STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0921	02	501,ETC	Mile 2 Rd., Etc.
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER
STP 2B24(399)HESG, ETC.
CSJ 0921-02-501,ETC.

NET LENGTH OF PROJECT = Varies

HIDALGO COUNTY
TRAFFIC SIGNAL IMPROVEMENTS

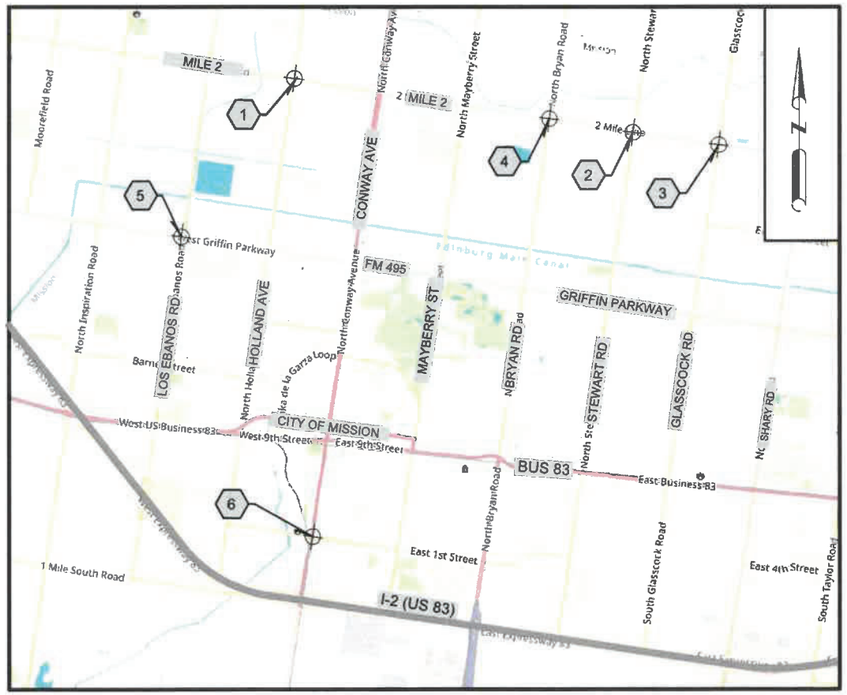
LIMITS: VARIOUS LOCATIONS
FOR THE CONSTRUCTION OF: TRAFFIC SIGNAL IMPROVEMENTS CONSISTING OF REMOVAL OF EXISTING FLASHING BEACON AND INSTALLATION OF NEW TRAFFIC SIGNALS, AND ADDITION OF LEFT TURN SIGNAL HEADS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

INDEX OF LOCATIONS

1. CSJ:0921-02-501
   MILE 2 AT TROSPER RD
   INSTALL TRAFFIC SIGNAL
2. CSJ:0921-02-502
   MILE 2 AT STEWART RD
   INSTALL TRAFFIC SIGNAL
3. CSJ:0921-02-503
   MILE 2 AT GLASSCOCK RD
   INSTALL TRAFFIC SIGNAL
4. CSJ:0921-02-517
   MILE 2 AT BRYAN RD
   IMPROVE TRAFFIC SIGNAL
5. CSJ:0921-02-518
   FM 495 AT LOS EBANOS RD
   IMPROVE TRAFFIC SIGNAL
6. CSJ:0921-02-519
   CONWAY AVE AT 1ST STREET
   IMPROVE TRAFFIC SIGNAL



LOCATION MAP
N.T.S.

OVERALL NUMBER OF LOCATIONS:	6
DESIGN SPEED:	VARIES
EXCEPTIONS:	NONE
EQUATIONS:	NONE
RAILROAD CROSSINGS:	2

AT LOCATION #6
1. RIO VALLEY SWITCHING CO., DOT # 448 909T (WEST)
2. RIO VALLEY SWITCHING CO., DOT # 448 910M (SOUTH)

TDLR TABS NO.:

LOC #1: TABS2024018534
LOC #2: TABS2024018536
LOC #3: TABS2024018537

TDLR INSPECTION _____

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION ON 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 23, 2023).

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

LIST OF APPROVED FIELD CHANGES, CHANGE ORDERS & SUPPLEMENTAL AGREEMENTS:

THIS IS TO certify THAT ALL CONSTRUCTION SUBSTANTIAL WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS SPECIFICATIONS AND CONTRACT.ALL PROPOSED CONSTRUCTION WAS COMPLETED UNLESS OTHERWISE NOTED.

_____ _____
HECTOR SILLER, P.E. DATE
PHARR AREA ENGINEER

CONCURRENCE: DATE: 6/11/2024

Mark R Perez
CITY OF MISSION

RECOMMENDED FOR LETTING: DATE: 6/17/2024

DocuSigned by:
Pedro R. Alvarez
EABA335C2DAA48C...
DISTRICT ENGINEER

SUBMITTED FOR LETTING: DATE: 6/17/2024

DocuSigned by:
Hector Siller
BD1D9DF7CC55415...
AREA ENGINEER

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI
TBPE F-1640

CITY OF MISSION

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INDEX OF SHEETS

	SHEET NO.	**GENERAL**
	1	TITLE SHEET
	2	INDEX OF SHEETS
	3 - 8	ESTIMATE & QUANTITY SHEETS
	9	LOCATION MAP
	10 - 16	GENERAL NOTES
	17 - 18	SUMMARY OF QUANTITIES
	SHEET NO.	**TRAFFIC SIGNAL LAYOUTS**
	19	MILE 2 AT TROSPER RD - EXISTING CONDITIONS LAYOUT
	20 - 21	MILE 2 AT TROSPER RD - PROPOSED SIGNAL LAYOUT
	22	MILE 2 AT TROSPER RD - SIGNING LAYOUT
	23	MILE 2 AT TROSPER RD - PAVEMENT MARKINGS LAYOUT
	24	MILE 2 AT STEWART RD - EXISTING CONDITIONS LAYOUT
	25 - 26	MILE 2 AT STEWART RD - PROPOSED SIGNAL LAYOUT
	27	MILE 2 AT STEWART RD - SIGN & PAVEMENT MARKINGS LAYOUT
	28	MILE 2 AT GLASSCOCK RD - EXISTING CONDITIONS LAYOUT
	29 - 30	MILE 2 AT GLASSCOCK RD - PROPOSED SIGNAL LAYOUT
	31	MILE 2 AT GLASSCOCK RD - SIGN & PAVEMENT MARKINGS LAYOUT
	32	MILE 2 AT BRYAN RD - EXISTING CONDITIONS LAYOUT
	33 - 34	MILE 2 AT BRYAN RD - PROPOSED SIGNAL LAYOUT
	35	MILE 2 AT BRYAN RD - PAVEMENT MARKINGS LAYOUT
	36	FM 495 AT LOS EBANOS RD - EXISTING CONDITIONS LAYOUT
	37 - 38	FM 495 AT LOS EBANOS RD - PROPOSED SIGNAL LAYOUT
	39	FM 495 AT LOS EBANOS RD - PAVEMENT MARKINGS LAYOUT
	40	CONWAY AVE AT 1ST STREET - EXISTING CONDITIONS LAYOUT
	41 - 42	CONWAY AVE AT 1ST STREET - PROPOSED SIGNAL LAYOUT
	43	CONWAY AVE AT 1ST STREET - SIGNING LAYOUT
	44 - 47	CONWAY AVE AT 1ST STREET - PAVEMENT MARKINGS LAYOUT
	SHEET NO.	**ROADWAY DETAIL STANDARDS**
*	48	(S) CCCG-22
*	49 - 52	(S) PED-18
*	53	(D) SIDEWALK & WHEELCHAIR RAMP DESIGN GUIDE
	SHEET NO.	**TRAFFIC CONTROL PLAN STANDARDS**
*	54 - 65	(S) BC (1-12)-21
*	66	(S) TCP(2-1)-18
*	67	(S) TCP(2-2)-18
*	68	(S) TCP(2-3)-23
*	69	(S) TCP(2-4)-18
*	70	(S) TCP(2-5)-18
*	71	(S) TCP(3-1)-13
*	72	(S) TCP(3-2)-13
*	73	(S) TCP(3-3)-14
*	74	(S) TCP(3-4)-13
*	75	(S) WZ(BTS-1)-13
*	76	(S) WZ(BTS-2)-13
*	77	(S) WZ(RS)-22
*	78	(S) WZ(STPM)-23

INDEX OF SHEETS

	SHEET NO.	**TRAFFIC SIGNAL STANDARDS**
*	79 - 86	(S) ED (1),(3),(4),(5),(6),(7),(8),(10)-14
*	87	(S) TS-FD-12
*	88	(S) CFA-12
*	89	(S) LUM-A-12
*	90	(S) TS-CF-21
*	91	(S) TS-BP-20
*	92	(D) ELECTRICAL SERVICE DESIGN WITH SIGNAL CONTROLLER
*	93	(D) TRAFFIC SIGNAL CONSTRUCTION DETAILS
	SHEET NO.	**SIGNING**
	94	SUMMARY OF SMALL SIGNS
	SHEET NO.	**SIGNING STANDARDS**
*	95	(S) SMD(GEN)-08
*	96	(S) SMD(SLIP-1)-08
*	97	(S) SMD(SLIP-2)-08
*	98	(S) SMD(SLIP-3)-08
*	99	(S) TSR(4)-13
*	100	(S) TSR(5)-13
	SHEET NO.	**PAVEMENT MARKING & DELINEATION STANDARDS**
*	101	(S) PM(1)-22
*	102	(S) PM(2)-22
*	103	(S) PM(3)-22
*	104	(S) PM(4)-22A
	SHEET NO.	**RAILROAD DETAILS**
	105 - 106	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
	107 - 108	RAILROAD SCOPE OF WORK- PROJECT SPECIFIC DETAILS
	SHEET NO.	**RAIROAD STANDARDS**
	109	(S) RCD(1)-22
	110	(S) RCD(2)-22
	SHEET NO.	**ENVIRONMENTAL ISSUES**
	111- 112	STORMWATER POLLUTION PREVENTION PLAN (SWP3)
	113 - 114	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	115 - 117	TPWD BEST MANAGEMENT PRACTICES (BMPs)
		ENVIRONMENTAL ISSUES STANDARDS
*	118 - 120	(S) EC(9)-16

LEGEND

(S) STATE STANDARDS

(D) DISTRICT STANDARDS

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A " * " HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TEDSI
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
INDEX OF SHEETS

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		2
TR:					
CK TR:					

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Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0921-02-501 **DISTRICT** Pharr **COUNTY** Hidalgo
HIGHWAY 1ST ST W, 2 MILE RD, LOS EBANOS, MILE 2 RD

				0921-02-501		0921-02-502		0921-02-503		0921-02-517		0921-02-518		0921-02-519	
CONTROL SECTION JOB															
PROJECT ID				A00184404		A00184407		A00184410		A00193184		A00193186		A00193187	
COUNTY				Hidalgo		Hidalgo		Hidalgo		Hidalgo		Hidalgo		Hidalgo	
HIGHWAY				MILE 2 RD		MILE 2 RD		MILE 2 RD		2 MILE RD		LOS EBANOS		1ST ST W	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	104-6015	REMOVING CONC (SIDEWALKS)	SY	62.000		119.000		52.000							
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	54.000											
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	24.000		12.000		24.000							
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	28.000		36.000		28.000							
	500-6001	MOBILIZATION	LS	0.252		0.267		0.249		0.070		0.079		0.083	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.500		1.500		1.500		1.500		1.500		1.500	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	116.000		148.000				100.000		16.000		32.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	116.000		148.000				100.000		16.000		32.000	
	529-6029	CONC CURB & GUTTER (TY A)	LF	75.000											
	531-6001	CONC SIDEWALKS (4")	SY	15.000		34.000		6.000							
	531-6004	CURB RAMPS (TY 1)	EA			1.000									
	531-6005	CURB RAMPS (TY 2)	EA			4.000									
	531-6008	CURB RAMPS (TY 5)	EA	3.000		3.000		4.000							
	618-6029	CONDT (PVC) (SCH 40) (3")	LF	56.000		128.000		117.000							
	618-6030	CONDT (PVC) (SCH 40) (3") (BORE)	LF	139.000		173.000		119.000							
	618-6033	CONDT (PVC) (SCH 40) (4")	LF	14.000		27.000		21.000							
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF	80.000		63.000		75.000							
	620-6009	ELEC CONDR (NO.6) BARE	LF	541.000		764.000		657.000		400.000		358.000		315.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	41.000		39.000		41.000		65.000		39.000		33.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	462.000		494.000		442.000							
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	3.000		4.000		3.000							
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	2.000		1.000		2.000							
	628-6002	REMOVE ELECTRICAL SERVICES	EA	1.000		1.000		1.000							
	628-6301	ELC SRV TY T 120/240 000(NS)GS(L)TS(O)	EA	1.000		1.000		1.000							
	636-6001	ALUMINUM SIGNS (TY A)	SF	7.500		7.500		7.500							
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	1.000										2.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	5.000		4.000		4.000						1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	4.000		4.000		4.000							
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	LF	90.000										42.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	280.000						170.000		320.000		476.000	
	666-6225	PAVEMENT SEALER 6"	LF	2,950.000		1,760.000		1,780.000		1,929.000		2,360.000		2,342.000	
	666-6226	PAVEMENT SEALER 8"	LF	370.000						170.000		320.000		518.000	
	666-6230	PAVEMENT SEALER 24"	LF	377.000		300.000		343.000		310.000		447.000		492.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	3.000						2.000		4.000		4.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	3.000						2.000		4.000		4.000	
	666-6242	PAVEMENT SEALER (RR XING)	EA											4.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	380.000		160.000		180.000		160.000		190.000		170.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0921-02-501 **DISTRICT** Pharr **COUNTY** Hidalgo
HIGHWAY 1ST ST W, 2 MILE RD, LOS EBANOS, MILE 2 RD

				0921-02-501		0921-02-502		0921-02-503		0921-02-517		0921-02-518		0921-02-519	
CONTROL SECTION JOB															
PROJECT ID				A00184404		A00184407		A00184410		A00193184		A00193186		A00193187	
COUNTY				Hidalgo		Hidalgo		Hidalgo		Hidalgo		Hidalgo		Hidalgo	
HIGHWAY				MILE 2 RD		MILE 2 RD		MILE 2 RD		2 MILE RD		LOS EBANOS		1ST ST W	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	140.000						169.000		570.000			
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	2,430.000		1,600.000		1,600.000		1,600.000		1,600.000		2,172.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	377.000		300.000		343.000		310.000		447.000		492.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	3.000						2.000		4.000		4.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	3.000						2.000		4.000		4.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA											4.000	
	672-6007	REFL PAV MRKR TY I-C	EA	34.000		8.000		8.000		18.000		31.000		44.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	124.000		70.000		80.000		68.000		80.000		112.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	2,481.000		1,476.000		1,664.000		1,660.000		2,434.000		1,800.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	175.000						162.000		276.000		500.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	469.000		358.000		415.000		335.000		472.000			
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	102.000		85.000		91.000		98.000		138.000		406.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2.000						2.000		7.000		6.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA									2.000			
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	1.000						2.000		4.000		4.000	
	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA											2.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	2,950.000		1,760.000		1,780.000		1,929.000		2,360.000		2,342.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	370.000						170.000		320.000		518.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	377.000		300.000		343.000		310.000		447.000		492.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	3.000						2.000		4.000		4.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	3.000						2.000		4.000		4.000	
	678-6020	PAV SURF PREP FOR MRK (RR XING)	EA											4.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1.000		1.000		1.000							
	680-6004	REMOVING TRAFFIC SIGNALS	EA	1.000		1.000		1.000							
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA							1.000		1.000		1.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	8.000		8.000		8.000		2.000		2.000		2.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2.000		2.000		2.000		2.000		4.000		2.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	8.000		8.000		8.000		2.000		2.000		2.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4.000		4.000		4.000		4.000		8.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	8.000		8.000		8.000		2.000		2.000		2.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	2.000		2.000		2.000		2.000		4.000		2.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8.000		8.000		8.000							
	682-6049	BACKPLATE W/REFL BRDR(4 SEC)	EA	2.000		2.000		2.000		2.000		4.000		4.000	
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)	EA	8.000		8.000		8.000		8.000		8.000		8.000	
	684-6007	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	912.000		979.000		842.000							
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	1,088.000		1,186.000		1,037.000		342.000		249.000		230.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	1,115.000		1,326.000		1,106.000		358.000		481.000		252.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0921-02-501 **DISTRICT** Pharr **COUNTY** Hidalgo
HIGHWAY 1ST ST W, 2 MILE RD, LOS EBANOS, MILE 2 RD

				0921-02-501		0921-02-502		0921-02-503		0921-02-517		0921-02-518		0921-02-519	
		CONTROL SECTION JOB													
		PROJECT ID		A00184404		A00184407		A00184410		A00193184		A00193186		A00193187	
		COUNTY		Hidalgo		Hidalgo		Hidalgo		Hidalgo		Hidalgo		Hidalgo	
		HIGHWAY		MILE 2 RD		MILE 2 RD		MILE 2 RD		2 MILE RD		LOS EBANOS		1ST ST W	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	686-6027	INS TRF SIG PL AM(S)1 ARM(24')LUM	EA	1.000				2.000							
	686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA			1.000									
	686-6033	INS TRF SIG PL AM(S)1 ARM(32')	EA	1.000											
	686-6037	INS TRF SIG PL AM(S)1 ARM(36')	EA	1.000				1.000							
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	1.000											
	686-6041	INS TRF SIG PL AM(S)1 ARM(40')	EA					1.000							
	686-6045	INS TRF SIG PL AM(S)1 ARM(44')	EA			1.000									
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA			1.000									
	686-6049	INS TRF SIG PL AM(S)1 ARM(48')	EA			1.000									
	687-6001	PED POLE ASSEMBLY	EA	2.000		7.000		6.000							
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	8.000		8.000		8.000							
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	8.000		8.000		8.000							
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000		2.000		2.000		2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	40.000		47.000		36.000		40.000		45.000		46.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	2.000		2.000		2.000		2.000		3.000		3.000	
	6306-6001	VIVDS PROSR SYS	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	6306-6004	VIVDS CAM ASSY 360	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	6306-6005	VIVDS CNTRL SOFTWARE	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	6306-6007	VIVDS CABLING	LF	41.000		39.000		41.000		65.000		39.000		35.000	
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON PARTICIPATING)	LS											1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000		1.000		1.000		1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000		1.000		1.000		1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0921-02-501 **DISTRICT** Pharr **COUNTY** Hidalgo

HIGHWAY 1ST ST W, 2 MILE RD, LOS EBANOS, MILE 2 RD

				CONTROL SECTION JOB / PROJECT ID / COUNTY / HIGHWAY	UNIT	TOTAL EST.	TOTAL FINAL
ALT	BID CODE	DESCRIPTION					
	104-6015	REMOVING CONC (SIDEWALKS)			SY	233.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)			LF	54.000	
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)			LF	60.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)			LF	92.000	
	500-6001	MOBILIZATION			LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING			MO	9.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")			LF	412.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)			LF	412.000	
	529-6029	CONC CURB & GUTTER (TY A)			LF	75.000	
	531-6001	CONC SIDEWALKS (4")			SY	55.000	
	531-6004	CURB RAMPS (TY 1)			EA	1.000	
	531-6005	CURB RAMPS (TY 2)			EA	4.000	
	531-6008	CURB RAMPS (TY 5)			EA	10.000	
	618-6029	CONDT (PVC) (SCH 40) (3")			LF	301.000	
	618-6030	CONDT (PVC) (SCH 40) (3") (BORE)			LF	431.000	
	618-6033	CONDT (PVC) (SCH 40) (4")			LF	62.000	
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)			LF	218.000	
	620-6009	ELEC CONDR (NO.6) BARE			LF	3,035.000	
	620-6010	ELEC CONDR (NO.6) INSULATED			LF	258.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)			LF	1,398.000	
	624-6002	GROUND BOX TY A (122311)W/APRON			EA	10.000	
	624-6010	GROUND BOX TY D (162922)W/APRON			EA	5.000	
	628-6002	REMOVE ELECTRICAL SERVICES			EA	3.000	
	628-6301	ELC SRV TY T 120/240 000(NS)GS(L)TS(O)			EA	3.000	
	636-6001	ALUMINUM SIGNS (TY A)			SF	22.500	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)			EA	3.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)			EA	14.000	
	644-6076	REMOVE SM RD SN SUP&AM			EA	12.000	
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)			LF	132.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)			LF	1,246.000	
	666-6225	PAVEMENT SEALER 6"			LF	13,121.000	
	666-6226	PAVEMENT SEALER 8"			LF	1,378.000	
	666-6230	PAVEMENT SEALER 24"			LF	2,269.000	
	666-6231	PAVEMENT SEALER (ARROW)			EA	13.000	
	666-6232	PAVEMENT SEALER (WORD)			EA	13.000	
	666-6242	PAVEMENT SEALER (RR XING)			EA	4.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)			LF	1,240.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0921-02-501 **DISTRICT** Pharr **COUNTY** Hidalgo

HIGHWAY 1ST ST W, 2 MILE RD, LOS EBANOS, MILE 2 RD

CONTROL SECTION JOB / PROJECT ID / COUNTY / HIGHWAY				TOTAL EST.	TOTAL FINAL
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	879.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	11,002.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	2,269.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	13.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	13.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	4.000	
	672-6007	REFL PAV MRKR TY I-C	EA	143.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	534.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	11,515.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,113.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	2,049.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	920.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	17.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	11.000	
	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA	2.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	13,121.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	1,378.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	2,269.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	13.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	13.000	
	678-6020	PAV SURF PREP FOR MRK (RR XING)	EA	4.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA	3.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA	3.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	3.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	30.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	14.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	30.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	28.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	30.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	14.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	24.000	
	682-6049	BACKPLATE W/REFL BRDR(4 SEC)	EA	16.000	
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)	EA	48.000	
	684-6007	TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	2,733.000	
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	4,132.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	4,638.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0921-02-501 **DISTRICT** Pharr **COUNTY** Hidalgo

HIGHWAY 1ST ST W, 2 MILE RD, LOS EBANOS, MILE 2 RD

				TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB			
		PROJECT ID			
		COUNTY			
		HIGHWAY			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		
	686-6027	INS TRF SIG PL AM(S)1 ARM(24')LUM	EA	3.000	
	686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA	1.000	
	686-6033	INS TRF SIG PL AM(S)1 ARM(32')	EA	1.000	
	686-6037	INS TRF SIG PL AM(S)1 ARM(36')	EA	2.000	
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	1.000	
	686-6041	INS TRF SIG PL AM(S)1 ARM(40')	EA	1.000	
	686-6045	INS TRF SIG PL AM(S)1 ARM(44')	EA	1.000	
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	1.000	
	686-6049	INS TRF SIG PL AM(S)1 ARM(48')	EA	1.000	
	687-6001	PED POLE ASSEMBLY	EA	15.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	24.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	24.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	12.000	
	6185-6002	TMA (STATIONARY)	DAY	254.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	14.000	
	6306-6001	VIVDS PROSR SYS	EA	6.000	
	6306-6004	VIVDS CAM ASSY 360	EA	6.000	
	6306-6005	VIVDS CNTRL SOFTWARE	EA	6.000	
	6306-6007	VIVDS CABLING	LF	260.000	
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON PARTICIPATING)	LS	1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	6.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	6.000	

SIGNALS LOCATIONS MAP

1 CSJ:0921-02-501
MILE 2 AT TROSPER RD
INSTALL TRAFFIC SIGNAL

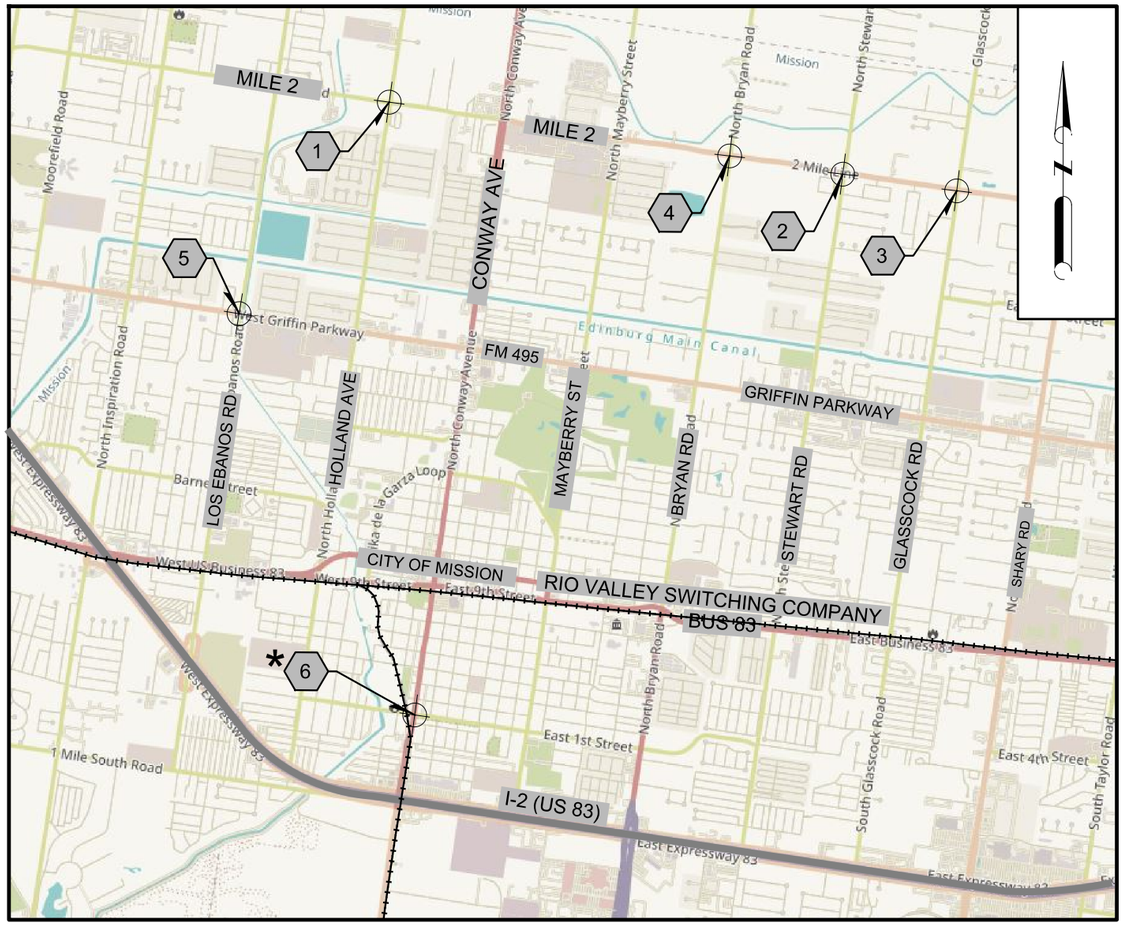
2 CSJ:0921-02-502
MILE 2 AT STEWART RD
INSTALL TRAFFIC SIGNAL

3 CSJ:0921-02-503
MILE 2 AT GLASSCOCK RD
INSTALL TRAFFIC SIGNAL

4 CSJ:0921-02-517
MILE 2 AT BRYAN RD
IMPROVE TRAFFIC SIGNAL

5 CSJ:0921-02-518
FM 495 AT LOS EBANOS RD
IMPROVE TRAFFIC SIGNAL

* 6 CSJ:0921-02-519
CONWAY AVE AT 1ST STREET
IMPROVE TRAFFIC SIGNAL



LOCATION MAP
N.T.S.

*** LOCATION IS ADJACENT TO THE RAILROAD ROW**
REFER TO THE RAILROAD DETAILS SECTION AND TO ITEM 5 IN THE GENERAL NOTES FOR MORE INFORMATION

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FILE: c:\pw-tedsi-connect\id0108934\MISSION SIG LOC MAP.dgn

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TEDSI
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS

LOCATION MAP

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		9
TR:					
CK TR:					

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

2014 SPECS GENERAL NOTES:

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General Requirements and Covenants to ITEMS 1 thru 9:

For all pits or quarries, comply with the "Texas Aggregate Quarry and Pit Safety Act."

Provide on a weekly basis a list of equipment, including idle equipment, utilized on the project that week.

The 1-800 call services for utility locations do not include TxDOT facilities. Contact the Pharr District Signal Section (956-702-6225) for coordination regarding TxDOT underground lines.

ITEM 2: Instructions to Bidders

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

Hector Siller, P.E., Pharr Area Engineer; Hector.Siller@txdot.gov
Jesus Noriega, P.E., Assist. Area Engineer; Jesus.Noriega@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.

Information found on TxDOT's FTP server will be considered for informational purposes only. Index of /pub/txdot-info/Pre-Letting Responses/Pharr District/21-Pharr District (Construction) (state.tx.us)

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

ITEM 5: Control of the Work

The responsibility for the construction surveying on this contract will be in accordance with Article 5.9.3., "Method C."

Work in this contract is required to be done on railroad property. Cooperate with the railroad companies and comply with all their requirements including obtaining any training they require before performing work on railroad property.

ITEM 6: Control of Materials

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: Legal Relations and Responsibilities

No significant traffic generator events identified.

Roadway or Lane closures during the following key dates and/or special events are prohibited:

- National Holidays
- The day before a National Holiday
- During emergency events such as natural disasters or as directed by the Engineer
- Local Special Event

ITEM 8: Prosecution and Progress

Working days will be computed and charged in accordance with Article 8.3.1.4. Standard Workweek.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

Where road closures or detours around structures are necessary to accomplish proposed work, the removal of existing structures and/or cutting of existing pavement will not be permitted until all precast members for the proposed structure have been cast, tested, and approved for use.

Prepare progress schedules as a Bar Chart.

The State Contractor shall not perform any work operations within the railroad right of way at Location NO.6 (CSJ 0921-02-519), 1ST STREET & CONWAY AVE (SH 107), until the railroad agreements have been executed.

A 90-day delay is included in the contract for Contractor Convenience.

ITEM 416: Drilled Shaft Foundations

Payment for furnishing and installing anchor bolts mounted in drill shafts will be included in the unit price bid for the various diameter drill shafts.

The Contractor shall coordinate with the utility companies to verify utility locations before drilling foundations.

The Contractor shall form, or provide a smooth finish, the portions of drilled shaft that project above the ground line. Place a ¾ inch chamfer on the top edge of each pole foundation. This work will not be paid for directly but will be considered subsidiary to this bid Item.

All drilled shaft foundations will be based on the lengths shown on the plans or those established in writing. Adequate calculations for measurements of foundations have been made in accordance with Article 9.1. of the Standard Specifications. Increases or decreases in the quantities required by change in design will be measured as specified and the revised quantities will be the basis for payment.

In the presence of excess ground water and/or unstable conditions in sub-grade soils prevents excavation to the line and depths indicated on the plans for “Drilled Shaft Foundation”, other proposed methods of foundation installation such as casing, etc. shall be submitted for review and approved by the Engineer.

ITEM 421: Hydraulic Cement Concrete

Provide Sulfate Resistant Concrete for all concrete piling and drilled shafts.

Provide equipment at the batch plant for determining the free moisture and/or absorption of aggregates in accordance with applicable TXDOT Test.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

Provide the following items for concrete batch inspection in accordance with specifications outlined in DMS-10101, “Computer Equipment”:

(1) One Desktop Microcomputer or One Laptop Microcomputer
(2) One Integrated Printer/Scanner/Copier/Fax Unit
(3) Contractor-Furnished Software
(4) Hardware

Submit to the Engineer for approval the project locations for all Portland Cement concrete washout areas prior to starting any concrete work.

Fiber Reinforced Concrete is not permitted.

ITEM 502: Barricades, Signs, and Traffic Handling

Shadow vehicles equipped with Truck-Mounted Attenuators are required for traffic handling. See notes for Item 6185: Truck Mounted Attenuator/Trailer Attenuator, for additional references pertaining to the TMAs.

A pilot car and radio equipped flaggers shall be required for all undivided roadway locations as directed by the Engineer. The pilot car with necessary flaggers and/or radio equipped flaggers and all signs, equipment, labor, and incidentals required for this method of traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

Replace/relocate all regulatory signs removed due to construction operations with the same sign on fixed support(s) immediately upon its removal. First obtain Project Engineer approval before removing any regulatory roadway sign. Required flaggers are to be available to direct traffic during sign intermediate down time.

Relocate any Directional Sign Assemblies removed during construction operations immediately upon their removal.

These signs shall be relocated to a location in accordance with the Latest Version of the “Texas Manual on Uniform Traffic Control Devices”. In no case will a sign be removed without a replacement sign and support(s) being readily available and a location established. Removal and relocation of these signs required for traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

From the beginning to the end of the project, all traffic control devices need to be in acceptable condition as per the Texas Quality Guidelines for Work Zone Traffic Control Devices.

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 "Safety Contingency" is not intended to be used in lieu of bid Items established by the contract.

Remove and dispose of all litter, debris, objectionable material, excess materials that accumulate at the base of all traffic control devices as directed by the Engineer.

ITEM 506: Temporary Erosion, Sedimentation, and Environmental Controls

Due to the nature of this project, it is unlikely a significant amount of soil will be disturbed. However, if erosion control logs are needed; it shall be placed as directed by the Engineer.

Before starting each phase of construction, review with the Engineer the SW3P used for temporary erosion control as outlined on the plans. Before construction, place the temporary erosion and sedimentation control features as shown on the SW3P. Location of Construction Exits are to be approved by the Engineer. After completing earthwork operations, restore and reseed the disturbed areas in accordance with the Department's specifications for permanent or temporary erosion control. Before starting grading operations and during the project duration, place the temporary or permanent erosion control measures to prevent sediment from leaving the right of way.

The Contractor Force Account "Erosion Control Maintenance" that has been established for this project is intended to be utilized for work zone Best Management Practice (BMP) maintenance, to improve the effectiveness of the Environmental Controls that may need maintenance attention and/or require replacement while the project is still under the construction stage. These procedures will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent BMP management reviews on the project. The "Erosion Control Maintenance" is not intended to be used in lieu of bid Items established by the contract.

ITEM 529: Concrete Curb, Gutter, and Combined Curb and Gutter

Before final acceptance of the project, remove discoloration caused by tire marks, mud, asphalt, paint, or other similar material by any method satisfactory to the Engineer to achieve a uniform color and texture of the finished surface exposed to view.

Curb attached to the MBGF thrie-beam transition section will be subsidiary to the MBGF transition.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

ITEM 531: Sidewalks

Construct ¼-inch thick score joints at a maximum 6-foot spacing and expansion joints at a maximum 18 foot spacing. Construct a joint in the center of the sidewalk if it is over 15-feet wide. For steel reinforcement, use 6x6-inch spacing with #3 bars or 6x6 – D6 welded wire fabric.

ITEM 610: Roadway Illumination Assemblies

Luminaires shown on the proposed Traffic Signal installation layout sheets may be shown at an angle for clarity. All luminaires shown shall be installed perpendicular to the main roadway under construction.

In addition to ED (3)-14, each cable for luminaires on traffic signal poles shall be identified in each ground box, pole base, or other accessible location with yellow electrical tape wrapped around the cable. The tape marking shall be at least 2 inches.

All luminaires on traffic signal poles shall be rated for 240 vac. All safety lighting poles shall be serviced for 480 vac.

Luminaires installed on traffic signal poles will not be paid for directly but shall be considered subsidiary to the various bid Items of the project.

ITEM 618: Conduit

All conduit ends in pole bases, controllers and ground boxes shall be plugged with 4 to 6 inches of polyurethane sealant or its equivalent after cables are in place.

Conduit shall be placed in a straight line not to exceed 2.0 feet in any direction. The depth of the conduit shall be 2.0 feet except when crossing a roadway where the depth shall not be more than 3.0 feet nor less than 1.0 foot below the bottom of the base material in the roadway when placed by the jacking or boring method. Any evidence of damage to the roadway during the jacking or boring operation shall be sufficient grounds to stop the method being used.

Conduit runs under paved roadways or driveways shall be bored. At these locations, galvanized rigid metal may be used. All other runs shall be made by trenching. Existing pavement which will be removed, reconstructed, or overlaid with new pavement may be trenched across. Trenches for conduit runs shall be a minimum 2 feet deep and 4 inches wide. The conduit shall be placed on a 2-inch sand cushion and then backfilled with a minimum of 6 inches sand fill. The remainder of the trench shall be backfilled with flexible base, soil or two-sack concrete as required by location of conduit on the project or as directed. The top 3 inches shall match the existing surface material.

All conduit elbows and rigid extensions required to be installed on PVC conduit systems will not be paid for separately but will be considered subsidiary to the various bid Items.

Use materials from prequalified Material Producer List as shown on the Texas Department of Transportation (TxDOT) - Construction Division's (CST) Material Producer List. Category is "Roadway Illumination and Electrical Supplies."

ITEM 620: Electrical Conductors

For Flashing Beacons (Item 685) and Ped poles (Item 687) within the project, provide single-pole breakaway disconnects.

Use Bussman HEBW, Littelfuse LEB, Ferraz-Shawmut FEB, or equal on ungrounded conductors.

For all grounded conductors use Bussman HET, Littelfuse LET, Ferraz-Shawmut FEBN, or equal on ungrounded conductors. For all grounded conductors use Bussman HET, Littelfuse LET, Ferraz Shawmut FEBN, or equal. These breakaway connectors have a white colored marking and a permanently installed solid neutral.

ITEM 621: Tray Cable

Connect luminaires on traffic signal poles using a 4-conductor tray cable with conductor colors of red, black, and green #12 AWG (XHHW). The white (neutral) conductor will not be needed and will be capped.

ITEM 624: Ground Boxes

Construct concrete aprons as shown on the plans and in accordance with Item 432, "Riprap" and Item 440 "Reinforcement for Concrete".

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: Electrical Services

Arrange for and cooperate with the utility company to provide electrical power for the service(s) shown and as required by the plans. A meter will be required on all electrical services.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

ITEMS 636: Signs

Complete sign blanks and panels shall be handled and stored at the job site in such a manner that corners, edges and faces are not damaged. Finished sign blanks shall be stored in either a weatherproof warehouse or outside and off the ground in a vertical position. All paper, cardboard and chemically treated separators and packaging shall be removed prior to outside storage.

ITEM 644: Small Roadside Sign Assemblies

All signs shall be installed as shown in the plans and in accordance with the current edition of the "Texas Manual on Uniform Traffic Control Devices" and the "Sign Crew Field Book" (SCFB).

All signs shall be erected according to the locations shown on the signing layout sheets except that a sign may be shifted in order to secure a more desirable location. All sign locations will be staked as shown in the plans and as approved. It is the intent of the plans to erect all roadside traffic signs with the sign edge a minimum of 6 feet from the edge of the shoulder, or if none, 12 feet from the edge of the travel lane. In curb and gutter sections, the sign edge shall be a minimum of 2 feet from the face of the curb.

For this project, aluminum type sign blanks as provided for under Item 636 will be required for all proposed signing installed under Item 644. Aluminum sign blanks less than 7.5 square feet shall be 0.08-inch-thick, sign blanks 7.5 to 15 square feet shall be 0.100-inch-thick and sign blanks greater than 15 square feet shall be 0.125 inch thick.

All excess excavation shall be spread uniformly inside the right of way as directed and shall be included in the price of these Items.

Sign types which design details are not shown on the plans shall conform with the latest edition of the Department's "Standard Highway Sign Design for Texas" Manual.

Signs shown to be removed shall include the complete sign installation and separate the sign post at the concrete foundation. The concrete foundation shall be disposed in accordance with this bid Item. Except for concrete foundations, all removed sign panels, sign posts, and hardware shall remain then property of the Department. All removed sign installations shall be completely disassembled. All salvageable sections of sign panels shall be recycled by TxDOT. The removed sign material will be required to be hauled to the maintenance yard closest to the project. No signs shall be removed without prior approval.

Existing signs shown to be removed and relocated within this project shall first be identified in the field before they are removed and relocated to their new installation position as determined in the plans. The complete sign assembly shall be removed and the sign with post shall be separated at the concrete foundation. The concrete foundation shall be disposed off in accordance with this bid Item. No sign shall be removed without prior approval.

All excess excavation shall be spread uniformly inside the right of way as directed and shall be included in the price of this Item.

ITEM 656: Foundations for Traffic Control Devices

The dimensions shown on the plans for location of signal pole foundations, conduit and other items may be varied to meet existing conditions as approved.

The work area shall be cleaned up and all loose material resulting from the contract operations shall be removed from the work area each day before work is suspended.

No traffic signal pole shall be placed on the foundations prior to seven (7) days following placement of concrete.

ITEMS 662 and 666: Work Zone Pavement Markings and Retroreflectorized Pavement Markings

All permanent pavement markings for this project under this item shall be 0.100 inches (100 mil) thick thermoplastic.

Any permanent pavement markings or non-removal work zone pavement markings lacking reflectivity in accordance with the requirements of Tex 828-B, or that fail to meet minimum retro reflectivity requirements for longitudinal pavement markings when required, will be addressed per the requirements of the specification. The roadway will be re-striped at no additional compensation.

Before the roadways are overlaid, the location and configuration of all existing pavement markings shall be recorded for use in installing the final permanent pavement marking. All roadways shall be striped as existing, unless otherwise noted in the plans.

The beads used on this project shall meet the requirements of Departmental Materials Specification DMS-8290, Glass Traffic Beads Texas Type II & III. Use a 50% Type II/ 50% Type III mix utilizing a double drop system with Type III beads dropped first.

ITEM 677: Eliminating Existing Pavement Markings and Markers

Asphalt and aggregate types and grades shall be as approved in writing when a surface treatment is used to eliminate existing pavement markings.

Removal method to be approved by Area Engineer.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

ITEM 680: Highway Traffic Signals

The installation of highway traffic signals shall consist of the following principal Items:

1. Furnishing and installing 16-phase full traffic actuated controllers, base mounted cabinets, conflict monitors, load switches and loop amplifiers.
2. Furnishing and installing post mounted flashing beacon controllers and cabinets.
3. Furnishing and installing either, steel strain and/or mast arm poles, electrical service, luminaires, signal heads and cables, pedestrian heads and push buttons with signs that meet the "Americans with Disabilities Act" Standards, galvanized steel span wire, loop detectors, ground boxes, conduit runs and controller foundations.
4. Removal and disposal of existing signal material specified in the plans.
5. All other Items not listed above which are needed to provide for complete traffic signal installations and for proper signal operation as called for in the plans and specifications shall be furnished and installed.

Any deviation of location for proposed signal work shall be as approved.

Signal controller

The signal installations shall be wired in accordance with the phase diagrams in the plans. The proposed base mounted cabinets shall contain 16-phase conflict monitors, which display the "R-Y-G" and "Walk" phases. In addition to detecting phasing conflicts, the Conflict monitors shall also be able to detect multiple signal head indications within every phase. The conflict monitors shall continue to operate in the event of a power supply failure in the timer and shall be able to retain in memory the time and date of the failure detection. Time changes shall be programmable in the field without replacing components or use of external devices. The full-actuated controllers shall meet N.E.M.A. Specifications. The flasher Controllers shall be solid state.

A controller manufacturer's technician shall be required to load initial timing programs into the controllers as called for in the plans. Once the traffic signals are turned on, the same technician shall monitor the signal operation and traffic movement and shall adjust settings for best signal operation. The technician shall provide the State with a certification that the timing plan and coordination has been established according to the plans. This certification shall include a record showing all settings and functions programmed into the timer and any related units.

The controller must be delivered with two sets of wiring diagrams and operating manuals enclosed in a weatherproof bag.

All wiring not covered by the plans and specifications shall be in accordance with the latest edition of the National Electrical Code.

Under this Item, the proposed cabinets shall be base mounted or as shown in the plans.

Existing utilities

The exact location of existing underground utilities shall be verified with the utility companies prior to construction to avoid conflict with or damage to these utilities.

The coordination with the utility companies will be required to make any adjustments, due to utility conflicts, as defined in the specifications or deemed necessary.

Uniformity in equipment

1. All traffic signal controllers furnished shall be by the same manufacturer.
2. All flashing beacon controllers furnished shall be by the same manufacturer.
3. All traffic signal heads, and flashing beacon heads furnished shall be by the same manufacturer.
4. All signal fittings and pipe brackets shall be of an approved metallic material and of the same design and manufacturer.
5. All traffic signal poles furnished shall be by the same manufacturer.
6. All loop detector amplifiers furnished shall be by the same manufacturer and of the same type.

Handling of traffic

Roads and streets shall always be kept open to traffic. The setting of loop detectors shall be arranged so as to close only one lane of a roadway at a time. The installation of signal heads, poles and conduit shall also be arranged so as to permit the continuous movement of traffic in both directions at all times.

All construction operations shall be conducted to provide the least possible interference to traffic as shown on the plans, as provided for in the specifications and/or as directed. All signing, barricading, and handling of traffic shall conform to the current edition of the "Texas Manual on Uniform Traffic Control Devices".

Sequence of work

1. The existing traffic signal installations and/or flashing beacon installations shall always remain in operation during construction of the proposed traffic signal and/or flashing beacon installations or modifications.
2. The complete removal of the specified existing traffic signal and/or flashing beacon installations or specified Items when the proposed traffic signal and/or flashing beacon installations are in place and operational.
3. All labor, tools, and materials used to remove the specified existing traffic signal material shall not be paid for directly but shall be considered subsidiary to the various items of work.
4. Final inspection shall be performed in conjunction with the district signal shop.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

ITEM 682: Vehicle and Pedestrian Signal Heads

All signal heads shall be covered with burlap from the time of installation until the signal is placed in operation. All signal heads shall be of polycarbonate material and yellow in color. Signal heads shall have standard detachable visors. LEDs shall be furnished for all traffic signal heads.

Signal heads shall be positioned carefully to provide the best view of signal indications to motorists. All signal heads shall be installed to a neat overall appearance. Nominal height for signal heads above pavement surface shall be 18 feet 6 inches, plus/minus 3 inches.

Pedestrian signal heads shall be positioned carefully to provide the best view to pedestrians.

ITEM 684: Traffic Signal Cables

All signal cable shall be #12 AWG; 2/c loop. Lead-In shall be #14 AWG shielded and loop wires in pavement.

ITEM 686: Traffic Signal Pole Assemblies (Steel)

The locations for the proposed traffic signal poles are approximate. The exact locations will be determined in the field in coordination with the District Signal Shop.

Erection and/or removal of poles and luminaries located near any overhead electrical power lines shall be accomplished using established industry and utility safety practices. The appropriate utility company shall be consulted with prior to beginning such work.

ITEM 688: Pedestrian Detectors and Vehicle Loop Detectors

The Contractor shall install loop vehicle detectors in accordance with the Intersection layouts in the plans or as directed. Each loop detector Lead-In cable shall be tagged inside the controller cabinet with its loop number. The loop amplifiers shall indicate the loop and phase of control or direction of control. Loop wires in street shall be #14 AWG. Pedestrian detectors shall meet the minimum requirements called for by the "Americans with Disabilities Act".

Loop detector lead-in cable shall be continuous from ground box to the controller.

Splices for loop wire will be permitted only at ground boxes or pole base with approved weatherproof splice kits.

A minimum length of 2.0 feet for each cable shall be left in each ground box.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

ITEM 6185: Truck Mounted Attenuator/Trailer Attenuator

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for the project, provide 1 additional shadow vehicle(s) with TMA as per as per TCP (2-1) -18 as detailed on General Note 5 of this standard sheet;
or as per TCP (2-2) -18 as detailed on General Note 7 of this standard sheet;
or as per TCP (2-3) -23 as detailed on General Note 8 of this standard sheet.
or as per TCP (2-4) -18 as detailed on General Note 6 of this standard sheet;
or as per TCP (2-5) -18 as detailed on General Note 4 of this standard sheet.

Therefore, 2 total shadow vehicles with TMA will be required on this project for the type of work as shown on the plans. The Contractor will be responsible for determining if one or more of his construction operations will be ongoing at the same time and thus determine the total number of TMAs needed for the project.

Project Number:

County: Hidalgo **Control:** 0921-02-501, Etc.

Highway: Mile 2 Rd., Etc.

SUMMARY OF QUANTITIES

ITEM	CODE	SP	DESCRIPTION	UNIT	1 MILE 2 AT TROSPER RD CSJ:0921-02-501		2 MILE 2 AT STEWART RD CSJ:0921-02-502		3 MILE 2 AT GLASSCOCK RD CSJ:0921-02-503		4 MILE 2 AT BRYAN RD CSJ:0921-02-517		5 FM 495 AT LOS EBANOS RD CSJ:0921-02-518		6 CONWAY AVE AT 1ST ST CSJ:0921-02-519		SHEET TOTALS
					EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	
104	6015		REMOVING CONC (SIDEWALKS)	SY	62		119		52								233
104	6022		REMOVING CONC (CURB AND GUTTER)	LF	54												54
416	6031		DRILL SHAFT (TRF SIG POLE)(30 IN)	LF	24		12		24								60
416	6032		DRILL SHAFT (TRF SIG POLE)(36 IN)	LF	28		36		28								92
500	6001		MOBILIZATION	LS	25.2		26.7		24.9		7		7.9		8.3		100
502	6001		BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.5		1.5		1.5		1.5		1.5		1.5		9
506	6041		BIODEG EROSN CONT LOGS (INSTL)(12")	LF	116		148				100		16		32		412
506	6043		BIODEG EROSN CONT LOGS (REMOVE)	LF	116		148				100		16		32		412
529	6029		CONC CURB & GUTTER (TY A)	LF	75												75
531	6001		CONC SIDEWALK (4")	SY	15		34		6								55
531	6004		CURB RAMPS (TY 1)	EA			1										1
531	6005		CURB RAMPS (TY 2)	EA			4										4
531	6008		CURB RAMPS (TY 5)	EA	3		3		4								10
618	6029		CONDT (PVC) (SCH 40) (3")	LF	56		128		117								301
618	6030		CONDT (PVC) (SCH 40) (3") (BORE)	LF	139		173		119								431
618	6033		CONDT (PVC) (SCH 40) (4")	LF	14		27		21								62
618	6034		CONDT (PVC) (SCH 40) (4") (BORE)	LF	80		63		75								218
620	6009		ELEC CONDR (NO. 6) BARE	LF	541		764		657		400		358		315		3035
620	6010		ELEC CONDR (NO.6) INSULATED	LF	41		39		41		65		39		33		258
621	6005		TRAY CABLE (4 CONDR) (12 AWG)	LF	462		494		442								1398
624	6002		GROUND BOX TY A (122311) W/APRON	EA	3		4		3								10
624	6010		GROUND BOX TY D (162922) W/APRON	EA	2		1		2								5
628	6002		REMOVE ELECTRICAL SERVICES	EA	1		1		1								3
628	6301		ELEC SRVC TY T 120/240 000 (NS) GS (L) TS (0)	EA	1		1		1								3
**	**		5/8 IN X 8 FT COPPER CLAD GROUND ROD	EA	1		1		1								3
636	6001		ALUMINUM SIGNS (TY A)	SF	7.5		7.5		7.5								22.5
644	6027		IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	1										2		3
644	6030		IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	5		4		4						1		14
644	6076		REMOVE SM RD SN SUP&AM	EA	4		4		4								12
666	6030		REFL PAV MRK TY I (W)8"(DOT) (100MIL)	LF	90										42		132
666	6036		REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	280		1760		1780		170		320		476		1246
666	6225		PAVEMENT SEALER 6"	LF	2950		1760		1780		1929		2360		2342		13121
666	6226		PAVEMENT SEALER 8"	LF	370						170		320		518		1378
666	6230		PAVEMENT SEALER 24"	LF	377		300		343		310		447		492		2269
666	6231		PAVEMENT SEALER (ARROW)	EA	3						2		4		4		13
666	6232		PAVEMENT SEALER (WORD)	EA	3						2		4		4		13
666	6242		PAVEMENT SEALER (RR XING)	EA											4		4
666	6306		RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	380		160		180		160		190		170		1240
666	6309		RE PM W/RET REQ TY I (W)6"(SLD)(100MI	LF	140						169		570				879
666	6321		RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	2430		1600		1600		1600		1600		2172		11002
668	6076		PREFAB PAV MRK TY C (W)(24")(SLD)	LF	377		300		343		310		447		492		2269
668	6077		PREFAB PAV MRK TY C (W)(ARROW)	EA	3						2		4		4		13
668	6085		PREFAB PAV MRK TY C (W)(WORD)	EA	3						2		4		4		13
668	6089		PREFAB PAV MRK TY C (W)(RR XING)	EA											4		4
672	6007		REFL PAV MRKR TY I-C	EA	34		8		8		18		31		44		143
672	6009		REFL PAV MRKR TY II-A-A	EA	124		70		80		68		80		112		534
677	6001		ELIM EXT PAV MRK & MRKS (4")	LF	2481		1476		1664		1660		2434		1800		11515
677	6003		ELIM EXT PAV MRK & MRKS (8")	LF	175						162		276		500		1113
677	6005		ELIM EXT PAV MRK & MRKS (12")	LF	469		358		415		335		472				2049
677	6007		ELIM EXT PAV MRK & MRKS (24")	LF	102		85		91		98		138		406		920
677	6008		ELIM EXT PAV MRK & MRKS (ARROW)	EA	2						2		7		6		17
677	6009		ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA									2				2
677	6012		ELIM EXT PAV MRK & MRKS (WORD)	EA	1						2		4		4		11
677	6016		ELIM EXT PAV MRK & MRKS (RR XING)	EA											2		2
678	6002		PAV SURF PREP FOR MRK (6")	LF	2950		1760		1780		1929		2360		2342		13121
678	6004		PAV SURF PREP FOR MRK (8")	LF	370						170		320		518		1378
678	6008		PAV SURF PREP FOR MRK (24")	LF	377		300		343		310		447		492		2269
678	6009		PAV SURF PREP FOR MRK (ARROW)	EA	3						2		4		4		13
678	6016		PAV SURF PREP FOR MRK (WORD)	EA	3						2		4		4		13
678	6020		PAV SURF PREP FOR MRK (RR XING)	EA											4		4
680	6002		INSTALL HWY TRF SIG (ISOLATED)	EA	1		1		1								3
680	6004		REMOVING TRAFFIC SIGNALS	EA	1		1		1								3
680	6011		INSTALL HWY TRF SIG (UPGRADE)	EA							1		1		1		3
***	***		ALUMINUM SIGNS (TY O)	SF	48.25		54.5		59		12.5		25		12.5		211.75
***	***		REMOVAL OF CONTROL CABINET(GRND MNT)	EA													0
***	***		INSTALL OF CONTROL CABINET(GRND MNT)	EA	1		1		1								3
682	6001		VEH SIG SEC (12")LED(GRN)	EA	8		8		8		2		2		2		30
682	6002		VEH SIG SEC (12")LED(GRN ARW)	EA	2		2		2		2		4		2		14
682	6003		VEH SIG SEC (12")LED(YEL)	EA	8		8		8		2		2		2		30
682	6004		VEH SIG SEC (12")LED(YEL ARW)	EA	4		4		4		4		8		4		28
682	6005		VEH SIG SEC (12")LED(RED)	EA	8		8		8		2		2		2		30

** QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY. THIS ITEM(S) IS A SUBSIDIARY TO ITEM 628.

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TEDSI INFRASTRUCTURE GROUP
TEDSI
TBPE F-1640
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
SUMMARY OF QUANTITIES

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		17
TR:					
CK TR:					

CONT. SUMMARY OF QUANTITIES

ITEM	CODE	SP	DESCRIPTION	UNIT	1 MILE 2 AT TROSPER RD CSJ:0921-02-501		2 MILE 2 AT STEWART RD CSJ:0921-02-502		3 MILE 2 AT GLASSCOCK RD CSJ:0921-02-503		4 MILE 2 AT BRYAN RD CSJ:0921-02-517		5 FM 495 AT LOS EBANOS RD CSJ:0921-02-518		6 CONWAY AVE AT 1ST ST CSJ:0921-02-519		SHEET TOTALS
					EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	
682	6006		VEH SIG SEC (12")LED(RED ARW)	EA	2		2		2		2		4		2		14
682	6018		PED SIG SEC (LED)(COUNTDOWN)	EA	8		8		8								24
682	6049		BACKPLATE W/REFL BRDR(4 SEC)	EA	2		2		2		2		4		4		16
682	6060		BACKPLATE W/REFL BRDR(3 SEC)	EA	8		8		8		8		8		8		48
684	6007		TRF SIG CBL (TY A)(12 AWG)(2 CONDR)	LF	912		979		842								2733
684	6010		TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	1088		1186		1037		342		249		230		4132
684	6012		TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	1115		1326		1106		358		481		252		4638
686	6027		INS TRF SIG PL AM(S)1ARM(24')LUM	EA	1				2								3
686	6031		INS TRF SIG PL AM(S)1ARM(28')LUM	EA			1										1
686	6033		INS TRF SIG PL AM(S)1ARM(32')	EA	1												1
686	6037		INS TRF SIG PL AM(S)1ARM(36')	EA	1				1								2
686	6039		INS TRF SIG PL AM(S)1ARM(36')LUM	EA	1												1
686	6041		INS TRF SIG PL AM(S)1ARM(40')	EA					1								1
686	6045		INS TRF SIG PL AM(S)1ARM(44')	EA			1										1
686	6047		INS TRF SIG PL AM(S)1ARM(44')LUM	EA			1										1
686	6049		INS TRF SIG PL AM(S)1ARM(48')	EA			1										1
687	6001		PED POLE ASSEMBLY	EA	2		7		6								15
688	6001		PED DETECT PUSH BUTTON (APS)	EA	8		8		8								24
688	6003		PED DETECTOR CONTROLLER UNIT	EA	8		8		8								a
6001	6002		PORTABLE CHANGEABLE MESSAGE SIGN	EA	2		2		2		2		2		2		12
6185	6002		TMA (STATIONARY)	DAY	40		47		36		40		45		46		254
6185	6005		TMA (MOBILE OPERATION)	DAY	2		2		2		2		3		3		14
6306	6001		VIVDS PROSR SYS	EA	1		1		1		1		1		1		6
6306	6004		VIVDS CAM ASSY 360	EA	1		1		1		1		1		1		6
6306	6005		VIVDS CNTRL SOFTWARE	EA	1		1		1		1		1		1		6
6306	6007		VIVDS CABLING	LF	41		39		41		65		39		35		260

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TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
SUMMARY OF QUANTITIES

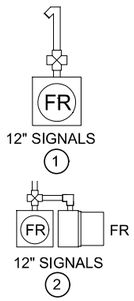
SHEET 2 OF 2

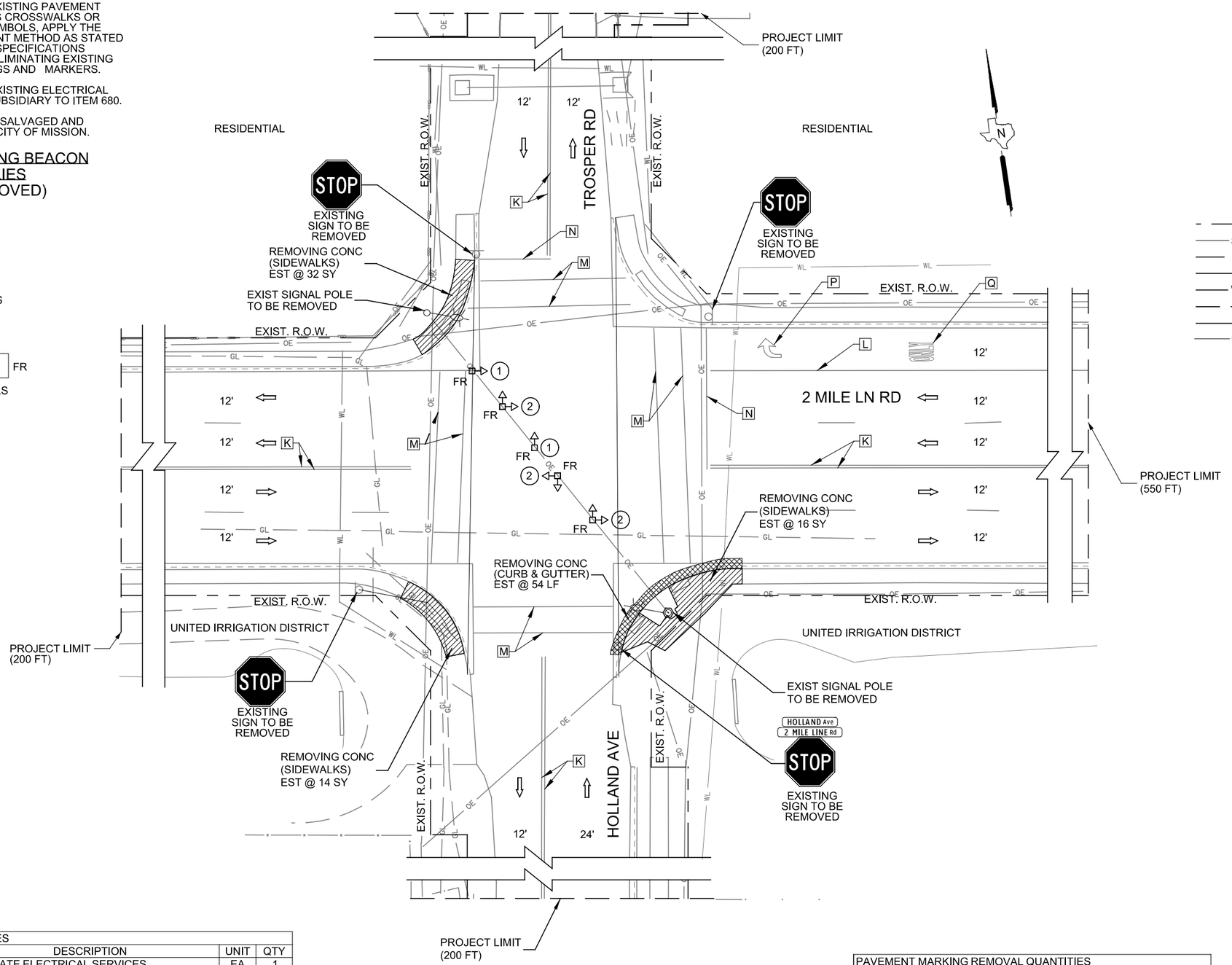
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		18
TR:					
CK TR:					

NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. MATERIALS WILL BE SALVAGED AND RETURNED TO THE CITY OF MISSION.

EXISTING FLASHING BEACON ASSEMBLIES (TO BE REMOVED)





LEGEND

- EXISTING SIGNAL POLE
- EXISTING SPAN WIRE
- EXISTING MAST ARM
- EXISTING HORIZONTAL SIGNAL HEAD
- EXISTING PEDESTRIAN HEAD
- EXISTING CONTROLLER CABINET
- EXISTING GROUND BOX
- EXISTING ELECTRICAL SERVICE
- EXISTING VIVDS CAMERA
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING CONDUIT (BORE)
- EXISTING CONDUIT (TRENCH)
- UT — UNDERGROUND TELEPHONE LINE
- SDB — STORM DRAIN BOX
- FOC — FIBER OPTIC CABLE
- WL — WATER LINE
- WWL — WASTE WATER LINE
- GL — GAS LINE
- UE — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- EXISTING GROUND SIGN

REMOVAL QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
628	6001	RELOCATE ELECTRICAL SERVICES	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	4
680	6004	REMOVING TRAFFIC SIGNAL	EA	1

CONCRETE REMOVAL QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
104	6015	REMOVING CONC (SIDEWALKS)	SY	62
104	6022	REMOVING CONC (CURB AND GUTTER)	LF	54

	PAVEMENT MARKING REMOVAL QUANTITIES				
	ITEM	CODE	DESCRIPTION	UNIT	QTY
K	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	2481
L	677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	740
M	677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	469
N	677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	102
P	677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2
Q	677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	1

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
TBPE F-1640
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT TROSPER RD EXISTING CONDITIONS LAYOUT

1

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		19
TR:					
CK TR:					

DATE: 6/6/2024 2:48:00 PM
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NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW FULL TRAFFIC ACTUATED FLASHING YELLOW ARROW (FYA) CAPABLE CONTROLLER UNIT COMPATIBLE WITH ATMS.COM, W/NEW CABINET & FOUNDATION, LED SIGNAL/PEDESTRIAN HEADS, SIGNAL CABLE, GROUND BOXES, CONDUIT RUNS AND RADAR DETECTORS AS SHOWN.

2. CONTACT MAURICIO DIAZ (956-702-6227) TWO WEEKS IN ADVANCE TO SCHEDULE THE FYA CONVERSION FOR EACH INTERSECTION. PLAN ONE CONVERSION A DAY.

3. THE LOCATION FOR THE CONTROLLER, TRAFFIC SIGNAL POLES AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE TxDOT/CITY OF MISSION.

4. ALL SIGNAL CABLE SHALL BE #12 AWG AND IMSA APPROVED. LUMINAIRE WIRE SHALL BE 4/C-#12 TRAY CABLE. SERVICE WIRE SHALL BE #6 AWG XHHW, VIVDS CABLES AS PER MANUFACTURER.

5. THE OPEN TRENCH METHOD FOR PLACING CONDUIT UNDER PAVEMENT WILL NOT BE ALLOWED.

6. CONTRACTOR SHALL EXTEND SDWK TO SIGNAL/PEDESTRIAN FOUNDATIONS.

7. ALL TRAFFIC SIGNAL HEADS SHALL HAVE NEW REFLECTIVE BACKPLATES.

8. THE CONTRACTOR SHALL REFER TO THE SIGNING AND PAVEMENT MARKING LAYOUTS FOR EXACT LOCATION OF PROPOSED PAVEMENT MARKINGS.

9. CONDUCTOR/CONDUIT QUANTITIES INCLUDE HORIZONTAL/VERTICAL MEASUREMENTS FOR SPAN WIRE, SIGNAL POLES, SIGNAL HEADS, PED HEADS, VIVDS, ELECTRICAL SERVICE, GROUND BOXES AND LUMINAIRES.

10. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.

11. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

12. PEDESTRIAN POLES/HEADS/PUSH BUTTON (PB) REQUIREMENTS:

    PB CONTROLS SHALL COMPLY WITH THE AMERICAN WITH DISABILITIES ACT AND THE TEXAS ACCESSIBILITY STANDARDS REQUIREMENTS.

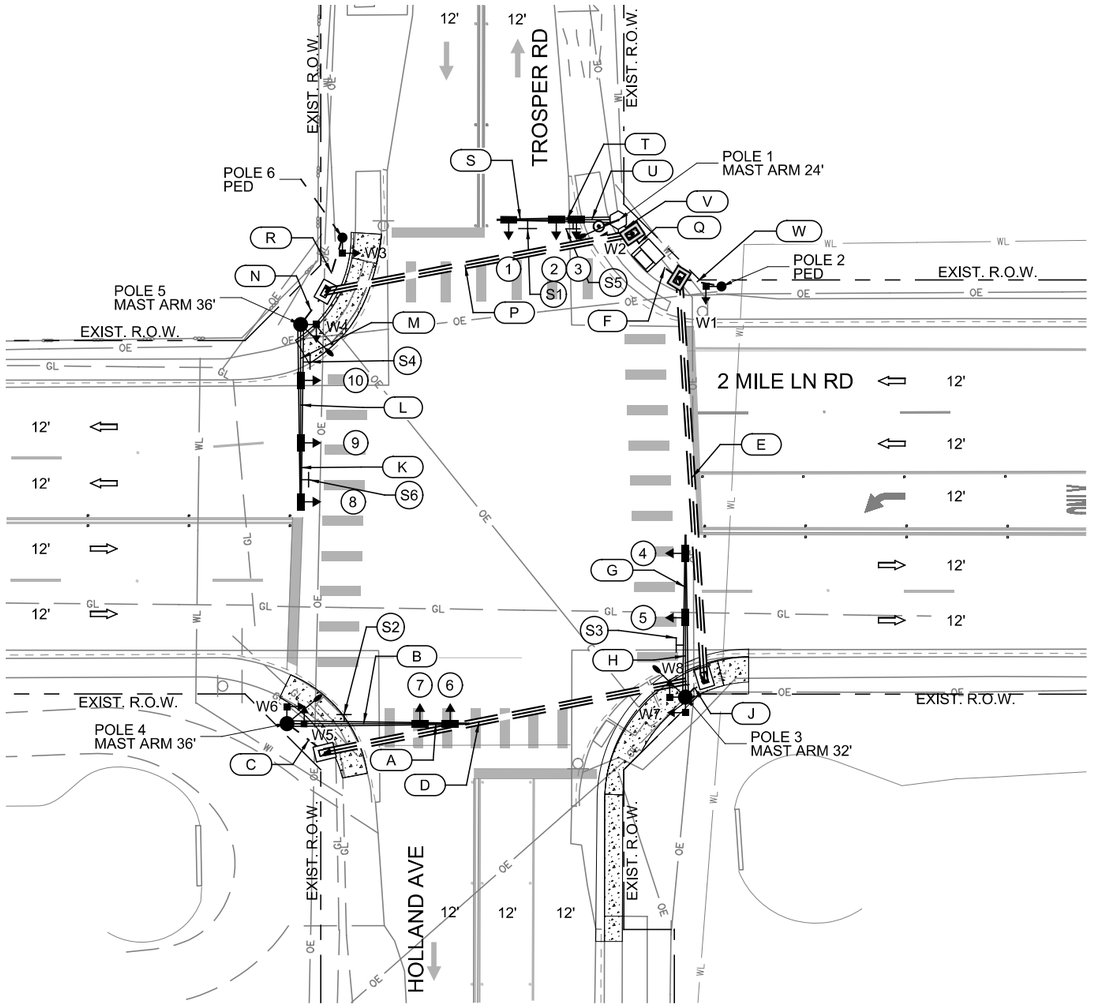
    PEDESTRIAN SIGNAL HEADS SHALL BE IN LINE WITH PROPOSED CROSSWALKS.

    PEDESTRIAN POLES SHALL BE 1.5' MIN / 6' MAX FROM THE FACE OF CURB, EDGE OF PAVEMENT OR SHOULDER. WHERE IMPRACTICAL, USE 10' MAX.

    THE PEDESTRIAN POLE SHALL NOT BE INSIDE ANY OF THE DOWNWARD SIDES OF THE RAMP.

    BETWEEN THE EDGE OF CROSSWALK (EXTENDED TO THE FACE OF THE CURB / EDGE OF PAVEMENT) FARTHEST FROM THE INTERSECTION AND THE EDGE OF THE RAMP BUT NO GREATER THAN 5' FROM THE CROSSWALK LINE.

    THE CLEARANCE BETWEEN PEDESTRIAN POLES/PB IN THE SAME CORNER, SHALL BE 10' MIN.



LEGEND

- MAST ARM POLE
- STRAIN POLE
- PEDESTAL POLE
- SPAN WIRE
- HORIZONTAL SIGNAL HEAD
- SIGNAL HEAD BACKPLATE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING GROUND MOUNTED CABINET
- EXISTING GROUND BOX
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- PEDESTRIAN SIGNAL HEAD W/AUDIBLE PEDESTRIAN SIGNAL
- VIVDS CAMERA (ADVANCED/PRESENCE)
- GROUND MOUNTED CONTROLLER CABINET
- POLE MOUNTED ELECTRICAL SERVICE W/METER
- GROUND BOX (TYPE A) W/APRON
- GROUND BOX (TYPE D) W/APRON
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- LUMINAIRE
- OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
MILE 2 AT TROSPER RD
PROPOSED SIGNAL LAYOUTS

1

SHEET 1 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		20
TR:					
CK TR:					

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ELECTRICAL SCHEDULE

ITEM	TOTAL QTY	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	CABLE IN POLE PED	CABLE IN POLE MAST ARM
		RUN LENGTH	6	27	10	77	80	8	13	16	6	12	13	12	9	62	6	12	10	4	9	10	9	17	25
POWER	41	1/C - #6 INSULATED															1					1			1
LUMINAIRE	462	4/C - #12 TRAY CABLE			1	1	2	2			1				1	1	2					1			4
GROUND	541	1/C - #6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	2	4
PEDESTRIAN HEADS	912	2/C - #12			2	2	4	5			2				1	2	3	1				1	1	2	6
	912	7/C - #12			2	2	4	5			2				1	2	3	1				1	1	2	6
SIGNAL HEADS	1088	5/C - #12	1	2	2	2	4	4	1	2	2		1	2	2	2	4			1	2	2			8
	203	7/C - #12										1	1	1	1	1	2		1	1	1	1			2
VIVDS	41	VIVDS CABLING															1					1			1
CONDUITS	56	3" PVC			1						1				1			1				1	1		
	14	4" PVC						1									1								
	139	3" PVC BORE				1										1									
	80	4" PVC BORE					1																		

SIGNAL POLE CHART

POLE NUMBER	1				2	3				4				5				6
MAST ARM LENGTH	24				PED	32				36				36				PED
FOUNDATION TYPE	30-A				24-A	30-A				36-A				36-A				24-A
WITH LUMINARES	NO				NO	YES				NO				YES				NO
WITH SIGNS	TROSPER RD R10-17T R10-3eL				R10-3eR	2 MILE LN (2) R10-3eL				TROSPER RD R10-17T R10-3eR R10-3eL				2 MILE LINE R10-17T R10-3eL				R10-3eR
SIZE OF LENS	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
SIGNAL HEAD NO.	1	2	3	W2	W1	4	5	W7	W8	6	7	W5	W6	8	9	10	W4	W3
12" LED SIGNAL INDICATIONS	←R	R	R	DW	DW	R	R	DW	DW	R	R	DW	DW	←R	R	R	DW	DW
	←SY	Y	Y	W	W	Y	Y	W	W	Y	Y	W	W	←SY	Y	Y	W	W
	←FY	G	G			G	G			G	G			←FY	G	G		
	←G													←G				

MINIMUM PEDESTRAIN TIMING

PED PHASE	SIGNAL HEAD NUMBERS	LENGTH OF ROADWAY CURB TO CURB	FEET/SECOND	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
Ø2	W1 & W8	73	3.5	7	21	28
Ø4	W6 & W7	48	3.5	7	14	21
Ø6	W4 & W5	74	3.5	7	22	29
Ø8	W2 & W3	47	3.5	7	14	21

VIVDS DETECTOR SCHEDULE

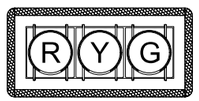
SENSOR	SETTING	SPLIT PHASE INTERSECTION
VIVDS 1	PRESENCE	PH 1- 8

TIMING CHART

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
STREET	TROSPER		2 MILE LN		TROSPER		2 MILE LN	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN	NOT IN USE	22.5	9.5	37.5	9.5	22.5	NOT IN USE	37.5
EXTENSION		3	3	3	3	3		3
MAX GREEN		32.9	9.6	37.5	9.5	23.4		47.1
YELLOW		3.5	3.5	3.5	3.5	3.5		3.5
ALL RED		1	1	1	1	1		1
WALK		3.5	-	3.5	-	3.5		3.5
DON'T WALK		28	-	21	-	29		21
RECALL		NONE	NONE	NONE	NONE	NONE		NONE

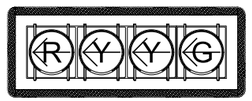
SIGNAL HEAD ARRANGEMENT

PROPOSED 12" HORIZONTAL



LED SIGNAL NO. 2, 3, 4, 5, 6, 7, 9, 10
WITH REFELECTIVE BACKPLATES

PROPOSED 12" HORIZONTAL



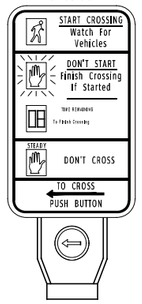
SY FY

LED SIGNAL NO. 1, 8
WITH REFELECTIVE BACKPLATES

SY = SOLID YELLOW
FY = FLASHING YELLOW

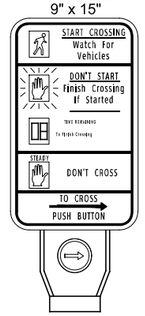
PEDESTRIAN ELEMENTS

PROPOSED 9" x 15"



PUSH BUTTON
W/R10-3eL
(9"X15")
W2, W4, W6, W7, W8

PROPOSED 9" x 15"



PUSH BUTTON
W/R10-3eR
(9"X15")
W1, W3, W5

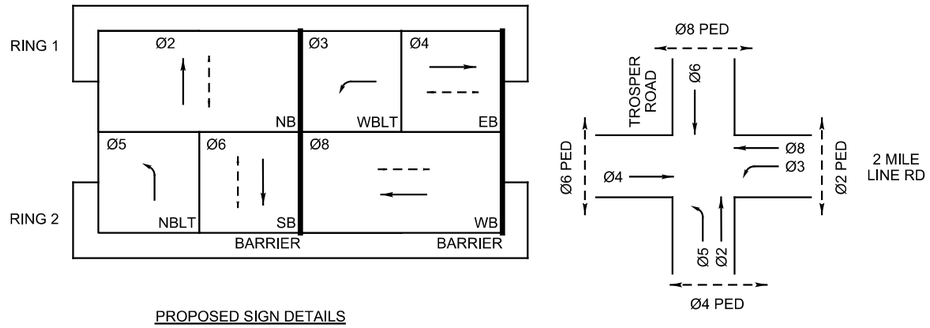
PROPOSED 18" x 16"

PEDESTRIAN
SIGNALS HEADS
W1 THRU W8

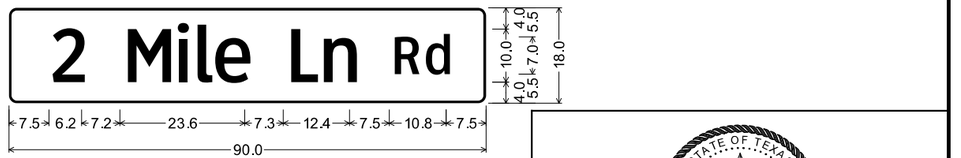
ELECTRICAL SERVICE DETAILS

ELECTRICAL SERVICE NO.	ELECTRICAL SERVICE DESCRIPTION (SEE ED(4) AND ED(5)-03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAINCIRCUIT BREAKER POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD./ LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT BREAKER POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
1	ELEC SERV TY T (120/240)000(NS)GS(L)TS(0)	1 1/2"	3/#6	N/A	70	30	100	1 2	1P/50 1P/15	30 4.5	<4.8

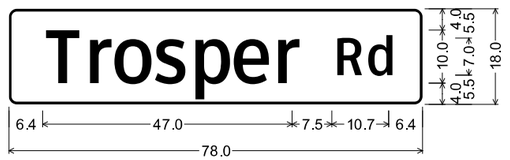
PHASING DIAGRAM



PROPOSED SIGN DETAILS



D3-1G; 90"X18"
1.5" Radius, 0.5" Border, White on Green;
"2 Mile Ln", ClearviewHwy-3-W 50% spacing;
"Rd", ClearviewHwy-3-W;
S1 S2



D3-1G; 78"X18"
1.5" Radius, 0.5" Border, White on Green;
"Trosper", ClearviewHwy-3-W 50% spacing;
"Rd", ClearviewHwy-3-W;
S3 S4

R10-17T; 30"X30"
S5 S6

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

Martina Mejia
AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
TEDSI
TBPE F-1640
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898

CITY OF MISSION

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Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT TROSPER RD PROPOSED SIGNAL LAYOUTS

1

SHEET 2 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		21
TR:					
CK TR:					

DATE: 6/6/2024 2:48:03 PM
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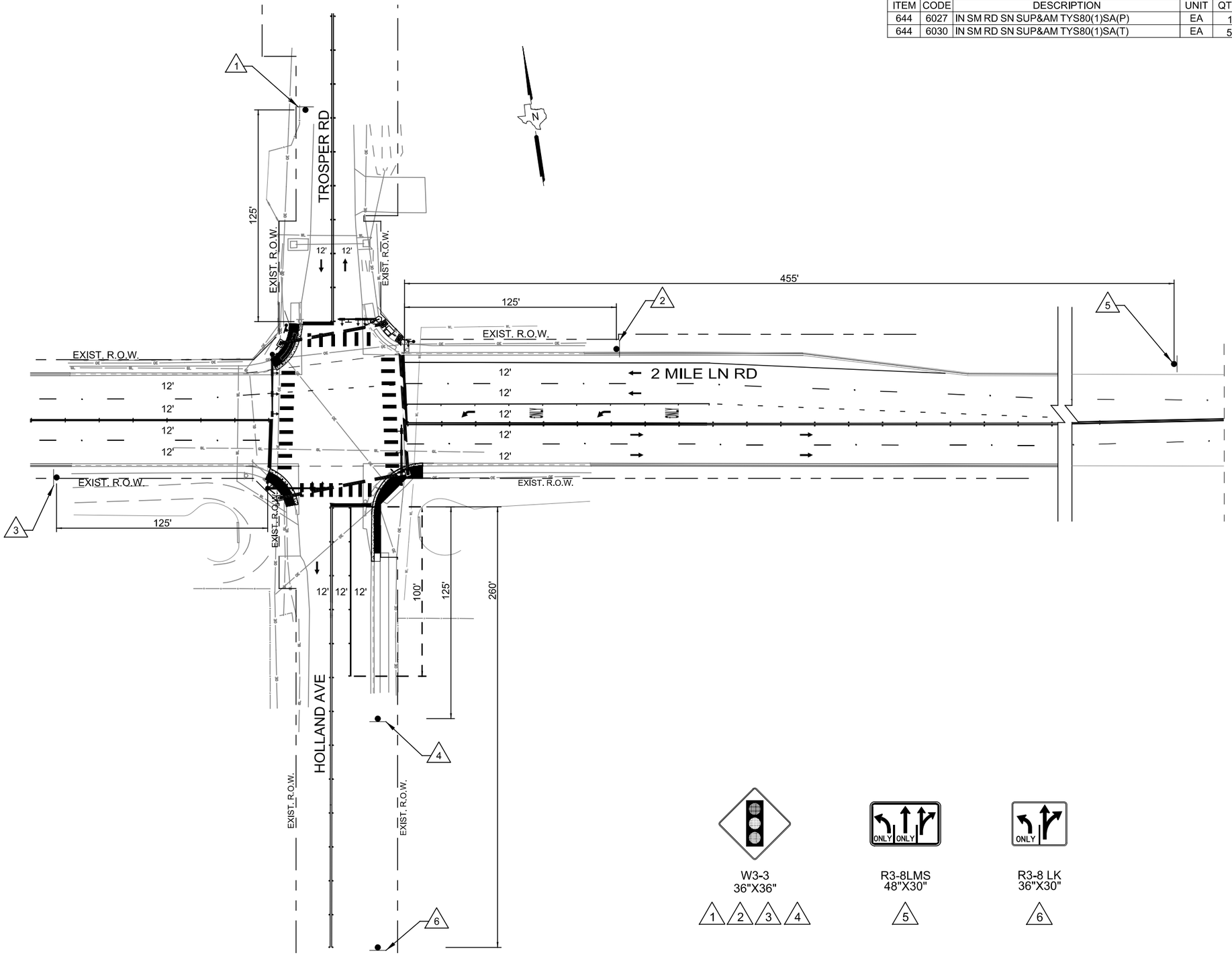
SIGN QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
644	6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	1
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	5

SMALL ROADSIDE ASSEMBLIES (ITEM 644)

SMALL ROADSIDE SIGN (GROUND)

PROPOSED SIGN



W3-3
36"X36"

1 2 3 4

R3-8LMS
48"X30"

5

R3-8 LK
36"X30"

6

0 60 120

SCALE 1" = 60'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

CITY OF MISSION
SIGNAL IMPROVEMENTS
MILE 2 AT TROSPER RD
(1) SIGNING LAYOUT

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		22
TR:					
CK TR:					

DATE: 6/6/2024 2:48:04 PM
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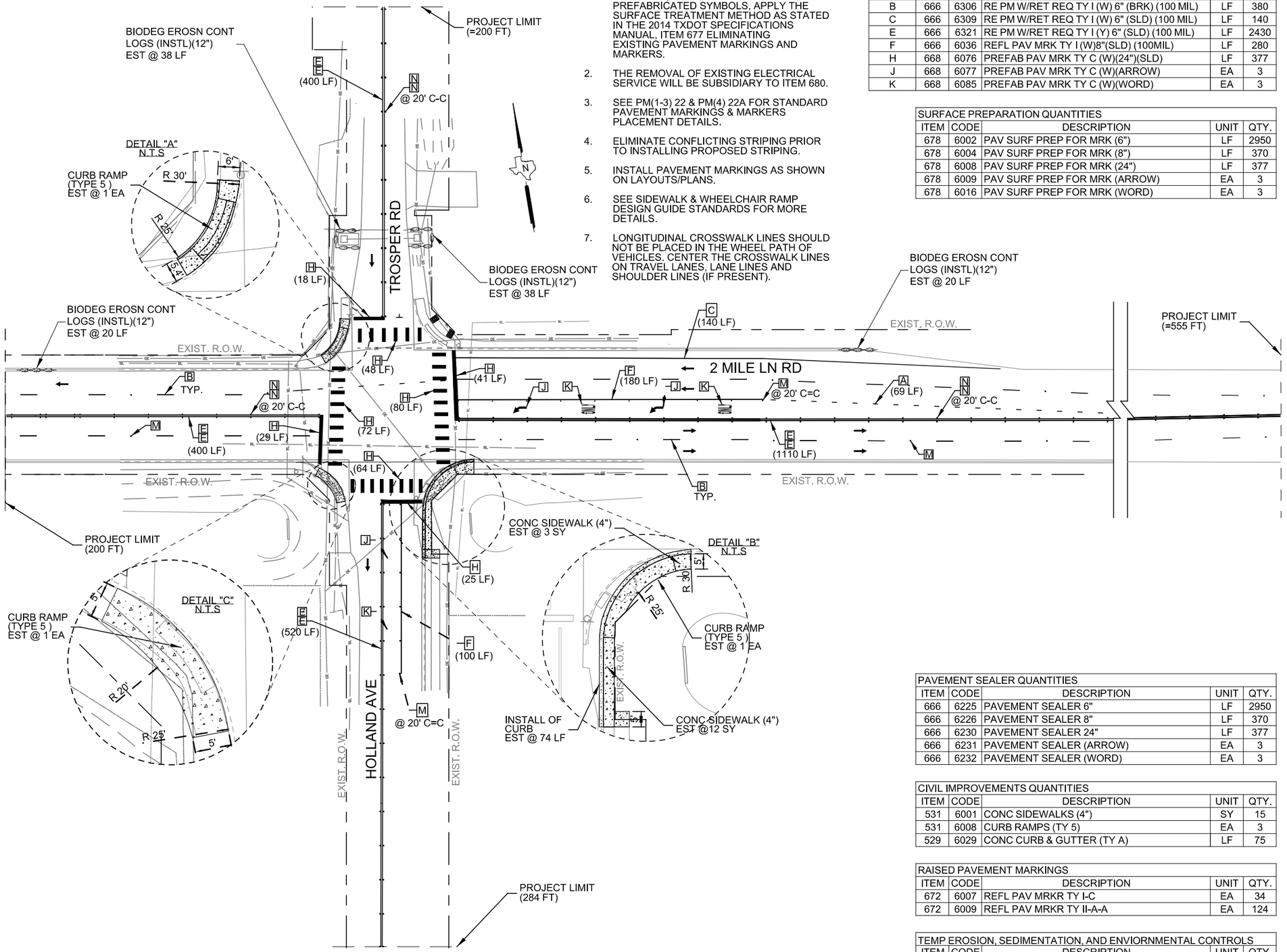

NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. SEE PM(1-3) 22 & PM(4) 22A FOR STANDARD PAVEMENT MARKINGS & MARKERS PLACEMENT DETAILS.
4. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
5. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
6. SEE SIDEWALK & WHEELCHAIR RAMP DESIGN GUIDE STANDARDS FOR MORE DETAILS.
7. 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).

PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
A	666	6030	REFL PAV MRK TY I (W)8"(DOT) (100MIL)	LF	90
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	380
C	666	6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL)	LF	140
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	2430
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	280
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	377
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	3
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	3

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	2950
678	6004	PAV SURF PREP FOR MRK (8")	LF	370
678	6008	PAV SURF PREP FOR MRK (24")	LF	377
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	3
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	3

PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

- A 6" WHITE DOT
- B 6" WHITE BROKEN
- C 6" WHITE SOLID
- D 6" YELLOW BROKEN
- E 6" YELLOW SOLID
- F 8" WHITE SOLID
- G 12" YELLOW SOLID
- H 24" WHITE SOLID
- I WHITE DBL ARROW
- J WHITE ARROW
- K WHITE WORD
- L WHITE RR XING
- TRAFFIC FLOW
- C-C CENTER TO CENTER
- STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M TYPE I-C
- N TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 60 120

SCALE 1" = 60'

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	2950
666	6226	PAVEMENT SEALER 8"	LF	370
666	6230	PAVEMENT SEALER 24"	LF	377
666	6231	PAVEMENT SEALER (ARROW)	EA	3
666	6232	PAVEMENT SEALER (WORD)	EA	3

CIVIL IMPROVEMENTS QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
531	6001	CONC SIDEWALKS (4")	SY	15
531	6008	CURB RAMPS (TY 5)	EA	3
529	6029	CONC CURB & GUTTER (TY A)	LF	75

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	34
672	6009	REFL PAV MRKR TY II-A-A	EA	124

TEMP EROSION, SEDIMENTATION, AND ENVIORNMENTAL CONTROLS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
506	6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	116
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	116

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

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TEDSI
TBPE F-1640
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT TROSPER RD PAVEMENT MARKINGS LAYOUT

1

SHEET 1 OF 1

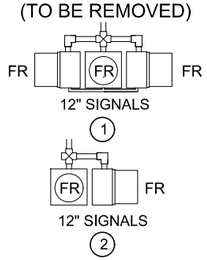
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		23
TR:					
CK TR:					

DATE: 6/6/2024 2:48:07 PM
FILE: c:\pw-tedsi-connect\d0108941\1. MILE2 AT TROSPER P PAV MRK LAYOUT.dgn

NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. MATERIALS WILL BE SALVAGED AND RETURNED TO THE CITY OF MISSION.

EXISTING FLASHING BEACON ASSEMBLIES (TO BE REMOVED)



LEGEND

- EXISTING SIGNAL POLE
- EXISTING SPAN WIRE
- EXISTING MAST ARM
- EXISTING HORIZONTAL SIGNAL HEAD
- EXISTING PEDESTRIAN HEAD
- EXISTING CONTROLLER CABINET
- EXISTING GROUND BOX
- EXISTING ELECTRICAL SERVICE
- EXISTING VIVDS CAMERA
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING CONDUIT (BORE)
- EXISTING CONDUIT (TRENCH)
- UT — UNDERGROUND TELEPHONE LINE
- SDB — STORM DRAIN BOX
- FOC — FIBER OPTIC CABLE
- WL — WATER LINE
- WWL — WASTE WATER LINE
- GL — GAS LINE
- UE — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- EXISTING GROUND SIGN

0 30 60
SCALE 1" = 30'

REMOVAL QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
628	6001	RELOCATE ELECTRICAL SERVICES	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	4
680	6004	REMOVING TRAFFIC SIGNAL	EA	1

CONCRETE REMOVAL QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
104	6015	REMOVING CONC (SIDEWALKS)	SY	119

	PAVEMENT MARKING REMOVAL QUANTITIES				
	ITEM	CODE	DESCRIPTION	UNIT	QTY
K	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1524
M	677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	358
N	677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	85

MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT STEWART RD EXISTING CONDITIONS LAYOUT

2

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		24
TR:					
CK TR:					

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NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW FULL TRAFFIC ACTUATED FLASHING YELLOW ARROW (FYA) CAPABLE CONTROLLER UNIT COMPATIBLE WITH ATMS.COM, W/NEW CABINET & FOUNDATION, LED SIGNAL/PEDESTRIAN HEADS, SIGNAL CABLE, GROUND BOXES, CONDUIT RUNS AND RADAR DETECTORS AS SHOWN.

2. CONTACT MAURICIO DIAZ (956-702-6227) TWO WEEKS IN ADVANCE TO SCHEDULE THE FYA CONVERSION FOR EACH INTERSECTION. PLAN ONE CONVERSION A DAY.

3. THE LOCATION FOR THE CONTROLLER, TRAFFIC SIGNAL POLES AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE TxDOT/CITY OF MISSION.

4. ALL SIGNAL CABLE SHALL BE #12 AWG AND IMSA APPROVED. LUMINAIRE WIRE SHALL BE 4/C-#12 TRAY CABLE. SERVICE WIRE SHALL BE #6 AWG XHHW, VIVDS CABLES AS PER MANUFACTURER.

5. THE OPEN TRENCH METHOD FOR PLACING CONDUIT UNDER PAVEMENT WILL NOT BE ALLOWED.

6. CONTRACTOR SHALL EXTEND SDWK TO SIGNAL/PEDESTRIAN FOUNDATIONS.

7. ALL TRAFFIC SIGNAL HEADS SHALL HAVE NEW REFLECTIVE BACKPLATES.

8. THE CONTRACTOR SHALL REFER TO THE SIGNING AND PAVEMENT MARKING LAYOUTS FOR EXACT LOCATION OF PROPOSED PAVEMENT MARKINGS.

9. CONDUCTOR/CONDUIT QUANTITIES INCLUDE HORIZONTAL/VERTICAL MEASUREMENTS FOR SPAN WIRE, SIGNAL POLES, SIGNAL HEADS, PED HEADS, VIVDS, ELECTRICAL SERVICE, GROUND BOXES AND LUMINAIRES.

10. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.

11. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

12. PEDESTRIAN POLES/HEADS/PUSH BUTTON (PB) REQUIREMENTS:

    PB CONTROLS SHALL COMPLY WITH THE AMERICAN WITH DISABILITIES ACT AND THE TEXAS ACCESSIBILITY STANDARDS REQUIREMENTS.

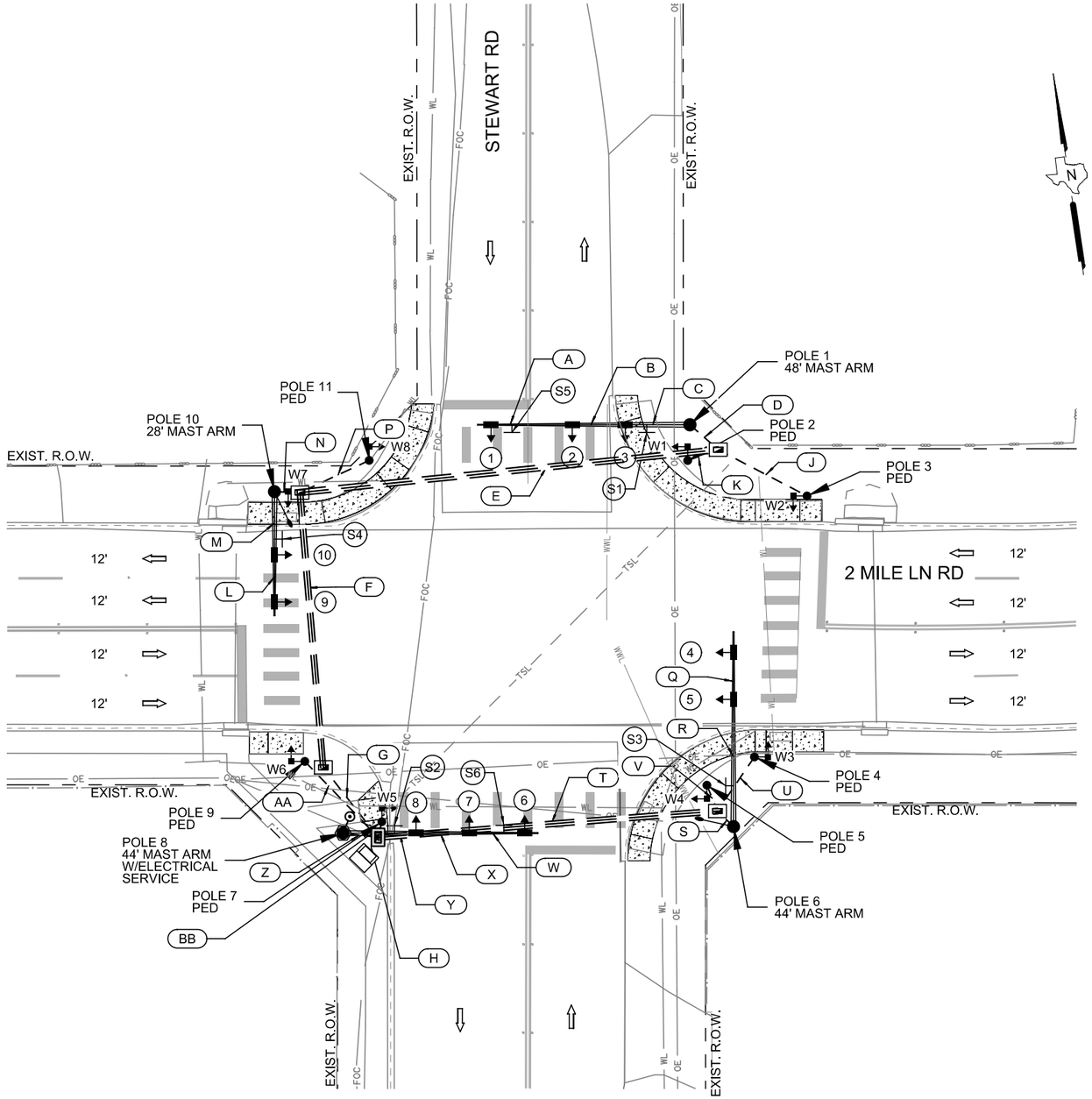
    PEDESTRIAN SIGNAL HEADS SHALL BE IN LINE WITH PROPOSED CROSSWALKS.

    PEDESTRIAN POLES SHALL BE 1.5' MIN / 6' MAX FROM THE FACE OF CURB, EDGE OF PAVEMENT OR SHOULDER. WHERE IMPRACTICAL, USE 10' MAX.

    THE PEDESTRIAN POLE SHALL NOT BE INSIDE ANY OF THE DOWNWARD SIDES OF THE RAMP.

    BETWEEN THE EDGE OF CROSSWALK (EXTENDED TO THE FACE OF THE CURB / EDGE OF PAVEMENT) FARTHEST FROM THE INTERSECTION AND THE EDGE OF THE RAMP BUT NO GREATER THAN 5' FROM THE CROSSWALK LINE.

    THE CLEARANCE BETWEEN PEDESTRIAN POLES/PB IN THE SAME CORNER, SHALL BE 10' MIN.



LEGEND

- MAST ARM POLE
- STRAIN POLE
- PEDESTAL POLE
- SPAN WIRE
- HORIZONTAL SIGNAL HEAD
- SIGNAL HEAD BACKPLATE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING GROUND MOUNTED CABINET
- EXISTING GROUND BOX
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- PEDESTRIAN SIGNAL HEAD W/AUDIBLE PEDESTRIAN SIGNAL
- VIVDS CAMERA (ADVANCED/PRESENCE)
- GROUND MOUNTED CONTROLLER CABINET
- POLE MOUNTED ELECTRICAL SERVICE W/METER
- GROUND BOX (TYPE A) W/APRON
- GROUND BOX (TYPE D) W/APRON
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- LUMINAIRE
- OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
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CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
MILE 2 AT STEWART RD
PROPOSED SIGNAL LAYOUTS

2

SHEET 1 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		25
TR:					
CK TR:					

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ELECTRICAL SCHEDULE

ITEM	TOTAL QTY	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CABLE IN POLE	
																													PED	MAST ARM
		RUN LENGTH	19	12	15	9	96	63	21	6	23	8	11	15	6	18	11	29	6	77	15	7	13	12	17	8	24	4	17	25
POWER	39	1/C - #6 INSULATED								1																1				1
LUMINAIRE	494	4/C - #12 TRAY CABLE				1	1	2	2	4					1				1	1						1				4
GROUND	764	1/C - #6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	4
PEDESTRIAN HEADS	979	2/C - #12					2	4	4	8	1	1			1	1			2	1	1					1	1		7	1
	979	7/C - #12					2	4	4	8	1	1			1	1			2	1	1					1	1		7	1
SIGNAL HEADS	1186	5/C - #12		1	2	2	2	4	4	8			1	2	2		1	2	2	2				1	2	2				8
	347	7/C - #12	1	1	1	1	1	1	1	2													1	1	1	1				2
VIVDS	39	VIVDS CABLING								1																1				1
CONDUITS	128	3" PVC				1					1	1			1	1			1		1	1				1	1	1		
	27	4" PVC							1	1																				
	173	3" PVC BORE					1													1										
	63	4" PVC BORE						1																						

TIMING CHART

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
STREET	STEWART		2 MILE LN		STEWART		2 MILE LN	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN	NOT IN USE	22.5	37.6	37.5	NOT IN USE	22.5	NOT IN USE	37.5
EXTENSION		3		3		3		3
MAX GREEN		24.8		37.5		22.6		37.5
YELLOW		3.5		3.5		3.5		3.5
ALL RED		1		1		1		1
WALK		4		4		4		4
DON'T WALK		14		16		13		12
RECALL		NONE		NONE		NONE		NONE

SIGNAL POLE CHART

POLE NUMBER	1			2	3	4	5	6		7	8			9	10			11
MAST ARM LENGTH	48			PED	PED	PED	PED	44		PED	44			PED	28			PED
FOUNDATION TYPE	36-A			24-A	24-A	24-A	24-A	36-A		24-A	36-A			24-A	30-A			24-A
WITH LUMINARES	NO			NO	NO	NO	NO	YES		NO	NO			NO	YES			NO
WITH SIGNS	2 MILE LN R10-17T			R10-3eR	R10-3eR	R10-3eR	R10-3eR	STEWART RD		R10-3eL	2 MILE LN R10-17T			R10-3eL	STEWART RD R10-3eL			R10-3eR
SIZE OF LENS	12"			12"	12"	12"	12"	12"		12"	12"			12"	12"	12"	12"	12"
SIGNAL HEAD NO.	1	2	3	W1	W2	W3	W4	4	5	W5	6	7	8	W6	9	10	W7	W8
12" LED SIGNAL INDICATIONS	←R	R	R	DW	DW	DW	DW	R	R	DW	←R	R	R	DW	R	R	DW	DW
	←SY	Y	Y	W	W	W	W	Y	Y	W	←SY	Y	Y	W	Y	Y	W	W
	←FY	G	G					G	G		←FY	G	G		G	G		
	←G										←G							

MINIMUM PEDESTRAIN TIMING

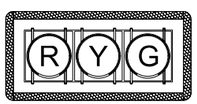
PED PHASE	SIGNAL HEAD NUMBERS	LENGTH OF ROADWAY CURB TO CURB	FEET/SECOND	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
Ø2	W2 & W3	47	3.5	7	14	21
Ø4	W4 & W5	54	3.5	7	16	23
Ø6	W6 & W7	43	3.5	7	13	20
Ø8	W1 & W8	41	3.5	7	12	19

VIVIDS DETECTOR SCHEDULE

SENSOR	SETTING	SPLIT PHASE INTERSECTION
VIVDS 1	PRESENCE	PH 1- 8

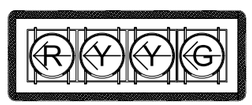
SIGNAL HEAD ARRANGEMENT

PROPOSED 12" HORIZONTAL



LED SIGNAL NO. 2, 3, 4, 5, 7, 8, 9, 10
WITH REFELECTIVE BACKPLATES

PROPOSED 12" HORIZONTAL



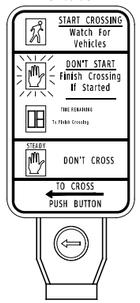
SY FY

LED SIGNAL NO. 1, 6
WITH REFELECTIVE BACKPLATES

SY = SOLID YELLOW
FY = FLASHING YELLOW

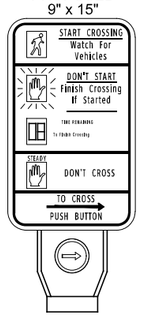
PEDESTRIAN ELEMENTS

PROPOSED 9" x 15"



PUSH BUTTON
W/R10-3eL
(9"X15")
W5, W6, W7

PROPOSED 9" x 15"



PUSH BUTTON
W/R10-3eR
(9"X15")
W1, W2, W3, W4, W8

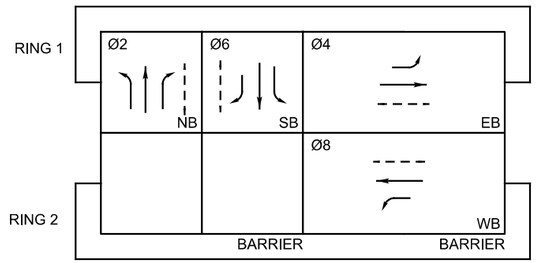
PROPOSED 18" x 16"

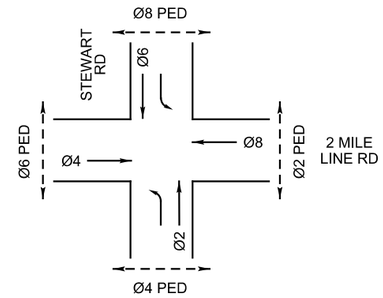
PEDESTRIAN
SIGNALS HEADS
W1 THRU W8

ELECTRICAL SERVICE DETAILS

ELECTRICAL SERVICE NO.	ELECTRICAL SERVICE DESCRIPTION (SEE ED(4) AND ED(5)-03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAINCIRCUIT BREAKER POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD./ LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT BREAKER POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
1	ELEC SERV TY D (120/240)070(NS)SS(E)SP(U)	1 1/2"	3/#6	N/A	70	30	100	1 2	1P/50 1P/15	30 4.5	<4.8

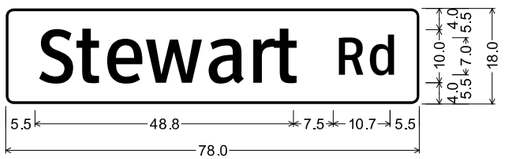
PHASING DIAGRAM





PROPOSED SIGN DETAILS

D3-1G; 90"X18"
1.5" Radius, 0.5" Border, White on Green;
"2 Mile Ln", ClearviewHwy-3-W 50% spacing;
"Rd", ClearviewHwy-3-W;
(S1)(S2)



D3-1G; 78"X18"
1.5" Radius, 0.5" Border, White on Green;
"Stewart", ClearviewHwy-3-W 50% spacing;
"Rd", ClearviewHwy-3-W;
(S3)(S4)

R10-17T; 30"X30"
(S5)(S6)

STATE OF TEXAS
MARTINA MEJIA
143950
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CITY OF MISSION

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CITY OF MISSION
SIGNAL IMPROVEMENTS
MILE 2 AT STEWART RD
PROPOSED SIGNAL
LAYOUTS

2

SHEET 2 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		26
TR:					
CK TR:					

DATE: 6/6/2024 2:48:11 PM
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PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	160
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	1600
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	300

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	1760
678	6008	PAV SURF PREP FOR MRK (24")	LF	300

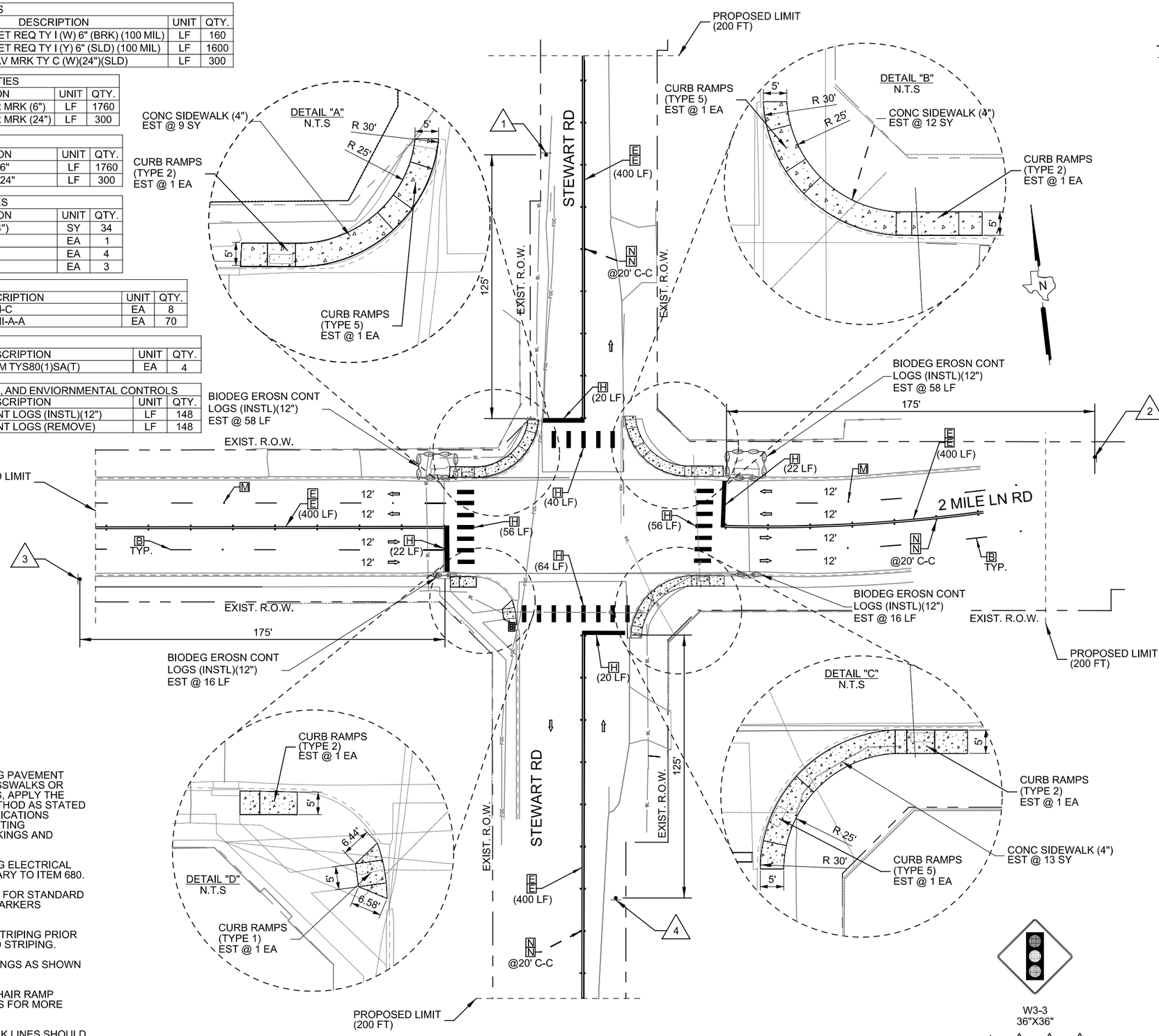
PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	1760
666	6230	PAVEMENT SEALER 24"	LF	300

CIVIL IMPROVEMENTS QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
531	6001	CONC SIDEWALKS (4")	SY	34
531	6004	CURB RAMPS (TY 1)	EA	1
531	6005	CURB RAMPS (TY 2)	EA	4
531	6008	CURB RAMPS (TY 5)	EA	3

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	8
672	6009	REFL PAV MRKR TY II-A-A	EA	70

SIGN QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	4

TEMP EROSION, SEDIMENTATION, AND ENVIORNMENTAL CONTROLS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
506	6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	148
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	148



PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

- A — 6" WHITE DOT
- B — 6" WHITE BROKEN
- C — 6" WHITE SOLID
- D — 6" YELLOW BROKEN
- E — 6" YELLOW SOLID
- F — 8" WHITE SOLID
- G — 12" YELLOW SOLID
- H — 24" WHITE SOLID
- I — WHITE DBL ARROW
- J — WHITE ARROW
- K — WHITE WORD
- L — WHITE RR XING
- ⇨ — TRAFFIC FLOW
- C-C — CENTER TO CENTER
- - - — STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M — TYPE I-C
- N — TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- ● — SMALL ROADSIDE SIGN (GROUND) (ITEM 644)
- # — PROPOSED SIGN

SCALE 1" = 50'

NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. SEE PM(1-3) 22 & PM(4) 22A FOR STANDARD PAVEMENT MARKINGS & MARKERS PLACEMENT DETAILS.
4. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
5. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
6. SEE SIDEWALK & WHEELCHAIR RAMP DESIGN GUIDE STANDARDS FOR MORE DETAILS.
7. 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).

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STATE OF TEXAS
MARTINA MEJIA
143950
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CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT STEWART RD SIGN & PAVEMENT MARKINGS LAYOUT

2

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		27
TR:					
CK TR:					

NOTES:

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2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. MATERIALS WILL BE SALVAGED AND RETURNED TO THE CITY OF MISSION.

EXISTING FLASHING BEACON ASSEMBLIES
(TO BE REMOVED)

LEGEND

- EXISTING SIGNAL POLE
- EXISTING SPAN WIRE
- EXISTING MAST ARM
- EXISTING HORIZONTAL SIGNAL HEAD
- EXISTING PEDESTRIAN HEAD
- EXISTING CONTROLLER CABINET
- EXISTING GROUND BOX
- EXISTING ELECTRICAL SERVICE
- EXISTING VIVDS CAMERA
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING CONDUIT (BORE)
- EXISTING CONDUIT (TRENCH)
- UT — UNDERGROUND TELEPHONE LINE
- SDB — STORM DRAIN BOX
- FOC — FIBER OPTIC CABLE
- WL — WATER LINE
- WWL — WASTE WATER LINE
- GL — GAS LINE
- UE — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- EXISTING GROUND SIGN

0 30 60
SCALE 1" = 30'

REMOVAL QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
628	6001	RELOCATE ELECTRICAL SERVICES	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	4
680	6004	REMOVING TRAFFIC SIGNAL	EA	1

CONCRETE REMOVAL QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY
104	6015	REMOVING CONC (SIDEWALKS)	SY	52

PAVEMENT MARKING REMOVAL QUANTITIES					
	ITEM	CODE	DESCRIPTION	UNIT	QTY
K	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1664
M	677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	415
N	677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	91

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AUTHORIZED 06-06-2024

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CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT GLASSCOCK RD EXISTING CONDITIONS LAYOUT

3

SHEET 1 OF 3

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		28
TR:					
CK TR:					

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2. CONTACT MAURICIO DIAZ (956-702-6227) TWO WEEKS IN ADVANCE TO SCHEDULE THE FYA CONVERSION FOR EACH INTERSECTION. PLAN ONE CONVERSION A DAY.

3. THE LOCATION FOR THE CONTROLLER, TRAFFIC SIGNAL POLES AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE TxDOT/CITY OF MISSION.

4. ALL SIGNAL CABLE SHALL BE #12 AWG AND IMSA APPROVED. LUMINAIRE WIRE SHALL BE 4/C-#12 TRAY CABLE. SERVICE WIRE SHALL BE #6 AWG XHHW, VIVDS CABLES AS PER MANUFACTURER.

5. THE OPEN TRENCH METHOD FOR PLACING CONDUIT UNDER PAVEMENT WILL NOT BE ALLOWED.

6. CONTRACTOR SHALL EXTEND SDWK TO SIGNAL/PEDESTRIAN FOUNDATIONS.

7. ALL TRAFFIC SIGNAL HEADS SHALL HAVE NEW REFLECTIVE BACKPLATES.

8. THE CONTRACTOR SHALL REFER TO THE SIGNING AND PAVEMENT MARKING LAYOUTS FOR EXACT LOCATION OF PROPOSED PAVEMENT MARKINGS.

9. CONDUCTOR/CONDUIT QUANTITIES INCLUDE HORIZONTAL/VERTICAL MEASUREMENTS FOR SPAN WIRE, SIGNAL POLES, SIGNAL HEADS, PED HEADS, VIVDS, ELECTRICAL SERVICE, GROUND BOXES AND LUMINAIRES.

10. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.

11. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

12. PEDESTRIAN POLES/HEADS/PUSH BUTTON (PB) REQUIREMENTS:

    PB CONTROLS SHALL COMPLY WITH THE AMERICAN WITH DISABILITIES ACT AND THE TEXAS ACCESSIBILITY STANDARDS REQUIREMENTS.

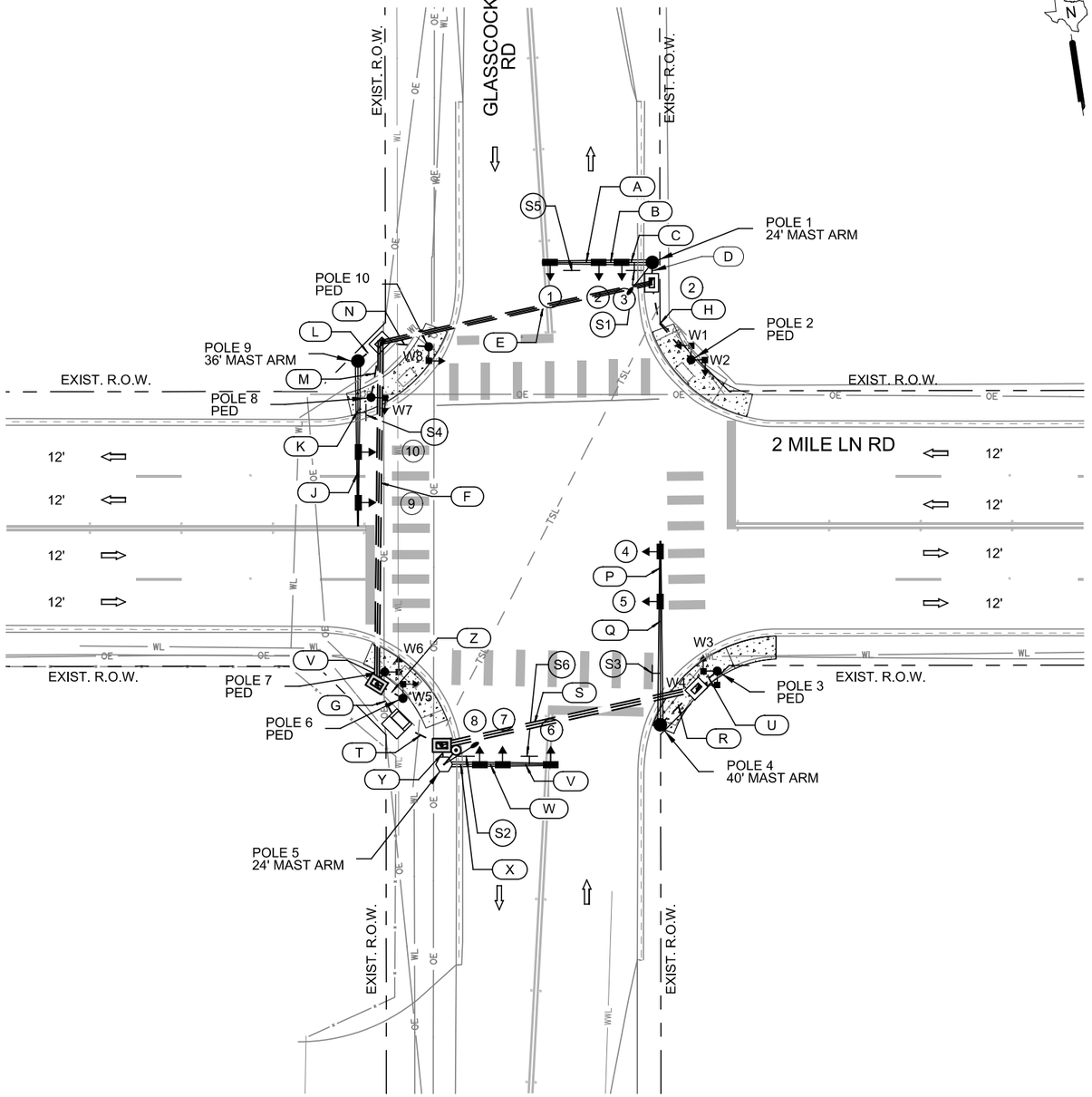
    PEDESTRIAN SIGNAL HEADS SHALL BE IN LINE WITH PROPOSED CROSSWALKS.

    PEDESTRIAN POLES SHALL BE 1.5' MIN / 6' MAX FROM THE FACE OF CURB, EDGE OF PAVEMENT OR SHOULDER. WHERE IMPRACTICAL, USE 10' MAX.

    THE PEDESTRIAN POLE SHALL NOT BE INSIDE ANY OF THE DOWNWARD SIDES OF THE RAMP.

    BETWEEN THE EDGE OF CROSSWALK (EXTENDED TO THE FACE OF THE CURB / EDGE OF PAVEMENT) FARTHEST FROM THE INTERSECTION AND THE EDGE OF THE RAMP BUT NO GREATER THAN 5' FROM THE CROSSWALK LINE.

    THE CLEARANCE BETWEEN PEDESTRIAN POLES/PB IN THE SAME CORNER, SHALL BE 10' MIN.



LEGEND

- MAST ARM POLE
- STRAIN POLE
- PEDESTAL POLE
- SPAN WIRE
- HORIZONTAL SIGNAL HEAD
- SIGNAL HEAD BACKPLATE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING GROUND MOUNTED CABINET
- EXISTING GROUND BOX
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- PEDESTRIAN SIGNAL HEAD W/AUDIBLE PEDESTRIAN SIGNAL
- VIVDS CAMERA (ADVANCED/PRESENCE)
- GROUND MOUNTED CONTROLLER CABINET
- POLE MOUNTED ELECTRICAL SERVICE W/METER
- GROUND BOX (TYPE A) W/APRON
- GROUND BOX (TYPE D) W/APRON
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- LUMINAIRE
- OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT GLASSCOCK RD PROPOSED SIGNAL LAYOUTS

3

SHEET 1 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		29
TR:					
CK TR:					

DATE: 6/6/2024 2:48:16 PM
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ELECTRICAL SCHEDULE

ITEM	TOTAL QTY	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z	AA	CABLE IN POLE	
		RUN LENGTH	11	5	7	5	61	75	10	20	12	20	7	12	11	11	27	12	58	11	6	11	5	8	5	7	4	PED 17	MAST ARM 25
POWER	41	1/C - #6 INSULATED																		1					1				1
LUMINAIRE	442	4/C - #12 TRAY CABLE				1	1	2	2				1					1	1	2						1			4
GROUND	657	1/C - #6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	4
PEDESTRIAN HEADS	842	2/C - #12					2	4	6	2				1	1				2	2	2					1	1	8	
	842	7/C - #12					2	4	6	2				1	1				2	2	2					1	1	8	
SIGNAL HEADS	1037	5/C - #12		1	2	2	2	4	4		1	2	2			1	2	2	2	4			1	2	2				8
	264	7/C - #12	1	1	1	1	1	1	1											1		1	1	1	1				2
VIVDS	41	VIVDS CABLING																		1					1				1
CONDUITS	117	3" PVC				1			1	1			1	1	1			1		1	1	1			1	1			
	21	4" PVC							1											1									
	119	3" PVC BORE					1												1										
	75	4" PVC BORE						1																					

SIGNAL POLE CHART

POLE NUMBER	1			2		3		4		5			6	7	8	9		10
MAST ARM LENGTH	24			PED		PED		40		24			PED	PED	PED	36		PED
FOUNDATION TYPE	30-A			24-A		24-A		36-A		30-A			24-A	24-A	24-A	36-A		24-A
WITH LUMINARES	YES			NO		NO		NO		YES			NO	NO	NO	NO		NO
WITH SIGNS	2 MILE LN RD R10-17T			R10-3eR R10-3eL		R10-3eR R10-3eL		GLASSCOCK RD R10-17T		2 MILE LN RD R10-17T			R10-3eL	R10-3eR	R10-3eL	GLASSCOCK RD R10-17T		R10-3eR
SIZE OF LENS	12"			12"		12"		12"		12"			12"	12"	12"	12"		12"
SIGNAL HEAD NO.	1	2	3	W1	W2	W3	W4	4	5	6	7	8	W5	W6	W7	9	10	W8
12" LED SIGNAL INDICATIONS	←R	R	R	DW	DW	DW	DW	R	R	←R	R	R	DW	DW	DW	R	R	DW
	←SY	Y	Y	W	W	W	W	Y	Y	←SY	Y	Y	W	W	W	Y	Y	W
	←FY	G	G					G	G	←FY	G	G				G	G	
	←G									←G								

MINIMUM PEDESTRAIN TIMING

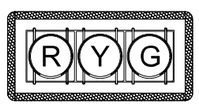
PED PHASE	SIGNAL HEAD NUMBERS	LENGTH OF ROADWAY CURB TO CURB	FEET/SECOND	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
Ø2	W2 & W3	56	3.5	7	16	23
Ø4	W4 & W5	55	3.5	7	16	23
Ø6	W6 & W7	56	3,5	7	16	23
Ø8	W8 & W1	54	3.5	7	16	23

VIVDS DETECTOR SCHEDULE

SENSOR	SETTING	SPLIT PHASE INTERSECTION
VIVDS1	ADVANCE	PH 1- 8

SIGNAL HEAD ARRANGEMENT

PROPOSED 12" HORIZONTAL



LED SIGNAL NO. 2, 3, 4, 5, 7, 8, 9, 10
WITH REFELECTIVE BACKPLATES

PROPOSED 12" HORIZONTAL

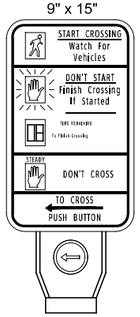
SY FY

LED SIGNAL NO. 1, 6
WITH REFELECTIVE BACKPLATES

SY = SOLID YELLOW
FY = FLASHING YELLOW

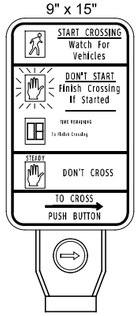
PEDESTRIAN ELEMENTS

PROPOSED 9" x 15"



PUSH BUTTON
W/R10-3eL
(9"X15")
W1, W3, W5, W7

PROPOSED 9" x 15"



PUSH BUTTON
W/R10-3eR
(9"X15")
W2, W4, W6, W8

PROPOSED 18" x 16"

PEDESTRIAN
SIGNALS HEADS
W1 THRU W8

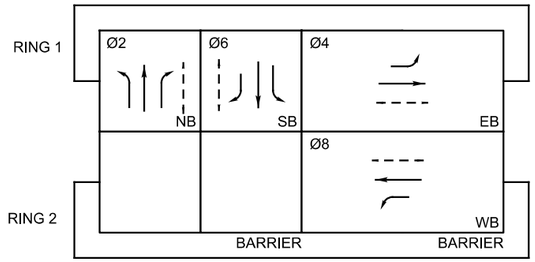
ELECTRICAL SERVICE DETAILS

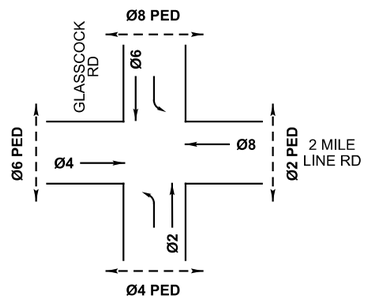
ELECTRICAL SERVICE NO.	ELECTRICAL SERVICE DESCRIPTION (SEE ED(4) AND ED(5)-03)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAINCIRCUIT BREAKER POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD./ LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT BREAKER POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
1	ELEC SERV TY T (120/240)000(NS)GS(L)TS(0)	1 1/2"	3/#6	N/A	70	30	100	1 2	1P/50 1P/15	30 4.5	<4.8

TIMING CHART

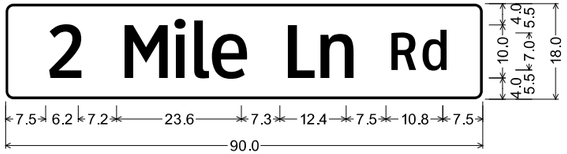
PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
STREET	TROSPER		2 MILE LN		TROSPER		2 MILE LN	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN	9.5	22.5	NOT IN USE	37.5	9.5	22.5	NOT IN USE	37.5
EXTENSION	3	3		3	3	3		3
MAX GREEN	9.5	23		37.5	9.5	23		37.5
YELLOW	3.5	3.5		3.5	3.5	3.5		3.5
ALL RED	1	1		1	1	1		1
WALK	-	4		4	-	4		4
DON'T WALK	-	16		16	-	16		16
RECALL	NONE	NONE		NONE	NONE	NONE		NONE

PHASING DIAGRAM

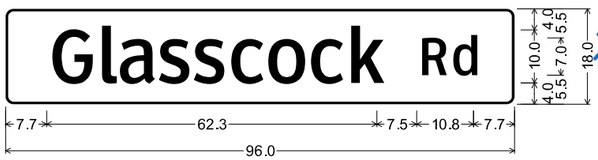




PROPOSED SIGN DETAILS

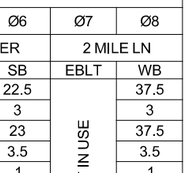


D3-1G; 90"X18"
1.5" Radius, 0.5" Border, White on Green;
"2 Mile Ln", ClearviewHwy-3-W 50% spacing;
"Rd", ClearviewHwy-3-W;
S1 S2



D3-1G; 96"X18"
1.5" Radius, 0.5" Border, White on Green;
"Glasscock", ClearviewHwy-3-W 50% spacing;
"Rd", ClearviewHwy-3-W;
S3 S4

R10-17T; 30"X30"
S5 S6



AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
TEDSI
TBPE F-1640
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT GLASSCOCK RD PROPOSED SIGNAL LAYOUTS

3

SHEET 2 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		30
TR:					
CK TR:					

DATE: 6/6/2024 2:48:17 PM
FILE: c:\pw-tedsi-connect\d0108943\3. MILE2_AT_GLASSCOCK_PROP_SIG.dgn

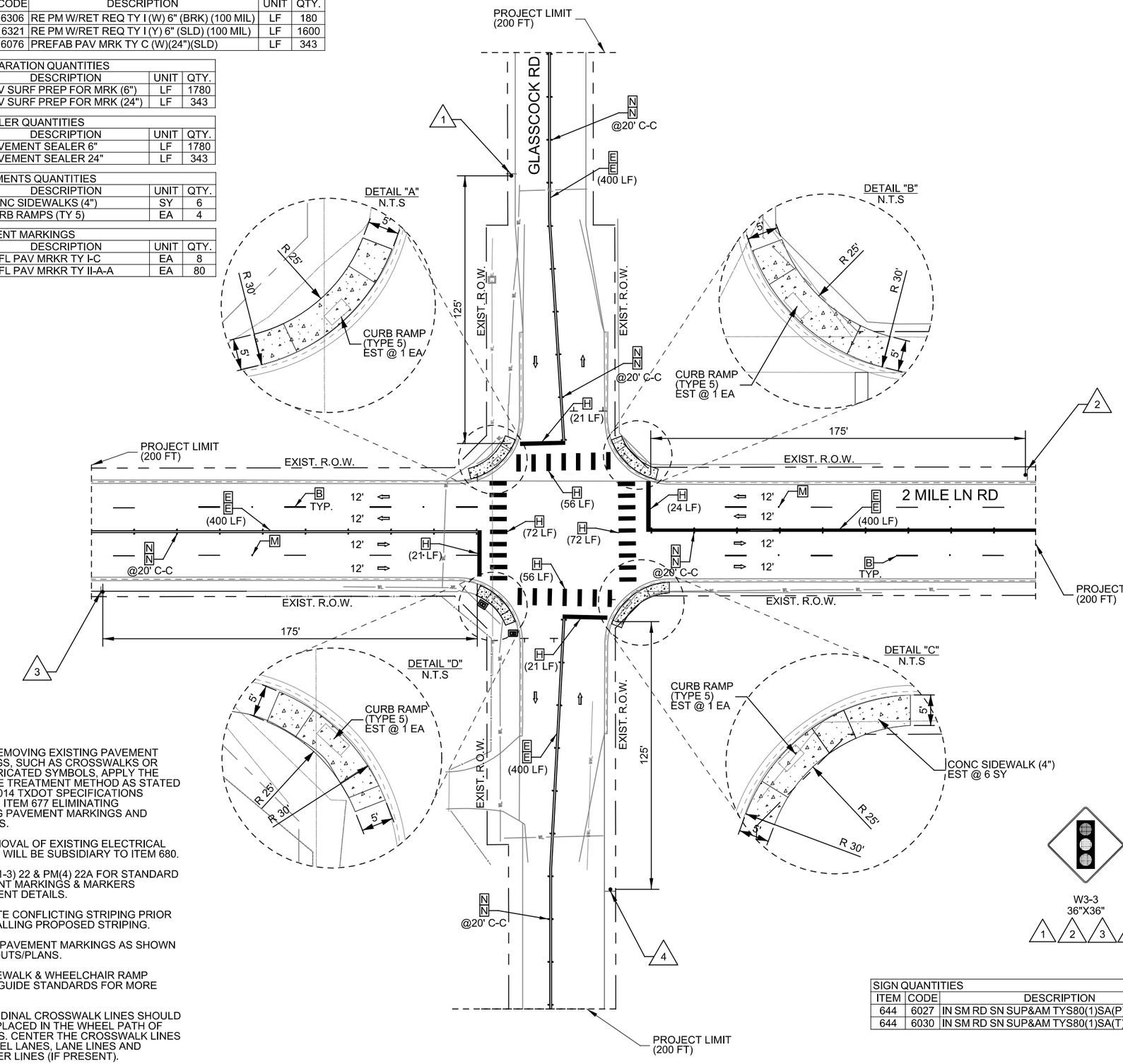
PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	180
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	1600
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	343

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	1780
678	6008	PAV SURF PREP FOR MRK (24")	LF	343

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	1780
666	6230	PAVEMENT SEALER 24"	LF	343

CIVIL IMPROVEMENTS QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
531	6001	CONC SIDEWALKS (4")	SY	6
531	6008	CURB RAMPS (TY 5)	EA	4

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	8
672	6009	REFL PAV MRKR TY II-A-A	EA	80



NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. SEE PM(1-3) 22 & PM(4) 22A FOR STANDARD PAVEMENT MARKINGS & MARKERS PLACEMENT DETAILS.
4. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
5. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
6. SEE SIDEWALK & WHEELCHAIR RAMP DESIGN GUIDE STANDARDS FOR MORE DETAILS.
7. 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).

W3-3
36"X36"
1 2 3 4

SIGN QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
644	6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	2
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	4

PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

- A 6" WHITE DOT
- B 6" WHITE BROKEN
- C 6" WHITE SOLID
- D 6" YELLOW BROKEN
- E 6" YELLOW SOLID
- F 8" WHITE SOLID
- G 12" YELLOW SOLID
- H 24" WHITE SOLID
- I WHITE DBL ARROW
- J WHITE ARROW
- K WHITE WORD
- L WHITE RR XING
- TRAFFIC FLOW
- C-C CENTER TO CENTER
- STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M TYPE I-C
- N TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)
- # PROPOSED SIGN

0 50 100
SCALE 1" = 50'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

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TEDSI TBPE F-1640

CITY OF MISSION

CITY OF MISSION
SIGNAL IMPROVEMENTS
MILE 2 AT GLASSCOCK RD
SIGN & PAVEMENT MARKINGS
LAYOUT

3

SHEET 1 OF 1

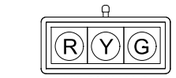
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		31
TR:					
CK TR:					

DATE: 6/6/2024 2:48:20 PM
FILE: c:\pw-tedsi-connect\d0108941\3. MILE2 AT GLASSCOCK P SIGNING PVMT MRKS.dgn

NOTES:

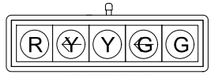
1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. MATERIALS WILL BE SALVAGED AND RETURNED TO THE CITY OF MISSION.

EXISTING SIGNAL HEADS



12" SIGNALS

①



12" SIGNALS

②

EXISTING SIGNS

Bryan Rd

S1

2 Mile Ln Rd

S2

LEGEND

- EXISTING SIGNAL POLE
- EXISTING SPAN WIRE
- EXISTING MAST ARM
- EXISTING HORIZONTAL SIGNAL HEAD
- EXISTING PEDESTRIAN HEAD
- EXISTING CONTROLLER CABINET
- EXISTING GROUND BOX
- EXISTING ELECTRICAL SERVICE
- EXISTING VIVDS CAMERA
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING CONDUIT (BORE)
- EXISTING CONDUIT (TRENCH)
- UT — UNDERGROUND TELEPHONE LINE
- SDB — STORM DRAIN BOX
- FOC — FIBER OPTIC CABLE
- WL — WATER LINE
- WWL — WASTE WATER LINE
- GL — GAS LINE
- UE — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- EXISTING GROUND SIGN

0 30 60

SCALE 1" = 30'

PAVEMENT MARKING REMOVAL QUANTITIES					
	ITEM	CODE	DESCRIPTION	UNIT	QTY
K	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1660
L	677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	162
M	677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	335
N	677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	98
P	677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2
Q	677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	2

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
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1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT BRYAN RD EXISTING CONDITIONS LAYOUT

④

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		32
TR:					
CK TR:					

DATE: 6/6/2024 2:48:23 PM
FILE: c:\pw-tedsi-connect\d01089434\4_MILE2_AT_BRYAN_EX_SIG.dgn

NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW FULL TRAFFIC ACTUATED FLASHING YELLOW ARROW (FYA) CAPABLE CONTROLLER UNIT COMPATIBLE WITH ATMS.COM, W/NEW CABINET & FOUNDATION, LED SIGNAL HEADS, SIGNAL CABLE, GROUND BOXES, CONDUIT RUNS AND RADAR DETECTORS AS SHOWN.
2. CONTACT MAURICIO DIAZ (956-702-6227) TWO WEEKS IN ADVANCE TO SCHEDULE THE FYA CONVERSION FOR EACH INTERSECTION. PLAN ONE CONVERSION A DAY.
3. THE LOCATION FOR THE CONTROLLER, TRAFFIC SIGNAL POLES AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE TXDOT/CITY OF MISSION.
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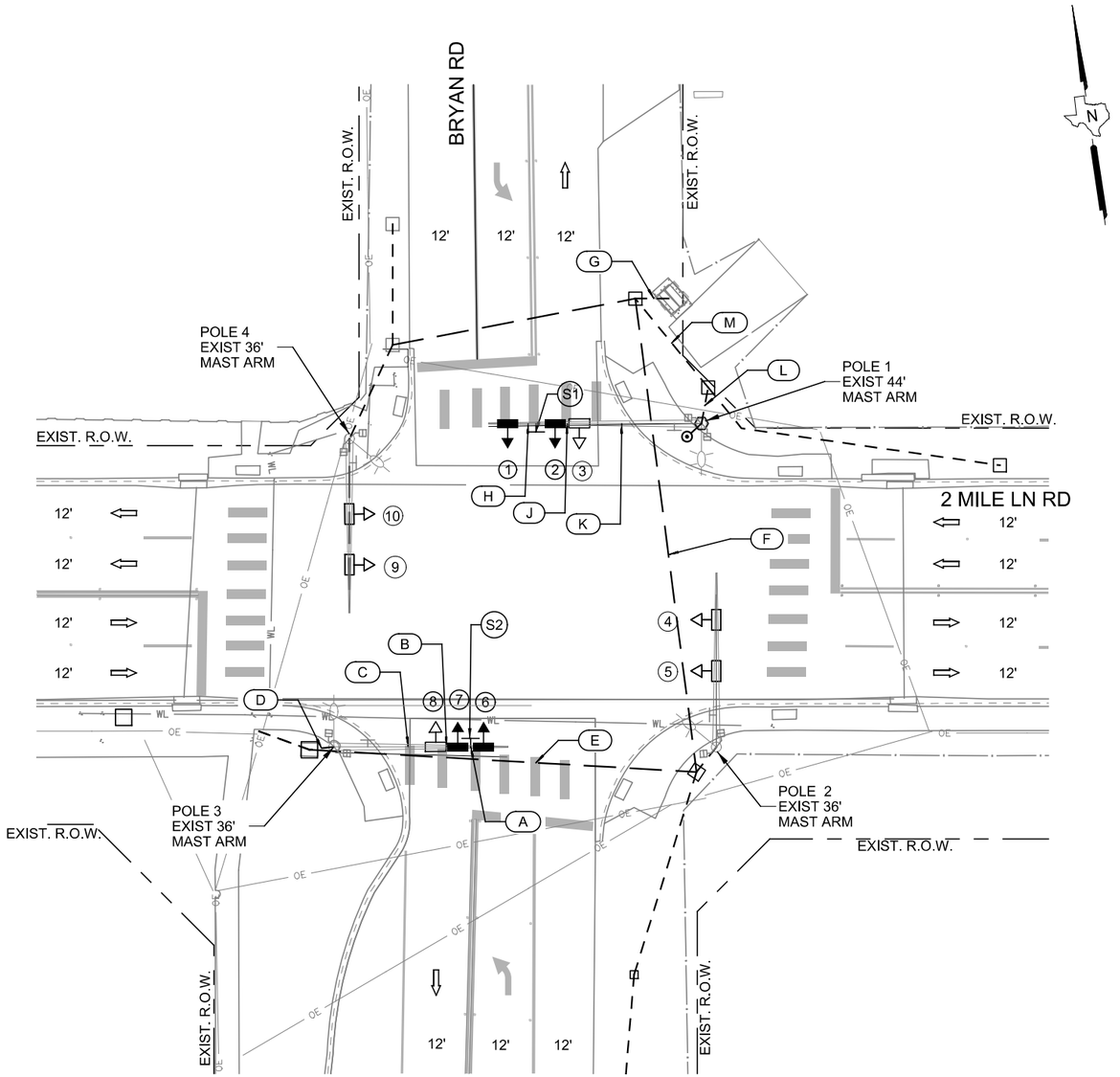
7. THE CONTRACTOR SHALL REFER TO THE SIGNING AND PAVEMENT MARKING LAYOUTS FOR EXACT LOCATION OF PROPOSED PAVEMENT MARKINGS.
8. CONDUCTOR/CONDUIT QUANTITIES INCLUDE HORIZONTAL/VERTICAL MEASUREMENTS FOR SPAN WIRE, SIGNAL POLES, SIGNAL HEADS, VIVDS, ELECTRICAL SERVICE, GROUND BOXES AND LUMINAIRES.
9. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.
10. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.



LEGEND

- MAST ARM POLE
- STRAIN POLE
- PEDESTAL POLE
- SPAN WIRE
- HORIZONTAL SIGNAL HEAD
- SIGNAL HEAD BACKPLATE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING GROUND MOUNTED CABINET
- EXISTING GROUND BOX
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- PEDESTRIAN SIGNAL HEAD W/AUDIBLE PEDESTRIAN SIGNAL
- VIVDS CAMERA (ADVANCED/PRESENCE)
- GROUND MOUNTED CONTROLLER CABINET
- POLE MOUNTED ELECTRICAL SERVICE W/METER
- GROUND BOX (TYPE A) W/APRON
- GROUND BOX (TYPE D) W/APRON
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- LUMINAIRE
- OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW

0 30 60
SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT BRYAN RD PROPOSED SIGNAL LAYOUTS

4

SHEET 1 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		33
TR:					
CK TR:					

DATE: 6/6/2024 2:48:25 PM
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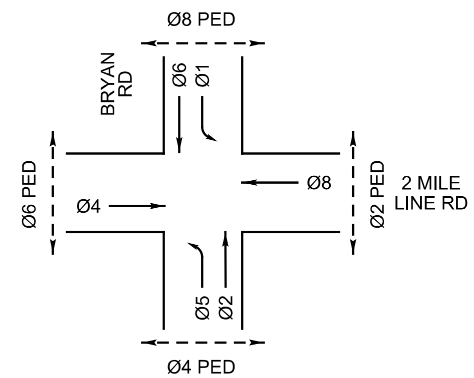
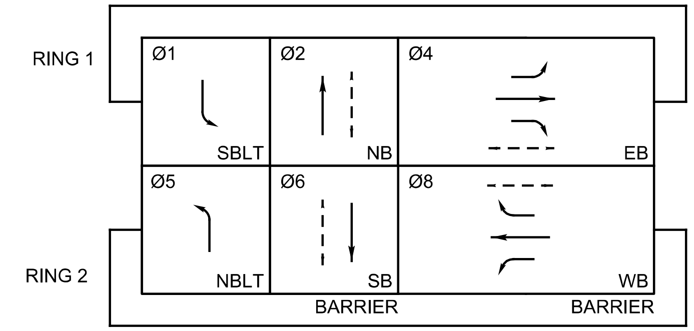
ELECTRICAL SCHEDULE																
ITEM	TOTAL QTY	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	CABLE IN POLE	
															PED	MAST ARM
		RUN LENGTH	6	5	22	6	81	99	8	10	5	26	8	24	17	25
POWER	65	1/C - #6 INSULATED							1				1	1		1
GROUND	400	1/C - #6 BARE	1	1	1	1	1	1	1	1	1	1	1	1		4
SIGNAL HEADS	342	5/C - #12		1	1	1	1	1	2		1	1	1	1		2
	358	7/C - #12	1	1	1	1	1	1	2	1	1	1	1	1		2
VIVDS	65	VIVDS CABLING							1				1	1		1

TIMING CHART								
PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
STREET	BRYAN		2 MILE LN		BRYAN		2 MILE LN	
MOVEMENT	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB
MIN GREEN	9.5	22.5	NOT IN USE	37.5	9.5	22.5	NOT IN USE	37.5
EXTENSION	3	3		3	3	3		3
MAX GREEN	9.5	23		37.5	9.5	22.9		37.5
YELLOW	3.5	3.5		3.5	3.5	3.5		3.5
ALL RED	1	1		1	1	1		1
WALK	-	4		4	-	4		4
DON'T WALK	-	14		11	-	14		11
RECALL	NONE	NONE		NONE	NONE	NONE		NONE

PHASING DIAGRAM



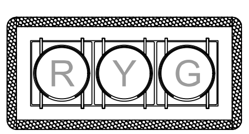


MINIMUM PEDESTRAIN TIMING						
PED PHASE	SIGNAL HEAD NUMBERS	LENGTH OF ROADWAY CURB TO CURB	FEET/SECOND	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
Ø2	W4 & W5	49	3.5	7	14	21
Ø4	W6 & W7	44	3.5	7	13	20
Ø6	W8 & W1	45	3.5	7	13	20
Ø8	W2 & W3	47	3.5	7	14	21

VIVIDS DETECTOR SCHEDULE		
SENSOR	SETTING	SPLIT PHASE INTERSECTION
VIVIDS1	ADVANCE	PH 1- 8

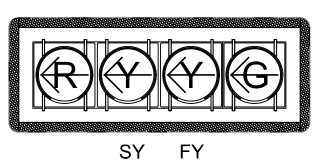
SIGNAL HEAD ARRANGEMENT

PROPOSED BACKPLATE WITH REFLECTIVE BORDER ON EXISTING 12" HORIZONTAL SIGNAL HEADS

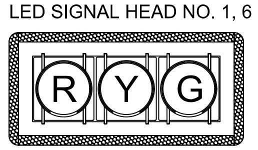


EXISTING SIGNAL HEAD NO. 3, 4, 5, 8, 9, 10

PROPOSED 12" HORIZONTAL



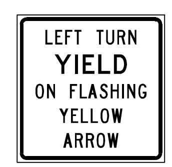
PROPOSED LED SIGNAL HEAD NO. 1, 6



PROPOSED LED SIGNAL HEAD NO. 2, 7

SY = SOLID YELLOW
FY = FLASHING YELLOW

PROPOSED SIGN DETAILS



R10-17T
30"X30"
S1 S2

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

Martina Mejia

AUTHORIZED 06-06-2024

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Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TEDSI
TBPE F-1640

CITY OF MISSION

CITY OF MISSION
SIGNAL IMPROVEMENTS
MILE 2 AT BRYAN RD
PROPOSED SIGNAL
LAYOUTS

4

SHEET 2 OF 2

DN:	CONT	SECT	JOB	HIGHWAY
CK DN:	0921	02	501,ETC	VARIOUS
DW:	DIST	COUNTY		SHEET NO.
CK DW:	PHR	HIDALGO		34
TR:				
CK TR:				

DATE: 6/6/2024 2:48:26 PM
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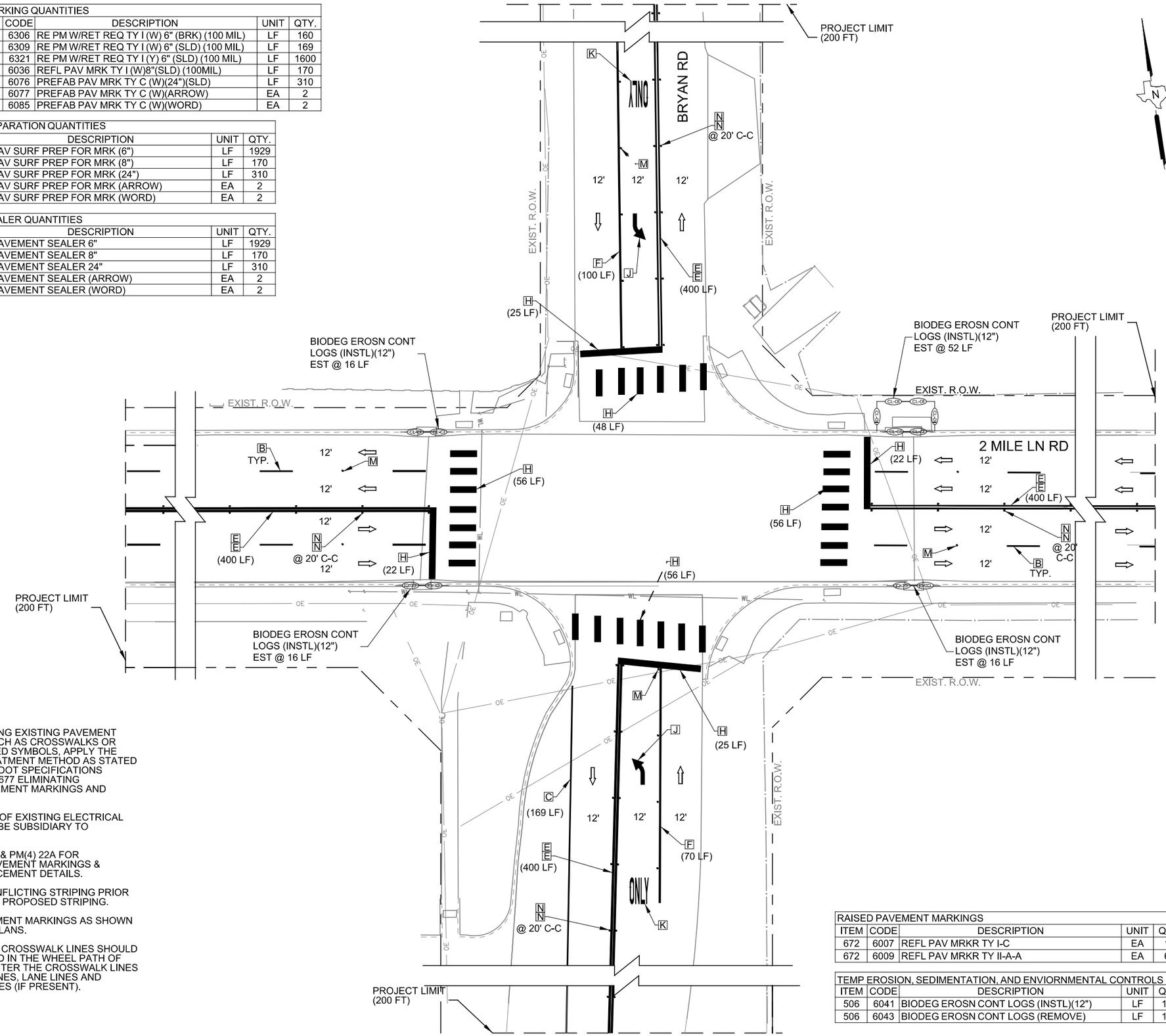
PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	160
C	666	6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL)	LF	169
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	1600
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	170
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	310
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	2
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	2

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	1929
678	6004	PAV SURF PREP FOR MRK (8")	LF	170
678	6008	PAV SURF PREP FOR MRK (24")	LF	310
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	2

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	1929
666	6226	PAVEMENT SEALER 8"	LF	170
666	6230	PAVEMENT SEALER 24"	LF	310
666	6231	PAVEMENT SEALER (ARROW)	EA	2
666	6232	PAVEMENT SEALER (WORD)	EA	2



PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

- A 6" WHITE DOT
- B 6" WHITE BROKEN
- C 6" WHITE SOLID
- D 6" YELLOW BROKEN
- E 6" YELLOW SOLID
- F 8" WHITE SOLID
- G 12" YELLOW SOLID
- H 24" WHITE SOLID
- I WHITE DBL ARROW
- J WHITE ARROW
- K WHITE WORD
- L WHITE RR XING
- ⇨ TRAFFIC FLOW
- C-C CENTER TO CENTER
- - - STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M TYPE I-C
- N TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 30 60

SCALE 1" = 30'

NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. SEE PM(1-3) 22 & PM(4) 22A FOR STANDARD PAVEMENT MARKINGS & MARKERS PLACEMENT DETAILS.
4. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
5. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
6. 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).

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	18
672	6009	REFL PAV MRKR TY II-A-A	EA	68

TEMP EROSION, SEDIMENTATION, AND ENVIORNMENTAL CONTROLS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
506	6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	100
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	100

STATE OF TEXAS
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(956) 424-7898
TEDSI
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS MILE 2 AT BRYAN RD PAVEMENT MARKINGS LAYOUT

4

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		35
TR:					
CK TR:					

DATE: 6/6/2024 2:48:30 PM
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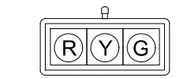
NOTES:

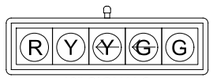
1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. MATERIALS WILL BE SALVAGED AND RETURNED TO THE CITY OF MISSION.

EXISTING SIGNAL HEADS



12" SIGNALS

1



12" SIGNALS

2

LEGEND

- EXISTING SIGNAL POLE
- EXISTING SPAN WIRE
- EXISTING MAST ARM
- EXISTING HORIZONTAL SIGNAL HEAD
- EXISTING PEDESTRIAN HEAD
- EXISTING CONTROLLER CABINET
- EXISTING GROUND BOX
- EXISTING ELECTRICAL SERVICE
- EXISTING VIVDS CAMERA
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING CONDUIT (BORE)
- EXISTING CONDUIT (TRENCH)
- UT — UNDERGROUND TELEPHONE LINE
- SDB — STORM DRAIN BOX
- FOC — FIBER OPTIC CABLE
- WL — WATER LINE
- WWL — WASTE WATER LINE
- GL — GAS LINE
- UE — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- EXISTING GROUND SIGN

0 30 60

SCALE 1" = 30'

PAVEMENT MARKING REMOVAL QUANTITIES					
	ITEM	CODE	DESCRIPTION	UNIT	QTY
K	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	2434
L	677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	276
M	677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	472
N	677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	138
P	677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	7
R	677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2
Q	677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	4

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
TEDSI
TBPE F-1640
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS FM 495 AT LOS EBANOS RD EXISTING CONDITIONS LAYOUT

5

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		36
TR:					
CK TR:					

DATE: 6/6/2024 2:48:31 PM
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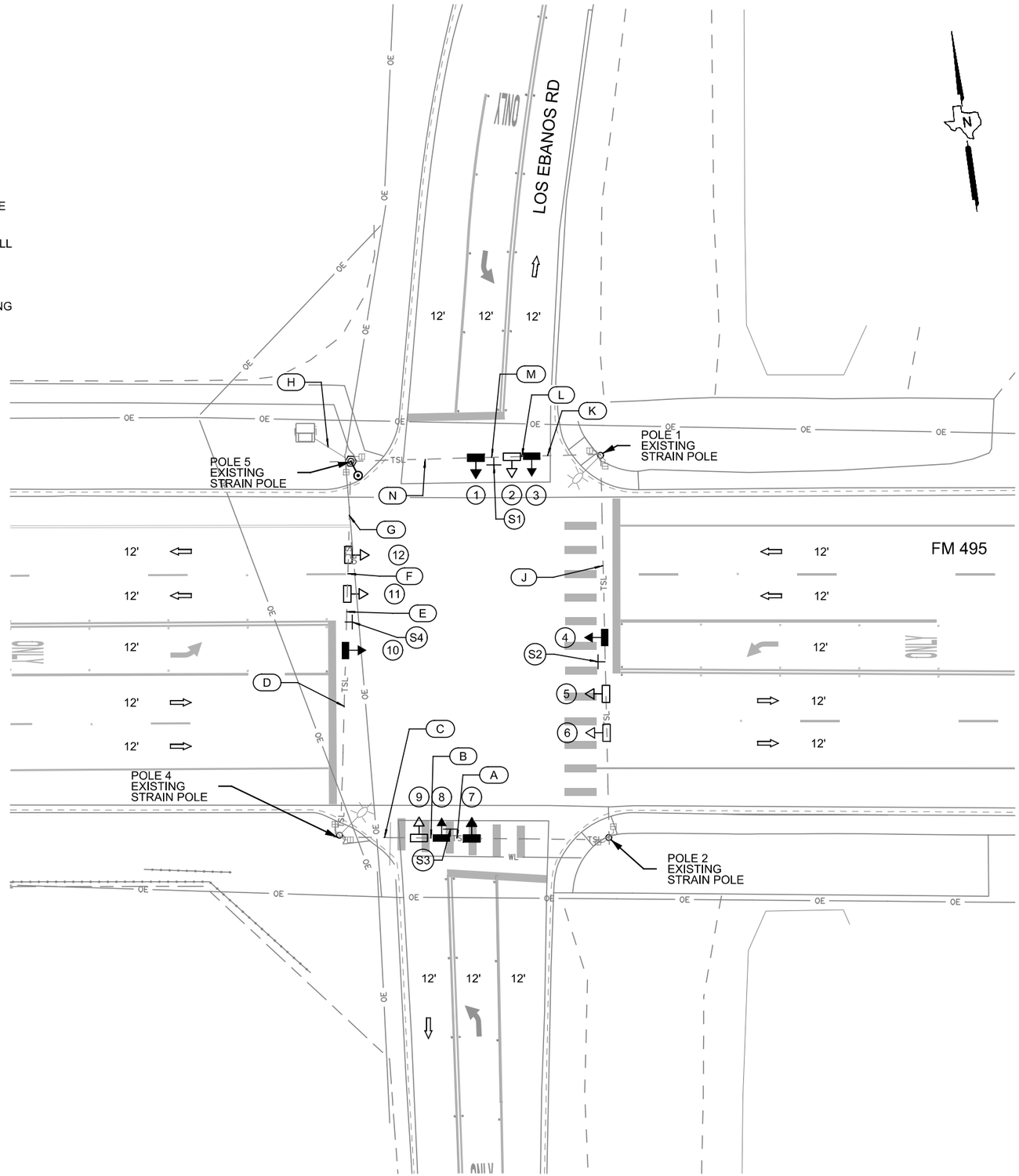
NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW FULL TRAFFIC ACTUATED FLASHING YELLOW ARROW (FYA) CAPABLE CONTROLLER UNIT COMPATIBLE WITH ATMS.COM, W/NEW CABINET & FOUNDATION, LED SIGNAL HEADS, SIGNAL CABLE, GROUND BOXES, CONDUIT RUNS AND RADAR DETECTORS AS SHOWN.
2. CONTACT MAURICIO DIAZ (956-702-6227) TWO WEEKS IN ADVANCE TO SCHEDULE THE FYA CONVERSION FOR EACH INTERSECTION. PLAN ONE CONVERSION A DAY.
3. THE LOCATION FOR THE CONTROLLER, TRAFFIC SIGNAL POLES AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE TXDOT/CITY OF MISSION.
4. ALL SIGNAL CABLE SHALL BE #12 AWG AND IMSA APPROVED. SERVICE WIRE SHALL BE #6 AWG XHHW, VIVDS CABLES AS PER MANUFACTURER.
5. THE OPEN TRENCH METHOD FOR PLACING CONDUIT UNDER PAVEMENT WILL NOT BE ALLOWED.
6. ALL TRAFFIC SIGNAL HEADS SHALL HAVE NEW REFLECTIVE BACKPLATES.
7. THE CONTRACTOR SHALL REFER TO THE SIGNING AND PAVEMENT MARKING LAYOUTS FOR EXACT LOCATION OF PROPOSED PAVEMENT MARKINGS.
8. CONDUCTOR/CONDUIT QUANTITIES INCLUDE HORIZONTAL/VERTICAL MEASUREMENTS FOR SPAN WIRE, SIGNAL POLES, SIGNAL HEADS, VIVDS, ELECTRICAL SERVICE, GROUND BOXES AND LUMINAIRES.
9. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.
10. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.



LEGEND

- MAST ARM POLE
- STRAIN POLE
- PEDESTAL POLE
- SPAN WIRE
- HORIZONTAL SIGNAL HEAD
- SIGNAL HEAD BACKPLATE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING GROUND MOUNTED CABINET
- EXISTING GROUND BOX
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- PEDESTRIAN SIGNAL HEAD W/AUDIBLE PEDESTRIAN SIGNAL
- VIVDS CAMERA (ADVANCED/PRESENCE)
- GROUND MOUNTED CONTROLLER CABINET
- POLE MOUNTED ELECTRICAL SERVICE W/METER
- GROUND BOX (TYPE A) W/APRON
- GROUND BOX (TYPE D) W/APRON
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- LUMINAIRE
- OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

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(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS FM 495 AT LOS EBANOS RD PROPOSED SIGNAL LAYOUTS

5

SHEET 1 OF 2

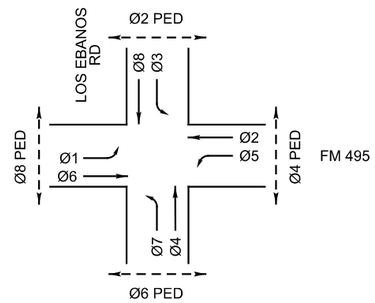
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		37
TR:					
CK TR:					

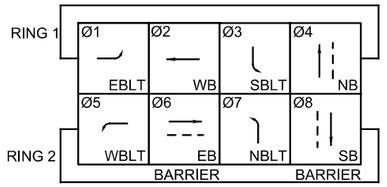
DATE: 6/6/2024 2:48:33 PM
FILE: c:\pw-tedsi-connect\d0108943\5_FM495_AT_LOS_EBANOS_PROP_SIG.dgn

ELECTRICAL SCHEDULE																
ITEM	TOTAL QTY	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	CABLE IN POLE
																PED / MAST ARM
		RUN LENGTH	8	6	21	47	15	10	24	14	47	18	6	10	32	17 / 25
POWER	39	1/C - #6 INSULATED								1						1
GROUND	358	1/C - #6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	4
SIGNAL HEADS	249	5/C - #12		1	1	1	1	1	1	2			1	1	1	2
	481	7/C - #12	1	1	1	1	2	2	2	4	1	1	1	1	2	4
VIVDS	39	VIVDS CABLING								1						1

TIMING CHART								
PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
STREET	FM 495		LOS EBANOS		FM 495		LOS EBANOS	
MOVEMENT	EBLT	WB	NBLT	SB	WBLT	EB	SBLT	NB
MIN GREEN	9.5	22.5	9.5	37.5	9.5	22.5	9.5	37
EXTENSION	3	3	3	3	3	3	3	3
MAX GREEN	9.6	23.3	9.5	37.5	9.5	23.4	9.6	37.5
YELLOW	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
ALL RED	1	1	1	1	1	1	1	1
WALK	-	4	-	4	-	4	-	4
DON'T WALK	-	12	-	23	-	12	-	23
RECALL	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASING DIAGRAM



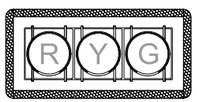


MINIMUM PEDESTRAIN TIMING						
PED PHASE	SIGNAL HEAD NUMBERS	LENGTH OF ROADWAY CURB TO CURB	FEET/SECOND	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
Ø2	W1 & W8	44	3.5	7	13	20
Ø8	W6 & W7	89	3.5	7	26	33
Ø6	W4 & W5	50	3.5	7	15	22
Ø4	W2 & W3	91	3.5	7	26	33

VIVIDS DETECTOR SCHEDULE		
SENSOR	SETTING	SPLIT PHASE INTERSECTION
VIVIDS1	ADVANCE	PH 1- 8

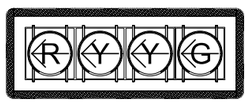
SIGNAL HEAD ARRANGEMENT

PROPOSED BACKPLATE WITH REFLECTIVE BORDER ON EXISTING 12" HORIZONTAL SIGNAL HEADS



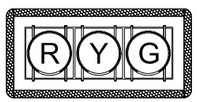
EXISTING SIGNAL HEAD NO. 2, 5, 6, 9, 11, 12

PROPOSED 12" HORIZONTAL



SY FY

PROPOSED LED SIGNAL HEAD NO. 1, 4, 7, 10



PROPOSED LED SIGNAL HEAD NO. 3, 8

SY = SOLID YELLOW
FY = FLASHING YELLOW

PROPOSED SIGN DETAILS

R10-17T
30"X30"
S1 S2 S3 S4

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
FM 495 AT LOS EBANOS RD
PROPOSED SIGNAL LAYOUTS

5

SHEET 2 OF 2

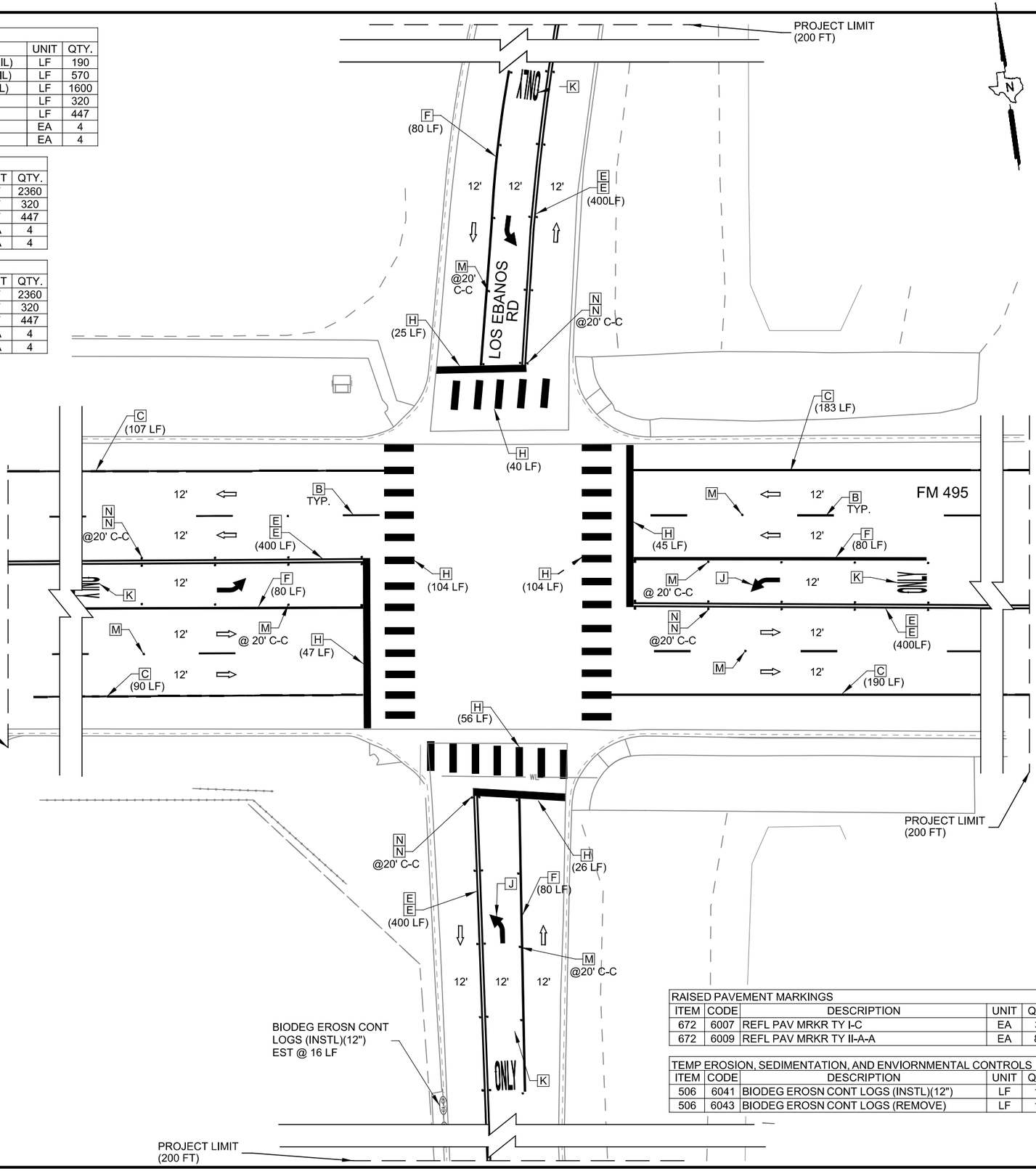
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		38
TR:					
CK TR:					

DATE: 6/6/2024 2:48:35 PM
FILE: c:\pw-tedsi-connect\d0108943\5_FM495_AT_LOS_EBANOS_PROP_SIG.dgn

PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	190
C	666	6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL)	LF	570
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	1600
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	320
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	447
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	4
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	4

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	2360
678	6004	PAV SURF PREP FOR MRK (8")	LF	320
678	6008	PAV SURF PREP FOR MRK (24")	LF	447
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	4
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	4

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	2360
666	6226	PAVEMENT SEALER 8"	LF	320
666	6230	PAVEMENT SEALER 24"	LF	447
666	6231	PAVEMENT SEALER (ARROW)	EA	4
666	6232	PAVEMENT SEALER (WORD)	EA	4



PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

- A — 6" WHITE DOT
- B — 6" WHITE BROKEN
- C — 6" WHITE SOLID
- D — 6" YELLOW BROKEN
- E — 6" YELLOW SOLID
- F — 8" WHITE SOLID
- G — 12" YELLOW SOLID
- H — 24" WHITE SOLID
- I — WHITE DBL ARROW
- J — WHITE ARROW
- K — WHITE WORD
- L — WHITE RR XING
- TRAFFIC FLOW
- C-C — CENTER TO CENTER
- STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M — TYPE I-C
- N — TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 30 60

SCALE 1" = 30'

NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. SEE PM(1-3) 22 & PM(4) 22A FOR STANDARD PAVEMENT MARKINGS & MARKERS PLACEMENT DETAILS.
4. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
5. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
6. 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).

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	31
672	6009	REFL PAV MRKR TY II-A-A	EA	80

TEMP EROSION, SEDIMENTATION, AND ENVIORNMENTAL CONTROLS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
506	6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	16
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	16

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

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Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS FM 495 AT LOS EBANOS RD PAVEMENT MARKINGS LAYOUT

5

SHEET 1 OF 1

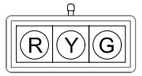
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		39
TR:					
CK TR:					

DATE: 6/6/2024 2:48:38 PM
FILE: c:\pw-tedsi-connect\d0108941\5. FM495 AT LOS EBANOS P PAV MRK.dgn

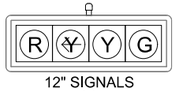
NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. MATERIALS WILL BE SALVAGED AND RETURNED TO THE CITY OF MISSION.

EXISTING SIGNAL HEADS

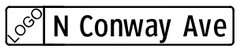


12" SIGNALS
(1)



12" SIGNALS
(2)

EXISTING SIGN OVERHEAD DETAILS

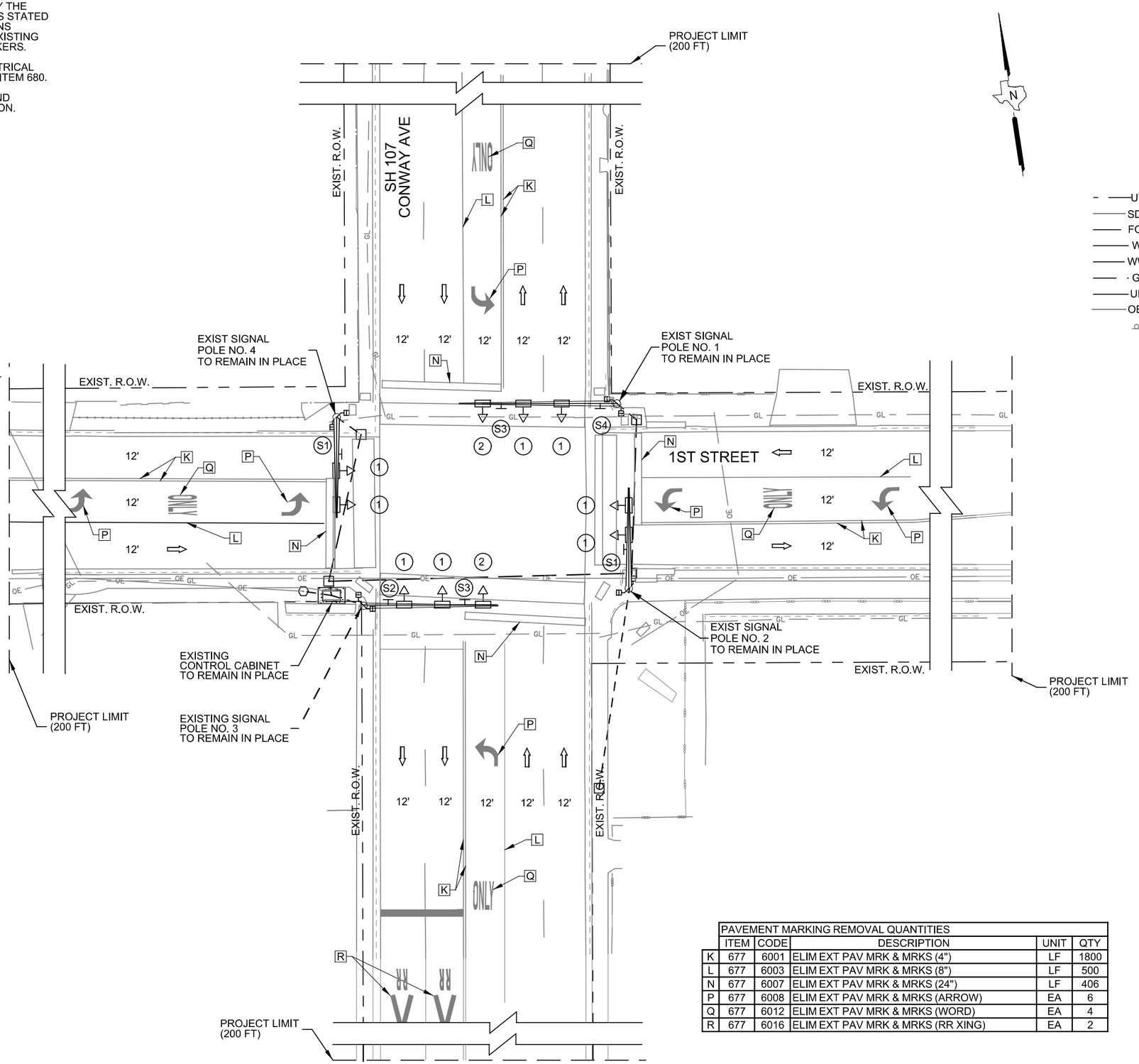


(S1)

(S2)

(S3)

(S4)



PAVEMENT MARKING REMOVAL QUANTITIES					
	ITEM	CODE	DESCRIPTION	UNIT	QTY
K	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1800
L	677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	500
N	677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	406
P	677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	6
Q	677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	4
R	677	6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA	2

LEGEND

- EXISTING SIGNAL POLE
- EXISTING SPAN WIRE
- EXISTING MAST ARM
- EXISTING HORIZONTAL SIGNAL HEAD
- EXISTING PEDESTRIAN HEAD
- EXISTING CONTROLLER CABINET
- EXISTING GROUND BOX
- EXISTING ELECTRICAL SERVICE
- EXISTING VIVDS CAMERA
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING CONDUIT (BORE)
- EXISTING CONDUIT (TRENCH)
- UT — UNDERGROUND TELEPHONE LINE
- SDB — STORM DRAIN BOX
- FOC — FIBER OPTIC CABLE
- WL — WATER LINE
- WWL — WASTE WATER LINE
- GL — GAS LINE
- UE — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- EXISTING GROUND SIGN

0 30 60
SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS CONWAY AVE AT 1ST STREET EXISTING CONDITIONS LAYOUT

6

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		40
TR:					
CK TR:					

DATE: 6/6/2024 2:48:41 PM
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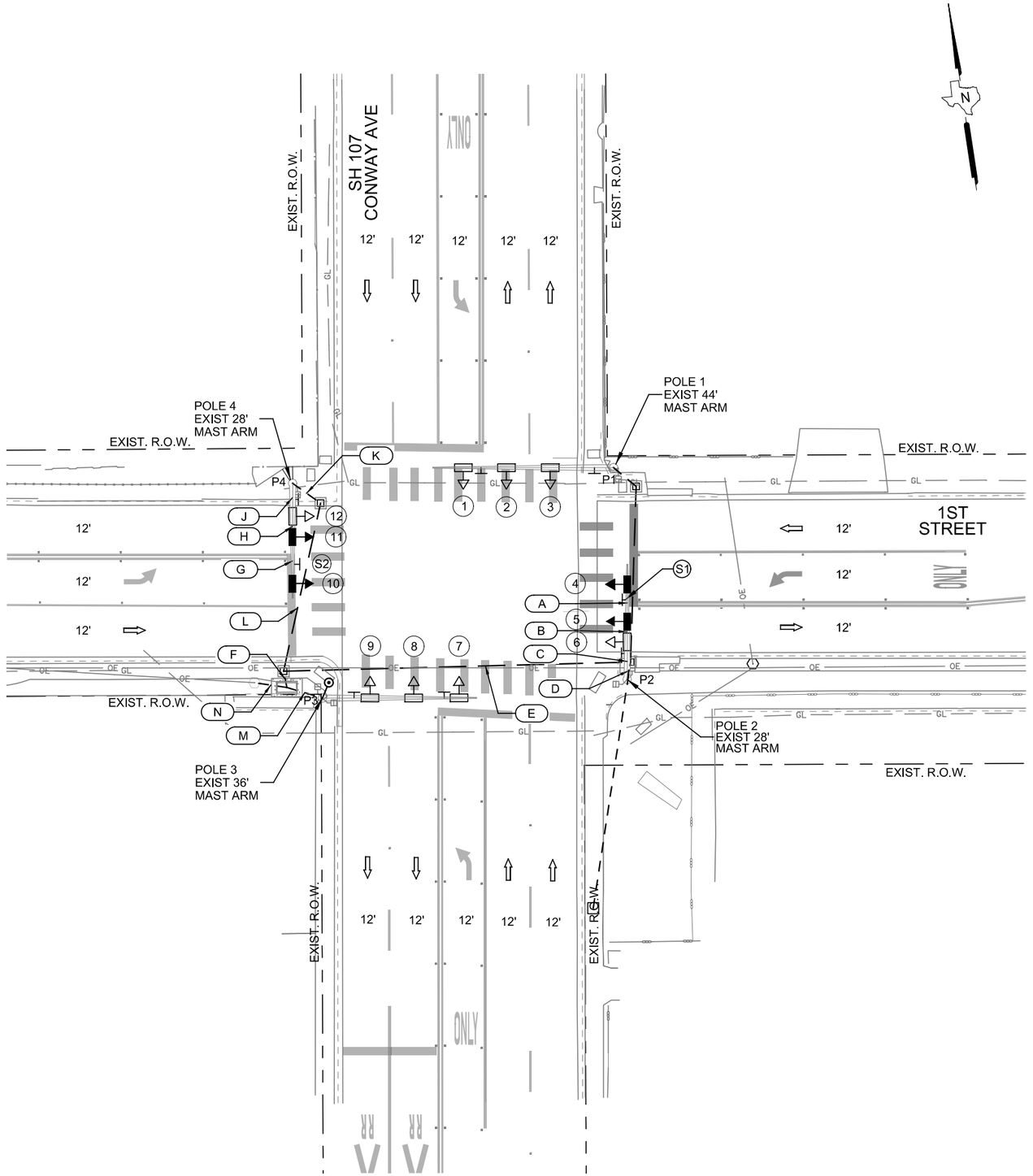
NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW FULL TRAFFIC ACTUATED FLASHING YELLOW ARROW (FYA) CAPABLE CONTROLLER UNIT COMPATIBLE WITH ATMS.COM, W/NEW CABINET & FOUNDATION, LED SIGNAL HEADS, SIGNAL CABLE, GROUND BOXES, CONDUIT RUNS AND RADAR DETECTORS AS SHOWN.
2. CONTACT MAURICIO DIAZ (956-702-6227) TWO WEEKS IN ADVANCE TO SCHEDULE THE FYA CONVERSION FOR EACH INTERSECTION. PLAN ONE CONVERSION A DAY.
3. THE LOCATION FOR THE CONTROLLER, TRAFFIC SIGNAL POLES AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE TXDOT/CITY OF MISSION.
4. ALL SIGNAL CABLE SHALL BE #12 AWG AND IMSA APPROVED. SERVICE WIRE SHALL BE #6 AWG XHHW, VIVDS CABLES AS PER MANUFACTURER.
5. THE OPEN TRENCH METHOD FOR PLACING CONDUIT UNDER PAVEMENT WILL NOT BE ALLOWED.
6. ALL TRAFFIC SIGNAL HEADS SHALL HAVE NEW REFLECTIVE BACKPLATES.
7. THE CONTRACTOR SHALL REFER TO THE SIGNING AND PAVEMENT MARKING LAYOUTS FOR EXACT LOCATION OF PROPOSED PAVEMENT MARKINGS.
8. CONDUCTOR/CONDUIT QUANTITIES INCLUDE HORIZONTAL/VERTICAL MEASUREMENTS FOR SPAN WIRE, SIGNAL POLES, SIGNAL HEADS, VIVDS, ELECTRICAL SERVICE, GROUND BOXES AND LUMINAIRES.
9. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.
10. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.



LEGEND

- MAST ARM POLE
- STRAIN POLE
- PEDESTAL POLE
- SPAN WIRE
- HORIZONTAL SIGNAL HEAD
- SIGNAL HEAD BACKPLATE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING GROUND MOUNTED CABINET
- EXISTING GROUND BOX
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING LUMINAIRE
- EXISTING OVERHEAD SIGN
- PEDESTRIAN SIGNAL HEAD W/AUDIBLE PEDESTRIAN SIGNAL
- VIVDS CAMERA (ADVANCED/PRESENCE)
- GROUND MOUNTED CONTROLLER CABINET
- POLE MOUNTED ELECTRICAL SERVICE W/METER
- GROUND BOX (TYPE A) W/APRON
- GROUND BOX (TYPE D) W/APRON
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- LUMINAIRE
- OVERHEAD SIGN
- DIRECTION OF TRAFFIC FLOW

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS CONWAY AVE AT 1ST STREET PROPOSED SIGNAL LAYOUTS

6

SHEET 1 OF 2

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		41
TR:					
CK TR:					

DATE: 6/6/2024 2:48:43 PM
FILE: c:\pw-tedsi-connect\d0108943\6_CONWAY_AT_FIRST_PROP_SIG.dgn

ELECTRICAL SCHEDULE																
ITEM	TOTAL QTY	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	CABLE IN POLE
		RUN LENGTH	10	5	10	5	85	5	12	5	9	9	42	10	8	PED / MAST ARM
																17 / 25
POWER	33	1/C - #6 INSULATED													1	1
GROUND	315	1/C - #6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	4
SIGNAL HEADS	230	5/C - #12		1	1	1	1	2		1	1	1	1			2
	252	7/C - #12	1	1	1	1	1	2	1	1	1	1	1			2
VIVDS	35	VIVDS CABLING												1		1

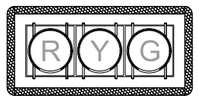
TIMING CHART								
PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
STREET	CONWAY AVE		1ST STREET		CONWAY AVE		1ST STREET	
MOVEMENT	NBLT	SB	EBLT	WB	SBLT	NB	WBLT	EB
MIN GREEN	9.5	22.5	9.5	37.5	9.5	22.5	9.5	37.5
EXTENSION	3	3	3	3	3	3	3	3
MAX GREEN	9.5	23.5	9.5	37.5	9.5	23.5	9.5	37.5
YELLOW	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
ALL RED	1	1	1	1	1	1	1	1
WALK	-	4	-	4	-	4	-	4
DON'T WALK	-	12	-	18	-	12	-	18
RECALL	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

MINIMUM PEDESTRAIN TIMING						
PED PHASE	SIGNAL HEAD NUMBERS	LENGTH OF ROADWAY CURB TO CURB	FEET/SECOND	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
Ø4	W2& W3	57	3.5	7	17	24
Ø6	W4 & W5	40	3.5	7	12	19
Ø8	W6 & W7	61	3.5	7	18	25
Ø2	W8 & W1	40	3.5	7	12	19

VIVDS DETECTOR SCHEDULE		
SENSOR	SETTING	SPLIT PHASE INTERSECTION
VIVDS1	ADVANCE	PH 1- 8

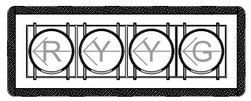
SIGNAL HEAD ARRANGEMENT

PROPOSED BACKPLATE WITH REFLECTIVE BORDER ON EXISTING 12" HORIZONTAL SIGNAL HEADS



EXISTING SIGNAL HEAD
NO. 2, 3, 6, 8, 9, 12

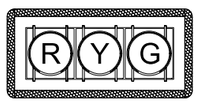
PROPOSED BACKPLATE WITH REFLECTIVE BORDER ON EXISTING 12" HORIZONTAL SIGNAL HEADS



SY FY

EXISTING SIGNAL HEAD
NO. 1, 7

PROPOSED 12" HORIZONTAL



PROPOSED
LED SIGNAL NO. 5,11

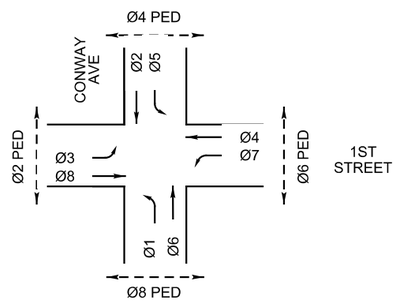
PROPOSED 12" HORIZONTAL

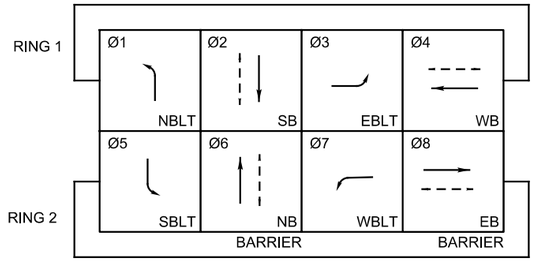
SY FY

PROPOSED
LED SIGNAL NO. 4, 10

SY = SOLID YELLOW
FY = FLASHING YELLOW

PHASING DIAGRAM





PROPOSED SIGN DETAILS

R10-17T
30"X30"
(S1)(S2)

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

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CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
CONWAY AVE AT 1ST STREET
PROPOSED SIGNAL LAYOUTS

6

SHEET 2 OF 2

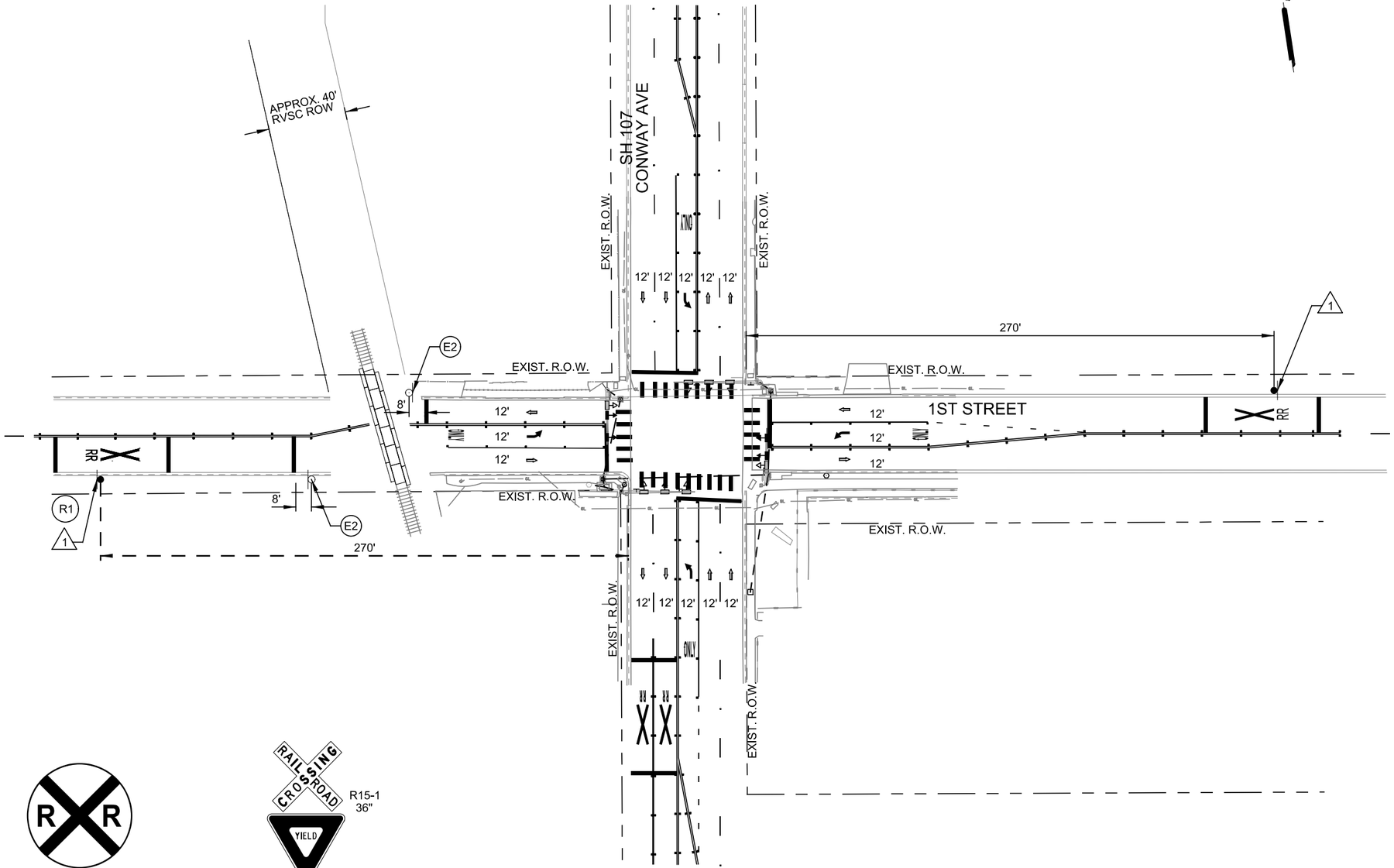
DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		42
TR:					
CK TR:					

DATE: 6/6/2024 2:48:44 PM
FILE: c:\pw-tedsi-connect\d0108943\6_CONWAY_AT_FIRST_PROP_SIG.dgn

SIGN QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
644	6076	REMOVE SM RD SN SUP&AM	EA	1

SIGNAGE LEGEND

- E# — EXISTING SIGN TO REMAIN IN PLACE
- R# — EXISTING SIGN TO BE REMOVED
- # — PROPOSED SIGN



W10-1
36" DIA.

1

E1

R15-1
36"

R1-2
36"X36"X36"

E2

0 60 120

SCALE 1" = 60'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

Martina Mejia

AUTHORIZED 06-06-2024

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CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
CONWAY AVE AT 1ST STREET
SIGNING LAYOUT

6

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		43
TR:					
CK TR:					

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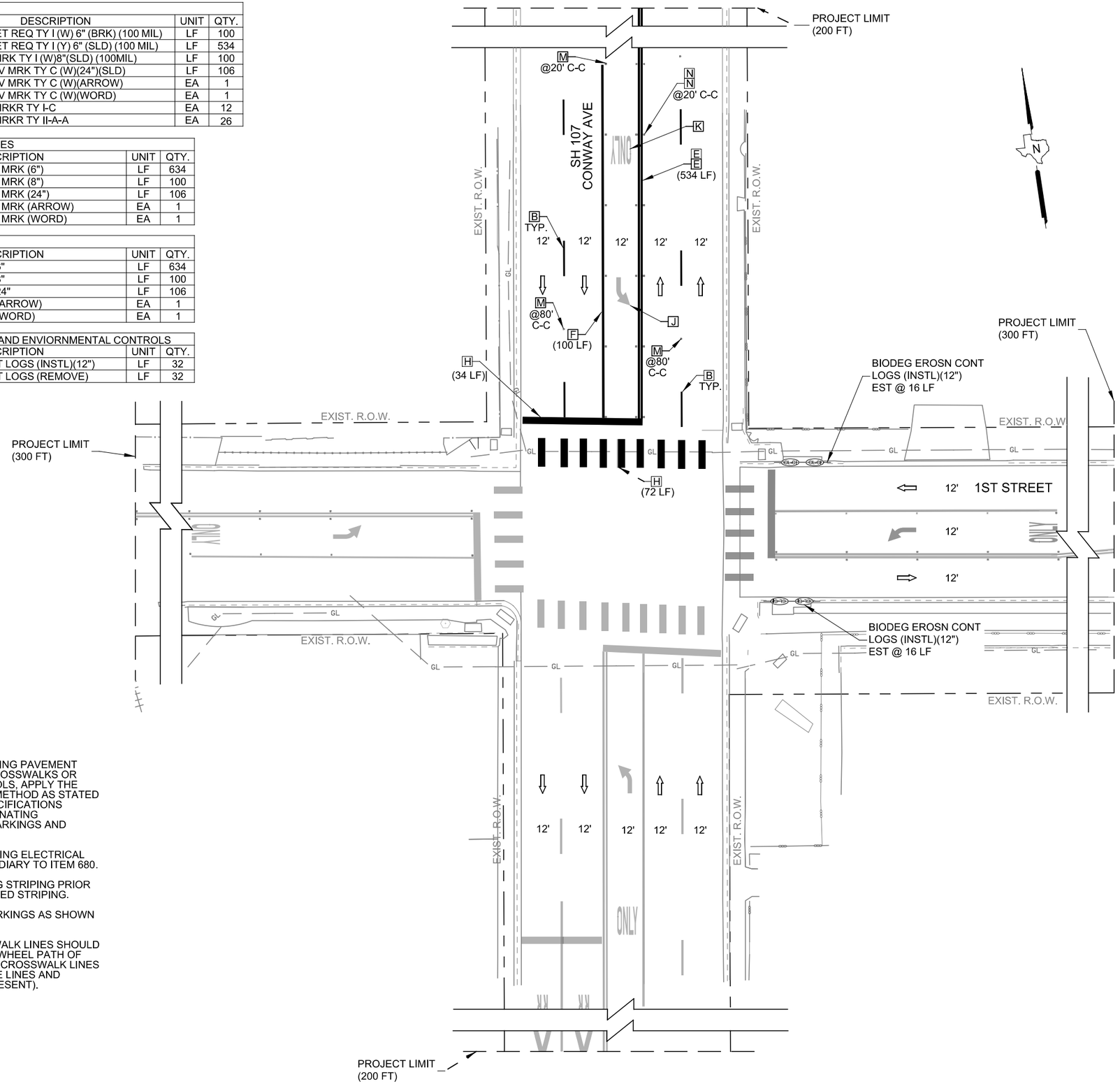
PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	100
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	534
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	100
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	106
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	1
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	1
M	672	6007	REFL PAV MRKR TY I-C	EA	12
N	672	6009	REFL PAV MRKR TY II-A-A	EA	26

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	634
678	6004	PAV SURF PREP FOR MRK (8")	LF	100
678	6008	PAV SURF PREP FOR MRK (24")	LF	106
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	1

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	634
666	6226	PAVEMENT SEALER 8"	LF	100
666	6230	PAVEMENT SEALER 24"	LF	106
666	6231	PAVEMENT SEALER (ARROW)	EA	1
666	6232	PAVEMENT SEALER (WORD)	EA	1

TEMP EROSION, SEDIMENTATION, AND ENVIORNMENTAL CONTROLS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
506	6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	32
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	32



NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
4. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
5. 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).

PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

- A — 6" WHITE DOT
- B — 6" WHITE BROKEN
- C — 6" WHITE SOLID
- D — 6" YELLOW BROKEN
- E — 6" YELLOW SOLID
- F — 8" WHITE SOLID
- G — 12" YELLOW SOLID
- H — 24" WHITE SOLID
- I — WHITE DBL ARROW
- J — WHITE ARROW
- K — WHITE WORD
- L — WHITE RR XING
- TRAFFIC FLOW
- C-C — CENTER TO CENTER
- STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M — TYPE I-C
- N — TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED
PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 E. Expressway 83
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
CONWAY AVE AT 1ST STREET
PAVEMENT MARKINGS
LAYOUT

6

SHEET 1 OF 4

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		44
TR:					
CK TR:					

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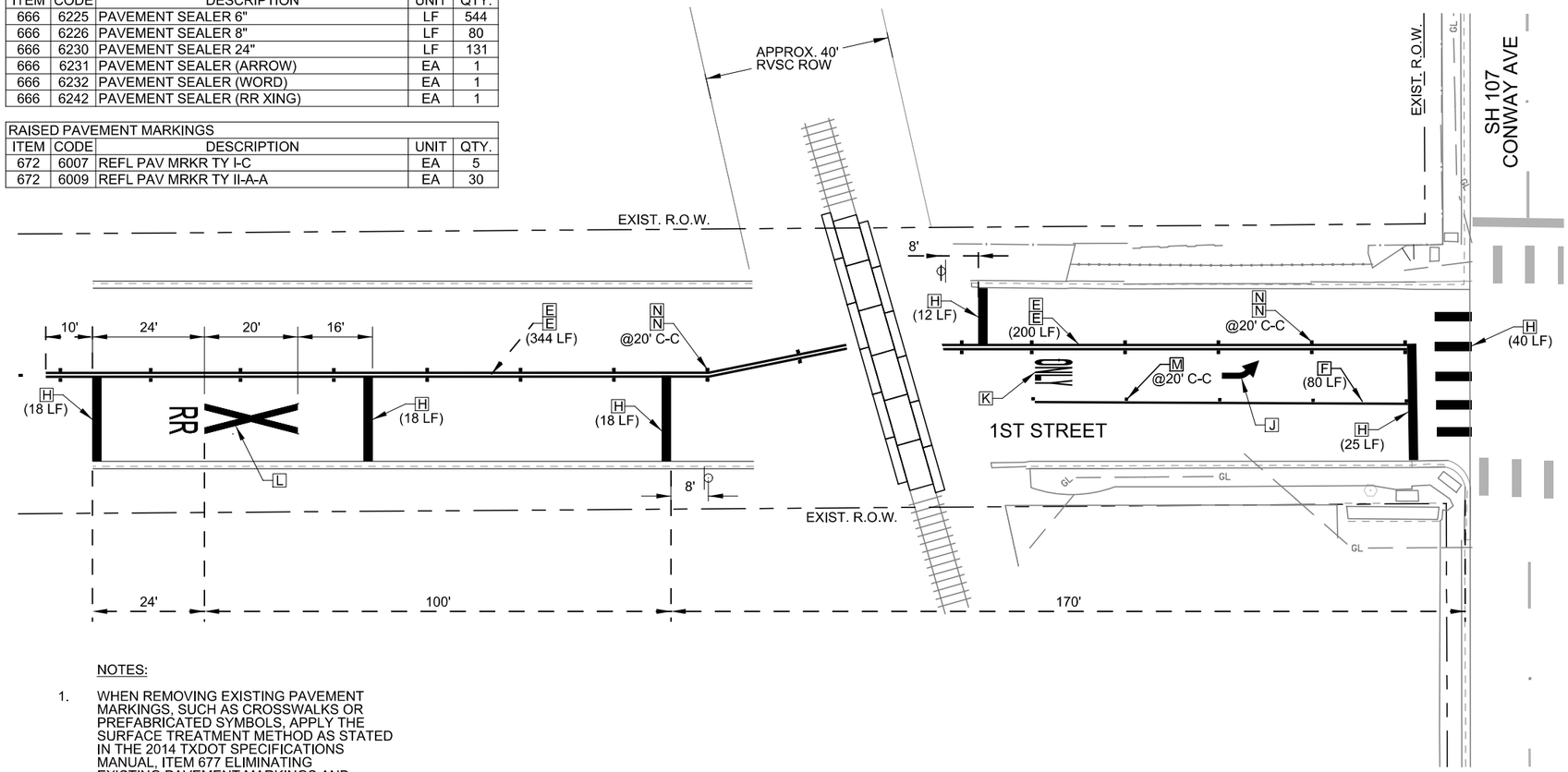
PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	544
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	80
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	131
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	1
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	1
L	666	6093	REFL PAV MRK TY I (W)(RR XING)(100MIL)	EA	1

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	544
678	6004	PAV SURF PREP FOR MRK (8")	LF	80
678	6008	PAV SURF PREP FOR MRK (24")	LF	131
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	1
678	6020	PAV SURF PREP FOR MRK (RR XING)	EA	1

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	544
666	6226	PAVEMENT SEALER 8"	LF	80
666	6230	PAVEMENT SEALER 24"	LF	131
666	6231	PAVEMENT SEALER (ARROW)	EA	1
666	6232	PAVEMENT SEALER (WORD)	EA	1
666	6242	PAVEMENT SEALER (RR XING)	EA	1

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	5
672	6009	REFL PAV MRKR TY II-A-A	EA	30



NOTES:

1. WHEN REMOVING EXISTING PAVEMENT MARKINGS, SUCH AS CROSSWALKS OR PREFABRICATED SYMBOLS, APPLY THE SURFACE TREATMENT METHOD AS STATED IN THE 2014 TXDOT SPECIFICATIONS MANUAL, ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS.
2. THE REMOVAL OF EXISTING ELECTRICAL SERVICE WILL BE SUBSIDIARY TO ITEM 680.
3. ELIMINATE CONFLICTING STRIPING PRIOR TO INSTALLING PROPOSED STRIPING.
4. INSTALL PAVEMENT MARKINGS AS SHOWN ON LAYOUTS/PLANS.
5. 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).

PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

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- L — WHITE RR XING
- TRAFFIC FLOW
- C-C — CENTER TO CENTER
- STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

- M — TYPE I-C
- N — TYPE II-A-A

SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
MARTINA MEJIA
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LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

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Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
CONWAY AVE AT 1ST STREET
PAVEMENT MARKINGS
LAYOUT

6

SHEET 2 OF 4

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		45
TR:					
CK TR:					

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PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
A	666	6030	REFL PAV MRK TY I (W)8"(DOT) (100MIL)	LF	21
B	666	6306	RE PM W/RET REQ TY I (W) 6" (BRK) (100 MIL)	LF	70
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	512
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	216
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	154
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	1
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	1
L	666	6093	REFL PAV MRK TY I (W)(RR XING)(100MIL)	EA	2

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	582
678	6004	PAV SURF PREP FOR MRK (8")	LF	237
678	6008	PAV SURF PREP FOR MRK (24")	LF	154
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	1
678	6020	PAV SURF PREP FOR MRK (RR XING)	EA	2

PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	582
666	6226	PAVEMENT SEALER 8"	LF	237
666	6230	PAVEMENT SEALER 24"	LF	154
666	6231	PAVEMENT SEALER (ARROW)	EA	1
666	6232	PAVEMENT SEALER (WORD)	EA	1
666	6242	PAVEMENT SEALER (RR XING)	EA	2

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	22
672	6009	REFL PAV MRKR TY II-A-A	EA	24

NOTES:

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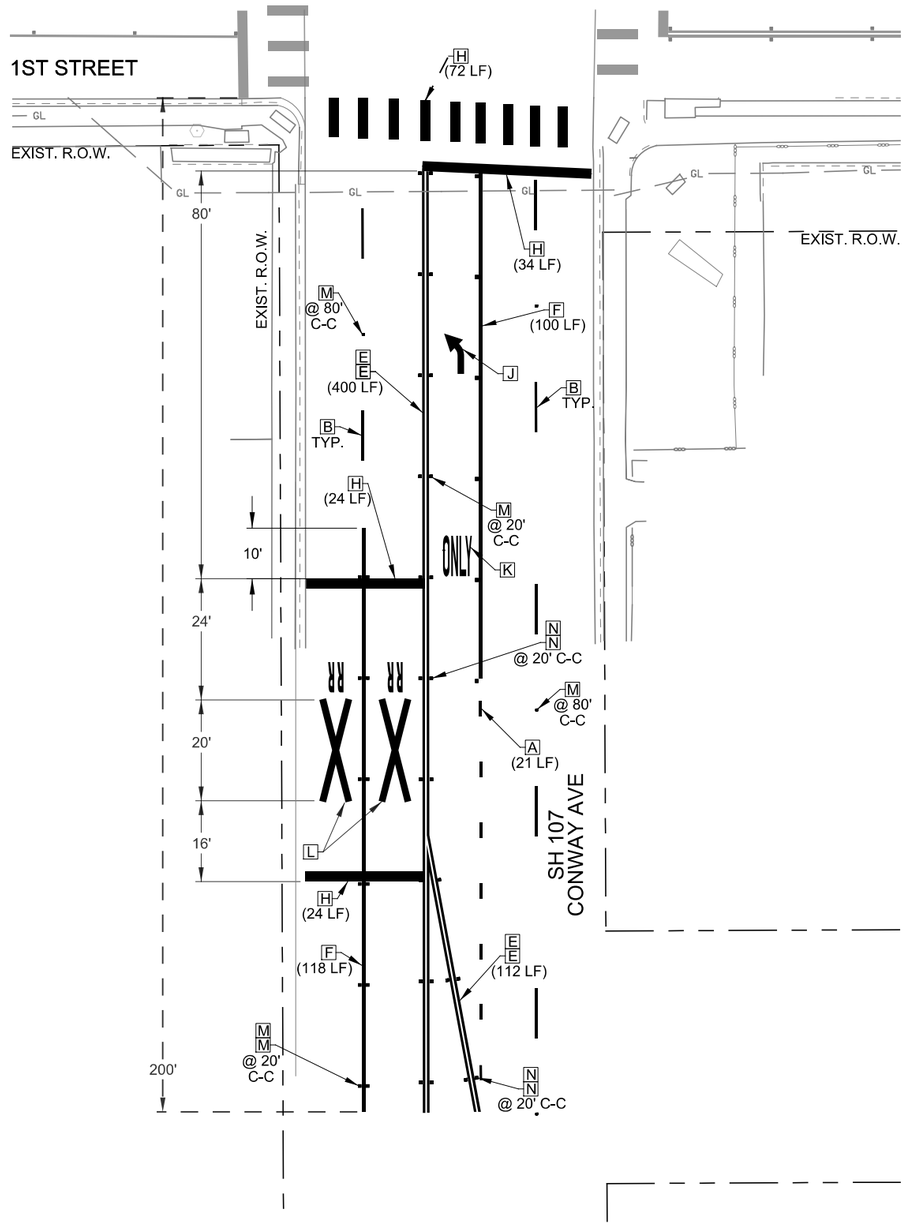

PAVEMENT MARKINGS LEGEND

TYPE I -THERMOPLASTIC (ITEM 666)

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RAISED PAVEMENT MARKERS (ITEM 672)

- M — TYPE I-C
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SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 30 60

SCALE 1" = 30'

STATE OF TEXAS
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CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION SIGNAL IMPROVEMENTS CONWAY AVE AT 1ST STREET PAVEMENT MARKINGS LAYOUT

6

SHEET 3 OF 4

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		46
TR:					
CK TR:					

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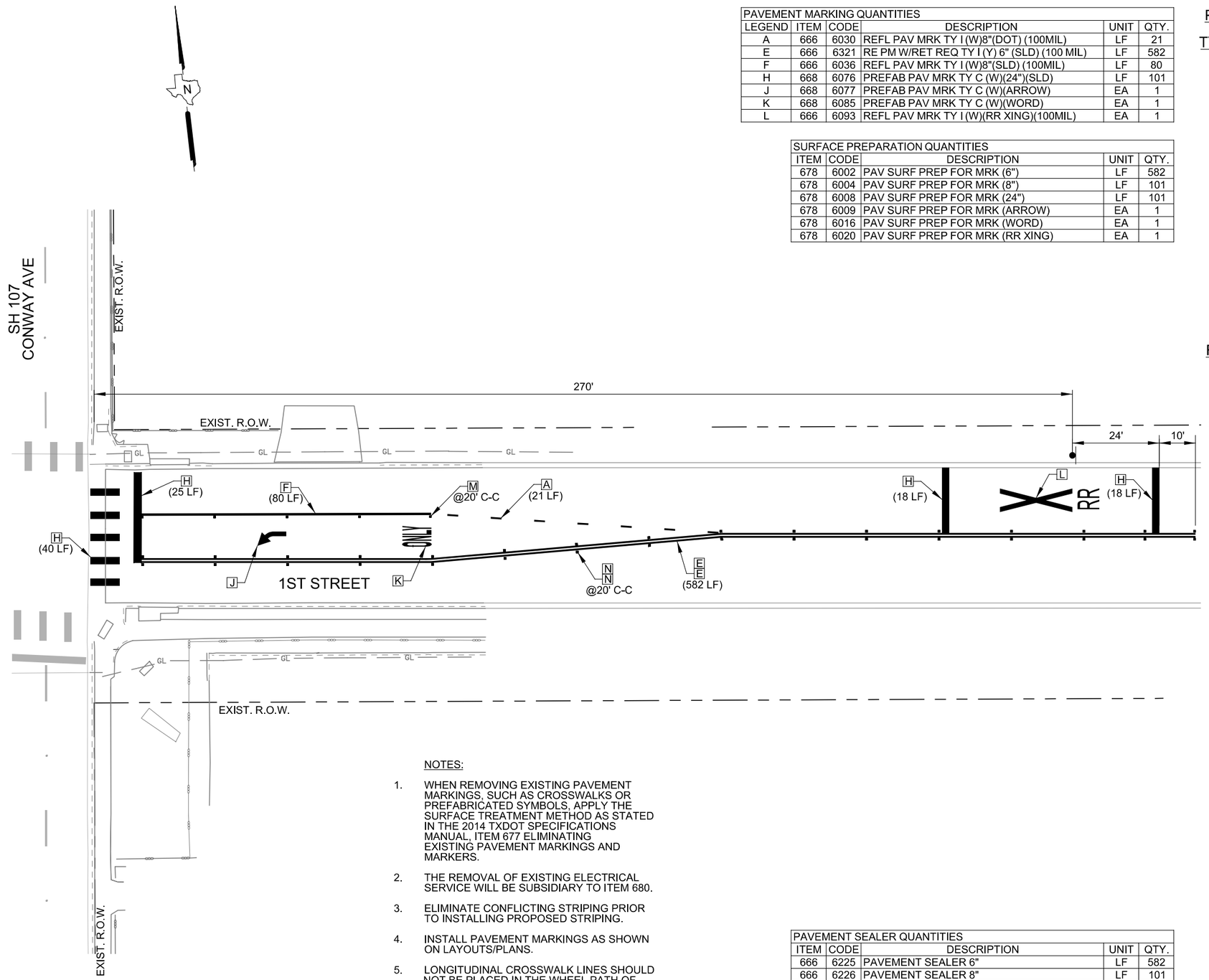

PAVEMENT MARKING QUANTITIES					
LEGEND	ITEM	CODE	DESCRIPTION	UNIT	QTY.
A	666	6030	REFL PAV MRK TY I (W)8"(DOT) (100MIL)	LF	21
E	666	6321	RE PM W/RET REQ TY I (Y) 6" (SLD) (100 MIL)	LF	582
F	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	80
H	668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	101
J	668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	1
K	668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	1
L	666	6093	REFL PAV MRK TY I (W)(RR XING)(100MIL)	EA	1

SURFACE PREPARATION QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
678	6002	PAV SURF PREP FOR MRK (6")	LF	582
678	6004	PAV SURF PREP FOR MRK (8")	LF	101
678	6008	PAV SURF PREP FOR MRK (24")	LF	101
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	1
678	6020	PAV SURF PREP FOR MRK (RR XING)	EA	1

PAVEMENT MARKINGS LEGEND

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- ⇨ — TRAFFIC FLOW
- C-C — CENTER TO CENTER
- - - — STATION LIMITS

RAISED PAVEMENT MARKERS (ITEM 672)

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SMALL ROADSIDE ASSEMBLIES

- SMALL ROADSIDE SIGN (GROUND) (ITEM 644)

0 30 60

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PAVEMENT SEALER QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
666	6225	PAVEMENT SEALER 6"	LF	582
666	6226	PAVEMENT SEALER 8"	LF	101
666	6230	PAVEMENT SEALER 24"	LF	101
666	6231	PAVEMENT SEALER (ARROW)	EA	1
666	6232	PAVEMENT SEALER (WORD)	EA	1
666	6242	PAVEMENT SEALER (RR XING)	EA	1

RAISED PAVEMENT MARKINGS				
ITEM	CODE	DESCRIPTION	UNIT	QTY.
672	6007	REFL PAV MRKR TY I-C	EA	5
672	6009	REFL PAV MRKR TY II-A-A	EA	32

STATE OF TEXAS
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CITY OF MISSION
SIGNAL IMPROVEMENTS
CONWAY AVE AT 1ST STREET
PAVEMENT MARKINGS
LAYOUT

6

SHEET 4 OF 4

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		47
TR:					
CK TR:					

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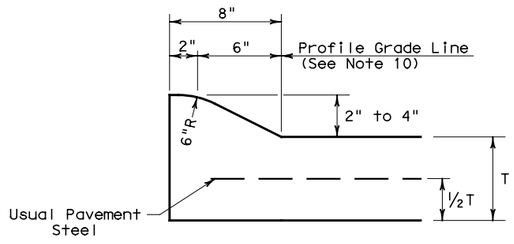
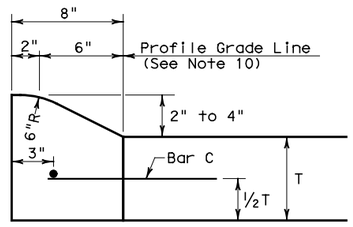
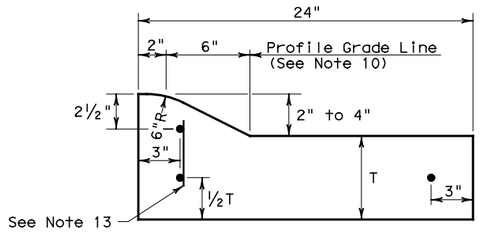


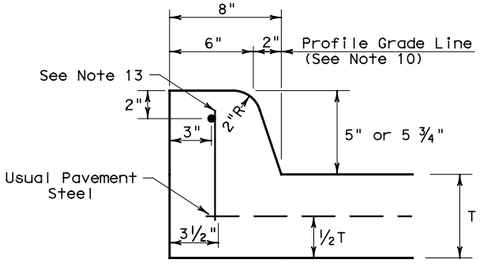
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



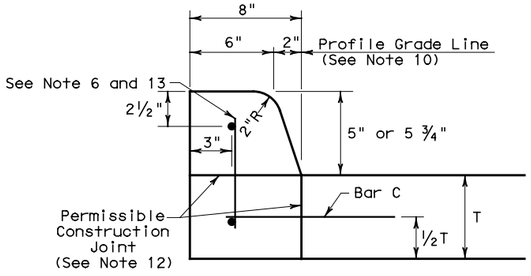
TYPE I CURB
2" - 4" HEIGHT



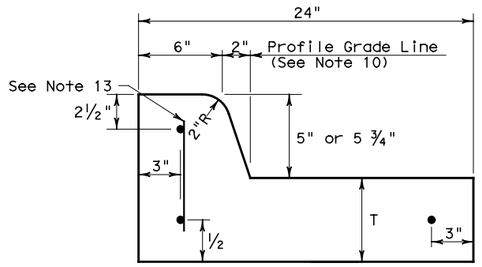
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



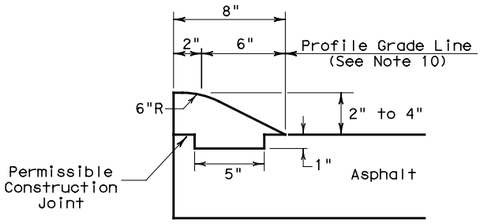
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



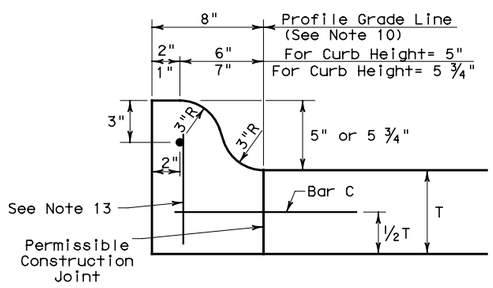
TYPE II CURB
5" - 5 ¾" HEIGHT



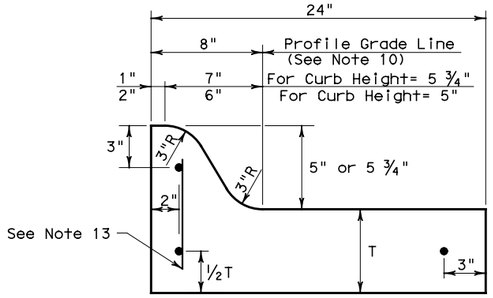
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



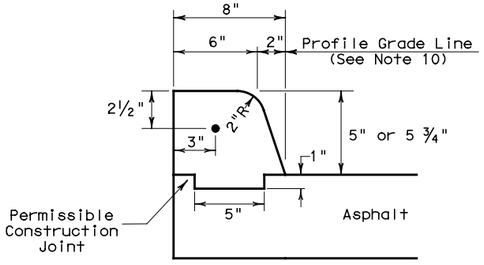
TYPE III CURB (KEYED)
2" - 4" HEIGHT



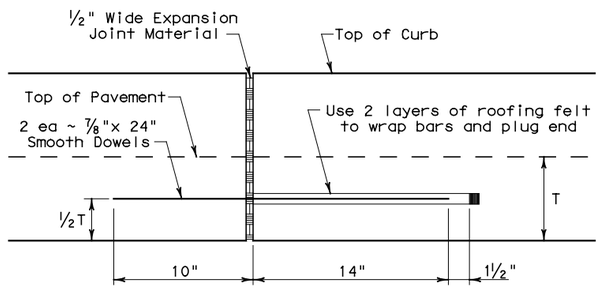
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

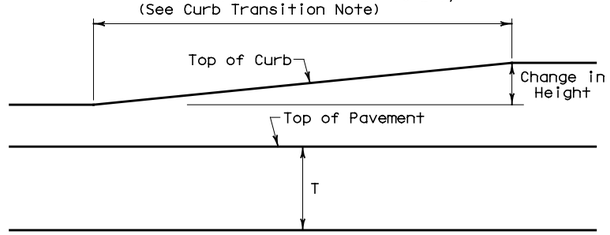


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

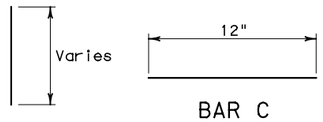
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

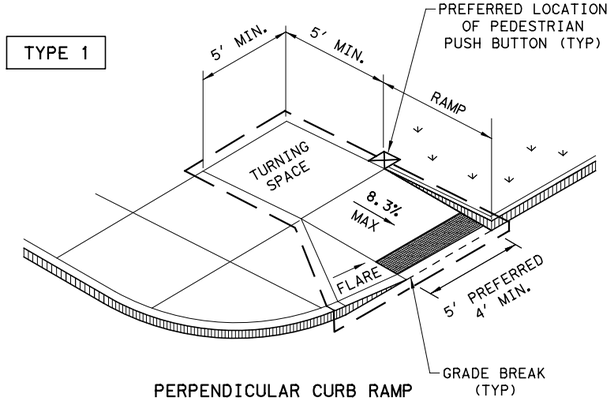
CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
©TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		48

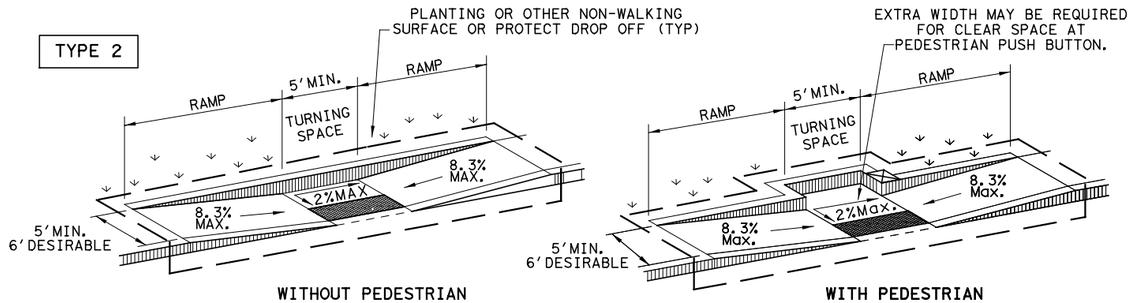
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

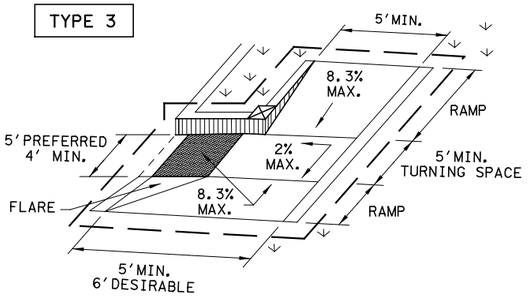


WITHOUT PEDESTRIAN PUSH BUTTON

WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3



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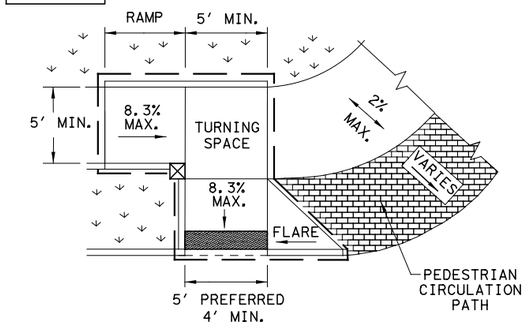
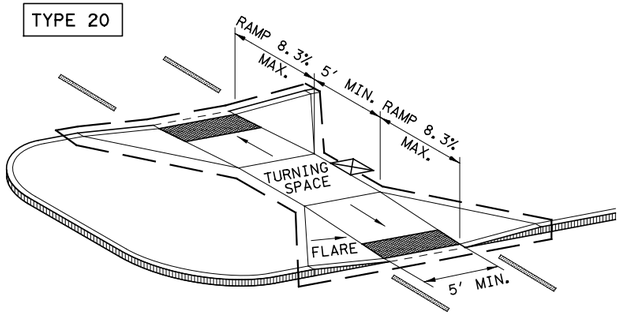


COMBINATION CURB RAMPS

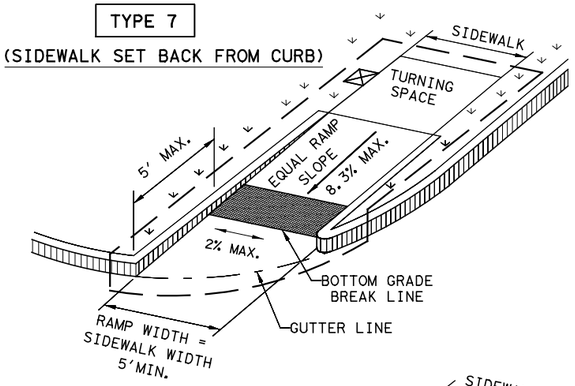
TYPE 20



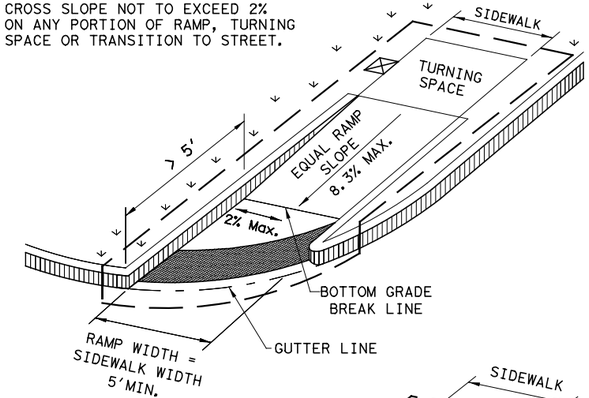
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

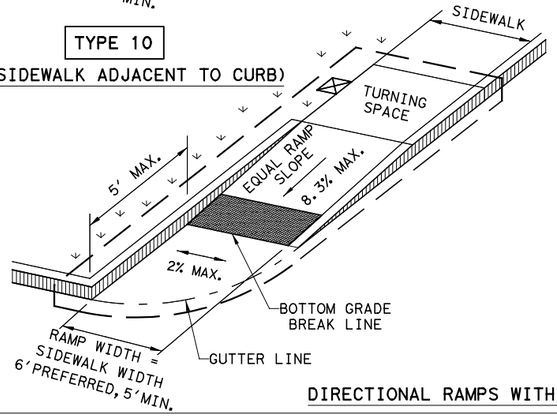


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

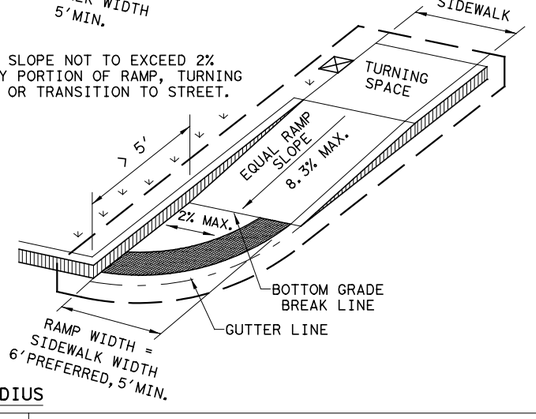


TYPE 10

(SIDEWALK ADJACENT TO CURB)

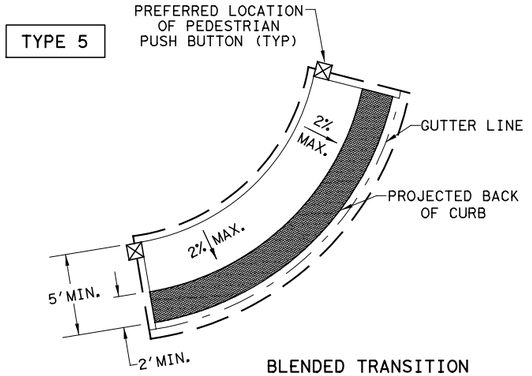


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

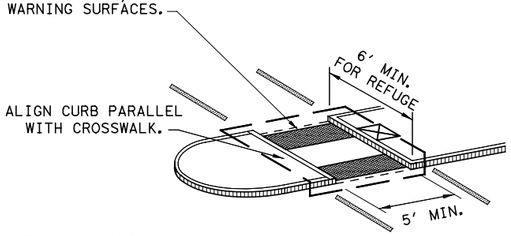
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

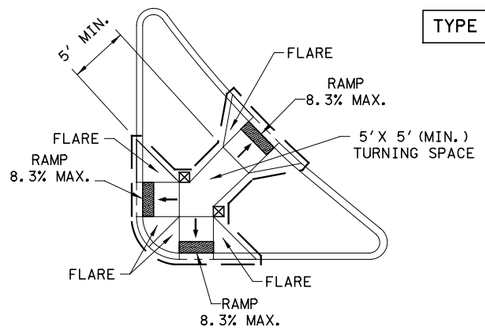
TYPE 21

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.



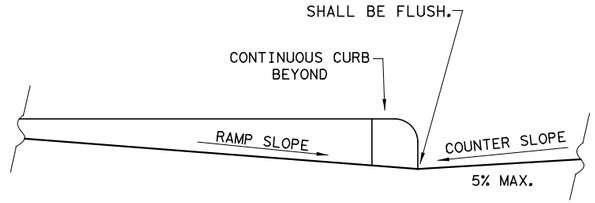
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

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

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	0921	02	501,ETC	VARIOUS
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		49

DATE:
FILE:

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 applicaible standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

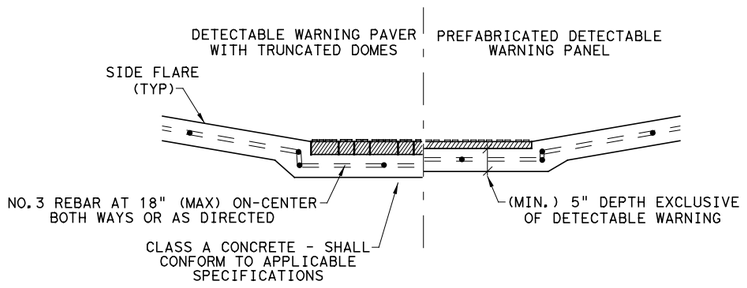
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material 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.

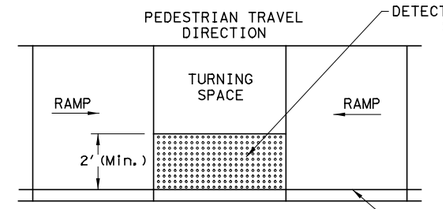
SIDEWALKS

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.



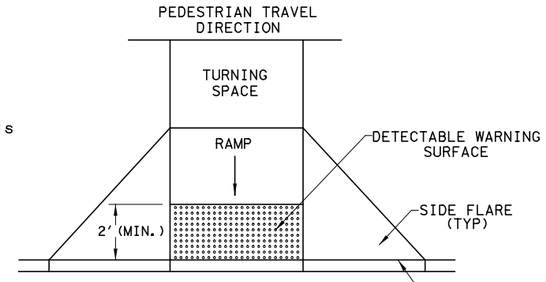
SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS



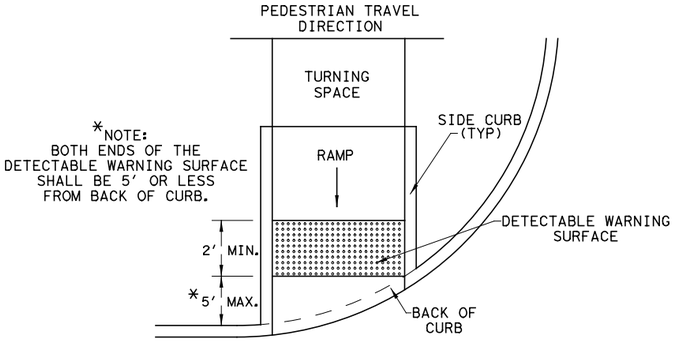
PARALLEL CURB RAMP

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.

Texas Department of Transportation | Design Division Standard

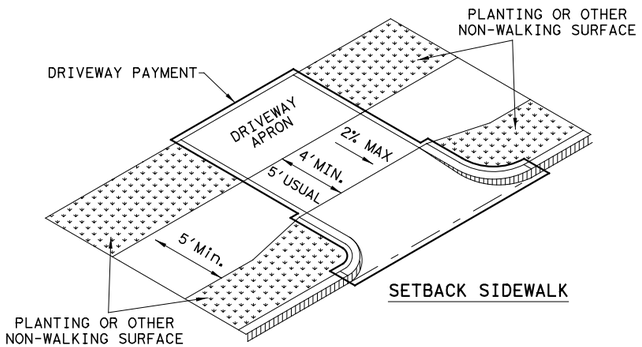
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

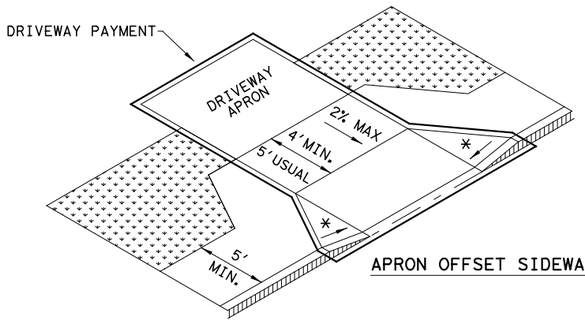
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	0921	02	501.ETC		VARIOUS
	DIST	COUNTY			SHEET NO.
	PHR	HIDALGO			50

DATE:
FILE:

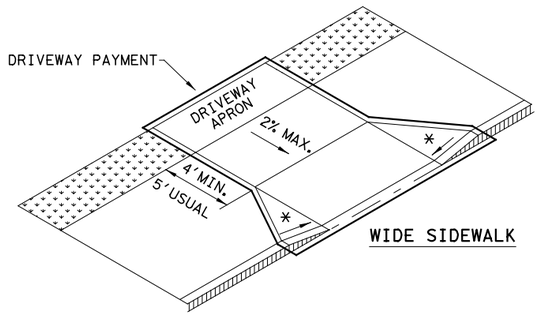
SIDEWALK TREATMENT AT DRIVEWAYS



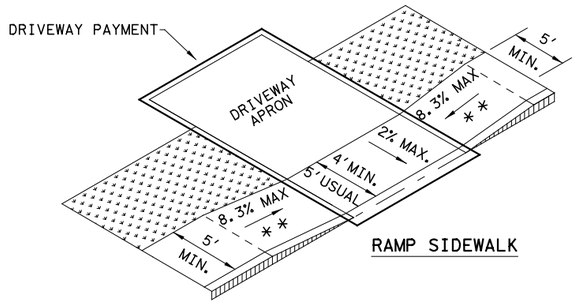
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

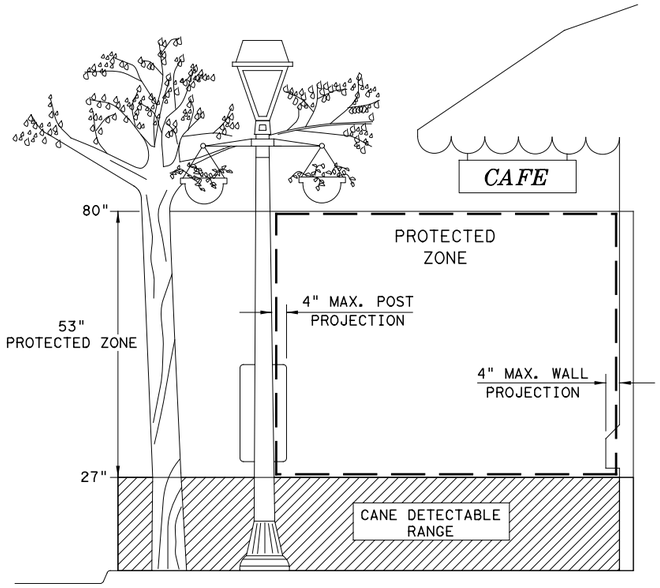


RAMP SIDEWALK

NOTES:

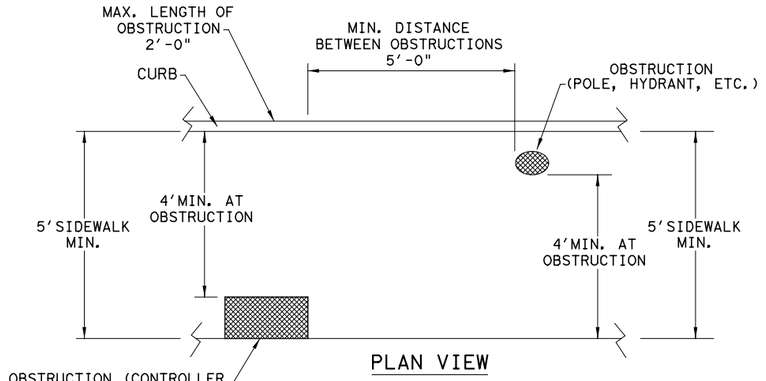
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * 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

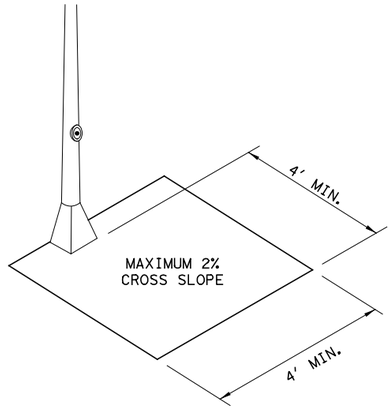
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



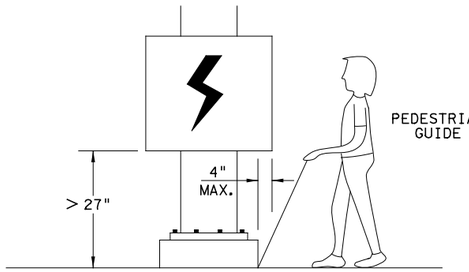
PLAN VIEW

PLACEMENT OF STREET FIXTURES

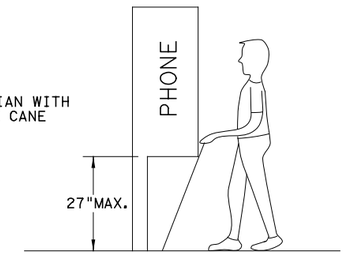
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



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
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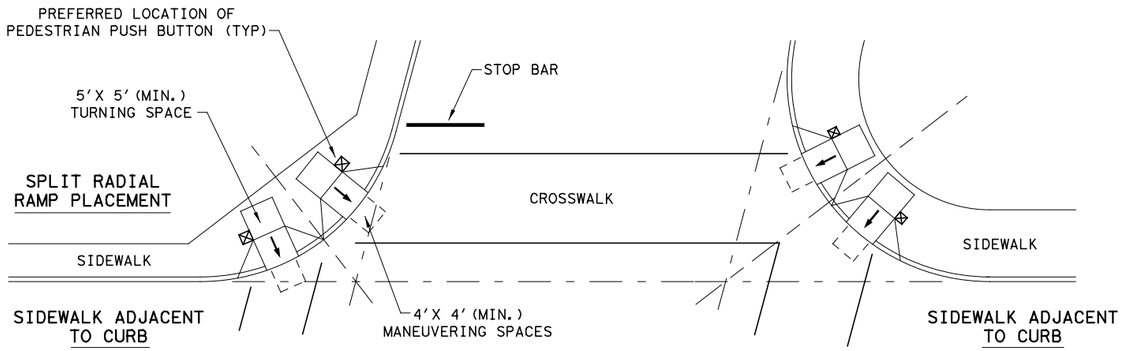
REVISIONS	0921	02	501,ETC		VARIOUS
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	PHR	HIDALGO			51

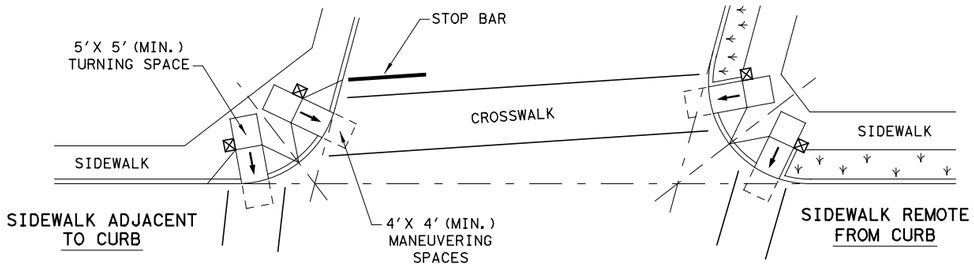
DATE:
FILE:

TYPICAL CROSSING LAYOUTS

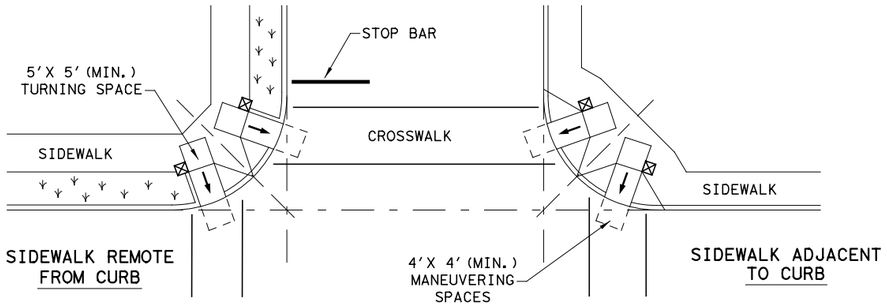
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



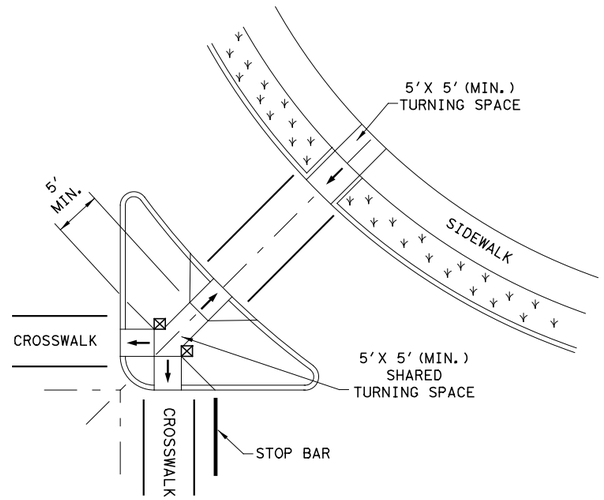
SKEWED INTERSECTION WITH "LARGE" RADIUS



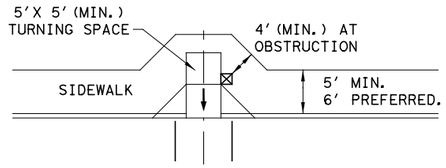
SKEWED INTERSECTION WITH "SMALL" RADIUS

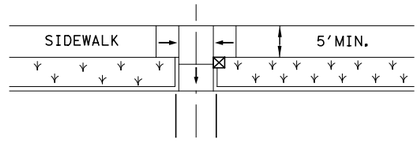


NORMAL INTERSECTION WITH "SMALL" RADIUS



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.

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PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
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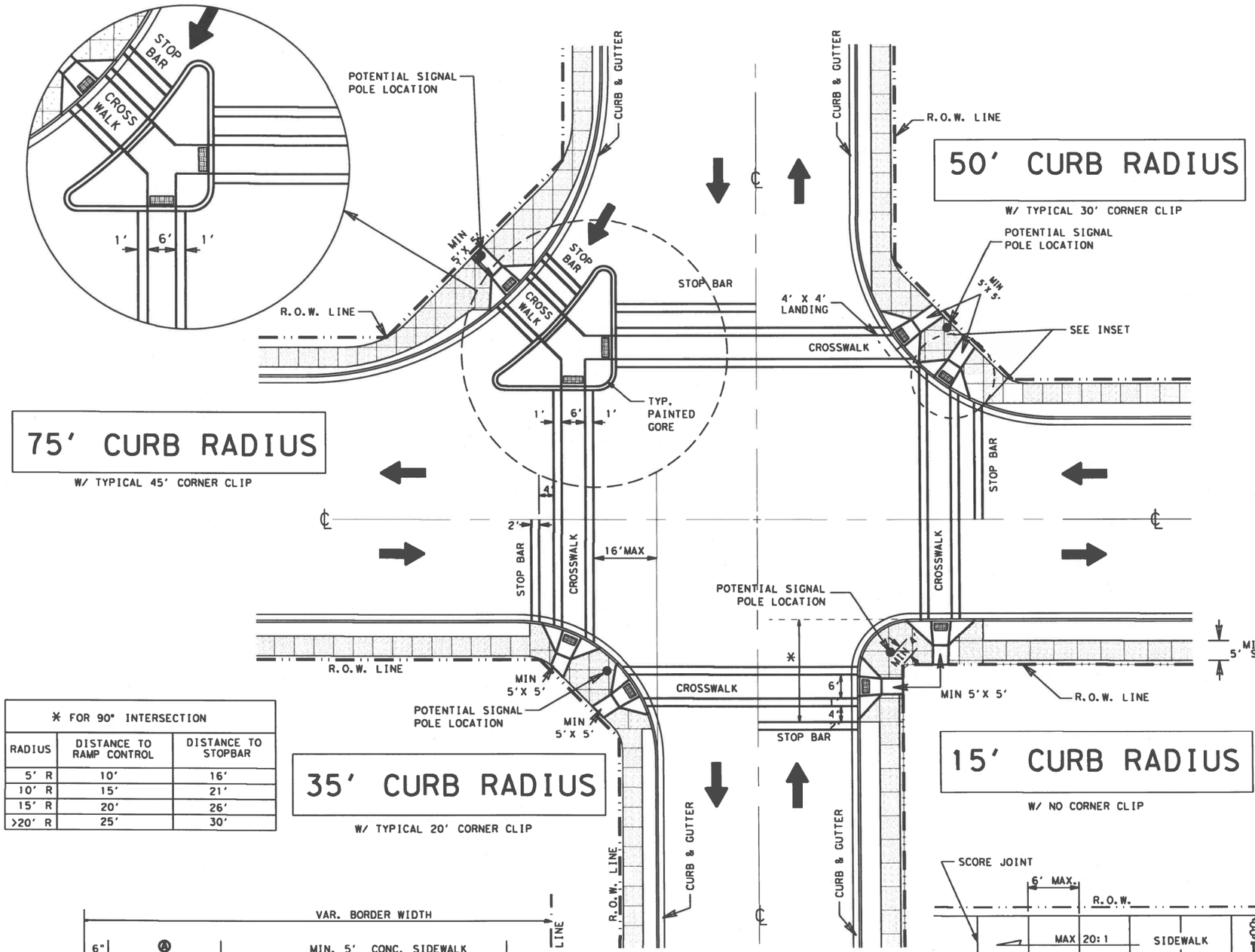
REVISIONS	0921	02	501,ETC		VARIOUS
REVISED 08,2005	DIST	COUNTY			SHEET NO.
REVISED 06,2012	PHR	HIDALGO			52
REVISED 01,2018					

GENERAL NOTES

- ALL RAMPS SHALL HAVE A 5' x 5' LANDING PAD.
- RAMP CENTER TO BE PERPENDICULAR TO FACE OF CURB. A PERPENDICULAR RAMP MAY BE LOCATED WITHIN THE RADIUS OF A CURBLINE.
- SIDEWALK GRADE TO BE PARALLEL TO TOP OF CURB AND GUTTER UNLESS OTHERWISE SHOWN ON PLANS OR DIRECTED BY THE ENGINEER.
- SIDEWALK WIDTH AS SHOWN ELSEWHERE IN PLANS. MIN WIDTH 5'. PROVIDE DROPPED CURBS AT INTERSECTIONS. ALL CONCRETE SHALL BE CLASS "A" PROPOSED SIDEWALKS TO MATCH EXIST. SIDEWALK.
- NO VERTICAL CHANGES SHALL EXCEED 1/4" IN ELEVATION AT ADJOINING SURFACES.
- TO PROVIDE ACCESS TO PEDESTRIAN BUTTON, SIDEWALK / LANDING PAD SHALL EXTEND AND/ OR ABUT TO SIGNAL POLE CONC. FOUNDATION.
- COLOR TEXTURIZED CONCRETE SHALL BE USED TO COLOR AREAS AT RAMPS. COLOR SHALL BE " BRICK RED " AS PER L.M. SCOFIELD COMPANY STANDARDS COLOR A-26 OR EQUAL. COLOR TEXTURIZED CONCRETE SHALL BE SUBSIDIARY TO CURB RAMP ITEM

(A) DESIRABLE 3' OR GREATER FOR HIGH SPEED TRAFFIC. FOR BORDER WIDTHS OF 8' OR LESS, PLACE SIDEWALK ADJACENT TO CURB.



75' CURB RADIUS

W/ TYPICAL 45' CORNER CLIP

50' CURB RADIUS

W/ TYPICAL 30' CORNER CLIP

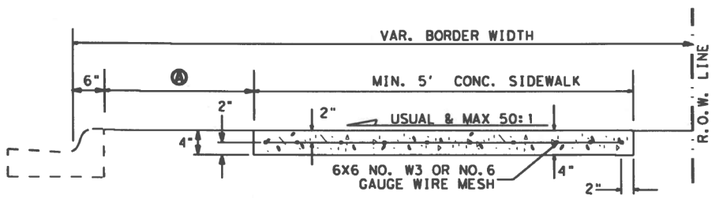
35' CURB RADIUS

W/ TYPICAL 20' CORNER CLIP

15' CURB RADIUS

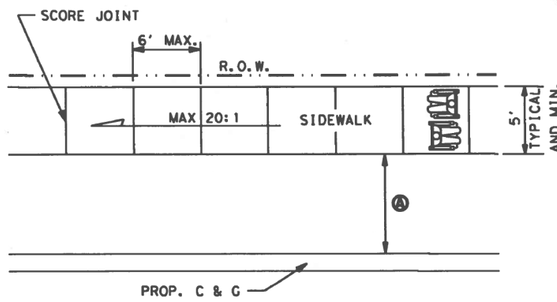
W/ NO CORNER CLIP

* FOR 90° INTERSECTION		
RADIUS	DISTANCE TO RAMP CONTROL	DISTANCE TO STOPBAR
5' R	10'	16'
10' R	15'	21'
15' R	20'	26'
>20' R	25'	30'



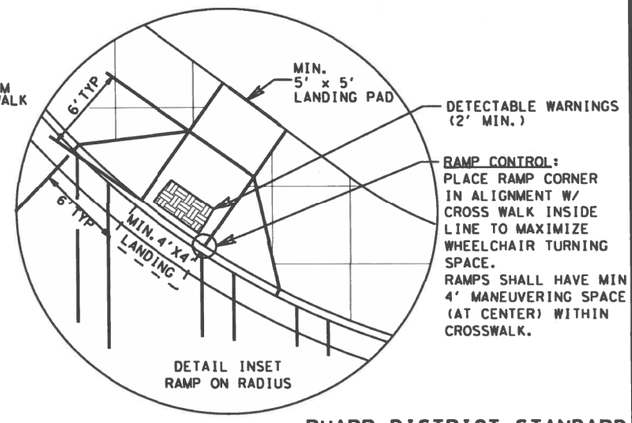
TYPICAL CONC. SIDEWALK

TYPICAL WHEEL CHAIR RAMP LOCATION



SCORE JOINTS 1/4" THICKNESS
EXPANSION JOINT EVERY 30'
JOINT IN CENTER OF SIDEWALK IF OVER 15' WIDE.

PLAN VIEW



DETAIL INSET RAMP ON RADIUS

PHARR DISTRICT STANDARD

Texas Department of Transportation

SIDEWALK & WHEELCHAIR RAMP DESIGN GUIDE

REV. 5/18

SIDEWALK.DGN

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	FILE NO.	SHEET NO.
6	STB 2B24(399)HESG, ETC.		53

STATE	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	PHR	HIDALGO	0921	02	501,ETC	VARIOUS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	PHR	HIDALGO		54
5-10 5-21				

DATE: 6/6/2024 2:49:13 PM
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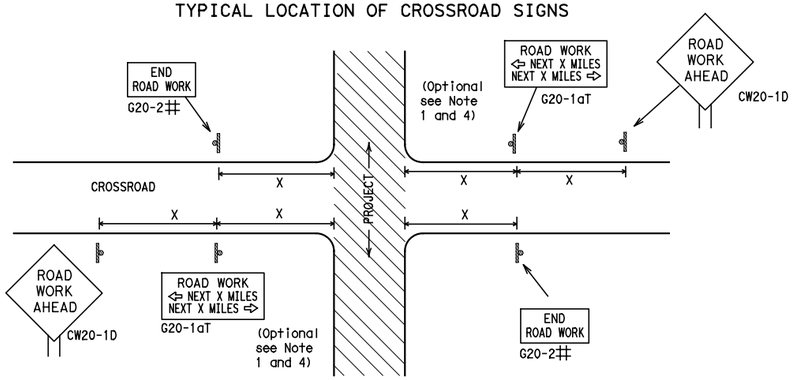
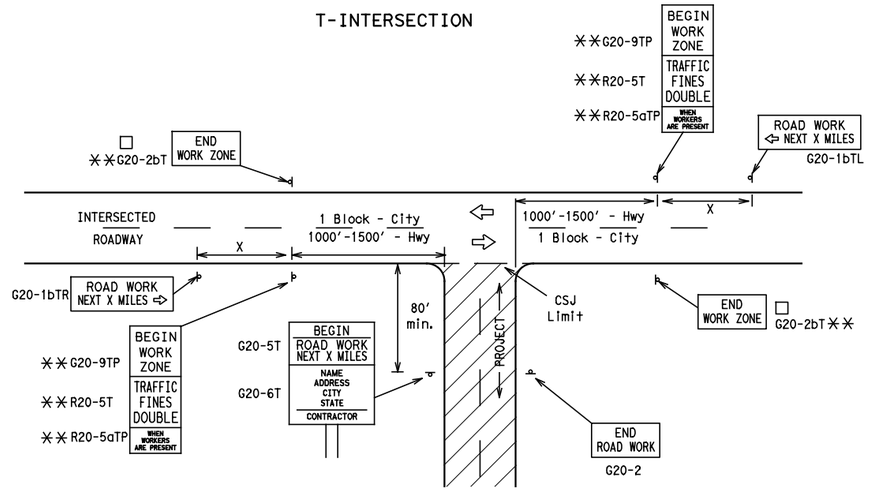
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

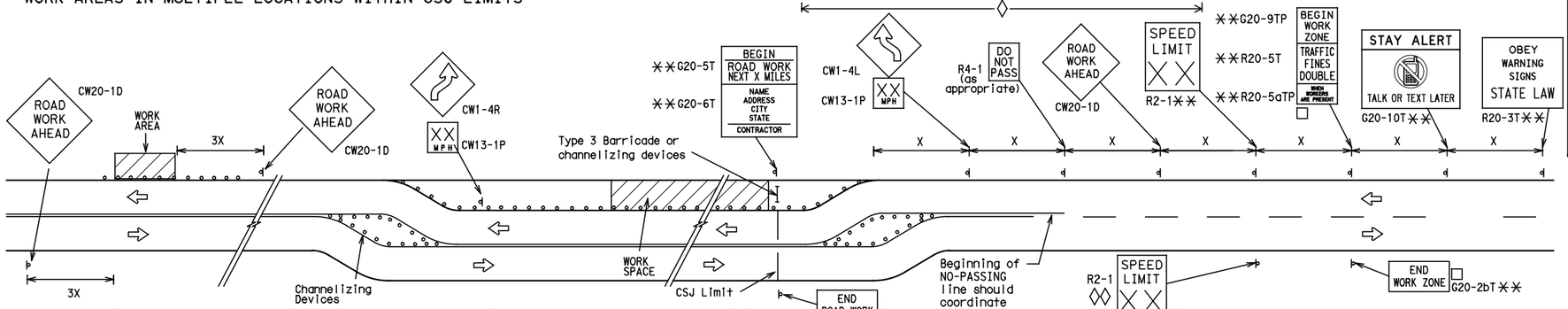
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

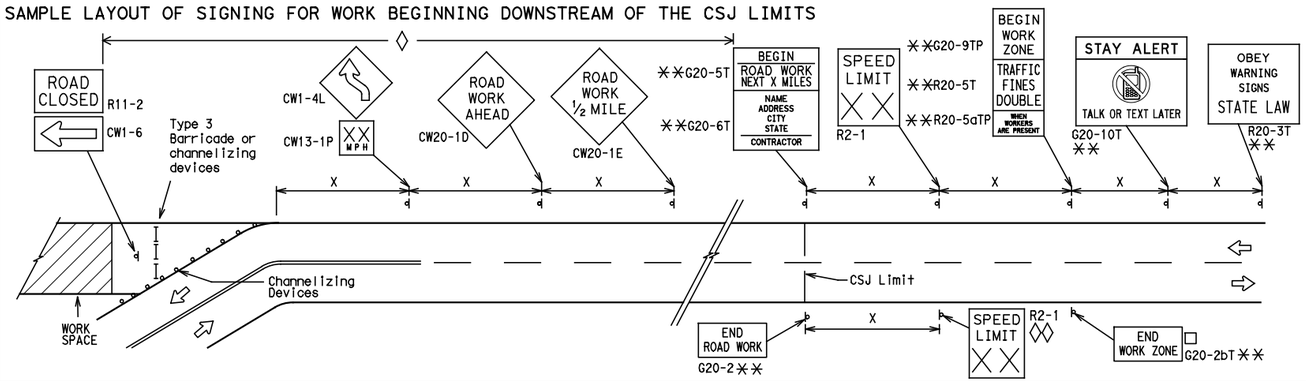
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may 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 DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT 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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		55

DATE: 6/6/2024 2:49:13 PM
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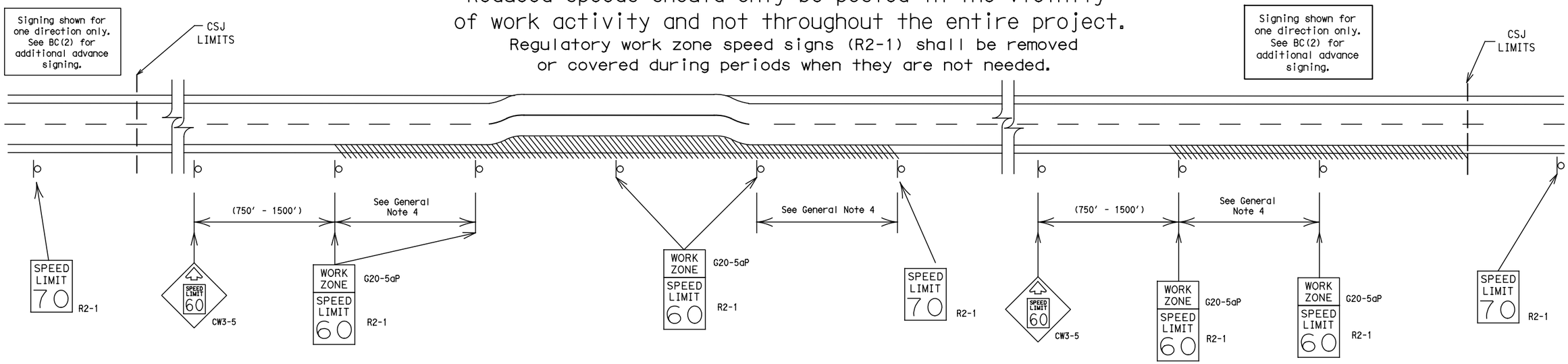
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		56

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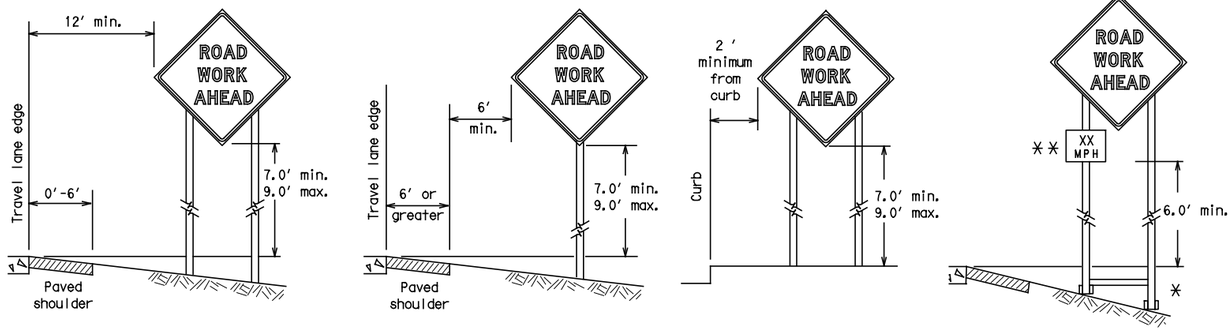
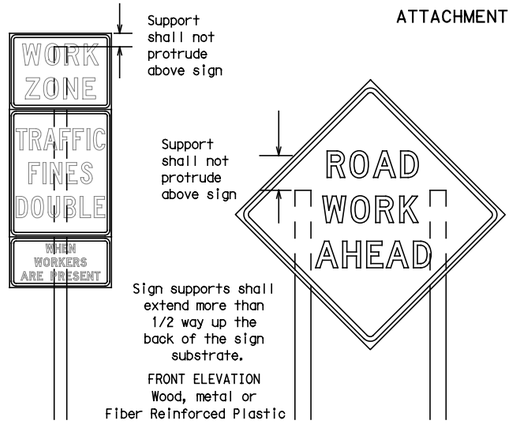
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

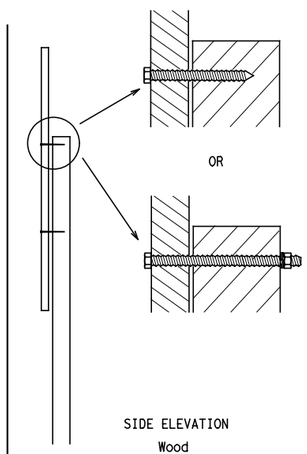


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





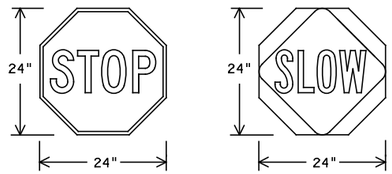
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

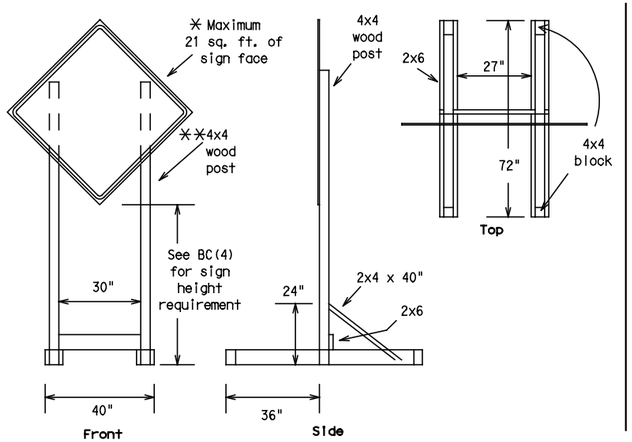
1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

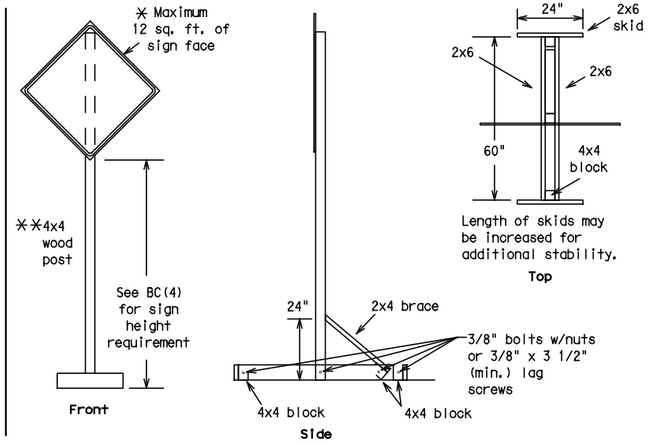
Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

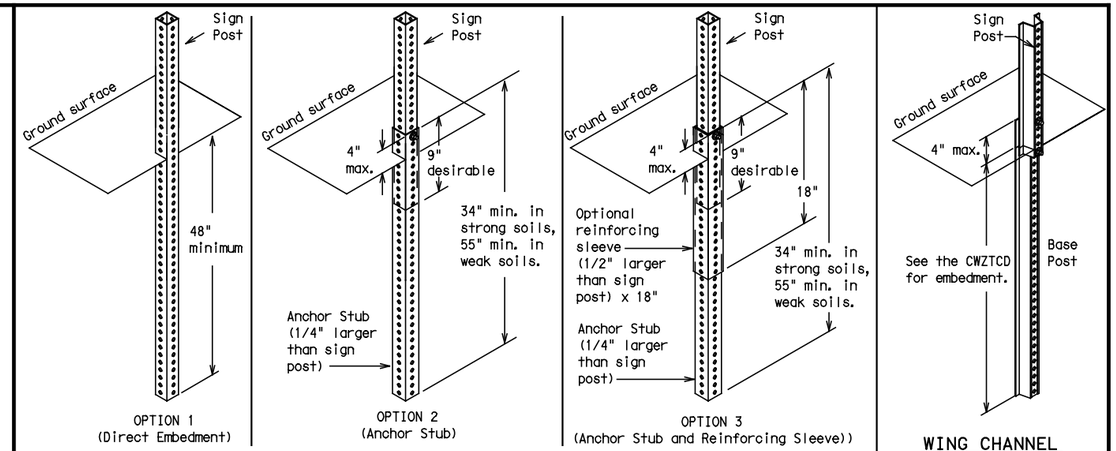
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		57





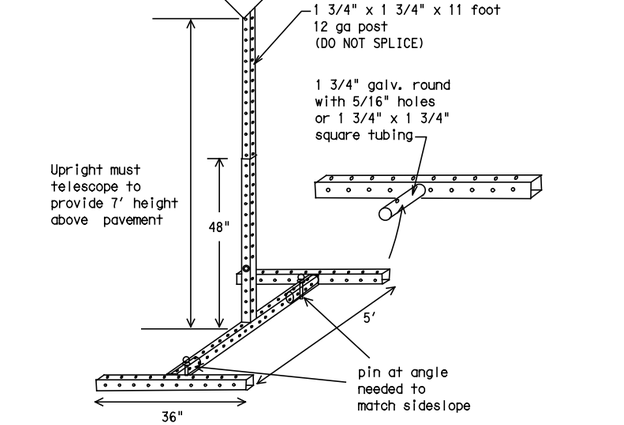
SKID MOUNTED WOOD SIGN SUPPORTS

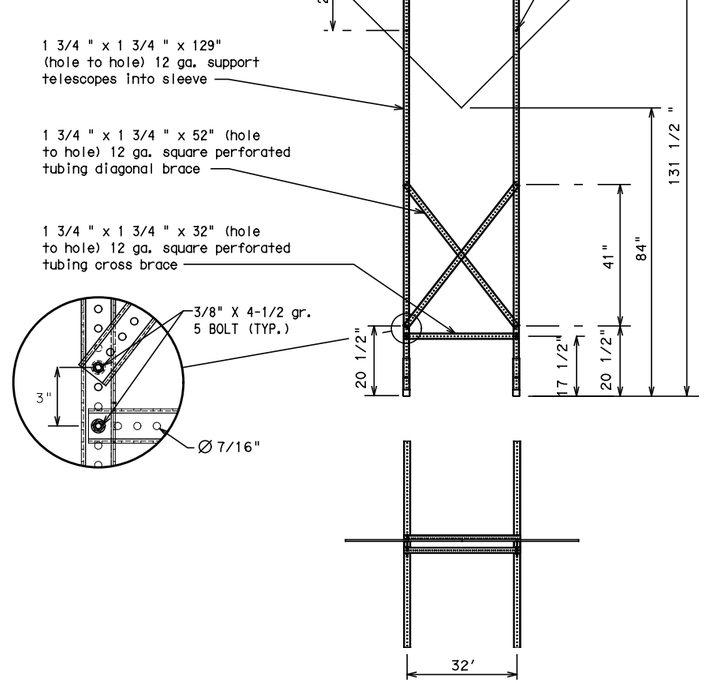
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

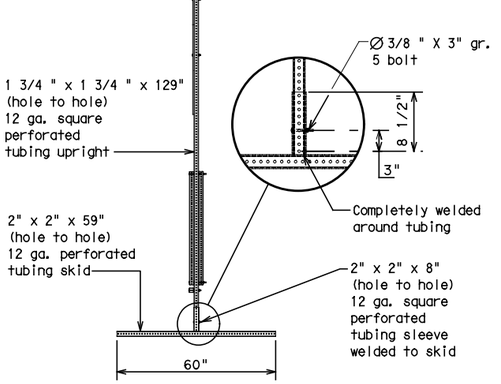


GROUND MOUNTED SIGN SUPPORTS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		58

DATE: 6/6/2024 2:49:14 PM
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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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		59

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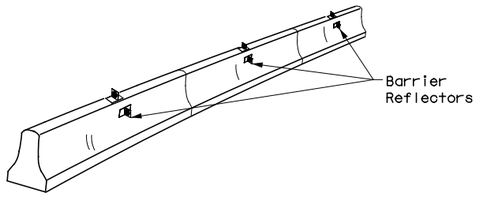
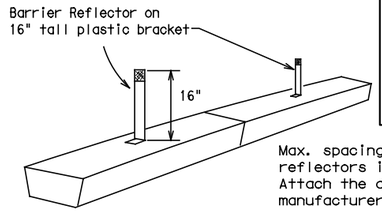
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



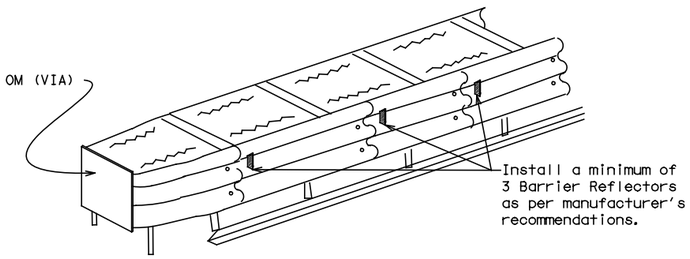
CONCRETE TRAFFIC BARRIER (CTB)

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)



DELINEATION OF END TREATMENTS

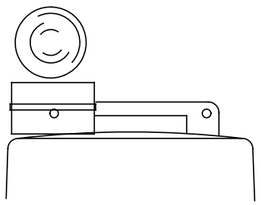
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

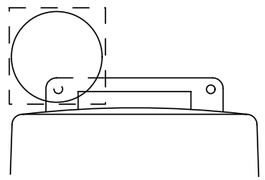
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

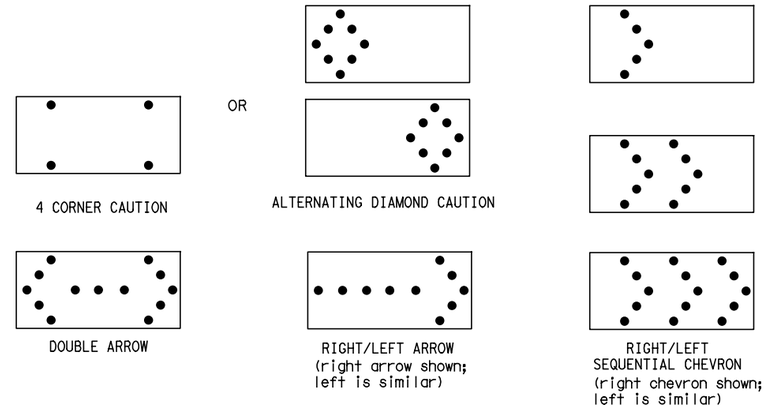
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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

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.

SHEET 7 OF 12

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	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		60

101

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:

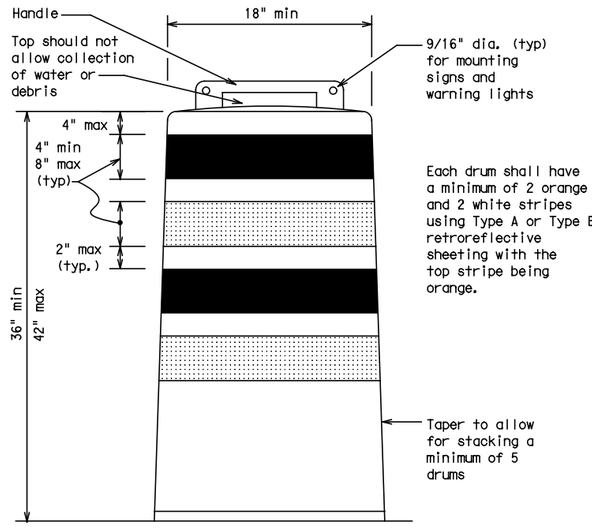
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

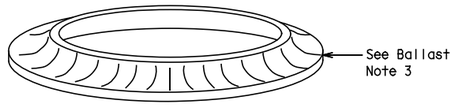
RETROREFLECTIVE SHEETING

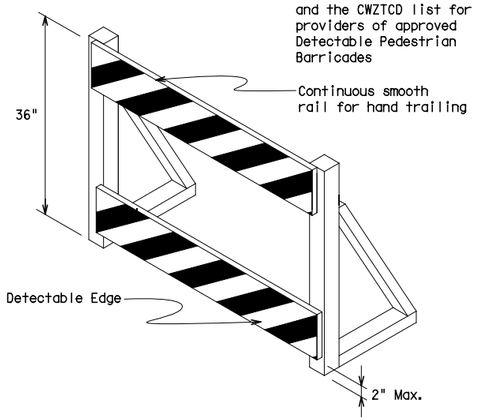
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

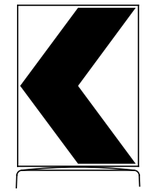




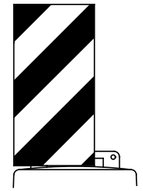


DETECTABLE PEDESTRIAN BARRICADES

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

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
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REVISIONS	0921	02	501,ETC	VARIOUS
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	PHR	HIDALGO		61
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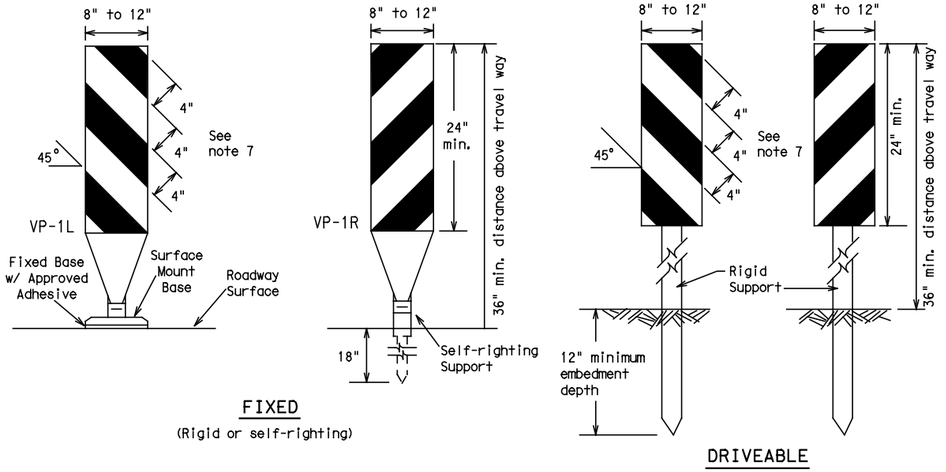
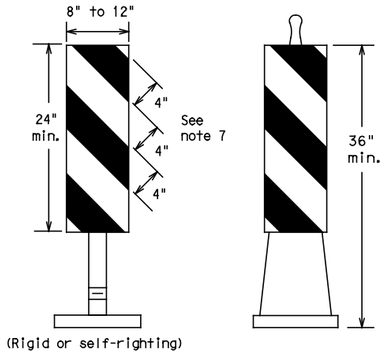


FIXED

(Rigid or self-righting)

DRIVEABLE

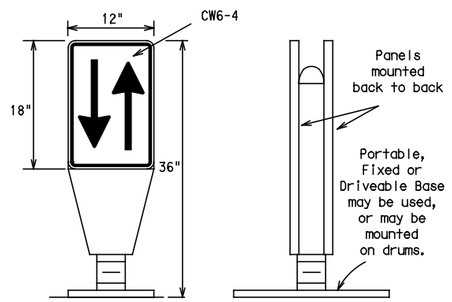


(Rigid or self-righting)

PORTABLE

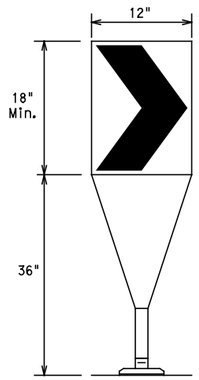
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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)



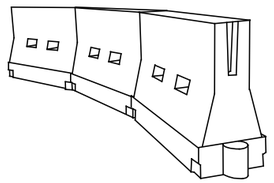
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		62

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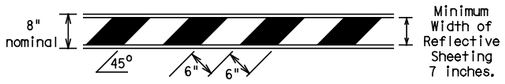
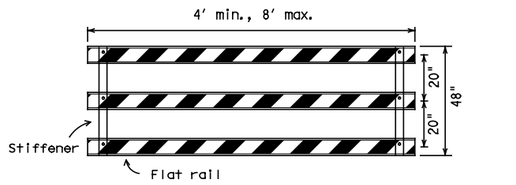
TYPE 3 BARRICADES

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.



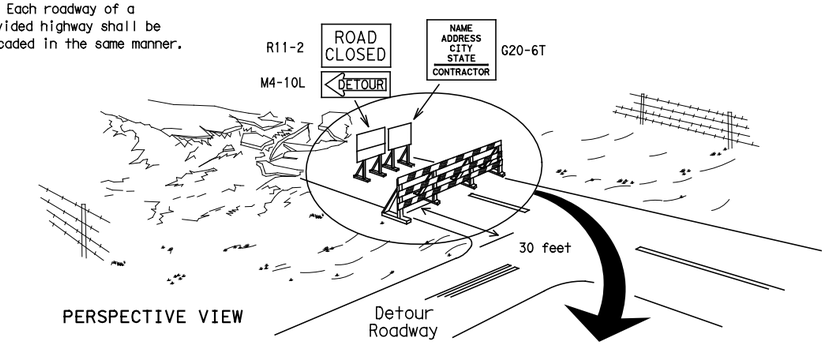
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

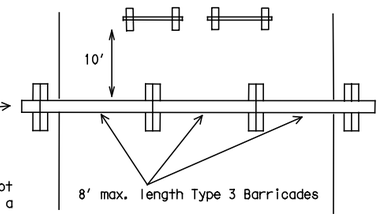
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

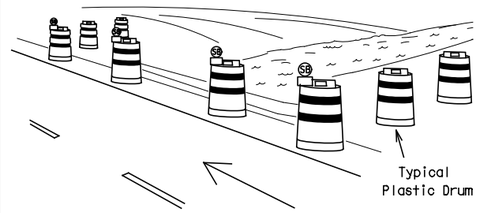
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

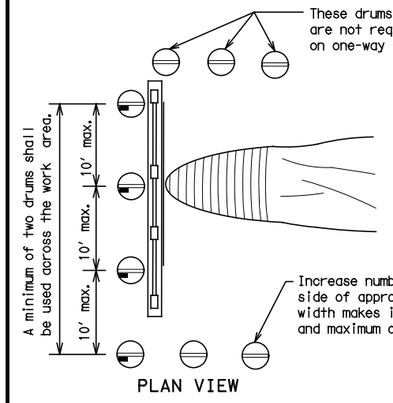
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

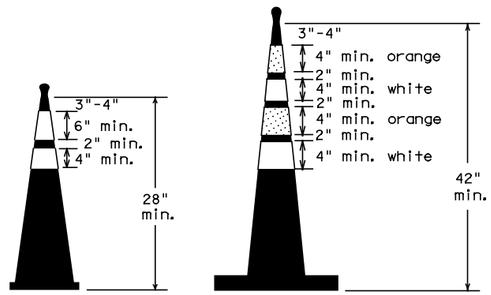
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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

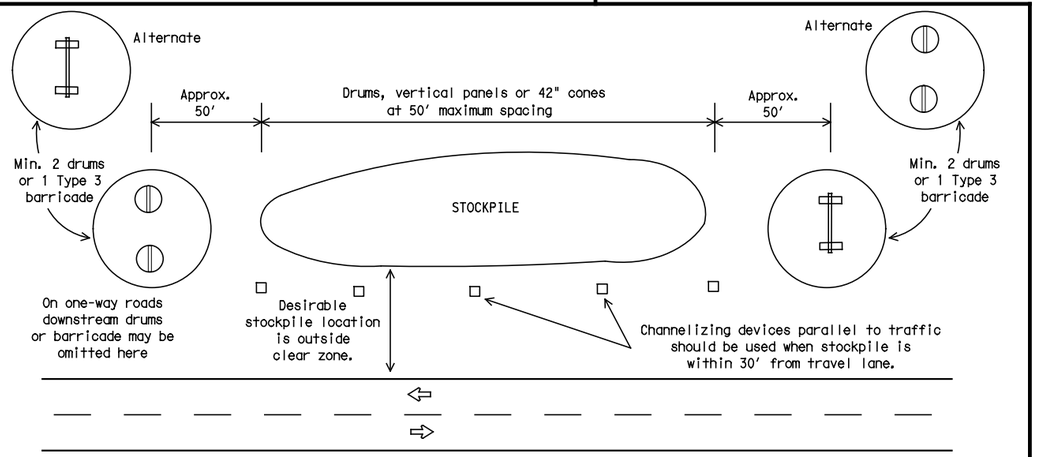
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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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
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		63

DATE: 6/6/2024 2:49:16 PM
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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.

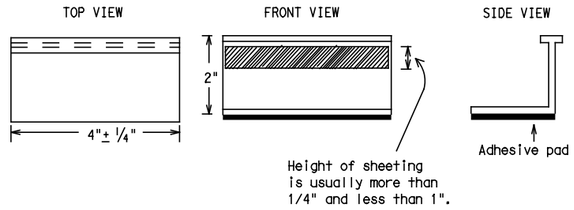
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

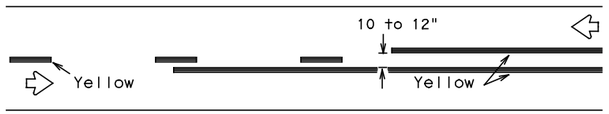
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

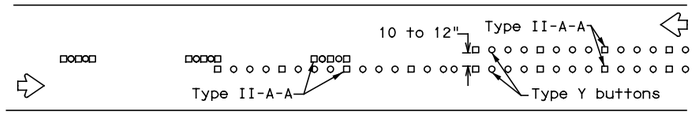
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21	0921	02	501,ETC	VARIOUS
1-02 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	PHR	HIDALGO		64

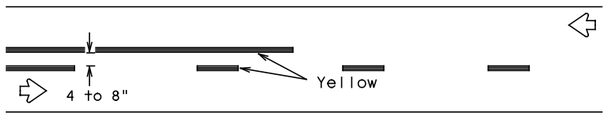
PAVEMENT MARKING PATTERNS



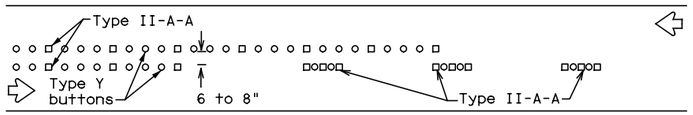
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



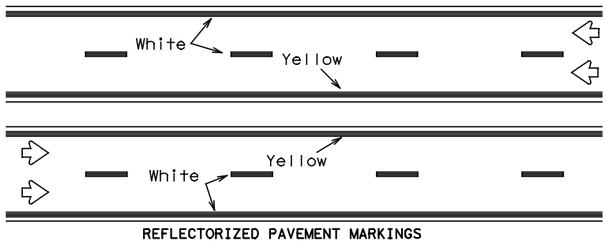
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



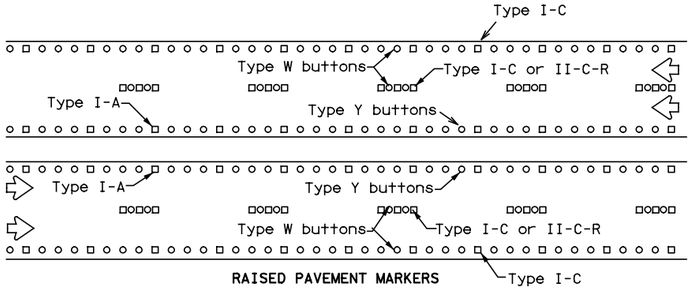
RAISED PAVEMENT MARKERS - PATTERN B

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



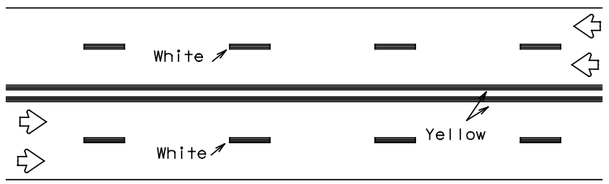
REFLECTORIZED PAVEMENT MARKINGS



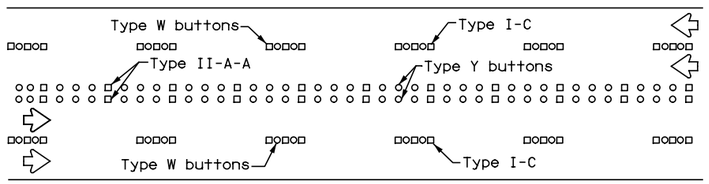
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



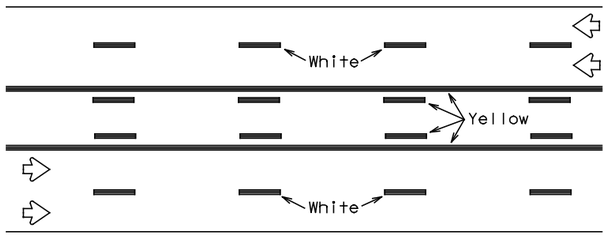
REFLECTORIZED PAVEMENT MARKINGS



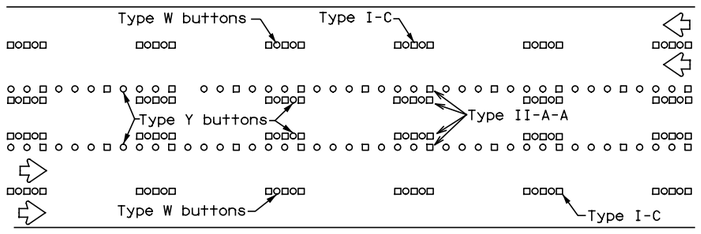
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

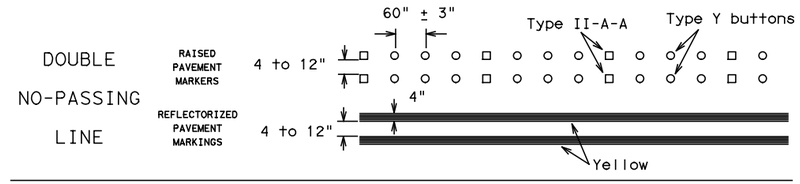
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

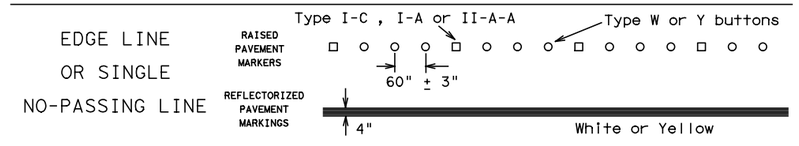
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

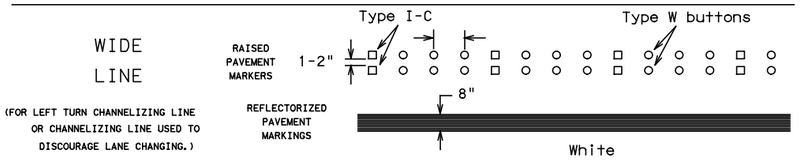


EDGE LINE OR SINGLE NO-PASSING LINE



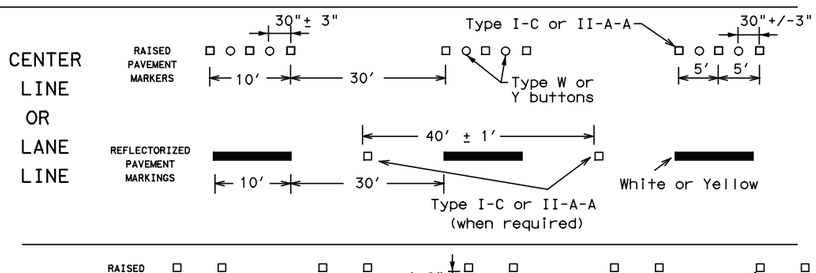
WIDE LINE

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

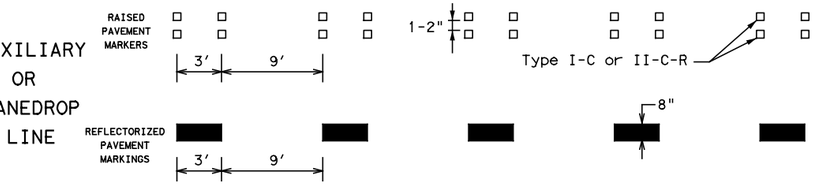


BROKEN LINES

CENTER LINE OR LANE LINE

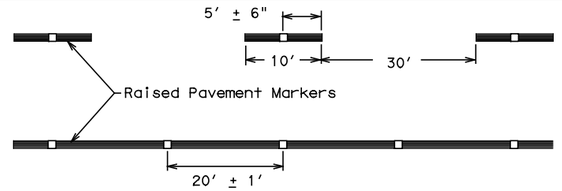


AUXILIARY OR LANEDROP LINE



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	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		65

106

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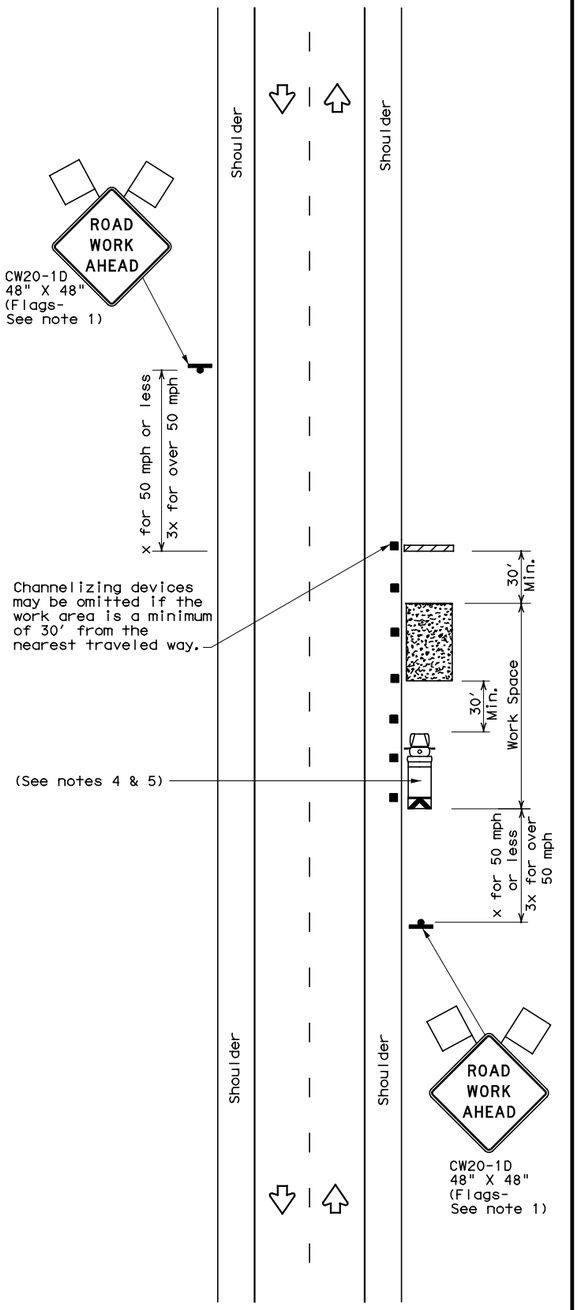
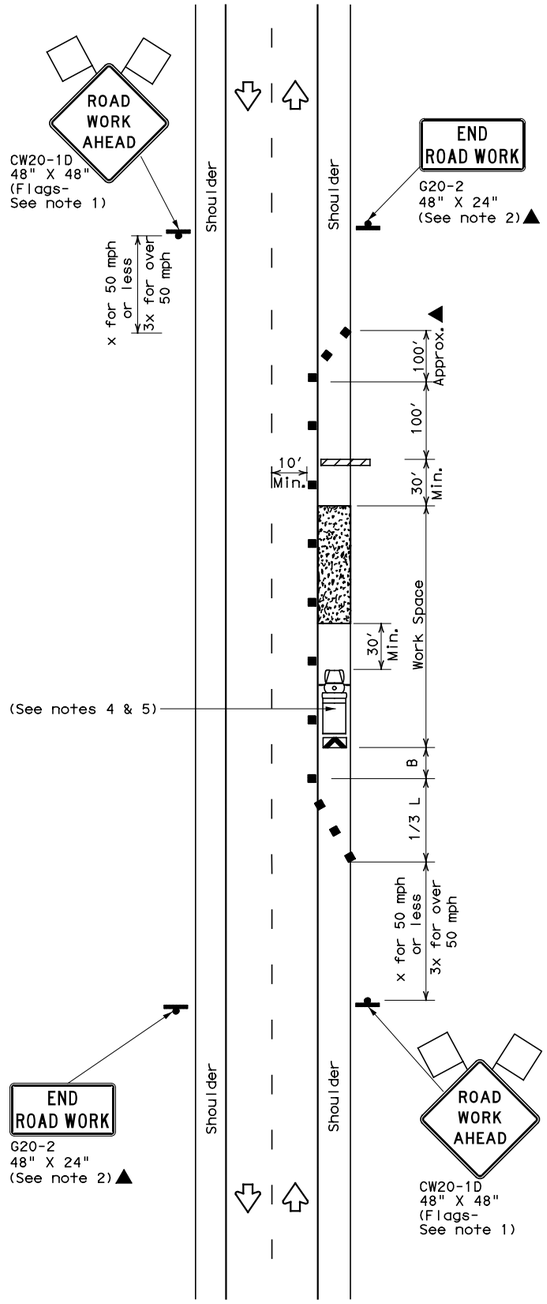


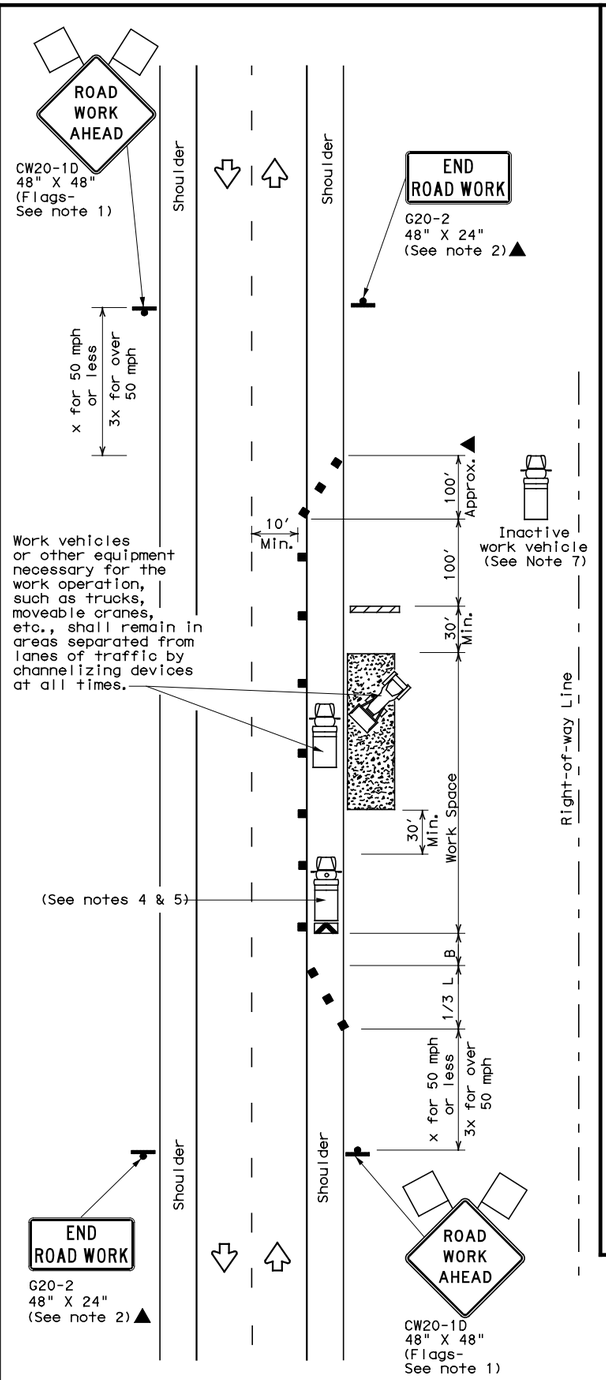
TCP (2-1a)

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

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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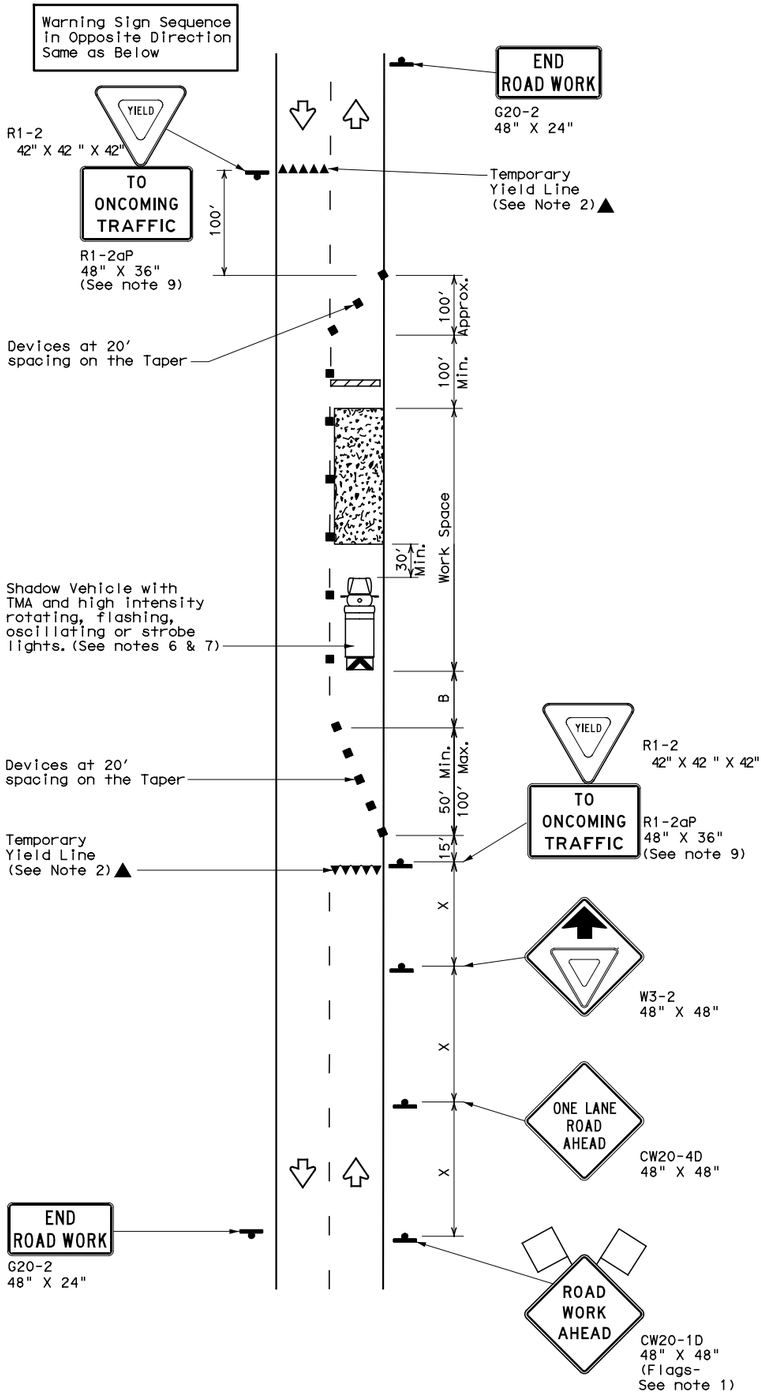
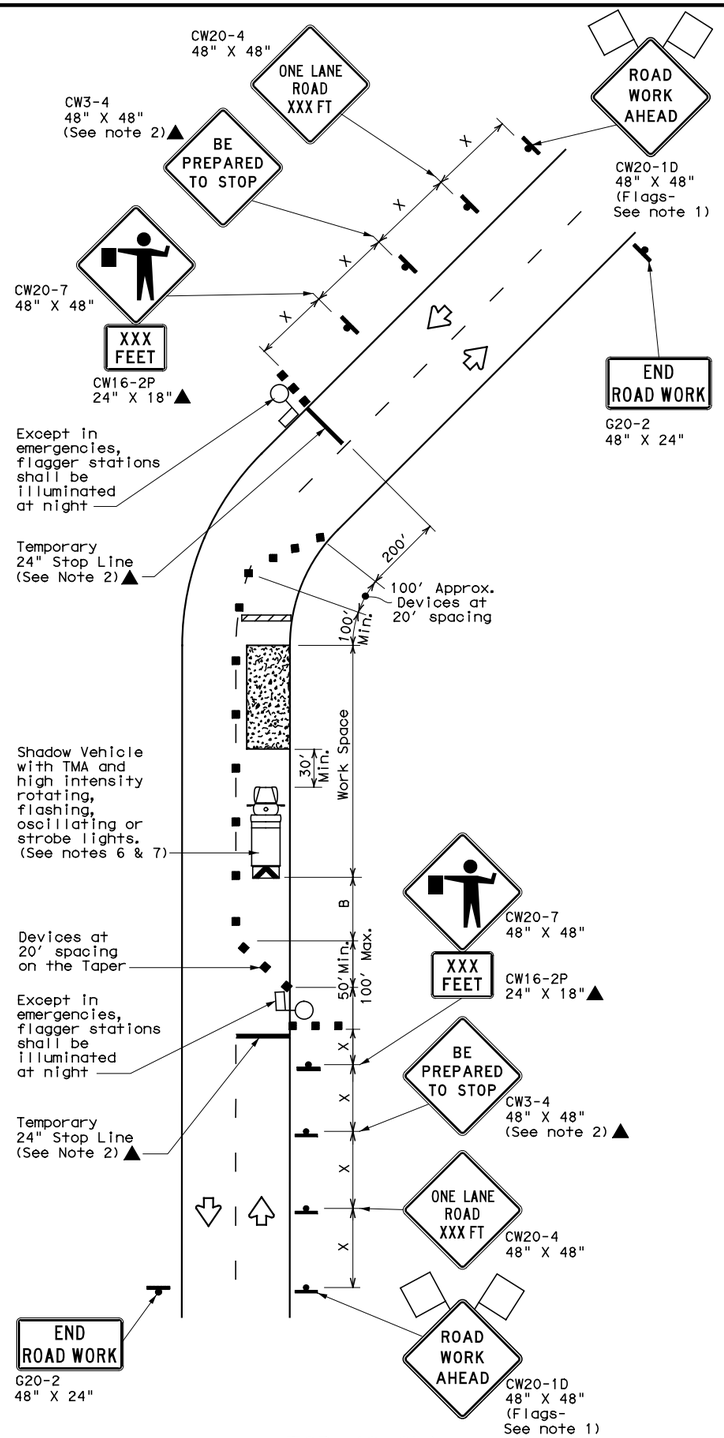
8-95 2-12	PHR	HIDALGO		66
1-97 2-18				



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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 CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP (2-2)-18

FILE: tcp2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	PHR	HIDALGO		67
4-98 2-18				

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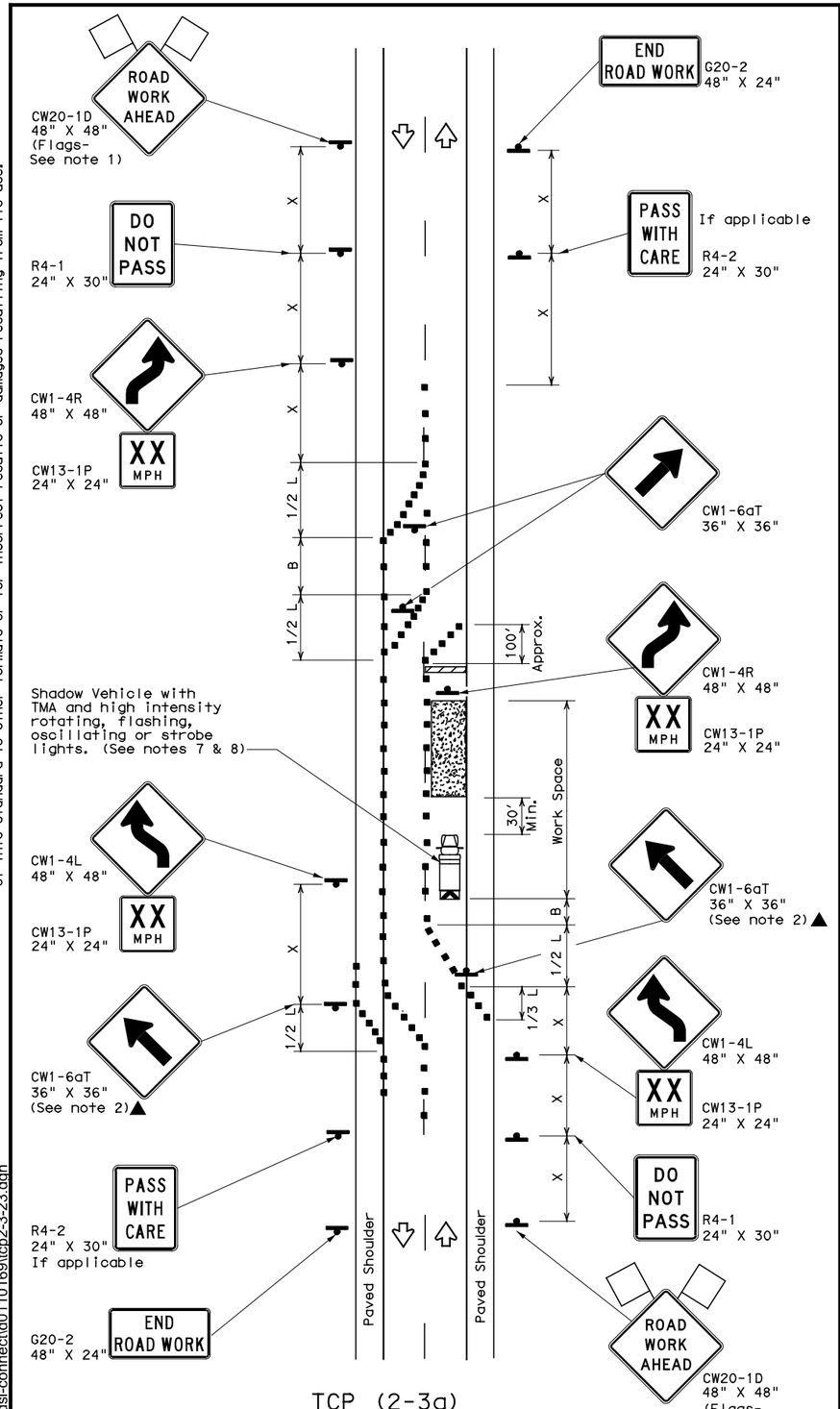
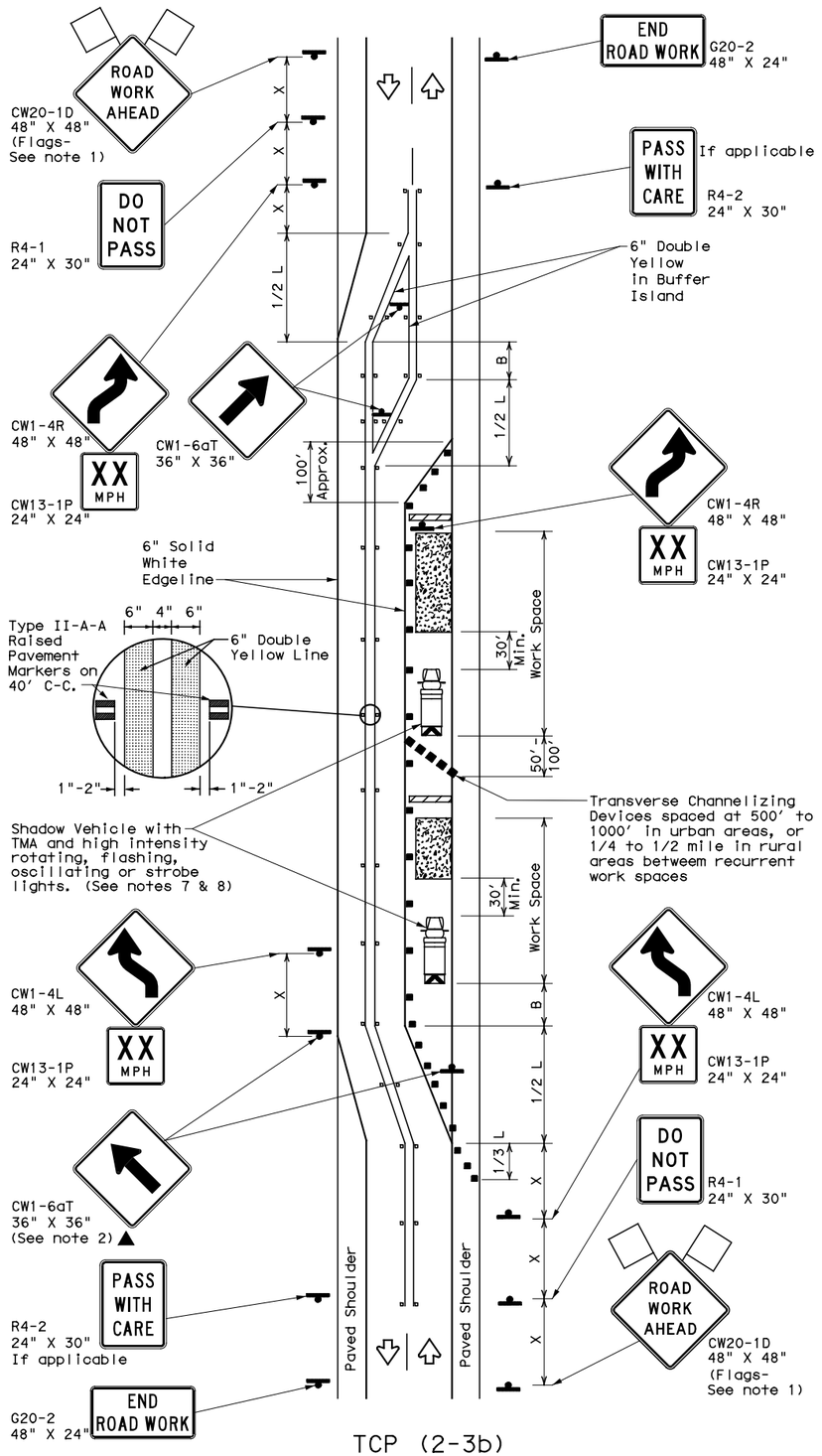


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	• • • •	Raised Pavement Markers Ty II-AA
	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
				TCP(2-3b)ONLY
			✓	✓

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. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

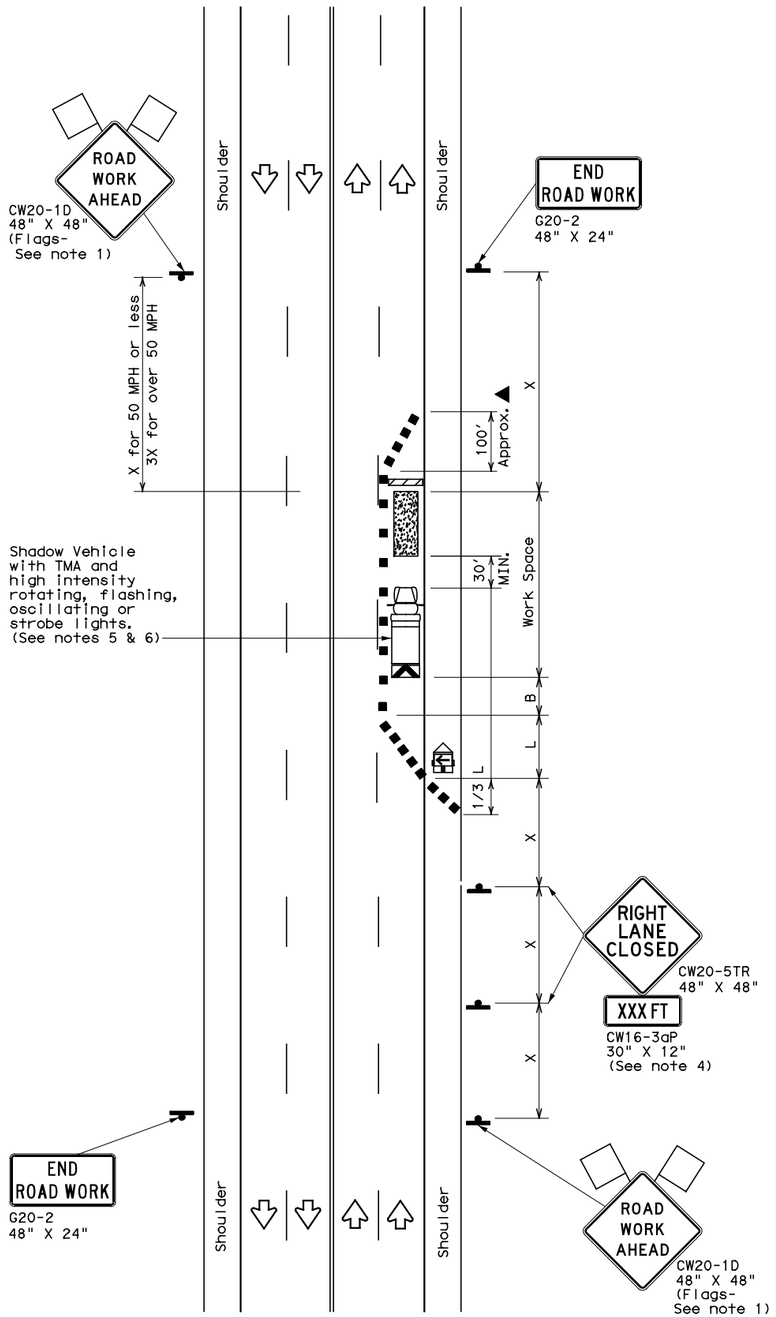
9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections,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

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

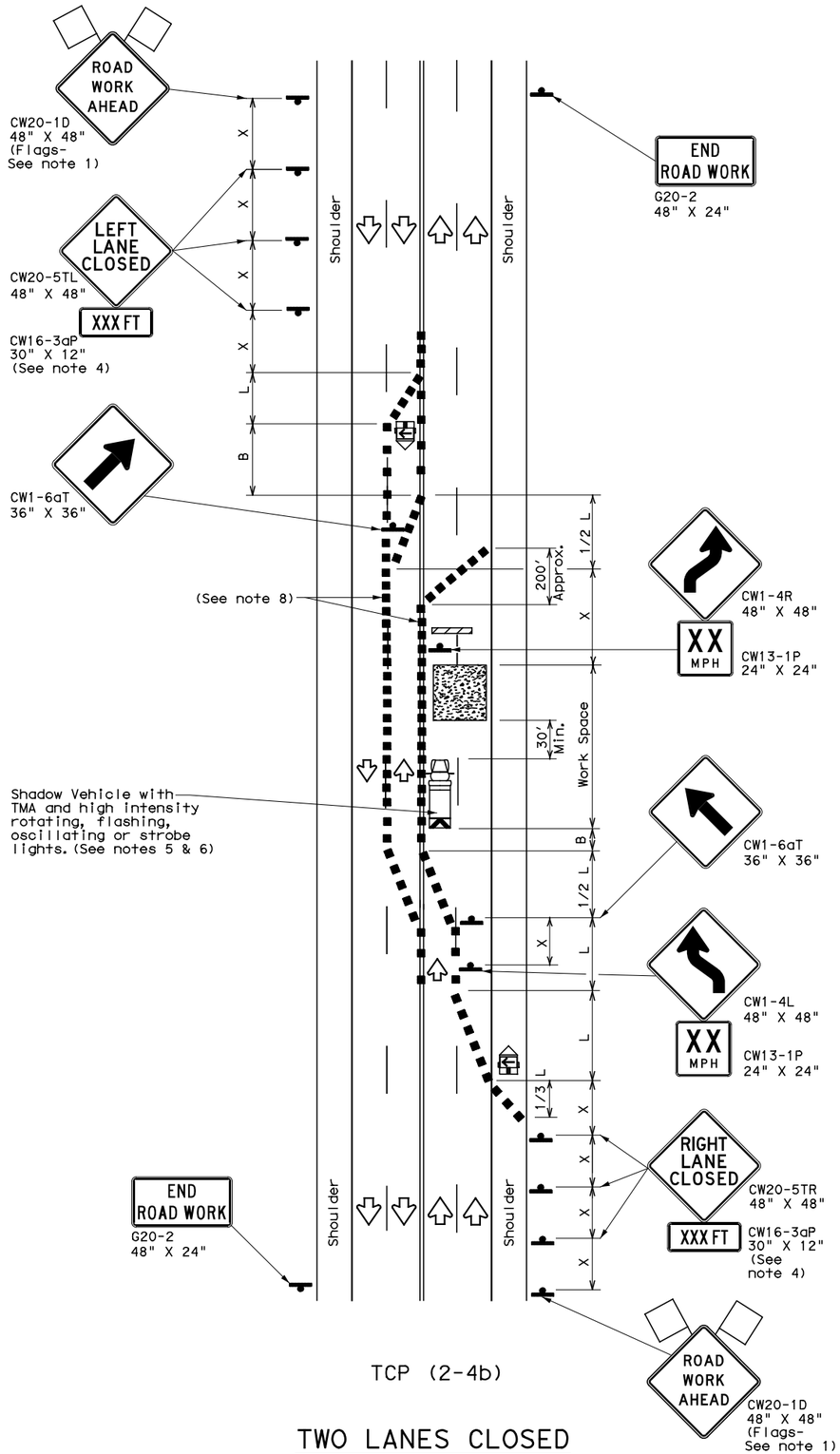
TCP (2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
©TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 8-95 3-03 4-23 1-97 2-12	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		68



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

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	PHR	HIDALGO		69
4-98 2-18				

DATE: 6/6/2024 2:49:20 PM
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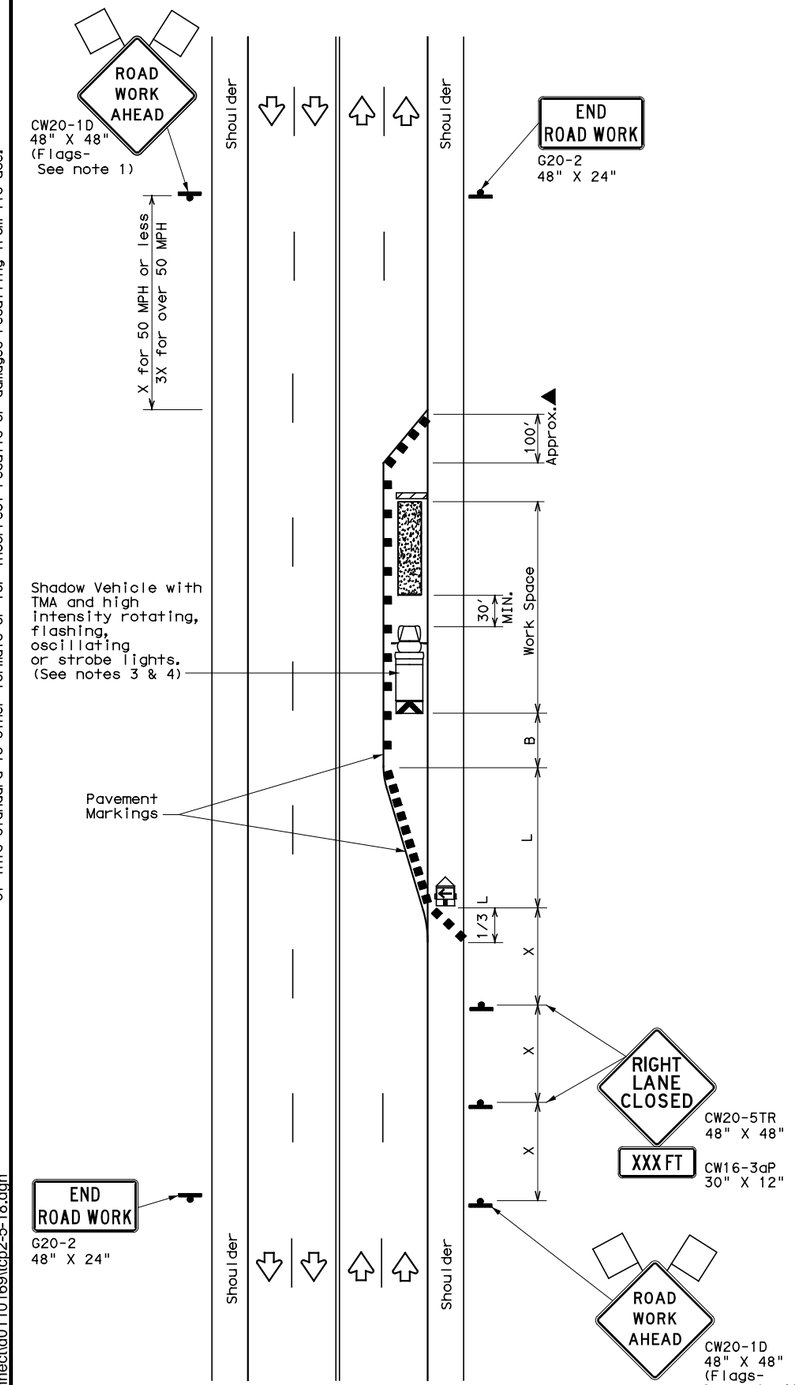
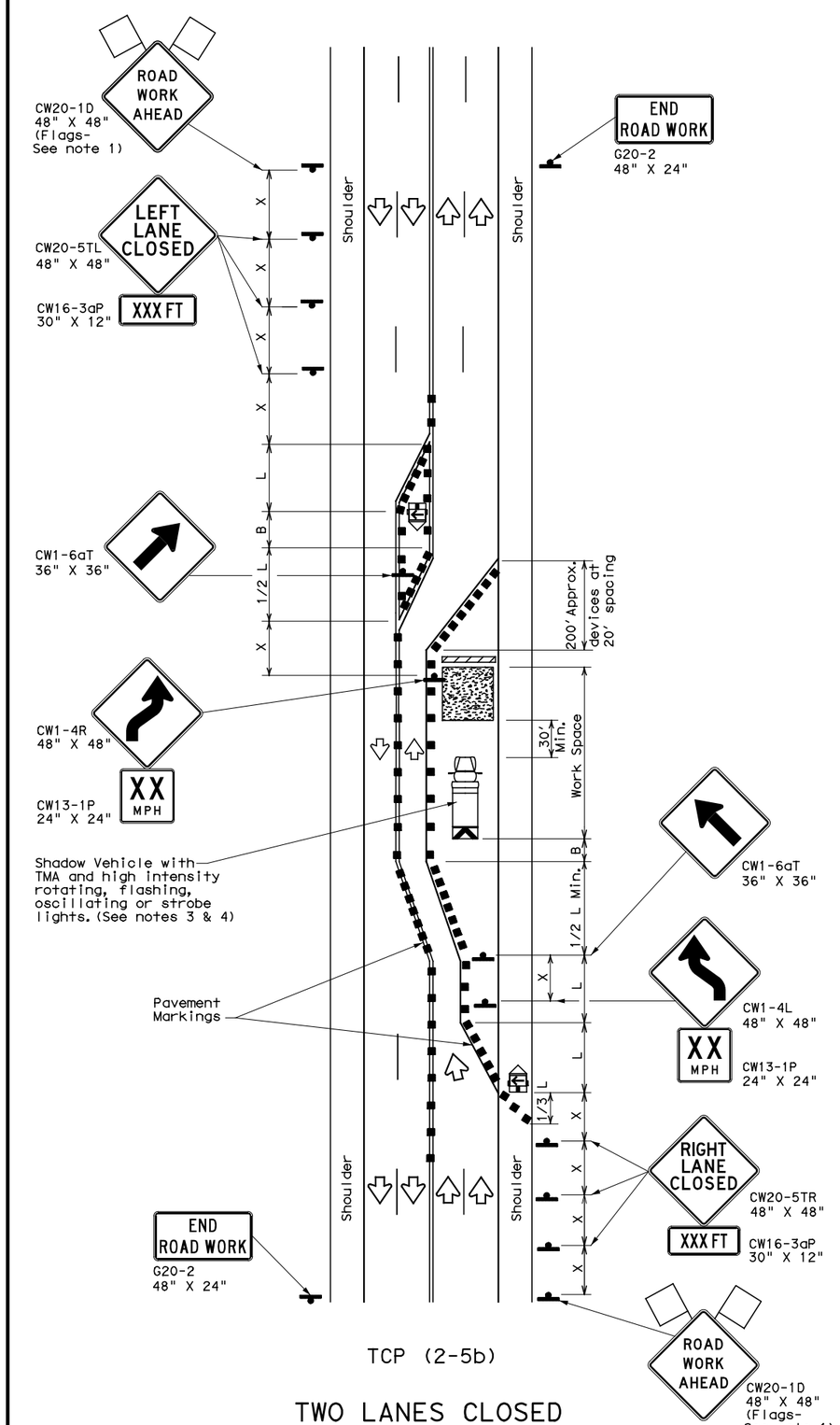


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

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. 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 eposure 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 substitutued for the Shadow Vehicle and TMA.
4. 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.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. 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 (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0921	02	501,ETC	VARIOUS
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	PHR	HIDALGO		70

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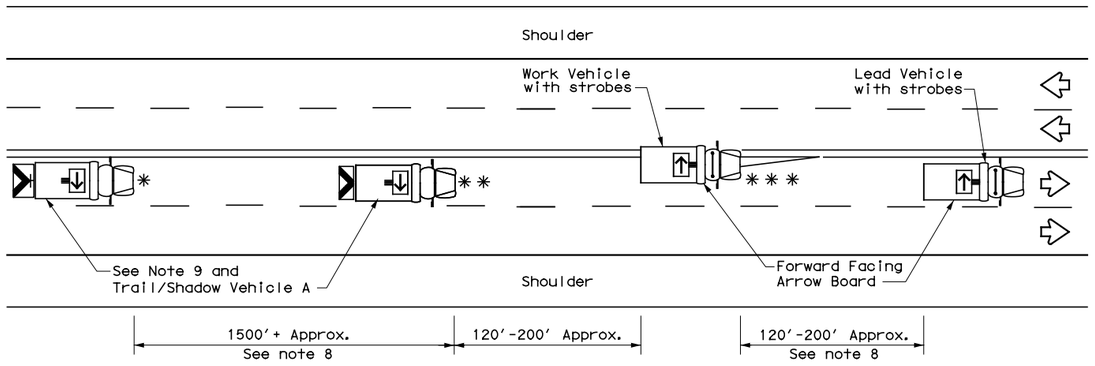
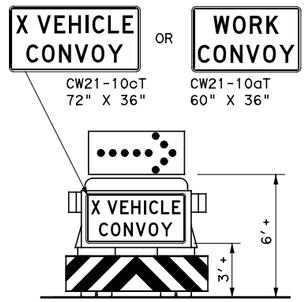


TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

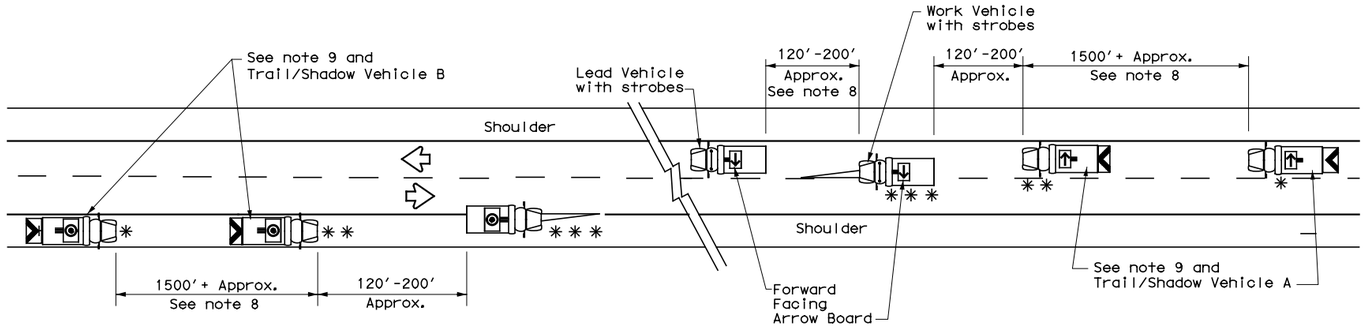
with RIGHT Directional display Flashing Arrow Board

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.

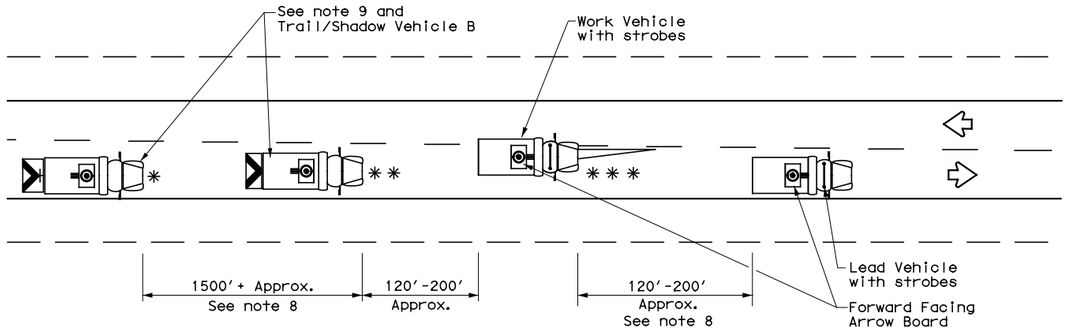


WORK ON SHOULDER

WORK ON TRAVEL LANE

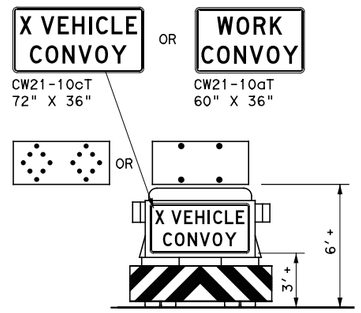
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



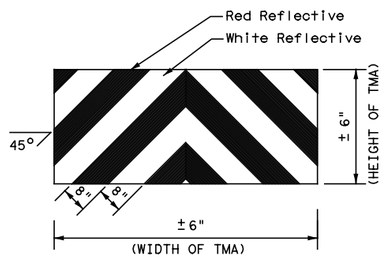
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP (3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
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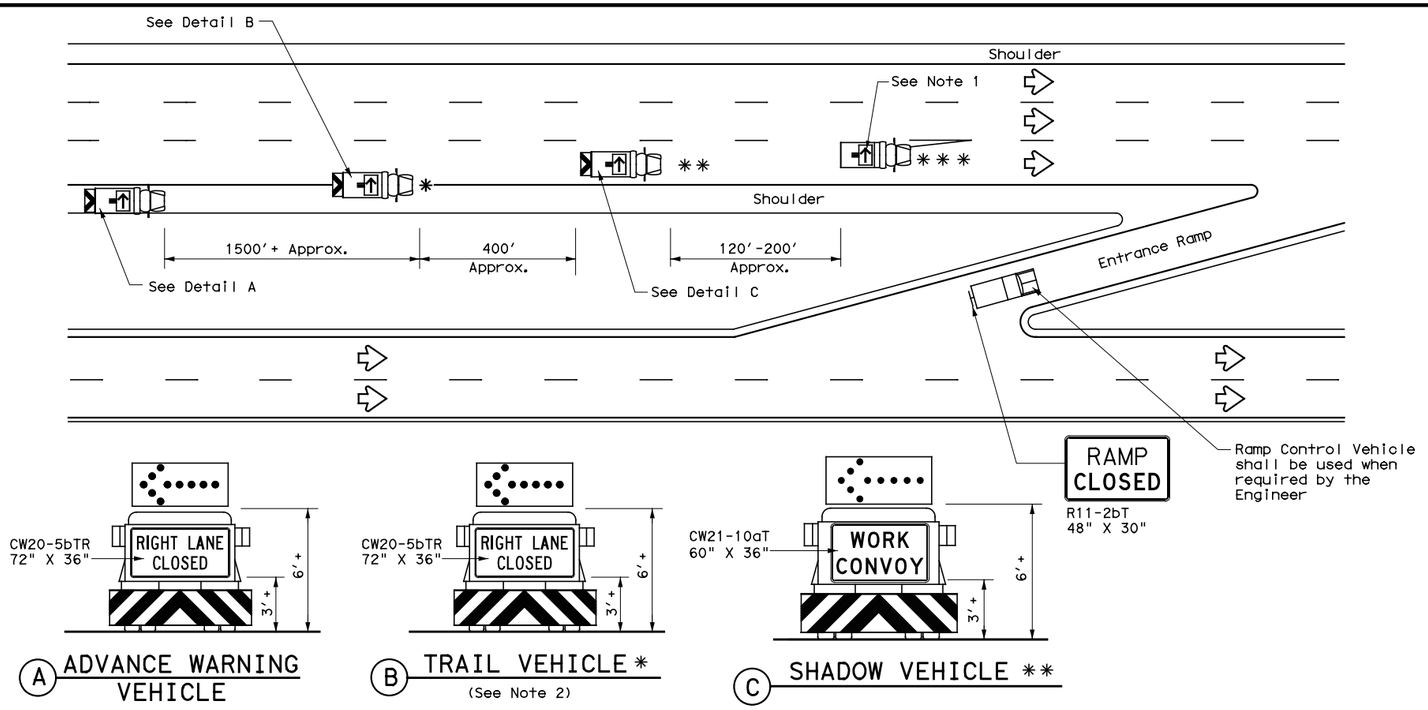
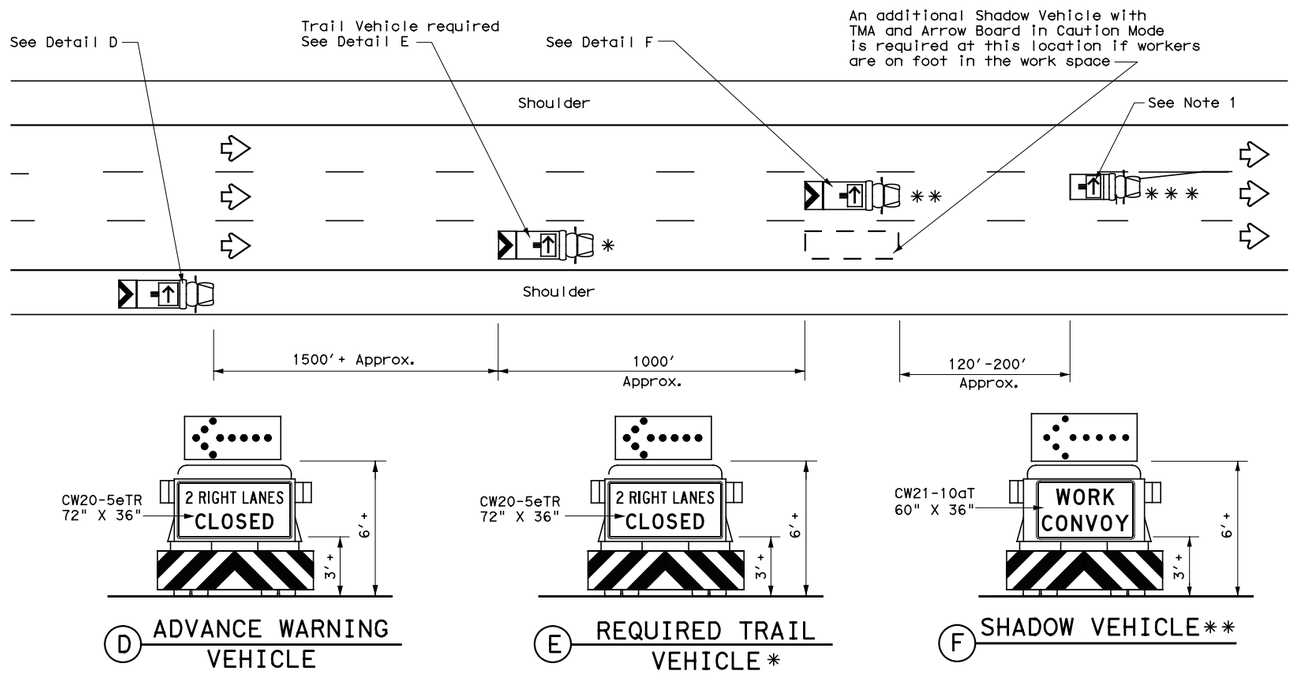


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



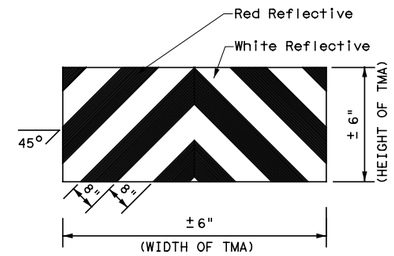
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
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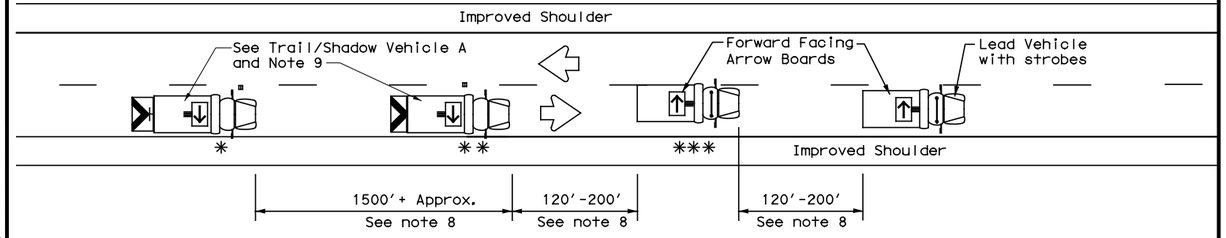
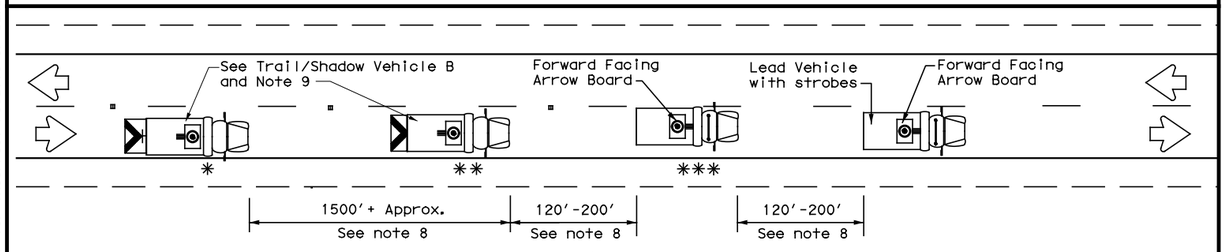


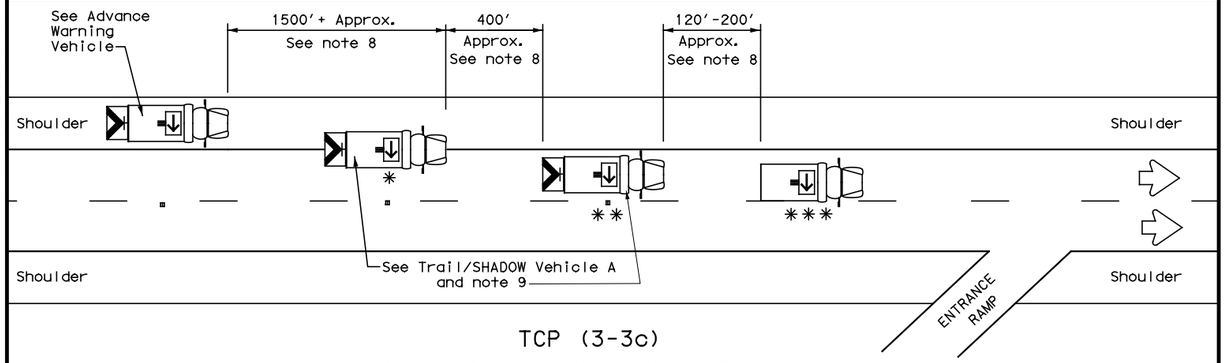
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



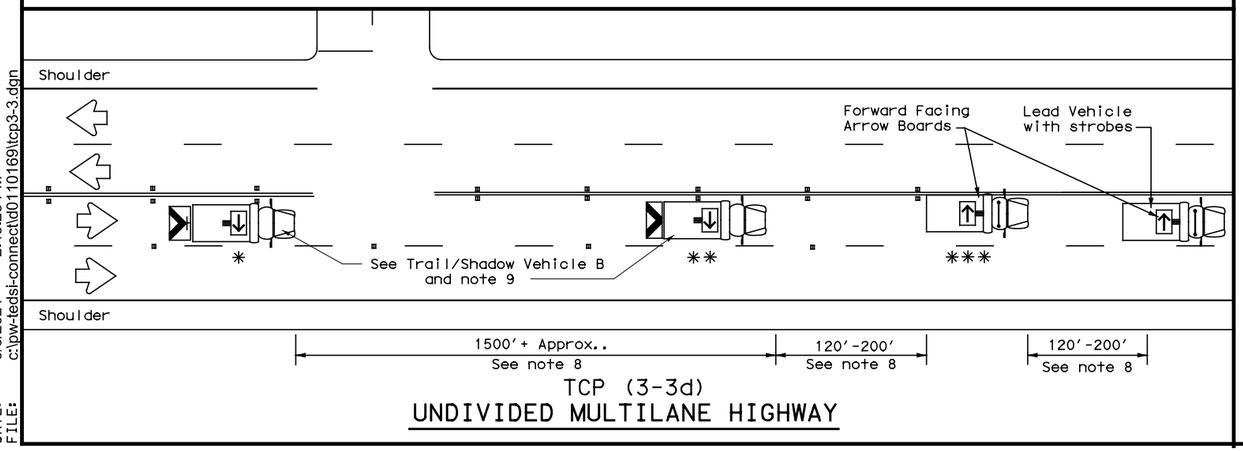
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



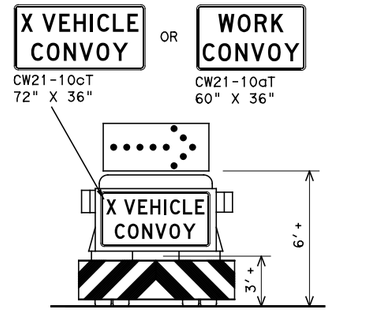
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



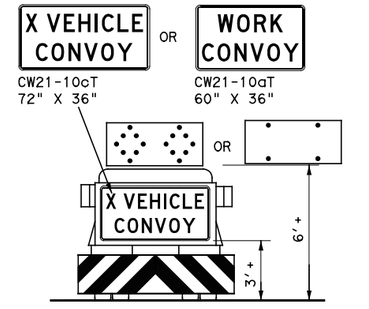
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



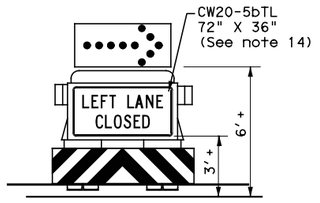
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

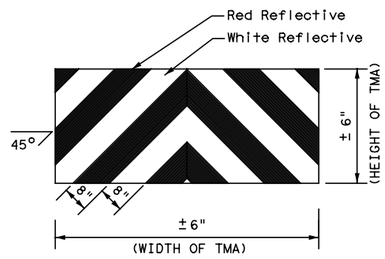


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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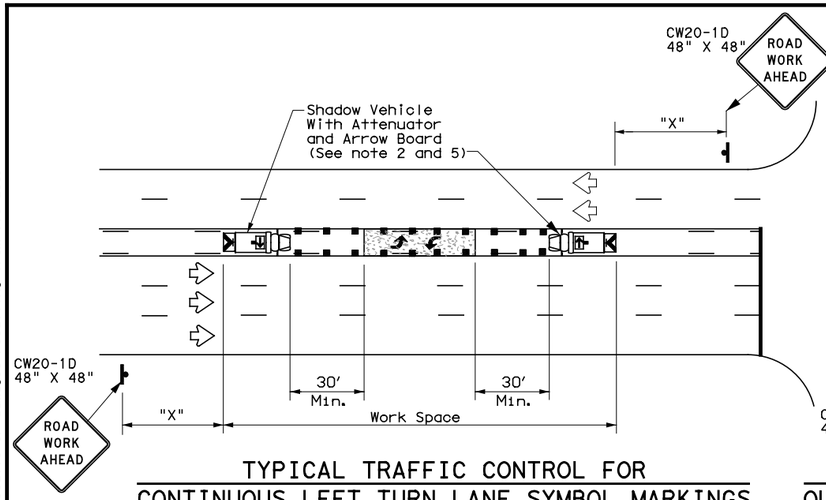
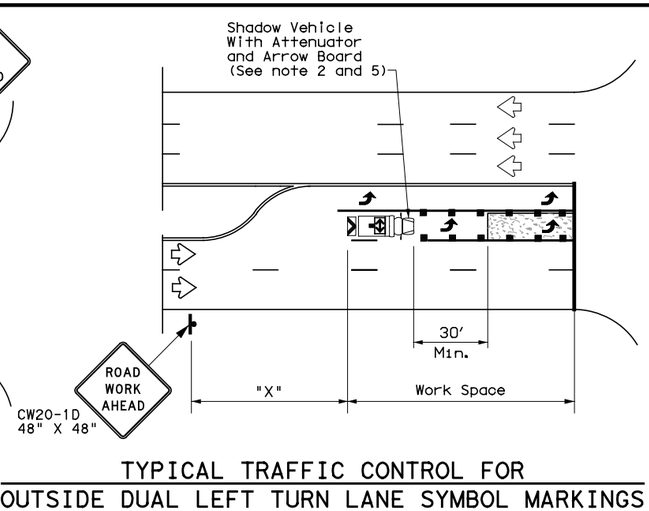
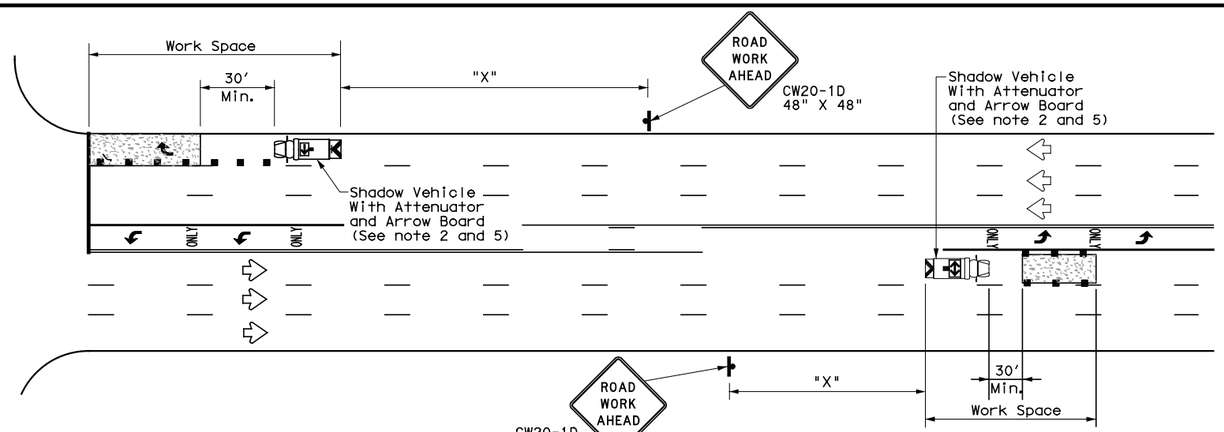


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

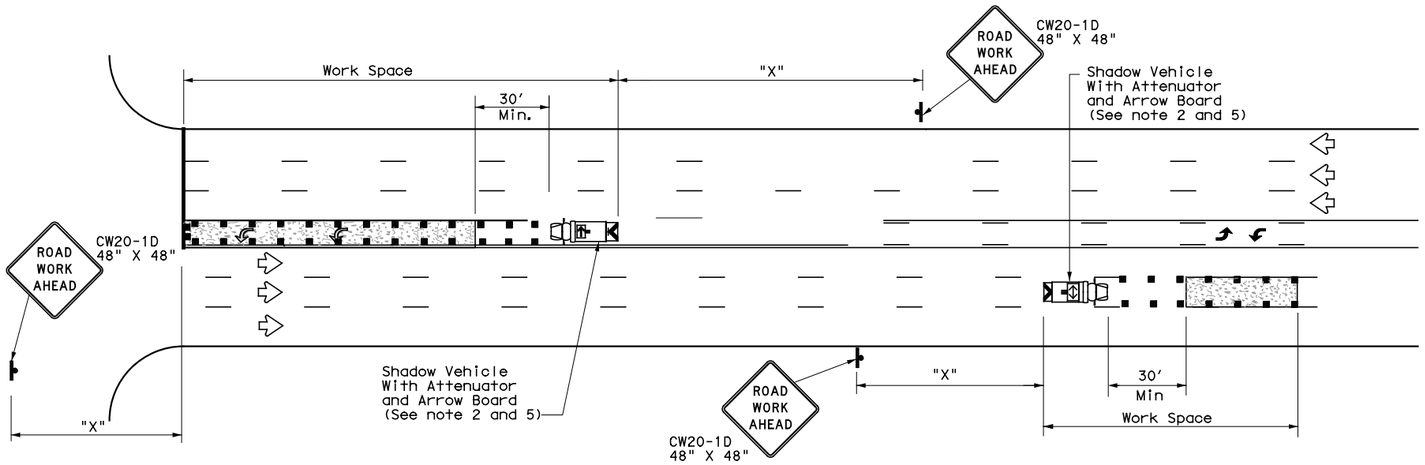


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

LEGEND			
✳	Trail Vehicle	ARROW BOARD DISPLAY	
✳✳	Shadow Vehicle		
✳✳✳	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow	■ ■ ■	Channelizing Devices

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′

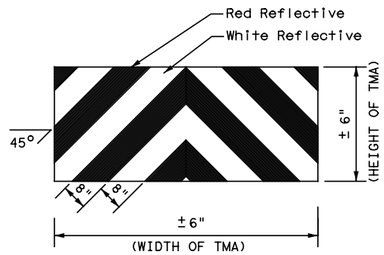
✳ Conventional Roads Only

✳✳ 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. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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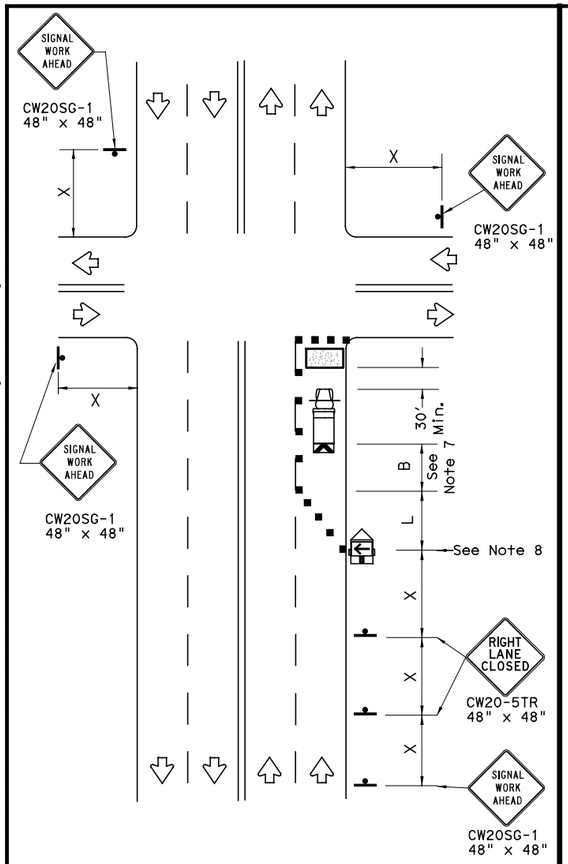
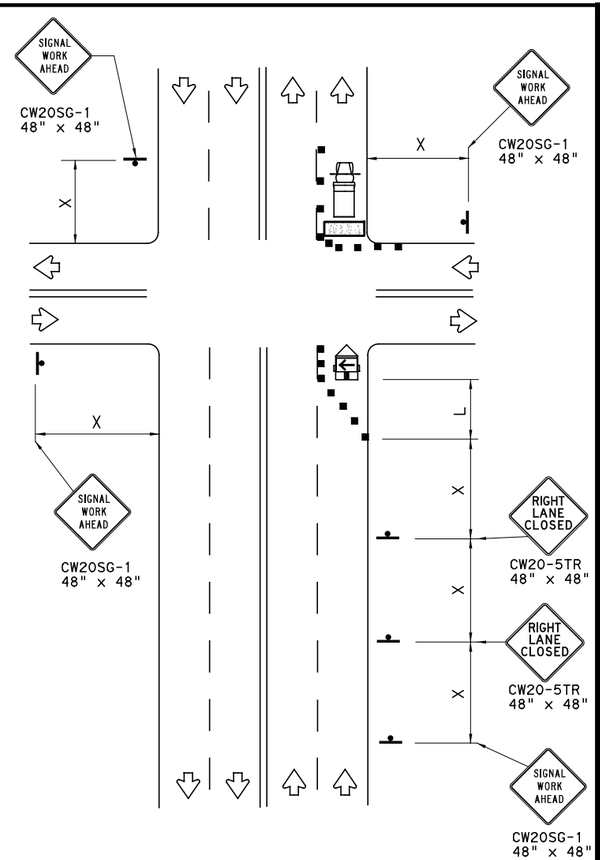


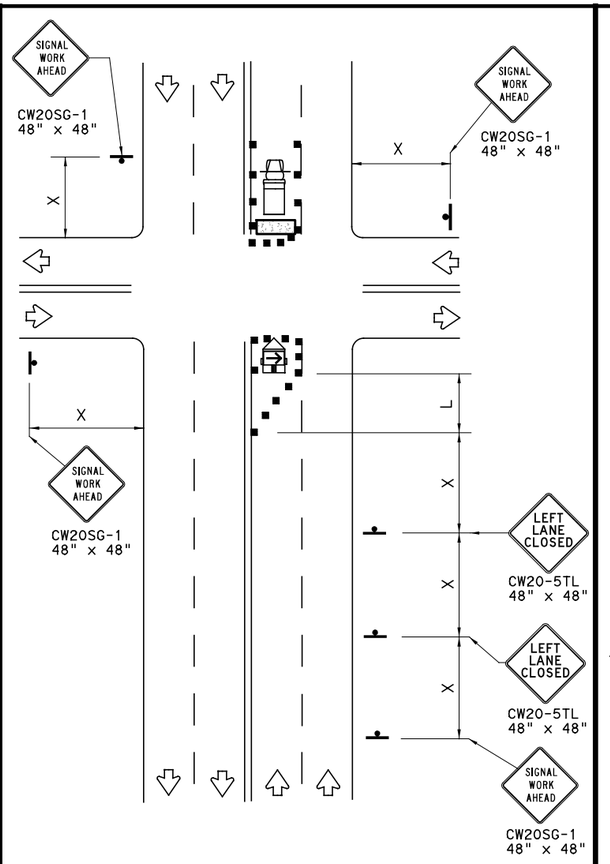
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



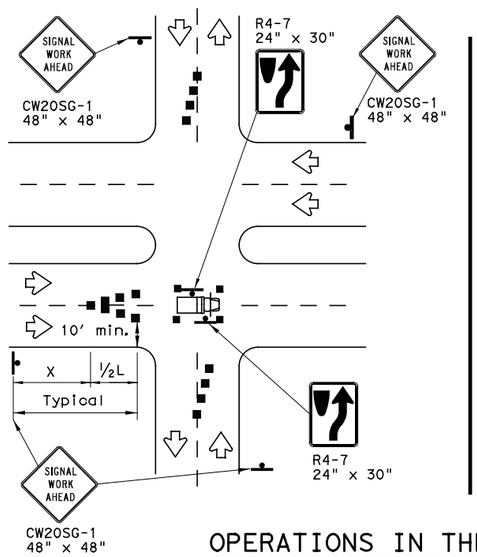
FAR SIDE RIGHT LANE CLOSURE

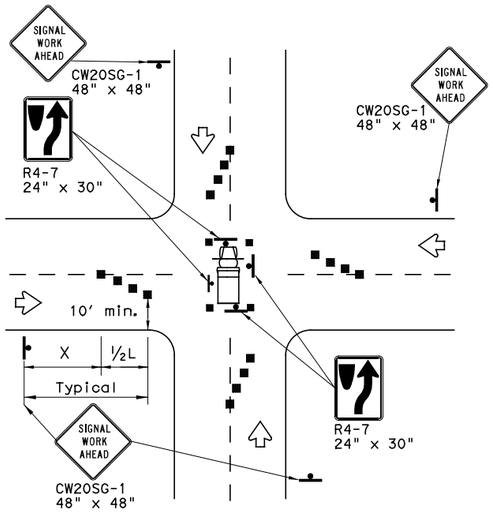
SHORT DURATION OR SHORT TERM STATIONARY



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

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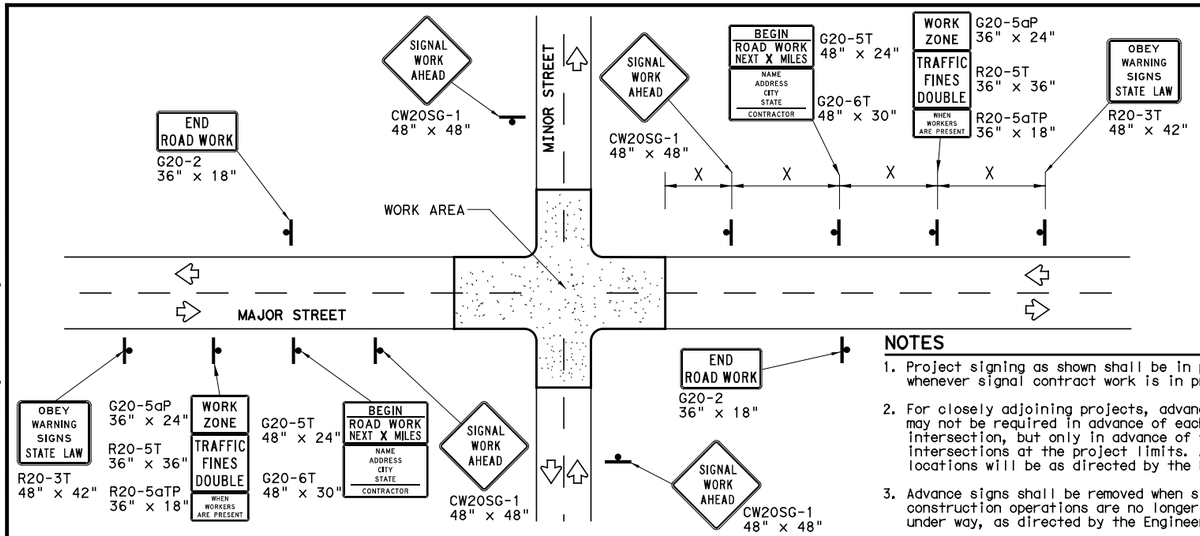


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

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

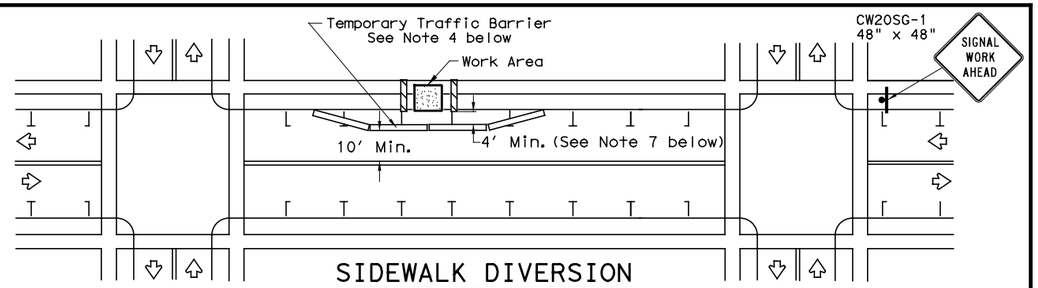
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support 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



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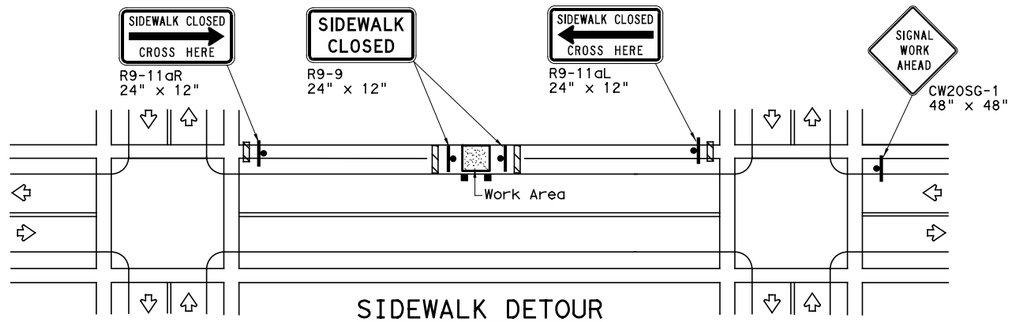
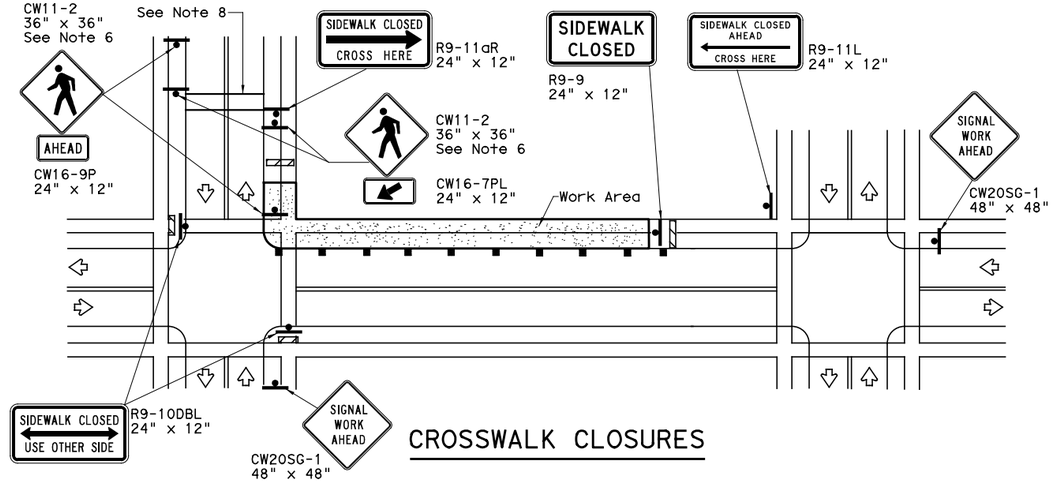


SIDEWALK DETOUR



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
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2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	PHR	HIDALGO		76

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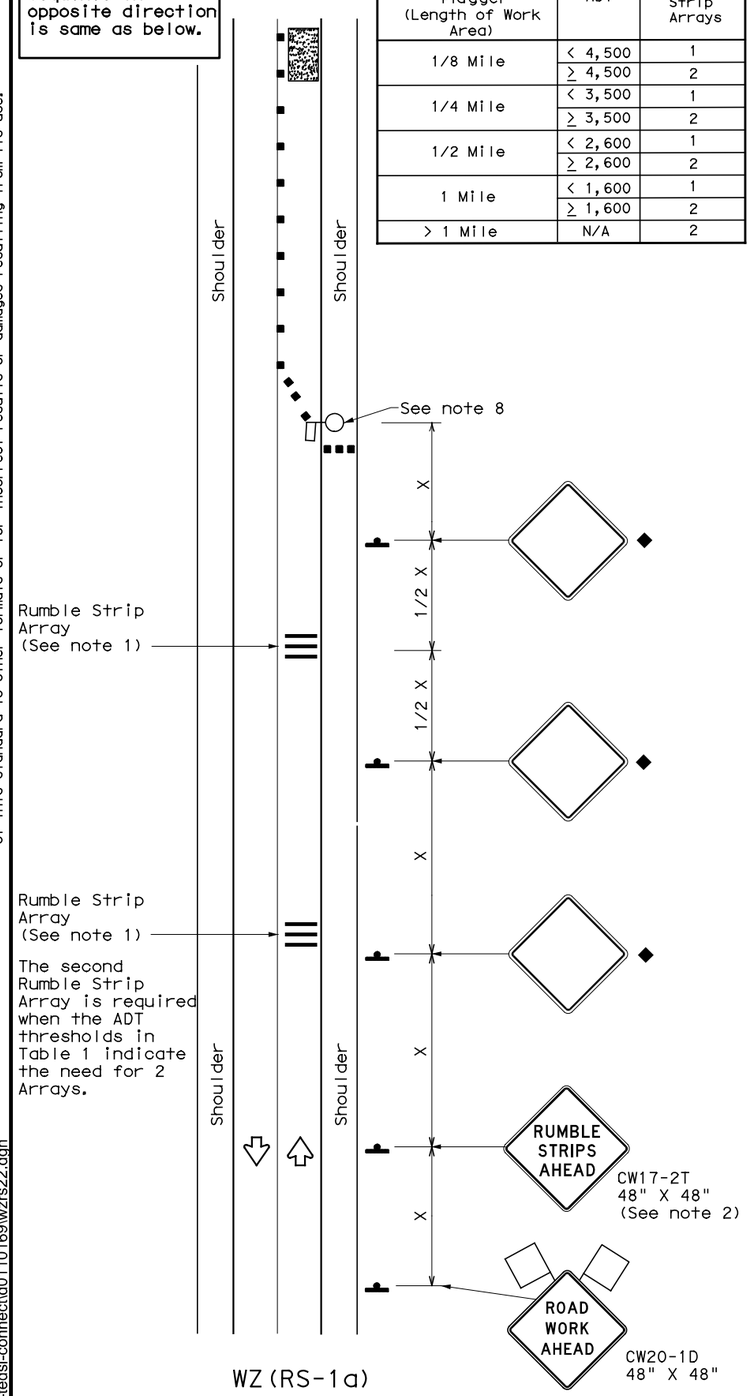
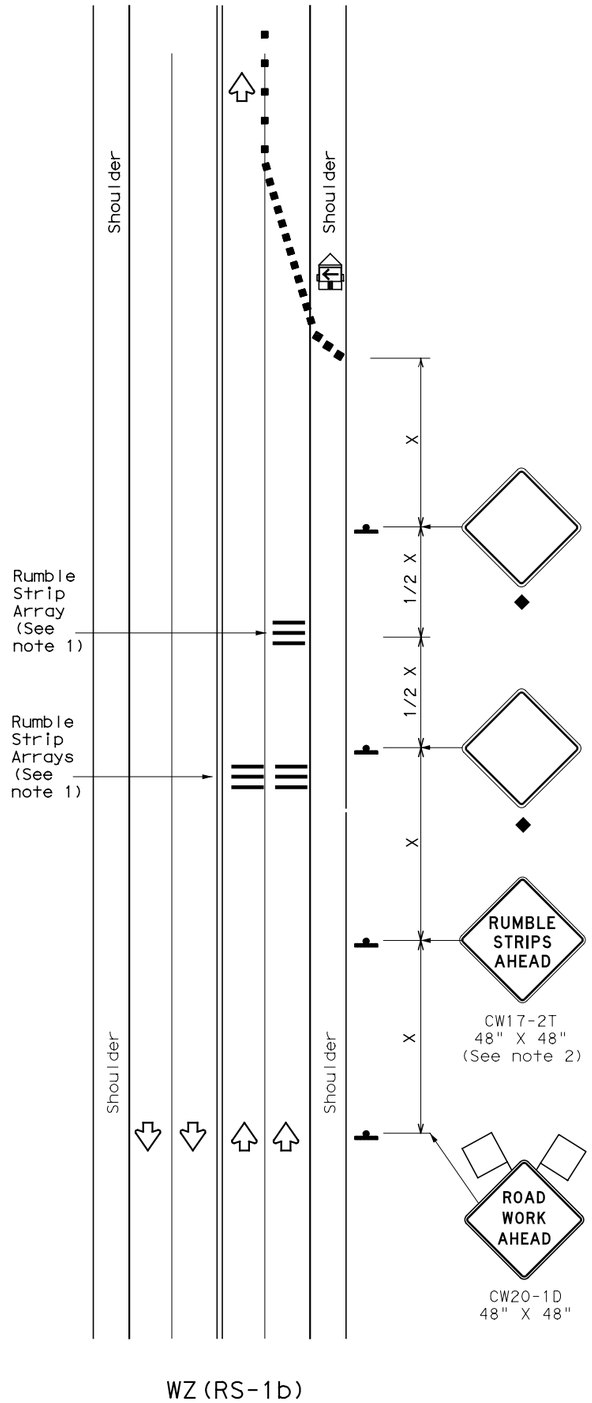
Warning sign and rumble strip sequence in opposite direction is same as below.

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

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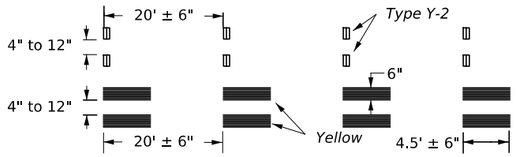
REVISIONS 2-14 1-22 4-16	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		77

117

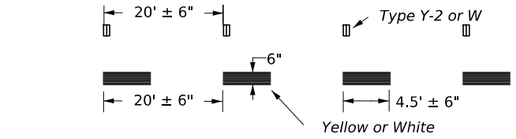
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

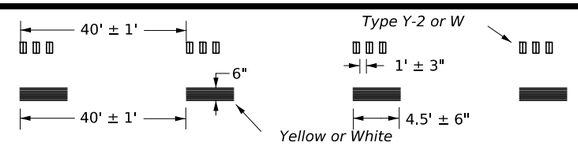


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



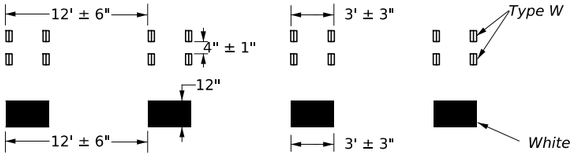
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

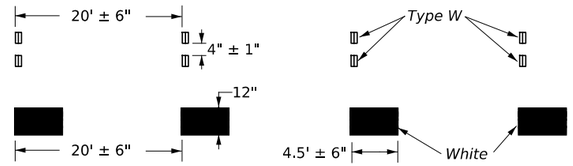


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



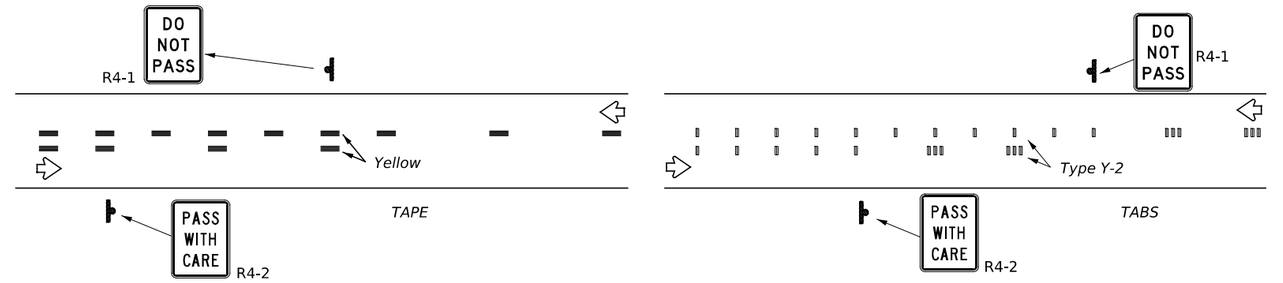
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

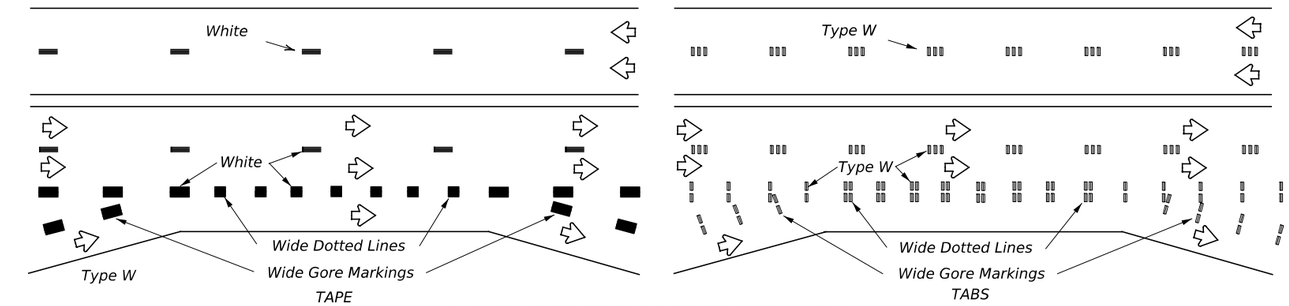
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

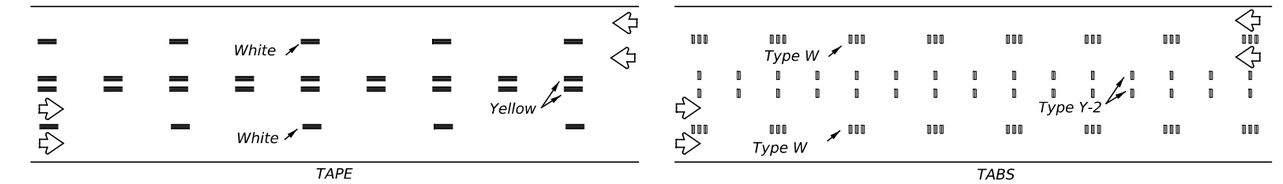
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



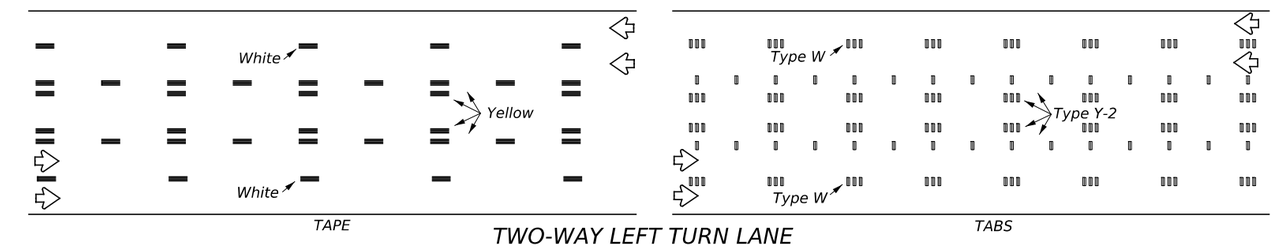
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



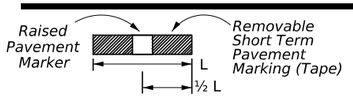
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

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1-97 2-23	PHR	HIDALGO		78
3-03				

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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.

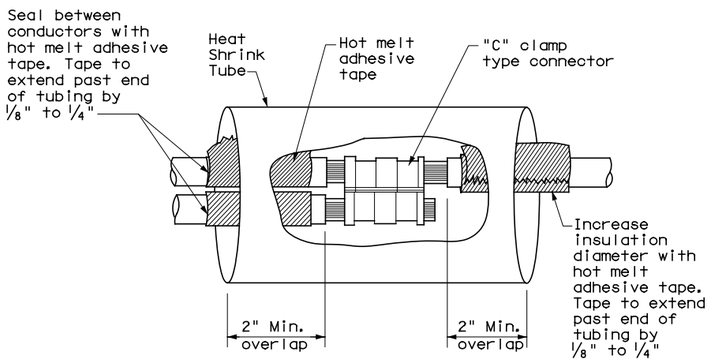
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

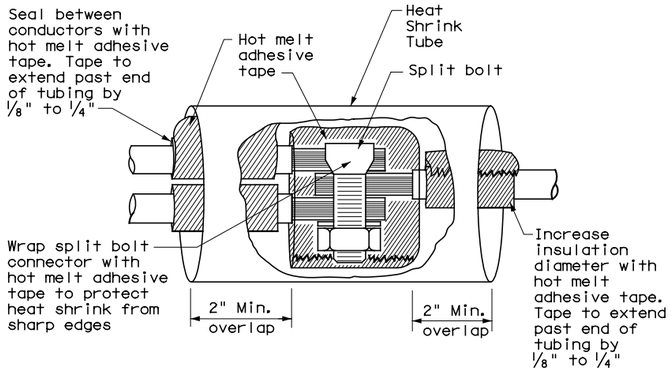
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in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

B. CONSTRUCTION METHODS

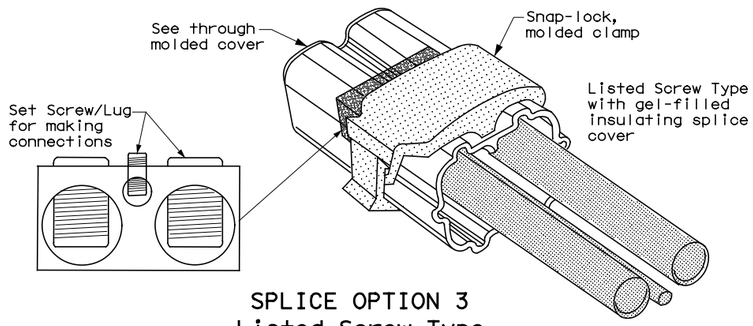
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, 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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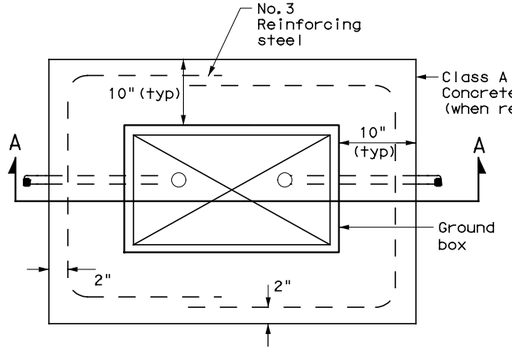
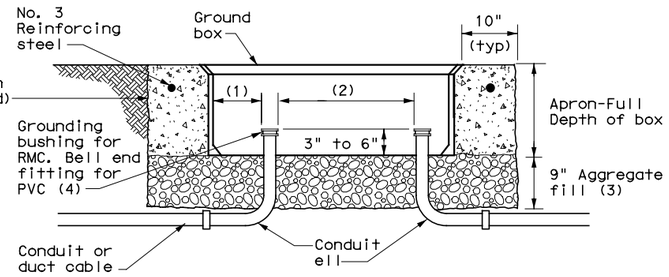


PLAN VIEW



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.

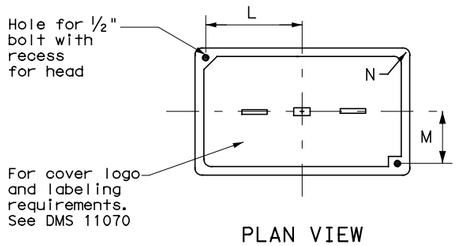
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

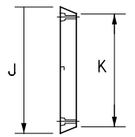
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

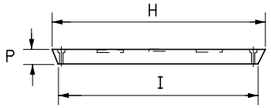
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



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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	PHR	HIDALGO		81

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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	

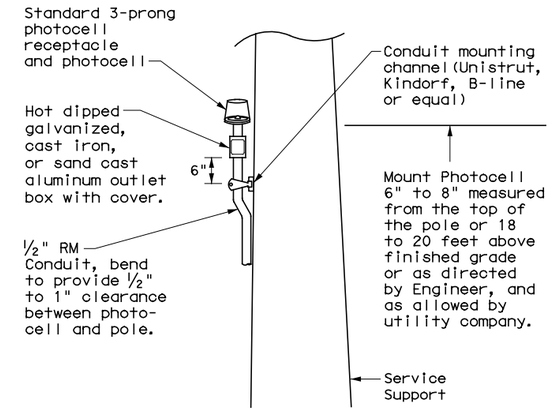
* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** 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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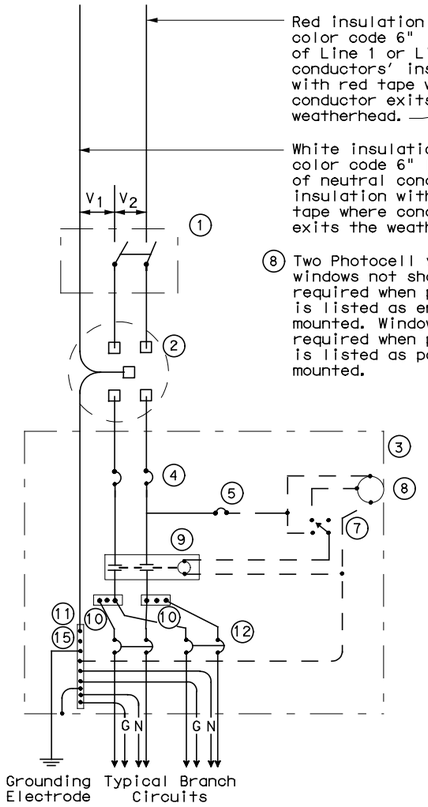
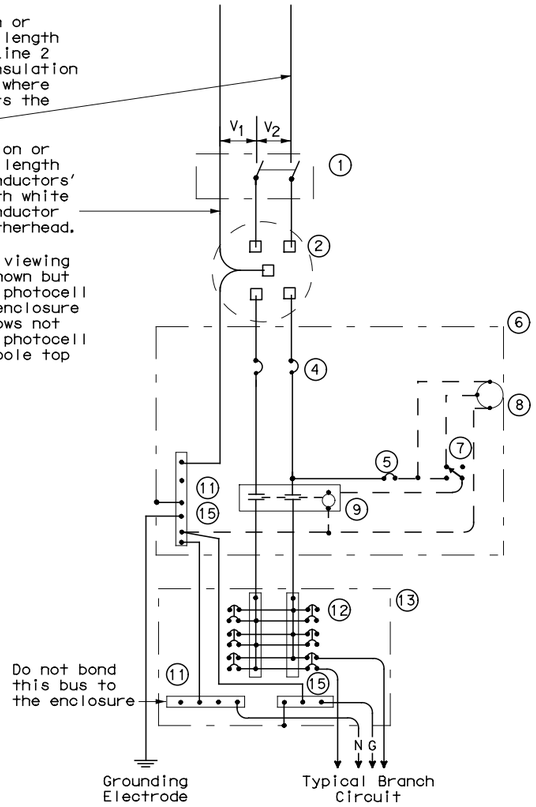
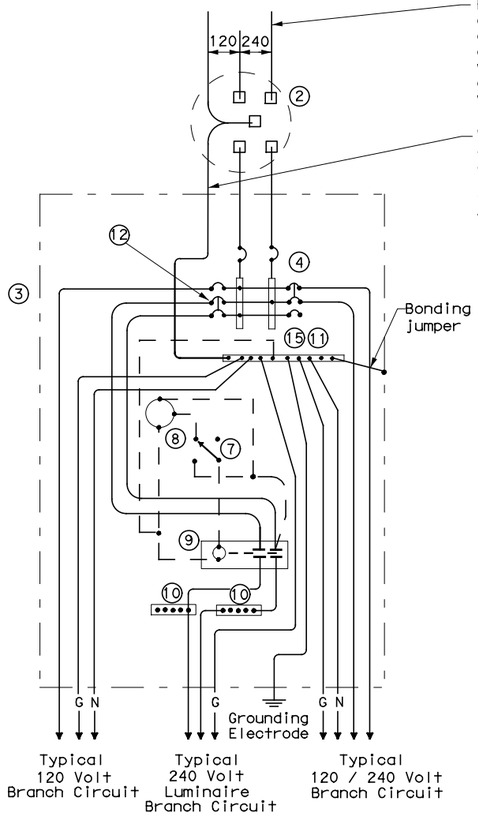


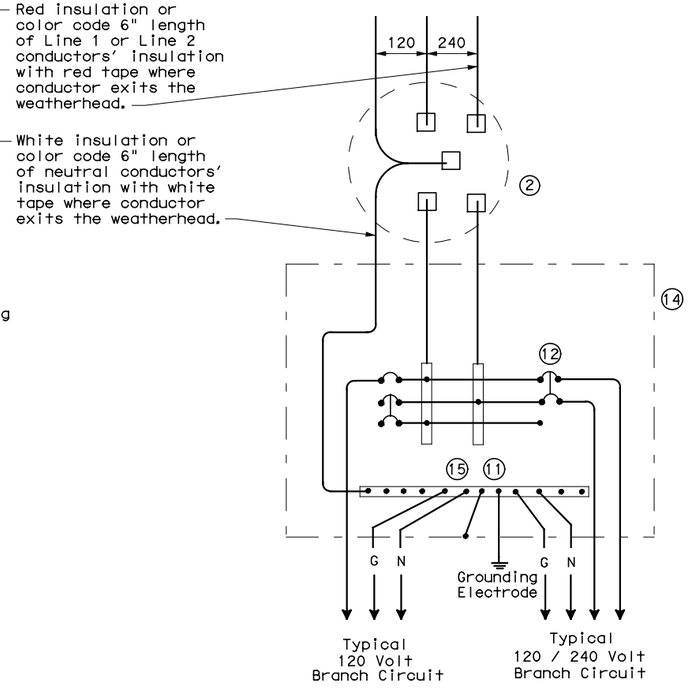
SCHEMATIC TYPE A
THREE WIRE



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

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REVISIONS	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		83

71F

SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

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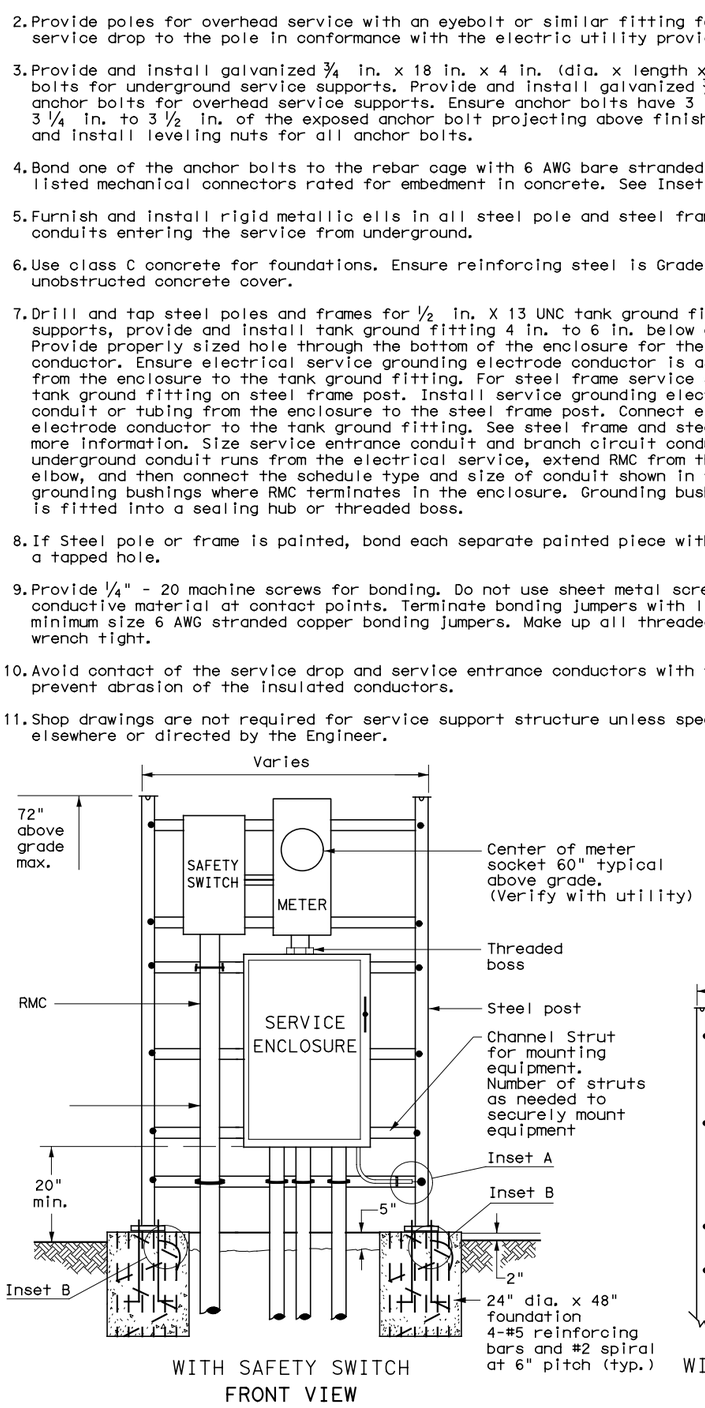
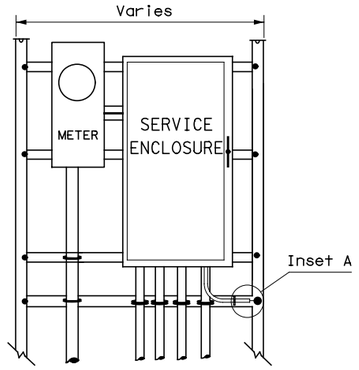
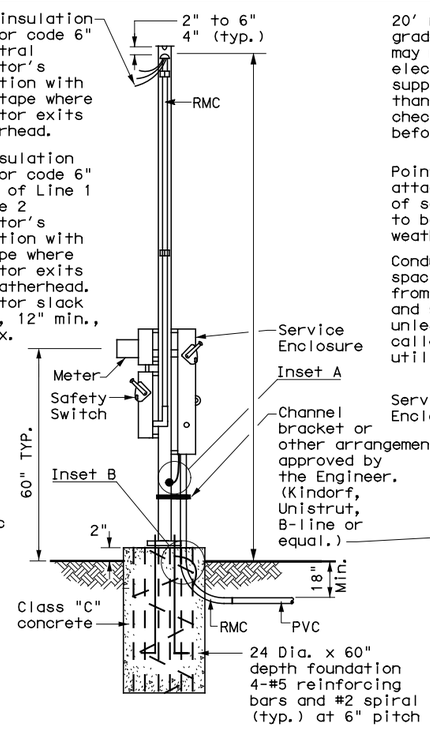


WITH SAFETY SWITCH
FRONT VIEW

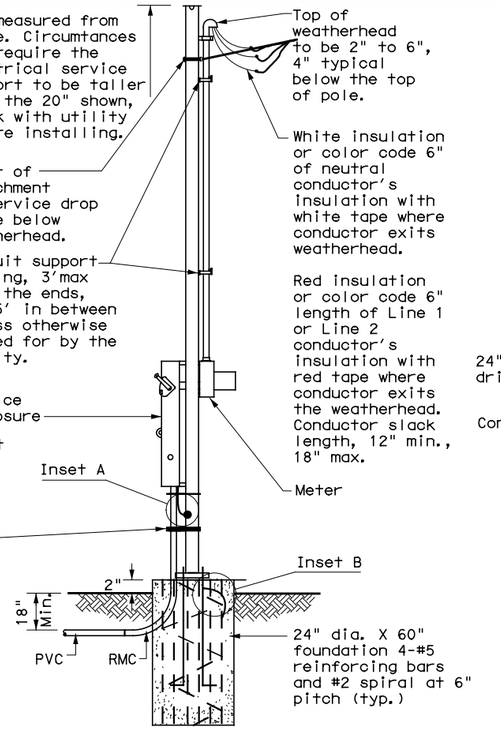


WITHOUT SAFETY SWITCH

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

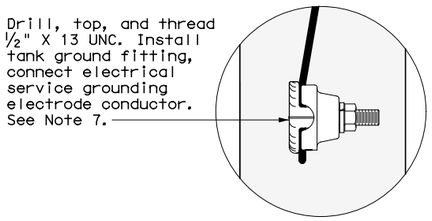


WITH SAFETY SWITCH

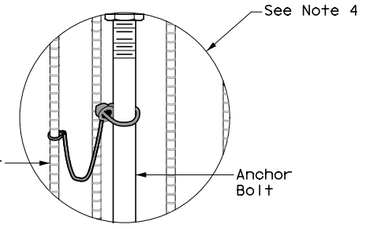


WITHOUT SAFETY SWITCH

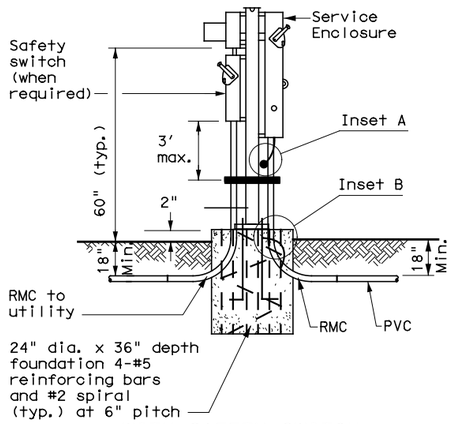
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



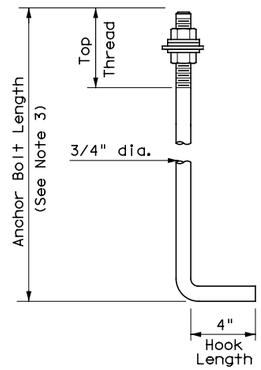
FRONT VIEW
INSET A



INSET B

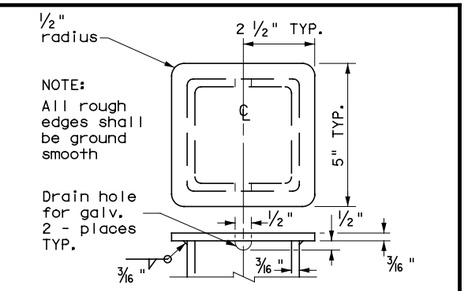


WITH SAFETY SWITCH

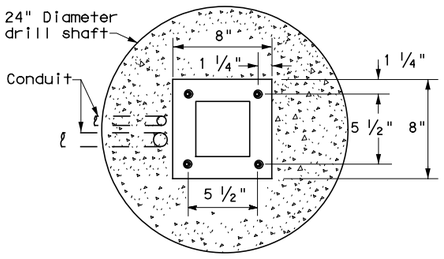


HOOKED ANCHOR DETAIL

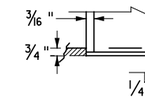
SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE



POLE TOP PLATE

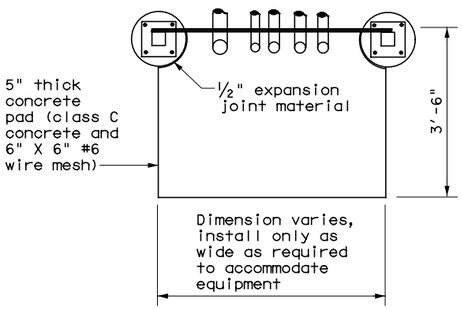


BASE PLATE DETAIL



BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

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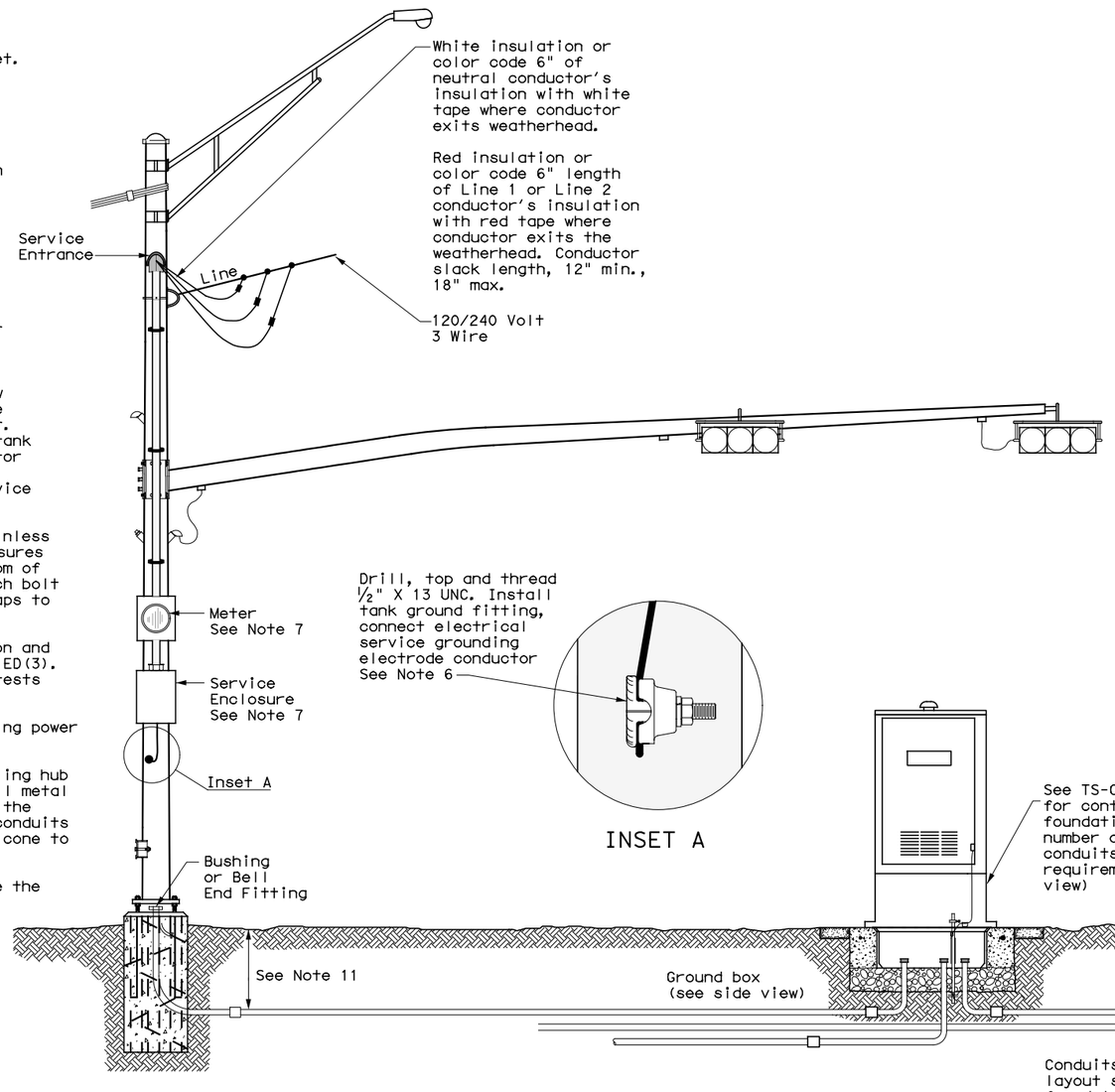
TRAFFIC SIGNAL NOTES

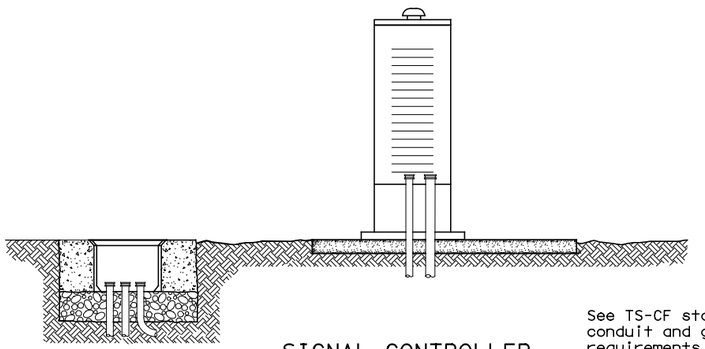
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material 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.

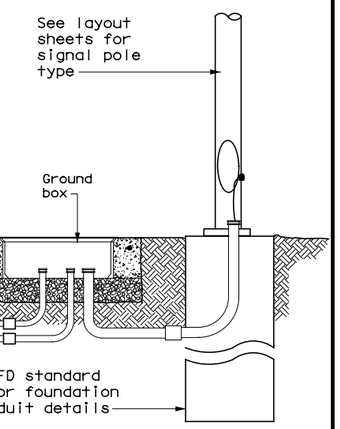
INSET A



SIGNAL CONTROLLER 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.

SIGNAL CONTROLLER FRONT VIEW



SIGNAL POLE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1½ in. to 1⅝ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, ¼ in. minimum diameter by 1½ in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.

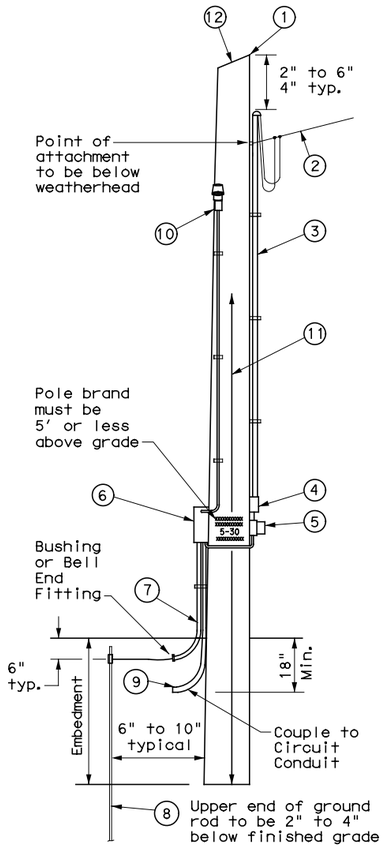
(8) 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

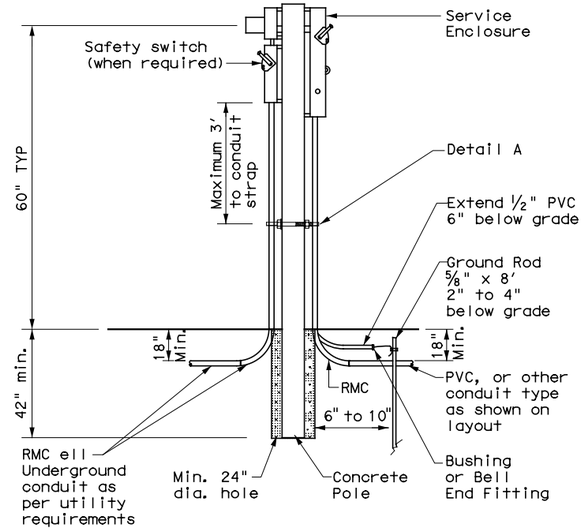


SERVICE SUPPORT TYPE TP (O)

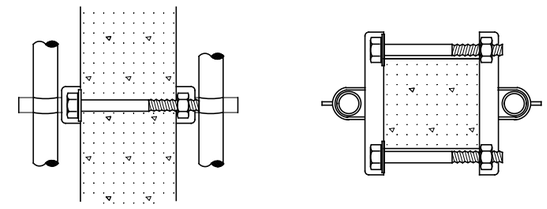
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.

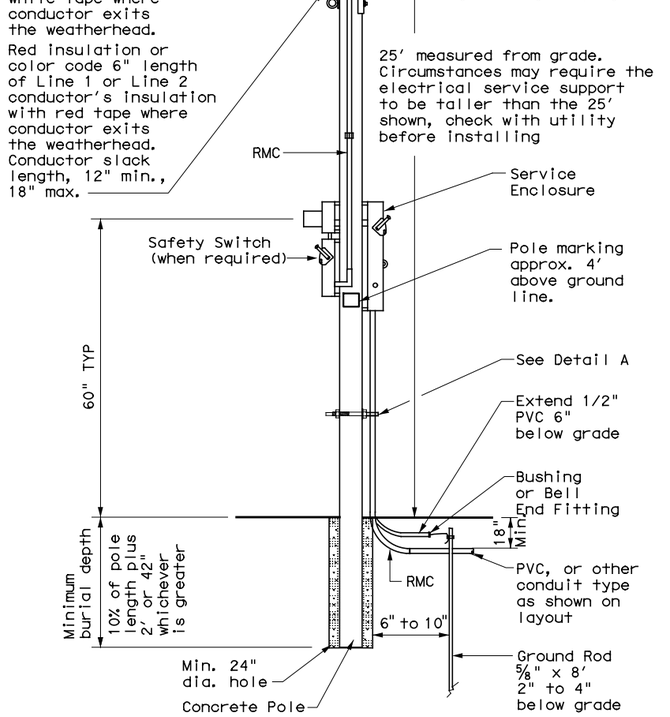


CONCRETE SERVICE SUPPORT
Underground (U)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.



CONCRETE SERVICE SUPPORT
Overhead (O)

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

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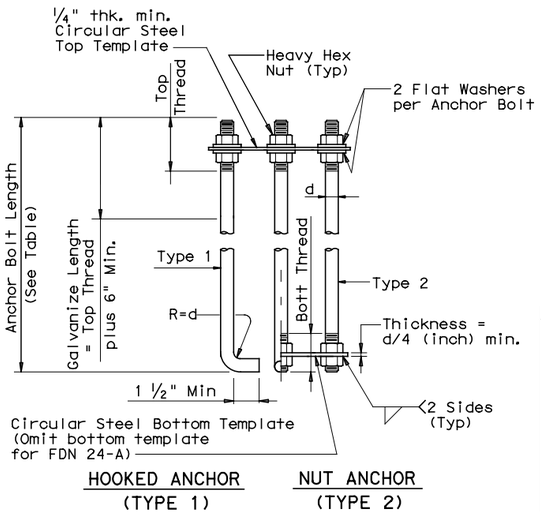
FOUNDATION DESIGN TABLE

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 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
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)

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'

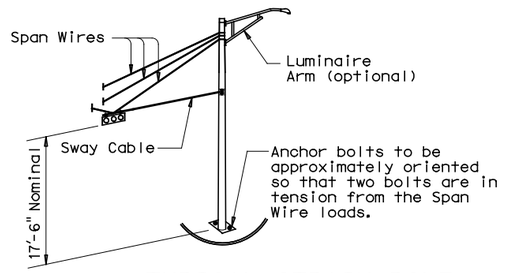
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



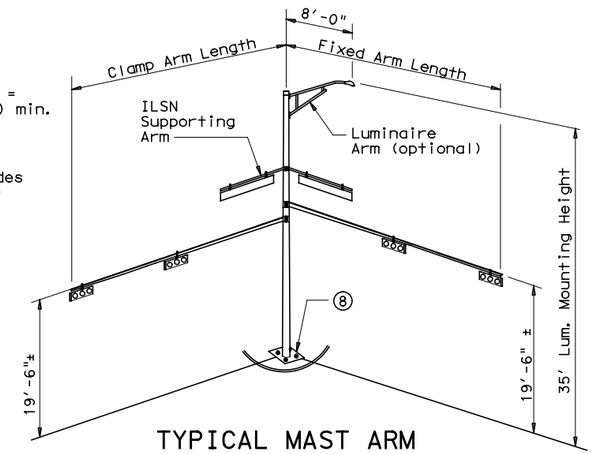
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

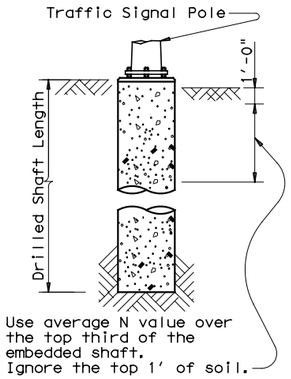
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



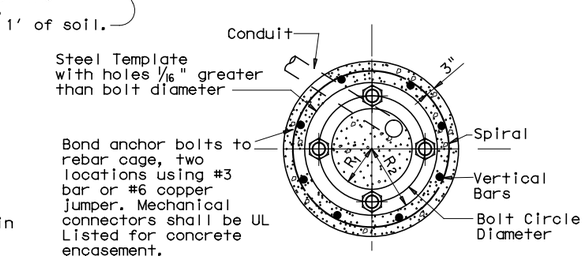
TYPICAL STRAIN POLE ASSEMBLY



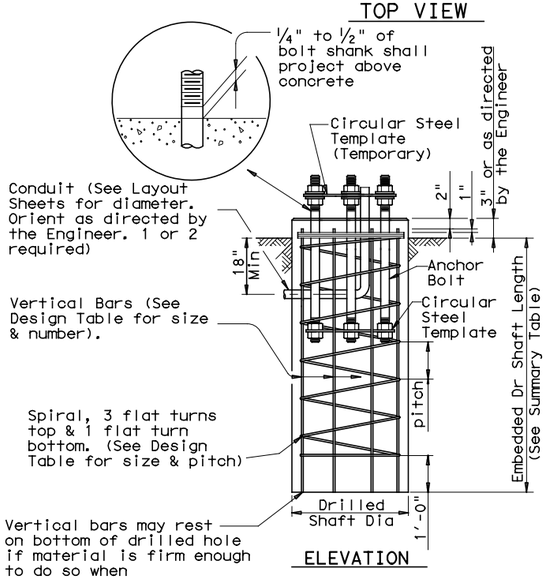
TYPICAL MAST ARM ASSEMBLY



Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.



TOP VIEW



ELEVATION

FOUNDATION DETAILS

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.

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
TROSPER & MILE 2								
POLE 1	10	30-A	1		12			
POLE 2 (PED)	10	24-A	1	6				
POLE 3	10	36-A	1			13		
POLE 4	10	36-A	1			13		
POLE 5	10	36-A	1			13		
POLE 6 (PED)	10	24-A	1	6				
STEWART & MILE 2								
POLE 1	10	30-A	1		12			
POLE 2 (PED)	10	24-A	1	6				
POLE 3 (PED)	10	24-A	1	6				
POLE 4 (PED)	10	24-A	1	6				
POLE 5 (PED)	10	24-A	1	6				
POLE 6	10	36-A	1			13		
POLE 7 (PED)	10	24-A	1	6				
POLE 8	10	36-A	1			13		
POLE 9 (PED)	10	24-A	1	6				
POLE 10	10	30-A	1		12			
POLE 11 (PED)	10	24-A	1	6				
GLASSCOCK & MILE 2								
POLE 1	10	30-A	1		12			
POLE 2 (PED)	10	24-A	1	6				
POLE 3 (PED)	10	24-A	1	6				
POLE 4	10	36-A	1			13		
POLE 5 (PED)	10	30-A	1		12			
POLE 6	10	24-A	1	6				
POLE 7 (PED)	10	24-A	1	6				
POLE 8	10	24-A	1	6				
POLE 9 (PED)	10	36-A	1			13		
POLE 10	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS								

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".

Texas Department of Transportation
Traffic Operations Division

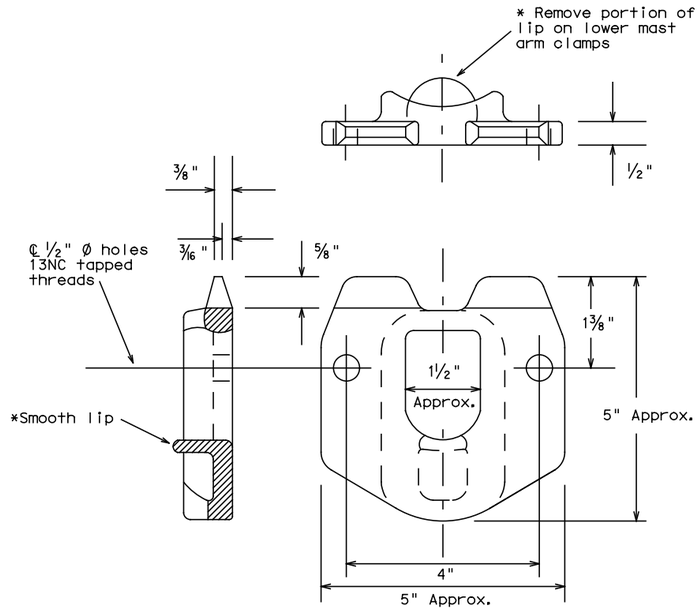
TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

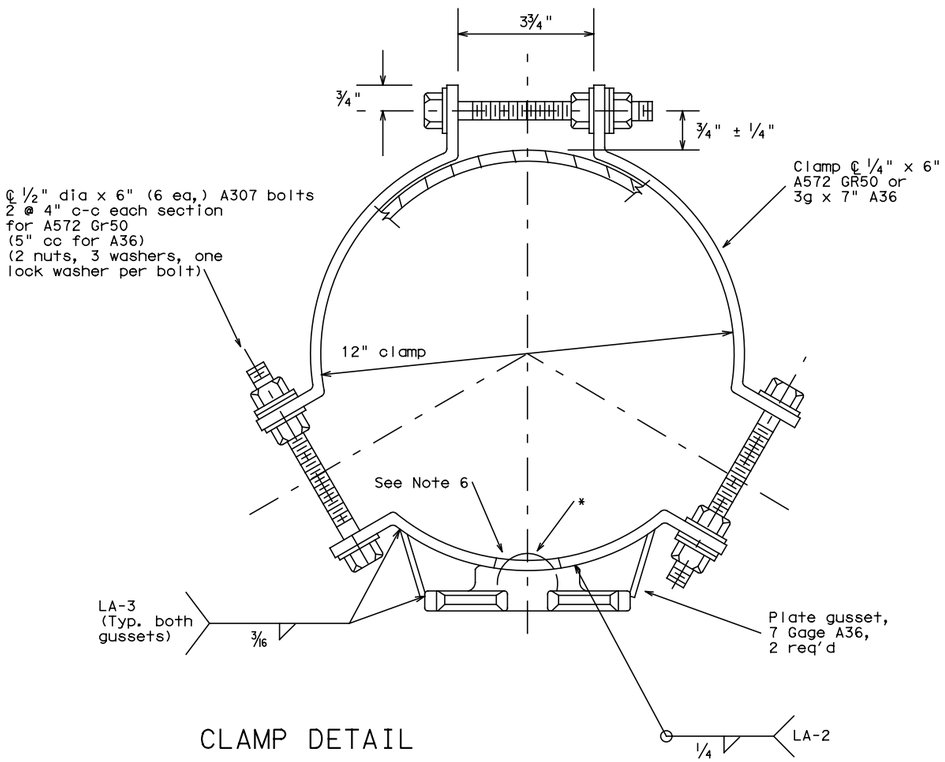
REVISIONS 5-96 11-99 1-12

DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
CONT	SECT	JOB	HIGHWAY
0921	02	501,ETC	VARIOUS
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		87

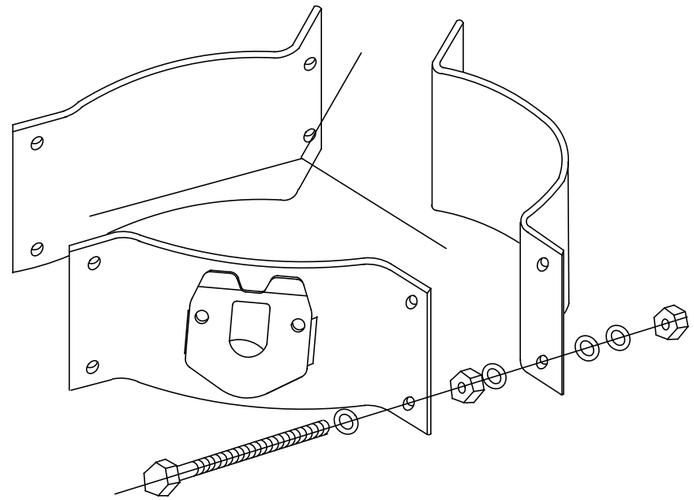
DATE:
FILE:



POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2in. X 1 1/2in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq.ft.,12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

For 8.9 - 12 inch diameter Signal Poles
(Two req'd for each mast arm)

Texas Department of Transportation
Traffic Operations Division

CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

CFA-12

© TxDOT	DN: KAB		CK: RES	DW: FDN	CK: CAL
REVISIONS	CONT	SECT	JOB	HIGHWAY	
11-99 1-12	0921	02	501,ETC	VARIOUS	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		88	

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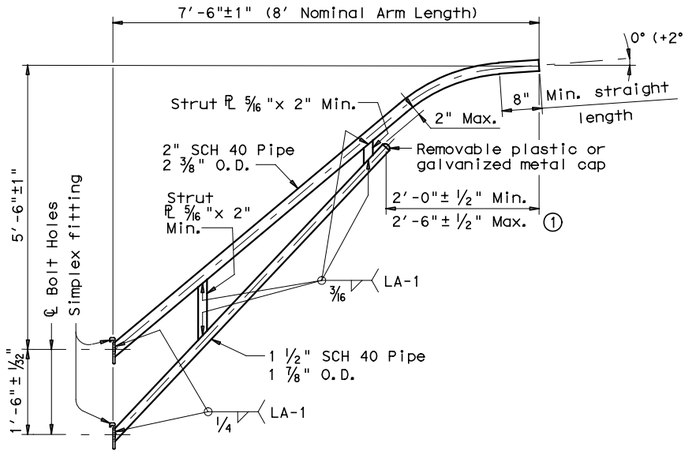
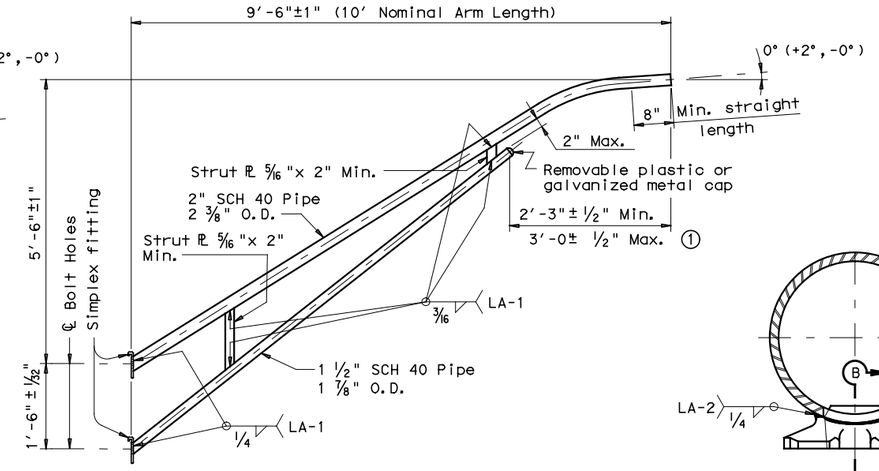
DATE:
FILE:



8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM

DIRECT ATTACHMENT DETAIL

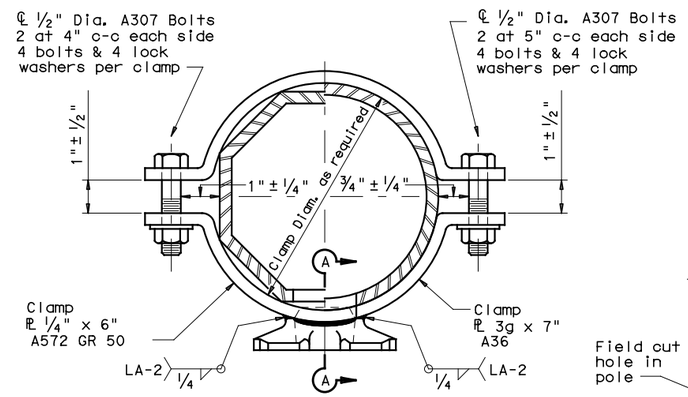
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

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

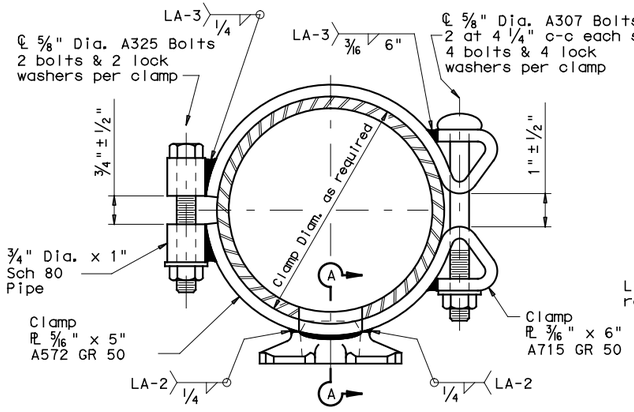
(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.



CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



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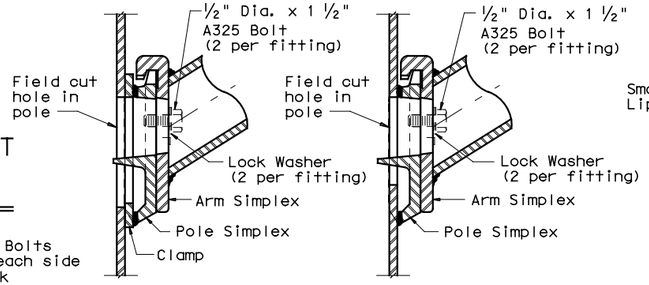
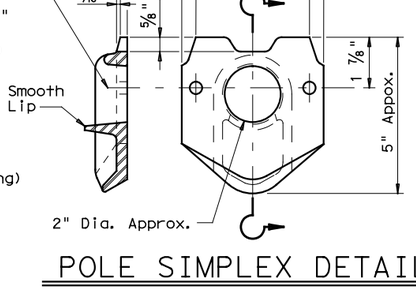
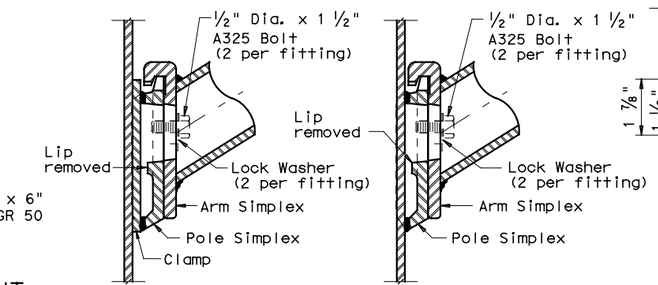


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

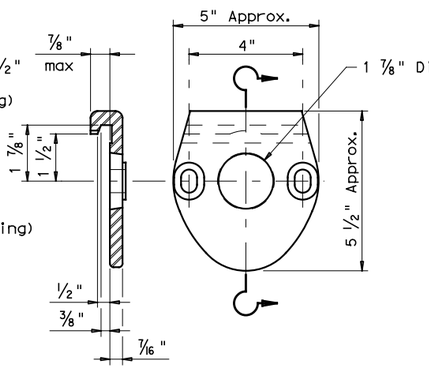


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

Materials and 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. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

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

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.

Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

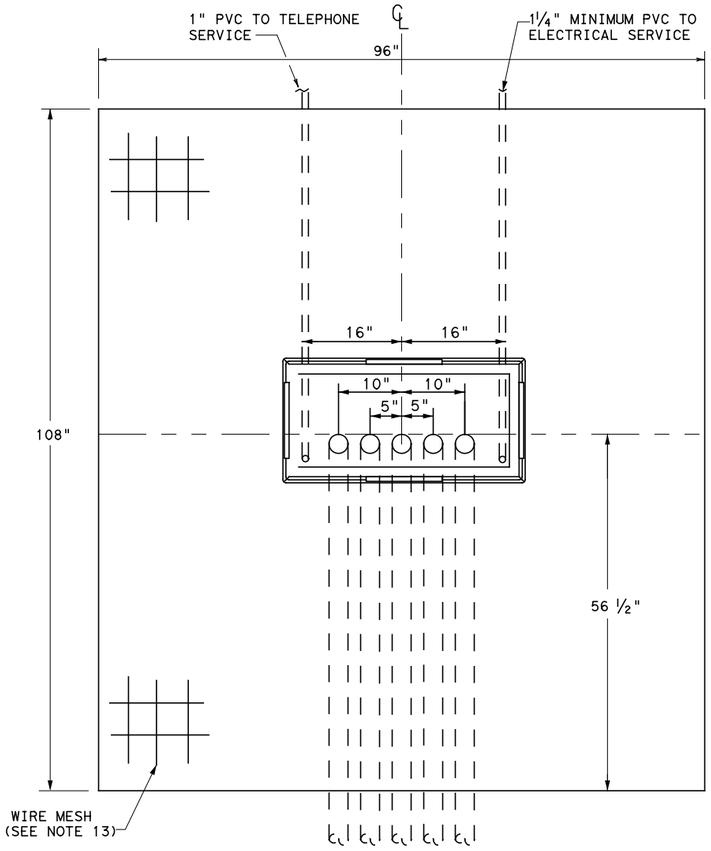
LUM-A-12

DN: LEH	CK: JSY	DW: LTT	CK: TEB

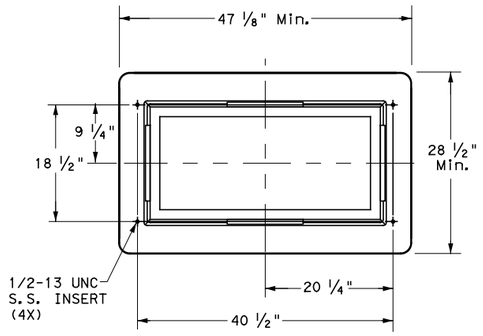
REVISIONS: 5-96, 1-99, 1-12

CONT	SECT	JOB	HIGHWAY
0921	02	501,ETC	VARIOUS
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		89

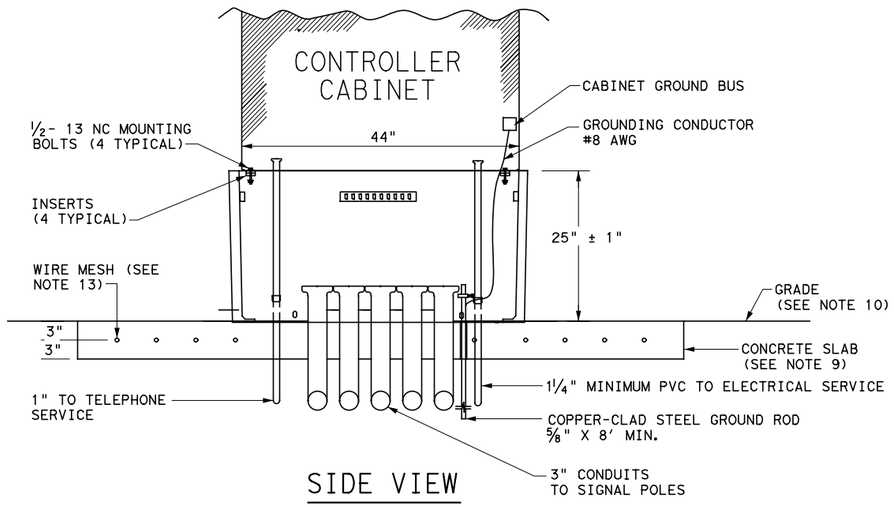
DATE:
FILE:



TOP VIEW



CABINET BASE



SIDE VIEW

TRAFFIC SIGNAL CONTROLLER BASE:

1. PROVIDE A TRAFFIC SIGNAL CONTROLLER BASE (CABINET BASE) MANUFACTURED OF POLYMER CONCRETE MATERIAL CONSISTING OF CALCAREOUS AND SILICEOUS STONE; GLASS FIBERS AND THERMOSET POLYESTER RESIN. THE POLYMER CONCRETE CABINET BASE MUST BE REINFORCED ON THE INSIDE OF THE CABINET BASE WITH FIBERGLASS MATTING. PROVIDE ONE OF THE FOLLOWING BASES: ARMORCAST PART # A6001848X24, QUAZITE MODEL # PG3048Z709, OR OTHER AS APPROVED BY TXDOT TRAFFIC SAFETY DIVISION.
2. THE POLYMER CONCRETE MATERIAL MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 10,300 POUNDS PER SQUARE INCH (PSI), MINIMUM FLEXURAL STRENGTH OF 3600 PSI, AND MINIMUM SHEAR STRENGTH OF 3600 PSI.
3. THE POLYMER CONCRETE CABINET BASE MUST CONFORM TO THE DIMENSIONS SHOWN AND MUST ACCOMMODATE A STANDARD TXDOT BASEMOUNT CABINET.
4. SUPPLY THE CABINET BASE WITH FOUR 1#2"-13 UNC STAINLESS STEEL INSERTS FOR ATTACHMENT OF THE CABINET TO THE BASE. INSERTS MUST WITHSTAND A MINIMUM TORQUE OF 50 FT-LB AND A MINIMUM STRAIGHT PULL OUT STRENGTH OF 750 LBS.
5. PROVIDE THE CABINET BASE WITH 4 CABLE RACKS MOUNTED ONE ON EACH SIDE OF THE BASE 2" TO 7 " FROM THE TOP EDGE OF THE BASE. UNLESS APPROVED OTHERWISE, CABLE RACKS MUST BE 1-1/2 X 9#16X 3#16INCH STEEL CHANNEL WITH EIGHT T-SLOTS SPACED AT 1-1/2 INCHES. THE CABLE RACKS MUST EASILY ACCOMMODATE THE INSERTION OF TIE WRAPS TO ATTACH FIELD WIRING TO THE RACKS TO SERVE AS STRAIN RELIEF. SECURE CABLE RACKS TO THE BASE USING 1#2"-13 UNC STAINLESS STEEL SCREWS AND INSERTS.
6. THE CABINET BASE, WHEN SECURED TO THE CONCRETE SLAB WITH CONTROLLER CABINET ATTACHED, MUST WITHSTAND A MINIMUM WIND LOAD OF 125 MPH OR A 850 LB FORCE APPLIED AT 49" ABOVE THE BOTTOM OF THE BASE WITHOUT CAUSING THE BASE OR CABINET TO COME OUT OF THEIR ANCHORED POSITION OR CAUSE ANY PERMANENT DEFORMATION. THE MANUFACTURER MUST SUPPLY CERTIFICATION BY AN INDEPENDENT TESTING LABORATORY OR SEALED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. PROVIDE THE CABINET BASE WITH HARDWARE FOR ATTACHMENT TO A CONCRETE SLAB.
7. THE TRAFFIC SIGNAL BASE MUST BE PERMANENTLY MARKED EITHER BY IMPRESS OR BY PERMANENT INK WITH THE MANUFACTURER'S MODEL NUMBER AND NAME OR LOGO.
8. SEAL THE BASE TO THE CONCRETE WITH A SILICONE CAULK BEAD AND FASTENED TO THE SLAB PER MANUFACTURER'S INSTRUCTIONS.

CONCRETE SLAB:

9. TRAFFIC SIGNAL CONTROLLER PAD MUST BE A PORTLAND CEMENT CONCRETE SLAB POURED IN PLACE, MUST CONFORM TO THE DIMENSIONS SHOWN, AND MUST BE LEVEL.
10. GRADE EARTHWORK SUCH THAT IT IS FLUSH WITH THE CONCRETE PAD ON ALL FOUR SIDES, UNLESS OTHERWISE SHOWN ON THE PLANS. SUBSIDIARY TO ITEM 680, FOUR INCH RIP RAP MAY BE USED IN LIEU OF EARTHWORK. SLOPES SHALL GRADUALLY CONTOUR TO MATCH PLANS.
11. BOND A #8 AWG COPPER GROUND WIRE AND AN 8 FT GROUND ROD BONDED TO THE REINFORCING MESH BY A SUITABLE UL LISTED CLAMP AND TERMINATED TO THE CABINET GROUNDING BUS FOR THE PURPOSE OF PROVIDING A LOCAL GROUND FOR THE ELECTRICAL GROUNDING CONDUCTOR. THE ELECTRICAL GROUNDING CONDUCTOR SPECIFIED IN ITEM 680-3.A.4 IS REQUIRED AND MUST BE TERMINATED TO THE CABINET GROUND BUS.
12. INSTALL A PVC SLEEVE TO PREVENT THE GROUND ROD FROM DIRECT EMBEDMENT IN THE SLAB.
13. PROVIDE WELDED WIRE MESH 6X6-W2.9 X W2.9 FOR REINFORCEMENT. PROVIDE JOINTS AND SPLICES IN THE MESH WITH A MINIMUM 6-INCH OVERLAP. CENTER THE MESH BETWEEN TOP AND BOTTOM AND PROVIDE A MINIMUM 3 INCH COVER ON THE EDGES.
14. PROVIDE CLASS B CONCRETE MINIMUM FOR THE SLAB IN ACCORDANCE WITH ITEM 421. CONSTRUCT THE SLAB IN ACCORDANCE WITH ITEM 531.

CONDUITS:

15. STUB UP AND RUN 3-INCH CONDUITS THROUGH THE SLAB TO THE VARIOUS TRAFFIC SIGNAL POLES AND GROUND BOXES AS SHOWN ON THE LAYOUTS. INSTALL THE NUMBER OF CONDUITS AS SHOWN ON LAYOUTS PLUS TWO ADDITIONAL 3 INCH CONDUITS FOR FUTURE USE. TERMINATE THE CONDUITS WITH A BUSHING BETWEEN 2 AND 4-INCHES ABOVE THE SLAB.
16. EXTEND CONDUITS FOR FUTURE USE AT LEAST 18-INCHES FROM THE EDGE OF THE SLAB, TERMINATE UNDERGROUND WITH A COUPLING, AND CAP AND SEAL SO THAT THE SEAL CAN BE REMOVED WITHOUT DAMAGING THE COUPLING. THIS MUST ALSO APPLY TO UNUSED TELEPHONE CONDUIT.
17. STUB UP TWO SEPARATE CONDUITS THROUGH THE SLAB FROM THE ELECTRICAL AND TELEPHONE SERVICES. RUN THE CONDUIT FOR THE ELECTRICAL FEED DIRECTLY TO THE ELECTRICAL SERVICE ENCLOSURE. RUN THE CONDUIT FOR THE TELEPHONE LINE DIRECTLY TO THE TELEPHONE SERVICE, USUALLY LOCATED ON THE SAME POLE AS THE ELECTRICAL SERVICE. TELEPHONE MUST NOT UNDER ANY CIRCUMSTANCE SHARE A CONDUIT WITH ANY OTHER FUNCTION.
18. TERMINATE ELECTRIC AND TELEPHONE CONDUITS ABOVE THE SLAB WITH A COUPLING. AFTER THE BASE IS INSTALLED, EXTEND THE CONDUITS ABOVE THE TOP OF THE BASE AND SECURE TO THE BASE USING A STEEL ONE-HOLE STRAP OR SIMILAR SUITABLE SUBSTITUTE.

CONTROLLER CABINET:

19. ANCHOR THE CONTROLLER CABINET TO THE BASE USING FOUR STAINLESS STEEL 1/2-13 NC BOLTS.
20. THE SILICONE CAULK BEAD SPECIFIED IN ITEM 680.3.B MUST BE RTV 133.

PAYMENT:

21. BID TS-CF AS SUBSIDIARY TO ITEM 680.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-21

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-04 2-21	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		90

DATE:
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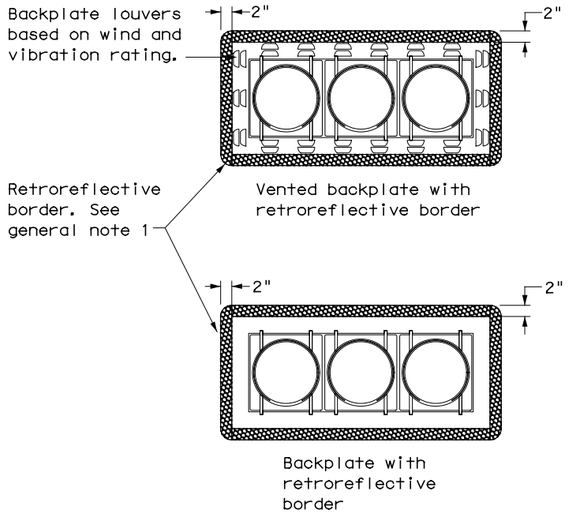
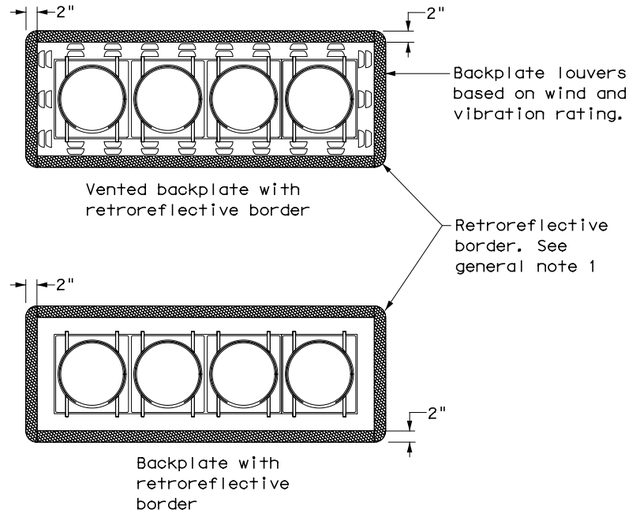


THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



FOUR-SECTION HEAD
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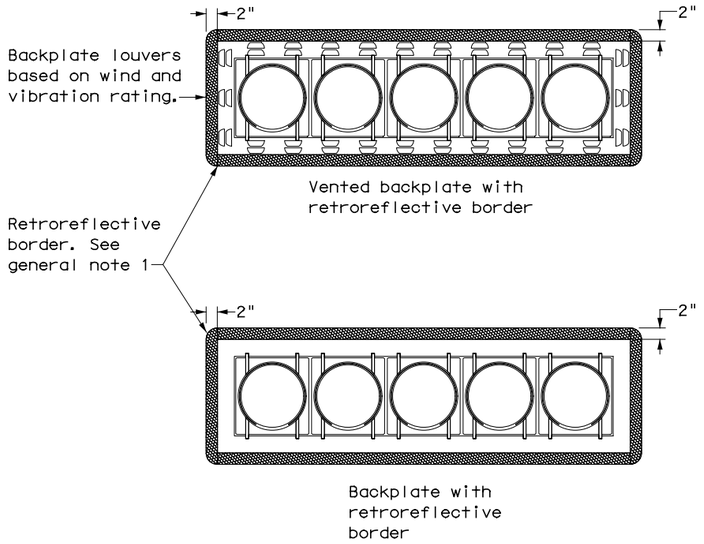
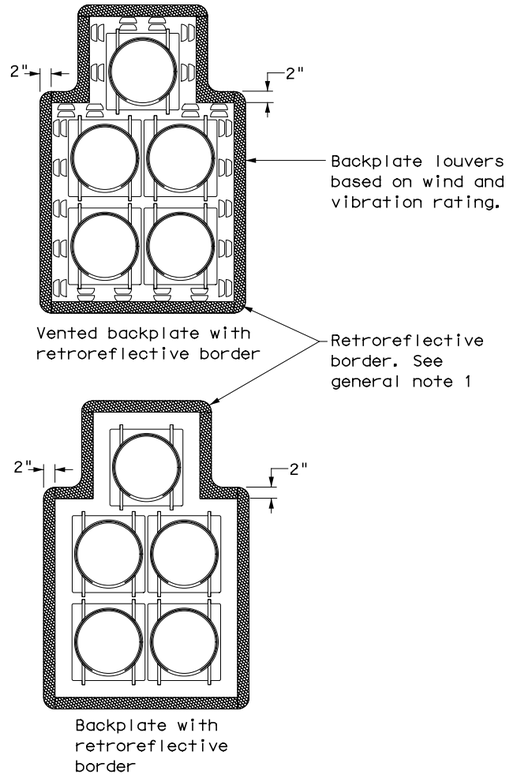
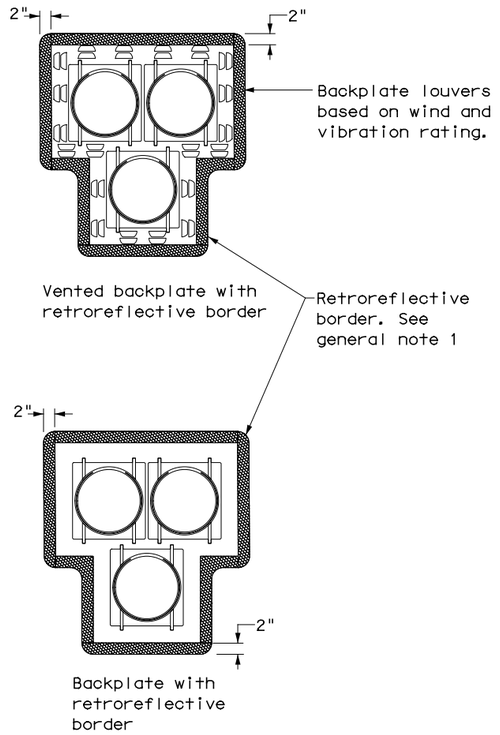


FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



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
REVISIONS	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		91

NOTES:

ENSURE MAIN SERVICE DROP IS BELOW WEATHERHEAD.

BREAKER BOX & METER BOX SHALL BE ATTACHED TO WOOD POLE BY GALVANIZED CHANNEL (SEE DETAIL "B").

BOLT BOX TO GALVANIZED CHANNEL MOUNTED FLUSH WITH POLE.

CONDUIT SHALL BE ATTACHED TO POLE WITH H.D. 2-HOLE STRAPS AND 1½"x1/4" #8 S.S. SCREW OR LAG BOLT.

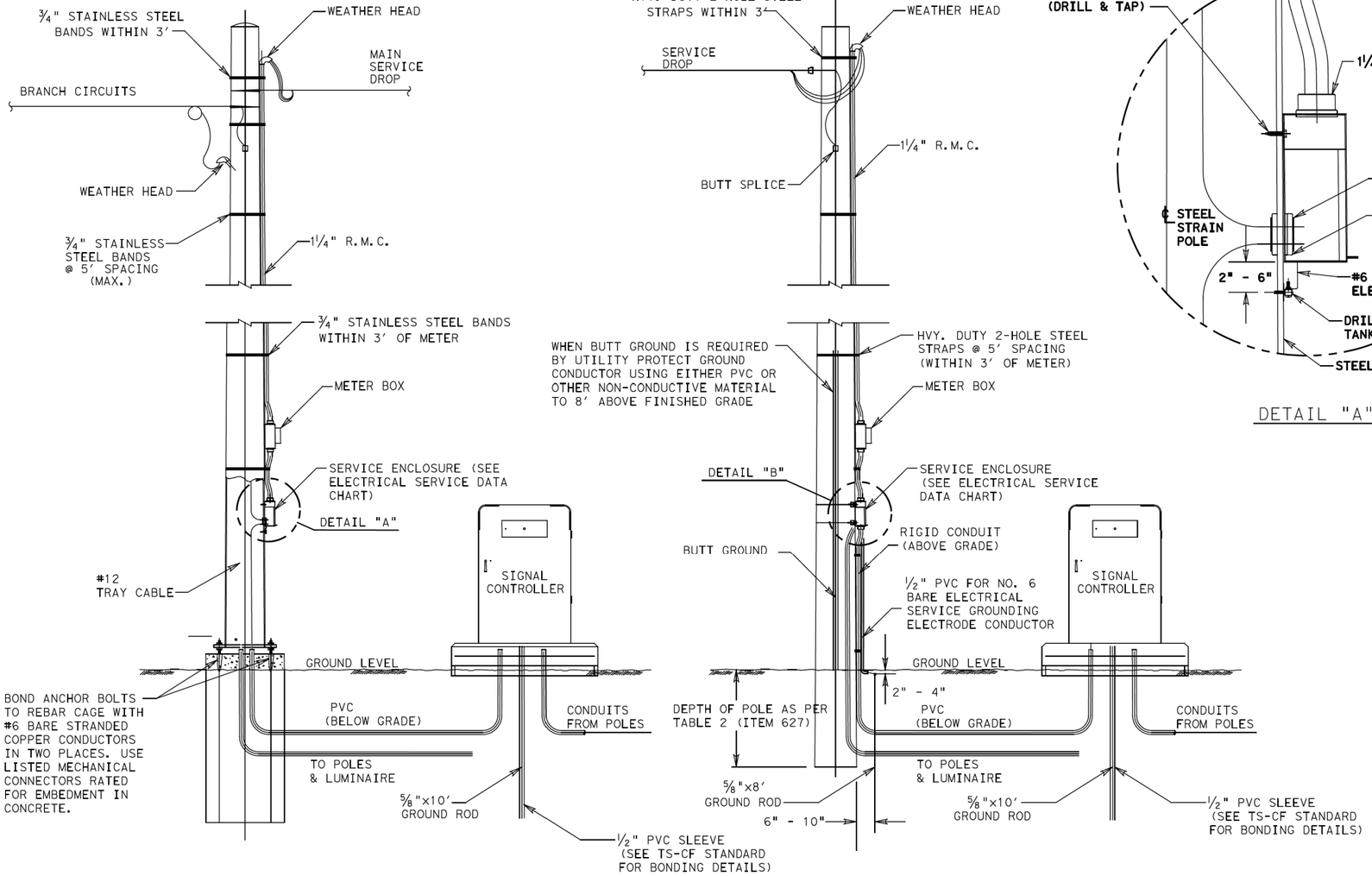
ALL EXPOSED CONDUIT SHALL BE RIGID METAL CONDUIT EXCEPT CONDUIT USED ON ELECTRICAL SERVICE GROUNDING ELECTRODE CONDUCTOR.

WHEN SERVICE IS CONNECTED WITHIN 100' OF THE CONTROLLER, NO PULL BOX SHALL BE USED.

DISTRIBUTION TO LUMINAIRE SHALL BE OUT OF THE SERVICE BREAKER BOX. EACH LUMINAIRE SHALL HAVE A SEPARATE PHOTO CONTROL.

FURNISH & INSTALL 3 PRONG WEATHERPROOF LOCKTYPE BASE WITH PHOTO CELL TO CONTROL ILLUMINATION SIGN WHICH IS ATTACHED TO TRAFFIC SIGNAL SUPPORTS. LOCKBASE & PHOTO CELL SHALL BE INSTALLED ON TRAFFIC SIGNAL POLE NEAREST CABINET.

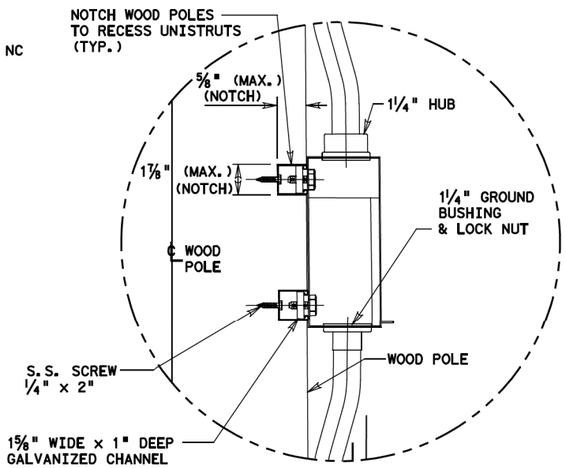
ALL CONDUIT & CONDUCTORS FROM SERVICE TO CONTROLLER CABINET SHALL BE AS PER PLANS.



STEEL STRAIN POLE

WOOD POLE

DETAIL "A"



DETAIL "B"

ELECTRICAL SERVICE

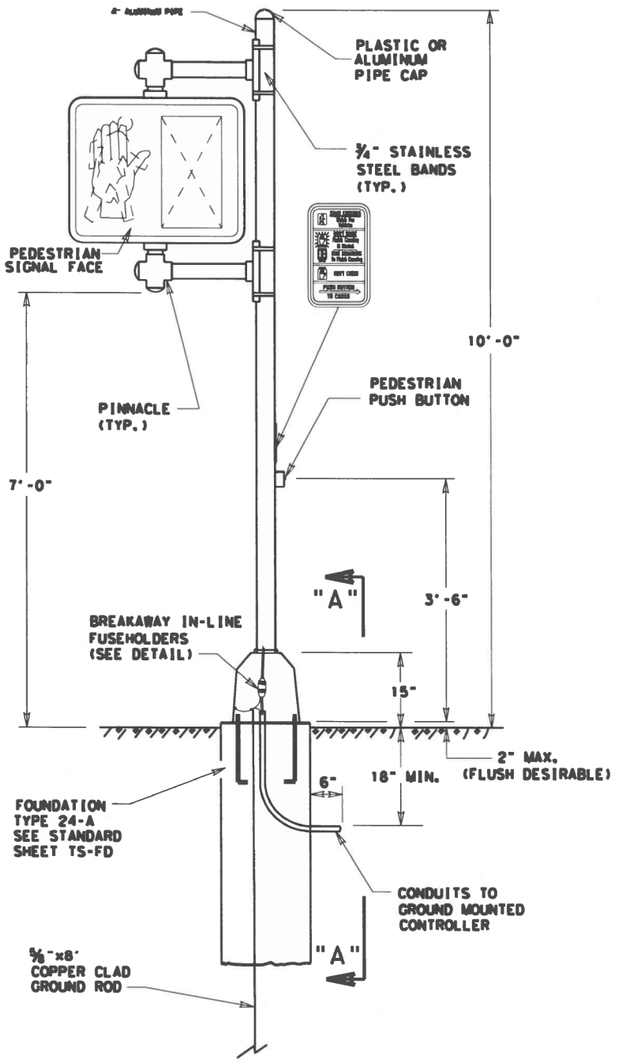
PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

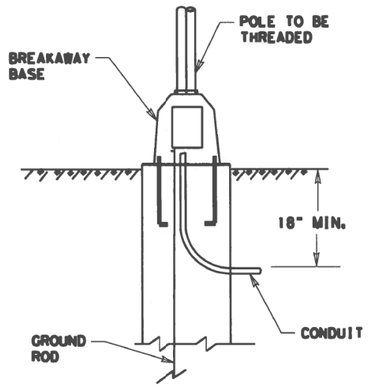
ELECTRICAL SERVICE DESIGN WITH SIGNAL CONTROLLER

SHEET 1 OF 1

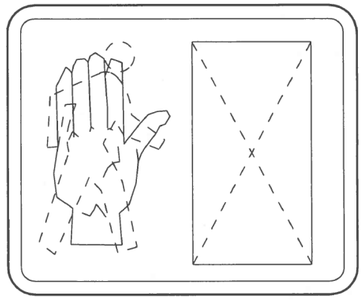
DN: OG	DRAWING	DATE	FEDERAL ID NO.	STATE	FEDERAL AID PROJECT NO.		SHEET NO.
CK DN: JSL	ORIGINAL	APR. 2010		TEXAS	STB 2B24(399)HESG, ETC.		92
DW: OG			STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW: JSL			PHR	HIDALGO	0921	02	501	ETC



PEDESTAL POLE DETAIL



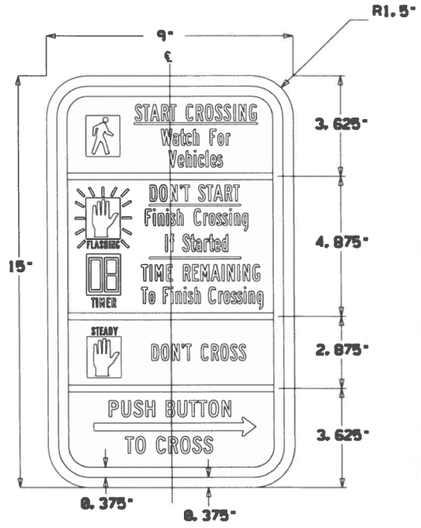
SECTION "A A"

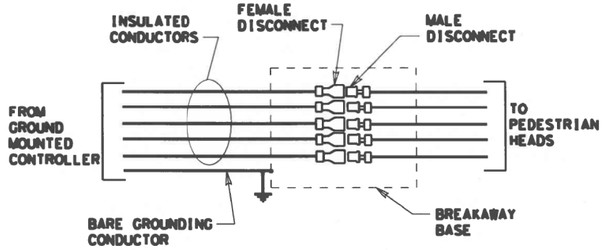


18"x16" LED PEDESTRIAN SIGNAL HEAD w/COUNTDOWN

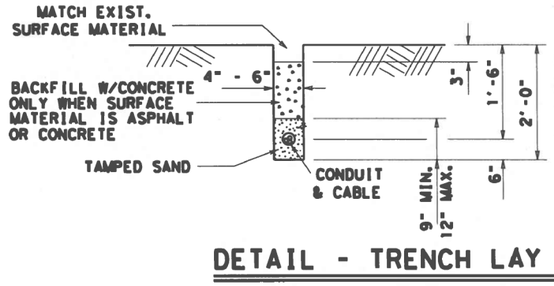
- LEGEND:
  BLACK
- BACKGROUND:
  WHITE (RETROREFLECTIVE)
- 08. HAND SYMBOL:
  ORANGE (RETROREFLECTIVE) ON BLACK
- PEDESTRIAN SYMBOL:
  WHITE (RETROREFLECTIVE) ON BLACK

NOTE:
REFER TO THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD) FOR MORE DETAILS AND DIMENSIONS REGARDING SIGN R10-3e



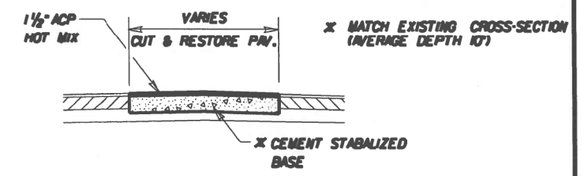


BREAKAWAY IN-LINE FUSEHOLDERS



NOTE:
ALL TRENCHES ARE TO BE MADE ONLY PARALLEL TO THE STREET. ALL CONDUIT RUNS CROSSING THE STREET SHALL BE PUSHED AND NO CUTS MADE IN THE SURFACE.

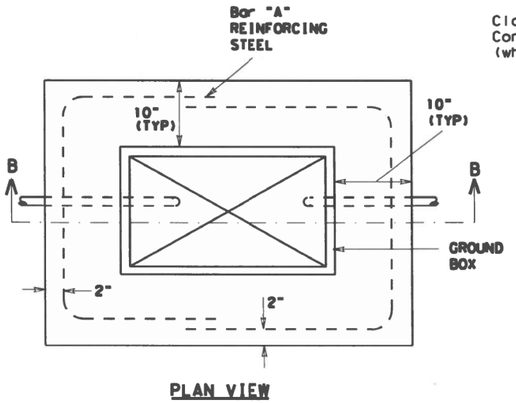
DETAIL - TRENCH LAY CONDUIT



DETAIL - CUT AND RESTORE PAVEMENT

NOTES:

1. BREAKAWAY ELECTRICAL QUICK-DISCONNECTS SHALL BE WATERTIGHT BUSSMANN HEB SERIES OR EQUAL.
2. DRILL POLE FOR WIRE ENTRY. USE BUSHING OR RUBBER GROMMET TO PROTECT CONDUCTORS.
3. POLE SHAFT SHALL BE ONE PIECE SCHEDULE 40 ALUMINUM PIPE, ASTM B429 OR B221 (ALLOY 6601-T6), DO NOT USE ALUMINUM CONDUIT.



APRON FOR GROUND BOXES

(Where required)

DISTRICT STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
PHARR DISTRICT STANDARD

TRAFFIC SIGNAL CONSTRUCTION DETAILS

MISCELLANEOUS DETAILS

SHEET 3 OF 3

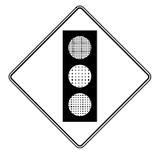
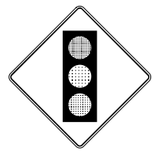
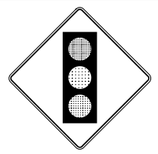
DN: TxDOT	DRAWING	DATE	FEDERAL ROAD NO.	STATE	PROJECT NO.	SHEET NO.
CK DN: JSL	ORIGINAL	JUNE 2015				
DW: BG	REV.	JUL. 2015 MAY 2016 AUG 2016 APR 2017	6	TEXAS	STP 2B24(399)HESG, ETC.	93
CK DW: JSL			STATE DIST. NO.	COUNTY	CONTROL NO. / SECTION NO. / JOB NO. / HIGHWAY NO.	
			PHR	HIDALGO	0921 / 02 / 501.ETC	

4-96 PHARR DISTRICT

ETC. ETC.

SUMMARY OF PROPOSED SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X - XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMECLATU	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = TWT = 10BWG = 10 S80 = Sch 80	POST 1 or 2	ANCHOR TYPE UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	MOUNTING DESIGNATION PREFABRICA P = T = "T" U = "U"	1 EXT or 2 EXT = # of Ext. 'BM = Extruded Wind Beam 'WC = 1.12 #/ft Wing Channel 'EXAL=Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
22												
OF 115	1	W3-3		36"X36"	X		Sch 80	1	SA	T		
	2											
	3											
	4											
	5	R3-8LMS		48"X30"	X		Sch 80	1	SA	P		
	6	R3-8LK		36"X30"	X		Sch 80	1	SA	P		
27 OF 115	1	W3-3		36" X 36"	X		Sch 80	1	SA	T		
	2											
	3											
	4											
31 OF 115	1	W3-3		36" X 36"	X		Sch 80	1	SA	T		
	2											
	3											
	4											
43 OF 115	1	W10-1		36" DIA.	X		Sch 80	1	SA	T		
43 OF 115	2	R15-1 R1-2		36" 36"X36"X36"	X		Sch 80	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI TBPE F-1640

CITY OF MISSION

Texas Department of Transportation

CITY OF MISSION
SIGNAL IMPROVEMENTS
SUMMARY OF SMALL SIGNS

SHEET 1 OF 1

DN:		CONT	SECT	JOB	HIGHWAY
CK DN:		0921	02	501,ETC	VARIOUS
DW:		DIST	COUNTY		SHEET NO.
CK DW:		PHR	HIDALGO		94
TR:					
CK TR:					

DATE: 6/6/2024 2:49:49 PM
FILE: c:\pw-tedsi-connect\d0108942\COM*SUM*SML*SGNS.dgn

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

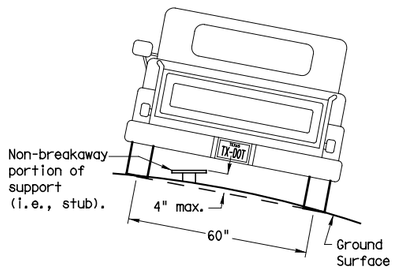
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

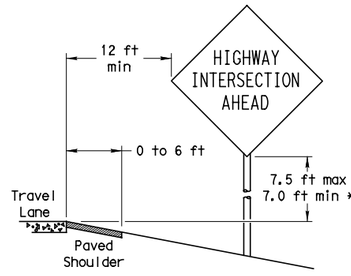
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

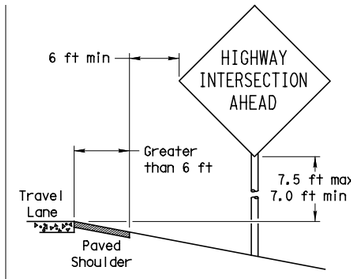
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

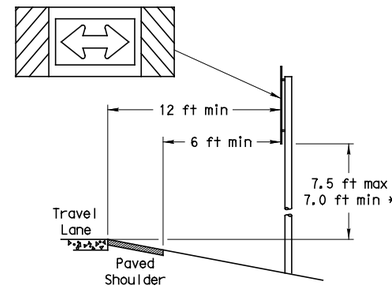
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



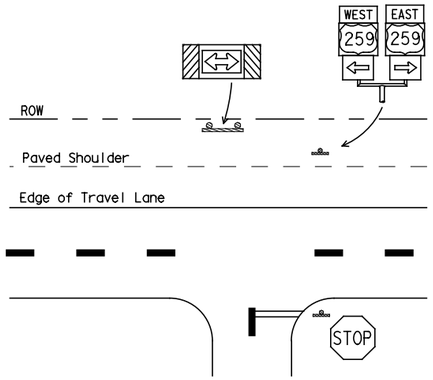
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

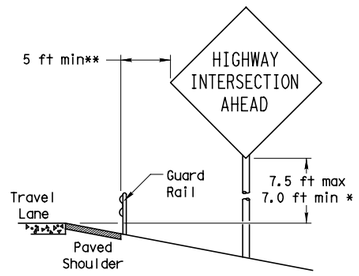
T-INTERSECTION



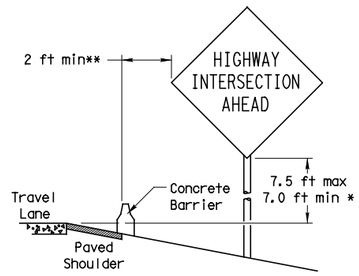
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

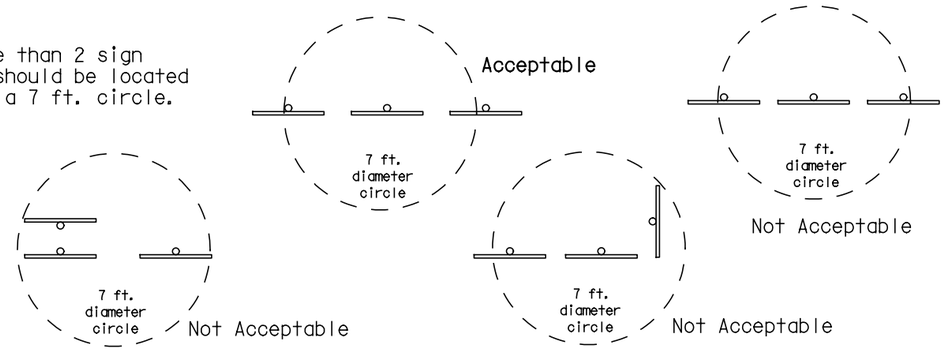
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

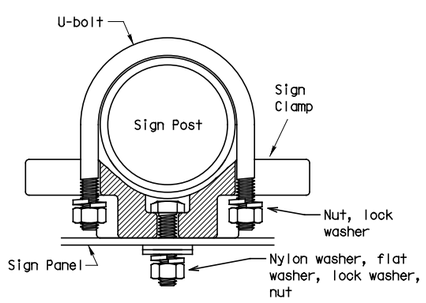
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.

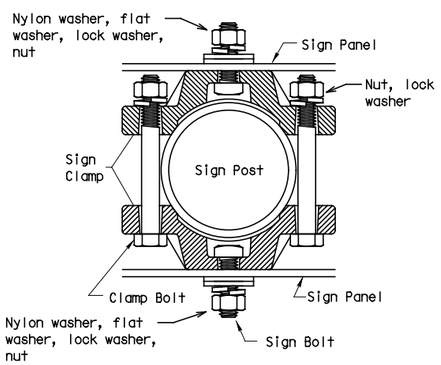


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



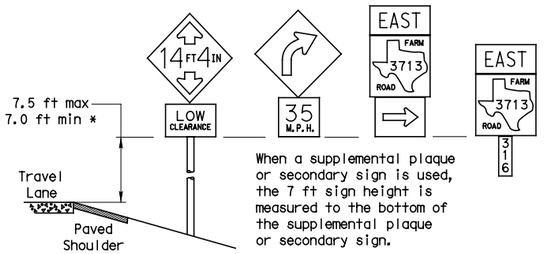
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

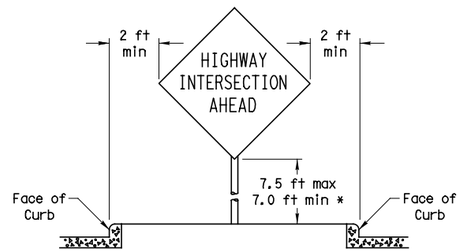
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



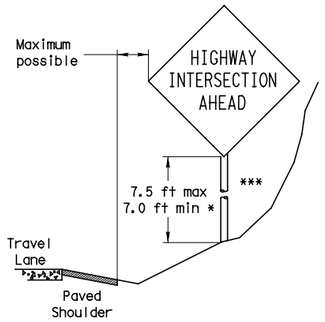
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS
9-08

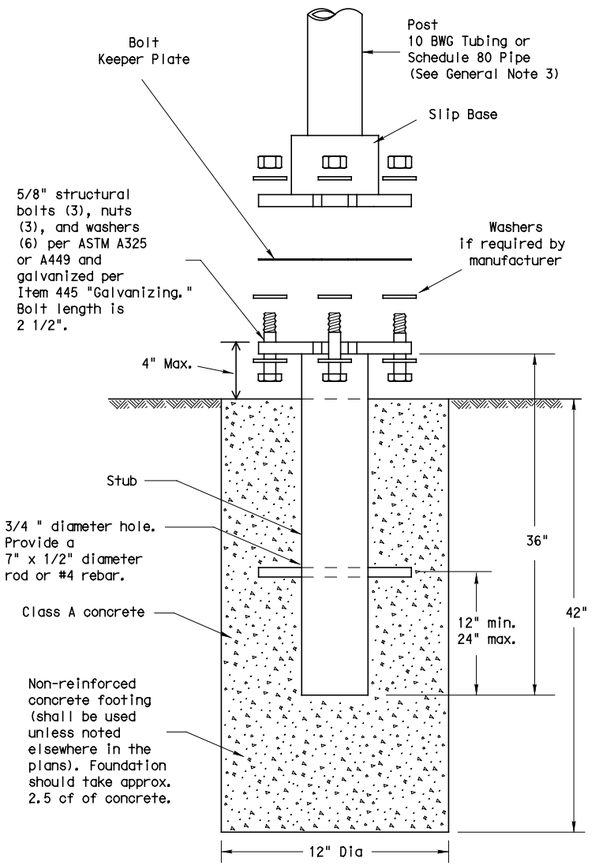
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0921	02	501,ETC	VARIOUS
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		95

26A

DATE:
FILE:

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

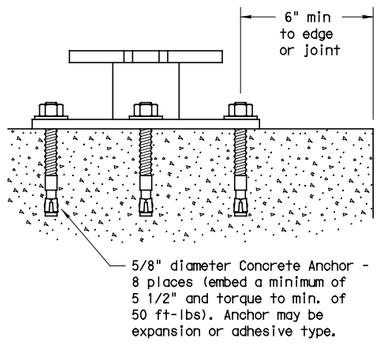
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0921	02	501,ETC	VARIOUS

DIST	COUNTY	SHEET NO.
PHR	HIDALGO	96

DATE:
FILE:

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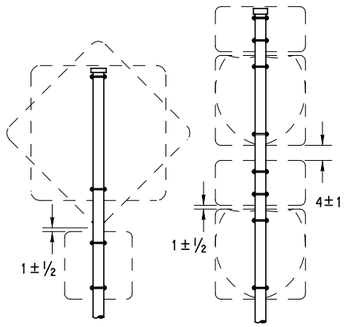
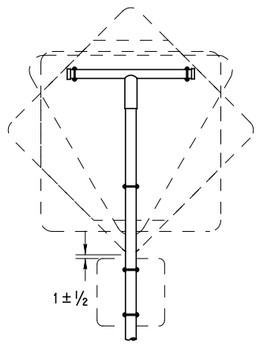
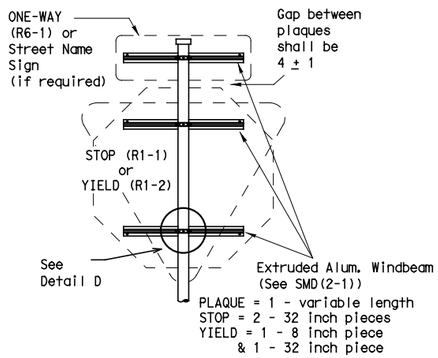


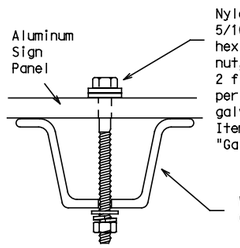
SM RD SGN ASSM TY XXXXX(1)XX(P)



SM RD SGN ASSM TY XXXXX(1)XX(T)

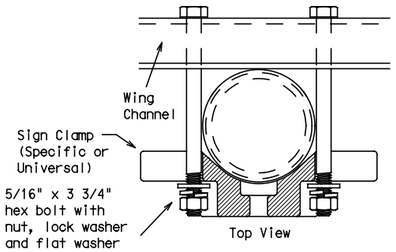


SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



Top View

Detail A



Top View

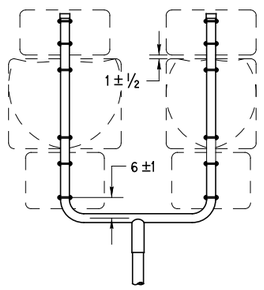
Detail B

GENERAL NOTES:

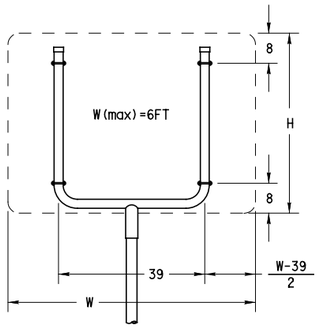
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

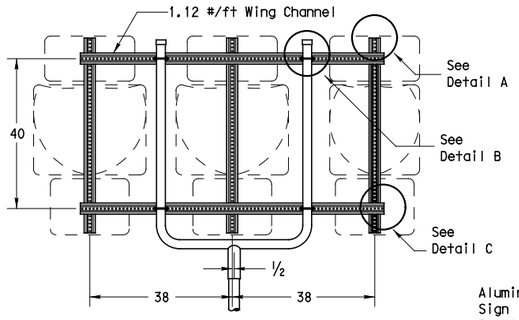
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



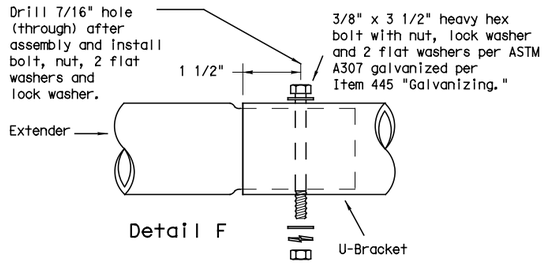
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

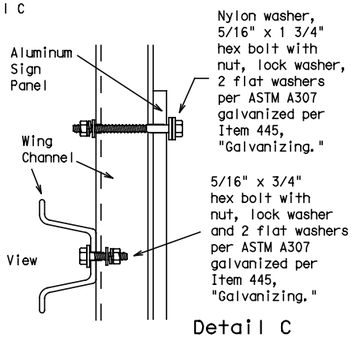


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

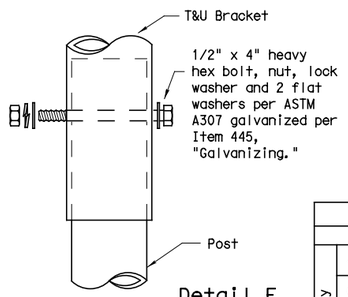


Detail F

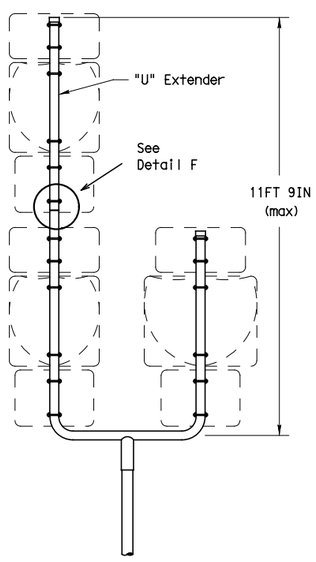
Splices shall only be allowed behind the sign substrate.



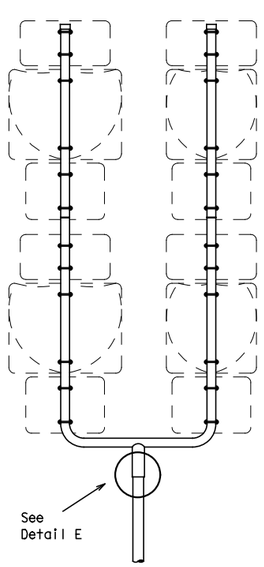
Detail C



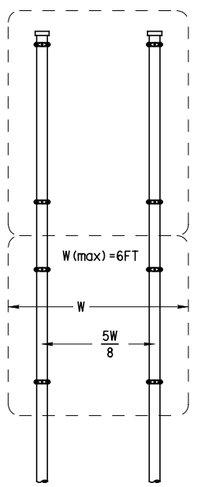
Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

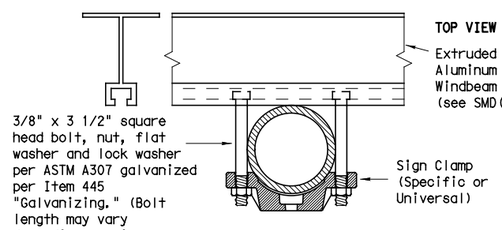


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

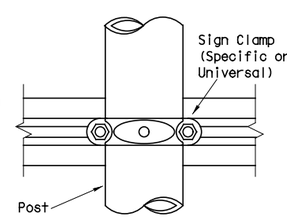


SM RD SGN ASSYM TY XXXXX(2)XX(P)

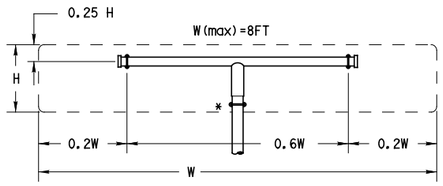
SIDE VIEW



Detail D



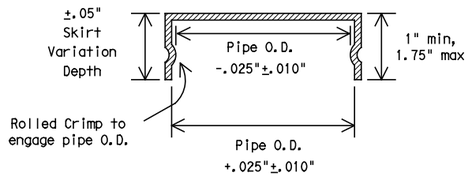
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

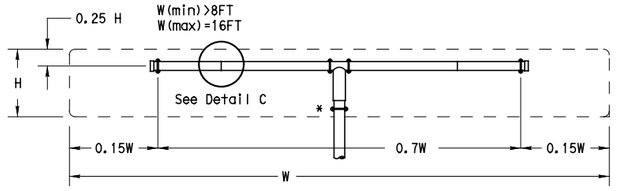
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0921	02	501,ETC	VARIOUS
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		97

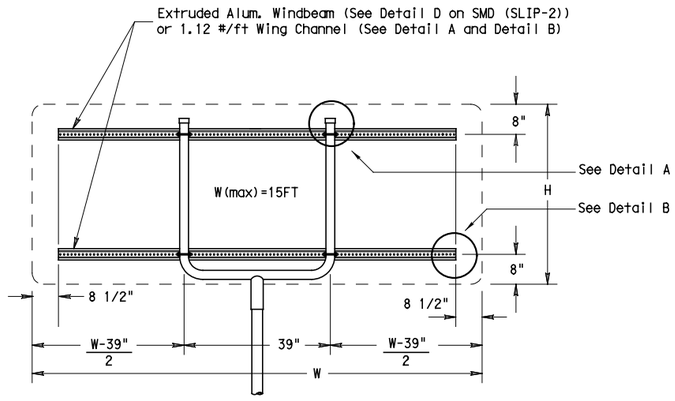
9-08 REVISIONS

DATE:
FILE:

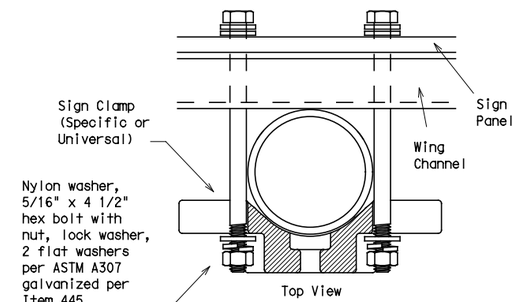
DATE:
FILE:



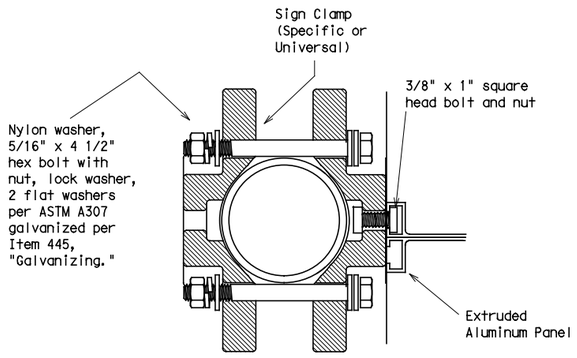
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



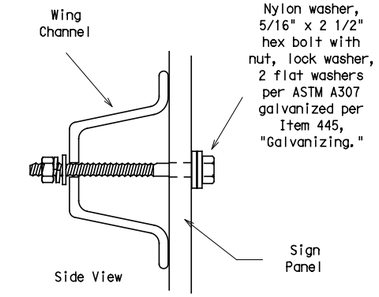
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



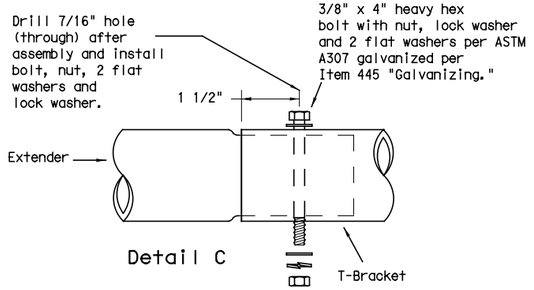
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

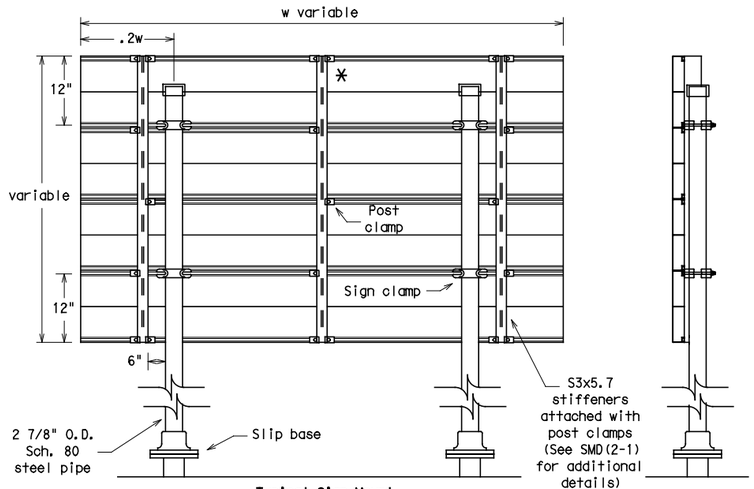


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

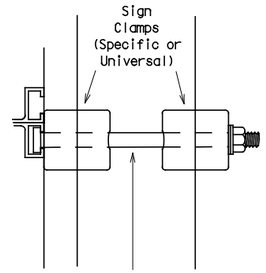


Typical Sign Mount

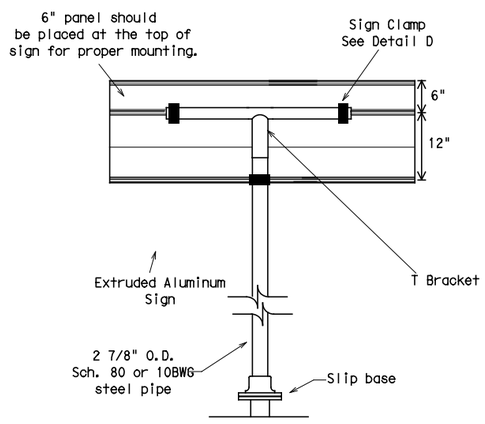
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

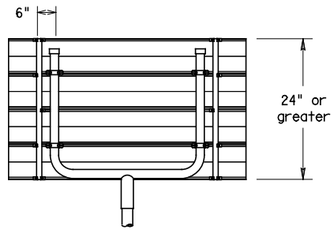
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

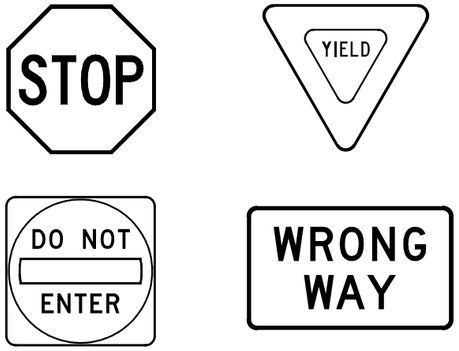
SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		98

DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

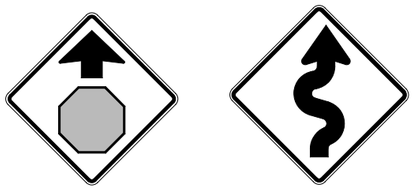
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

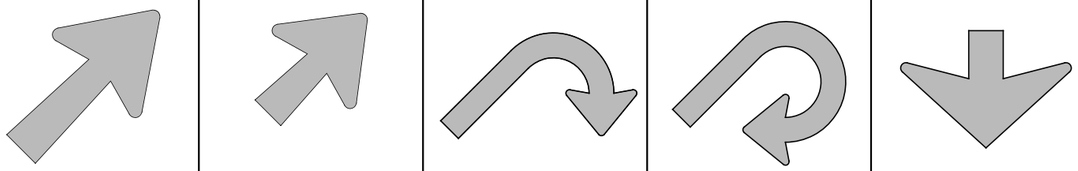
TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	HIDALGO		99

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

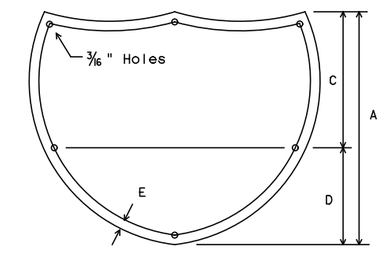
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

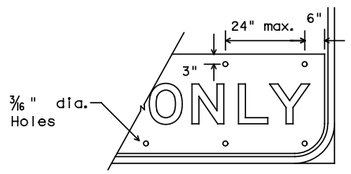
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

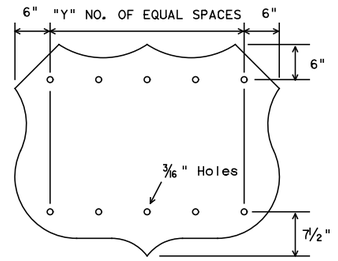


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

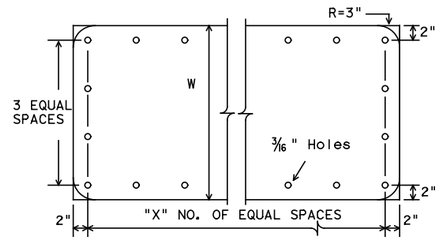


EXIT ONLY PANEL



U.S. ROUTE MARKERS

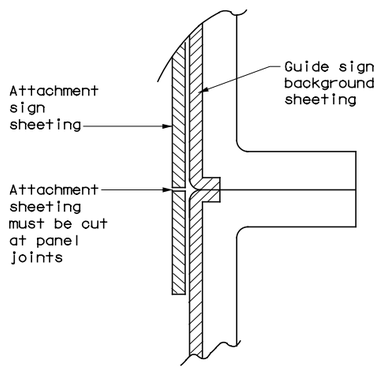
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



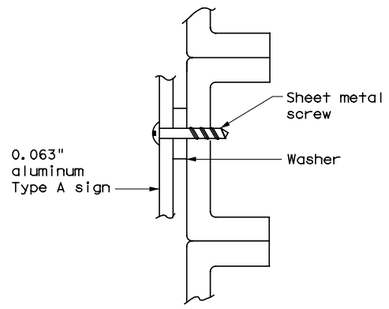
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

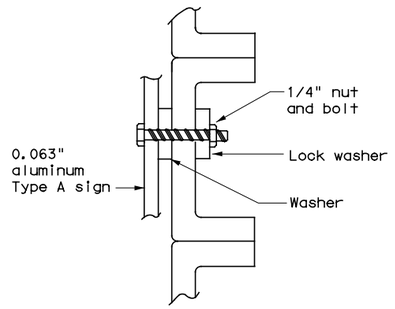
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

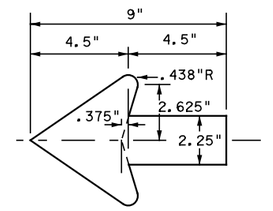
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

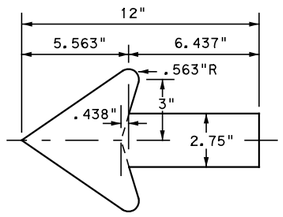
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

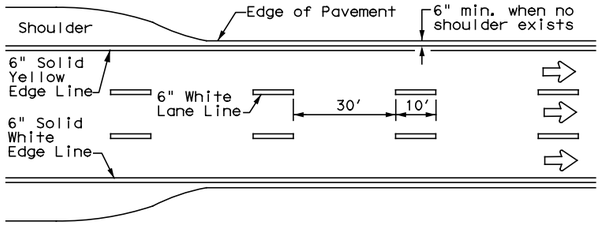
Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

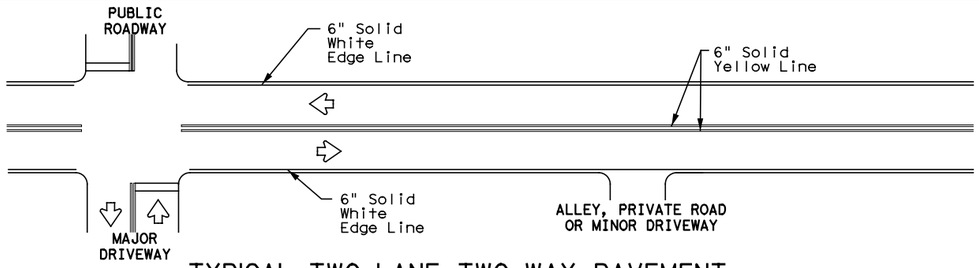
TSR(5)-13

FILE:	tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0921	02	501,ETC	VARIOUS
12-03 7-13		DIST	COUNTY		SHEET NO.
9-08		PHR	HIDALGO		100

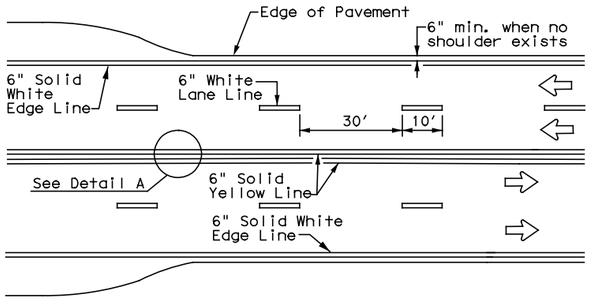
DATE:
FILE:

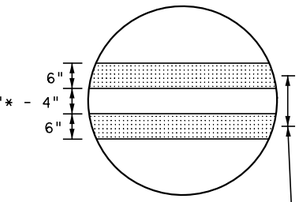


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS





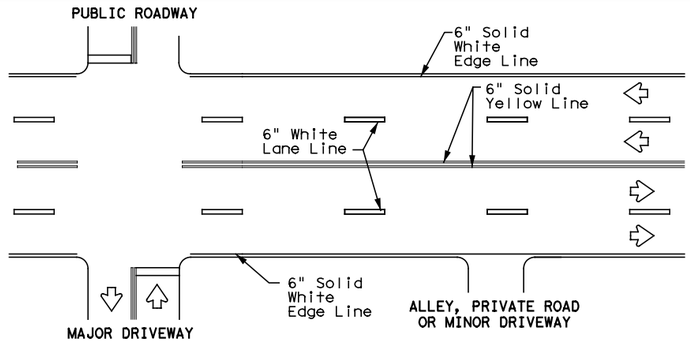
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

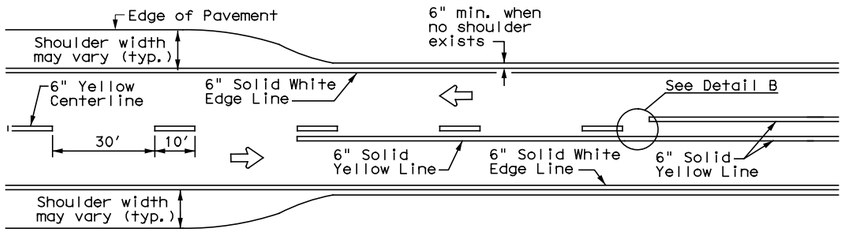
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

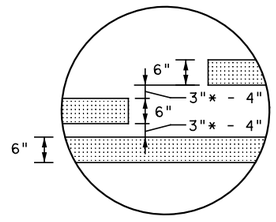
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



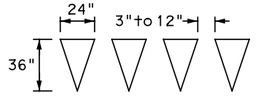
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)

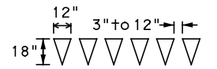
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

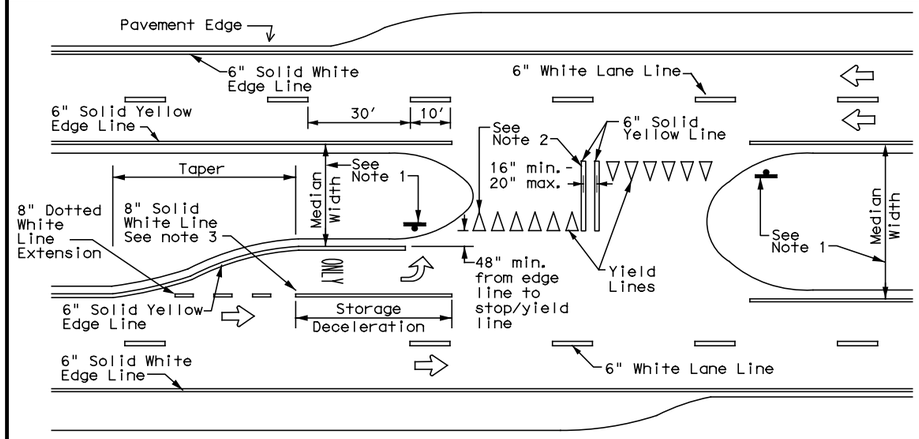


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



For posted speed on road being marked equal to or less than 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

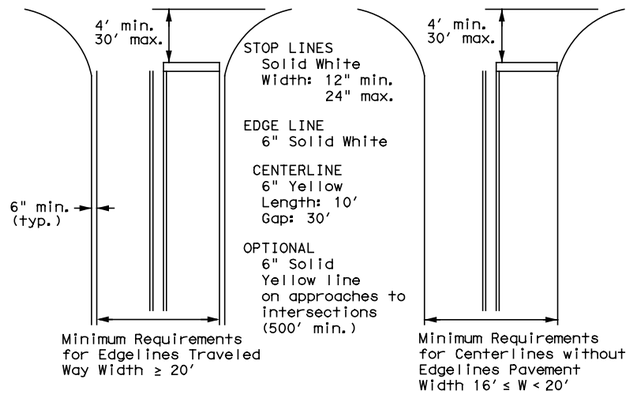
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling 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

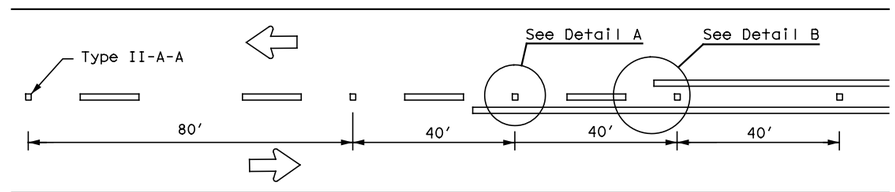
PM(1)-22

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	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		101

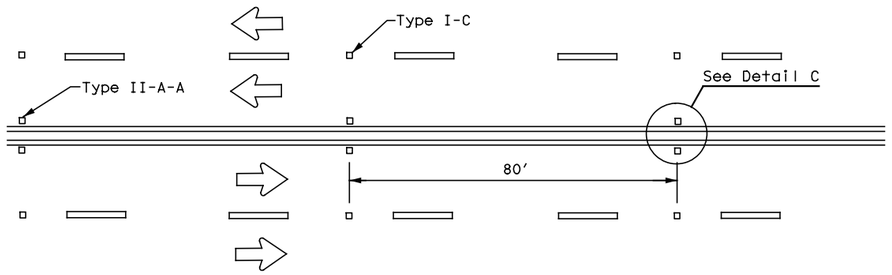
22A

DATE:
FILE:

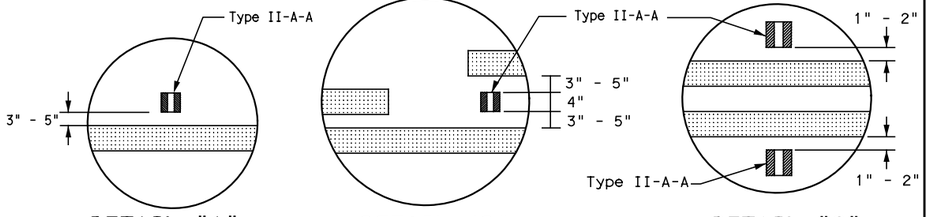
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

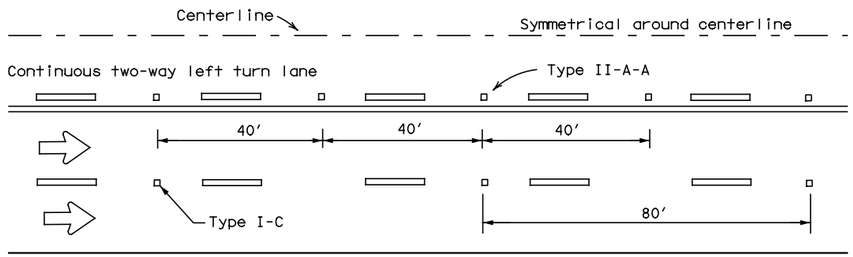


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

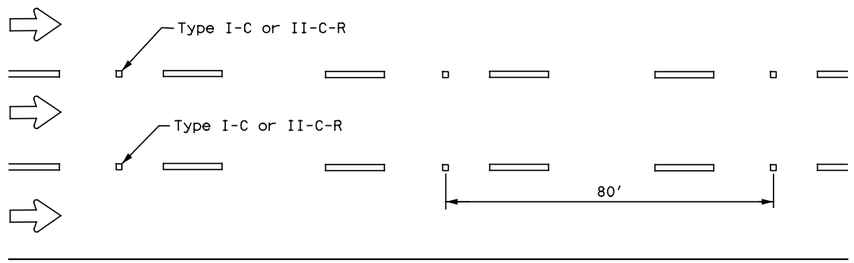


CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



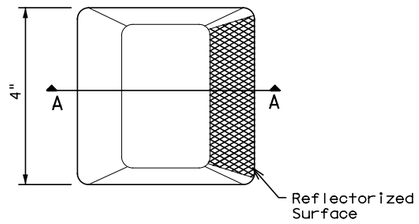
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

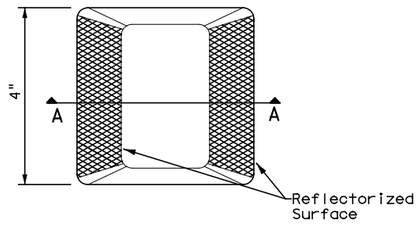
See Note 3.

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

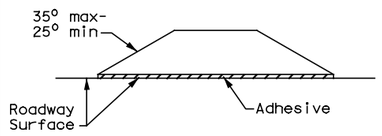
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

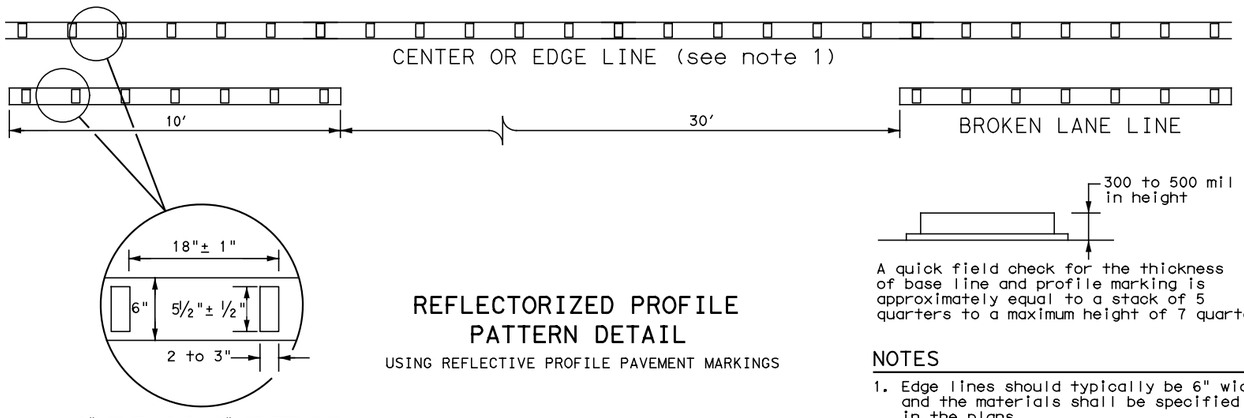


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE
OR 6" LANE LINE

REFLECTORIZED PROFILE
PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

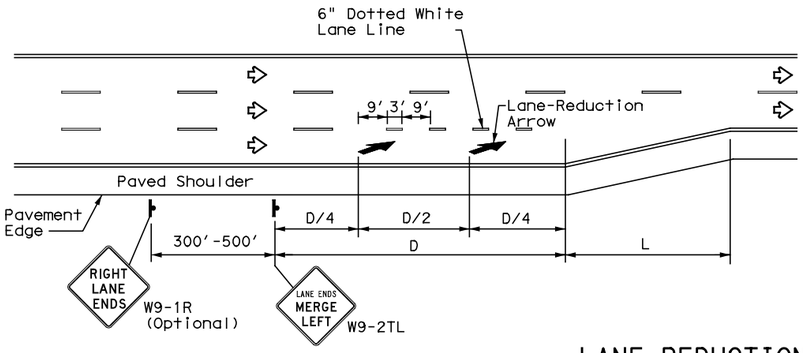
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		102

22B

DATE:
FILE:



LANE REDUCTION

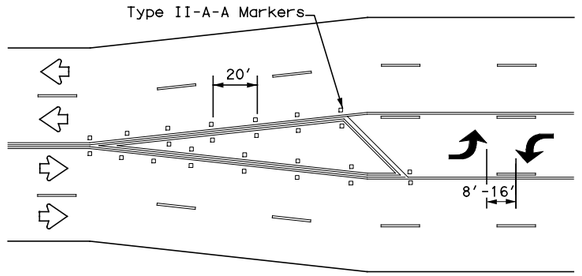
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

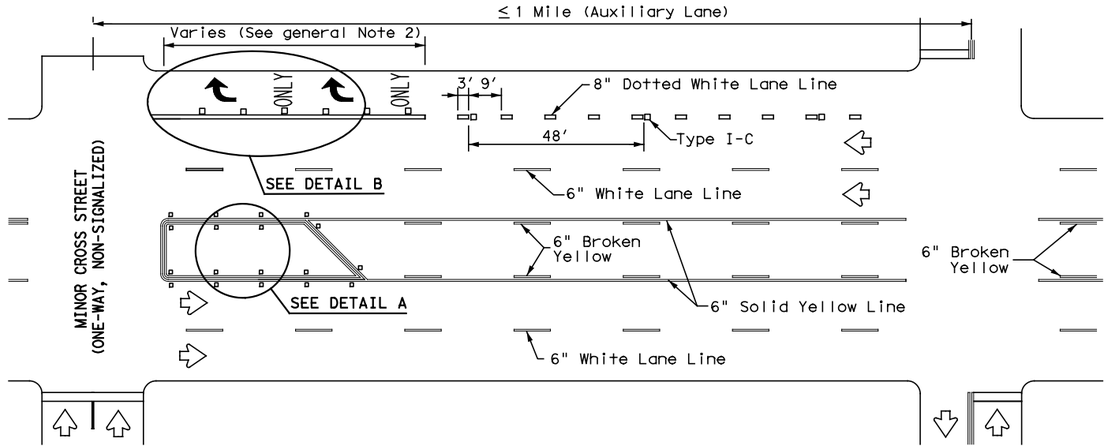


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

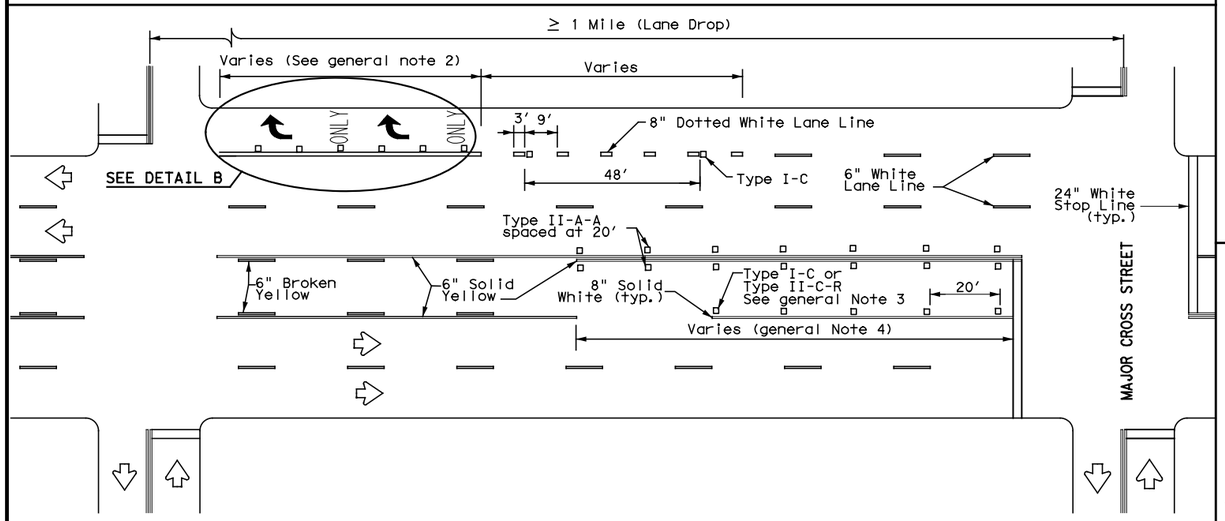
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

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

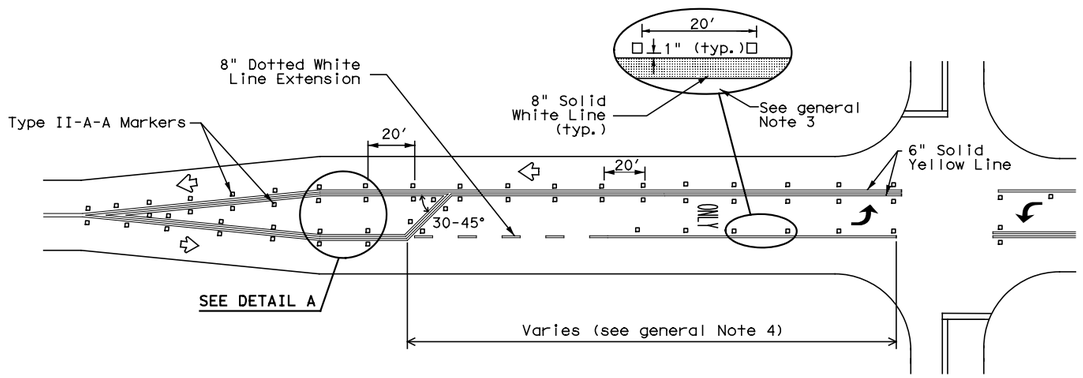
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



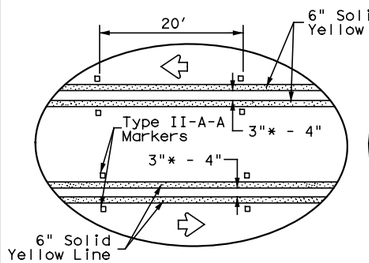
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



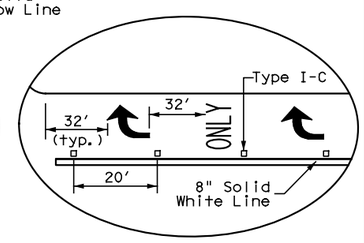
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

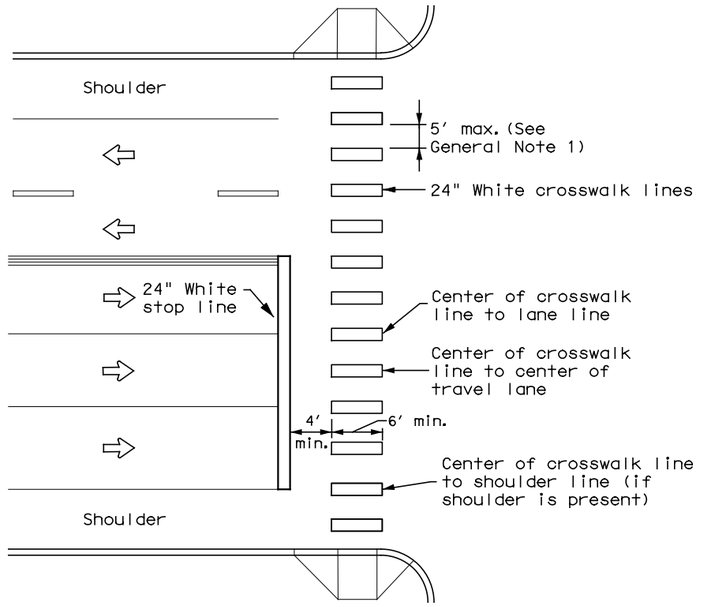
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		103

22C

DATE:
FILE:



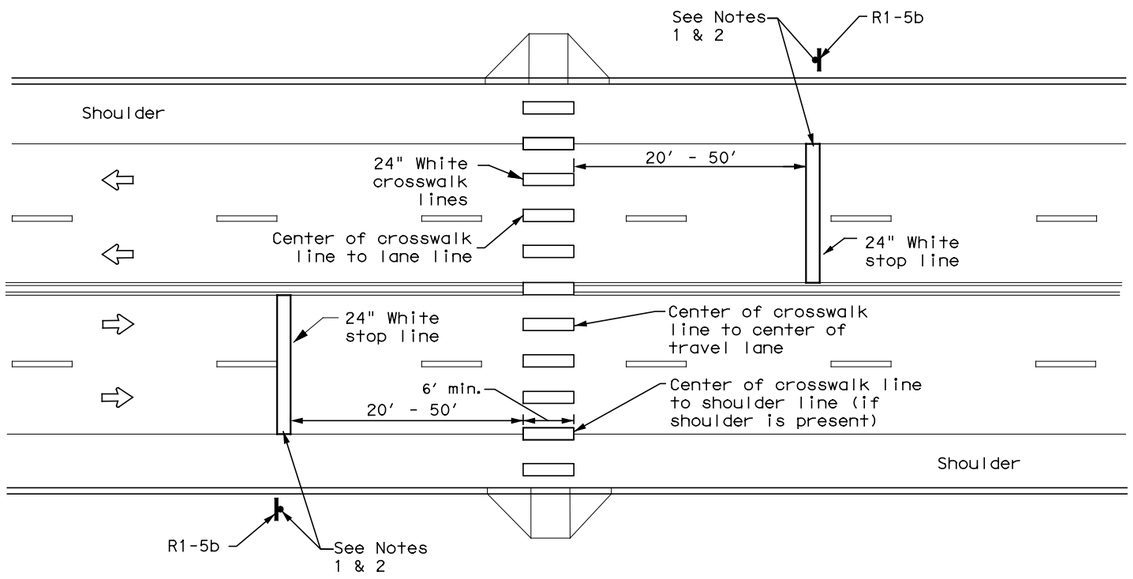
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

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

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
6-20	DIST	COUNTY		SHEET NO.
6-22	PHR	HIDALGO		104
12-22				

220

DATE:
FILE:

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the Right-of-Way and/or properties of the Railroad Company and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right-of-Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right-Of-Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right-Of-Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received writtern Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of Railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 12 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 12 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work withing 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the Contract Site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a Railroad flag person will be required. At the direction of the Railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right-of-Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right-of-Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right-of-Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right-of-Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right-of-Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the Railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on Railroad property. This orientation is available at www.contractororientation.com. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Contractor's employees entering the KCS railroad shall hold current certificates at all times. The training can be had by contacting Larry Slater of TrackSense Inc. at 330-847-8661 or by email at lslater@neo.rr.com."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right-of-Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF), 14'-0" (KCS), and 12'-0" (UPRR) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Traffic Operations Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		105

DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right-of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the Project Site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other Railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to Railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger Railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, Railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around Railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near Railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near Railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor-assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of ¼" vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the RIGHT OF ENTRY agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor work and at least 30 working days in advance of any Contractor work in which any person or equipment will be within 25 feet of nearest rail.

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right-of-Way and leave the Right-of-Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

DATE:
FILE:

Texas Department of Transportation

Traffic Operations Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		106

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.: 448 909T
Crossing Type: Public At Grade
RR Company Operating Track at Crossing: Rio Valley Switching Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 10.20
RR Subdivision: Mission
City: Mission
County: Hidalgo
CSJ at this Crossing: 0921-02-519
Latitude: 26.206684
Longitude: -98.327733

Scope of Work, including any TCP, to be performed by State Contractor:

Work adjacent to the RR ROW: Existing traffic signal improvements consisting of adding reflective border backplates to existing 3-section signal heads and addition of 12" horizontal 4-section signal heads with reflective border backplates for left turn lanes at 1st St. Includes replacement of overhead R10-17T signs, and replacement of pavement markings.

Work through the RR ROW: pavement markings, signage, and installation of traffic control channelizing devices.

Scope of Work to be performed by Railroad Company:

Railroad Flagging Services.

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 5

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:

RVSC - PATRICK JOHNSON
MANAGER OF OPERATIONS
RIO VALLEY SWITCHING COMPANY
101 N. 21st St., McAllen, TX 78501
(956) 971-9111, EXT. 117 / patrick@riovalleyswitching.com

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: RIO VALLEY SWITCHING COMPANY

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: Rio Valley Switching Company
Railroad Emergency Line at: (956) 971-9111, Ext 117
Location: DOT 448 909T
RR Milepost: 10.20
Subdivision: Mission

RRD Review Only
Initials: _____
Date: 05/20/2024

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	0921	02	501,ETC.	MILE 2 RD.,ETC.
6/2023	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		107

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.: 448 910M
Crossing Type: Public at Grade
RR Company Operating Track at Crossing: Rio Valley Switching Company
RR Company Owning Track at Crossing: Union Pacific Railroad Comapny
RR MP: 10.10
RR Subdivision: Mission
City: Mission
County: Hidalgo
CSJ at this Crossing: 0921-02-519
Latitude: 26.205115
Longitude: -98.327638

Scope of Work, including any TCP, to be performed by State Contractor:

Work adjacent to the RR ROW: Existing traffic signal improvements consisting of adding reflective border backplates to existing 3-section signal heads and addition of 12" horizontal 4-section signal heads with reflective border backplates for left turn lanes at 1st St. Includes replacement of overhead R10-17T signs, and replacement of pavement markings.

Work through the RR ROW: pavement markings, signage, and installation of traffic control channelizing devices.

Scope of Work to be performed by Railroad Company:

Railroad Flagging Services.

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 5

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:

RVSC - PATRICK JOHNSON
MANAGER OF OPERATIONS
RIO VALLEY SWITCHING COMPANY
101 N. 21st St., McAllen, TX 78501
(956) 971-9111, EXT. 117 / patrick@riovalleyswitching.com

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: RIO VALLEY SWITCHING COMPANY

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

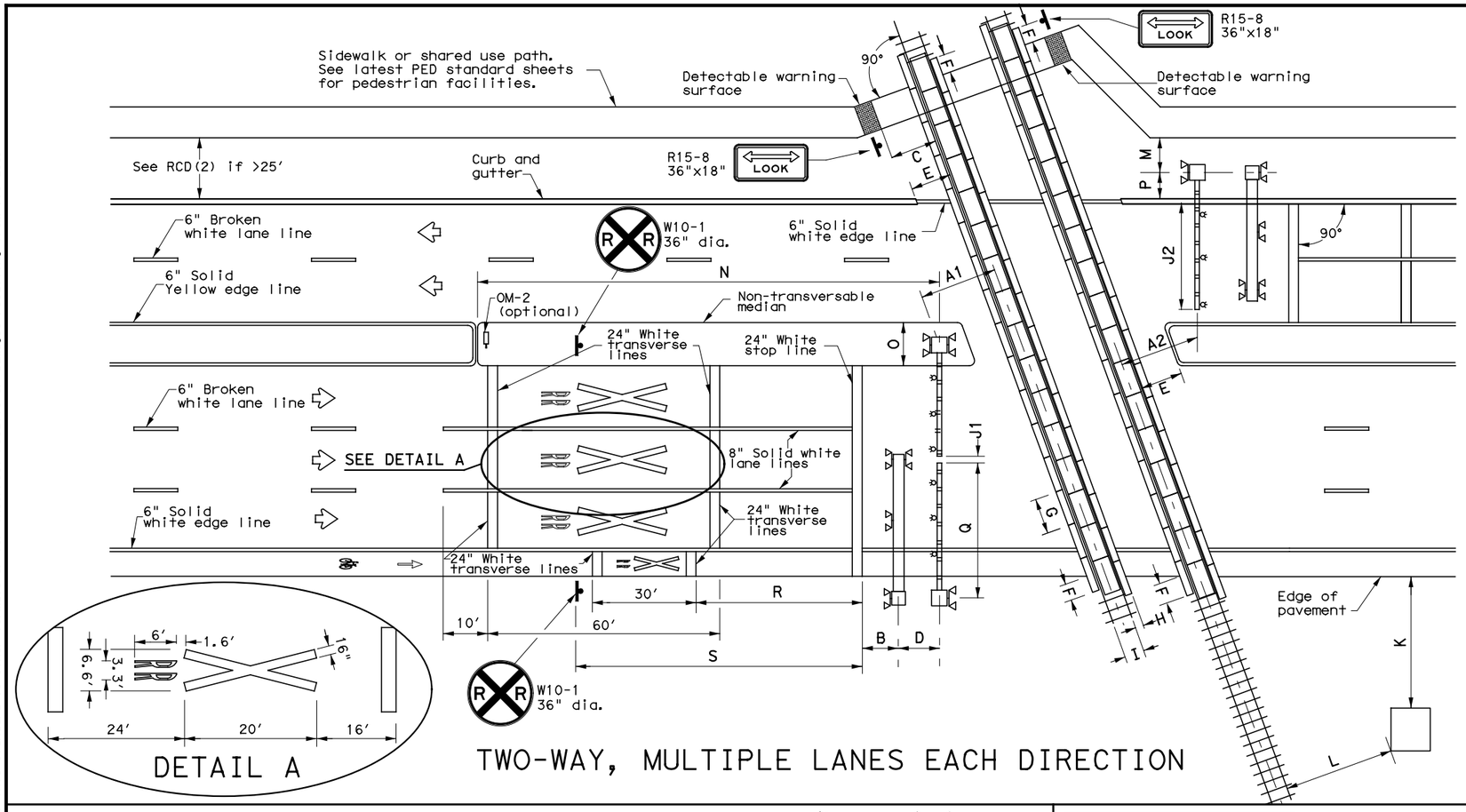
In Case of Railroad Emergency
Call: Rio Valley Switching Company
Railroad Emergency Line at: (956) 971-9111, Ext 117
Location: DOT 448 910M
RR Milepost: 10.10
Subdivision: Mission

RRD Review Only
Initials: _____
Date: 05/20/2024

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	0921	02	501,ETC.	MILE 2 RD.,ETC.
6/2023	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		108



TWO-WAY, MULTIPLE LANES EACH DIRECTION

NOTES

A1: Center of RR mast to center of rail: 12′ minimum, 15′ typical.

A2: Tip of gate to center of rail: 12′ minimum, 15′ typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8′ (NOTE: Stop line may be moved as needed, but should be at least 8′ back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12′ minimum.

D: Center of gate mast to center of cantilever mast: 6′ typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10′ typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3′ minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8′ typical.

H: Width of field panel: 2′ typical (check with railroad company).

I: Distance between rails: 4′- 8′1/2".

J1: Tip of gate to tip of gate: 2′ maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30′ typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25′ typical.

M: Center of RR mast to edge of sidewalk: 6′ minimum.

N: Center of gate mast to leading edge of non-traversable median: 100′ minimum to qualify as a Quiet Zone SSM. NOTE: 60′will suffice if there is a street intersection within the 100′ and all street intersections within 60′ are closed.

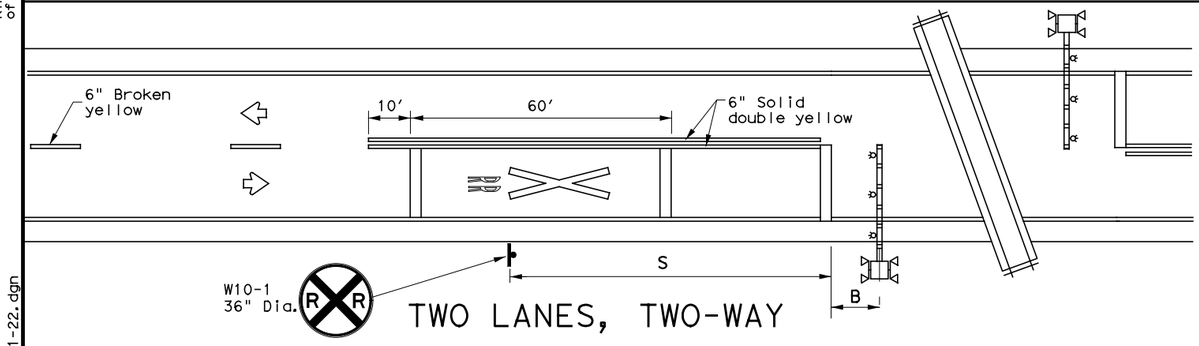
O: Width of median for RR gate assembly: 8′-6" minimum, 10′ typical when using median gates. NOTE: Center of gate mast minimum 4′-3" from face of curb.

P: Center of RR mast to face of curb: 5′-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 7′ minimum.
Center of RR mast to edge of pavement (no shoulder): 9′-3" minimum.
NOTE: Final location determined by the railroad company.

Q: Gate length: 28′ or less typical, but railroad company may allow up to 32′ under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50′ typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



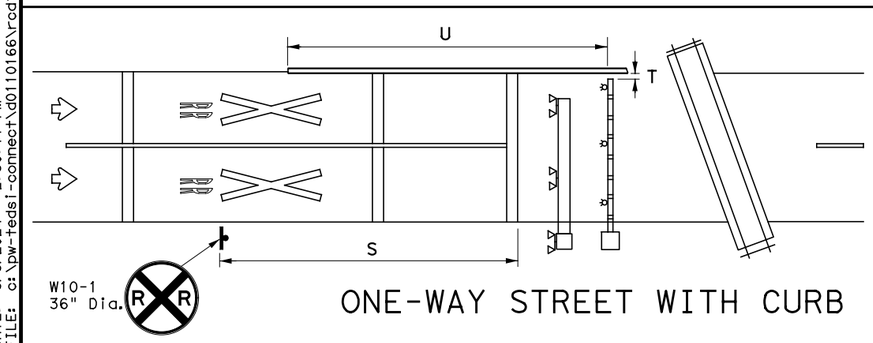
TWO LANES, TWO-WAY

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

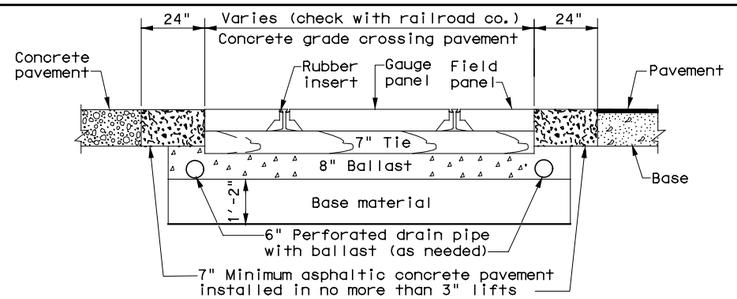


ONE-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1′ maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

U: Non-traversable curb length from gate: 100′ minimum for a Quiet Zone SSM, 10′ minimum for all other locations.



CROSSING SURFACE CROSS SECTION

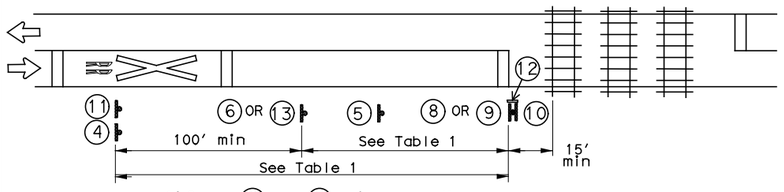
Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-22

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
2-16 11-22	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		109

DATE: 6/6/2024 2:50:11 PM
FILE: c:\pw-teds1-connect\d0110166\rcd1-22.dgn

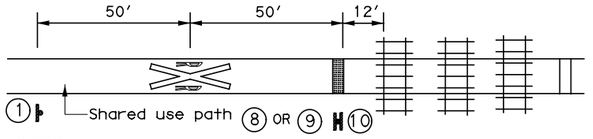


(if no (6) or (13) sign used)

PASSIVE CROSSING

NOTES

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.



NOTES

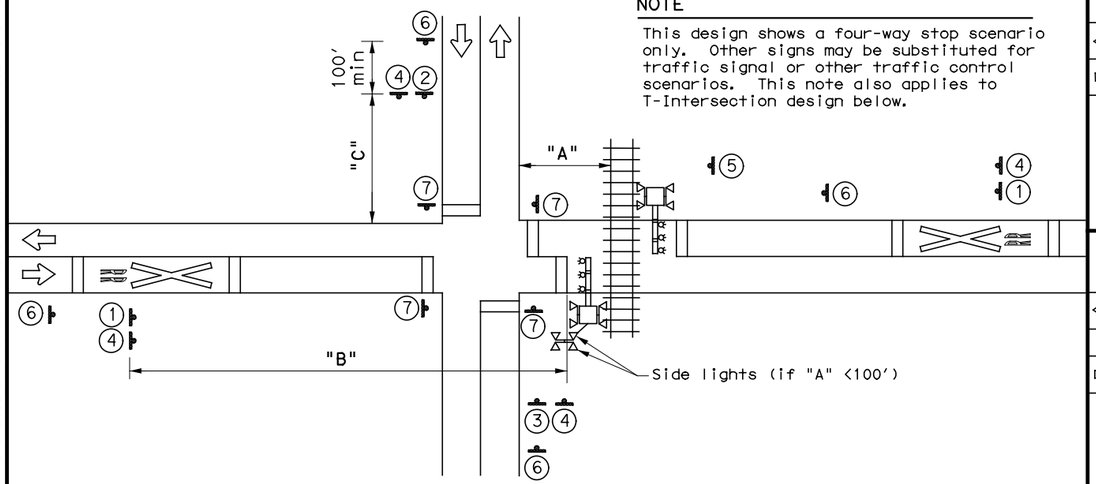
1. A shared use path is considered a separate pathway crossing when more than 25′ from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

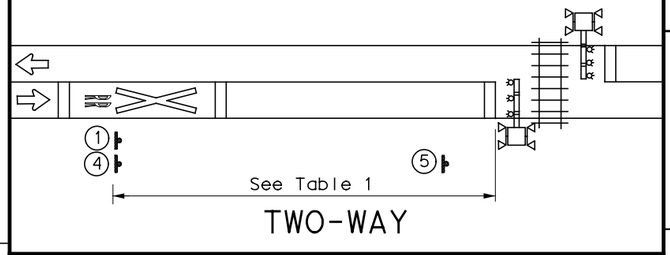


NOTE

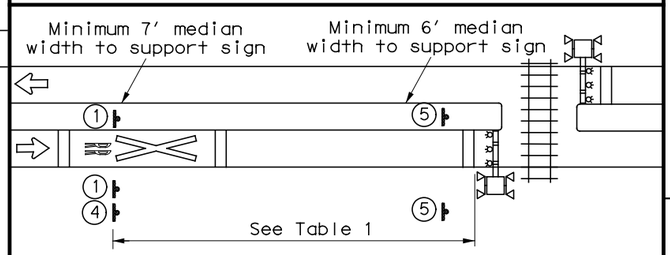
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"A" <100′	"A" ≥100′
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

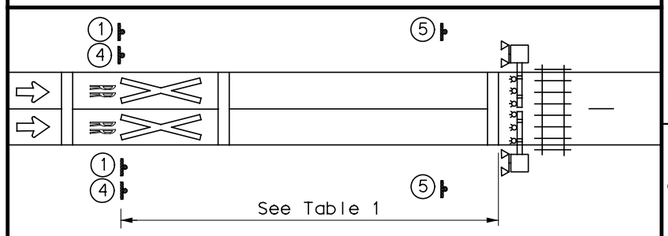
GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY

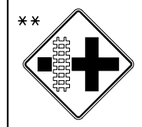
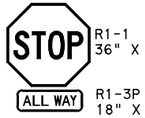
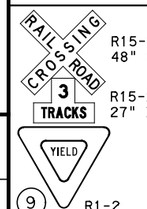
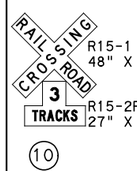
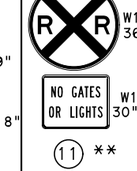
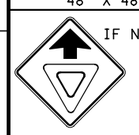


TWO-WAY WITH MEDIAN



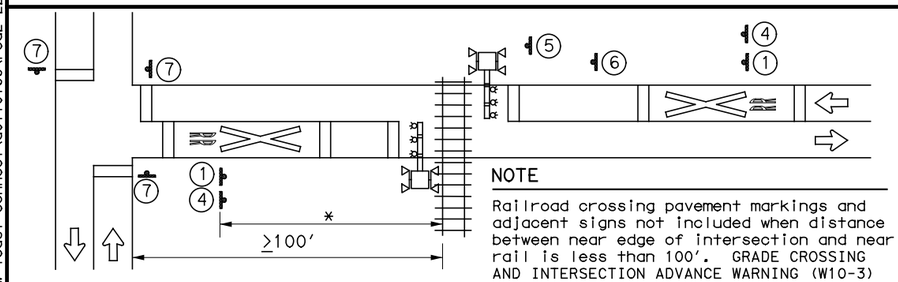
ONE-WAY

SIGNS

**  (1) W10-1 36" Dia.	**  (2) W10-2L 36" X 36"	**  (3) W10-2R 36" X 36"	IF NEEDED  W10-5 36" X 36"; LOW GROUND CLEARANCE W10-5P 30" X 24" (4)
IF NEEDED  (5) R8-8 24" X 30"	IF NEEDED  (6) W3-1 30" X 30"	 R1-1 36" X 36"; ALL WAY R1-3P 18" X 6" (7)	 R15-1 48" X 9"; R15-2P 27" X 18"; STOP R1-1 36" X 36" (8)
 R15-1 48" X 9"; R15-2P 27" X 18"; YIELD R1-2 48" X 48" X 48" (9)	 R15-1 48" X 9"; R15-2P 27" X 18" (10)	 W10-1 36" Dia.; NO GATES OR LIGHTS W10-13P 30" X 24" (11) **	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H; Sign may be placed perpend. to travel lanes. (12) I-13 15" X 9"
IF NEEDED  (13) W3-2 30" X 30"			

** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30" X 24"

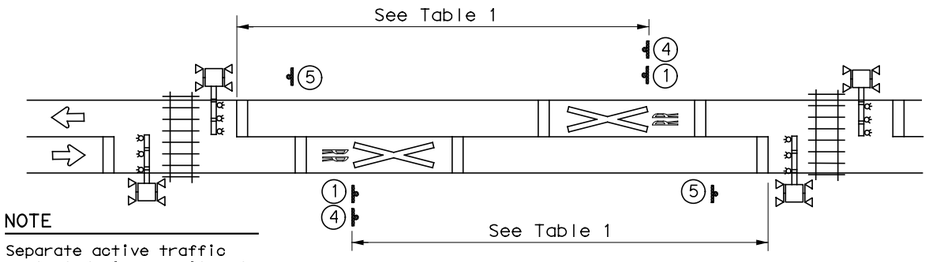


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100′. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100′ apart.

TWO ADJACENT CROSSINGS

Texas Department of Transportation — Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
2-16 11-22	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		110

DATE: 6/6/2024 2:50:12 PM
FILE: c:\pw-tedsi-connect\d0110166\rcd2-22.dgn

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0921-02-501,ETC

1.2 PROJECT LIMITS:

From: MULTIPLE LOCATIONS. SEE TITLE SHEET

To: _____

1.3 PROJECT COORDINATES:

BEGIN: (Lat)_____,(Long)_____

END: (Lat)_____,(Long)_____

1.4 TOTAL PROJECT AREA (Acres): _____

1.5 TOTAL AREA TO BE DISTURBED (Acres): _____

1.6 NATURE OF CONSTRUCTION ACTIVITY:

UPGRADE EXISTING TRAFFIC SIGNALS AND PROVIDE ADA COMPLIANT RAMPS AND SIDEWALK

1.7 MAJOR SOIL TYPES:

Soil Type	Description
HIDALGO URBAN LAND COMPLEX	MODERATE PERMEABILITY & RUNOFF. AVAILABLE WATER CAPACITY IS MODERATE. THE SURFACE LAYER IS A DARK GRAYISH BROWN SANDY CLAY LOAM ABOUT 11 INCHES THICK.
HIDALGO FINE SANDY LOAM	MODERATE PERMEABILITY & SLOW RUNOFF. WATER CAPACITY IS MEDIUM. THE SURFACE LAYER IS A DARK GRAYISH BROWN FINE SANDY LOAM ABOUT 15 INCHES THICK.
HIDALGO SANDY CLAY LOAM	MODERATE PERMEABILITY & SLOW RUNOFF. AVAILABLE WATER CAPACITY IS MEDIUM TO HIGH. THE SURFACE LAYER IS DARK GRAYISH BROWN, CALCAREOUS CLAY ABOUT 12 INCHES THICK, WITH BROWN SANDY CLAN LOAM ABOUT 15 INCHES THICK.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- [X] PSLs determined during preconstruction meeting
- [ ] PSLs determined during construction
- [ ] No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

- [X] Mobilization
- [X] Install sediment and erosion controls
- [ ] Blade existing topsoil into windrows, prep ROW, clear and grub
- [ ] Remove existing pavement
- [ ] Grading operations, excavation, and embankment
- [ ] Excavate and prepare subgrade for proposed pavement widening
- [ ] Remove existing culverts, safety end treatments (SETs)
- [ ] Remove existing metal beam guard fence (MBGF), bridge rail
- [ ] Install proposed pavement per plans
- [ ] Install culverts, culvert extensions, SETs
- [ ] Install mow strip, MBGF, bridge rail
- [ ] Place flex base
- [ ] Rework slopes, grade ditches
- [ ] Blade windrowed material back across slopes
- [X] Revegetation of unpaved areas
- [X] Achieve site stabilization and remove sediment and erosion control measures
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- [X] Sediment laden stormwater from stormwater conveyance over disturbed area
- [X] Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- [ ] Solvents, paints, adhesives, etc. from various construction activities
- [ ] Transported soils from offsite vehicle tracking
- [ ] Construction debris and waste from various construction activities
- [ ] Contaminated water from excavation or dewatering pump-out water
- [ ] Sanitary waste from onsite restroom facilities
- [X] Trash from various construction activities/receptacles
- [ ] Long-term stockpiles of material and waste
- [ ] Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
HCDD#1 DRAINAGE DITCH: MISSION LATERAL (2491C)	ARROYO COLORADO ABOVE TIDAL (2202F)

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- [X] Development of plans and specifications
- [X] Perform SWP3 inspections
- [X] Maintain SWP3 records and update to reflect daily operations
- [ ] Other: _____
- [ ] Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- [X] Day To Day Operational Control
- [X] Maintain schedule of major construction activities
- [X] Install, maintain and modify BMPs
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

AUTHORIZED 06-06-2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	STP 2B24(399)HESG, ETC.		111
STATE	STATE DIST.	COUNTY	
TEXAS	PHR	HIDALGO	
CONT.	SECT.	JOB	HIGHWAY NO.
0921	02	501,ETC	VARIOUS

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [ ] Protection of Existing Vegetation
- [ ] [ ] Vegetated Buffer Zones
- [ ] [ ] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [ ] Soil Surface Treatments
- [ ] [ ] Temporary Seeding
- [ ] [ ] Permanent Planting, Sodding or Seeding
- [X] [ ] Biodegradable Erosion Control Logs
- [ ] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Vertical Tracking
- [ ] [ ] Interceptor Swale
- [ ] [ ] Riprap
- [ ] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [ ] [ ] Embankment for Erosion Control
- [ ] [ ] Paved Flumes
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- [X] [ ] Biodegradable Erosion Control Logs
- [ ] [ ] Dewatering Controls
- [ ] [ ] Inlet Protection
- [ ] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [X] [ ] Sediment Control Fence
- [ ] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [ ] [ ] Vegetated Buffer Zones
- [ ] [ ] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
NONE		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- [X] Excess dirt/mud on road removed daily
- [X] Haul roads dampened for dust control
- [ ] Loaded haul trucks to be covered with tarpaulin
- [X] Stabilized construction exit
- [X] Daily street sweeping
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- [ ] Chemical Management
- [ ] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [X] Dust Control
- [ ] Sanitary Facilities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
NONE		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STATE OF TEXAS
MARTINA MEJIA
143950
LICENSED PROFESSIONAL ENGINEER

Martina Mejia
AUTHORIZED 06-06-2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	STP 2B24(399)HESG, ETC.		112
STATE	STATE DIST.	COUNTY	
TEXAS	PHR	HIDALGO	
CONT.	SECT.	JOB	HIGHWAY NO.
0921	02	501,ETC	VARIOUS

During the planning phase of project development, the following Environmental Permits, Issues and Commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities as additional environmental clearances may be required.

I. Clean Water Act, Section 402; Stormwater Pollution Prevention

Action Items Required : ☐ No Action Required

1. ☒ The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.

2. ☒ For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.

3. ☒ Based on the acreage of impact, select the appropriate box below:

   ☒ This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.

   or

   ☐ This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.

   or

   ☐ This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.

4. ☒ Need to address MS4 requirements (Cameron & Hidalgo Counties only) ☐ MS4 requirements not needed

II. Clean Water Act, Sections 401 and 404 Compliance

Action Items Rquired : ☐ No Action Required

1. ☒ Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet areas is prohibited unless specified in the USACE permit and approved by the Engineer. The contractor shall adhere to all agreements, mitigation plans, and BMPs required by the NWP as regulated by the USACE.

   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 (1/10th to <1/2 acre, 1/3 in tidal waters)

   ☐ Individual 404 Permit Required

   ☐ Other Nationwide Permit Required: NWP#_____

2. ☒ The contractor is responsible for obtaining new or revised Section 404 permit(s) for Contractor initiated changes in construction methods that change Impacts To Waters Of The U.S., including wetlands. The Contractor will ensure that the water quality of the State will be maintained and not degraded.

3. ☒ Best Management Practices for applicable Section 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

☐ Temporary Vegetation	☐ Interceptor Swale	☐ Mulch Filter Berms and/or Socks
☐ Blankets, Matting	☐ Diversion Dike	☐ Compost Filter Berms and/or Socks
☐ Mulch	☐ Erosion Control Compost	☐ Compost Blankets
☐ Sodding		

Category II (Sedimentation Control)

☒ Silt Fence	☐ Hay (Straw) Bale Dike	☐ Mulch Filter Berms and/or Socks
☐ Rock Berm	☐ Brush Berms	☐ Compost Filter Berms and/or Socks
☐ Triangular Filter Dike	☐ Sediment Basins	☐ Stone Outlet Sediment Traps
☐ Sand Bag Berm	☐ Erosion Control Compost	

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

☐ Vegetative Filter Strips	☐ Wet Basins	☐ Mulch Filter Berms and/or Socks
☐ Retention/Irrigation	☐ Grassy Swales	☐ Compost Filter Berms and/or Socks
☐ Extended Detention Basin	☐ Vegetation-Lined Ditches	☐ Sand Filter Systems
☐ Constructed Wetlands	☐ Erosion Control Compost	☐ Sedimentation Chambers

II. Clean Water Act, Sections 401 and 404 Compliance - Continued:

4. ☒ The Contractor's designated and qualified Contractor Responsible Person Environmental (CRPe) will monitor the project site daily to ensue compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.

5. ☐ Other Project Specific Actions:

   1.

   2.

III. Cultural Resources

Action Items Required : ☐ No Action Required

1. ☒ Refer to the 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., 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.

2. ☐ Other Project Specific Actions:

   1.

   2.

IV. Vegetation Resources

Action Items Required : ☐ No Action Required

1. ☒ In accordance with the 2014 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)

2. ☐ In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)

3. ☒ Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.

4. ☐ Other Project Specific Actions:

   1.

   2.

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

List of Abbreviations

BMP: Best Management Practice	NWP: Nationwide Permit
CGP: Construction General Permit	PCN: Pre-Construction Notification
CRPe: Contractor Responsible Person Environmental	PSL: Project Specific Location
DSHS: Texas Department of State Health Services	SPCC: Spill Prevention Control and Countermeasure
FEMA: Federal Emergency Management Agency	SW3P: Storm Water Pollution Prevention Plan
FHWA: Federal Highway Administration	TCEQ: Texas Commission on Environmental Quality
MOA: Memorandum of Agreement	THC: Texas Historical Commission
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MSAT: Mobile Source Air Toxic	TxDOT: Texas Department of Transportation
MBTA: Migratory Bird Treaty Act	T&E: Threatened and Endangered Species
NOI: Notice of Intent	USACE: U.S. Army Corp of Engineers
NOT: Notice of Termination	USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	STP 2B24(399)HESG, ETC.		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	
CONTROL	SECTION	JOB	SHEET NO.
0921	02	501, ETC	113

Date Printed: X-X-XX

V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds

Action Items Required : ☐ No Action Required

1. ☒ Under the Migratory Bird Treaty Act (MBTA) of 1918, codified at 16 U.S.C. §703-712 and as enforced by the USFWS, the proposed construction work will not remove active nests from bridges, trees, ground and other structures during migratory bird nesting season, (February 1st. through October 1st.). If the Contractor needs to perform work within the right of way during nesting season, a qualified Biologist shall conduct a survey to determine if active nests are present. If present, the Contractor shall maintain a buffer zone around the nest(s) as directed by the Biologist. The buffer zone will be protected from clearing and disturbance until such time as the Biologist has determined that the nest(s) is no longer active. Prior to the nesting season, existing bridges and culverts should be treated against migratory bird nesting by utilizing Bird Exclusion Methods. Bird Exclusion Methods should be monitored and maintained throughout the nesting season. Refer to Standard Bird Exclusion Details.

2. ☒ There is the potential for the presence of state-listed species & species of concern in the project area and state law prohibits the taking (incidental or otherwise) of state-listed species. Taking is defined as the collection, hooking, hunting, netting, shooting, or share by any means or devices. If any listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

3. ☐ Other Project Specific Actions:

   1.

   2.

   3.

VI. Hazardous Materials on Contamination Issues

Action Items Required : ☐ No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) 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 HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr 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 (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

1. ☒ If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

VI. Hazardous Materials on Contamination Issues - Continued:

2. 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 required.
   If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.

3. Are the results of the asbestos inspection positive (is asbestos present)?

   ☐ Yes ☒ No

   If "Yes", then TxDOT must retain a Texas Department of State Health Services (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 abatement activities and/or demolition.

   If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

4. ☒ The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

Action Items Required : ☐ No Action Required

1. ☒ Noise

   Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

2. ☒ Air

   Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

   Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

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Texas Department of Transportation

PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	STP 2B24(399)HESG, ETC.		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	501,ETC	114

Date Printed: X-X-XX

TPWD BMPs

Under Section 12.0011 of the Texas Parks and Wildlife Code, Texas Parks and Wildlife Department (TPWD) is charged with "providing recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct developmental projects" and "providing information on fish and wildlife resources to any local, state, and federal agencies or private organizations that make decisions affecting those resources."

The purpose of this section is to provide beneficial management practices (BMP) that should be implemented during construction, and maintenance activities statewide for transportation projects with the goal of avoidance and minimization of impacts to natural resources. Statewide Standard BMP pertain to all fish and wildlife species, including state-listed species and other Species of Greatest Conservation Need (SGCN). Implementing the recommendations as outlined below will improve conservation of species and their habitat.

☒ General Design/Construction BMPs

- ☒ Prior to start of construction, information will be provided to personnel of the potential for all state-listed threatened species or other SGCN to occur within the project area and should be advised of relevant rules and regulations to protect plants, fish, and wildlife.
- ☒ Contractor should avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
- ☒ Contractors should install wildlife exclusion fencing and should examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities.
- ☒ Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas.
- ☒ Contractor should use woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
- ☒ Project staging areas, stockpiles, temporary construction easements, and other project related sites should be situated in previously disturbed areas to avoid or minimize impacts to sensitive or unique habitats including intact native vegetation, floodplains, riparian corridors, wetlands, playa lakes, and habitat for wildlife species.
- ☒ When lighting is added, consider wildlife impacts from light pollution and incorporating dark-sky practices into design strategies. Minimize sky glow by focusing light downward, with full cutoff luminaries to avoid light emitting above the horizontal. The minimum amount of night-time lighting needed for safety and security should be used.

☒ Vegetation BMPs

- ☒ Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided. Impacted vegetation should be replaced with in-kind on- site replacement /restoration of native vegetation.
- ☒ It is strongly recommended that trees greater than 12 inches in diameter at breast height (DBH) that are removed be replaced. TPWD 5/32 s experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to either on-site or off-site. Trees less than 12 inches DBH should be replaced at a 1:1 ratio.
- ☒ The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- ☒ The use of seed mix that contains seeds from only regional ecotype native species is recommended

☐ Invasive Species BMPs

- ☐ For all work in water bodies designated as 3/32 infested 5/32 or 3/32 positive 5/32 for invasive zebra (Dreissena polymorpha) OR quagga mussels (Dreissena bugensis) as well as waters downstream of these lakes, all machinery, equipment, vessels, or vehicles coming in contact with such waters should be cleaned prior to leaving the site to remove any mud, plants, organisms, or debris, water drained (if applicable), and dried completely before use in another water body to prevent the potential spread of invasive mussels.
- ☐ Care should be taken to prevent the spread of aquatic and terrestrial invasive plants during construction activities.
- ☐ Care should be taken to avoid the spread of aquatic invasive plants such as giant Salvinia (Salvinia molesta), common salvinia (Salvinia minima), hydrilla (Hydrilla verticillata), water hyacinth (Eichhornia spp.), Eurasian watermilfoil (Myriophyllum spicatum), water lettuce (Pistia stratiotes), and alligatorweed (Alternanthera philoxeroides) from infested water bodies into areas not currently infested. All machinery, equipment, vessels, boat trailers, or vehicles coming in contact with waters containing aquatic invasive plant species should be cleaned prior to leaving the site to remove all aquatic plant material and dried completely before use on another water body to prevent the potential spread of invasive plants. Removed plants should be transported for disposal in a secure manner to prevent dispersal.
- ☐ Only native or non-invasive plants should be planted. Care should be taken to avoid mowing invasive giant reed (Arundo donax), which spreads by fragmentation, and to clean equipment if inadvertently mowed to prevent spread. If using hay bales for sediment control, use locally grown weed-free hay to prevent the spread of invasive species. Leave the hay bales in place and allow them to break down, as this acts as mulch assisting in revegetation.

☐ Stream Crossings BMPs

- ☐ Riparian buffer zones should remain undisturbed.

☐ Dewatering BMPs

- ☐ Impact avoidance measures for aquatic organisms, including all native fish and freshwater mussel species, regardless of state-listing status, should be considered during project planning and construction activities.

☐ Wildlife Crossing BMPs

- ☐ Incorporate wildlife crossings with fencing, particularly in areas that bisect wildlife travel corridors or seasonal movement routes to avoid further habitat fragmentation and minimize wildlife-vehicle interactions.

☐ Rare Plant BMPs

- ☐ Avoid impacts and minimize unavoidable impacts. Plant locations should be protected with temporary barrier fencing and contractors should be instructed to avoid protected areas. Conducting construction outside of the growing season or after a plant has produced mature fruit is the preferred way to avoid/minimize impacts to SGCN plant populations. Staging areas, stockpiles, and other project related sites on TxDOT ROW should not impact SGCN plant populations. After construction begins, minimize herbicide use near SGCN plant populations (if possible, use hand-held spot sprayers, several meters from rare plants, on still or days with little wind).

Pharr District Contact No. 956-702-6100

☐ Rare Plants BMPs (Continued)

- ☐ If there are unintended impacts to SGCN populations, these impacts should be reported to TPWD Transportation Staff.
- ☐ During project period, conduct work during times of the year when plants are dormant and/or conditions minimize disturbance of the habitat.

☒ Bird BMPs

- ☒ Avoid vegetation clearing activities during the general bird nesting season, February 15th to October 1st to minimize adverse impacts to birds.
- ☒ Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
- ☒ Minimize extended human presence near nesting birds during construction and maintenance activities. Protect sensitive habitat areas with temporary barriers or fencing to limit human foot- traffic and off-road vehicle use to alert and discourage contractors from causing any unintentional impacts.
- ☒ Minimize construction noise above ambient levels during general bird nesting season to minimize adverse impacts on birds.
- ☒ Minimize construction lighting during the general bird nesting season by scheduling work activities between dawn and dusk.

☐ Rookeries BMPs

- ☐ In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great blue herons (GBHE) (Ardea herodis) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year.
- ☐ If rookeries are encountered, avoid and minimize disturbance during nesting to protect rookery species and their habitat.
- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a rookery or heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- ☐ Clearing activities or construction using heavy machinery in a secondary buffer area of 1000 meters (3281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

Revised 02/24/2022

List of Abbreviations

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CGP: Construction General Permit	MBTA: Migratory Bird Treaty Act	THC: Texas Historical Commission
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MS4: Municipal Separate Stormwater Sewer System	SW3P: Storm Water Pollution Prevention Plan	

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PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	STP 2B24(399)HESG, ETC.		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	
CONTROL	SECTION	JOB	SHEET NO.
0921	02	501,ETC	115

Date Printed: X-X-XX

☐ Fish BMPs

- ☐ The following Fish BMP apply to projects for all fish species in waters of the state to minimize impacts to water quality and aquatic passage from transportation projects.
- ☐ For projects in waters of the state and work is adjacent to water: follow Water Quality and Stream Crossing BMPs.
- ☐ For projects in waters of the state and work is in the water: follow Water Quality, Stream Crossing, and Dewatering BMP.

☐ Aquatic Invertebrate BMPs

- ☐ For projects within the range of a SGCN or state-listed species and work is adjacent to water: Water Quality and Stream Crossing BMP
- ☐ For projects within the range of a SGCN or state-listed species and work is in the water: Water Quality, Stream Crossing, and Dewatering BMP.
- ☐ For spring-seep associated caddisflies (Cheumatopsyche morsei, Chimarra holzenthali, and Hydroptila ouachita): Avoid or minimize impacts to the natural riparian buffer along stream channel including native shrubs and trees.

☐ Crayfish BMP

- ☐ For projects within the range of a SGCN or state-listed species and work is adjacent to water: Water Quality and Stream Crossing BMP.
- ☐ For projects within the range of a SGCN or state-listed species and work is in the water: Water Quality, Stream Crossing, and Dewatering BMP.
- ☐ Avoid or minimize impacts to the natural riparian buffer that provides terrestrial and aquatic plant matter for the diet of most crayfish species.

☐ Freshwater Mussel BMP

- ☐ In addition to Water Quality and Stream Crossing BMP, follow the most recent, 7/32 TPWD13/32 TxDOT Annual Work Plan for Pre-Construction Surveys, Aquatic Resources Relocations, and Other Best Management Practices to Avoid, Minimize, and Mitigate Impacts to Freshwater Resources.9/32
- ☐ When work is adjacent to the water: Water Quality BMP implemented as part of the Texas Commission on Environmental Quality (TCEQ) Stormwater Pollution Prevention Plan (SWPPP) for a construction general permit or any conditions of the 401 Water Quality Certification for the project will be implemented.

☐ Insect Pollinator BMP

- ☐ Deep soil disturbances, such as, tilling or deep disking in areas that host aggregations of ground- nesting bees should be avoided. Tilling and disking also may promote the invasion or germination of non-native plants. Different species of native ground-nesting bees prefer different soil conditions, although research suggests that many ground nesting bees prefer sandy, loamy sand or sandy loam soils. In areas with these soil types consider leaving open patches of soil.
- ☐ Allow dead trees to stand (so long as they do not pose a risk to property or people) and protect shrubs and herbaceous plants with pithy or hollow stems (e.g., cane fruits, sumac, elderberry), as these provide nesting habitat for tunnel-nesting native bees.
  Retain dead or dying branches whenever it is safe and practical at the edges of the ROW. Wood- boring beetle larvae often fill dead trees and branches with narrow tunnels into which tunnel- nesting bees will establish nests. Additionally, bumble bees may choose to nest in wood piles.
- ☐ Retain rotting logs at edges of the ROW where some bee species may burrow tunnels in which to nest.

☐ Insect Pollinator BMP (Continued)

- ☐ Protect sloped or well-drained ground sites where plants are sparse and direct access to soil is available. These are the areas where ground-nesting bees may dig nests. Turning the soil destroys all ground nests that are present at that depth and hinders the emergence of bees that are nesting deeper in the ground.
- ☐ Protect grassy thickets, or other areas of dense, low cover from mowing or other disturbance. These are the sites where bumble bees might find the nest cavities they need, as well as annual and perennial wildflowers that can provide important food resources.
- ☐ Where available and economical, native plants and seed should be procured from local eco-type providers. Seed mixes should be diverse and include as many ecoregion natives as possible ensuring full season floral resources. Species by Texas ecoregion can be found in the Texas Management Recommendations for Native Insect Pollinators in Texas document: https://tpwd.texas.gov/publications/pwdpubs/media/pwd*bk*w7000*1813.pdf
- ☐ Planting at least three different native flowering plants within each of three blooming periods are recommended (spring, summer, early fall) in high rainfall regions of Texas. In drier regions of the state, a target of three native flowering plants within each of two blooming periods can be used.

☐ Small Mammal BMP

For Coues' rice rat (Oryzomys couesi aquaticus):

- ☐ Minimize impacts to wetland, resaca, oxbow Conversion of property containing cave or cliff features to transportation purposes should be avoided.lake, and marsh habitats
- ☐ Water Quality BMP

☐ Fossorial Mammal BMP

- ☐ When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
- ☐ When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

☐ Bat BMP

- ☐ For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- ☐ For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- ☐ If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- ☐ Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area.

Pharr District Contact No. 956-702-6100

☐ Bat BMP (Continued)

- ☐ If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features.
- ☐ Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1 through October 31. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warms periods (nighttime temperatures = 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- ☐ Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- ☐ Retain mature, large diameter hardwood forest species and native/ornamental palm trees.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☐ Aquatic Amphibian and Reptile BMP

For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:

- ☐ Minimize impacts to wetlands, temporary and permanent open water features, including depressions, and riverine habitats.
- ☐ Maintain the existing hydrologic regime and any connections between wetlands and other aquatic features.
- ☐ Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
- ☐ Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
- ☐ Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
- ☐ When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and refugia/overwinter sites (e.g., brush and debris piles, crayfish burrows, aquatic logjams, and leaf packs).

Revised 02/24/2022

List of Abbreviations

BMP: Best Management Practice	MSAT: Mobile Source Air Toxic	TCEQ: Texas Commission on Environmental Quality
CGP: Construction General Permit	MBTA: Migratory Bird Treaty Act	THC: Texas Historical Commission
CRPe: Contractor Responsible Person Environmental	NOI: Notice of Intent	TPDES: Texas Pollutant Discharge Elimination System
DSHS: Texas Department of State Health Services	NOT: Notice of Termination	TPWD: Texas Parks and Wildlife Department
FEMA: Federal Emergency Management Agency	NWP: Nationwide Permit	TxDOT: Texas Department of Transportation
FHWA: Federal Highway Administration	PCN: Pre-Construction Notification	T&E: Threatened and Endangered Species
MOA: Memorandum of Agreement	PSL: Project Specific Location	USACE: U.S. Army Corp of Engineers
MOU: Memorandum of Understanding	SPCC: Spill Prevention Control and Countermeasure	USFWS: U.S. Fish and Wildlife Service
MS4: Municipal Separate Stormwater Sewer System	SW3P: Storm Water Pollution Prevention Plan	

Texas Department of Transportation

PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	STP 2B24(399)HESG, ETC.		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	501,ETC	116

Date Printed: X-X-XX

☐ Aquatic Amphibian and Reptile BMP (Continued)

- ☐ If gutters and curbs are part of the roadway design, install gutters that do not include the side box inlet and include sloped (i.e., mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement BMP for projects within existing ROW above plus those below:

- ☐ For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
- ☐ For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
- ☐ When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Biotechnical streambank stabilization methods using live native vegetation, or a combination of vegetative and structural materials should be used.

☐ Terrestrial Amphibian and Reptile BMP

- ☐ For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling
- ☐ Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion.
- ☐ Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.
- ☐ Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season.
  Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged.
- ☐ If Texas tortoises (Gopherus berlandieri) or box turtles (Terrepene spp.) are present in a project area, they should be removed from the area and relocated between 100 and 200 meters from the project area. After removal of the individuals, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude reentry by turtles, tortoises, and other reptiles. The exclusion fence should be constructed and maintained as follows:

  - The exclusion fence should be constructed with metal flashing or drift fence material.
  - Rolled erosion control mesh material should not be used.
  - The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
  - The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

☐ Terrestrial Amphibian and Reptile BMP (Continued)

- ☐ After project is complete, revegetate disturbed areas with an appropriate locally sourced native seed mix. If erosion control blankets or mats will be used, the product should not contain nylon netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.

☐ Black-spotted newt/Mexican Burrowing toad/ Mexican treefrog/ Strecker's chorus frog/White-lipped frog/Woodhouse's toad

- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Water Quality BMP
- ☐ Vegetation BMP

☐ Sheep Frog

- ☐ Minimize disturbance to burrows or downed woody debris
- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Water Quality BMP
- ☐ Vegetation BMP

☐ South Texas Siren (Large Form)

- ☐ Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches
- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Water Quality BMP

☐ Black-striped snake/ Eastern box turtle/Northern cat-eyed snake/Plateau spot-tailed earless lizard/ Reticulate collared lizard/ Slender glass lizard/ Speckler racer/Tamaulipan spot-tailed earless lizard/ Texas Indigo snake/ Western box turtle/Western hognose snake/Western massasauga

- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Vegetation BMP

☐ Rio Grande River Cooter

- ☐ Aquatic Amphibian and Reptile BMP
- ☐ Water Quality BMP

☐ Texas Horned Lizard

- ☐ Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs).
- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Vegetation BMP

☐ Texas Tortoise

- ☐ Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species
- ☐ Terrestrial Amphibian and Reptile BMP
- ☐ Vegetation BMP

Pharr District Contact No. 956-702-6100

OTHER PERTINENT INFORMATION

☐ Trifold Available

- ☐ Ocelot information
- ☐ Pelican information
- ☐ Ashy dogweed

☐ Stockcards Available

- ☐ Mitigatory Bird Treaty Act
- ☐ Texas Tortoise
- ☐ Harvester Ants and Horn Lizards

Revised 02/24/2022

List of Abbreviations

BMP: Best Management Practice	MSAT: Mobile Source Air Toxic	TCEQ: Texas Commission on Environmental Quality
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Texas Department of Transportation

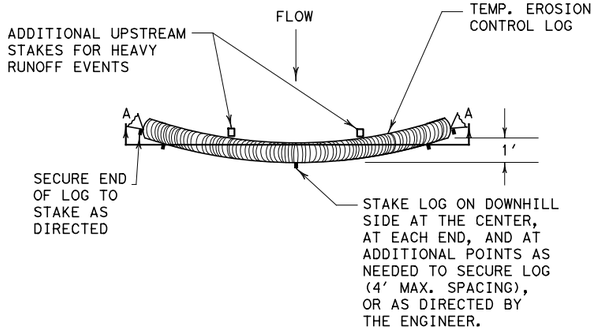
PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	STP 2B24(399)HESG, ETC.		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	501,ETC	117

Date Printed: X-X-XX



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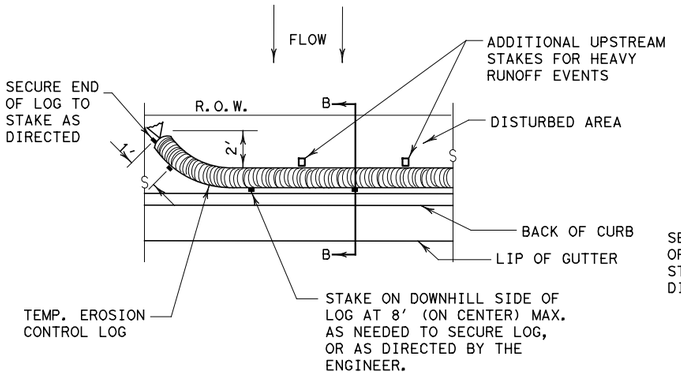

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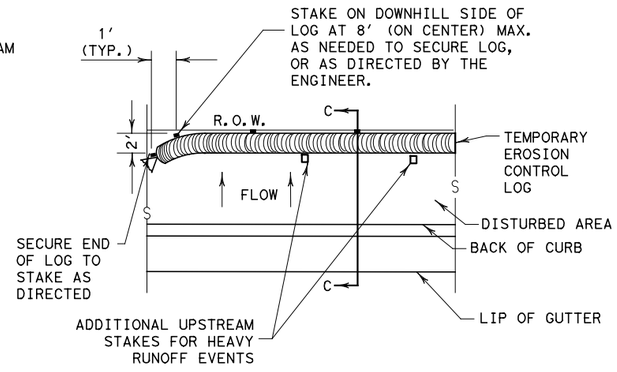

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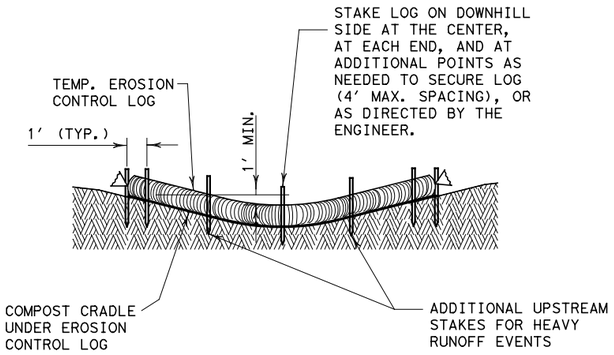
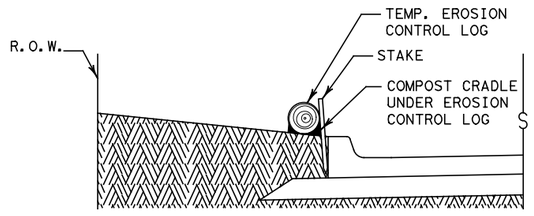


SECTION A-A

EROSION CONTROL LOG DAM

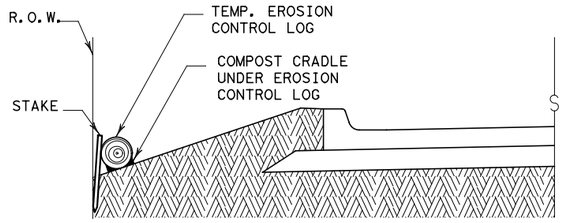
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

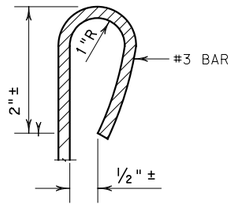
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

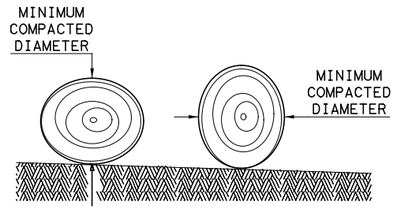
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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	DIST	COUNTY			SHEET NO.		
	PHR	HIDALGO			118		

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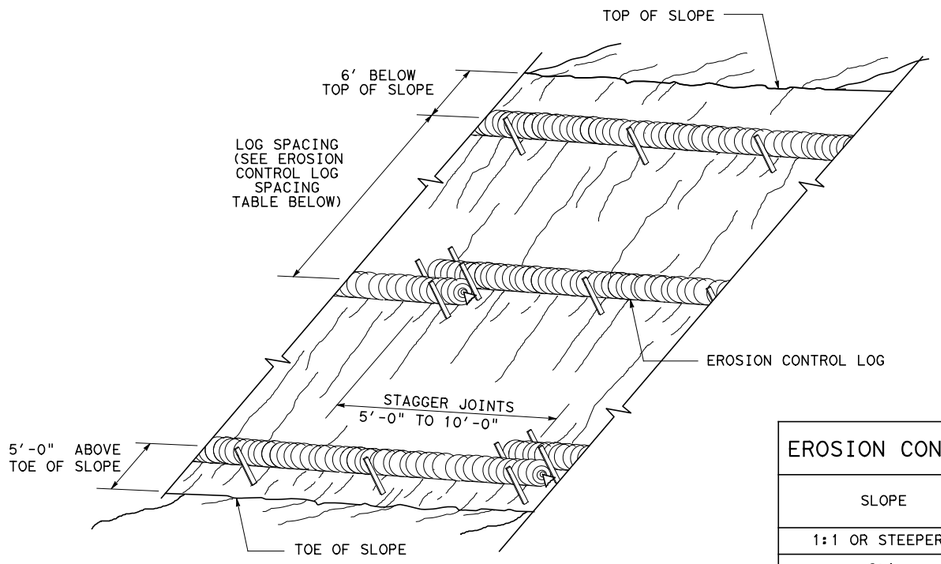
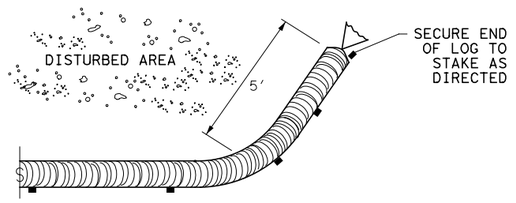


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

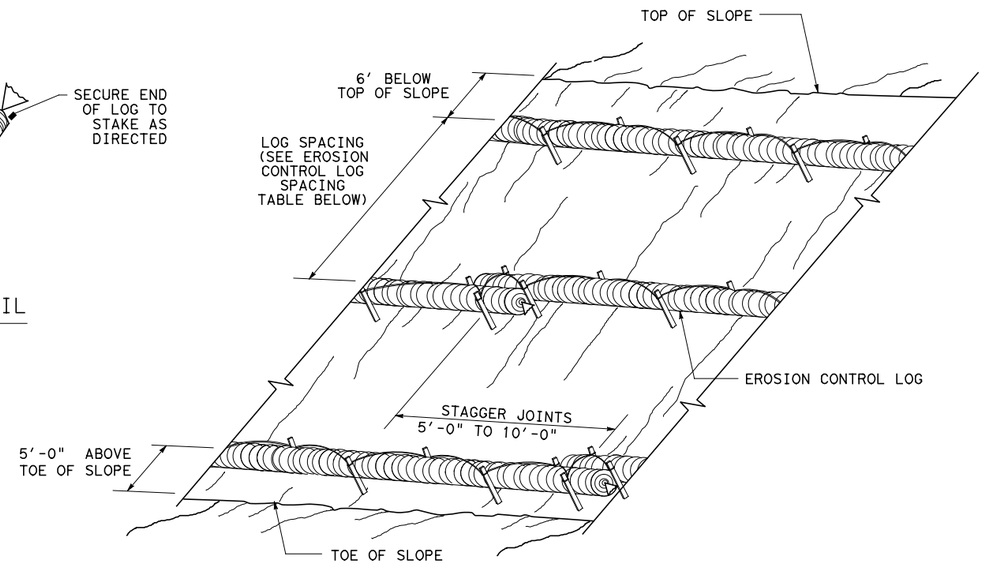
CL-SST



END SECTION RAP DETAIL

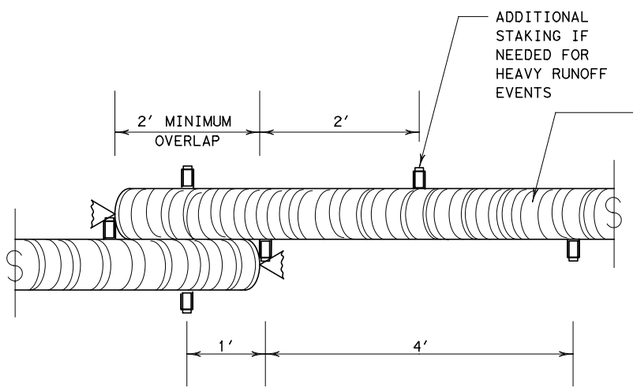
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5′	10′	15′	20′
2:1	10′	20′	30′	40′
3:1	15′	30′	45′	60′
4:1 OR FLATTER	20′	40′	60′	80′

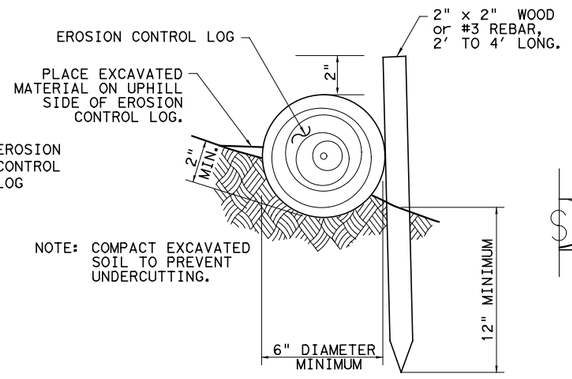
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

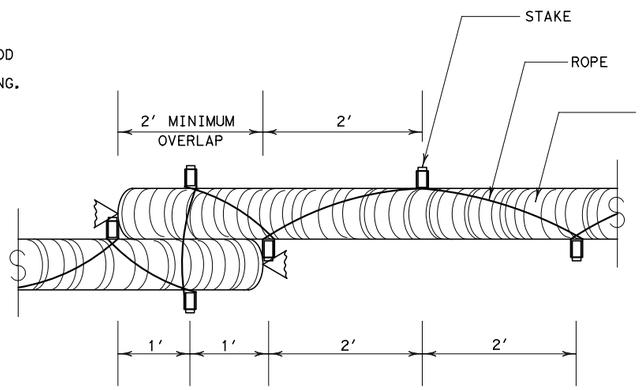


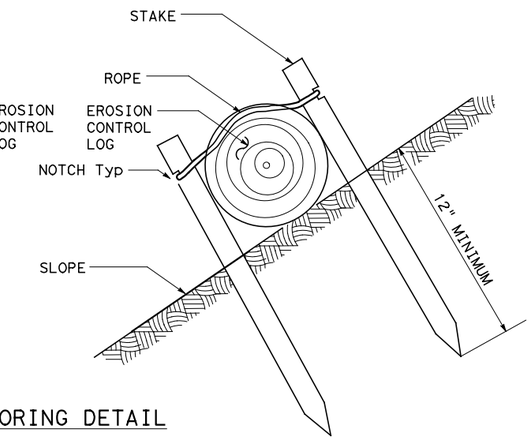


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

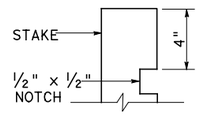
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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	PHR	HIDALGO		119

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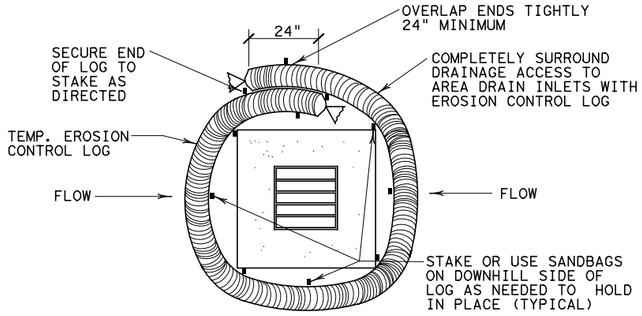
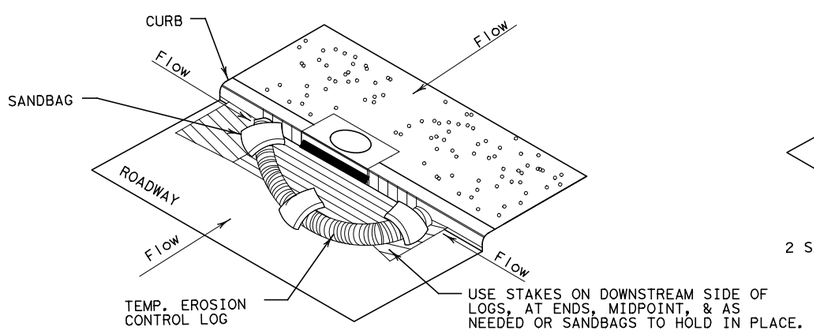


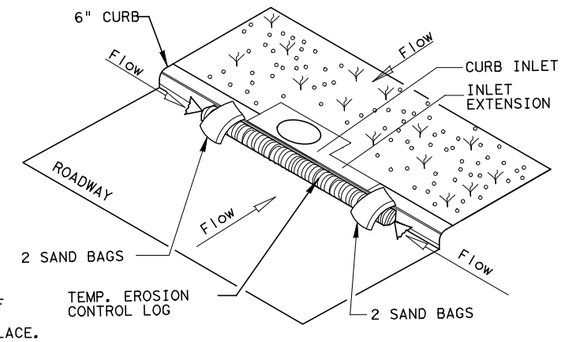
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

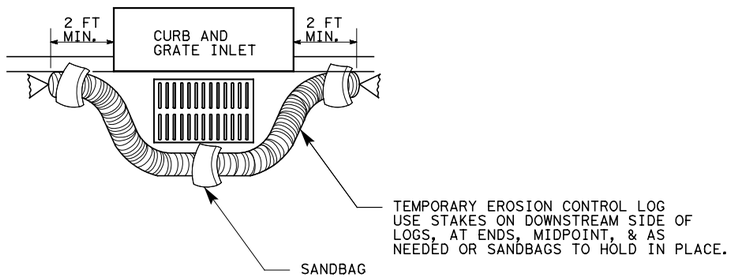
CL-CI



EROSION CONTROL LOG AT CURB INLET

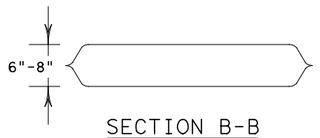
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

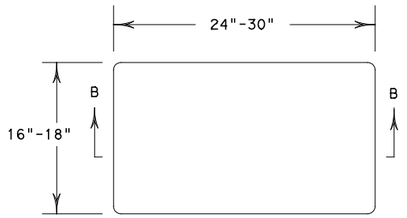


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	501,ETC	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		120