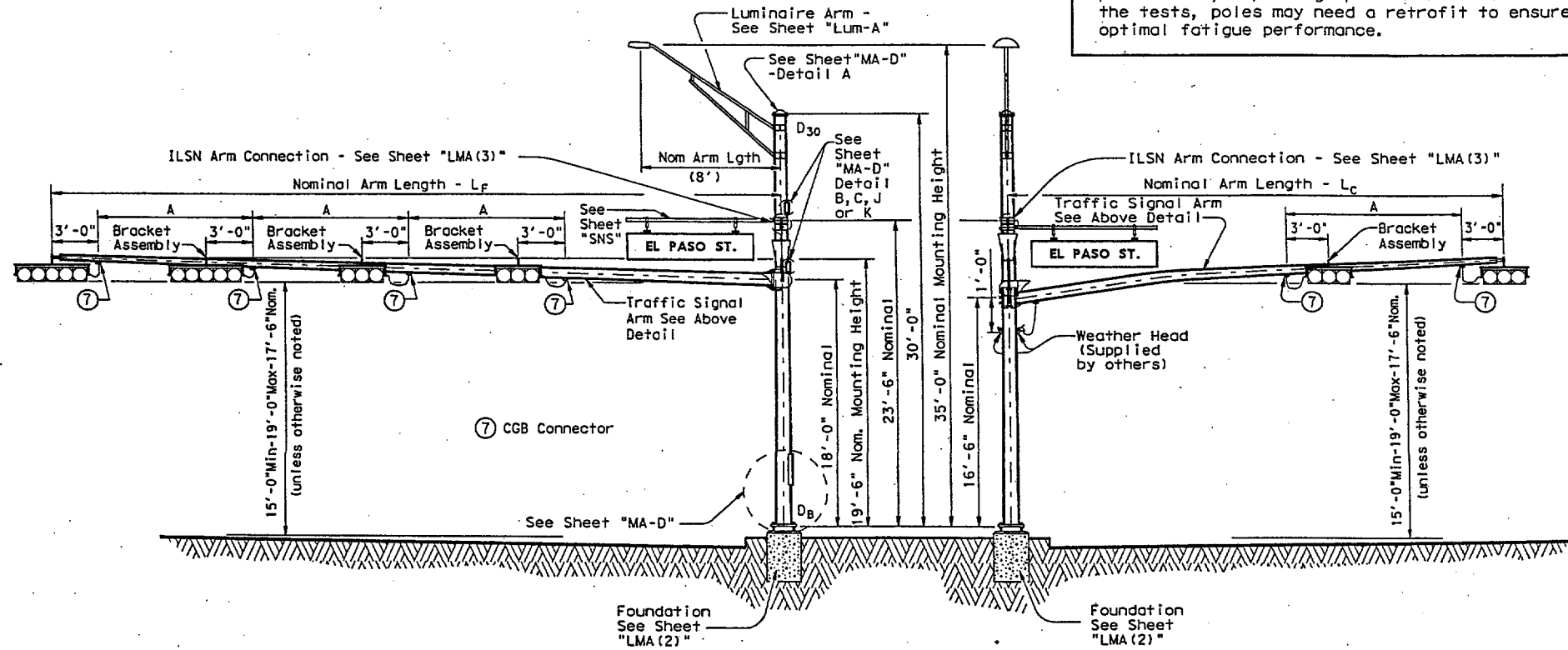


FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM

(If required, See DMA-80 or DMA-100 Standard Sheets for Clamp-on Arm Details)

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.



ELEVATION
(Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp mount arm)

TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'

VIBRATION WARNING

Mast Arms of approximately 40'-0" or longer are subject to possible harmonic vertical vibrations in light wind conditions due to unusual combinations of signal numbers, weights or positions, arm-wind orientation, and arm-pole stiffness. Arms shall be visually inspected in 5 to 20 mph wind conditions after signal head installation and, if vertical movements with a total excursion (max positive to max negative) of more than approximately 8" are observed at arm tip, damping devices or other means shall be fitted to the arm(s). The necessary damping device(s) or other remedial measures shall be as recommended by the fabricator. Excessive vibrations shall not be allowed to continue for more than two days. If damping plate is used, the size shall be 16" x 66". The plate must be installed directly above traffic light located nearest the free end.

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 can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, 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 limited length combinations. The specified luminaire load applied at the end of luminaire arm equals 75 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.5 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. For 50 ft. to 65 ft. fixed-mount mast arm the specified signal load applied at the end of the traffic signal arm equals 310 lbs vertical dead load plus the horizontal wind load on an effective projected area of 52.0 sq ft. (actual area times drag coefficient). For clamp-on mast arm, the specified signal load applied at the end of the traffic signal arms 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).

Except as noted in sheets 1 thru 3 of 3, also refer to Standard Sheet "MA-D" for pole 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.

Fabrication shall be in accordance with the Specifications 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. Miscellaneous welds which do not call for preapproved weld procedures are nevertheless subject to rejection for poor workmanship. Material, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and the Specifications.

Unless otherwise noted, all parts shall be galvanized in accordance with the Specifications.

Special designs require submission of shop drawings in accordance with the item "Steel Structures".

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

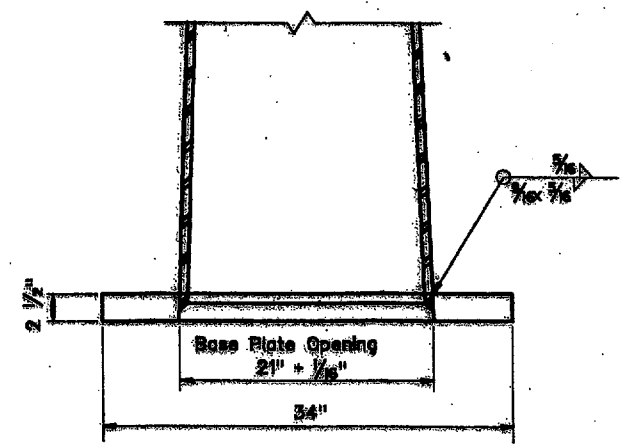
TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY
(50 TO 65 FT)
(80 AND 100 MPH WIND ZONE)

Sheet 1 of 4
LMA(1)-01

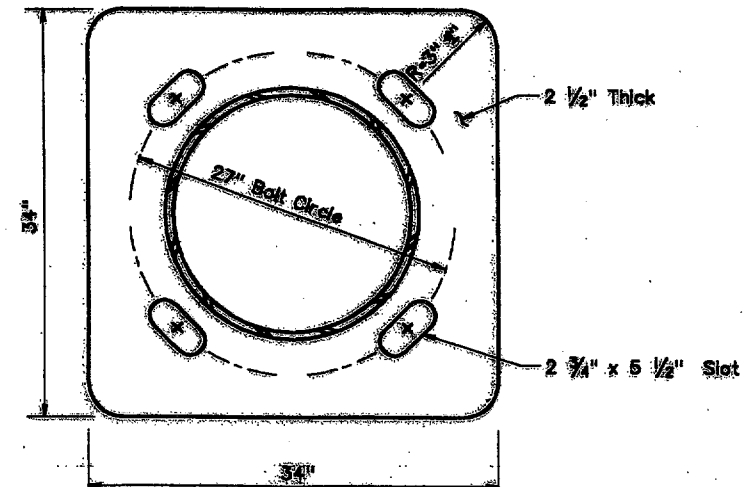
REVISIONS	STATE DISTRICT	FEDERAL AID PROJECT	DATE	BY	CHKD	APP'D
4-20-01	DAL	6	01/18/01	CS		
COUNTY	CENTRAL	SECTION	JOB	SECTION	JOB	SECTION
DALLAS	0918	45	344	CS		

ACC: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

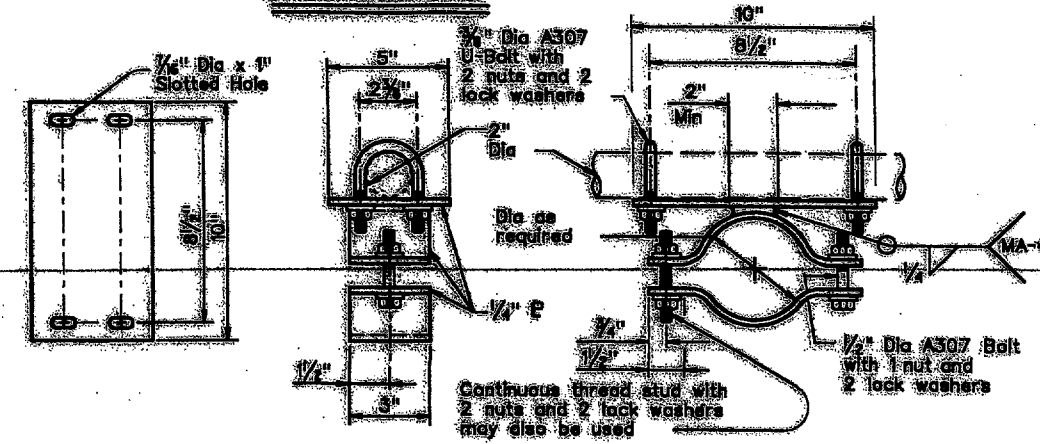
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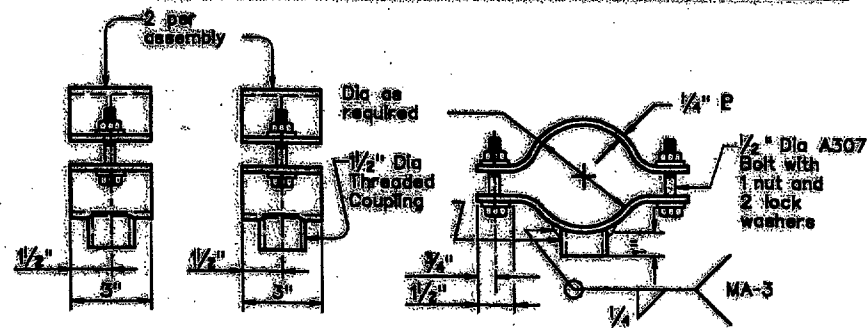
POLE CONNECTION TO BASE PLATE



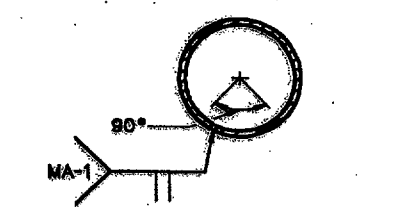
BASE PLATE



BRACKET ASSEMBLY DETAILS OPTION A

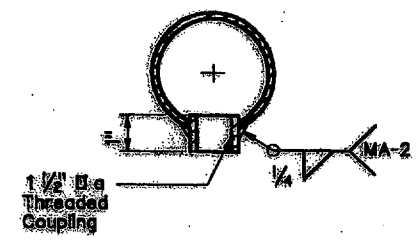


BRACKET ASSEMBLY DETAILS OPTION B

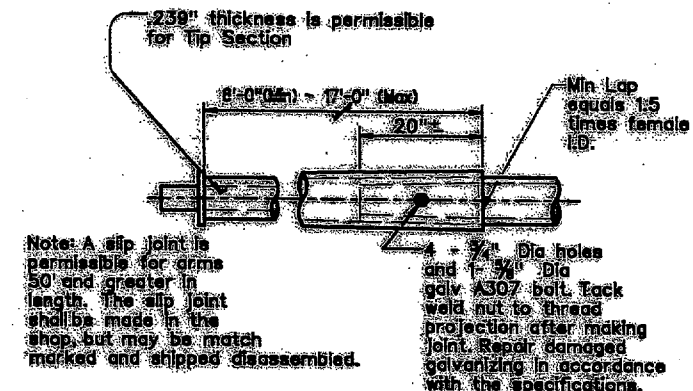


Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.

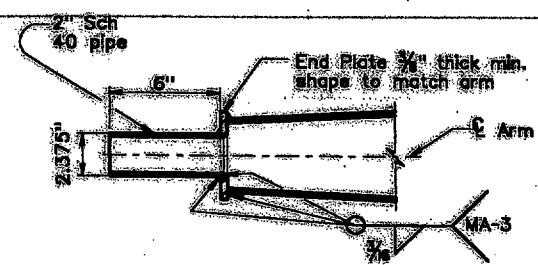
ARM WELD DETAIL



COUPLING DETAIL



SLIP JOINT DETAIL



TENON DETAIL

Stainless steel bands and cast bracket as in "Astro-Brac" with 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY OPTION C

Arm Length ft.	ROUND POLES					Foundation Type
	D ₀ In.	D ₂₀ In.	D ₂₄ In.	D ₃₀ In.	thk In.	
50-55'	21.0	18.3	17.6	16.8	.3125	4B-A
60-65'						

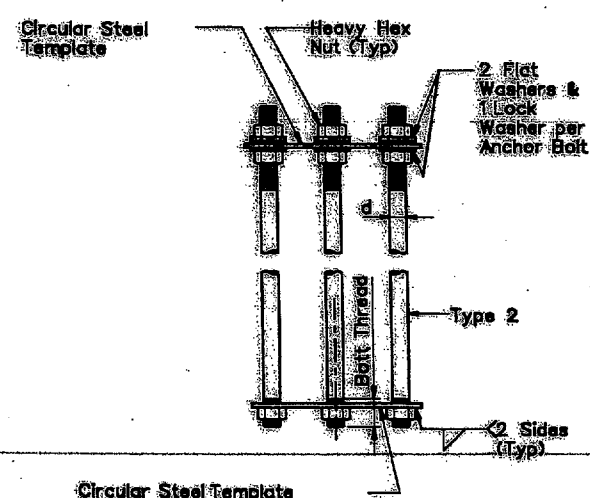
Arm Length ft.	ROUND ARMS				
	L ₁ ft.	D ₁ In.	D ₂ In.	thk In.	Rise (2") In.
50	49	18.5	11.7	.3125	3'- 8"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'- 11"
65	64	18.5	9.6	.3125	4'- 4"

D₀ = Pole Base O.D.
 D₂₀ = Pole Top O.D. with no Luminaire and no LSN
 D₂₄ = Pole Top O.D. with LSN 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

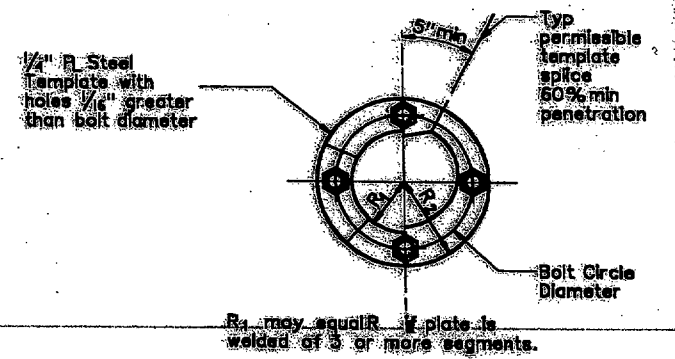
Thickness shown is minimum, thicker materials may be used.

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-R			ANCHOR BOLT DESIGN				FOUNDATION DESIGN LOAD		TYPICAL APPLICATION
		VERT BARS	SPIRAL & FITCH	TEXAS CONE PENETROMETER			ANCHOR BOLT DIA	F _y (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT	SHEAR	
				10	15	40							
4B-A	48"	20 #9	*4 at 8"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	Most arm assembly.

SEE SHEET "TS-FB" FOR ADDITIONAL DETAILS.



NUT ANCHOR (TYPE 2) ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

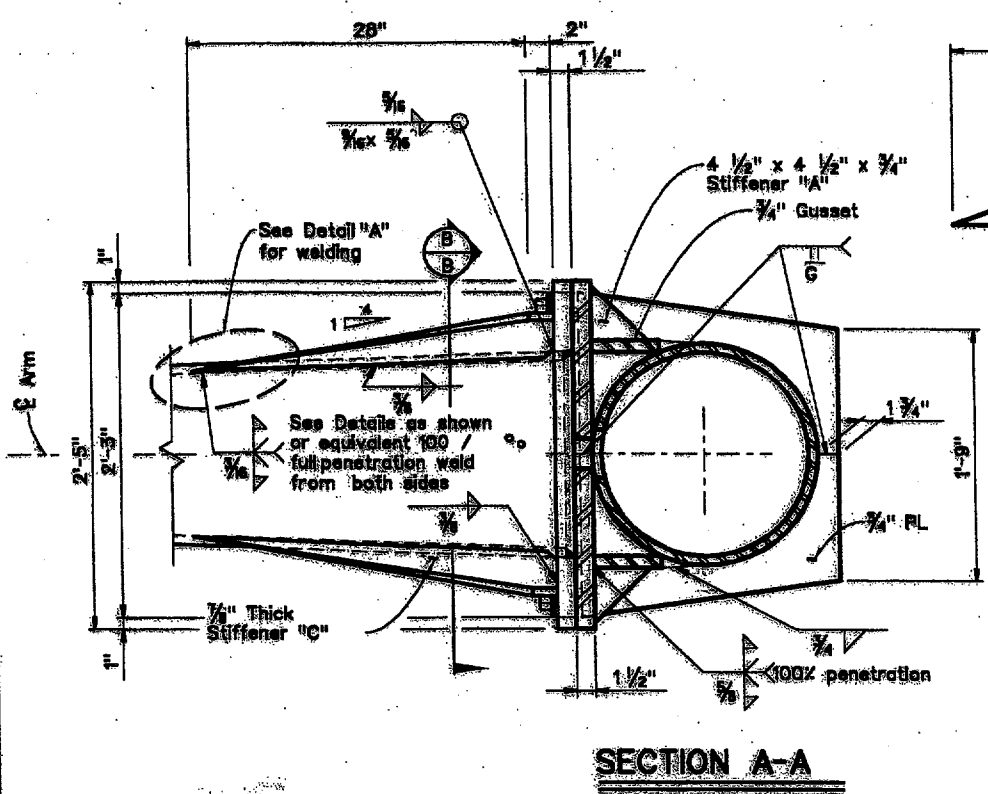
STANDARD PLANS
 Texas Department of Transportation
 Traffic Operations Division
TRAFFIC SIGNAL SUPPORT STRUCTURES LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA(2)-01
 Sheet 2 of 4

DATE	BY	CHKD	APP'D
4-20-01	DAL	DM	97 (87)
SCALE	DATE	BY	CHKD
DALLEAS	091845	344	ES

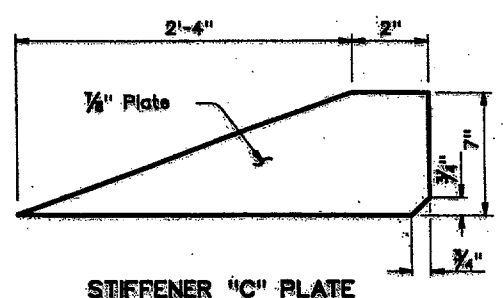
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MATERIALS	
Round Shafts or Polygonal Shafts	ASTM A595 GR A, ASTM A570 GR 50, ASTM A807 GR 50, ASTM A572 GR 50 or A38M50
Plates	ASTM A36 OR A572 GR 50 or A595 ⁽¹⁾ or A36M50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe	ASTM A53 GR A or B, or A501
Misc. Hardware	Galvanized steel or stainless steel or as noted

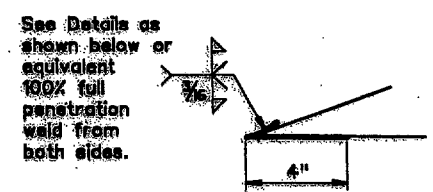
⁽¹⁾ Any of the materials listed for plates may be used where the drawings do not specify a particular Grade designation.
⁽²⁾ If A595 materials are used, it need not be cold worked to A595 requirements, but material must have 40 ksi minimum yield prior to fabrication.



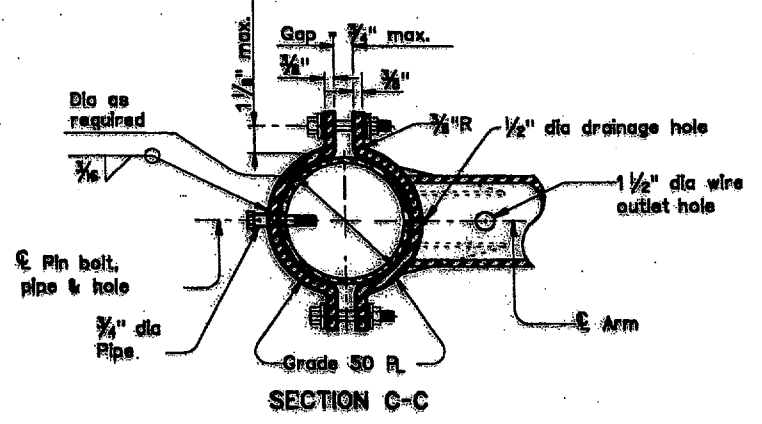
SECTION A-A



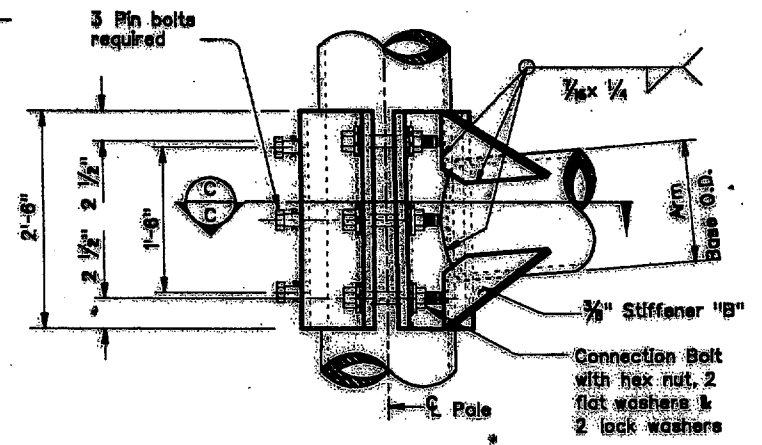
STIFFENER "C" PLATE



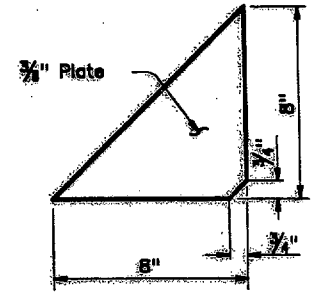
DETAIL "A"



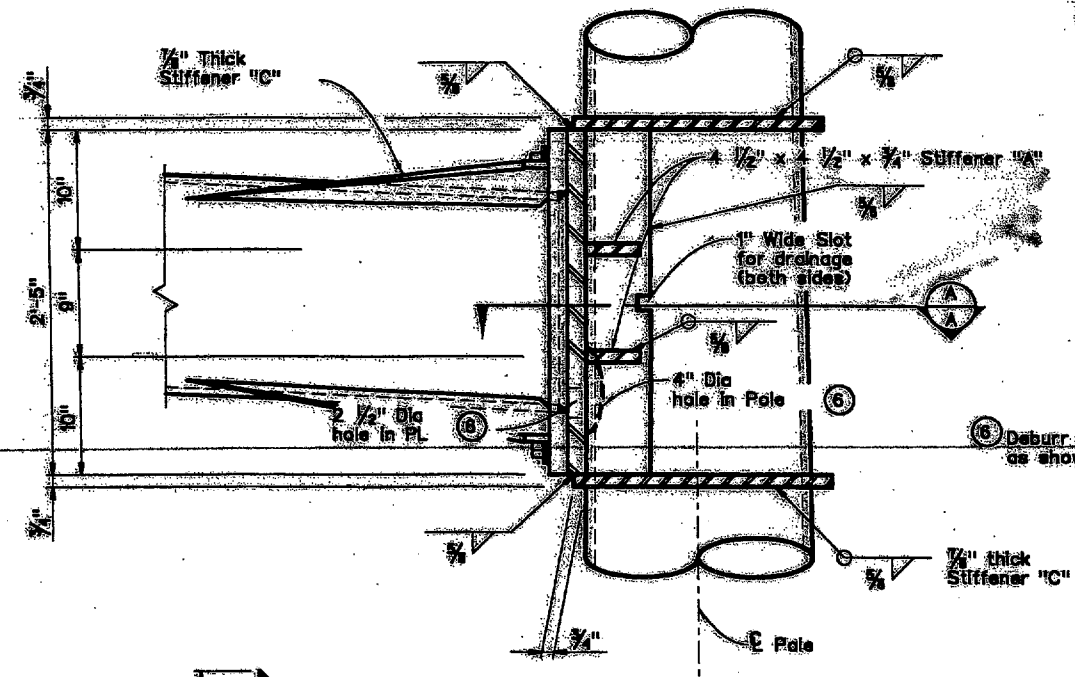
SECTION C-C



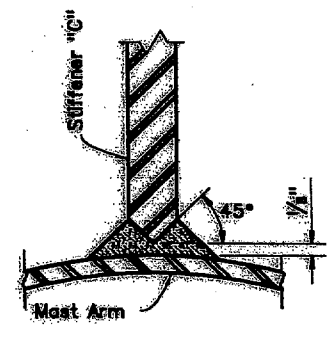
ELEVATION



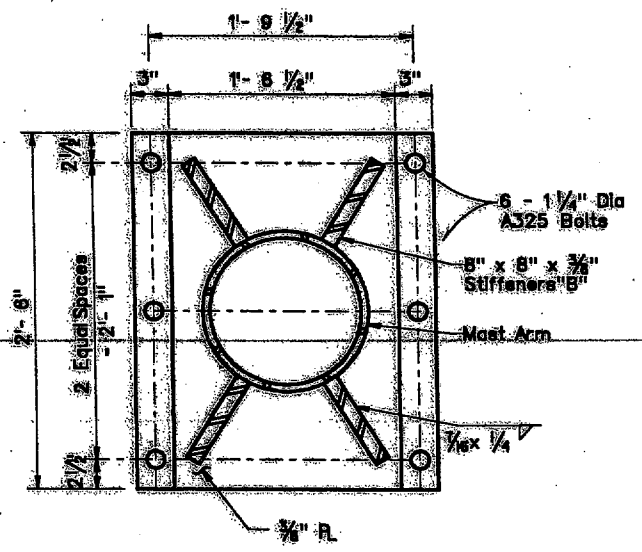
STIFFENER "B" PLATE



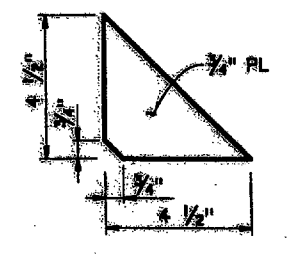
ELEVATION



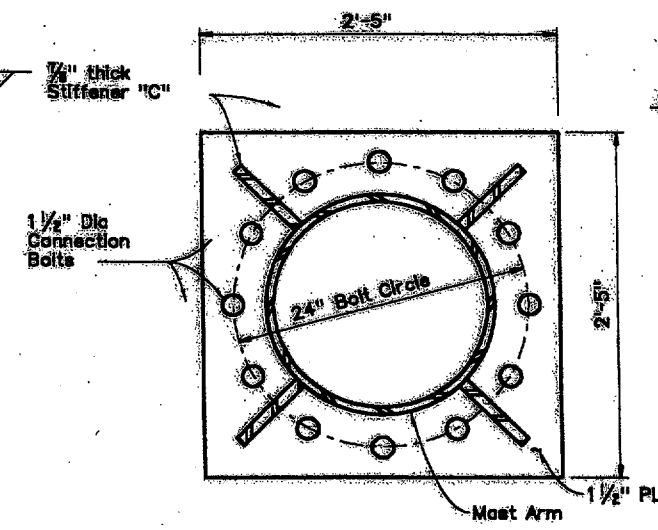
MAST ARM



MAST ARM AND ILSN ARM TO POLE CLAMP-ON DETAIL



STIFFENER "A" PLATE



SECTION B-B

GENERAL NOTES:

- Clamp-on details are used for the second arm on dual mast arm assemblies. A maximum 1 1/2 inch wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1".
- Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast assemblies.
- Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.
- Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

STANDARD PLANS
 Texas Department of Transportation
 Traffic Operations Division
TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY
 (50 TO 65 FT)
 (80 AND 100 MPH WIND ZONE)
 LMA(3)-01
 Sheet 3 of 4
 12001 July 2000
 4-20-01
 DALLAS 091845344

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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				
Single Mast Arm							
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity	
50	50L		50S		50		
55	55L	4	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	
55	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
60	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
	20	6020L		6020S		6020	
65	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
65	44	6044L		6044S		6044	
	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
65	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)
MIDWAY AT SPRING VALLEY	10	3	66 (20.1M)
MIDWAY AT KELLER SPRINGS	10	3	66 (20.1M)
MIDWAY AT SOJOURN	10	2	44 (13.4M)
Total Drill Shaft Length			176 (53.6M)

Notes

- * Supply Option "A" unless otherwise noted
- ** 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.)

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) *		Luminaire Arms (1 per 30' pole)			
	3 Bracket Assembly * and 4 CGB Connectors		Nominal Arm Length		Quantity	
ft.	Designation	Quantity	8' Arm		7	
50	50IV		ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers			
55	55IV	4	Nominal Arm Length		Quantity	
60	60IV	3	7' Arm			
65	65IV		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)	Type II Arm (2 Signals) *	Type III Arm (3 Signals) *			
	2 CGB connector and 1 clamp w/bolts and washers	1 Bracket Assembly * and 3 CGB connectors, and 1 clamp w/bolts and washers	2 Bracket Assembly * and 4 CGB connectors, and 1 clamp w/bolts and washers			
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
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 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 * and 3 CGB connectors, and 1 clamp w/bolts and washers	2 Bracket Assembly * and 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			
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)						
Anchor Bolt Diameter	Anchor Bolt Length	Quantity	Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, 4 lock washers and 4 nut anchor devices (type 2) per Standard Drawing "IS-FD". Templates may be removed for shipment.			
2 1/2"	5' - 3"	7				

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

LONG MAST
ARM ASSEMBLY
PARTS LIST

Sheet 4 of 4 LMA (4) -

© TxDOT November 2000 | REV - JK | CUI - GRB | DR - FDN | CUI - CAL

REVISIONS: 4-20-01 | STATE DISTRICT: DAL | FEDERAL AID PROJECT: 6 | SHEET: 1167

COUNTY: DALLAS | CONTROL: 0915145 | SECTION: 344 | JOB: CS

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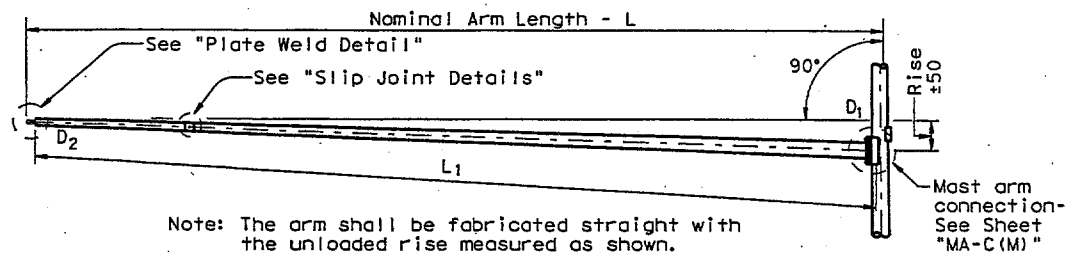
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 ACC: d48npl01/usr/d482517
 LV=1,2 for English 1,3 for Metric

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	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
6,100	267	198	180	160	4.55	292	216	196	173	4.55	750-A
7,300	279	211	193	173	4.55	305	229	208	185	4.55	750-A
8,500	292	224	206	185	4.55	318	241	221	198	4.55	750-A
9,800	318	249	231	211	4.55	305	229	208	185	6.07	750-A
11,000	305	236	218	198	6.07	318	241	221	198	6.07	900-A
12,200	305	236	218	198	6.07	343	267	246	224	6.07	900-A
13,400	318	249	231	211	6.07	356	279	259	236	6.07	900-A
14,600	330	262	244	224	6.07	381	305	285	262	6.07	900-A

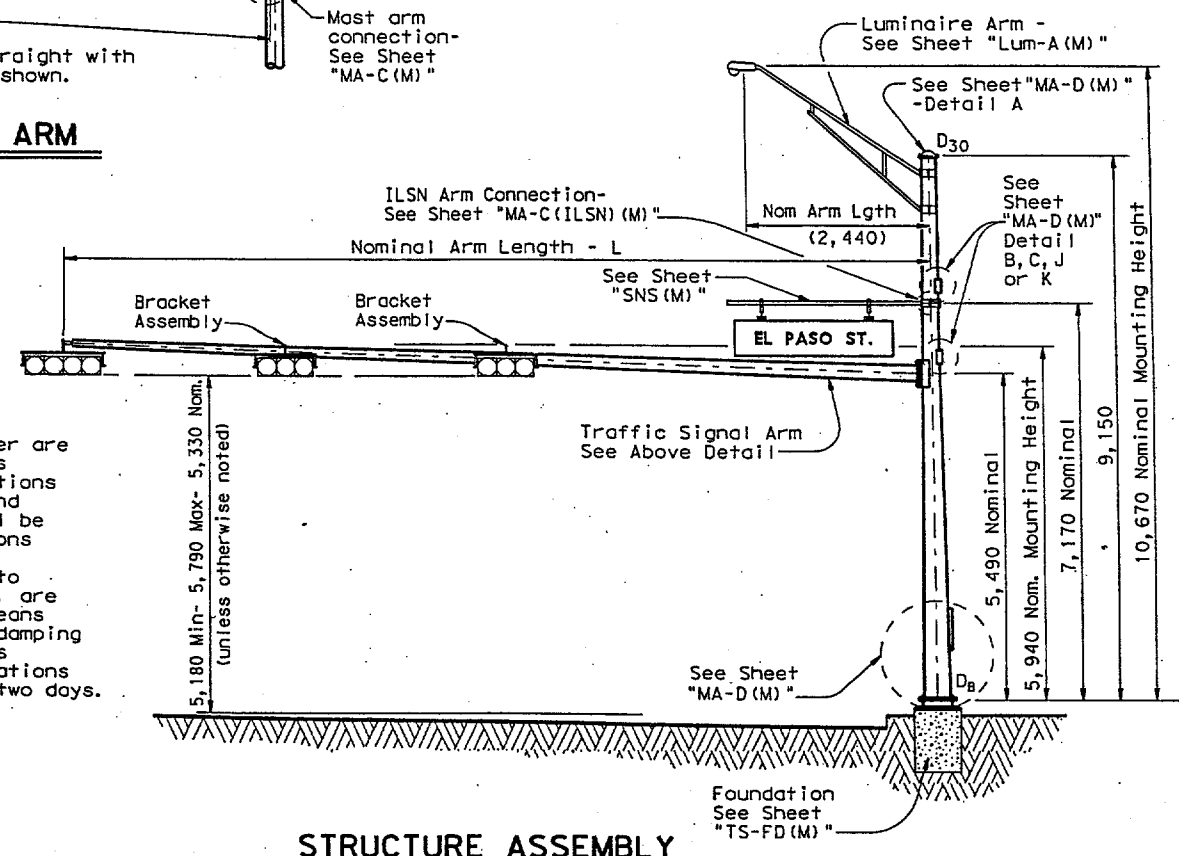
Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6,100	5,822	165	97	4.55	533	5,822	180	89	4.55	508
7,300	7,041	190	109	4.55	559	7,041	190	89	4.55	533
8,500	8,260	205	107	4.55	584	8,260	205	89	4.55	559
9,800	9,449	230	119	4.55	635	9,449	230	89	4.55	610
11,000	10,668	245	117	4.55	711	10,668	255	89	4.55	635
12,200	11,887	245	104	6.07	813	11,887	245	89	6.07	686
13,400	13,106	255	104	6.07	889	13,106	255	89	6.07	762
14,600	14,326	270	104	6.07	1,016	14,326	280	89	6.07	838

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
 L₂ = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.
 ② D₂ may be increased by up to 25 mm for polygonal arms.



TRAFFIC SIGNAL ARM
(Fixed Mount)



STRUCTURE ASSEMBLY

VIBRATION WARNING
 Mast Arms of approximately 12,200 mm or longer are subject to possible harmonic vertical vibrations in light wind conditions due to unusual combinations of signal numbers, weights or positions, arm-wind orientation, and arm-pole stiffness. Arms shall be visually inspected in 8 to 32 kmph wind conditions after signal head installation and, if vertical movements with a total excursion (max positive to max negative) of more than approximately 200 mm are observed at arm tip, damping devices or other means shall be fitted to the arm(s). The necessary damping device(s) or other remedial measures shall be as recommended by the fabricator. Excessive vibrations shall not be allowed to continue for more than two days.

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	9,150 mm Poles With Luminaire		7,320 mm Poles With ILSN		5,800 mm Poles With No Luminaire and No ILSN	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
6,100	6,100L-130		6,100 S-130		6,100-130	
7,300	7,300L-130		7,300 S-130		7,300-130	
8,500	8,500L-130		8,500 S-130		8,500-130	
9,800	9,800L-130		9,800 S-130		9,800-130	
11,000	11,000L-130		11,000 S-130		11,000-130	
12,200	12,200L-130		12,200 S-130		12,200-130	
13,400	13,400L-130	3	13,400 S-130		13,400-130	
14,600	14,600L-130		14,600 S-130		14,600-130	

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type II Arm (2 Signals)		Type III Arm (3 Signals)		Type IV Arm (4 Signals)	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
6,100	6,100II-130					
7,300	7,300II-130		7,300III-130			
8,500	8,500II-130		8,500III-130			
9,800			9,800III-130		9,800IV-130	
11,000			11,000III-130		11,000IV-130	
12,200			12,200III-130		12,200IV-130	
13,400			13,400III-130	3	13,400IV-130	
14,600					14,600IV-130	

Luminaire Arms (1 per 9,150 mm pole)

Nominal Arm Length	Quantity
2,440 mm Arm	3

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

Nominal Arm Length	Quantity
2,140 mm Arm	
2,750 mm Arm	

Anchor Bolt Assemblies (1 per pole)

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

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

Templates may be removed for shipment.

- MODIFICATIONS**
- (A) REMOVED BRACKET ASSEMBLY OPTIONS A AND B
 - (B) REMOVED CGB CONNECTORS
 - (C) REMOVED TENON DETAIL
 - (D) REQUIRE MEASUREMENT OF POLE HEIGHT
 - (E) MIN. AND MAX. SIGNAL HEAD HEIGHT DISTANCE

11/99 Revision
 Changed to Facilitate new terminal strip enclosure

Note: All dimensions are in millimeters (mm) except as noted.

Texas Department of Transportation
 Traffic Operations Division

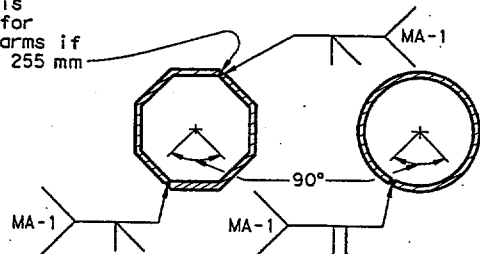
TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
 (130 KMPH WIND ZONE)
SMA-130(1)-99(M)(DAL)

FILE: SMA-80.DGN DWF: MS CK: JSY DW: MMF CK: JSY
 © TxDOT August 1995 DIST: FED REG FEDERAL AID PROJECT SHE:
 REVISIONS DAL 6 CM 97087 17
 5-96 COUNTY CONTROL SECT JOB HIGH
 11-99 DALLAS 091845 C

Stainless steel bands and cast bracket as in "Astro-Brac" with 1 1/2" Dia Threaded Coupling.

**BRACKET ASSEMBLY
OPTION C**

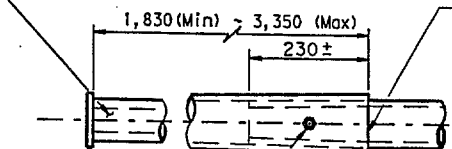
Second longitudinal Seam Weld is permitted for polygonal arms if D₁ exceeds 255 mm



Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.

ARM WELD DETAIL

4.55 mm thickness is permissible for Tip Section



Note: A slip joint is permissible for arms 12,200 mm and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

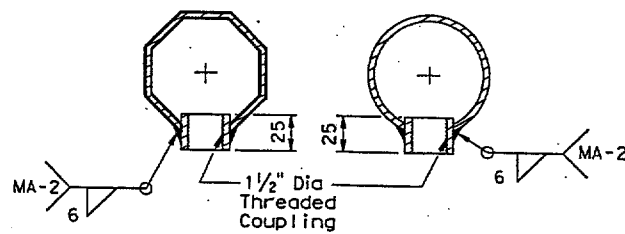
Min. lap equals 1.5 times female I.D.

4 - 3/4" Dia holes and 1 - 5/8" Dia galv A307 bolt. Tack weld after making joint. Repair damaged galvanizing in accordance with the specifications.

SLIP JOINT DETAIL

NOTE:

Pole manufacturer shall drill 1/2" hole in bottom of mast arm at end plate. (for hot-dip galvanizing)



COUPLING DETAILS

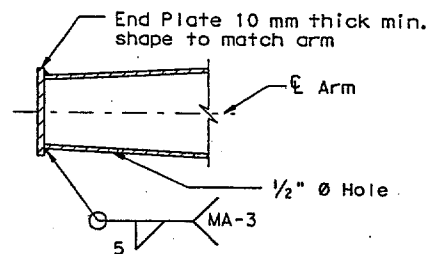


PLATE WELD DETAIL

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 130 kmph plus a 1.3 gust factor.

Poles are designed to support one 2,440mm luminaire arm, one 2,750mm 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 335 N vertical dead load plus the horizontal wind load on an effective projected area of 0.14 sq meter. The specified internally lighted street name sign load applied 1,400mm from the centerline of the pole equals 378 N vertical dead load plus horizontal wind load on an effective projected area of 1.07 sq meter. The specified signal load applied at the end of the traffic signal arm equals 800 N vertical dead load plus the horizontal wind load on an effective projected area of 3.0 sq meter (actual area times drag coefficient).

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

Fabrication shall be in accordance with the Specifications 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. Miscellaneous welds which do not call for preapproved weld procedures are nevertheless subject to rejection for poor workmanship. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and the Specifications.

Unless otherwise noted, all parts shall be galvanized in accordance with the Specifications.

Special design require submission of shop drawings in accordance with the item "Steel Structures".

△ The pole heights are for bidding purposes only. Prior to fabrication, the Contractor in cooperation with the Engineer shall make field measurements to determine the actual pole height necessary to ensure a verticle clearance of 5,330mm min., 5,790mm max.

Texas Department of Transportation
Traffic Operations Division

**TRAFFIC SIGNAL
SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(130 KMPH WIND ZONE)
SMA-130(2)-96(M) (DA)**

FILE# SMA-80.DGN	DN# MS	CK# JSY	DR# MAF	CK# JSY
© TxDOT AUGUST 1995	DIST FED REG	FEDERAL AID PROJECT#	SHEET	
5-96	REVISIONS	DAL 6	CM 97 (87)	17
	COUNTY	DALLAS	CONTROL SECT	JOB HIGH
			091845344 C	

Note: All dimensions are in millimeters (mm) except as noted.

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LEVELS DISPLAYED
ACC: d48hplq:/usr/d482517
LV-1,2 for English 1,3 for Metric