

**CONSTRUCTION CONTRACT CHANGE ORDER NUMBER:** 1

1. CONTRACTOR: The Levy Company, Inc.
2. Change Order Work Limits: Sta. Carmen Avila to Sta. Mile 22 1/2 N
3. Type of Change (on federal-aid non-exempt projects): \_\_\_\_\_ (Major/Minor)
4. Describe the change and the reason for the change order. When necessary, include exceptions to this agreement.

This change order is for The Levy Company to add Flashing Beacon at Carmen Avila and Mile 22 1/2 N Intersection. With Mile 22 1/2 N opening up and an Elementary School on Carmen Avila, Flashing Beacons will improve the intersection.

**CCSJ:** NA

**Project:** Flashing Beacon

**Highway:** Carmen Avila

**County:** Hidalgo

**District:** NA

**Contract Number:** C-21-0686-10-19

5. New or revised plan sheet(s) are attached and numbered: \_\_\_\_\_

Each signatory hereby warrants that each has the authority to execute this Change Order.

<p>By signing this change order, the contractor agrees to waive any and all claims for additional compensation due to any and all other expenses; additional changes for time, overhead and profit; or loss of compensation as a result of this change. Further, the contractor agrees that this agreement is made in accordance with Item 4 and the Contract. Exceptions should be noted in the response for #5 above.</p>	<p><b>The following information must be provided</b></p> <p>Time Ext. #: _____ Days added on this C.O.: <u>15</u></p> <p>Amt. added by this change order: <u>\$72,522.77</u></p>
<p>THE CONTRACTOR _____ Date <u>7/18/22</u></p> <p>By <u>Jose Garcia</u></p> <p>Typed/Printed Name <u>Jose Garcia</u></p> <p>Typed/Printed Title <u>Project Manager</u></p>	<p><b>For TxDOT use only:</b></p> <p>Days participating: <u>NA</u></p> <p>Amount participating: <u>NA</u></p> <p>Signature _____ Date _____</p> <p>Name/Title _____</p>

**RECOMMENDED FOR EXECUTION:**

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

APPROVED  REQUEST APPROVAL

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

APPROVED  REQUEST APPROVAL

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

APPROVED  REQUEST APPROVAL

**Robert Macheska, P.E., CFM** 7/22/22  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_  
Name/Title \_\_\_\_\_ Date \_\_\_\_\_

APPROVED

Engineer's Seal:



# Change Order #1 Flashing Beacon Project

To: The Levy Company, Inc  
16294 IH 35 North  
Selma, TX 78154-1212

From Owner: Hidalgo County Precinct #4  
and: GDJ Engineering, LLC

Project: Flashing Beacons  
Contract: C-21-0686-10-19  
Limits: Carman Avila & Mile 22 ½ N

Change Order #1 is for an additional intersection to be added. 10<sup>th</sup> St and Chapin St Intersection along with the Rogers Road and Depot Road Intersection were on the original contract. This CO will add Carmen Avila and Mile 22 1/ 2 N Intersection to the original contract.

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIME:
Original Contract Price <u>\$140,952.50</u>	Original Contract Time <u>70 Calendar Days</u>
Previous Change Orders <u>\$0.00</u>	Previous Change Orders 0 Calendar Days

Contract Price prior to this Change Order <u>\$140,952.50</u>	Contract Time prior to this Change Order <u>70 Calendar Days</u>
Net <b>increase/decrease</b> of the Change Order <u>\$72,522.77</u>	Net <b>increase/decrease</b> of the Change Order <u>15 Calendar Days</u>
Contract Price with all approved Change Orders <u>\$213,475.27</u>	Contract Time with all approved Change Orders <u>85 Calendar Days</u>

# BID PROPOSAL



## The Levy Company, Inc.

16294 IH 35 North

Selma, TX 78154-1212

Contact: Harry Levy or Andy Ajas

Phone: 210-497-4500

Fax: 210-653-2835

Quote Date: July 1, 2022  
Quote To: GDJ Engineering  
Attn: Eddie Ramirez

Owner: Hidalgo County  
Project: Flashing Beacon Project  
Levy Job #: 2021-815  
Field Change: Flashing Beacon at Carmen Avila & Mile 22-1/2 N

We are pleased to submit to you our quotation for the work items indicated below:

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
100 6002	PREPARING ROW	1.00	STA	1,020.00	1,020.00
416 6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	30.40	LF	330.00	10,032.00
500 6001	MOBILIZATION	1.00	LS	7,252.27	7,252.27
502 6001	BARRICADES ,SIGNS AND TRAFFIC HANDLING	1.00	MO	5,100.00	5,100.00
618 6058	CONDT (PVC) (SCH 80) (4")	85.00	LF	46.00	3,910.00
620 6009	ELEC CONDR (NO.6) BARE	85.00	LF	2.90	246.50
620 6010	ELEC CONDR (NO.6) INSULATED	260.00	LF	2.90	754.00
621 6005	TRAY CABLE (4 CONDR) (12 AWG)	340.00	LF	3.70	1,258.00
624 6010	GROUND BOX TY D (162922)W/APRON	1.00	EA	1,500.00	1,500.00
625 6003	ZINC-COAT STL WIRE STRAND (3/8")	90.00	LF	6.50	585.00
628 6167	ELC SRV TY D 120/240 070(NS)AL(E)TP(O)	1.00	EA	6,400.00	6,400.00
677 6005	ELIM EXT PAV MRK & MRKS (12")	70.00	LF	33.00	2,310.00
677 6007	ELIM EXT PAV MRK & MRKS (24")	15.00	LF	65.00	975.00
680 6001	INSTALL HWY TRF SIG (FLASH BEACON)	1.00	EA	4,600.00	4,600.00
682 6005	VEH SIG SEC (12")LED(RED)	8.00	EA	290.00	2,320.00
684 6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	200.00	LF	3.30	660.00
686 6020	INS TRF SIG PL AM (S)STR(TY D)LUM	2.00	EA	10,600.00	21,200.00
6185 6002	TMA (STATIONARY)	10.00	DAY	240.00	2,400.00

**GRAND TOTAL**

**72,522.77**

**NOTES:**

We offer field change pricing to construct a span wire flashing beacon signal system at Carmen Avila & Mile 22-1/2 N in accordance with the plan sheets dated 6/9/2022. Additional bond cost for this added work is included in our pricing. Signal pole lead-time is approx 16 weeks after submittal approval and pole release. This proposal expires on 7/31/2022 as that is when the vendor quote for the signal poles expires.

We request 15 working days be added to the contract time to account for this added work. This does not include the time needed to procure the materials as we assume time will be suspended on the project to allow time to receive the materials.

Sincerely,

Andy Ajas, PE  
The Levy Company, Inc.

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 Legacy Engineering Group  
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TRAFFIC SIGNAL SUMMARY				
CARMEN AVILA RD AND MILE 22 1/2 N				
ITEM	CODE	DESCRIPTION	UNIT	TOTAL QUANTITY
100	6002	PREPARING ROW	STA	1
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	30.4
500	6001	MOBILIZATION	LS	1
502	6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1
618	6058	CONDT (PVC) (SCH 80) (4")	LF	85
620	6009	ELEC CONDR (NO.6) BARE	LF	85
620	6010	ELEC CONDR (NO.6) INSULATED	LF	260
621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	340
624	6010	GROUND BOX TY D (162922)W/APRON	EA	1
625	6003	ZINC-COAT STL WIRE STRAND (3/8")	LF	90
628	6167	ELC SRV TY D 120/240 070(NS)AL(E)TP(O)	EA	1
677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	70
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	15
680	6001	INSTALL HWY TRF SIG (FLASH BEACON)	EA	1
	**	FLASHING BEACON CONTROLLER ASSEMBLY	EA	1
	**	ROD, 5/8" X 10' COPPER GROUND	EA	1
682	6005	VEH SIG SEC (12")LED(RED)	EA	8
684	6010	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	200
686	6020	INS TRF SIG PL AM (S)STR(TY D)LUM	EA	2
6185	6002	TMA (STATIONARY)	DAY	10
** MATERIALS SUBSIDIARY TO PERTINENT ITEMS				



2805 Fountain Plaza Blvd, Ste. A Edinburg, TX Ph: (956)603-2025 / Firm No. 20061 / Planning & Dvlpmt/Transportation/Environmental/Drainage/Construction/Structural/Geotech



Legacy Engineering Group, PLLC  
 7800 W Interstate 10, Ste. 830, San Antonio, Texas 78230, 210.660.1960  
 TBPE Firm Registration No. 20623

FLASHING BEACON PROJECT  
 SUMMARY OF QUANTITIES  
 CARMEN AVILA RD AND  
 MILE 22 1/2 N

SHEET 1 OF 1

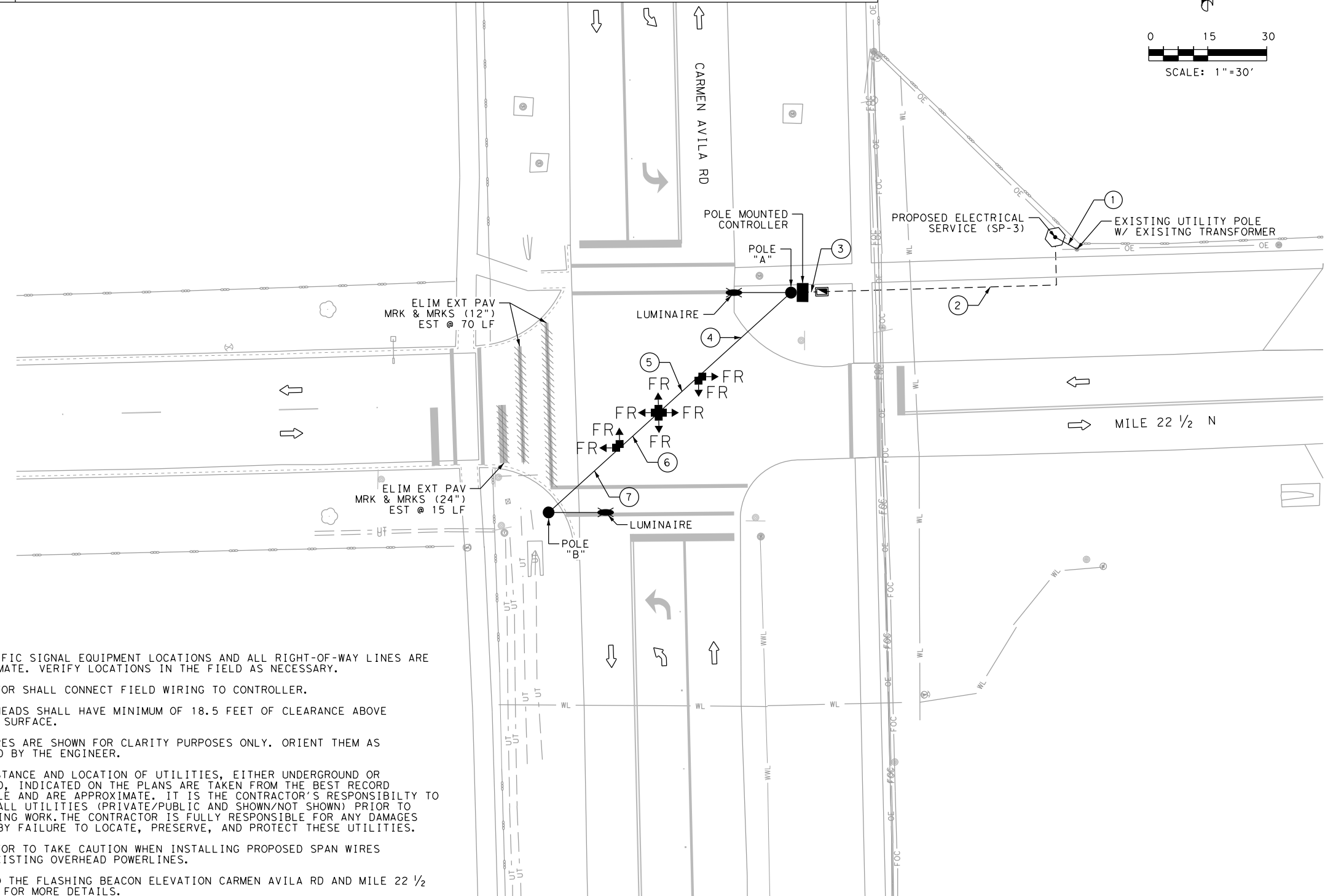
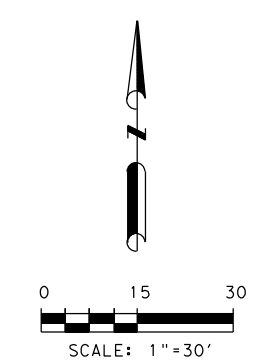
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6	-		1
STATE	DIST.	COUNTY	
TEXAS	PHR	HIDALGO	
CONT.	SECT.	JOB	ROADWAY
-	-	-	VARIES

CONDUCTOR SCHEDULE										
ITEM	TOTAL QTY	RUN NUMBER	RUN LENGTH (FT)							POLE "A"
			1	2	3	4	5	6	7	
			10	75	10	35	15	15	25	35
			S	T	T	S	S	S	S	-
POWER	130	120 POWER HOT	1	1	1					1
	130	120 POWER COMMON	1	1	1					1
GROUND	85	#6 BARE		1	1					
SIGNAL CABLE	200	5/C #12				2	2	2		2
LUMINAIRE	330	4/C #12 (TRAY CABLE)		2	2	1	1	1	1	2
CONDUIT	85	4" SCH 80		1	1					

POLE DESCRIPTION	
POLE ID	DESCRIPTION
POLE "A"	34' STEEL STRAIN POLE ON A 36-B FOUNDATION AT 15.2 LF WITH ONE (1) LUMINAIRE AND ONE (1) FLASHER CONTROLLER.
POLE "B"	34' STEEL STRAIN POLE ON A 36-B FOUNDATION AT 15.2 LF WITH ONE (1) LUMINAIRE.

**LEGEND**

- PROPOSED SIGNAL POLE
- ◀ PROPOSED SIGNAL HEAD
- PROPOSED LUMINAIRE
- PROPOSED CONTROLLER
- PROPOSED CONDUIT (SCH 80) (TRENCHED)
- PROPOSED SPAN WIRE
- ⬡ PROPOSED ELECTRICAL SERVICE
- FR FLASHING RED
- //// ELIM EXT PAV MRK & MRKS
- ← TRAFFIC FLOW ARROW
- ⊙(XX) RUN NUMBER



- NOTES:**
- ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND ALL RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
  - CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
  - SIGNAL HEADS SHALL HAVE MINIMUM OF 18.5 FEET OF CLEARANCE ABOVE ROADWAY SURFACE.
  - LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
  - THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORD AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY FAILURE TO LOCATE, PRESERVE, AND PROTECT THESE UTILITIES.
  - CONTRACTOR TO TAKE CAUTION WHEN INSTALLING PROPOSED SPAN WIRES BELOW EXISTING OVERHEAD POWERLINES.
  - REFER TO THE FLASHING BEACON ELEVATION CARMEN AVILA RD AND MILE 22 1/2 N SHEET FOR MORE DETAILS.

ELECTRICAL SERVICE DATA									
SERVICE TYPE	EXISTING ELECTRICAL SERVICE DESCRIPTION (SEE ED (6) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	MAIN DISCONNECT	TWO-POLE CONTACTOR AMPS	PANELBD./LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT POLE/AMP	KVA LOAD
SP-3	ELEC SERV TY D(120/240)070(NS)AL(E)TP(O)	1-1/4"	3/#6	2P/60	N/A	100	FLASHING BEACON LUMINAIRE	1P/50 2P/20	<7.1



**GDJ Engineering**  
 2805 Fountain Plaza Blvd. Ste. A Edinburg, TX Ph: (956)603-2025 / Firm No. 20061 / Planning & Design/Transportation/Environmental/Drainage/Construction/Structural/Geotech

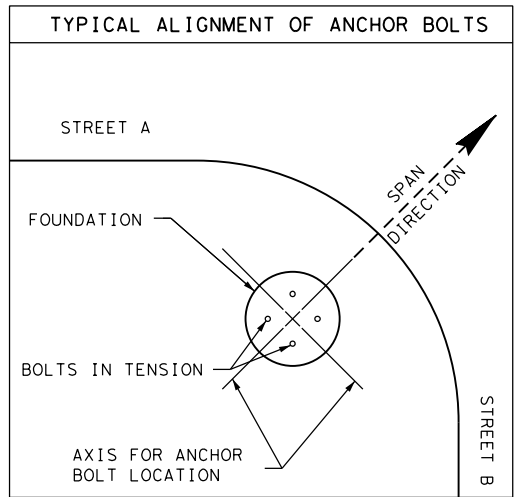
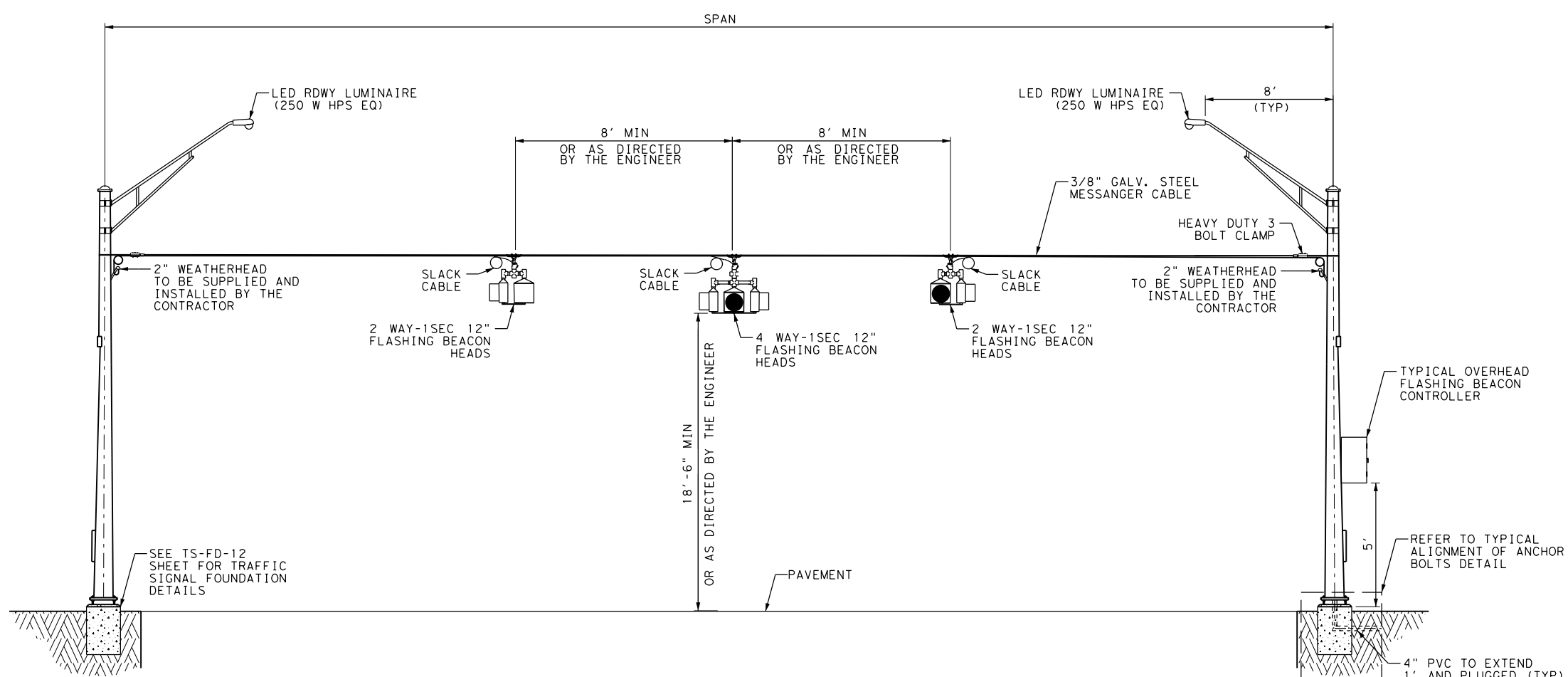
**LEGACY ENGINEERING GROUP**  
 Legacy Engineering Group, PLLC  
 7800 W Interstate 10, Ste. 830, San Antonio, Texas 78230, 210.660.1960  
 TBPE Firm Registration No. 20623

**FLASHING BEACON PROJECT**  
**FLASHING BEACON LAYOUT**  
**CARMEN AVILA RD AND**  
**MILE 22 1/2 N**  
 SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.		SHEET
6	-		2
STATE	DIST.	COUNTY	
TEXAS	PHR	HIDALGO	
CONT.	SECT.	JOB	ROADWAY
-	-	-	VARIES

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**TYPICAL 2-POLE FLASHING BEACON INSTALLATION**  
 N. T. S.

STATE OF TEXAS  
  
 OSCAR MICHAEL GARZA  
 108602  
 LICENSED PROFESSIONAL ENGINEER  
  
 6/9/2022

- NOTES:**
1. THE CONTRACTOR SHALL FURNISH NEW 12" LED TRAFFIC SIGNALS FOR ALL FLASHING BEACON HEADS.
  2. 3/8" MESSENGER CABLE SHALL BE USED FOR SPAN.
  3. ALL LOOSE ENDS OF MESSENGER CABLE SHALL BE SERVED WITH SERVISLEEVE.
  4. SIGNAL CABLE SHALL BE ATTACHED TO MESSENGER CABLE (SPAN) CABLE WITH LASHING WIRE USING THE CABLE SPINNING METHOD WITH ONE TURN PER FOOT.
  5. DETERMINE THE MOUNTING HEIGHT OF THE SIGNAL SPAN AND THE PLACEMENT OF THE WEATHER HEADS.
  6. ALL SLACK CABLE COILS SHALL BE A MINIMUM OF 6" IN DIAMETER AND SHALL HAVE A MINIMUM OF TWO TURNS.
  7. BEACONS SHALL BE FLASHED AT A RATE OF NOT LESS THAN 50 OR MORE THAN 60 TIMES PER MINUTE. THE ILLUMINATED PERIOD OF EACH FLASH SHALL BE A MINIMUM OF 1/2 AND MAXIMUM OF 3/4 OF THE TOTAL CYCLE. ALL FLASHING BEACONS SHALL FLASH SIMULTANEOUSLY FOR EACH APPROACH.
  8. SIGNAL CABLE SHALL BE #12 AWG AND SERVICE CABLE SHALL BE #6 AWG.
  9. LOCATION OF SIGNAL HEADS ARE APPROXIMATE. ANY CHANGES WILL BE APPROVED BY THE ENGINEER.

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**FLASHING BEACON PROJECT**  
**FLASHING BEACON ELEVATION**  
**CARMEN AVILA RD AND**  
**MILE 22 1/2 N**  
 SHEET 1 OF 1

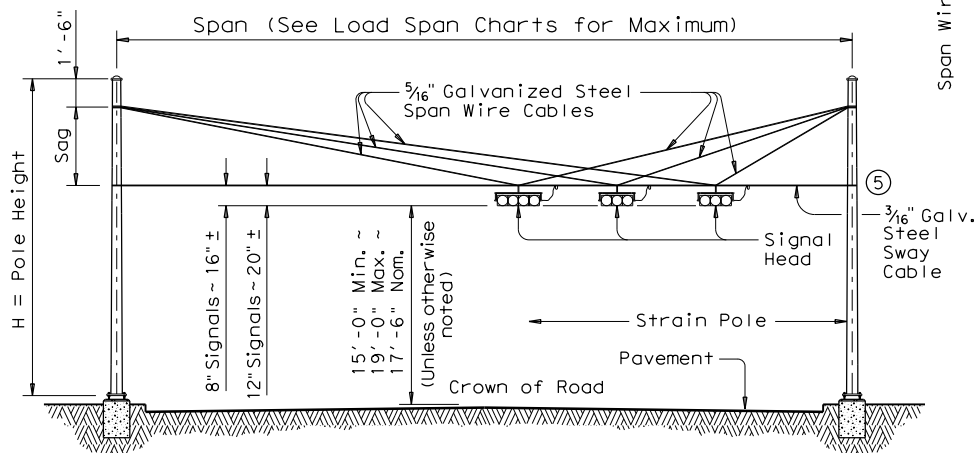
FED. RD. DIV. NO.	PROJECT NO.		SHEET
6	-		3
STATE	DIST.	COUNTY	
TEXAS	PHR	HIDALGO	
CONT.	SECT.	JOB	ROADWAY
-	-	-	VARIES

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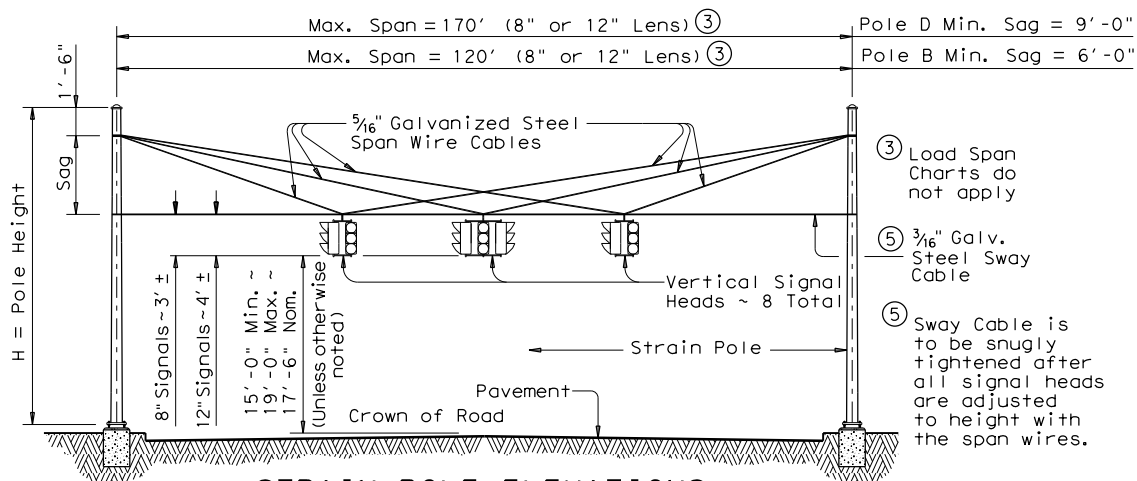
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STRAIN POLE DESCRIPTION	Pole Type	Founda-tion Type	Maximum Permissible Span Wire Load (lbs.)
26' Pole	A	36-A	5200
30' Pole	B	36-A	4600
30' Pole with Lum.	B	36-A	4400
30' Pole with 20' Mast Arm	C	36-B	5600
30' Pole with 24' Mast Arm	C	36-B	5500
30' Pole with 28' Mast Arm	C	36-B	5300
30' Pole with 32' Mast Arm	C	36-B	5100
30' Pole with 36' Mast Arm	C	36-B	4900
30' Pole with 20' Mast Arm & Lum.	C	36-B	5300
30' Pole with 24' Mast Arm & Lum.	C	36-B	5200
30' Pole with 28' Mast Arm & Lum.	C	36-B	5000
30' Pole with 32' Mast Arm & Lum.	C	36-B	4800
30' Pole with 36' Mast Arm & Lum.	C	36-B	4500
34' Pole	D	36-B	5600
34' Pole with Lum.	D	36-B	5400

② Numbers on Load Span Charts indicate the number of signal heads on the span. The total span wire design load is based on one 5-section head and one or more additional 3-section head(s). Design wind pressures on cables are assumed as 1.0 lb/ft. Weight of span wire cables (one per signal head) is assumed as 0.65 lb/ft which includes an allowance for conductor cables and miscellaneous hardware. The effect of the sway cable on load distribution is ignored as it is assumed to break at design wind conditions. When a pole supports 2 spans, the span wire design loads for both spans should be added vectorially to determine the design load for that pole.

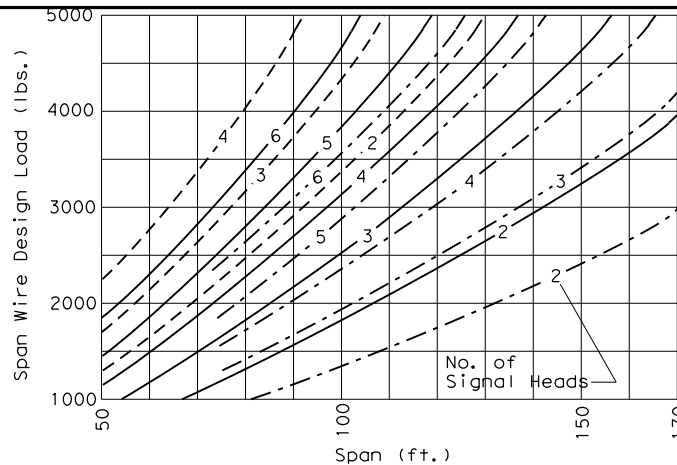


**STRAIN POLE ELEVATIONS HORIZONTAL SIGNALS**

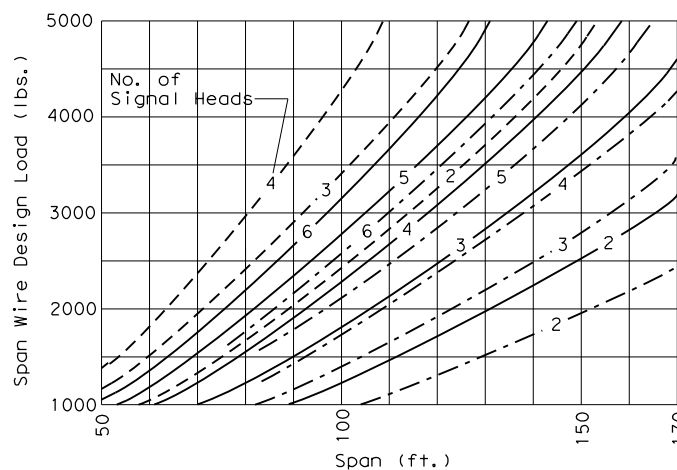


**STRAIN POLE ELEVATIONS VERTICAL SIGNALS**

(Mast arms are not used with vertical signals)



② **SIGNALS WITH 12-INCH LENS**



② **SIGNALS WITH 8-INCH LENS**

Signal Head Type	Wt. Per Head	Wind Area
5-Section, 12" Lens	125 lbs	9.6 sq. ft.
5-Section, 8" Lens	70 lbs	4.8 sq. ft.
3-Section, 12" Lens	75 lbs	5.64 sq. ft.
3-Section, 8" Lens	45 lbs	3.0 sq. ft.

◆ Effective projected design wind area (actual area times drag coefficient)

- Sag = 4'-6" (26' or 30' Pole)
- Sag = 8'-0" (30' or 34' Pole)
- Sag = 11'-6" (34' Pole)

Pole Type	ROUND POLES				POLYGONAL POLES			
	D <sub>B</sub>	D <sub>T</sub>	(4)thk	H	D <sub>B</sub>	D <sub>T</sub>	(4)thk	H
A	12.5	8.9	.239	26	13.0	9.0	.239	26
B	13.5	9.3	.239	30	14.0	9.0	.239	30
C	15.5	11.3	.239	30	16.0	11.0	.239	30
D	15.5	10.7	.239	34	16.0	11.0	.239	34

D<sub>B</sub> = Pole Base O.D. D<sub>T</sub> = Pole Top O.D. H = Pole Height

④ Thickness shown are minimum, thicker materials may be used.

**SHIPPING PARTS LIST**

Poles (Without Traffic Signal Arm)						
Pole Type	Strain poles with Luminaire			Strain poles without Luminaire		
	Description	Designation	Quantity	Description	Designation	Quantity
A				26' Strain Pole	SP 26 A-80	
B	30' Strain Pole	SPL 30 B-80		30' Strain Pole	SP 30 B-80	
D	34' Strain Pole	SPL 34 D-80	2	34' Strain Pole	SP 34 D-80	

Poles (With Traffic Signal Arm)						
Pole Type	Strain poles with Luminaire			Strain poles without Luminaire		
	Description	Designation	Quantity	Description	Designation	Quantity
C	30' SPw/TS Arm	SPL 30 C-80		30' SPw/TS Arm	SP 30 C-80	

Traffic Signal Arms (For Type C poles)						
Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	ft.	Designation	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24 II -80			
28	28I-80		28 II -80			
32			32 II -80		32 III -80	
36			36 II -80		36 III -80	

**Anchor Bolt Assemblies (1 per pole)**

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

**Luminaire Arms**

Nominal Arm Length	Quantity
8' Arm	2

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

① See Sheet "DMA-80"

CARMEN AVILA RD AND MILE 22 1/2 N

SHEET 1 OF 2



Texas Department of Transportation  
 Traffic Operations Division  
**TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES**  
 (80 MPH WIND ZONE)  
**SP-80(1)-12**

REVISIONS		DN: MS	CK: JSY	DW: BR	CK: JSY
6-96	1-12	CONT	SECT	JOB	HIGHWAY
		-	-	-	VARIES
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO		4

120A

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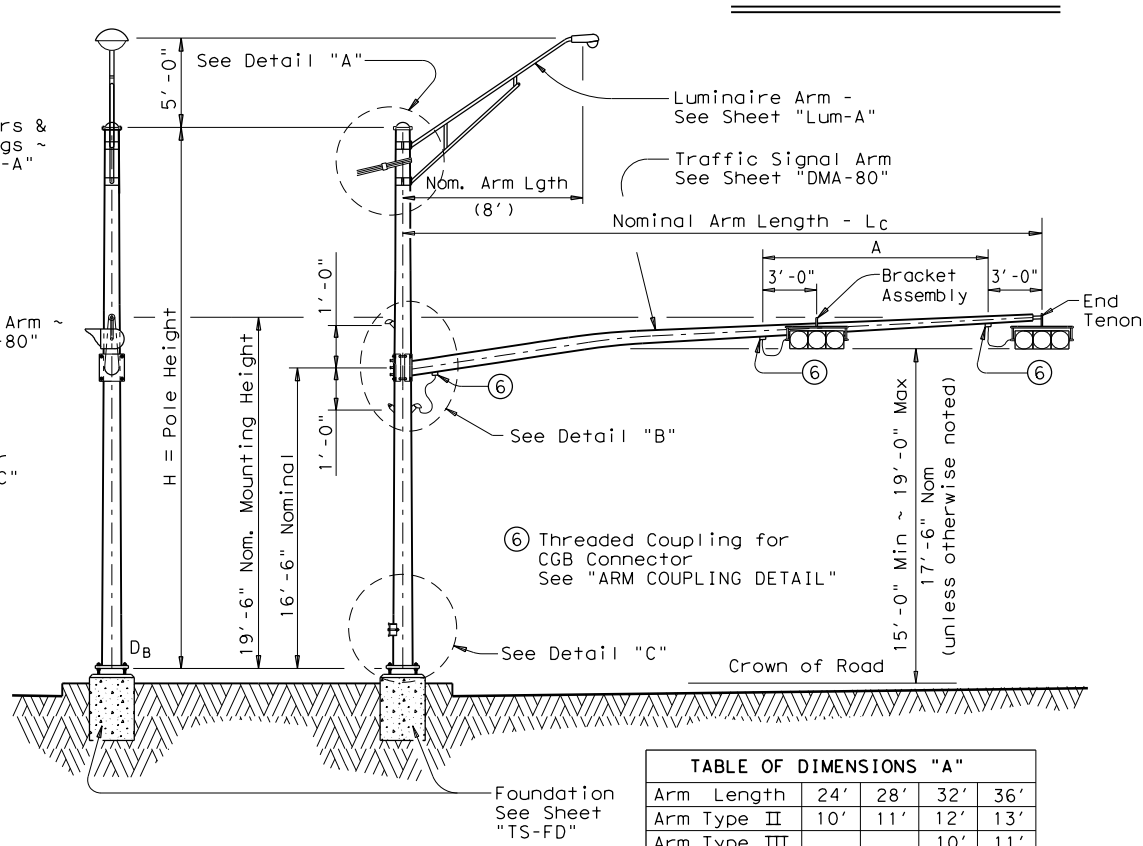
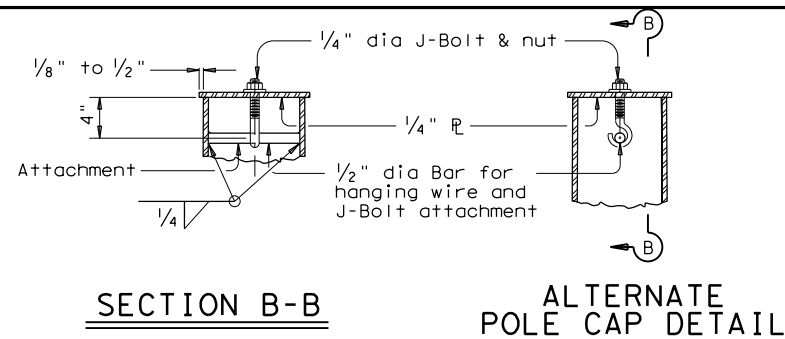
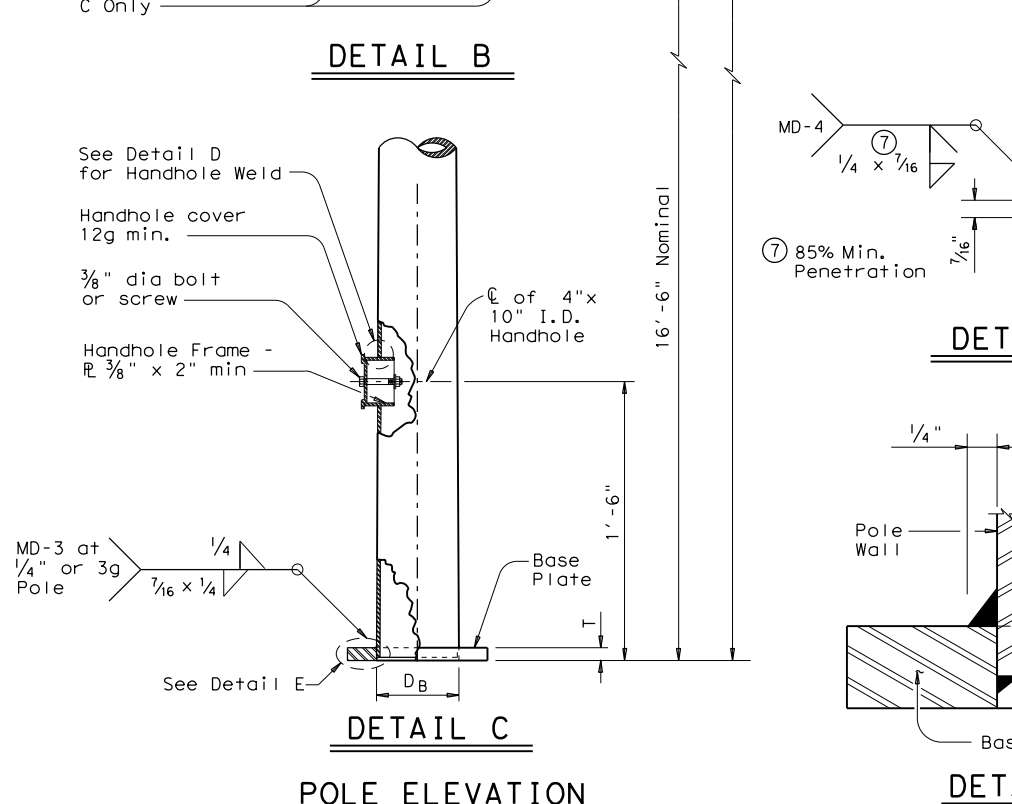
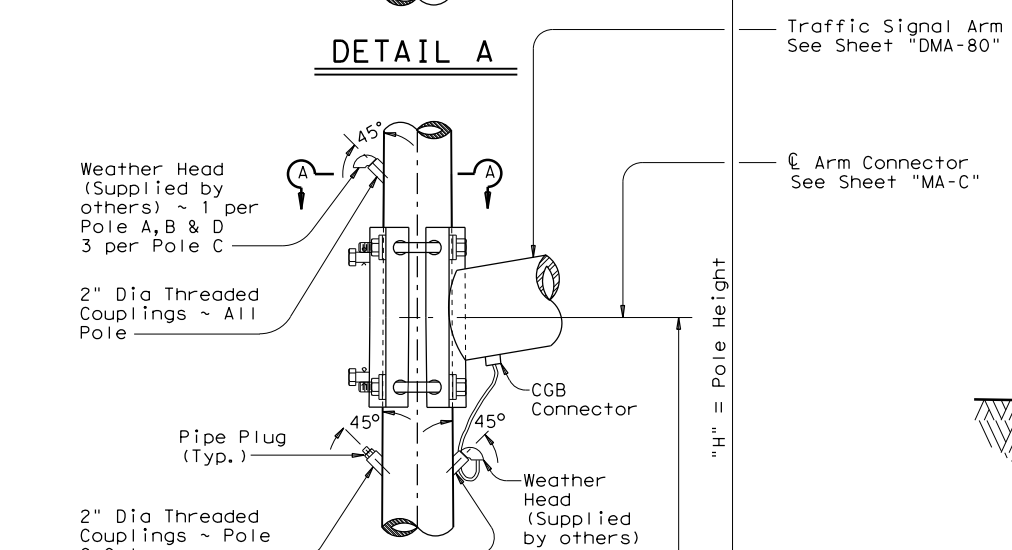
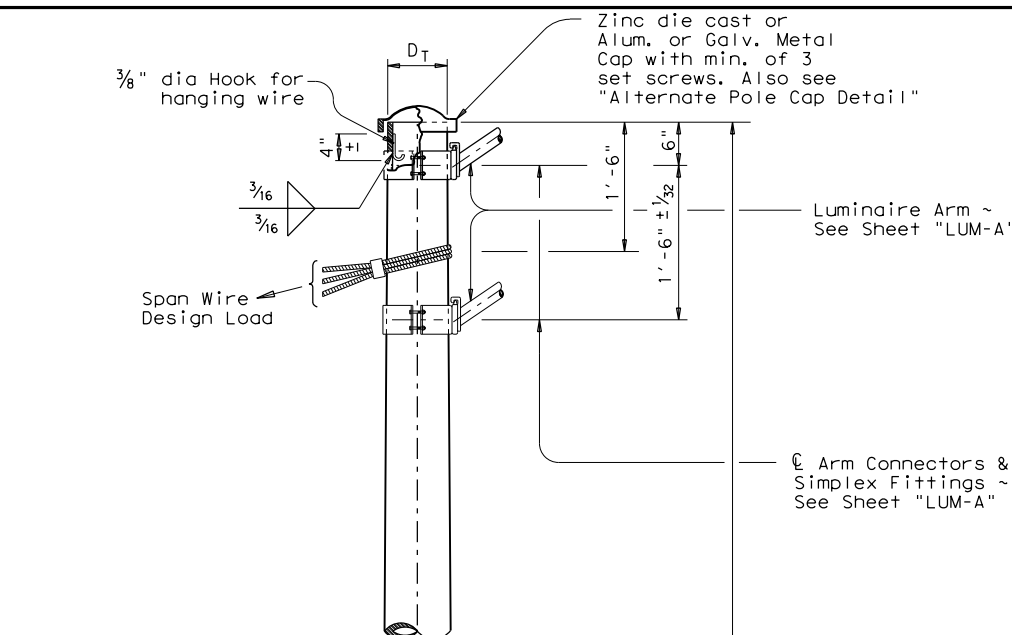
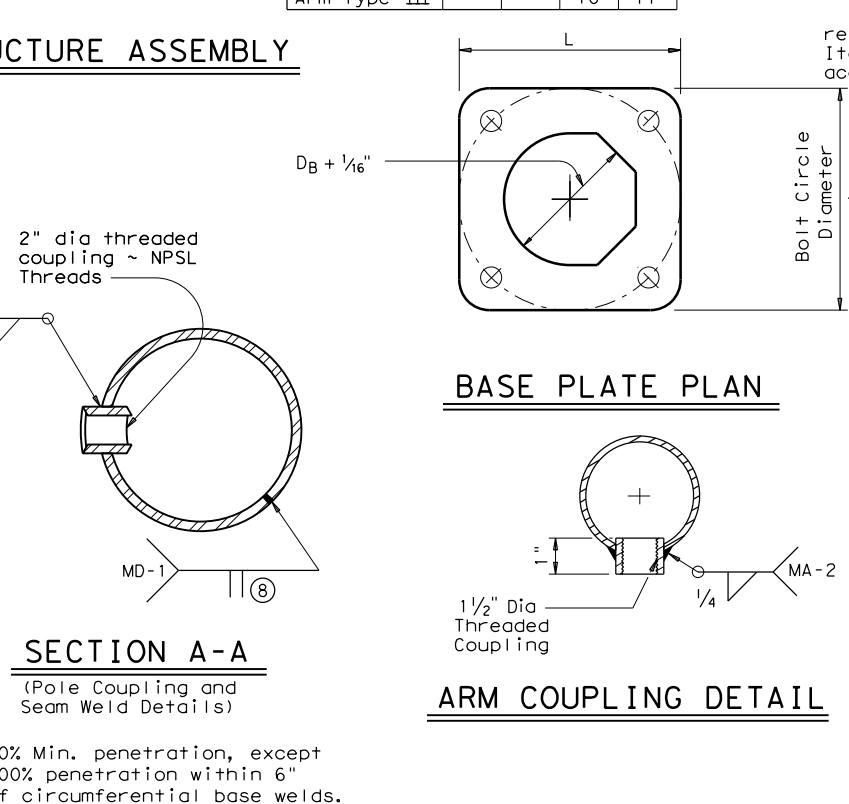
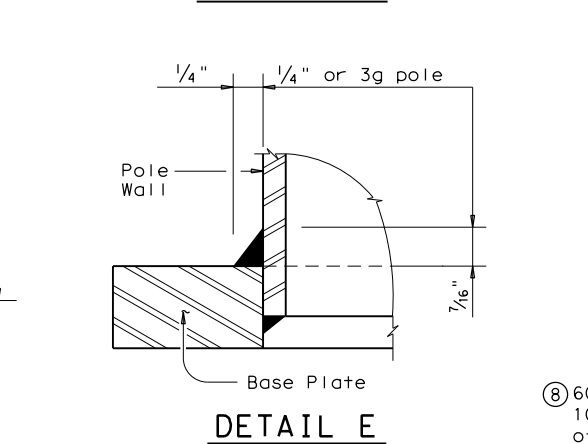
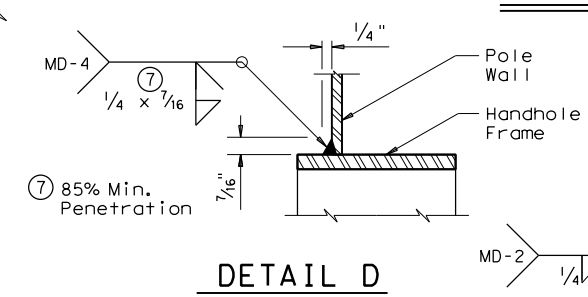


TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'



8 60% Min. penetration, except 100% penetration within 6" of circumferential base welds.

MATERIALS

Round Shafts or Polygonal Shafts 9	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 10
Plates 9	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe 9	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Steel Cable	ASTM A475, 7 Wire Utilities Grade
Misc. Hardware	Galvanized steel or stainless steel or as noted

9 ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

10 ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

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 80 mph plus a 1.3 gust factor. The maximum permissible span wire design loads tabulated are calculated at a stress load of 1.4 times the basic allowable stress. A simultaneous wind on the pole, mast arm, and luminaire is also included.

See standard sheet "DMA-80" for details of clamp-on traffic signal arms, sheet "MA-C" for traffic signal arm connection details, sheet "LUM-A" for luminaire arm and connection details, and sheet "TS-FD" for anchor bolt and foundation details.

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

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

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

Foundation Type	Anchor Bolt Diameter	Bolt Hole Diameter	Bolt Circle Diameter	Base R Dim. L x T
36-A	1 3/4"	2"	19"	19" x 1 3/4"
36-B	2"	2 1/4"	21"	21" x 2"

Texas Department of Transportation  
 Traffic Operations Division  
**TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES**  
 (80 MPH WIND ZONE)  
**SP-80(2)-12**

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6-96	REVISIONS	CONT	SECT	JOB
1-12	-	-	-	HIGHWAY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		5

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**FOUNDATION DESIGN TABLE**

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft (4), (5), (6)			ANCHOR BOLT DESIGN (1)			FOUNDATION DESIGN LOAD (2)		TYPICAL APPLICATION	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N Blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	3/4"	36	12 3/4"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 1/2"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 3/4"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 1/4"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

**NOTES:**

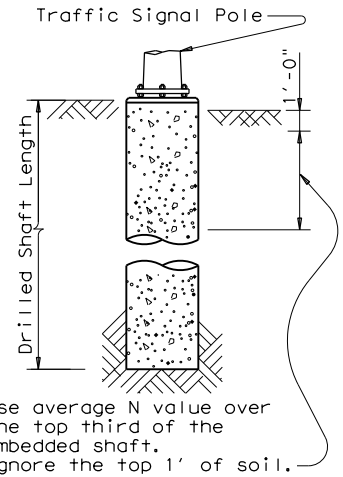
- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- Foundation Design Loads are the allowable moments and shears at the base of the structure.
- Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the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

**FOUNDATION SUMMARY TABLE (3)**

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (6) (FEET)				
				24-A	30-A	36-A	36-B	42-A
POLE "A"	10	36-B	1				15.2	
POLE "B"	10	36-B	1				15.2	
TOTAL DRILLED SHAFT LENGTHS							30.4	

**FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)**

80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
		24' X 24'			
MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	28' X 28'				
	32' X 28'				
	36' X 36'				
	40' X 36'				
100 MPH DESIGN WIND SPEED	44' X 28'				
	MAX SINGLE ARM LENGTH		36'	44'	
	24' X 24'				
	28' X 28'				
MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	32' X 24'				
	32' X 32'				
	36' X 36'				
	40' X 24'				
			40' X 36'		
			44' X 36'		

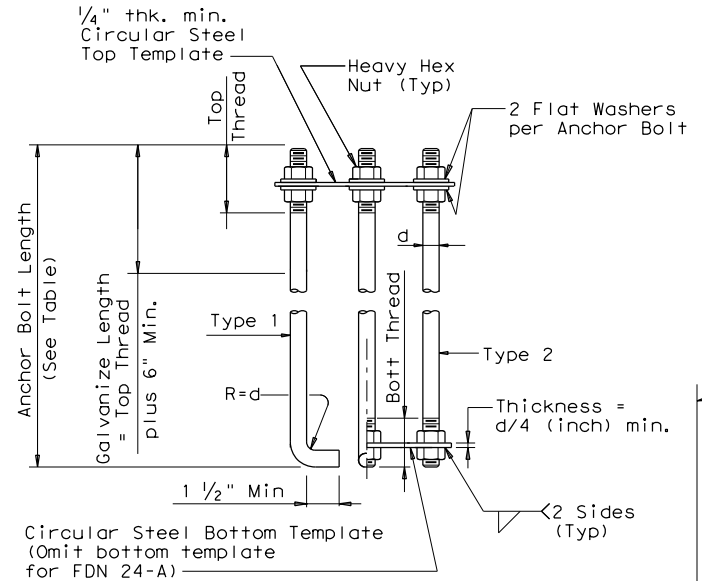


**ANCHOR BOLT & TEMPLATE SIZES**

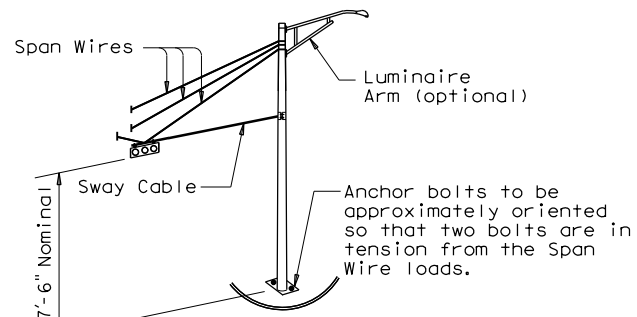
BOLT DIA IN.	(7) BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
3/4"	1'-6"	3"	—	12 3/4"	7 1/8"	5 5/8"
1 1/2"	3'-4"	6"	4"	17"	10"	7"
1 3/4"	3'-10"	7"	4 1/2"	19"	11 1/4"	7 3/4"
2"	4'-3"	8"	5"	21"	12 1/2"	8 1/2"
2 1/4"	4'-9"	9"	5 1/2"	23"	13 3/4"	9 1/4"

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

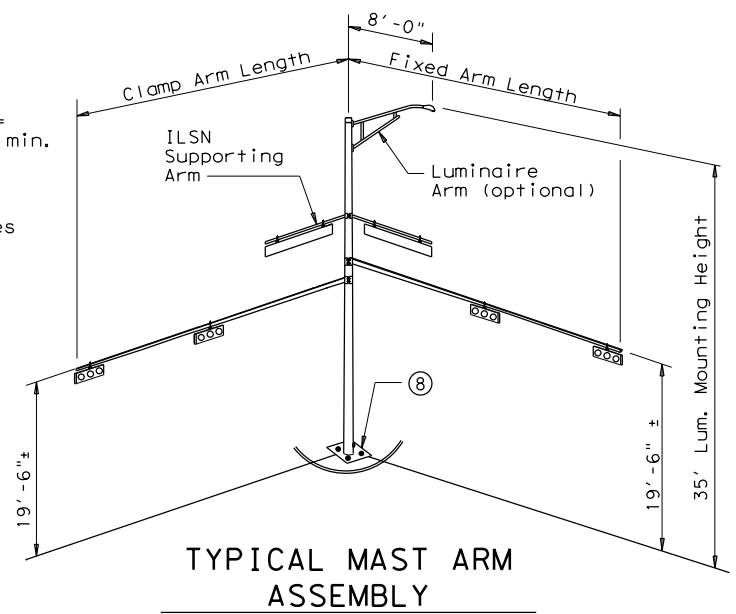
- EXAMPLE:**
- For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
  - For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



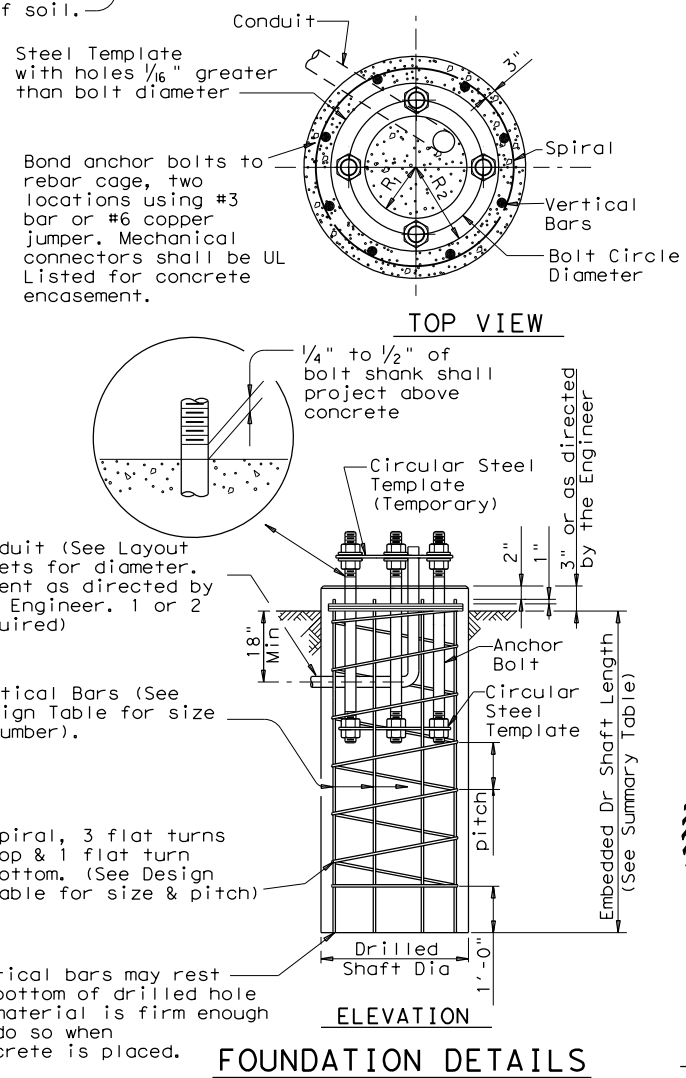
**ANCHOR BOLT ASSEMBLY**



**TYPICAL STRAIN POLE ASSEMBLY**



**TYPICAL MAST ARM ASSEMBLY**



**FOUNDATION DETAILS**

**GENERAL NOTES:**

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

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

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

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

CARMEN AVILA RD AND MILE 22 1/2 N



6/9/2022

Texas Department of Transportation  
Traffic Operations Division

**TRAFFIC SIGNAL POLE FOUNDATION**

TS-FD-12

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5-96 11-99 1-12	REVISIONS	CON	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		6	