SEE SHEET 1A FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY
GRAPHICS	6	STP 2B24(150)VRU		US 181
	STATE	DISTRICT	COUNTY	SHEET
CHECK	TEXAS	CRP	SAN PATRICIO	1
CHECK	CONTROL	SECTION	JOB	
	0101	03	120	

RAS review required.TDLR #

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL PROJECT
STP 2B24(150)VRU
CSJ: 0101-03-120, ETC.

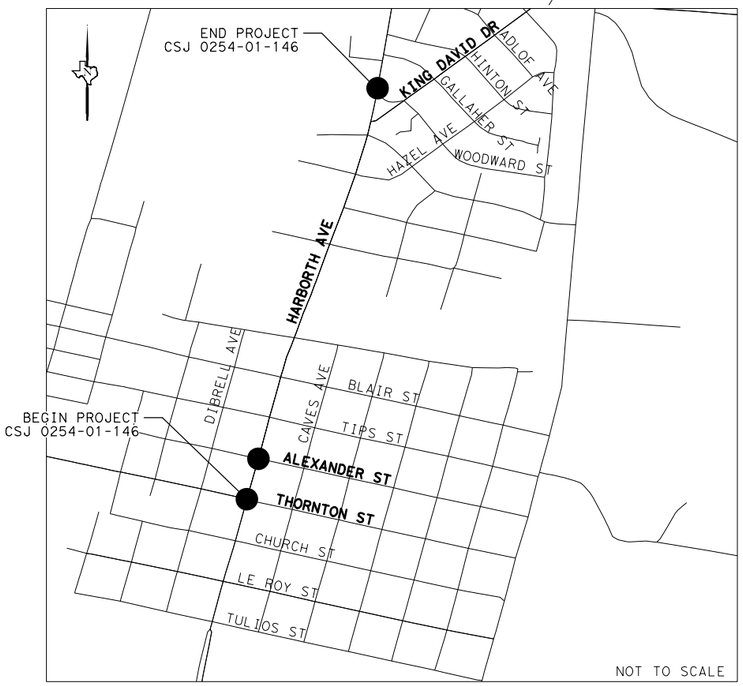
US 181
LOCATIONS IN
SAN PATRICIO AND LIVE OAK
COUNTIES

FOR THE CONSTRUCTION OF:
IMPROVEMENT AND INTERCONNECTION
OF TRAFFIC SIGNALS

LIMITS:
CSJ 0101-03-120 (SINTON) FROM 0.1 MI W OF SAN PATRICIO AVE TO 0.1 MI E OF PIRATE BLVD
CSJ 0254-01-146 (THREE RIVERS) FROM 0.1 MI N OF KING DAVID DR TO 0.1 S OF THORNTON ST

SINTON, TX

THREE RIVERS, TX



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS AFFECTED INCLUDE: UNION PACIFIC RAILROAD COMPANY

ROCKPORT (ABAN) SUBDIVISION
DOT # 746380W @ RRMP 122.680 AT GRADE (ABANDONED) ON SH 188/US 181
DOT # 746381D @ RRMP 122.790 AT GRADE ON VINEYARD AVE (CROSS STREET)
DOT # 746379C @ RRMP 122.590 AT GRADE ON S RACHAL ST (CROSS STREET)

CORPUS CHRISTI SUBDIVISION
DOT # 435745M @ RRMP 77.300 AT GRADE ON SH 72

BROWNSVILLE SUBDIVISION
DOT # 436011U @ RRMP 162.090 AT GRADE ON US 181

ENS: (800)-848-8715

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 2023)

RECOMMENDED FOR LETTING: 4/10/2024

DocuSigned by:
Paula Sales-Evans, P.E.
5975450A18CC435...

DISTRICT DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 4/10/2024

DocuSigned by:
Valente Olivarez
303F64E8A9B44E0...

DISTRICT ENGINEER

4/8/2024
\\nasuntftw.pkce.com\dwg\DWG-51\5199-21.742\DGN\Traffic\Sheets\General\CORPUS-COVER.dgn

INDEX OF SHEETS

SHEET NO. DESCRIPTION

GENERAL

TRAFFIC CONTROL PLAN & STANDARDS

TRAFFIC SIGNAL ITEMS

TRAFFIC SIGNAL STANDARDS

ENVIRONMENTAL

RAILROAD

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER
04/05/2024

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

Carl B. Laferney 04/05/2024
Signature of Registrant & Date

STATE OF TEXAS
MILKYAS GASHAW
142840
LICENSED
PROFESSIONAL ENGINEER
04/05/2024

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

Milkyas Gashaw 04/05/2024
Signature of Registrant & Date

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

INDEX OF SHEETS

SHEET 1 OF 1

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	1A

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0101-03-120 **DISTRICT** Corpus Christi **COUNTY** Live Oak, San Patricio
HIGHWAY US 181, US 281

			CONTROL SECTION JOB		**0101-03-120**		**0254-01-146**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00176990**		**A00176998**			
			COUNTY		**San Patricio**		**Live Oak**			
			HIGHWAY		**US 181**		**US 281**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	104-6015	REMOVING CONC (SIDEWALKS)		SY	17.000		4.000		21.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)		LF			26.000		26.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)		LF	22.000		22.000		44.000	
	500-6001	MOBILIZATION		LS	0.700		0.300		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	10.500		4.500		15.000	
	528-6006	REMOVE AND RELAY PAVERS		SY	1.000				1.000	
	529-6001	CONC CURB (TY I)		LF	18.000		30.000		48.000	
	531-6002	CONC SIDEWALKS (5")		SY	7.000		13.000		20.000	
	531-6004	CURB RAMPS (TY 1)		EA	30.000		17.000		47.000	
	531-6005	CURB RAMPS (TY 2)		EA			1.000		1.000	
	531-6031	CURB RAMPS (TY 22)		SY			2.000		2.000	
	618-6023	CONDT (PVC) (SCH 40) (2")		LF	185.000		50.000		235.000	
	618-6029	CONDT (PVC) (SCH 40) (3")		LF	275.000		150.000		425.000	
	618-6030	CONDT (PVC) (SCH 40) (3") (BORE)		LF			50.000		50.000	
	618-6033	CONDT (PVC) (SCH 40) (4")		LF	200.000		30.000		230.000	
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)		LF	755.000		310.000		1,065.000	
	620-6008	ELEC CONDR (NO.8) INSULATED		LF	2,875.000		1,640.000		4,515.000	
	620-6009	ELEC CONDR (NO.6) BARE		LF	185.000		45.000		230.000	
	620-6010	ELEC CONDR (NO.6) INSULATED		LF	370.000		90.000		460.000	
	624-6010	GROUND BOX TY D (162922)W/APRON		EA	29.000		12.000		41.000	
	624-6028	REMOVE GROUND BOX		EA	29.000		12.000		41.000	
	628-6002	REMOVE ELECTRICAL SERVICES		EA	7.000				7.000	
	628-6310	ELC SRV TY T 120/240 000(NS)GS(N)TS(O)		EA	7.000		3.000		10.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)		EA	1.000		2.000		3.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)		EA			1.000		1.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)		EA	1.000				1.000	
	644-6051	IN SM RD SN SUP&AM TYS80(2)SA(P-EXAL)		EA			1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM		EA	2.000		4.000		6.000	
	668-6072	PREFAB PAV MRK TY C (W) (8") (SLD)		LF	8.000				8.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)		LF	3,364.000		1,194.000		4,558.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)		EA			4.000		4.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")		LF	41.000		63.000		104.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")		LF	3,859.000		1,222.000		5,081.000	
	677-6018	ELIM EXT PAV MRK & MRKS (18")(YLD TRI)		EA			4.000		4.000	
	680-6004	REMOVING TRAFFIC SIGNALS		EA	7.000		3.000		10.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)		EA	7.000		3.000		10.000	
	682-6001	VEH SIG SEC (12")LED(GRN)		EA	56.000		24.000		80.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0101-03-120 **DISTRICT** Corpus Christi **COUNTY** Live Oak, San Patricio
HIGHWAY US 181, US 281

			CONTROL SECTION JOB		**0101-03-120**		**0254-01-146**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00176990**		**A00176998**			
			COUNTY		**San Patricio**		**Live Oak**			
			HIGHWAY		**US 181**		**US 281**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	682-6002	VEH SIG SEC (12")LED(GRN ARW)		EA	10.000		7.000		17.000	
	682-6003	VEH SIG SEC (12")LED(YEL)		EA	56.000		24.000		80.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)		EA	14.000		12.000		26.000	
	682-6005	VEH SIG SEC (12")LED(RED)		EA	56.000		24.000		80.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)		EA	6.000		5.000		11.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)		EA	56.000		20.000		76.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM		EA	52.000		24.000		76.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM		EA	8.000		7.000		15.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM		EA	2.000				2.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)		LF	3,415.000		1,355.000		4,770.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)		LF	2,965.000		1,222.000		4,187.000	
	684-6042	TRF SIG CBL (TY A)(14 AWG)(16 CONDR)		LF	3,110.000		990.000		4,100.000	
	684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)		LF	6,489.000		1,950.000		8,439.000	
	686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM		EA			1.000		1.000	
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM		EA			1.000		1.000	
	686-6055	INS TRF SIG PL AM(S)1 ARM(50')LUM		EA	1.000				1.000	
	686-6275	INS TRF SIG PL AM(S)2 ARM(65-40')LUM		EA			1.000		1.000	
	687-6001	PED POLE ASSEMBLY		EA	23.000		11.000		34.000	
	688-6001	PED DETECT PUSH BUTTON (APS)		EA	50.000		20.000		70.000	
	688-6003	PED DETECTOR CONTROLLER UNIT		EA	5.000		3.000		8.000	
	690-6036	INSTALL OF FND FOR GROUND MNT CABINETS		EA	4.000				4.000	
	690-6097	REMOVE SPREAD SPECTRUM ANTENNA		EA	2.000				2.000	
	752-6022	TREE TRIMMING AND BRUSH REMOVAL		LF	10.000				10.000	
	5114-6003	CONC SIDEWALKS (5")(HISTORIC AREAS)		SY	5.000		23.000		28.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN		DAY	350.000		150.000		500.000	
	6010-6002	CCTV FIELD EQUIPMENT (DIGITAL)		EA	4.000		3.000		7.000	
	6027-6003	CONDUIT (PREPARE)		LF	1,820.000		475.000		2,295.000	
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)		EA	7.000		3.000		10.000	
	6185-6002	TMA (STATIONARY)		DAY	350.000		150.000		500.000	
	6292-6001	RVDS(PRESENCE DETECTION ONLY)		EA	16.000		3.000		19.000	
	6292-6007	RELOCATE RVDS		EA	1.000		2.000		3.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)		LS	1.000				1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000				1.000	

GENERAL NOTES:

Find, for your information and convenience, tools such as forms, software, materials, and various other information provided by the Department at https://www.txdot.gov/business.html. Please note that these tools are updated periodically, and your attention is directed to the latest edition.

In the event of a called evacuation, emergencies, impending adverse weather or as directed, do not perform any work without written authorization. The District reserves the right to suspend all work in support of evacuations or emergencies occurring from other parts of the state. Any work performed, other than work directed by the Department, is unauthorized work in accordance with Item 5.

Sweep, clean and remove any construction waste, surplus materials or debris from the roadway and right of way at the end of each day unless otherwise approved. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Asphalt application season will be established in accordance with Item 316.4.4 Adverse Weather Conditions or as directed by the Engineer.

Promptly pick up and properly dispose of paper and other materials used for pavement joints.

All pavement markings shall be in accordance with the latest edition of Texas MUTCD.

Contractor questions on this project are to be addressed to the following individual(s):

Robert Isassi, P.E.	Robert.Isassi@txdot.gov
Chandler Williams, P.E.	Chandler.Williams@txdot.gov

Contractor questions on this project are to be addressed to the following individual(s):

Ernest Longoria, P.E.	Ernest.Longoria@txdot.gov
Fidencio Lopez, Jr. P.E.	Fidencio.Lopez@txdot.gov

Contractor questions on this project are to be addressed to the following individual(s):

Nick Novosad, P.E.	Nick.Novosad@txdot.gov
Roberto Jimenez, P.E.	Roberto.A.Jimenez@txdot.gov

Contractor questions on this project are to be addressed to the following individual(s):

Lucia Adame, P.E.	Lucia.Adame@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

ITEM 2

It is recommended that prospective bidders examine the specified work locations with the Engineer to view the nature of the work, the need for close coordination with the various utilities, traffic control considerations, and other factors influencing the prosecution of the work.

ITEM 5

Field verify all dimensions and notify Engineer prior to initiating any work.

Verify the locations of utilities, underground or overhead, shown within the limits of the right-of-way. Adhere to OSHA Standards when working within the vicinity of overhead power lines. Coordinate with the utility companies and notify the Engineer of any possible conflicts. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

The 811 call services for a utility location does not include TxDOT facilities. Provide notification to the District Traffic Signal Shop by email at CRP_Utility_Locate@txdot.gov or call 361-739-6044 when planning, drilling, or excavating in areas where existing TxDOT underground utilities exist. Visual evidence of TxDOT underground utilities in the area include illumination poles, ground boxes, flashing beacons, traffic signals, etc. This notification must be provided 48 hours in advance of performing the work, but no earlier than 72 business hours before the work will commence. Drilled shaft locations or excavation areas must be staked prior to the notification so that the underground utilities can be located in relationship to the proposed work.

Notify the Engineer immediately of utility conflicts in accordance with Item 5.6. Refer to Item 4.5 for consideration of differing site conditions.

GENERAL NOTES

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	3

The responsibility for the construction surveying on this contract will be in accordance with Item 5.9.3, “Method C”.

Establish and mark the location of existing standard pavement markings including but not limited to edge lines, transitions, passing and no passing zones, gore areas, etc.

ITEM 6

Inspection at Precast Concrete Fabrication Plants is as follows: TxDOT's Materials and Pavements Section will inspect any precast units at commercial fabrication yards and staging areas. The Area Engineer will inspect all other precast units.

For Department-furnished material, contact the Engineer or his designated representative to request material a minimum of one workday prior to pick up. Load material with contract personnel. Materials are to be stored in a safe location outside TXDOT property or right-of-way, {unless otherwise approved.} Use material furnished by the Department only on the project(s) intended. Return any unused material as soon as possible.

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit an original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link. https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

ITEM 7

The work performed for Item 7.2.4, “Public Safety and Convenience” will not be measured or paid for directly, but will be subsidiary to pertinent Items.

When working at street, farm-to-market, state highway, and county road intersections, schedule work to minimize intersection closures. During nonworking hours, all public road intersections will be open to the traveling public.

Submit charge summary and invoices for Law Enforcement Personnel using the Department forms.

Patrol vehicles must be clearly marked to correspond with the officer’s agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles. No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site.

If the Contractor has a field office, provide an office location for a supervisory officer when event requires a supervising officer. This work is subsidiary.

A maximum combined rate of $70 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or “show up” fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual “show up” time to the event site due to cancellation will be on a case by case basis at a maximum of 2 hours per officer.

Alterations to the cancellation and maximum rate must be approved by the Engineer or pre-determined by official policy of the officers governing authority.

ITEM 8

Prepare the progress schedule using the Critical Path Method (CPM). Submit (2) two 11” x 17” hard copies and an electronic file of the original or updated progress schedule. Submit the original progress schedule seven (7) days before the Preconstruction Conference.

Submit an updated progress schedule as directed to show proposed major changes, changes affecting compliance with the contract requirements, or changes affecting the critical path/controlling item of work.

Working days will be computed and charge in accordance with Article 8.3.1.4, “Standard Workweek”.

Lane closures are not permitted Monday through Friday between 9 AM and 4 PM unless approved.

Notify the Engineer at least 48 hours in advance of weekend or nighttime work.

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DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	3A

ITEM 9

Monthly progress payments will be made for items of work completed by the 28th day of each month. Any work completed after the 28th will be included for payment in the subsequent monthly progress estimate.

Submit signed request for compensation of material-on-hand (MOH), including any requests from subcontractors, suppliers, or fabricators for MOH, at least two (2) working days prior to the end of the month on the Departments approved forms.

ITEM 100

Coordinate all right of way preparation activities with the project's Storm Water Pollution Prevention Plan (SWP3) and Environmental Permit Issues, and Commitments Sheet (EPIC) or as approved.

Prune trees and shrubs as directed. Use accepted pruning practices in accordance with Item 192 and as defined by the National Arborist Association. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

ITEM 500

"Materials on Hand" payments are not considered when determining partial payments.

ITEM 502

Furnish additional barricades, signs, and traffic handling as directed. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Traffic control for daytime lane closures shall be in accordance with applicable standards. Traffic control shall include temporary rumble strips in accordance with WZ (RS)-22.

When advanced warning flashing arrow panels are specified, furnish one (1) standby unit in good condition at the job site for immediate use.

Attach stop/slow paddle to a staff with a minimum length of 6 feet to the bottom of the sign.

The use of a pilot vehicle in conjunction with flaggers will be permitted. If used, provide positive and unrestricted communication between the driver of the pilot vehicle and the flaggers. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

County: San Patricio, etc. **Control: 0101-03-120, ETC.**

Highway: US 181, ETC.

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

All items marked as optional on all traffic control standards shall be required unless otherwise approved by an Engineer.

ITEM 506

Designate in writing a Contractor Responsible Person (CRP) for implementing, maintaining, and reviewing environmental requirements.

The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4 and 9.7.

ITEM 531

Reinforce sidewalks with 4 x 4 – W2.9 x W2.9 welded wire fabric or with No. 3 reinforcing bars spaced at a maximum of 12 inch in each direction unless otherwise shown.

Construct an expansion joint at a depth equal to the depth of the sidewalk every 40 feet. Construct a tooled joint every 5 feet. When sidewalks are constructed next to curb or curb and gutter, place sidewalk expansion joints at the same location as the curb and gutter expansion joints.

Mixing of detectable warning materials is not permitted on curb ramps.

ITEM 618

Seal all conduits terminating in ground boxes and pole foundations with a sealant made of polyurethane or equivalent that will cure in the presence of moisture. Ensure sealant is suitable for sealing ends with electrical conductor extending past the ends of the conduit. Inject the sealant a minimum of 3 inches and a maximum of 5 inches into the conduit.

GENERAL NOTES

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	3B

Provide rigid metal conduit (RMC) elbows for all underground conduit bends of 45 degrees or more, including bends into ground boxes. Provide a polyvinyl chloride conduit (PVC) elbow in lieu of a RMC elbow for conduit 1 inch or larger. Ensure the elbow is the same schedule rating as the conduit to which it is connected.

Bond the RMC to the grounding conductor with grounding type bushings when the RMC is exposed or extends into the ground box.

Provide a flat, high tensile strength polyester fiber pull tape in each conduit to pull conductors.

Provide wide sweep conduit elbows.

Jacking of conduit will not be permitted.

All conduit runs under existing pavement or existing driveways shall be bored. Where boring is required, it shall be placed at a minimum depth of 3.5 feet from proposed grade.

ITEM 620

Grounding conductors that share the same conduit, junction box, ground box, or structure shall be bonded together at every accessible point in accordance with the current National Electrical Code and TxDOT requirements. Provide cable with green color insulation.

Ensure all grounding conductors size 8AWG and larger are stranded, except for the grounding electrode conductor that terminates at meter Enclosure, which will be a solid conductor.

ITEM 624

Aggregate fill shall consist of ¾ inch up to 2 inch course aggregate. Ensure aggregate is in place prior to setting box and conduits shall be capped.

ITEM 628

Provide a meter box for all electrical services.

ITEM 636

All sign wraps are subsidiary to Item 636.

County: San Patricio, etc. Control: 0101-03-120, ETC.

Highway: US 181, ETC.

Field verify vertical clearance as directed by the online Texas Department of Transportation manual, “Sign Guidelines and Applications Manual” chapter 6 section 3. The Engineer’s approval will be required prior to fabrication.

Furnish new sign supports when replacing overhead signs. This will be subsidiary to pertinent items.

Disassemble, deliver, and neatly stack salvageable materials at _______. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

ITEM 644

Use crash worthy supports as shown on the BC sheets, the CWZTCD, or as directed for signs relocated using temporary supports. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

All slip bases and hardware including but not limited to nuts, bolts, screws and washers will be galvanized. All sign and housing components will be galvanized. Slip bases shall be clamp-style.

Disassemble, deliver and neatly stack salvageable materials at _______. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

ITEM 666

Establish and mark the location of existing standard pavement markings including but not limited to edge lines, transitions, passing and no passing zones, gore areas, etc.

ITEM 677

Eliminate all conflicting pavement markings as work progresses or as directed.

Removal method must be approved by the Engineer.

No Surface Treatment Method on concrete surfaces.

When using Surface Treatment Method for asphaltic pavements, use a PB Grade 5 aggregate at an application rate of 1 cy/130 sy and asphalt AC-10, CRS-2 or HFRS-2 at a application rate of 0.39 Gal/sy.

GENERAL NOTES

FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			US 181
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CRP	SAN PATRICIO	0101	03	120	3C

ITEM 680

Do not activate traffic signals without approval. For new signal installations, notify the Engineer two (2) weeks in advance of the activation date for advertisement purposes and place the signals on flash as directed.

ITEM 681

Use LED optical units for the signal heads unless otherwise approved.

Provide a controller assembly capable of operating the temporary traffic signals as approved. Coordinate an inspection of the unit prior to installation in the field.

ITEM 684

Aluminum conductors will be permitted.

Coil an extra 5 feet of cable in each ground box, pole base, and controller assembly.

ITEM 5114

General Protection Notes for Buildings and Historic Structures:

1. Saw cut existing sidewalk 6 to 8 inches away from protected building/structure to minimize potential damage, prior to demolition of walk.
2. Contractor is responsible for preventing damage to all buildings and structures during the entire construction project. If directed by engineer to hand remove existing paving adjacent to historic structures. Protect foundation, materials, elevation and entryways. Do not remove existing materials if facade (brick/stone, etc.) utilizes the materials to be removed as a footing, foundation or support. If this condition is observed, immediately contact engineer and do not excavate further. Separate payment will not be made for hand removal.
3. Repair or replace in kind, at no expense to the department, and damage to historic or non-historic material that results from an act of omission on the part of or on behalf of the Contractor. Contractor is responsible for locating a replacement source for historic and non-historic materials damaged in the process of construction. Inform TxDOT environmental affairs division (ENV) of proposed repairs and/or damaged areas in order to facilitate consultation with Texas historical commission. Material and source shall be approved by TxDOT env prior to replacement.
4. Protect building and structure from concrete splash utilizing a material approved by the engineer. Any concrete splash as a result of construction activities must be removed from the building or structure at Contractors expense. No payment will be made for building protection.

ITEM 6001

Furnish the portable changeable message signs displaying the correct message at least seven (7) days prior to beginning work or as directed.

The Contractor's Responsible Person (CRP) will maintain full control of messages at all times.

The Engineer will provide the sign message text to use at each sign.

A minimum of _2_ PCMS will be required. However, additional units may be necessary depending on the work in progress.

Standby time will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Portable changeable message signs may be moved and message changed at any time as deemed necessary by the Engineer. This will be considered subsidiary to Item 6001.

ITEM 6010

The contractor will provide an Axis IP Camera (with 36X Zoom, Image Stabilization, Defog, Fan, Heater, and T8154 POE) Model: Q6154-E and Pole Bracket Model: T91L61.

ITEM 6058

The contractor is will provide the Alpha UPS System for each signalized intersection.

ITEM 6185

A minimum of 2 TMAS will be required. However, additional units may be necessary depending on the work in progress.

Provide manufacturer's curb weight or certified scales weight ticket to the Engineer for approval.

GENERAL NOTES

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	3D

SUMMARY OF MATERIALS FOR CONTRACTOR'S USE

	BID ITEM	DESCRIPTION	UNIT	0101-03-120								0254-01-146		
				San Patricio	McCall	Rachal	Vineyard	Sodville	Bowie	Pirate		Thornton	Alexander	King David
	0104 6015	REMOVING CONC (SIDEWALKS)	SY	2	3	4	3	1	2	2		2	1	1
	0416 6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF										26	
	0416 6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF				22					22		
	0500 6001	MOBILIZATION	LS	1										
	0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5
	0528 6006	REMOVE AND RELAY PAVERS	SY	1										
	0529 6001	CONC CURB (TY 1)	LF						18			15		15
	0531 6002	CONC SIDEWALKS (5")	SY						7				13	
	0531 6004	CURB RAMPS (TY 1)	EA	2			8	8	6	6		6	8	3
	0531 6005	CURB RAMPS (TY 2)	EA											1
	0531 6031	CURB RAMPS (TY 22)	SY									1		1
	0618 6023	CONDT (PVC)(SCH 40)(2")	LF	20	25	20	45	20	15	40		20	20	10
	0618 6029	CONDT (PVC)(SCH 40)(3")	LF	35	35	50	60	35	10	50		65	45	40
	0618 6030	CONDT (PVC)(SCH 40)(3")BORE	LF											50
	0618 6033	CONDT (PVC)(SCH 40)(4")	LF	10	30	10	70	10	20	50		10	10	10
	0618 6034	CONDT (PVC)(SCH 40)(4")BORE	LF	80			95	240	155	185		160	150	
	0620 6008	ELEC CONDR (NO.8) INSULATED	LF	325	350	365	710	325	395	405		410	830	400
	0620 6009	ELEC CONDR (NO.6) BARE	LF	20	25	20	45	20	15	40		20	15	10
	0620 6010	ELEC CONDR (NO.6) INSULATED	LF	40	50	40	90	40	30	80		40	30	20
	0624 6010	GROUND BOX TY D (162922)W/APRON	EA	4	4	4	4	4	5	4		4	4	4
	0624 6028	REMOVE GROUND BOX	EA	4	4	4	4	4	5	4		4	4	4
	0628 6002	REMOVE ELECTRICAL SERVICES	EA	1	1	1	1	1	1	1		1	1	1
	0628 6310	ELC SRV TY T 120/240 000(NS)GS(N)TS(O)	EA	1	1	1	1	1	1	1		1	1	1
	0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA					1				2		
	0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA											1
	0644 6034	IN SM RD SN SUP&AM TYS80(1)SA(U-EXT)	EA				1							
	0644 6051	IN SM RD SN SUP&AM TYS80(2)SA(P-EXAL)	EA									1		
	0644 6076	REMOVE SM RD SN SUP&AM	EA				1	1				3		1
	0668 6072	PREFAB PAV MRK TY C (W)(8")(SLD)	LF							8				
	0668 6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	500	441	445	508	530	352	588		482	487	225
	0668 6091	PREFAB PAV MRK TY C (W)(18")(YLD TRI)	EA											4
	0677 6001	ELIM EXT PAV MRK @ MRKS (4")	LF				9		18	14		15	30	18
	0677 6007	ELIM EXT PAV MRK @ MRKS (24")	LF	379	485	557	930	472	453	583		569	349	304
	0677 6018	ELIM EXT PAV MRK @ MRKS (18")(YLD TRI)	EA											4
&*	0680 6004	REMOVING TRAFFIC SIGNALS**	EA	1	1	1	1	1	1	1		1	1	1
***	0680 6011	INSTALL HWY TRF SIG (UPGRADE)***	EA	1	1	1	1	1	1	1		1	1	1
	0682 6001	VEH SIG SEC (12")LED(GRN)	EA	8	8	8	8	8	8	8		9	8	7
	0682 6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2				2	2	4		4	2	1
	0682 6003	VEH SIG SEC (12")LED(YEL)	EA	8	8	8	8	8	8	8		9	8	7
	0682 6004	VEH SIG SEC (12")LED(YEL ARW)	EA	2				4	4	4		6	4	2
	0682 6005	VEH SIG SEC (12")LED(RED)	EA	8	8	8	8	8	8	8		9	8	7
	0682 6006	VEH SIG SEC (12")LED(RED ARW)	EA					2	2	2		2	2	1
	0682 6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8	8	8	8	8	8	8		8	8	4
	0682 6054	BACKPLATE W/REFL BRDR(3 SEC)(VENT)ALUM	EA	6	8	8	8	8	8	6		9	8	7
	0682 6055	BACKPLATE W/REFL BRDR(4 SEC)(VENT)ALUM	EA					2	2	4		4	2	1
	0682 6056	BACKPLATE W/REFL BRDR(5 SEC)(VENT)ALUM	EA	2										
*	0684 6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)*	LF	280	525	545	635	230	585	615		555	435	365
*	0684 6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)*	LF	408	401	394	436	455	422	440		587	485	150
*	0684 6042	TRF SIG CBL (TY A)(14 AWG)(16 CONDR)*	LF	395	450	445	555	400	340	525		275	370	345
*	0684 6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)*	LF	843	943	933	1158	848	656	1108		788	778	384
	0686 6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA										1	
	0686 6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA										1	
	0686 6055	INS TRF SIG PL AM(S)1 ARM(50')LUM	EA				1							
	0686 6275	INS TRF SIG PL AM(S)2 ARM(65-40')LUM	EA									1		
	0687 6001	PED POLE ASSEMBLY	EA	3	4	5	4	2	2	3		5	3	3
	0688 6001	PED DETECT PUSH BUTTON (APS)	EA	8	8	8	8	6	4	8		8	8	4
	0688 6003	PED DETECT CONTROLLER UNIT	EA	1	1	1	1			1		1	1	1
	0690 6036	INSTALL OF FND FOR GROUND MNT CABINETS	EA	1		1	1			1				
	0690 6097	REMOVE SPREAD SPECTRUM ANTENNA	EA	1				1						
	5114 6003	CONC SIDEWALKS (5") (HISTORIC AREAS)	SY				5					23		
	6001 6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	50	50	50	50	50	50	50		50	50	50
****	6010 6002	CCTV FIELD EQUIP (DIGITAL)****	EA	1			1	1	1			1	1	1
	6027 6003	CONDUIT (PREPARE)	LF	205	390	415	220	225	220	145		80	85	310
	6058 6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1	1	1	1	1	1	1		1	1	1
	6185 6002	TMA (STATIONARY)	DAY	50	50	50	50	50	50	50		50	50	50
	6292 6001	RVDS(PRESENCE DETECTION ONLY)	EA	4	4	4	4							3
	6292 6007	RELOCATE RVDS	EA					1				2		

*COIL 5 FT CONDUCTOR INSIDE THE SIGNAL HEADS, GROUND BOXES, POLE BASE, CONTROLLER AS PER ITEM 684 SPECIFICATION, ADDITIONAL CABLE IS SUBSIDIARY TO ITEM 684.

**COVERS REMOVAL OF SIGNAL HEADS, SIGNAL SIGNS, PED HEADS, PUSH BUTTONS, VIVDS DETECTION, CABINETS, FOUNDATIONS, CABLING, CONDUIT, AND GROUND BOXES

*** REPLACE ALL TERMINAL BLOCKS ON TRAFFIC SIGNAL POLES. SUBSIDIARY TO ITEM 680.

****CABLE FOR CAMERA INCLUDED IN ITEM 6010

STATE OF TEXAS
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Carl La Ferney

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TBPLS FIRM REGISTRATION NO. 10074301

SUMMARY OF MATERIALS

FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			US 181
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CRP	SAN PATRICIO	0101	03	120	4

DGN: CHK DGN: DWG: CHK DWG:

Elec Service ID	Plan Sheet Number	Electrical Service Description	Service "Conduit" Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Light Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SAN PATRICIO ST.	27	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
McCALL AVE.	30	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
RACHAL AVE.	33	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
VINEYARD AVE.	36	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
RUSS AVE.	39	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
BOWIE AVE.	42	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
PIRATE BLVD.	45	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
THORNTON ST.	48	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
ALEXANDER ST.	51	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8
KING DAVID DR.	54	ELC SRV TY T 120/240 000 (NS)GS(N)TS(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	TRAFFIC SIGNAL	1P/50	40	4.8

STATE OF TEXAS
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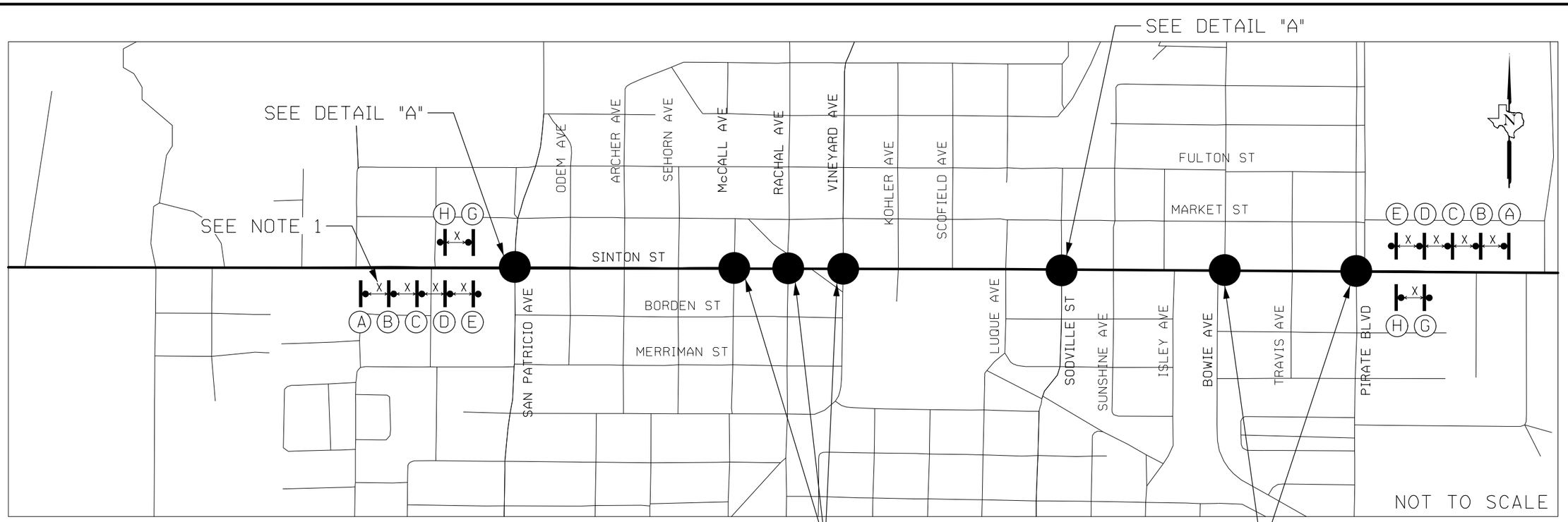
ELECTRICAL SERVICE DATA SHEET

SHEET 1 OF 1

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	5



A

R20-3T
48"X42"

B

G20-10T
60"X48"

C

G20-9TP
24"X24"

R20-5T
24"X30"

R20-5aTP
24"X12"

D

CW20-1D
36"X36"

E

G20-5T
48"X24"

G20-6T
48"X30"

F

CW20SG-1
36"X36"

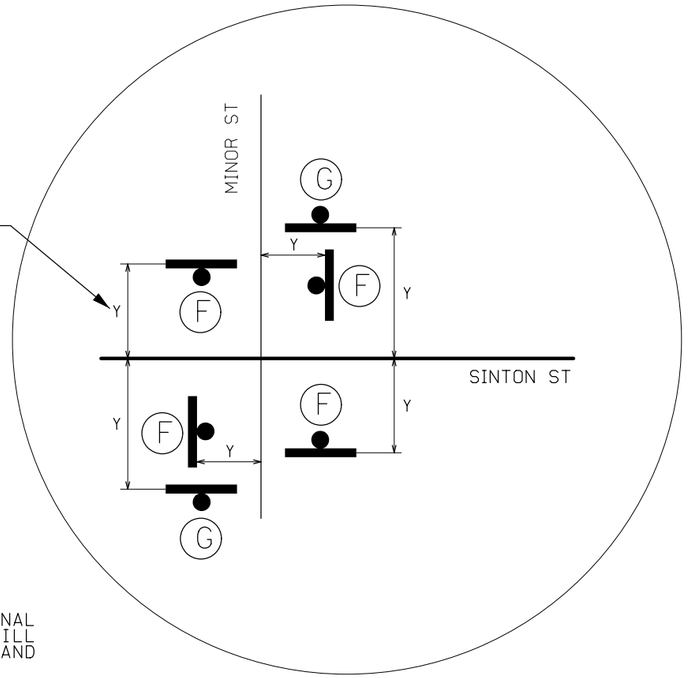
G

G20-2
36"X18"

H

G20-2bT
36"X18"

SEE NOTE 1



DETAIL "A"

NOTES:

1. X=160′ MIN, Y=120′ MIN.
2. ADDITIONAL SIGNS MAY BE ADDED BY THE ENGINEER BASED ON EXISTING FIELD CONDITIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THESE SIGNS AS THEY WILL BE SUBSIDIARY TO ITEM 502, BARRICADES, SIGNS, AND TRAFFIC HANDLING.
3. SEE BC SHEETS FOR ADDITIONAL INFORMATION ON ADVANCE WARNING SIGNS.

04/05/2024

REV. NO.	DATE	DESCRIPTION	BY

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SINTON ST TRAFFIC CONTROL PLAN SHEET ADVANCE WARNING

SHEET 1 OF 1

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	6

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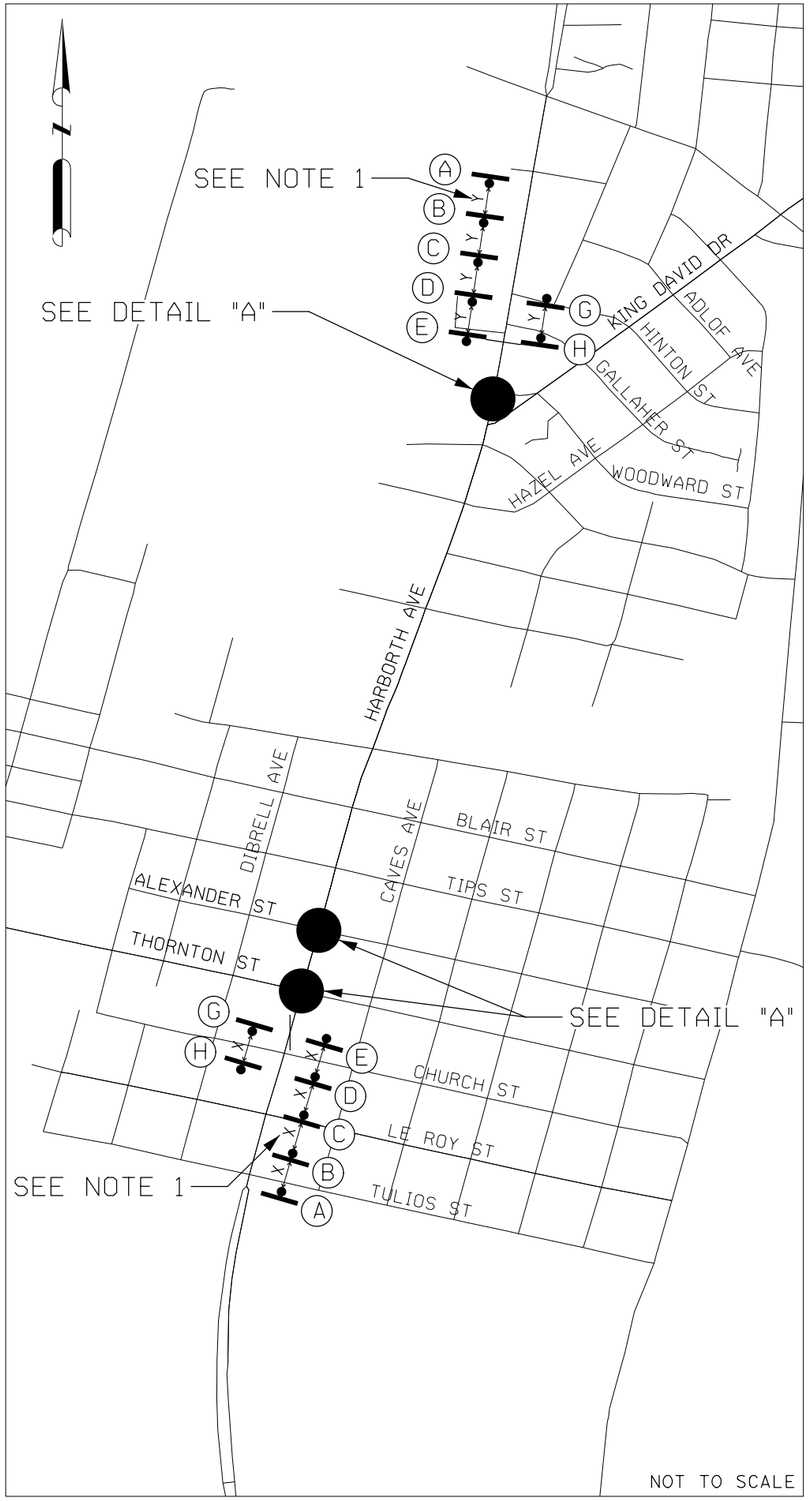


A

OBEY WARNING SIGNS STATE LAW

R20-3T
48"X42"

B

STAY ALERT

TALK OR TEXT LATER

G20-10T
60"X48"

C

BEGIN WORK ZONE — G20-9TP 24"X24"

TRAFFIC FINES DOUBLE — R20-5T 24"X30"

WHEN WORKERS ARE PRESENT — R20-5aTP 24"X12"

D

ROAD WORK AHEAD

CW20-1D
36"X36"

E

BEGIN ROAD WORK NEXT X MILES — G20-5T 48"X24"

NAME
ADDRESS
CITY
STATE
CONTRACTOR — G20-6T 48"X30"

F

SIGNAL WORK AHEAD

CW20SG-1
36"X36"

G

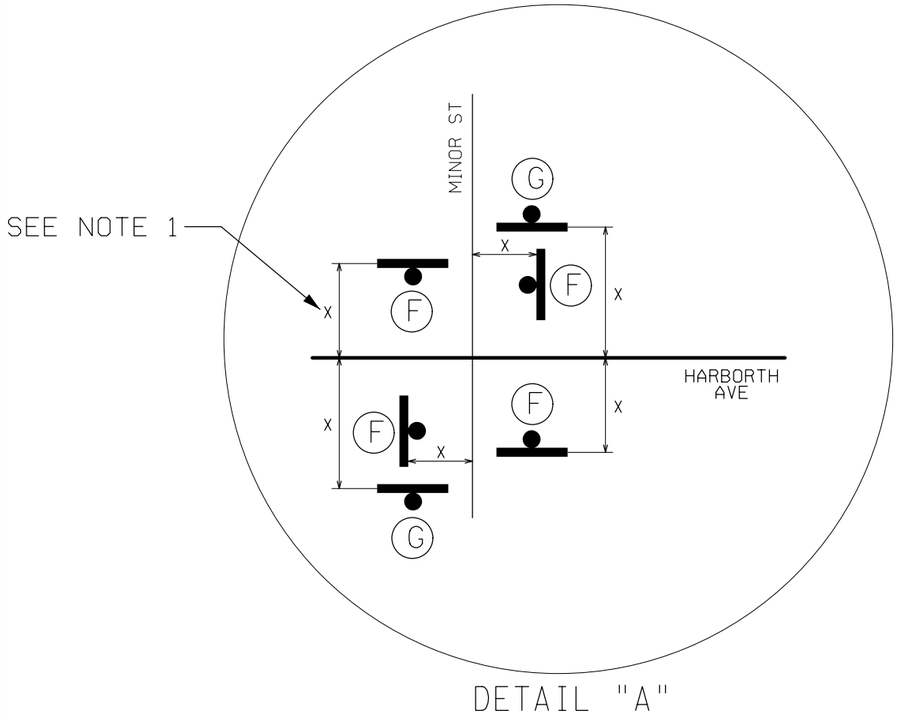
END ROAD WORK

G20-2
36"X18"

H

END WORK ZONE

G20-2bT
36"X18"



DETAIL "A"

NOTES:

1. X=120' MIN, Y=400' MIN.
2. ADDITIONAL SIGNS MAY BE ADDED BY THE ENGINEER BASED ON EXISTING FIELD CONDITIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THESE SIGNS AS THEY WILL BE SUBSIDIARY TO ITEM 502, BARRICADES, SIGNS, AND TRAFFIC HANDLING.
3. SEE BC SHEETS FOR ADDITIONAL INFORMATION ON ADVANCE WARNING SIGNS.

STATE OF TEXAS
MILKYAS GASHAW
142840
LICENSED
PROFESSIONAL ENGINEER

04/05/2024

REV. NO.	DATE	DESCRIPTION	BY

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TBPLS FIRM REGISTRATION NO. 10074301

HARBORTH AVE TRAFFIC CONTROL PLAN SHEET ADVANCE WARNING

SHEET 1 OF 1

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	7

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04/05/2024
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	SUMMARY OF MATERIALS FOR CONTRACTOR'S USE			0101-03-120							0254-01-146		
	BID ITEM	DESCRIPTION	UNIT	San Patricio	McCall	Rachal	Vineyard	Sodville	Bowie	Pirate	Thornton	Alexander	King David
	0104 6015	REMOVING CONC (SIDEWALKS)	SY	2	3	4	3	1	2	2	2	1	1
	0416 6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF									26	
	0416 6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF				22				22		
	0500 6001	MOBILIZATION	LS	1									
	0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	0528 6006	REMOVE AND RELAY PAVERS	SY	1									
	0529 6001	CONC CURB (TY 1)	LF						18		15		15
	0531 6002	CONC SIDEWALKS (5")	SY						7			13	
	0531 6004	CURB RAMPS (TY 1)	EA	2			8	8	6	6	6	8	3
	0531 6005	CURB RAMPS (TY 2)	EA										1
	0531 6031	CURB RAMPS (TY 22)	SY								1		1
	0618 6023	CONDT (PVC)(SCH 40)(2")	LF	20	25	20	45	20	15	40	20	20	10
	0618 6029	CONDT (PVC)(SCH 40)(3")	LF	35	35	50	60	35	10	50	65	45	40
	0618 6030	CONDT (PVC)(SCH 40)(3")BORE	LF										50
	0618 6033	CONDT (PVC)(SCH 40)(4")	LF	10	30	10	70	10	20	50	10	10	10
	0618 6034	CONDT (PVC)(SCH 40)(4")BORE	LF	80			95	240	155	185	160	150	
	0620 6008	ELEC CONDR (NO.8) INSULATED	LF	325	350	365	710	325	395	405	410	830	400
	0620 6009	ELEC CONDR (NO.6) BARE	LF	20	25	20	45	20	15	40	20	15	10
	0620 6010	ELEC CONDR (NO.6) INSULATED	LF	40	50	40	90	40	30	80	40	30	20
	0624 6010	GROUND BOX TY D (162922)W/APRON	EA	4	4	4	4	4	5	4	4	4	4
	0624 6028	REMOVE GROUND BOX	EA	4	4	4	4	4	5	4	4	4	4
	0628 6002	REMOVE ELECTRICAL SERVICES	EA	1	1	1	1	1	1	1	1	1	1
	0628 6310	ELC SRV TY T 120/240 000(NS)GS(N)TS(O)	EA	1	1	1	1	1	1	1	1	1	1
	0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA					1			2		
	0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA										1
	0644 6034	IN SM RD SN SUP&AM TYS80(1)SA(U-EXT)	EA				1						
	0644 6051	IN SM RD SN SUP&AM TYS80(2)SA(P-EXAL)	EA								1		
	0644 6076	REMOVE SM RD SN SUP&AM	EA				1	1			3		1
	0668 6072	PREFAB PAV MRK TY C (W)(8")(SLD)	LF							8			
	0668 6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	500	441	445	508	530	352	588	482	487	225
	0668 6091	PREFAB PAV MRK TY C (W)(18")(YLD TRI)	EA										4
	0677 6001	ELIM EXT PAV MRK @ MRKS (4")	LF				9		18	14	15	30	18
	0677 6007	ELIM EXT PAV MRK @ MRKS (24")	LF	379	485	557	930	472	453	583	569	349	304
	0677 6018	ELIM EXT PAV MRK @ MRKS (18")(YLD TRI)	EA										4
&*	0680 6004	REMOVING TRAFFIC SIGNALS**	EA	1	1	1	1	1	1	1	1	1	1
***	0680 6011	INSTALL HWY TRF SIG (UPGRADE)***	EA	1	1	1	1	1	1	1	1	1	1
	0682 6001	VEH SIG SEC (12")LED(GRN)	EA	8	8	8	8	8	8	8	9	8	7
	0682 6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2				2	2	4	4	2	1
	0682 6003	VEH SIG SEC (12")LED(YEL)	EA	8	8	8	8	8	8	8	9	8	7
	0682 6004	VEH SIG SEC (12")LED(YEL ARW)	EA	2				4	4	4	6	4	2
	0682 6005	VEH SIG SEC (12")LED(RED)	EA	8	8	8	8	8	8	8	9	8	7
	0682 6006	VEH SIG SEC (12")LED(RED ARW)	EA					2	2	2	2	2	1
	0682 6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8	8	8	8	8	8	8	8	8	4
	0682 6054	BACKPLATE W/REFL BRDR(3 SEC)(VENT)ALUM	EA	6	8	8	8	8	8	6	9	8	7
	0682 6055	BACKPLATE W/REFL BRDR(4 SEC)(VENT)ALUM	EA					2	2	4	4	2	1
	0682 6056	BACKPLATE W/REFL BRDR(5 SEC)(VENT)ALUM	EA	2									
*	0684 6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)*	LF	280	525	545	635	230	585	615	555	435	365
*	0684 6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)*	LF	408	401	394	436	455	422	440	587	485	150
*	0684 6042	TRF SIG CBL (TY A)(14 AWG)(16 CONDR)*	LF	395	450	445	555	400	340	525	275	370	345
*	0684 6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)*	LF	843	943	933	1158	848	656	1108	788	778	384
	0686 6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA									1	
	0686 6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA									1	
	0686 6055	INS TRF SIG PL AM(S)1 ARM(50')LUM	EA				1						
	0686 6275	INS TRF SIG PL AM(S)2 ARM(65-40')LUM	EA								1		
	0687 6001	PED POLE ASSEMBLY	EA	3	4	5	4	2	2	3	5	3	3
	0688 6001	PED DETECT PUSH BUTTON (APS)	EA	8	8	8	8	6	4	8	8	8	4
	0688 6003	PED DETECT CONTROLLER UNIT	EA	1	1	1	1			1	1	1	1
	0690 6036	INSTALL OF FND FOR GROUND MNT CABINETS	EA	1		1	1			1			
	0690 6097	REMOVE SPREAD SPECTRUM ANTENNA	EA	1				1					
	0752 6022	TREE TRIMMING AND BRUSH REMOVAL	LF				10					10	
	5114 6003	CONC SIDEWALKS (5") (HISTORIC AREAS)	SY				5				23		
	6001 6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	50	50	50	50	50	50	50	50	50	50
****	6010 6002	CCTV FIELD EQUIP (DIGITAL)****	EA	1			1	1	1		1	1	1
	6027 6003	CONDUIT (PREPARE)	LF	205	390	415	220	225	220	145	80	85	310
	6058 6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1	1	1	1	1	1	1	1	1	1
	6185 6002	TMA (STATIONARY)	DAY	50	50	50	50	50	50	50	50	50	50
	6292 6001	RVDS(PRESENCE DETECTION ONLY)	EA	4	4	4	4						3
	6292 6007	RELOCATE RVDS	EA					1			2		

*COIL 5 FT CONDUCTOR INSIDE THE SIGNAL HEADS, GROUND BOXES, POLE BASE, CONTROLLER
AS PER ITEM 684 SPECIFICATION, ADDITIONAL CABLE IS SUBSIDIARY TO ITEM 684.
**COVERS REMOVAL OF SIGNAL HEADS, SIGNAL SIGNS, PED HEADS, PUSH BUTTONS, VIVDS DETECTION, CABINETS, FOUNDATIONS, CABLING, CONDUIT, AND GROUND BOXI
*** REPLACE ALL TERMINAL BLOCKS ON TRAFFIC SIGNAL POLES. SUBSIDIARY TO ITEM 680.
****CABLE FOR CAMERA INCLUDED IN ITEM 6010

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TBPLS FIRM REGISTRATION NO. 10074301

SUMMARY OF MATERIALS

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			US 181
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CRP	SAN PATRICIO	0101	03	120	8

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	0101	03	120	US 181
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	CRP	SAN PATRICIO		9

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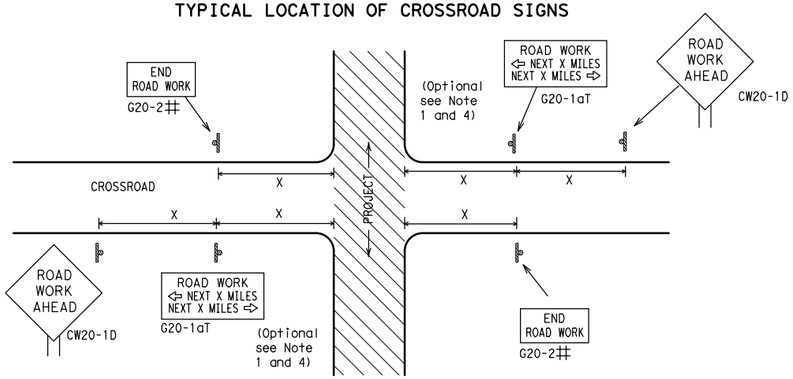
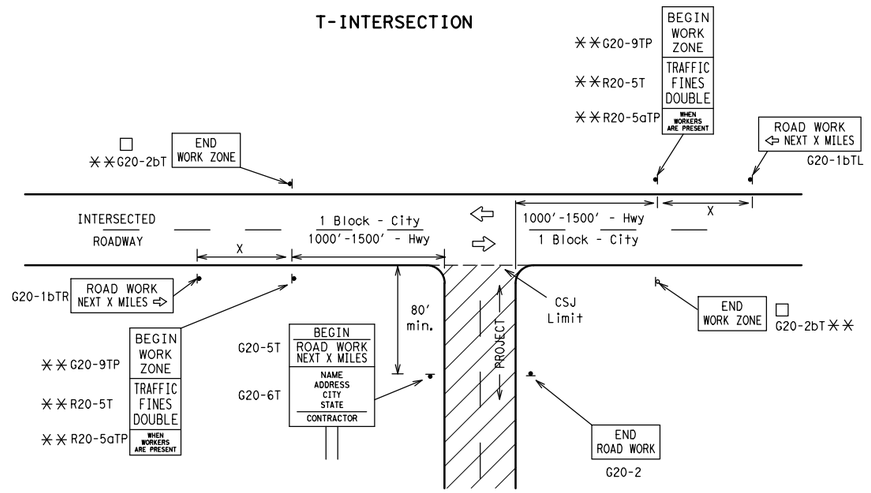
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	*[3]

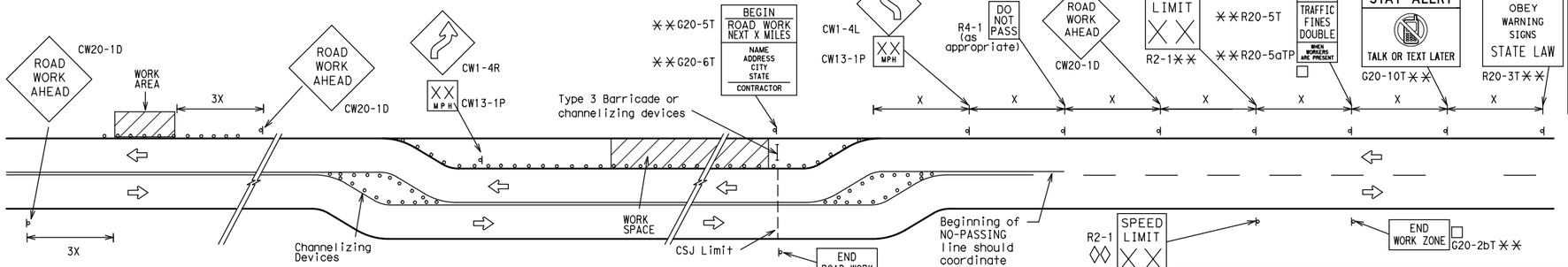
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

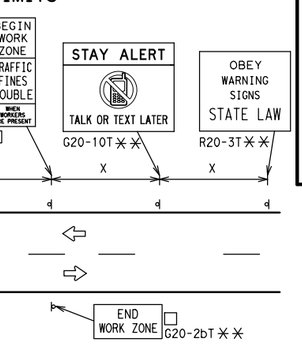
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

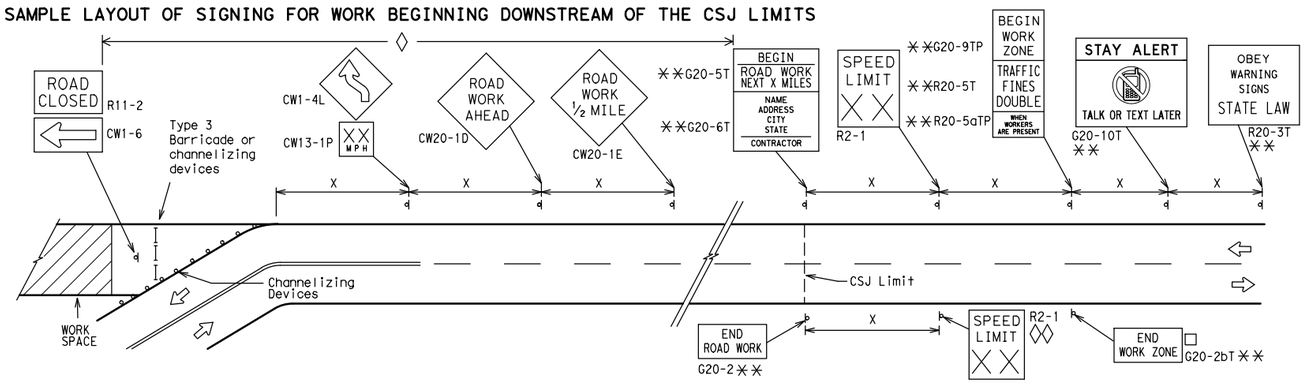


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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REVISIONS	0101	03	120	US 181
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	SAN PATRICIO		10

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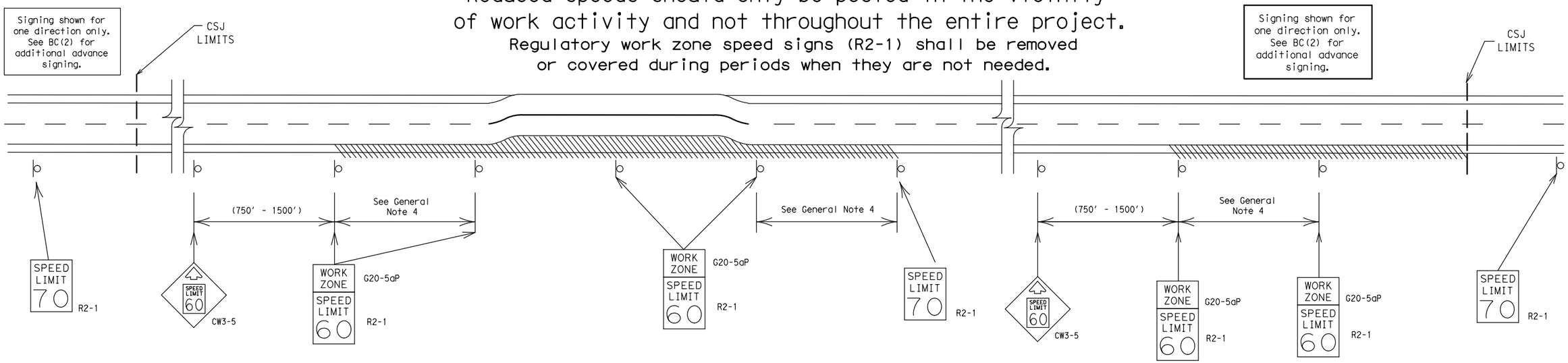
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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	DIST	COUNTY		SHEET NO.
	CRP	SAN PATRICIO		11

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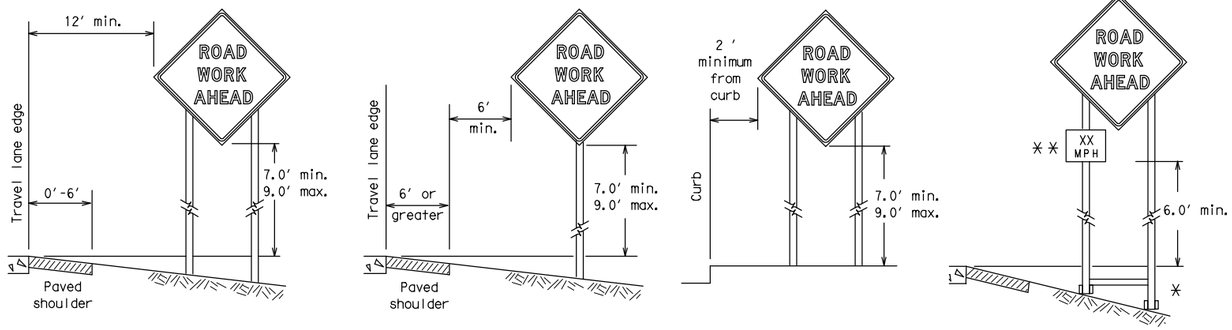
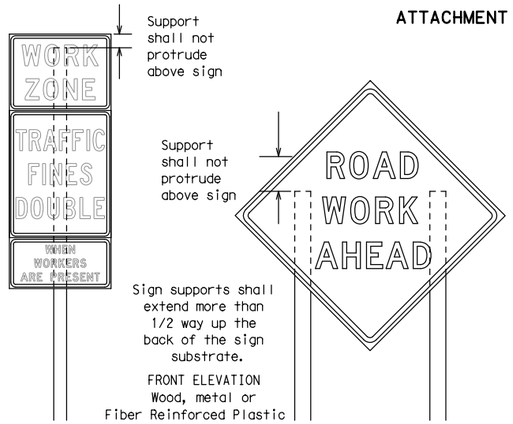
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

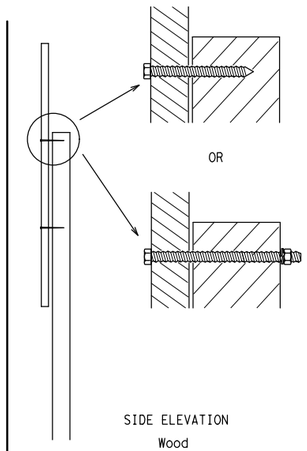


⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⚹⚹ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS





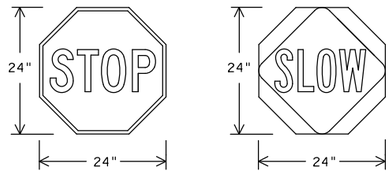
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6′ to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets.The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height,the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		CRP	SAN PATRICIO		12

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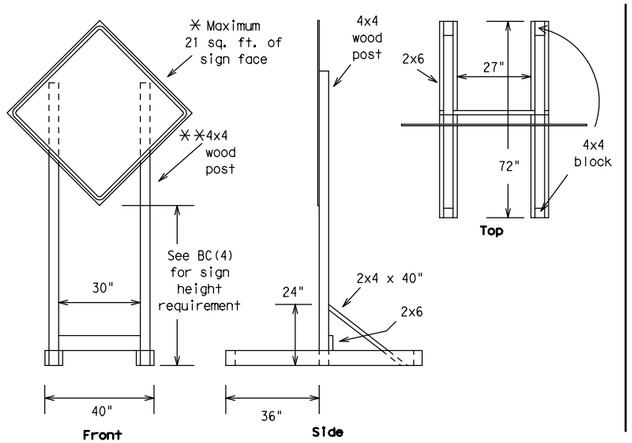
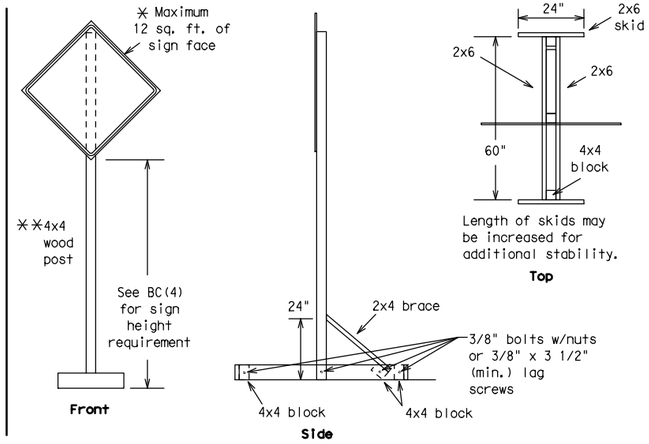
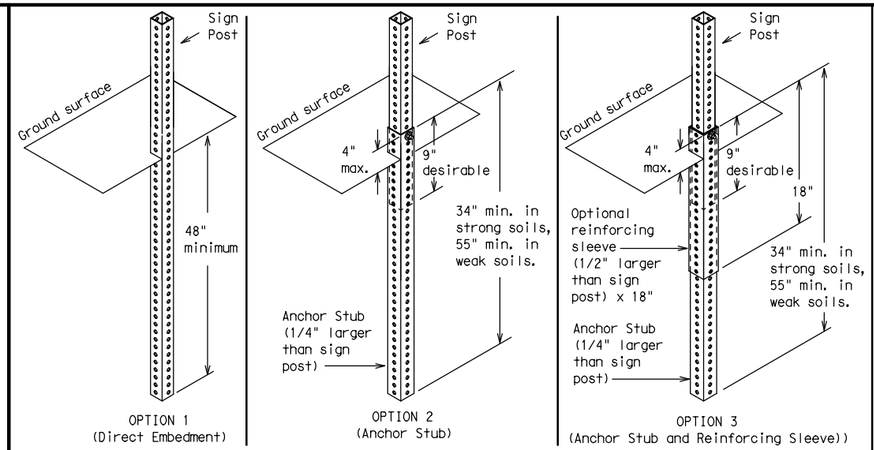




SKID MOUNTED WOOD SIGN SUPPORTS

✳ LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

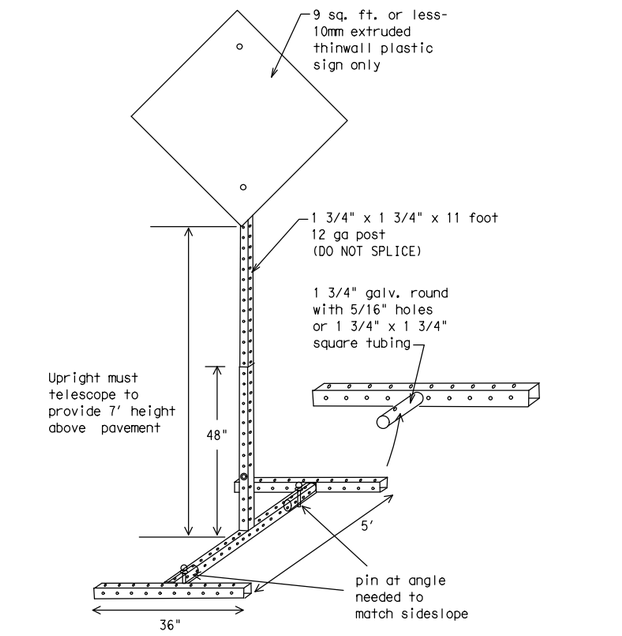


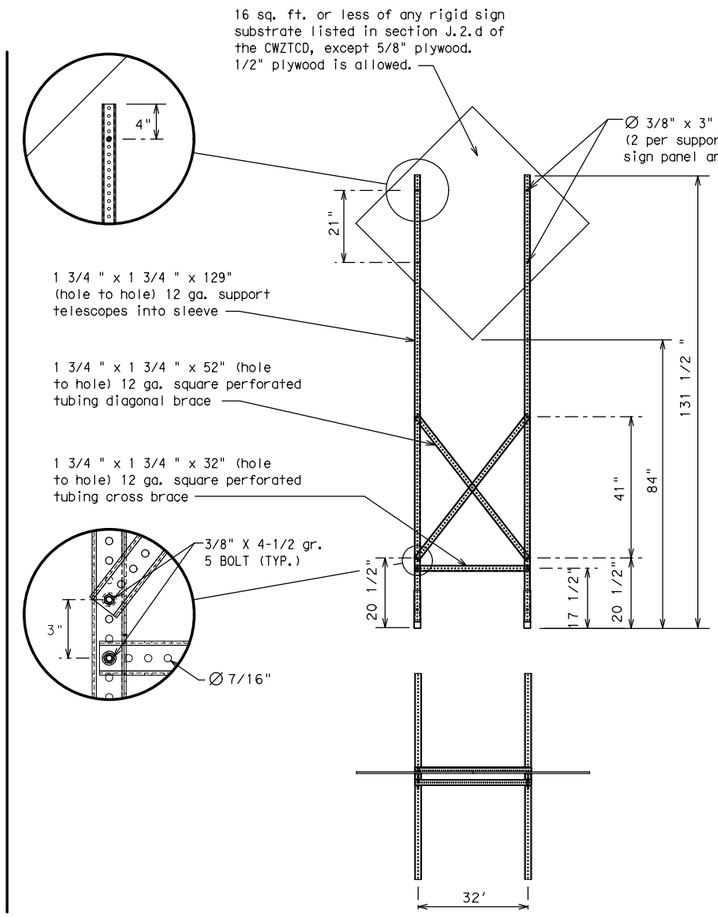
PERFORATED SQUARE METAL TUBING

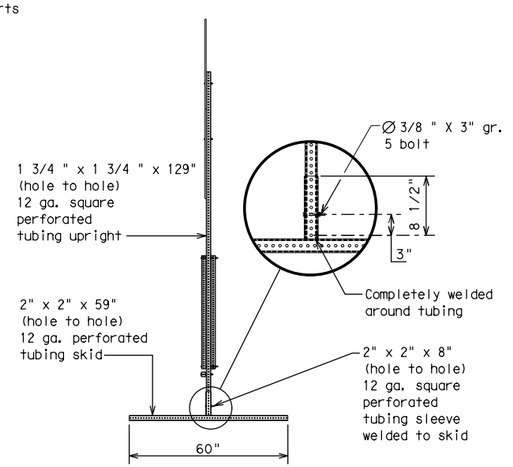
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

✳ LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

✳ See BC(4) for definition of "Work Duration."

✳✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

□ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	SAN PATRICIO		13

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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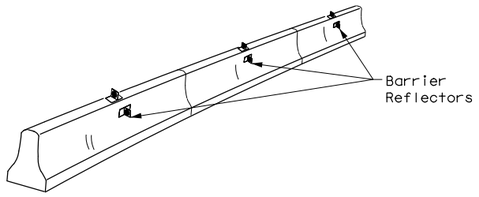
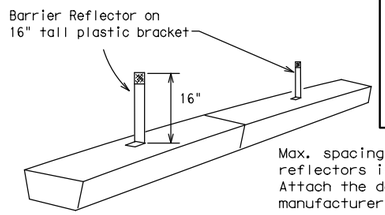
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

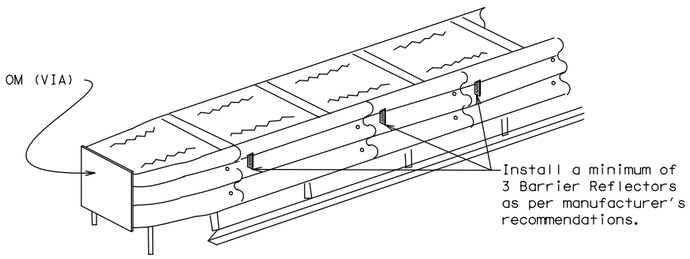


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

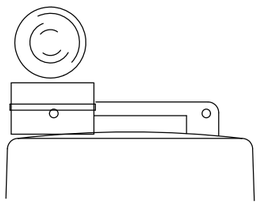


DELINEATION OF END TREATMENTS

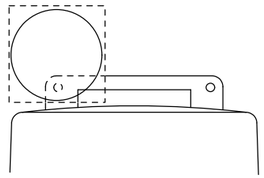
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

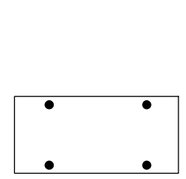
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

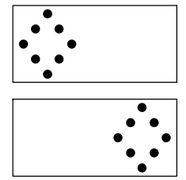
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:

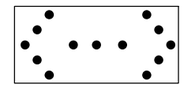


4 CORNER CAUTION

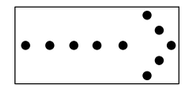
OR



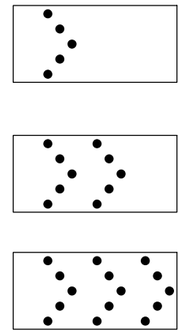
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



RIGHT/LEFT ARROW
(right arrow shown; left is similar)



RIGHT/LEFT SEQUENTIAL CHEVRON
(right chevron shown; left is similar)

5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	SAN PATRICIO		15

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

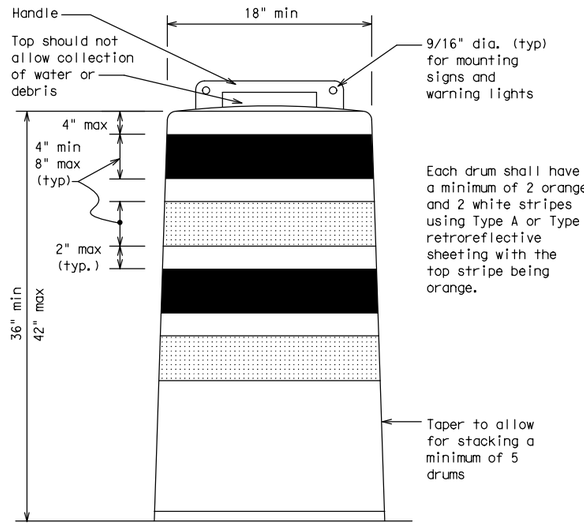
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

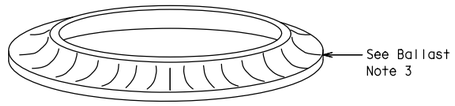
RETROREFLECTIVE SHEETING

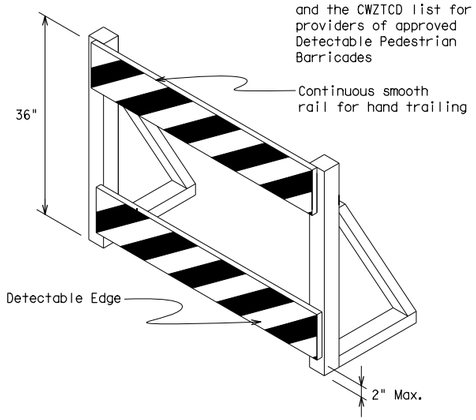
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

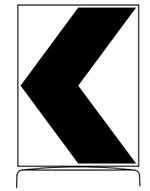




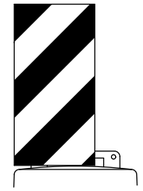


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	CRP	SAN PATRICIO		16
7-13				

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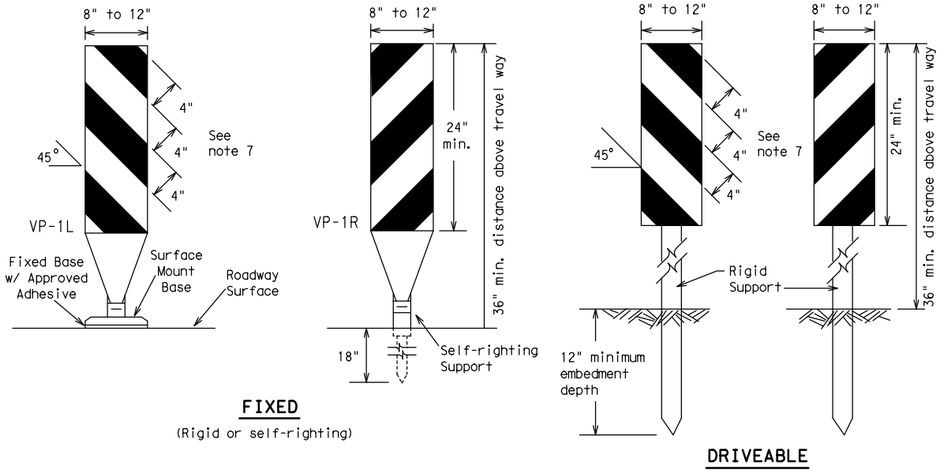
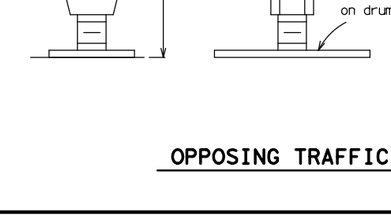


FIXED
(Rigid or self-righting)

DRIVEABLE

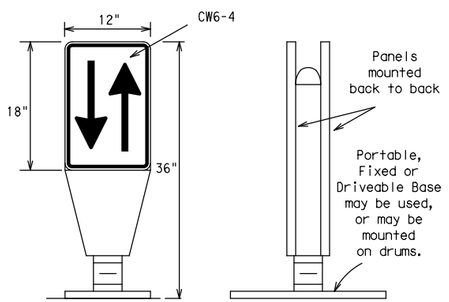


(Rigid or self-righting)

PORTABLE

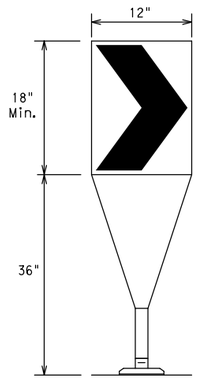
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



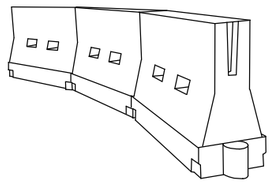
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

** Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	CRP	SAN PATRICIO		17

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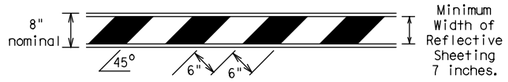
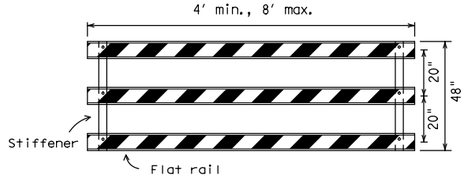
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



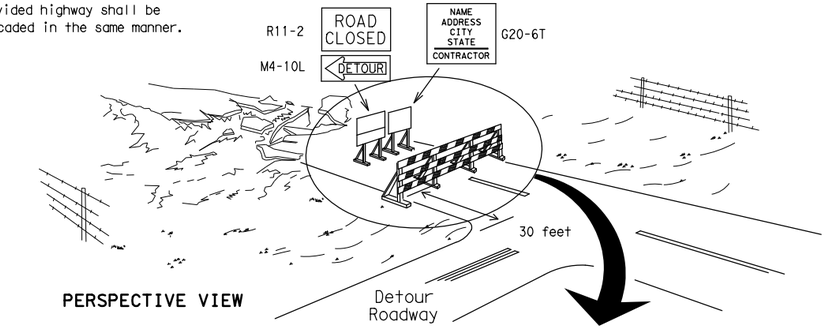
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

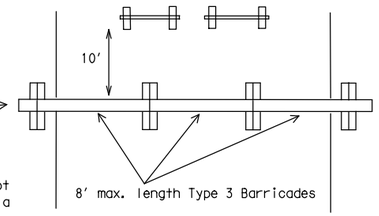
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

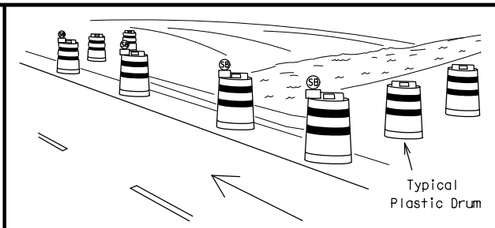
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

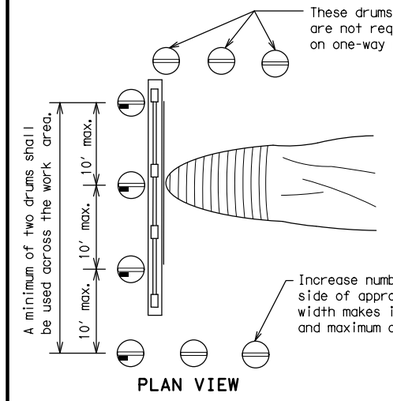
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

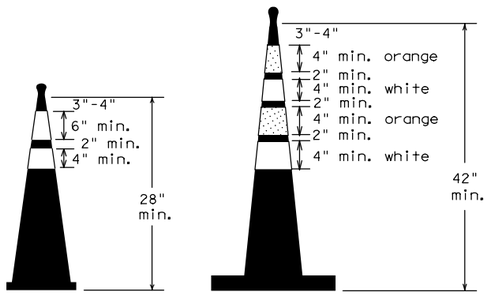
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



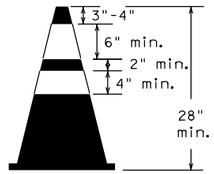
PLAN VIEW

LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

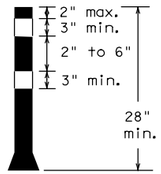
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

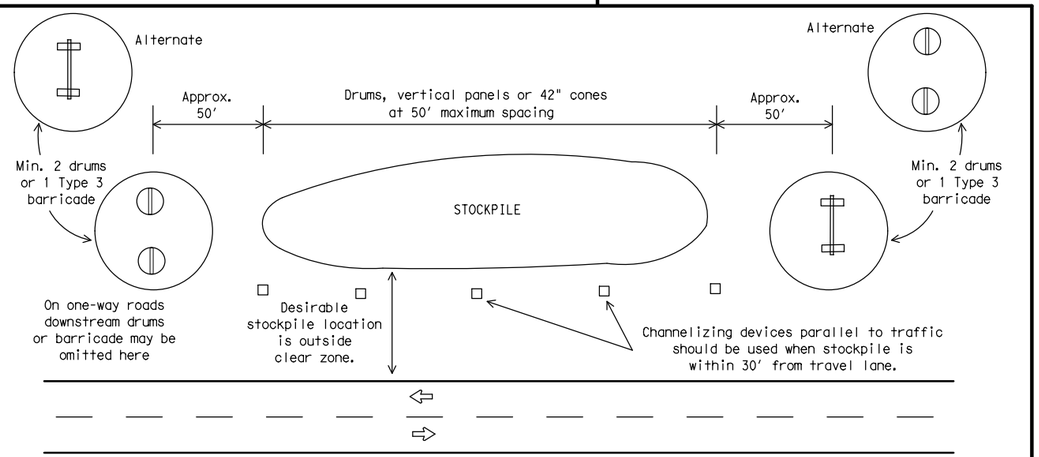


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0101	03	120	US 181
9-07 8-14	DIST	COUNTY		SHEET NO.
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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

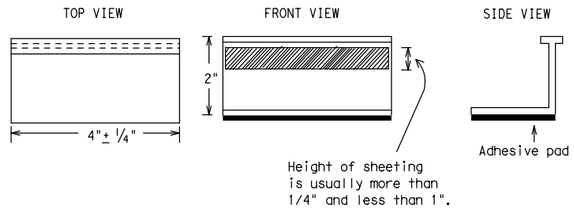
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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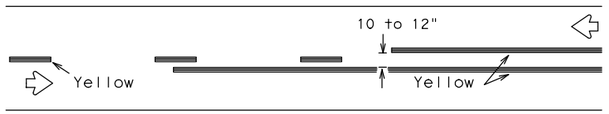
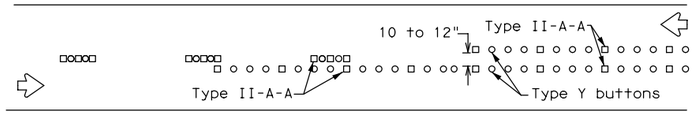
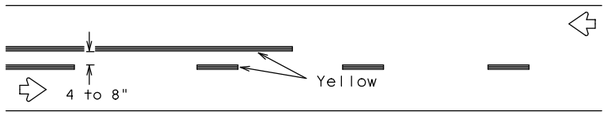
PAVEMENT MARKING PATTERNS



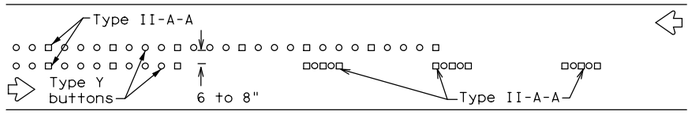
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



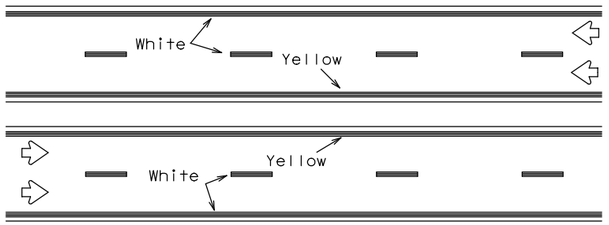
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



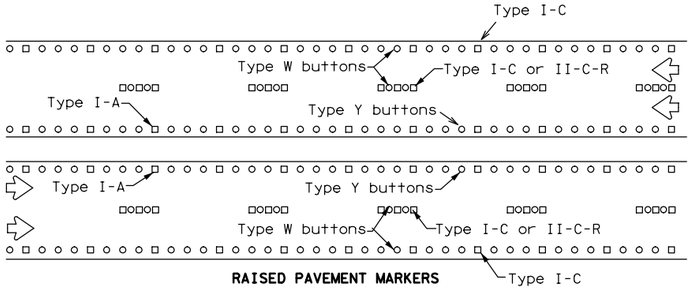
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



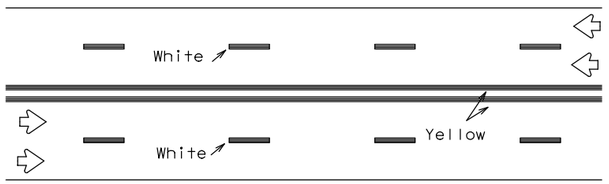
REFLECTORIZED PAVEMENT MARKINGS



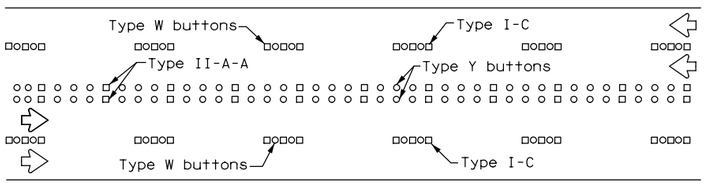
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



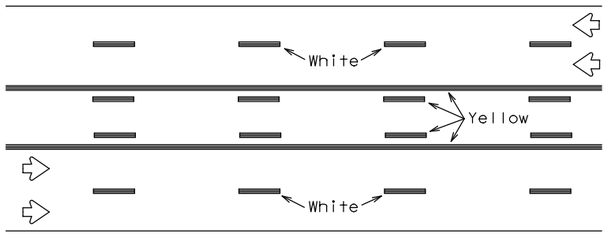
REFLECTORIZED PAVEMENT MARKINGS



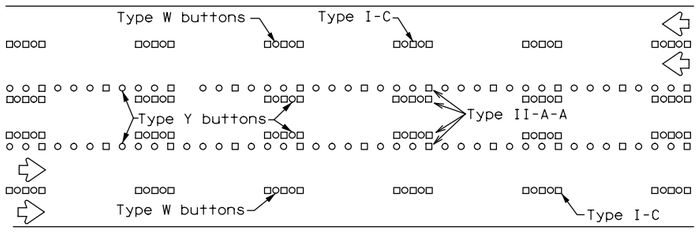
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

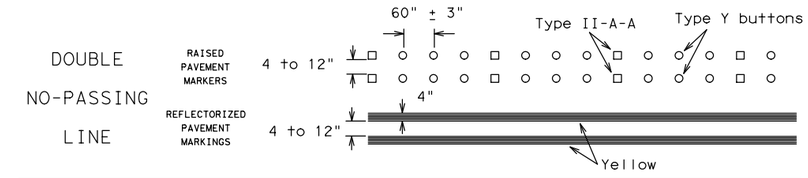
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

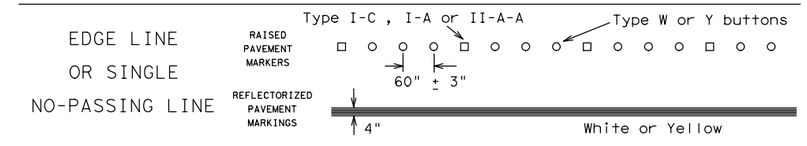
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

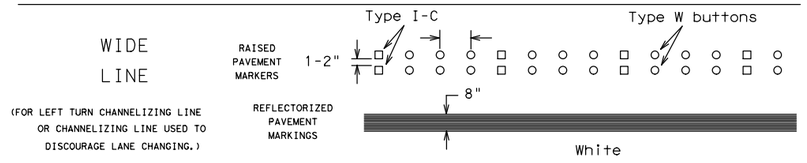


EDGE LINE OR SINGLE NO-PASSING LINE



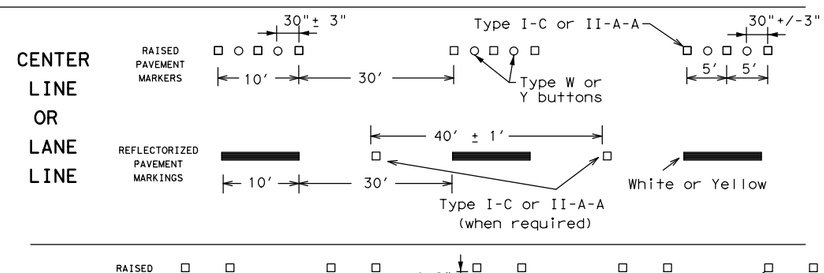
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

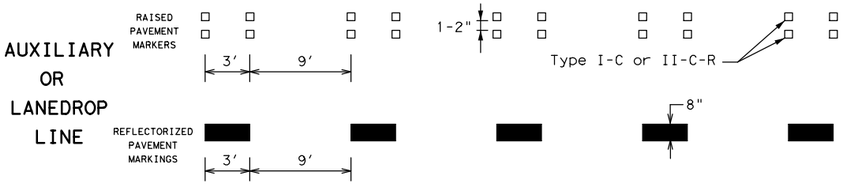


BROKEN LINES

CENTER LINE OR LANE LINE

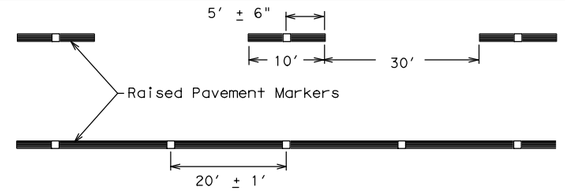


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0101	03	120	US 181
	DIST	COUNTY		SHEET NO.
	CRP	SAN PATRICIO		20

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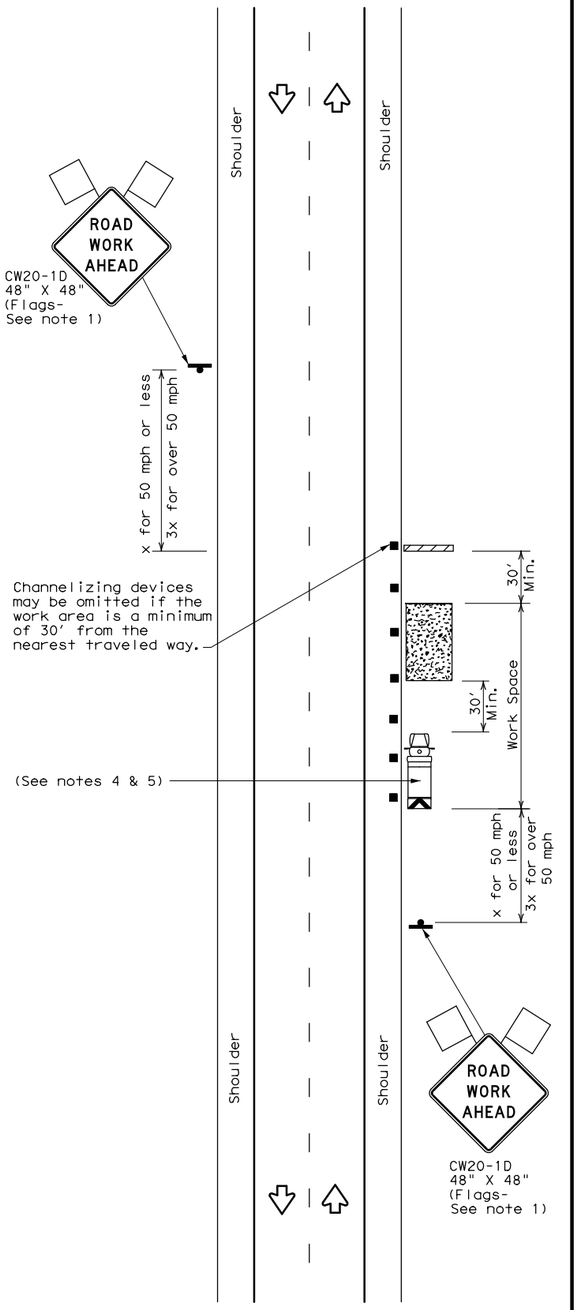
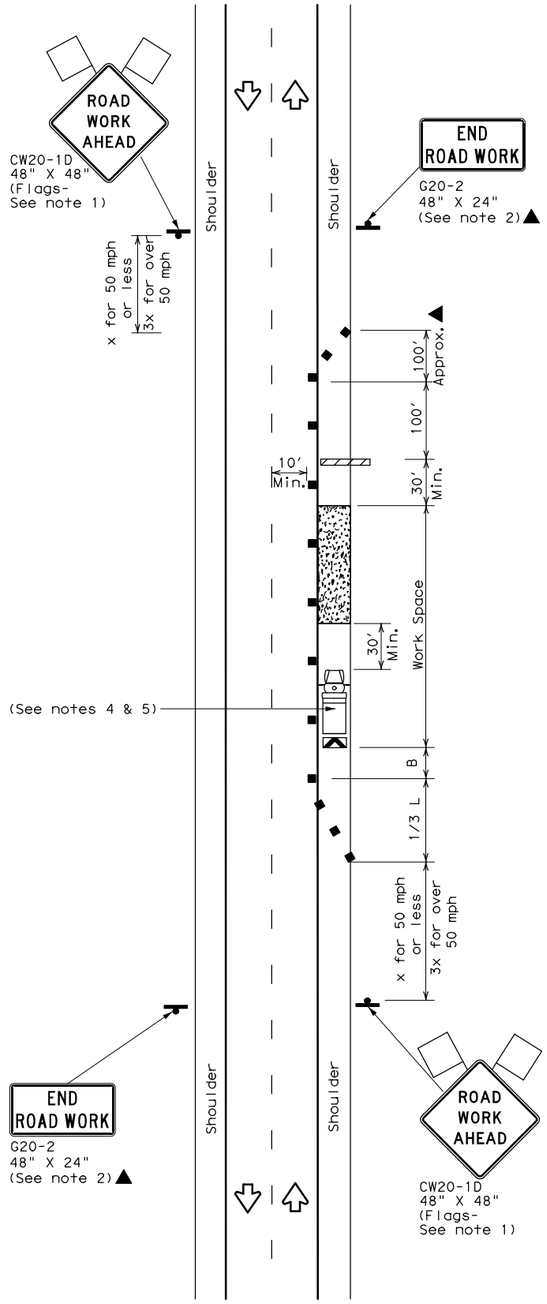


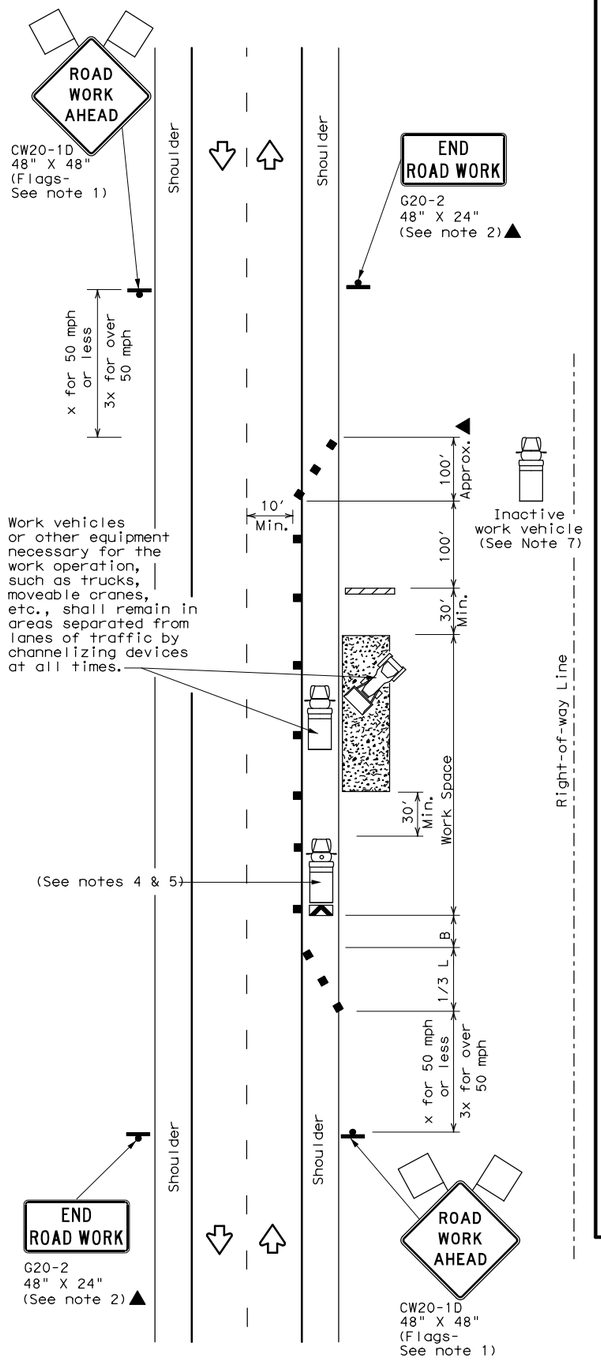
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	CRP	SAN PATRICIO		21
1-97 2-18				

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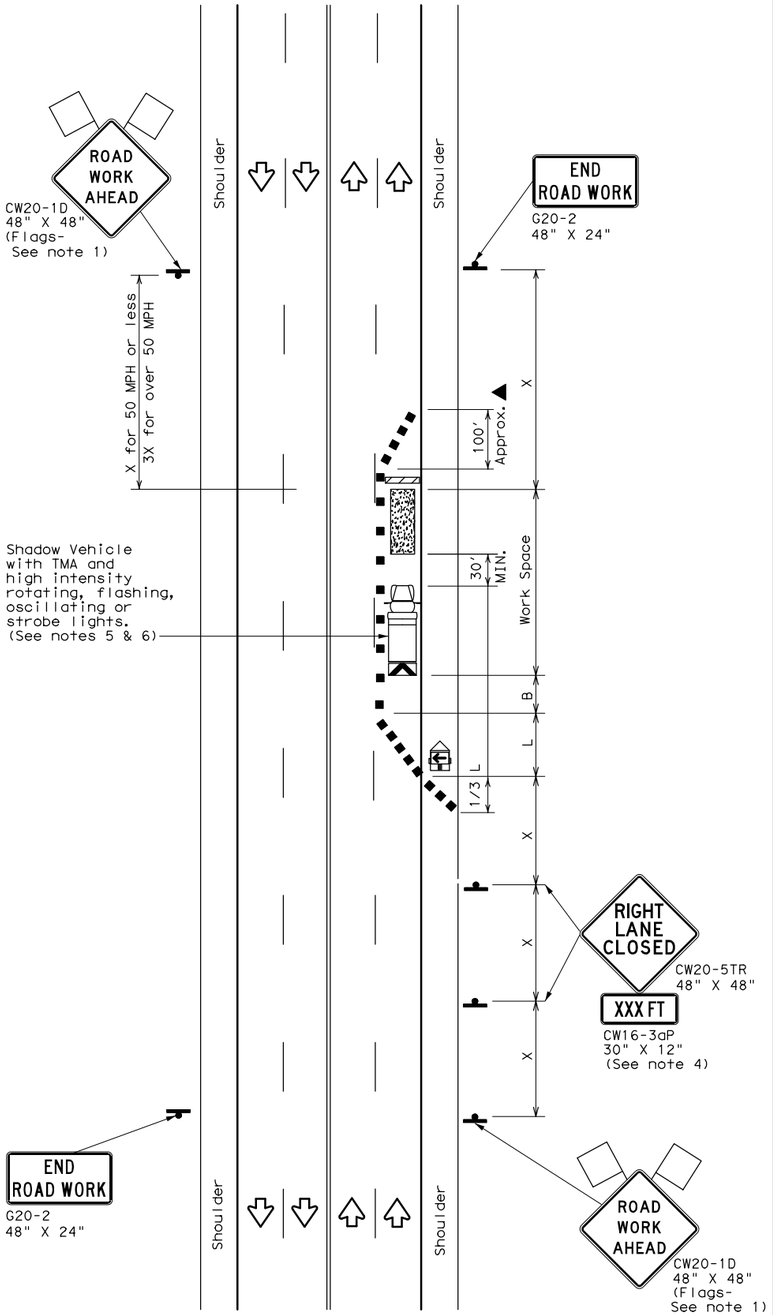
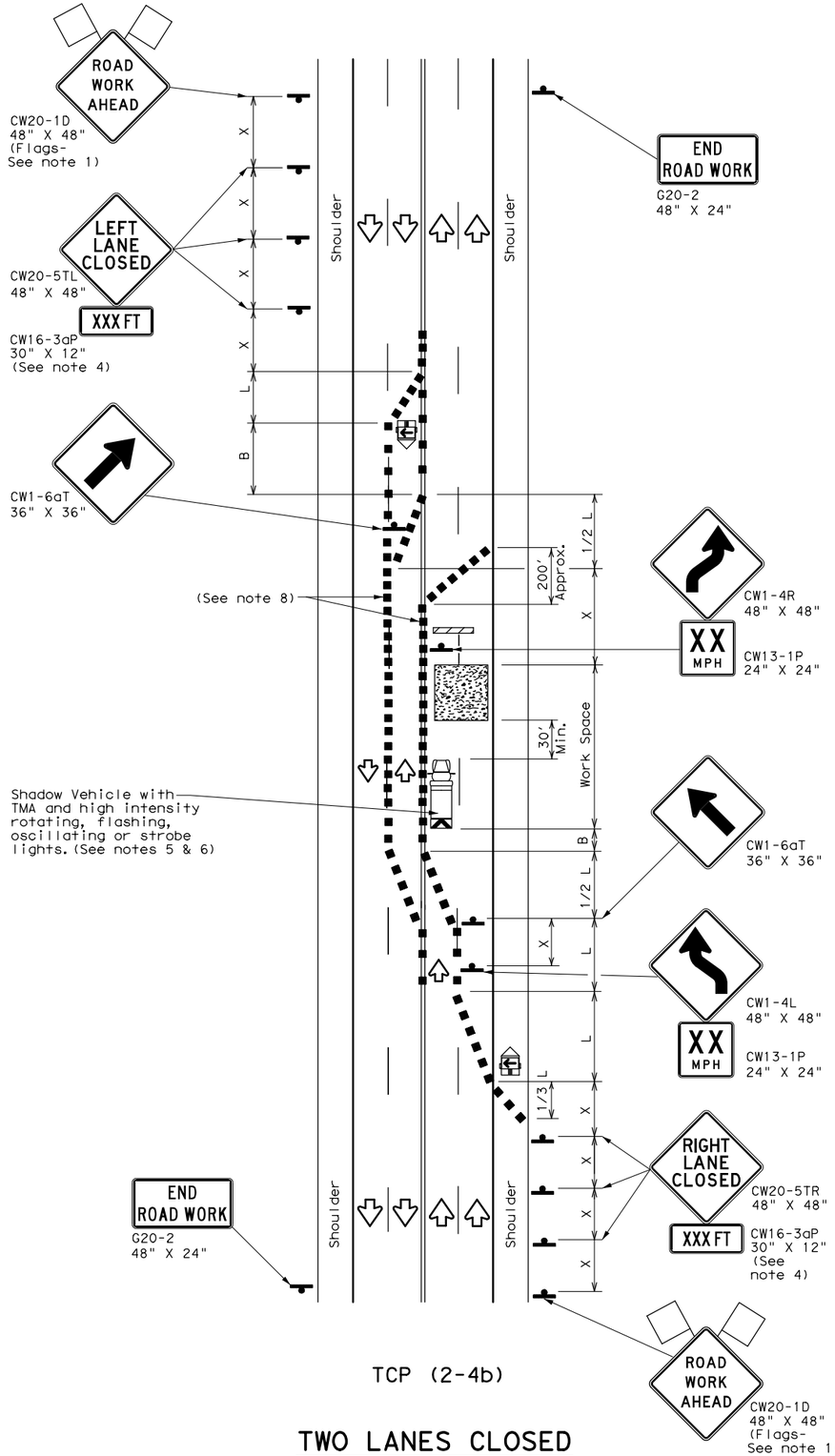


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′	120′	90′
35		205′	225′	245′	35′	70′	160′	120′
40		265′	295′	320′	40′	80′	240′	155′
45	L=WS	450′	495′	540′	45′	90′	320′	195′
50		500′	550′	600′	50′	100′	400′	240′
55		550′	605′	660′	55′	110′	500′	295′
60		600′	660′	720′	60′	120′	600′	350′
65		650′	715′	780′	65′	130′	700′	410′
70		700′	770′	840′	70′	140′	800′	475′
75		750′	825′	900′	75′	150′	900′	540′

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓	✓	

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20′ or 15′ if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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1-97 2-12	CRP	SAN PATRICIO		22
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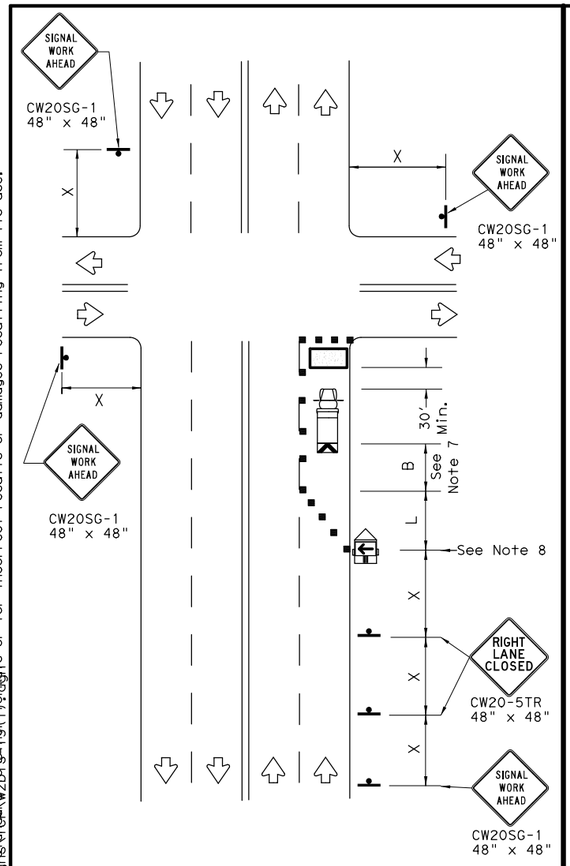
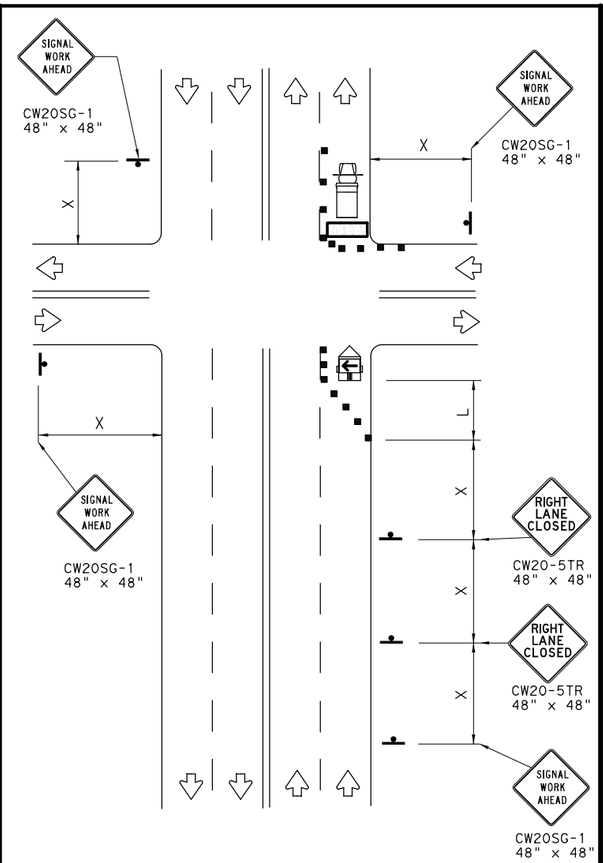


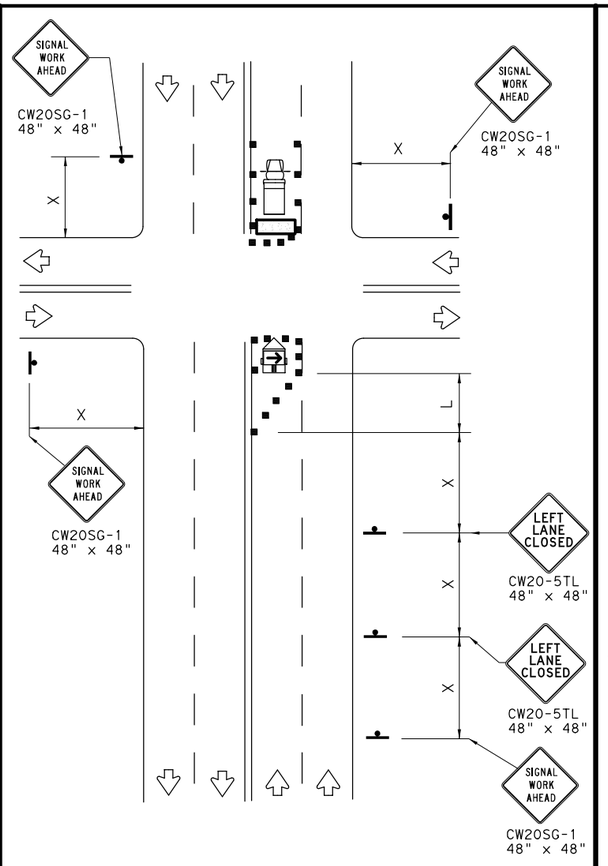
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



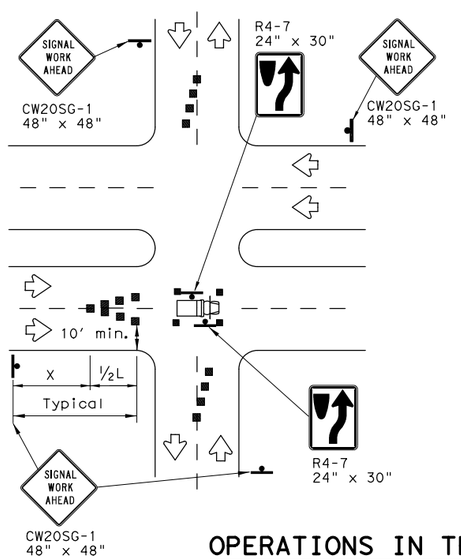
FAR SIDE RIGHT LANE CLOSURE

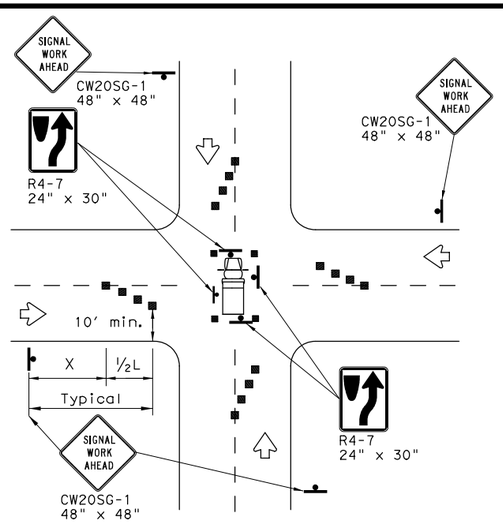
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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4-98 3-03	CRP	SAN PATRICIO		23

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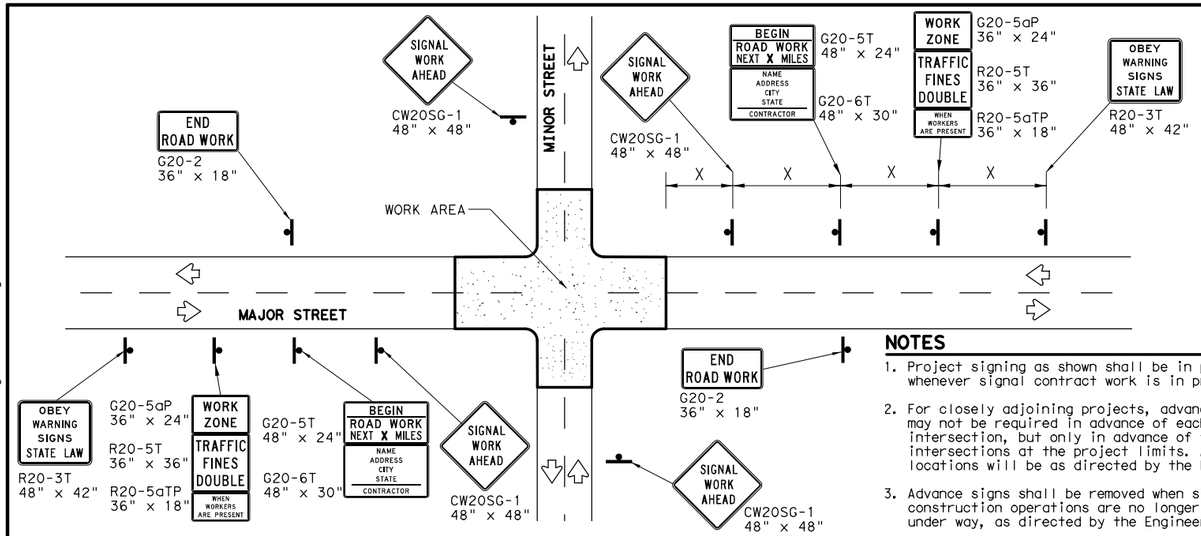


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

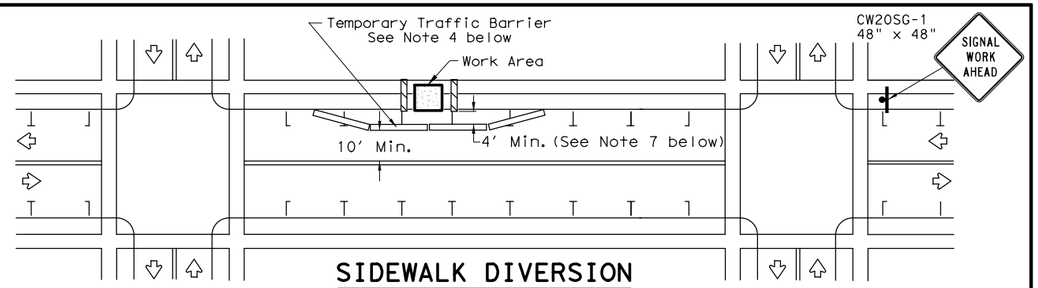
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fastners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

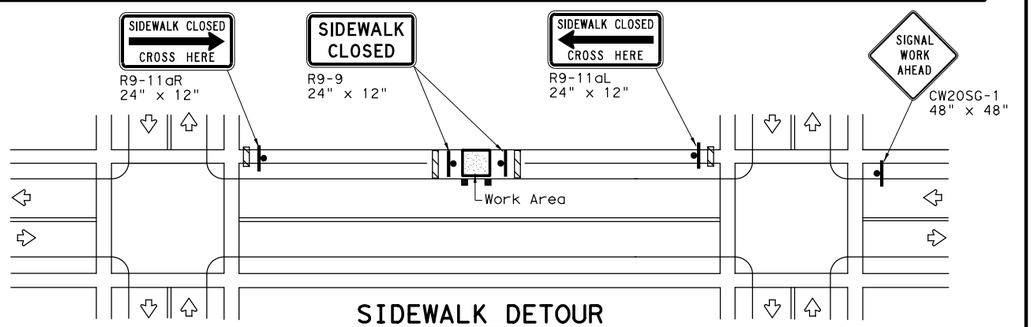
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

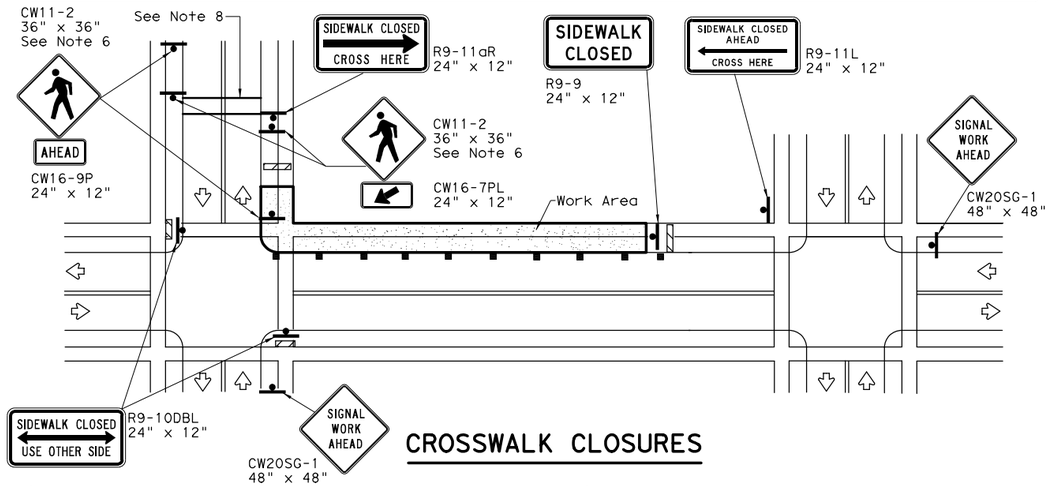
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

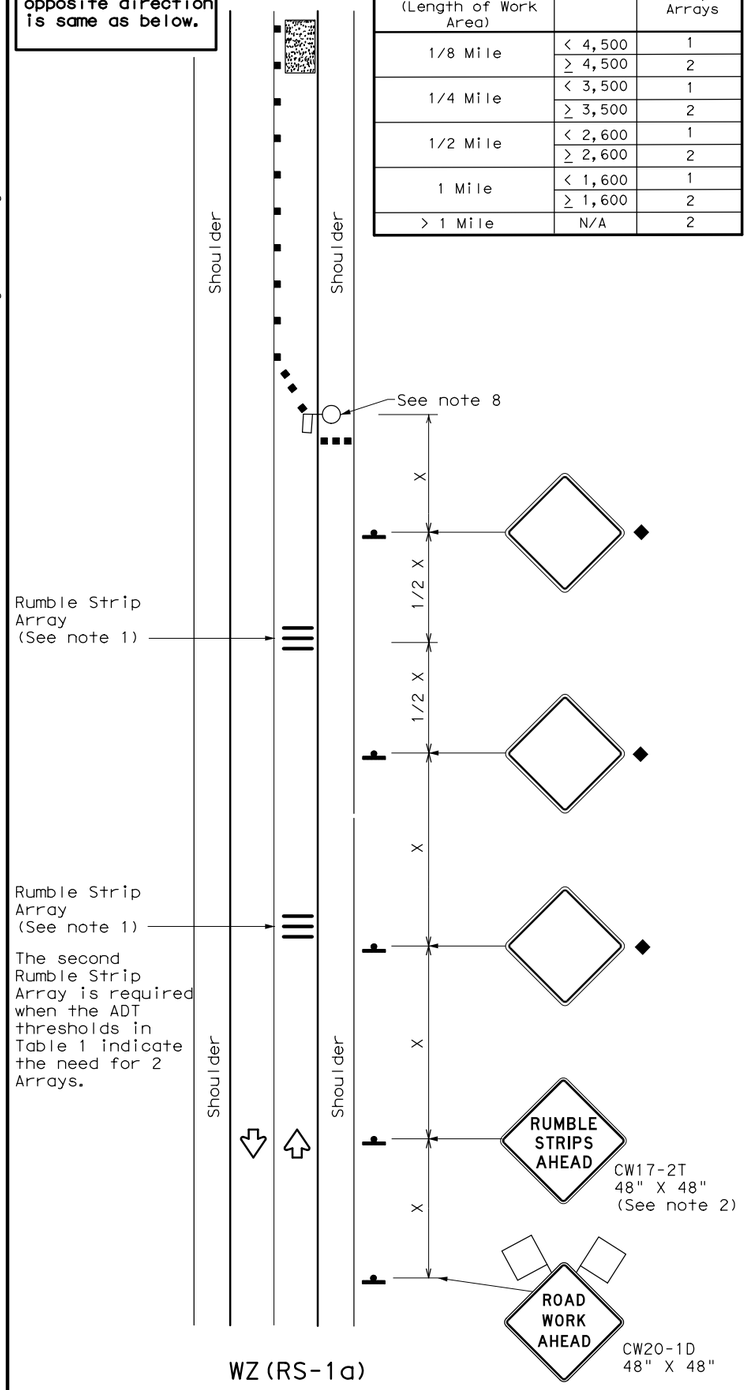
WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	CRP	SAN PATRICIO		24

DATE:
FILE:

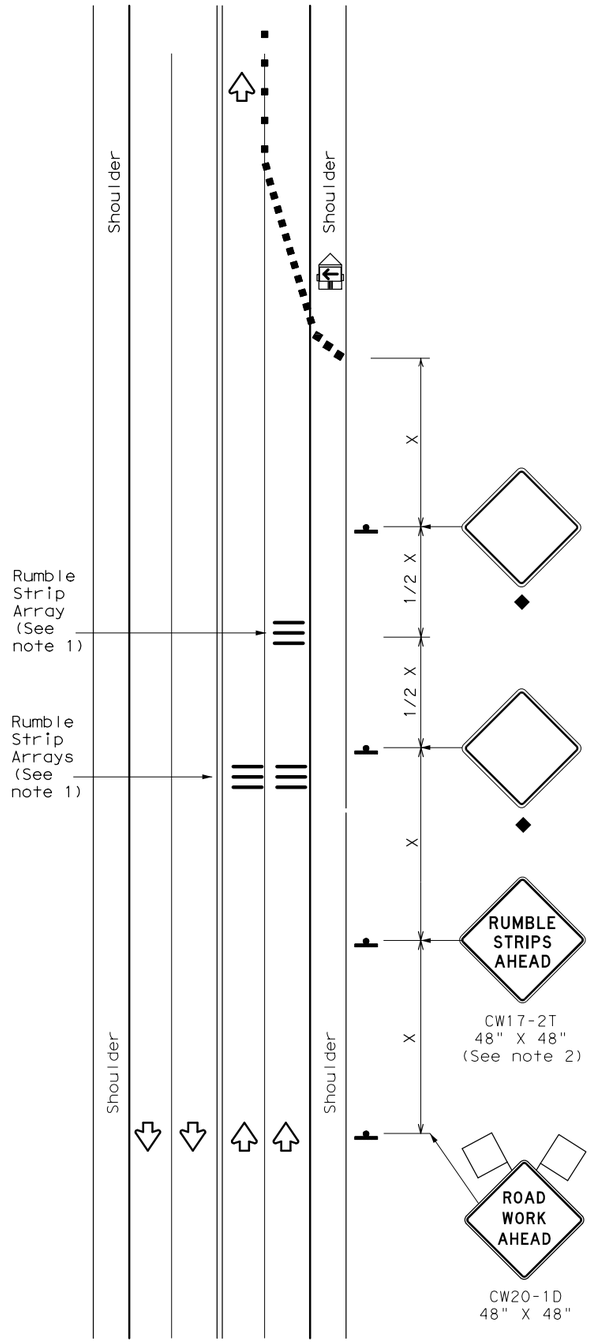
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Remove Temporary Rumble Strips before removing the advanced warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed ⁎	Formula	Minimum Desirable Taper Lengths ⁎⁎ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′	120′	90′
35		205′	225′	245′	35′	70′	160′	120′
40		265′	295′	320′	40′	80′	240′	155′
45	L=WS	450′	495′	540′	45′	90′	320′	195′
50		500′	550′	600′	50′	100′	400′	240′
55		550′	605′	660′	55′	110′	500′	295′
60		600′	660′	720′	60′	120′	600′	350′
65		650′	715′	780′	65′	130′	700′	410′
70		700′	770′	840′	70′	140′	800′	475′
75		750′	825′	900′	75′	150′	900′	540′

⁎ Conventional Roads Only

⁎⁎ Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT)
S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

⁎ For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10′
> 40 MPH & ≤ 55 MPH	15′
= 60 MPH	20′
≥ 65 MPH	⁎ 35′+

Texas Department of Transportation

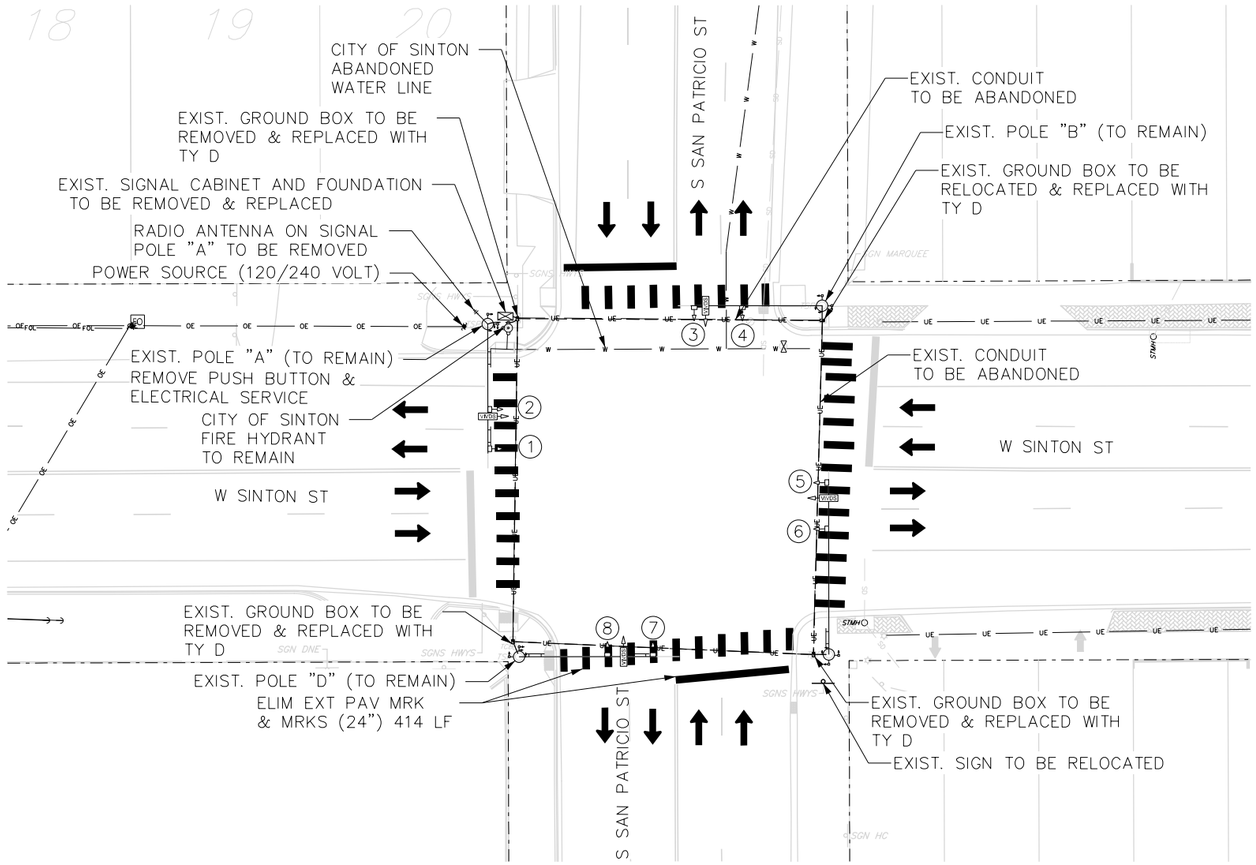
Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
2-14 1-22	DIST	COUNTY		SHEET NO.
4-16	CRP	SAN PATRICIO		25

117



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LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OVERHEAD POWER LINE
- UNDERGROUND ELECTRIC
- STORM DRAIN
- WATER LINE
- GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTROLLER CABINET SHALL BE RETURNED TO TXDOT.

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

ALL VIVDS DETECTORS TO BE REMOVED AND REPLACED WITH RADAR DETECTORS.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20′ 40′
SCALE: 1" = 40′

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT SAN PATRICIO ST CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	26

USER: kegrelliano
3:51:05 PM
04/05/2024
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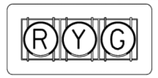
NOTES:

CONTRACTOR TO PROVIDE AND INSTALL THE FOLLOWING EQUIPMENT: ELECTRONIC LOCK, SMART MMU, CONTROLLER, AND CABINET. CELLULAR ROUTERS WILL BE PROVIDED BY THE DISTRICT AND INSTALLED BY THE CONTRACTOR.

THE CONTRACTOR SHALL TERMINATE ALL ETHERNET DEVICES INCLUDING TRAFFIC SIGNAL CONTROLLER, (MMU) MALFUNCTION MONITOR UNIT, (APS) ACCESSIBLE PEDESTRIAN SYSTEM CONTROLLER UNIT, AND DETECTION DEVICES TO THE CELLULAR ROUTER. USE THE FOLLOWING TRAFFIC SIGNAL NETWORK COLOR SCHEME:
BLUE – TRAFFIC SIGNAL CONTROLLER
GREEN – MALFUNCTION MONITOR UNIT (MMU)
YELLOW – ACCESSIBLE PEDESTRIAN SYSTEM (APS)
BLACK – DETECTION

THE CELLULAR ROUTERS WILL BE CONFIGURED BY TXDOT, HOWEVER THE CONTRACTOR SHALL BE ON SITE AS NECESSARY FOR FINAL ROUTER ACCEPTANCE.

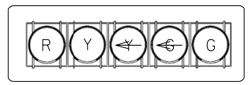
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

2 3 4 5 6 8

QTY: 6

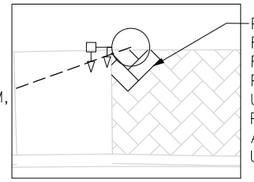


12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

1 7

QTY: 2

PAVER DETAIL



PAVERS WITHIN PROPOSED PED POLE FOUNDATION AREA ARE TO BE REMOVED WITH CARE. REUSE EXISTING PAVERS IF IN GOOD CONDITION OR USE NEW PAVERS IF NECESSARY. POWER SAW TO CUT PAVERS TO FIT ANY CREATED GAPS. WORK IS COVERED UNDER BID CODE 528.

RADAR DETECTOR SHALL BE MOUNTED PER MANUFACTURER RECOMMENDATION AND MOUNTING LOCATION WILL BE VERIFIED BY THE TRAFFIC ENGINEER REPRESENTATIVE BEFORE THEY ARE INSTALLED.

ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

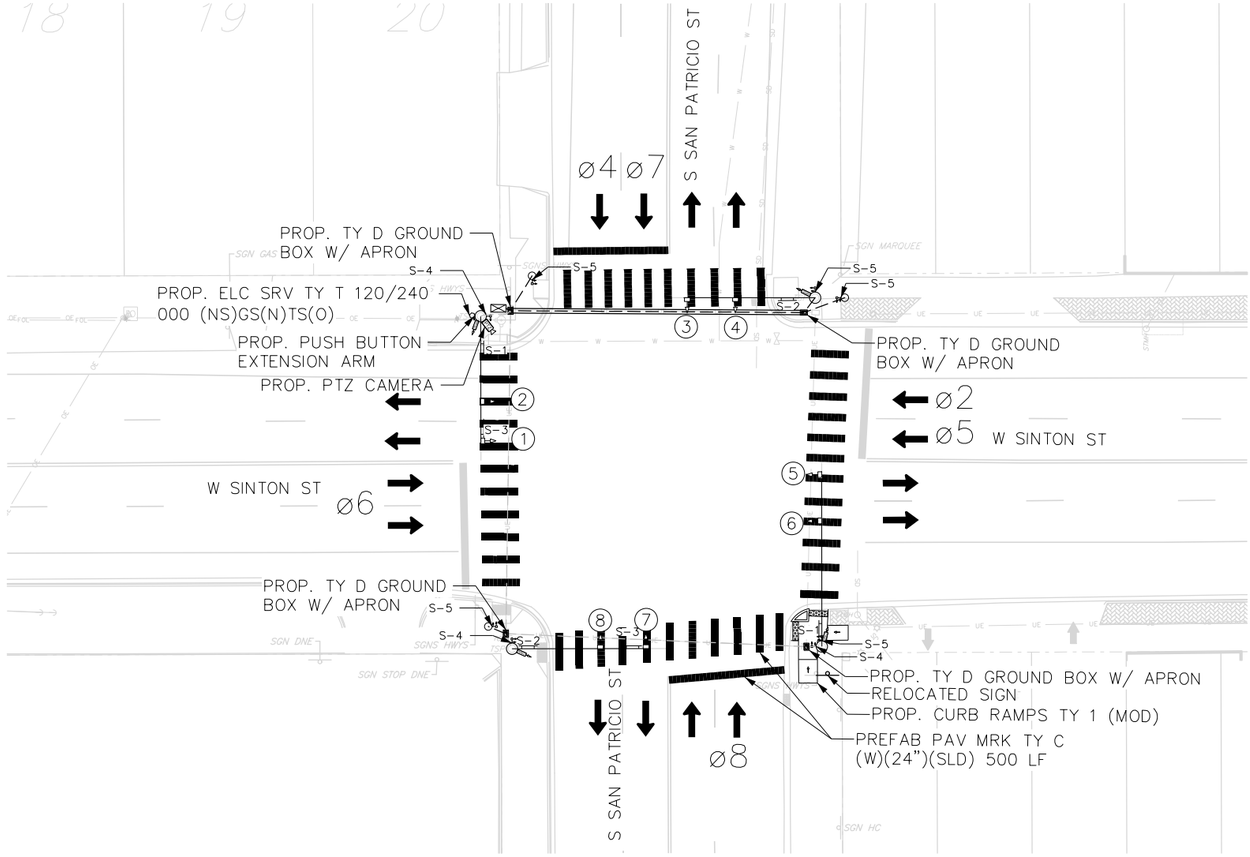
2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

PHASE DIAGRAM

NOT IN USE ø1	PED ø2	NOT IN USE ø3	PED ø4
ø5	PED ø6	ø7	PED ø8

CONFLICT FLASH: RED ALL PHASES



S-4

R10-3eL 9"X15"

QTY: 3

S-5

R10-3eR 9"X15"

QTY: 5

S-1

San Patricio St

QTY: 2

S-2

Sinton St

QTY: 2

S-3

R10-12 30"X36"

QTY: 2

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA

NOTES:

RADARS SHALL BE MOUNTED ON TRAFFIC SIGNAL POLE AND MAST ARMS AS SHOWN. CORD GRIP CONNECTORS SHALL BE USED AT WIRE OUTLETS FOR CAMERA AND RADAR CABLES.

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBLITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416.
CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.

0 20' 40'

SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood

Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com

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TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT SAN PATRICIO ST PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	27

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NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

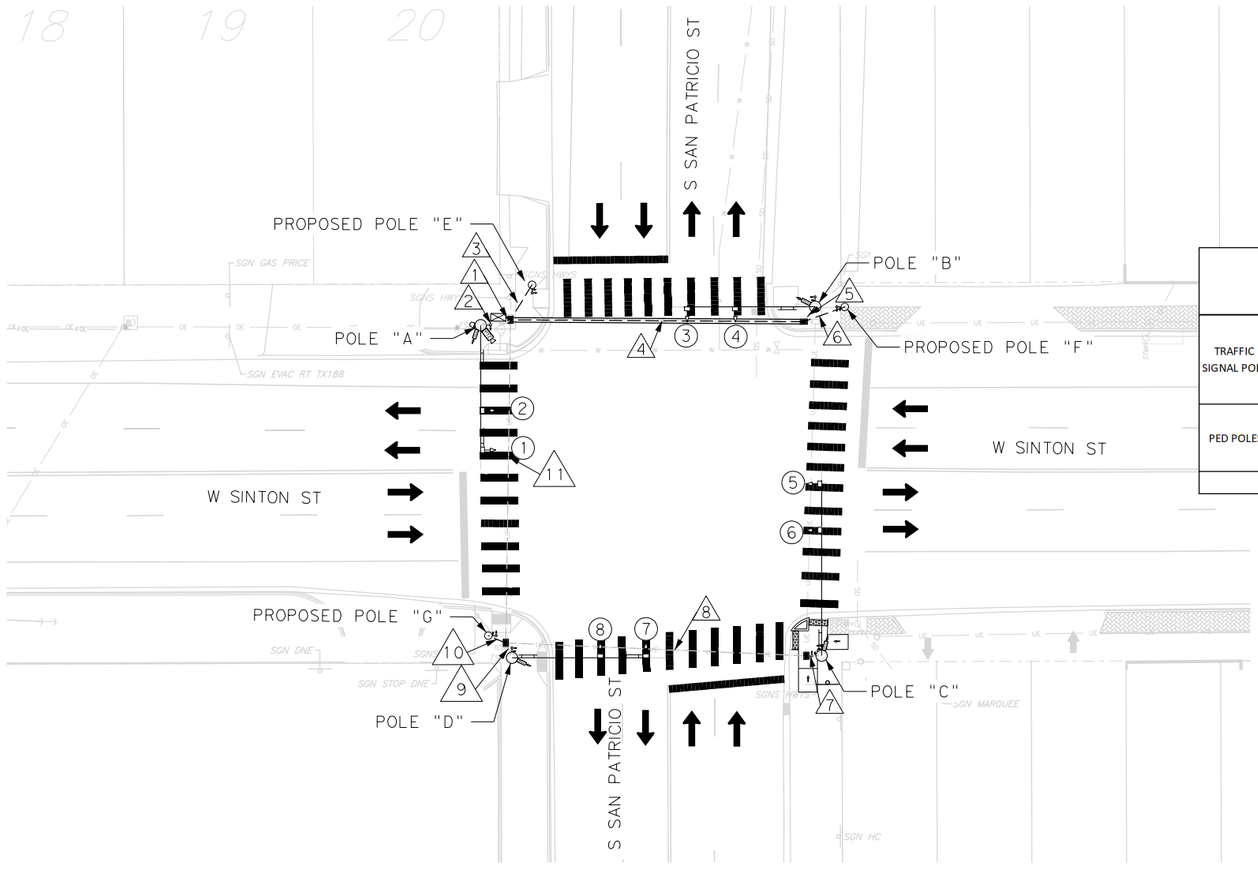
ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	34	
HEAD 2	23	
RADAR		5
POLE B		
HEAD 3	34	
HEAD 4	21	
RADAR		5
POLE C		
HEAD 5	45	
HEAD 6	33	
RADAR		5
POLE D		
HEAD 7	35	
HEAD 8	23	
RADAR		5
TOTAL	248	20

	INSIDE POLES	#14 AWG (TY A) 7/C		#14 AWG (TY A) 5/C		#14 AWG (TY C) 2/C		RADAR CABLE		CAMERA CAT5-E
			(FT)		(FT)		(FT)		(FT)	(FT)
TRAFFIC SIGNAL POLE	POLE A	2	20	1	10	1	6	1	20	30
	POLE B	2	20	1	10	1	6	1	20	
	POLE C	2	20	2	10	2	6	1	20	
	POLE D	2	20	1	10	1	6	1	20	
PED POLES	POLE E			1	10	1	6			
	POLE F			1	10	1	6			
	POLE G			1	10	1	6			
	TOTAL	160		80		48		80		30

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (LF)	9 LENGTH (LF)	10 LENGTH (LF)	11 LENGTH (LF)
	EXISTING 2" CONDUIT											
	EXISTING 3" CONDUIT		1 15			1 10		1 5		1 5		
	EXISTING 4" CONDUIT								1 80			1 90
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 5	1 15									
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)			1 15			1 15				1 5	
0618-6033	CONDT (PVS) (SCH 40) (4") (TRENCH)	2 5										
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)				1 80							
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 5	1 15	1 15	1 80	1 10	1 15	1 5	1 80	1 5	1 5	1 90
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 5	1 15									
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 5	2 15									
0684-6031	5/C #14 AWG CABLE (PED HEAD)	2 5			1 80		1 15				1 5	1 90
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4 5	1 15		1 80	1 10		1 5	1 80	1 5		2 90
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8 5	1 15	1 15	2 80	1 10	1 15	2 5	2 80	1 5	1 5	4 90
	RADAR CONTROL CABLE	4 5	1 15		1 80	1 10		1 5	1 80	1 5		2 90
	CAT5-E CAMERA CABLE	1 5	1 15									

STATE OF TEXAS
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PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

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SINTON ST AT SAN PATRICIO ST CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	28

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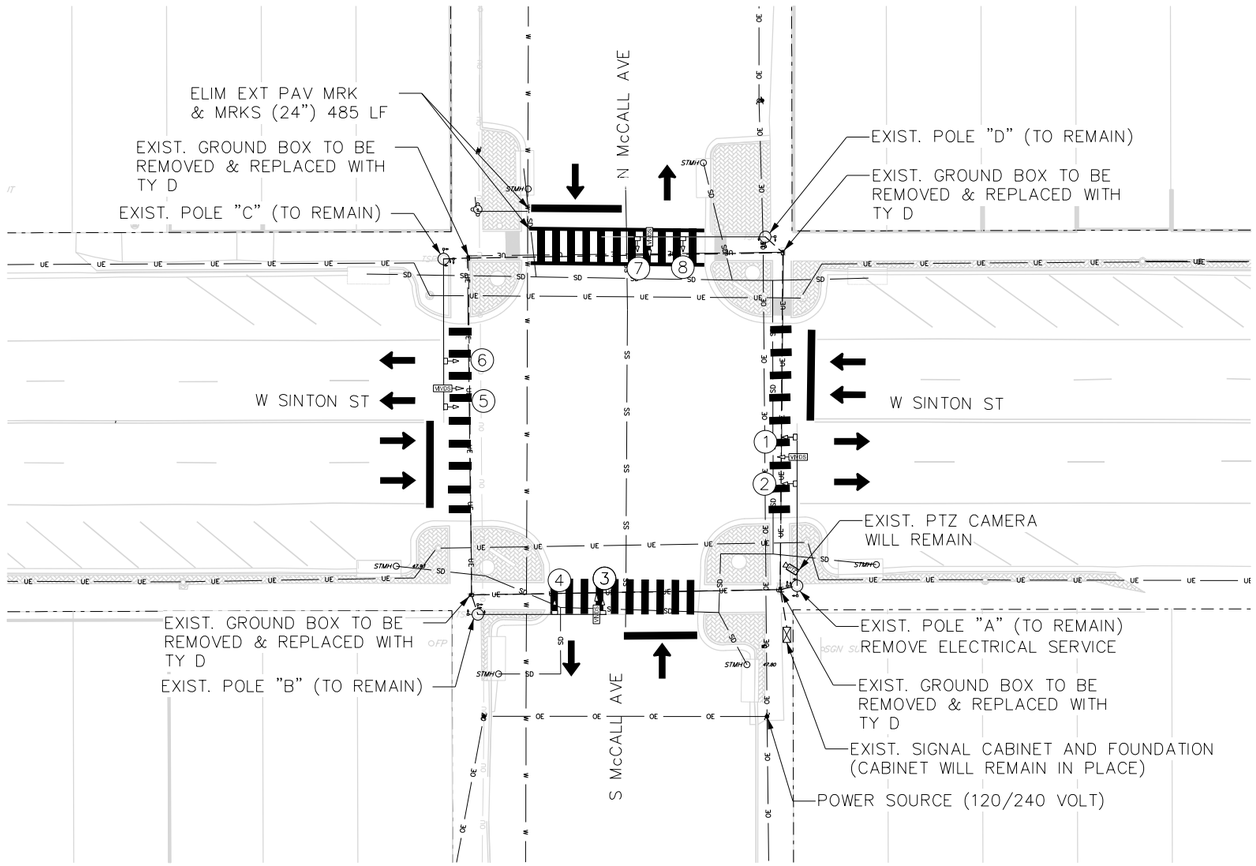

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LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
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STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

Carl B. Laferney

0 20' 40'

SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

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SINTON ST AT McCALL AVE CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	29

USER: kgarellano
3:51:26 PM
04/05/2024
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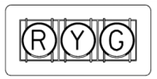
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS
WITH BACKPLATES, (VENT) ALUM,
AND RETROREFLECTIVE BORDER

(1) (2) (3) (4)

(5) (6) (7) (8)

QTY: 8

PHASE DIAGRAM

NOT IN USE ø1	PED ø2	NOT IN USE ø3	PED ø4
NOT IN USE ø5	PED ø6	NOT IN USE ø7	PED ø8

CONFLICT FLASH: RED ALL PHASES

S-1

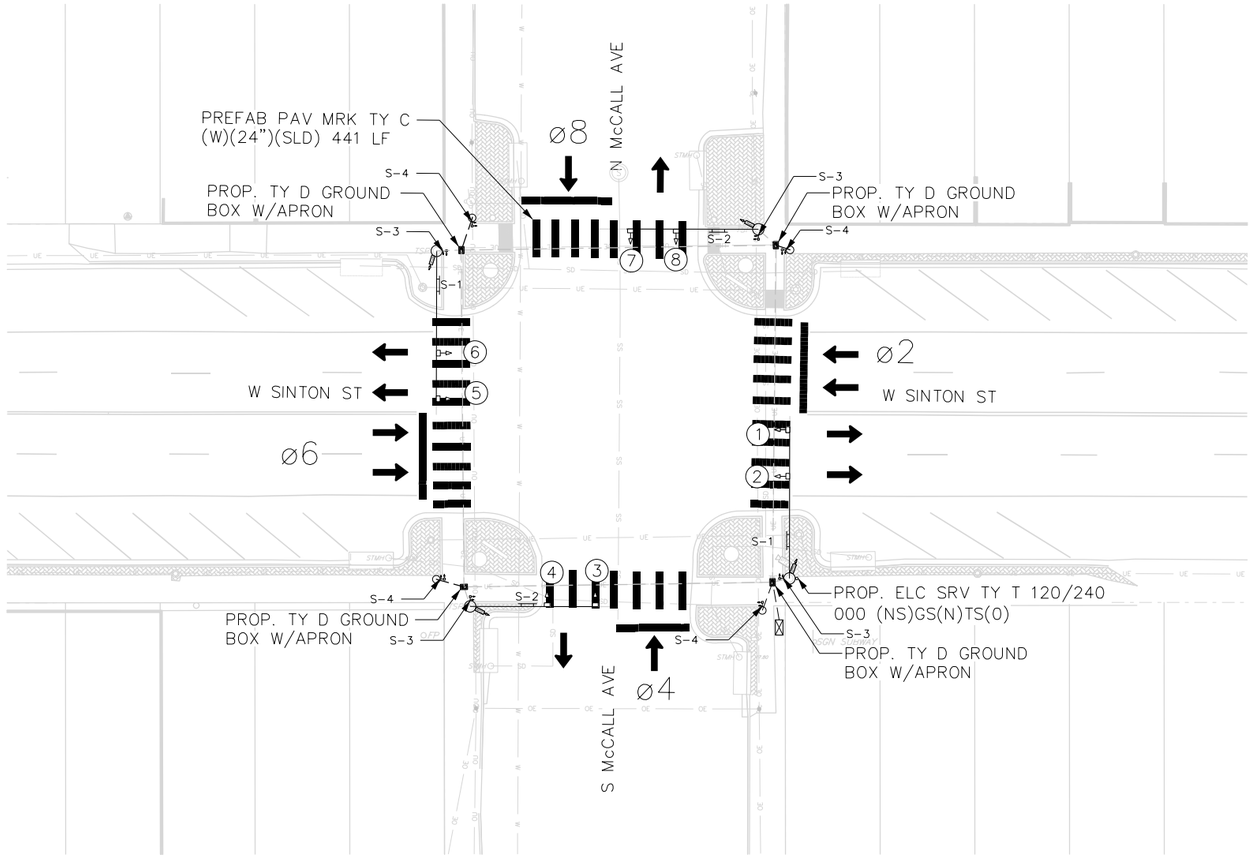
McCall Ave

QTY: 2

S-2

Sinton St

QTY: 2



RADAR DETECTOR SHALL BE MOUNTED PER MANUFACTURER RECOMMENDATION AND MOUNTING LOCATION WILL BE VERIFIED BY THE TRAFFIC ENGINEER REPRESENTATIVE BEFORE THEY ARE INSTALLED.

ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

S-3

R10-3eL
9"X15"

QTY: 4

S-4

R10-3eR
9"X15"

QTY: 4

0 20' 40'

SCALE: 1" = 40'

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA

NOTES:

RADARS SHALL BE MOUNTED ON TRAFFIC SIGNAL POLE AND MAST ARMS AS SHOWN. CORD GRIP CONNECTORS SHALL BE USED AT WIRE OUTLETS FOR CAMERA AND RADAR CABLES.

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBLITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416.
CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.
CONTRACTOR TO PROVIDE AND INSTALL ELECTRONIC LOCK ON THE CABINET.

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT McCALL AVE PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	30

NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

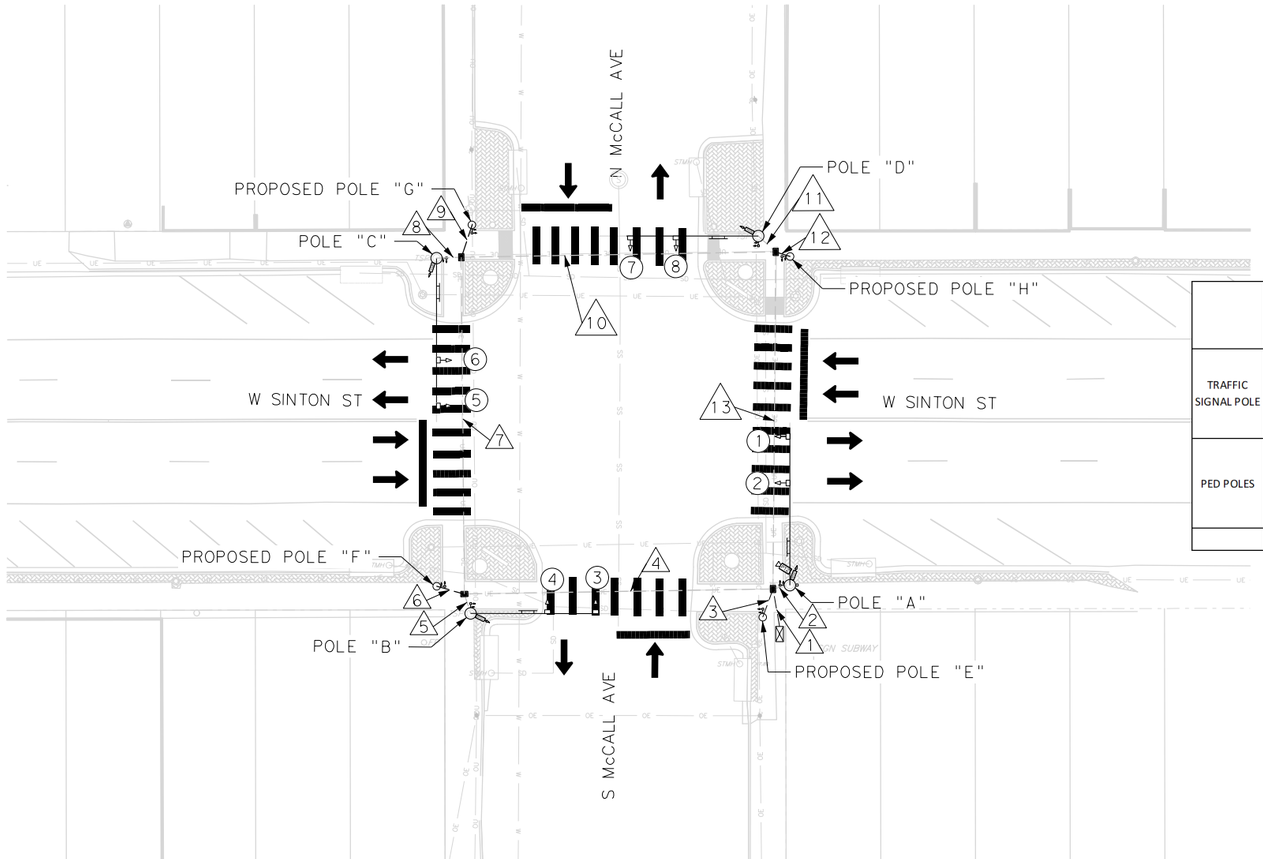
ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	39	
HEAD 2	27	
RADAR		5
POLE B		
HEAD 3	33	
HEAD 4	20	
RADAR		5
POLE C		
HEAD 5	39	
HEAD 6	27	
RADAR		5
POLE D		
HEAD 7	34	
HEAD 8	22	
RADAR		5
TOTAL	241	20

	INSIDE POLES	#14 AWG (TY A) 7/C		#14 AWG (TY A) 5/C		#14 AWG (TY C) 2/C		RADAR CABLE		CAMERA CAT5-E
			(FT)		(FT)		(FT)		(FT)	(FT)
TRAFFIC SIGNAL POLE	POLE A	2	20	1	10	1	6	1	20	30
	POLE B	2	20	1	10	1	6	1	20	
	POLE C	2	20	1	10	1	6	1	20	
	POLE D	2	20	1	10	1	6	1	20	
PED POLES	POLE E			1	10	1	6			
	POLE F			1	10	1	6			
	POLE G			1	10	1	6			
	POLE H			1	10	1	6			
	TOTAL	160		80		48		80		30

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (iLF)	9 LENGTH (LF)	10 LENGTH (LF)	11 LENGTH (LF)	12 LENGTH (LF)	13 LENGTH (LF)
	EXISTING 2" CONDUIT													
	EXISTING 3" CONDUIT		1 10			1 10			1 10			1 10		
	EXISTING 4" CONDUIT				1 85			1 90			1 85			1 90
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 15	1 10											
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)			1 10			1 10			1 10			1 5	
618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	2 15												
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)													
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 15	1 10	1 10	1 85	1 10	1 10		1 10	1 10	1 85	1 10	1 5	1 90
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 15	1 10											
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 15	2 10											
0684-6031	5/C #14 AWG CABLE (PED HEAD)	4 15		1 10	1 85		1 10			1 10	1 85		1 5	2 90
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4 15	1 10		1 85	1 10			1 10		1 85	1 10		2 90
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8 15	1 10	1 10	2 85	1 10	1 10		1 10	1 10	2 85	1 10	1 5	4 90
	RADAR CONTROL CABLE	4 15	1 10		1 85	1 10			1 10		1 85	1 10		2 90
	CAT5-E CAMERA CABLE	1 15	1 10											

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

Carl B. Laferney

0 20' 40'

SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 100743-01

SINTON ST AT McCALL AVE CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	31

USER: kgarelli.gno
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04/05/2024
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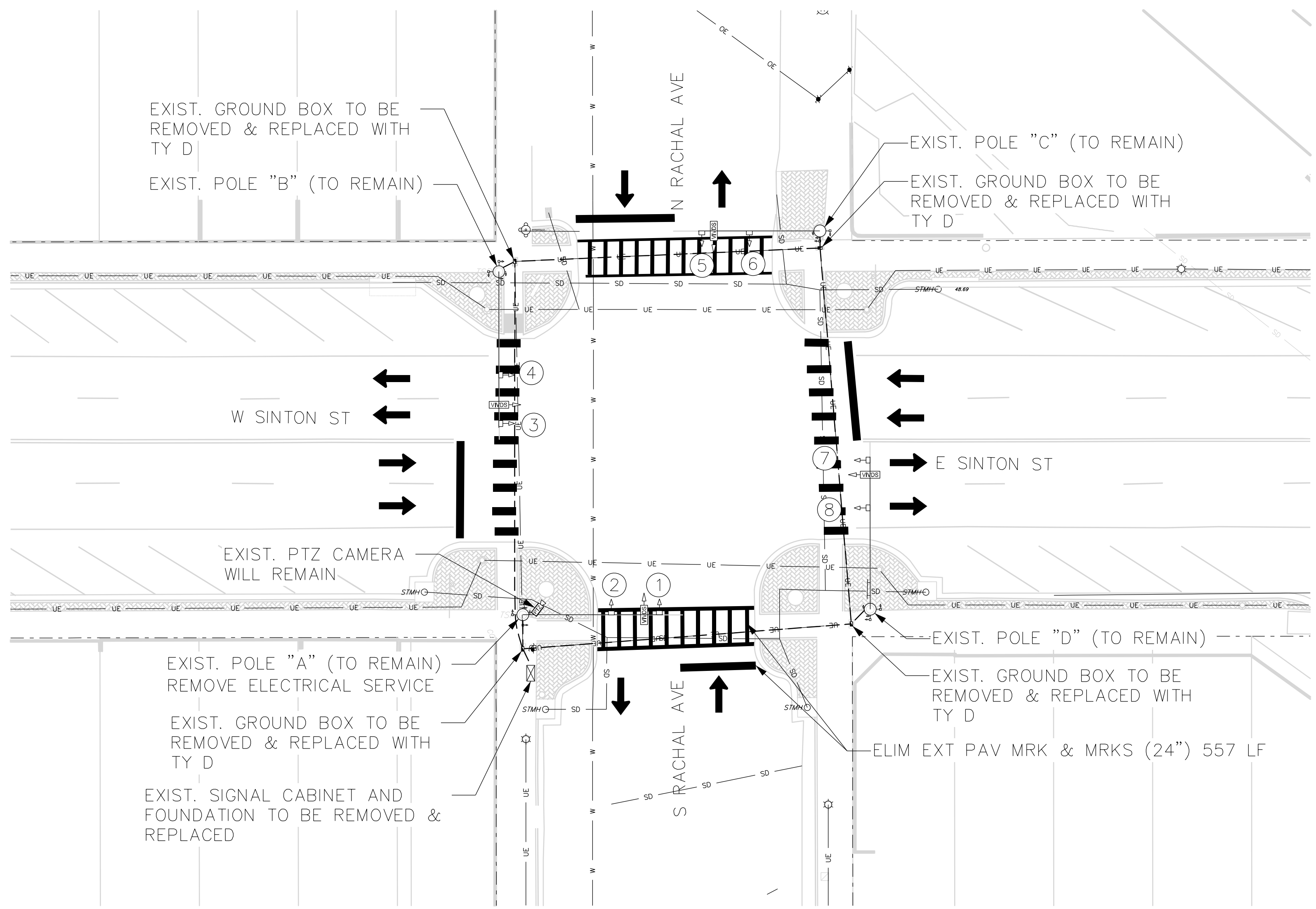

NOTES:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH TXDOT REPRESENTATIVE JOE TELLEZ WITH THE CORPUS CHRISTI DISTRICT TEXAS DEPARTMENT OF TRANSPORTATION BY PHONE 512-568-8432 OR EMAIL JOE.TELLEZ@TXDOT.GOV TO COORDINATE THE DISCONNECTION AND RECONNECTION OF THE ELECTRICAL SERVICES TO THE POWER SOURCES.

CARL B. LAFERNEY 108697 LICENSED PROFESSIONAL ENGINEER — STATE OF TEXAS

0 20' 40'

SCALE: 1" = 40'

LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OVERHEAD POWER LINE
- UNDERGROUND ELECTRIC
- STORM DRAIN
- WATER LINE
- GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTROLLER CABINET SHALL BE RETURNED TO TXDOT.

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

ALL VIVDS DETECTORS TO BE REMOVED AND REPLACED WITH RADAR DETECTORS.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

REV. NO.	DATE	DESCRIPTION	BY

Westwood

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Toll Free (888) 937-5150 Fort Worth, TX 76109
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TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT RACHAL AVE CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	32

USER: kearellano
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NOTES:

ALL EXISTING POLES SHALL BE REUSED, UNLESS NOTED OTHERWISE. ALONG WITH THEIR MAST ARMS.

ALL SIGNAL HEADS, CAMERAS, RADARS & ALL ASSOCIATED MATERIAL SHALL BE NEW.

ALL WIRING CONNECTIONS WITHIN ALL SIGNAL HEADS SHALL BE MADE WITH THE USE OF SPADE LUGS.

CONTRACTOR TO PROVIDE AND INSTALL THE FOLLOWING EQUIPMENT: ELECTRONIC LOCK, SMART MMU, CONTROLLER, AND CABINET. CELLULAR ROUTERS WILL BE PROVIDED BY THE DISTRICT AND INSTALLED BY THE CONTRACTOR.

THE CONTRACTOR SHALL TERMINATE ALL ETHERNET DEVICES INCLUDING TRAFFIC SIGNAL CONTROLLER, (MMU) MALFUNCTION MONITOR UNIT, (APS) ACCESSIBLE PEDESTRIAN SYSTEM CONTROLLER UNIT, AND DETECTION DEVICES TO THE CELLULAR ROUTER. USE THE FOLLOWING TRAFFIC SIGNAL NETWORK COLOR SCHEME:
BLUE – TRAFFIC SIGNAL CONTROLLER
GREEN – MALFUNCTION MONITOR UNIT (MMU)
YELLOW – ACCESSIBLE PEDESTRIAN SYSTEM (APS)
BLACK – DETECTION

THE CELLULAR ROUTERS WILL BE CONFIGURED BY TXDOT, HOWEVER THE CONTRACTOR SHALL BE ON SITE AS NECESSARY FOR FINAL ROUTER ACCEPTANCE.

PHASE DIAGRAM

NOT IN USE ø1	PED ø2	NOT IN USE ø3	PED ø4
NOT IN USE ø5	PED ø6	NOT IN USE ø7	PED ø8

CONFLICT FLASH: RED ALL PHASES

S-1

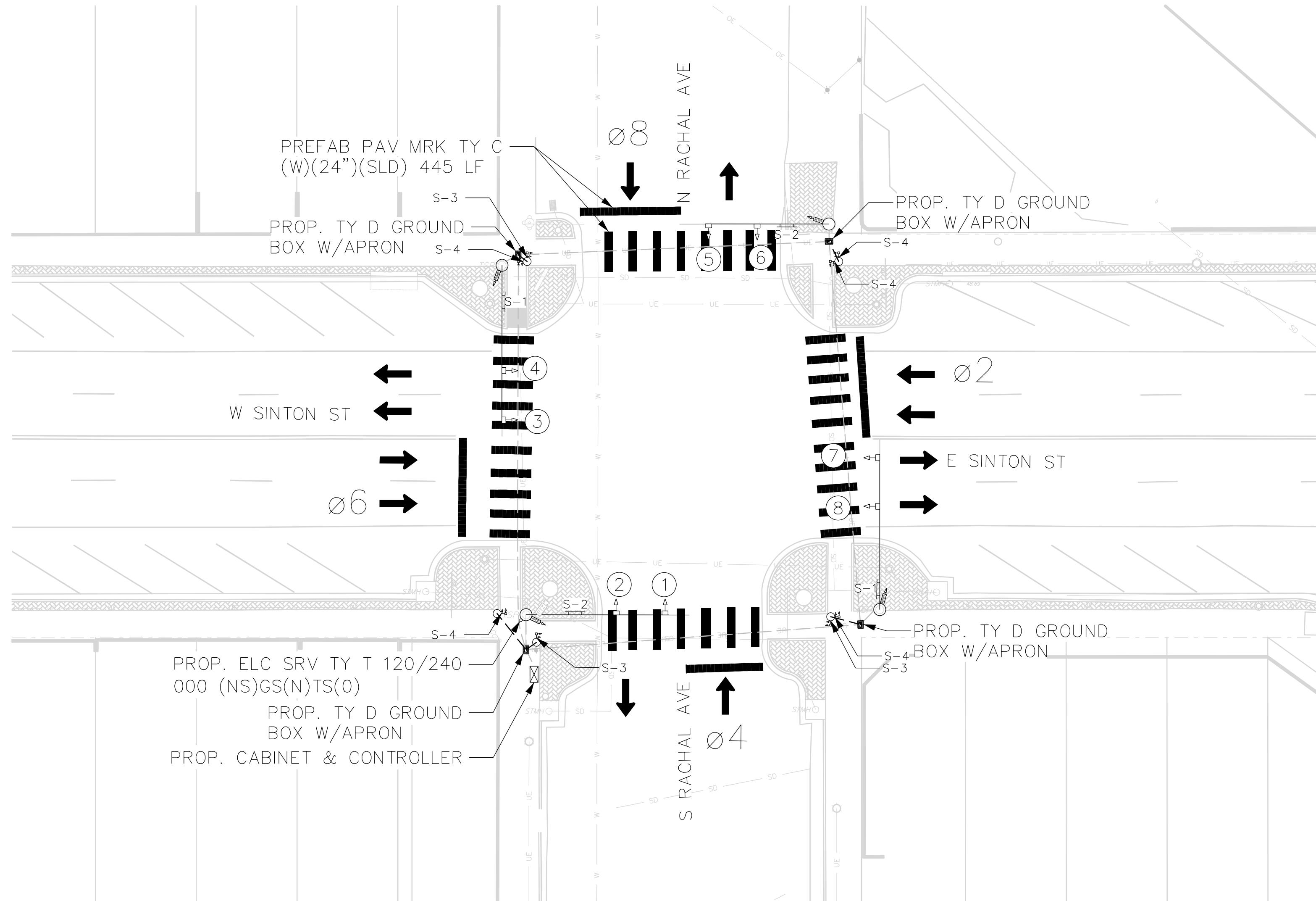
Rachal Ave

QTY: 2

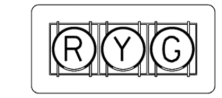
S-2

Sinton St

QTY: 2



TRAFFIC SIGNAL HEADS

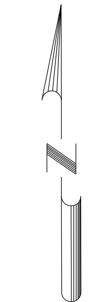


12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

1 2 3 4

5 6 7 8

QTY: 8



RADAR DETECTOR SHALL BE MOUNTED PER MANUFACTURER RECOMMENDATION AND MOUNTING LOCATION WILL BE VERIFIED BY THE TRAFFIC ENGINEER REPRESENTATIVE BEFORE THEY ARE INSTALLED.

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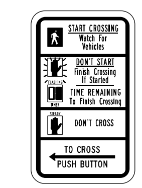
IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

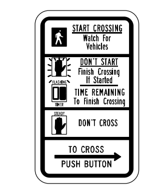
S-3



R10-3eL

QTY: 3

S-4



R10-3eR

QTY: 5

0 20' 40'

SCALE: 1" = 40'

NOTES:

RADARS SHALL BE MOUNTED ON TRAFFIC SIGNAL POLE AND MAST ARMS AS SHOWN. CORD GRIP CONNECTORS SHALL BE USED AT WIRE OUTLETS FOR CAMERA AND RADAR CABLES.

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

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CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416. CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

REV. NO.	DATE	DESCRIPTION	BY

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westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT RACHAL AVE PLAN VIEW

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	33

USER: kearellano
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3:51:56 PM

NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

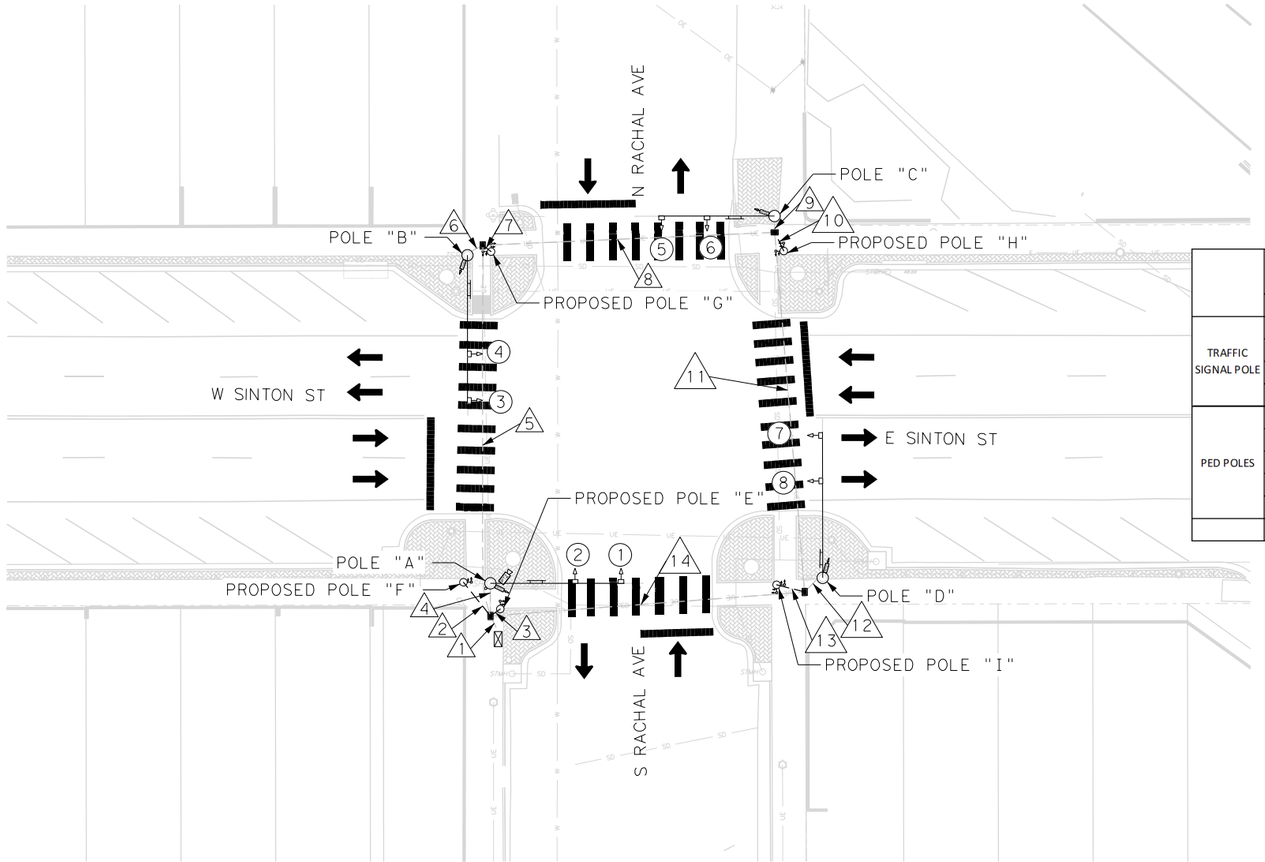
ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	35	
HEAD 2	23	
RADAR		5
POLE B		
HEAD 3	38	
HEAD 4	26	
RADAR		5
POLE C		
HEAD 5	30	
HEAD 6	18	
RADAR		5
POLE D		
HEAD 7	38	
HEAD 8	26	
RADAR		5
TOTAL	234	20

	INSIDE POLES	#14 AWG (TY A) 7/C		#14 AWG (TY A) 5/C		#14 AWG (TY C) 2/C		RADAR CABLE		CAMERA CAT5-E
			(FT)		(FT)		(FT)		(FT)	(FT)
TRAFFIC SIGNAL POLE	POLE A	2	20					1	5	30
	POLE B	2	20					1	5	
	POLE C	2	20					1	5	
	POLE D	2	20					1	5	
PED POLES	POLE E			1	10	1	6			
	POLE F			1	10	1	6			
	POLE G			2	10	2	6			
	POLE H			2	10	2	6			
	POLE I			2	10	2	6			
	TOTAL	160		80		48		20		30

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (LF)	9 LENGTH (LF)	10 LENGTH (LF)	11 LENGTH (LF)	12 LENGTH (LF)	13 LENGTH (LF)	14 LENGTH (LF)
	EXISTING 2" CONDUIT														
	EXISTING 3" CONDUIT						1 10			1 10			1 10		
	EXISTING 4" CONDUIT	1 10			1 10	1 100			1 80			1 100			1 85
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 10			1 10										
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)		1 15	1 10				1 5			1 10			1 10	
618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	1 10													
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)														
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 10	1 15	1 10	1 10	1 100	1 10	1 5	1 80	1 10	1 10		1 10	1 10	1 85
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 10			1 10										
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 10			2 10										
0684-6031	5/C #14 AWG CABLE (PED HEAD)	5 10	1 15	1 10		2 100		1 5	1 80		1 10			1 10	1 85
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4 10			1 10	2 100	1 10		1 80	1 10			1 10		1 85
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8 10	1 15	1 10		4 100		2 5	2 80		2 10			2 10	2 85
	RADAR CONTROL CABLE	4 10			1 10	2 100	1 10		1 80	1 10			1 10		1 85
	CAT5-E CAMERA CABLE	1 10			1 10										

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 100743-01

SINTON ST AT RACHAL AVE CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	34

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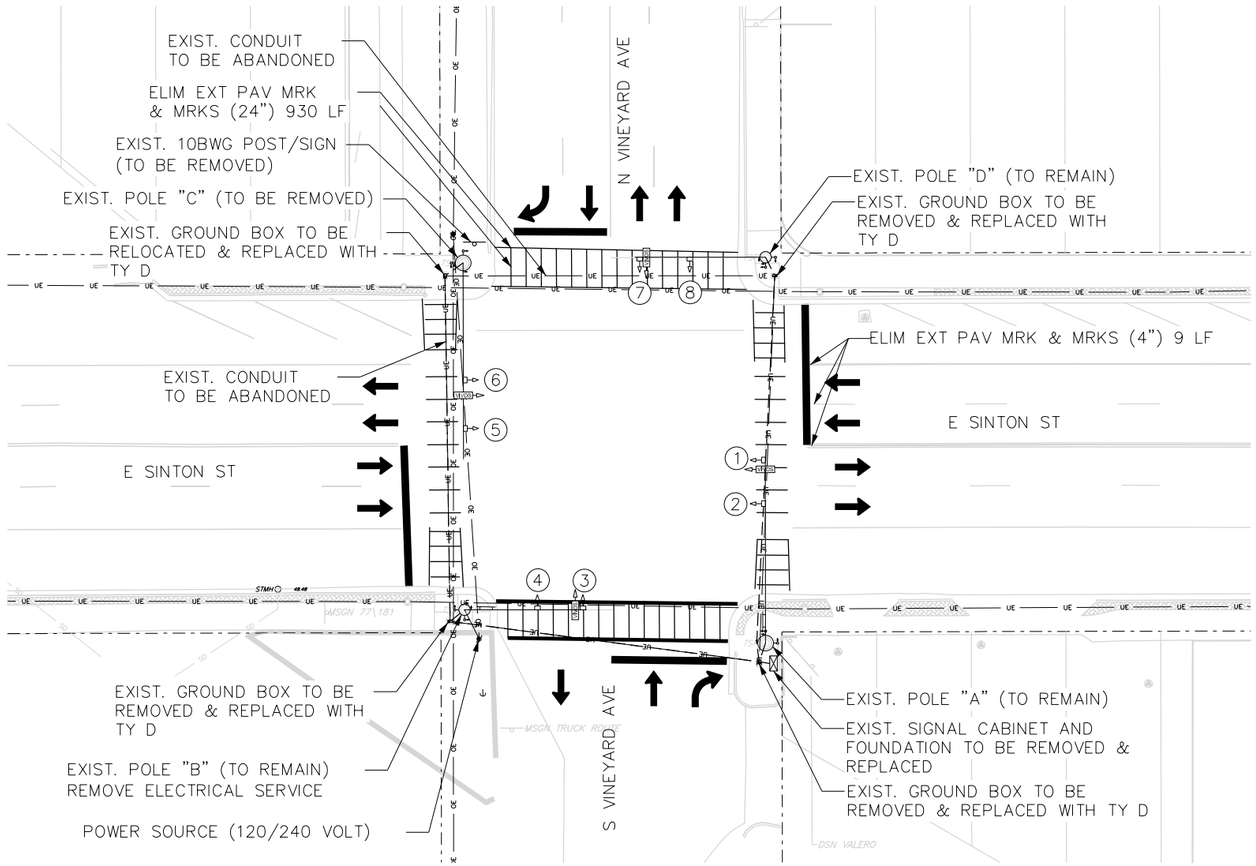

NOTES:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH TXDOT REPRESENTATIVE JOE TELLEZ WITH THE CORPUS CHRISTI DISTRICT TEXAS DEPARTMENT OF TRANSPORTATION BY PHONE 512-568-8432 OR EMAIL JOE.TELLEZ@TXDOT.GOV TO COORDINATE THE DISCONNECTION AND RECONNECTION OF THE ELECTRICAL SERVICES TO THE POWER SOURCES.

LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OVERHEAD POWER LINE
- UNDERGROUND ELECTRIC
- STORM DRAIN
- WATER LINE
- GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTROLLER CABINET SHALL BE RETURNED TO TXDOT.

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

ALL VIVDS DETECTORS TO BE REMOVED AND REPLACED WITH RADAR DETECTORS.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

Carl B. Laferney

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

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SINTON ST AT VINEYARD AVE CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	35

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04/05/2024
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NOTES:

CONTRACTOR TO PROVIDE AND INSTALL THE FOLLOWING EQUIPMENT: ELECTRONIC LOCK, SMART MMU, CONTROLLER, AND CABINET. CELLULAR ROUTERS WILL BE PROVIDED BY THE DISTRICT AND INSTALLED BY THE CONTRACTOR.

THE CONTRACTOR SHALL TERMINATE ALL ETHERNET DEVICES INCLUDING TRAFFIC SIGNAL CONTROLLER, (MMU) MALFUNCTION MONITOR UNIT, (APS) ACCESSIBLE PEDESTRIAN SYSTEM CONTROLLER UNIT, AND DETECTION DEVICES TO THE CELLULAR ROUTER. USE THE FOLLOWING TRAFFIC SIGNAL NETWORK COLOR SCHEME:
BLUE TRAFFIC SIGNAL CONTROLLER
GREEN – MALFUNCTION MONITOR UNIT (MMU)
YELLOW – ACCESSIBLE PEDESTRIAN SYSTEM (APS)
BLACK – DETECTION

THE CELLULAR ROUTERS WILL BE CONFIGURED BY TXDOT,
HOWEVER THE CONTRACTOR SHALL BE ON SITE AS NECESSARY FOR FINAL ROUTER ACCEPTANCE.

CONTRACTOR TO MATCH EXISTING SCORING PATTERN AND COLOR OF SIDEWALK, SUBSIDIARY TO ITEM 5114–6003, IN AREAS AROUND THE ODEM BUILDING.

PHASE DIAGRAM

ø1	ø2 (PED)	ø3 (NOT IN USE)	ø4 (PED)
ø5	ø6 (PED)	ø7 (NOT IN USE)	ø8 (PED)

CONFLICT FLASH: RED ALL PHASES

S–1

Vineyard Ave

QTY: 2

S–2

Sinton St

QTY: 2

S–3

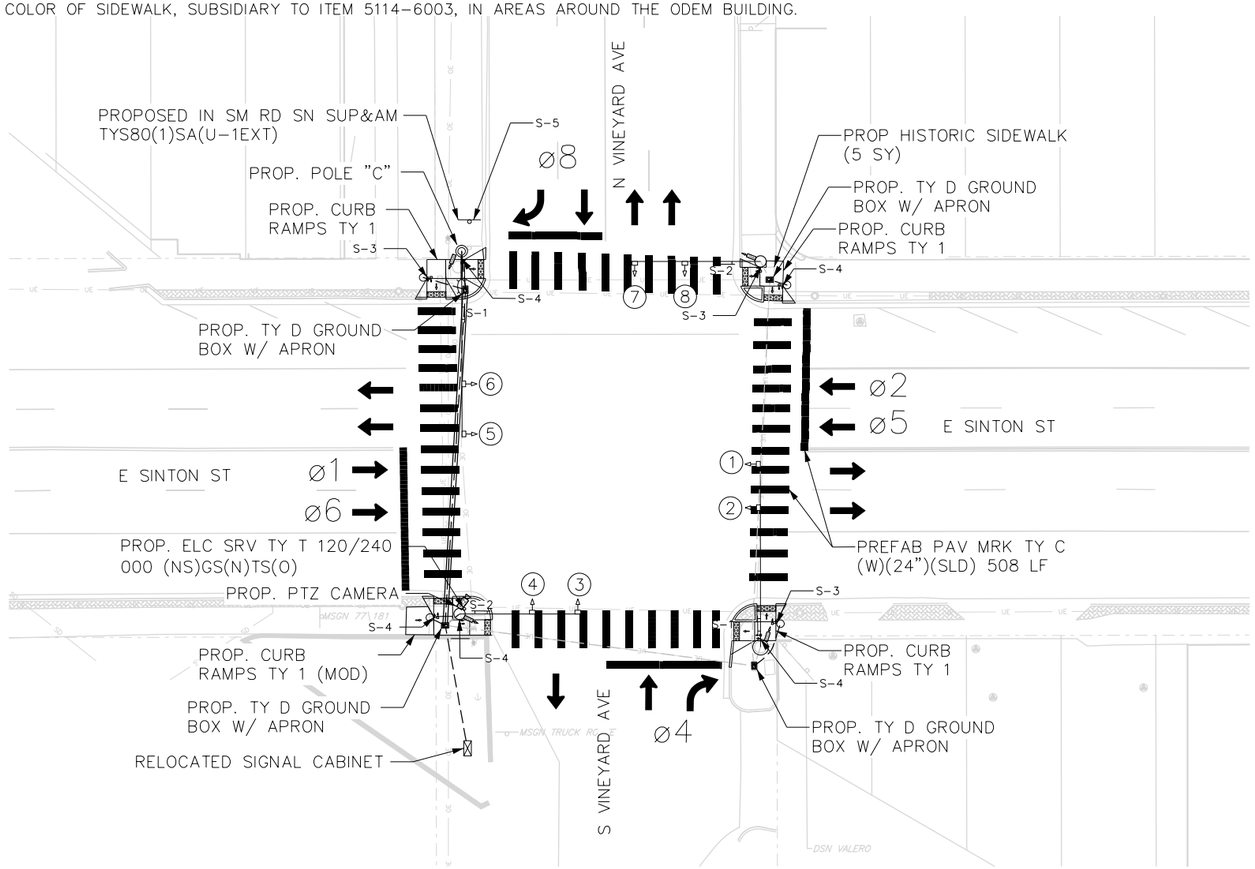
R10–3eL
9"X15"

QTY: 3

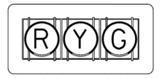
S–4

R10–3eR
9"X15"

QTY: 5



TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

① ② ③ ④

⑤ ⑥ ⑦ ⑧

QTY: 8

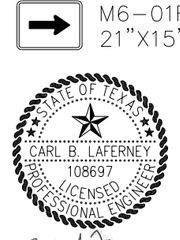
RADAR DETECTOR SHALL BE MOUNTED PER MANUFACTURER RECOMMENDATION AND MOUNTING LOCATION WILL BE VERIFIED BY THE TRAFFIC ENGINEER REPRESENTATIVE BEFORE THEY ARE INSTALLED.

ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2–INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS–BP–20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

S–5
QTY: 1



0 20′ 40′

SCALE: 1" = 40′

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ — PROP. PTZ CAMERA

NOTES:

RADARS SHALL BE MOUNTED ON TRAFFIC SIGNAL POLE AND MAST ARMS AS SHOWN. CORD GRIP CONNECTORS SHALL BE USED AT WIRE OUTLETS FOR CAMERA AND RADAR CABLES.

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBLITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2–TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361–946–5079, 361–739–6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416. CONTACT: CARLOS CARRILLO AT 361–946–5079 OR 361–739–6044.

REV. NO.	DATE	DESCRIPTION	BY

Westwood
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TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT VINEYARD AVE
PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	36

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TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	48	
HEAD 2	37	
RADAR		5
POLE B		
HEAD 3	32	
HEAD 4	20	
RADAR		5
POLE C		
HEAD 5	48	
HEAD 6	36	
RADAR		5
POLE D		
HEAD 7	34	
HEAD 8	21	
RADAR		5
TOTAL	276	20

NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

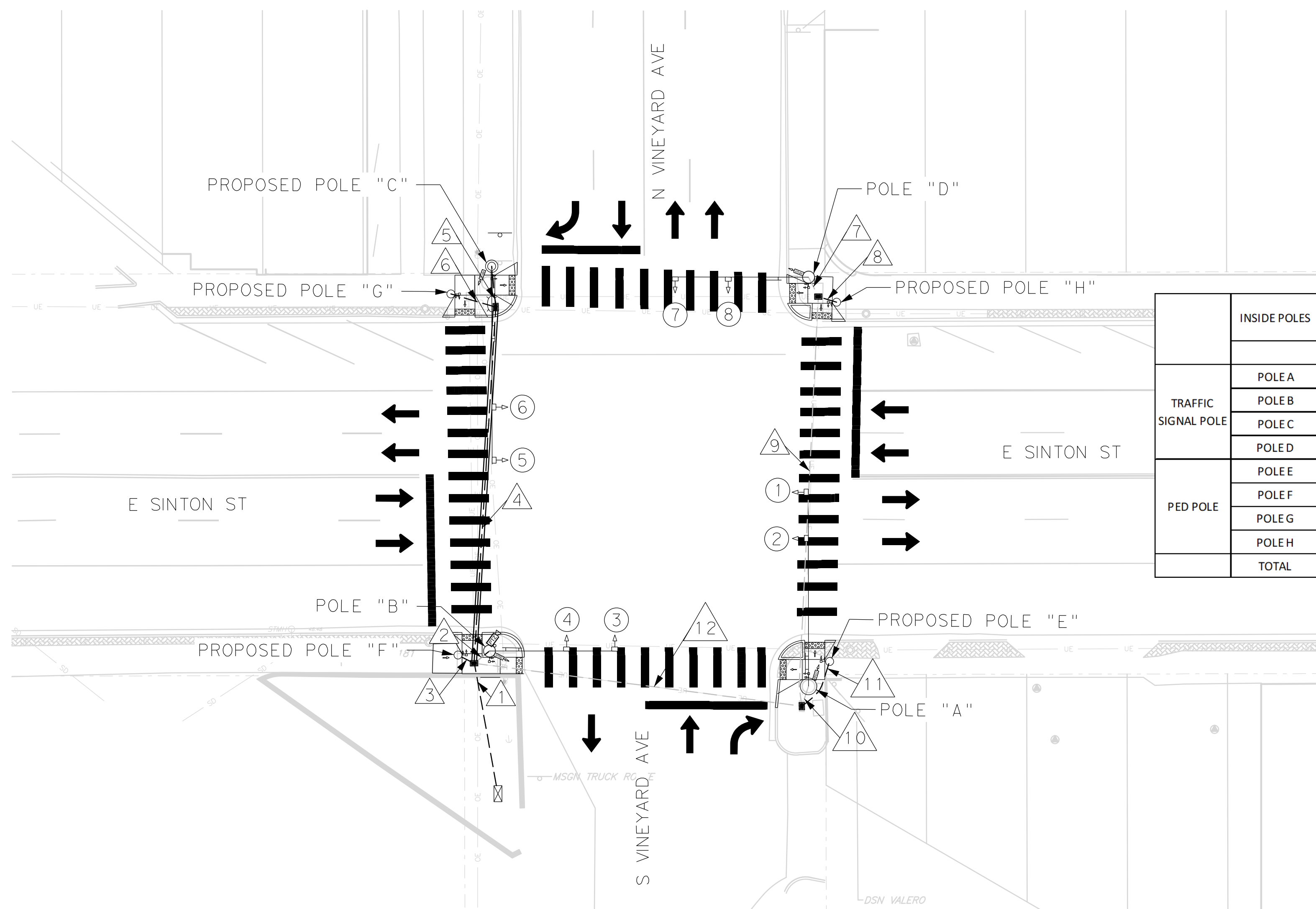
ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.



	INSIDE POLES	#14 AWG (TY A) 7/C	(FT)	5/C	(FT)	#14 AWG (TY C) 2/C	(FT)	RADAR CABLE	(FT)	ILLUM #8 XHHW	(FT)	CAMERA CAT5-E (FT)
TRAFFIC SIGNAL POLE	POLE A	2	20	1	10	1	6	1	20			
	POLE B	2	20	1	10	1	6	1	20			30
	POLE C	2	20	1	10	1	6	1	20	2	30	
	POLE D	2	20	1	10	1	6	1	20			
PED POLE	POLE E			1	10	1	6					
	POLE F			1	10	1	6					
	POLE G			1	10	1	6					
	POLE H			1	10	1	6					
	TOTAL	160		80		48		80		60		30

0 20' 40'

SCALE: 1" = 40'

ITEM	CONDUCTOR/CONDUIT RUN	1	LENGTH (LF)	2	LENGTH (LF)	3	LENGTH (LF)	4	LENGTH (LF)	5	LENGTH (LF)	6	LENGTH (LF)	7	LENGTH (LF)	8	LENGTH (LF)	9	LENGTH (LF)	10	LENGTH (LF)	11	LENGTH (LF)	12	LENGTH (LF)
	EXISTING 2" CONDUIT																								
	EXISTING 3" CONDUIT													1	10										
	EXISTING 4" CONDUIT			1	10													1	105	1	10			1	85
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1	35	1	10																				
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)					1	10			1	15	1	15			1	5					1	15		
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	2	35																						
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)							1	95																
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1	35	1	10	1	10	1	95	1	15	1	15	1	10	1	5	1	105	1	10	1	15	1	85
0620-6008	1/C #8 XHHW (ILLUM)			2	10			2	95	2	15														
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1	35	1	10																				
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2	35	2	10																				
0684-6031	5/C #14 AWG CABLE (PED HEAD)	4	35			1	10	1	95			1	15			1	5	1	105			1	15	2	85
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4	35	1	10			1	95	1	15			1	10			1	105	1	10			2	85
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8	35	1	10	1	10	2	95	1	15	1	15	1	10	1	5	2	105	1	10	1	15	4	85
	RADAR CONTROL CABLE	4	35	1	10			1	95	1	15			1	10			1	105	1	10			2	85
	CAT5-E CAMERA CABLE	1	35	1	10																				

LEGEND

PROP. CABINET

EXIST. GROUND BOX TO BE PREPARED

PROP. GROUND BOX

EXIST. CONDUIT TO BE PREPARED

PROP. CONDUIT (TRENCH)

PROP. CONDUIT (BORE)

PROP. ELECTRICAL SERVICE

PTZ PROP. PTZ CAMERA

REV. NO.	DATE	DESCRIPTION	BY

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TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT VINEYARD AVE CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	37

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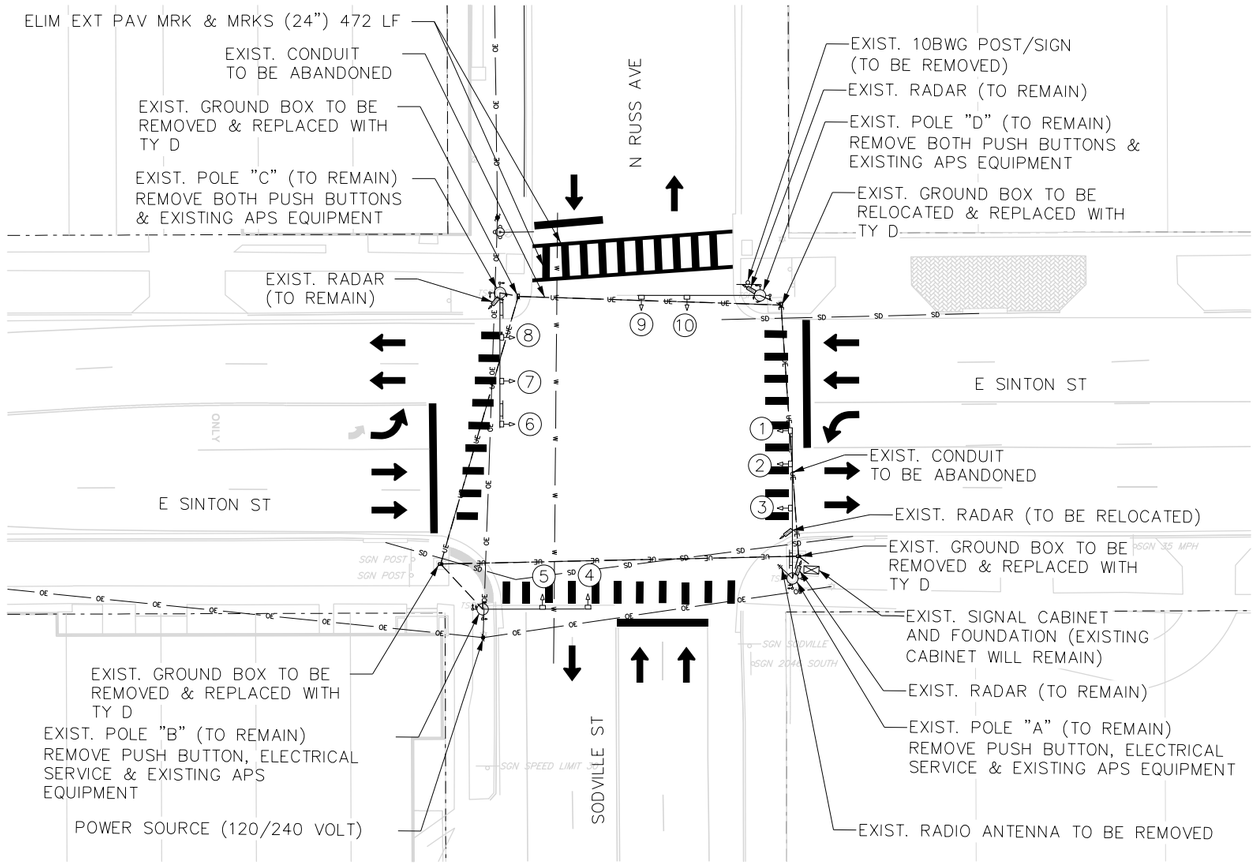

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LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OVERHEAD POWER LINE
- UNDERGROUND ELECTRIC
- STORM DRAIN
- WATER LINE
- GAS LINE

NOTES:

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THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

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SINTON ST AT SODVILLE ST & RUSS AVE CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	38

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NOTES:

ALL EXISTING POLES SHALL BE REUSED, UNLESS NOTED OTHERWISE. ALONG WITH THEIR MAST ARMS.

ALL SIGNAL HEADS, CAMERAS & ALL ASSOCIATED MATERIAL SHALL BE NEW.

ALL WIRING CONNECTIONS WITHIN ALL SIGNAL HEADS SHALL BE MADE WITH THE USE OF SPADE LUGS.

PHASE DIAGRAM

ø1	ø2 (PED)	ø3 NOT IN USE	ø4 (PED)
ø5	ø6 (PED)	ø7 NOT IN USE	ø8 (PED)

CONFLICT FLASH: RED ALL PHASES

S-1

QTY: 1

S-2

QTY: 1

S-3

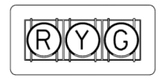
QTY: 2

S-4

R10-17T
36"X42"

QTY: 2

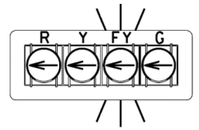
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

② ③ ④ ⑤ ⑦ ⑧ ⑨ ⑩

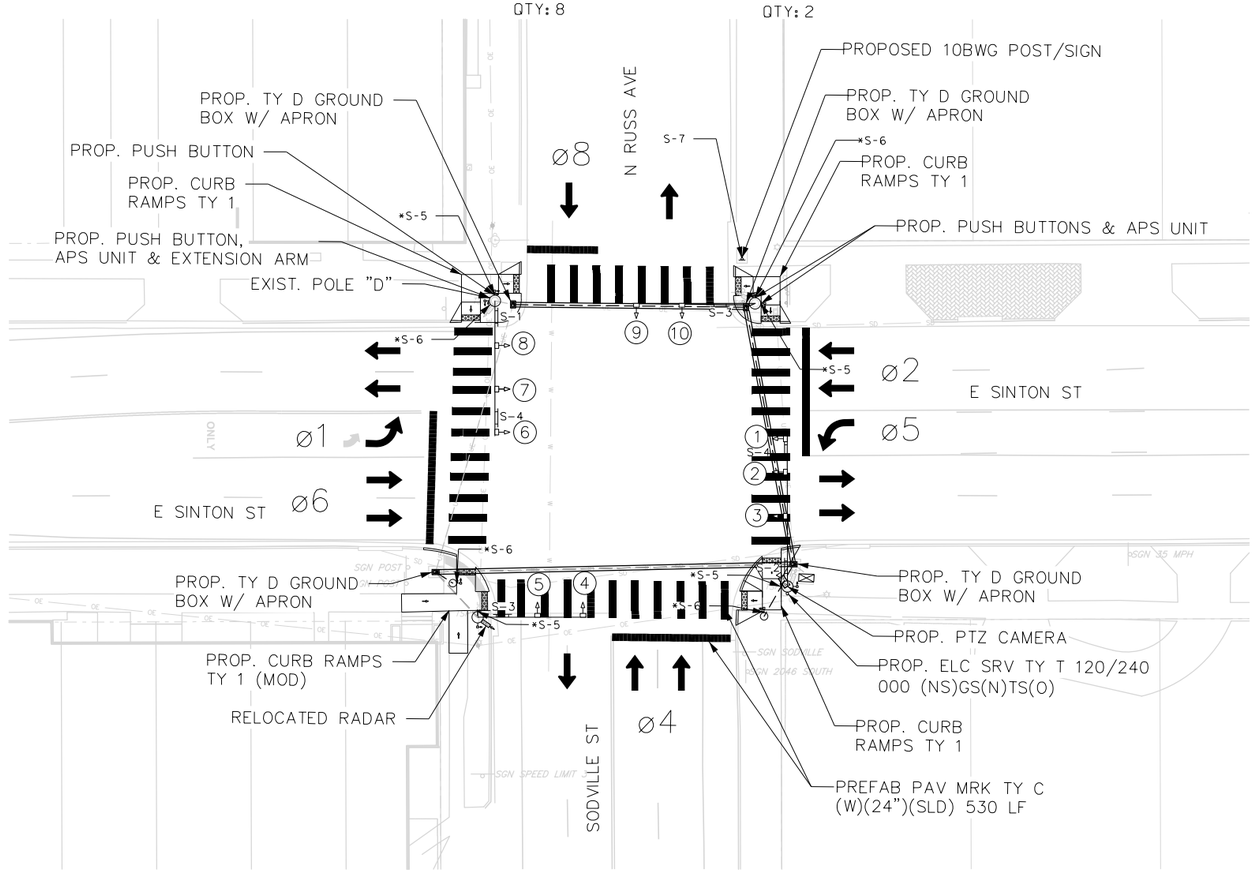
QTY: 8



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

① ⑥

QTY: 2



RADAR DETECTOR SHALL BE MOUNTED PER MANUFACTURER RECOMMENDATION AND MOUNTING LOCATION WILL BE VERIFIED BY THE TRAFFIC ENGINEER REPRESENTATIVE BEFORE THEY ARE INSTALLED.

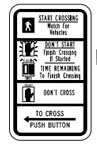
ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

* EXISTING APS EQUIPMENT TO BE REUSED

*S-5



R10-3eL
9"x15"

QTY: 4

*S-6

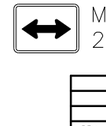
R10-3eR
9"x15"

QTY: 4

S-7

QTY: 1

M1-4
30"X24"



M1-6T
24"X24"

M6-04
21"X15"

0 20' 40'

SCALE: 1" = 40'

NOTES:

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBLITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416.
CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.
CONTRACTOR TO PROVIDE AND INSTALL ELECTRONIC LOCK ON THE CABINET.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT SODVILLE ST & RUSS AVE PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	39

NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

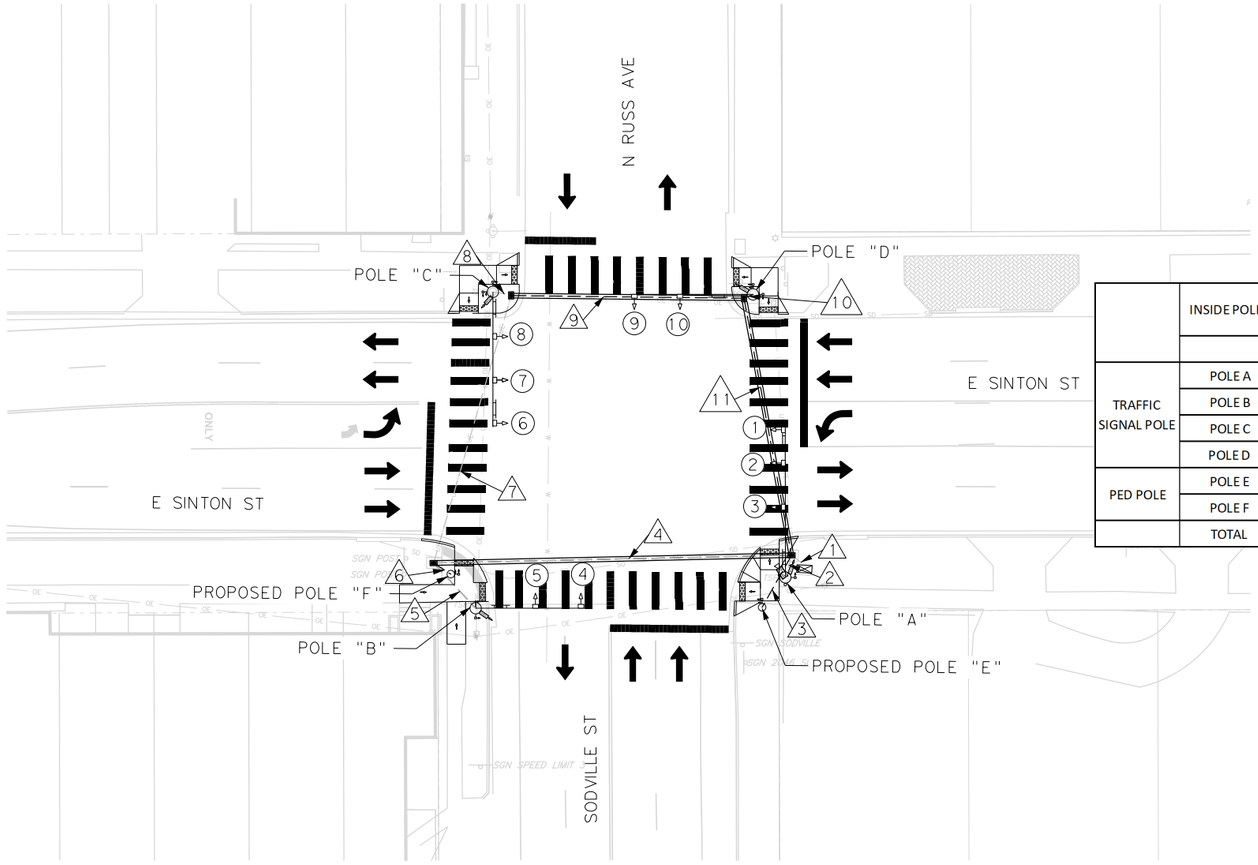
ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	40	
HEAD 2	30	
HEAD 3	19	
RADAR		5
POLE B		
HEAD 4	28	
HEAD 5	16	
RADAR		5
POLE C		
HEAD 6	34	
HEAD 7	24	
HEAD 8	12	
RADAR		5
POLE D		
HEAD 9	32	
HEAD 10	20	
RADAR		5
TOTAL	255	20

	INSIDE POLES	#14 AWG (TY A) 7/C		#14 AWG (TY A) 5/C		#14 AWG (TY C) 2/C		RADAR CABLE		CAMERA CAT5-E
			(FT)		(FT)		(FT)		(FT)	(FT)
TRAFFIC SIGNAL POLE	POLE A	3	20	1	10	1	6	1	20	30
	POLE B	2	20	1	10	1	6	1	20	
	POLE C	3	20	2	10	2	6	1	20	
	POLE D	2	20	2	10	2	6	1	20	
PED POLE	POLE E			1	10	1	6			
	POLE F			1	10	1	6			
	TOTAL	200		80		48		80		30

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (LF)	9 LENGTH (LF)	10 LENGTH (LF)	11 LENGTH (LF)
	EXISTING 2" CONDUIT											
	EXISTING 3" CONDUIT				1 100							
	EXISTING 4" CONDUIT	1 10	1 10			1 20		1 75	1 10			
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 10	1 10									
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)			1 20			1 10				1 5	
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	1 10										
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)				1 100					1 65		1 75
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 10	1 10	1 20	1 100	1 20	1 10		1 10	1 65	1 5	1 75
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 10	1 10									
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 10	2 10									
0684-6031	5/C #14 AWG CABLE (PED HEAD)	2 10		1 20	1 100		1 10					
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4 10	1 10		1 100	1 20			1 10	1 65	1 5	2 75
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8 10	1 10	1 20	2 100	1 20	1 10		2 10	2 65	2 5	4 75
	RADAR CONTROL CABLE	4 10	1 10		1 100	1 20			1 10	1 65	1 5	2 75
	CAT5-E CAMERA CABLE	1 10	1 10									

0 20′ 40′

SCALE: 1" = 40′

REV. NO.	DATE	DESCRIPTION	BY

Westwood

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Toll Free (888) 937-5150 Fort Worth, TX 76109
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Westwood Professional Services, Inc.
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TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT SODVILLE ST & RUSS AVE CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	40

USER: kgarelano
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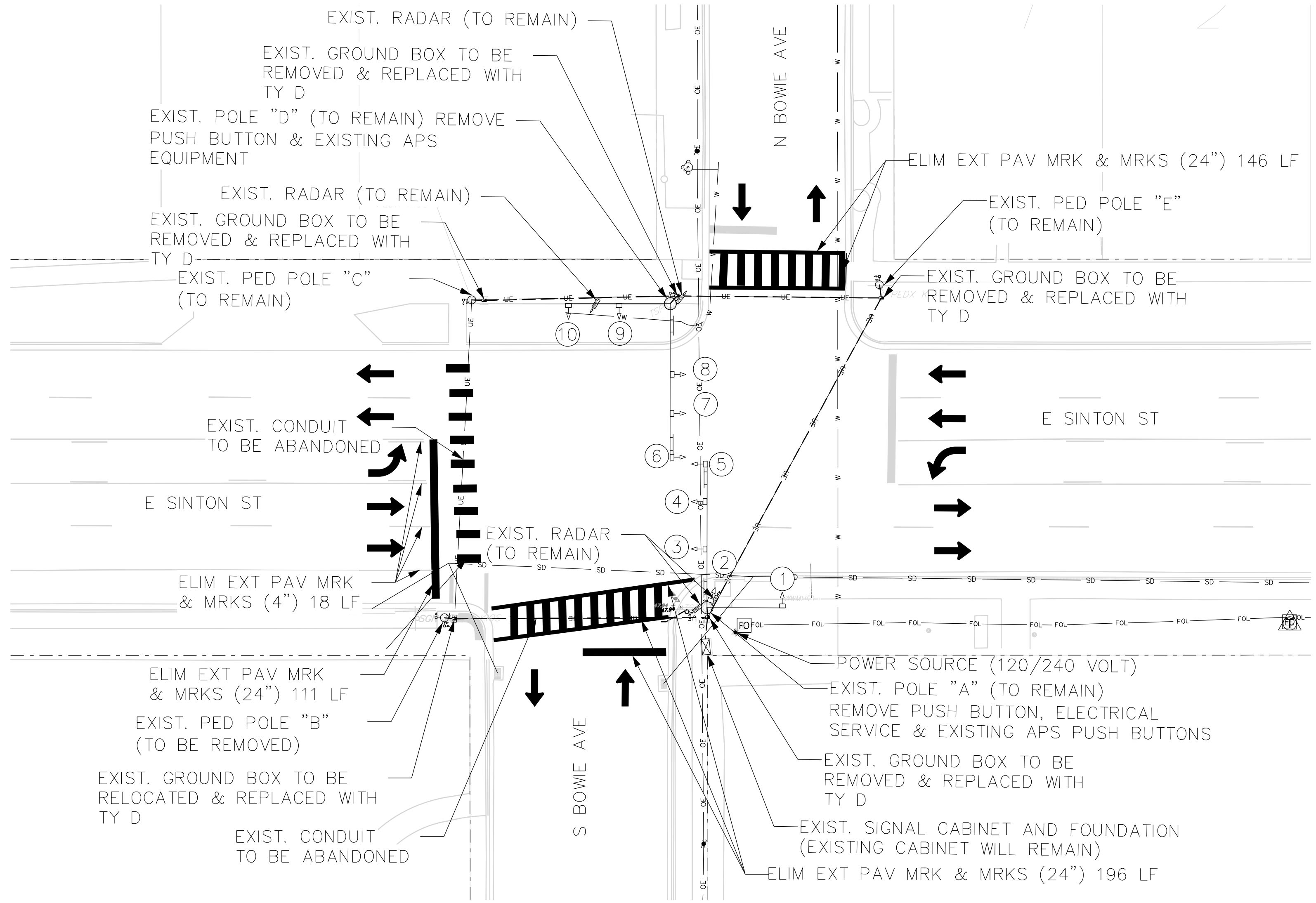


NOTES:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH TXDOT REPRESENTATIVE JOE TELLEZ WITH THE CORPUS CHRISTI DISTRICT TEXAS DEPARTMENT OF TRANSPORTATION BY PHONE 512-568-8432 OR EMAIL JOE.TELLEZ@TXDOT.GOV TO COORDINATE THE DISCONNECTION AND RECONNECTION OF THE ELECTRICAL SERVICES TO THE POWER SOURCES.

LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- VIVDS — EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- —OE—OE—OE— OVERHEAD POWER LINE
- —UE—UE—UE— UNDERGROUND ELECTRIC
- —SD—SD—SD— STORM DRAIN
- —W—W—W— WATER LINE
- —G—G—G— GAS LINE

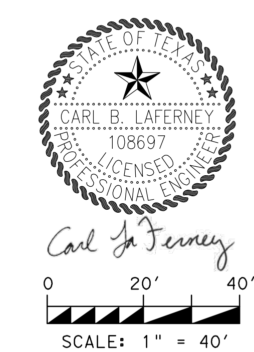
NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.



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westwoodps.com
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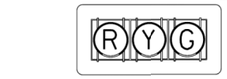
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT BOWIE AVE CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
DGN: / CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	41

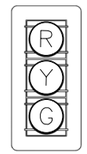
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

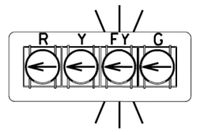
① ③ ④ ⑦ ⑧ ⑨ ⑩

QTY: 7



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

② QTY: 1



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

⑤ ⑥

QTY: 2

PHASE DIAGRAM

ø1	ø2 (PED)	ø3	ø4 (PED)
ø5	ø6 (PED)	ø7 NOT IN USE	ø8 NOT IN USE

CONFLICT FLASH: RED ALL PHASES

S-1

Bowie Ave

QTY: 2

S-2

Sinton St

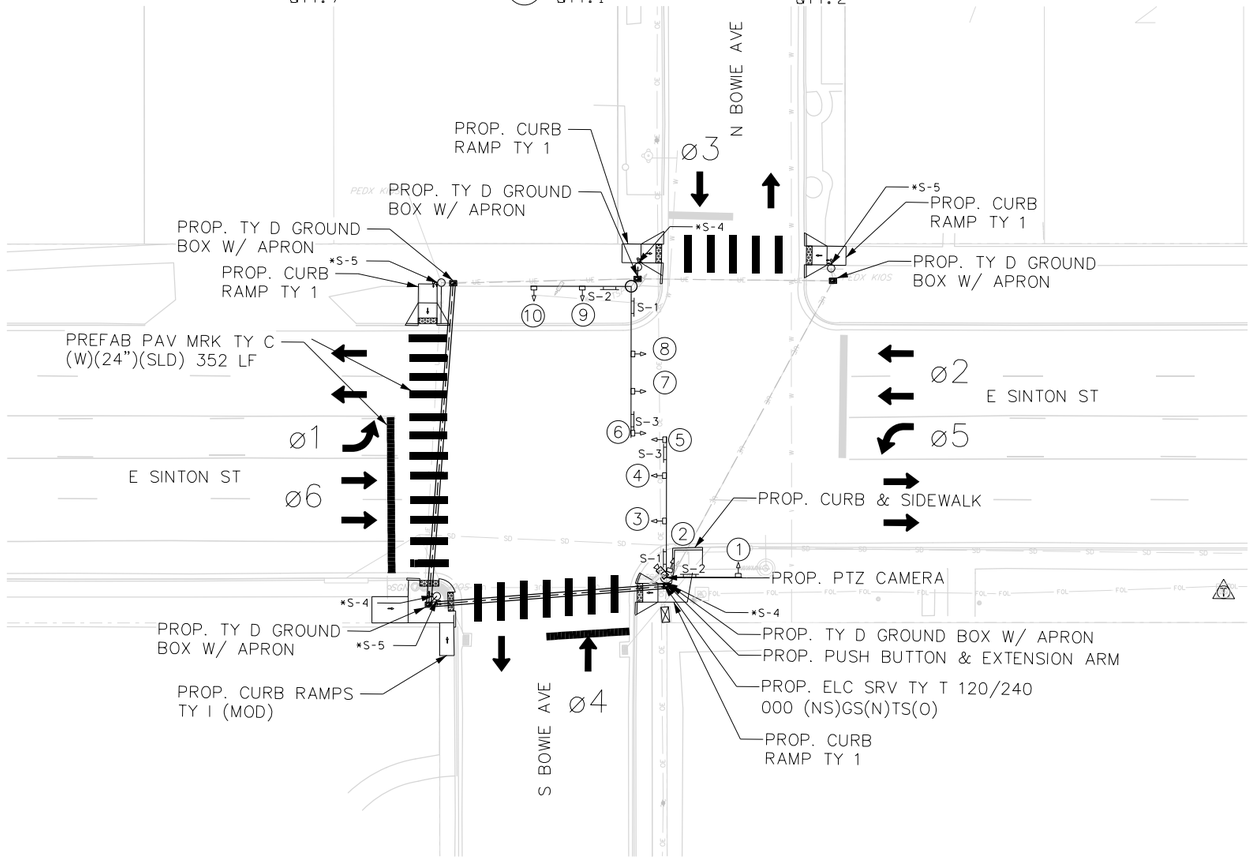
QTY: 2

S-3

LEFT TURN YIELD ON FLASHING YELLOW ARROW

R10-17T 36"X42"

QTY: 2



ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

* EXISTING APS EQUIPMENT TO BE REUSED

*S-4

R10-3eL 9"X15"

QTY: 3

*S-5

R10-3eL 9"X15"

QTY: 3

CARL B. LAFERNEY 108697 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

0 20' 40'

SCALE: 1" = 40'

NOTES:

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

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CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416. CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.
EXISTING APS TO BE UTILIZED AT INTERSECTION. CONTRACTOR TO WORK WITH TXDOT ON VOICE CROSSINGS.
CONTRACTOR TO PROVIDE AND INSTALL ELECTRONIC LOCK ON THE CABINET.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

REV. NO.	DATE	DESCRIPTION	BY

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SINTON ST AT BOWIE AVE PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	42

NOTES:

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TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.

LEGEND

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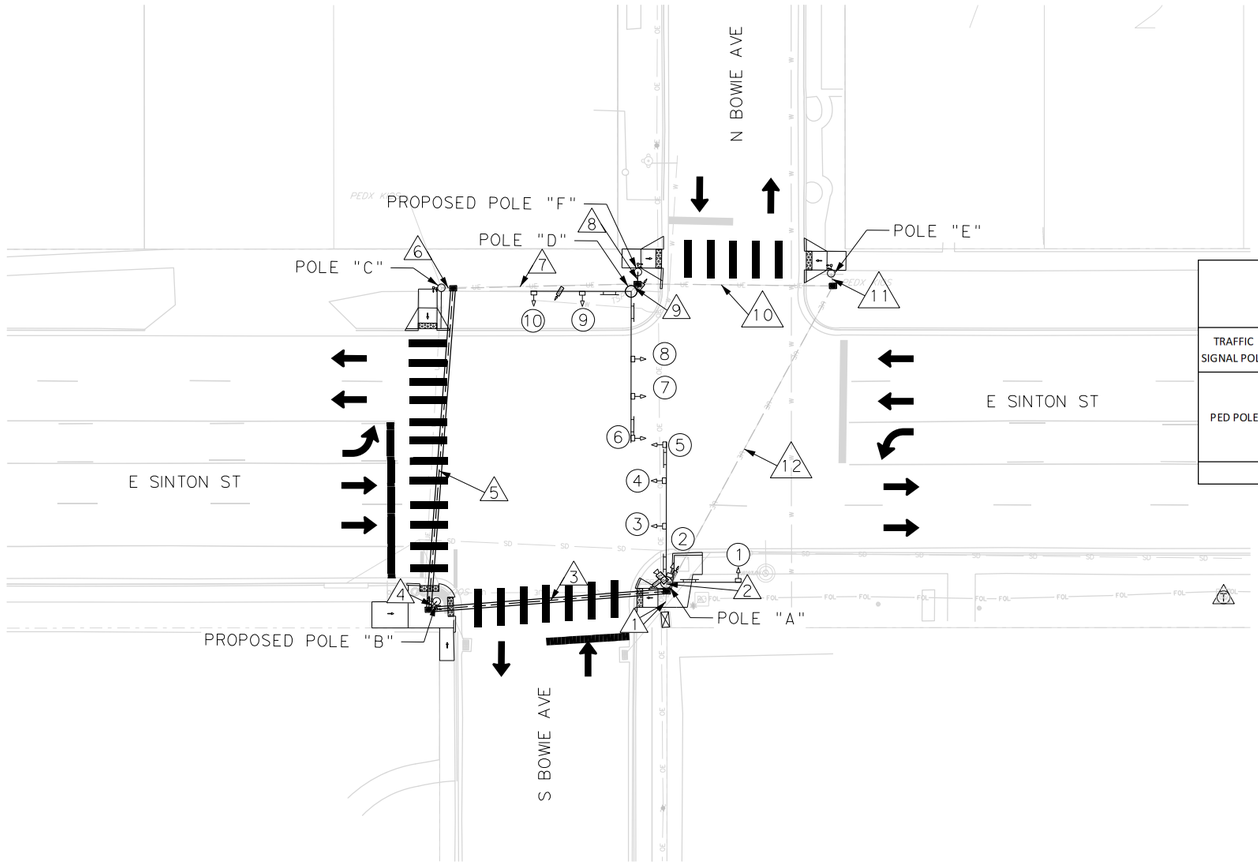
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ — PROP. PTZ CAMERA



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	19	
HEAD 2	0	
HEAD 3	15	
HEAD 4	27	
HEAD 5	36	
RADAR		5
RADAR		5
POLE D		
HEAD 6	39	
HEAD 7	28	
HEAD 8	18	
HEAD 9	14	
HEAD 10	26	
RADAR		5
RADAR		19
TOTAL	222	34

	INSIDE POLES	#14 AWG (TY A) 7/C		#14 AWG (TY A) 5/C		#14 AWG (TY C) 2/C		RADAR CABLE		CAMERA CAT5-E
			(FT)		(FT)		(FT)		(FT)	(FT)
TRAFFIC SIGNAL POLE	POLE A	5	20	1	10	1	6	2	20	30
	POLE D	5	20					2	20	
PED POLE	POLE B			2	10	2	6			
	POLE C			1	10	1	6			
	POLE E			1	10	1	6			
	POLE F			1	10	1	6			
	TOTAL	200		60		36		80		30

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (LF)	9 LENGTH (LF)	10 LENGTH (LF)	11 LENGTH (LF)	12 LENGTH (LF)
	EXISTING 2" CONDUIT												
	EXISTING 3" CONDUIT		1 5				1 5	1 50		1 5	1 55	1 5	1 95
	EXISTING 4" CONDUIT												
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 10	1 5										
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)				1 5				1 5				
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	2 10											
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)			1 65		1 90							
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 10	1 5	1 65	1 5	1 90	1 5	1 50	1 5	1 5	1 55	1 5	1 95
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 10	1 5										
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 10	2 5										
0684-6031	5/C #14 AWG CABLE (PED HEAD)	4 10		2 65	1 5	1 90	1 5		1 5		1 55	1 5	2 95
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	2 10	2 5							2 5	2 55		2 95
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	6 10	1 5	3 65	2 5	1 90	1 5		1 5		1 55	1 5	2 95
	RADAR CONTROL CABLE	4 10	2 5							2 5	2 55		2 95
	CAT5-E CAMERA CABLE	1 10	1 5										

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

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SINTON ST AT BOWIE AVE CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	43

USER: kgarelli
3:53:12 PM
04/05/2024
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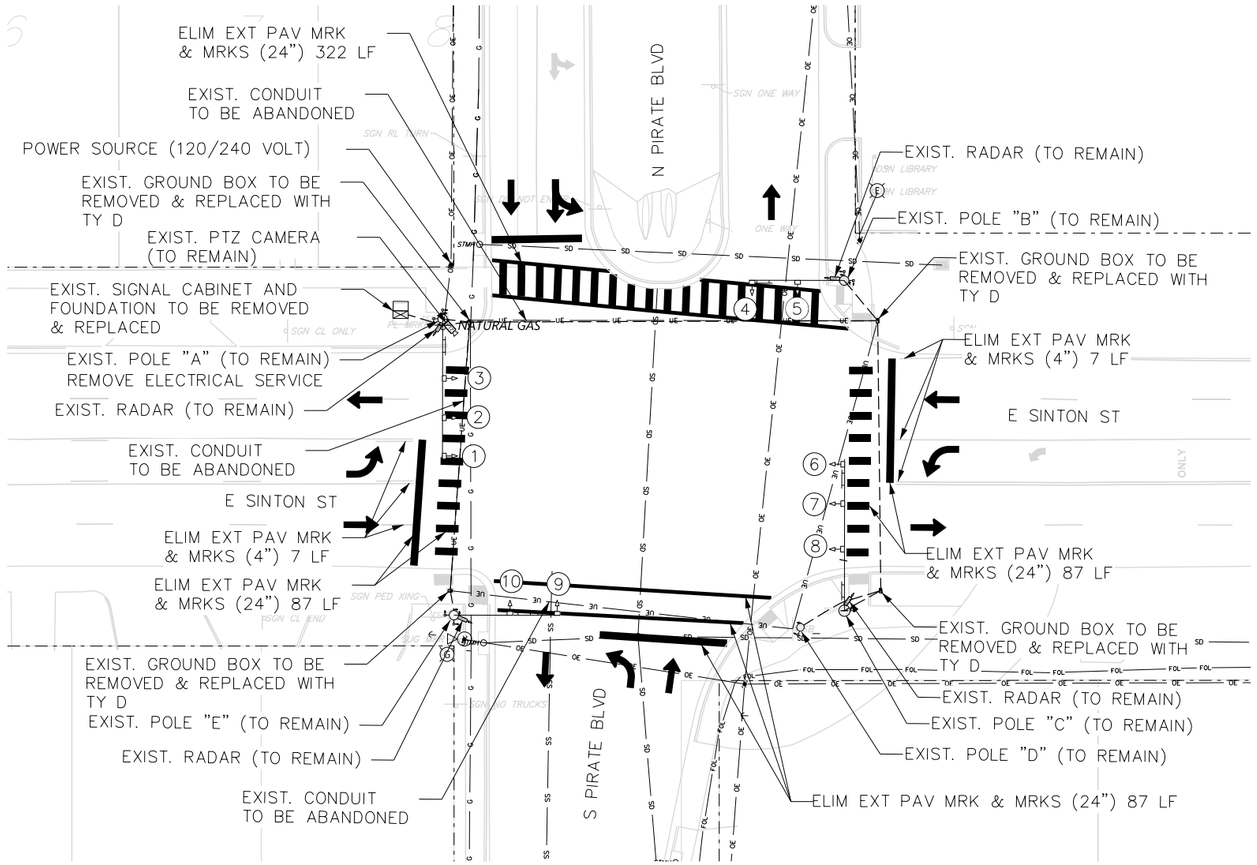


NOTES:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH TXDOT REPRESENTATIVE JOE TELLEZ WITH THE CORPUS CHRISTI DISTRICT TEXAS DEPARTMENT OF TRANSPORTATION BY PHONE 512-568-8432 OR EMAIL JOE.TELLEZ@TXDOT.GOV TO COORDINATE THE DISCONNECTION AND RECONNECTION OF THE ELECTRICAL SERVICES TO THE POWER SOURCES.

LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OVERHEAD POWER LINE
- UNDERGROUND ELECTRIC
- STORM DRAIN
- WATER LINE
- GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTROLLER CABINET SHALL BE RETURNED TO TXDOT.

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT PIRATE BLVD CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	44

USER: kearellano
3:53:19 PM
04/05/2024
M:\DWG-S\S199-21.742\DGN\Traffic\Sheets\Signals\1 - CONDITION DIAGRAM & UTILITY LAYOUT\7 - COND DIAG - SINTON&PIRATE.dgn

NOTES:

ALL EXISTING POLES SHALL BE REUSED, UNLESS NOTED OTHERWISE. ALONG WITH THEIR MAST ARMS.

ALL SIGNAL HEADS, CAMERAS & ALL ASSOCIATED MATERIAL SHALL BE NEW.

ALL WIRING CONNECTIONS WITHIN ALL SIGNAL HEADS SHALL BE MADE WITH THE USE OF SPADE LUGS.

CONTRACTOR TO PROVIDE AND INSTALL THE FOLLOWING EQUIPMENT: ELECTRONIC LOCK, SMART MMU, CONTROLLER, AND CABINET. CELLULAR ROUTERS WILL BE PROVIDED BY THE DISTRICT AND INSTALLED BY THE CONTRACTOR.

THE CONTRACTOR SHALL TERMINATE ALL ETHERNET DEVICES INCLUDING TRAFFIC SIGNAL CONTROLLER, (MMU) MALFUNCTION MONITOR UNIT, (APS) ACCESSIBLE PEDESTRIAN SYSTEM CONTROLLER UNIT, AND DETECTION DEVICES TO THE CELLULAR ROUTER. USE THE FOLLOWING TRAFFIC SIGNAL NETWORK COLOR SCHEME:
BLUE – TRAFFIC SIGNAL CONTROLLER
GREEN – MALFUNCTION MONITOR UNIT (MMU)
YELLOW – ACCESSIBLE PEDESTRIAN SYSTEM (APS)
BLACK – DETECTION

THE CELLULAR ROUTERS WILL BE CONFIGURED BY TXDOT, HOWEVER THE CONTRACTOR SHALL BE ON SITE AS NECESSARY FOR FINAL ROUTER ACCEPTANCE.

PHASE DIAGRAM

ø1	ø2 (PED)	ø3 (PED)	ø4 (PED)
ø5	ø6 (PED)	ø7 NOT IN USE	ø8 NOT IN USE

CONFLICT FLASH: RED ALL PHASES

S-1

Pirate Blvd

QTY: 2

S-2

Sinton St

QTY: 2

S-3

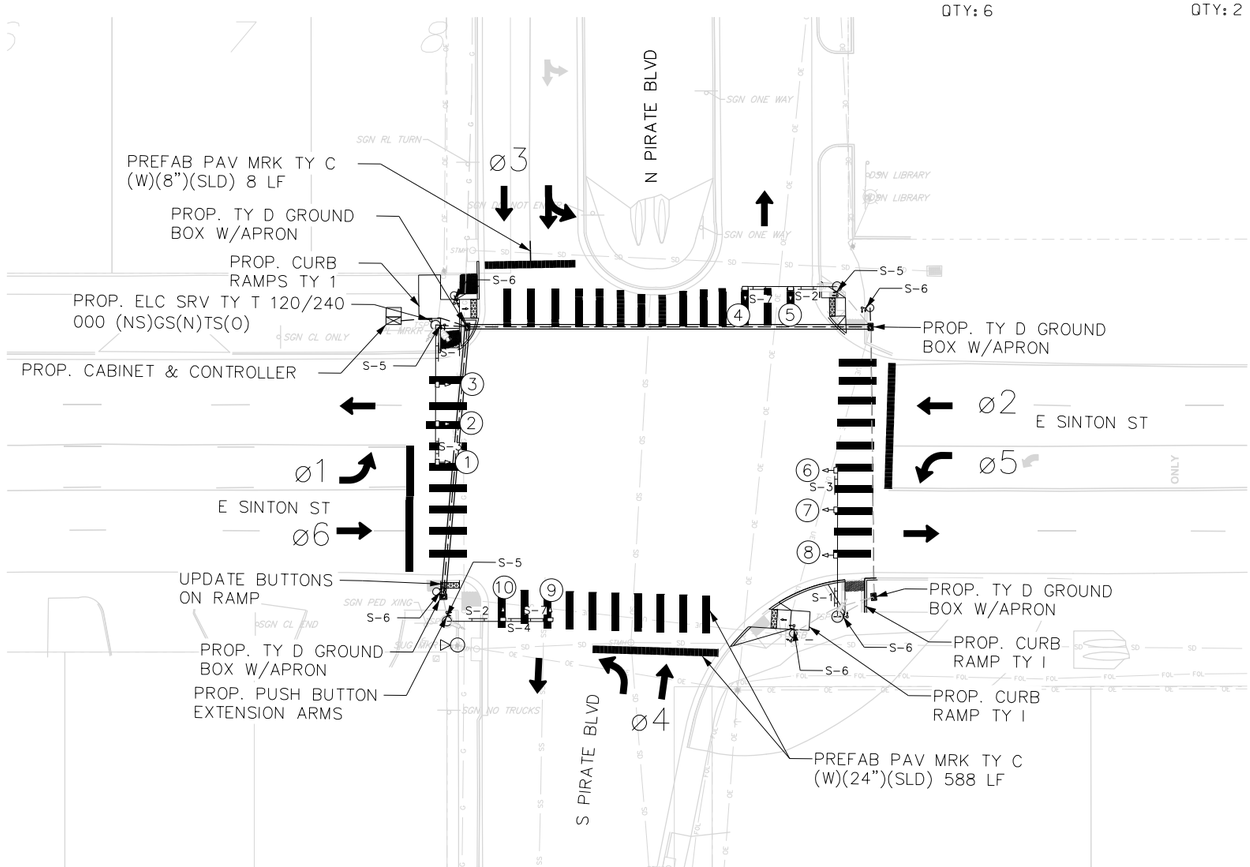
R10-17T
36"X42"
QTY: 2

S-4

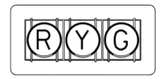
R3-8
30"x30"
QTY: 1

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA



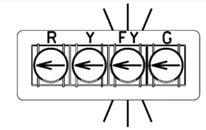
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

2 3 5 7 8 10

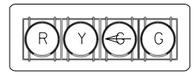
QTY: 6



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

1 6

QTY: 2



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

4 9

QTY: 2

ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

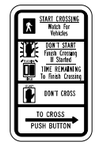
2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

S-5

R10-3eL
9"x15"
QTY: 3

S-6



R10-3eR
9"x15"
QTY: 5

S-7

PROTECTED LEFT ON GREEN ARROW

R10-9T
36"x24"
QTY: 2

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

Carl B. Laferney

0 20' 40'

SCALE: 1" = 40'

NOTES:

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBLITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416.
CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
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Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT PIRATE BLVD PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	45

USER: kegreiano
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04/05/2024
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TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	37	
HEAD 2	26	
HEAD 3	16	
RADAR		5
POLE B		
HEAD 4	24	
HEAD 5	12	
RADAR		5
POLE C		
HEAD 6	39	
HEAD 7	28	
HEAD 8	16	
RADAR		5
POLE E		
HEAD 9	27	
HEAD 10	15	
RADAR		5
TOTAL	240	20

NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

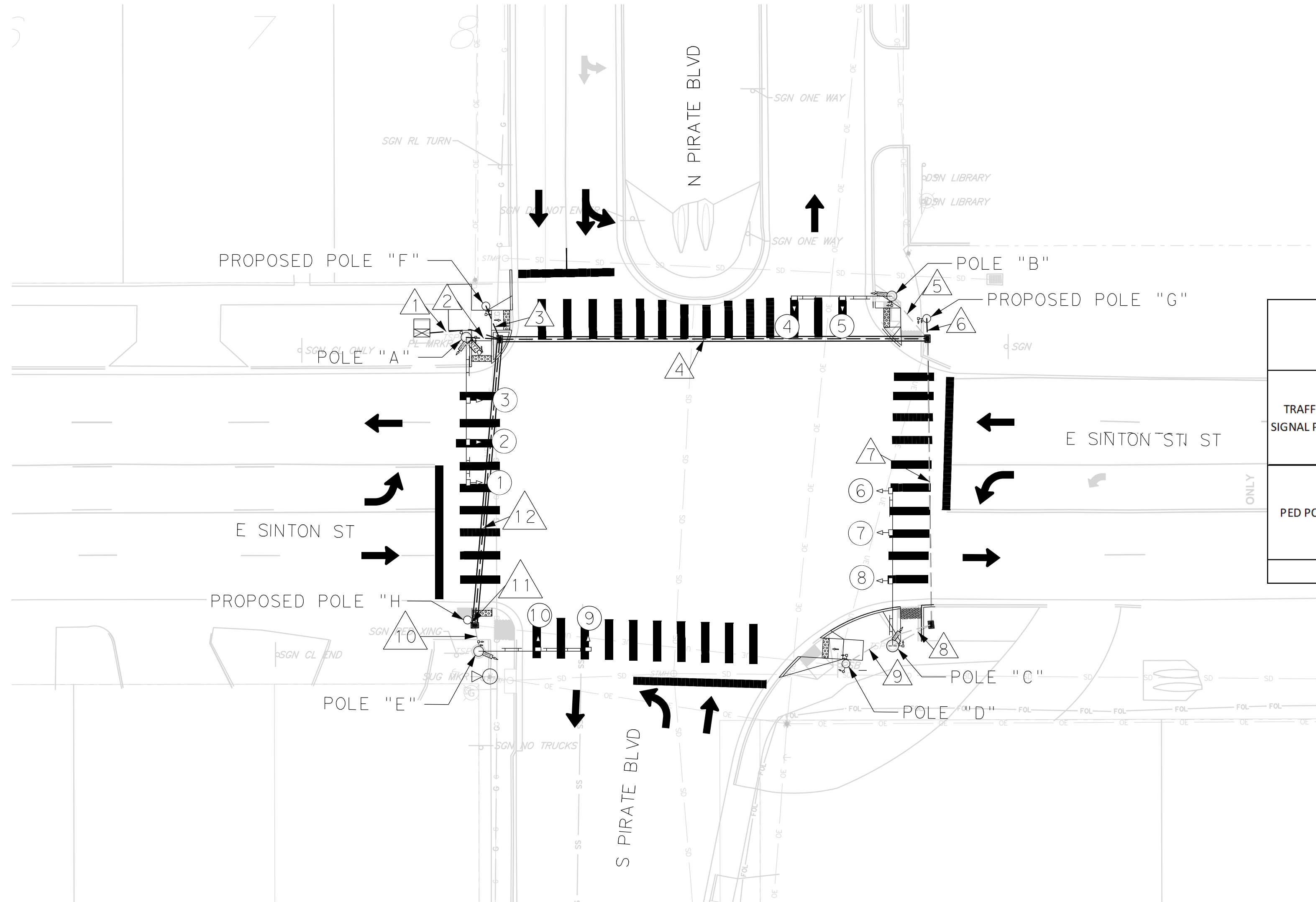
ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.



	INSIDE POLES	#14 AWG (TY A) 7/C	(FT)	#14 AWG (TY A) 5/C	(FT)	#14 AWG (TY C) 2/C	(FT)	RADAR CABLE	(FT)	CAMERA CAT5-E (FT)
TRAFFIC SIGNAL POLE	POLE A	3	20	1	10	1	6	1	20	30
	POLE B	2	20	1	10	1	6	1	20	
	POLE C	3	20	1	10	1	6	1	20	
	POLE E	2	20	1	10	1	6	1	20	
PED POLE	POLE D			1	10	1	6			
	POLE F			1	10	1	6			
	POLE G			1	10	1	6			
	POLE H			1	10	1	6			
	TOTAL	200		80		48		80		30

0 20' 40'

SCALE: 1" = 40'

ITEM	CONDUCTOR/CONDUIT RUN	1	LENGTH (LF)	2	LENGTH (LF)	3	LENGTH (LF)	4	LENGTH (LF)	5	LENGTH (LF)	6	LENGTH (LF)	7	LENGTH (LF)	8	LENGTH (LF)	9	LENGTH (LF)	10	LENGTH (LF)	11	LENGTH (LF)	12	LENGTH (LF)
	EXISTING 2" CONDUIT																								
	EXISTING 3" CONDUIT									1	15			1	75	1	15	1	30	1	10				
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1	25	1	15																				
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)			1	15	1	15					1	10									1	10		
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	2	25																						
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)							1	110															1	75
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1	25	1	15	1	15	1	110	1	15	1	10	1	75	1	15	1	30	1	10	1	10	1	75
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1	25	1	15																				
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2	25	2	15																				
0684-6031	5/C #14 AWG CABLE (PED HEAD)	4	25			1	15	2	110			1	10	1	75			1	30			1	10	1	75
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4	25	1	15			2	110	1	15			1	75	1	15			1	10			1	75
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8	25	1	15	1	15	4	110	1	15	1	10	2	75	1	15	1	30	1	10	1	10	2	75
	RADAR CONTROL CABLE	4	25	1	15			2	110	1	15			1	75	1	15			1	10			1	75
	CAT5-E CAMERA CABLE	1	25	1	15																				

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

REV. NO.	DATE	DESCRIPTION	BY

Westwood

Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com

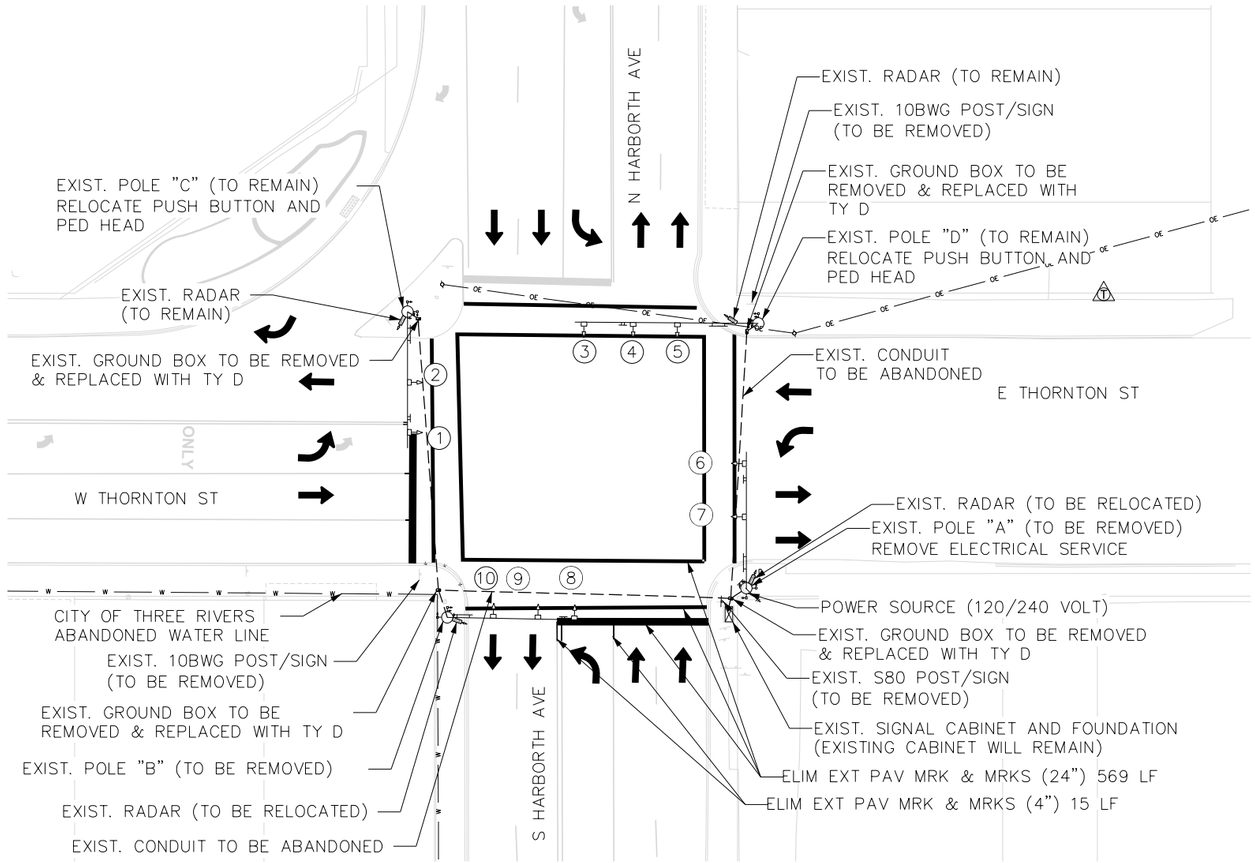
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SINTON ST AT PIRATE BLVD CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			US 181
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CRP	SAN PATRICIO	0101	03	120	46

DGN: CHK DGN: DWG: CHK DWG:



NOTES:

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LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OVERHEAD POWER LINE
- UNDERGROUND ELECTRIC
- STORM DRAIN
- WATER LINE
- GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
TollFree (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

HARBORTH AVE AT THORNTON ST CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	47

USER: kegrell.cano
3:53:42 PM
04/05/2024
M:\DWG\51\5199-21.742\DGN\Traffic\Sheets\Signals\1 - CONDITION DIAGRAM & UTILITY LAYOUT.& - COND DIAG - HARBORTH&THORNTON.dgn

NOTES:

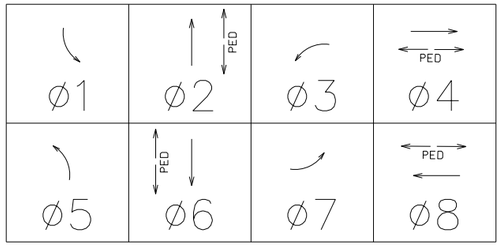
ALL EXISTING POLES SHALL BE REUSED, UNLESS NOTED OTHERWISE. ALONG WITH THEIR MAST ARMS.

ALL SIGNAL HEADS, CAMERAS & ALL ASSOCIATED MATERIAL SHALL BE NEW.

ALL WIRING CONNECTIONS WITHIN ALL SIGNAL HEADS SHALL BE MADE WITH THE USE OF SPADE LUGS.

CONTRACTOR TO MATCH EXISTING SCORING PATTERN AND COLOR OF SIDEWALK, SUBSIDIARY TO ITEM 5114-6003, IN AREAS AROUND THE FIRST STATE BANK BUILDING.

PHASE DIAGRAM



CONFLICT FLASH: RED ALL PHASES

S-1

Thornton St

QTY: 2

S-2

Harborth Ave

QTY: 2

S-3

LEFT TURN YIELD ON FLASHING YELLOW ARROW

R10-12
36"X42"
QTY: 4

S-4

M3-2
24"X12"
M1-6T
24"X24"
M6-01L
21"X15"
QTY: 1

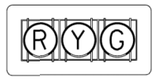
S-5

R10-3eL
9"X15"
QTY: 4

S-6

R10-3eR
9"X15"
QTY: 4

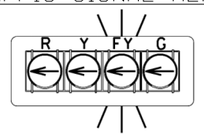
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

(2) (5) (6) (8) (11) (12)

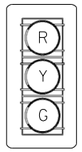
QTY: 6



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

(1) (4) (7) (10)

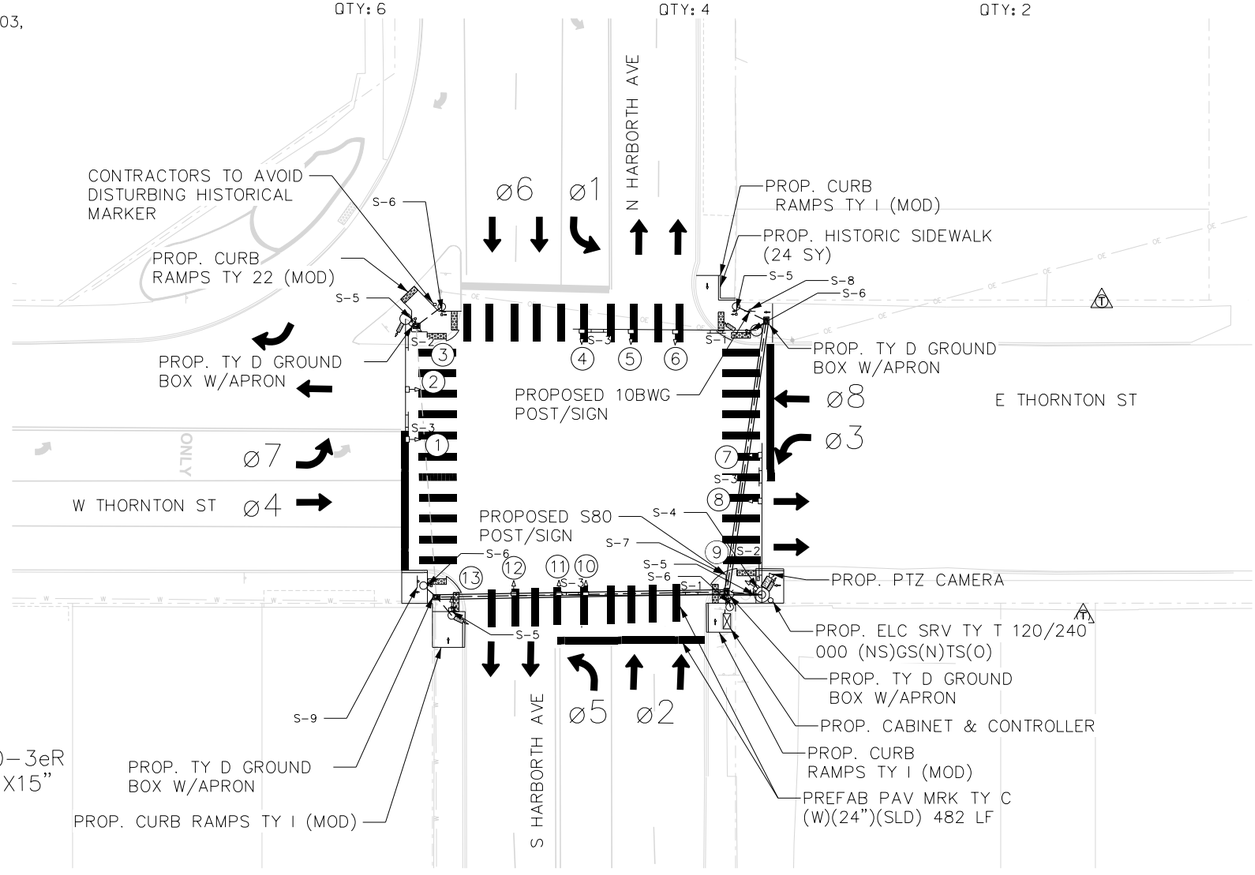
QTY: 4



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

(3) (9) (13)

QTY: 2



ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

S-7

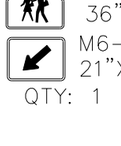
S4-03P
24"X8"
R2-01
24"X30"
S4-01P
24"X10"
S4-06P
24"X10"
S7-1T
24"X18"

M6-04
21"X15"
QTY: 1

S-8

M3-4
24"X12"
M1-6T
24"X24"
M6-01L
21"X15"
S1-01
36"X36"
QTY: 1

S-9



S1-01
36"X36"
M6-02AL
21"X15"
QTY: 1

0 20' 40'

SCALE: 1" = 40'

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

NOTES:

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

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EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416.
CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.

REV. NO.	DATE	DESCRIPTION	BY

Westwood

Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com

Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

HARBORTH AVE AT THORNTON ST
PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	48

CONSTRUCTION SEQUENCE NOTE:

PROPOSED POLE C IS A DUAL MAST ARM WITH 65'/36' ARMS. DUE TO SPACE, THE 65' MAST ARM CANNOT BE INSTALLED UNTIL THE EXISTING POLE ON THE SOUTHEAST CORNER IS REMOVED.

- INSTALL POLE C FOUNDATION, POLE, AND 36' MAST ARM FIRST.
- MOUNT EQUIPMENT FOR W. THORNTON STREET AND MAKE OPERATIONAL.
- TAKE DOWN EXISTING SIGNAL POLE AND MAST ARM FOR EASTBOUND TRAFFIC.
- INSTALL 65' MAST ARM, MOUNT EQUIPMENT, AND MAKE OPERATIONAL.
- INSTALL POLE E FOUNDATION, POLE, MOUNT EQUIPMENT, AND MAKE OPERATIONAL.
- REMOVE EXISTING SIGNAL POLE ON SOUTHWEST CORNER.

TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	32	
HEAD 2	20	
RADAR		5
POLE B		
HEAD 3	46	
HEAD 4	34	
HEAD 5	22	
RADAR		8
POLE C		
HEAD 6	32	
HEAD 7	20	
HEAD 8	43	
HEAD 9	53	
HEAD 10	65	
RADAR		5
RADAR		5
TOTAL	367	23

NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

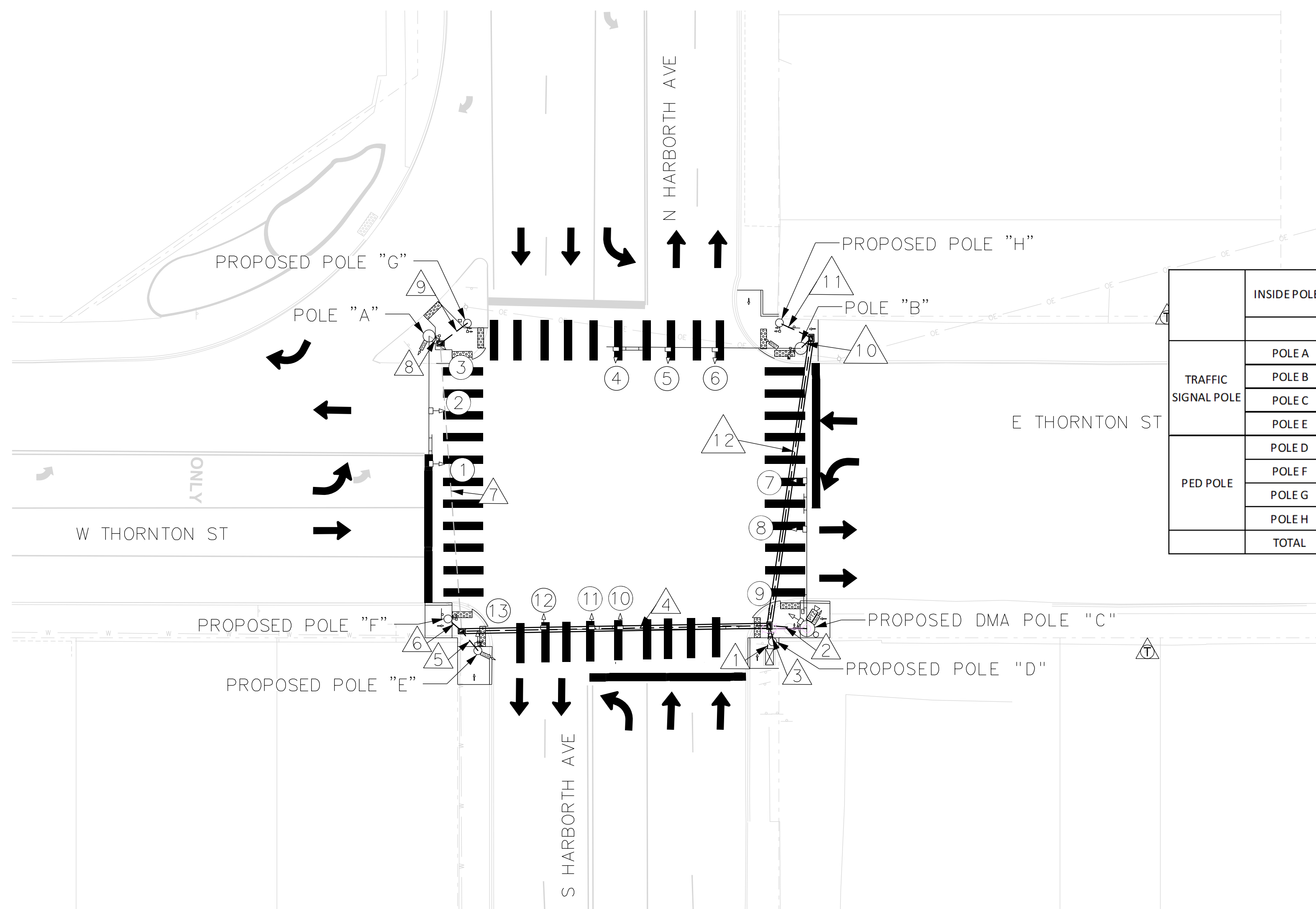
PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.

20' TALL PED POLE F WILL HOUSE SUPPLEMENTAL SIGNAL HEAD 11 FOR THE SOUTHBOUND TRAFFIC ON S. HARORTH AVE.



	INSIDE POLES	#14 AWG (TY A) 7/C	(FT)	#14 AWG (TY A) 5/C	(FT)	#14 AWG (TY C) 2/C	(FT)	RADAR CABLE	(FT)	ILLUM #8 XHHW	(FT)	CAMERA CAT5-E (FT)
TRAFFIC SIGNAL POLE	POLE A	3	20	1	10	1	6	1	20			
	POLE B	3	20	1	10	1	6	1	20			
	POLE C	6	20	1	10	1	6	1	20	2	30	30
	POLE E	1	20	1	10	1	6	1	20			
PED POLE	POLE D			1	10	1	6					
	POLE F			1	10	1	6					
	POLE G			1	10	1	6					
	POLE H			1	10	1	6					
	TOTAL	260		80		48		80		60		30

0 20' 40'
SCALE: 1" = 40'

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

ITEM	CONDUCTOR/CONDUIT RUN	1	1 LENGTH (LF)	2	2 LENGTH (LF)	3	3 LENGTH (LF)	4	4 LENGTH (LF)	5	5 LENGTH (LF)	6	6 LENGTH (LF)	7	7 LENGTH (LF)	8	8 LENGTH (LF)	9	9 LENGTH (LF)	10	10 LENGTH (LF)	11	11 LENGTH (LF)	12	12 LENGTH (LF)
	EXISTING 2" CONDUIT																								
	EXISTING 3" CONDUIT													1	75										
	EXISTING 4" CONDUIT															1	5								
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1	5	1	15																				
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)			1	15	1	5			1	10	1	10					1	10	1	5	1	10		
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	2	5																						
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)							1	80															1	80
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1	5	1	15	1	5	1	80	1	10	1	10	1	75	1	5	1	10	1	5	1	10	1	80
0620-6009	1/C #8 XHHW (ILLUM)			2	15	2	5																		
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1	5	1	15																				
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2	5	2	15																				
0684-6031	5/C #14 AWG CABLE (PED HEAD)	5	5			1	5	3	80	2	10	1	10	1	75			1	10			1	10	1	80
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	3	5	1	15			1	80					1	75	1	5			1	5			1	80
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8	5	1	15	1	5	4	80	1	10	1	10	2	75	1	5	1	10	1	5	1	10	2	80
	RADAR CONTROL CABLE	4	5	1	15			2	80	1	10			1	75	1	5			1	5			1	80
	CAT5-E CAMERA CABLE	1	5	1	15																				

REV. NO.	DATE	DESCRIPTION	BY

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HARBORTH AVE AT THORNTON ST CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	49

USER: kearellano

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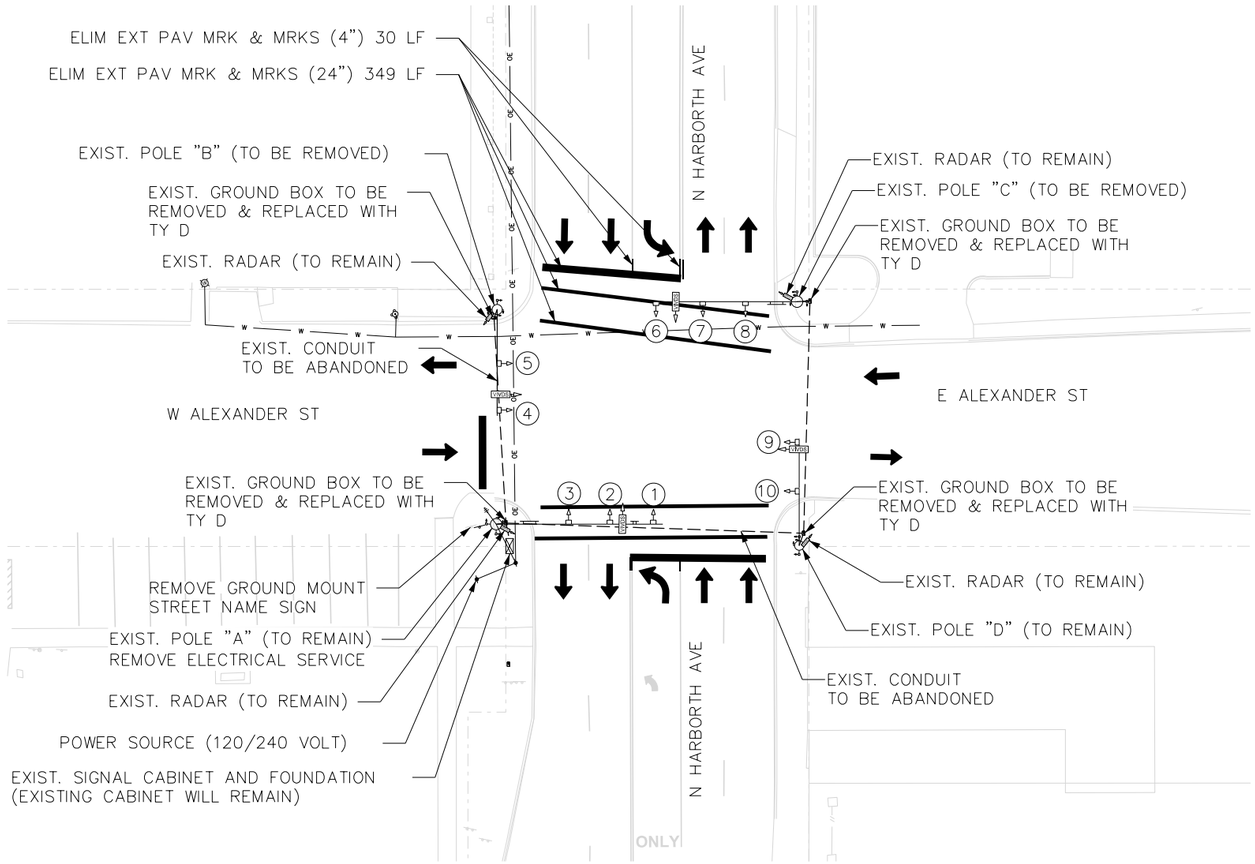

NOTES:

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LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- VIVDS EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OE OVERHEAD POWER LINE
- UE UNDERGROUND ELECTRIC
- SD STORM DRAIN
- W WATER LINE
- G GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

ALL VIVDS DETECTORS TO BE REMOVED.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
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HARBORTH AVE AT ALEXANDER ST CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	50

USER: kearellano
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NOTES:

ALL EXISTING POLES SHALL BE REUSED, UNLESS NOTED OTHERWISE. ALONG WITH THEIR MAST ARMS.

ALL SIGNAL HEADS, CAMERAS & ALL ASSOCIATED MATERIAL SHALL BE NEW.

ALL WIRING CONNECTIONS WITHIN ALL SIGNAL HEADS SHALL BE MADE WITH THE USE OF SPADE LUGS.

PHASE DIAGRAM

ø1	ø2 PED	NOT IN USE ø3	PED ø4
ø5	ø6 PED	NOT IN USE ø7	PED ø8

CONFLICT FLASH: RED ALL PHASES

S-1

Alexander St

QTY: 2

S-2

Harborth Ave

QTY: 2

S-3

LEFT TURN YIELD ON FLASHING YELLOW ARROW

R10-17T 36"X42"

QTY: 2

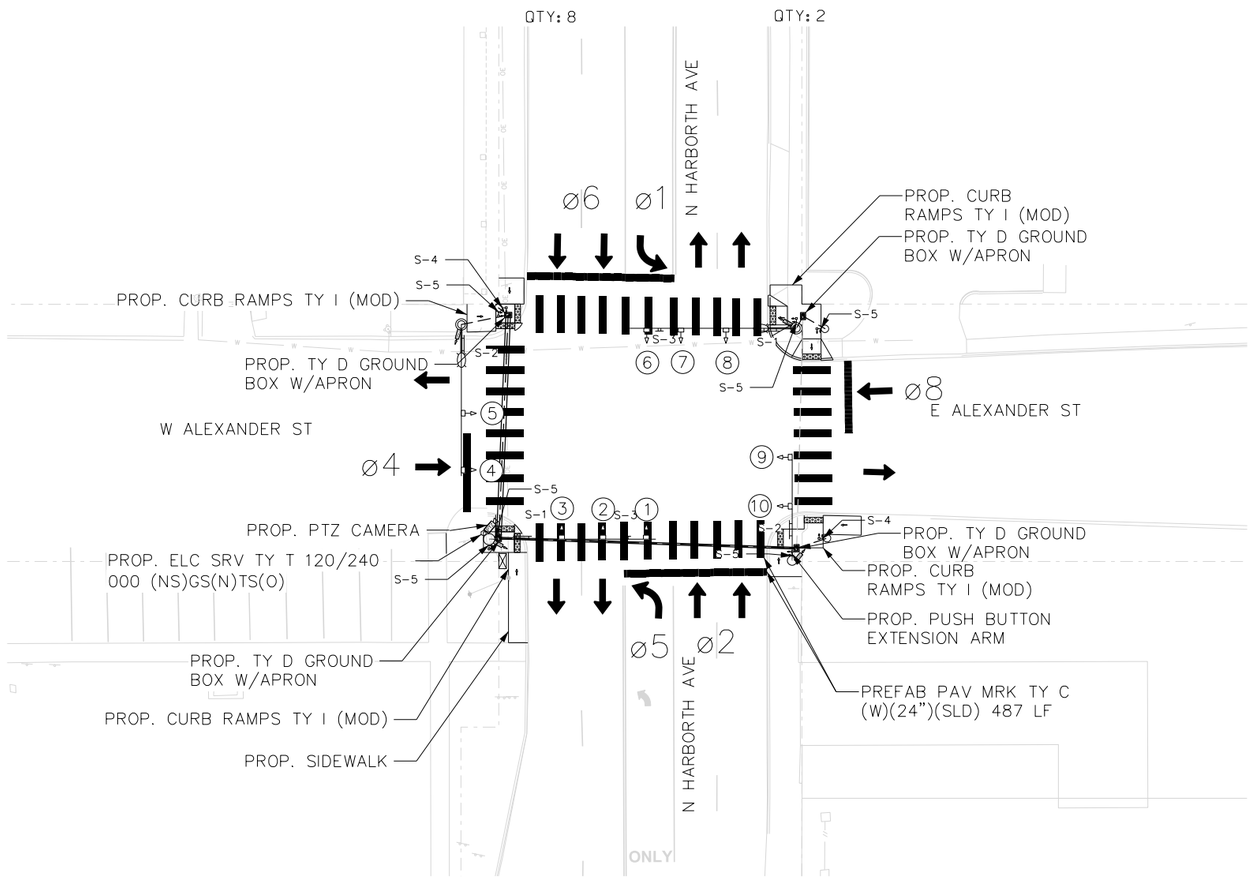
TRAFFIC SIGNAL HEADS

12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

② ③ ④ ⑤ ⑦ ⑧ ⑨ ⑩

12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

① ⑥



ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

S-4

R10-3eL 9"X15"

QTY: 2

S-5

R10-3eR 9"X15"

QTY: 6

0 20' 40'

SCALE: 1" = 40'

NOTES:

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- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

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HARBORTH AVE AT ALEXANDER ST PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	51

USER: kgarellano
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04/05/2024
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NOTES:

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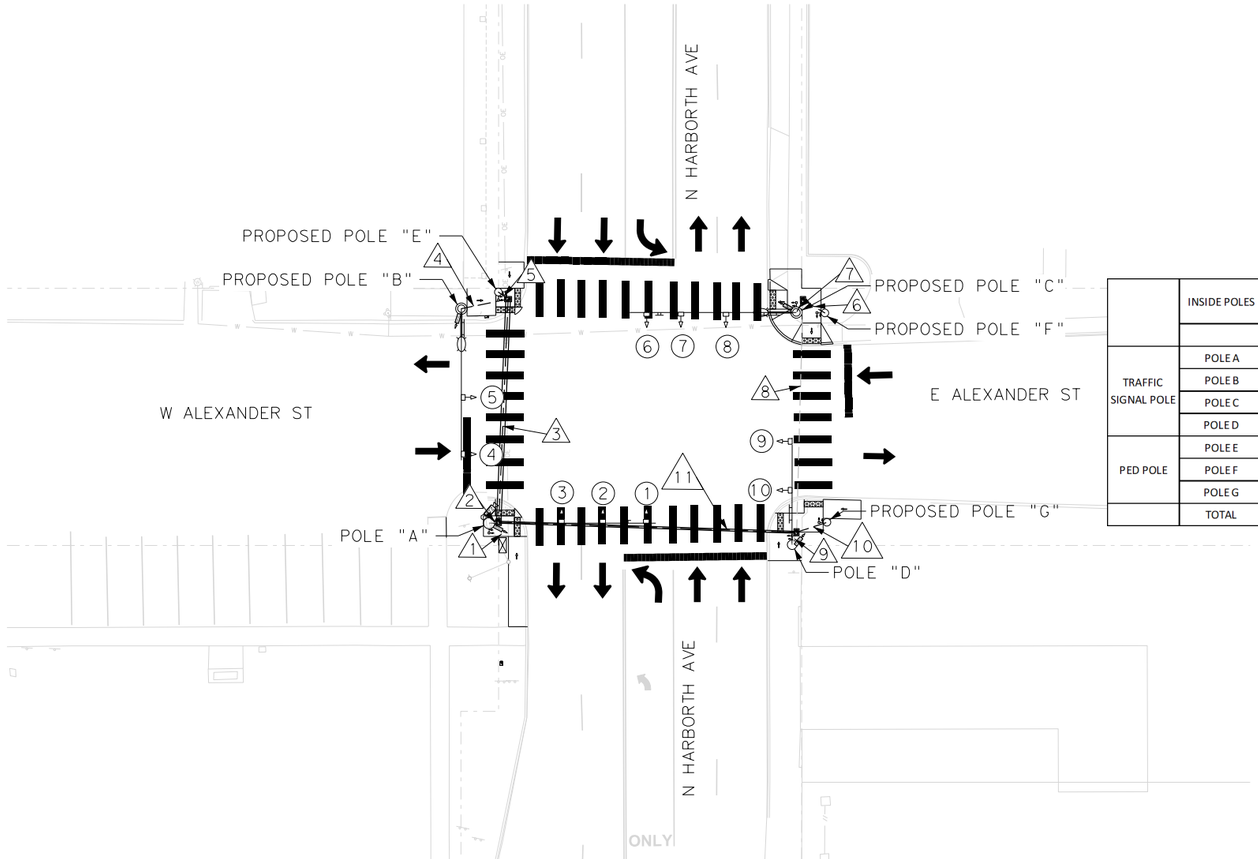
TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C CABLE (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	42	
HEAD 2	30	
HEAD 3	19	
RADAR		5
POLE B		
HEAD 4	38	
HEAD 5	24	
RADAR		5
POLE C		
HEAD 6	40	
HEAD 7	31	
HEAD 8	19	
RADAR		5
POLE D		
HEAD 9	27	
HEAD 10	15	
RADAR		5
TOTAL	285	20

	INSIDE POLES	#14 AWG (TY A) 7/C (FT)	#14 AWG (TY A) 5/C (FT)	#14 AWG (TY C) 2/C (FT)	RADAR CABLE (FT)	ILLUM #8 XHHW (FT)	CAMERA CAT5-E (FT)
TRAFFIC SIGNAL POLE	POLE A	3 20	2 10	2 6	1 20		30
	POLE B	2 20			1 20	2 30	
	POLE C	3 20	1 10	1 6	1 20	2 30	
	POLE D	2 20	1 10	1 6	1 20		
PED POLE	POLE E		2 10	2 6			
	POLE F		1 10	1 6			
	POLE G		1 10	1 6			
	TOTAL	200	80	48	80	60	30

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (LF)	9 LENGTH (LF)	10 LENGTH (LF)	11 LENGTH (LF)
	EXISTING 2" CONDUIT								1 65			
	EXISTING 3" CONDUIT											
	EXISTING 4" CONDUIT	1 10	1 5							1 5		
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 10	1 10									
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)				1 15	1 5	1 10	1 5			1 10	
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	1 10										
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)			1 65								1 85
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 10	1 5	1 65	1 15	1 5	1 10	1 5	1 65	1 5	1 10	1 85
0620-6008	1/C #8 XHHW (ILLUM)		4 5	2 65	2 15			2 5	2 65			2 85
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 10	1 5									
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 10	2 5									
0684-6031	5/C #14 AWG CABLE (PED HEAD)	3 10		1 65		1 5	1 10		1 65		1 10	2 85
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	4 10	1 5	1 65	1 15			1 5	1 65	1 5		2 85
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	8 10	2 5	2 65		2 5	1 10	1 5	2 65	1 5	1 10	4 85
	RADAR CONTROL CABLE	4 10	1 5	1 65	1 15			1 5	1 65	1 5		2 85
	CAT5-E CAMERA CABLE	1 10	1 5									

0 20' 40'

SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

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HARBORTH AVE AT ALEXANDER ST CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	52

USER: kgarelli
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04/05/2024
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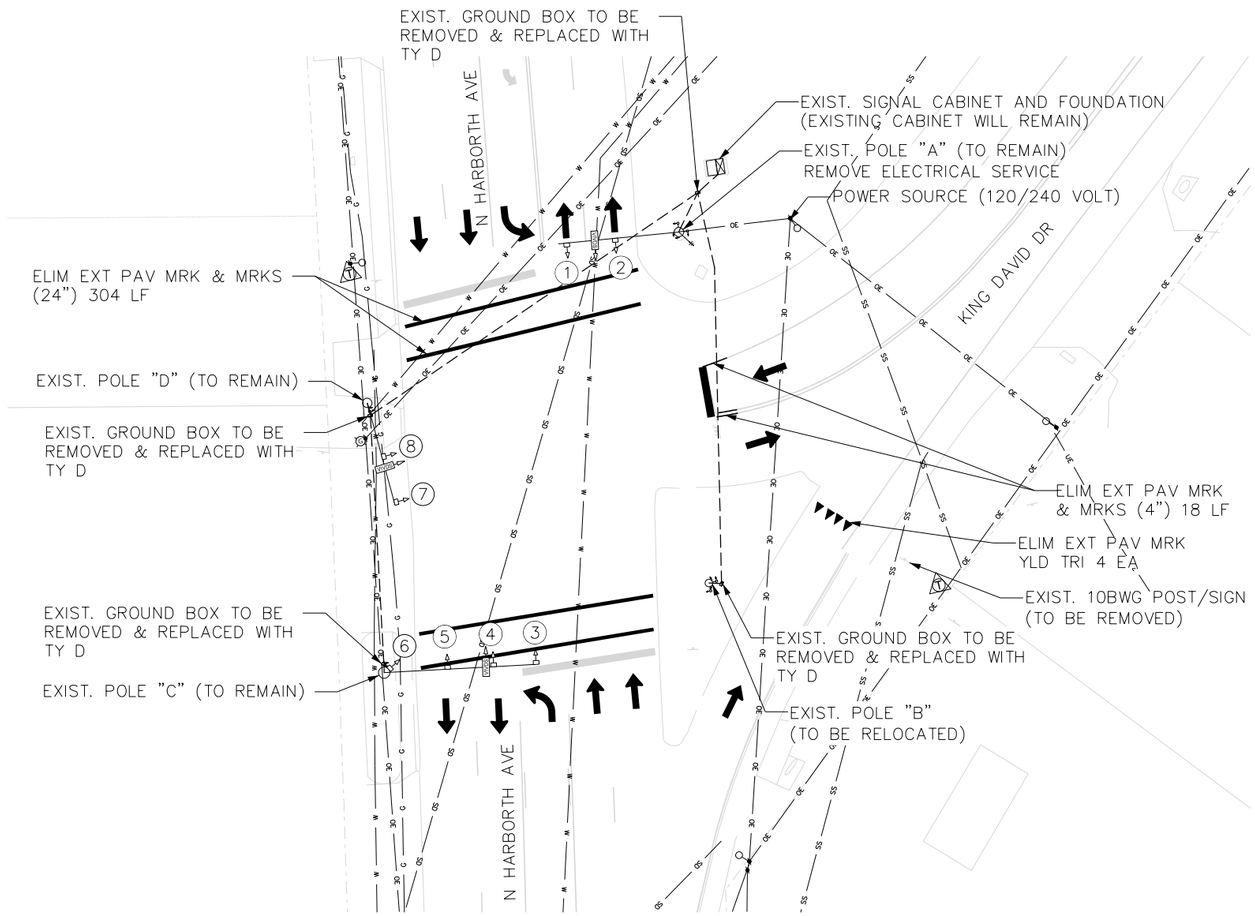

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LEGEND

- EXIST. CONTROLLER
- EXIST. GROUND BOX
- EXIST. CONDUIT
- VIVDS EXIST. VIVDS CAMERA (TO BE REMOVED)
- EXIST. SIGNAL HEAD (SIGNAL HEAD & WIRING TO BE REMOVED AND REPLACED)
- EXIST. PEDESTRIAN BUTTON (TO REMAIN)
- EXIST. PEDESTRIAN HEAD (TO REMAIN)
- EXIST. RADIO ANTENNA
- OE OVERHEAD POWER LINE
- UE UNDERGROUND ELECTRIC
- SD STORM DRAIN
- W WATER LINE
- G GAS LINE

NOTES:

THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE EXISTING SIGNAL SYSTEM AS NOTED. ALL SIGNAL EQUIPMENT REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, EXCEPT AS NOTED, AND REMOVED FROM THE PROJECT SITE.

THE CONTRACTOR SHALL REMOVE ALL EXIST. CONDUCTORS AND DISPOSED OF THEM PROPERLY. (SUBSIDIARY TO ITEM 680-6004).

CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO AS SIGNAL DOWN TIME WILL BE KEPT TO A MINIMUM.

REMOVE ALL EXISTING STREET NAME SIGNS STRAPPED TO THE SIGNAL POLES.

ALL VIVDS DETECTORS TO BE REMOVED AND REPLACED WITH RADAR DETECTORS.

REMOVE ALL EXISTING PED PUSH BUTTONS, PED HEADS, AND SIGNS. TO BE REPLACED WITH APS/COUNTDOWN.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

0 20' 40'
SCALE: 1" = 40'

REV. NO.	DATE	DESCRIPTION	BY

Westwood
Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

HARBORTH AVE AT KING DAVID DR CONDITION DIAGRAM & UTILITY LAYOUT

SHEET 1 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	53

USER: kegrelliano
3:54:24 PM
04/05/2024
M:\DWG-SI\5199-21.742\DGN\Traffic\Sheets\Signals\1 - CONDITION DIAGRAM & UTILITY LAYOUT\10 - COND DIAG - HARBORTH&KINGDAVID.dgn

USER: kgarellano

PHASE DIAGRAM

ø1	ø2 PED	NOT IN USE ø3	NOT IN USE ø4
NOT IN USE ø5	ø6	NOT IN USE ø7	ø8 PED

CONFLICT FLASH: RED ALL PHASES

S-1

King David Dr

QTY: 2

S-2

Harborth Ave

QTY: 1

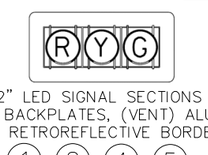
S-3

LEFT TURN
YIELD
ON FLASHING
YELLOW
ARROW

R10-17T
36"X42"

QTY: 1

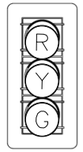
TRAFFIC SIGNAL HEADS



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

1 2 4 5 7 8

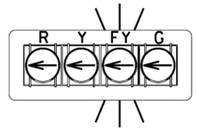
QTY: 6



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

6

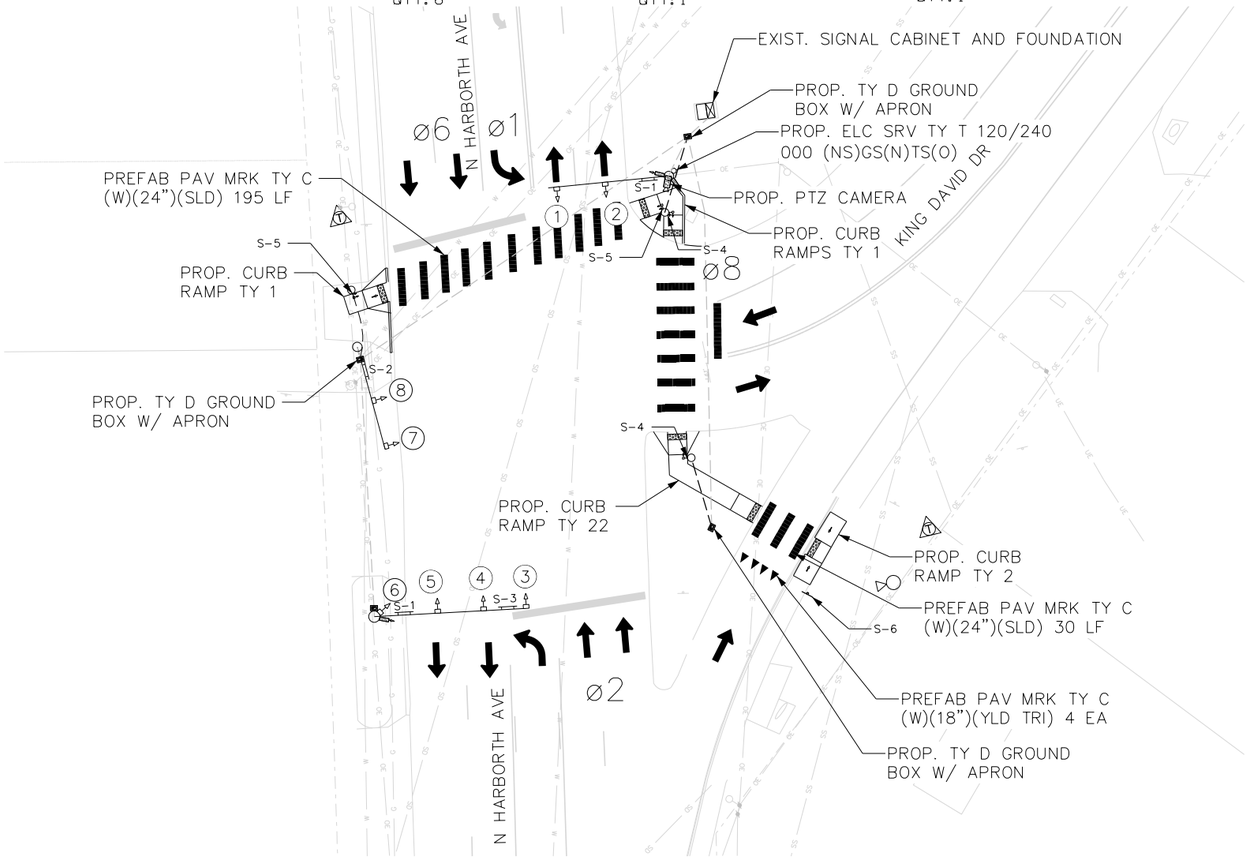
QTY: 1



12" LED SIGNAL SECTIONS WITH BACKPLATES, (VENT) ALUM, AND RETROREFLECTIVE BORDER

3

QTY: 1



RADAR DETECTOR SHALL BE MOUNTED PER MANUFACTURER RECOMMENDATION AND MOUNTING LOCATION WILL BE VERIFIED BY THE TRAFFIC ENGINEER REPRESENTATIVE BEFORE THEY ARE INSTALLED.

ALL PROPOSED SIGNAL HEADS WILL BE MOUNTED USING ARTICULATING MOUNTED BRACKETS.

2-INCH RETROREFLECTIVE BORDER SHALL BE INSTALLED ON ALL VENTED, ALUMINUM BACKPLATES. SEE TS-BP-20.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY CONDUCTORS AND COMMUNICATION CABLES.

S-4

R10-3eL
9"X15"

QTY: 2

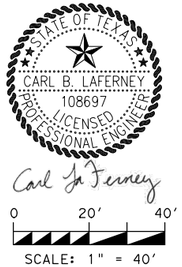
S-5

R10-3eR
9"X15"

QTY: 2

S-6

R1-02
36"X36"
QTY: 1



SCALE: 1" = 40'

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PTZ PROP. PTZ CAMERA

NOTES:

RADARS SHALL BE MOUNTED ON TRAFFIC SIGNAL POLE AND MAST ARMS AS SHOWN. CORD GRIP CONNECTORS SHALL BE USED AT WIRE OUTLETS FOR CAMERA AND RADAR CABLES.

IN AREAS WHERE EXIST. CONCRETE ARE DISTURBED DUE TO GROUND BOX, CONDUIT AND FOUNDATION INSTALLATION. REPLACE DISTURBED AREA WITH CONCRETE OF SAME COLOR AND TEXTURE A EXISTING ISLANDS. THIS MATERIAL AND WORK WILL BE PAID BY ITEM 624. PROPOSED GROUND BOXES INSTALLED ON SIDEWALK OR RAMP LANDINGS ARE TO BE INSTALLED FLUSH WITH THE CONCRETE.

LOCATIONS OF ALL UTILITIES ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBLITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

EXISTING CONDUIT, TRAFFIC SIGNAL MAST ARM AND POLES ARE TO BE REUSED. THE EXISTING WIRING AND CABLING CONDUIT IN TRAFFIC SIGNAL MAST ARM AND POLES SHALL BE REMOVED AND ALL NEW WIRING AND CABLING SHALL BE INSTALLED.

CONTRACTOR SHALL FURNISH AND DELIVER TS2-TY1 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079, 361-739-6044, OR CARLOS.CARRILLO@TXDOT.GOV
CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT SIGNAL SHOP AT 1701 S. PADRE ISLAND DR. CORPUS CHRISTI, TX 78416.
CONTACT: CARLOS CARRILLO AT 361-946-5079 OR 361-739-6044.

NORTHBOUND LEFT IS STRIPED AS A TWO-WAY LEFT-TURN LANE. THREE SECTION SIGNAL HEAD TO REMAIN.

REV. NO.	DATE	DESCRIPTION	BY

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Westwood Professional Services, Inc.
TBPE FIRM REGISTRATION NO. F-11756
TBPLS FIRM REGISTRATION NO. 10074301

HARBORTH AVE AT KING DAVID DR PLAN VIEW

SHEET 2 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	54

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04/05/2024
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NOTES:

PREPARATION OF EXISTING CONDUIT ONCE EXISTING CONDUCTORS ARE REMOVED, PULL A MANDREL THROUGH EMPTY CONDUIT. USE A MANDREL WITH THE DIAMETER OF THE CONDUIT AND 2 IN LENGTH. REPAIR OR REPLACE CONDUIT RUNS THAT WILL NOT ALLOW PASSAGE OF THE MANDREL. REPLACE CONDUIT DEEMED IMPRACTICAL TO REPAIR OR REMAINS USUITABLE IN ACCORDANCE WITH ITEM 618, "CONDUIT". CLEAN THE CONDUIT BY PULLING A RUBBER SWAB LIGHTLY LARGE IN DIAMETER THAN THE CONDUIT.

ALL NEW AND EXISTING CONDUIT TERMINATING IN GROUND BOXES SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL OF A COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

PREPARATION OF EXISTING GROUND BOXES BY REMOVE ALL SILT AND DEBRIS INSIDE OF THE GROUND BOX. SO THAT THE BOTTOM OF THE GROUND BOX IS VISIBLE AND CLEARED FROM SILT AND DEBRIS.

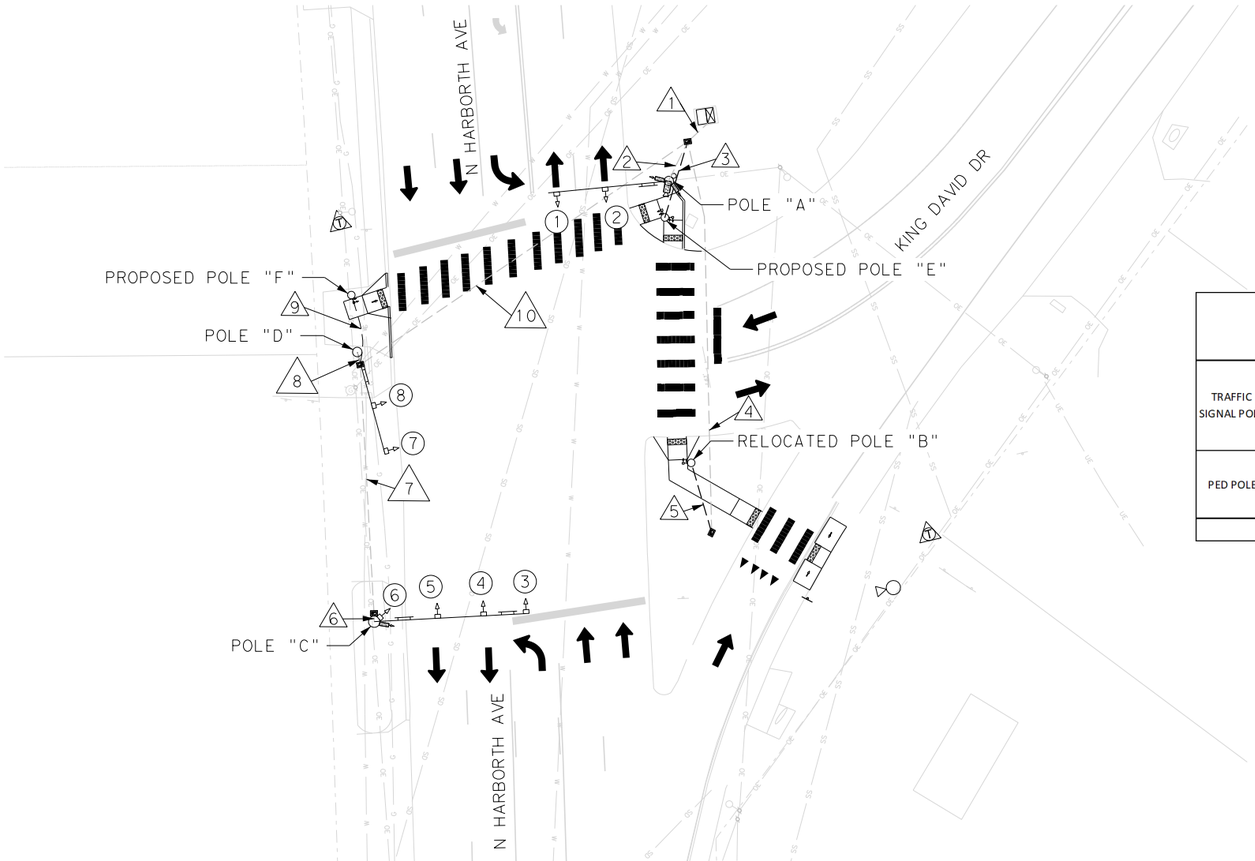
ALL MATERIALS AND LABOR ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTOR AT EACH PEDESTAL ASSEMBLY WILL BE CONSIDERED SUBSIDIARY TO ITEM 682.

ALL MATERIAL AND LABOR ASSOCIATED WITH REMOVAL AND INSTALLATION OF 1-1/2" COUPLING AND CBG CONNECTOR ON EACH TRAFFIC SIGNAL ARM WILL BE CONSIDERED SUBSIDIARY TO ITEM 680.

TRAFFIC SIGNAL CABLE FOR EACH CABLE RUN, COIL AN EXTRA 5 FEET OF CABLE IN EACH GROUND BOX.

LEGEND

- PROP. CABINET
- EXIST. GROUND BOX TO BE PREPARED
- PROP. GROUND BOX
- EXIST. CONDUIT TO BE PREPARED
- PROP. CONDUIT (TRENCH)
- PROP. CONDUIT (BORE)
- PROP. ELECTRICAL SERVICE
- PROP. PTZ CAMERA



TRAFFIC SIGNAL POLES/ARMS	#14 AWG (TY A) 7/C (FT)	RADAR CABLE (FT)
POLE A		
HEAD 1	42	
HEAD 2	30	
HEAD 3	19	
RADAR		5
POLE B		
HEAD 4	38	
HEAD 5	24	
RADAR		5
POLE C		
HEAD 6	40	
HEAD 7	31	
HEAD 8	19	
RADAR		5
POLE D		
HEAD 9	27	
HEAD 10	15	
RADAR		5
TOTAL	285	20

	INSIDE POLES	#14 AWG (TY A) 7/C	(FT)	5/C	(FT)	#14 AWG (TY C) 2/C	(FT)	RADAR CABLE	(FT)	CAMERA CAT5-E (FT)
TRAFFIC SIGNAL POLE	POLE A	3	20	2	10	2	6	1	20	30
	POLE B	2	20					1	20	
	POLE C	3	20	1	10	1	6	1	20	
	POLE D	2	20	1	10	1	6	1	20	
PED POLE	POLE E			2	10	2	6			
	POLE F			1	10	1	6			
	POLE G			1	10	1	6			
	TOTAL	200		80		48		80		30

ITEM	CONDUCTOR/CONDUIT RUN	1 LENGTH (LF)	2 LENGTH (LF)	3 LENGTH (LF)	4 LENGTH (LF)	5 LENGTH (LF)	6 LENGTH (LF)	7 LENGTH (LF)	8 LENGTH (LF)	9 LENGTH (LF)	10 LENGTH (LF)
	EXISTING 2" CONDUIT										
	EXISTING 3" CONDUIT										
	EXISTING 4" CONDUIT	1 10			1 110		1 5	1 70	1 5		1 110
0618-6023	CONDT (PVC) (SCH 40) (2") (TRENCH)	1 10									
0618-6029	CONDT (PVC) (SCH 40) (3") (TRENCH)		1 15	1 25							
0618-6030	CONDT (PVC) (SCH 40) (3") (BORE)					1 25				1 25	
0618-6033	CONDT (PVC) (SCH 40) (4") (TRENCH)	1 10									
0618-6034	CONDT (PVC) (SCH 40) (4") (BORE)										
0620-6008	1/C #8 XHHW (GREEN)(SYSTEM GROUND)	1 10	1 15	1 25	1 110	1 25	1 5	1 70	1 5	1 25	1 110
0620-6009	1/C #6 BARE (SIGNAL GROUND)	1 10									
0620-6010	1/C #6 XHHW (SIGNAL POWER)	2 10									
0684-6031	5/C #14 AWG CABLE (PED HEAD)	3 10		1 25	1 110	1 25				1 25	1 110
0684-6042	16/C #14 AWG CABLE (SIGNAL HEAD)	3 10	1 15				1 5	1 70	1 5		2 110
0684-6080	2/C #14 AWG CABLE (TY C) (PED BUTTON)	4 10		2 25	1 110	1 25				1 25	1 110
	RADAR CONTROL CABLE	3 10	1 15				1 5	1 70			1 110
	CAT5-E CAMERA CABLE	1 10	1 15								

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

Carl B. Laferney

0 20' 40'

SCALE: 1" = 40'

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TBPLS FIRM REGISTRATION NO. 10074301

HARBORTH AVE AT KING DAVID DR CONDUIT & CONDUCTOR LAYOUT

SHEET 3 OF 3

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US281
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	55

USER: kgarelli
3:54:41 PM
04/05/2024
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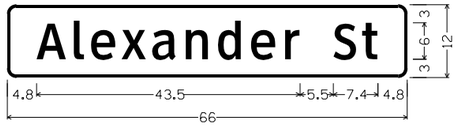
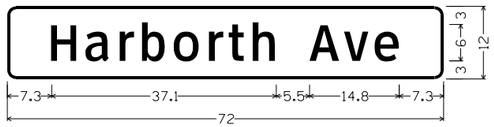
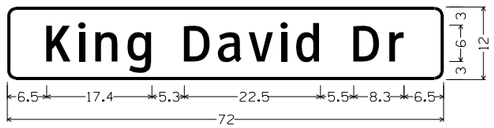


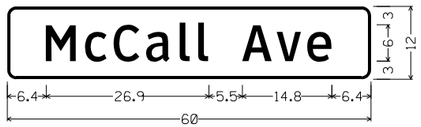
D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Alexander", ClearviewHwy-3-W; "St", ClearviewHwy-3-W;



D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Harborth", ClearviewHwy-3-W; "Ave", ClearviewHwy-3-W;

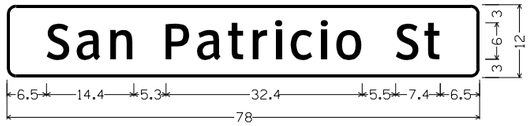


D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"King David", ClearviewHwy-3-W; "Dr", ClearviewHwy-3-W;

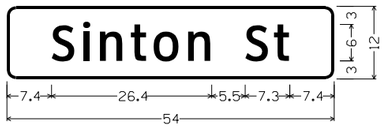


D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"McCall", ClearviewHwy-3-W; "Ave", ClearviewHwy-3-W;

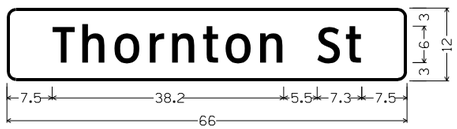
D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Pirate", ClearviewHwy-3-W; "Blvd", ClearviewHwy-3-W;



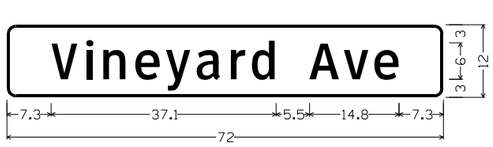
D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"San Patricio", ClearviewHwy-3-W; "St", ClearviewHwy-3-W;



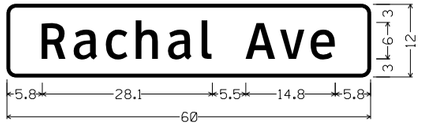
D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Sinton", ClearviewHwy-3-W;
"St", ClearviewHwy-3-W;



D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Thornton", ClearviewHwy-3-W; "St", ClearviewHwy-3-W;



D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Vineyard", ClearviewHwy-3-W; "Ave", ClearviewHwy-3-W;



D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Rachal", ClearviewHwy-3-W; "Ave", ClearviewHwy-3-W;

D3-1G(2) 6in;
1.5" Radius, Ø.5" Border, White on Green;
"Bowie", ClearviewHwy-3-W; "Ave", ClearviewHwy-3-W;

D3-1G(5) 8in (2 Lines);

1.5" Radius, No border, None on Green;
Standard Arrow Custom 10.0" X 6.1" 180 33/64 White;
"Russ" White, ClearviewHwy-3-W; "Ave" White, ClearviewHwy-2-W;

1.5" Radius, No border, None on Green;
"Sodville" White, ClearviewHwy-3-W 84% spacing;
"Ave" White, ClearviewHwy-2-W 101% spacing;
Standard Arrow Custom 10.0" X 6.1" Ø 33/64 White;

D3-1G(5) 8in (2 Lines);

1.5" Radius, No border, None on Green;
Standard Arrow Custom 10.0" X 6.1" 180 33/64 White;
"Sodville" White, ClearviewHwy-3-W 84% spacing;
"Ave" White, ClearviewHwy-2-W 101% spacing;

1.5" Radius, No border, None on Green;
"Russ" White, ClearviewHwy-3-W; "Ave" White, ClearviewHwy-2-W;
Standard Arrow Custom 10.0" X 6.1" Ø 33/64 White;

NOTE: INSTALLATION IS SUBSIDIARY TO ITEM 680 INSTALL HWY TRAFFIC SIGNAL (UPGRADE). QUANTITIES ARE REFLECTED IN THE PLAN SHEET PER LOCATION.

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER

Carl B. Laferney

REV. NO.	DATE	DESCRIPTION	BY

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Phone (817) 412-7155 4060 Bryant Irvin Blvd
Toll Free (888) 937-5150 Fort Worth, TX 76109
westwoodps.com
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TBPE FIRM REGISTRATION NO.: F-11756
TBPLS FIRM REGISTRATION NO. 10074301

SMALL SIGN DETAIL

SHEET 1 OF 1

DGN:	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CHK DGN:	6	TEXAS	SEE TITLE SHEET			US 181
DWG:	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
CHK DWG:	CRP	SAN PATRICIO	0101	03	120	56

31 55:55 PM
04/05/2024
M:\DWG-SI\SI199-21.742\DGN\Traffic\Sheets\Signing & Pavement Marking\SIGN DETAILS_01.dgn
USER: kearellano

DATE: 04/05/2024 3:55:56 PM
FILE: \\nasuniftw.pkce.com\dwg\DWG-51\5199-21.742\DGN\Traffic\Sheets\Standard\ed1-14.dgn

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.
2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.
3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.
4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.
2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.
3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.
4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.
6. Support conductors in illumination poles with a J-hook at the top of the pole.
7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.
8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.
11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.
12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.
4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.
5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

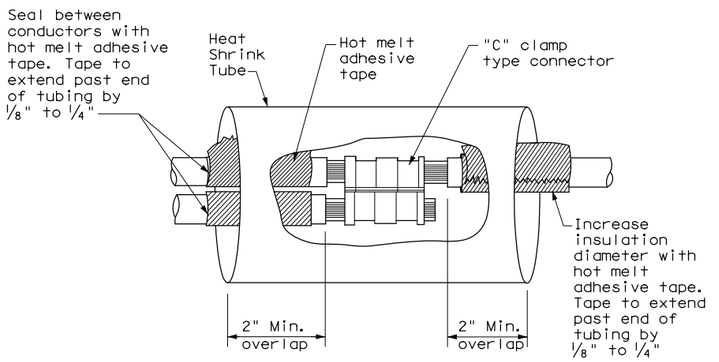
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
2. Do not place ground rods in the same drilled hole as a timber pole.
3. Install ground rods so the imprinted part number is at the upper end of the rod.
4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.
6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type

SPLICE OPTION 2
Split Bolt Type

SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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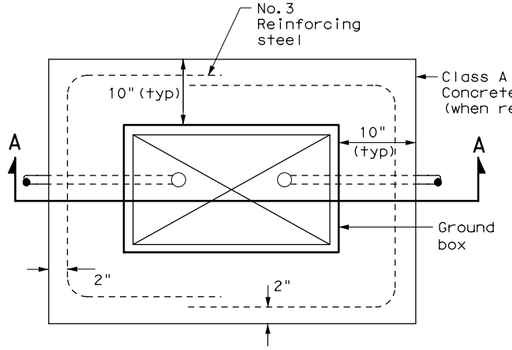
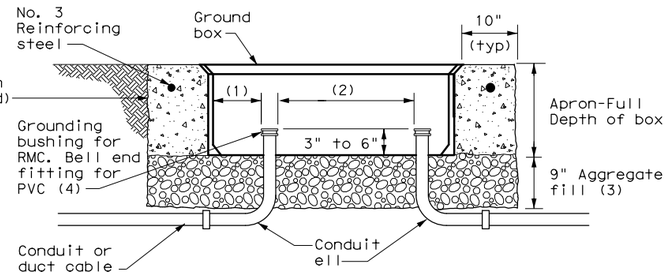


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

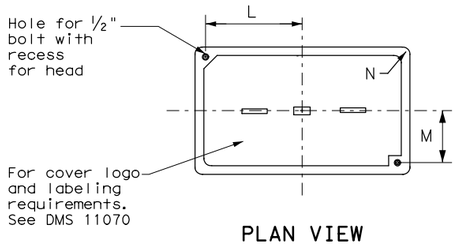
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

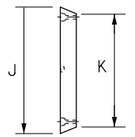
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



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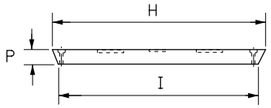

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

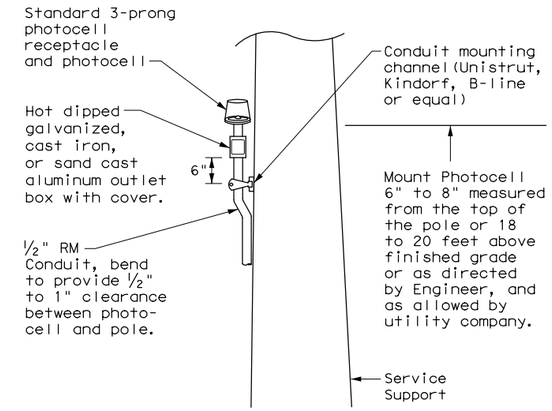
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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	CRP	SAN PATRICIO		60

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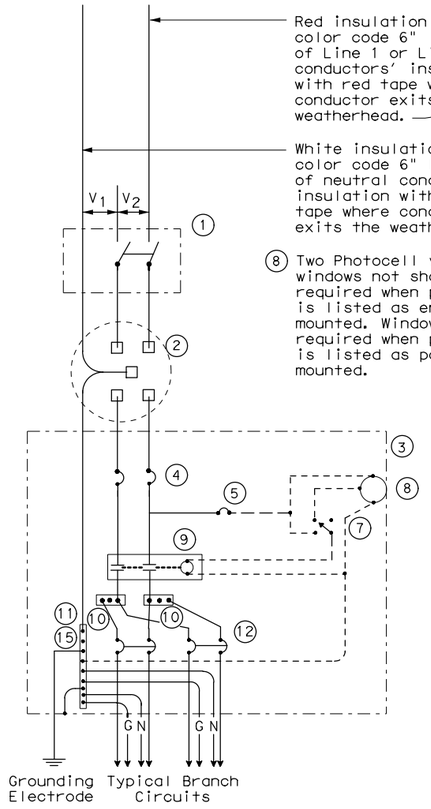
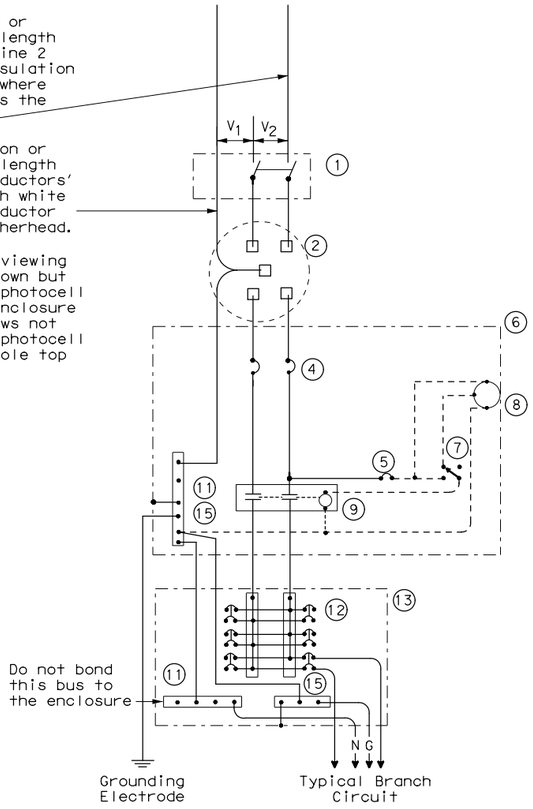
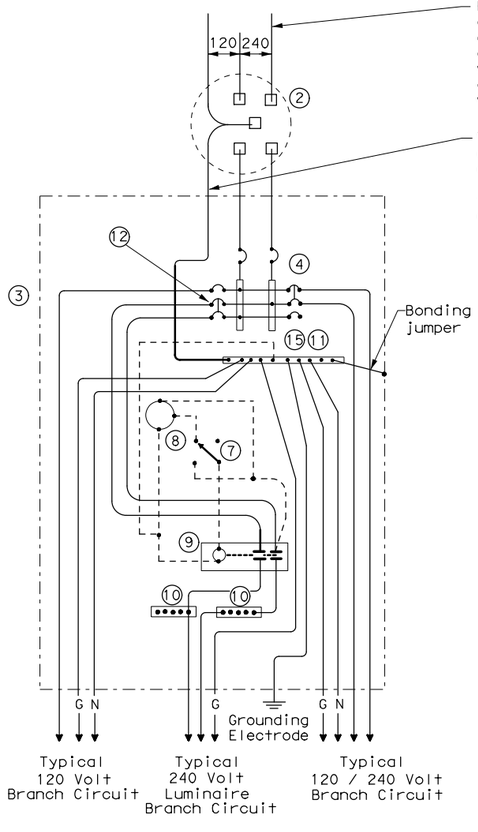


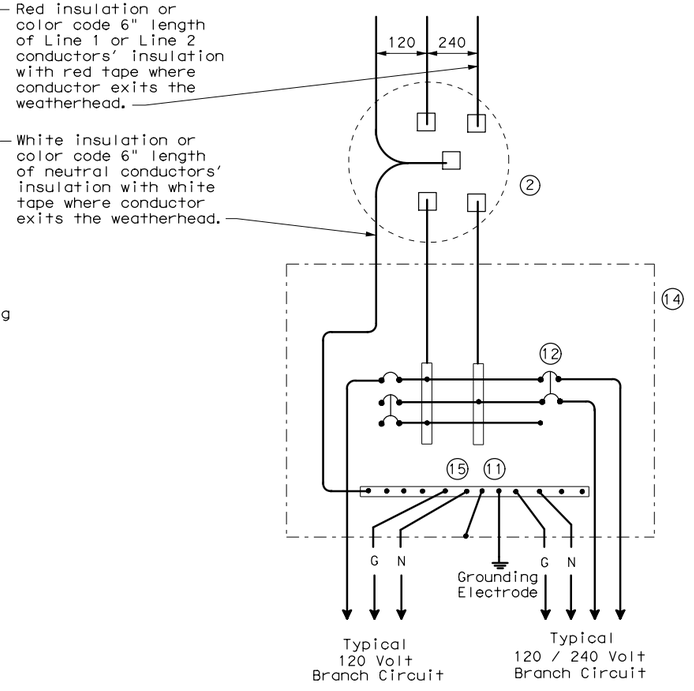
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
·------	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	CRP	SAN PATRICIO		61

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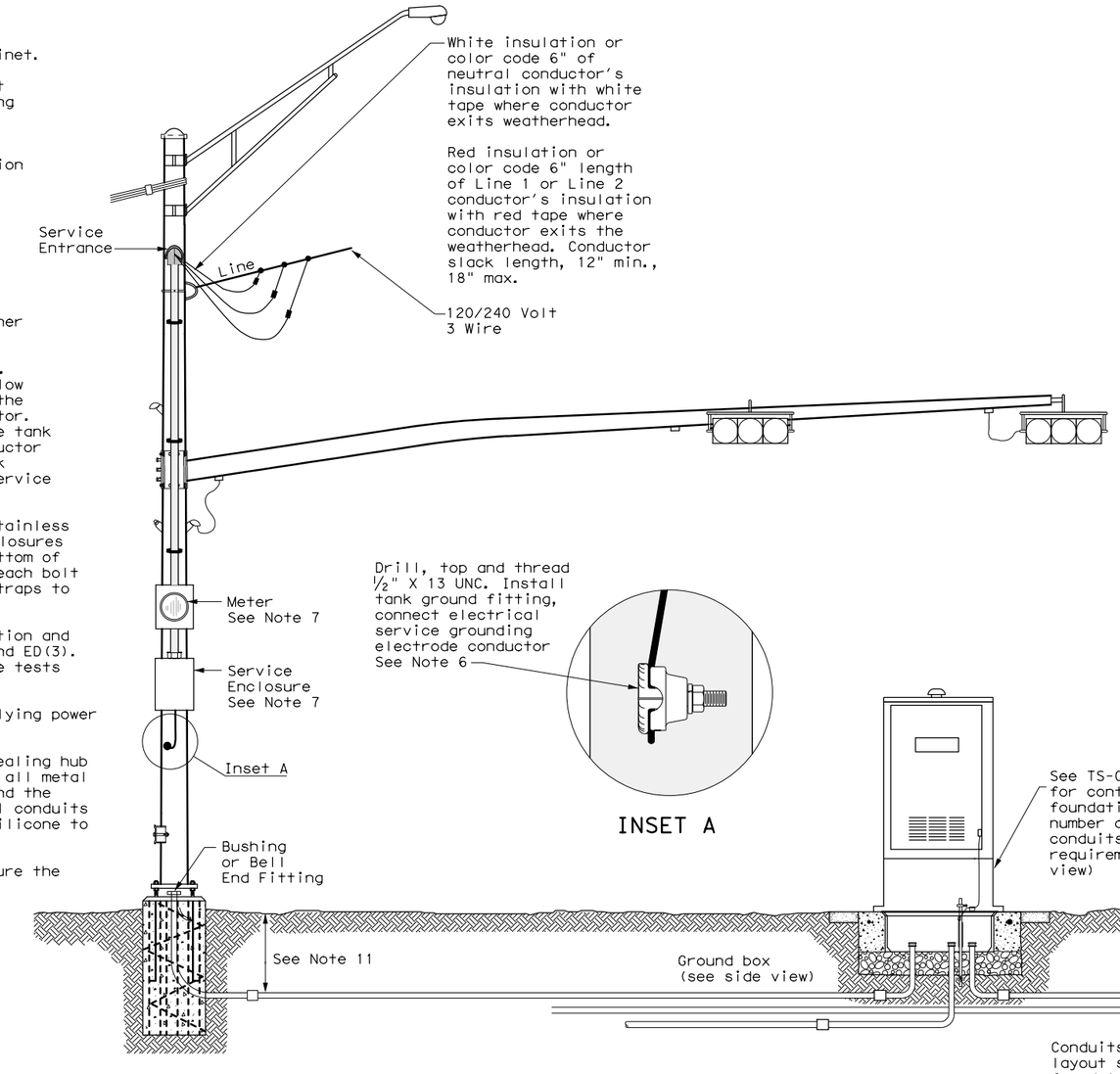
TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".

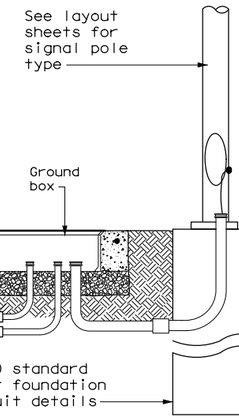


SIGNAL POLE WITH SERVICE

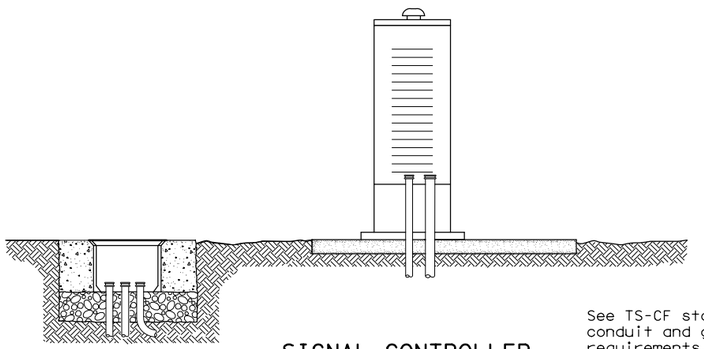
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A

SIGNAL CONTROLLER FRONT VIEW



SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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	CRP	SAN PATRICIO		62

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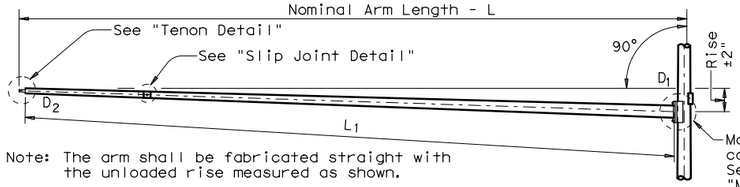
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239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

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1′-8"	19.1	8.0	3.5	.179	1′-7"
24	23.1	9.0	5.8	.179	1′-9"	23.1	9.0	3.5	.179	1′-8"
28	27.1	9.5	5.7	.179	1′-10"	27.1	10.0	3.5	.179	1′-9"
32	31.0	9.5	5.2	.239	1′-11"	31.0	9.5	3.5	.239	1′-10"
36	35.0	10.0	5.1	.239	2′-0"	35.0	10.0	3.5	.239	1′-11"
40	39.0	10.5	5.1	.239	2′-3"	39.0	11.0	3.5	.239	2′-1"
44	43.0	11.0	5.1	.239	2′-8"	43.0	11.5	4.0	.239	2′-3"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

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

② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)

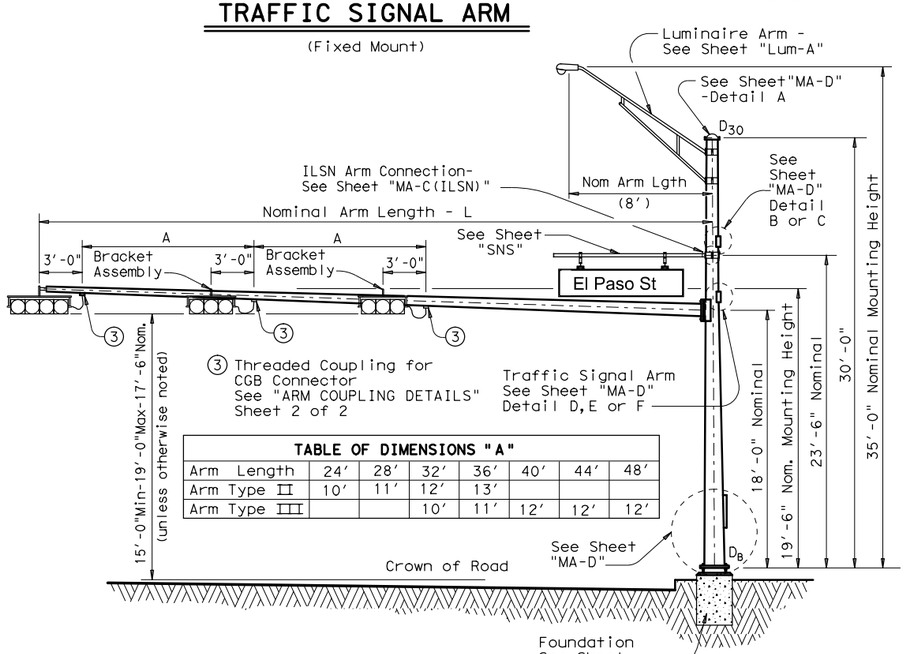


TABLE OF DIMENSIONS "A"

Arm Length	24′	28′	32′	36′	40′	44′	48′
Arm Type II	10′	11′	12′	13′			
Arm Type III			10′	11′	12′	12′	12′

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

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

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

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

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

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	2

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

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3′-4"	
1 ¾"	3′-10"	
2"	4′-3"	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".

Templates may be removed for shipment.

SHEET 1 OF 2

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER
Carl B. Laferney

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY (100 MPH WIND ZONE)

SMA-100(1)-12

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

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
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CRP	SAN PATRICIO		63

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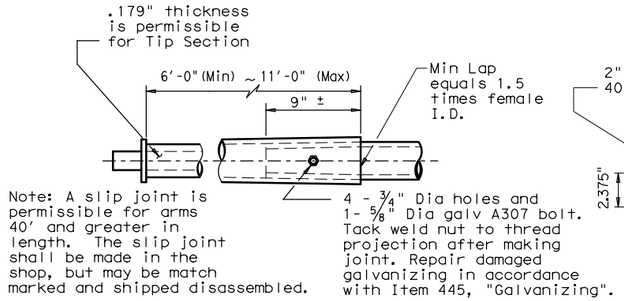
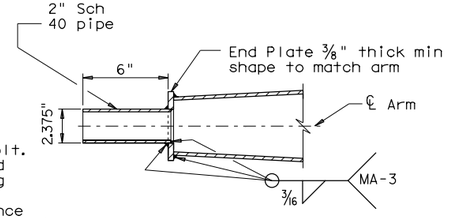


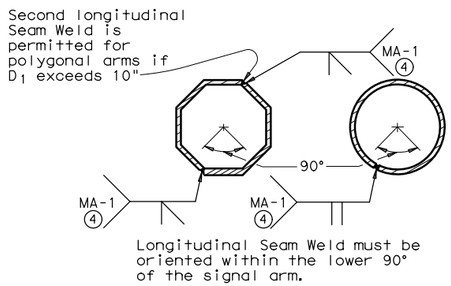
SLIP JOINT DETAIL



TENON DETAIL

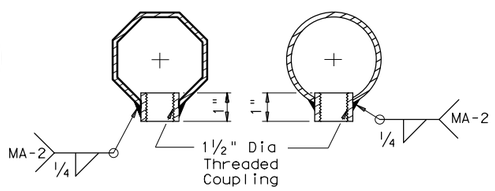
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

④ 60% Min. penetration
100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

VIBRATION WARNING

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

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

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

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

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

GENERAL NOTES:

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(2)-12

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

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
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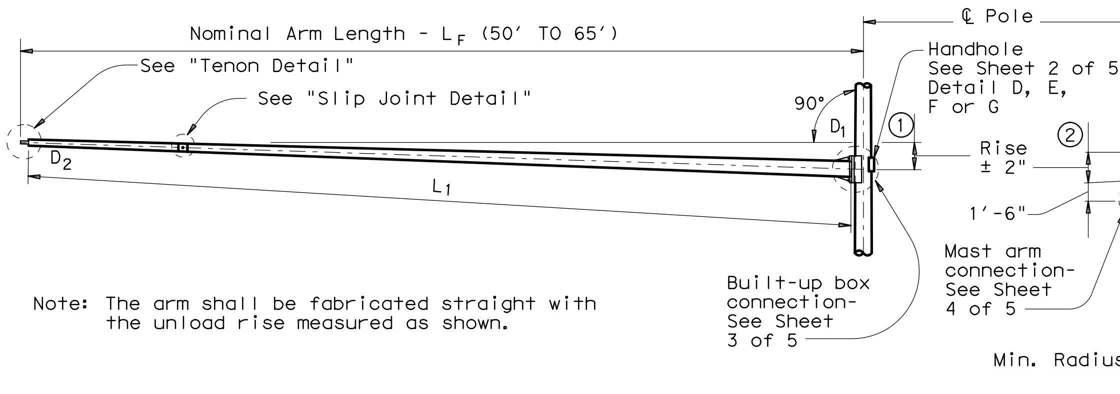
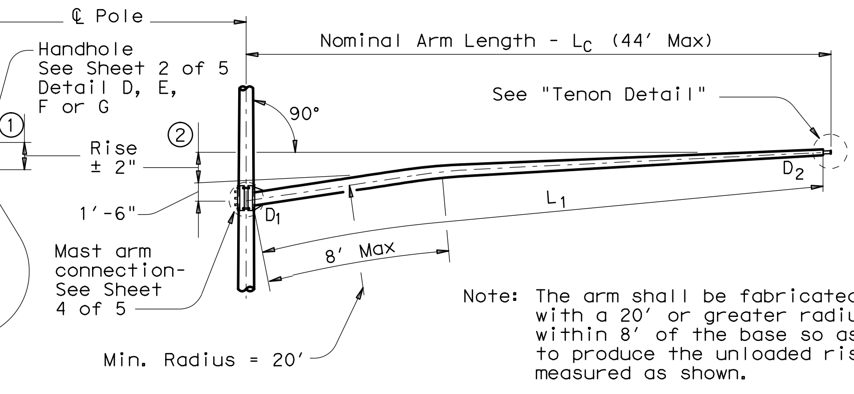
CRP	SAN PATRICIO		64



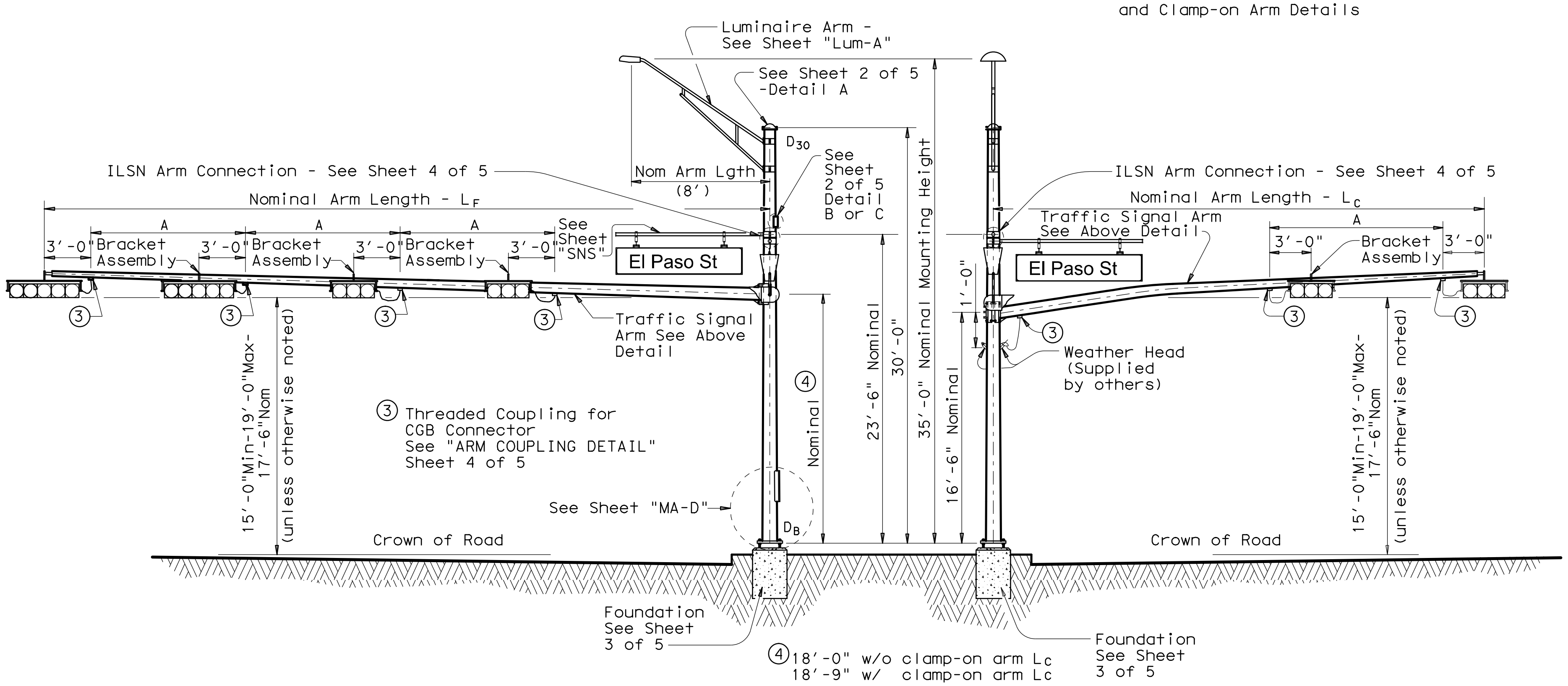
FIXED MOUNT TRAFFIC SIGNAL ARM

(1) See Sheet 3 of 5 for Arm Rise



CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

(2) See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details



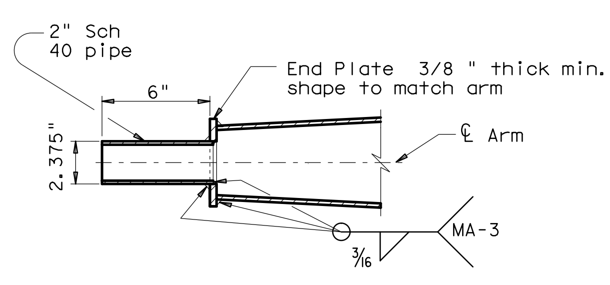
ELEVATION
(Showing fixed mount arm)

STRUCTURE ASSEMBLY

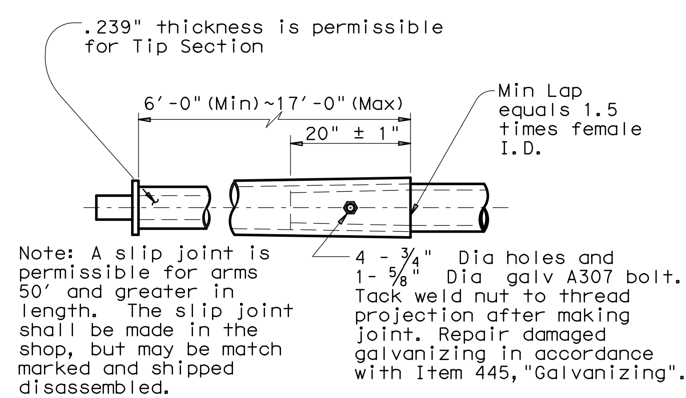
ELEVATION
(Showing clamp-on arm)

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'



TENON DETAIL



SLIP JOINT DETAIL (FIXED MOUNT ARM)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed 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 (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL (5)	WL EPA (5)(6)
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

(5) Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

(6) Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

Except as noted in Sheet 1 thru 5 of 5, other details not covered shall 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 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. Material, fabrication tolerances, and shipping practices shall also 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.

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

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

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.

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TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
LMA(1)-12

Sheet 1 of 5

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181
DIST	COUNTY		SHEET NO.
CRP	SAN PATRICIO		65

REVISIONS
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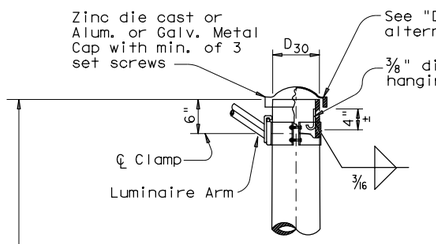
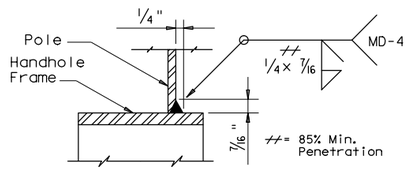
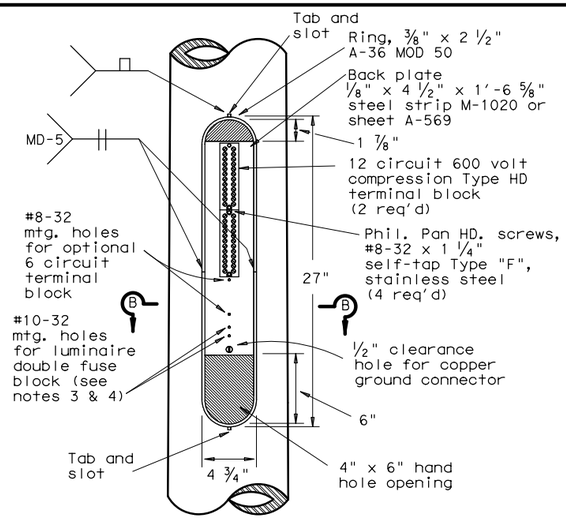


DETAIL A

(for pole with luminaire)



DETAIL H

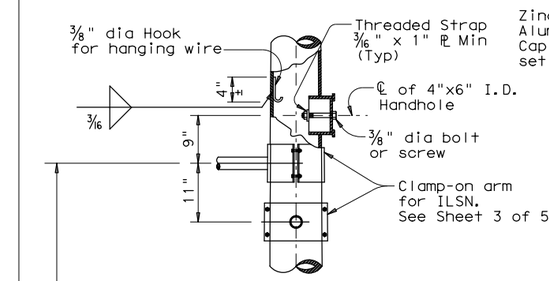


ACCESS COMPARTMENT

MATERIALS	
Round Shafts or Polygonal Shafts (7)	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 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

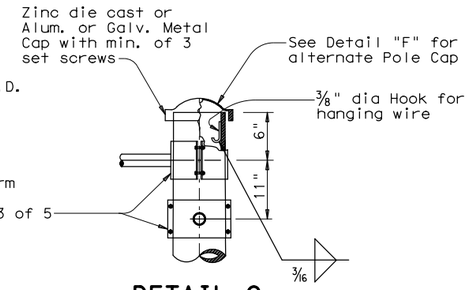
(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

(8) 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.

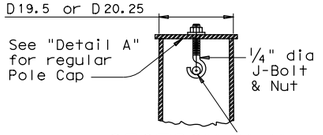


DETAIL B

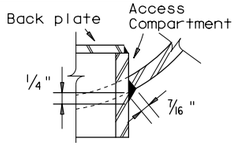
(If ILSN applied)



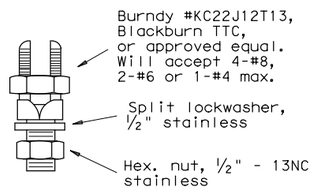
DETAIL C



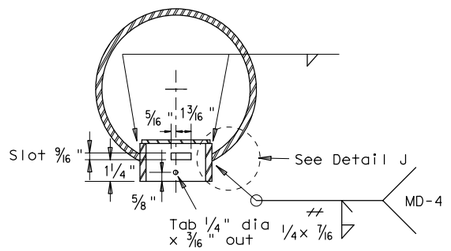
SECTION Y-Y



DETAIL J

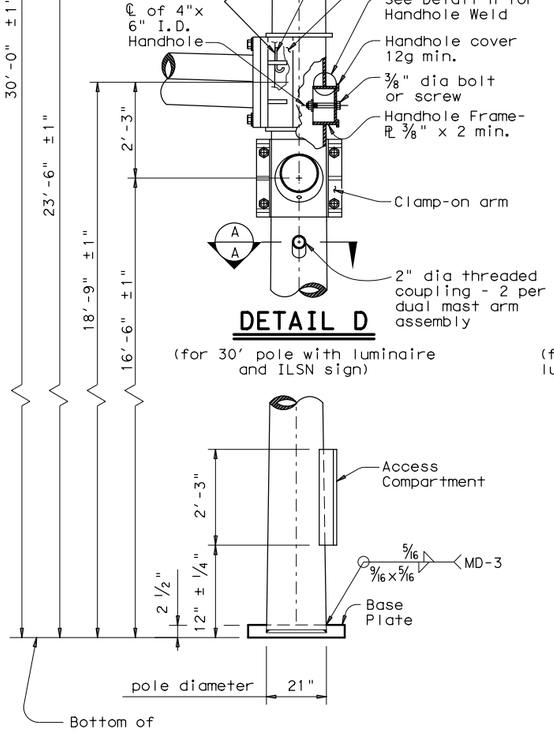


COPPER GROUND CONNECTOR



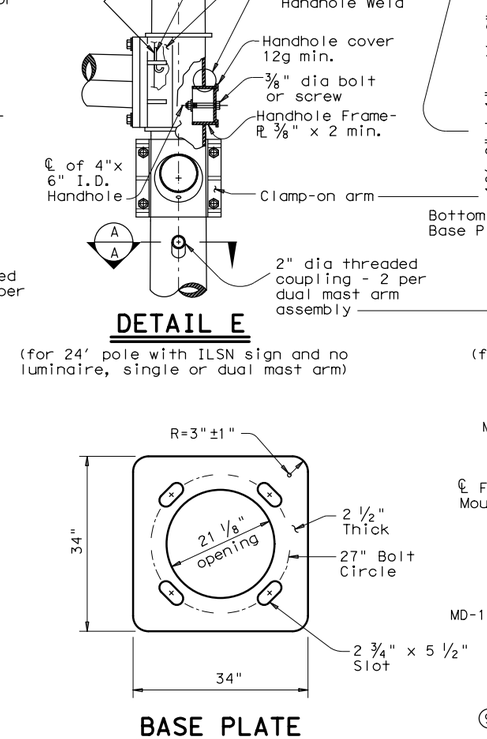
SECTION B-B

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.



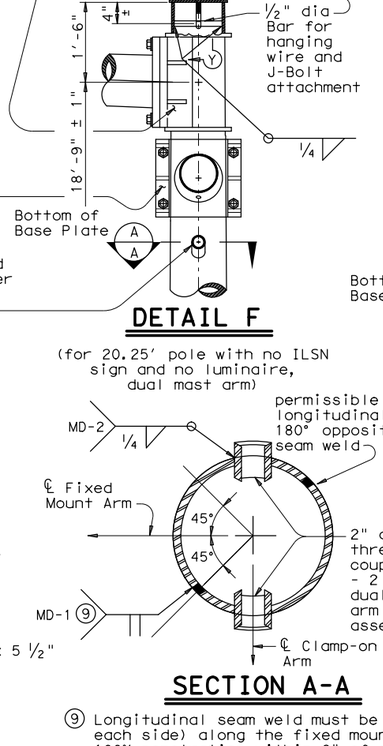
DETAIL D

(for 30' pole with luminaire and ILSN sign)



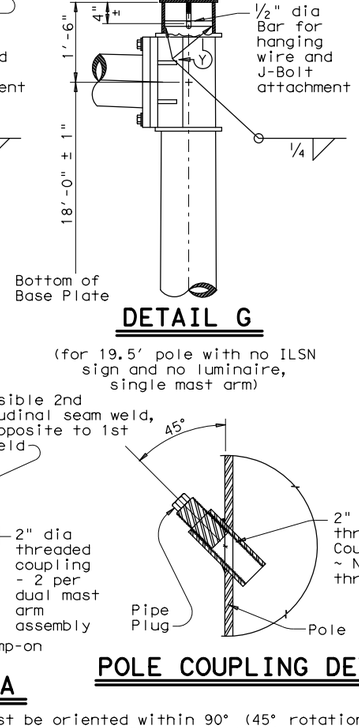
DETAIL E

(for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



DETAIL F

(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)

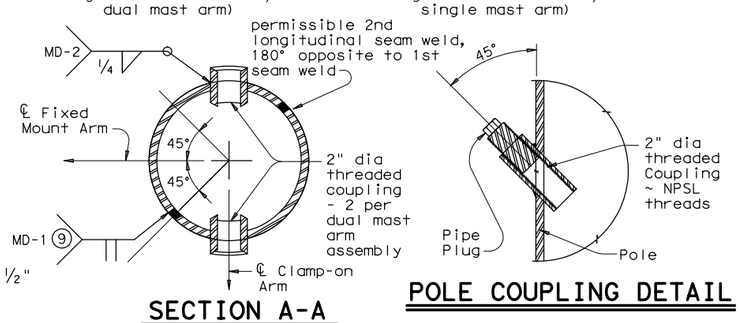


DETAIL G

(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)

POLE ELEVATION

BASE PLATE



SECTION A-A

POLE COUPLING DETAIL

(9) Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

ACCESS COMPARTMENT NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

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

Sheet 2 of 5

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DN: JSY	CK: ARC	DW: TGG	CK: JSY

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CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181

DIST	COUNTY	SHEET NO.
CRP	SAN PATRICIO	66

131B

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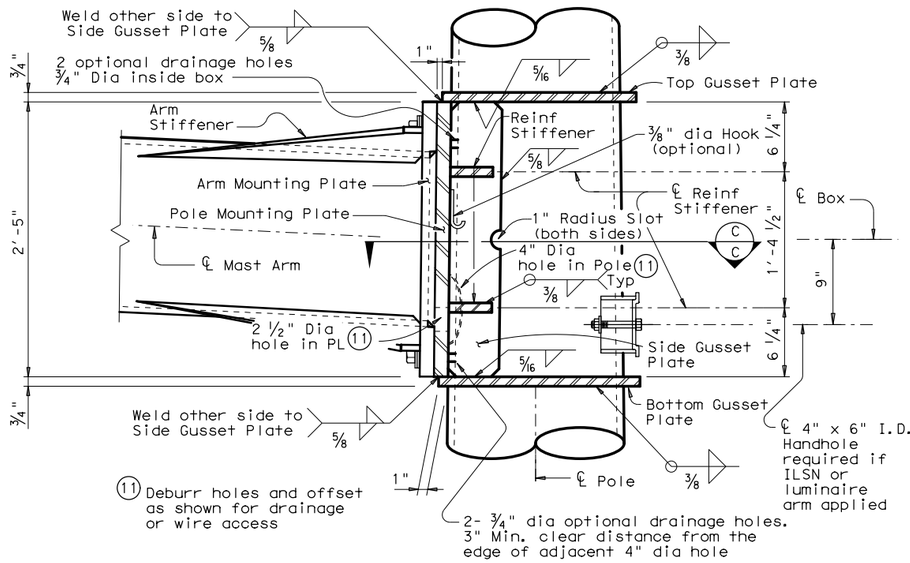
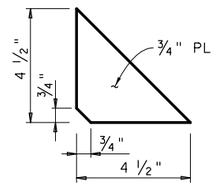
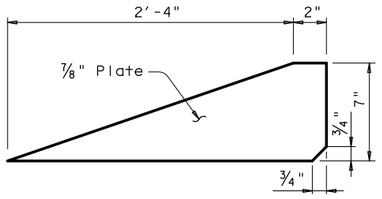


BUILT-UP BOX CONNECTION

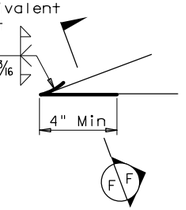


REINFORCING STIFFENER



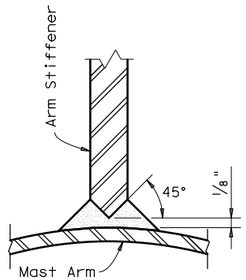
ARM STIFFENER
(Cut to match arm inclination and taper)

Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.



Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.

DETAIL "K"



SECTION F-F

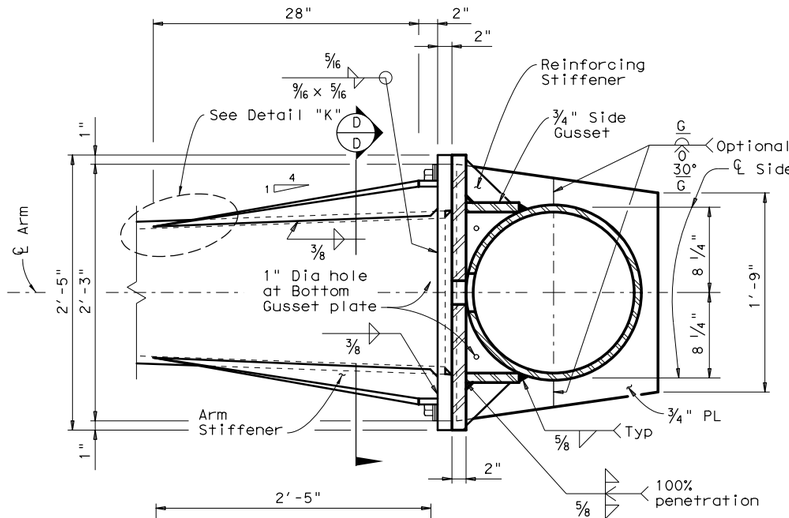
Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
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"

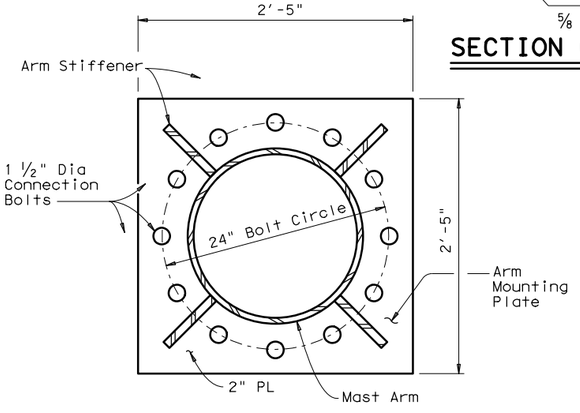
D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

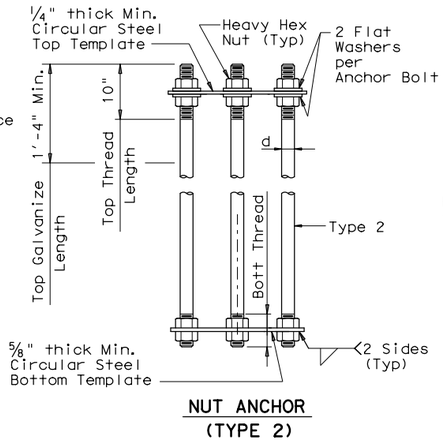
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.



SECTION C-C

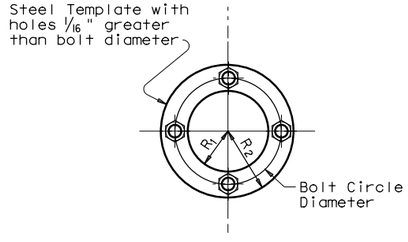


SECTION D-D



NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length ‡	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

‡ Min dimension given, longer bolts are acceptable.

FOUNDATION DESIGN TABLE													
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)				FOUNDATION DESIGN LOAD (15)		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							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

(14) Anchor bolt design develops the foundation capacity given under Foundation Design Laods.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

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

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

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DN: JSY	CK: ARC	DW: TGG	CK: JSY

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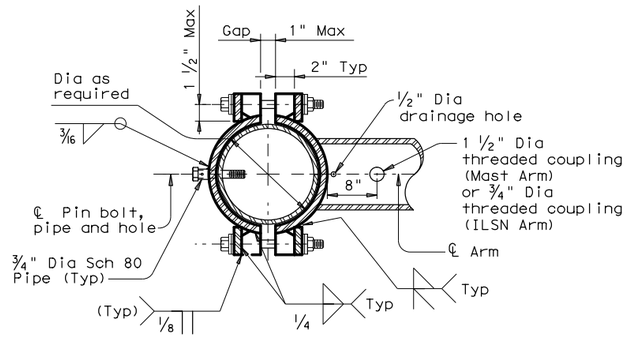
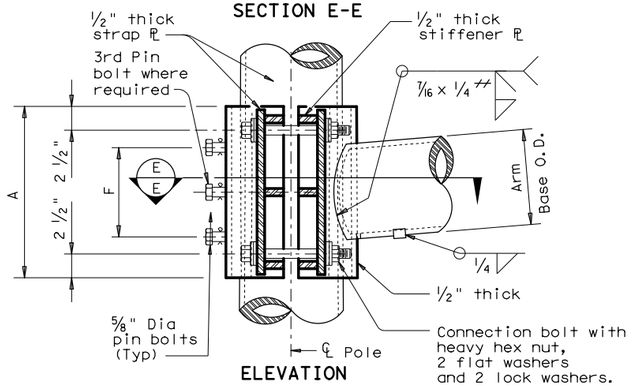
CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181
DIST	COUNTY		SHEET NO.
CRP	SAN PATRICIO		67

131C



SECTION E-E



ELEVATION
(Mast Arm or ILSN Arm to pole)

= 85% Min. Penetration

CLAMP-ON CONNECTION

80 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

100 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

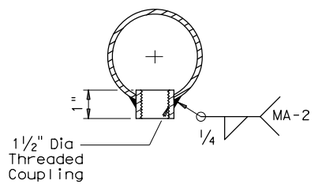
D1 = Arm Base O.D.
D2 = Arm End O.D.
L1 = Shaft Length
Lc = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

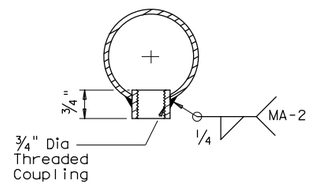
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

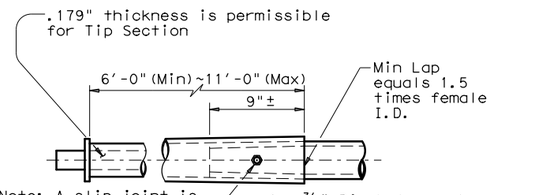
Mast Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



ILSN ARM COUPLING DETAIL

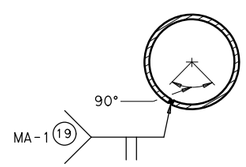


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

(19) Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.
60% Min penetration
100% penetration within 6" of circumferential base welds.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" 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". For an ILSN arm, a 1 ½" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for 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. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a 1/8" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

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 4 of 5 — LMA(4)-12

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181

DIST	COUNTY	SHEET NO.
CRP	SAN PATRICIO	68

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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: See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24' Poles with ILSN: See note above plus one small hand hole		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN: See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L	1	50S		50	
55	55L		55S		55	
60	60L		60S		60	
65	65L		65S		65	
Dual Mast Arm						
Lf ft. / Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50 / 20	5020L		5020S		5020	
50 / 24	5024L		5024S		5024	
50 / 28	5028L		5028S		5028	
50 / 32	5032L		5032S		5032	
50 / 36	5036L		5036S		5036	
50 / 40	5040L		5040S		5040	
50 / 44	5044L		5044S		5044	
55 / 20	5520L		5520S		5520	
55 / 24	5524L		5524S		5524	
55 / 28	5528L		5528S		5528	
55 / 32	5532L		5532S		5532	
55 / 36	5536L		5536S		5536	
55 / 40	5540L		5540S		5540	
55 / 44	5544L		5544S		5544	
60 / 20	6020L		6020S		6020	
60 / 24	6024L		6024S		6024	
60 / 28	6028L		6028S		6028	
60 / 32	6032L		6032S		6032	
60 / 36	6036L		6036S		6036	
60 / 40	6040L		6040S		6040	
60 / 44	6044L		6044S		6044	
65 / 20	6520L		6520S		6520	
65 / 24	6524L		6524S		6524	
65 / 28	6528L		6528S		6528	
65 / 32	6532L		6532S		6532	
65 / 36	6536L		6536S		6536	
65 / 40	6540L	1	6540S		6540	
65 / 44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet) 48-A
VINYARD AVE	10	1	22
THORNTON ST	10	1	22
Total Drill Shaft Length			44

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Shipping Parts List

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

Nominal Arm Length	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	1
55	55IV	
60	60IV	
65	65IV	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	2

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

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	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	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
ft.	Designation	Quantity	Designation	Quantity	Designation	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	1
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	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". Templates may be removed for shipment.

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

STATE OF TEXAS
CARL B. LAFERNEY
108697
PROFESSIONAL ENGINEER

Carl B. Laferney

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12

Sheet 5 of 5

©TxDOT November 2000	DN: JK	CK: GRB	DW: FDN	CK: CAL
REVISIONS 4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
	0101	03	120	US 181
	DIST	COUNTY		SHEET NO.
	CRP	SAN PATRICIO		69

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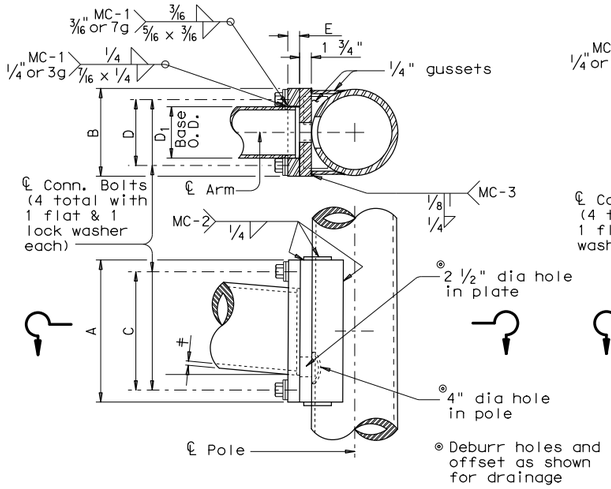
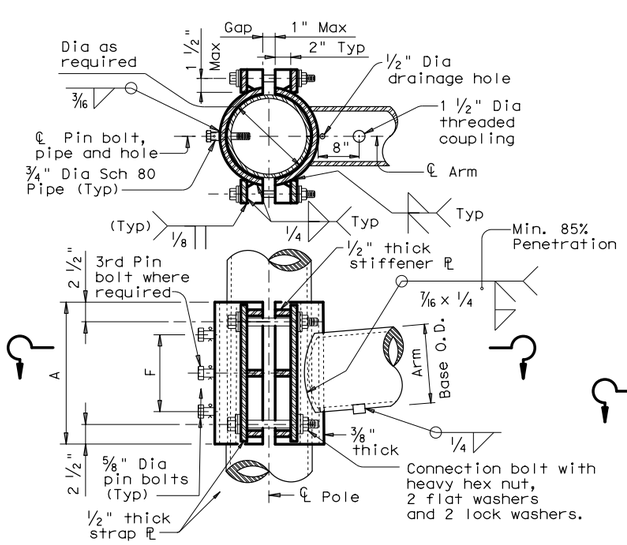
ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
10.5	.239	18	13	15	10	3	1 1/2
11.0	.239	18	13	15	10	3	1 1/2



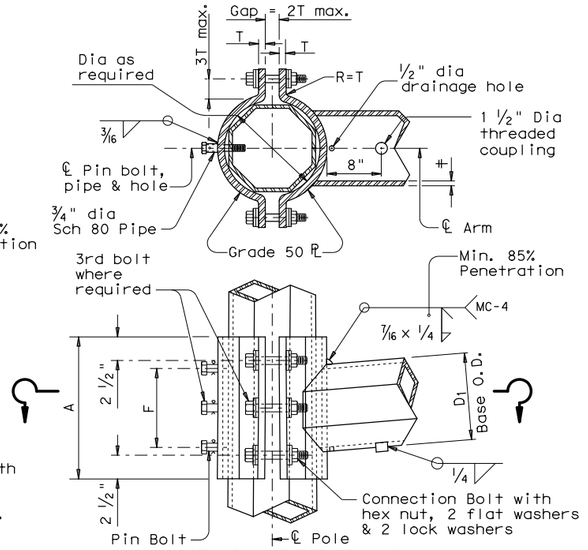
FIXED MOUNT DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8

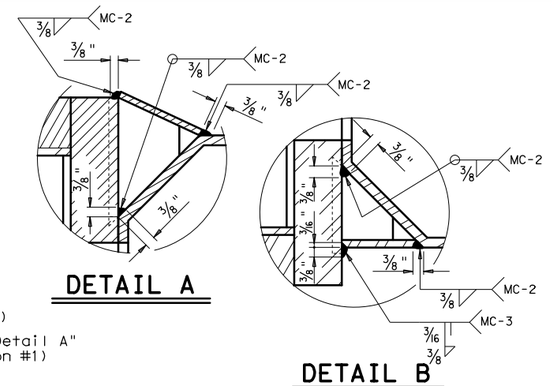


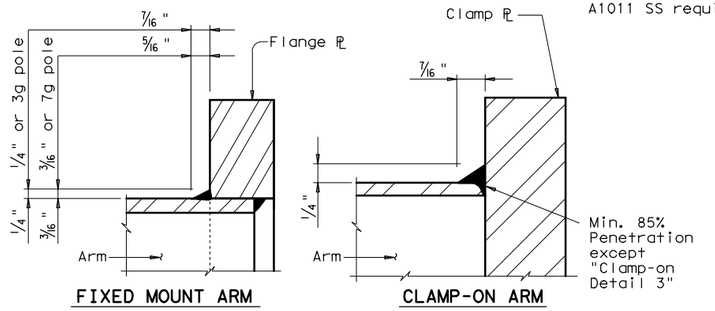
CLAMP-ON DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	F in.	T in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8



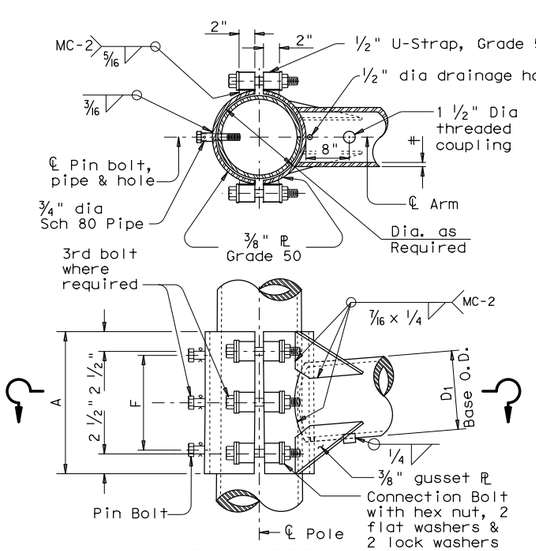
FIXED MOUNT DETAIL 2





ARM BASE WELD DETAILS

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



CLAMP-ON DETAIL 3

MATERIALS	
Round Shafts or Polygonal Shafts (1)	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 (2)
Plates (1)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe (1)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

(1) 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.

(2) ASTM A1011 SS Gr.50 material 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:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall 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 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 A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

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

REVISIONS
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5-09
1-12

CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181

DIST	COUNTY	SHEET NO.
CRP	SAN PATRICIO	70

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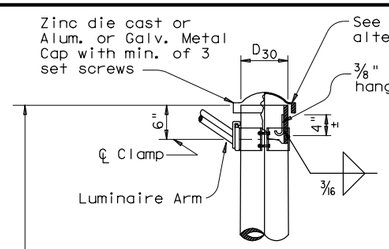
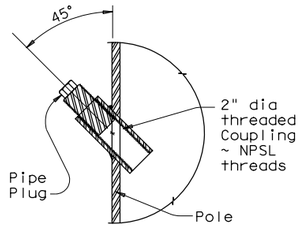
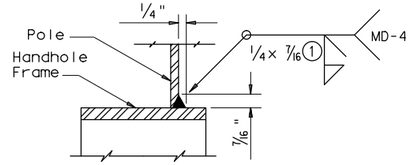


DETAIL A

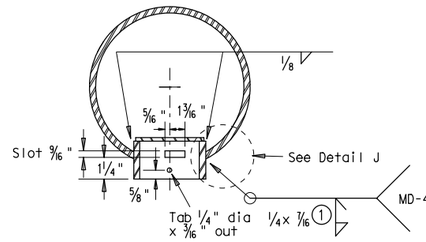
(for pole with luminaire)



POLE COUPLING DETAIL

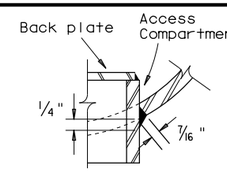


DETAIL G

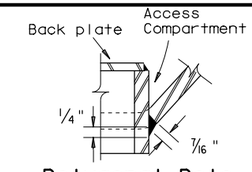


SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

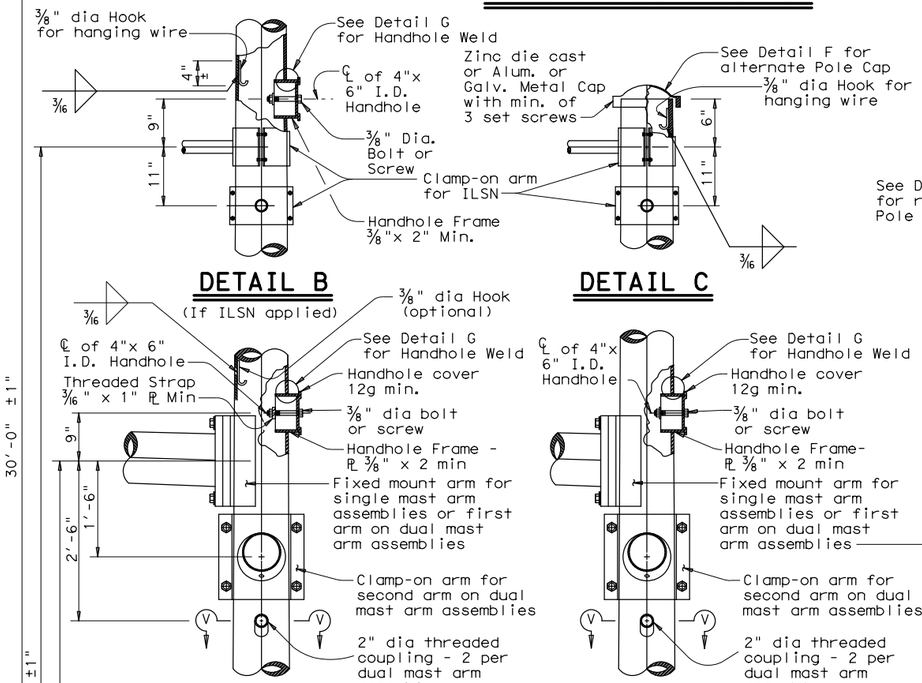


Round Pole



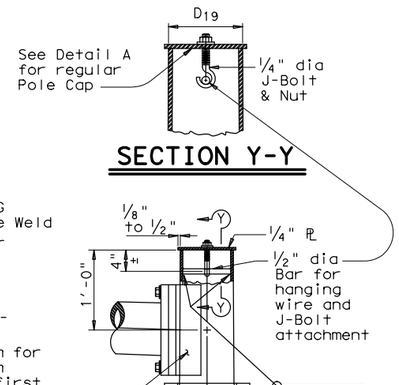
Polygonal Pole

DETAIL J

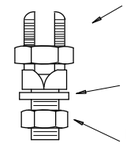


DETAIL B

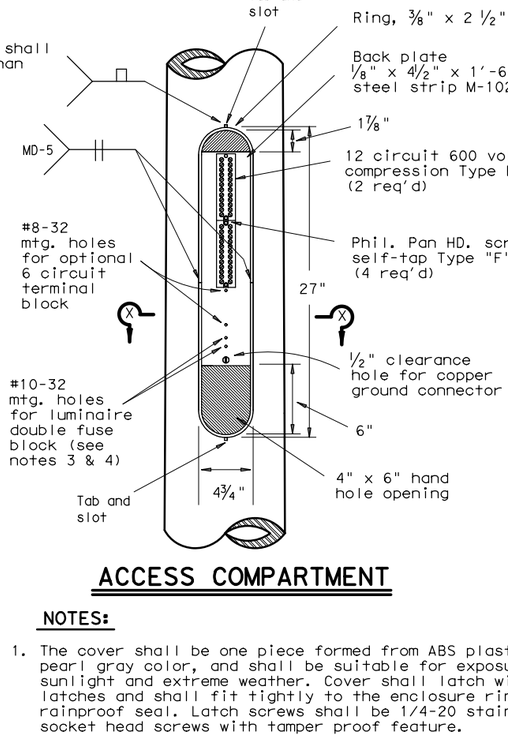
DETAIL C



SECTION Y-Y



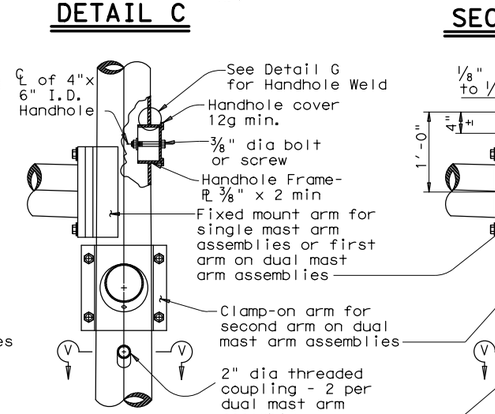
COPPER GROUND CONNECTOR



ACCESS COMPARTMENT

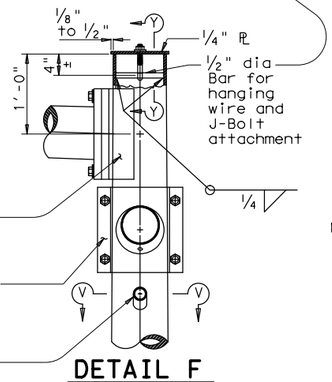
DETAIL D

(for 30' pole with luminaire and ILSN sign)



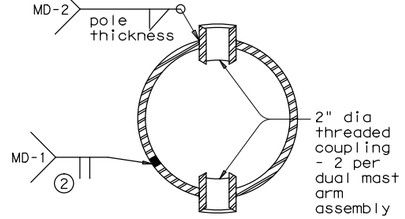
DETAIL E

(for 24' pole with ILSN sign and no luminaire)



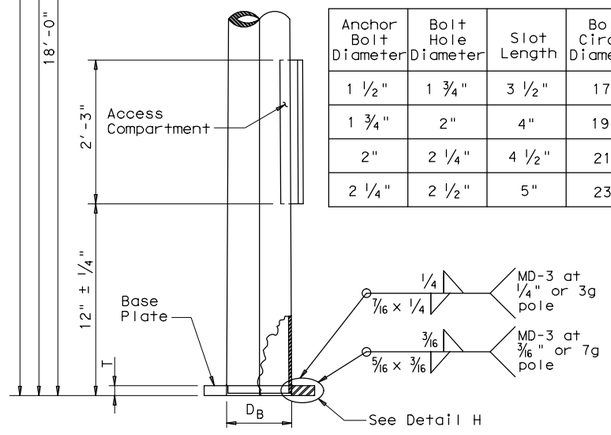
DETAIL F

(for 19' pole with no ILSN sign and no luminaire)

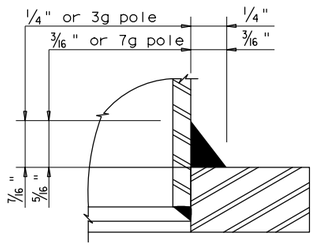


SECTION V-V

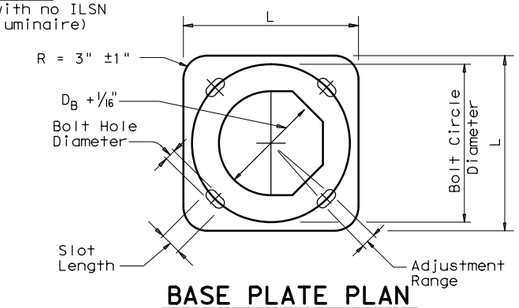
Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ Dim. L x T	Adjust. Range
1 1/2"	1 3/4"	3 1/2"	17"	18" x 1 1/2"	13.4°
1 3/4"	2"	4"	19"	20" x 1 3/4"	13.5°
2"	2 1/4"	4 1/2"	21"	22" x 2"	13.6°
2 1/4"	2 1/2"	5"	23"	24" x 2 1/4"	13.7°



POLE ELEVATION



DETAIL H



BASE PLATE PLAN

(1) 85% Min. penetration

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

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

DN: MS	CK: JSY	DW: FDN	CK: CAL

REVISIONS
8-99
1-12

CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181
DIST	COUNTY		SHEET NO.
CRP	SAN PATRICIO		71

DATE: 04/05/2024 3:56:28 PM
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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

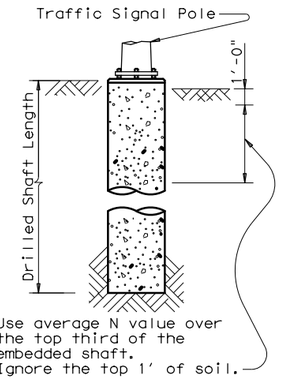
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

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
SAN PATRICIO ST	10	24-A	3	18				
McCALL AVE	10	24-A	4	24				
RACHAL AVE	10	24-A	5	30				
VINEYARD AVE	10	24-A	4	24				
SODVILLE ST	10	24-A	2	12				
BOWIE ST	10	24-A	2	12				
PIRATE BLVD	10	24-A	3	18				
THORNTON ST	10	24-A	5	30				
ALEXANDER ST	10	24-A	3	18				
	10	36-B	2				32	
KING DAVID DR	10	24-A	3	18				
TOTAL DRILLED SHAFT LENGTHS				204			32	

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

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

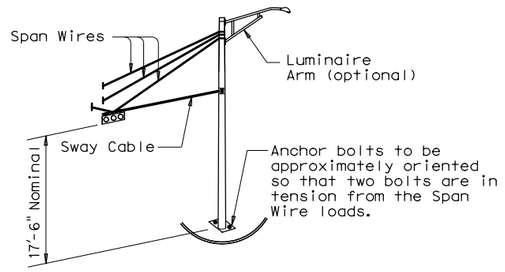


ANCHOR BOLT & TEMPLATE SIZES

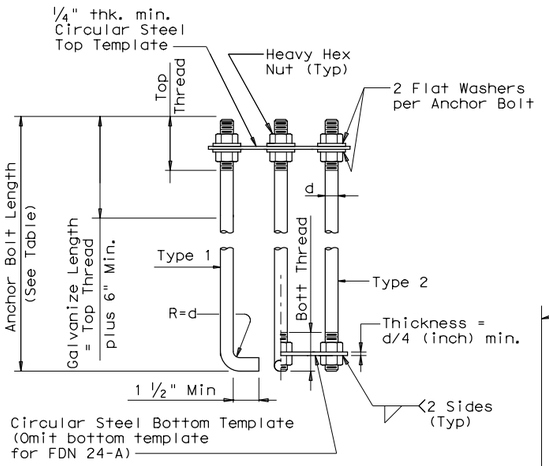
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

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



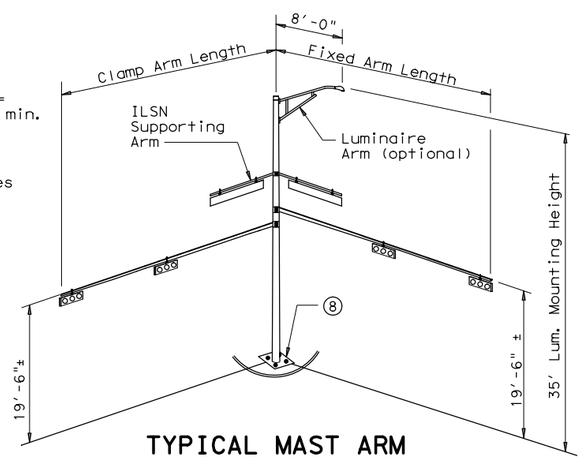
TYPICAL STRAIN POLE ASSEMBLY



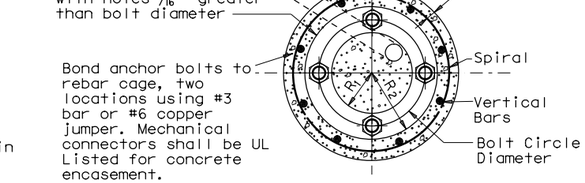
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

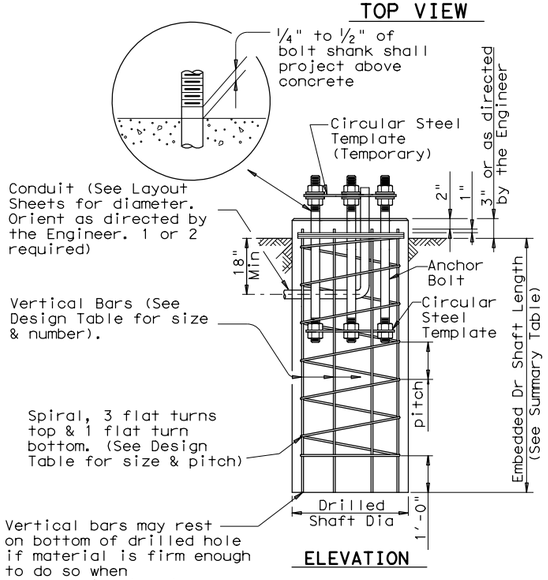
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

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".

STATE OF TEXAS
CARL B. LAFERNEY
108697
LICENSED
PROFESSIONAL ENGINEER
Carl B. Laferney

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

DN: MS	CK: JSY	DW: MAO/MMF	CK:JSY/TEB

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
0101	03	120	US 181
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CRP	SAN PATRICIO		72

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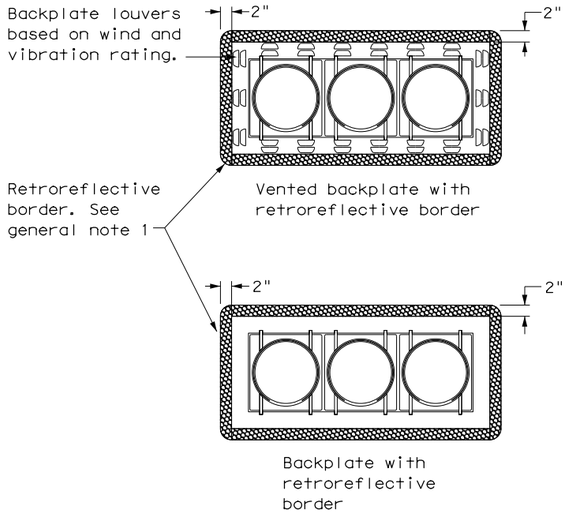
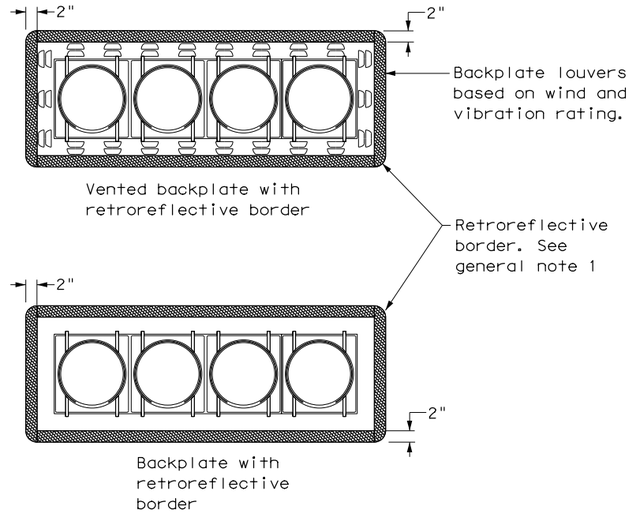
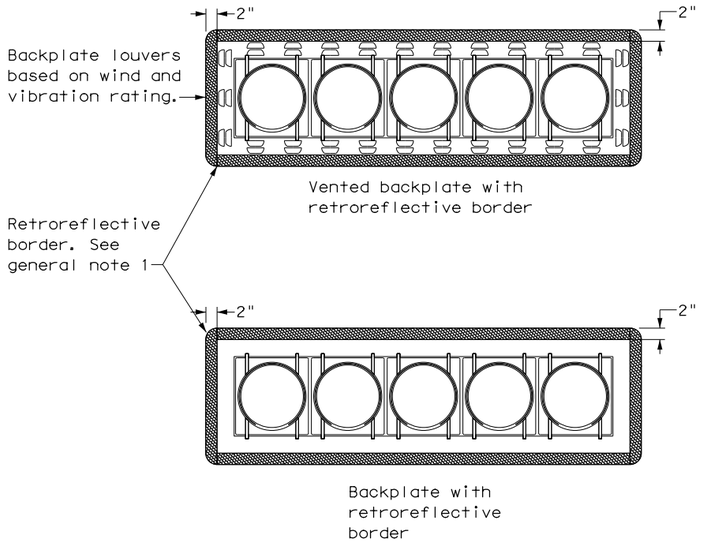


THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
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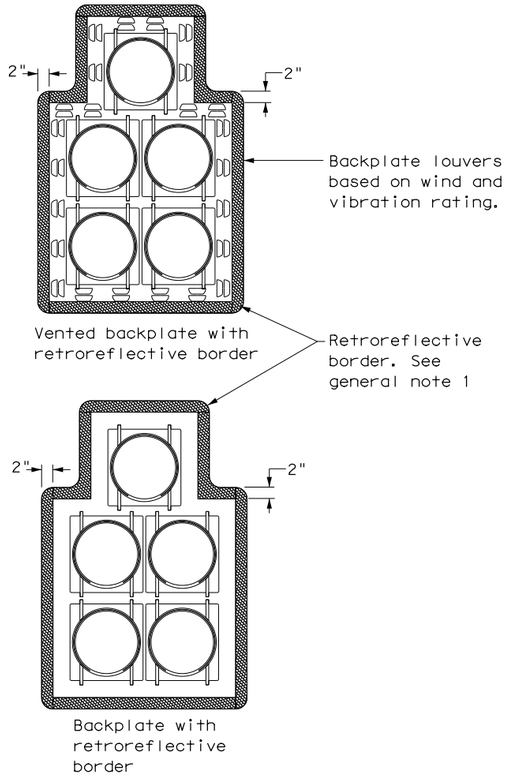
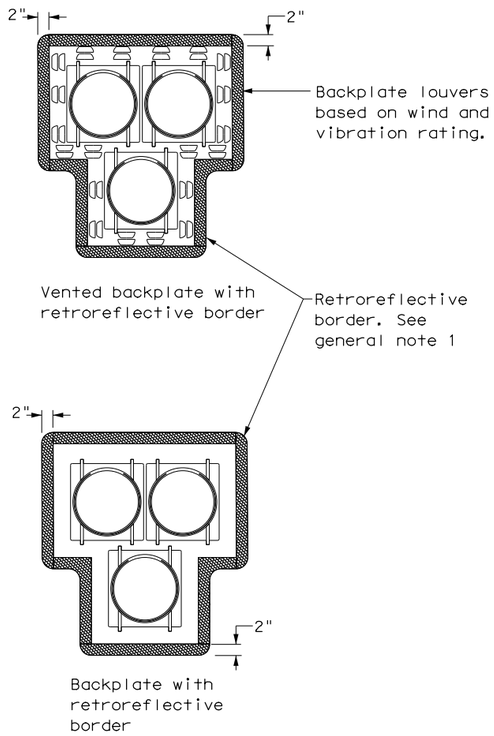


FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
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	CRP	SAN PATRICIO		73

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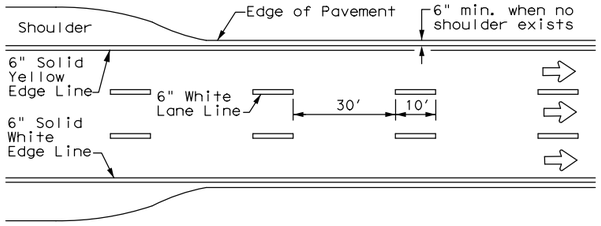
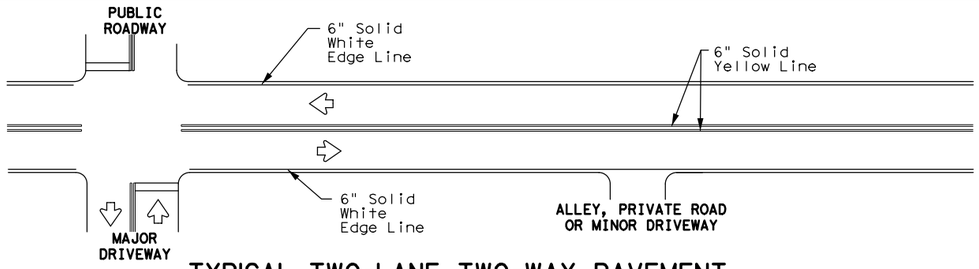
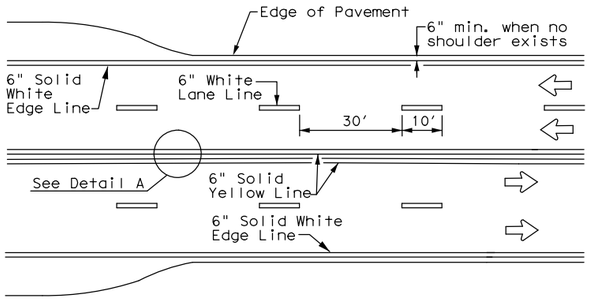
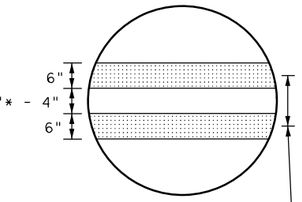


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS





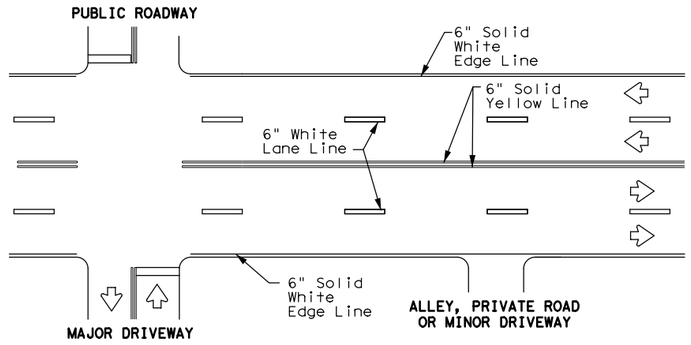
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

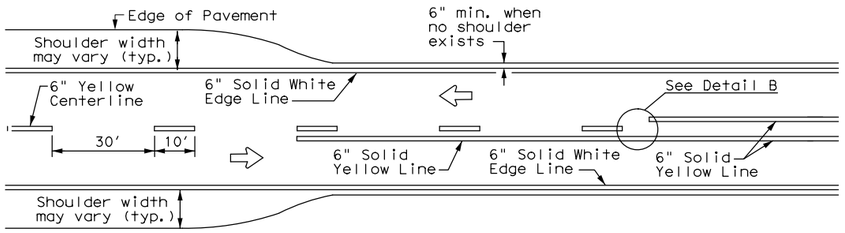
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

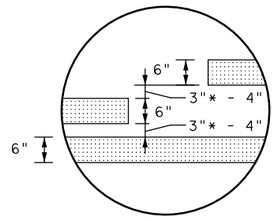
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



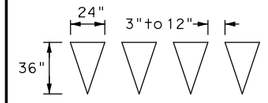
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)

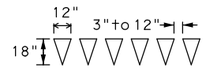
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

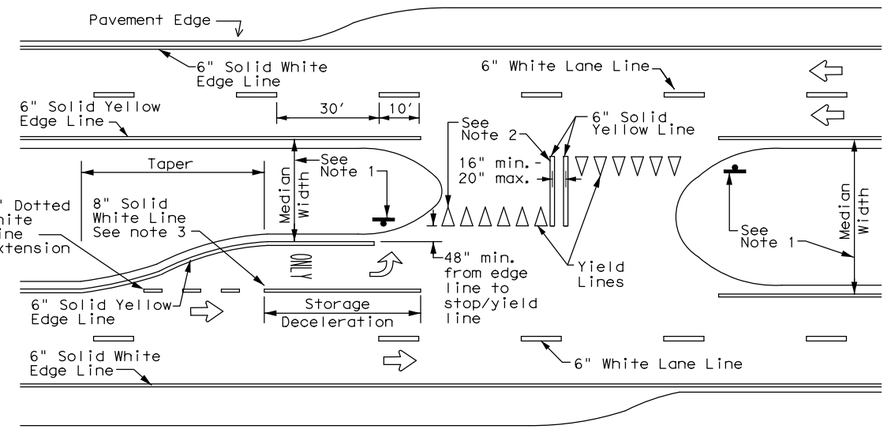


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



For posted speed on road being marked equal to or less than 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

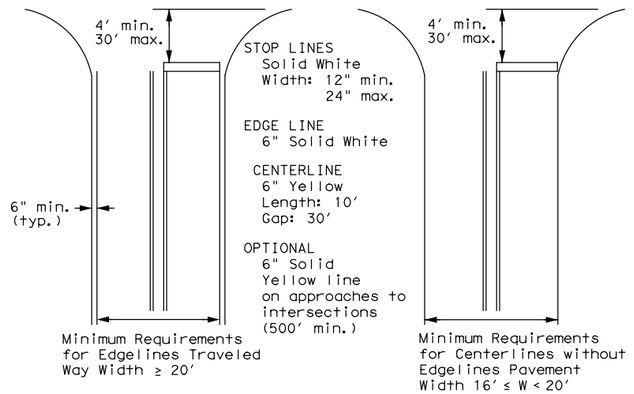
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0101	03	120	US 181
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22A

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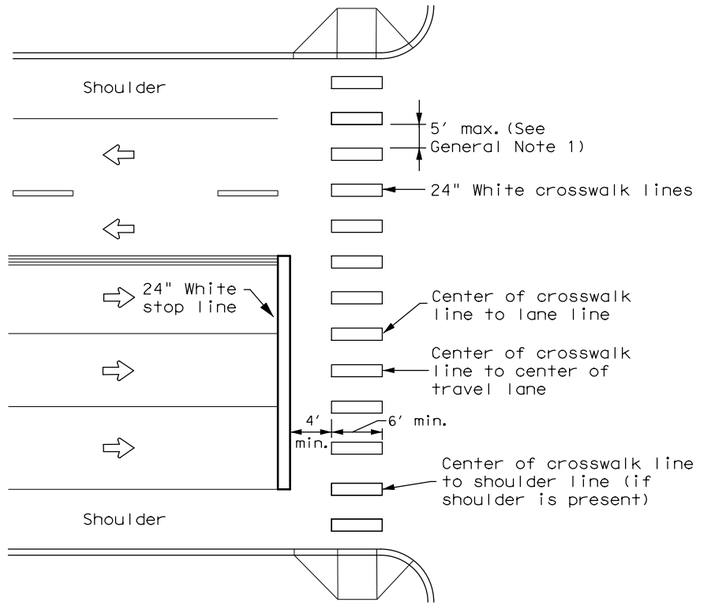


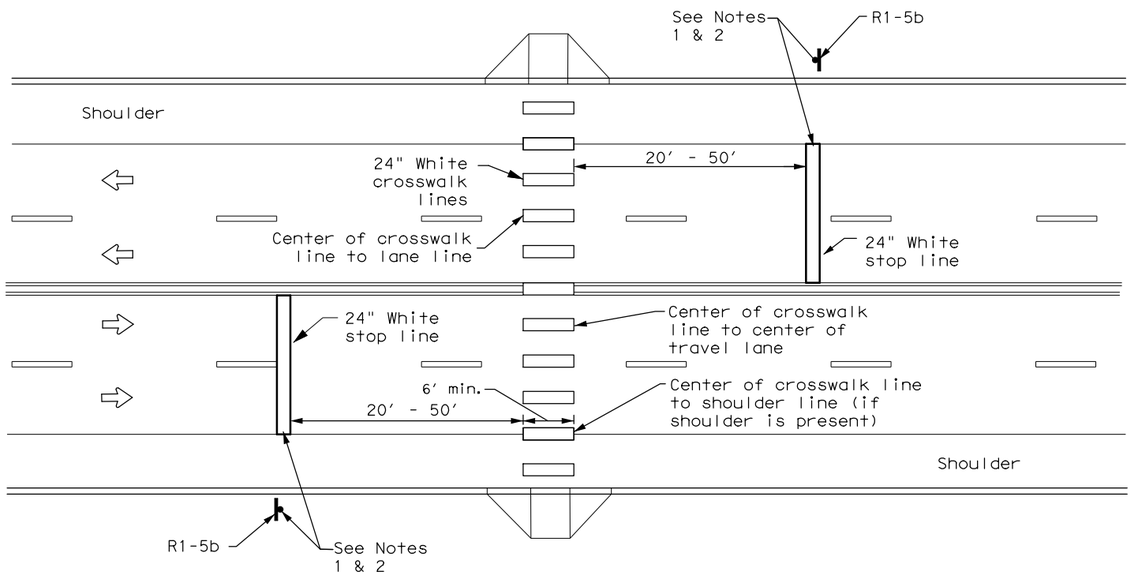
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6′ wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

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©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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6-22	CRP	SAN PATRICIO		75
12-22				
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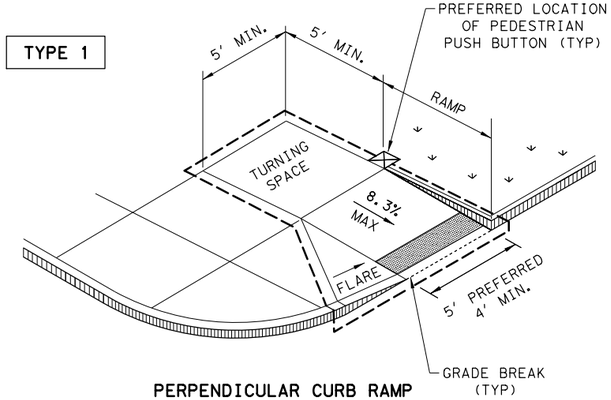
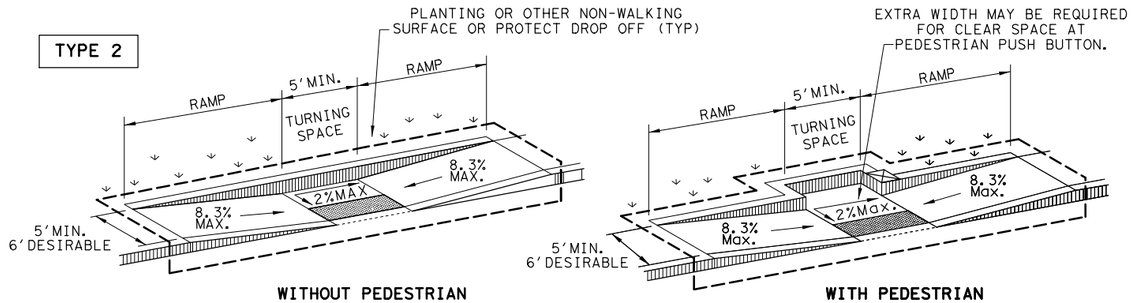


PERPENDICULAR CURB RAMP

TYPE 2

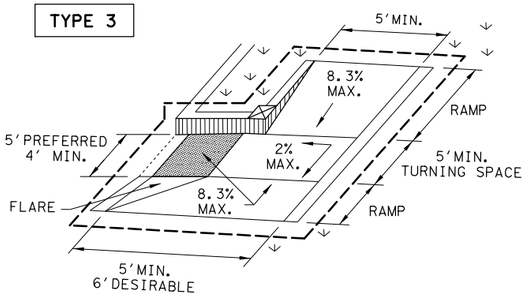


WITHOUT PEDESTRIAN PUSH BUTTON

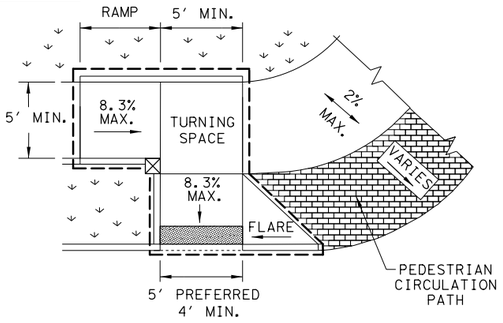
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

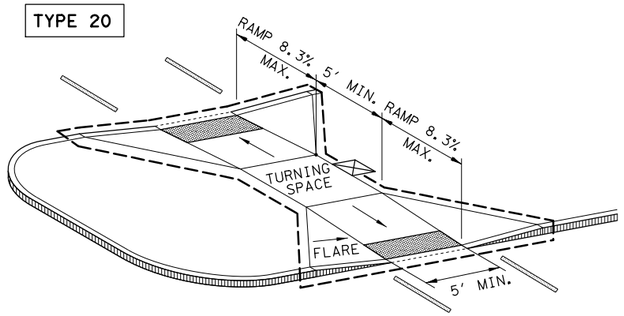


TYPE 6



COMBINATION CURB RAMPS

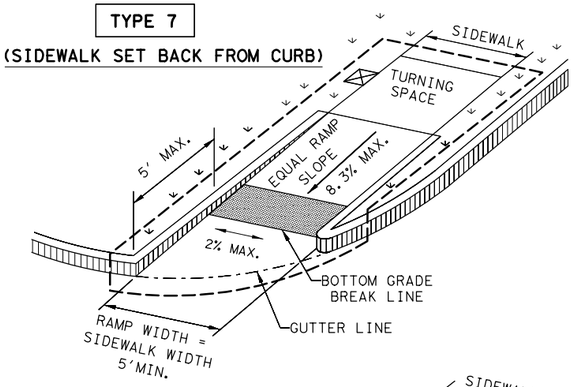
TYPE 20



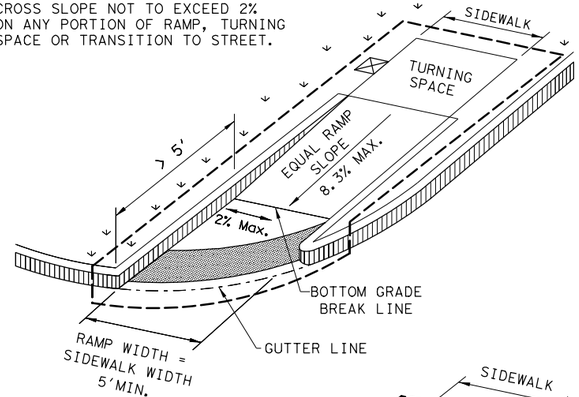
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

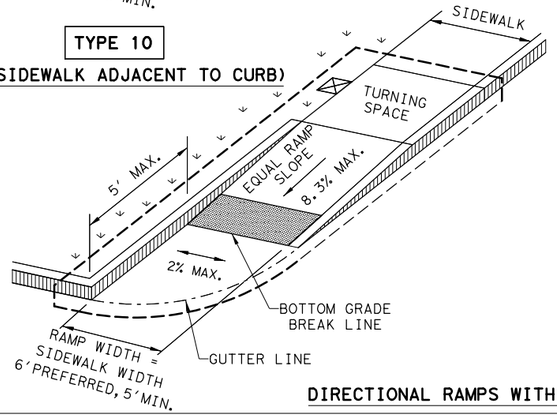


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

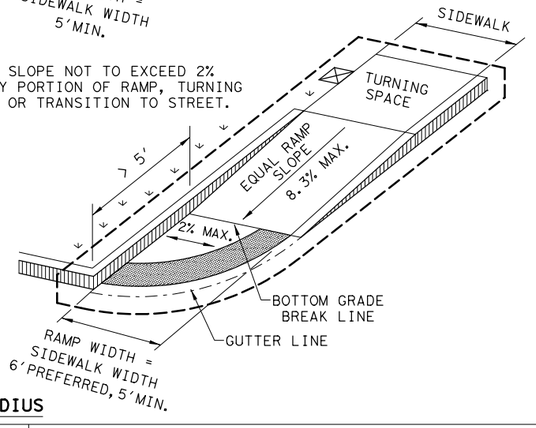


TYPE 10

(SIDEWALK ADJACENT TO CURB)

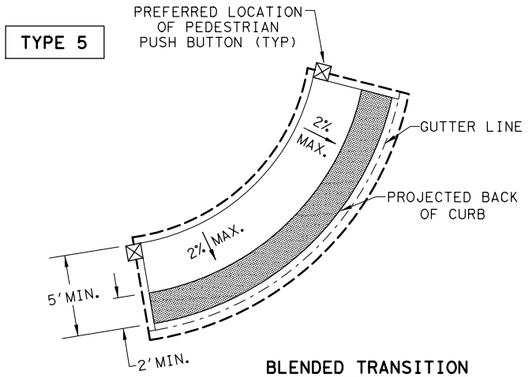


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

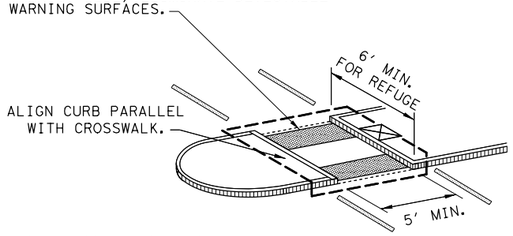
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

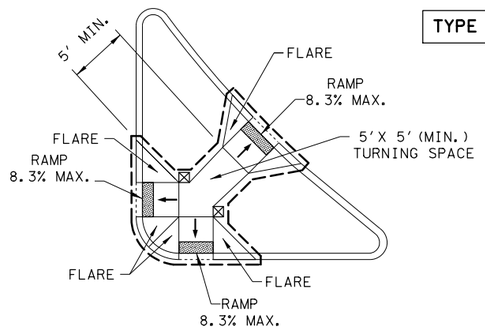
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



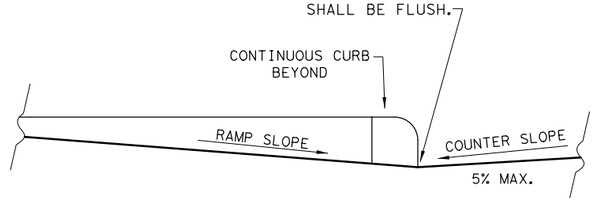
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0101	03	120		US 181
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	CRP	SAN PATRICIO			76

DATE: 04/05/2024
FILE: M:\DWG-51\5199-21.742\DGN\Traffic\Sheets\Standards\dgns\ped18(2of4).dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5′. Where the sidewalk is adjacent to the back of curb, a 6′ sidewalk width is desirable. Where a 5′ sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4′ for short distances. 5′x 5′ passing areas at intervals not to exceed 200′ are required.
5. Turning Spaces shall be 5′x 5′ minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4′x 4′ wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6′ wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5′x 5′ landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

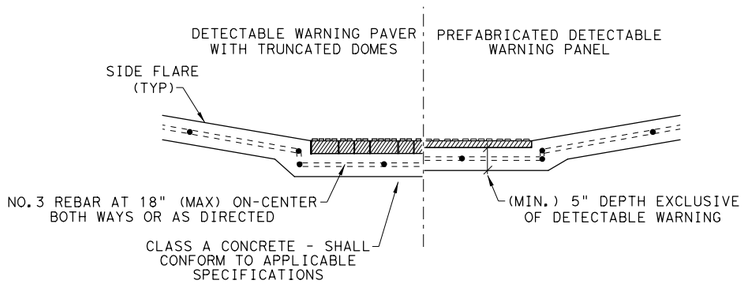
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

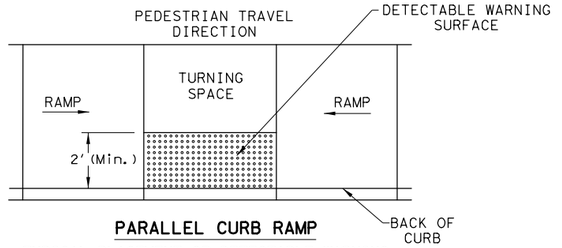
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

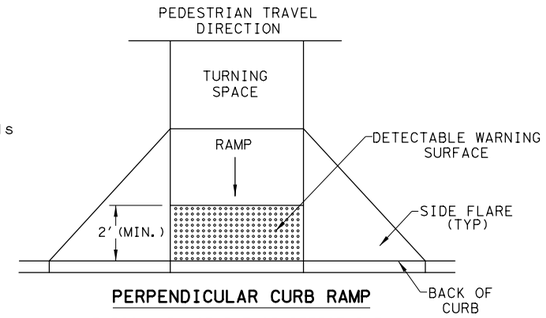


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

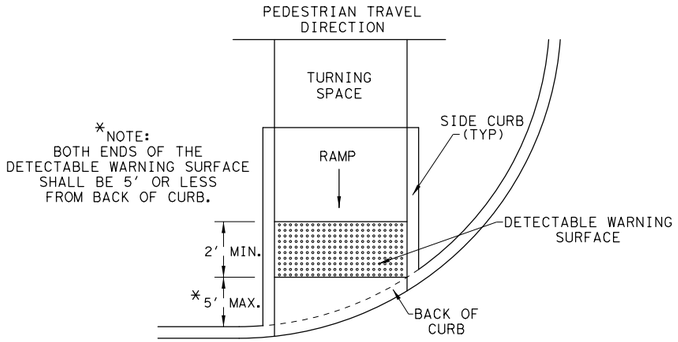
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

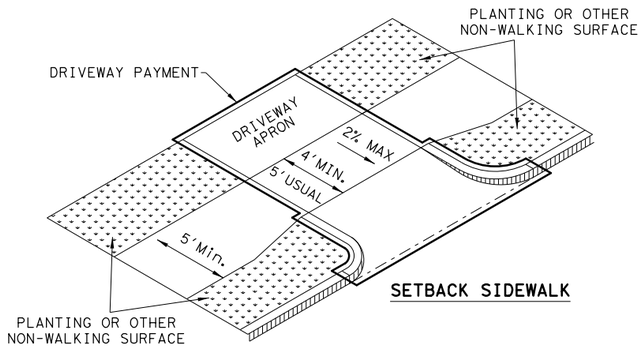
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

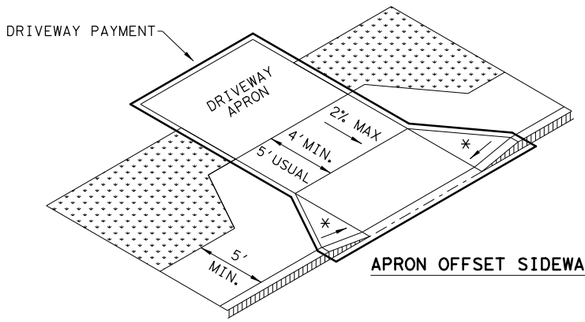
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0101	03	120	US 181
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	CRP	SAN PATRICIO		77

DATE: 04/05/2024
FILE: M:\DWG-51\5199-21.742\DGN\Traffic\Sheets\Standards\dgns\ped18(3of4).dgn

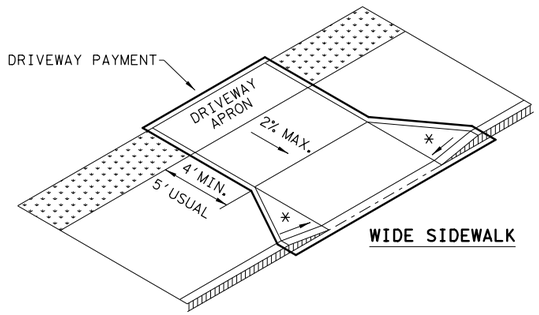
SIDEWALK TREATMENT AT DRIVEWAYS



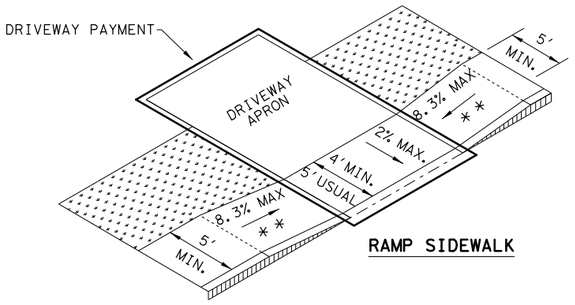
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

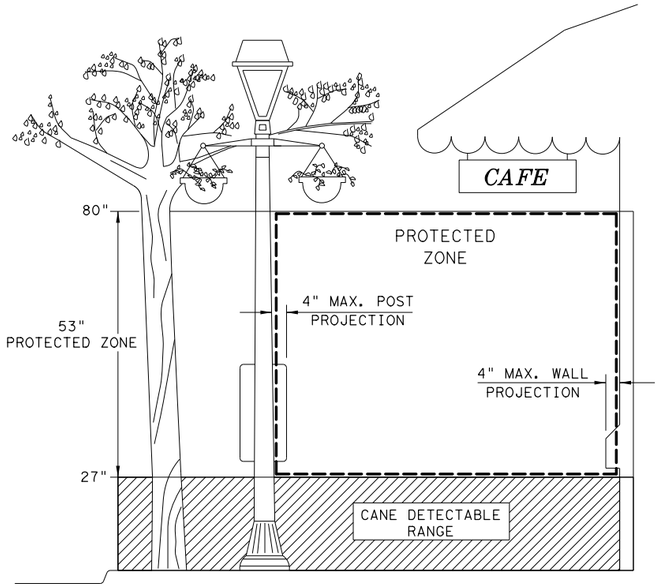


RAMP SIDEWALK

NOTES:

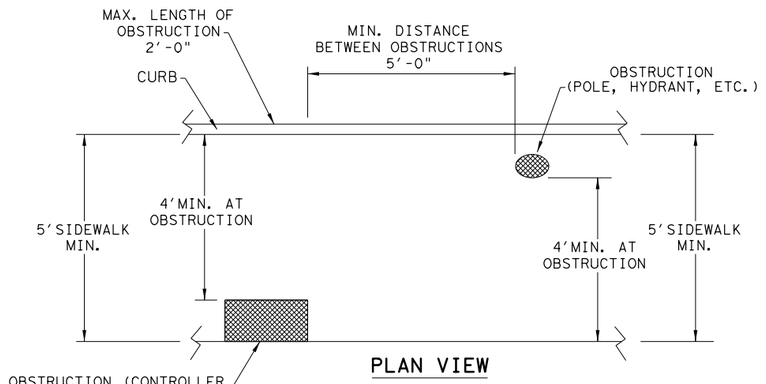
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

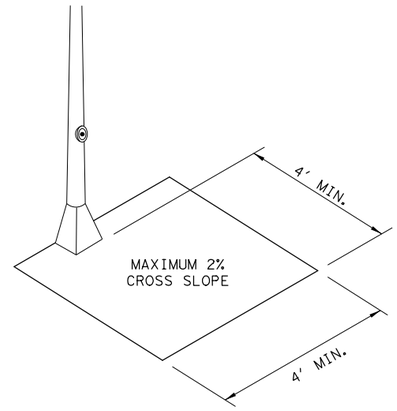
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



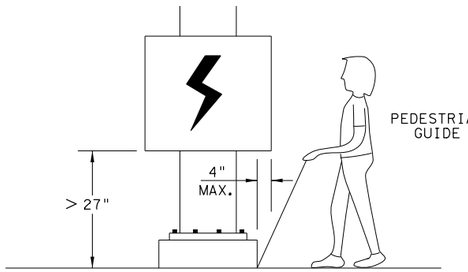
PLAN VIEW

PLACEMENT OF STREET FIXTURES

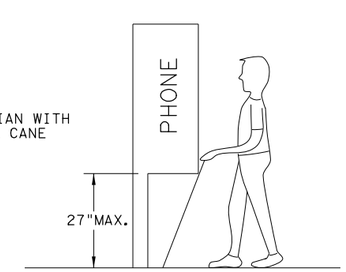
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

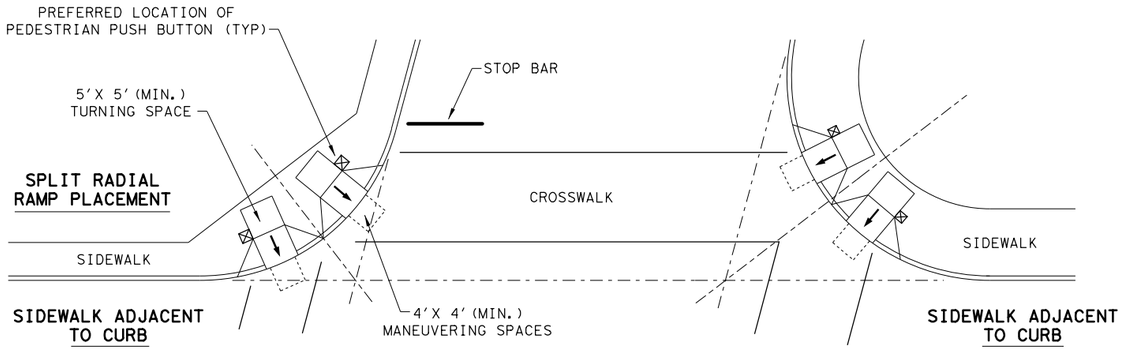
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0101	03	120		US 181
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	CRP	SAN PATRICIO			78

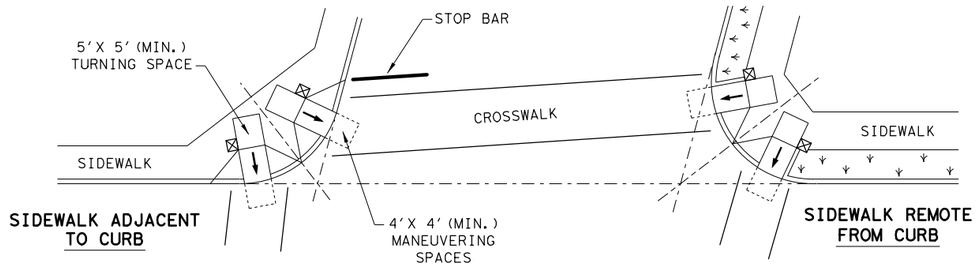
DATE: 04/05/2024
FILE: M:\DWG-51\5199-21.742\DGN\Traffic\Sheets\Standards\dgns\ped18(4of4).dgn

TYPICAL CROSSING LAYOUTS

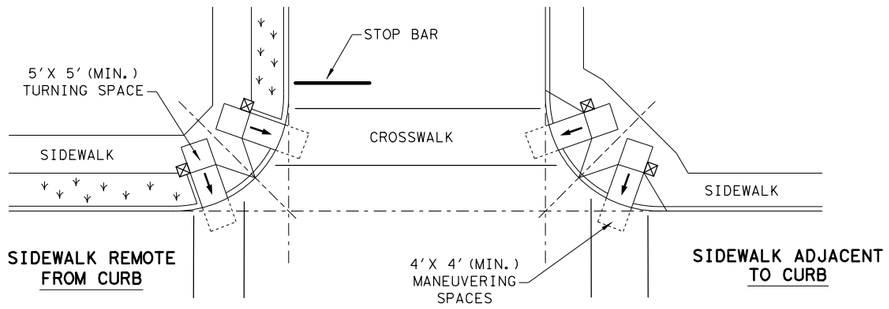
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



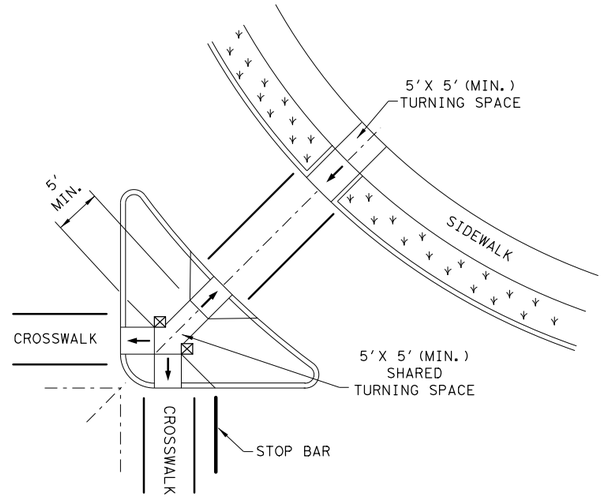
SKEWED INTERSECTION WITH "LARGE" RADIUS



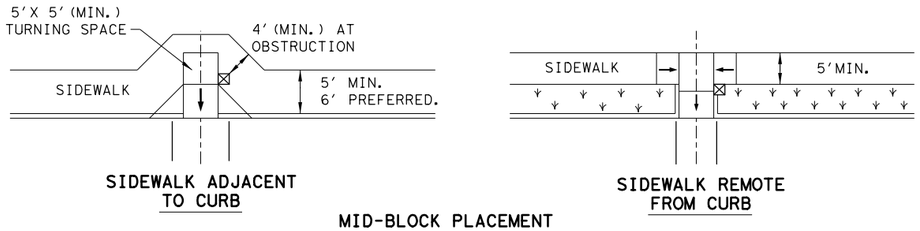
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
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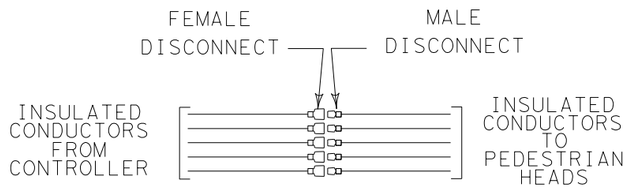
REVISIONS	0101	03	120	US 181
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	CRP	SAN PATRICIO		79



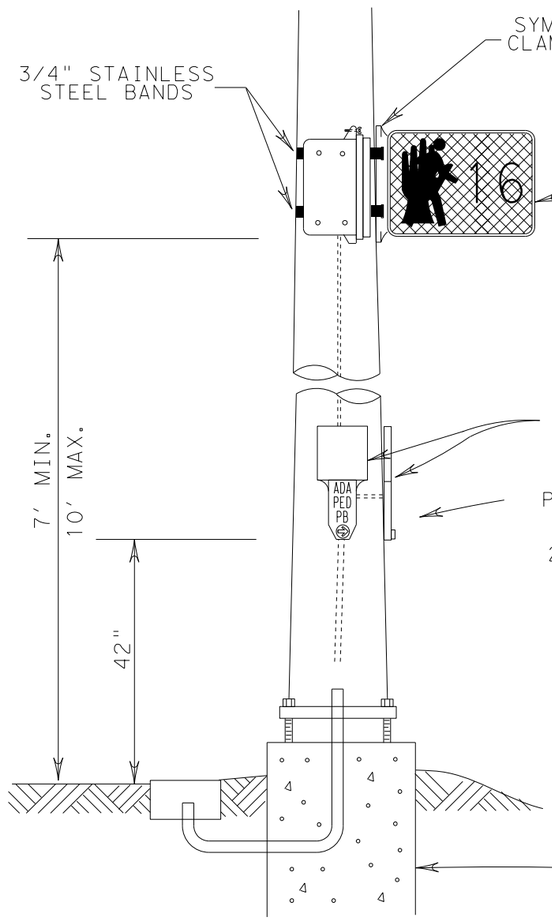
BREAKAWAY IN-LINE DISCONNECT

NOTE:

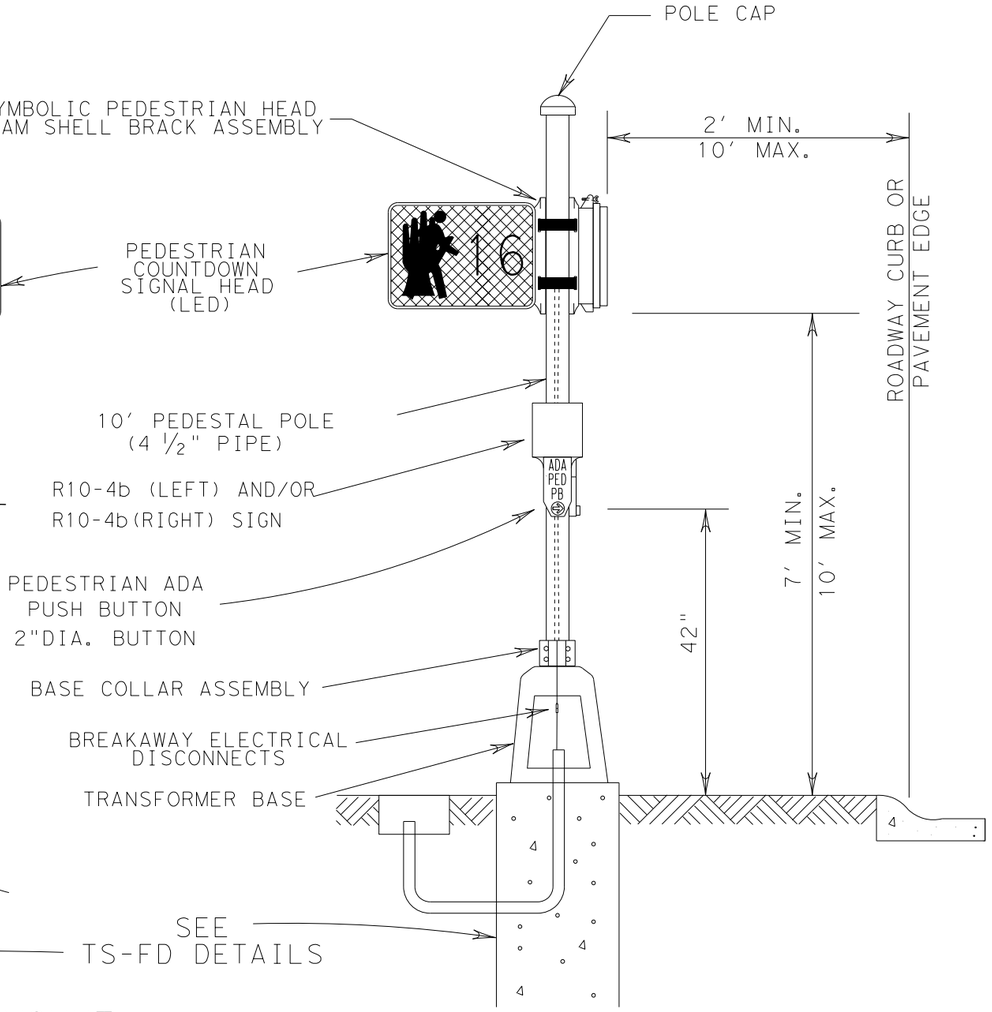
SEE INTERSECTION PLAN VIEW & MATERIALS LIST FOR NUMBER & LOCATION OF PEDESTRIAN SIGNALS ADA PUSH BUTTONS.

THE CONTRACTOR SHALL MOUNT THE PEDESTRIAN HEADS AT A UNIFORM HEIGHT FOR EACH INTERSECTION.

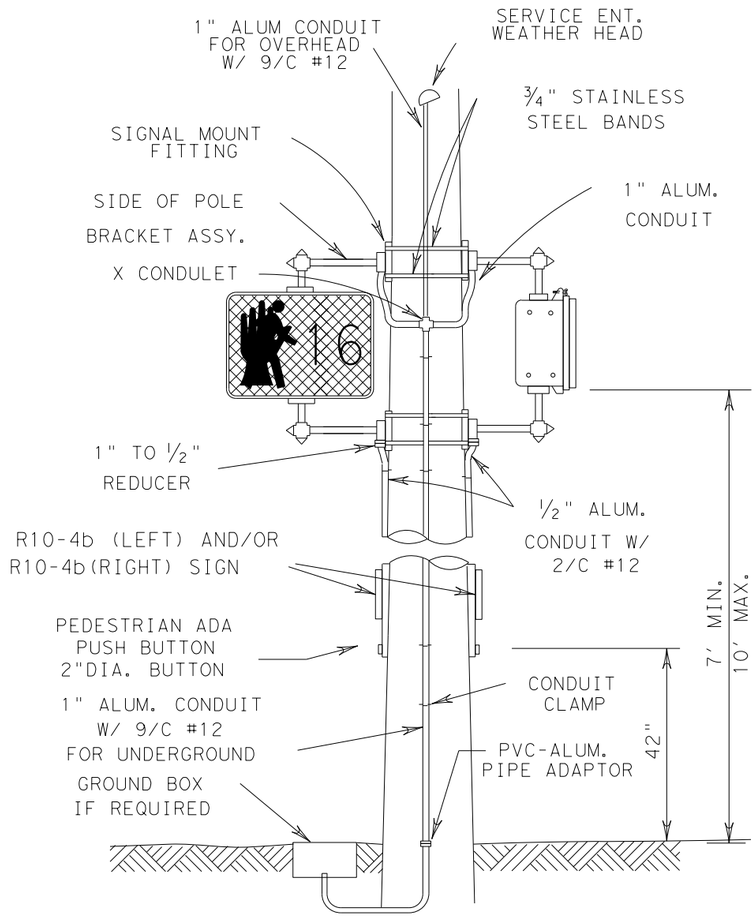
PROVIDE NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTORS FOKR BREAKAWAY POLES. (BUSSMAN HET, LITTLEFUSE LET, FERRAZ-SHAWMUT FEBN OR APPROVED EQUAL) INSTALL APPROVED 10 AMP TIME DELAY FUSE IN BREAKAWAY CONNECTORS FOR UNGROUNDED CONDUCTORS.



SIDE OF POLE (STEEL) MOUNT



PEDESTAL POLE MOUNT



SIDE OF POLE (WOOD) MOUNT

REV. 6-14-01 DCT
REV. 6-14-01 JAS
REV. 8-15-00 JAS
REV. 4-07-07 DCT

PEDESTRIAN SIGNAL DETAILS
CORPUS CHRISTI DIST. STANDARD

FED.RD.DIV.NO.	STATE PROJECT NO.		SHEET NUMBER
6			80
STATE	DISTRICT	COUNTY	
TEXAS	CRP	SAN PATRICIO	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0101	03	120	US 181

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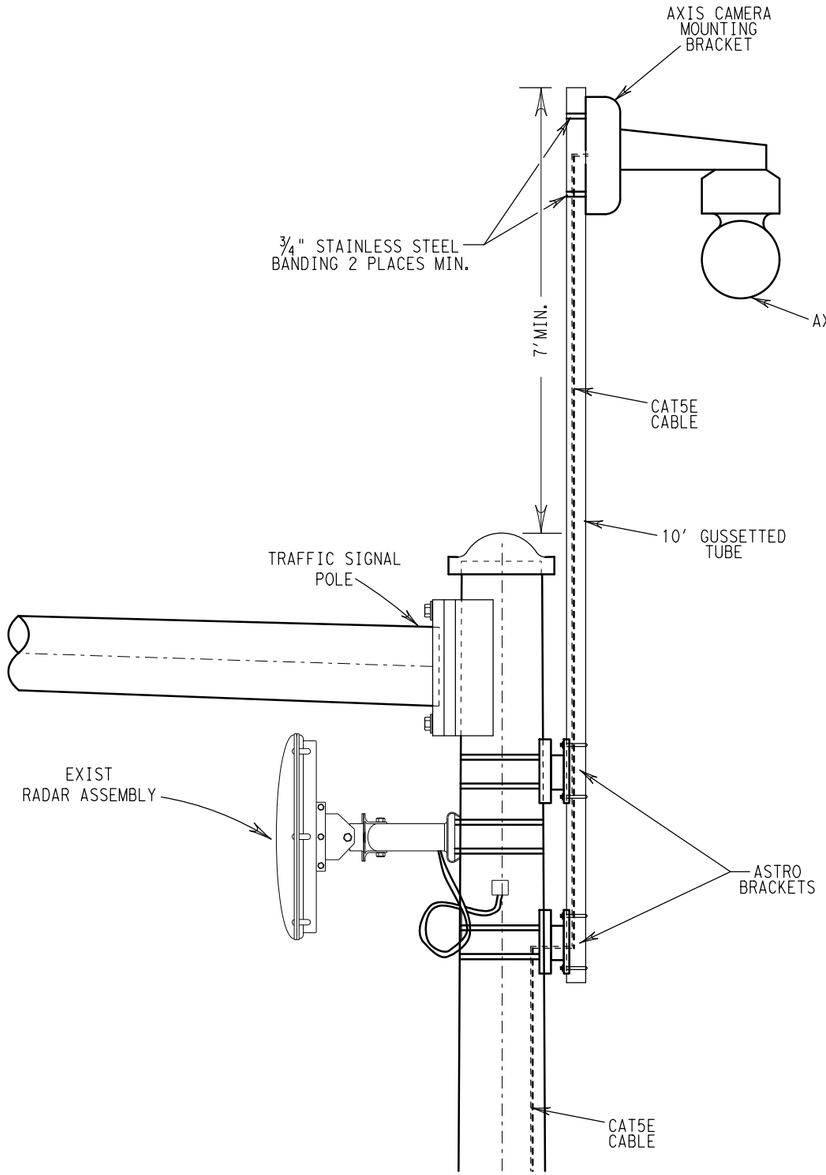
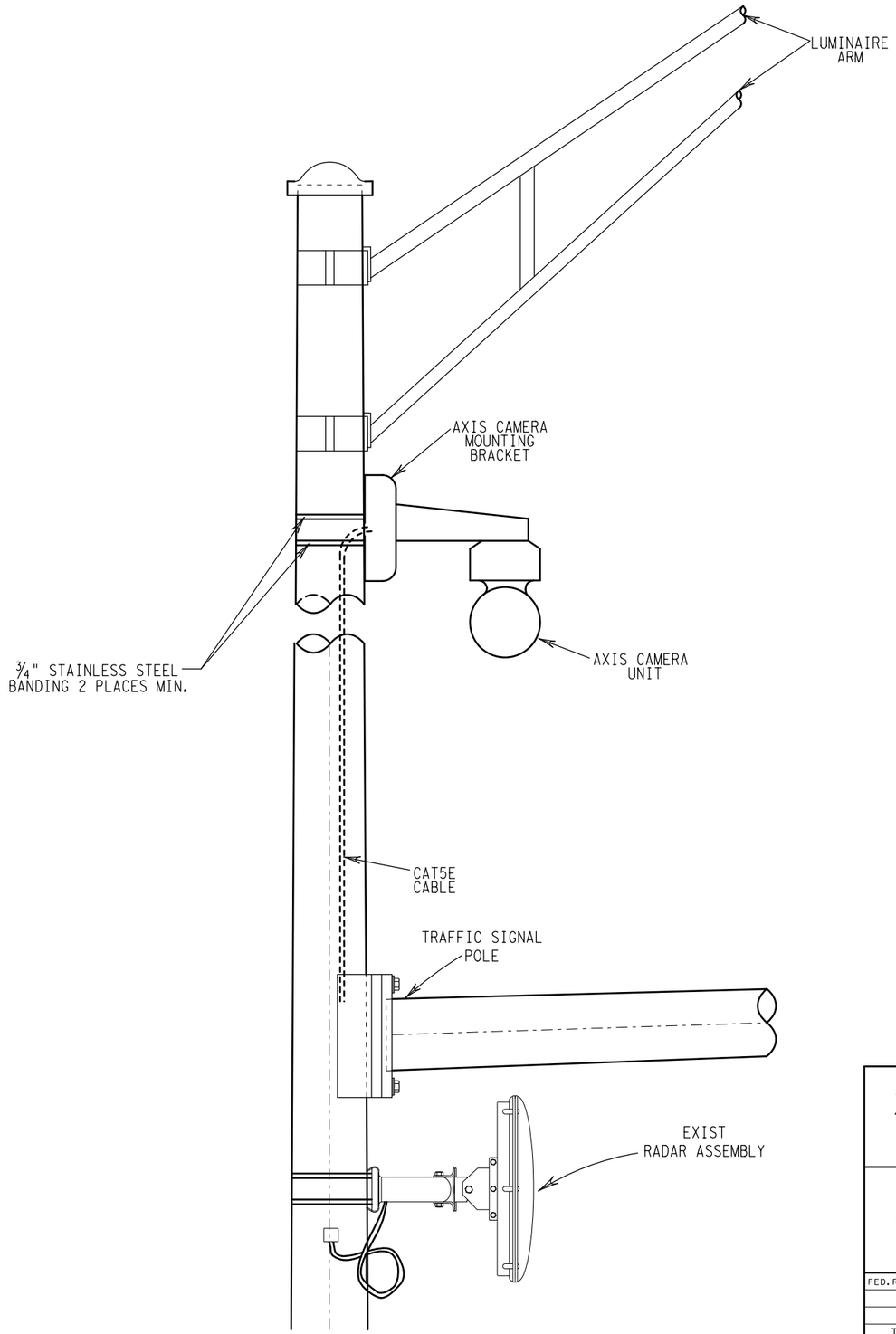
NOTES :

AXIS CAMERA

1. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MATERIALS NOT SUPPLIED BY TXDOT THAT IS NECESSARY FOR THE INSTALLATION OF THE AXIS CAMERA. ALL MATERIALS PROVIDED BY THE CONTRACTOR MUST BE NEW AND CONSIDER SUBSIDIARY TO BID ITEM 6010.
2. AXIS CAMERA UNIT, MOUNTING BRACKET, GUSSETED TUBE AND ASTRO BRACKET SHALL BE INSTALLED AS DETAILED
3. ¾" STAINLESS STEEL BANDING MATERIAL SHALL BE USED TO INSTALL THE AXIS MOUNTING BRACKET
4. ALL CABLE ENTRY AND EXIT POINTS IN THE MAST ARM, POLES AND/OR GUSSETED TUBES SHALL BE WATER TIGHT.
5. THE LOCATION AND ORIENTATION OF AXIS CAMERA UNIT SHALL BE PLACED AS DIRECTED BY THE ENGINEER IN THE FIELD AND MANUFACTURES RECOMMENDATION.



POLE MOUNT

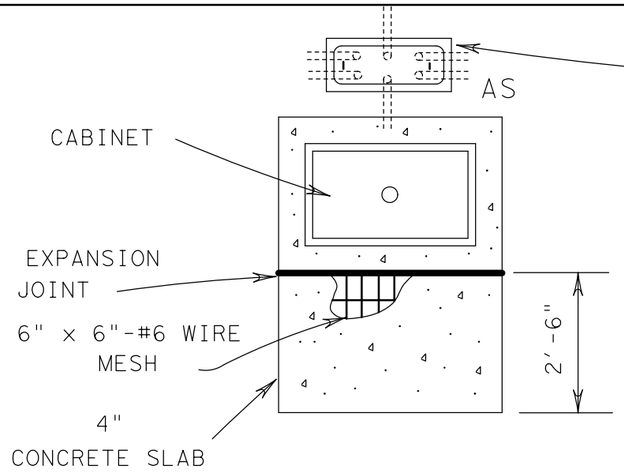


POLE MOUNT

Texas Department of Transportation

CCTV MOUNTING DETAIL

FED.RD.DIV.NO.	STATE PROJECT NO.		SHEET NUMBER
6			81
STATE	DISTRICT	COUNTY	
TEXAS	CRP	SAN PATRICIO	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0101	03	120	US 181



TOP VIEW

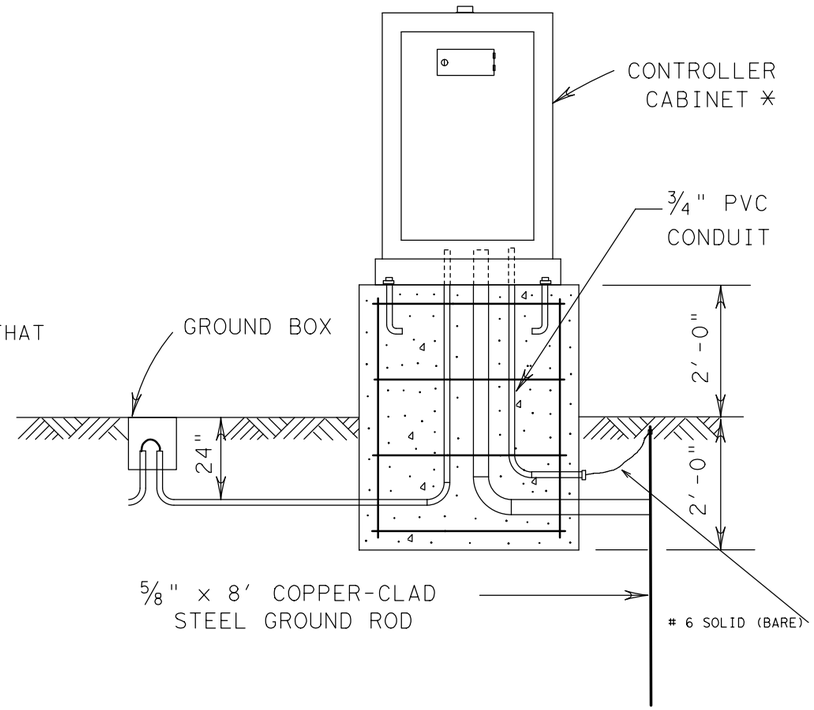
NOTES:

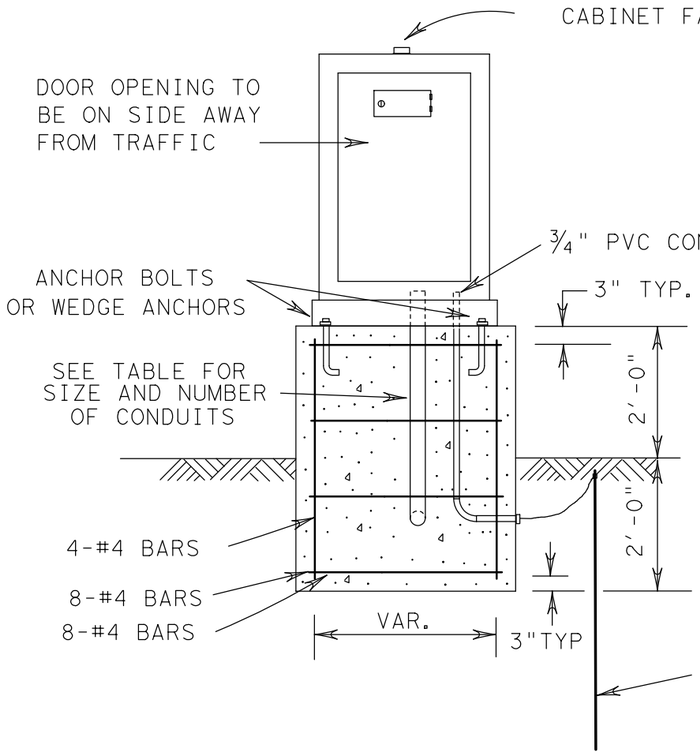
1 THE CONTROLLER CABINET SHALL BE SEALED BETWEEN CABINET AND FOUNDATION WITH A SILICONE SEALING COMPOUND AS APPROVED BY THE ENGINEER. THE SEALING COMPOUND USED SHALL HAVE A MELTING POINT OF NOT LESS THAN TWO HUNDRED (200) DEGREES FAHRENHEIT, AND SHALL NOT BE ADVERSELY AFFECTED BY THE SURROUNDING ATMOSPHERE OR MOISTURE.

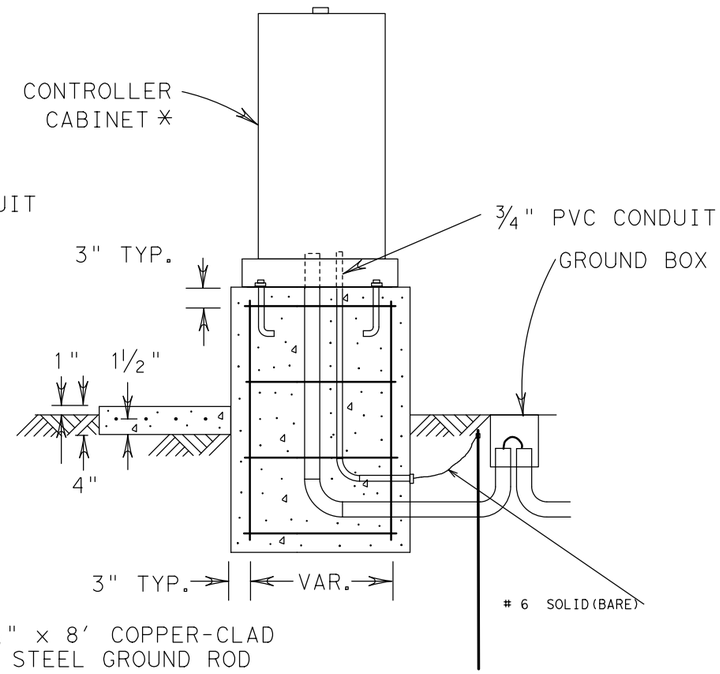
2 CONDUIT TERMINATING IN THE CONTROLLER FOUNDATION SHALL EXTEND VERTICALLY APPROXIMATELY 2 INCHES ABOVE THE FOUNDATION.

3 AFTER ALL WIRING IS COMPLETE, CONDUIT TERMINATING IN THE CONTROLLER SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.

4 FINAL PLACEMENT OF GROUND ROD TO BE APPROVED BY ENGINEER.







ALL CONCRETE FOR CONTROLLER FOUNDATIONS SHALL BE CLASS A. CONTROLLER FOUNDATIONS SHALL BE POURED IN PLACE. PRECAST FOUNDATIONS WILL NOT BE PERMITTED.

CONTFND.DGN
1 2 3 4 5 6 7 8 9 10

REV 6/20/08 GG contfnd.dgn

Texas Department of Transportation

CONTROLLER FOUNDATION DETAILS

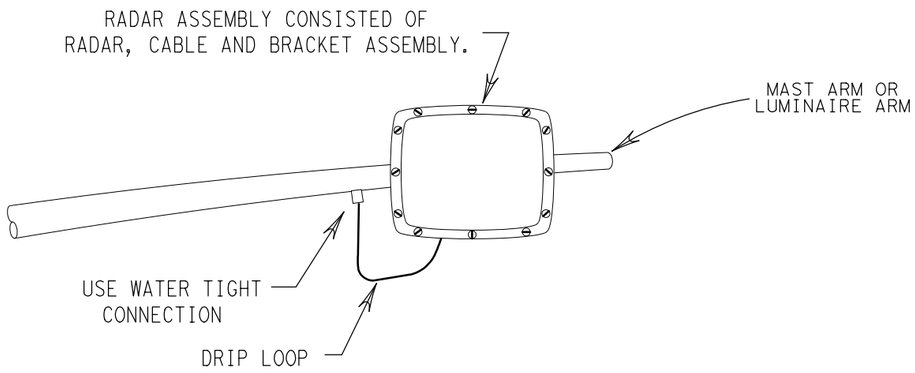
CORPUS CHRISTI DIST. STANDARD

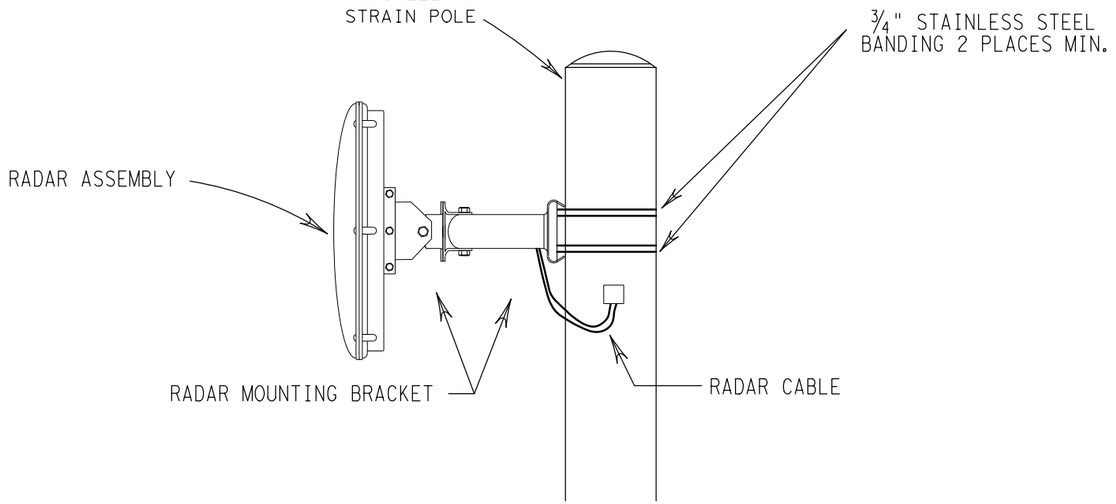
FED.RD.DIV.NO.	STATE PROJECT NO.		SHEET NUMBER
6			82
STATE	DISTRICT	COUNTY	
TEXAS	CRP	SAN PATRICIO	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0101	03	120	US 181

NOTES :

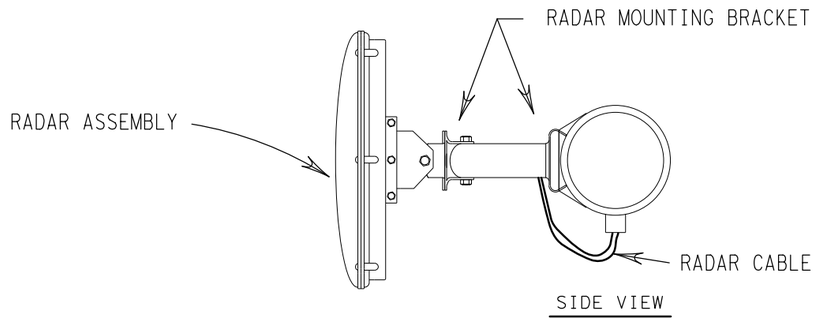
RADAR (MATRIX OR RADD) DETECTION

1. RADAR DETECTION INTERFACE UNIT SHALL BE INSTALLED INSIDE CONTROLLER CABINET.
2. RADAR DETECTION UNIT & BRACKET SHALL BE INSTALLED AS DETAILED OR AS DIRECTED BY THE RADAR DETECTION SUPPLIER.
3. ¾" STAINLESS STEEL BANDING MATERIAL SHALL BE USED TO INSTALL RADAR MOUNTS.
4. RADAR ENCLOSURE ASSEMBLY SHALL BE ROTATABLE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.
5. ALL CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES SHALL BE WATER TIGHT.





POLE MOUNT

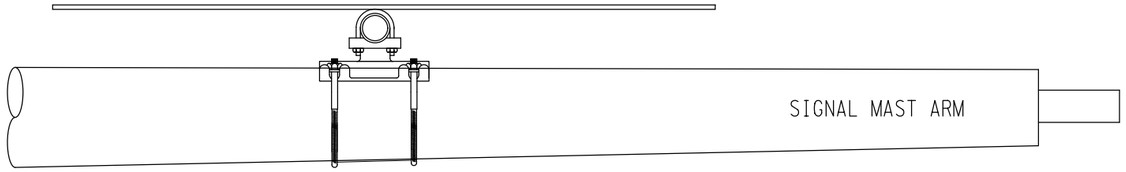


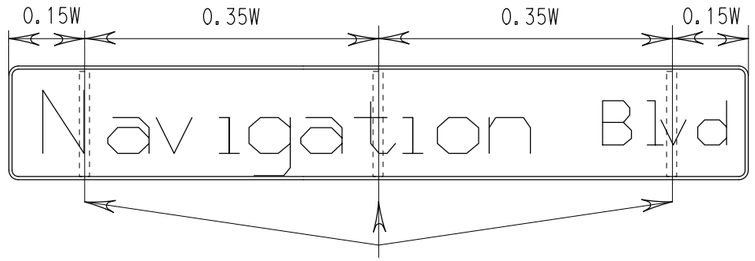
SIDE VIEW

RADAR DETAIL SHEET
(CC DIST. STANDARD)

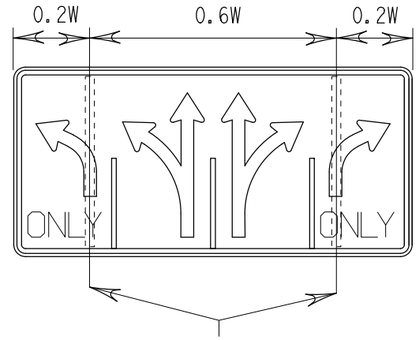
FED.RD.DIV.NO.	STATE PROJECT NO.		SHEET NUMBER
6			83
STATE	DISTRICT	COUNTY	
TEXAS	CRP	SAN PATRICIO	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0101	03	120	US 181

$file$

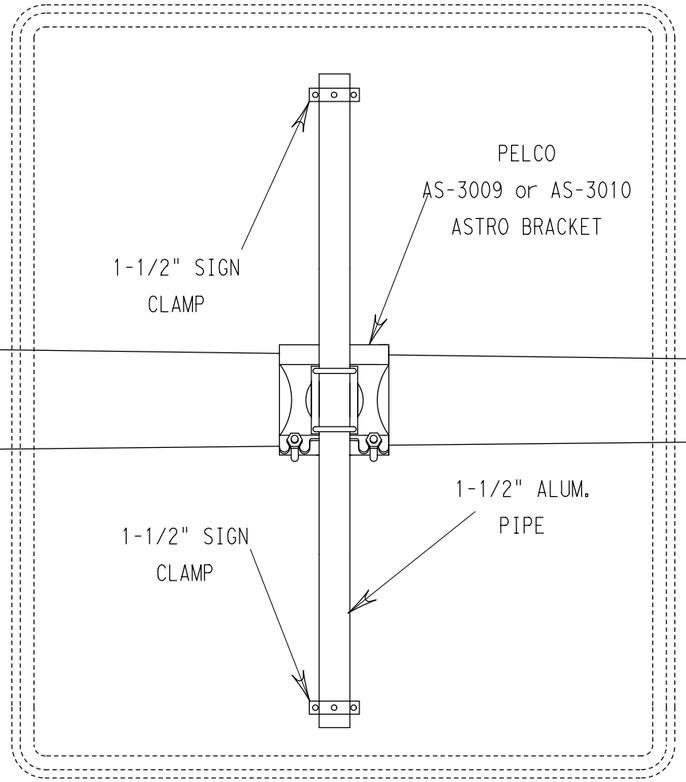




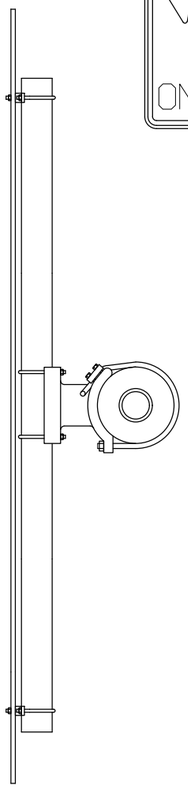
Sign Width greater than 6 ft. use three Astro Brackets



Sign Width is 3 ft. to 6 ft.
use two Astro Brackets



Sign Width is less than 3 ft. use one Astro Bracket



SIGN MOUNT FOR TRAFFIC SIGNAL MAST ARMS

SCALE: NONE
SHEET 1 OF 1

FED.RD.DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NUMBER
6			84
STATE	DISTRICT	COUNTY	
TEXAS	CRP	SAN PATRICIO	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0101	03	120	US 181

$date$
$file$

NOTES:

-This diagram is for informational purpose to show each size of conductor location.

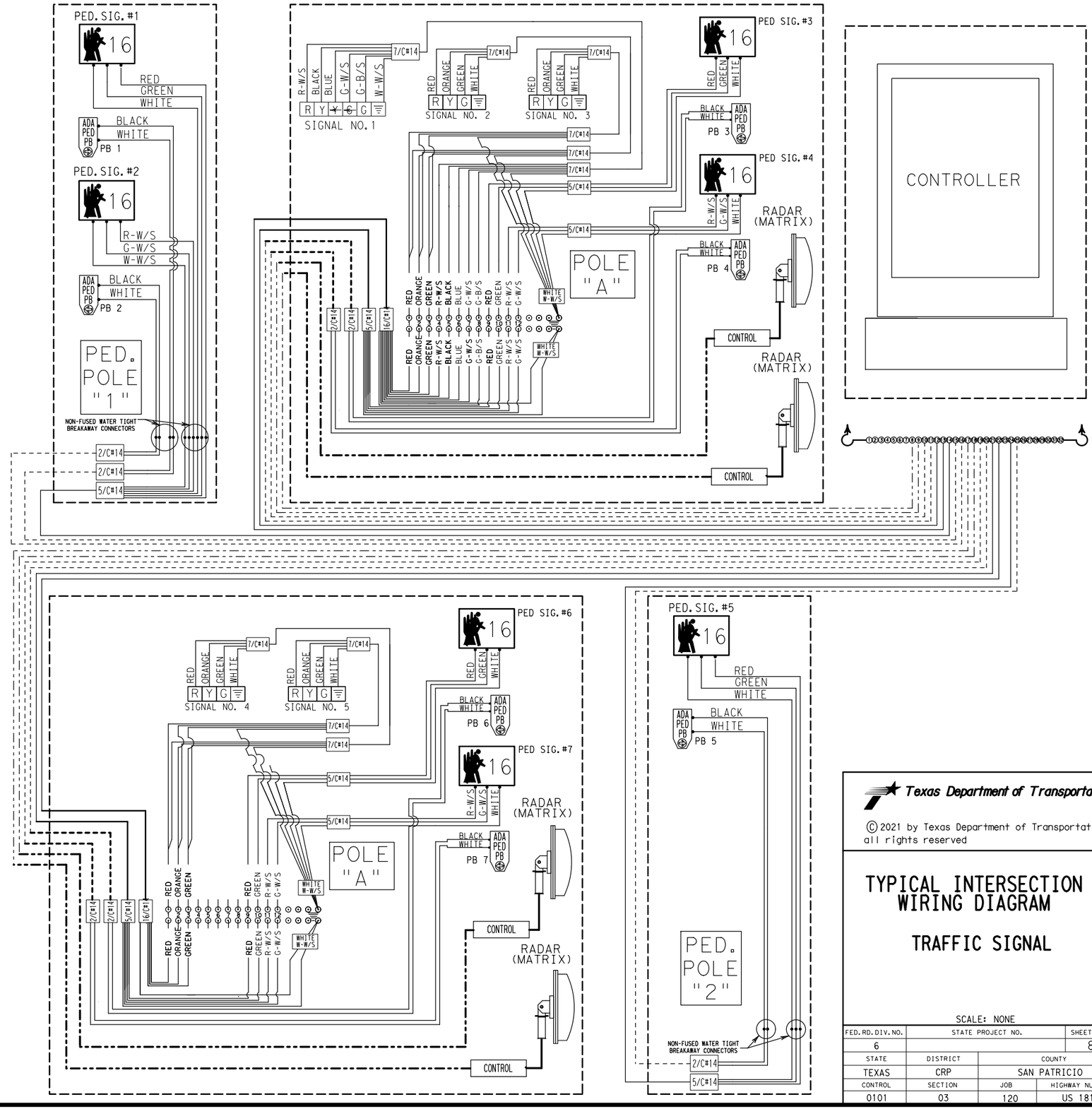
-For Clarity, Continuos System Ground Conductor not shown but shall be installed.

-All material and labor associated with the removal, and replacement of fuses and one Bussmann, Little fuse, or Ferraz-Shawmut fuse block in each traffic signal pole where existing luminaire are will be considered subsidiary to item

-All material and labor associated with the removal and installation of two -12 circuit 600 volt compression Type HD terminal block with four-Phil. Pan Hd screws, #8-32 x 1-1/4 self-tap Type "F" stainless steel, in each traffic signal pole will be considered subsidiary to item 680.

-All material and labor associated with the removal and installation of 1-1/2" coupling and CBG Connector on each traffic signal arm will be considered subsidiary to item 680.

-All material and labor associated with the removal and installation of Non-Fused watertight breakaway electrical connector at each pedestal assembly will be considered subsidiary to item 682.



TYPICAL INTERSECTION WIRING DIAGRAM

TRAFFIC SIGNAL

SCALE: NONE

FED. RD. DIV. NO.	STATE PROJECT NO.		SHEET NUMBER
6			85
STATE	DISTRICT	COUNTY	
TEXAS	CRP	SAN PATRICIO	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0101	03	120	US 181

DATE: 04/05/2024
FILE: \\nasunifftw.pkce.com\dwg\DWG-51\5199-21.742\DGN\Traffic\Sheets\Standards\dgns\Environmental\epic (1).dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ No Action Required ☒ Required Action

PROTECTION NOTES FOR THE REMOVAL OF EXISTING PAVEMENT, CURB OR SIDEWALK AND CONSTRUCTION OF NEW PAVEMENT, CURB OR SIDEWALK ADJACENT TO HISTORIC BUILDINGS, MATERIALS, FENCES, AND RETAINING WALLS

Where proposed work is in proximity to historic buildings or other structures (walls, retaining walls, fences, stone markers), planting beds, and vegetation/groundcover, follow the procedures listed below for demolition and construction at these locations the contractor must:

IN SINTON:

THE ODEM BUILDING AT THE CORNER OF BUS 77 (N VINEYARD AVE) AND US 181 (E SINTON ST), SPECIFICALLY ABUTTING 203 E SINTON ST ON THE SOUTHWEST CORNER OF THE BUILDING. (Station #+#)

IN THREE RIVERS:

THE FIRST STATE BANK BUILDING AT THE CORNER OF US 281 (N HARBORTH ST) AND SH 72 (E THORNTON ST), SPECIFICALLY ABUTTING 101 E THORNTON ST ON THE SOUTHWEST CORNER OF THE BUILDING. (Station #+#)

To minimize potential damage to historic structures and materials, contractor must saw cut existing sidewalk 8 to 12 inches away from the historic resource.

1. Contractor shall construct new sidewalk next to the saw cut edge with installation of expansion joint in between. If existing sidewalk is to be removed entirely, the remaining 8 to 12 inches next to the historic structure, material, fence, or retaining wall must be removed by hand. Expansion joint must be placed between historic structure, material, fence, or retaining wall and new sidewalk.

2. Contractor must prevent damage to historic structure, materials, fences, retaining walls, including garden elements (planting beds, plantings) during the entire construction project, especially during removal of existing pavement, curb, or sidewalk. During the saw cut and hand removal process, contractor shall exercise utmost caution and shall physically protect historic structure foundation, materials, elevations, entryways with decorative flooring, fences, retaining walls, and landscape elements. When pouring concrete for repair or new install, contractor shall prevent splashback of concrete onto historic resource.

3. Contractor must repair or replace in kind, at his own expense, any historic materials damaged in the course of executing the work. Contractor shall locate replacement source for historic materials damaged in the course of the work. TxDOT-Environmental Affairs Division shall be informed of proposed repairs to facilitate consultation with Texas Historical Commission prior to execution of repair work.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☒ Required Action

Action No.

1. No Tree or brush removal if active nests are observed.

2.

3.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

The Federal Migratory Bird Treaty Act (MBTA) states that it is unlawful to pursue, hunt, take, kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit. This project does not have a federal permit; therefore, in accordance with this regulation, the Contractor will avoid disturbing, destroying, removing, or relocating migratory birds and active nests found in trees, culverts, bridges, on the ground, etc. Typical breeding season occurs from March through August; therefore, tree trimming and other vegetation clearing activities that may disturb breeding birds should be done in the non-breeding season (September- February), when possible. If work must be performed during the breeding season, the Contractor shall have a qualified biologist conduct a survey of the right of way to determine if bird nests are present. In the event that active nests are encountered on-site during construction, the Contractor shall notify the Engineer and measures shall be taken to avoid disturbance of these birds, their occupied nest, eggs, and/or young, in accordance with the MBTA. Phasing of work during construction may be necessary to stay in compliance with the MBTA. The Contractor can discuss other preventative measures with the Project Engineer and/or District Environmental Staff.

Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed. Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season. Avoid the removal of unoccupied, inactive nests, as practicable. Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0101	03	120	US 181
	DIST	COUNTY		SHEET NO.
	CRP	SAN PATRICIO		86

DATE: 04/05/2024
FILE: \\nasuniftw.pkce.com\dwg\DWG-51\5199-21.742\DGN\Traffic\Sheets\Standards\dgns\Environmental\epic (2).dgn

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

LIST OF ABBREVIATIONS

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NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0101	03	120	US 181
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	CRP	SAN PATRICIO		87

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 746380W
Crossing Type: at grade abandoned on SH 188/ US 181 (Sinton St)
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 122.680
RR Subdivision: Rockport (ABAN)
City: Sinton
County: San Patricio
CSJ at this Crossing: 0101-03-120
Latitude: 28.0367192
Longitude: -97.509857

Scope of Work, including any TCP, to be performed by State Contractor:

The State's Contractor will be performing Traffic Signal work at intersection 193 ft to the west of the tracks (Rachal) and at the intersection 196 feet to the east of the tracks (Vineyard). Advance traffic control signs should be within 73 feet of the closed/abandoned tracks from the west and within 76 feet of those tracks from the east. Traffic control will be implemented through railroad ROW with TCP channelizers across this closed, removed crossing.

Scope of Work to be performed by Railroad Company:

None

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: 800-848-8715
Location: DOT 746380W
RR Milepost: 122.680
Subdivision: Rockport (ABAN)

RRD Review Only
Initials: _____
Date: 04/05/2024

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0101	03	120		US 181	
6/2023		DIST	COUNTY			SHEET NO.	
		CRP	SAN PATRICIO			88	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 436011U
Crossing Type: at grade on US 181
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 162.090
RR Subdivision: Brownsville
City: Sinton
County: San Patricio
CSJ at this Crossing: 0101-03-120
Latitude: 28.0366620
Longitude: -97.5067298

Scope of Work, including any TCP, to be performed by State Contractor:

The State's Contractor will be performing Traffic Signal work on US 181 at the intersection 812 ft to the west of the tracks (Vineyard) and then at the intersection 739 ft to the east of the tracks (Sodville). Advance traffic control signs should be within 720 feet of this crossing from the west. The Contractor will then perform the work at the Sodville intersection where the advance traffic control signs should be within 619 feet of this crossing from the east. Traffic control will not be implemented through railroad ROW and no TCP channelizers will be placed in RR ROW.

Scope of Work to be performed by Railroad Company:

None

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

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VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

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Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: 800-848-8715
Location: DOT 436011U
RR Milepost: 162.090
Subdivision: Brownsville

RRD Review Only
Initials: _____
Date: 04/05/2024

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0101	03	120		US 181	
6/2023		DIST	COUNTY			~~SHEET~~ NO.	
		CRP	SAN PATRICIO			89	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 746381D
Crossing Type: at grade abandoned on Vineyard Avenue (cross street)
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 122.790
RR Subdivision: Rockport (ABAN)
City: Sinton
County: San Patricio
CSJ at this Crossing: 0101-03-120
Latitude: 28.0363148
Longitude: -97.5092704

Scope of Work, including any TCP, to be performed by State Contractor:

The State's Contractor will be performing Traffic Signal work at the intersection of US 181 and Vineyard Ave to the north of this closed/ abandoned crossing. Advance traffic control signs should be approximately 1322 feet north of the abandoned tracks. There will be no TCP channelizers across this closed, removed crossing.

Scope of Work to be performed by Railroad Company:

None

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: 800-848-8715
Location: DOT 746381D
RR Milepost: 122.790
Subdivision: Rockport (ABAN)

RRD Review Only
Initials: _____
Date: 04/05/2024

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0101	03	120		US 181	
6/2023		DIST	COUNTY			~~SHEET~~ NO.	
		CRP	SAN PATRICIO			90	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 746379C
Crossing Type: at grade abandoned on SRachal St (cross street)
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 122.590
RR Subdivision: Rockport (ABAN)
City: Sinton
County: San Patricio
CSJ at this Crossing: 0101-03-120
Latitude: 28.0371808
Longitude: -97.5104675

Scope of Work, including any TCP, to be performed by State Contractor:

The State's Contractor will be performing Traffic Signal work on US 181 at the Rachal St intersection approximately 175 feet south of this closed, abandoned crossing. Traffic control will be implemented through railroad ROW with TCP channelizers across this closed, removed crossing.

Scope of Work to be performed by Railroad Company:

None

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

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Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

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Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: 800-848-8715
Location: DOT 746379C
RR Milepost: 122.590
Subdivision: Rockport (ABAN)

RRD Review Only
Initials: _____
Date: 04/05/2024

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS	6/2023	0101	03	120		US 181	
		DIST	COUNTY			~~SHEET~~ NO.	
		CRP	SAN PATRICIO			91	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 435645M
Crossing Type: at grade on SH 72
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 77.300
RR Subdivision: Corpus Christi
City: Three Rivers
County: Live Oak
CSJ at this Crossing: 0101-03-120
Latitude: 28.4614630
Longitude: -98.1860631

Scope of Work, including any TCP, to be performed by State Contractor:

The State's Contractor will be performing Traffic Signal work on SH 72 at US 281 approximately 1132 feet from the RR tracks. Advance traffic control signs should be within approximately 1043 feet of the railroad tracks to the east of the tracks. Traffic control will not be implemented through railroad ROW and no TCP channelizers will be placed in RR ROW.

Scope of Work to be performed by Railroad Company:

None

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

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Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
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Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

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Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
https://bnsf.railpermitting.com
- ☐ CPKCR
https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

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Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: 800-848-8715
Location: DOT 435645M
RR Milepost: 77.300
Subdivision: Corpus Christi

RRD Review Only
Initials: _____
Date: 04/05/2024

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS	6/2023	0101	03	120		US 181	
		DIST	COUNTY			SHEET NO.	
		CRP	LIVE OAK			92	