INDEX OF SHEETS
SEE SHEET 2

PROJECT REFERENCE
SEE SHEET 3

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NO. C 18-2-91,ETC

STATE PROJECT NO.			
C 18-2-91, ETC			
CONT	SECT	JOB	HIGHWAY
0018	02	091, etc.	IH35, etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, etc.		1

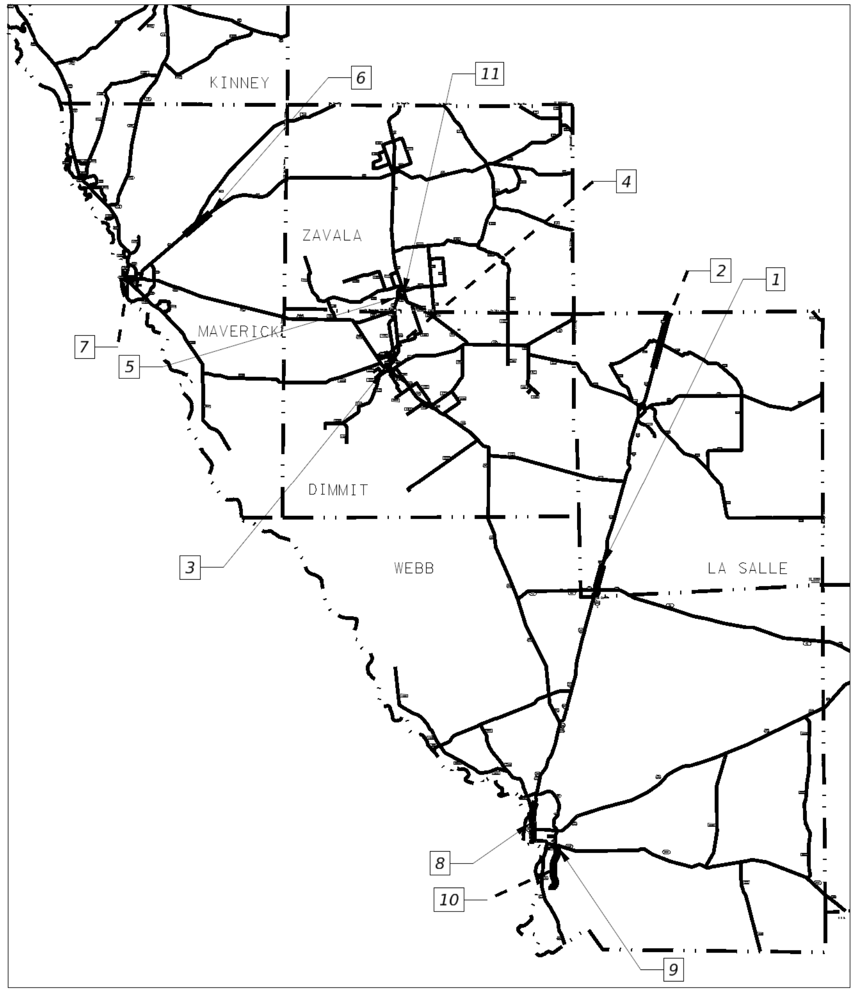
DESIGN CRITERIA: PREVENTIVE MAINTENANCE
A.D.T. (20XX): N/A
A.D.T. (20XX): N/A
% TRUCK IN ADT: N/A
FUNCTIONAL CLASS: INTERSTATE
DESIGN SPEED: N/A
TDLR REQUIRED: NO

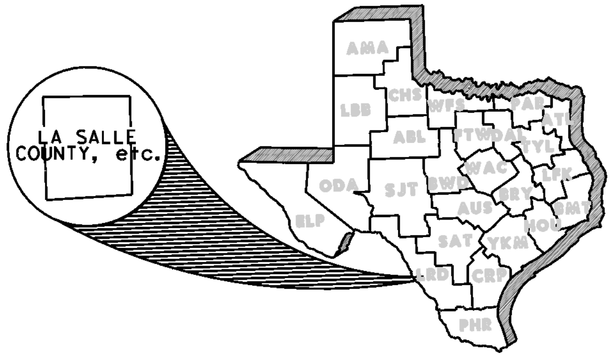
IH35,etc.
LA SALLE COUNTY, etc.
CSJ:0018-02-091, etc.

NET LENGTH OF ROADWAY = 192,616.80 FT.= 35.969 MI.
NET LENGTH OF BRIDGE = 5,832.00 FT.= 1.105 MI.
NET LENGTH OF PROJECT = 198, 448.80 FT.= 37.585 MI.

LIMITS FROM: WEBB/LA SALLE COUNTY LINE(NBML), etc.
TO: 4.885 MI NORTH OF WEBB COUNTY LINE, etc.

FOR THE CONSTRUCTION OF RESURFACE OF EXISTING HIGHWAY
CONSISTING OF MILL INLAYS & PAVEMENT MARKINGS





EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: LOCATION 7, CSJ: 0299-13-034, DOT# 764108U

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000---008).

FINAL PLANS

LETTING DATE: ____________________
DATE CONTRACTOR BEGAN WORK: ____________________
DATE WORK WAS COMPLETED & ACCEPTED: ____________________
FINAL CONTRACT COST: $ ____________________
CONTRACTOR : ____________________

FINAL AS BUILTS

THE CONSTRUCTION WAS PERFORMED UNDER MY SUPERVISION IN ACCORDANCE WITH THE PLANS AND CONTRACT

____
AREA ENGINEER

____
DATE

Texas Department of Transportation

SUBMITTED FOR LETTING: 12/20/2023
DocuSigned by: Cynthia Garcia
96CA7DFE12674F3...
TRANSPORTATION ENGINEER

RECOMMENDED FOR LETTING: 12/20/2023
DocuSigned by: Jorge A. Millan, P.E.
2F8086BC105C409...
AREA ENGINEER

RECOMMENDED FOR LETTING: 12/21/2023
DocuSigned by: Roberto Rodriguez III
B6BEDC41D58848E...
DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 12/21/2023
DocuSigned by:
A5A9883ECD1E4F7...
DISTRICT ENGINEER

DATE: 12/20/2023 2:38:57 PM
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	GENERAL		**ROADWAY DETAILS STANDARDS**		**PAVEMENT MARKINGS, SIGNING & DELINEATION STANDARDS**
1	TITLE SHEET	93	GF(31)-19	141-143	PM(1)-22 THRU PM(3)-22
2	INDEX OF SHEETS	94	GF(31) DAT-19	144	PM(4)- 22A
3	PROJECT LOCATION REFERENCE	95	GF(31) MS-19	145	PM(5)- 22
4	LOCATION MAP LA SALLE	96-97	GF (31) TR TL3-20	146	CPM(1)-23
5	LOCATION MAP DIMMIT	98	SGT(10S)31-16	147-149	FPM(1)-22 THRU FPM(3)-22
6	LOCATION MAP ZAVALA	99	SGT(11S)31-18	150	FPM(5)-22
7	LOCATION MAP MAVERICK	100	SGT(12S)31-18	151	FPM(6)-22
8	LOCATION MAP WEBB	101	SGT(15)31-20	152-157	D&OM(1)-20 THRU D&OM(6)-20
9-19	TYPICAL SECTIONS	102	BED-14	158	D&OM(VIA)-20
20	RATES OF APPLICATON	103-104	SSTR	159	CCCG-22
21-27	GENERAL NOTES	105	TRF	160-161	TS2(PL-1)- 23 & TS2(PL-2)- 23
28-33	ESTIMATE & QUANTITY SHEET	106-107	T502	162-163	RCD(1)- 22 & RCD(2)- 22
34-40	SUMMARY OF QUANTITIES	108	QGELITE (M10) (N)-20	164-165	RAILROAD SCOPE OF WORK
		109	SMTC (N) - 16	166-167	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
	TRAFFIC CONTROL PLAN	110	TAU-II-R(N)-16		
41	TCP GENERAL NOTES	111	REACT (M) -21		**ENVIRONMENTAL ISSUES STANDARDS**
42-43	TCP SEQUENCE OF CONSTRUCTION	112	RS(1)-23	168	EC(1)-16
44-45	PLACEMENT OF MESSAGE SIGN & TMSP RADAR	113	RS(2)-23	169	EC(2)-16
46	TCP CLOSURE DETAIL	114	RS(3)-23	170	EC(3)-16
47	TCP CONSTRUCTION JOINT DETAIL	115	RS(4)-23	171-173	EC(9)-16
				174	EPIC
	TRAFFIC CONTROL PLAN STANDARDS		**BRIDGE DETAILS**		
48-59	BC(1)-21 THRU BC(12)-21	116-126	MBGF, RAIL & TERMINAL INSTALLATION LAYOUT		
60	TCP(2-1)-18	127	BRIDGE RAIL RETROFIT HSS TUBE DETAIL		
61	TCP(2-2)-18	128-129	CLEANING AND SEALING EXISTING BRIDGE JOINTS		
62	TCP(2-4)-18				
63	TCP(2-6)-18		**PAVEMENT MARKINGS DETAILS**		
64	TCP(3-1)-13	130	LOCATION #4 SL 517 PAVEMENT MARKING LAYOUT		
65	TCP(3-2)-13	131-132	LOCATION #9 SS 259 PAVEMENT MARKING LAYOUT		
66	TCP(3-3)- 14	133-137	CUATRO VIENTOS LAYOUT		
67	TCP(3-4)- 13	138	SAN DARIO AVE		
68	TCP(5-1)- 18	139	RAISED MEDIAN DETAILS		
69-73	TCP(6-1)- 12 THRU TCP(6-5)- 12	140	SUMMARY OF SMALL SIGNS		
74	TCP(7-1)- 13				
75	WZ(STPM)-23				
76	WZ(BRK)-13				
77	WZ(RS)-22				
78	WZ(UL)- 13				
	ROADWAY DETAILS				
79-85	DIAGRAMMATIC LAYOUTS				
86	ROADWAY MISCELLANEOUS DETAILS PLANING PROFILE				
87-92	MISCELLANEOUS DETAILS				

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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

DocuSigned by:
Cynthia Garcia
98CA7DFE12674F3...
P.E.

12/22/2023
DATE

Texas Department of Transportation

IH 35, etc.

INDEX OF SHEETS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		2

DATE: 12/22/2023 2:08:16 PM
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COUNTY	LOCATION	PROJECT CSJ	HIGHWAY	LENGTH		TYPE OF WORK	PROJECT LIMITS		REFERENCE MARKER
				FEET	MILES				
LA SALLE	1	0018-02-091	IH 35	25,771.68	4.881	Mill-Inlay	FROM:	WEBB/LASALLE COUNTY LINE (NBML)	38 +0.278
							TO:	4.885 MI NORTH OF WEBB COUNTY	43 +0.163
	2	0017-08-116	IH 35	44,880.00	8.500	Mill-Inlay	FROM:	8.5 MILES SOUTH OF FRIO CL (SBML)	73 +0.924
							TO:	LASALLE/FRIO COUNTY LINE	82 +0.445
DIMMIT	3	0300-04-011	FM 790	7,835.52	1.484	Mill-Inlay	FROM:	US 277	562 -0.082
							TO:	US 83	564 +0.047
	4	2485-02-012	SL 517	14,224.32	2.694	Overlay	FROM:	US 83	408 -0.025
							TO:	US 277	411 +0.033
ZAVALA	5	0037-04-019	SL 155	3,284.16	0.622	Mill-Inlay	FROM:	US 83	410 -0.066
							TO:	FM 65	410 +0.556
MAVERICK	6	0276-01-047	US 57	26,669.28	5.051	Overlay	FROM:	MM 382+00	382 +0
							TO:	2.887 MILES EAST OF FM 481	386 +1.073
	7	0299-13-034	BU 277N	4,788.96	0.907	Mill-Inlay	FROM:	US 57/BU 277 INT	550 +0.061
							TO:	N CEYLON ST	550 +0.969
WEBB	8	0018-06-193	IH 35	29,388.48	5.566	Mill-Inlay	FROM:	SCOTT STREET (EFR)	1 -0.252
							TO:	0.222 MILE NORTH OF SHILOH RD	6 +0.504
	9	3631-01-002	SS 259	1,821.60	0.345	Pavement Marking	FROM:	SH 359	638 -0.061
							TO:	SL 20	638 +0.284
	10	0086-16-013	SL 20	37,213.44	7.048	Mill-Inlay	FROM:	SH 359	432 +0.15
							TO:	MANGANA HEIN RD	436 +3.056
ZAVALA	11	0037-04-021	FM 582	2,571.36	0.487	Mill-Inlay	FROM:	FM 65	414 -0.049
							TO:	FM 1433	414 +0.438
			TOTAL	198,448.80	37.585				

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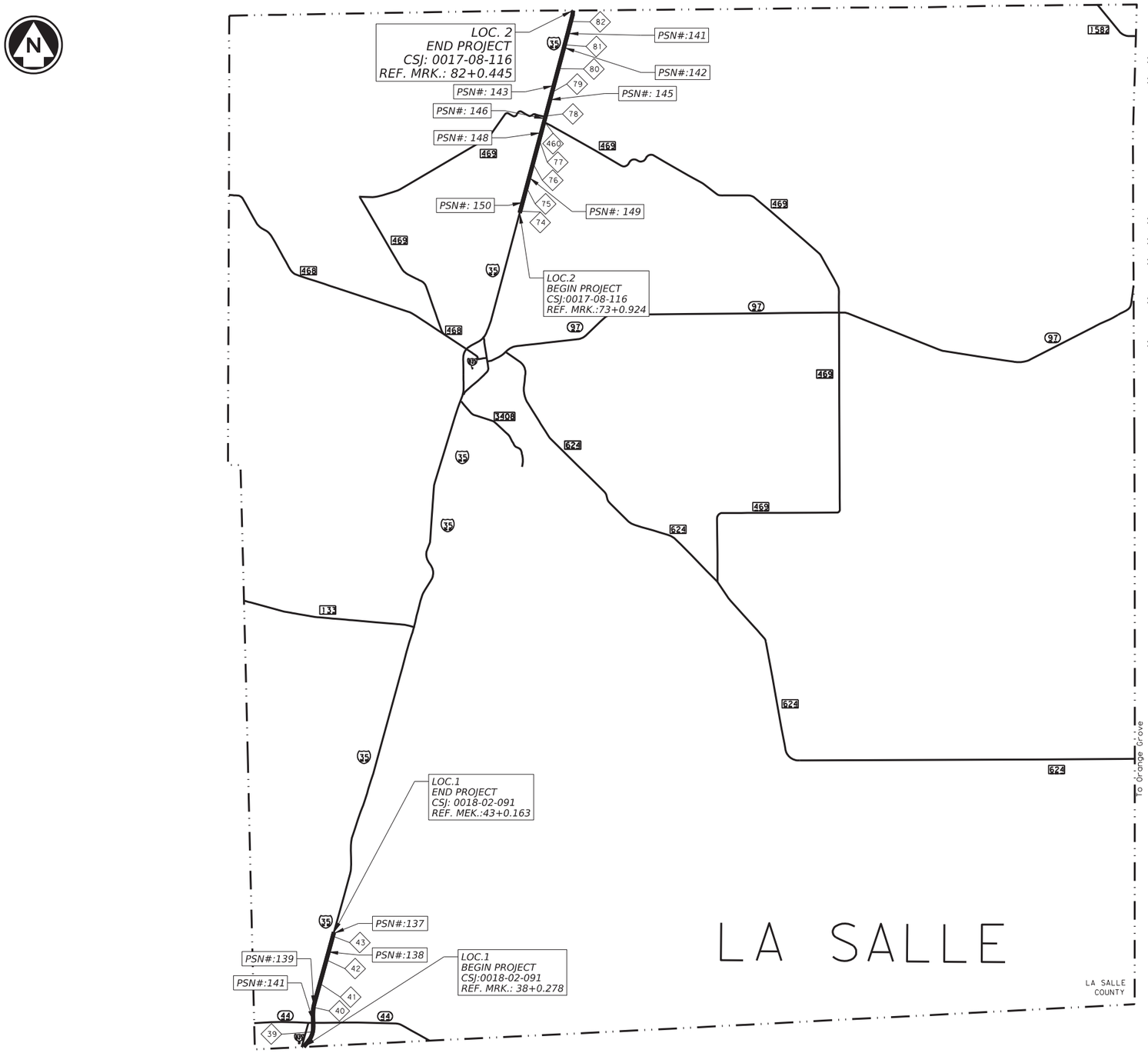
Texas Department of Transportation

IH 35, etc.

PROJECT LOCATION REFERENCE

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		3



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	1	IH 35 NB	221420001802141	SPAN	175
*	1	IH 35 NB	221420001802139	CULVERT	29
*	1	IH 35 NB	221420001802138	CULVERT	51
	1	IH 35 NB	221420001802137	SPAN	160

	LOC. #	HWY	PSN #	TYPE	LENGTH (FT)
*	2	IH 35 SBML	221420001708150	CULVERT	40
*	2	IH 35 SBML	221420001708149	CULVERT	40
*	2	IH 35 SBML	221420001708148	CULVERT	34
	2	IH 35 SBML	221420001708146	SPAN	120
*	2	IH 35 SBML	221420001708145	CULVERT	93
	2	IH 35 SBML	221420001708143	SPAN	120
*	2	IH 35 SBML	221420001708142	CULVERT	28
	2	IH 35 SBML	221420001708141	CULVERT	23

NOTES:

1. REFER TO "PROJECT LOCATION REFERENCE" SHEET FOR MORE PROJECT INFORMATION.
2. NO WORK SHALL BE DONE ON PSN'S LABELED WITH AN ASTERISK (*).
3. THE BRIDGE LENGTH WILL BE EXCLUDED FROM THE PROJECT NET LENGTH OF BRIDGE SHOWN ON THE TITLE SHEET.
4. ADDITIONAL WORK. REFER TO DIAGRAMMATIC LAYOUTS.

NOT TO SCALE

Texas Department of Transportation

IH 35, etc.

LOCATION MAP
LA SALLE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		4

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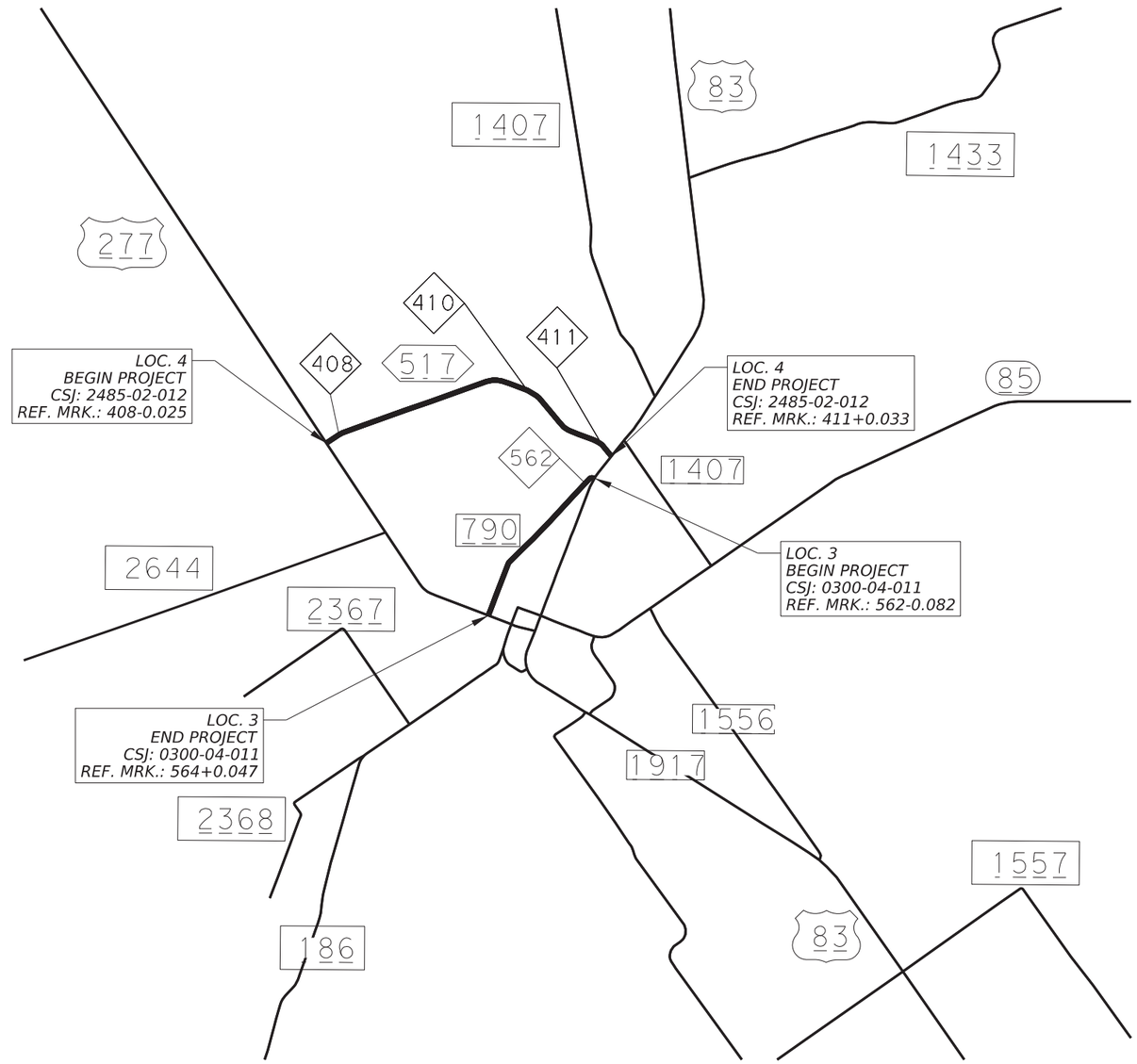

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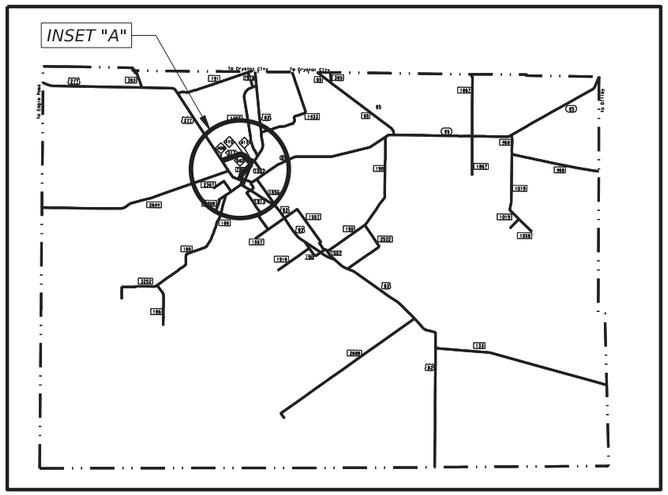

DIMMIT COUNTY MAP

NOT TO SCALE

Texas Department of Transportation

IH 35, etc.

LOCATION MAP
DIMMIT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		5

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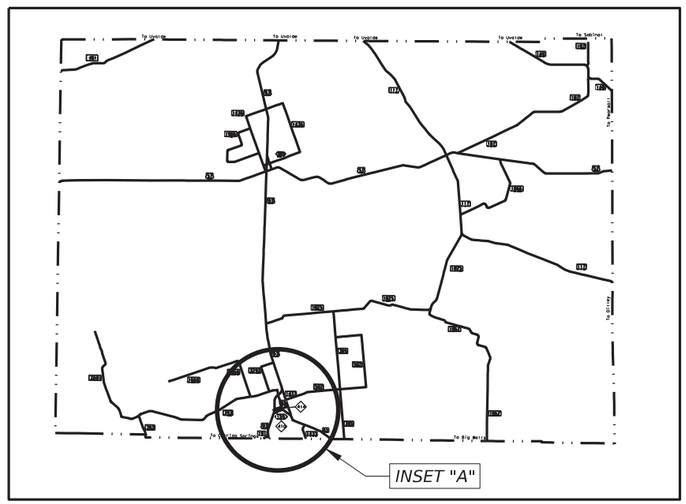
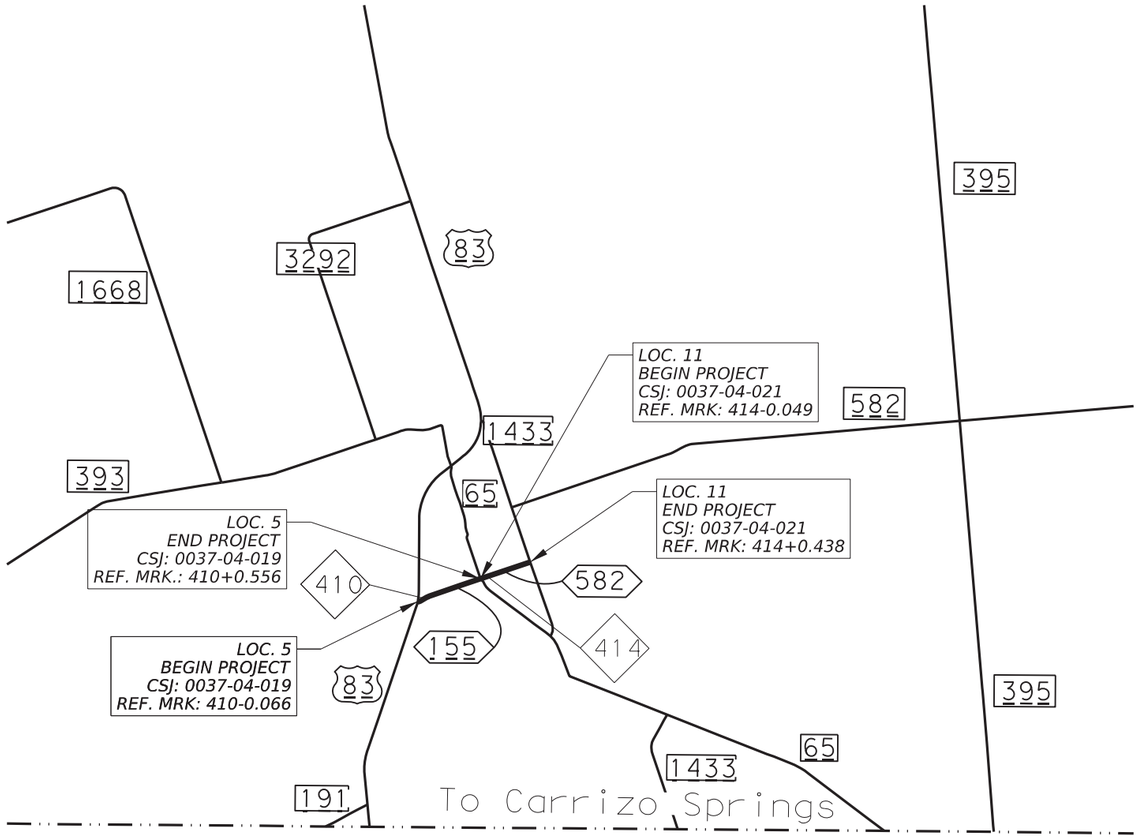


ZAVALA COUNTY MAP

NOT TO SCALE



INSET "A"

NOT TO SCALE

Texas Department of Transportation

IH 35, etc.

LOCATION MAP
ZAVALA

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		6

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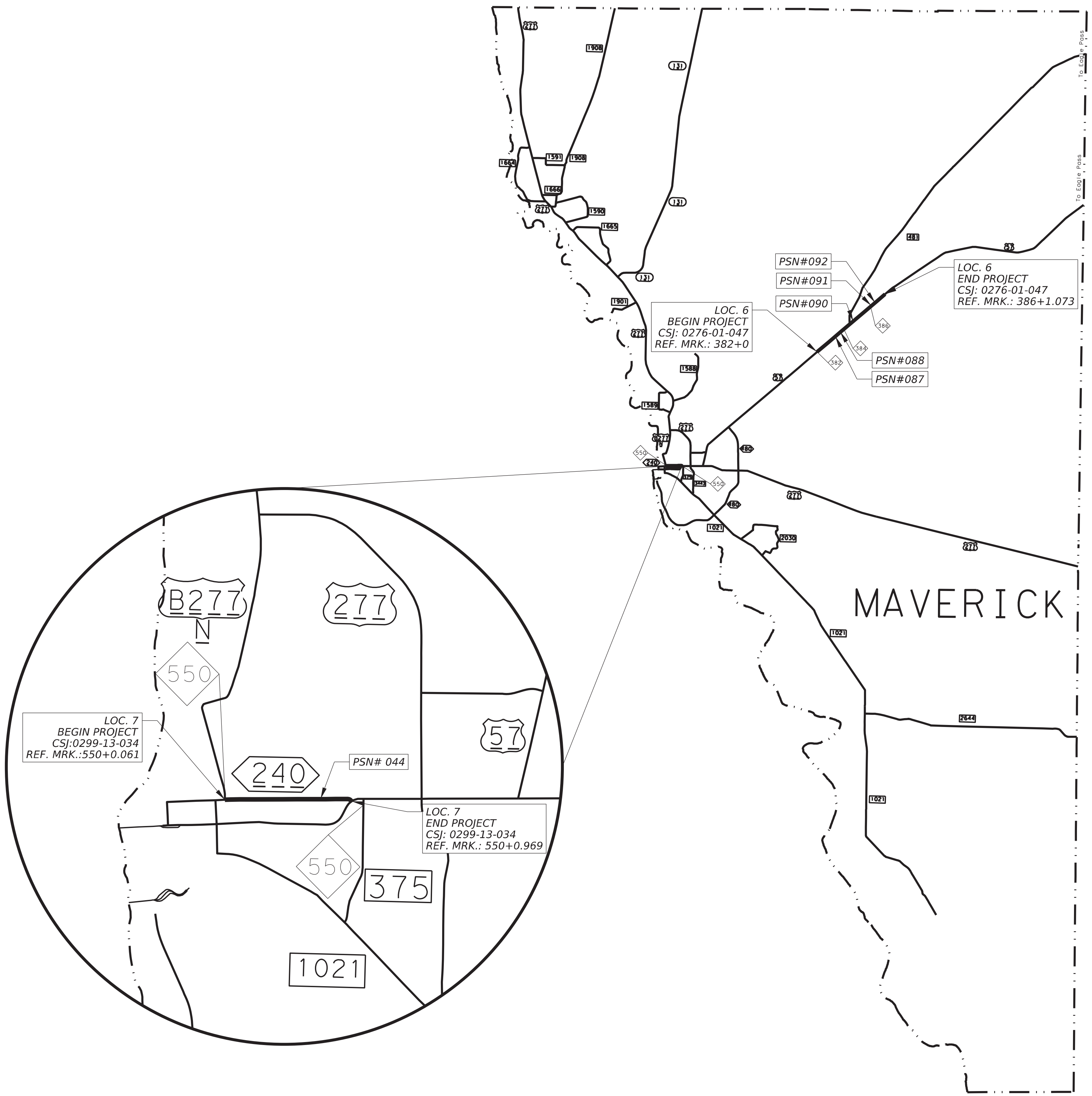

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*	6	US 57	221590027601087	CULVERT	30
*	6	US 57	221590027601088	CULVERT	30
	6	US 57	221590027601090	CULVERT	31
*	6	US 57	221590027601091	CULVERT	38
*	6	US 57	221590027601092	CULVERT	29

	LOC. #	HWY	PSN #	TYPE	LENGTH (FT)
*	7	US 277 BU	221590029913044	CULVERT	32

NOTES:

1. REFER TO "PROJECT LOCATION REFERENCE" SHEET FOR MORE PROJECT INFORMATION.
2. NO WORK SHALL BE DONE ON PSN'S LABELED WITH AN ASTERISK (*).
3. THE BRIDGE LENGTH WILL BE EXCLUDED FROM THE PROJECT NET LENGTH OF BRIDGE SHOWN ON THE TITLE SHEET.
4. ADDITIONAL WORK. REFER TO DIAGRAMMATIC LAYOUTS.

NOT TO SCALE

Texas Department of Transportation

IH 35, etc.

LOCATION MAP
MAVERICK

 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.

DIST	COUNTY	SHEET NO.
22	LA SALLE, Etc.	7

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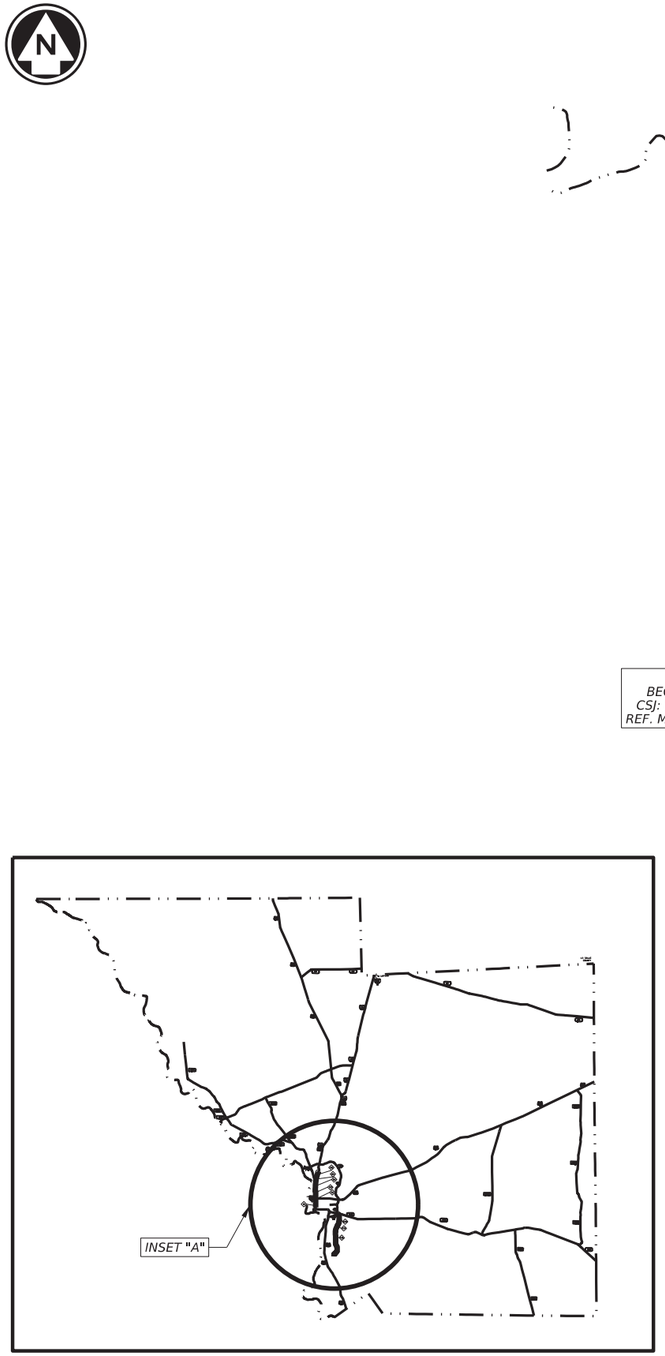
	LOC. #	HWY	PSN #	TYPE	LENGTH (FT)
*	8	IH 35 EFR	222400001806077	CULVERT	46
*	8	IH 35 EFR	222400001806076	CULVERT	53

	LOC. #	HWY	PSN #	TYPE	LENGTH (FT)
	10	LP 20 NB/SB	222400008616185	SPAN	60
	10	LP 20 SB	222400008616187	SPAN	1364
	10	LP 20 NB	222400008616188	SPAN	1364
	10	LP 20 SB	222400008616186	SPAN	896
	10	LP 20 NB	222400008616190	SPAN	896
*	10	LP 20 NB/SB	222400008616189	CULVERT	50

NOTES:

1. REFER TO "PROJECT LOCATION REFERENCE" SHEET FOR MORE PROJECT INFORMATION.
2. NO WORK SHALL BE DONE ON PSN'S LABELED WITH AN ASTERISK (*).
3. THE BRIDGE LENGTH WILL BE EXCLUDED FROM THE PROJECT NET LENGTH OF BRIDGE SHOWN ON THE TITLE SHEET.
4. ADDITIONAL WORK. REFER TO DIAGRAMMATIC LAYOUTS.



WEBB COUNTY MAP
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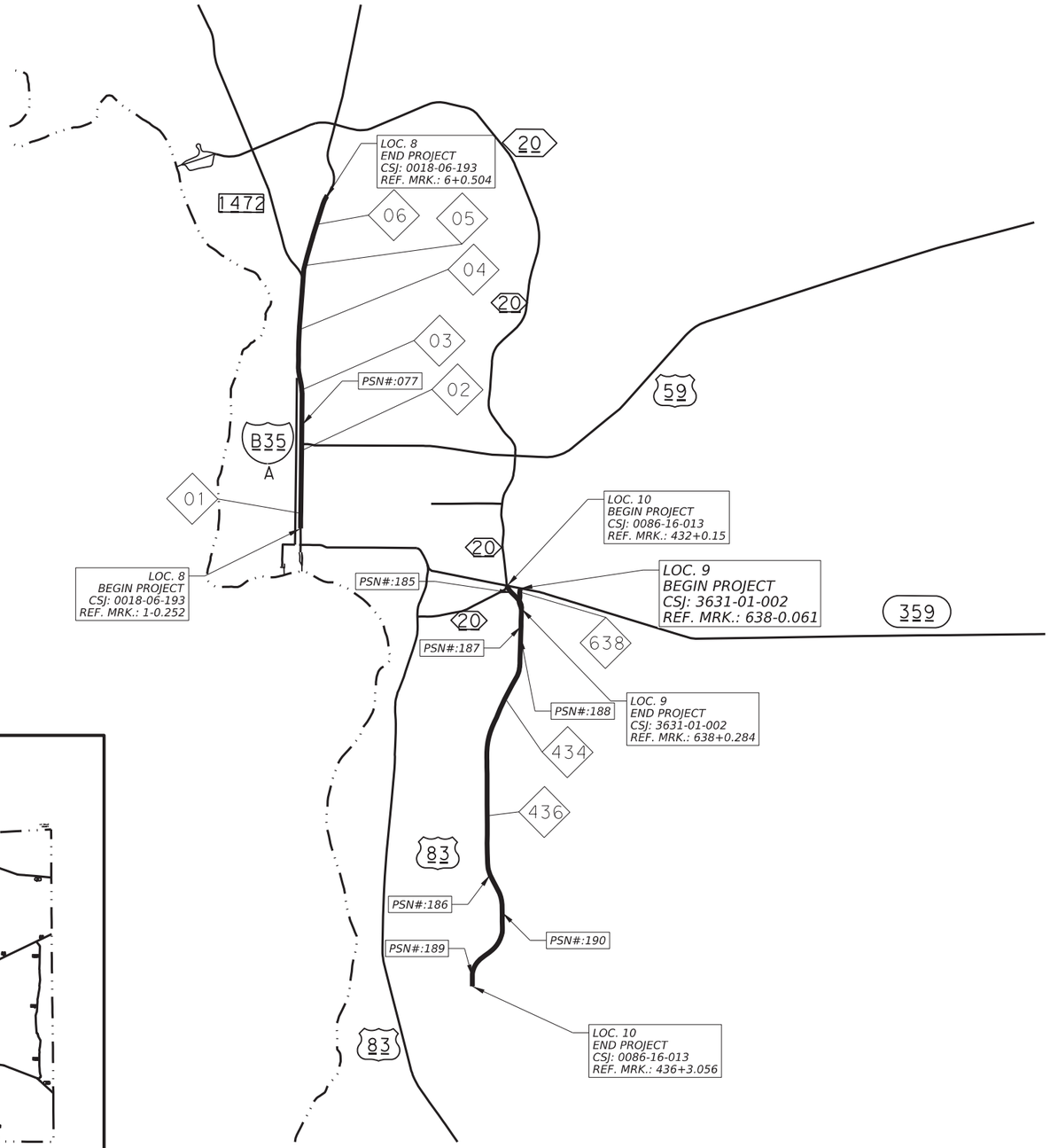

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NOT TO SCALE

Texas Department of Transportation

IH 35, etc.
LOCATION MAP
WEBB

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		8

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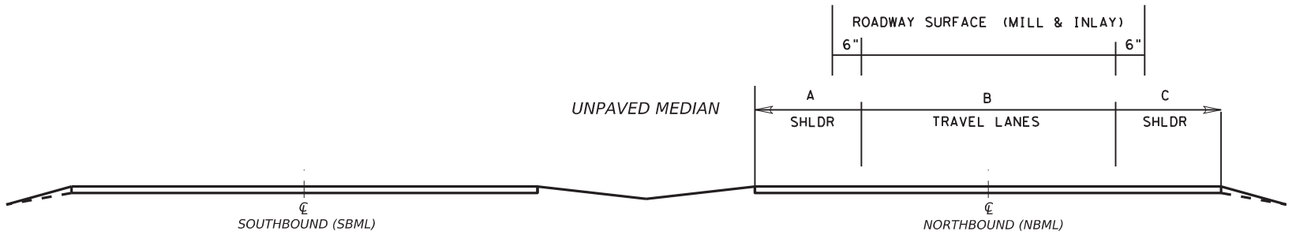
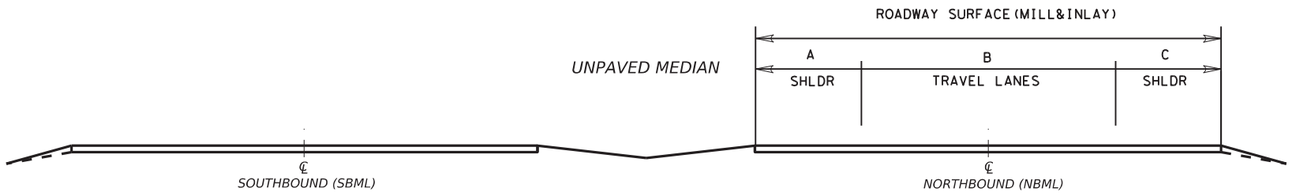


TYPICAL SECTION No. 1

DIVIDED HIGHWAY



TYPICAL SECTION No. 1A

DIVIDED HIGHWAY

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTA	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
6	12	24	12	10	25	9,502.78	1	LOC.	1	IH 35 NB	LA SALLE	3421.00
6	12	25	13	10	26	840.67	1	LOC.	1	IH 35 NB	LA SALLE	291.00
6	12	24	12	10	25	3,597.22	1	LOC.	1	IH 35 NB	LA SALLE	1295.00
6	12	24	12	10	40	1,666.67	2	LOC.	1	IH 35 NB	LA SALLE	375.00
6	12	24	12	10	40	777.78	2	LOC.	1	IH 35 NB Bridge - 221420001802141	LA SALLE	175.00
6	12	24	12	10	40	555.56	2	LOC.	1	IH 35 NB	LA SALLE	125.00
6	12	24	12	10	25	3,283.33	1	LOC.	1	IH 35 NB	LA SALLE	1182.00
6	12	25	13	10	26	2,715.56	1	LOC.	1	IH 35 NB	LA SALLE	940.00
6	12	24	12	10	25	40,538.33	1	LOC.	1	IH 35 NB	LA SALLE	14593.80
6	12	24	12	10	40	12,272.00	1	LOC.	1	IH 35 NB - Asphalt Sec. to remain	LA SALLE	2761.20
6	12	24	12	10	40	1,666.67	2	LOC.	1	IH 35 NB	LA SALLE	375.00
6	12	24	12	10	40	711.11	2	LOC.	1	IH 35 NB Bridge - 221420001802137	LA SALLE	160.00
6	12	24	12	10	40	345.24	2	LOC.	1	IH 35 NB	LA SALLE	77.68
6	12	24	12	10	40	213.33	2	LOC.	1	IH 35 NB- Additional Segment	LA SALLE	48.00
2	0	14	14	6	22	2,200.00	#	LOC.	1	IH 35 NB - Exit Ramp MM 39	LA SALLE	900.00
2	0	14	14	6	22	2,567.00	#	LOC.	1	IH 35 NB - Entrance Ramp MM 39	LA SALLE	1050.00
TOTAL						69,693.24						25771.7

SEE NOTE 8

SEE NOTE 9

SEE NOTE 8

SEE NOTE 9

1. REFER TO "RATES OF APPLICATION SHEET" FOR PAVEMENT DESIGN.

2. "TOTAL ROADWAY SURFACE (MILL & INLAY)" HAS BEEN ADJUSTED TO OMIT THE FOLLOWING AREAS:

SPAN BRIDGE(S)
- IH 35 NB - 221420001802141
- IH 35 NB - 221420001802137

ROADWAY
-IH 35 NB - ASPHALT SEC. TO REMAIN, STRIPING TO BE REPLACED

3. MAINTAIN EXISTING CROSS SLOPES AND RESPECTIVE PGL THROUGHOUT THE PROJECT(S).

4. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR MORE INFORMATION ON ROADWAY AREAS TO BE WORKED WITHIN THE PROJECT LIMITS.

5. REFER TO "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.

6. EXISTING EDGE LINE RUMBLE STRIP WITHIN PROJECT LIMITS TO REMAIN IN PLACE.

7. "#" SEE ROADWAY MISCELLANEOUS DETAILS (RAMP OVERLAY DETAIL) FOR RAMP TYPICAL SECTIONS. LENGTH SHOWN ARE FOR CONTRACTORS INFORMATION AND ARE EXCLUDED FROM THE TOTAL APPROXIMATE ROADWAY LENGTH.

8. SHOULDER WIDTHS DISPLAY FOR CONTRACTORS INFORMATION AND AREAS ARE EXCLUDED FROM THE SURFACE WIDTH AND TOTAL SURFACE AREA. REFER TO "RATE OF APPLICATION SHEET FOR PROPOSED WORK AT SHOULDERS.

9. REFER TO ROADWAY MICELLANEOUS DETAILS PLANING PROFILE FOR MORE INFORMATION.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by CYNTHIA GARCIA P.E. 149715, on

DocuSigned by:
Cynthia Garcia
96CA7DFE12674F3...

12/22/2023

NOT TO SCALE

Texas Department of Transportation

IH 35, etc.

TYPICAL SECTIONS

SHEET 1 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		9

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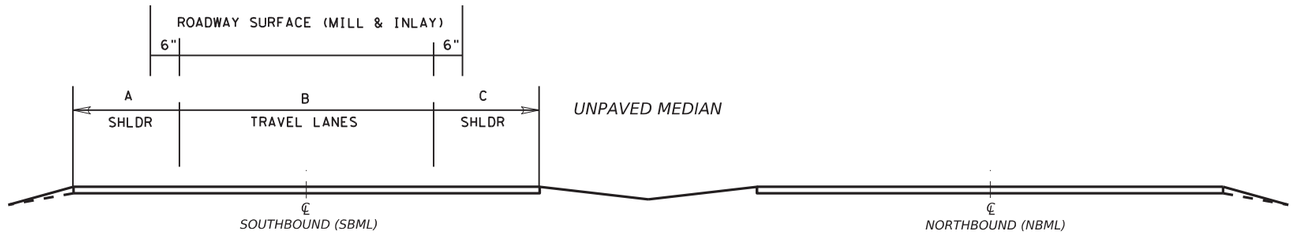

TYPICAL SECTION No. 1

1. REFER TO "RATES OF APPLICATION" SHEET FOR PAVEMENT DESIGN.
3. MAINTAIN EXISTING CROSS SLOPES AND RESPECTIVE PGL THROUGHOUT THE PROJECT(S).
4. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR MORE INFORMATION ON ROADWAY AREAS TO BE WORKED WITHIN THE PROJECT LIMITS.
5. REFER TO "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.
6. EXISTING EDGE LINE RUMBLE STRIP WITHIN PROJECT LIMITS TO REMAIN IN PLACE.
7. "#" SEE ROADWAY MISCELLANEOUS DETAILS (RAMP OVERLAY DETAIL) FOR RAMP TYPICAL SECTIONS. LENGTH SHOWN ARE FOR CONTRACTORS INFORMATION AND ARE EXCLUDED FROM THE TOTAL APPROXIMATE ROADWAY LENGTH.
8. SHOULDER WIDTHS DISPLAY FOR CONTRACTORS INFORMATION AND SOME AREAS ARE EXCLUDED FROM THE SURFACE WIDTH AND TOTAL SURFACE AREA. REFER TO "RATE OF APPLICATION SHEET FOR PROPOSED WORK AT SHOULDERS.
9. REFER TO ROADWAY MISCELLANEOUS DETAILS PLANING PROFILE FOR MORE INFORMATION.

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
SEE NOTE 8	6	12	24	12	10	25	4,108.33	1	LOC.	2	IH 35 SB	LA SALLE	1479.00
	6	12	25	13	10	26	2,591.33	1	LOC.	2	IH 35 SB	LA SALLE	897.00
	6	12	24	12	10	25	48,400.00	1	LOC.	2	IH 35 SB	LA SALLE	17424.00
SEE NOTE 9	6	12	24	12	10	25	333.33	1	LOC.	2	IH 35 SB - 221420001708143	LA SALLE	120.00
SEE NOTE 8	6	12	24	12	10	25	7,294.44	1	LOC.	2	IH 35 SB	LA SALLE	2626.00
	6	12	25	13	10	26	1,525.33	1	LOC.	2	IH 35 SB	LA SALLE	528.00
	6	18	36	18	10	37	1,192.22	1	LOC.	2	IH 35 SB	LA SALLE	290.00
	6	12	24	12	10	25	4,811.11	1	LOC.	2	IH 35 SB	LA SALLE	1732.00
SEE NOTE 9	6	12	24	12	10	25	333.33	1	LOC.	2	IH 35 SB - 221420001708146	LA SALLE	120.00
SEE NOTE 8	6	12	24	12	10	25	3,875.00	1	LOC.	2	IH 35 SB	LA SALLE	1395.00
	6	18	36	18	10	37	1,196.33	1	LOC.	2	IH 35 SB	LA SALLE	291.00
	6	12	25	13	10	26	990.89	1	LOC.	2	IH 35 SB	LA SALLE	343.00
	6	12	24	12	10	25	48,986.11	1	LOC.	2	IH 35 SB	LA SALLE	17635.00
	2	14	14	0	6	22	2,688.89	#	LOC.	2	IH 35 SB - ENTRANCE RAMP MM 82	LA SALLE	1100.00
	2	14	14	0	6	22	806.67	#	LOC.	2	IH 35 SB - EXIT RAMP MM 77	LA SALLE	330.00
	2	14	14	0	6	22	928.89	#	LOC.	2	IH 35 SB - ENTRANCE RAMP MM 77	LA SALLE	380.00
TOTAL							129,395.56						44880.0

2. "TOTAL ROADWAY SURFACE (MILL & INLAY)" HAS BEEN ADJUSTED TO OMIT THE FOLLOWING AREAS:

SPAN BRIDGE(S)
- IH 35 SB - 221420001708143
- IH 35 SB - 221420001708146

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IH 35, etc.

TYPICAL SECTIONS

SHEET 2 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		10

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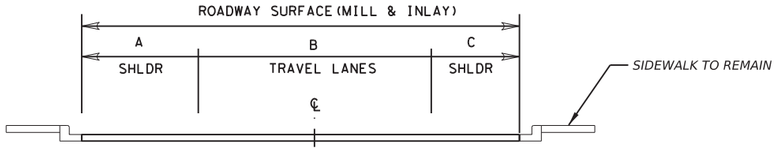

TYPICAL SECTION No. 2

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL& INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
4	12	24	12	4	32	8,896.00	2	LOC.	3	FM 790 NB/SB	DIMMIT	2502.00
2.5	12	24	12	2.5	29	7,507.78	2	LOC.	3	FM 790 NB/SB	DIMMIT	2330.00
4	12	24	12	4	32	9,742.22	2	LOC.	3	FM 790 NB/SB	DIMMIT	2740.00
2.5	12	24	12	4	30.5	893.04	2	LOC.	3	FM 790 NB/SB	DIMMIT	263.52
TOTAL						27,039.00						7835.52

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4. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR MORE INFORMATION ON ROADWAY AREAS TO BE WORKED WITHIN THE PROJECT LIMITS.
5. REFER TO "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.

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TYPICAL SECTIONS

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		11

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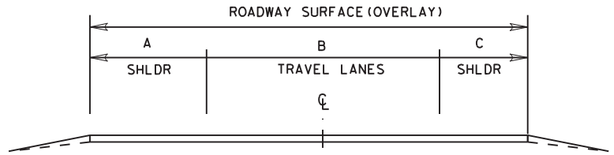
6. REFER TO "RS(1)-23" STANDARD SHEET(S) FOR MORE INFORMATION ON EDGELINE RUMBLE STRIPS.



TYPICAL SECTION No. 3

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (OVERLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
2	24	36	12	2	40	1,257.78	3	LOC.	4	SL 517 WB/EB	DIMMIT	283.00
7	12	24	12	7	38	57,489.78	3	LOC.	4	SL 517 WB/EB	DIMMIT	13616.00
2	12	36	24	2	40	1,445.87	3	LOC.	4	SL 517 WB/EB	DIMMIT	325.32
10	32	64	32	10	84	3,266.67	3	LOC.	4	Additional Segment Intersection SL 517/US 83	DIMMIT	350.00
TOTAL						63,461.00						14224.32

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TYPICAL SECTIONS

SHEET 4 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		12

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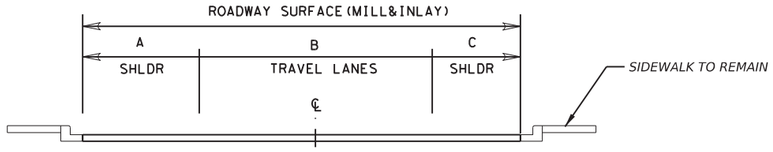

TYPICAL SECTION No. 2

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
0	30	60	30	0	60	21,894.40	2	LOC.	5	SL 155 EB & WB	ZAVALA	3284.16
TOTAL						21,894.40						3284.16

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH
LT	LT	TOTA	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
0	30	60	30	0	60	17,142.40	2	LOC.	11	FM 582	ZAVALA	2571.36
TOTAL						17,142.40						2571.4

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TYPICAL SECTIONS

SHEET 5 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		13

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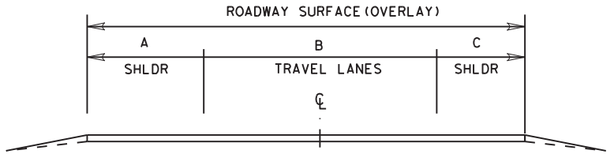

TYPICAL SECTION No. 3

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (OVERLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
10	24	36	12	10	56	3,216.89	3	LOC.	6	US 57 NB/SB	MAVERICK	517.00
10	18	30	12	10	50	4,133.33	3	LOC.	6	US 57 NB/SB	MAVERICK	744.00
10	12	24	12	10	44	3,275.56	3	LOC.	6	US 57 NB/SB	MAVERICK	670.00
10	18	30	12	10	50	2,816.67	3	LOC.	6	US 57 NB/SB	MAVERICK	507.00
10	24	36	12	10	56	51,003.56	3	LOC.	6	US 57 NB/SB	MAVERICK	8197.00
10	18	30	12	10	50	3,133.33	3	LOC.	6	US 57 NB/SB	MAVERICK	564.00
10	12	24	12	10	44	7,333.33	3	LOC.	6	US 57 NB/SB	MAVERICK	1500.00
10	18	36	18	10	56	3,733.33	3	LOC.	6	US 57 NB/SB	MAVERICK	600.00
10	31	62	31	10	82	3,516.89	3	LOC.	6	US 57 NB/SB	MAVERICK	386.00
10	36	60	24	10	80	3,822.22	3	LOC.	6	US 57 NB/SB	MAVERICK	430.00
10	31	62	31	10	82	7,653.33	3	LOC.	6	US 57 NB/SB	MAVERICK	840.00
10	24	48	24	10	68	88,507.89	3	LOC.	6	US 57 NB/SB	MAVERICK	11714.28
TOTAL						182,146.34						26669.28

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6. REFER TO "RS(1)-23" STANDARD SHEET(S) FOR MORE INFORMATION ON EDGELINE RUMBLE STRIPS.

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TYPICAL SECTIONS

SHEET 6 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		14

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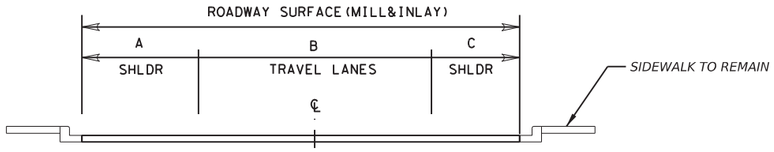

TYPICAL SECTION No. 2

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
0	17.5	35	17.5	0	35	18,623.73	2	LOC.	7	US 277 BU WB/EB	MAVERICK	4788.96
TOTAL						18,623.73						4788.96

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TYPICAL SECTIONS

SHEET 7 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		15

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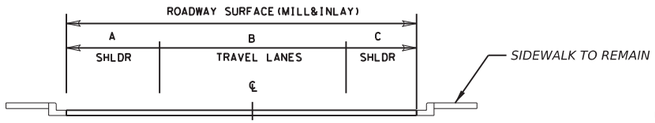

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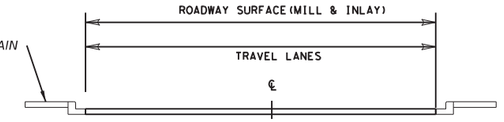

TYPICAL SECTION No. 2A

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
CONCRETE SURFACE TO REMAIN							2	LOC.	8	IH 35 East Frontage Rd.	Webb	35.00
0	18	36	18	0	36	9,668.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	2417.00
0	21	39	18	0	39	1,547.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	357.00
0	18	36	18	0	36	5,140.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	1285.00
0	30	48	18	0	48	3,114.67	2	LOC.	8	IH 35 East Frontage Rd.	Webb	584.00
0	18	36	18	0	36	424.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	106.00
0	21	39	18	0	39	1,369.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	316.00
0	18	36	18	0	36	4,320.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	1080.00
0	12	24	12	0	24	1,642.67	2	LOC.	8	IH 35 East Frontage Rd.	Webb	616.00
0	30	54	24	0	54	2,496.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	416.00
CONCRETE SURFACE TO REMAIN							2	LOC.	8	IH 35 East Frontage Rd.	Webb	240.00
0	21	39	18	0	39	1,928.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	445.00
0	18	36	18	0	36	9,292.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	2323.00
0	12	24	12	0	24	1,312.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	492.00
0	18	36	18	0	36	3,028.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	757.00
0	30	54	24	0	54	1,056.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	176.00
0	30	60	30	0	60	2,053.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	308.00
CONCRETE SURFACE TO REMAIN							2	LOC.	8	IH 35 East Frontage Rd.	Webb	297.00
0	21	39	18	0	39	619.67	2	LOC.	8	IH 35 East Frontage Rd.	Webb	143.00
0	18	36	18	0	36	10,816.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	2704.00
0	24	36	12	0	36	2,500.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	625.00
0	12	24	12	0	24	517.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	194.00
0	18	36	18	0	36	1,152.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	288.00
0	24	42	18	0	42	406.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	87.00
CONCRETE SURFACE TO REMAIN							2	LOC.	8	IH 35 East Frontage Rd.	Webb	388.00
0	18	36	18	0	36	7,248.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	1812.00
0	15	27	12	0	27	1,485.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	495.00
0	12	24	12	0	24	1,298.67	2	LOC.	8	IH 35 East Frontage Rd.	Webb	487.00
0	18	36	18	0	36	1,068.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	267.00
0	30	60	30	0	60	1,953.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	293.00
CONCRETE SURFACE TO REMAIN							2	LOC.	8	IH 35 East Frontage Rd.	Webb	356.00
0	24	48	24	0	48	885.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	166.00
0	21	42	21	0	42	1,428.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	306.00
0	18	36	18	0	36	5,420.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	1355.00
0	15	27	12	0	27	1,185.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	395.00
0	18	36	18	0	36	18,556.00	2	LOC.	8	IH 35 East Frontage Rd.	Webb	4639.00
0	24	42	18	0	42	1,656.67	2	LOC.	8	IH 35 East Frontage Rd.	Webb	355.00
0	30	60	30	0	60	933.33	2	LOC.	8	IH 35 East Frontage Rd.	Webb	140.00
0	18	36	18	0	36	6,573.92	2	LOC.	8	IH 35 East Frontage Rd.	Webb	1643.48
* UNDERPASS 1, 2, 3, 5, 6 & 10						8,681.00	2A	LOC.	8	IH 35 East Frontage Rd. Underpass locations	Webb	1148.00
2	0	14	14	6	22	11,366.67	#	LOC.	8	IH 35 East Frontage Rd. Entrance & Exit Ramps	Webb	4650.00
* TURNAROUNDS 1-12						6,579.00	2A	LOC.	8	IH 35 East Frontage Rd. Turnaround locations	Webb	3005.00
TOTAL						140,720.25						29388.48

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4. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR MORE INFORMATION ON ROADWAY AREAS TO BE WORKED WITHIN THE PROJECT LIMITS.
5. REFER TO "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.
6. "#" SEE ROADWAY MISCELLANEOUS DETAILS (RAMP OVERLAY DETAIL) FOR RAMP TYPICAL SECTIONS. LENGTH SHOWN ARE FOR CONTRACTORS INFORMATION AND ARE EXCLUDED FROM THE TOTAL APPROXIMATE ROADWAY LENGTH.
7. "*" ALL APPLICABLE LOCATIONS SURFACE AREAS FOR THE PROPOSSED WORK HAVE BEEN INCLUDED IN THE TOTAL SURFACE AREA. REFER TO "DIAGRAMATRIC SHEETS" FOR MORE INFORMATION.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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Texas Department of Transportation

IH 35, etc.

TYPICAL SECTIONS

SHEET 8 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		16

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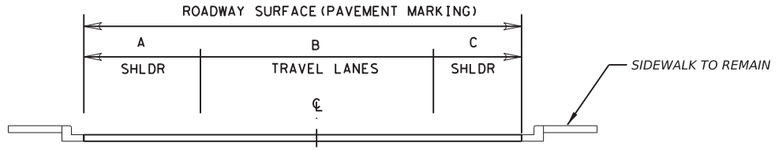
1. REFER TO "PAVEMENT MARKING LAYOUTS" FOR PROPOSED STRIPING CONFIGURATION.



TYPICAL SECTION No. 2

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	SURFACE AREA	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
CONCRETE ROADWAY AREA TO REMAIN							2	LOC.	9	SS 259 (NB & SB)	WEBB	1821.60
TOTAL						0						1821.6

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TYPICAL SECTIONS

SHEET 9 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		17

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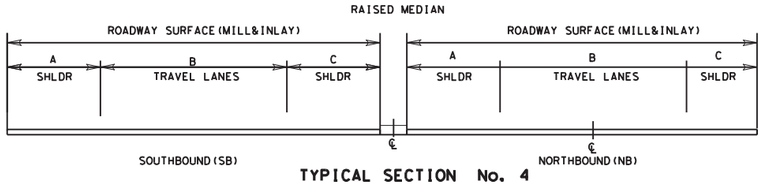
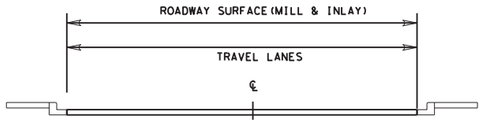


TYPICAL SECTION No. 4

DIVIDED HIGHWAY



TYPICAL SECTION No. 2A

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)
A	B			C		
LT	LT	TOTAL	RT	RT		
FT	FT	FT	FT	FT	FT	SY
4	12	24	12	16	44	4,644
CONCRETE SURFACE TO REMAIN						
CONCRETE SURFACE TO REMAIN						
4	12	24	12	16	44	4,776
CONCRETE SURFACE TO REMAIN						
4	12	24	12	16	44	6,918
CONCRETE SURFACE TO REMAIN						
0	24	48	24	4	52	2,109
0	12	36	24	16	52	1,889
0	12	36	24	4	40	10,187
0	12	25	13	1	26	4,894
2	12	24	12	10	36	1,184
0	12	25	13	1	26	488
2	12	36	24	4	42	7,392
2	12	24	12	16	42	1,848
2	14	26	12	10	38	3,120
4	12	24	12	0	28	2,862
4	12	25	13	0	29	445
1	24	36	12	0	37	7,754
0	12	24	12	0	24	1,115
0	12	24	12	10	34	5,693
0	12	25	13	4	29	3,651
2	12	24	12	0	26	3,527
2	18	36	18	0	38	583
0	24	48	24	0	48	1,269
1	27	54	27	0	55	9,381
2	12	24	12	0	26	7,245
2	18	36	18	0	38	714
0	24	48	24	0	48	1,504
2	12	25	13	0	27	3,888
0	13	25	12	0	25	3,953
CONCRETE SURFACE TO REMAIN						
4	12	24	12	10	38	2,246
0	12	24	12	10	34	6,452
0	12	24	12	0	24	2,131
10	12	24	12	0	34	1,530
10	17	29	12	0	39	702
6	26	38	12	10	54	1,818
6	12	24	12	0	30	7,350
0	12	24	12	10	34	9,174
2	14	20	6	10	32	2,347
TURNAROUNDS 1,3,5,7,8						4,196
TOTAL SURFACE AREA SOUTHBOUND						140,978

DESCRIPTION					
TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
4	LOC.	10	Additional Roadway Segment SL 20 SB	WEBB	950.0
4	LOC.	10	Additional Roadway Segment SL 20 SB - 222400008601178	WEBB	550.00
4	LOC.	10	SL 20 SB - 222400008601178	WEBB	525.00
4	LOC.	10	SL 20 SB	WEBB	977.00
4	LOC.	10	SL 20 SB -222400008616185	WEBB	60.00
4	LOC.	10	SL 20 SB	WEBB	1415.00
4	LOC.	10	SL 20 SB - 222400008616187	WEBB	1364.00
4	LOC.	10	SL 20 SB	WEBB	365.00
4	LOC.	10	SL 20 SB	WEBB	327.00
4	LOC.	10	SL 20 SB	WEBB	2292.00
4	LOC.	10	SL 20 SB	WEBB	1694.00
4	LOC.	10	SL 20 SB	WEBB	296.00
4	LOC.	10	SL 20 SB	WEBB	169.00
4	LOC.	10	SL 20 SB	WEBB	1584.00
4	LOC.	10	SL 20 SB	WEBB	396.00
4	LOC.	10	SL 20 SB	WEBB	739.00
4	LOC.	10	SL 20 SB	WEBB	920.00
4	LOC.	10	SL 20 SB	WEBB	138.00
4	LOC.	10	SL 20 SB	WEBB	1886.00
4	LOC.	10	SL 20 SB	WEBB	418.00
4	LOC.	10	SL 20 SB	WEBB	1507.00
4	LOC.	10	SL 20 SB	WEBB	1133.00
4	LOC.	10	SL 20 SB	WEBB	1221.00
4	LOC.	10	SL 20 SB	WEBB	138.00
4	LOC.	10	SL 20 SB	WEBB	238.00
4	LOC.	10	SL 20 SB	WEBB	1535.00
4	LOC.	10	SL 20 SB	WEBB	2508.00
4	LOC.	10	SL 20 SB	WEBB	169.00
4	LOC.	10	SL 20 SB	WEBB	282.00
4	LOC.	10	SL 20 SB	WEBB	1296.00
4	LOC.	10	SL 20 SB	WEBB	1423.00
4	LOC.	10	SL 20 SB -222400008616186	WEBB	896.00
4	LOC.	10	SL 20 SB	WEBB	532.00
4	LOC.	10	SL 20 SB	WEBB	1708.00
4	LOC.	10	SL 20 SB	WEBB	799.00
4	LOC.	10	SL 20 SB	WEBB	405.00
4	LOC.	10	SL 20 SB	WEBB	162.00
4	LOC.	10	SL 20 SB	WEBB	303.00
4	LOC.	10	SL 20 SB	WEBB	2205.00
4	LOC.	10	SL 20 SB	WEBB	3914.28
#	LOC.	10	SL 20 SB - Entrance Ramp	WEBB	660.00
2A	LOC.	10	SL 20 SB - Turnarounds	WEBB	2178.00
TOTAL SOUTHBOUND					37939.28

1. REFER TO "RATES OF APPLICATION" SHEET FOR PAVEMENT DESIGN.

2. "TOTAL MILL & INLAY ROADWAY SURFACE" HAS BEEN ADJUSTED TO OMIT THE FOLLOWING AREAS:

SPAN BRIDGES(S)
- SL 20 SB - 222400008601178
- SL 20 SB - 222400008616185
- SL 20 SB - 222400008616187
- SL 20 SB -222400008616186

3. MAINTAIN EXISTING CROSS SLOPES AND RESPECTIVE PGL THROUGHOUT THE PROJECT(S).

4. DRIVEWAYS AND CONCRETE PAVEMENTS WILL NOT BE PLANE/OVERLAID ON THIS PROJECT.

5. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR MORE INFORMATION ON ROADWAY AREAS TO BE WORKED WITHIN THE PROJECT LIMITS.

6. REFER TO "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.

7. "#" SEE ROADWAY MISCELLANEOUS DETAILS (RAMP OVERLAY DETAIL) FOR RAMP TYPICAL SECTIONS. LENGTH SHOWN ARE FOR CONTRACTORS INFORMATION AND ARE EXCLUDED FROM THE TOTAL APPROXIMATE ROADWAY LENGTH.

STATE OF TEXAS
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Texas Department of Transportation

IH 35, etc.

TYPICAL SECTIONS

SHEET 10 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		18

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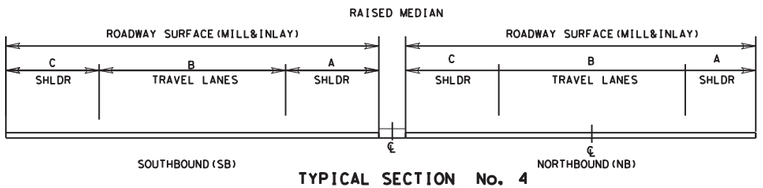
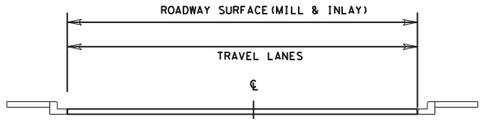


TYPICAL SECTION No. 4

DIVIDED HIGHWAY



TYPICAL SECTION No. 2A

SHLDR WIDTH	ROADWAY WIDTH (TRAVEL LANES)			SHLDR WIDTH	SURFACE WIDTH	ROADWAY SURFACE (MILL & INLAY)	DESCRIPTION					
A	B			C			TYPICAL SECTION	LOCATION NUMBER		HIGHWAY	COUNTY	APPROX. ROADWAY LENGTH (FT)
LT	LT	TOTAL	RT	RT								
FT	FT	FT	FT	FT	FT	SY						
0	12	24	12	16	40	15,222	4	LOC.	10	SL 20 NB	WEBB	3425.00
0	12	24	12	10	34	2,539	4	LOC.	10	SL 20 NB	WEBB	672.00
4	12	24	12	0	28	1,758	4	LOC.	10	SL 20 NB	WEBB	565.00
0	18	30	12	0	30	397	4	LOC.	10	SL 20 NB	WEBB	119.00
0	13	25	12	0	25	4,917	4	LOC.	10	SL 20 NB	WEBB	1770.00
0	12	24	12	8	32	1,767	4	LOC.	10	SL 20 NB	WEBB	497.00
0	12	24	12	10	34	1,296	4	LOC.	10	SL 20 NB	WEBB	343.00
0	12	24	12	8	32	1,685	4	LOC.	10	SL 20 NB	WEBB	474.00
0	12	24	12	10	34	6,146	4	LOC.	10	SL 20 NB	WEBB	1627.00
CONCRETE SURFACE TO REMAIN							4	LOC.	10	SL 20 NB -222400008616190	WEBB	896.00
6	12	24	12	8	38	1,182	4	LOC.	10	SL 20 NB	WEBB	280.00
0	12	24	12	0	24	1,512	4	LOC.	10	SL 20 NB	WEBB	567.00
2	12	24	12	0	26	2,779	4	LOC.	10	SL 20 NB	WEBB	962.00
4	18	30	12	0	34	1,723	4	LOC.	10	SL 20 NB	WEBB	456.00
0	13	25	12	0	25	3,189	4	LOC.	10	SL 20 NB	WEBB	1148.00
4	17	29	12	0	33	1,844	4	LOC.	10	SL 20 NB	WEBB	503.00
2	12	24	12	0	26	6,988	4	LOC.	10	SL 20 NB	WEBB	2419.00
4	18	30	12	0	34	1,575	4	LOC.	10	SL 20 NB	WEBB	417.00
0	13	25	12	0	25	3,172	4	LOC.	10	SL 20 NB	WEBB	1142.00
4	19	31	12	0	35	883	4	LOC.	10	SL 20 NB	WEBB	227.00
4	12	24	12	0	28	395	4	LOC.	10	SL 20 NB	WEBB	127.00
4	12	24	12	10	38	2,006	4	LOC.	10	SL 20 NB	WEBB	475.00
0	12	24	12	10	34	10,045	4	LOC.	10	SL 20 NB	WEBB	2659.00
0	12	24	12	0	24	2,403	4	LOC.	10	SL 20 NB	WEBB	901.00
0	18	36	18	0	36	784	4	LOC.	10	SL 20 NB	WEBB	196.00
0	24	48	24	0	48	2,475	4	LOC.	10	SL 20 NB	WEBB	464.00
0	12	24	12	10	34	7,080	4	LOC.	10	SL 20 NB	WEBB	1874.00
0	12	36	24	0	36	12,160	4	LOC.	10	SL 20 NB	WEBB	3040.00
0	12	24	12	10	34	1,296	4	LOC.	10	SL 20 NB	WEBB	343.00
0	12	36	24	0	36	10,400	4	LOC.	10	SL 20 NB	WEBB	2600.00
0	12	24	12	10	34	2,229	4	LOC.	10	SL 20 NB	WEBB	590.00
0	12	30	18	0	30	1,310	4	LOC.	10	SL 20 NB	WEBB	393.00
0	12	36	24	4	40	2,773	4	LOC.	10	SL 20 NB	WEBB	624.00
CONCRETE SURFACE TO REMAIN							4	LOC.	10	SL 20 NB -222400008616188	WEBB	1364.00
2	12	24	12	16	42	6,669	4	LOC.	10	SL 20 NB	WEBB	1429.00
CONCRETE SURFACE TO REMAIN							4	LOC.	10	SL 20 NB -222400008616185	WEBB	60.00
4	12	24	12	16	44	5,164	4	LOC.	10	SL 20 NB	WEBB	1056.28
CONCRETE SURFACE TO REMAIN							4	LOC.	10	SL 20 NB -222400008601178	WEBB	525.00
CONCRETE SURFACE TO REMAIN							4	LOC.	10	Additional Roadway Segment SL 20 NB -222400008601178	WEBB	550.00
4	12	24	12	16	44	4644	4	LOC.	10	Additional Roadway Segment SL 20 NB	WEBB	950.00
2	0	14	14	4	20	2,378	#	LOC.	10	SL 20 NB - Exit Ramp	WEBB	1070.00
TURNAROUND 2,4,6,9						3,755	2A	LOC.	10	SL 20 NB - Turnarounds	WEBB	2610.00
TOTAL NORTHBOUND SURFACE AREA						138,539	TOTAL NORTHBOUND					37229.28
TOTAL NORTHBOUND & SOUTHBOUND SURFACE AREA						279,517						

1. REFER TO "RATES OF APPLICATION" SHEET FOR PAVEMENT DESIGN.
2. " TOTAL MILL & INLAY ROADWAY SURFACE" HAS BEEN ADJUSTED TO OMIT THE FOLLOWING AREAS:

SPAN BRIDGE(S)
- SL 20 NB -222400008616190
- SL 20 NB -222400008616188
- SL 20 NB -222400008616185
- SL 20 NB -222400008601178

3. MAINTAIN EXISTING CROSS SLOPES AND RESPECTIVE PGL THROUGHOUT THE PROJECT(S).
4. DRIVEWAYS AND CONCRETE PAVEMENTS WILL NOT BE PLANE/OVERLAID ON THIS PROJECT.
5. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR MORE INFORMATION ON ROADWAY AREAS TO BE WORKED WITHIN THE PROJECT LIMITS.
6. REFER TO "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.
7. "#" SEE ROADWAY MISCELLANEOUS DETAILS (RAMP OVERLAY DETAIL) FOR RAMP TYPICAL SECTIONS. LENGTH SHOWN ARE FOR CONTRACTORS INFORMATION AND ARE EXCLUDED FROM THE TOTAL APPROXIMATE ROADWAY LENGTH.

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Texas Department of Transportation

IH 35, etc.

TYPICAL SECTIONS

SHEET 11 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		19

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LOC. 1 - IH-35 (NBML) & LOC. 2 - IH 35 (SBML)

PAVEMENT DESIGN
MAINLANES & RAMPS: MILL & INLAY: 5" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 3" STONE-MATRIX-ASPHALT (SMA Ty-C PG76-22 SAC-A) - 115 LBS/SY/IN ⚠ BONDING COURSE SHOULDERS: # FOG SEAL - .10 GAL/SY BRIDGES: MICRO MILL & INLAY: 1.5" STONE-MATRIX-ASPHALT (SMA Ty-D PG76-22 SAC-A) - 110 LBS/SY/IN

LOC. 3 -FM 790 NB & SB

PAVEMENT DESIGN
MILL & INLAY: 5" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 2.5" DENSE GRADED HMA (DG HMA Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE

LOC. 4 - SL 517 NB & SB & INTERSECTION SL 517/US 83

PAVEMENT DESIGN
OVERLAY: 4" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 2" DENSE GRADED HMA (DG HMA Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE

LOC. 5 - SL 155 EB & WB

PAVEMENT DESIGN
MILL & INLAY: 4" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 3" DENSE GRADED HMA (DG HMA Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE

LOC. 6 - US 57 NB & SB

PAVEMENT DESIGN
OVERLAY: 5" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 2" DENSE GRADED HMA (DG HMA Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE LEVEL UP: (D-GR HMA Ty-D PG70-22(LEVEL UP)

LOC. 7- BU 277N WB & EB

PAVEMENT DESIGN
MILL & INLAY: 4" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 2" DENSE GRADED HMA (DG HMA Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE

LOC. 8- IH 35 EFR

PAVEMENT DESIGN
MILL & INLAY: 4" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B) 3" SUPER PAVEMENT (SP Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE RAMP(S) 8" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-B PG70-22 SAC-B)

LOC. 10- SL 20 NB & SB & ADDITIONAL ROADWAY SEGMENT

PAVEMENT DESIGN
MILL & INLAY: 3" FLEXIBLE PAVEMENT STRUCTURE REPAIR (DG HMA Ty-C PG70-22 SAC-B)(NO RAP) 2.5" STONE MATRIX ASPHALT (SMA Ty-C PG76-22 SAC-A)- 115 -LBS/SY/IN ⚠ BONDING COURSE

LOC. 11- FM 582

PAVEMENT DESIGN
MILL & INLAY: 2" DENSE GRADED HMA (DG HMA Ty-C PG76-22 SAC-A) - 115 -LBS/SY/IN ⚠ BONDING COURSE

NOTES:

-REFERENCE ALL EXISTING STRIPING AND PAVEMENT MARKINGS IN A MANNER WHICH ALLOWS THE MARKINGS TO BE RE-ESTABLISHED. NEW STRIPING SHALL BE IN ACCORDANCE WITH MOST UPDATED TXDOT STANDARDS. PLACE EXTRA REFERENCE (IF NEEDED) TO ENSURE THAT THE MARKINGS (LANE LINES, EDGE LINES, ETC.) ARE IN LINE WITH SIGNS ON OSB'S, TMS ARROWS, ETC.

-MAINTAIN EXISTING SLOPES AND PGL THROUGHOUT THE PROJECT.

-DRIVEWAYS WILL NOT BE MILLED/OVERLAY.

-APPLICATION RATES NOTED IN THE PLANS ARE FOR BIDDING AND ESTIMATION PURPOSES ONLY. ACTUAL APPLICATION RATES WILL BE DETERMINED AND ADJUSTED AS NECESSARY.

-"⚠" REFER TO GENERAL NOTES ITEM 3084 FOR MORE INFORMATION.

-REFER TO "DIAGRAMMATIC LAYOUT" SHEET FOR RAMP LOCATIONS.

-"#"REFER TO GENERAL NOTES ITEM 315 FOR MORE INFORMATION

STATE OF TEXAS
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12/22/2023

Texas Department of Transportation

IH 35, etc.

RATES OF APPLICATION

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		20

DATE: 12/19/2023 2:10:36 PM
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GENERAL NOTES:

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

Cynthia Garcia – Cynthia.Garcia@txdot.gov

Angel Martinez – Angel.Martinez@txdot.gov

Questions may 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 webpage for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

Item 5 - Control of the Work

The Contractor shall maintain and preserve the integrity of all “existing survey markers” by avoiding the disturbance of such markers, which include all control points (horizontal and/or vertical), stakes, marks, and right-of-way markers. The Department will repair all Contractor disturbed control points, stakes, marks, and right-of-way markers. The cost for any and all repairs to the “existing survey markers” will be deducted from money due or to become due to the Contractor.

Reference all existing striping and pavement markings in a manner which allow the markings to be re-established. Place extra reference (if needed) to ensure that the markings (lane lines, edge lines, ramp gores, etc.) are in-line with signs on OSB’s, TMS arrows, etc.

Contact the Laredo District Signal Section (956-712-7770) for coordination with TxDOT underground lines and/or facilities.

Place temporary asphalt around the manholes and/or valves to provide a minimum of 50:1 taper when manholes and/or valves are exposed to traffic. The cost of the elevation adjustment and asphalt tapers will not be paid for directly, but will be subsidiary to the price bid for other manhole and/or valve work.

Prior to construction must call 811 to verify any utilities located within project limits. Contractor will also coordinate with utility owners listed below for any adjustments needed to sanitary sewer manholes, water valves, gas valve, telecommunication, television manhole located within project limits. The utility company is responsible for any adjustment when necessary. The work should be performed in a manner as to not delay construction contractor work activity.

Item 7 - Legal Relations and Responsibilities

No significant traffic generator events identified.

Jurisdictional Waters of the United States and Project Specific Locations (PSL) Coordination - This project requires permit(s) with environmental resource agencies. There is a high probability that environmentally sensitive areas will be encountered on contractor designated project specific locations (PSLS) for the project (including but not limited to haul roads, equipment staging areas, parking areas, etc.).
Requirements for Work within Jurisdictional Waters of the United States:
The department has been authorized to perform work within designated areas of the project under U.S. Army Corps of Engineers (USACE) nationwide permit (NWP) #14 and/or #3a and/or #3b.

The contractor will not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area (i.e. an area where the USACE has jurisdiction) that has not been previously evaluated by the USACE as part of the permitting for this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here includes materials delivered to or from the PSL. The permit area includes all waters of the U.S. and their associated wetlands affected by activities associated with this project. Special restrictions may be required for such work in these USACE jurisdictional areas. The contractor will be responsible for any and all consultations with the USACE regarding activities, including PSLs, which have not been previously evaluated by the USACE. The

Contractor will provide the department with a copy of all consultation(s) or approval(s) from the USACE prior to initiating activities.

The contractor may proceed with activities in PSLs that do not affect a USACE permit area if a self-determination has been made that the PSL is non-jurisdictional or proper USACE clearances have been obtained in jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. The contractor is solely responsible for documenting any determination(s) that their activities do not affect a USACE permit area. The contractor will maintain copies of their determination(s) for review by the department and/or any regulatory agency.

The disturbed area for all project locations in the Contract, and the Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges.

The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, the Contractor shall provide a copy of the Contractor Notice of Intent (NOI) for the PSLs to the Engineer and to the local government operating a municipal separate storm sewer system (MS4) if applicable. If the total area of project disturbed areas and PSLs total between 1-acre but less than 5-acres, the Contractor shall post the appropriate Contractor Construction Site Notice for all Contractor PSLs to be in compliance with TCEQ storm water regulations.

In order to expedite the approval process for PSLs or to eliminate or minimize potential impacts to project progress, initiate coordination efforts with the U.S.A.C.E. within 30 days from the date of “authorization to begin work” for all PSLs that are in areas where the USACE has jurisdiction (i.e. USACE permit areas). If this is not done, the contractor waives the right to request any contract time considerations if project progress is impacted and PSL’S approval is still pending.

Requests submitted to the area engineer will be evaluated on this basis and will require documentation showing substantial early coordination efforts to expedite the approval process as herein stated. The request will include a detailed chronological summary status with dates of coordination activities with the resource agencies, including those occurring after the initial coordination, to be reviewed and confirmed by the district’s environmental section.

For PSLs that fall within USACE permit areas, the Contractor must document and coordinate with the USACE, if required, before any excavation hauled from or embankment hauled into a USACE permit area by either (1) or (2) below.

1. Restricted Use of Materials for Previously Evaluated Permit Areas. The Contractor will document both the project specific location (PSL) and their authorization, and the Contractor will maintain copies for review by the Department and/or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project, then:
   a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or
   b. temporary fill (Item 132, Embankment) within a USACE permit area may be restricted.
   c. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area may be restricted; and,
   d. Unsuitable excavation or excess excavation [“Waste”] (Item 110) that is disposed of at an approved location within a USACE evaluated area may be restricted.

2. Contractor Materials from Areas Other than Previously Evaluated Areas. The Contractor will provide the Department with a copy of all USACE coordination or approvals before initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off-right-of-way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites, including:
   a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area; and,
   b. Unsuitable excavation or excess excavation [“Waste”] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

Storm Water Regulations Requirements:
The Contractor shall be responsible for (off ROW) PSLs applicable to the TCEQ Construction General Permit (CGP) requirements and will notify the Engineer of the disturbed acreage within one (1) mile of the project limits. The Contractor shall obtain any required authorization form the TCEQ for any Contractor PSLs for construction support activities on or off ROW.

The total disturbed areas within the ROW are anticipated at less than one (1) acre and/or this project is classified as “surface work” consisting of an asphalt overlay of an existing roadway without shoulder-up disturbances. Due to this type of construction, the project qualifies for exclusion under the *Construction General Permit* (CGP) issued by the Texas Commission on Environmental Quality (TCEQ) on March 5, 2018 and amended on January 28, 2022. However, should the sum of the Engineer’s anticipated disturbances and all of the Contractor’s (On ROW and off ROW) PSLs equal or exceed the one (1) acre threshold, both TxDOT and the Contractor shall have project responsibilities under the CGP that reverts to non-exclusion status. To ensure project compliance with all applicable water quality regulations, the Contractor shall obtain Engineer approval for all non-depicted areas of disturbance that increases the Engineer’s initial soil and vegetation disturbed area estimates before associated work operations start.

Item 8 - Prosecution and Progress

Before starting work, provide a sequence of work and estimated progress schedule meeting the requirements of Section 8.5.2, “Progress Schedule.”

No closures will be allowed on the weekends which include the following holidays: January 1, the last Monday in May, July 4, the first Monday in September, the fourth Thursday in November, December 25 and Easter weekend.

Nighttime work will be allowed to be performed, as approved and directed by the Engineer. Refer to the Sequence of Work, Traffic Control Plan, etc. shown in the plans, for other details.

Perform work at night, with traffic control set up no earlier than **9:00 P.M.** and all work completed, and traffic control removed by **6:00 A.M.,** when work is required on the following highways:

Highway	From	To
FM 790	**US 277**	**US 83**
BU 277 N	**US 57/BU 277 INT**	**N CEYLON ST**
IH 35	**SCOTT ST (EFR)**	**0.222 MI. NORTH OF SHILOH RD**
SS 259	**SH 359**	**SL 20**
SL 20	**SH 359**	**MANGANA HEIN RD.**

Equipment and material may be pre-staged at approved locations.

Item 9 - Measurement and Payment

Coordinate and provide off-duty law enforcement officers with officially marked vehicles (if patrol cruisers are available from the enforcement agency involved) during the following operations: transitioning to a new sequence of construction, traffic signal upgrades, lane closures, *and/or* during a one-way traffic control situation. For payment through TxDOT state force account method, complete the weekly tracking forms provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Submit Material on hand (MOH) payment requests at least _5_ working days prior to the end of the month for payment on that month’s estimate. For out-of-town MOH submit requests at least 10 working days prior to the end of the month.

Item 315 - Fog Seal

Use _____40_____% of total volume, emulsified asphalt in the mixture.

Item 320 – Equipment for Hot Mix Asphalt Materials

For staged construction, all longitudinal ACP joints shall be constructed with a 3:1 to 6:1 taper. For placement of 2 inches or more, the device will provide a maximum ½ inch vertical edge. Outside edges (next to the grass/earth) will also have a taper or will be backfilled the same day.

Final Surface course: all longitudinal ACP joints for the final Hot Mix surface course shall be in widths equal to travel lane widths so that all final course ACP joints will match the proposed lane striping (pavement markings), unless otherwise directed by the engineer.

Item 351 - Flexible Pavement Structure Repair

The section of roadway where the repair is to be made will be the entire width of the lane and a minimum length of 50 feet, unless otherwise directed by the Engineer.

Item 354 - Planing and Texturing Pavement

Contractor to retain ownership of planed materials for location in Webb and Dimmit.

The contractor will not be allowed to remove all existing asphalt from (edge of pavement to edge of pavement) when TCP requires to be done in phases.

The contractor will be responsible for verifying the existing asphalt depth at the bridge before beginning planing operations. The contractor will be responsible for any needed repairs to the armor joint(s) and/or deck(s) as a result of the planing operations. The repairs will be conducted to the satisfaction of the Engineer. The Contractor will be responsible for all costs incurred for the repairs, including but not limited to materials, labor, equipment, and pertinent incidentals.

Stockpile salvaged materials from the highways mentioned below at the following stockpile locations:

Highway	From	To	Stockpile Location
BU 277 N	US 57/BU 277 INT	N CEYLON ST	INT. 57/481
SL 155	US 83	FM 65	INT. FM 393/US 83
FM 582	FM 65	FM 1433	INT. FM 393/US 83
IH 35	WEBB COUNTY LINE	4.885 MI NORTH OF WEBB COUNTY	28.052367, -99.350995
IH 35	8.5 MI SOUTH OF FRIO CL	LASALLE/ FRIO CL	-28.577814, -99.196567

Item 420 - Concrete Substructures

Sulfate resistant concrete shall be used in all situations for concrete structures in contact with the natural ground.

Item 421 - Hydraulic Cement Concrete

Sulfate resistant cement concrete shall be used in all situations for structural elements in contact with the natural ground. These includes, but is not limited to, all reinforced concrete pipe, concrete box culverts, drill shafts, bridge columns, bridge abutments, wingwalls, approach slabs, inlets, manholes, junction boxes, ground boxes and all concrete riprap.

Air entrainment is not required. If concrete is supplied with air entrainment, the concrete must adhere to the requirements of item 421.4.2.4.

Item 432 - Riprap

Provide Class B Concrete for riprap.

Item 438 – Cleaning and Sealing Joints and Cracks

The contractor will advise the Engineer of any loose or damaged seal joint areas Not noted in the plans. Upon approval from the Engineer, these areas will be Addressed and the Contractor compensated for such additional work.

After cleaning and sealing of joints, care will be taken to assure that the bent Caps and abutment seats are clean of all debris. Cleaning and removal of this Excess material will not be paid for directly but will be subsidiary to this item.

Class 3 – hot poured rubber sealant shall be used with ACP overlay.
Class 4 -low modulus silicone, nonsag shall be used on vertical faces on bridge Elements.
Class 7 -low modulus silicone, rapid curing, self-leveling shall be used without ACP overlay and existing armor joints.
Refer to the 2014 Standard Specification for additional information.

Item 500 - Mobilization

"Materials-on-Hand" payments will not be considered in determining percentages used to compute mobilization payments.

Item 502 - Barricades, Signs, and Traffic Handling

Designate, as the Contractor Responsible Person (CRP), an English-speaking employee on-call nights and weekends (or any other time that work is not in progress) with a local address and telephone number for maintenance of signs and barricades. This employee will be located within one (1) hour of traveling time to the project site. Notify the Engineer in writing of the name, address and

telephone number of this employee. Furnish this information to local law enforcement officials.
When advanced warning flashing arrow panel(s) is/are specified, maintain one standby unit in good condition at the job site ready for immediate use is required.

Traffic control required for this project will not be paid for directly, but will be considered subsidiary to the various bid items.

Provide two-way radios in areas where flagmen do not have visual contact with one another or cannot communicate with one another.

Limit lane closures to a maximum of 2 miles. If more than one lane closure location is desired, provide a minimum of a 2 mile passing zone between locations. Provide a separate sign set up for each location.

Ensure equipment not in use, stockpile aggregate, and other working materials are:
A minimum of 30 feet from the edge of the travel lane;
Do not obstruct traffic or sight distance;
Do not interfere with the access from abutting property; or
Do not interfere with roadway drainage.

Erect signs in locations not obstructing the traveling public's view of the normal roadway signing or necessary sight distance at intersections and curves.

During the holiday time frame of December 21st through January 1st, every effort should be taken to ensure that all travel lanes remain open where possible.

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

Item 506 - Temporary Erosion, Sedimentation, and Environmental Controls

Concrete washout area(s) shall be installed prior to concrete placement on site. The concrete washout area(s) shall be entirely self-contained. Location must be Approved by the Engineer. Concrete washout area(s) are subsidiary to pertinent Items.

Item 540 – Metal Beam Guard Fence

Install cast-in place concrete curb Type II in the metal beam guard fence transition (Thrie-Beam Transition). Pre-cast concrete curb will not be allowed.

Item 585 - Ride Quality for Pavement Surfaces

Use pay adjustment schedule 2

Item 644 - Small Roadside Sign Assemblies

Salvage and deliver all aluminum sign faces to the local TxDOT maintenance office.

Item 658 – Delineator and Object Marker Assemblies

Proposed delineators for this project will consist of oval shape tube flexible post with a quick release embedded anchor insert stub only, such as Flexstake Inc. – 650 series or Shur-Tite – SD series or equal flexible driveable delineators.

Provide and place delineator Type 1, 2, 3, 4, object markers/chevrons and large arrows signs project 4' or 7' above the pavement surface and not the ground line. (Provide adequate length for proper anchor and projection above ground line).

Item 666 – Reflectorized Pavement Markings

Reflectivity requirements for Type I will be as per Item 666.

Payment on Type I markings requiring retroreflective testing will be made at a 75% rate until passing test results are received.

Item 3076 - Dense-Graded Hot-Mix Asphalt

Use aggregate that meets the SAC-A, only for the final riding surface.

Apply the Bonding Course in accordance with Item 3084.

Substitute Binders (grade dumping) will not be allowed on the final riding surface.

Refer to item 585 for ride quality requirements.

The use of RAP or RAS will not be allowed on the final riding surface.

For Mill inlays sections:
Only mill what can be paved at the end of the workday.

RAP 20% is allowed for TY B mixes, but RAS will not be allowed. Substitute Binders in the intermediate layer (grade dumping) may be allowed when the surface HMA layer is placed not more than 6 months after the intermediate layer is complete or as approved by the engineer.

Item 3077 – Superpave Mixtures

Use aggregate that meets the SAC-A only for final riding surface.

Excess RAP will be retained by the contractor.

Apply the Bonding Course in accordance to item 3084.

Refer to item 585 for ride quality requirements.

For mill and inlay sections:
Only mill what can be paved by the end of the workday.

The use of RAP, RAS, and/or Substitute Binders will not be allowed on the final riding surface.

RAP 20% is allowed for Ty B mixes, but RAS will not be allowed. Substitute Binders in the intermediate layer (grade dumping) may be allowed when the surface HMA layer is placed not more than 6 months after the intermediate layer is complete or as approved by the Engineer.

Over lay requirements will only be for the final riding surface.

Mixture Property	Test Method	Surface Mixtures
Critical Fracture Energy (CFE), in.-lb/in.^{2}, Min	Tex-248-F[1]	1.0
Crack Progression Rate (CPR), Max		0.45

1. For JMF 2 and greater, Tex-250-F and the IDEAL CT correlation developed during the trial batch may be used to monitor cracking performance. If at any time the minimum correlation limit is not met, use Tex-248-F and the limits above to determine specification compliance.

Methylene Blue (AASHTO T 330.07) will be tested for informational purposes only.

- Asphalt content will be determined by nuclear gauge.

Item 3080 – Stone-Matrix Asphalt

Provide an asphalt binder PG 76-22. Substitution of the PG binder is not allowed.

Use aggregate that meets the SAC requirement of class A.

Apply the Bonding Course in accordance to Item 3084.

The use of RAP, RAS, and/or Substitute Binders will not be allowed on the final riding surface.

For mill and inlay sections:
Only mill what can be paved by the end of the workday.

Refer to Item 585 for ride quality requirements.

Item 3084 – Bonding Course

An average rate of 0.20 GAL/SY was used for estimation purposes. Contractor shall choose an option shown below and bid accordingly.

OPTIONS:

MATERIAL	MINIMUM TYPICAL APPLICATION RATE (GAL/SY)
TRAIL – Emulsified Asphalt	#
TRAIL – Hot Applied	#
Spray Applied Underseal Membrane	#

Typical Application Rate may vary from 0.07 to 0.20 GAL/SY depending on option.

Apply bonding course at every intermediate layer, unless otherwise directed. The type of tack coat must be approved by the Engineer.

The Engineer may adjust the application rates as per field conditions.

Shear Bond Strength Test will be performed for informational purposes, and will not be used for specification compliance. The target shear bond strength is a minimum of 40 psi and for final surface layer a minimum of 50 psi.

Item 6001 - Portable Changeable Message Sign

Provide Four (4) electronic portable changeable message signs as required by the Engineer. Provide backups and keep operational and available on the jobsite at all times during traffic control operations. The electronic portable changeable message signs will be made available for utilization for the entire duration of the project, including all alternative locations.

Item 6158 – Trailer Mounted Solar Powered Radar Speed Control Monitor

Provide Two (2) trailer mounted solar powered radar speed detection radar unit With light emitting diode (LED) display panel. Install as per plans or as directed by The Engineer.

Provide a display panel that consist of two characters, each a minimum of 18 in. Height. Display Panel shall be in amber color and visible from a minimum of 600 Ft. Provide a display panel that is equipped to alert motorist when they are traveling over the posted speed, either by flashing the traveling speed, changing the display color, or by blinking out the display.

Item 6185 – Truck Mounted Attenuator (TMA) and Trailer

Provide Truck Mounted Attenuators as required by the Engineer. Provide backup and keep operational and available on the jobsite at all times during traffic control operations. The Truck Mounted Attenuator will be made available for utilization for the entire duration of the project, including all alternative locations.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-02-091 **DISTRICT** Laredo **COUNTY** Dimmit, La Salle, Maverick, Webb, Zavala
HIGHWAY BU 277N, FM 582, FM 790, IH 35, SL 155, SL 20, SL 517, SS 259, US 57

			CONTROL SECTION JOB	**0017-08-116**		**0018-02-091**		**0018-06-193**		**0037-04-021**		**0037-04-021**		**0086-16-013**	
			PROJECT ID	**A00180283**		**A00180229**		**A00119646**		**A00071185**		**A00206024**		**A00072954**	
			COUNTY	**La Salle**		**La Salle**		**Webb**		**Zavala**		**Zavala**		**Webb**	
			HIGHWAY	**IH 35**		**IH 35**		**IH 35**		**SL 155**		**FM 582**		**SL 20**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	104-6010	REMOVING CONC (RIPRAP)	CY											61.800	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF											470.000	
	134-6002	BACKFILL (TY B)	STA	18.100		19.500		46.500		5.804				279.960	
	150-6002	BLADING	HR	10.000		5.000									
	315-6004	FOG SEAL (CSS-1H)	GAL	7,936.000		3,621.000									
	351-6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	SY	25,880.000		13,939.000									
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY					2,274.000							
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	SY					25,871.000		1,095.000					
	351-6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR(3")	SY											28,232.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY			1,335.000						17,143.000			
	354-6048	PLANE ASPH CONC PAV (3")	SY	129,396.000		65,246.000		140,721.000		21,895.000					
	354-6064	PLANE ASPH CONC PAV (2 1/2")	SY											282,312.000	
	354-6091	PLANE ASPH CONC PAV(4.5")	SY			1,335.000									
	354-6204	PLANE ASPH CONC PAV (2" TO 4 1/2")	SY			1,780.000									
	354-6221	PLANE ASPH CONC PAV(MICRO)(0"-3")	SY	668.000		1,490.000									
	420-6135	CL C CONC (RAIL FOUNDATION)(HPC)	CY											52.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY											61.700	
	432-6003	RIPRAP (CONC)(6 IN)	CY											84.490	
	432-6006	RIPRAP (CONC)(CL B)	CY												
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	123.000		57.000								61.000	
	438-6001	CLEANING AND SEALING EXISTING JOINTS	LF	320.000		525.000								2,650.600	
	450-6110	RAIL (TY SSTR) (HPC) (MOD)	LF											412.500	
	451-6048	RETROFIT RAIL (ADD HSS)	LF			726.750									
	500-6001	MOBILIZATION	LS			1.000									
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			10.000									
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF					1,200.000							
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF					1,200.000							
	510-6001	ONE-WAY TRAF CONT (FLAGGER CONT)	HR					200.000		100.000		100.000		150.000	
	510-6002	ONE-WAY TRAF CONT (PILOT CAR)	HR												
	529-6005	CONC CURB (MONO) (TY II)	LF											844.560	
	529-6022	CONC CURB (DOWEL) (TY II)	LF												
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF												
	533-6004	RUMBLE STRIPS (CENTERLINE) ASPHALT	LF												
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	2,362.500		850.000								812.500	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF											50.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	8.000		7.000								7.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	4.000		4.000								6.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-02-091 **DISTRICT** Laredo **COUNTY** Dimmit, La Salle, Maverick, Webb, Zavala
HIGHWAY BU 277N, FM 582, FM 790, IH 35, SL 155, SL 20, SL 517, SS 259, US 57

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			HIGHWAY	**IH 35**		**IH 35**		**IH 35**		**SL 155**		**FM 582**		**SL 20**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	540-6018	MTL BM GD FEN TRANS (NON - SYM)	EA			1.000								2.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF												
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	2,237.500		462.500								738.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA												
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA	4.000											
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8.000		4.000								7.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000								5.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4.000		4.000								7.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA											1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA					2.000							
	644-6017	IN SM RD SN SUP&AM TY10BWG(2)SA(P)	EA											1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA					2.000						1.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	40.000		22.000								66.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	20.000		8.000								22.000	
	658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	8.000		8.000									
	658-6069	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BR)	EA	6.000		3.000								46.000	
	658-6070	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BR)	EA	6.000		3.000									
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	6,773.000		3,877.000		7,802.000		493.000		387.000		11,910.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA							329.000		258.000			
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF											500.000	
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	LF											5,276.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	622.000		1,354.000		8,275.000		170.000		229.000		15,682.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	515.000		242.000		3,978.000						1,700.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF					602.000		64.000		129.000		40.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA					125.000		4.000		4.000		47.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1.000		1.000		81.000		2.000		2.000		47.000	
	666-6093	REFL PAV MRK TY I (W)(RR XING)(100MIL)	EA												
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA											52.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF											1,550.000	
	666-6225	PAVEMENT SEALER 6"	LF					9,443.000						10,420.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	11,290.000		6,460.000		13,686.000		1,650.000		1,290.000		19,830.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	46,690.000		27,770.000		31,715.000		6,569.000				77,429.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF												
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	46,690.000		27,770.000		38,909.000		6,569.000		5,160.000		77,429.000	
	666-6350	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	LF											475.000	
	672-6007	REFL PAV MRKR TY I-C	EA	567.000		328.000		680.000		83.000		76.000		1,722.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA					185.000		83.000		65.000			

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-02-091 **DISTRICT** Laredo **COUNTY** Dimmit, La Salle, Maverick, Webb, Zavala
HIGHWAY BU 277N, FM 582, FM 790, IH 35, SL 155, SL 20, SL 517, SS 259, US 57

			CONTROL SECTION JOB	**0017-08-116**		**0018-02-091**		**0018-06-193**		**0037-04-021**		**0037-04-021**		**0086-16-013**	
			PROJECT ID	**A00180283**		**A00180229**		**A00119646**		**A00071185**		**A00206024**		**A00072954**	
			COUNTY	**La Salle**		**La Salle**		**Webb**		**Zavala**		**Zavala**		**Webb**	
			HIGHWAY	**IH 35**		**IH 35**		**IH 35**		**SL 155**		**FM 582**		**SL 20**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	672-6010	REFL PAV MRKR TY II-C-R	EA	61.000		69.000		581.000		18.000				147.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF					9,443.000						9,710.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF												
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF											2,630.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF					572.000							
	678-6002	PAV SURF PREP FOR MRK (6")	LF					10,015.000						19,230.000	
	778-6001	CONCRETE RAIL REPAIR (IN-KIND)	LF	6.000											
	3076-6032	D-GR HMA TY-C SAC-A PG76-22	TON							3,777.000		1,972.000			
	3076-6043	D-GR HMA TY-D PG70-22 (LEVEL-UP)	TON												
	3077-6033	SP MIXES SP-C SAC-A PG76-22	TON					24,275.000							
	3080-6001	STONE-MTRX-ASPH SMA-C SAC-A PG76-22	TON	22,321.000		11,745.000								40,583.000	
	3080-6007	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	55.000		124.000									
	3084-6001	BONDING COURSE	GAL	26,013.000		14,237.000		28,145.000		4,379.000		3,429.000		56,463.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA			4.000									
	6049-6001	LONG CHANNEL MOUNT CURB SYS (INSTALL)	LF					168.000						477.000	
	6049-6003	LONG CHANNEL MOUNT CURB SYS (REMOVE)	LF					198.000						1,050.000	
	6158-6001	TMSP RADAR SPEED CONTROL MONITOR	EA			2.000									
	6185-6002	TMA (STATIONARY)	DAY	18.000		18.000		29.000		19.000		10.000		46.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	150.000		150.000		200.000		100.000		100.000		250.000	
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS			1.000									
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS			1.000									
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS			1.000									

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-02-091 **DISTRICT** Laredo **COUNTY** Dimmit, La Salle, Maverick, Webb, Zavala
HIGHWAY BU 277N, FM 582, FM 790, IH 35, SL 155, SL 20, SL 517, SS 259, US 57

														TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB	**0276-01-047**		**0299-13-034**		**0300-04-011**		**2485-02-012**		**3631-01-002**			
			PROJECT ID	**A00196663**		**A00130814**		**A00180322**		**A00196572**		**A00198986**			
			COUNTY	**Maverick**		**Maverick**		**Dimmit**		**Dimmit**		**Webb**			
			HIGHWAY	**US 57**		**BU 277N**		**FM 790**		**SL 517**		**SS 259**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	104-6010	REMOVING CONC (RIPRAP)	CY									17.000		78.800	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF											470.000	
	134-6002	BACKFILL (TY B)	STA	266.700						142.250				778.814	
	150-6002	BLADING	HR											15.000	
	315-6004	FOG SEAL (CSS-1H)	GAL											11,557.000	
	351-6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	SY	18,215.000				2,704.000						60,738.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY											2,274.000	
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	SY			2,794.000				6,346.000				36,106.000	
	351-6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR(3")	SY											28,232.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY			18,624.000								37,102.000	
	354-6048	PLANE ASPH CONC PAV (3")	SY											357,258.000	
	354-6064	PLANE ASPH CONC PAV (2 1/2")	SY					27,039.000						309,351.000	
	354-6091	PLANE ASPH CONC PAV(4.5")	SY											1,335.000	
	354-6204	PLANE ASPH CONC PAV (2" TO 4 1/2")	SY											1,780.000	
	354-6221	PLANE ASPH CONC PAV(MICRO)(0"-3")	SY											2,158.000	
	420-6135	CL C CONC (RAIL FOUNDATION)(HPC)	CY											52.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY											61.700	
	432-6003	RIPRAP (CONC)(6 IN)	CY									17.000		101.490	
	432-6006	RIPRAP (CONC)(CL B)	CY									101.000		101.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	40.000										281.000	
	438-6001	CLEANING AND SEALING EXISTING JOINTS	LF											3,495.600	
	450-6110	RAIL (TY SSTR) (HPC) (MOD)	LF											412.500	
	451-6048	RETROFIT RAIL (ADD HSS)	LF											726.750	
	500-6001	MOBILIZATION	LS											1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO											10.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF											1,200.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF											1,200.000	
	510-6001	ONE-WAY TRAF CONT (FLAGGER CONT)	HR	100.000		100.000		240.000		100.000		100.000		1,190.000	
	510-6002	ONE-WAY TRAF CONT (PILOT CAR)	HR							120.000				120.000	
	529-6005	CONC CURB (MONO) (TY II)	LF											844.560	
	529-6022	CONC CURB (DOWEL) (TY II)	LF									1,203.000		1,203.000	
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	53,339.000						28,449.000				81,788.000	
	533-6004	RUMBLE STRIPS (CENTERLINE) ASPHALT	LF	26,670.000						14,225.000				40,895.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	600.000								75.000		4,700.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF											50.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA									2.000		24.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	2.000								1.000		17.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-02-091 **DISTRICT** Laredo **COUNTY** Dimmit, La Salle, Maverick, Webb, Zavala
HIGHWAY BU 277N, FM 582, FM 790, IH 35, SL 155, SL 20, SL 517, SS 259, US 57

		CONTROL SECTION JOB	0276-01-047		0299-13-034		0300-04-011		2485-02-012		3631-01-002		TOTAL EST.	TOTAL FINAL
		PROJECT ID	A00196663		A00130814		A00180322		A00196572		A00198986			
		COUNTY	Maverick		Maverick		Dimmit		Dimmit		Webb			
		HIGHWAY	US 57		BU 277N		FM 790		SL 517		SS 259			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	540-6018	MTL BM GD FEN TRANS (NON - SYM)	EA	4.000										7.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF	75.000										75.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	425.000								75.000		3,938.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	2.000								1.000		3.000	
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA											4.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA									2.000		21.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2.000								3.000		18.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2.000								3.000		20.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA											1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA									4.000		6.000	
	644-6017	IN SM RD SN SUP&AM TY10BWG(2)SA(P)	EA											1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA									3.000		6.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	6.000										134.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6.000								2.000		58.000	
	658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA									3.000		19.000	
	658-6069	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BR)	EA											55.000	
	658-6070	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BR)	EA											9.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	2,734.000						40.000		550.000		34,566.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	3,113.000		1,198.000		766.000		1,628.000				7,292.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF											500.000	
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	LF											5,276.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	275.000		374.000				300.000		525.000		27,806.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF											6,435.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF			562.000		210.000		194.000		45.000		1,846.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2.000		10.000				5.000		3.000		200.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2.000		2.000				5.000		5.000		148.000	
	666-6093	REFL PAV MRK TY I (W)(RR XING)(100MIL)	EA			2.000								2.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA											52.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF									460.000		2,010.000	
	666-6225	PAVEMENT SEALER 6"	LF									8,211.000		28,074.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	9,110.000								460.000		63,776.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	53,339.000		9,578.000		15,672.000		29,207.000		2,563.000		300,532.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF	1,480.000		3,120.000		190.000		2,045.000				6,835.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	58,228.000		9,578.000		14,154.000		20,187.000		3,055.000		307,729.000	
	666-6350	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	LF											475.000	
	672-6007	REFL PAV MRKR TY I-C	EA	472.000		18.000						49.000		3,995.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,161.000		192.000		188.000		361.000		200.000		2,435.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-02-091 **DISTRICT** Laredo **COUNTY** Dimmit, La Salle, Maverick, Webb, Zavala
HIGHWAY BU 277N, FM 582, FM 790, IH 35, SL 155, SL 20, SL 517, SS 259, US 57

														TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB	**0276-01-047**		**0299-13-034**		**0300-04-011**		**2485-02-012**		**3631-01-002**			
			PROJECT ID	**A00196663**		**A00130814**		**A00180322**		**A00196572**		**A00198986**			
			COUNTY	**Maverick**		**Maverick**		**Dimmit**		**Dimmit**		**Webb**			
			HIGHWAY	**US 57**		**BU 277N**		**FM 790**		**SL 517**		**SS 259**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	672-6010	REFL PAV MRKR TY II-C-R	EA							15.000		60.000		951.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF									8,202.000		27,355.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF									525.000		525.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF											2,630.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF									45.000		617.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF									8,202.000		37,447.000	
	778-6001	CONCRETE RAIL REPAIR (IN-KIND)	LF											6.000	
	3076-6032	D-GR HMA TY-C SAC-A PG76-22	TON	20,947.000		2,142.000		3,887.000		7,299.000				40,024.000	
	3076-6043	D-GR HMA TY-D PG70-22 (LEVEL-UP)	TON	3,143.000										3,143.000	
	3077-6033	SP MIXES SP-C SAC-A PG76-22	TON											24,275.000	
	3080-6001	STONE-MTRX-ASPH SMA-C SAC-A PG76-22	TON											74,649.000	
	3080-6007	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON											179.000	
	3084-6001	BONDING COURSE	GAL	36,430.000		3,725.000		5,408.000		12,693.000				190,922.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA											4.000	
	6049-6001	LONG CHANNEL MOUNT CURB SYS (INSTALL)	LF											645.000	
	6049-6003	LONG CHANNEL MOUNT CURB SYS (REMOVE)	LF											1,248.000	
	6158-6001	TMSP RADAR SPEED CONTROL MONITOR	EA											2.000	
	6185-6002	TMA (STATIONARY)	DAY	25.000		10.000		12.000		12.000		21.000		220.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	100.000		100.000		100.000		100.000		200.000		1,550.000	
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS											1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS											1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS											1.000	

SUMMARY OF MOBILIZATION ITEMS		
	500 6001	502 6001
LOCATION - CSJ	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING
	LS	MO
1 - 0018-02-091	1.00	10.00
PROJECT TOTALS	1	10

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS					
	662 6109	6001 6002	6158 6001	6185 6002	6185 6003
LOCATION - CSJ	WK ZN PAV MRK SHT TERM (TAB)TY W	PORTABLE CHANGEABLE MESSAGE SIGN	TMSP RADAR SPEED CONTROL MONITOR	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	EA	EA	EA	DAY	HR
1 - 0018-02-091	3877	4	2	18	150
PROJECT TOTALS	3877	4	2	18	150

SUMMARY OF ROADWAY																
		134	150	351	BONDING COURSE		HOTMIX		SURFACE TREATMENT		MILLING	HOTMIX	MILLING			
		6002	6002	6001		3084		3080		315	354	3080	354	354	354	354
						6001		6001		6004	6048	6007	6045	6091	6204	6221
LOCATION-CSJ	LENGTH	BACKFILL (TY B)	BLADING	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	AREA	BONDING COURSE	AREA	STONE-MT RX-ASPH SMA-C SAC-A PG76-22	AREA	FOG SEAL (CSS-1H)	PLANE ASPH CONC PAV (3")	STONE-MT RX-ASPH SMA-D SAC-A PG 76-22	PLANE ASPH CONC PAV (2")	PLANE ASPH CONC PAV(4.5")	PLANE ASPH CONC PAV (2" TO 4 1/2")	PLANE ASPH CONC PAV(MICRO) (0"-3")
	LF	STA	HR	SY	SY	GAL	SY	TON	SY	GAL	SY	TON	SY	SY	SY	SY
1 - 0018-02-091	25771.68		5	13938.6	71182.1	14236.4	65245.8	11744.2	36205.0	3620.5	65245.8	124.0	1335.0	1335.0	1780.0	1490.0
EXR & ER MM39		19.5														
TOTAL	25,771.68	19.50	5	13,939	71,183	14,237	65,246	11,745	36,205	3,621	65,246	124	1,335	1,335	1,780	1,490

SUMMARY OF ROADWAY ITEMS														
	432 6045	540 6001	540 6006	540 6016	540 6018	542 6001	542 6004	544 6001	544 6003	658 6060	658 6061	658 6064	658 6069	658 6070
LOCATION - CSJ	RIPRAP (MOW STRIP)(4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FEN TRANS (NON - SYM)	REMOVE METAL BEAM GUARD FENCE	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BR)	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BR)
	CY	LF	EA	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	EA
1 - 0018-02-091	57	850	7	4	1	462.5	4	4	4	22.0	8	8	3	3
PROJECT TOTALS	57	850	7	4	1	462.5	4	4	4	22	8	8	3	3

SUMMARY OF BRIDGE # 1 ITEMS		
	438 6001	451 6048
LOCATION - PSN	CLEANING AND SEALING EXISTING JOINTS	RETROFIT RAIL (ADD HSS)
	LF	LF
1 - 221420001802137	363	340.75
PROJECT TOTALS	363	340.75

SUMMARY OF BRIDGE # 2 ITEMS		
	438 6001	451 6048
LOCATION - PSN#	CLEANING AND SEALING EXISTING JOINTS	RETROFIT RAIL (ADD HSS)
	LF	LF
1 - 221420001802141	162	386
PROJECT TOTALS	162	386

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by CYNTHIA GARCIA P.E. 149715, on

DocuSigned by:
Cynthia Garcia
96CA7DFE12674F3...

1/4/2024

Texas Department of Transportation

IH 35, etc.

SUMMARY OF QUANTITIES

SHEET 1 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		34

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SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	666 6036	666 6042	666 6078	666 6306	666 6309	666 6321	672 6007	672 6010
	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)12"(SLD) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	RE PM W/RET REQ TY I (W)6"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)6"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-C-R
	LF	LF	EA	LF	LF	LF	EA	EA
1 - 0018-02-091				6460	25820	25820	328	
RAMPS	1354	242	1		1950	1950		69
PROJECT TOTALS	1354	242	1	6460	27770	27770	328	69

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION - CSJ	662 6109	6185 6002	6185 6003
	WK ZN PAV MRK SHT TERM (TAB)TY W	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	EA	DAY	HR
2 - 0017-08-116	6773	18	150
PROJECT TOTALS	6773	18	150

SUMMARY OF BRIDGE # 1 ITEMS

LOCATION - PSN	438 6001	778 6001
	CLEANING AND SEALING EXISTING JOINTS	CONCRETE RAIL REPAIR (IN-KIND)
	LF	LF
2 - 221420001708143	160	6
PROJECT TOTALS	160	6

SUMMARY OF BRIDGE # 2 ITEMS

LOCATION - PSN#	438 6001
	CLEANING AND SEALING EXISTING JOINTS
	LF
2 - 221420001708146	160
PROJECT TOTALS	160

SUMMARY OF ROADWAY

LOCATION-CSJ	LENGTH	134 6002	150 6002	351 6001	BONDING COURSE 3084 6001		HOTMIX 3080 6007		3080 6001	SURFACE TREATMENT 315 6004	MILLING 354 6048	MILLING 354 6221
		BACKFILL (TY B)	BLADING	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	AREA	BONDING COURSE	BRIDGE AREA	STONE-MTRX-ASPH SMA-D SAC-A PG 76-22	ROADWAY AREA	STONE-MTRX-ASPH SMA-C SAC-A PG76-22	AREA	FOG SEAL (CSS-1H)	PLANE ASPH CONC PAV (3")	PLANE ASPH CONC PAV(MICRO) (0"-3")
	LF	STA	HR	SY	SY	GAL	SY	TON	SY	TON	SY	GAL	SY	SY
2 - 0017-08-116	44880.00		10	25879.1	130062.2	26012.4	666.7	55.0	129395.6	22320.7	79360.0	7936.0	129395.6	668.0
2- Ex-MM82 SB, EXR7ER MM77 SB		18.1												
TOTAL	44,880.00	18.10	10	25,880	130,063	26,013	667	55	129,396	22,321	79360	7,936	129,396	668

SUMMARY OF ROADWAY ITEMS

LOCATION - CSJ	432 6045	540 6001	540 6006	540 6016	542 6001	542 6003	542 6004	544 6001	544 6003	658 6060	658 6061	658 6064	658 6069	658 6070
	RIPRAP (MOW STRIP)(4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE DOWNSTREAM ANCHOR TERMINAL	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BR)	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BR)
	CY	LF	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
2 - 0017-08-116	123	2,362.5	8	4	2,237.5	4	8	4	4	40	20	8	6	6
PROJECT TOTALS	123	2362.5	8	4	2237.5	4	8	4	4	40	20	8	6	6

STATE OF TEXAS
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Texas Department of Transportation

IH 35, etc.

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		35

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SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS								
LOCATION - CSJ	666 6036	666 6042	666 6078	666 6306	666 6309	666 6321	672 6007	672 6010
	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)12"(SLD) (100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-C-R
	LF	LF	EA	LF	LF	LF	EA	EA
2 - 0017-08-116				11290	44880	44880	567	
ALL RAMPS	622	515	1		1810.00	1810		61
PROJECT TOTALS	622	515	1	11290	46690	46690	567	61

SUMMARY OF ROADWAY							
LOCATION-CSJ	LENGTH	351 6001 FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	BONDING COURSE AREA	BONDING COURSE 3084 6001 BONDING COURSE	HOTMIX AREA	HOTMIX 3076 6032 D-GR HMA TY-C SAC-A PG76-22	MILLING 354 6064 PLANE ASPH CONC PAV (2 1/2")
	LF	SY	SY	GAL	SY	TON	SY
3 - 0300-04-011	7835.52	2703.9	27039.0	5407.8	27039.0	3886.9	27039.0
TOTAL	7,835.52	2,704	27,039	5,408	27,039	3,887	27,039

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS				
LOCATION - CSJ	510 6001 ONE-WAY TRAF CONT (FLAGGER CONT)	662 6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE OPERATION)
	HR	EA	DAY	HR
3 - 0300-04-011	240	766	12	100
PROJECT TOTALS	240	766	12	100

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS					
LOCATION - CSJ	666 6048 REFL PAV MRK TY I (W)24"(SLD) (100MIL)	666 6309 RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	666 6318 RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	666 6321 RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	672 6009 REFL PAV MRKR TY II-A-A
	LF	LF	LF	LF	EA
3 - 0300-04-011		15672	190	14154	188
CROSSWALKS & STOP LINES	210				
PROJECT TOTALS	210	15672	190	14154	188

SUMMARY OF ROADWAY							
LOCATION-CSJ	LENGTH	134 6002 BACKFILL (TY B)	351 6013 FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	BONDING COURSE AREA	BONDING COURSE 3084 6001 BONDING COURSE	HOTMIX AREA	HOTMIX 3076 6032 D-GR HMA TY-C SAC-A PG76-22
	LF	STA	SY	SY	GAL	SY	TON
4 - 2485-02-012	14224.32	142.243	6346.0	63461.0	12692.2	63461.0	7298.0
TOTAL	14,224.32	142.25	6,346	63,461	12,693	63,461	7,299

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS						
LOCATION - CSJ	510 6002 ONE-WAY TRAF CONT (PILOT CAR)	662 6109 WK ZN PAV MRK SHT TERM (TAB)TY W	662 6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE OPERATION)	510 6001 ONE-WAY TRAF CONT (FLAGGER CONT)
	HR	EA	EA	DAY	HR	HR
4 - 2485-02-012	120	40	1628	12	100	100
PROJECT TOTALS	120	40	1628	12	100	100

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Texas Department of Transportation

IH 35, etc.

SUMMARY OF QUANTITIES

SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		36

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SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS											
LOCATION - CSJ	533 6003	533 6004	666 6036	666 6048	666 6054	666 6078	666 6309	666 6318	666 6321	672 6009	672 6010
	RUMBLE STRIPS (SHOULDER) ASPHALT	RUMBLE STRIPS (CENTERLINE) ASPHALT	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	REFL PAV MRK TY I (W)(ARROW)(100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
	LF	LF	LF	LF	EA	EA	LF	LF	LF	EA	EA
4 - 2485-02-012	28449	14225					29207	2045	20187	361	
TURNING AND STOP LINES			300	194	5	5					15
PROJECT TOTALS	28449	14225	300	194	5	5	29207	2045	20187	361	15

SUMMARY OF ROADWAY								
LOCATION-CSJ	LENGTH	134 6002	351 6013	BONDING COURSE	3084 6001	HOTMIX	3076 6032	MILLING 354 6048
		BACKFILL (TY B)	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	AREA	BONDING COURSE	AREA	D-GR HMA TY-C SAC-A PG76-22	PLANE ASPH CONC PAV (3")
	LF	STA	SY	SY	GAL	SY	TON	SY
5 - 0037-04-019	3284.16	5.804	1094.7	21894.4	4378.9	21894.4	3776.8	21894.4
TOTAL	3,284.16	5.80	1,095	21,895	4,379	21,895	3,777	21,895

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS					
LOCATION - CSJ	510 6001	662 6109	662 6111	6185 6002	6185 6003
	ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	HR	EA	EA	DAY	HR
5 - 0037-04-019	100	493	329	19	100
PROJECT TOTALS	100	493	329	19	100

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS										
LOCATION - CSJ	666 6036	666 6048	666 6054	666 6078	666 6306	666 6309	666 6321	672 6007	672 6009	672 6010
	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	REFL PAV MRK TY I (W)(ARROW)(100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
	LF	LF	EA	EA	LF	LF	LF	EA	EA	EA
5 - 0037-04-019					1650	6569	6569	83	83	
TURNING & STOP LINES	170	64	4	2						18
PROJECT TOTALS	170	64	4	2	1650	6569	6569	83	83	18

SUMMARY OF ROADWAY								
LOCATION-CSJ	LENGTH	134 6002	351 6001	3076 6043	BONDING COURSE 3084 6001	HOTMIX	3076 6032	
		BACKFILL (TY B)	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	D-GR HMA TY-D PG70-22 (LEVEL-UP)	AREA	BONDING COURSE	AREA	D-GR HMA TY-C SAC-A PG76-22
	LF	STA	SY	TON	SY	GAL	SY	TON
6 - 0276-01-047	26669.28	266.693	18214.6	3142.0	182146.3	36429.3	182146.3	20946.8
TOTAL	26,669.28	266.70	18,215	3,143	182,147	36,430	182,147	20,947

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS					
LOCATION - CSJ	510 6001	662 6109	662 6111	6185 6002	6185 6003
	ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	HR	EA	EA	DAY	HR
6 - 0276-01-047	100	2734	3113	25	100
PROJECT TOTALS	100	2734	3113	25	100

STATE OF TEXAS
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Texas Department of Transportation

IH 35, etc.

SUMMARY OF QUANTITIES

SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		37

DATE: 1/4/2024 10:35:53 AM
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SUMMARY OF ROADWAY ITEMS

LOCATION - CSJ	432 6045	540 6001	540 6016	540 6018	540 6020	542 6001	542 6002	544 6001	544 6003	658 6060	658 6061
	RIPRAP (MOW STRIP)(4 IN)	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FEN TRANS (NON - SYM)	MTL W - BEAM GD FEN (LOW FILL CULVERT)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2
	CY	LF	EA	EA	LF	LF	EA	EA	EA	EA	EA
6 - 0276-01-047	40	600	2	4	75	425	2	2	2	6	6
PROJECT TOTALS	40	600	2	4	75	425	2	2	2	6	6

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	533 6003	533 6004	666 6036	666 6054	666 6078	666 6306	666 6309	666 6318	666 6321	672 6007	672 6009
	RUMBLE STRIPS (SHOULDER) ASPHALT	RUMBLE STRIPS (CENTERLINE) ASPHALT	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
	LF	LF	LF	EA	EA	LF	LF	LF	LF	EA	EA
6 - 0276-01-047	53339	26670				9107	53339	1480	53339	458	670
TURNING LANE AND TRANSITIONS			275	2	2				4889	14	491
PROJECT TOTALS	53339	26670	275	2	2	9110	53339	1480	58228	472	1161

SUMMARY OF ROADWAY

LOCATION-CSJ	LENGTH	351 6013 FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	BONDING COURSE AREA	3084 6001 BONDING COURSE	HOTMIX AREA	3076 6032 D-GR HMA TY-C SAC-A PG76-22	MILLING 354 6045 PLANE ASPH CONC PAV (2")
	LF	SY	SY	GAL	SY	TON	SY
7 - 0299-13-034	4788.96	2793.6	18623.7	3724.7	18623.7	2141.7	18623.7
TOTAL	4,788.96	2,794	18,624	3,725	18,624	2,142	18,624

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION - CSJ	510 6001 ONE-WAY TRAF CONT (FLAGGER CONT)	662 6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE OPERATION)
	HR	EA	DAY	HR
7 - 0299-13-034	100	1198	10	100
PROJECT TOTALS	100	1198	10	100

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	666 6036	666 6048	666 6054	666 6078	666 6093	666 6309	666 6318	666 6321	672 6007	672 6009
	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	REFL PAV MRK TY I (W)(RR XING)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
	LF	LF	EA	EA	EA	LF	LF	LF	EA	EA
7 - 0299-13-034						9578	2400	9578		120
CROSS WALKS/ TURNING LANES	374	562	10	2	2		720		18	72
PROJECT TOTALS	374	562	10	2	2	9578	3120	9578	18	192

SUMMARY OF ROADWAY

LOCATION-CSJ	134 6002 BACKFILL (TY B)	351 6013 FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	351 6004 FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	BONDING COURSE AREA	3084 6001 BONDING COURSE	HOTMIX AREA	3077 6033 SP MIXES SP-C SAC-A PG76-22	MILLING 354 6048 PLANE ASPH CONC PAV (3")
	STA	SY	SY	SY	GAL	SY	TON	SY
8 - 0018-06-193		25870.7	2273.3	140720.3	28144.1	140720.3	24274.2	140720.3
Ramps	46.5							
TOTAL	46.50	25,871	2,274	140,721	28,145	140,721	24,275	140,721

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION - CSJ	510 6001 ONE-WAY TRAF CONT (FLAGGER CONT)	662 6109 WK ZN PAV MRK SHT TERM (TAB)TY W	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE OPERATION)
	HR	EA	DAY	HR
8 - 0018-06-193	200	7802	29	200
PROJECT TOTALS	200	7802	29	200

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IH 35, etc.

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		38

DATE: 1/4/2024 10:35:54 AM
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SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	666 6036	666 6042	666 6048	666 6054	666 6078	666 6225	666 6306	666 6309	666 6321	672 6007	672 6009	672 6010	677 6001	677 6007	678 6002	6049 6001	6049 6003	644 6076	644 6001
	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	REFL PAV MRK TY I (W)(ARROW)(100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	PAVEMENT SEALER 6"	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (24")	PAV SURF PREP FOR MRK (6")	LONG CHANNEL MOUNT CURB SYS (INSTALL)	LONG CHANNEL MOUNT CURB SYS (REMOVE)	REMOVE SM RD SN SUP&AM	IN SM RD SN SUP&AM TY10BWG(1) SA(P)
	LF	LF	LF	EA	EA	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA
8 - 0018-06-193							12993	29389	29449	660								2	2
RAMP LOCATIONS	8275	3978	602	81	52				6700	20	185	581				168	198		
UNDERPASS LOCATIONS				44	29	9443	693	2326	2760				9443	572	10015				
PROJECT TOTALS	8275	3978	602	125	81	9443	13686	31715	38909	680	185	581	9443	572	10015	168	198	2	2

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	644 6001	644 6076	666 6036	666 6048	666 6054	666 6078	666 6225	666 6306	666 6309	666 6321	672 6007	672 6009	672 6010	677 6001	678 6002	677 6007	677 6003	666 6162
	IN SM RD SN SUP&AM TY10BWG(1) SA(P)	REMOVE SM RD SN SUP&AM	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	REFL PAV MRK TY I (W)(ARROW)(100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	PAVEMENT SEALER 6"	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK & MRKS (4")	PAV SURF PREP FOR MRK (6")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (8")	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)
	EA	EA	LF	LF	EA	EA	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF
9 - 3631-01-002	4	3					8211	460	2563	3055	49			8202				460
TURNING AND STOP LINES			525	45	3	5						200	60			45	525	
															8202			
PROJECT TOTALS	4	3	525	45	3	5	8211	460	2563	3055	49	200	60	8202	8202	45	525	460

SUMMARY OF ROADWAY ITEMS

LOCATION - CSJ	104 6010	432 6003	432 6006	529 6022	540 6001	540 6006	540 6016	542 6001	542 6002	542 6004	544 6001	544 6003	658 6061	658 6064
	REMOVING CONC (RIPRAP)	RIPRAP (CONC)(6 IN)	RIPRAP (CONC)(CL B)	CONC CURB (DOWEL) (TY II)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2
	CY	CY	CY	LF	LF	EA	EA	LF	EA	EA	EA	EA	EA	EA
9 - 3631-01-002	17.0	17	101	1203	75	2	1	75	1	2	3	3	2	3
PROJECT TOTALS	17	17	101	1203	75	2	1	75	1	2	3	3	2	3

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION - CSJ	510 6001	662 6109	6185 6003	6185 6002
	ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK SHT TERM (TAB)TY W	TMA (MOBILE OPERATION)	TMA (STATIONARY)
	HR	EA	HR	DAY
9 - 3631-01-002	100	550	200	21
PROJECT TOTALS	100	550	200	21

SUMMARY OF ROADWAY

LOCATION-CSJ	351 6019	104 6010	134 6002	BONDING COURSE 3084 6001	HOTMIX 3080 6001	MILLING 354 6064
	FLEXIBLE PAVEMENT STRUCTURE REPAIR(3")	REMOVING CONC (RIPRAP)	BACKFILL (TY B)	AREA / BONDING COURSE	AREA / STONE-MTRX-ASPH SMA-C SAC-A PG76-22	PLANE ASPH CONC PAV (2 1/2")
	SY	CY	STA	SY / GAL	SY / TON	SY
10 - 0086-16-013	28231.1		262.66	282311.1 / 56462.2	282311.1 / 40582.2	282311.1
Signpost Near 185		1.3				
Bridge 186		20.6				
Bridge 187		13.9				
Bridge 188		11.4				
Bridge 190		14.5				
10 - ER SB & EXR NB			17.30			
TOTAL	28,232	61.8	279.96	282,312 / 56,463	282,312 / 40,583	282,312

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION - CSJ	510 6001	662 6109	6185 6002	6185 6003
	ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK SHT TERM (TAB)TY W	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	HR	EA	DAY	HR
10 - 0086-16-013	150	11910	46	250
PROJECT TOTALS	150	11910	46	250

SUMMARY OF ROADWAY ITEMS

LOCATION - CSJ	104 6010	104 6022	420 6135	432 6002	432 6003	432 6045	450 6110	529 6005	540 6001	540 6002	540 6006	540 6016	540 6018	542 6001	542 6004	544 6001	544 6003	545 6007	658 6060	658 6061	658 6069
	REMOVING CONC (RIPRAP)	REMOVING CONC (CURB AND GUTTER)	CL C CONC (RAIL FOUNDATION)(HPC)	RIPRAP (CONC)(5 IN)	RIPRAP (CONC)(6 IN)	RIPRAP (MOW STRIP)(4 IN)	RAIL (TY SSTR) (HPC) (MOD)	CONC CURB (MONO) (TY II)	MTL W-BEAM GD FEN (TIM POST)	MTL W-BEAM GD FEN (STEEL POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FEN TRANS (NON - SYM)	REMOVE METAL BEAM GUARD FENCE	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	REMOVE DELIN & OBJECT MARKER ASSMS	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BR)
	CY	LF	CY	CY	CY	CY	LF	LF	LF	LF	EA	EA	EA	LF	EA	EA	EA	EA	EA	EA	EA
10 - 0086-16-013	61.8	470	52	61.7		61	412.5	45	812.5	50	7	6	2	738.0	7	5	7	1	66	22	46
Cuatro Vientos					84.49			799.56													
PROJECT TOTALS	61.8	470	52	61.7	84.49	61	412.5	844.56	812.5	50	7	6	2	738	7	5	7	1	66	22	46

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Texas Department of Transportation

IH 35, etc.

SUMMARY OF QUANTITIES

SHEET 6 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		39

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SUMMAR OF BRIDGE # 1 ITEMS

LOCATION - PSN	438 6001 CLEANING AND SEALING EXISTING JOINTS
	LF
10 - 222400008616185	184
PROJECT TOTALS	184

SUMMAR OF BRIDGE # 2 ITEMS

LOCATION - PSN#	438 6001 CLEANING AND SEALING EXISTING JOINTS
	LF
10 - 222400008616186	471.6
PROJECT TOTALS	471.6

SUMMARY OF BRIDGE # 3 ITEMS

LOCATION - PSN#	438 6001 CLEANING AND SEALING EXISTING JOINTS
	LF
10 - 222400008616187	838.5
PROJECT TOTALS	838.5

SUMMARY OF BRIDGE # 4 ITEMS

LOCATION - PSN#	438 6001 CLEANING AND SEALING EXISTING JOINTS
	LF
10 - 222400008616188	682.5
PROJECT TOTALS	682.5

SUMMARY OF BRIDGE # 5 ITEMS

LOCATION - PSN#	438 6001 CLEANING AND SEALING EXISTING JOINTS
	LF
10 - 222400008616190	474
PROJECT TOTALS	474

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	644 6017 IN SM RD SN SUP&AM TY10BWG(2) SA(P)	644 6076 REMOVE SM RD SN SUP&AM	666 6018 REFL PAV MRK TY I (W)6"(DOT) (100MIL)	666 6030 REFL PAV MRK TY I (W)8"(DOT) (100MIL)	666 6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	666 6042 REFL PAV MRK TY I (W)12"(SLD) (100MIL)	666 6048 REFL PAV MRK TY I (W)24"(SLD) (100MIL)	666 6054 REFL PAV MRK TY I (W)(ARROW) (100MIL)	666 6078 REFL PAV MRK TY I (W)(WORD)(100MIL)	666 6102 REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	666 6162 RE PV MRK TY I(BLACK)6" (SHADOW)(1 00MIL)	666 6225 PAVEMENT SEALER 6"	666 6306 RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	666 6309 RE PM W/RET REQ TY I (W)6*(SLD)(100MIL)	666 6321 RE PM W/RET REQ TY I (Y)6*(SLD)(100MIL)	666 6350 REFL PAV MRK TY I (W)12*(DOT)(100MIL)	672 6007 REFL PAV MRKR TY I-C	672 6010 REFL PAV MRKR TY II-C-R	677 6001 ELIM EXT PAV MRK & MRKS (4")	677 6005 ELIM EXT PAV MRK & MRKS (12")	678 6002 PAV SURF PREP FOR MRK (6")	6049 6001 LONG CHANNEL MOUNT CURB SYS (INSTALL)	6049 6003 LONG CHANNEL MOUNT CURB SYS (REMOVE)
	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF
10 - 0086-16-013	1	1										10420	19830	77429	77429		1011				10420		
NORTHBOUND			350	446	15682	1100	40	33	33		610						490	60	4955	2485	7440	55	343
SOUTHBOUND			150	4830		600		14	14	52	940					475	221	87	4755	145	1370	422	707
PROJECT TOTALS	1	1	500	5276	15682	1700	40	47	47	52	1550	10420	19830	77429	77429	475	1722	147	9710	2630	19230	477	1050

SUMMARY OF ROADWAY

LOCATION-CSJ	LENGTH	BONDING COURSE AREA	BONDING COURSE 3084 6001 BONDING COURSE	HOTMIX AREA	HOTMIX 3076 6032 D-GR HMA TY-C SAC-A PG76-22	MILLING 354 6045 PLANE ASPH CONC PAV (2")
	LF	SY	GAL	SY	TON	SY
11 - 0037-04-021	2571.36	17142.4	3428.5	17142.4	1971.4	17142.4
TOTAL	2,571.36	17,143	3,429	17,143	1,972	17,143

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION - CSJ	510 6001 ONE-WAY TRAF CONT (FLAGGER CONT)	662 6109 WK ZN PAV MRK SHT TERM (TAB)TY W	662 6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE OPERATION)
	HR	EA	EA	DAY	HR
11 - 0037-04-021	100	387	258	10	100
PROJECT TOTALS	100	387	258	10	100

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS

LOCATION - CSJ	666 6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	666 6048 REFL PAV MRK TY I (W)24"(SLD) (100MIL)	666 6054 REFL PAV MRK TY I (W)(ARROW) (100MIL)	666 6078 REFL PAV MRK TY I (W)(WORD)(100MIL)	666 6306 RE PM W/RET REQ TY I (W)6"(BRK)(10 0MIL)	666 6321 RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	672 6007 REFL PAV MRKR TY I-C	672 6009 REFL PAV MRKR TY II-A-A
	LF	LF	EA	EA	LF	LF	EA	EA
11 - 0037-04-021	229	129	4	2	1290	5160	76	65
PROJECT TOTALS	229	129	4	2	1290	5160	76	65

STATE OF TEXAS
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Texas Department of Transportation

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SUMMARY OF QUANTITIES

SHEET 7 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		40

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TCP GENERAL NOTES

1. This is a suggested Traffic Control Plan (TCP). When mutually beneficial changes are proposed to the seggested TCP and are agreed upon by the Contractor and the Department, the plan sheets may be developed. The Contractor may submit an alternate TCP, signed and sealed by a Licensed Professional Engineer in Texas, for approval by the Department.

2. Refer to Item 8 "Prosecution and Progress" and project general notes for additional information regarding the Traffic Control Plan.

3. Furnish and install all Traffic Control Plans devices, including but not limited to barricades, signs, and work zone markings, in compliance with the latest version of the Texas Manual on Uniform Traffic Control Devices (TMUTCD), the State Standard Traffic Control Plans (TCP) sheets, and the Barricades and Construction (BC) sheets.

4. Place the traffic control devices only while work is actually in progress or a definite need exists. Always have enough barricades, channelizing devices, and signs at all times to replace those damaged.

5. Cover all existing signs that conflict with the Traffic Control Plan and uncover during non-working hours or as directed by the Engineer. Partial coverage of the sign or coverage by material that will not cover the entire sign all the time is not permitted.

6. Additional signs, barricades and channelizing devices may be required to maintain traffic during construction, as shown on TCP standards. Additional signs, barricades, etc. (if any), will be subsidiary to items 502 "Barricades, Signs and Traffic Handling".

7. Use plastic drums to channelize traffic when existing pavement markings have been obliterated.

8. Limit the length of daily lane closures to maximum of two-miles. Such area must not exceed two miles, unless approved by the Engineer. Within the two mile section, only close off the area where actual work is being performed. Allow for all lanes open to traffic during non-working hours unless otherwise specified in the sequence of construction. Any additional overnight lane closures not specified in the sequence of construction will require approval by the Engineer.

9. Maintain a minimum of one through lane open in each direction during working hours unless otherwise mentioned in the sequence of construction or as directed by the Engineer.

10. Verify the location and spacing of signs, barricades, and channelizing devices prior to their placement along vertical curves, horizontal curves, and other geometric constraints to ensure visibility to all motorists.

11. Vary the spacing of signs to meet traffic conditions or as directed by the engineer and assure that all traffic control devices and work zone pavement markings are kept in a highly visible condition (clean, upright and at proper location).

12. Maintain the roadway surface and work zone striping within the project while the traffic control plan is in effect. Place and be responsible for all work zone pavement markings in accordance with standard sheets WZ(STPM), BC (11), BC (12) and the TMUTCD.

13. Conduct construction operations so as to provide the least possible interference to traffic and to permit the continuous movement of traffic in all allowable directions at all times or as permitted by the sequence of construction. Provide for safe and convenient access to abutting property, highways, public roads, and street crossings except as otherwise shown on the sequence of construction.

14. Regulate all construction traffic to minimal inconvenience to the traveling public. At the times when it is necessary for trucks to stop, unload or cross roadways under traffic, provide warning signs and flaggers as needed to adequately protect the traveling public.

15. Notify the Engineer in writing two weeks prior to shifting of traffic within each phase of the Traffic Control Plan, when applicable and/or as directed by the engineer.

16. Moving an existing sign to a temporary location is subsidiary to item 502. Installations with permanent supports at permanent locations will be paid for under the applicable bid item(s).

17. Use truck mounted attenuators as noted on the plans, TxDOT traffic control plan standards or as directed by the engineer.

18. If the contractor chooses to work multiple locations, simultaneously with approval of the engineer, the contractor will be responsible for providing all applicable traffic control devices, including portable changeable message boards, at their own expense.

19. Placement of portable changeable message sign as advance notice of lane closures will be required at least 1 week before closure or as directed by the engineer. For locations that are adjacent to each other, a single sign in advance of the entire work area is acceptable. Portable changeable message sign must be used in all phases of the project and is intended to be relocated as needed or as directed by the engineer.

20. Refer to BC(6) Portable Changeable Message Sign (PCMS) Standards for a listing of abbreviated words and two-word phrases that are acceptable for use on PCMS. Submit the suggested message for the board to the Engineer for approval.

21. Place all stockpiled material, waste material, signs, barricades, channelizing devices, and work vehicles not in use, at a minimum of 30 feet from the outer edge of the nearest travel lane.

22. Maintain all existing drainage conditions during all construction phases until the permanent drainage facilities are constructed and ready to use. Handle excavated and stockpiled material in such a way that it will not block drainage.

23. During non-working hours all drop-offs are to be filled. Refer to standard WZ(UL) for lateral drop-offs and details shown in the plans or as directed by the Engineer.

24. During the holiday time frame of December 21st through January 1st, every effort should be taken to ensure that all travel lanes remain open where possible.

Remove from the work area all loose materials and debris resulting from construction operations at the end of each workday.

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12/22/2023

Texas Department of Transportation

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TCP
GENERAL NOTES

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		41

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OVERLAY SEQUENCE OF CONSTRUCTION

GENERAL INSTRUCTIONS

THIS IS A DISTRICT-WIDE ROADWAY SURFACING PROJECT AND WORK ON EACH ROADWAY SECTION SHALL BE PERFORMED IN (9) PHASES, AS APPLICABLE. ONCE WORK HAS BEGUN AT A REFERENCE LOCATION, ALL PHASES MUST BE WORKED ON CONTINUOUSLY TO COMPLETION BEFORE STARTING WORK AT ANOTHER LOCATION.

PORTABLE MESSAGE SIGNS MUST BE IN USED IN ALL PHASES OF THE PROJECT AND ARE INTENDED TO BE RELOCATED AS NEEDED OR AS DIRECTED BY THE ENGINEER.

SPEED RADAR FEEDBACK SIGNS MUST BE USED IN ALL PHASES AND LOCATIONS OF THE PROJECT AND ARE INTENDED TO BE RELOCATED AS NEEDED OR AS DIRECTED BY THE ENGINEER.

ANY PAVEMENT STRUCTURE REPAIRS OR BLADING WORK NEEDED IN THE ROADWAY SHALL BE COORDINATED WITH TXDOT PERSONNEL AND APPROVED BY THE ENGINEER.

SPOT BASE REPAIRS SHALL BE COMPLETED THE SAME DAY TO AVOID DROP OFFS GREATER THAN 2" AT THE END OF EACH WORKING DAY. ROADWAY SURFACE SHALL NOT BE EXPOSED TO MORE THAN 2 DAYS, BEFORE PLACING THE CORRESPONDING BONDING COURSE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

ROADWAY RESURFACING OPERATION WILL NOT BE PERFORMED IN CONCRETE PAVEMENT AREAS AND OTHER AREAS SHOWN ON THE PLANS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

PRE-PLACEMENT MEETING MUST BE CONDUCTED BEFORE PLACEMENT OF HOTMIX.

FOR LOCATIONS 3, 7, 8, 9 & 10 WORKING HOURS PERMITTED SHALL BE FROM 9PM- 6AM TO AVOID PEAK HOURS, UNLESS APPROVED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES:

THE FOLLOWING WORK WILL BE PERFORMED ON THE ROADWAY. REFER TO TCP PHASES, TCP GENERAL NOTES AND CORRESPONDING PLAN SHEETS FOR MORE DETAILED INFORMATION.

INSTALL ALL APPLICABLE BARRICADES, SIGNS AND WORK ZONE MARKINGS IN ACCORDANCE WITH PROJECT'S TCP, APPLICABLE TXDOT STANDARD SHEETS, AND TCP BC STANDARDS FOR TRAFFIC CONTROL SETUP.

INSTALL ALL APPLICABLE ADVANCE WARNING SIGNS IN ACCORDANCE WITH TXDOT TCP STANDARD SHEETS. INSTALL SPEED REDUCTION SIGN CONFIGURATIONS IN ALL SPECIFIED LOCATIONS IN THE PLANS.

AT THE COMMENCEMENT OF THE PROJECT, ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCEPTABLE CONDITION, AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT, AS PER GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES AND FEATURES. CONTRACTOR SHALL HAVE A SUFFICIENT AMOUNT OF TRAFFIC CONTROL DEVICES TO REPLACE ANY DAMAGED TRAFFIC CONTROL DEVICE WITHIN 24 HRS OF NOTIFICATION. PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD CONSTRUCTIBILITY & VISIBILITY. THESE ADDITIONAL SIGNS WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

WHERE APPLICABLE, THE CONTRACTOR WILL PLACE ALL TRAFFIC CONTROL SIGNS, BARRICADES, AND CHANNELIZING DEVICES FOR ONE-WAY TRAFFIC CONTROL OPERATIONS AS SHOWN ON THE TRAFFIC CONTROL PLANS. REFER TO STANDARDS AND CONSTRUCTION STANDARD SHEETS AS WELL AS GENERAL NOTES.
A PILOT CAR AND RADIO EQUIPPED FLAGGERS ARE REQUIRED FOR ALL UNDIVIDED ROADWAY LOCATIONS AS DIRECTED BY THE ENGINEER. THE PILOT CAR WITH NECESSARY FLAGGERS AND/OR RADIO EQUIPPED FLAGGERS AND SIGNS, EQUIPMENT, LABOR AND INCIDENTALS REQUIRED FOR THIS METHOD OF TRAFFIC CONTROL WILL BE PAID FOR DIRECTLY THROUGH ITEM 510.

CONTRACTOR SHALL MAINTAIN TCP AND LANE CLOSURE UNTIL ALL WORK IN AREA HAS BEEN COMPLETED. ADJACENT LANES (SAME DIRECTION) MAY BE COMBINED WHEN APPLICABLE AND AS APPROVED BY THE ENGINEER.

TEMPORARY RUMBLE STRIPS SHALL BE USED IN ALL APPLICABLE LOCATIONS.

SW3P:

INSTALL REQUIRED SW3P MEASURES WITHIN CONSTRUCTION LIMITS AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

ADDITIONAL NOTES:

LIMIT THE LENGTH OF LANE CLOSURE TO A MAXIMUM OF TWO (2) MILE ROADWAY SEGMENT AT ANY GIVEN TIME, UNLESS APPROVED BY THE ENGINEER.

FOR ALL LOCATIONS, IN THE EVENT OF A SEGMENT NOT BEING COMPLETED AT THE END OF THE DAY NO DROP OFFS GREATER THAN 2" SHALL BE LEFT. CONTRACTOR SHALL IMPLEMENT "CONSTRUCTION JOINT DETAIL" FOR LONGITUDINAL DROP OFFS AND CONDUCT ROADWAY SWEEPING BEFORE OPENING TO TRAFFIC.

INSTALL ANY REQUIRED WORK ZONE SHORT TERM TABS TO GUIDE TRAFFIC PRIOR TO OPENING TRAVEL LANES.

FOR LOCATIONS WITH RAILROAD CROSSINGS, THE CONTRACTOR WILL COORDINATE WITH THE ENGINEER TO OBTAIN FLAGGERS PRIOR TO COMMENCING THE PROPOSED WORK. REFER TO THE RAILROAD REQUIREMENTS AND RAILROAD SCOPE OF WORK FOR MORE INFORMATION.

CONTRACTOR WILL VERIFY, IF APPLICABLE, ANY RAILROAD R.O.W. BEFORE CONSTRUCTION STARTS. NO WORK IS TO BE DONE WITHIN THE RAILROAD R.O.W., UNLESS SPECIFICALLY STATED ON THE PLANS. AT NO TIME DURING CONSTRUCTION OPERATIONS SHALL THE CONTRACTOR ALLOW EQUIPMENT TO ENCROACH WITHIN 25 FEET OF THE NEAREST RAIL.

SEQUENCE OF WORK

PHASE 1- INSTALL TRAFFIC CONTROL DEVICES

SET UP TEMPORARY TRAFFIC CONTROL DEVICES AND BARRICADES FOR SURFACING OPERATIONS ON THE PROPOSED LOCATIONS AND BEFORE COMMENCING WORK ON THE ROADWAY.

PHASE (2 - 3) & (5 - 8):
LOC. 1,2,8 & 10 - USE TCP(2-6)-18, TCP(5-1)-18, TCP(6-1)-12, TCP(6-2)-12, TCP(6-3)-12, TCP(6-4)-12, TCP(6-5)-12, TCP(7-1)-13 & TCP CLOSURE DETAIL "LOC. 8- TURNAROUNDS"

LOC. (3-7 & 9)- USE TCP(2-1)-18, TCP(2-2b)-18, TCP(2-4)-18 &
TCP CLOSURE DETAIL "LOC. 6 -PTB INSTALLATION LAYOUT"

PHASE 4: USE TCP(3-1)-13, TCP(3-2)-13, TCP(3-3)-14, TCP(3-4)-13

PHASE 2- PERFORM MILLING & FLEXIBLE PAVEMENT STRUCTURE REPAIRS.

OPTION 1 FOR OVERLAY LOCATIONS:
PERFORM ANY PAVEMENT STRUCTURE REPAIRS PREVIOUSLY APPROVED BY TXDOT PERSONNEL.

OPTION 2 FOR MILL AND INLAY LOCATIONS:
PERFORM PLANNING OPERATIONS ON LOCATIONS SHOWN ON THE PLANS AND PERFORM PAVEMENT STRUCTURE REPAIRS PREVIOUSLY APPROVED BY TXDOT PERSONNEL.

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TCP SEQUENCE OF CONSTRUCTION

 SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		42

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OVERLAY SEQUENCE OF CONSTRUCTION (CONT.)

PHASE 3- PLACE SURFACE MIX

PERFORM ROADWAY SWEEPING PRIOR TO RESURFACING OPERATIONS.

PLACE BONDING COURSE ON LOCATIONS SHOWN ON THE PLANS.

PLACE ROADWAY SURFACE MIX AT WIDTHS AND RATES SPECIFIED ON "TYPICAL SECTIONS" AND "RATE OF APPLICATION" SHEETS.

INSTALL WORK ZONE SHORT TERM TABS/ MARKINGS.

PHASE 4- PLACE FINAL PAVEMENT MARKINGS AND PERFORM TEXTURIZING OF PAVEMENT SHOULDERS AND OR/ CENTERLINE

REMOVE WORK ZONE SHORT TERM TABS/MARKINGS AND INSTALL FINAL PAVEMENT MARKING FOR THE LIMITS SHOWN IN THE PLANS. REFER TO PM STANDARD SHEETS AND SUPPLEMENTAL PAVEMENT MARKING SHEETS FOR MORE DETAILS.

MILL RUMBLE STRIPS ON SHOULDERS/ CENTERLINE AS PER STANDARD AND SPECIFICATIONS AND ON LOCATIONS MENTIONED IN THE PLANS.

PHASE 5- PERFORM BLADING AND BACKFILL EDGES

CONDUCT BLADING WORK PREVIOUSLY IDENTIFIED OR DIRECTED BY THE ENGINEER.

BACKFILL EDGES AT AREAS SPECIFIED IN THE PLANS.

PHASE 6- REMOVE/ INSTALL MBGF/ RAIL AT LOCATIONS SPECIFIED IN THE PLANS

PHASE 1 - REMOVE EXISTING MBGF, RAIL SHOWN IN THE PLANS
PHASE 2 - INSTALL PROPOSED MBGF/ RAIL
PHASE 3 - INSTALL PROPOSED MOW STRIP AT LOCATIONS SHOWN IN THE PLANS

REMOVAL OF EXISTING MBGF WILL BE LIMITED TO THAT WHICH CAN BE REMOVED AND INSTALLED WITHIN THE SAME DAY. THIS PHASE CAN BE WORKED IN CONJUNCTION WITH OTHER PHASES MENTIONED IN THE SEQUENCE OF CONSTRUCTION AS APPROVED BY THE ENGINEER.

PHASE 7- INSTALLATION OF RAISED MEDIAN - LOC. 9

PHASE 1 - REMOVE DELINEATORS SHOWN IN THE PLANS
PHASE 2 - PLACE RAISED MEDIAN AND RIPRAP AS SHOWN IN THE PLANS
PHASE 3 - INSTALL FINAL PAVEMENT MARKINGS AS SHOWN IN "PAVEMENT MARKING LAYOUTS"
PHASE 4 - REPLACE ROADWAY SIGNS AS SHOWN IN THE PLANS

THIS PHASE CAN BE WORKED IN CONJUCTION WITH OTHER PHASES MENTIONED IN THE SEQUENCE OF CONSTRUCTION AS APPROVED BY THE ENGINEER.

PHASE 8- INSTALLATION OF CONCRETE ISLANDS- LOC. 10

PHASE 1 - REMOVE DELINEATORS SHOWN IN THE PLANS
PHASE 2 - PLACE RAISED DIVIDER AND RIPRAP AS SHOWN IN THE PLANS
PHASE 3 - INSTALL FINAL PAVEMENT MARKINGS

THIS PHASE CAN BE WORKED IN CONJUCTION WITH OTHER PHASES MENTIONED IN THE SEQUENCE OF CONSTRUCTION AS APPROVED BY THE ENGINEER.

PHASE 9- PERFORM FINAL CLEAN UP

PERFORM FINAL CLEAN UP AND REMOVE ALL BARRICADES, AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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DocuSigned by:
Cynthia Garcia
96CA7DFE12674F3...

12/22/2023

Texas Department of Transportation

IH 35, etc.

TCP SEQUENCE OF CONSTRUCTION

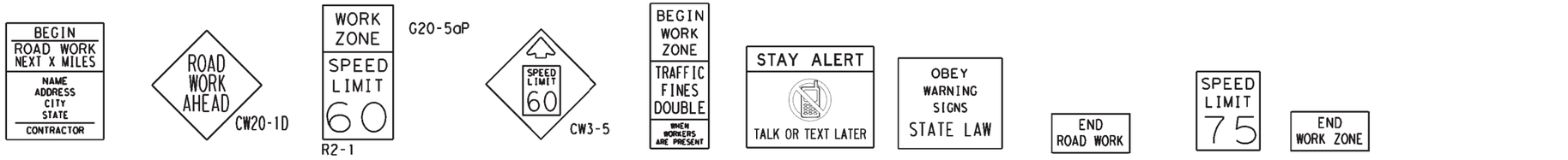
 SHEET 2 OF 2

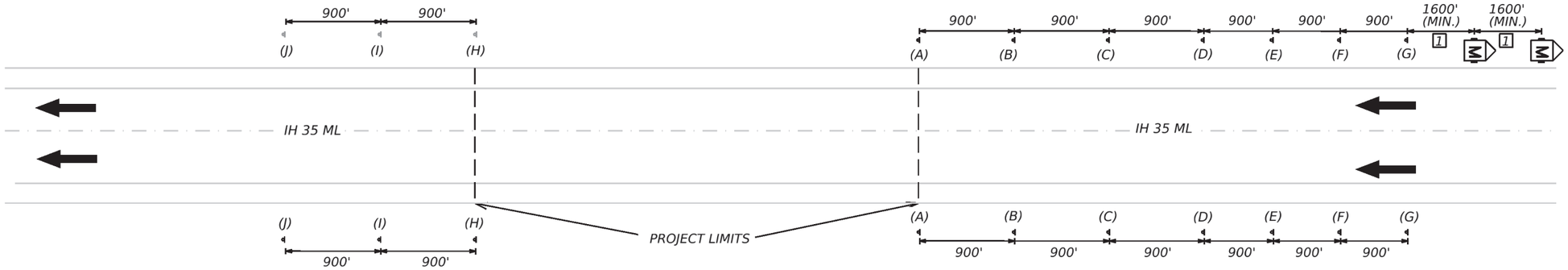
CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		43

DATE: 12/8/2023 12:35:00 PM
FILE: c:\txdot\pw_online\txd015\daniel.garzald\d1010034\1091TCP SEQUENCE OF CONSTRUCTIONL.dgn

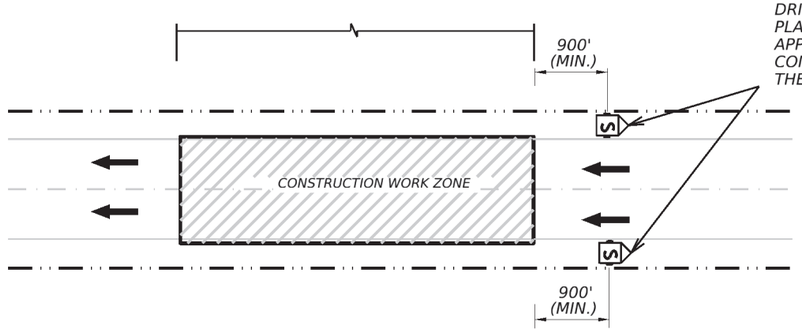
LEGEND

- Portable Changeable Message Sign (PCMS)
- Traffic Flow
- Sign
- Driver Feedback Speed Sign





REFER TO TCP STANDARDS FOR CONSTRUCTION ZONE SIGN SETUP



DRIVER FEEDBACK SPEED SIGN TO BE PLACED MIN. 900 FT BEFORE FIRST SIGN OF APPLICABLE TCP STANDARD FOR THE CONSTRUCTION WORK ZONE OR AS DIRECTED BY THE ENGINEER.

NOTES

1. DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1/2 MILE OR MORE ADVANCE WARNING
   REFER TO BC(2)-21 FOR MORE INFORMATION

LOC. 1 IH 35 NBML & LOC. 2 IH 35 SBML

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PLACEMENT OF MESSAGE SIGN & TMSP RADAR

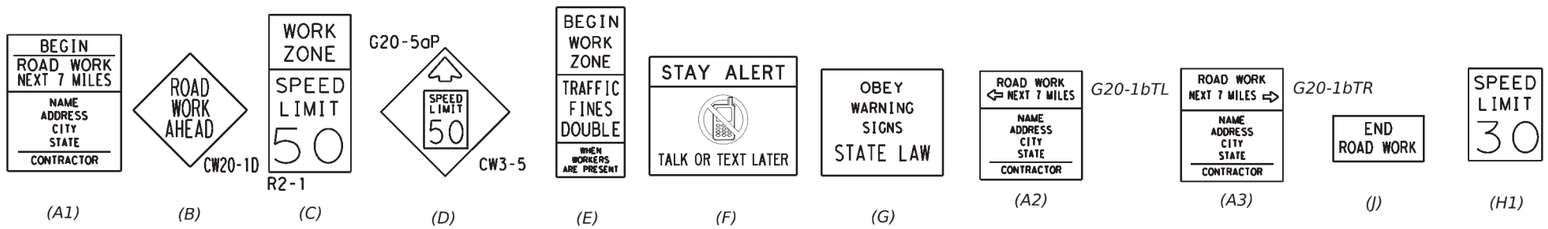
 SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		44

DATE: 12/8/2023 12:35:11 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garzald1010034091 TCP Messaging Sign & TMSP Radar 1.dgn

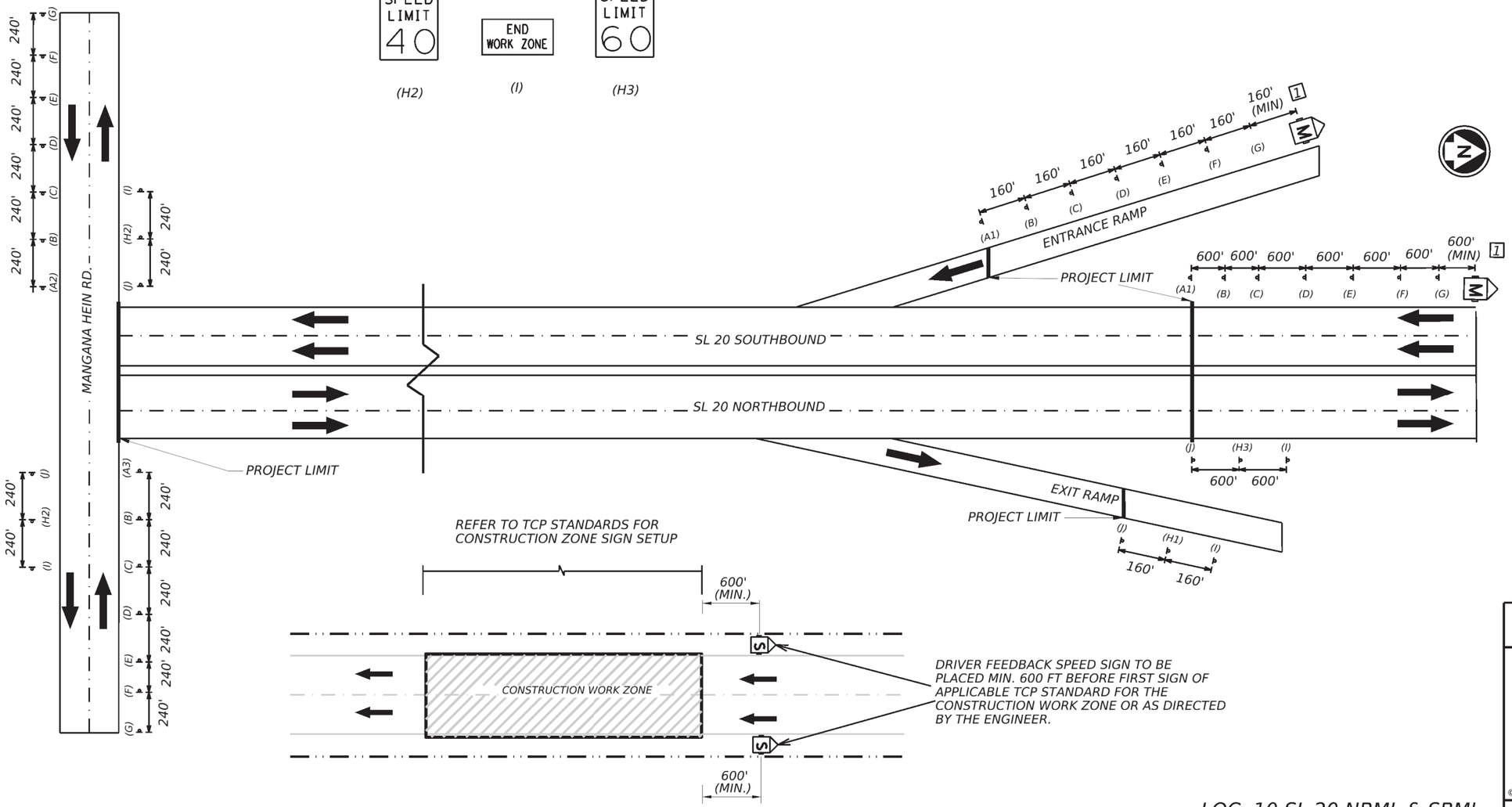
NOTES

1. DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1/2 MILE OR MORE ADVANCE WARNING
* REFER TO BC(2)-21 FOR MORE INFORMATION



LEGEND

- Portable Changeable Message Sign (PCMS)
- Traffic Flow
- Sign
- Driver Feedback Speed Sign



LOC. 10 SL 20 NBML & SBML

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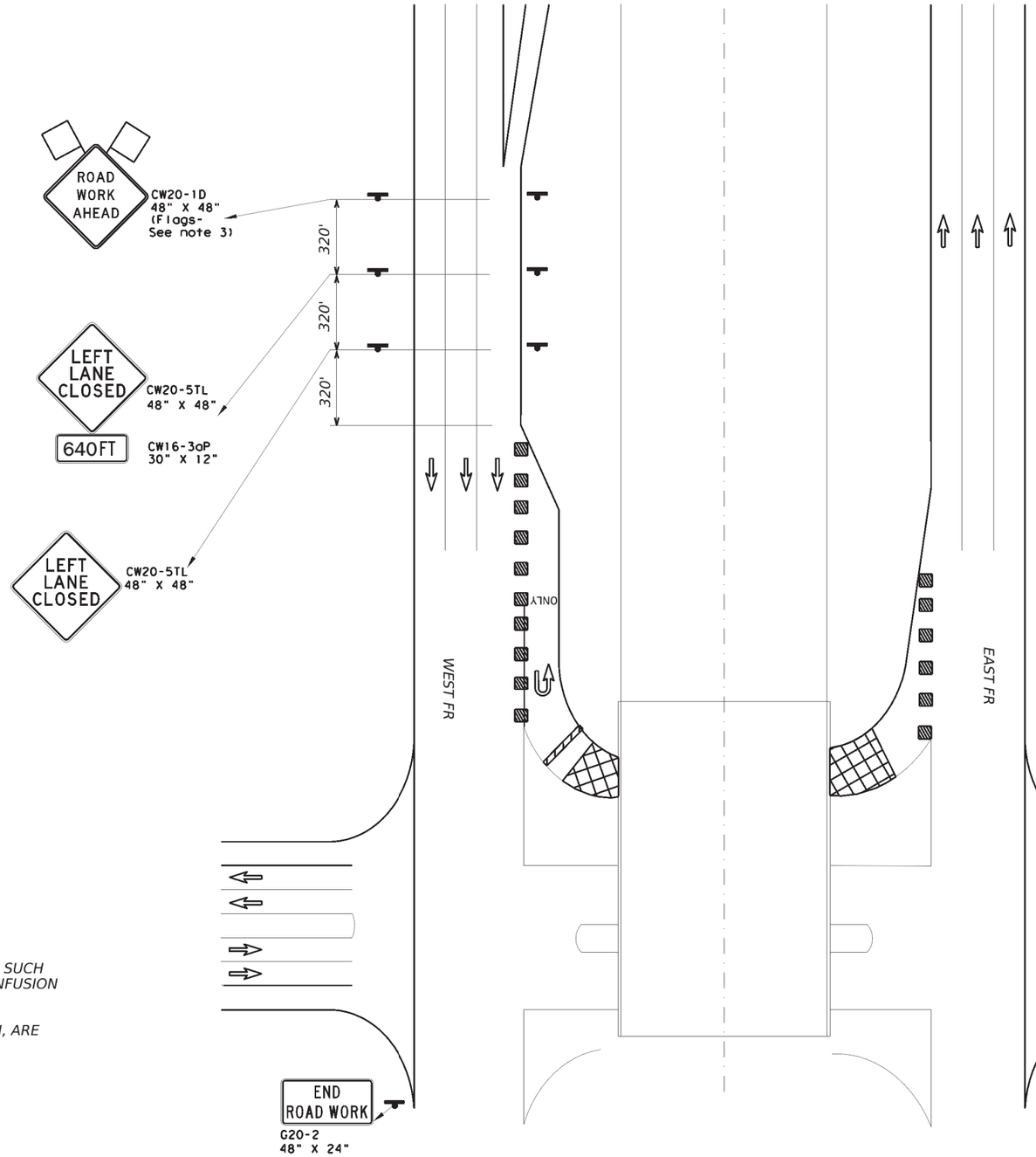
IH 35, etc.

PLACEMENT OF MESSAGE SIGN & TMSP RADAR

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		45

DATE: 12/8/2023 3:52:31 PM
FILE: c:\txdot\ow online\txdot5\daniel.garza\d1010034\091 TCP Messaging Sign & TMSP Radar2.dgn



LEGEND

- *Channelizing Devices*
- *Type 3 Barricade*
- *Sign*
- *Traffic Flow*
- *Work Space*

N

NOTES:

1. WHEN EXIT RAMP IS PRESENT. PLACE SIGNS SUCH THAT THEY DO NOT INTERFERE OR CAUSE CONFUSION WITH EXISITING SIGNS ON MAINLANES.

2. FLAGS ATTACHED TO SIGNS WHERE SHOWN, ARE REQUIRED.

LOC. 8 IH 35 EFR - TURNAROUNDS

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IH 35, etc

TCP CLOSURE DETAIL

 SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		46

DATE: 12/8/2023 12:35:34 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garzald\10100341\TCP Closure Detail 4.dgn

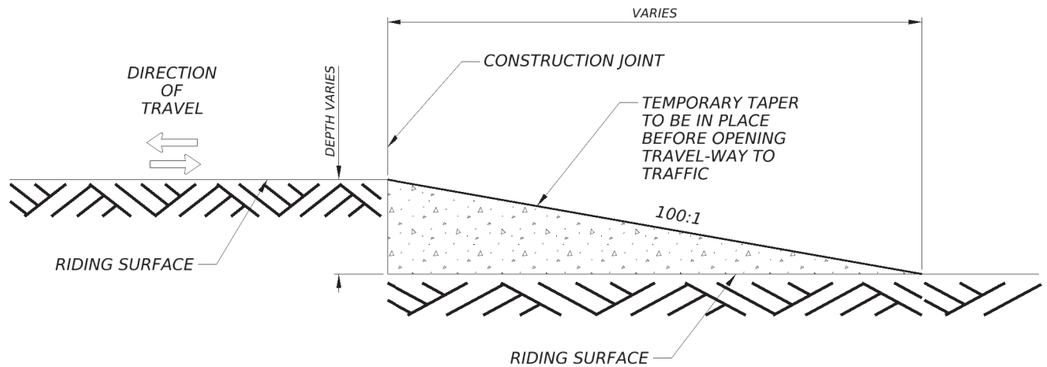
CK:
DW:
CK:
DN:

NOTES:

- DURING ANY PHASE OF CONSTRUCTION, A CONSTRUCTION JOINT TAPER IS TO BE IN PLACE AT THE END OF THE WORK DAY PRIOR TO OPENING ALL LANES TO TRAFFIC, IN ALL DIRECTIONS.

- USE FOR ALL LONGITUDINAL DROP-OFFS WHICH MAY RESULT FROM PLANING, OVERLAYS, OR ANY OTHER CONSTRUCTION OPERATIONS.

- PLACEMENT AND REMOVAL OF THIS CONSTRUCTION TAPER DURING CONSTRUCTION WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO ITEM 502.



CONSTRUCTION JOINT TAPER - END OF WORK DAY
(PROFILE)

DATE: 12/8/2023 12:35:46 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garzald\d0100341091 TCP Const Joint Dtl.dgn

Texas Department of Transportation

IH 35, Etc.

TCP
CONSTRUCTION JOINT
DETAIL

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		47

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

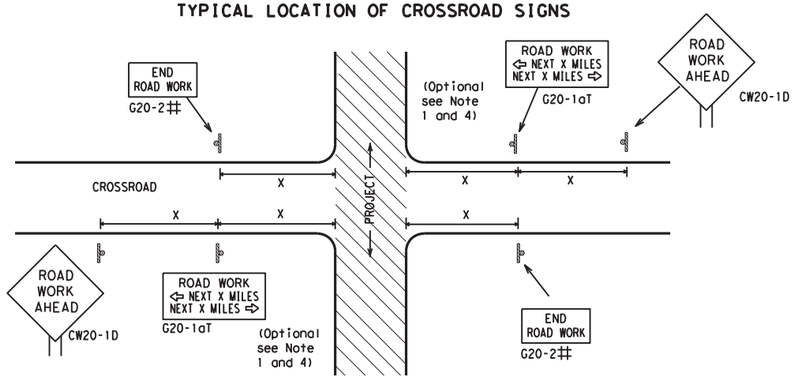
Texas Department of Transportation | Traffic Safety Division Standard

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 4-03 7-13 9-07 8-14 5-10 5-21	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		48

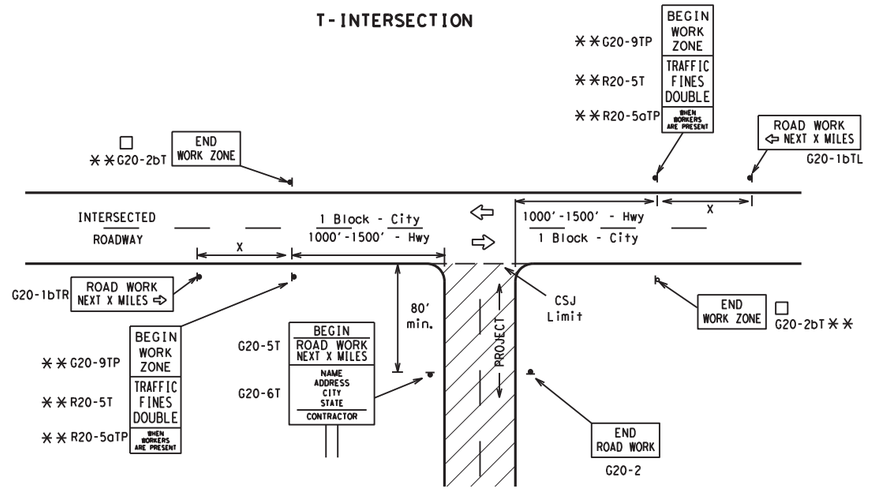
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

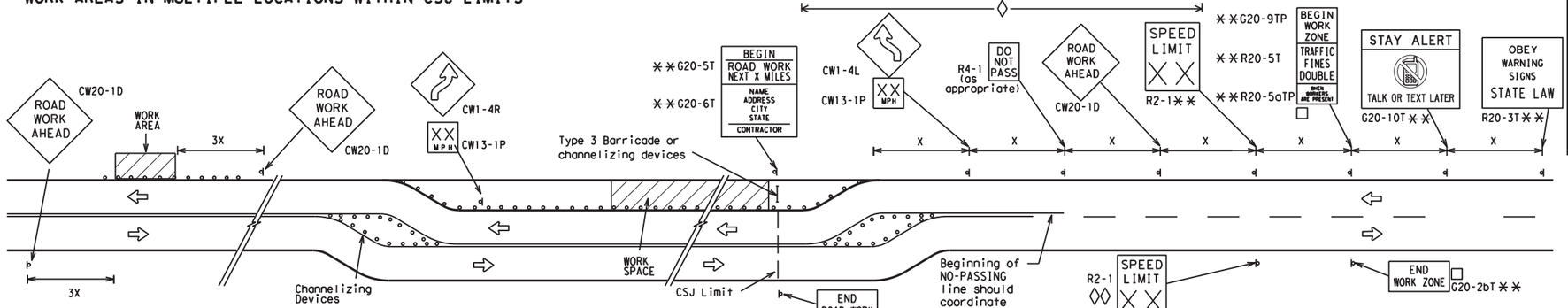
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

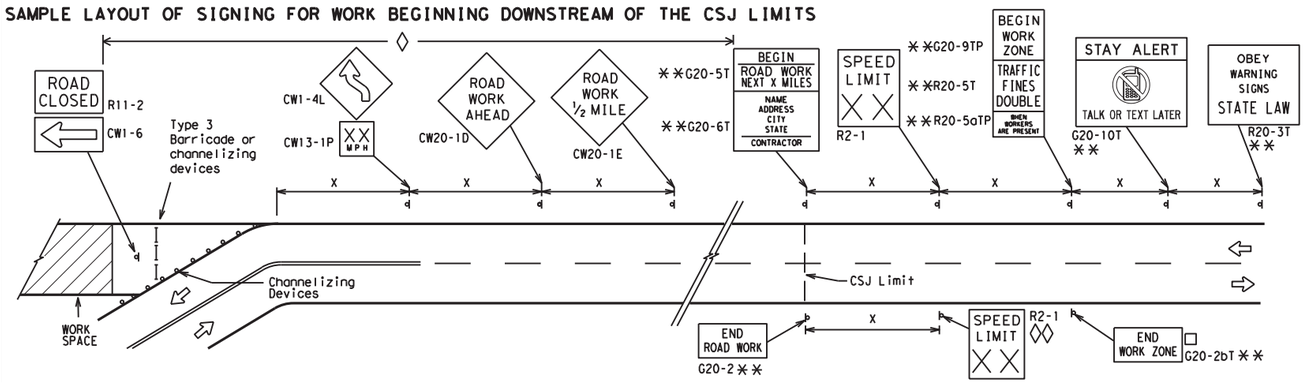
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE 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



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

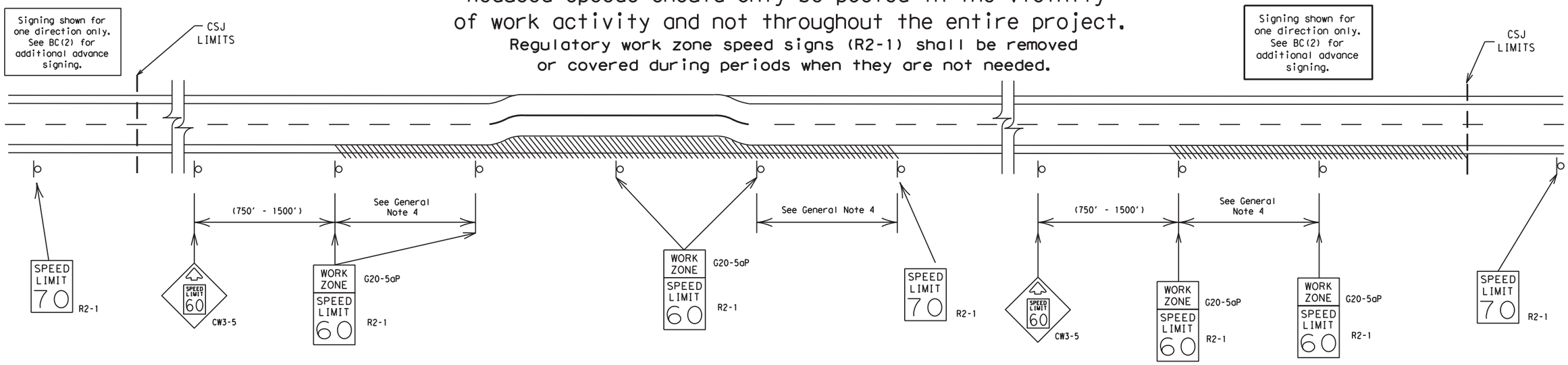
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	22	LA SALLE, Etc.		49

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.

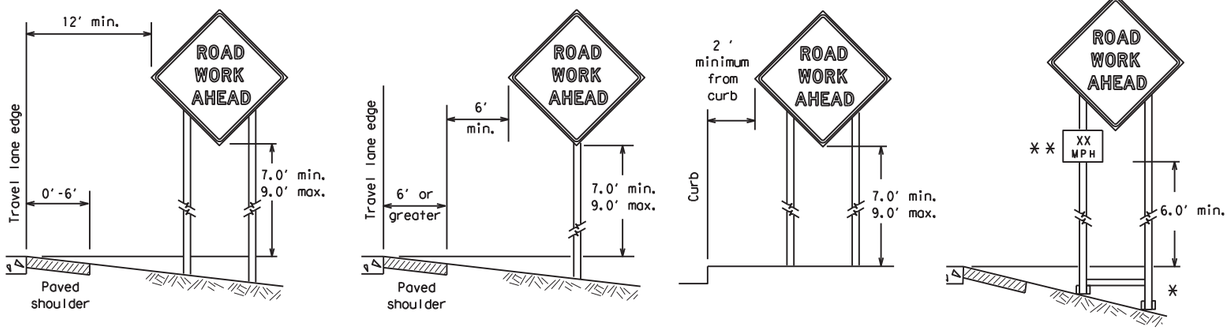
Texas Department of Transportation | Traffic Safety Division Standard

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 9-07 8-14 7-13 5-21	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		50

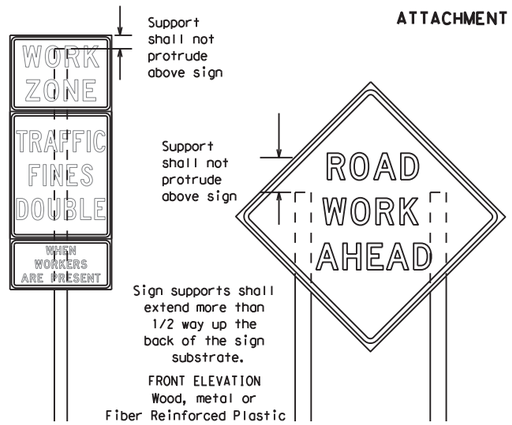
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

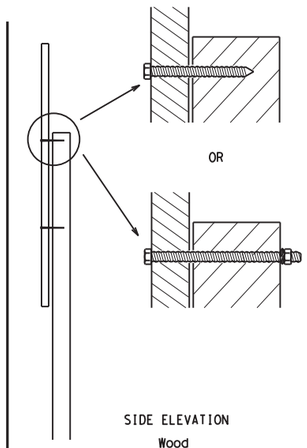


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

* * 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





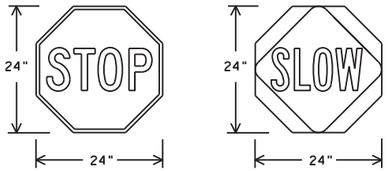
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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	0018	02	091,etc.	IH 35,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	22	LA SALLE, Etc.		51

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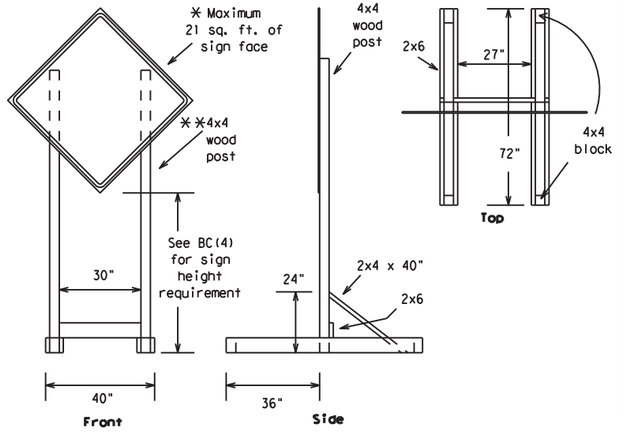
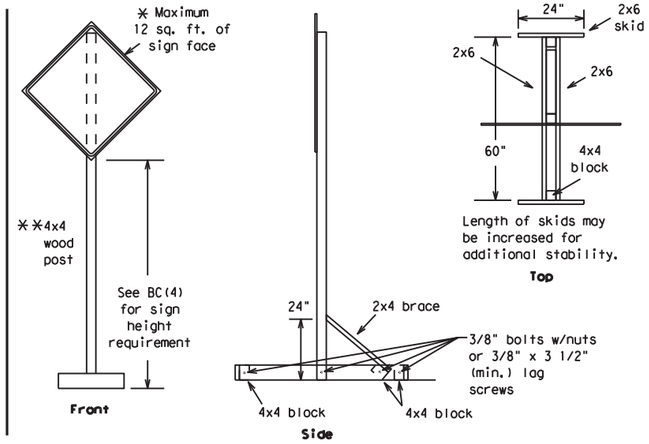
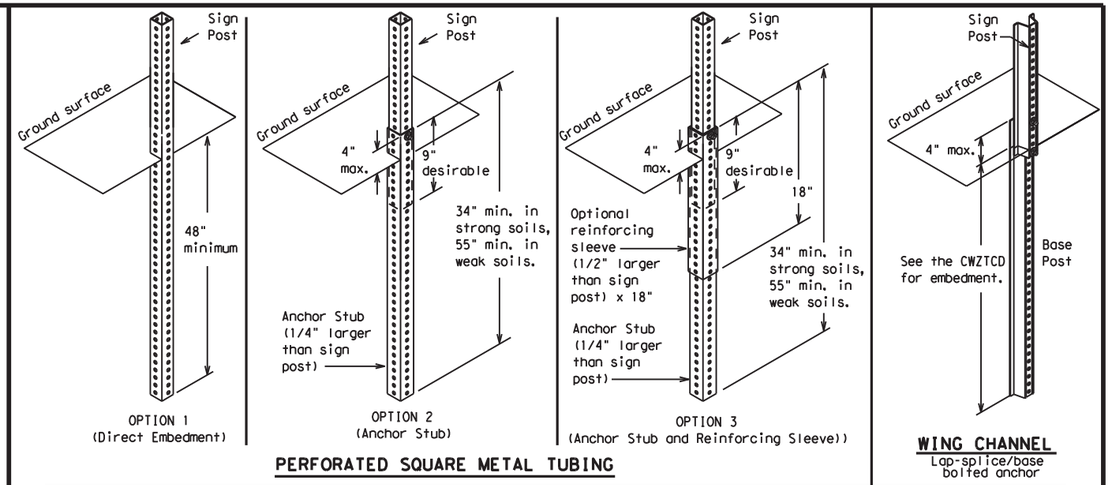




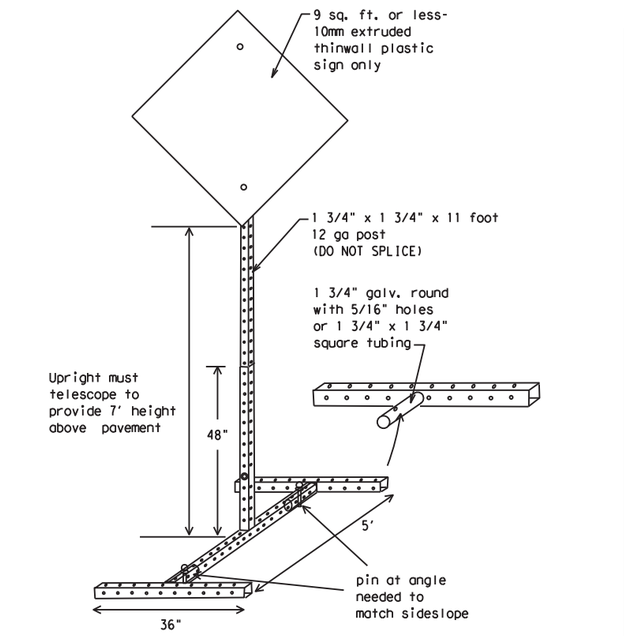
SKID MOUNTED WOOD SIGN SUPPORTS

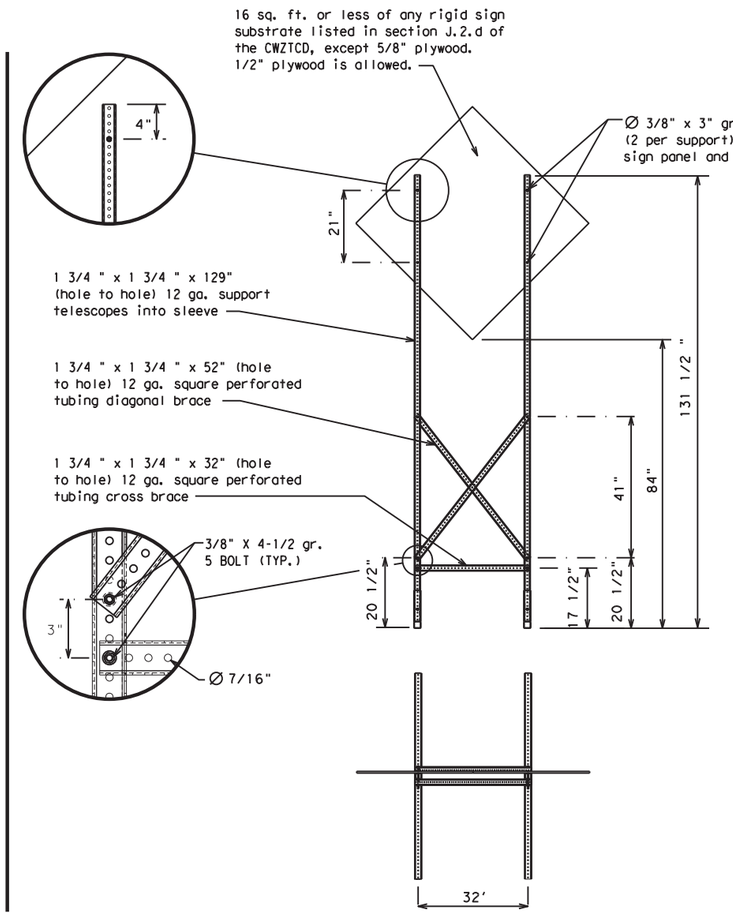
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

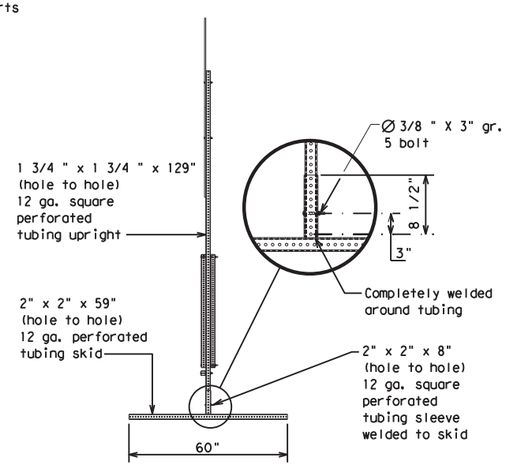


GROUND MOUNTED SIGN SUPPORTS

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	0018	02	091,etc.	IH 35,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	22	LA SALLE, Etc.		52

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
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
REVISIONS	0018	02	091,etc.	IH 35,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	22	LA SALLE, Etc.		53

100

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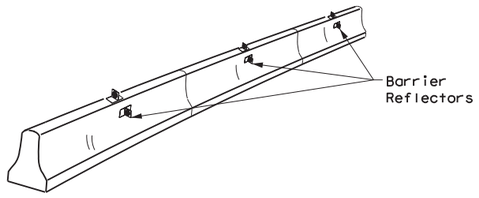
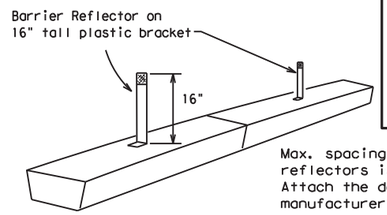
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

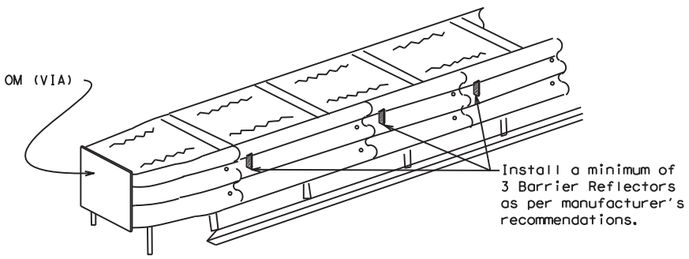


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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.

LOW PROFILE CONCRETE BARRIER (LPCB)

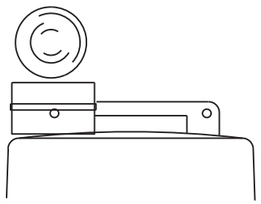


DELINEATION OF END TREATMENTS

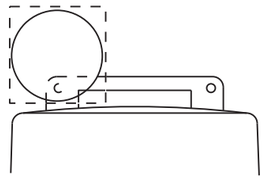
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

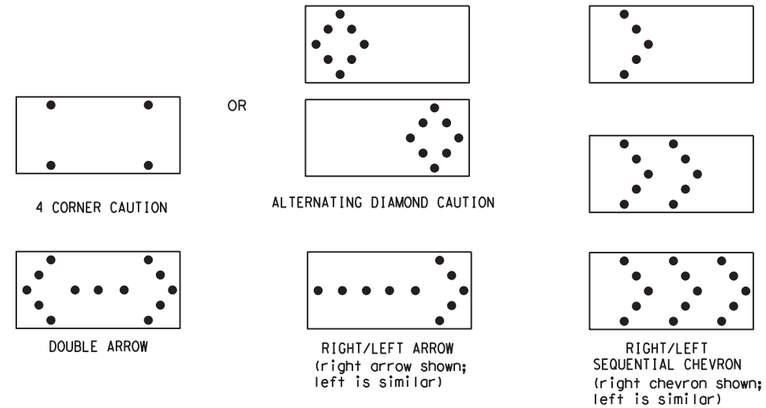
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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
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REVISIONS	0018	02	091,etc.	IH 35,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

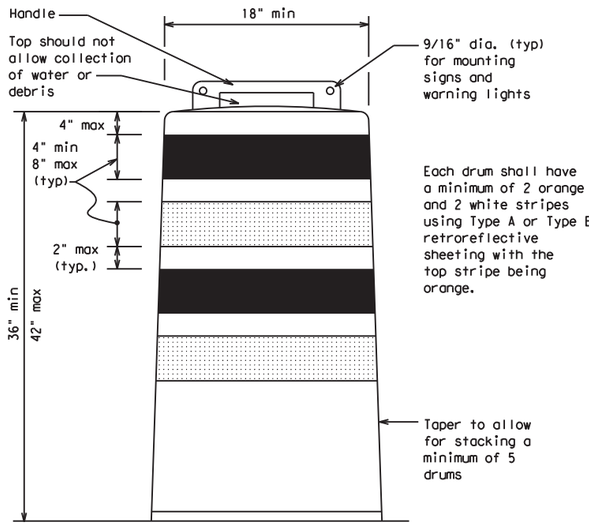
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

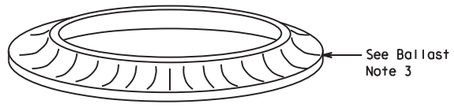
RETROREFLECTIVE SHEETING

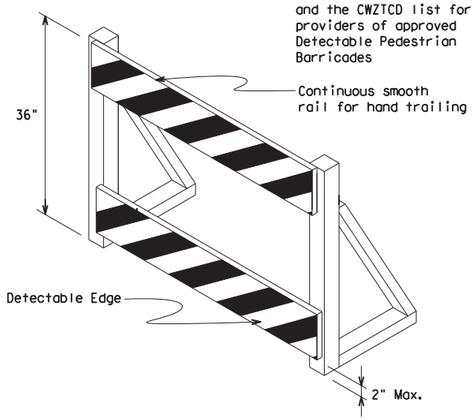
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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



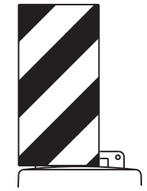




DETECTABLE PEDESTRIAN BARRICADES

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

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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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REVISIONS	0018	02	091,etc.	IH 35,etc.
4-03 8-14	DIST	COUNTY		SHEET NO.
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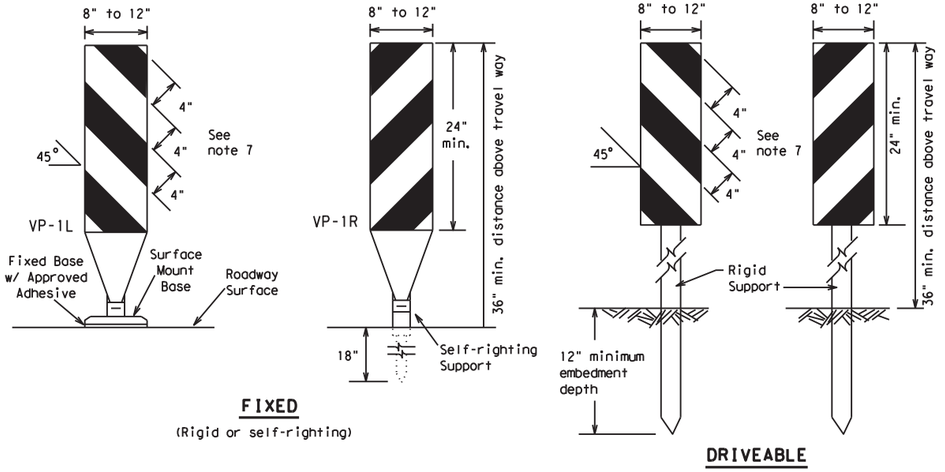
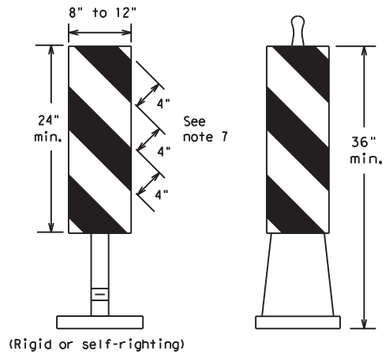


FIXED
(Rigid or self-righting)

DRIVEABLE

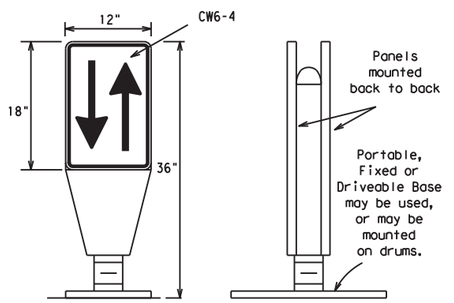


(Rigid or self-righting)

PORTABLE

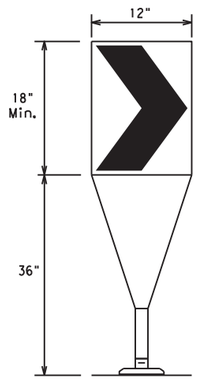
VERTICAL PANELS (VPs)

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.



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)



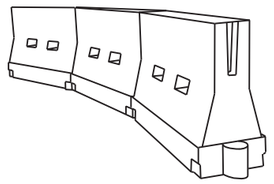
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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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REVISIONS	0018	02	091,etc.	IH 35,etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
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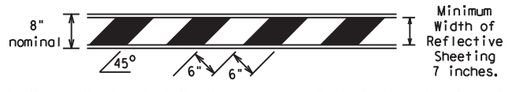
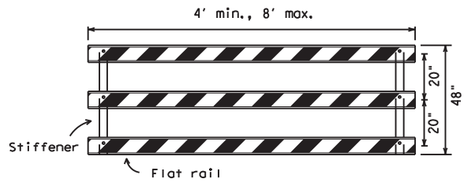
TYPE 3 BARRICADES

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.



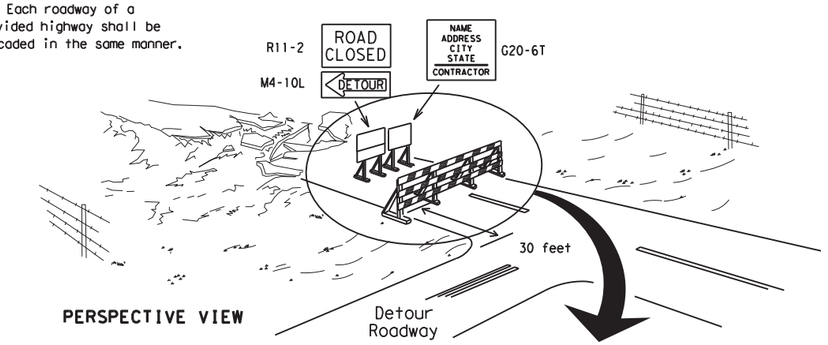
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

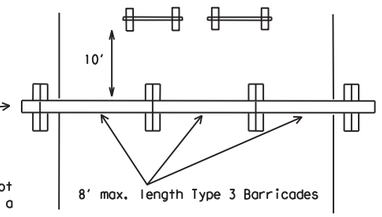
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

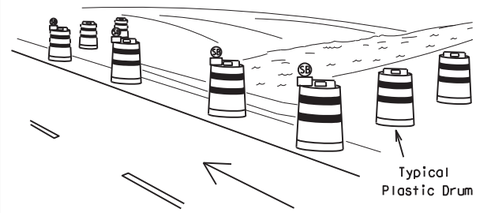
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

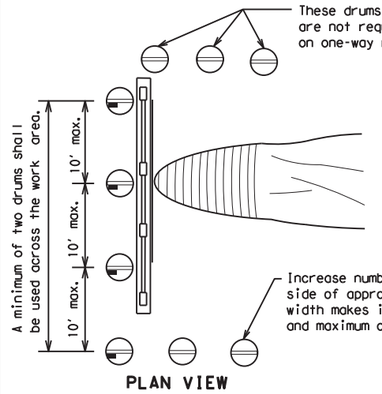
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

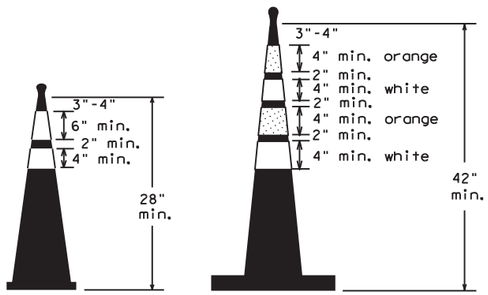
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



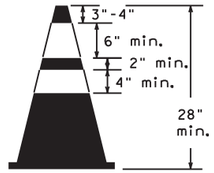
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

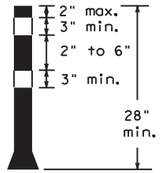
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

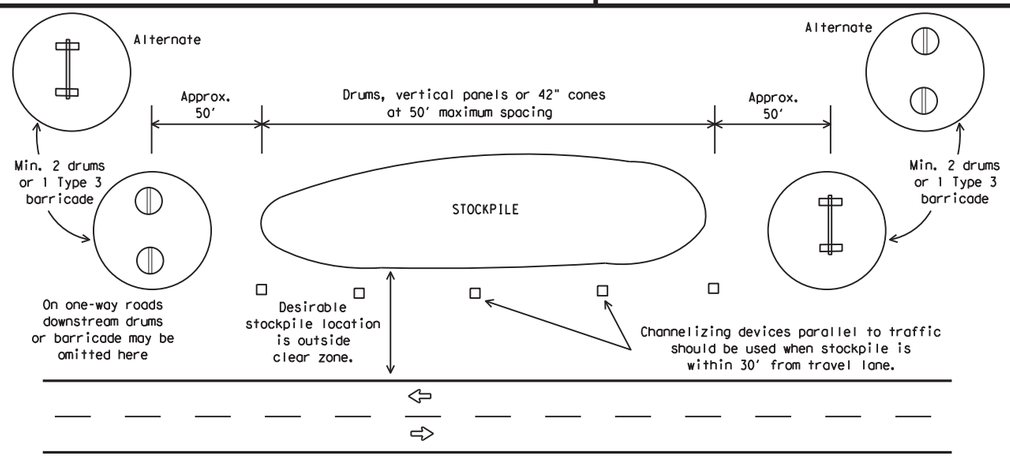


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		57

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.

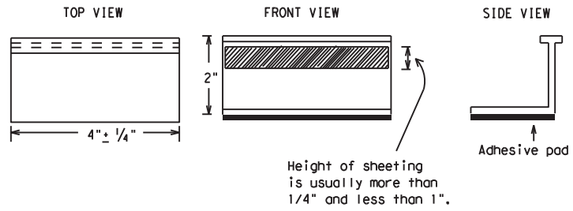
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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	0018	02	091,etc.	IH 35,etc.
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	22	LA SALLE, Etc.		58
11-02 8-14				

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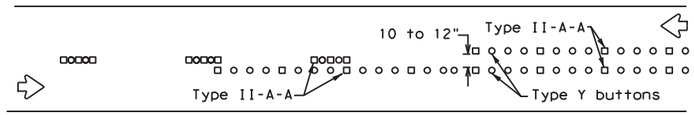
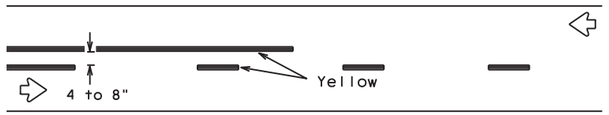
PAVEMENT MARKING PATTERNS

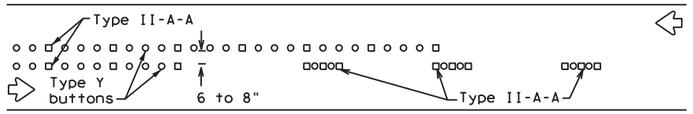
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



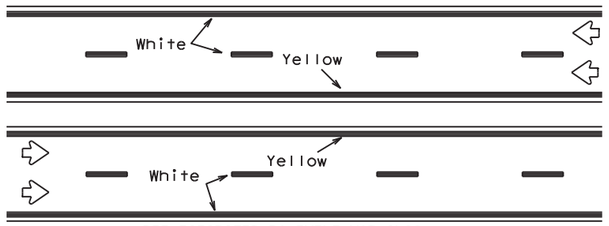
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



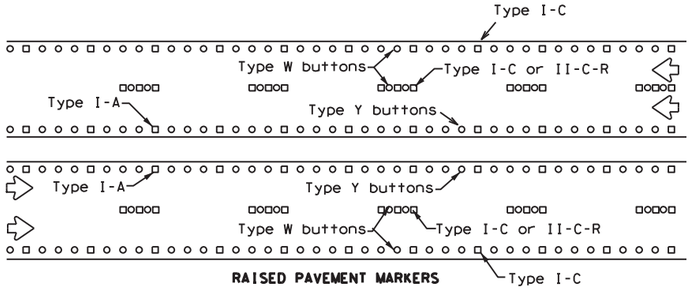
RAISED PAVEMENT MARKERS - PATTERN B

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

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



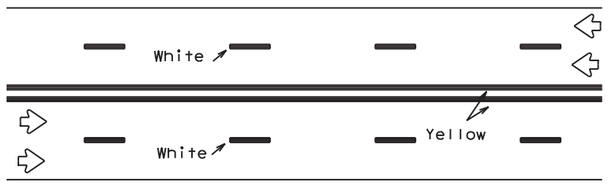
REFLECTORIZED PAVEMENT MARKINGS



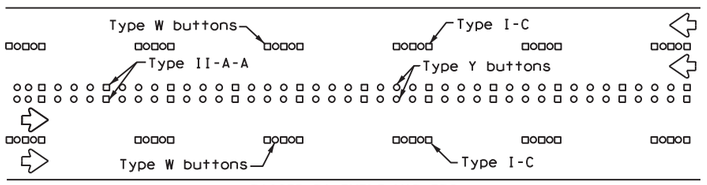
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



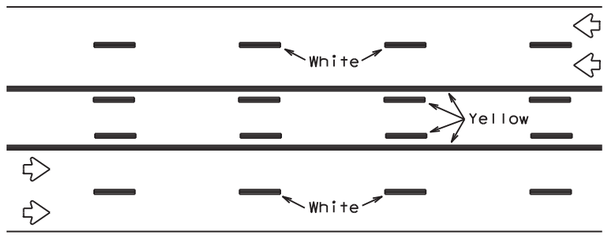
REFLECTORIZED PAVEMENT MARKINGS



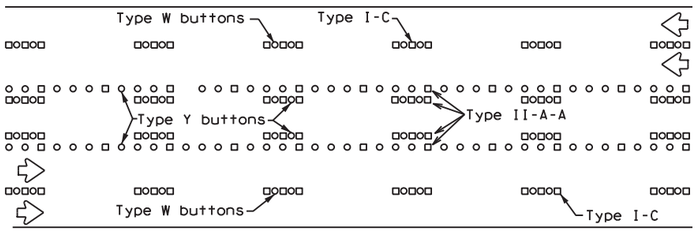
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

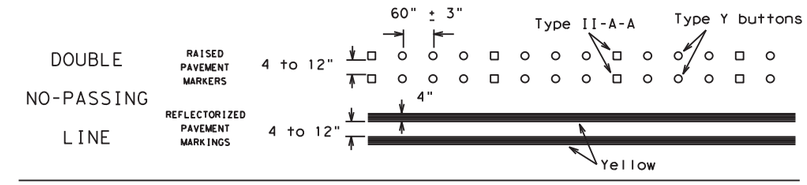
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

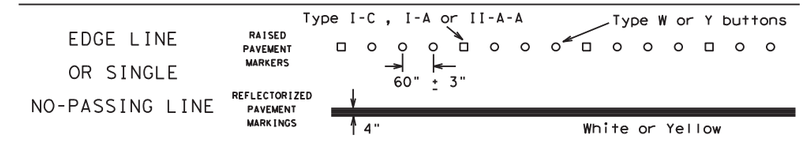
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

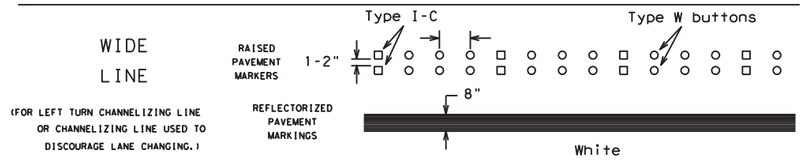


EDGE LINE OR SINGLE NO-PASSING LINE



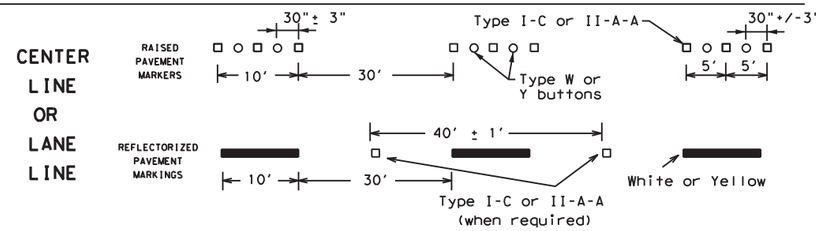
WIDE LINE

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

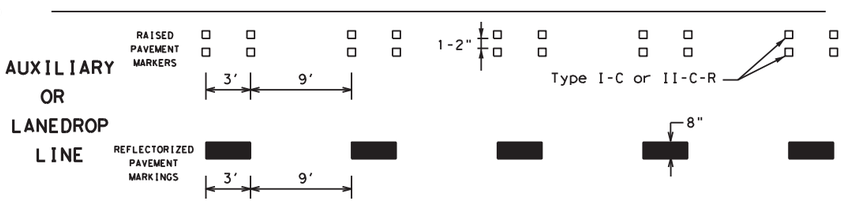


BROKEN LINES

CENTER LINE OR LANE LINE

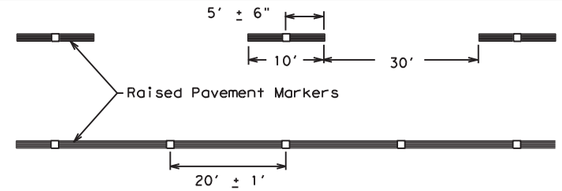


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		59

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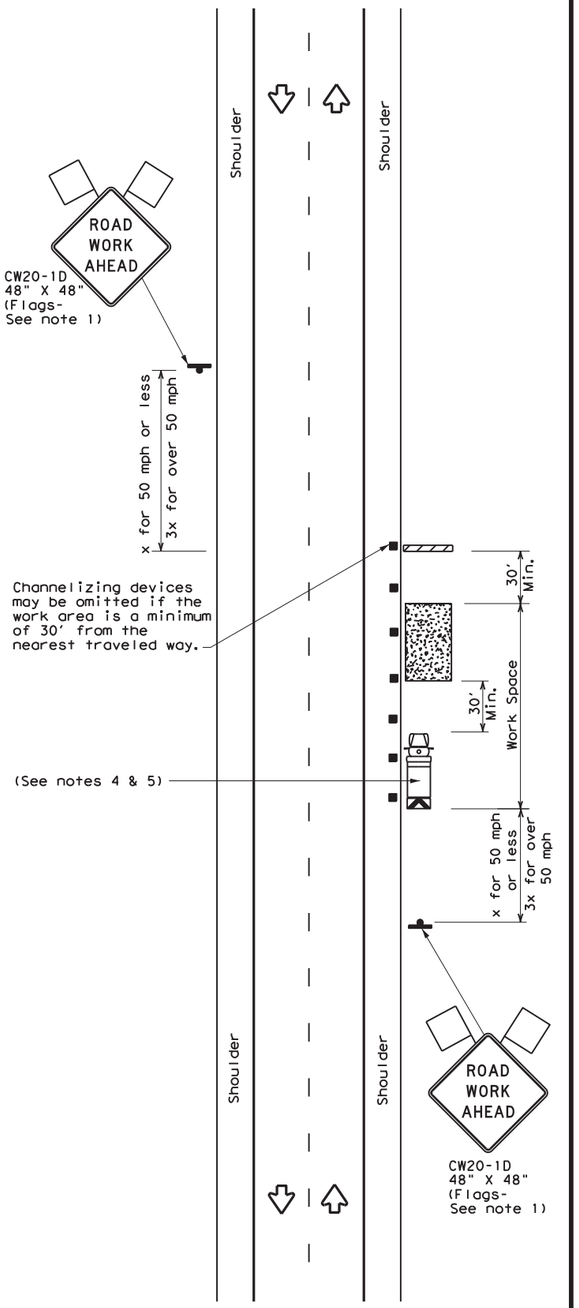
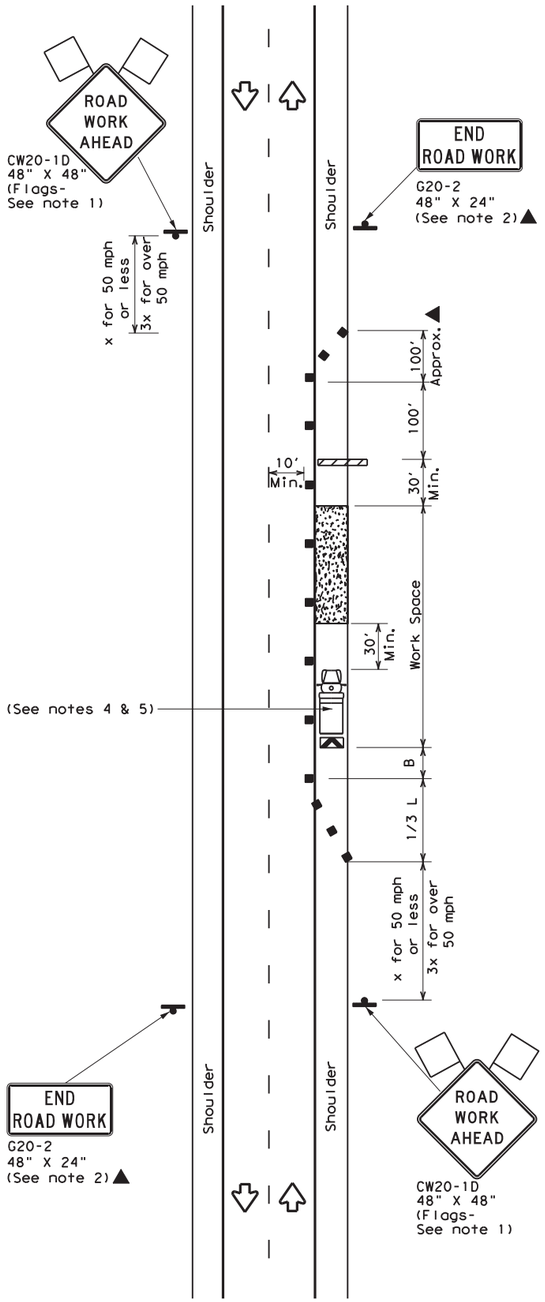


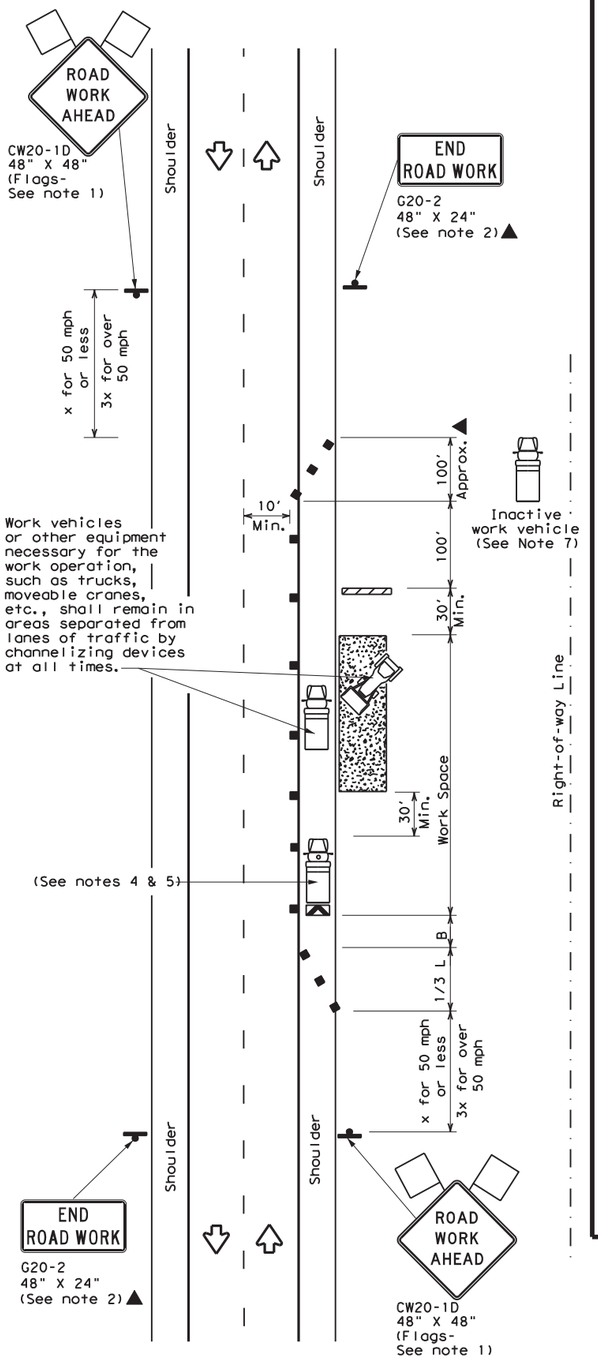
TCP (2-1a)

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.

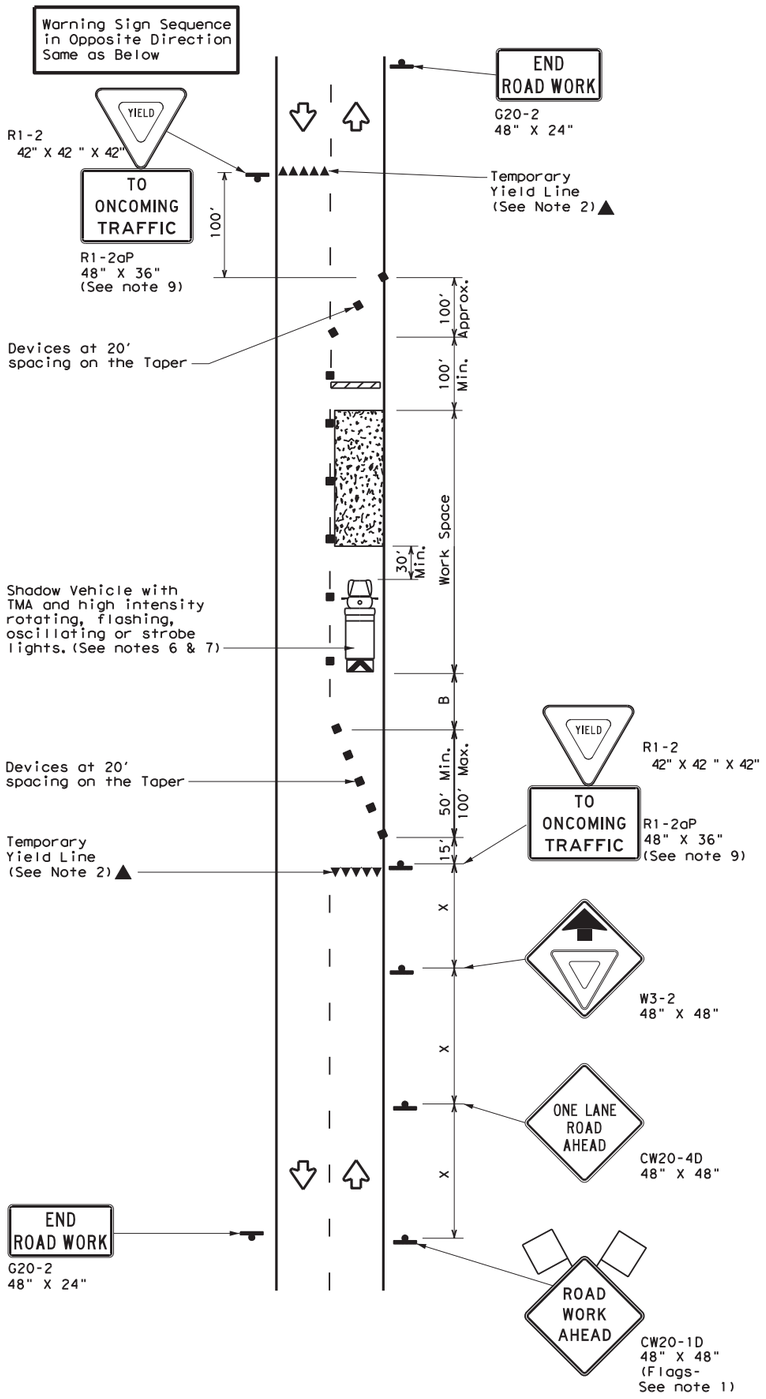
Texas Department of Transportation

Traffic Operations Division Standard

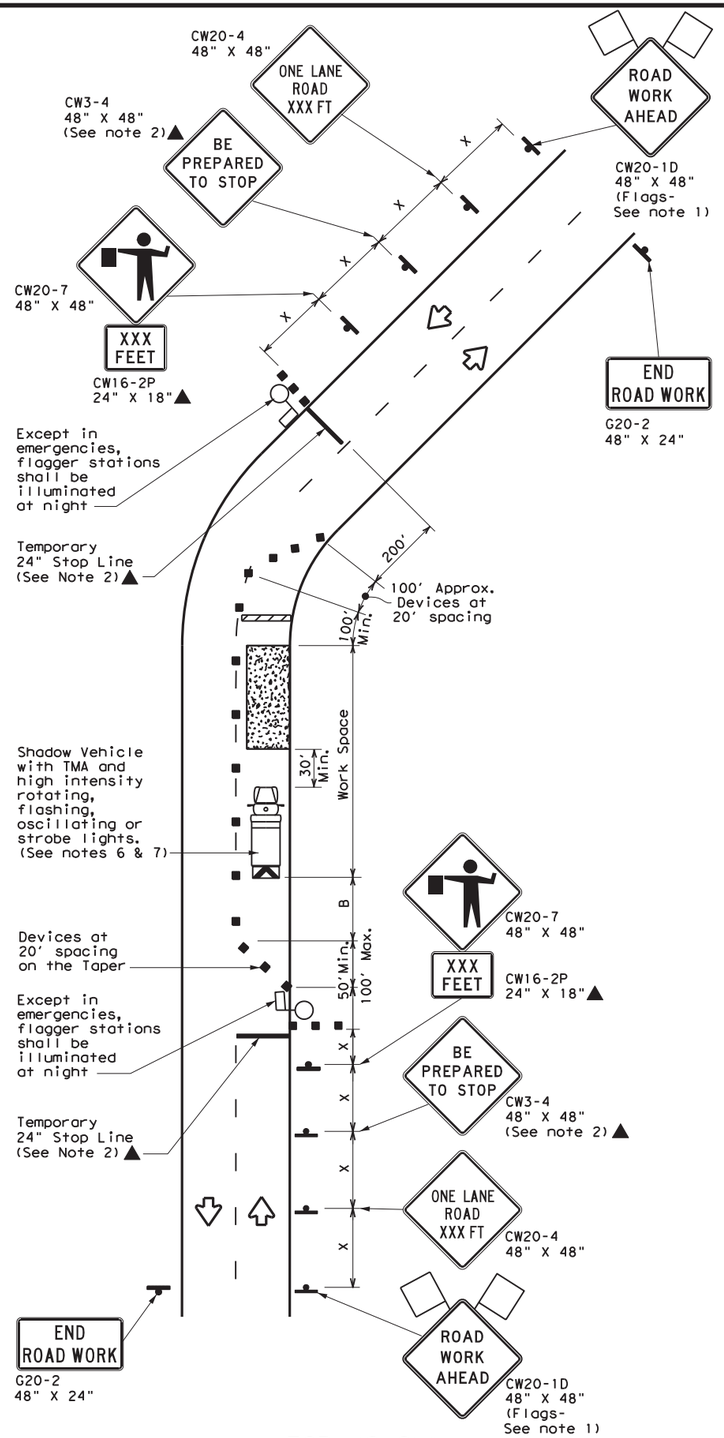
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	22	LA SALLE, Etc.		60
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: tcp2-2-18.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		61

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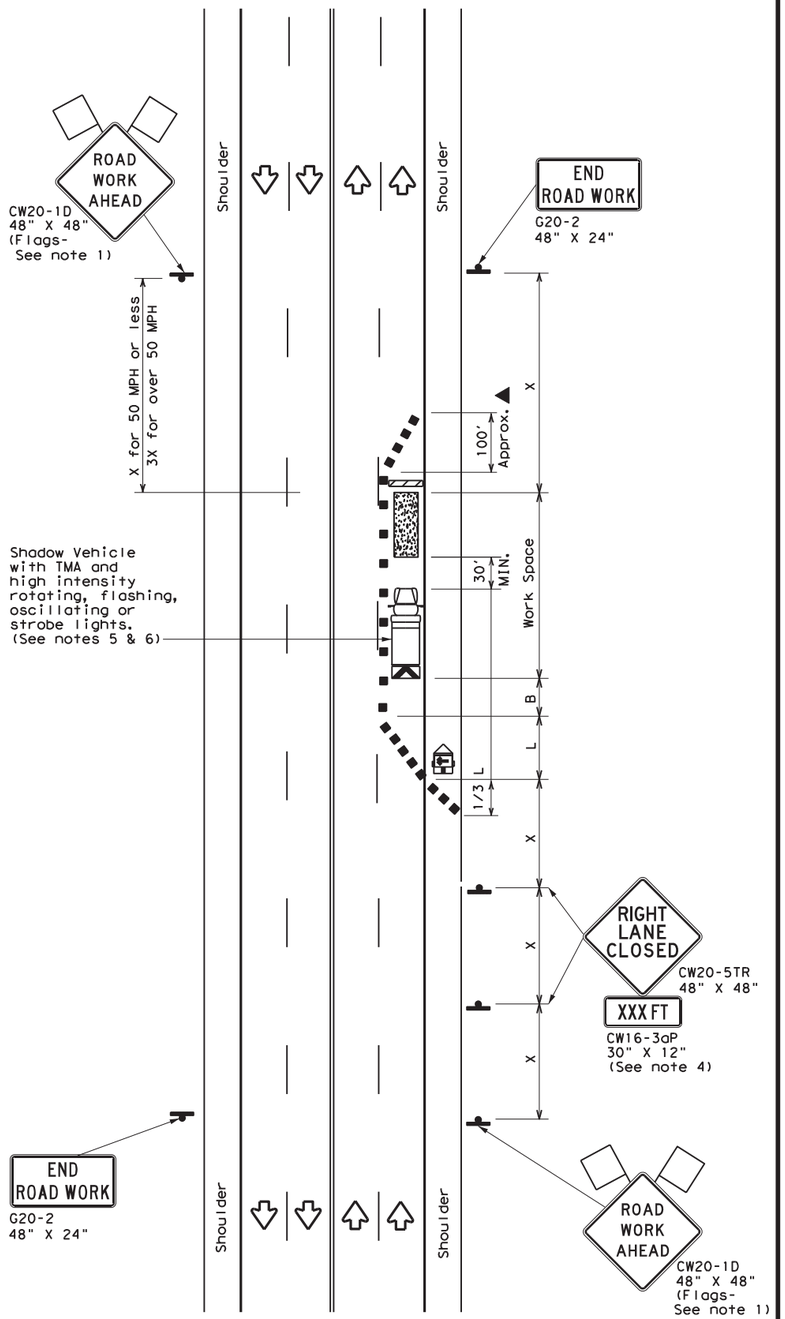
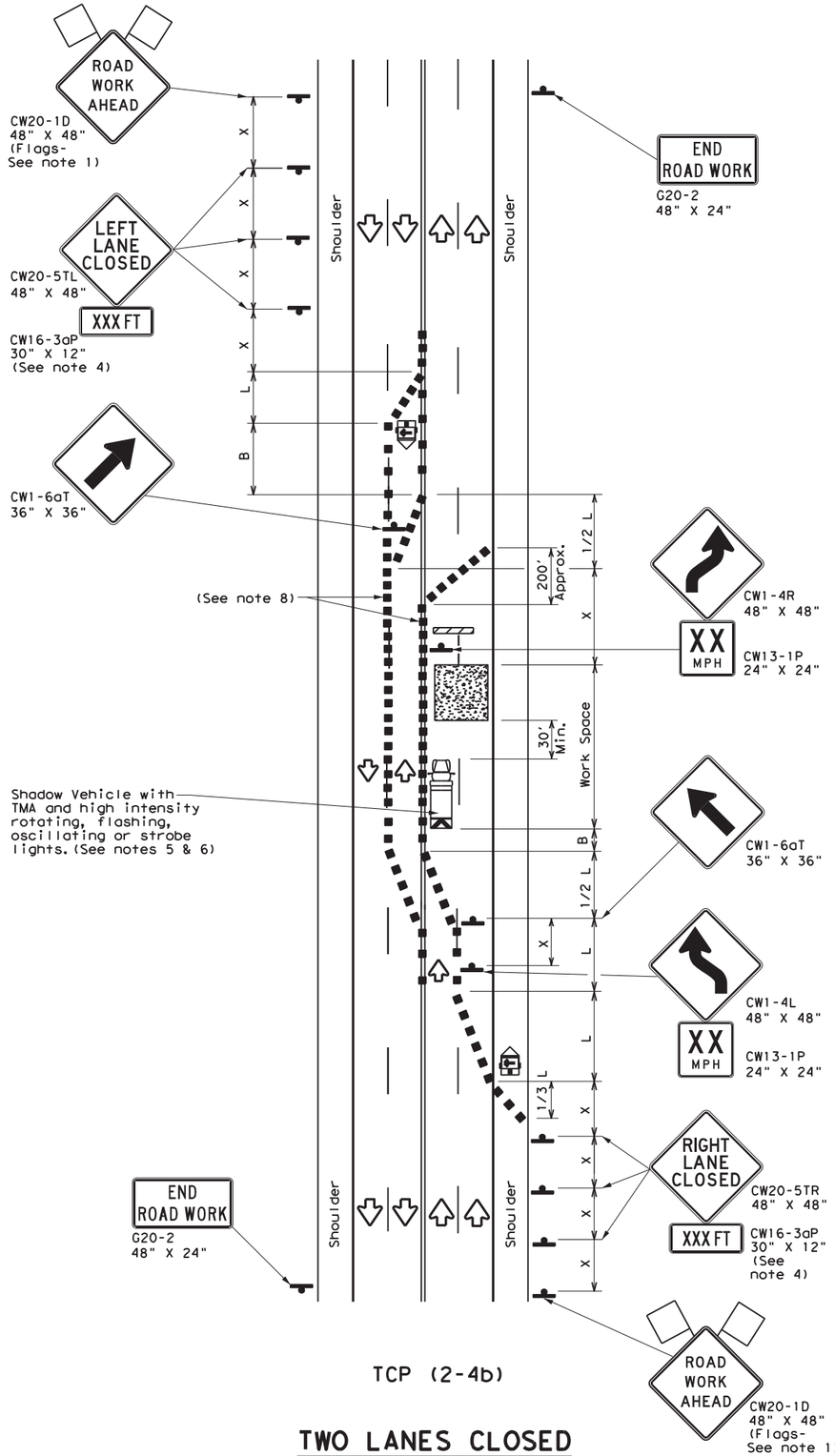


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0018	02	091,etc.	IH 35,etc.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	22	LA SALLE, Etc.		62

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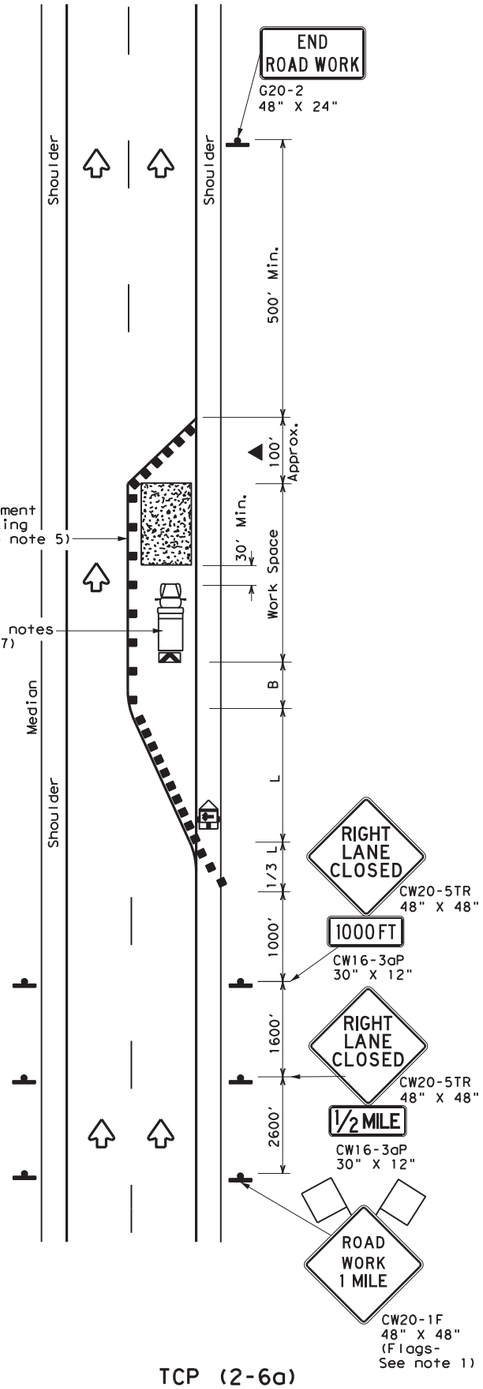
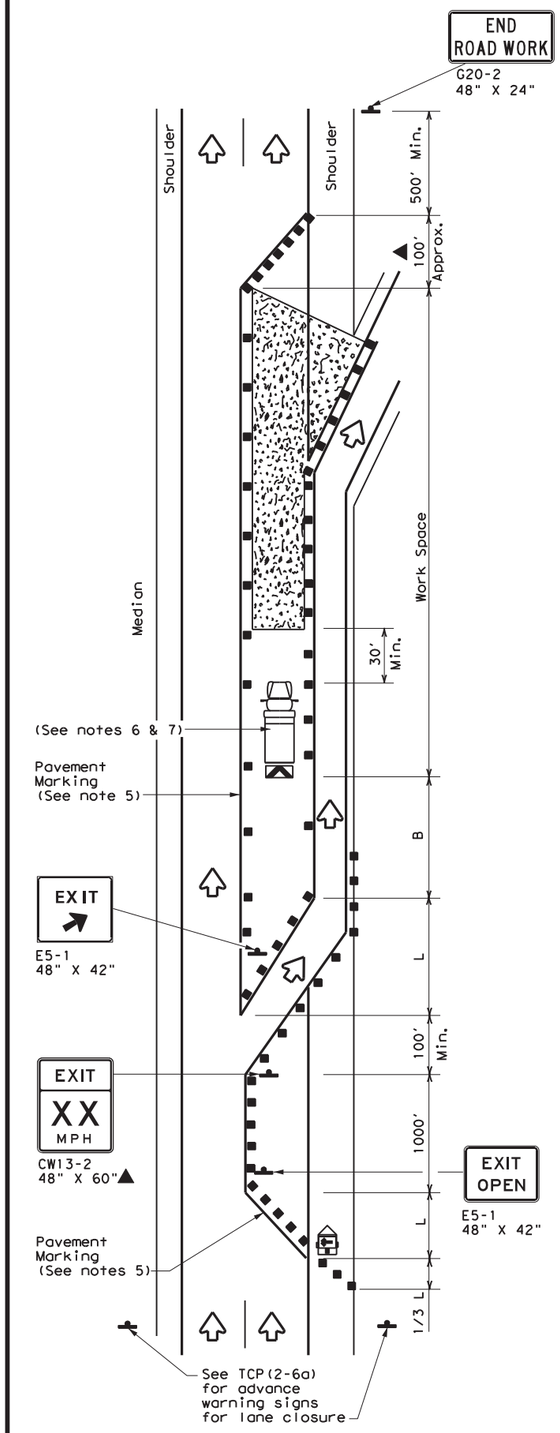


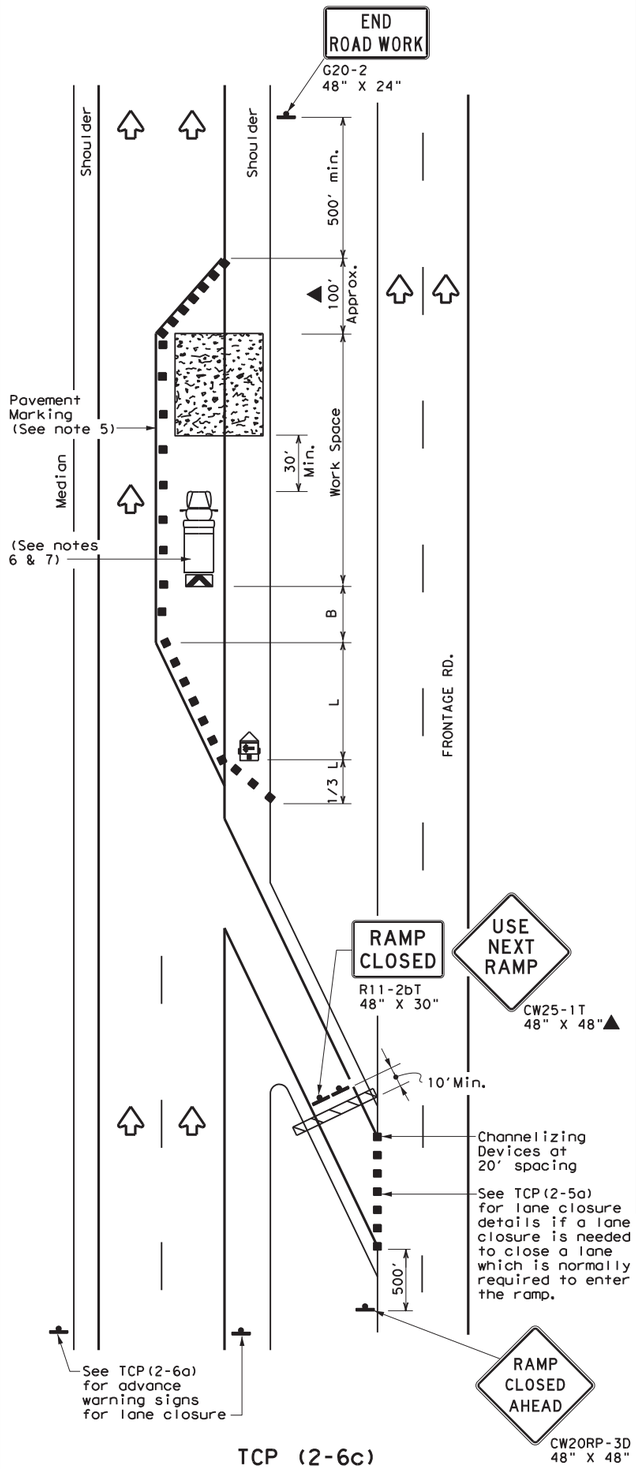
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing,oscillating or strobe lights. 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.
7. 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.

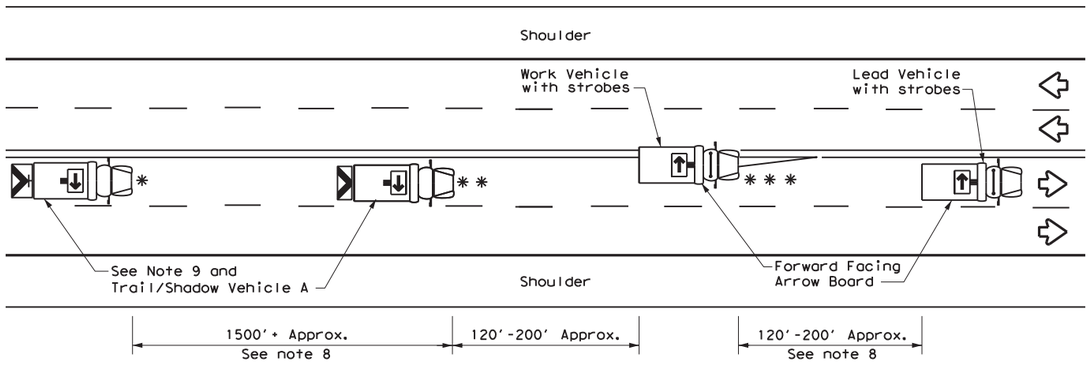
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

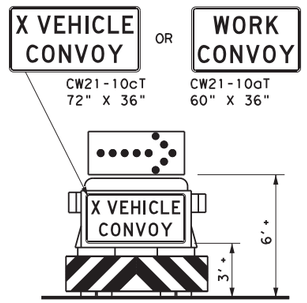
TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		63



TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

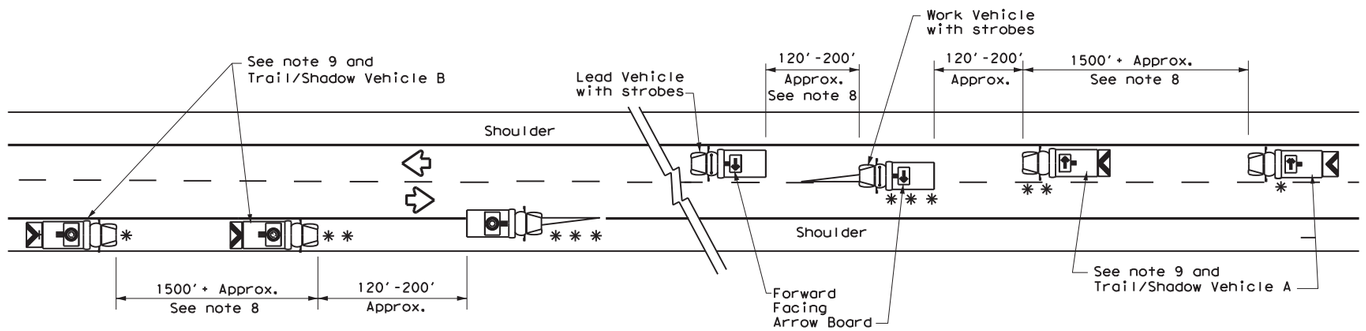
with RIGHT Directional display Flashing Arrow Board

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.

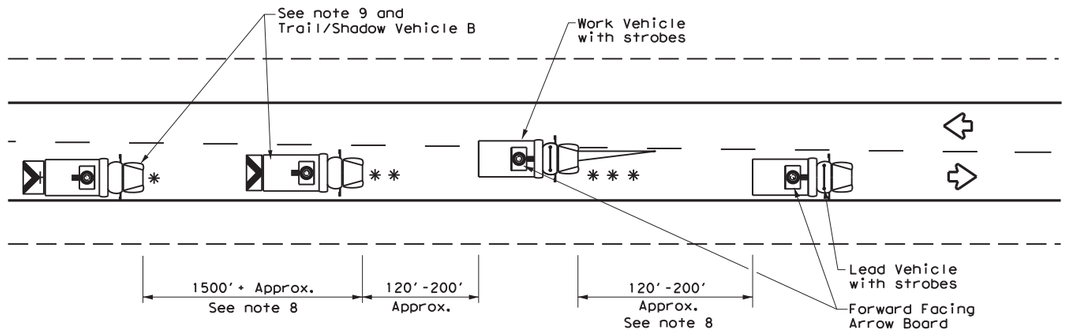


WORK ON SHOULDER

WORK ON TRAVEL LANE

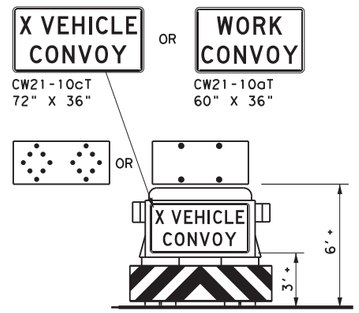
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



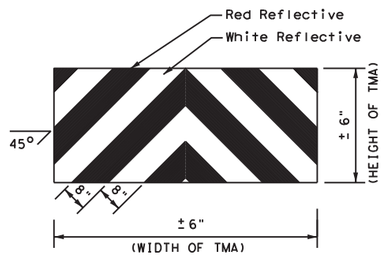
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

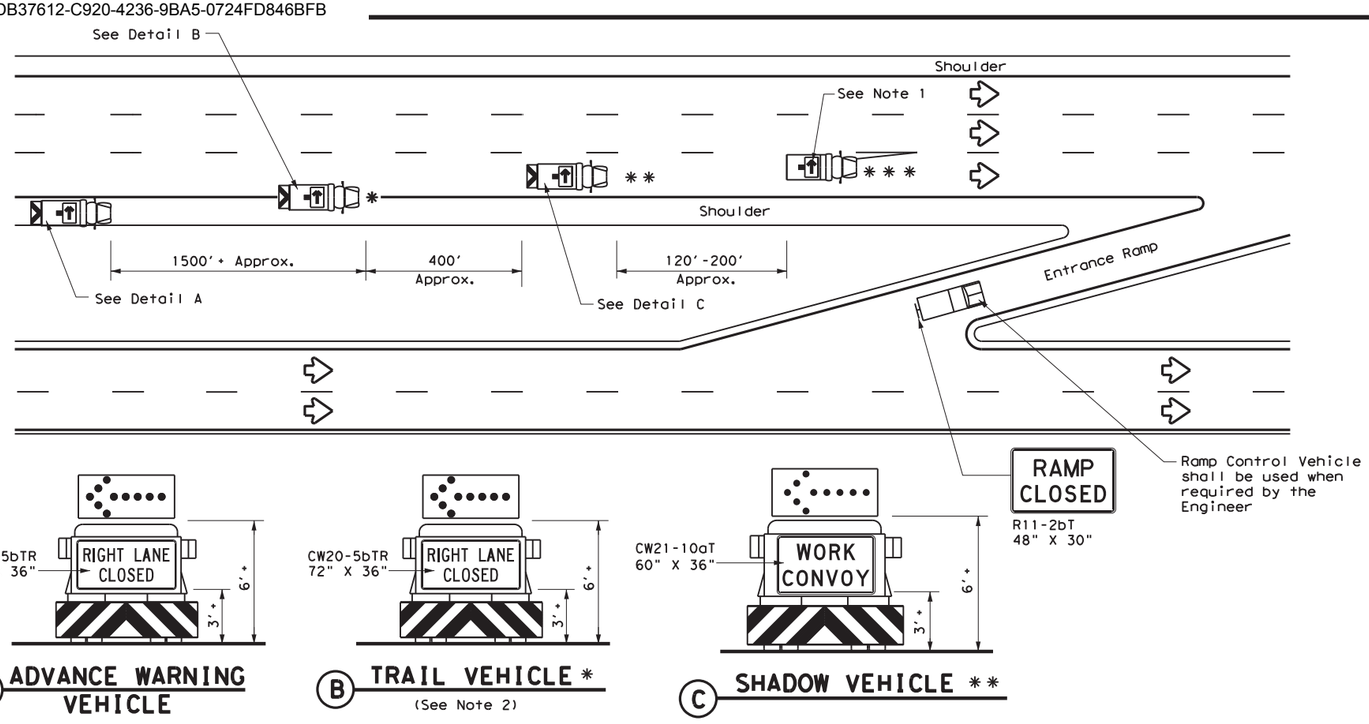
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.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	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		64

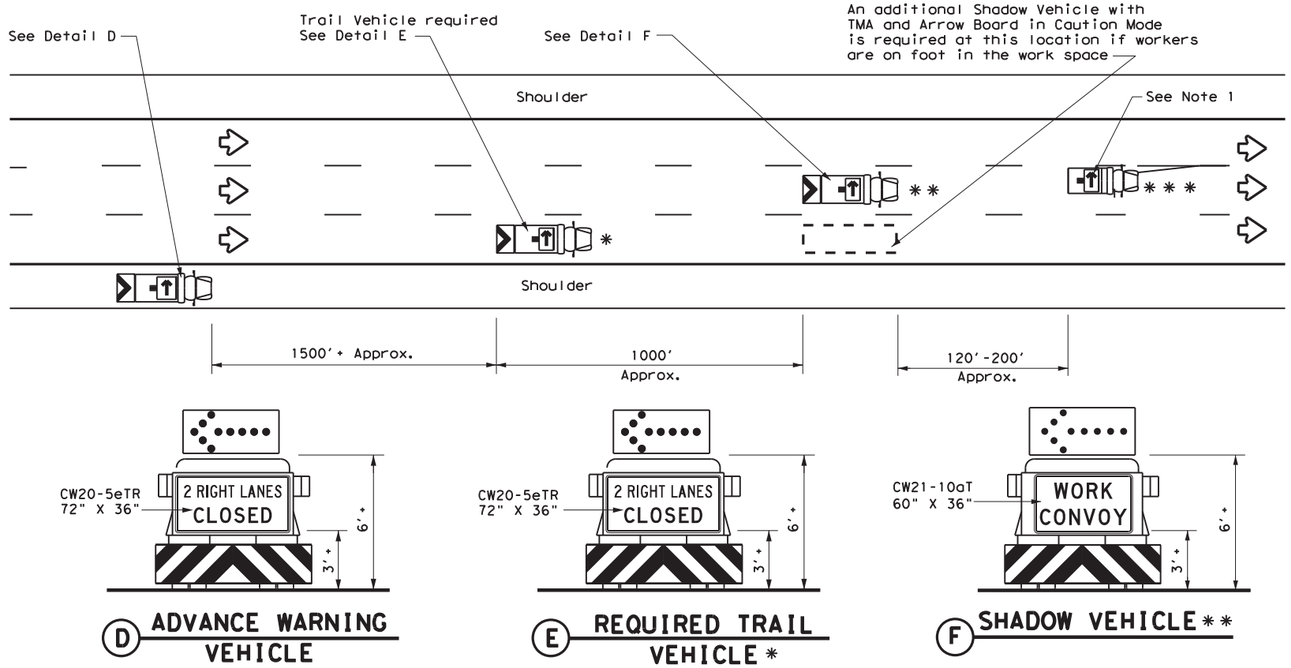


A ADVANCE WARNING VEHICLE

B TRAIL VEHICLE * (See Note 2)

C SHADOW VEHICLE **

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



D ADVANCE WARNING VEHICLE

E REQUIRED TRAIL VEHICLE *

F SHADOW VEHICLE **

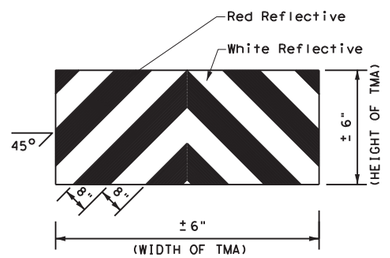
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		65

176

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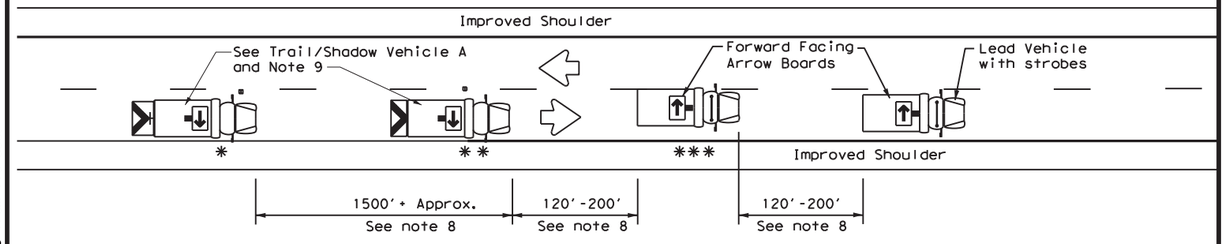
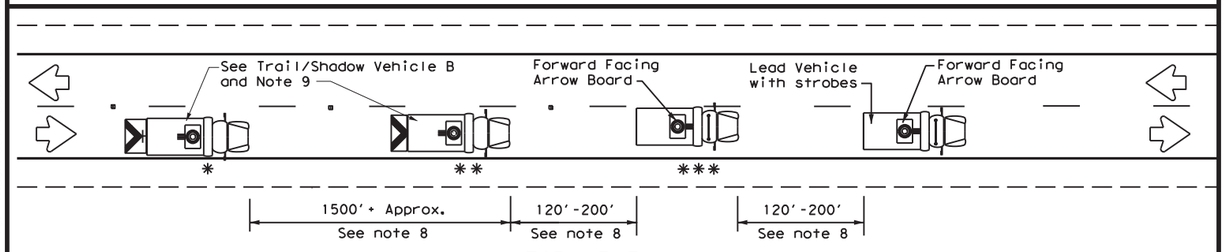


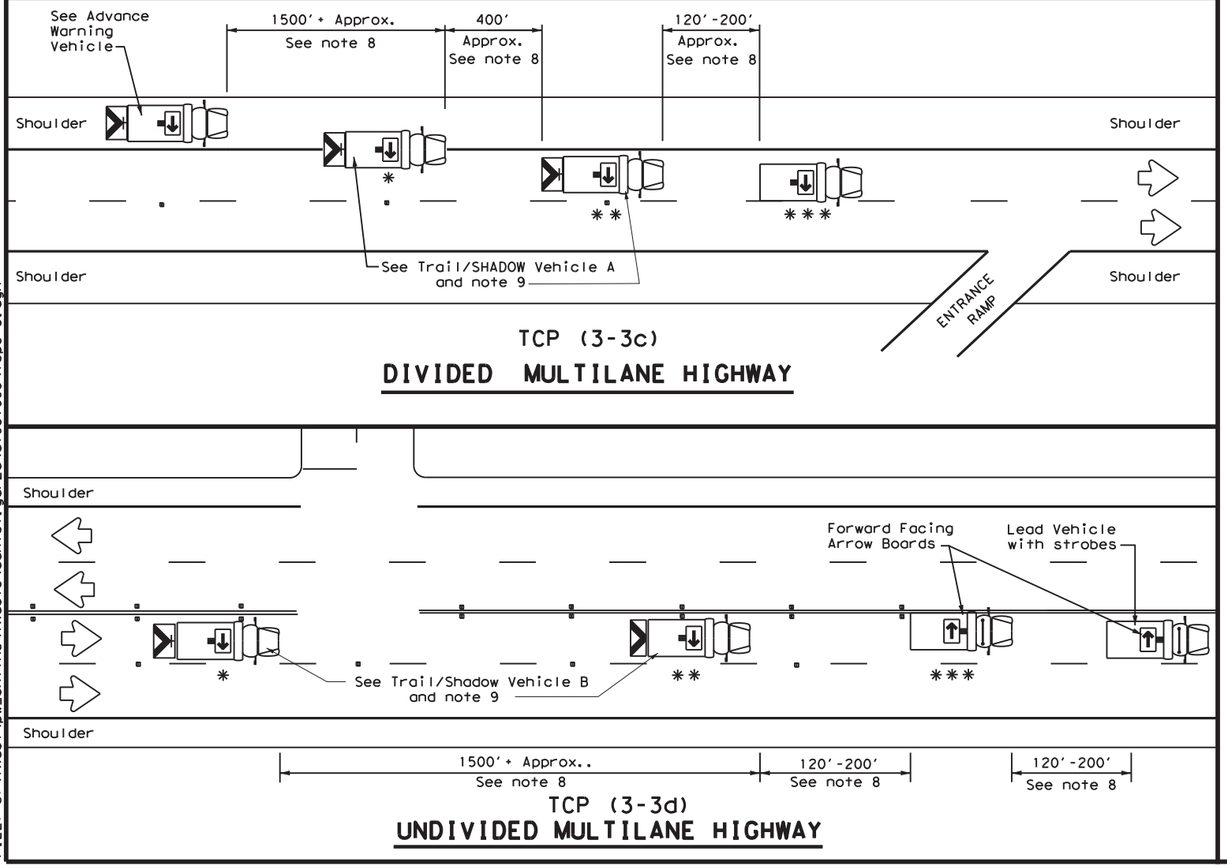
TCP (3-3a)

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



TCP (3-3b)

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

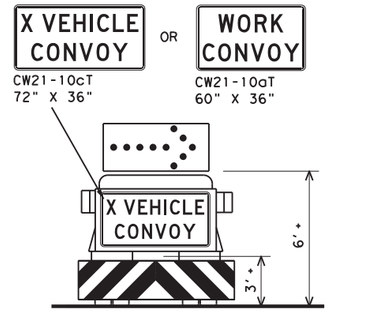


TCP (3-3c)

DIVIDED MULTILANE HIGHWAY

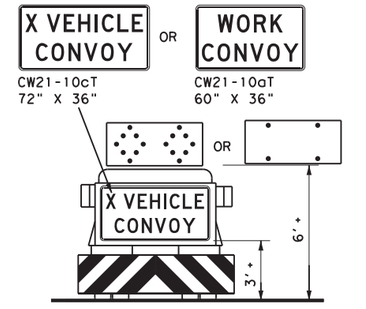
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



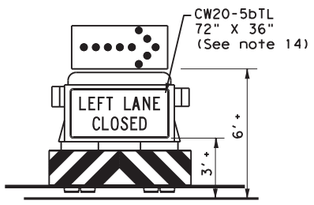
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

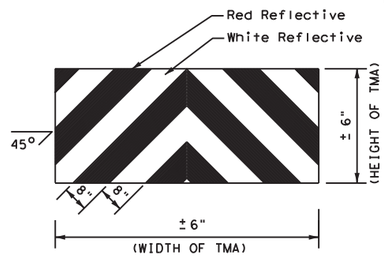


TRAIL/SHADOW VEHICLE B

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
REVISIONS	0018	02	091,etc.	IH 35,etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	22	LA SALLE, Etc.		66
1-97 7-14				

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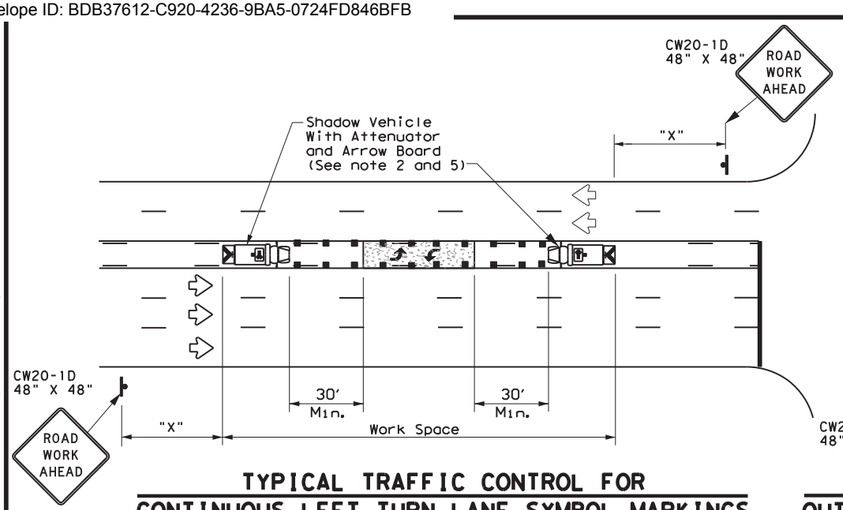
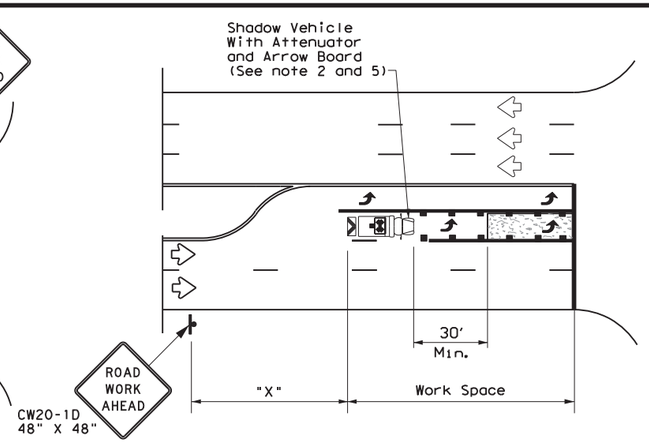
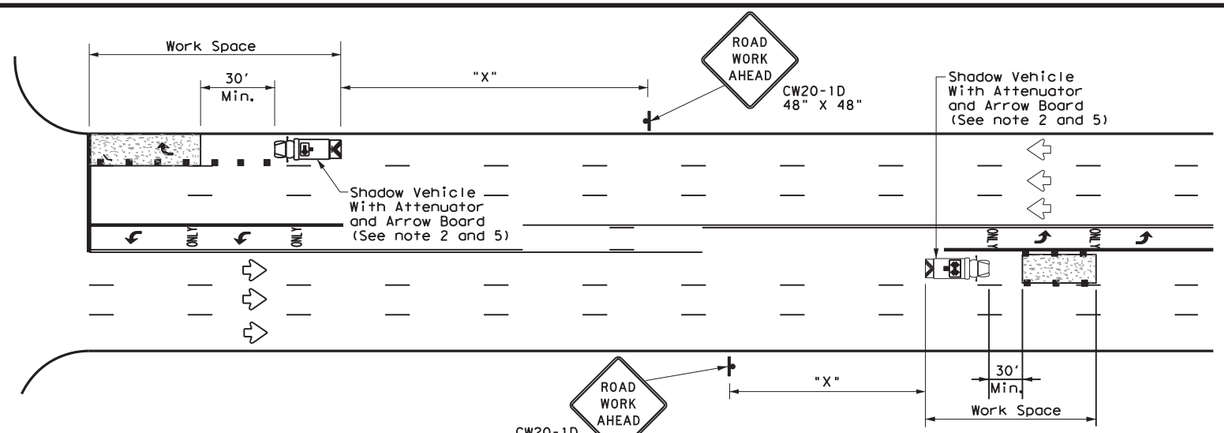


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

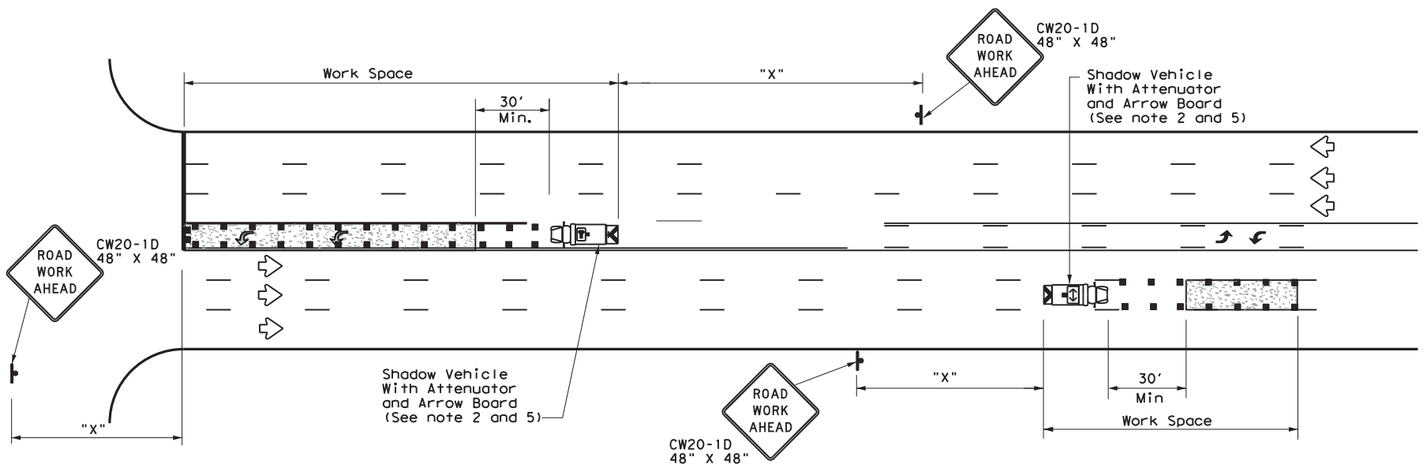


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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'

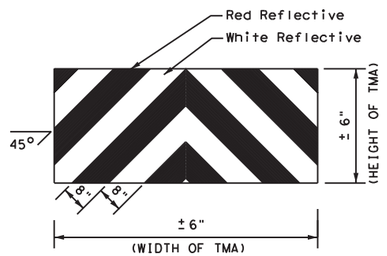
* Conventional Roads Only

** 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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	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		67

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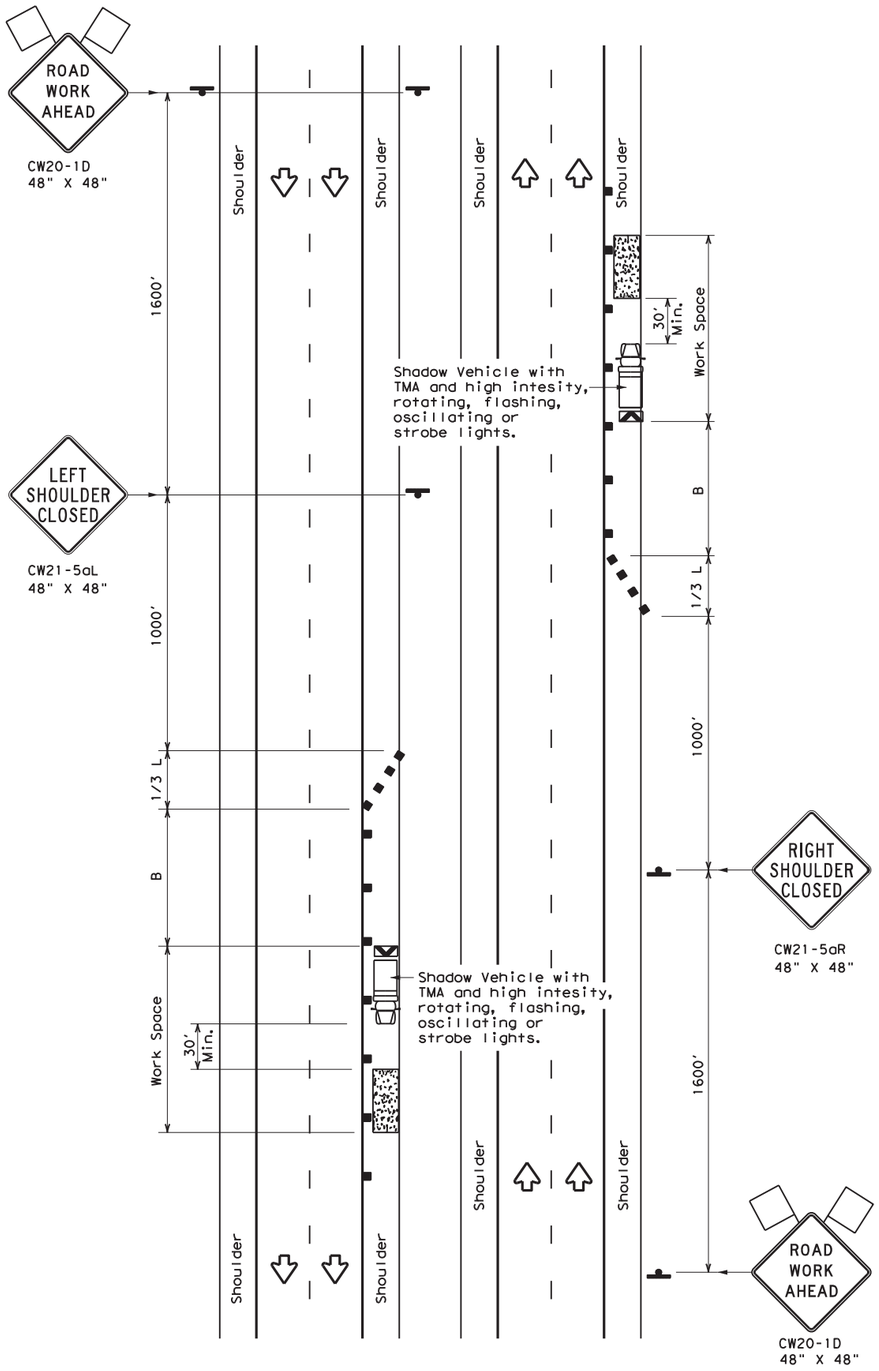
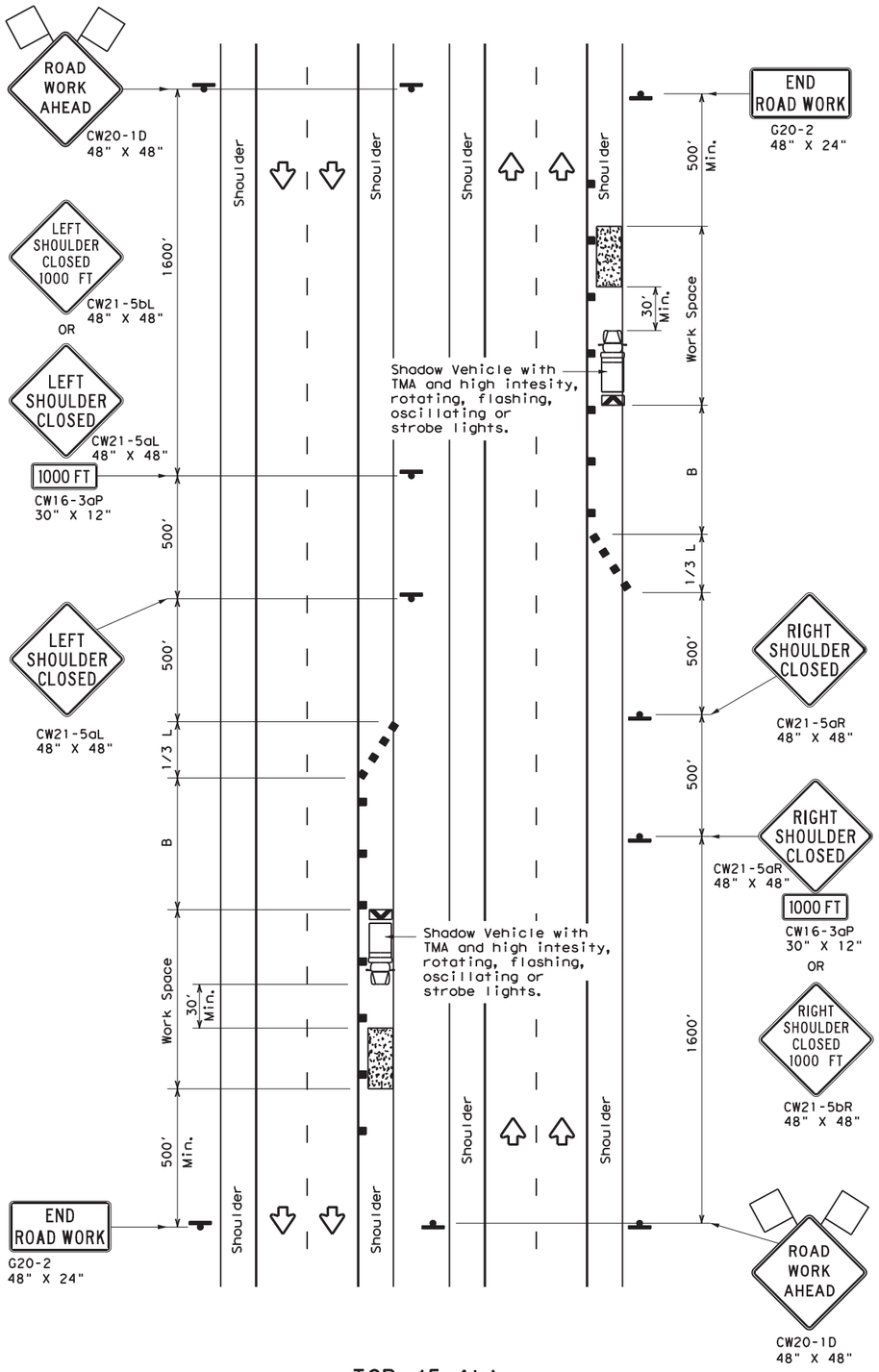


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* 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(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

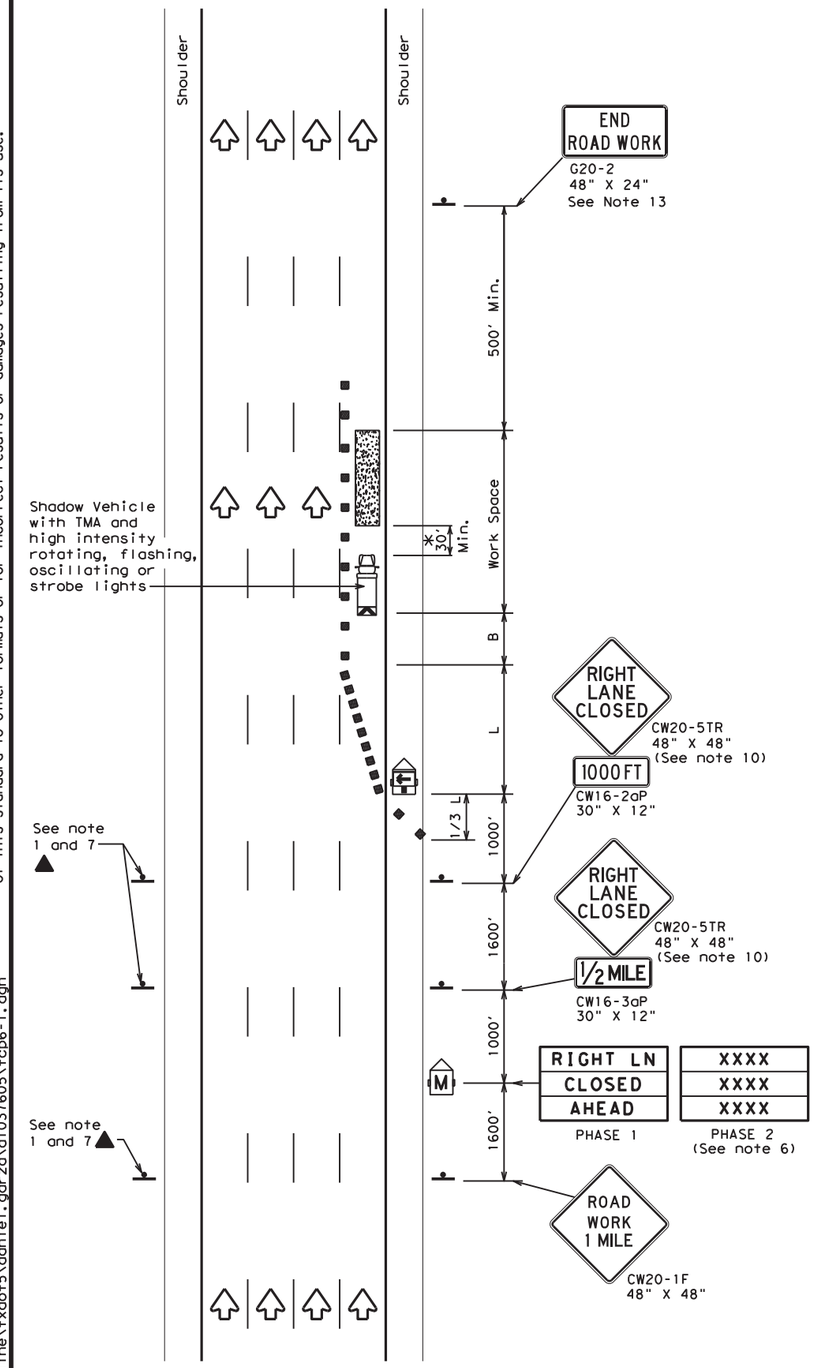
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

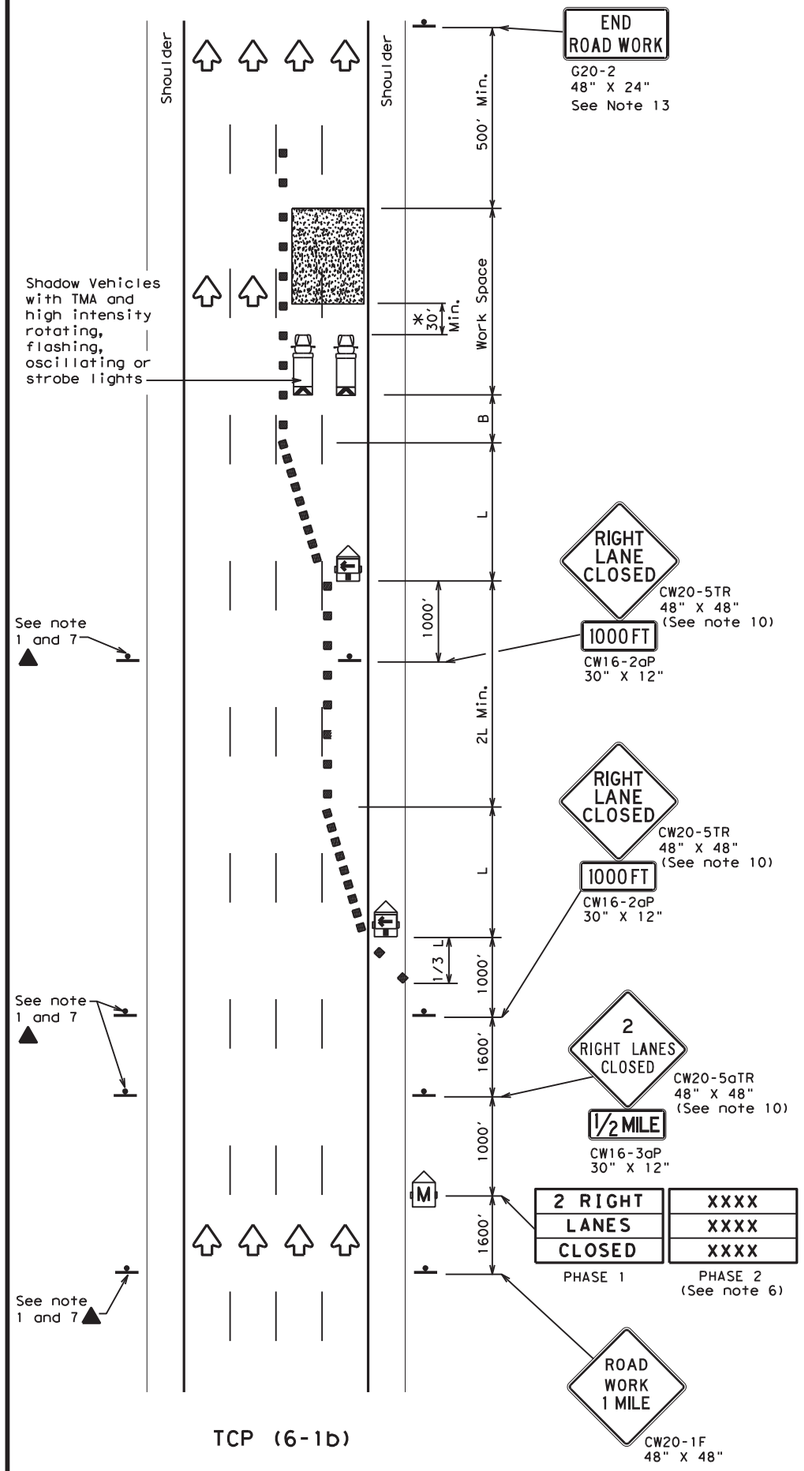
TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		68



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		69

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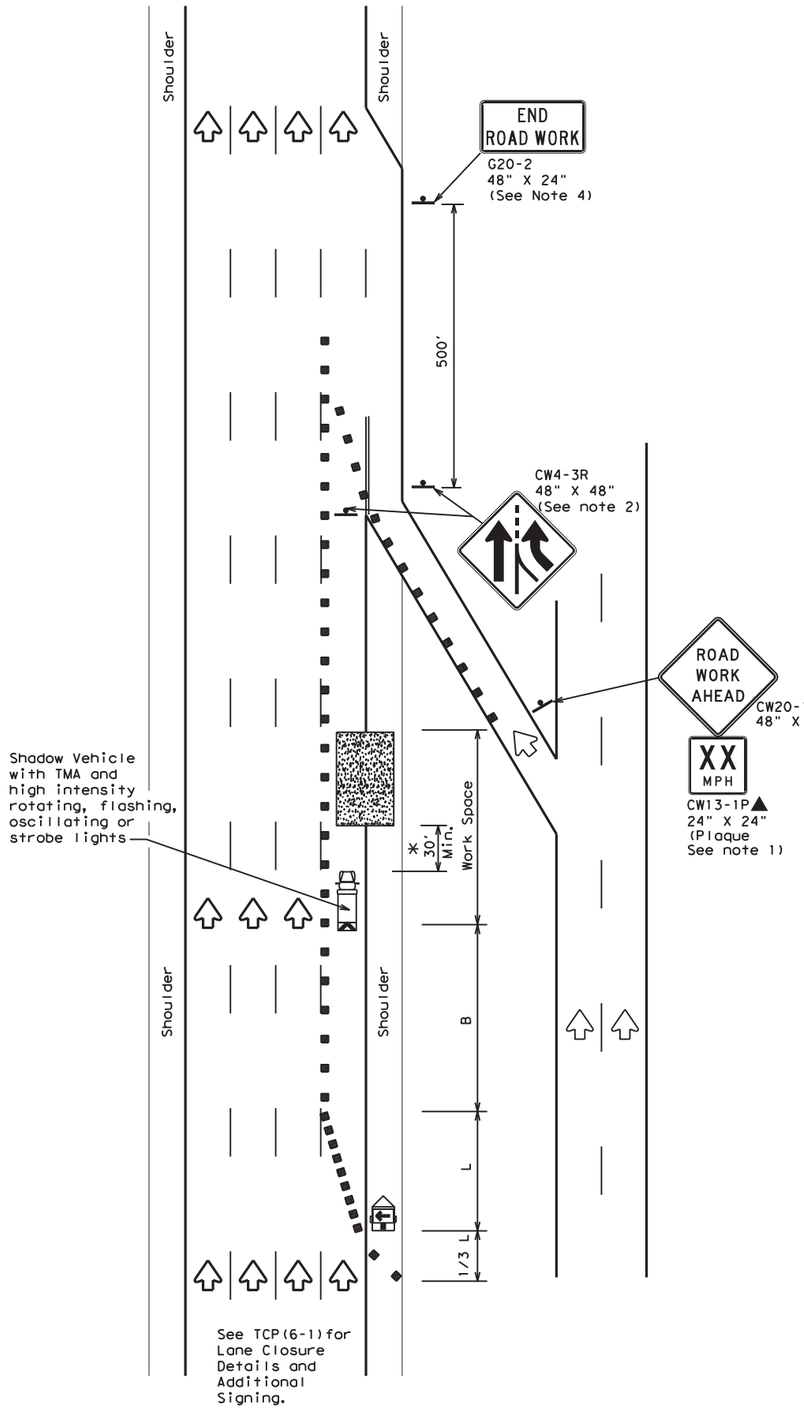
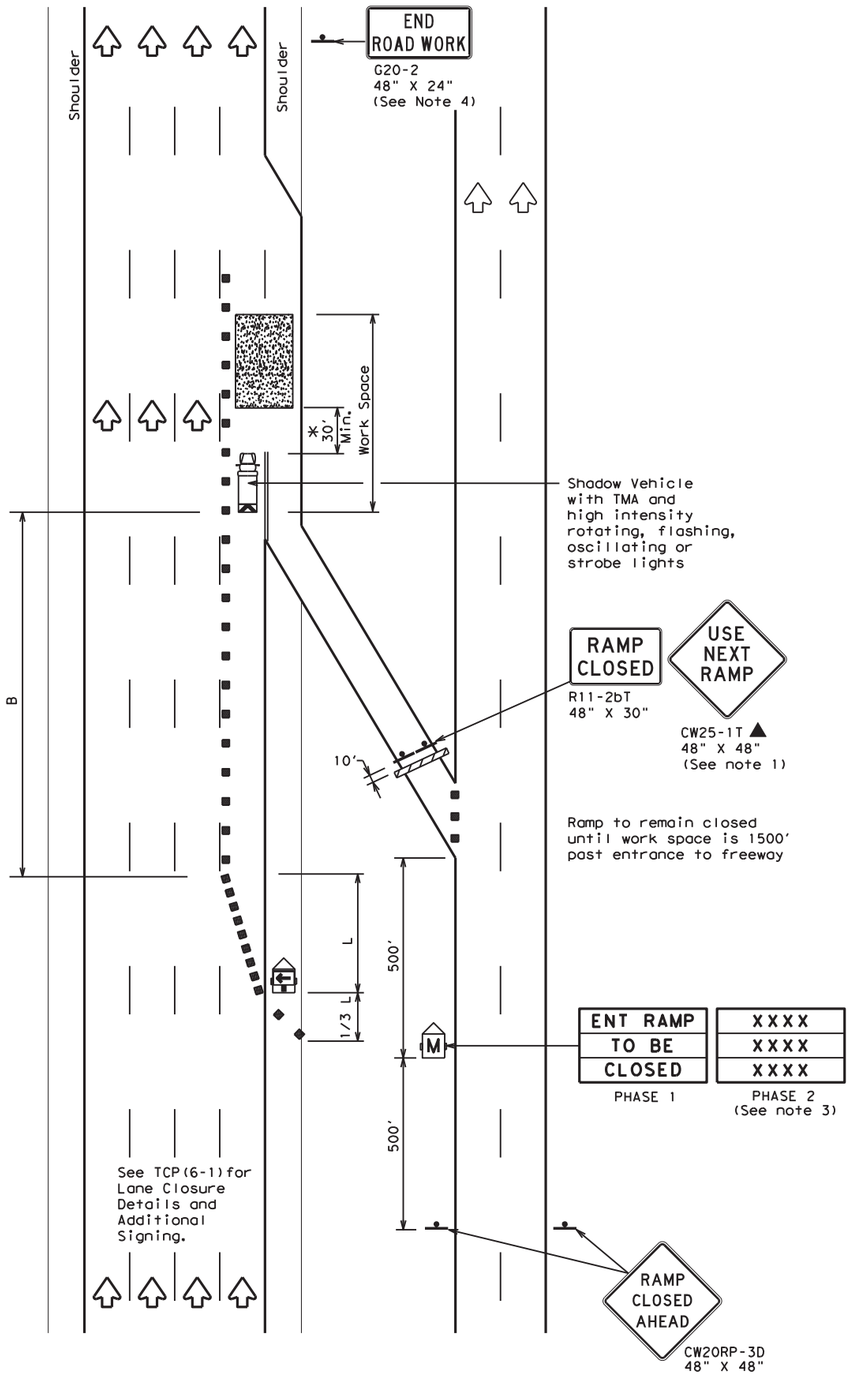


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP 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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

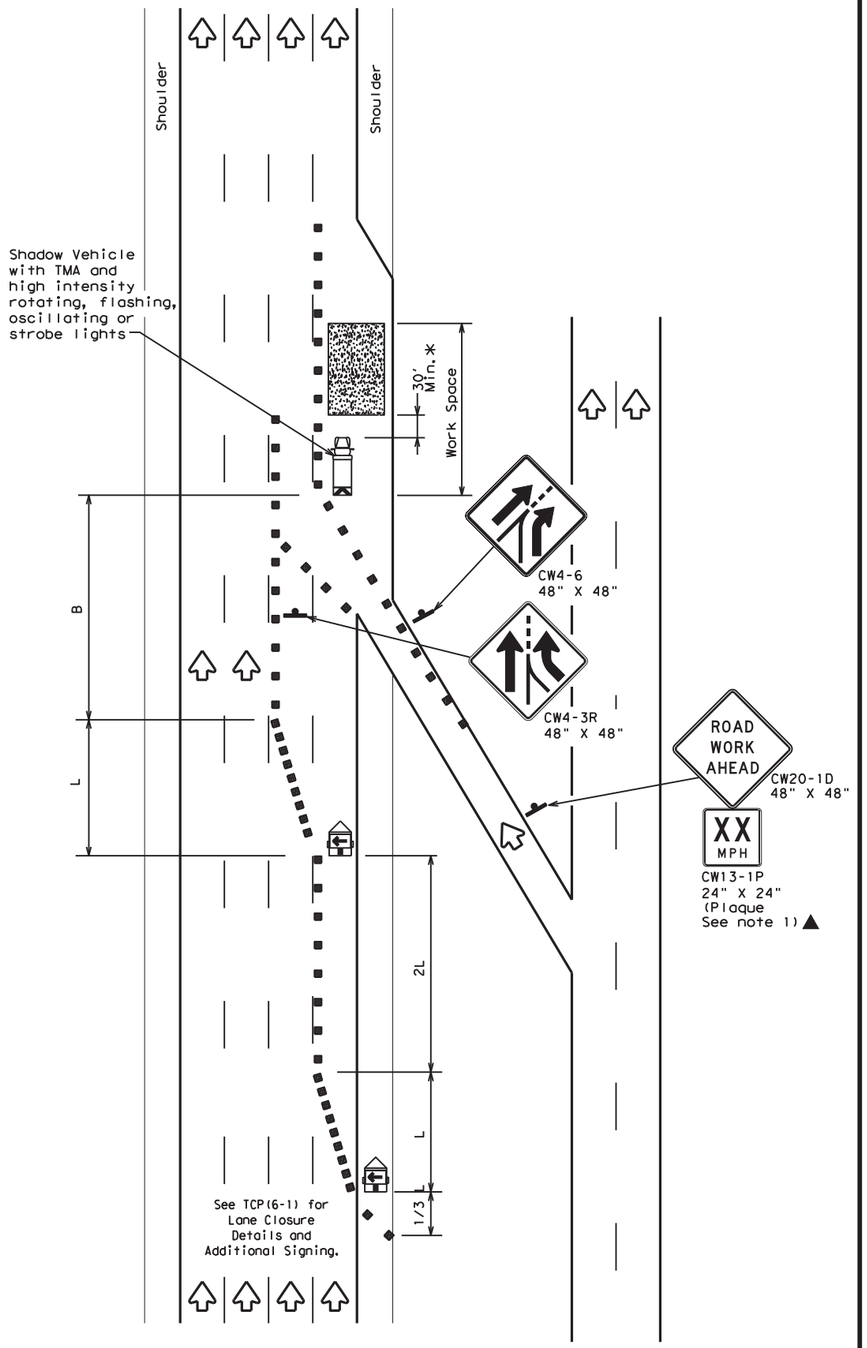
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

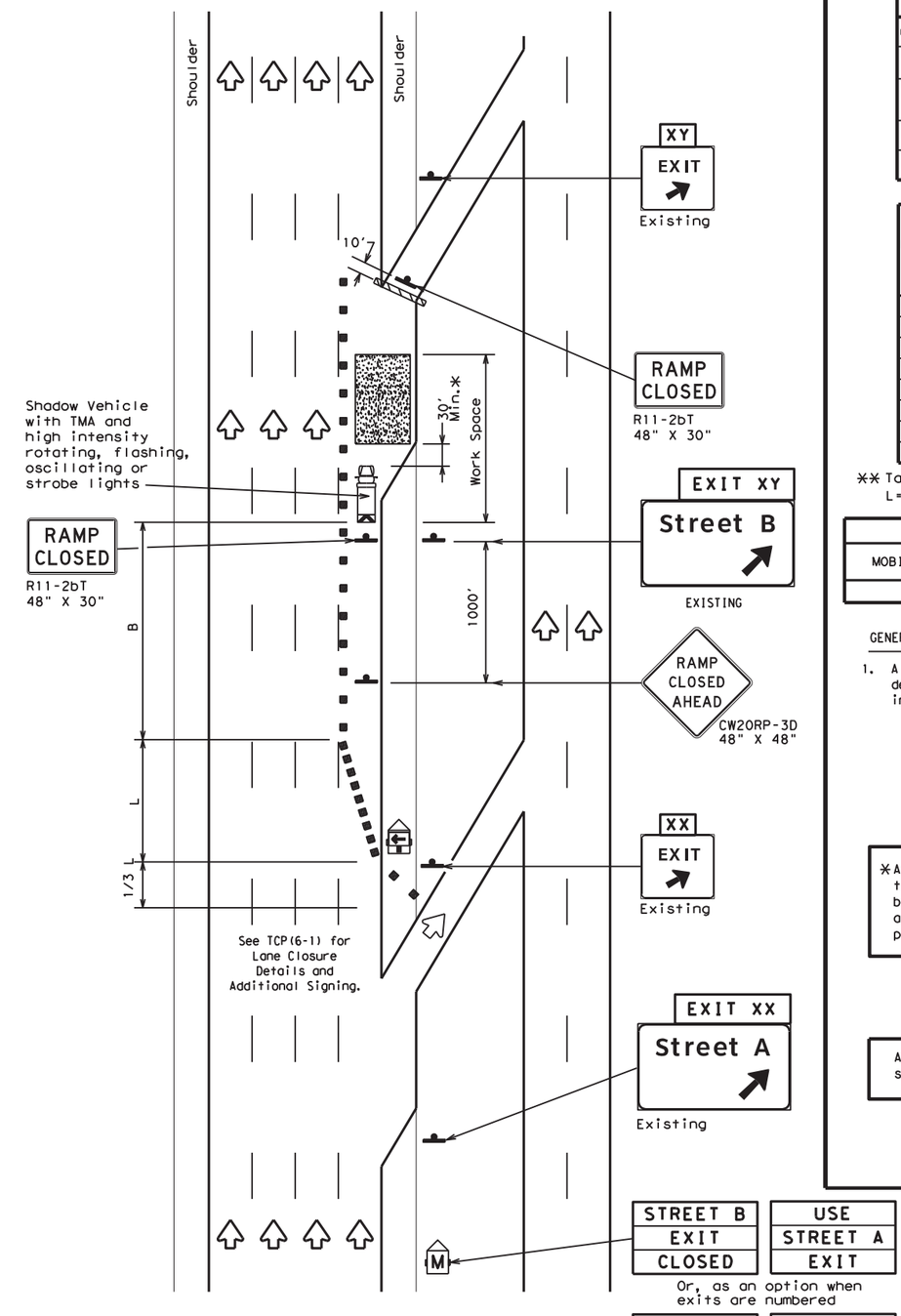
FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	22	LA SALLE, Etc.		70

202



TCP (6-3a)

ENTRANCE RAMP OPEN



TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

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1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	22	LA SALLE, Etc.		71

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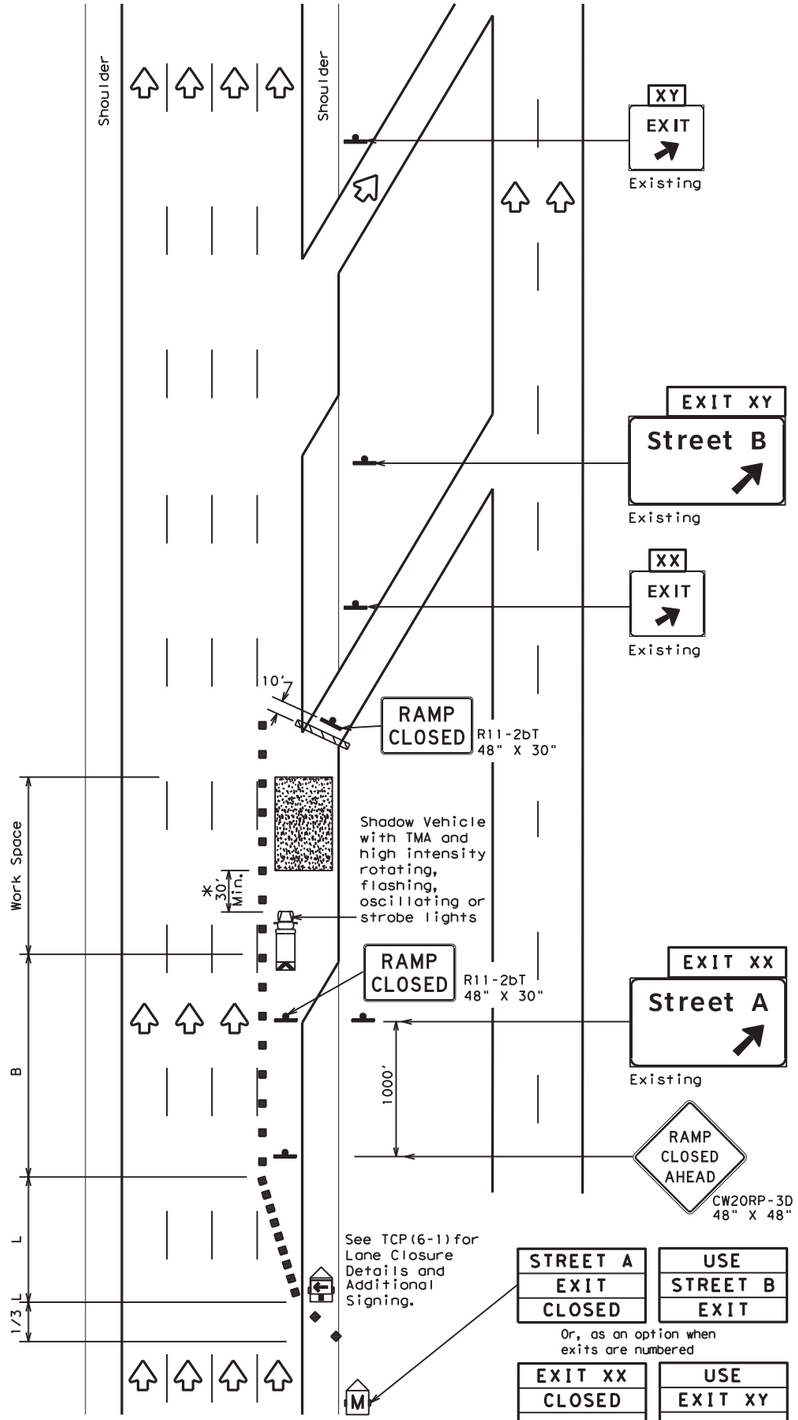
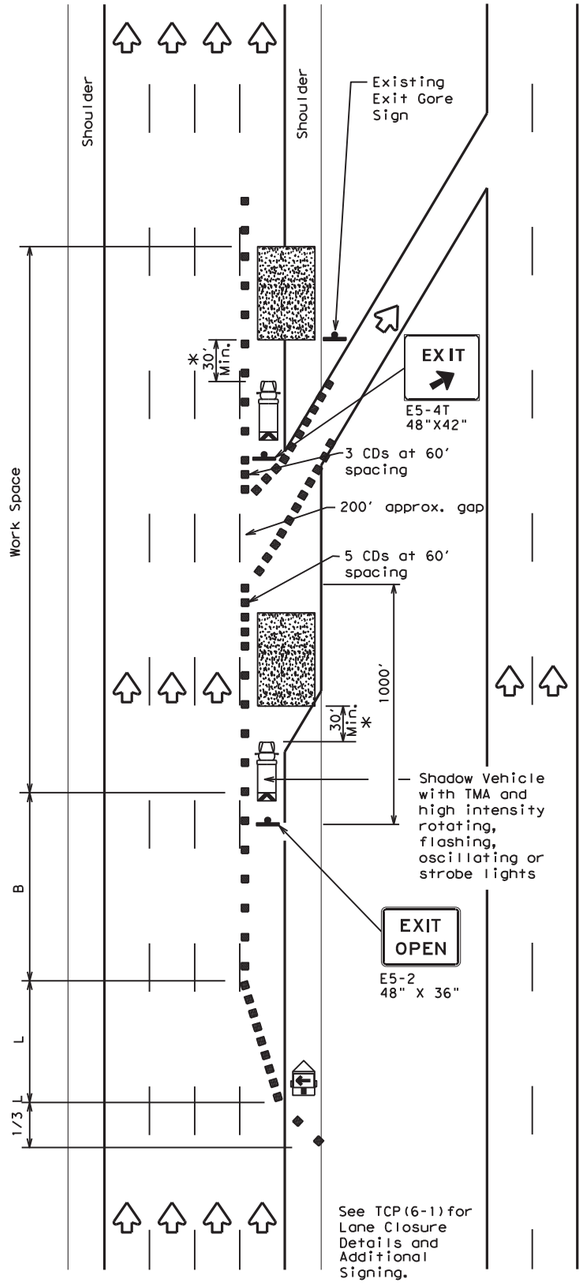


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

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1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	22	LA SALLE, Etc.		72

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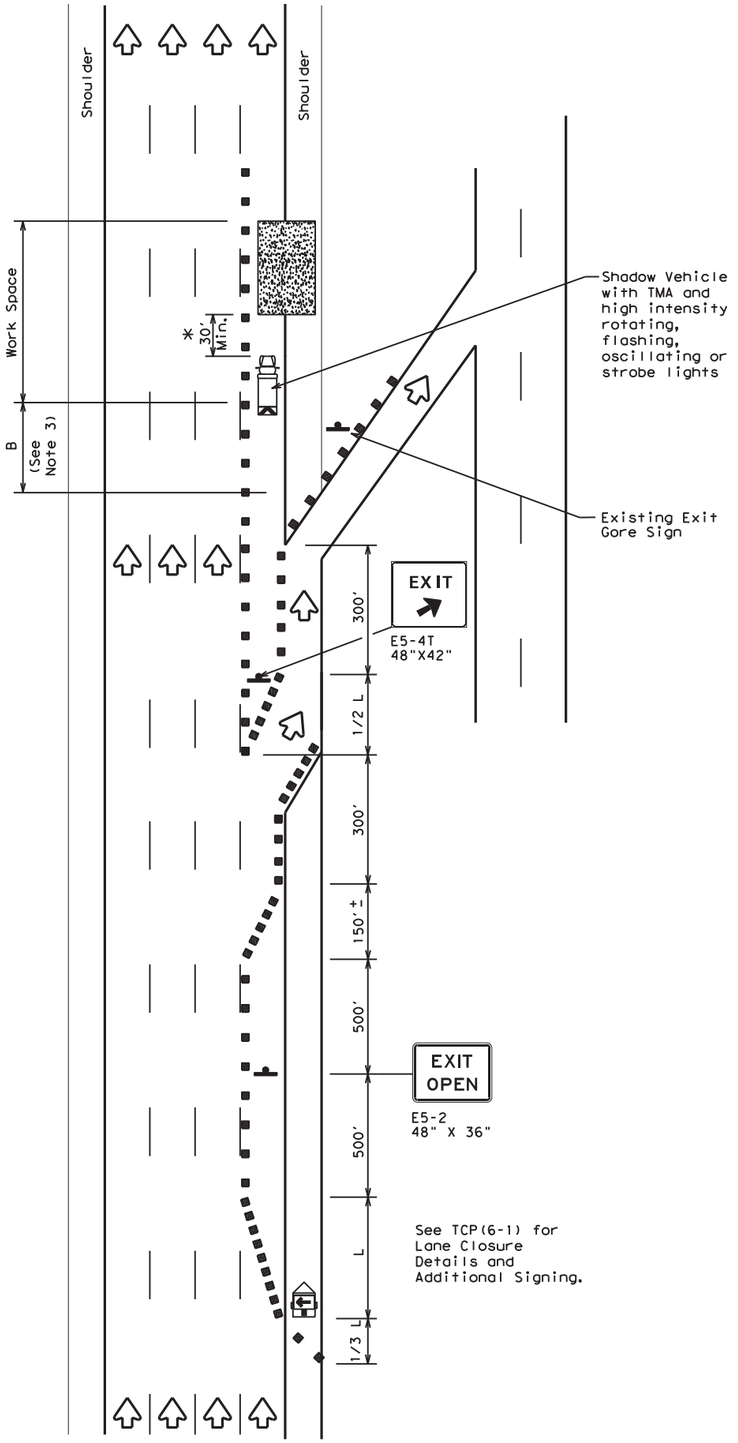
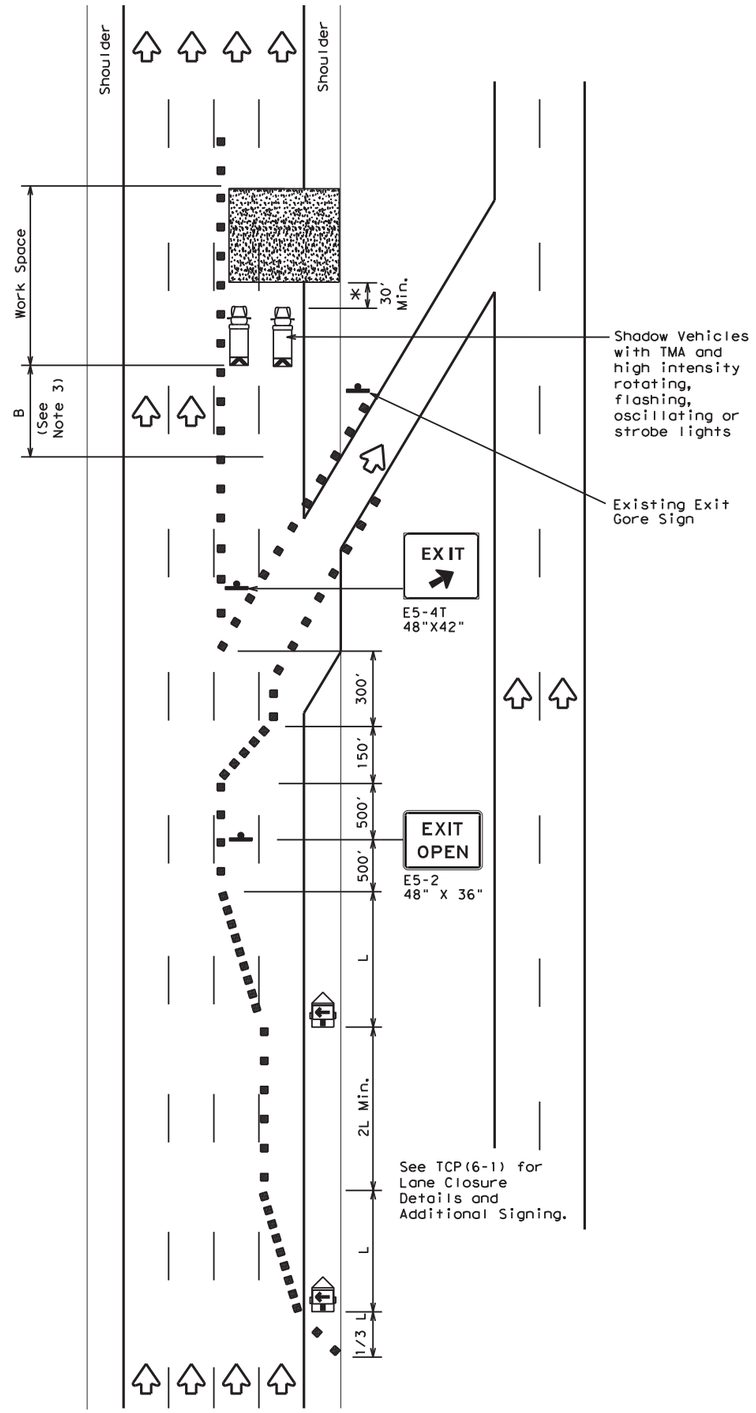


TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

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©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
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4-98 8-12	22	LA SALLE, Etc.		73

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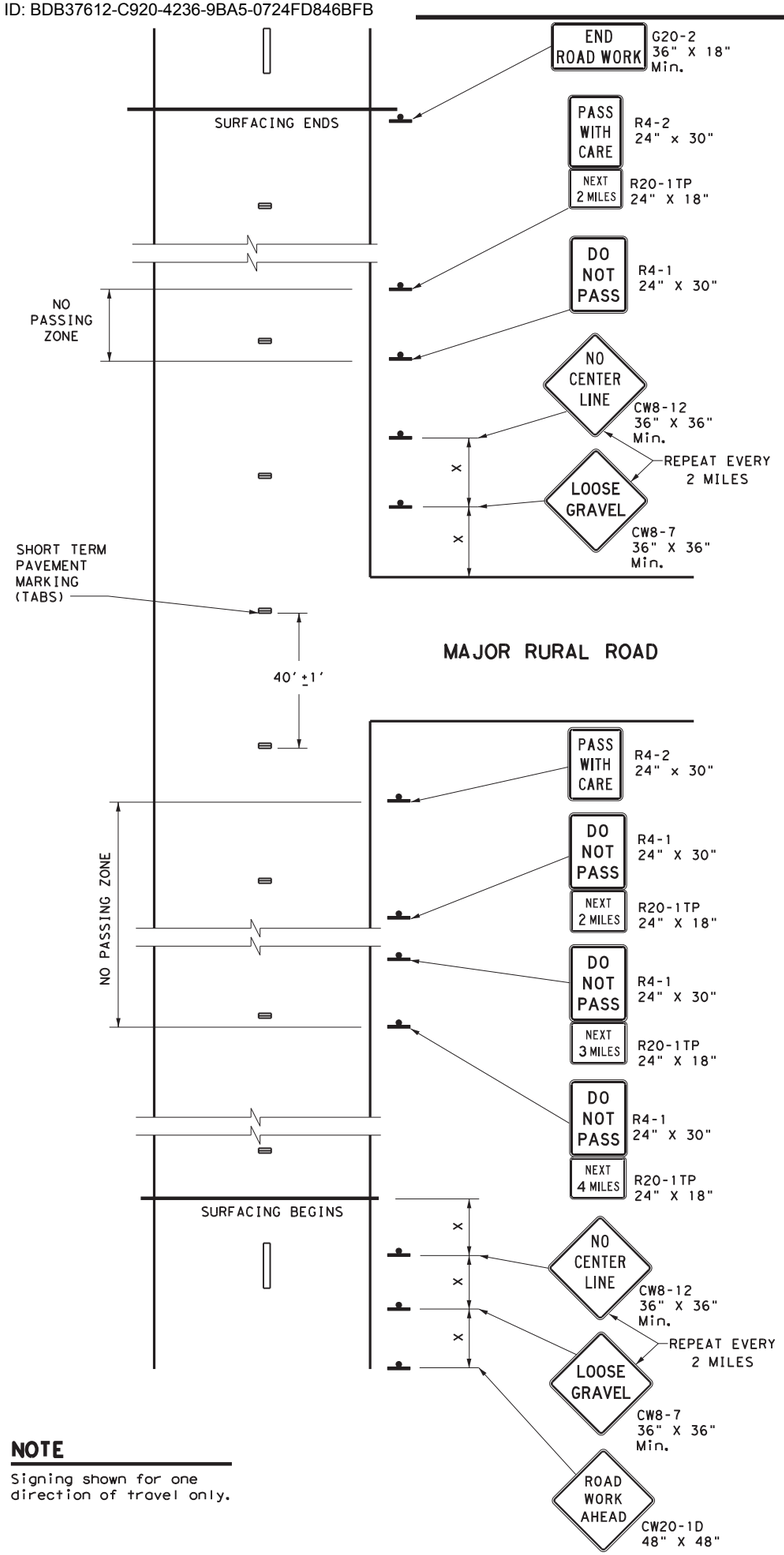
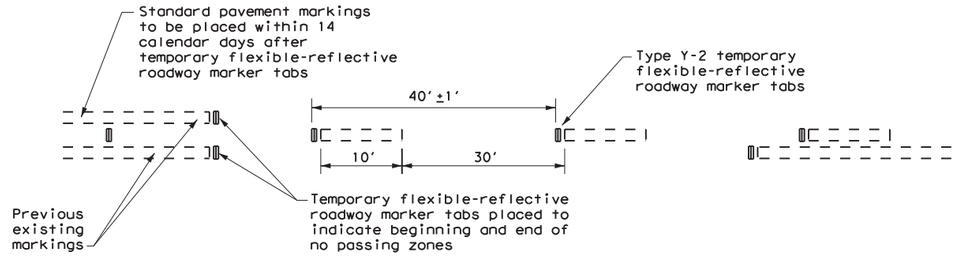


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement
no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T)sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	22	LA SALLE, Etc.		74

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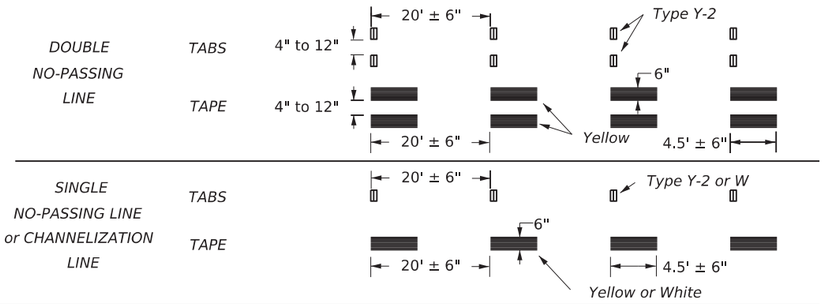
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



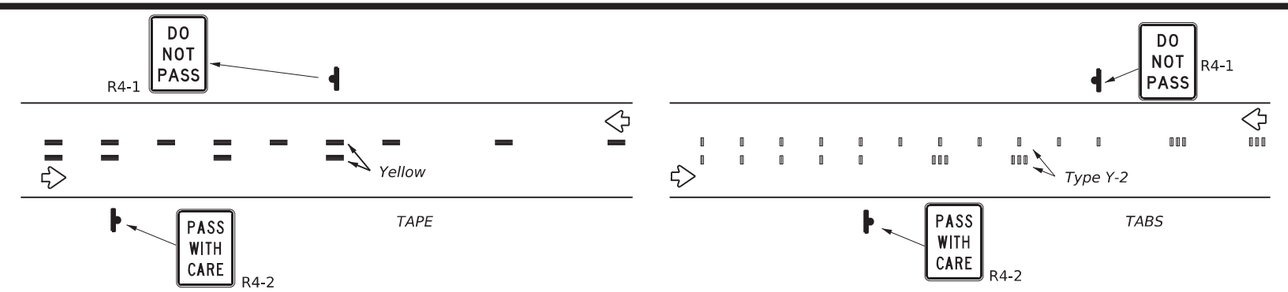
NOTES:

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.

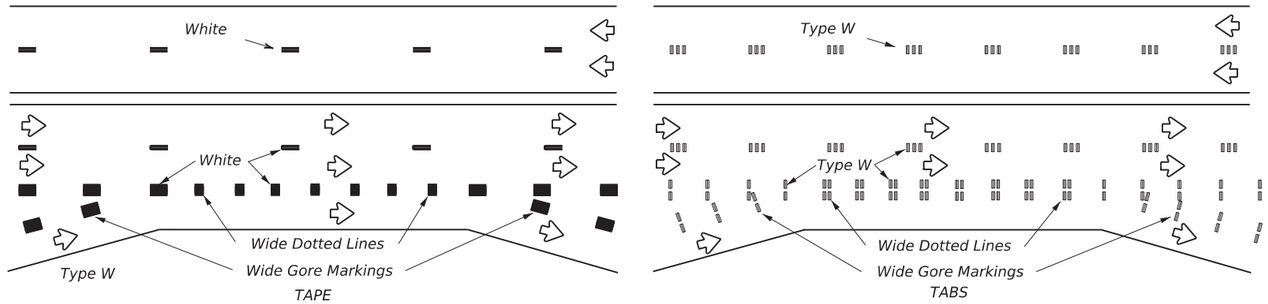
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

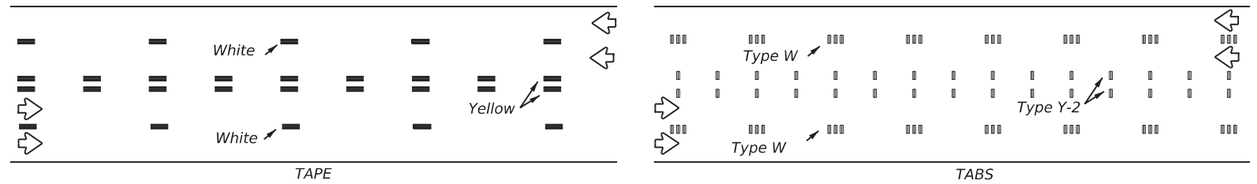
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



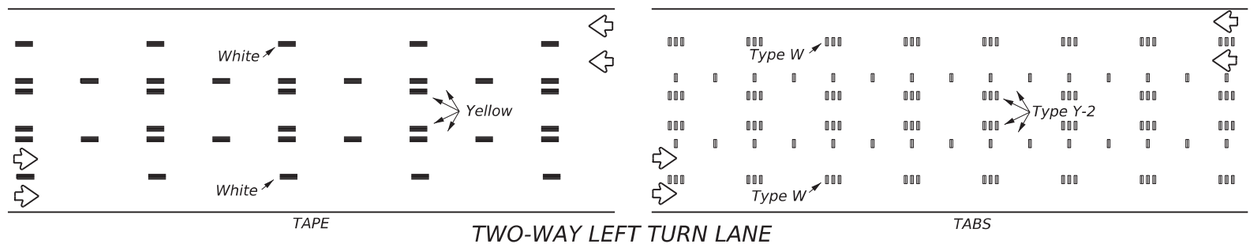
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



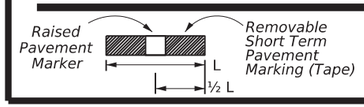
LANE LINES FOR DIVIDED HIGHWAY



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	22	LA SALLE, Etc.		75
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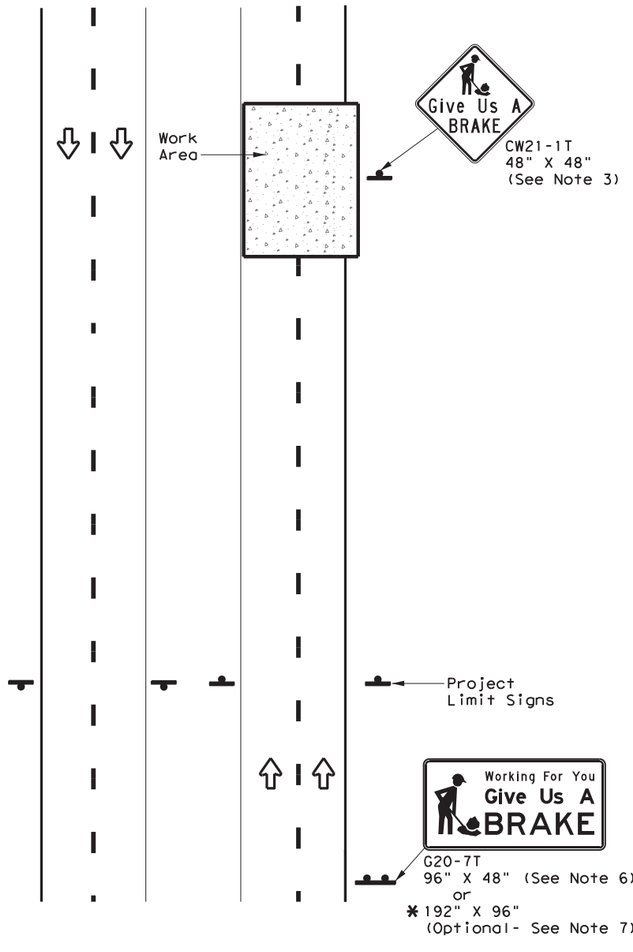
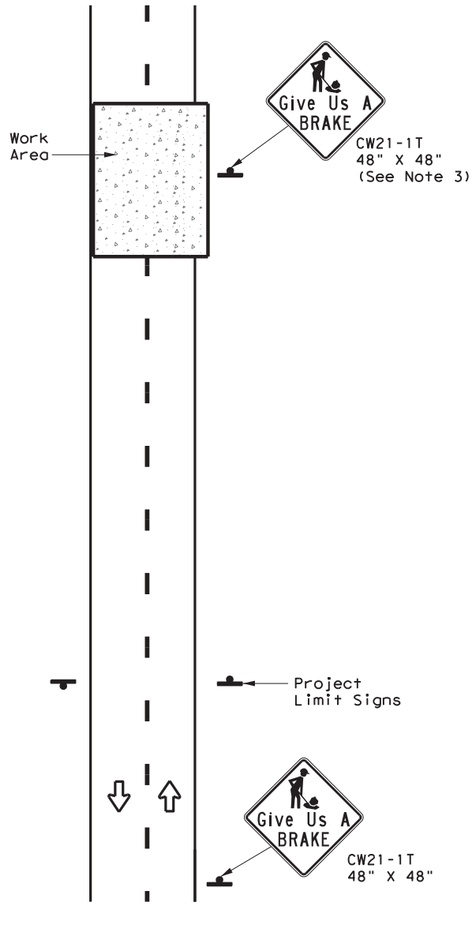


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
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.

Texas Department of Transportation

Traffic Operations Division Standard

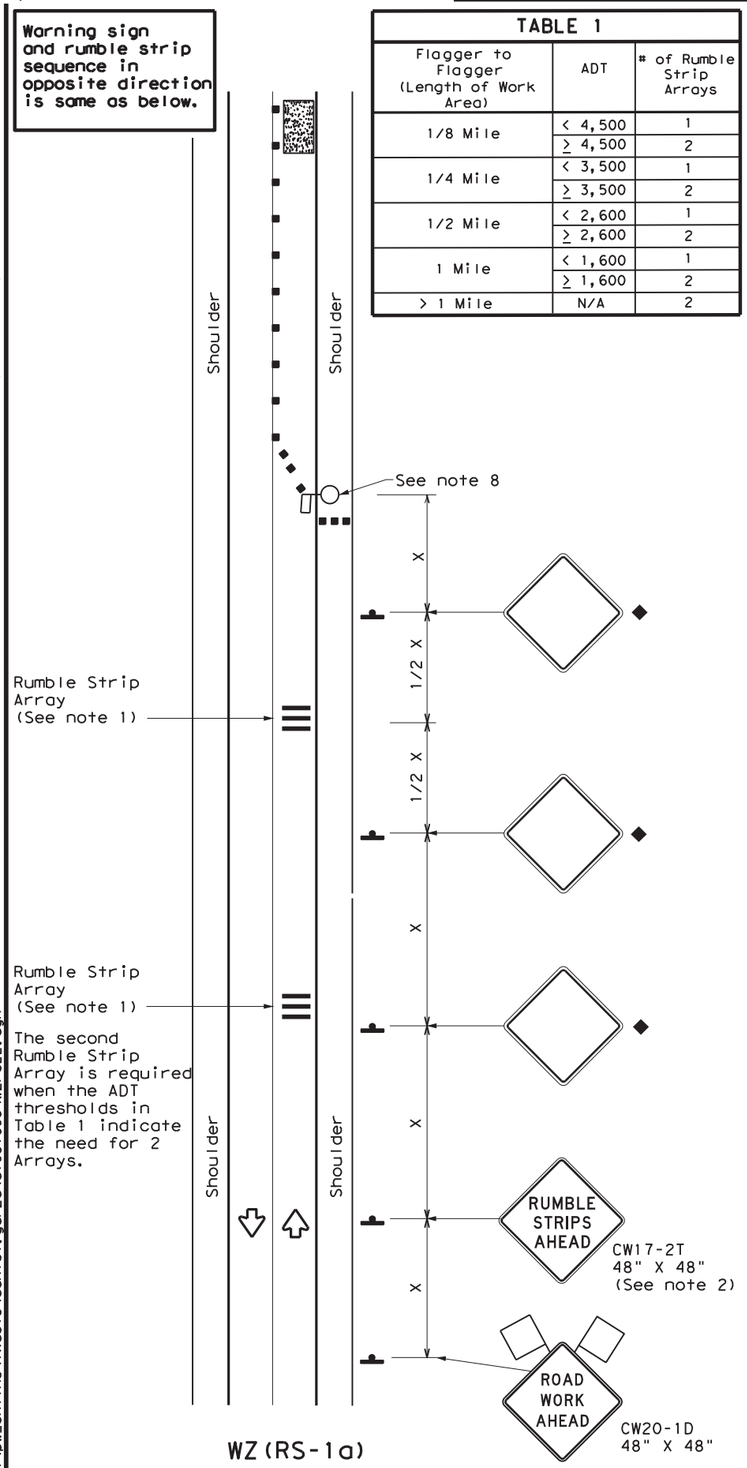
WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	22	LA SALLE, Etc.		76

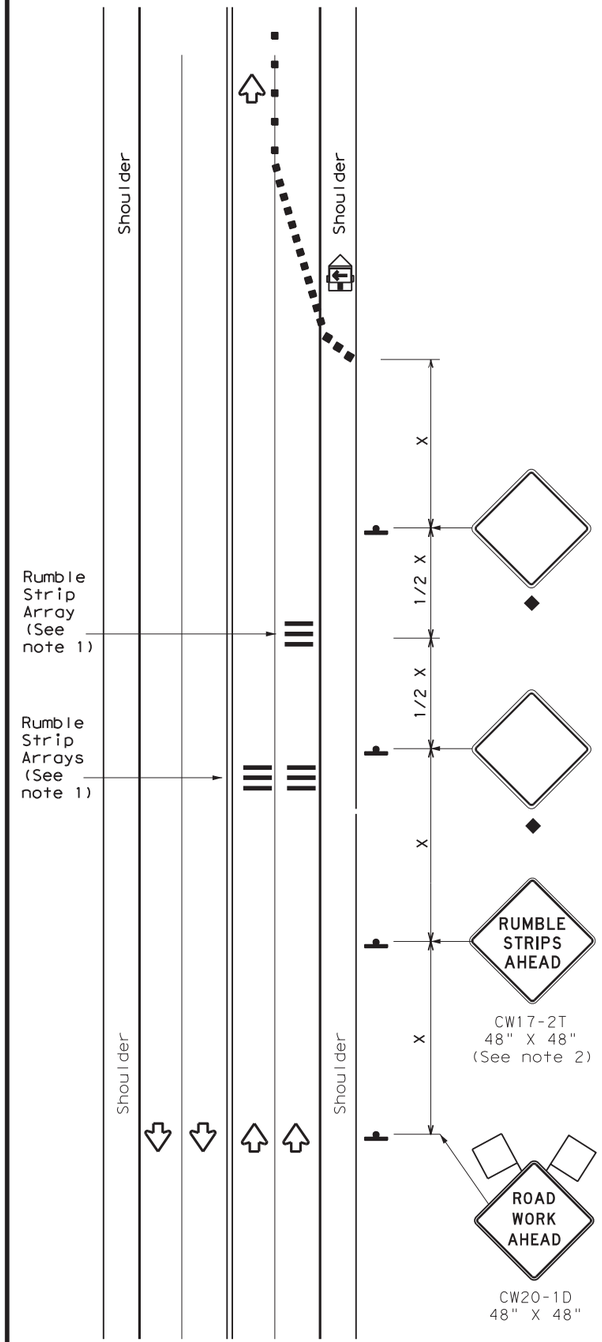
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		77

117

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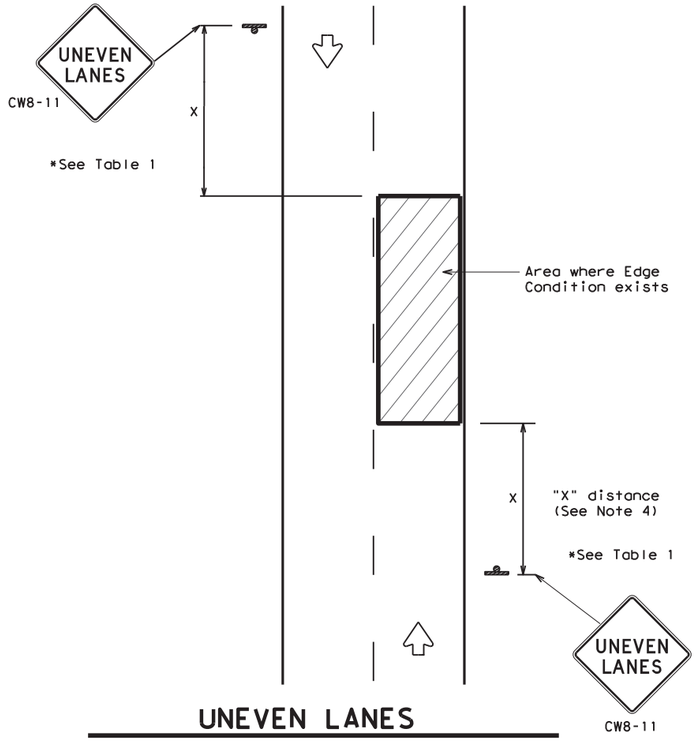
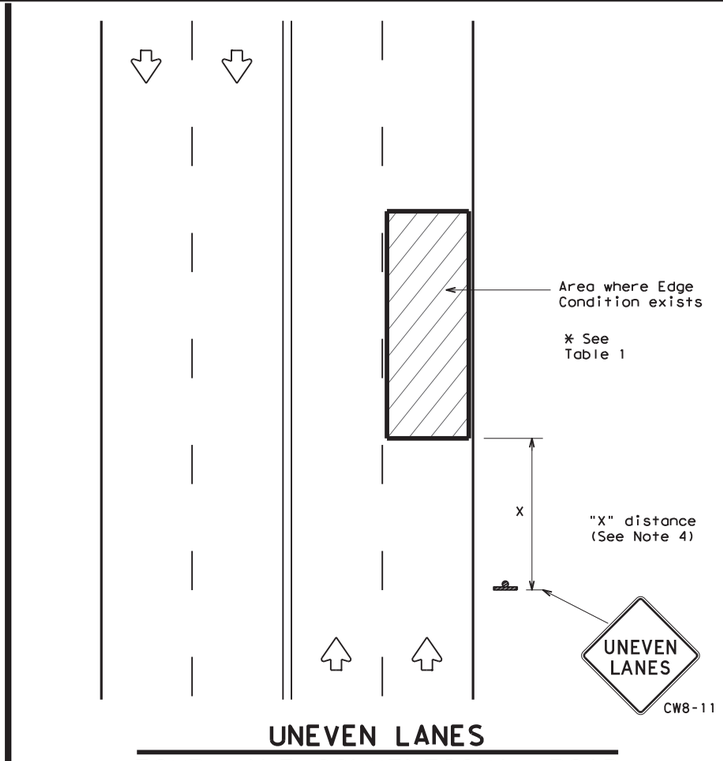
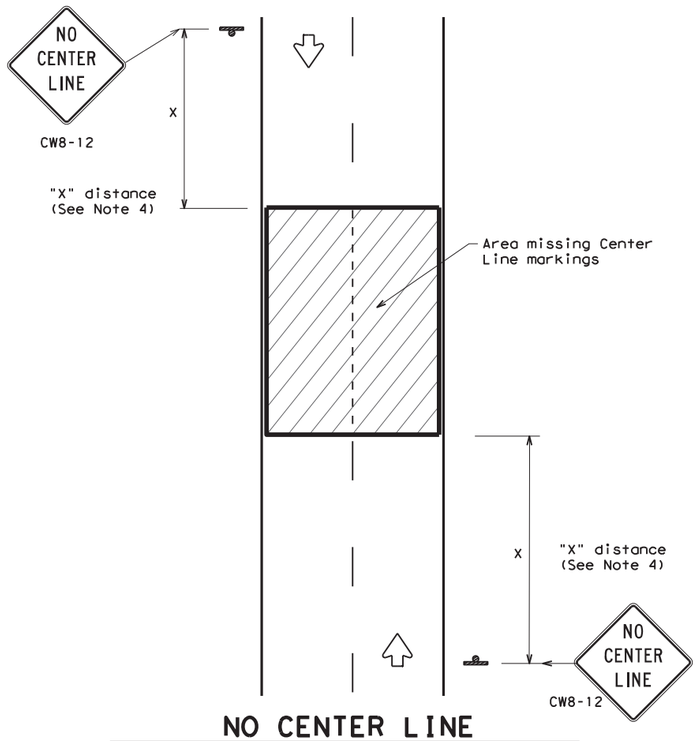


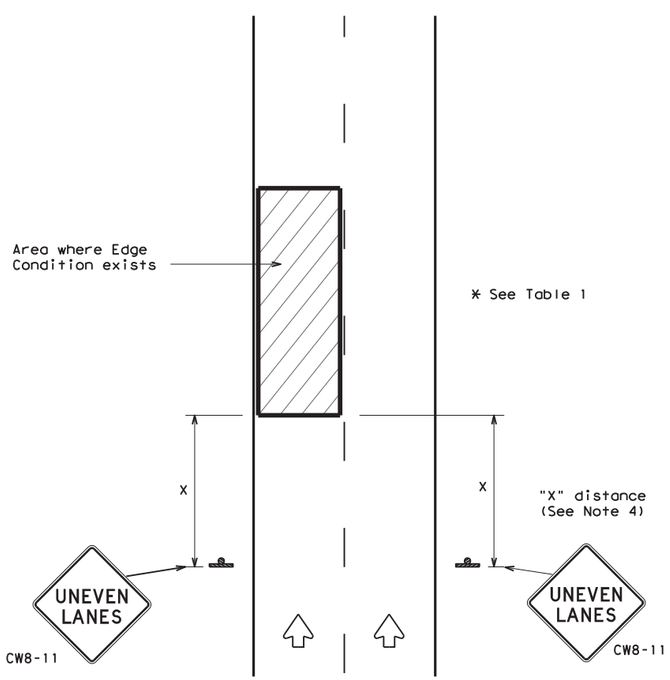
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

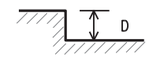
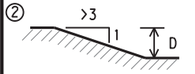
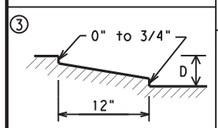
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	22	LA SALLE, Etc.		78

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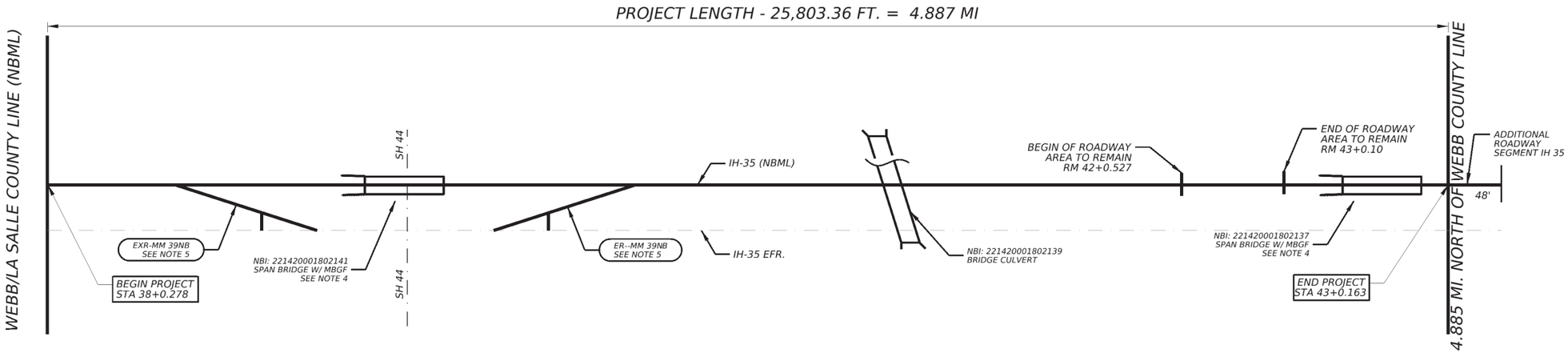
CK:
DW:
CK:
DN:

LEGEND

- BRIDGE
- CONCRETE AREA TO REMAIN
- EXR-MM XX - EXIT RAMP - MILE MARKER #
- ER-MM XX - ENTRANCE RAMP - MILE MARKER #
- METAL BEAM GUARD FENCE



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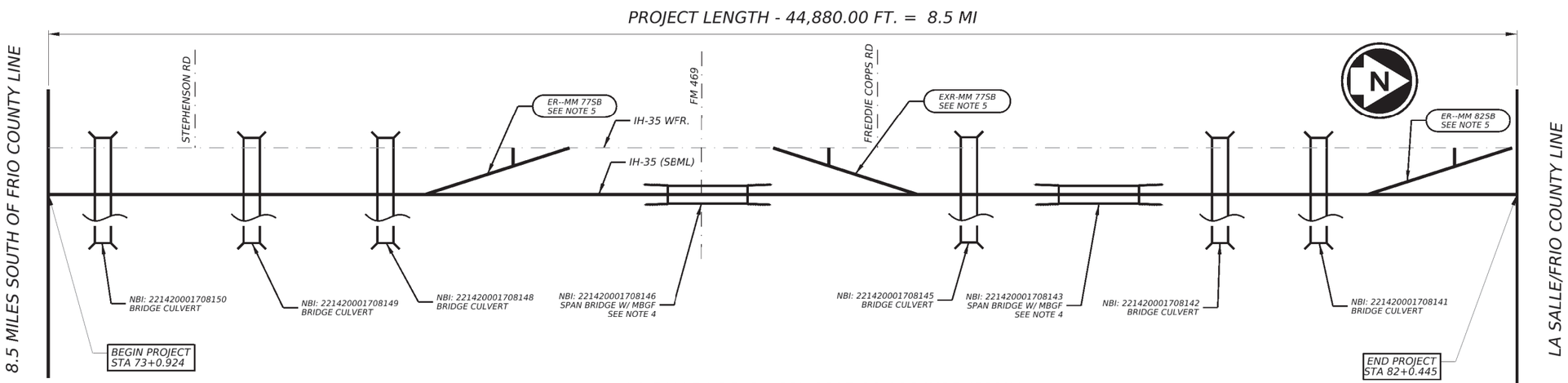

LA SALLE LOC. 2 - CSJ: 0017-08-116 IH35 (SBML)

NOTES:
1. REFER TO "TYPICAL SECTIONS" SHEET FOR ROADWAY WIDTH TO BE WORKED ON.
2. REFER TO "RATES OF APPLICATION" SHEET FOR RATES OF APPLICATION.
3. REFER TO "SUMMARY OF OUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.
4. REFER TO "ROADWAY MISCELLANEOUS DETAILS PLANING PROFILE" & MBGF. RAIL & TERMINAL INSTALLATION LAYOUTS" FOR MORE INFORMATION.
5. REFER TO "ROADWAY MISCELLANEOUS DETAILS RAMP OVERLAY" FOR MORE INFORMATION.

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IH 35, etc.

DIAGRAMMATIC LAYOUTS

SHEET 1 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		79

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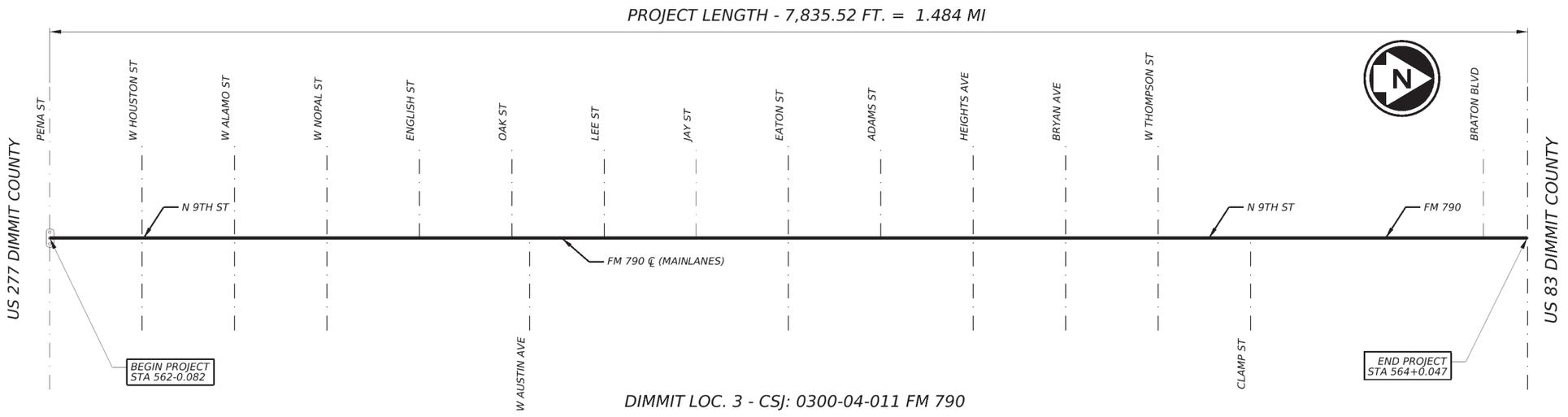
LEGEND

- TRAFFIC SIGNAL



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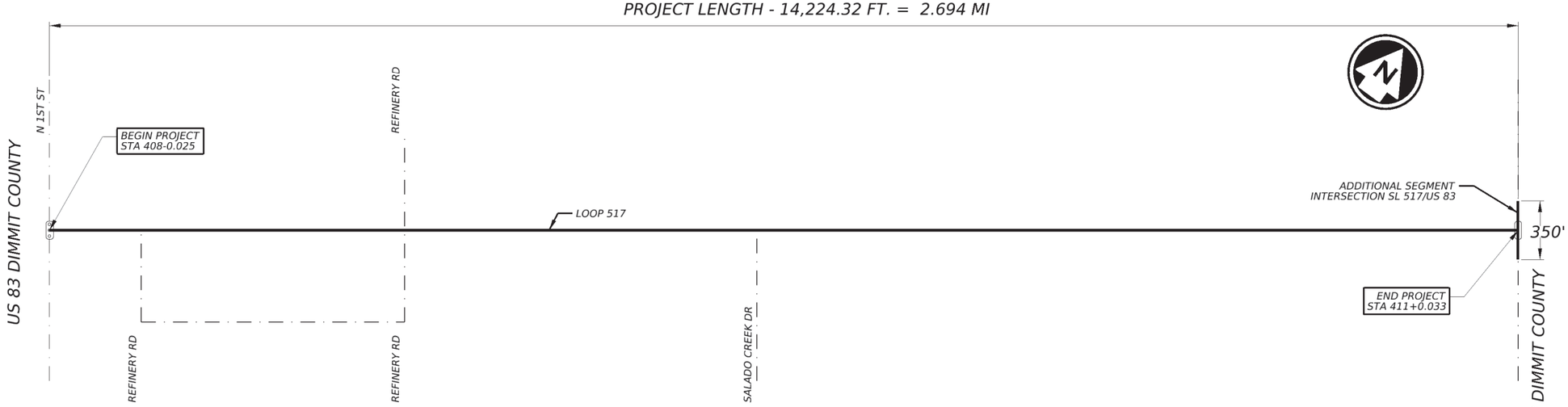

DIMMIT LOC. 4 CSJ: 2485-02-012 SL 517

NOTES:
1. REFER TO "TYPICAL SECTIONS" SHEET FOR ROADWAY WIDTH TO BE WORKED ON.
2. REFER TO "RATES OF APPLICATION" SHEET FOR RATES OF APPLICATION.
3. REFER TO "SUMMARY OF QUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.

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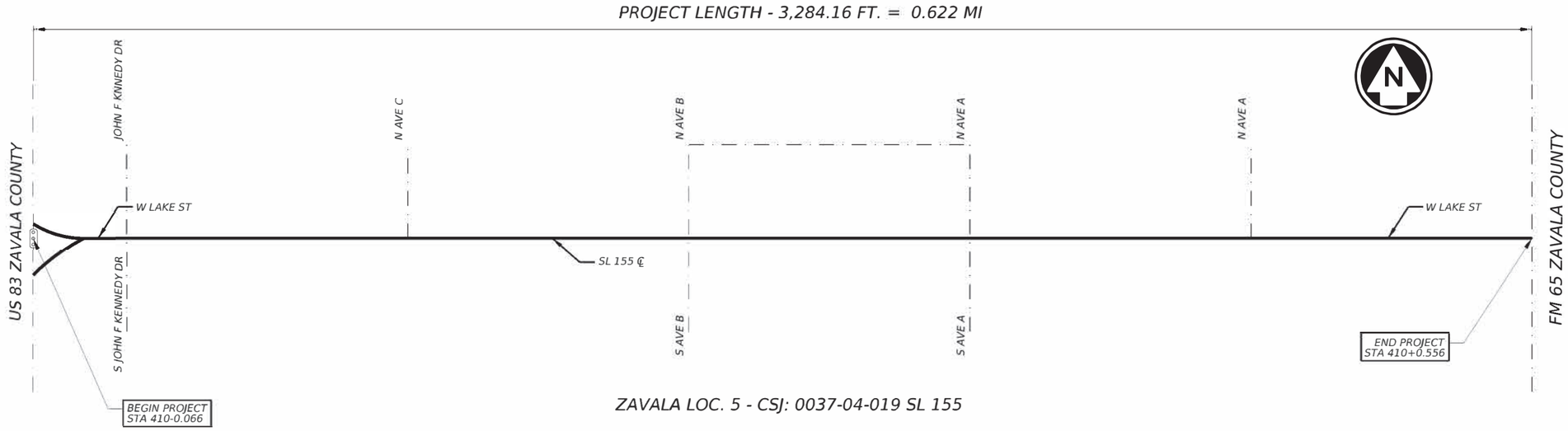
 SHEET 2 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		80

LEGEND

- BRIDGE
- TRAFFIC SIGNAL
- METAL BEAM GUARD FENCE



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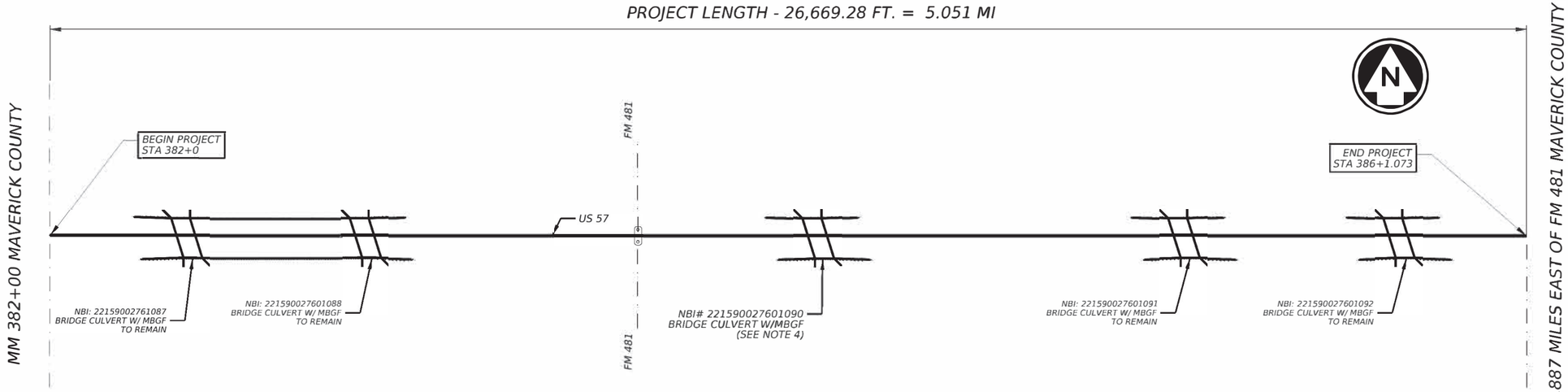

MAVERICK LOC. 6 CSJ: 0276-01-047 US 57

NOTES:
1. REFER TO "TYPICAL SECTIONS" SHEET FOR ROADWAY WIDTH TO BE WORKED ON.
2. REFER TO "RATES OF APPLICATION" SHEET FOR RATES OF APPLICATION.
3. REFER TO "SUMMARY OF QUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.
4. REFER TO "MBGF, RAIL & TERMINAL INSTALLATION LAYOUTS" SHEET(S) FOR MORE INFORMATION.

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DIAGRAMMATIC LAYOUTS

SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		81

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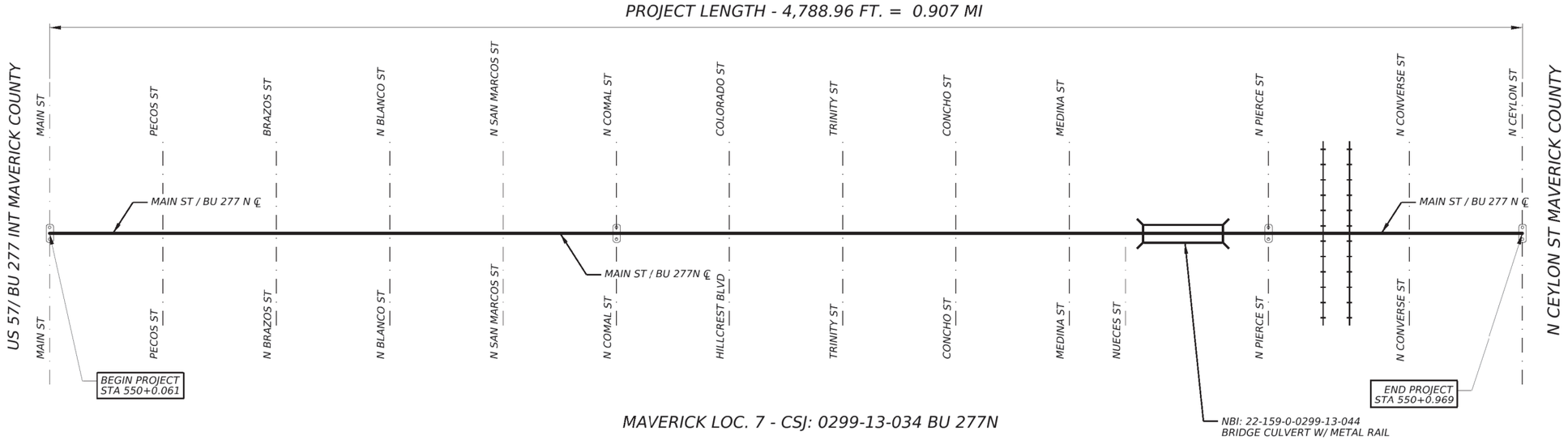
LEGEND

- BRIDGE
- RAIL ROAD TRACKS
- METAL BEAM GUARD FENCE
- TRAFFIC SIGNAL



MAVERICK LOC. 7 - CSJ: 0299-13-034 BU 277N

NOTES:
1. REFER TO "TYPICAL SECTIONS" SHEET FOR ROADWAY WIDTH TO BE WORKED ON.
2. REFER TO "RATES OF APPLICATION" SHEET FOR RATES OF APPLICATION.
3. REFER TO "SUMMARY OF QUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.
4. REFER TO "MBGF, RAIL & TERMINAL INSTALLATION LAYOUTS" SHEET FOR MORE INFORMATION.

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DIAGRAMMATIC LAYOUTS

 SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
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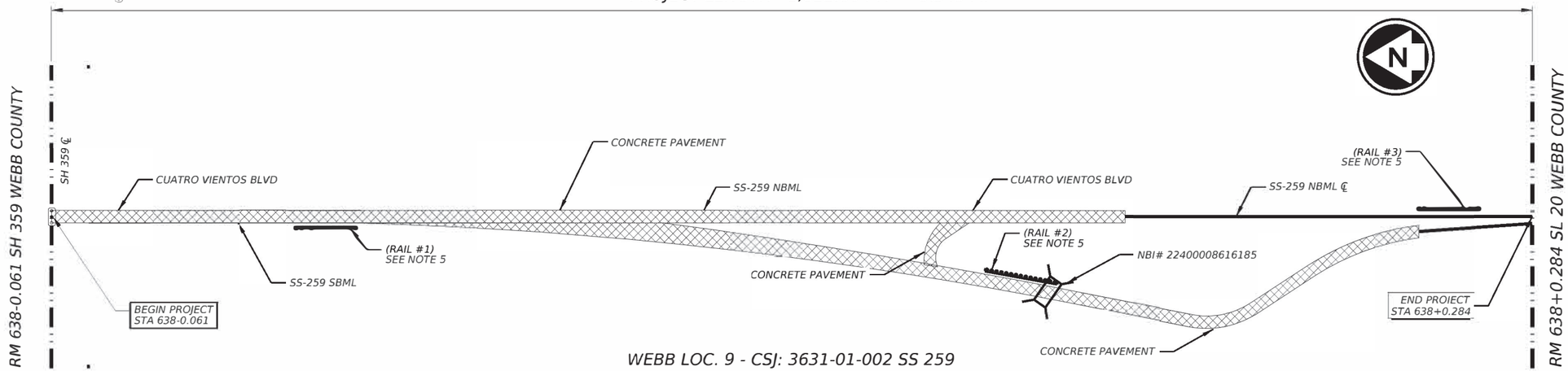
LEGEND

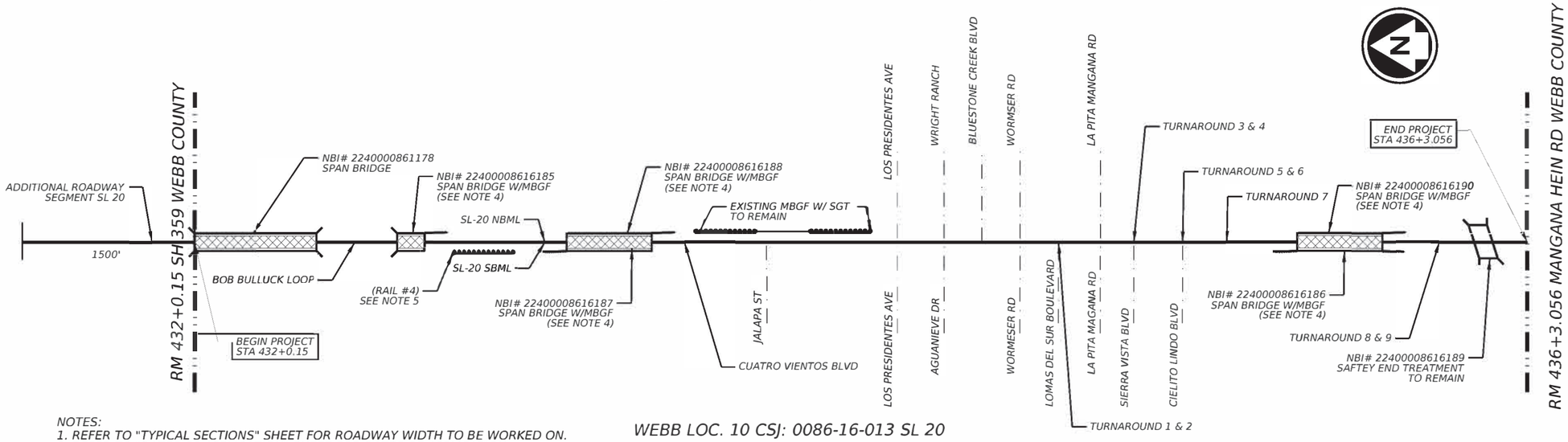
- BRIDGE
- CONCRETE AREA TO REMAIN
- EXR-MM XX - EXIT RAMP - MILE MARKER #
- ER-MM XX - ENTRANCE RAMP - MILE MARKER #
- METAL BEAM GUARD FENCE
- TRAFFIC SIGNAL

PROJECT LENGTH - 1,821.60 FT. = 0.345 MI



WEBB LOC. 9 - CSJ: 3631-01-002 SS 259

PROJECT LENGTH - 37,213.44 FT. = 7.048 MI



WEBB LOC. 10 CSJ: 0086-16-013 SL 20

NOTES:
1. REFER TO "TYPICAL SECTIONS" SHEET FOR ROADWAY WIDTH TO BE WORKED ON.
2. REFER TO "RATES OF APPLICATION" SHEET FOR RATES OF APPLICATION.
3. REFER TO "SUMMARY OF QUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.
4. REFER TO "MBGF. RAIL & TERMINAL INSTALLATION LAYOUTS" SHEETS FOR MORE INFORMATION.
5. REFER TO "ROADWAY MISCELLANEOUS DETAILS MBGF LAYOUT" FOR MORE INFORMATION.
6. EXISTING STRIPING WITHIN CONCRETE AREAS SHALL BE RE-ESTABLISH WITH NEW STRIPING IN ACCORDANCE WITH MOST UPDATED TXDOT STANDARDS OR DETAILS PROVIDED IN THE PLANS.

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DIAGRAMMATIC LAYOUTS

SHEET 6 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		83

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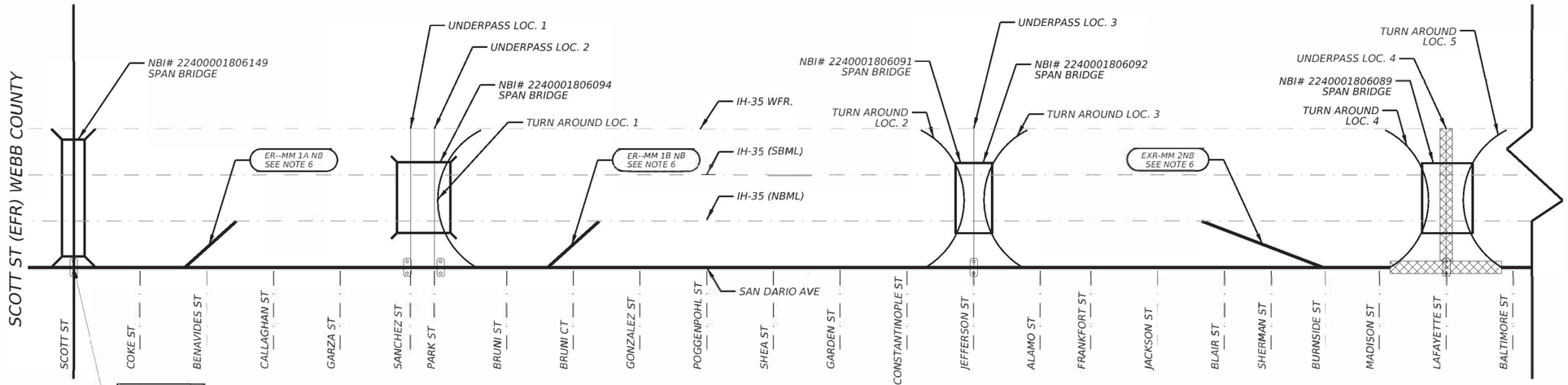
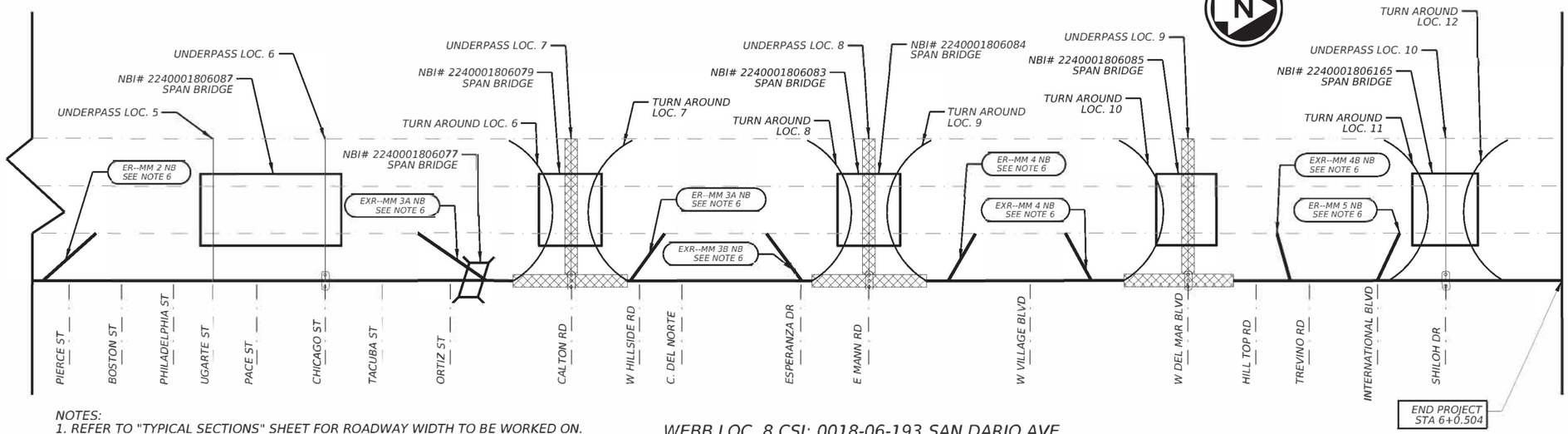
LEGEND

- BRIDGE
- CONCRETE AREA TO REMAIN
- EXR-MM XX - EXIT RAMP - MILE MARKER #
- ER-MM XX - ENTRANCE RAMP - MILE MARKER #
- METAL BEAM GUARD FENCE
- TRAFFIC SIGNAL

PROJECT LENGTH - 29,388.48 FT. = 5.566 MI





0.222 MILES N. OF SHILOH RD COUNTY

WEBB LOC. 8 CSJ: 0018-06-193 SAN DARIO AVE.

NOTES:
1. REFER TO "TYPICAL SECTIONS" SHEET FOR ROADWAY WIDTH TO BE WORKED ON.
2. REFER TO "RATES OF APPLICATION" SHEET FOR RATES OF APPLICATION.
3. REFER TO "SUMMARY OF QUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.
4. REFER TO "MBGF. RAIL & TERMINAL INSTALLATION LAYOUTS" SHEET FOR MORE INFORMATION.
5. REFER TO "ROADWAY MISCELLANEOUS DETAILS MBGF LAYOUT" FOR MORE INFORMATION.
6. REFER TO "ROADWAY MISCELLANEOUS DETAILS RAMP OVERLAY" FOR MORE INFORMATION.
7. EXISTING STRIPING WITHIN CONCRETE AREAS SHALL BE RE-ESTABLISH WITH NEW STRIPING IN ACCORDANCE WITH MOST UPDATED TXDOT STANDARDS OR DETAILS PROVIDED IN THE PLANS.

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IH 35, etc.

DIAGRAMMATIC LAYOUTS

SHEET 5 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		84

DATE: 12/19/2023 1:35:11 PM
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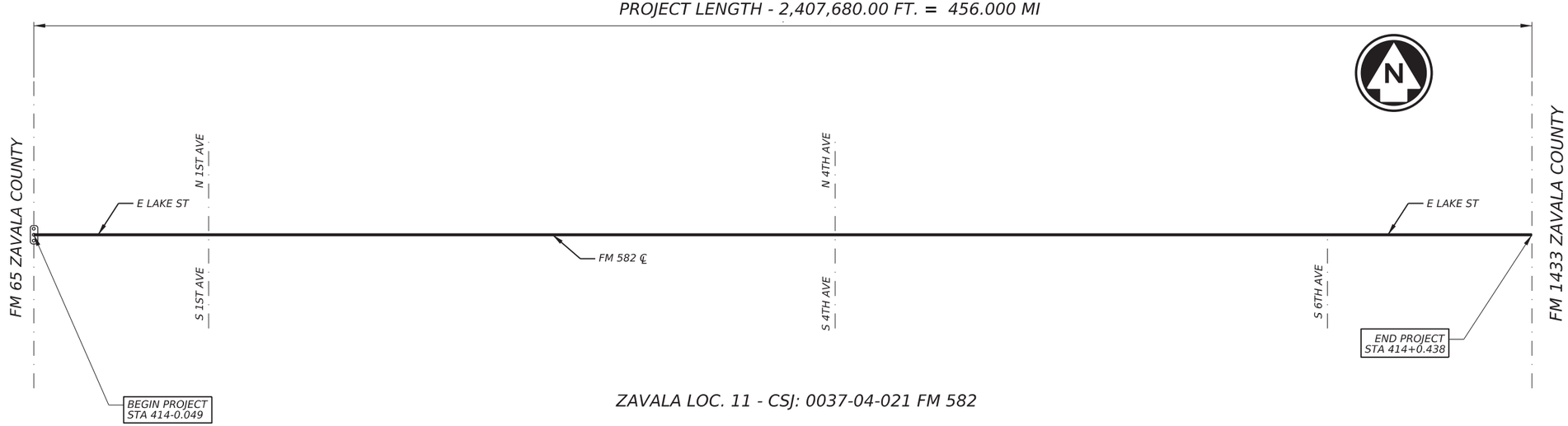
LEGEND

- BRIDGE
- CONCRETE AREA TO REMAIN
- EXR-MM XX - EXIT RAMP - MILE MARKER #
- ER-MM XX - ENTRANCE RAMP - MILE MARKER #
- METAL BEAM GUARD FENCE
- TRAFFIC SIGNAL

PROJECT LENGTH - 2,407,680.00 FT. = 456.000 MI



ZAVALA LOC. 11 - CSJ: 0037-04-021 FM 582

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IH 35, etc.

DIAGRAMMATIC LAYOUTS

SHEET 7 OF 7

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		85

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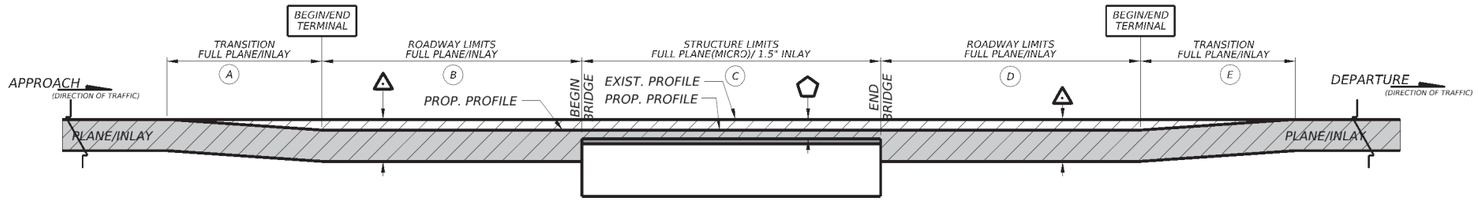
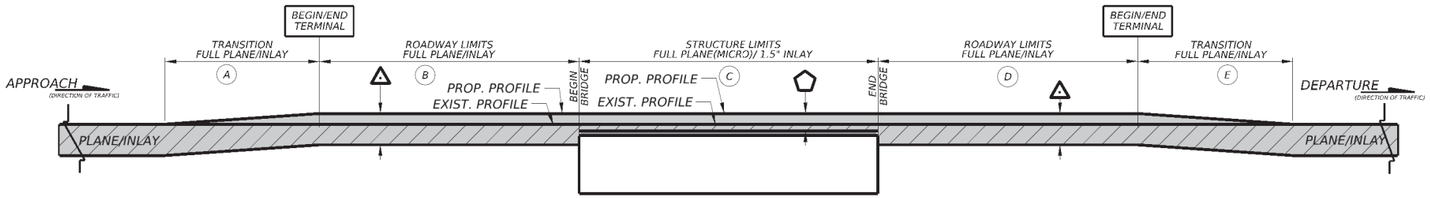
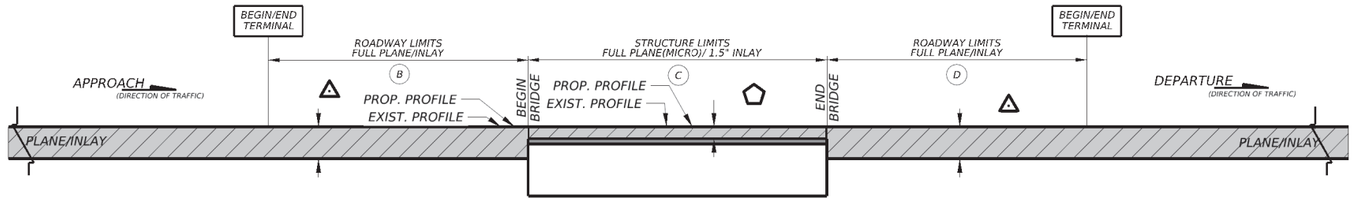


ROADWAY PROFILE VIEW 1



ROADWAY PROFILE VIEW 2



ROADWAY PROFILE VIEW 3

LOCATION #	STRUCTURE PSN:	ROADWAY PROFILE VIEW	ROADWAY		STRUCTURE		A PLANE ASPH CONC PAV		SUB TOTAL	B PLANE ASPH CONC PAV		SUB TOTAL	C PLANE ASPH CONC PAV (MICRO) (0"-3")		SUB TOTAL	D PLANE ASPH CONC PAV		SUB TOTAL	E PLANE ASPH CONC PAV		SUB TOTAL	TOTAL
			FULL PLANE	FULL INLAY	FULL PLANE	FULL INLAY																
			IN	IN	IN	IN	LENGTH	WIDTH	SY	LENGTH	WIDTH	SY	LENGTH	WIDTH	SY	LENGTH	WIDTH	SY	LENGTH	WIDTH	SY	SY
1	22-142-0-0018-02-137	1	4.5	3	3	1.5	100	40	445	275	40	1223	160	40	712	25	40	112	100	40	445	2937
1	22-142-0-0018-02-141	2	2	3	0.5	1.5	100	40	445	275	40	1223	175	40	778	25	40	112	100	40	445	3003
2	22-142-0-0017-08-143	3	3	3	1.5	1.5	-	-	0	375	25	1042	120	25	334	175	25	487	-	-	0	1863
2	22-142-0-0017-08-146	3	3	3	1.5	1.5	-	-	0	725	25	2014	120	25	334	662.5	25	1841	-	-	0	4189
																						11992

NOTES:

1. REFER TO "MBGF,RAIL & TERMINAL INSTALLATION LAYOUT" SHEET(S) FOR ADDITIONAL STRUCTURAL INFORMATION.
2. REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR STRUCTURE LOCATION.
3. ALL PLANING WORK DONE OVER STRUCTURE LIMITS SHOWN ON THIS SHEET TO BE DONE AT 1" INCREMENTS UNTIL FULL PLANING DEPTH IS ACHIEVED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
4. ANY ADDITIONAL WORK NEEDED TO ACHIEVE FULL PLANE DEPTH WILL NOT BE PAID DIRECTLY BUT WILL BE SUBSIDIARY TO ITEM "354".
5. CONTRACTOR TO VERIFY DEPTH OVER STRUCTURE BEFORE PLANING OPERATIONS.

LEGEND

-PLANING

-INLAY

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IH 35

ROADWAY MISCELLANEOUS DETAILS PLANING PROFILE

 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		86

DATE: 12/19/2023 1:35:42 PM
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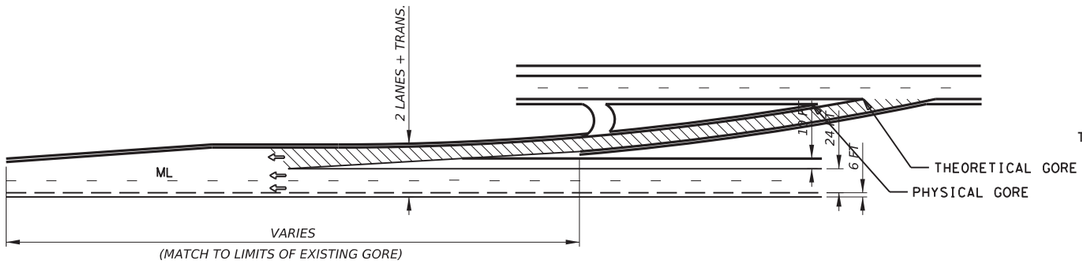
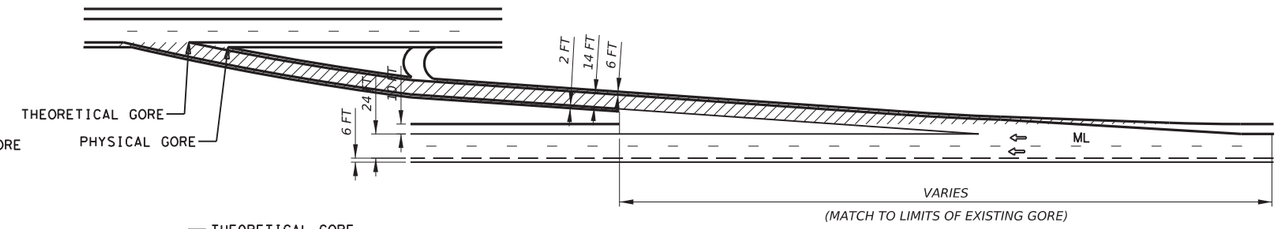
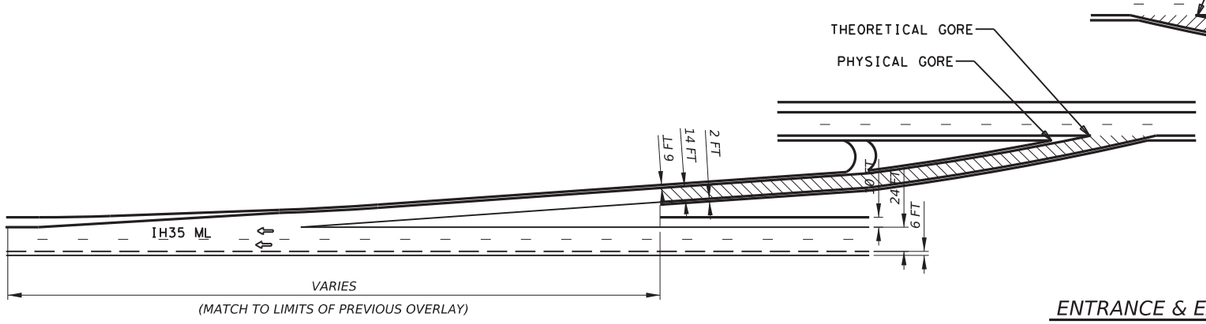
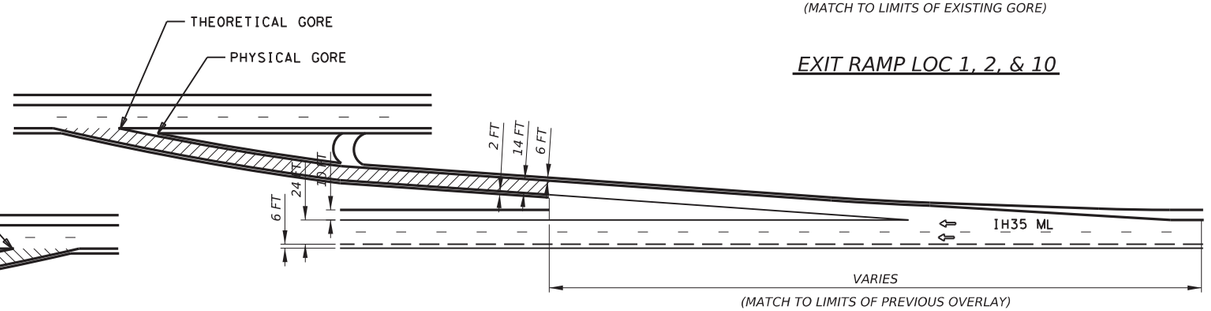


ENTRANCE RAMP LOC 1, 2, & 10

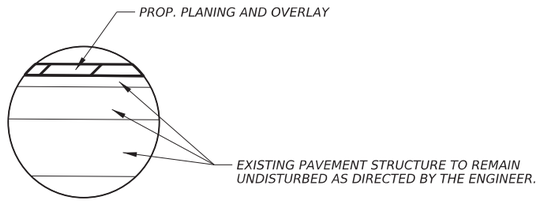


EXIT RAMP LOC 1, 2, & 10

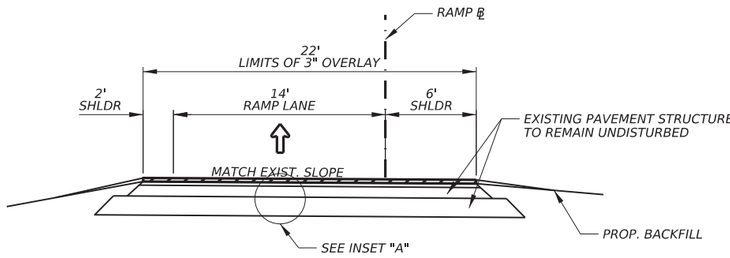




ENTRANCE & EXIT RAMPS LOC 8



INSET "A"



RAMP TYPICAL SECTION

LEGEND

▨ — PROP. PLANING AND OVERLAY

NOTES:

- APPLICATION RATES ARE FOR ESTIMATION PURPOSES ONLY, THESE RATES MAY BE ADJUSTED ON THE FIELD AS PER ENGINEER.
- MAINTAIN EXISTING SLOPES AND PGL THROUGHOUT THE PROJECT
- REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR ENTRANCE / EXIT RAMP LOCATIONS
- PLANING TRANSITIONS AT RAMPS WILL BE 50 FT IN LENGTH. REFER TO "TRANSITION DETAILS" FOR MORE INFORMATION.
- REFER TO RATES OF APPLICATION FOR PAVEMENT SURFACES.

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IH 35, etc.

MISCELLANEOUS DETAILS

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		87

LOC. 1, 2, 8 & 10 RAMP DETAIL

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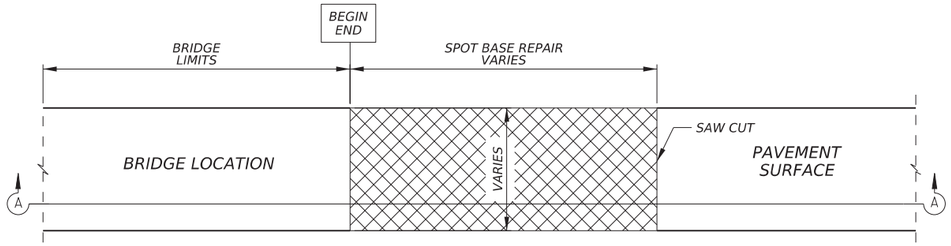
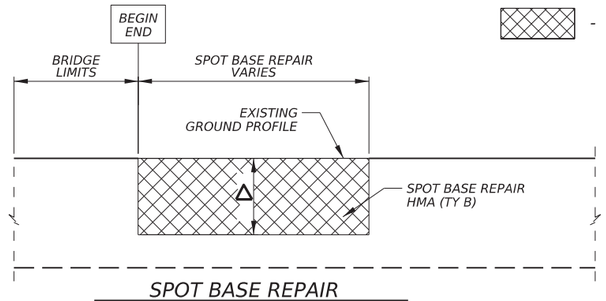


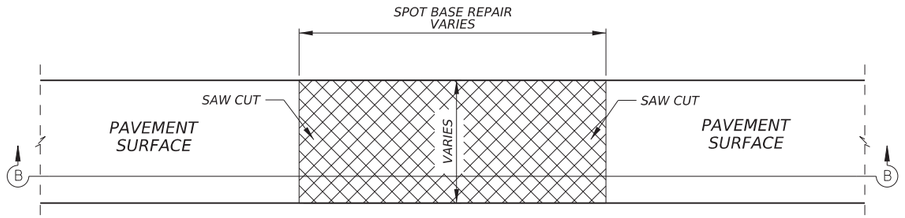
SPOT BASE REPAIR DETAIL
BRIDGE LOCATIONS

LEGEND

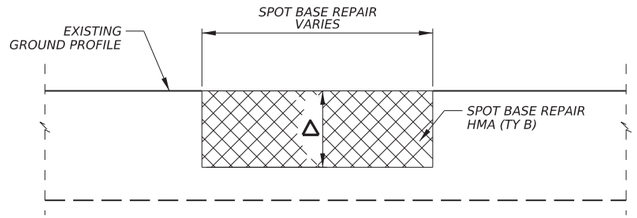
- SPOT BASE REPAIR



SPOT BASE REPAIR
BRIDGE SECTION A-A



SPOT BASE REPAIR DETAIL
ROADWAY SECTION



SPOT BASE REPAIR
ROADWAY SECTION B-B

RATES OF APPLICATION

SPOT BASE REPAIR:

FLEXIBLE PAVEMENT STRUCTURE REPAIR - 120 LBS/SY/IN

NOTES

1. CONTRACTOR WILL FIELD VERIFIED ALL SPOT BASE REPAIR LENGTHS, DEPTHS, AND TRANSITION LENGTHS WITH TXDOT PERSONNEL PRIOR TO CONSTRUCTION.
2. CONTRACTOR WILL SAW CUT TO PROVIDE A SMOOTH SURFACE. THIS WILL NOT BE PAID DIRECTLY BUT BE SUBSIDIARY TO ITEM "351" FLEXIBLE PAVEMENT STRUCTURE REPAIR.

Δ 3. REFER TO "SUMMARY OF QUANTITIES" FOR SPECIFIC REPAIR DEPTHS AND MATERIALS AT EACH LOCATION.

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IH 35, etc.

MISCELLANEOUS DETAILS

SPOT BASE REPAIRS DETAIL

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		88

DATE: 12/8/2023 12:40:02 PM
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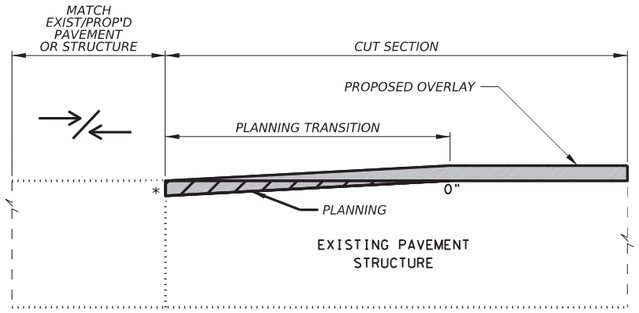
LEGEND

- OVERLAY
- BACKFILL MATERIAL
- PLANNING

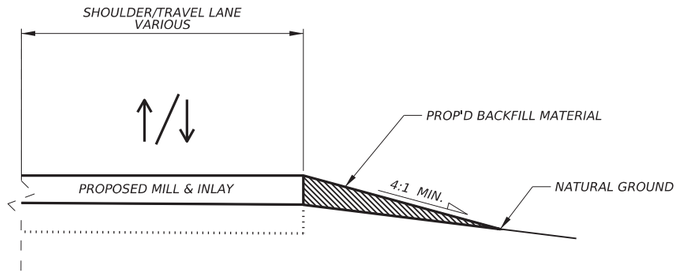


LONGITUDINAL

PLANING/MILL & INLAY (PROFILE)

NOTES OVERLAY- LONGITUDINAL

1. TRANSITION LOCATIONS WILL BE LIMITED TO 100 FT. UNLESS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER
2. BEGIN/END PROJECT LIMITS AND BRIDGES (APPROACHES/DEPARTURES)LOCATIONS TRANSITIONS WILL CONSIST OF HMA MATERIAL.
3. CONTRACTOR WILL FIELD VERIFY ALL LIMITS THAT WILL REQUIRE TRANSITIONS PRIOR TO CONSTRUCTION.
4. REFER TO "TYPICAL SECTION" SHEET(S) FOR RATES OF APPLICATION.
5. * REFER TO "DIAGRAMMATIC LAYOUT" SHEET(S) FOR PAVEMENT DESIGN LIMITS.
6. REFER TO "TCP CONSTRUCTION JOINT DETAIL" IN ORDER TO AVOID LONGITUDINAL PAVEMENT DROP-OFF.



BACKFILL

MILL & INLAY/BACKFILL (CROSS SECTION)

NOTES OVERLAY- BACKFILL

1. BACKFILL WILL VARY DUE TO EXISTING NATURAL GROUND CONDITIONS.
2. REFER TO "SUMMARY OF QUANTITIES" SHEET(S) FOR BACKFILL MATERIAL TYPE TO BE PLACED.
3. DURING ALL NON-WORK HOURS ALL PAVEMENT EDGE DROP-OFFS ARE TO BE FILLED TO A 3:1 MAXIMUM SLOPE, UNTIL FINAL BACKFILL MATERIAL CAN BE PLACED.

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TRANSITION DETAILS

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MISCELLANEOUS DETAILS

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		89

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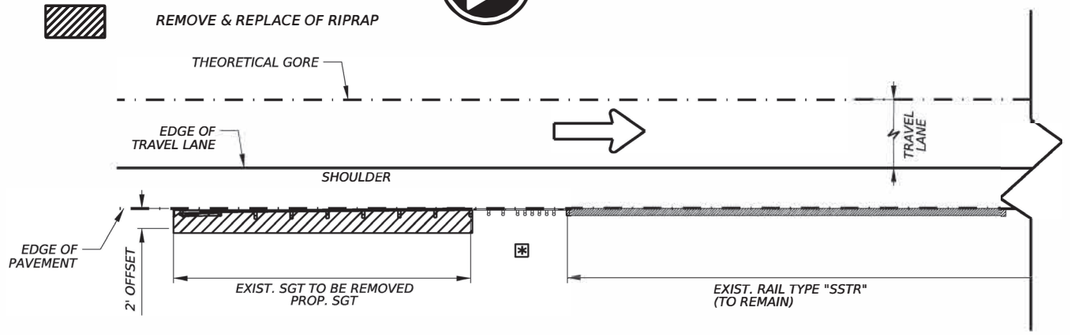
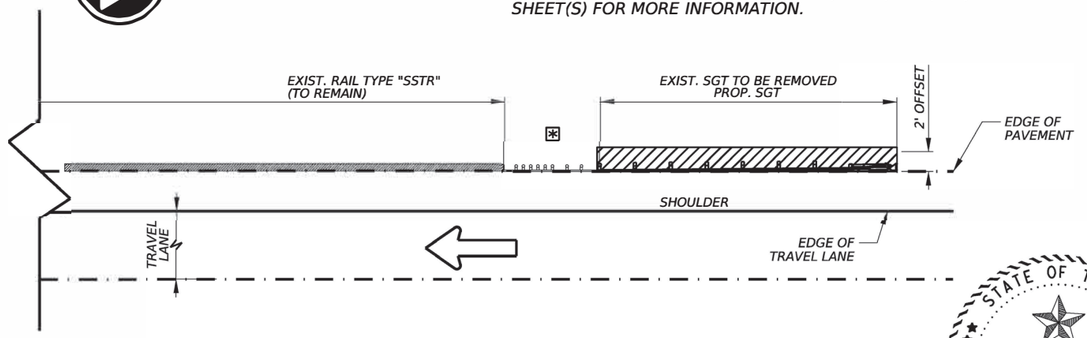
LEGEND

- EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED & REPLACED
- DIRECTION OF TRAVEL
- EXISTING RAIL TYPE "SSTR"
- DOWNSTREAM ANCHOR TERMINAL
- REMOVE & REPLACE OF RIPRAP



RAIL LOCATION 3 DETAIL



RAIL LOCATION 1 DETAIL

GENERAL NOTES:

1. MBGF AND SGT INSTALLATION TO BE DONE IN SECTIONS (APPROACH UPSTREAM TRAFFIC, BRIDGE, DEPARTURE DOWNSTREAM TRAFFIC). EACH SECTION WILL BE COMPLETED IN ONE DAY, UNLESS MORE SECTIONS CAN BE COMPLETED. WHERE EXISTING MBGF IS LOCATED, PROPOSED MBGF MUST BE CONNECTED TO THE REMAINING EXISTING MBGF AT THE END OF THE DAY. ALL EXPOSED MBGF ENDS WILL BE TIED DOWN AT THE END OF THE DAY AS STATED IN "TRAFFIC CONTROL PLAN GENERAL NOTES".

2. REFER TO TXDOT STANDARDS GF(31)-19, GF(31)DAT-19, GF(31)TR TL 3-20, GF(31)MS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18 AND SGT(15)31-20 SHEET(S) FOR MORE INFORMATION.

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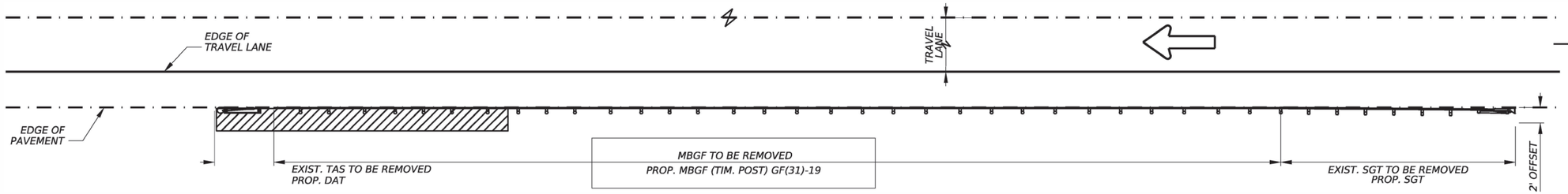


RAIL LOCATION 2 DETAIL

NOT TO SCALE

REFERENCE LOCATION	RAIL NUMBER	HWY	BOUND	SIDE	APPOX. DISTANCE FROM BEGIN OF PROJECT	REMOVAL					INSTALLATION			
						MTL W-BEAM GD FEN (TIM POST)	GUARDRAIL END TREATMENT	REMOVING CONC (RIPRAP)	TERMINAL ANCHOR SECTION	MTL BM GD FENCE TRANS (THRIE-BEAM)	MTL W-BEAM GD FEN (TIM POST)	GUARDRAIL END TREATMENT	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FENCE TRANS (THRIE-BEAM)
						LF	EA	CY	EA	EA	LF	EA	EA	EA
9	1	SS 259	SOUTHBOUND	RT	445	0	1	5.08	0	1	0	1	0	1
9	2	SS 259	SOUTHBOUND	LT	1000	75	1	9.95	1	0	75	1	1	0
9	3	SS 259	NORTHBOUND	RT	1710	0	1	5.08	0	1	0	1	0	1
TOTAL						75	3	20.1	1	2	75	3	1	2

LOC. 9 MBGF LAYOUT

Texas Department of Transportation

IH 35, etc.

MISCELLANEOUS DETAILS

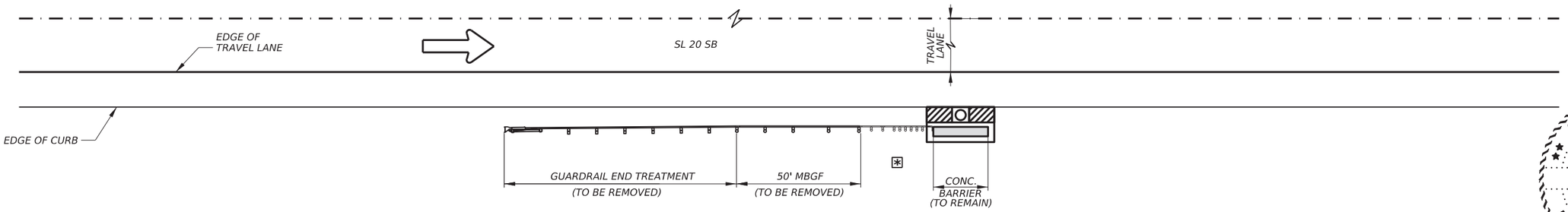
CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		90

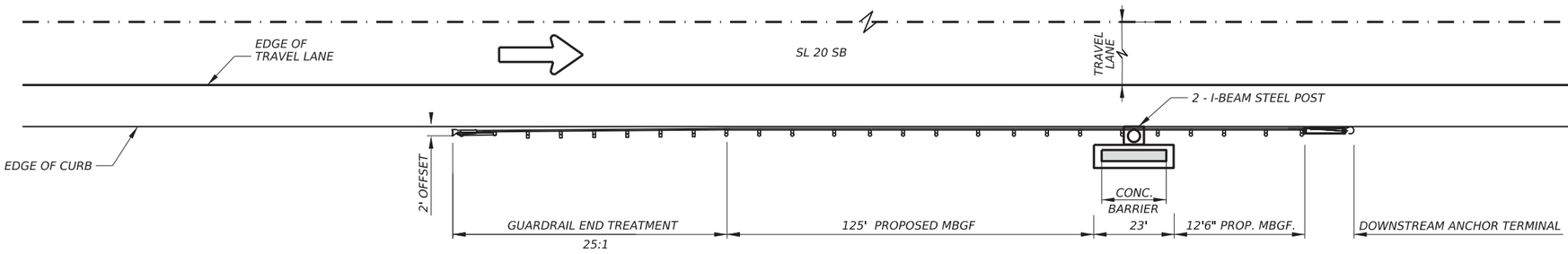
DATE: 12/18/2023 3:19:21 PM
FILE: c:\txdot\pw online\txdot05\daniel.garza\d1010035\091 RMD MBGF Layout.dgn

CK DW CK DW

LEGEND

- EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED
- DIRECTION OF TRAVEL
- CONCRETE BARRIER
- DOWNSTREAM ANCHOR TERMINAL
- INLET TO REMAIN
- REMOVAL OF RIPRAP





RAIL LOCATION 4 DETAIL

NOT TO SCALE

REFERENCE LOCATION	RAIL NUMBER	HWY	BOUND	SIDE	APPOX. DISTANCE FROM BEGIN OF PROJECT	REMOVAL				INSTALLATION		
						MTL W-BEAM GD FEN (TIM POST)	GUARDRAIL END TREATMENT	REMOVING CONC (RIPRAP)	MTL BM GD FENCE TRANS (THRIE-BEAM)	MTL W-BEAM GD FEN (TIM POST)	GUARDRAIL END TREATMENT	DOWNSTREAM ANCHOR TERMINAL SECTION
						LF	EA	CY	EA	LF	EA	EA
10	4	SL 20	SOUTHBOUND	RT	2150	50	1	1.55	1	162	1	1
TOTAL						50	1	1.55	1	162	1	1

LOC. 10 MBGF LAYOUT

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IH 35, etc.

MISCELLANEOUS DETAILS

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		91

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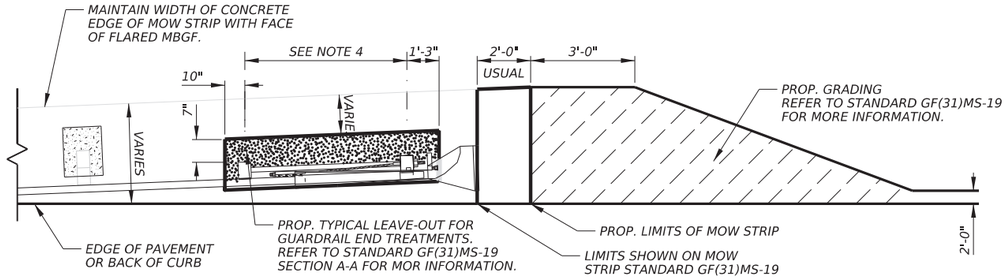
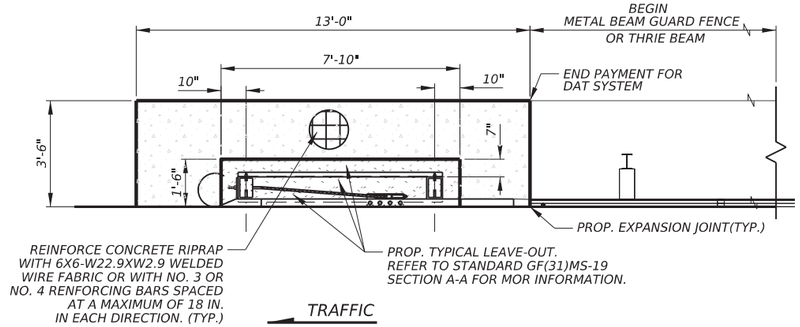


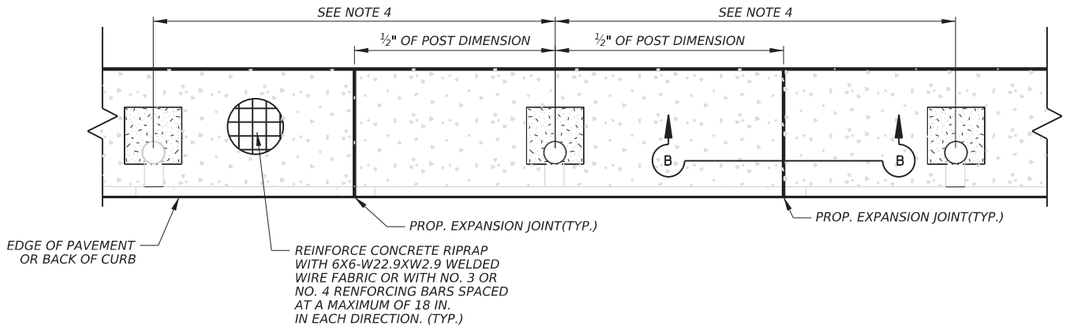
TYPICAL GUARDRAIL END TREATMENT MOW STRIP DETAIL

N.T.S.



TYPICAL DOWNSTREAM ANCHOR TERMINAL MOW STRIP DETAIL

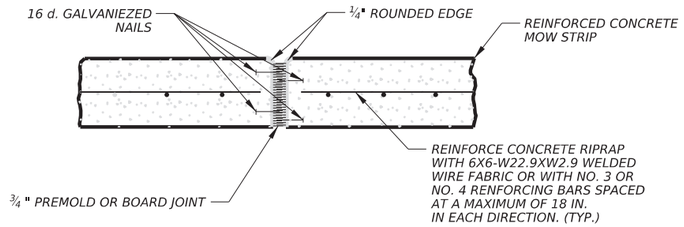
N.T.S.



TYPICAL GUARDRAIL END TREATMENT MOW STRIP EXPANSION JOINT DETAIL

-

N.T.S.



SECTION B-B

N.T.S.

NOTES

1. PLACE CONCRETE MOW STRIPS AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH ITEM 432 "RIPRAP". USE CLASS B REINFORCED CONCRETE.
2. PLACE THE MOW STRIP THE ENTIRE LENGTH OF THE GUARD FENCE PLUS ANY DOWNSTREAM ANCHOR TERMINAL (DAT) OR SINGLE GUARDRAIL TERMINAL (SGT) TO 2' BEYOND THE FACE OF THE OBJECT MARKER AT THE END OF THE TERMINAL. DO NOT ALLOW CONCRETE TO ADHERE TO THE GROUND LINE STRUT SHOWN ON THE SGT STANDARD SHEET.
3. MOWSTRIP TO BE CONVENTIONALLY FORMED CONCRETE. PROVIDE MOWSTRIP SECTIONS SEPARATED BY PREMOLD OR BOARD JOINT OF THE THICKNESS SHOWN ON THE PLANS IN LENGTHS GREATER THAN 8 FT. BUT LESS THAN OR EQUAL TO 12.5 FT, UNLESS OTHERWISE DIRECTED. TERMINATE WORKDAY PRODUCTION AT AN EXPANSION JOINT.
4. REFER TO TXDOT STANDARD GF(31)-19, GF(31)TRTL3-20, GF(31)MS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18, SGT(15)31-20 SHEET(S) IF APPLICABLE FOR INSTALLATION, DIMENSIONS AND OTHER INFORMATION.
5. MOWSTRIP EXPANSION JOINT SPACING SHALL BE MINIMUM 24 FT. AND NO MORE THAN 40 FT.

MOWSTRIP QUANTITY CALCULATIONS

FOR ESTIMATION PURPOSES

EVERY THRIE-BEAM TRANS = 0.81 CY (7.29 SY)
EVERY 25 FT. OF MBGF = 1.08 CY (9.72 SY)
EVERY GET SYSTEM = 2.85 CY (25.74 SY)
EVERY DAT SYSTEM = 0.56 CY (5.0 SY)

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by CYNTHIA GARCIA P.E. 149715, on

DocuSigned by: Cynthia Garcia 96CA7DFE12674F3...

12/22/2023

Texas Department of Transportation

IH 35, etc.

MISCELLANEOUS DETAILS

LOC. 1, 2 & 6 MOW STRIP DETAIL

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		92

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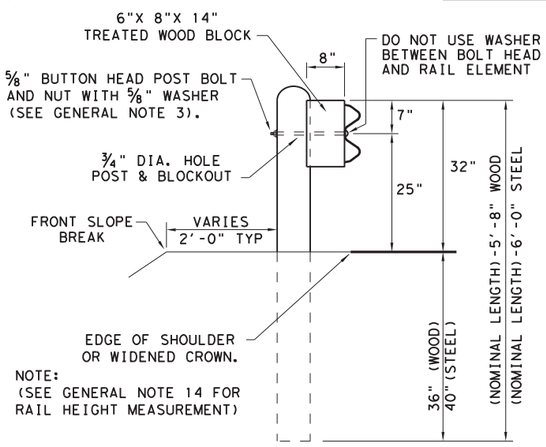
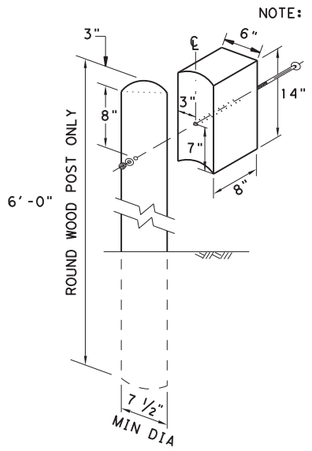
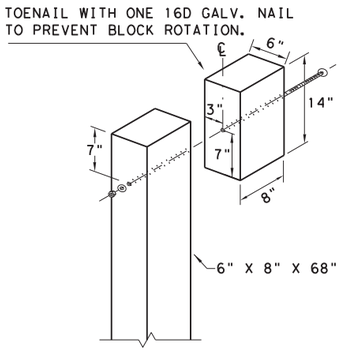


TYPICAL POST PLACEMENT

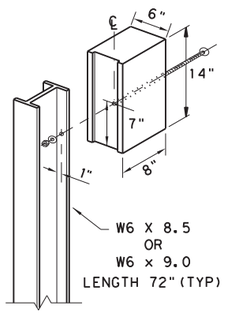


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

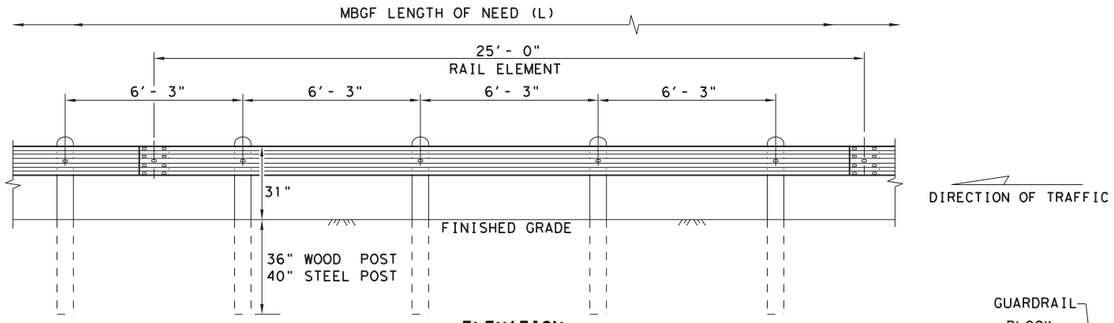


WOOD BLOCK TO RECTANGULAR WOOD POST



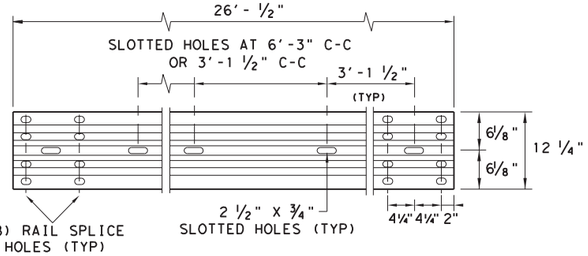
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

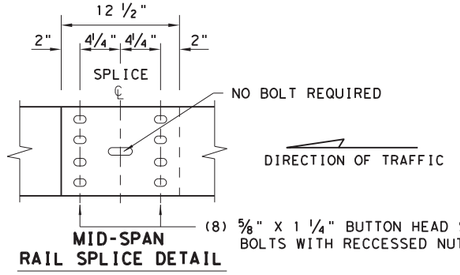
NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.

SPLICE BOLT LENGTH — VARIES
FBB01 = 1 ¼"
FBB02 = 2"
⅝"

POST & BLOCK LENGTH
FBB03 = 10"
FBB04 = 18"

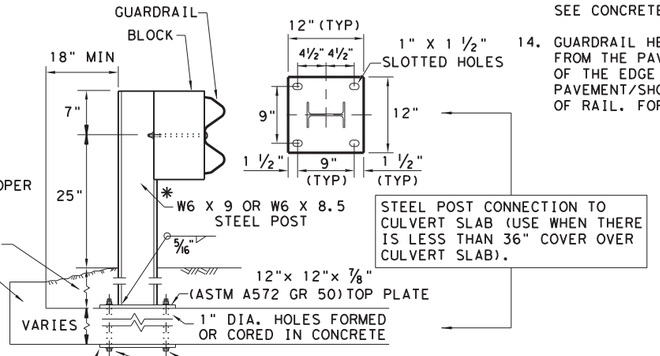
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

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©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		93

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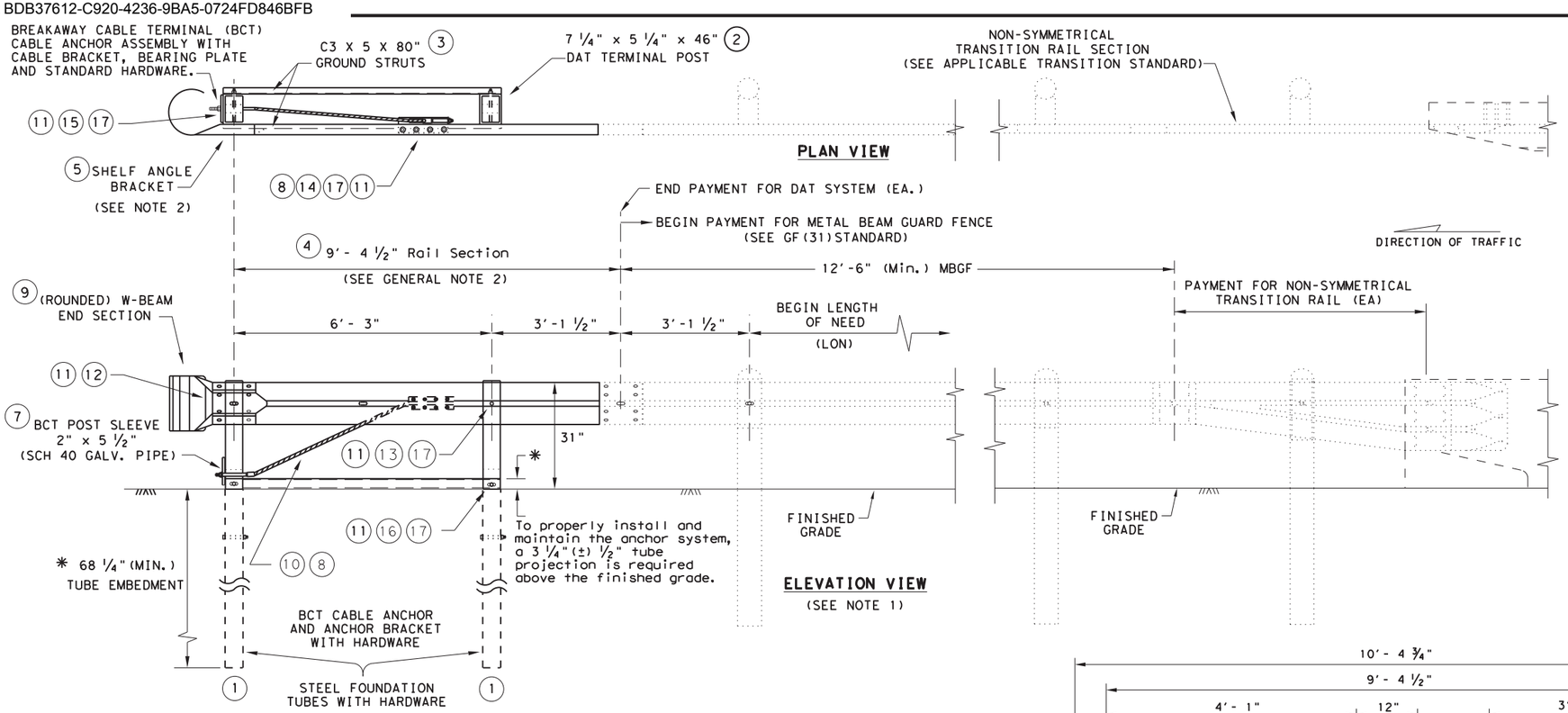


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

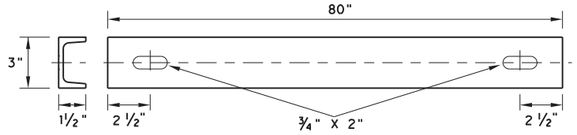
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

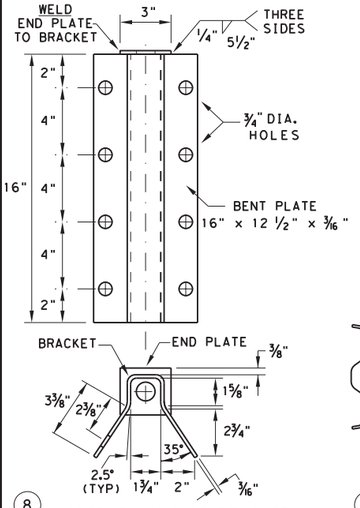
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

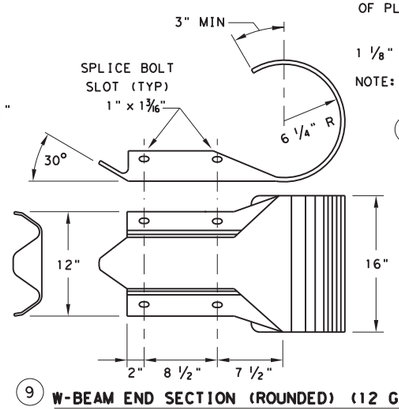
(4) TERMINAL RAIL ELEMENT FOR DAT



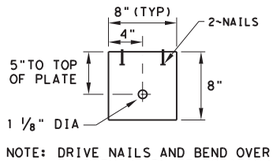
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

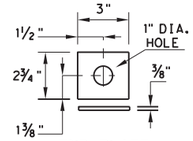


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

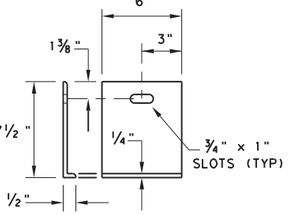


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

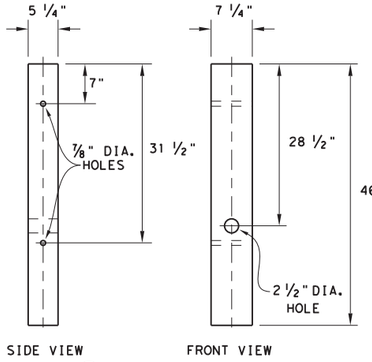
(6) BEARING PLATE
8"x 8"x 5/8" R



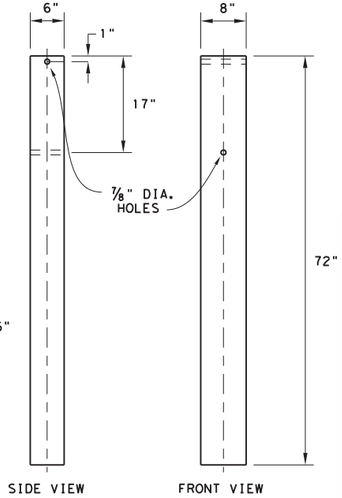
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		94

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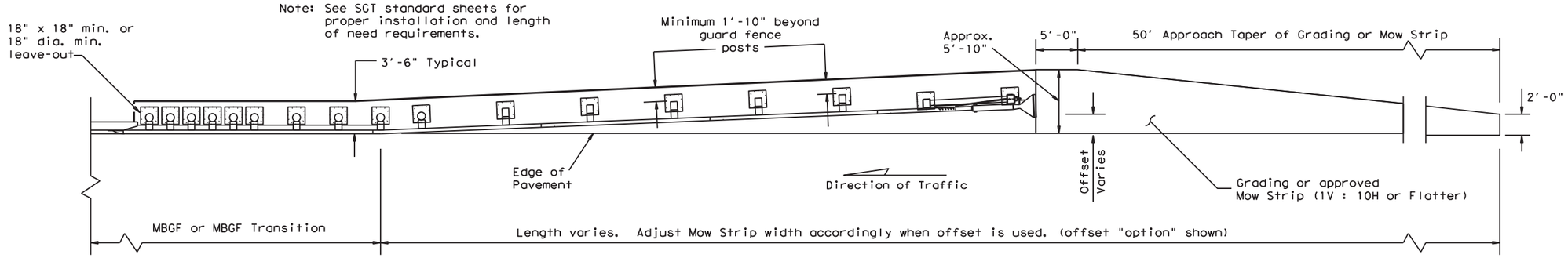
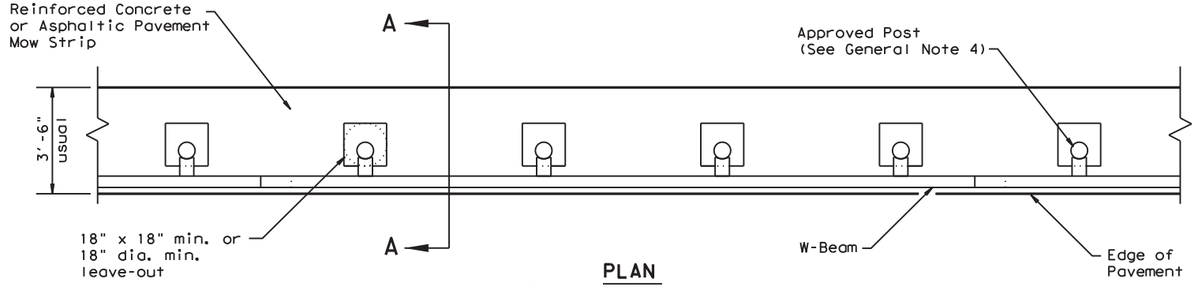
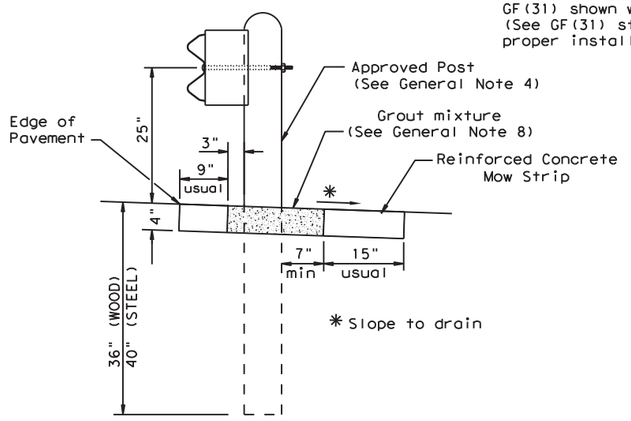


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



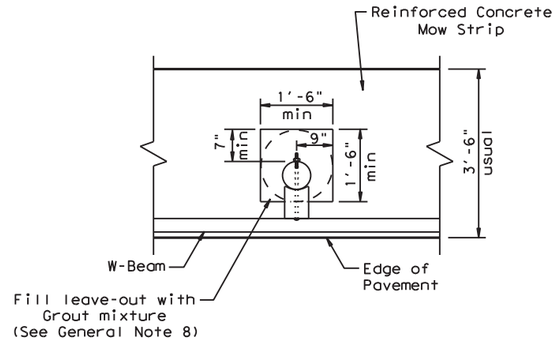
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



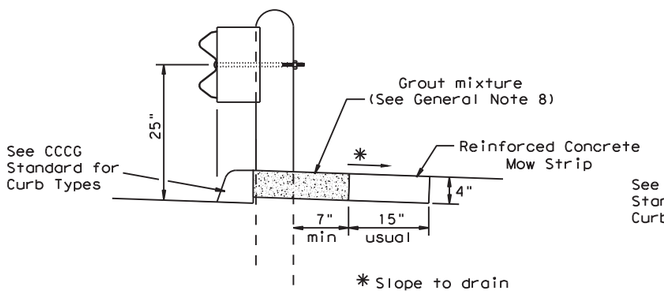
SECTION A-A

Typical



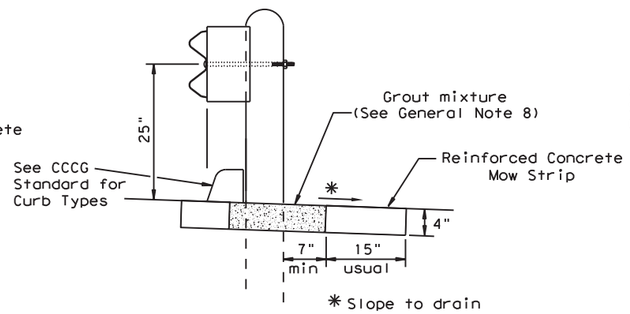
MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.



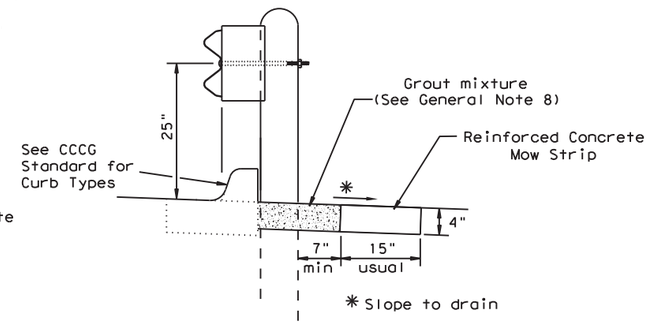
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		95

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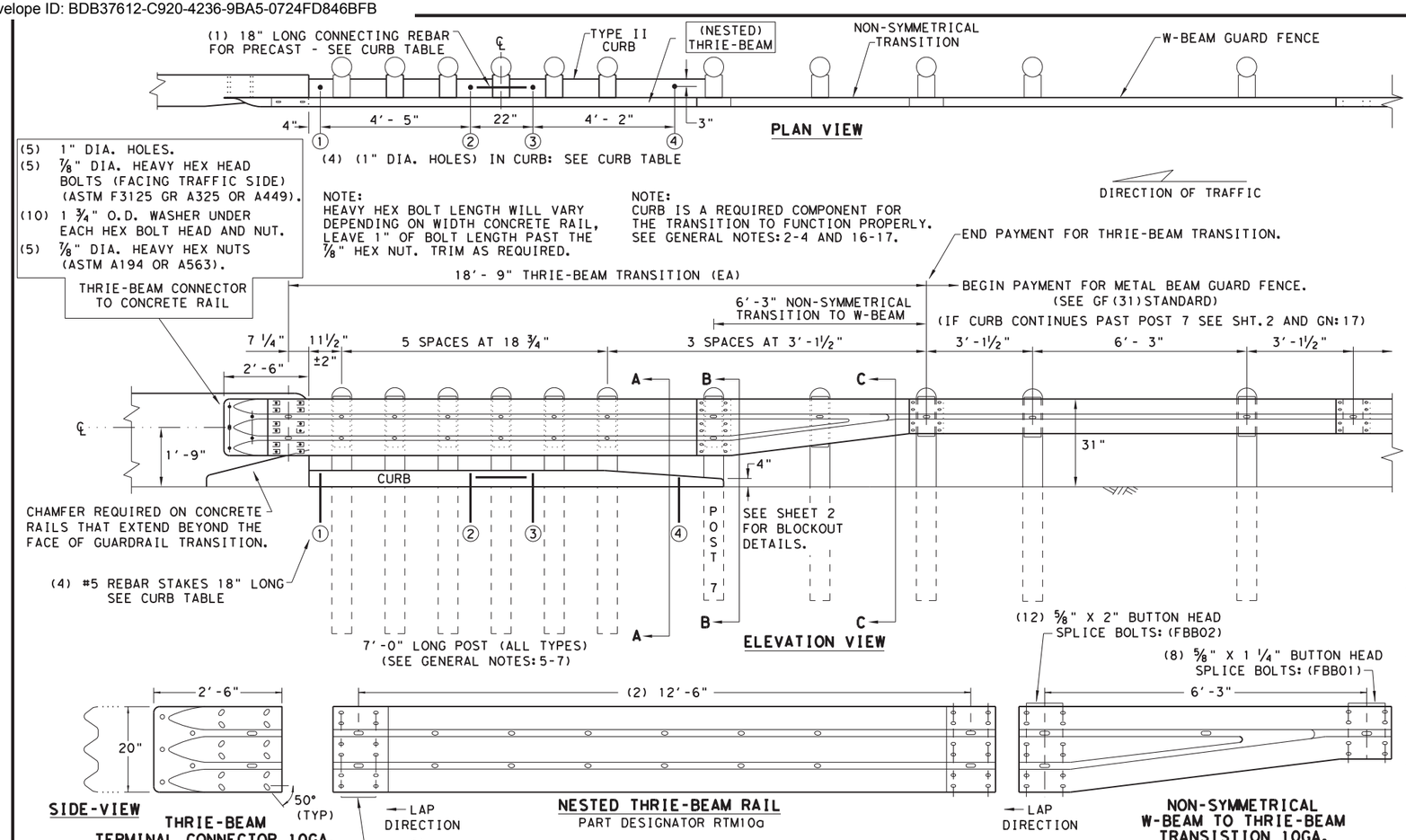


GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- 3/4" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST 5/8" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

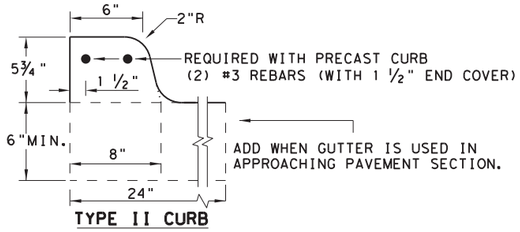
THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

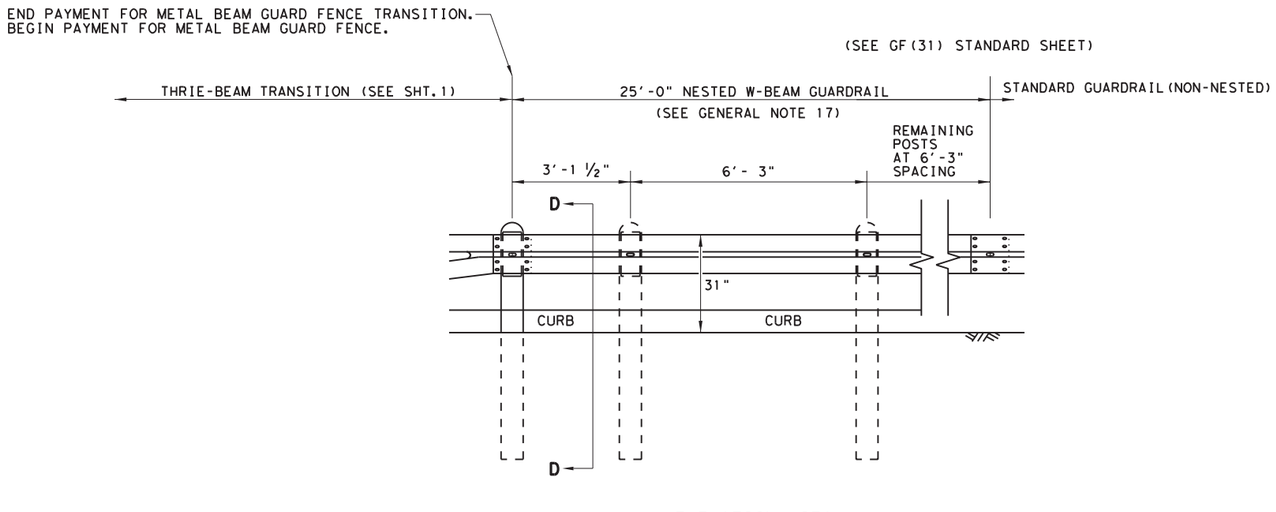
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

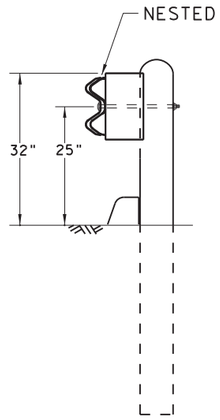
FILE: gf31tr-tl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		96

DATE: 12/8/2023
FILE: c:\txdot\pw_online\txdot5\daniel.garza\d1037604\gf31trt1320.dgn

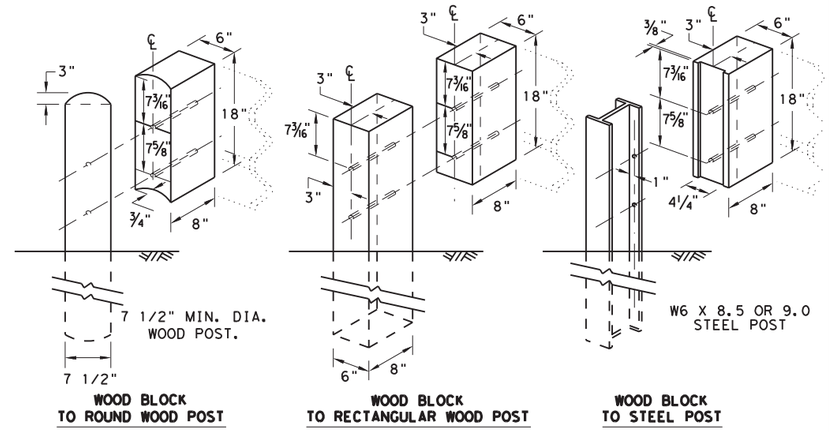
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		97

DATE: 12/8/2023
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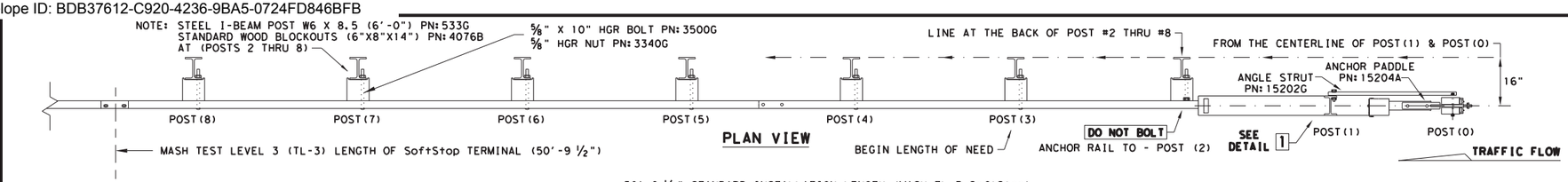
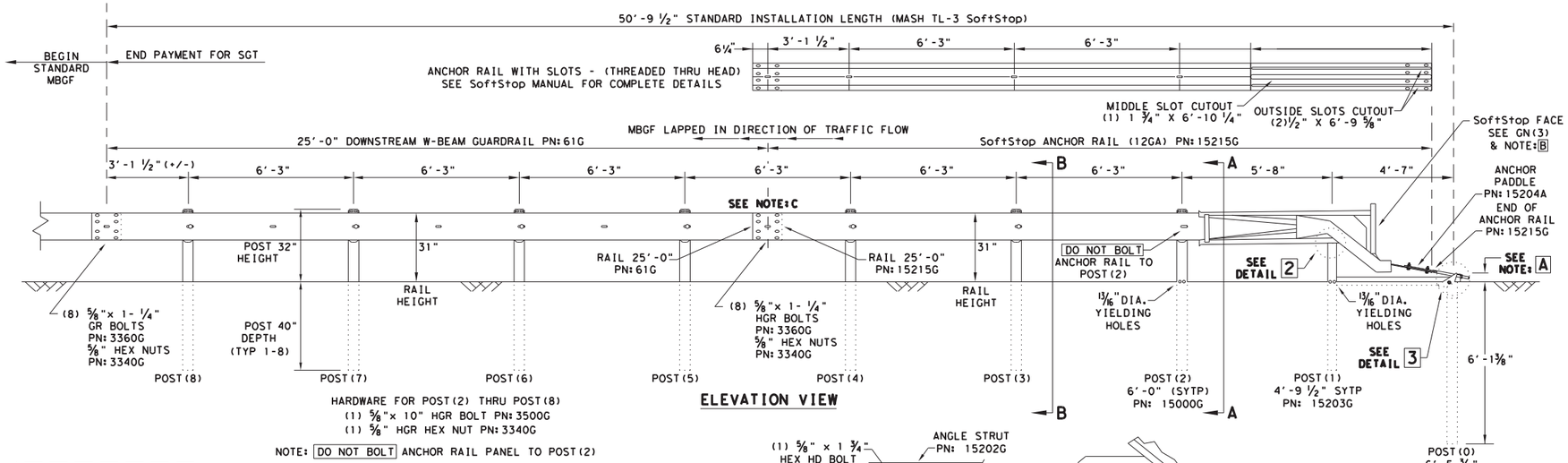
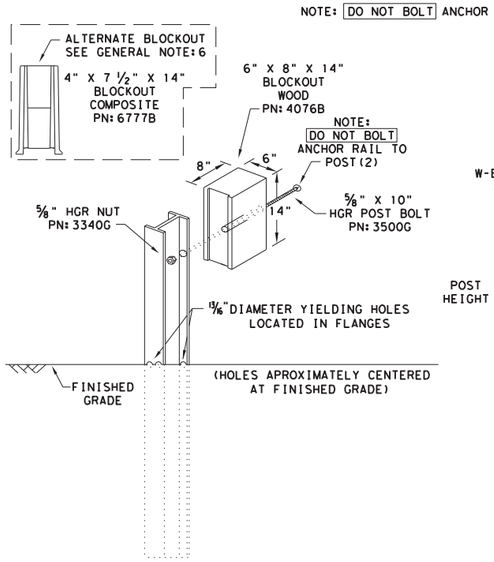


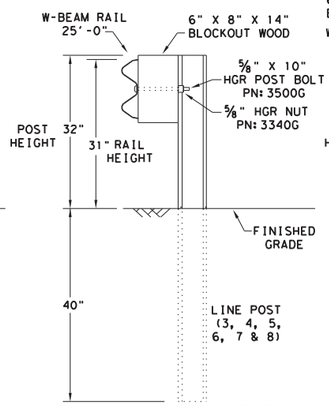




ISOMETRIC VIEW POST(1 & 2)

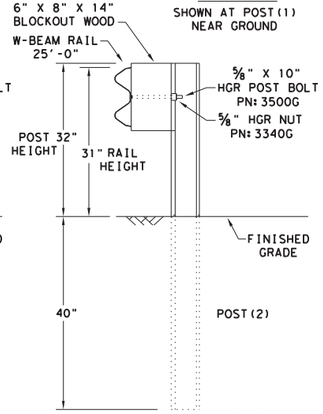
W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)



SECTION VIEW B-B

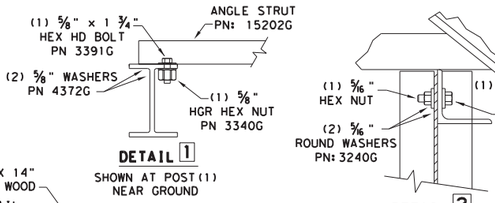
6'-0" (W6 X 8.5)
I-BEAM POST PN: 533G



SECTION VIEW A-A

6'-0" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

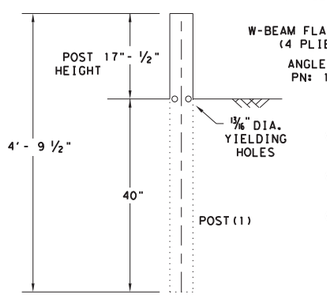


DETAIL 1

SHOWN AT POST(1) NEAR GROUND

DETAIL 2

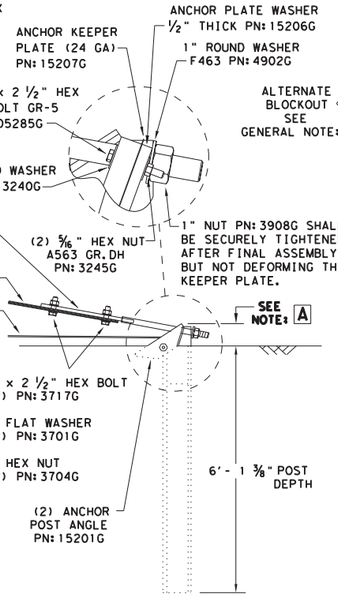
SHOWN AT POST(1)



FRONT VIEW POST(1)

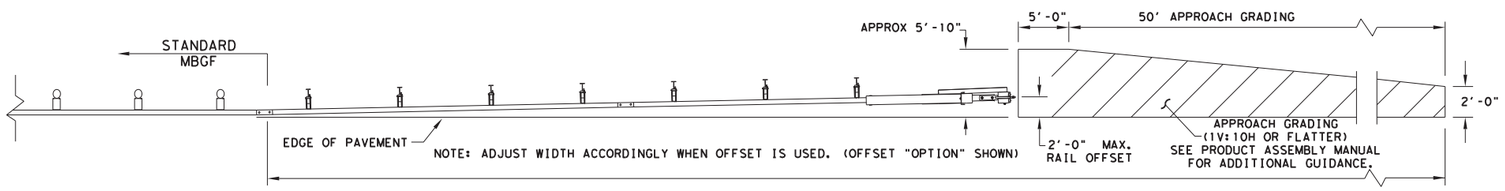
4'-9 1/2" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15203G

NOTE: NO BLOCKOUT INSTALLED AT POST(1)



DETAIL 3 AT POST(0)

6'-5 3/8" (W6 X 15)
I-BEAM POST PN: 15205A



APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 3/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		98

DATE: 12/8/2023
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(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6) INNER SIDE SLIDER (ISS) PANEL FOR RAIL 3

FIELD-SIDE (RAIL 3)

NOTE: RECESSED HEX NUTS FACING TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED 7-⅝" FROM REFERENCE LINE

ITEM (10) CABLE ASSEMBLY

ITEM (2) GROUNDSTRUT

NO BLOCKOUT AT (POST 1)

POST 9 POST 8 POST 7 POST 6 POST 5 POST 4 POST 3 POST 2

RAIL 4 RAIL 3 RAIL 2 RAIL 1

CABLES

ITEM (5) TRAFFIC SIDE SLIDER (TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

PLAN VIEW

MBGF RAIL 2

INSTALL GUARD FENCE RECESSED HEX NUTS ON TRAFFIC-SIDE

MBGF RAIL 1

DETAIL (C)

TRAFFIC FLOW

END PAYMENT (SGT) BY EACH

DO NOT BOLT RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 9/16"

6'-3" 6'-3" 6'-3" 6'- ¾" 6'-3" 6'-3" 6'-3" 37 ½" 5'-3 11/16"

ITEM (25) MAX-TENSION HEAD **SEE DETAIL (A)**

RAIL HEIGHT 31"

ITEM (13) RAIL 4 ITEM (13) RAIL 3 ITEM (13) RAIL 2 ITEM (13) RAIL 1

ARROWS

DETAIL (D)

RAIL HEIGHT 31"

HEAD HEIGHT

DETAIL (B)

32-¼"

68-⅛"

FINISHED GRADE

CABLES

ITEM (10) CABLE ASSEMBLY

ITEM (2) GROUNDSTRUT

POST 9 POST 8 POST 7 POST 6 POST 5 POST 4 POST 3 POST 2 POST 1

ITEM (4) I-BEAM W6 X 9

NO BLOCKOUT AT (POST 1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

SOIL ANCHOR POST
ITEM (1)

A — A

TSS PANEL GALVANIZED ITEM (5)

RSS PLATE GALVANIZED ITEM (8)

INSTALL THE TSS AND RSS WITH THE ARROWS POINTING TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE

DETAIL (D)

HEAD HEIGHT 32-¼"

TOP OF POST

31-⅞"

FINISHED GRADE

40-⅛"

68-⅛" ANCHOR POST DEPTH

ITEM (1) ANCHOR

ITEM (11) LINE POSTS 2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN), TO BE INSTALLED AT SAME DEPTH AS LINE POSTS.)

SOIL ANCHOR, POST 1 & LINE POST 2 THRU 9

SECTION VIEW A-A

NOTE:
USE THE MASH APPROVED X-TENSION CABLE ASSEMBLY.

7 5/16"

2 ⅛"

UPPER CABLE (BACK SIDE)

LOWER CABLE (TRAFFIC SIDE)

DETAIL (B)

CABLE FRICTION PLATE HEAD UNIT ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX NUTS ON TRAFFIC SIDE.

ITEM (24)

ITEM (21)

ITEM (20) 8X

ITEM (17) 8X

ITEM (23) 6X 3 SCREWS EACH SIDE

ITEM (22) BRACKET SHIPPED FLAT

ITEM (3)

ITEM (16) 4X

(RAIL 1)

* ITEM (25) HIGH INTENSITY REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD TO GUARD FENCE (RAIL1)

DETAIL (A)

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX. RAIL OFFSET

APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

Texas Department of Transportation

Design Division Standard

MAX-TENSION END TERMINAL MASH - TL-3

SGT(11S)31-18

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REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		99

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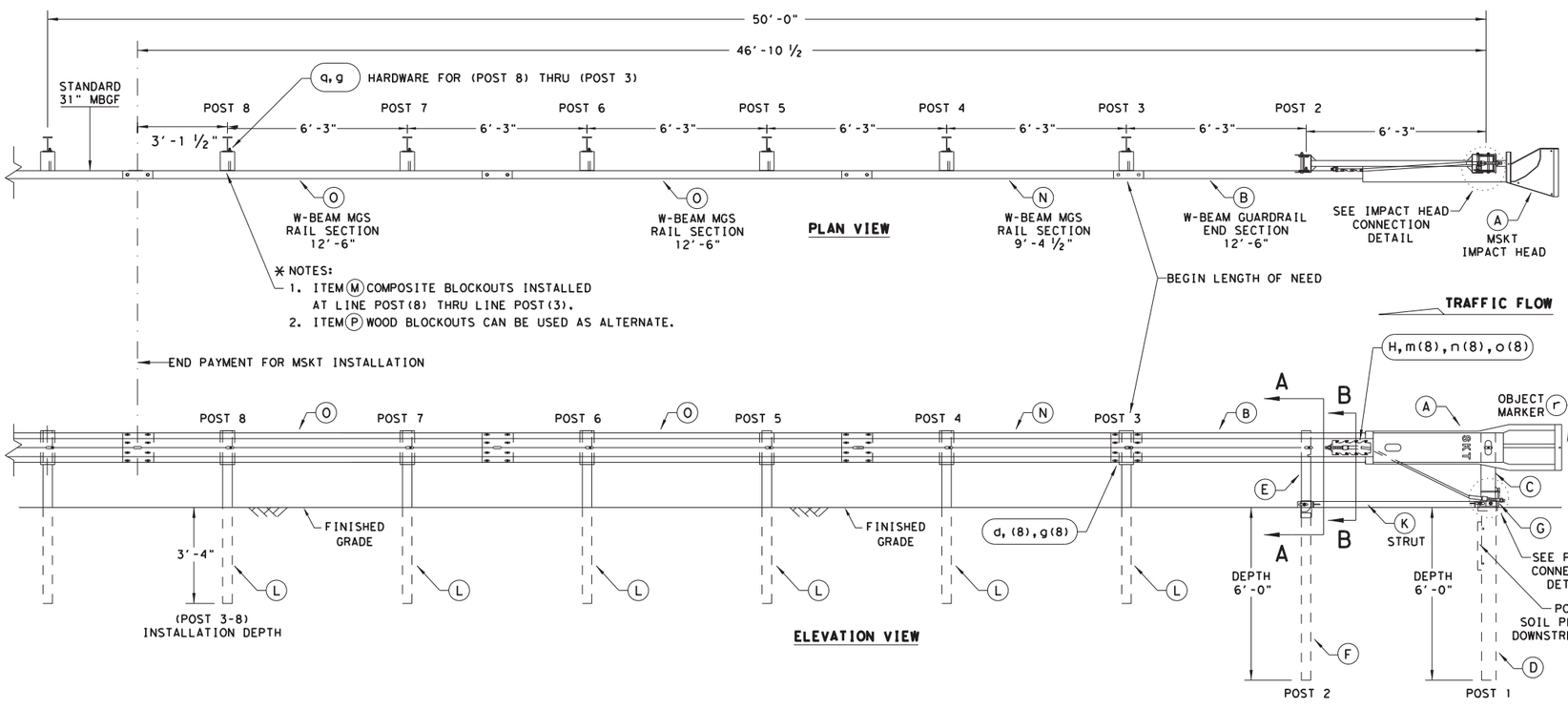
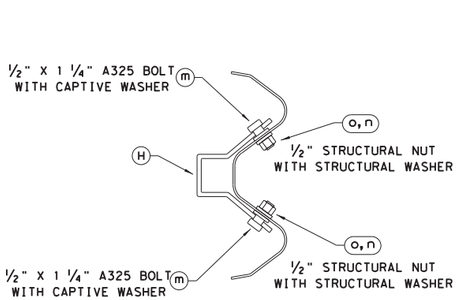
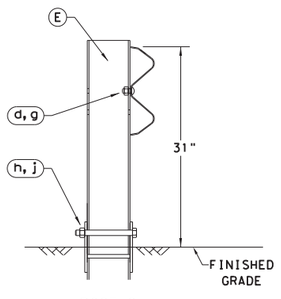


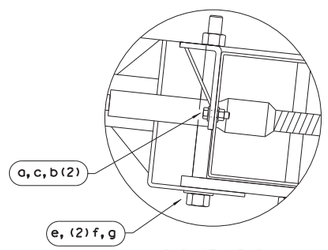
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



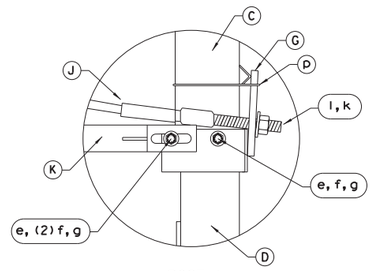
SECTION B-B
ANCHOR BRACKET



POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL

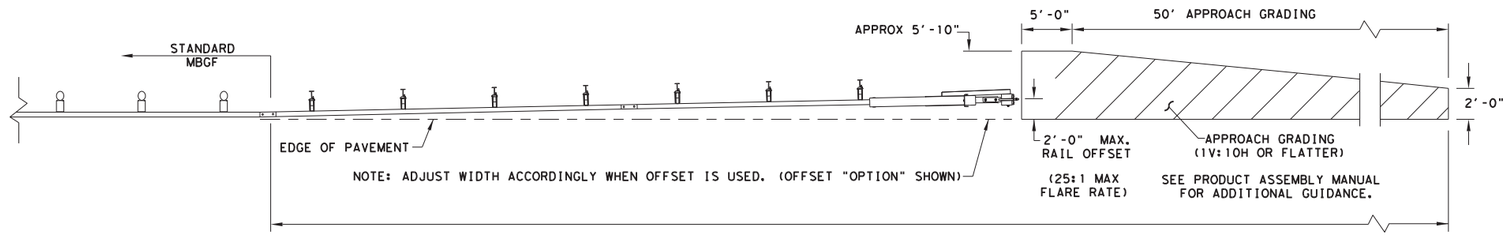
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X ⅛" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 ½")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x ⅜" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

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© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
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	DIST	COUNTY		SHEET NO.	
	22	LA SALLE, Etc.		100	

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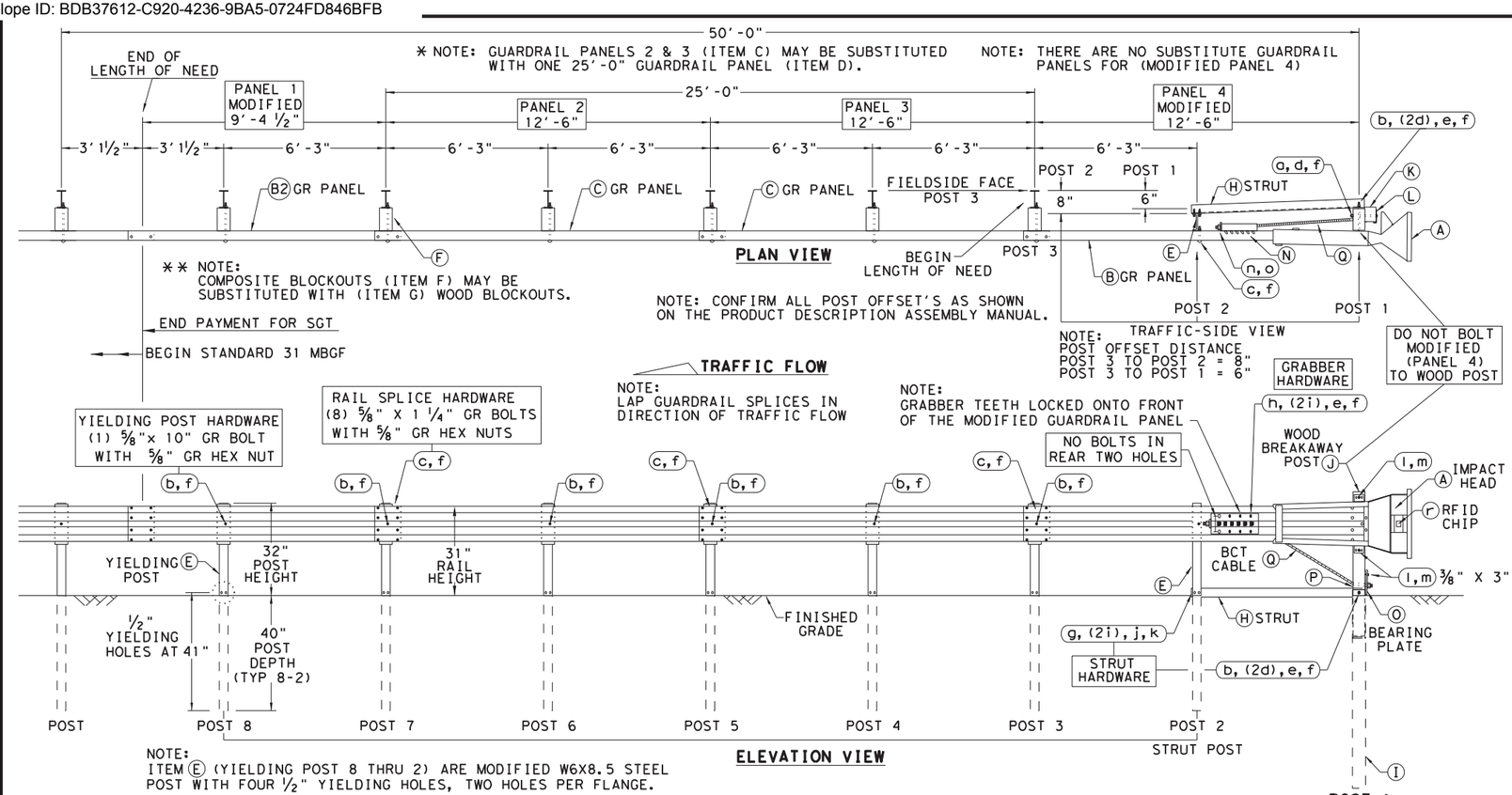
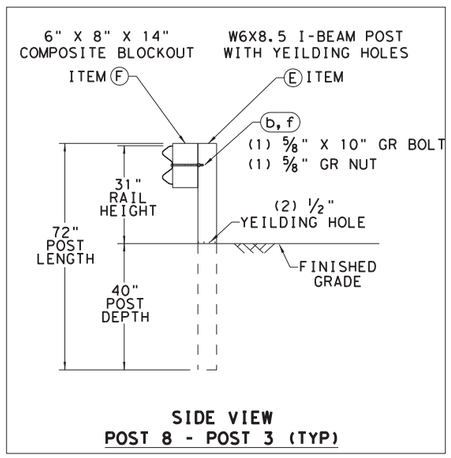


GENERAL NOTES

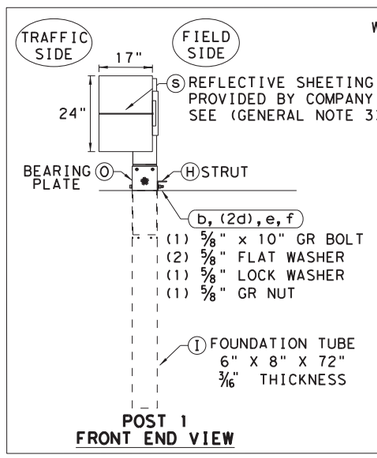
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

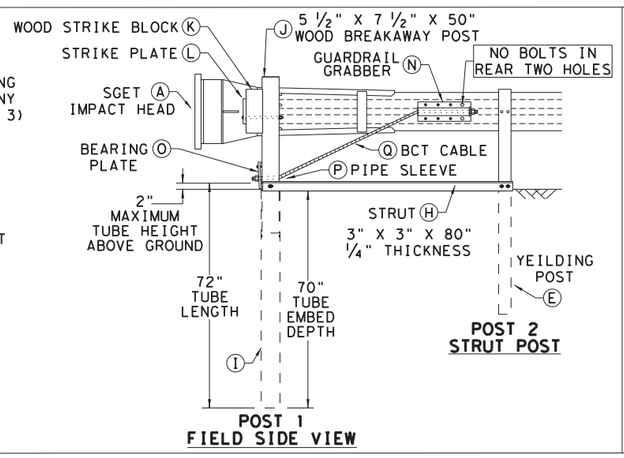
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



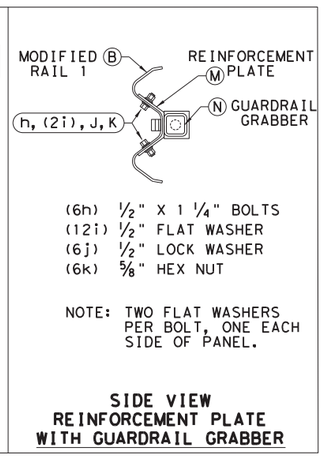
SIDE VIEW
POST 8 - POST 3 (TYP)



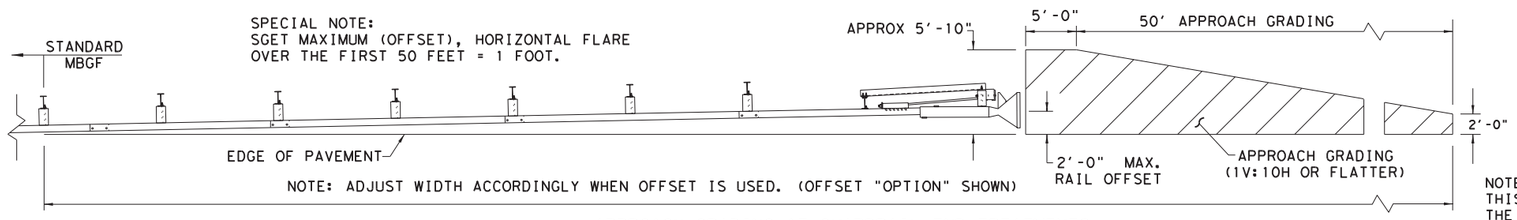
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW
POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation — Design Division Standard

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
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	22	LA SALLE, Etc.		101

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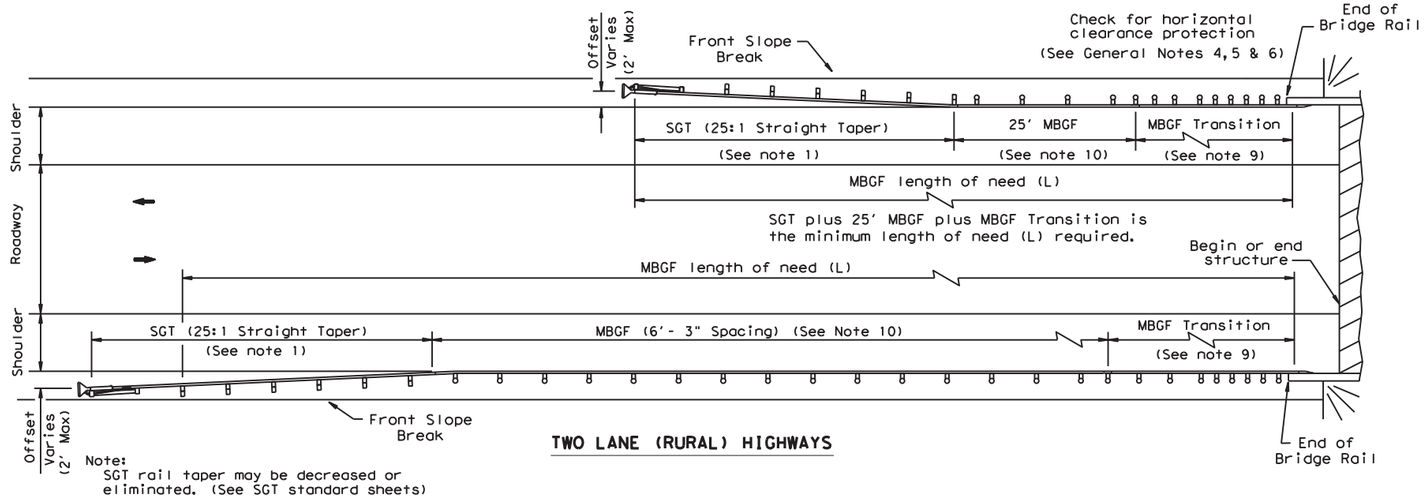
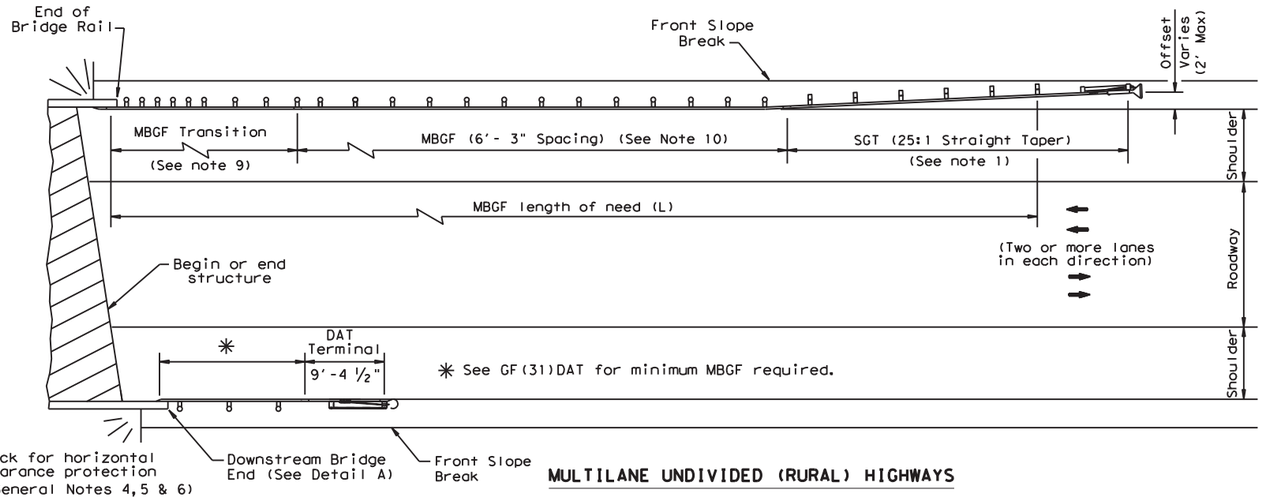
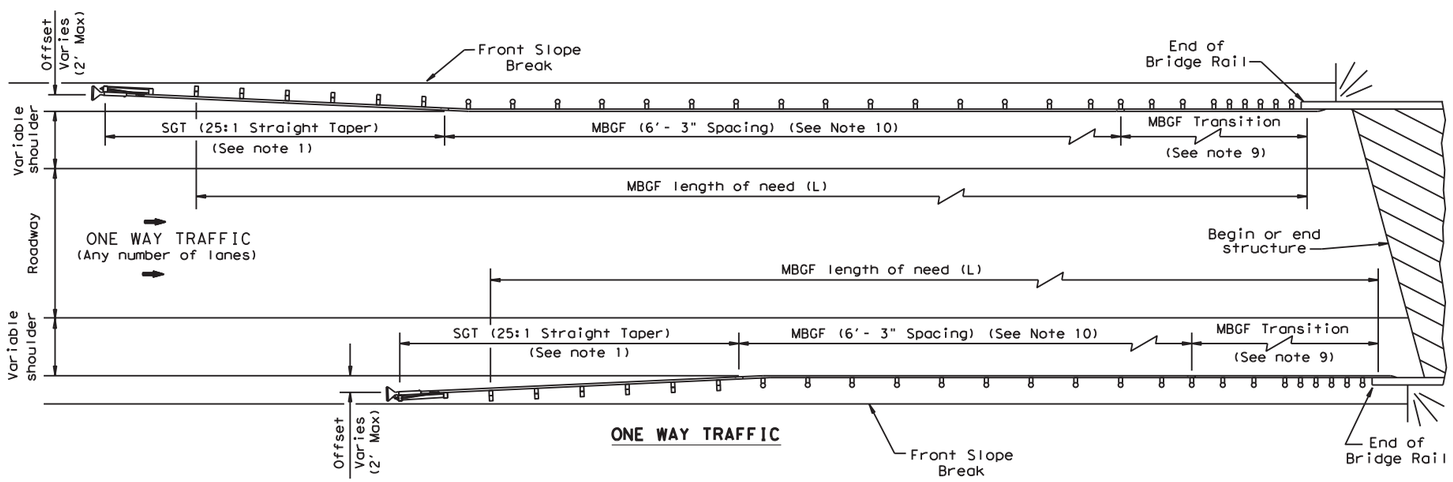


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



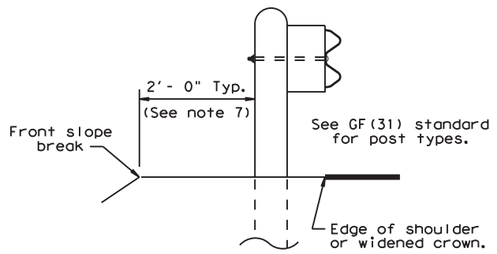
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



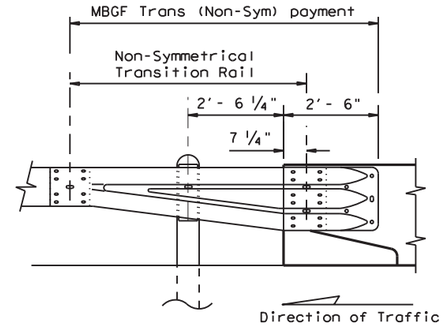
ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF



Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation — Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
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REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0018	02	091, etc.	IH 35, etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		102

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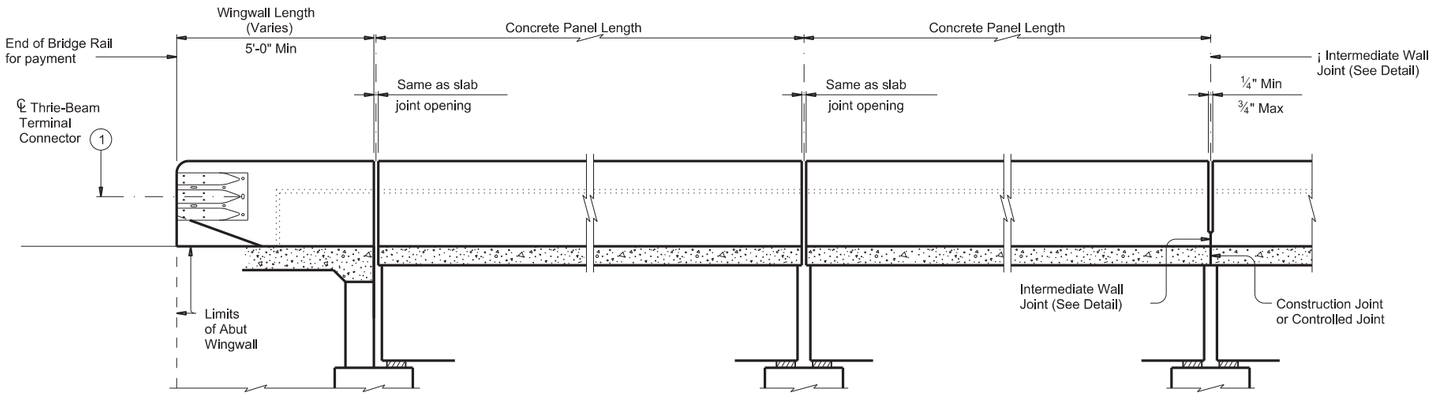
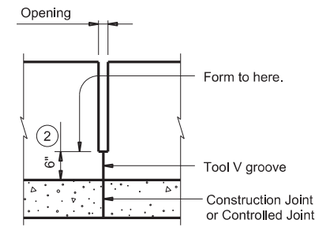
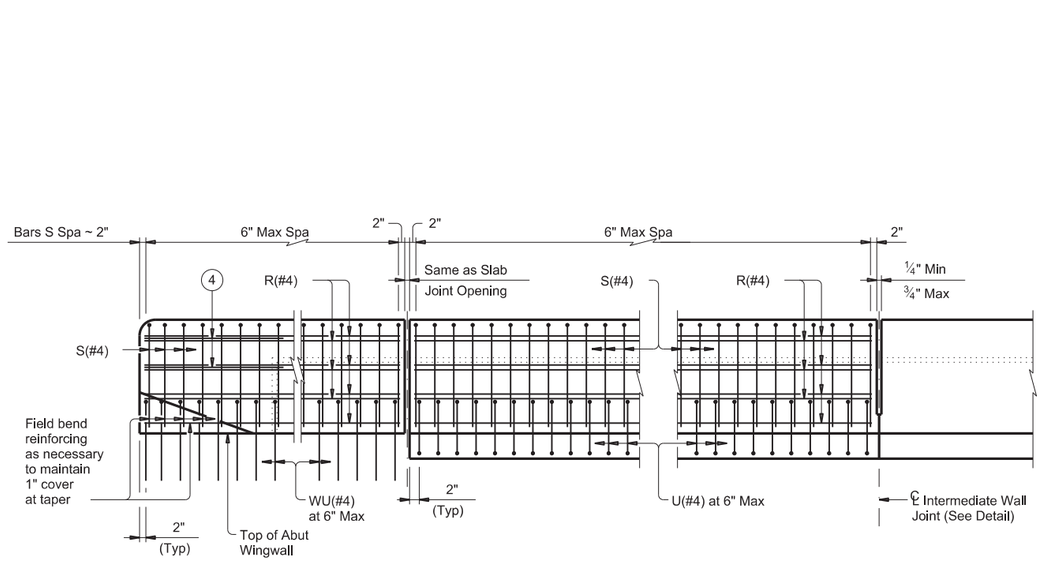


ROADWAY ELEVATION OF RAIL



INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.

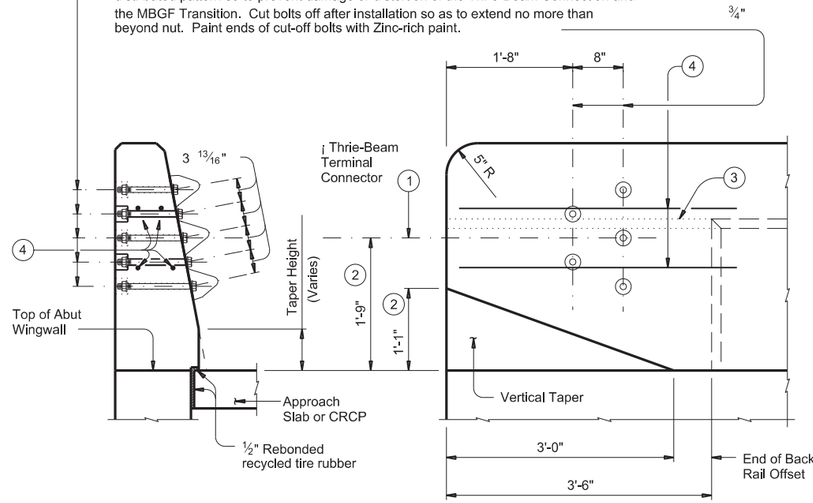


ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

□ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION ELEVATION

TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence." Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Increase 2" for structures with Overlay.
3. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
4. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.

Texas Department of Transportation

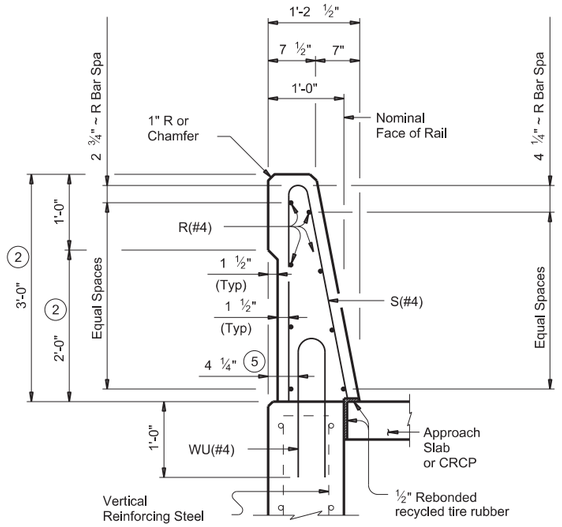
Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

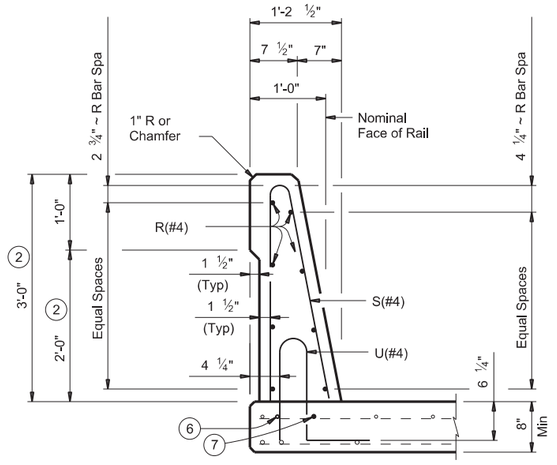
TYPE SSTR

FILE: RL-SSTR-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		103

DATE:
FILE:



ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL

(2) Increase 2" for structures with Overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) No longitudinal wires may be within upper bend.

(9) Bend or cut as required to clear drain slots.

(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.

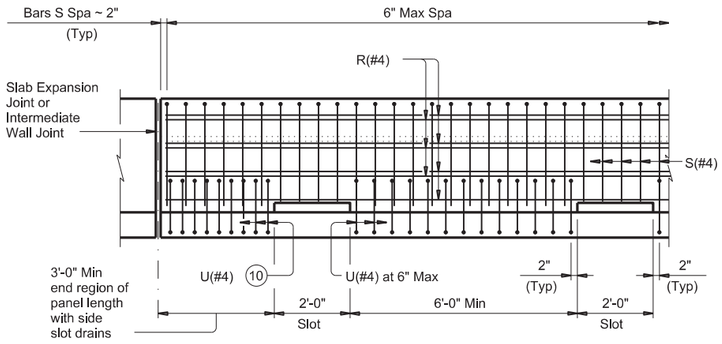
BARS S (#4)

BARS U (#4)

BARS WU (#4)

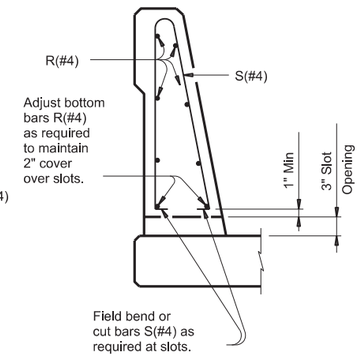
OPTIONAL WELDED WIRE
REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU
OPTIONAL SIDE SLOT DRAIN

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #4 = 1'-7"

Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

Average weight of railing with no overlay is 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

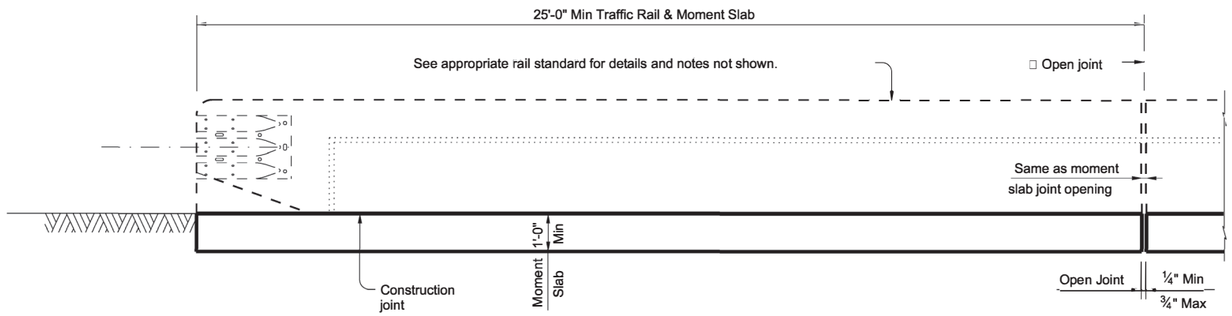
Bridge Division Standard

TRAFFIC RAIL
SINGLE SLOPE

TYPE SSTR

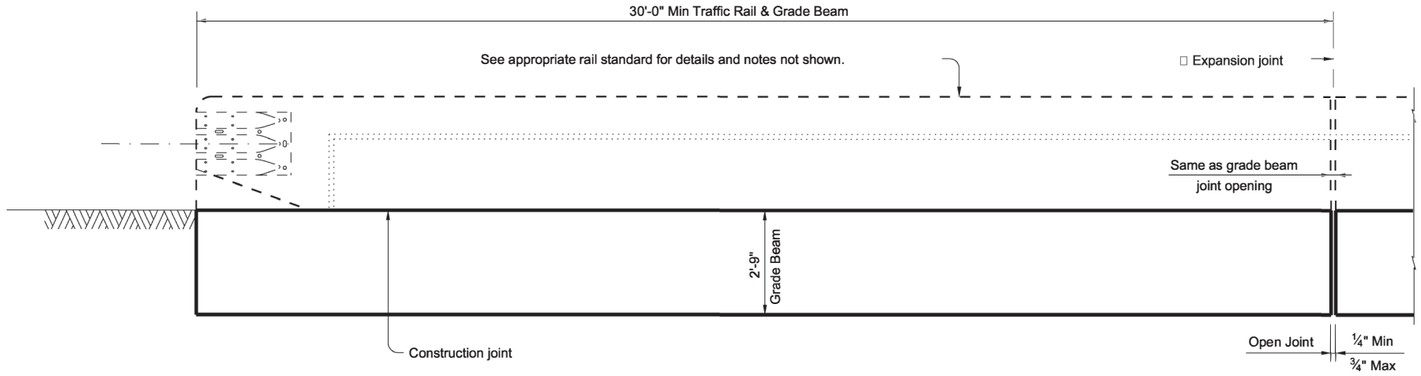
FILE: RL-SSTR-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		104

DATE:
FILE:



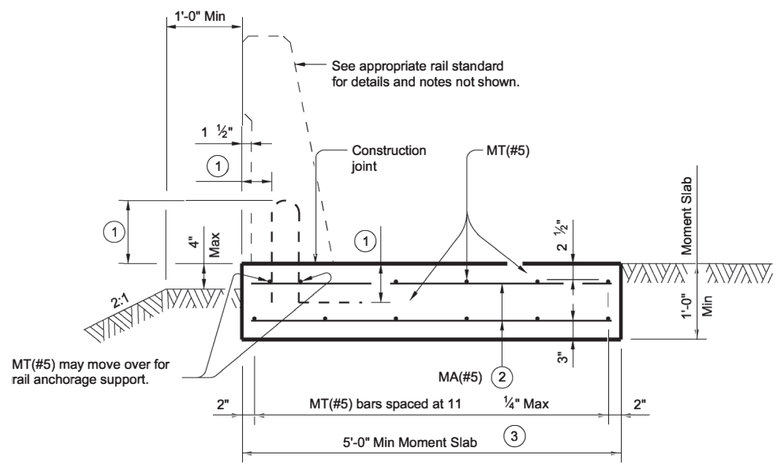
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



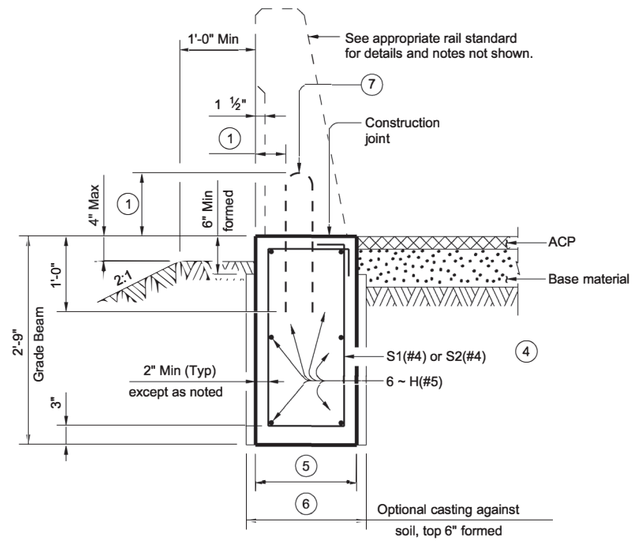
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



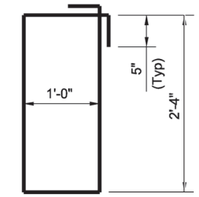
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

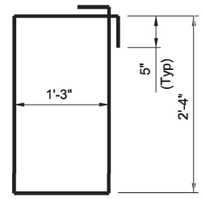
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
   Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66.
   Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"

Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

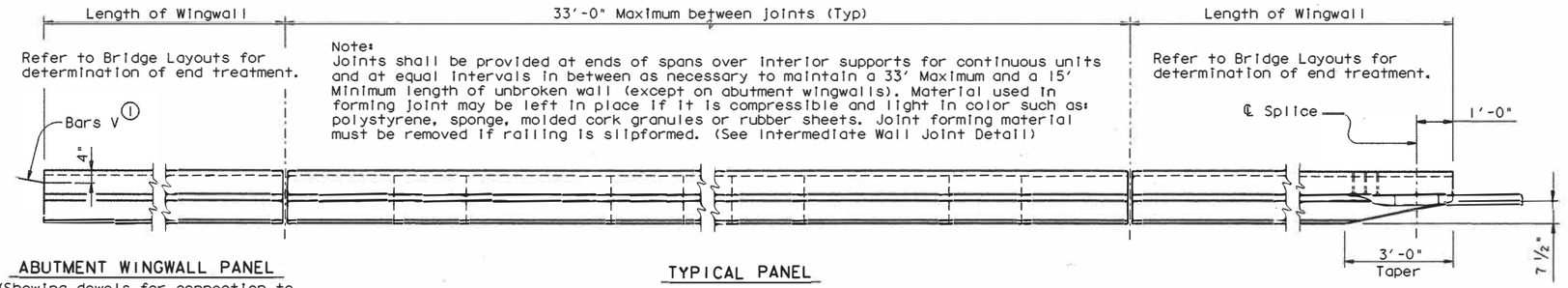
Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE: RL-TRF-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
07-20: Added moment slab with rail foundation lengths.	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		105

LEVELS DISPLAYED | ACC: | (LV=1,2 for English; 1,3 for Metric) | 1 2

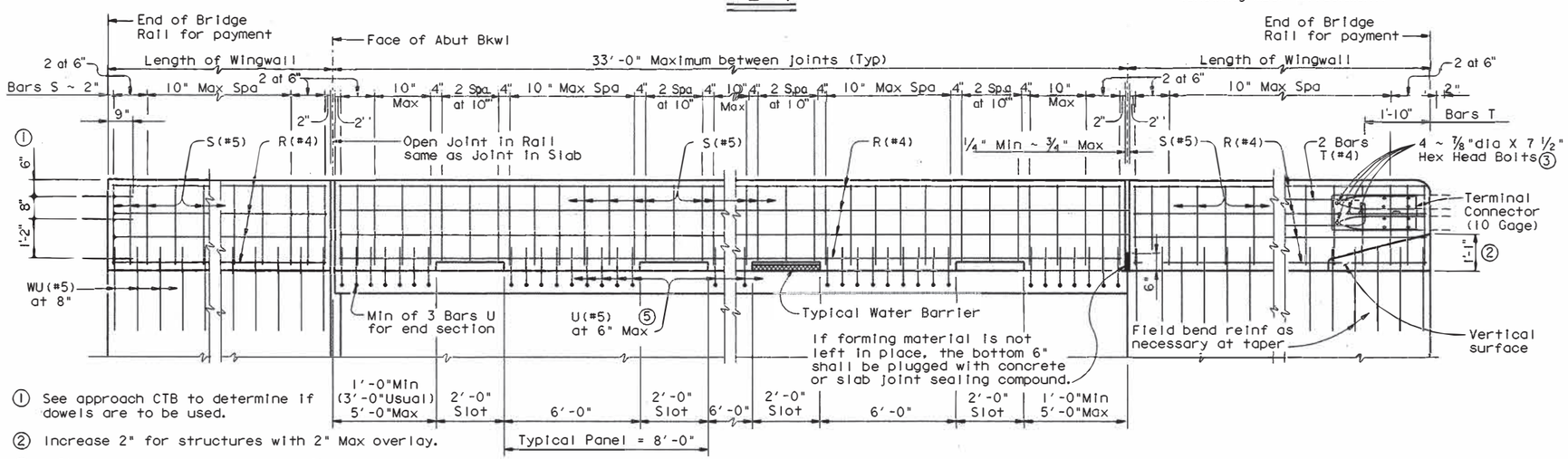


ABUTMENT WINGWALL PANEL
(Showing dowels for connection to approach Concrete Traffic Barrier)

TYPICAL PANEL

PLAN

ABUTMENT WINGWALL PANEL
(Showing MBGF Attachment)



ROADWAY ELEVATION OF RAIL

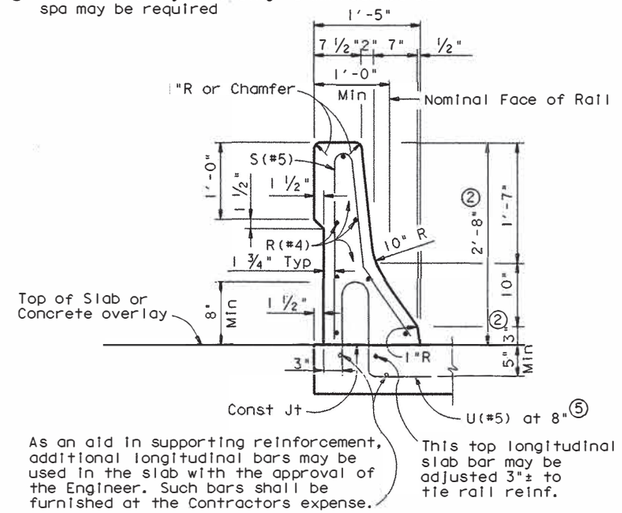
① See approach CTB to determine if dowels are to be used.

② Increase 2" for structures with 2" Max overlay.

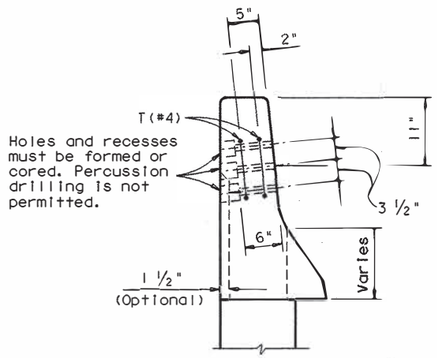
③ 1 3/4" Dia washer required under 7/8" Dia Bolt Heads and Nuts.

④ Back offset may optionally be continued to end of railing.

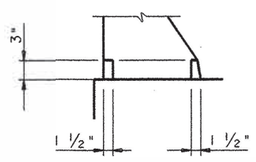
⑤ For ACP Overlay exceeding 75 mm reduced bar spa may be required



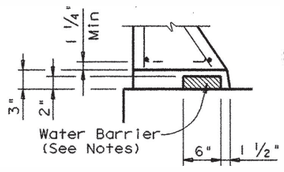
TYPICAL SECTION
(SHOWING CONVENTIONAL REINF)



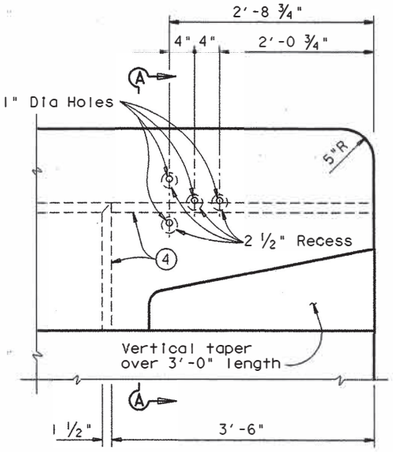
SECTION A-A



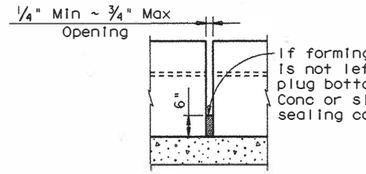
SHOWING CAST-IN-PLACE WATER BARRIER



SEC AT 75 mm OPENING



END TREATMENT AT MBGF



INTERMEDIATE
WALL JOINT DETAIL

GENERAL NOTES:

This rail has been structurally evaluated to be equivalent or greater in strength to other safety shape railings which have been crash tested to NCHRP Report 230 SL-2 criteria. Also equivalent to railings tested to 1989 AASHTO Guide Specification PL-2 criteria.

All parts of the railing including concrete parapet wall, reinforcing, terminal connector, bolts, nuts and washers are included in the price bid per linear foot of rail.

All steel components except reinforcing shall be galvanized unless otherwise shown in plans.

All concrete for railing wall shall be Class "C".

All reinforcing steel shall be Grade 60.

Metal Beam Guard Fence or Concrete Traffic Barrier is usually attached to the abutment wingwall panel. See plan sheet for details and length for payment. The splice between the approach guard fence and the terminal connector shall be with the normal eight bolts. The dowel connection to the approach traffic barrier shall be grouted the same as other barrier joints.

Shop drawings will not be required for this rail.

This railing may be constructed with slip-forms when shown on the plans or approved by the Engineer, with equipment approved by the Engineer. Sensor control for both line and grade must be provided. When slip-forming is used, the concrete may be cured with membrane curing compound.

Additional reinforcing may be tack welded to the upper two thirds of the reinforcing cage to provide bracing when slip-forming is used. Additional anchorage devices may be added when welding is necessary in the lower one third of the cage. Do not weld to U or S bars in the lower one third of the cage.

The back of railing shall be vertical unless otherwise shown on the plans or approved by the Engineer.

Welded wire fabric may be used as an option to conventional reinforcement and shall be made in accordance with ASTM A497 (Deformed Wire).

Welded Wire Fabric Detail shown is for D8.5 longitudinal wires and D8.3 vertical wires. Combinations of Reinforcing Steel and Welded Wire Fabric or configurations of Welded Wire Fabric other than shown will be permitted when the conditions in the table are satisfied and the dimension from end of section to first welded vertical wire does not exceed 3".

Water barriers shall be provided at openings draining onto undercrossing roadways and sidewalks. They may be cast in place or precast in convelent length and bonded to the bridge deck with an apporved epoxy cement.

Epoxy coat bars U and WU if slab bars are epoxy coated.

Average weight of railing (with no overlay) is 313 plf.

SHEET 1 OF 2

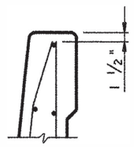
Texas Department of Transportation
Design Division (Bridge)

TRAFFIC RAIL

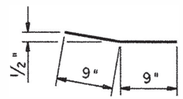
TYPE T502

FILE: rlstd017.dgn	DN: JJP	CK: THD	DW: RNP	CK: LDS	NEG: B590
ORIG DATE: JULY 1995	DIST	FED REG	FEDERAL AID PROJECT #		SHEET
REVISIONS		6			
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
						106

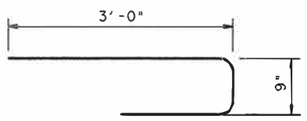
LEVELS DISPLAYED: 1 | 2 — ACC: — (LV=1,2 for English; 1,3 for Metric)



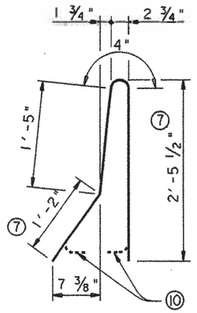
Bars S may be constructed as two separate bars at the contractors's option.



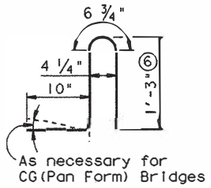
BARS V (#8)
(3 at each connection)



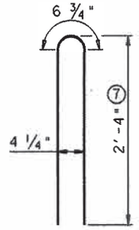
BARS T (#4)
(2 at each terminal)



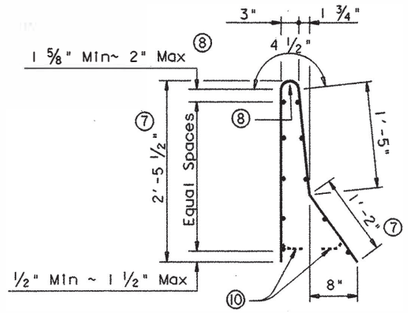
BARS S (#5)



BARS U (#5)



BARS WU (#5)



WELDED WIRE FABRIC
(OPTIONAL)

⑥ Increase to slab thickness plus 5 ½" for slabs over 10". Dimension given is permissible without increase for slabs 10" or less. Increase by nominal concrete overlay thickness if over 2".

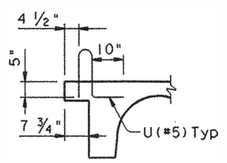
⑦ Dimension given is permissible for structures with up to 2" of overlay.

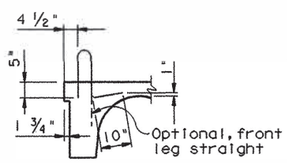
⑧ No longitudinal wires may be within upper bend.

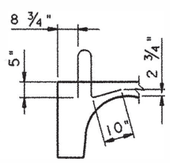
⑨ Place additional No.4 longitudinal bar (included as part of railing reinforcement) when U bars are embedded less than 5".

⑩ Bend or cut as required to clear drain slots.

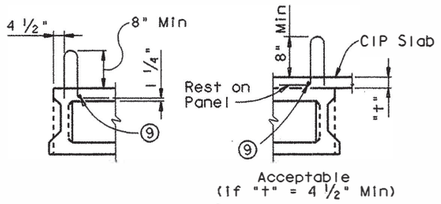
DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.100 Sq In.	0.295 Sq In. per Ft
	No. of Wires	Spacing
Minimum	6	4"
Maximum	11	12"
Maximum Wire Size Differential	The smaller wire shall have an area of 40% or more of the larger wire.	



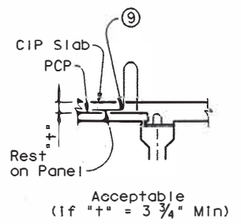




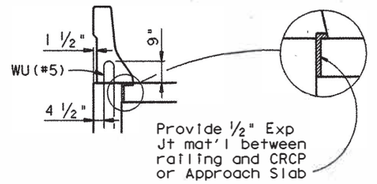
PAN FORM BRIDGES



PRESTRESSED BOXES

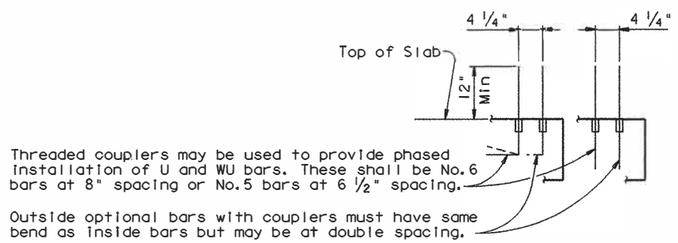


PRECAST PANELS



WINGWALLS AND CIP RETAINING WALLS

TYPICAL U AND WU BAR PLACEMENT



OPTIONAL BARS U(#6) OR WU(#6)

Texas Department of Transportation
Design Division (Bridge)

TRAFFIC RAIL

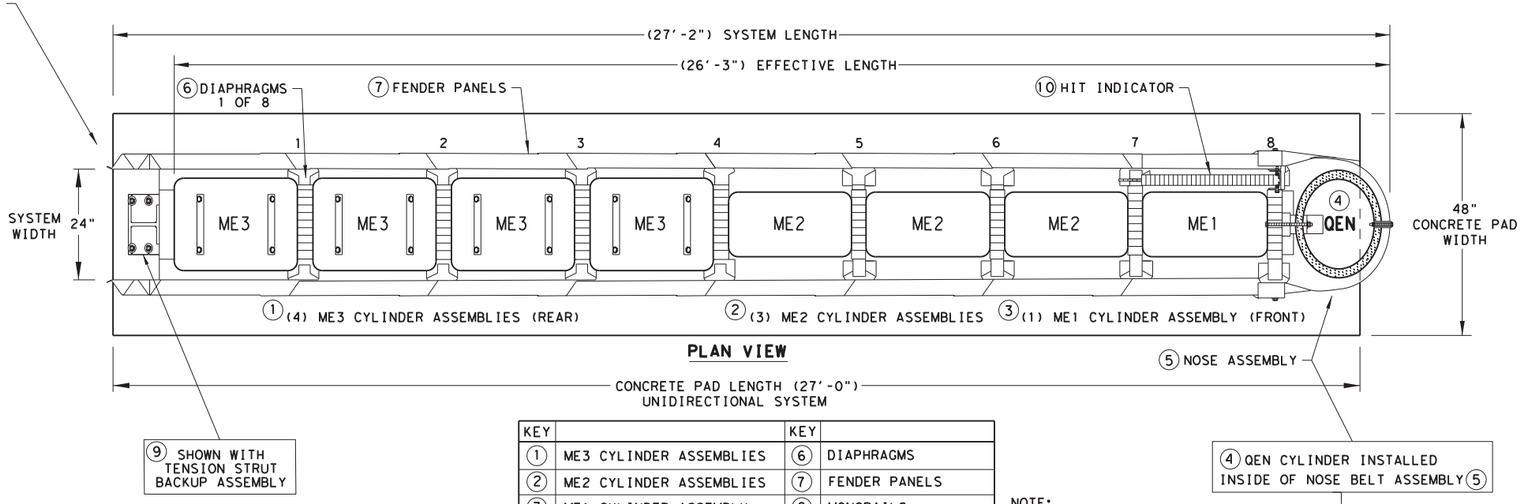
TYPE T502

FILE: rlstd017.dgn	DN: JJP	CK: THD	DW: RNP	CK: LDS	NEG: B590
ORIG DATE: JULY 1995	DIST	FED REG	FEDERAL AID PROJECT #		SHEET
REVISIONS		6			
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
						107

DATE:
FILE:

NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

QUADGUARD ELITE M10 24" WIDE (8 BAY) SYSTEM



PLAN VIEW

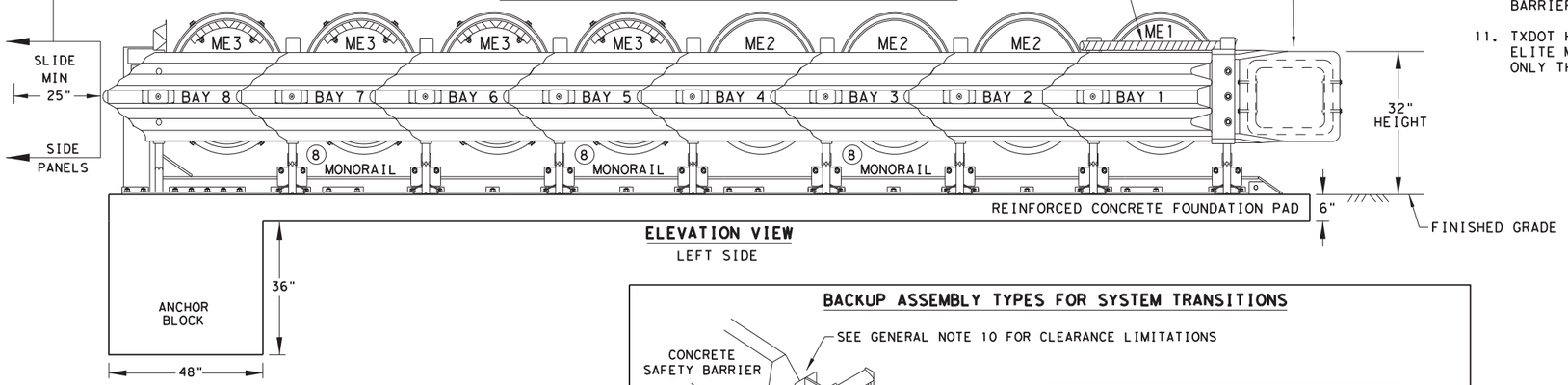
⑨ SHOWN WITH TENSION STRUT BACKUP ASSEMBLY

KEY		KEY	
①	ME3 CYLINDER ASSEMBLIES	⑥	DIAPHRAGMS
②	ME2 CYLINDER ASSEMBLIES	⑦	FENDER PANELS
③	ME1 CYLINDER ASSEMBLY	⑧	MONORAILS
④	QEN CYLINDER	⑨	TYPE OF BACKUP
⑤	NOSE BELT ASSEMBLY	⑩	HIT INDICATOR

④ QEN CYLINDER INSTALLED INSIDE OF NOSE BELT ASSEMBLY ⑤

NOTE:
HIT INDICATOR WILL RAISE UPON IMPACT.

NOTE:
PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 25" MIN.



ELEVATION VIEW
LEFT SIDE

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD ELITE M10 FIELD INSTALATION AND INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY REQUIRED FOR THE TRANSITION WILL BE PROVIDED BY THE MANUFACTURER TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

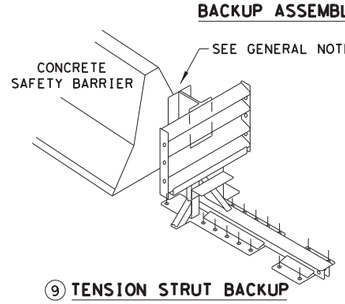
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
THE QUADGUARD ELITE M10 8-BAY, 24" WIDE - NARROW SYSTEM TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024E	CYLINDER TYPES IN BAYS			
BAYS	8	TYPE-ME3	TYPE-ME2	TYPE-ME1	TYPE-QEN
DIAPHRAGMS	8	4	3	1	1
WIDTH	24"	REAR	FRONT		NOSE

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS

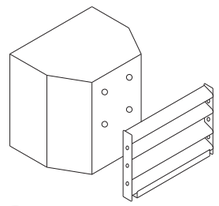


⑨ TENSION STRUT BACKUP

SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD ELITE M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:

ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).



⑨ CONCRETE BACKUP

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD ELITE M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
2. SEE THE RECENT QUADGUARD ELITE M10 PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD ELITE M10 AT ANY GIVEN LOCATION.
3. FOR BI-DIRECTIONAL TRAFFIC: THE LOCATION AND OR WIDTH OF THE QUADGUARD ELITE M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD ELITE M10, THE QUADGUARD ELITE M10 SHOULD NOT EXTEND FURTHER INTO THE TRAFFIC-SIDE OF THE BARRIER THAN THE OBSTACLE. ANY TRANSITION INSTALLED MUST EITHER BE TANGENT TO BOTH QUADGUARD ELITE M10 AND OBSTACLE OR MUST ANGLE TOWARD FIELD SIDE OF THE BARRIER.
4. SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD ELITE M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
5. COMPONENTS FOR THE QUADGUARD ELITE (M10) BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
6. CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
7. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
8. THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS,OR DEPRESSIONS.
9. THE QUADGUARD ELITE M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
10. FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
11. TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD ELITE M10 SYSTEM. THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION AND ASSEMBLY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

FOUNDATION & ANCHORING REQUIREMENTS FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE:A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 ½" - APPROVED ADHESIVE
FOUNDATION TYPE:B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE:C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE:D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE

KEY:
ASPHALT CONCRETE (A.C.)
COMPACTED SUBBASE (C.S.)
PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.

IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

LOW MAINTENANCE

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD ELITE M10 (MASH TL-3)

QGELITE(M10)(N)-20

FILE: qgelitem10n20.dgn	DN:TxDOT	CK:KM	DW:VP	CK:AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		108

DATE:
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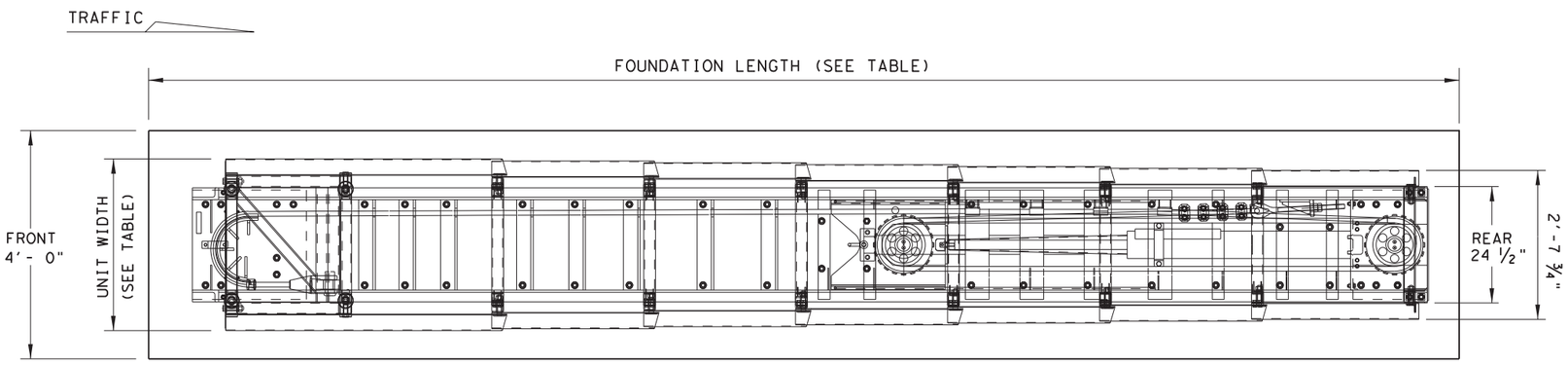
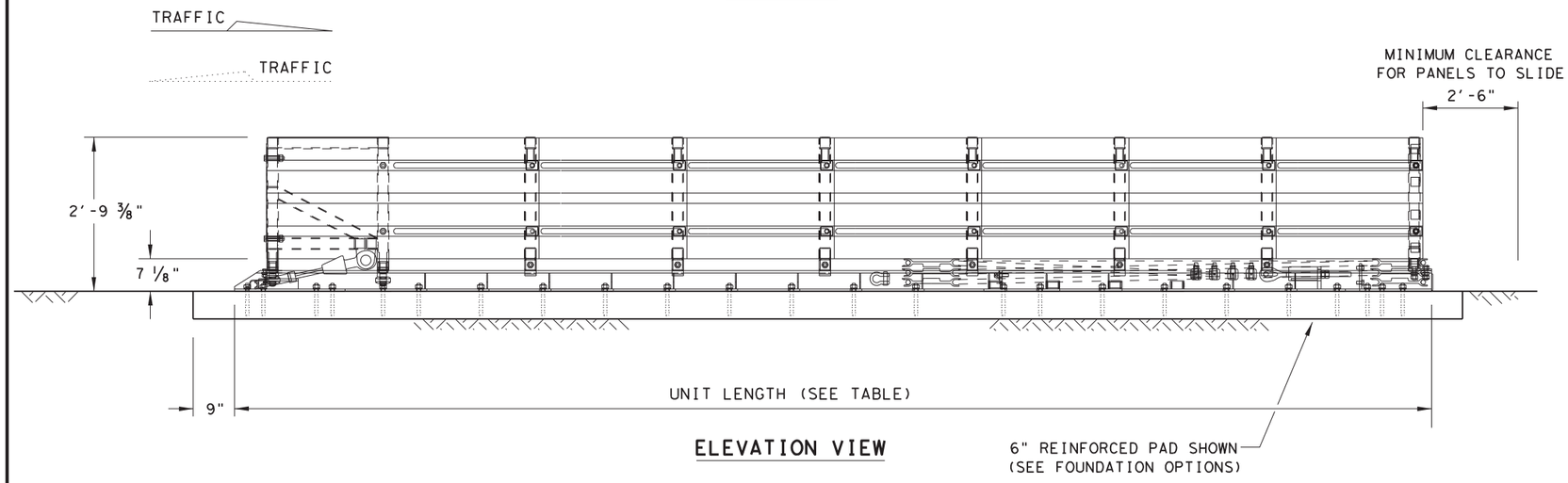


PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION AND FOUNDATION OPTION WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
5. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13′-6"	2′-10 ⅝"	15′- 6 ¼"	24"to 36"
SCI100GM	TL-3	21′-6"	3′-1 ½"	23′- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 ½" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 ½" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 ½" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

LOW MAINTENANCE

Texas Department of Transportation

Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
©TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
REVISED 06, 2013 (VP) REVISED 03, 2016 (VP)	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		109

DATE:
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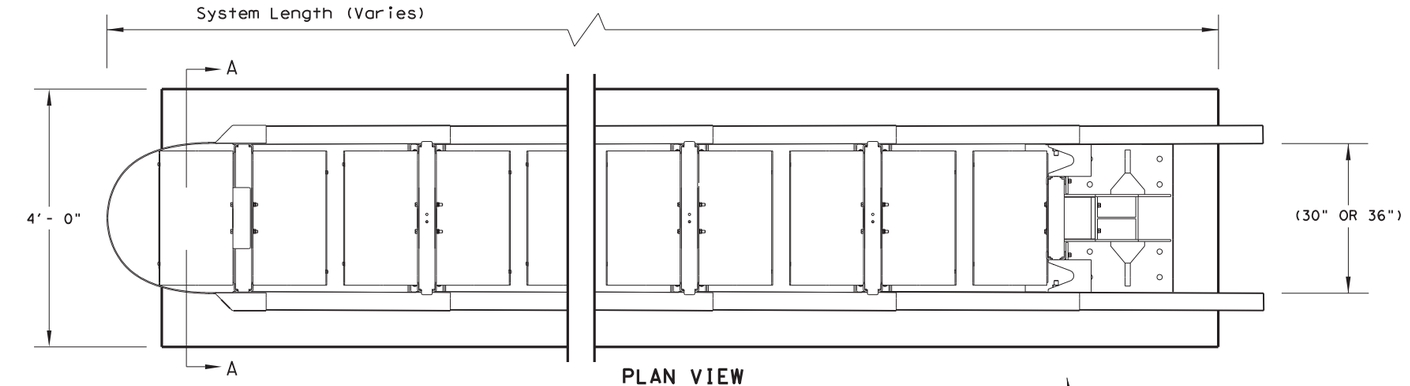
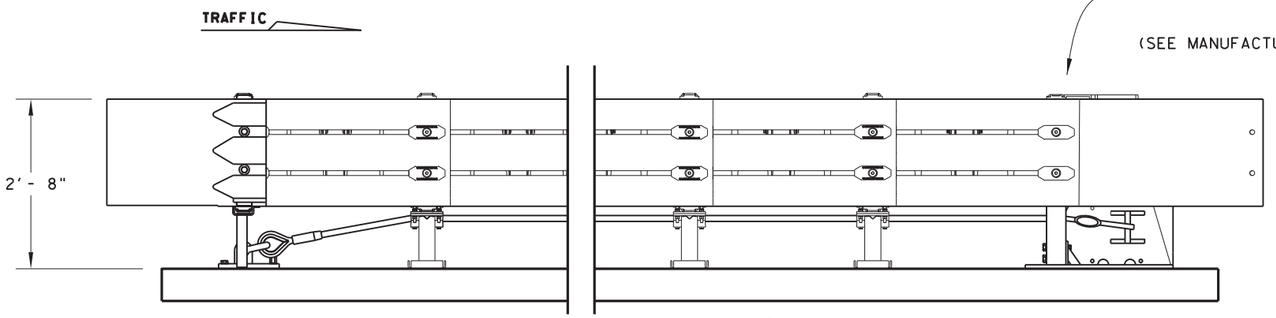


PLAN VIEW

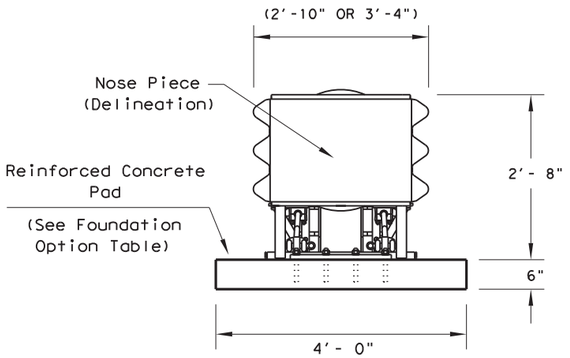
Attachments and transitions to various barrier shapes, barrier railings and bi-directional traffic flows are available.

(SEE MANUFACTURER'S PRODUCT MANUAL)



Pad Length (Varies)
(Pad length on TAU-II-R Systems depend on design speed and backup type)

ELEVATION VIEW



SECTION A-A

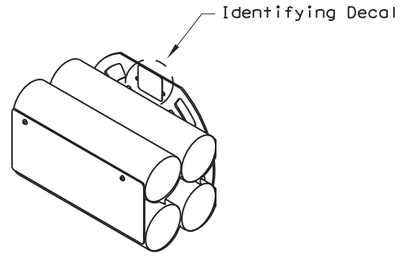
Nose Piece delineation orientation, is shown elsewhere on the plans.

TRANSITION OPTIONS
Vertical Wall
Concrete Traffic Barriers
W-Beam Guardrail
Thrie Beam Guardrail

For bi-directional transition panel and end shoe details.
(See manufacturer's product manual.)

FOUNDATION OPTIONS
6" Reinforced Concrete
8" Unreinforced Concrete
Asphalt over Concrete with Minimum 6" Embedment in Concrete
6" Asphalt over 6" Compact Subbase
8" Minimum Asphalt

For steel placement in concrete foundations.
(See manufacturer's product manual)



ENERGY ABSORBING ELEMENTS (EAE)

BACKUP SUPPORT OPTIONS
Compact (Stand Alone)
Flush Mount
PCB (Concrete Barrier)

TAU-II-R (NARROW) SYSTEM LENGTHS			
BACKSTOP	TL-2	TL-3	70 mph
PCB	13'-7"	27'-10"	30'-7"
Flush Mount	14'-0"	28'-3"	31'-0"
Compact	15'-3"	29'-6"	32'-3"

Backup and Transition types are shown elsewhere on the plans, (i.e. Attenuator location details or in the general notes).

Note: System lengths are ± 2"

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Lindsay Transportation Solutions - Barrier Systems, Inc. at (707) 374-6800. 180 River Road, Rio Vista, CA 94571
2. For bi-directional traffic, appropriate transition panels will be required.
3. Additional details for the backup support option, transition options and foundation option will be shown on the manufacturer's shop drawings furnished to the Engineer.
4. Concrete shall be class "S" with a minimum compressive strength of 4,000 psi.
5. Maximum permissible cross-slope is 8%.
6. The installation area should be free from curbs, elevated objects, or depressions.
7. The TAU-II-R system should be approximately parallel with the barrier or center of merging barriers.
8. Refer to Universal TAU-II-R configuration chart for specific systems configuration number and location of each type of energy absorbing element.
9. 30-inch (30") model shown, also available in 36-inch (36") configuration.

BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
B030704	1	Front Support
B030703	TBD	Mid Support
TBD	1	Backstop Assembly (See Table)
TBD	1	Front Cable Anchor
TBD	1	Nose Assembly
B010202	TBD	Sliding Panel
B010659	2	End Panel
K001003	1	Slider Assembly Kit
BSI-1202006-KT	TBD	TAU-II-R Slider Kit
BSI-1107131-KT	TBD	TAU-II-R EAE Mounting Hw Kit
BSI-1012069-00	TBD	Energy Absorbing Element, Type 1
BSI-1012070-00	TBD	Energy Absorbing Element, Type 2
BSI-1012071-00	TBD	Energy Absorbing Element, Type 3
BSI-1110009-00	TBD	Energy Absorbing Element, Type 3N
TBD	TBD	Cable Assembly
K001004	TBD	Cable Guide Kit
K001005	2	Front Support Leg Kit
B010651	4	Pipe Panel Mount
TBD	1	Anchoring Package

(TBD) = To Be Determined, depending on Backup Type and System Length.

(See manufacturer's product manual for details)

Texas Department of Transportation

Design Division Standard

LTS-BARRIER SYSTEMS CRASH CUSHION (R-NARROW)

TAU-II-R(N)-16

LOW MAINTENANCE

FILE: tauiirn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL
©TxDOT: January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06,2013 (VP) REVISED 03,2016 (VP)	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		110

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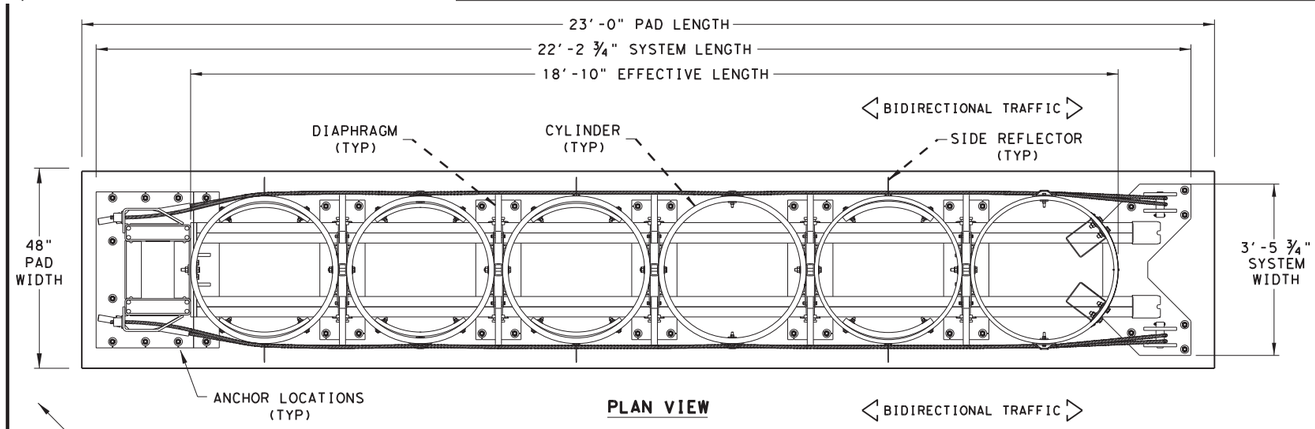
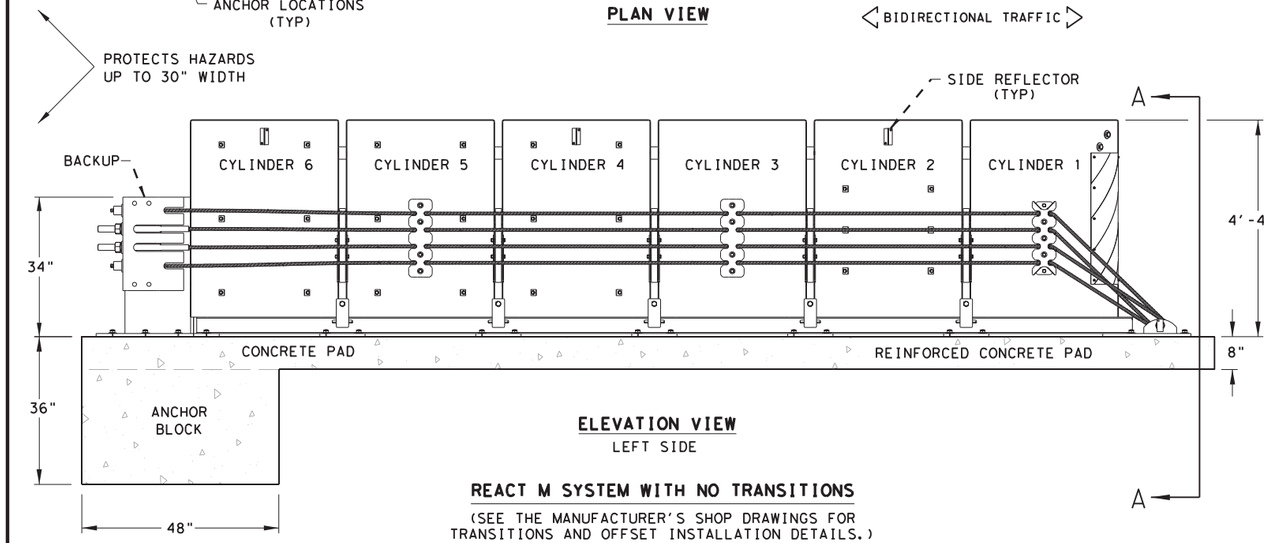


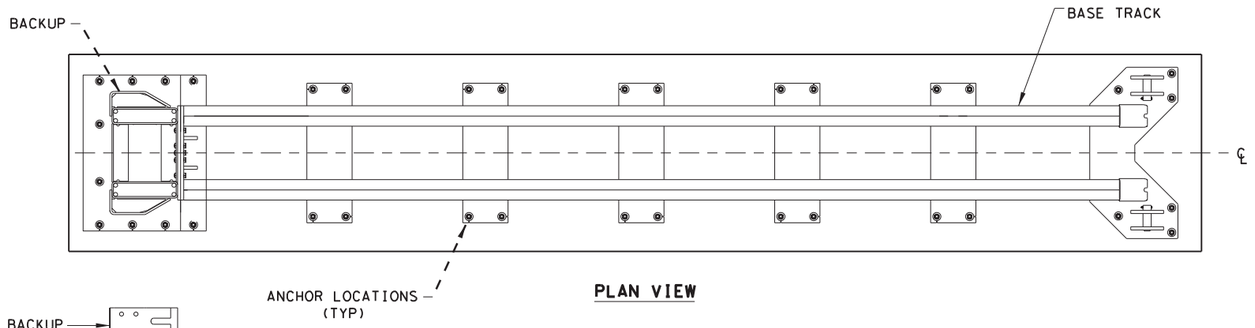
PLAN VIEW



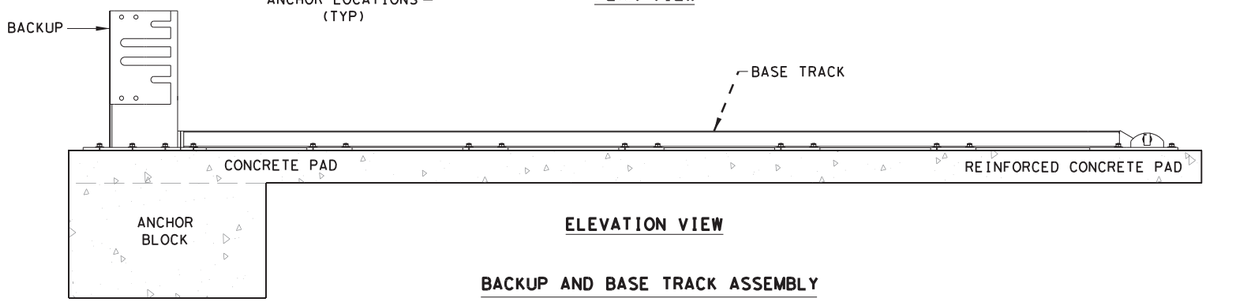
ELEVATION VIEW
LEFT SIDE

REACT M SYSTEM WITH NO TRANSITIONS

(SEE THE MANUFACTURER'S SHOP DRAWINGS FOR TRANSITIONS AND OFFSET INSTALLATION DETAILS.)



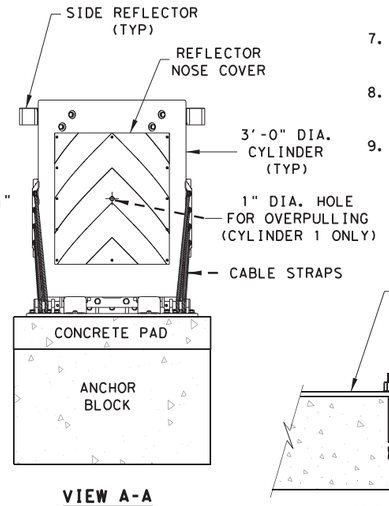
PLAN VIEW



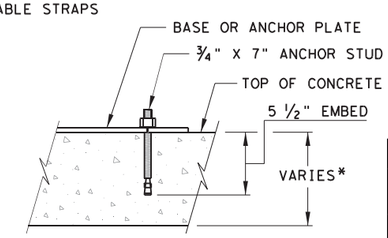
ELEVATION VIEW

BACKUP AND BASE TRACK ASSEMBLY

(SEE THE MANUFACTURER'S SHOP DRAWINGS FOR TRANSITIONS, OFFSETS, BIDIRECTIONAL AND UNIDIRECTIONAL INSTALLATION DETAILS.)



VIEW A-A



ANCHORING DETAIL
*SEE FOUNDATION TYPES TABLE

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION AT 1(888)323-6374 OR WEBSITE: www.trinityhighway.com.
2. THE NOSE OF THE REACT M SHALL BE CLAD WITH A PLASTIC WRAP WITH STANDARD DELINEATION ADHERED TO THE WRAP AND SHALL HAVE A SERIES OF SIDE MARKER REFLECTORS ON BOTH SIDES OF THE UNIT. SEE SITE PLAN VIEWS FOR MARKER AND PLASTIC WRAP COLOR ORIENTATION.
3. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION DETAILS WILL BE AS SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS.
4. DETAILS OF COMPONENTS FOR THE REACT M, BACKUPS AND REINFORCING DETAILS WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
5. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE REACT M SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.
8. ALL STEEL COMPONENTS TO BE HOT DIPPED GALVANIZED EXCEPT STAKES, DRIVE SPIKES, THREADED BOLTS IN BACKUP UNIT, AND WEDGE FITTINGS ON CABLES.
9. THIS DRAWING REPRESENTS THE REACT M TL-3 SYSTEM, RE-DIRECTIVE, NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH.

DESIGN DATA TABLE FOR REACT M

TEST NUMBER	TEST LEVEL	OVERALL LENGTH	TRANSITION LENGTH	SYSTEM WIDTH
3-30 TO 3-36	TL-3	22'-2 ¾"	-	3'-5 ¾"
3-37A	TL-3	22'-2 ¾"	9'-10 ¾"	3'-5 ¾"
3-38	TL-3	22'-2 ¾"	-	3'-5 ¾"

ANCHOR SYSTEM TYPE

APPROVED ADHESIVE, 7" STUDS, 5.5" EMBEDMENT

FOUNDATION TYPES

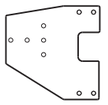
MINIMUM 8" REINFORCED PORTLAND CEMENT CONCRETE PAD (REQUIRED REINFORCING STEEL FOR CONCRETE PAD SHALL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS.

MINIMUM 8" NON-REINFORCED PORTLAND CEMENT CONCRETE ROADWAY MEASURING AT LEAST 12' WIDE BY 50' LONG)

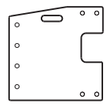
MINIMUM 7" CONCRETE DECK STRUCTURE, OR MINIMUM 6" REINFORCED CONCRETE ROADWAY

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE REACT M SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

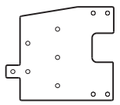
BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS



SAFETY SHAPE BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S) (OPTIONAL)
REQUIRED W/BI-DIRECTIONAL TRAFFIC FLOWS ONLY.



VERTICAL WALL BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S) (OPTIONAL)
REQUIRED W/UNIDIRECTIONAL TRAFFIC FLOWS ONLY.



VERTICAL WALL BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S) (OPTIONAL)
REQUIRED W/BI-DIRECTIONAL TRAFFIC FLOWS ONLY.

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

LOW MAINTENANCE

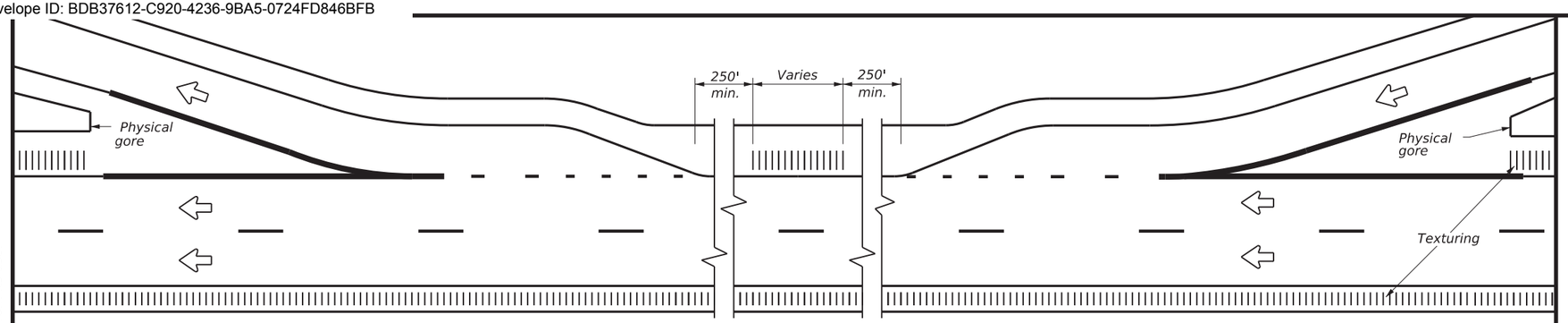
Texas Department of Transportation

Design Division Standard

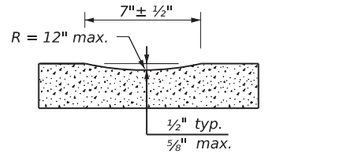
TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION REACT M (NARROW) (MASH TL-3)

REACT(M)-21

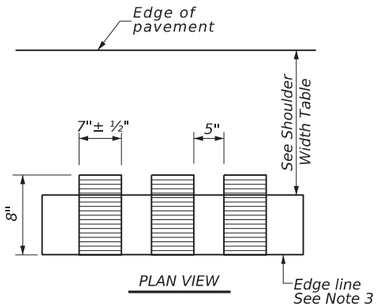
FILE: reactm21.dgn	DN: TXDOT	CK: KM	DW: SS	CK: CL
©TxDOT: JULY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		111



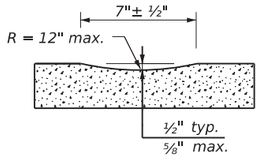
TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS



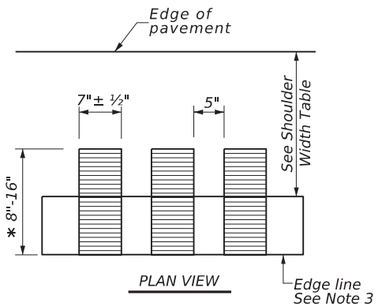
PROFILE VIEW
OPTION 1



CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

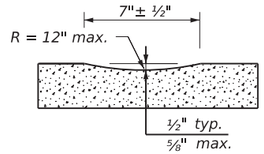


PROFILE VIEW
OPTION 2

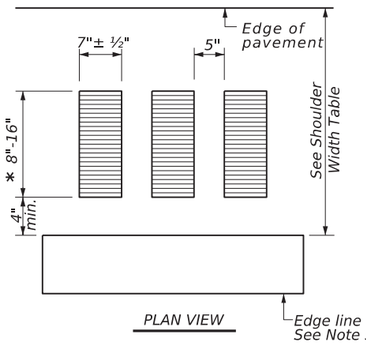


* This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

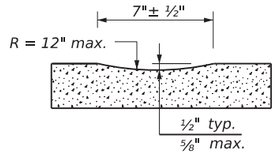


PROFILE VIEW
OPTION 3

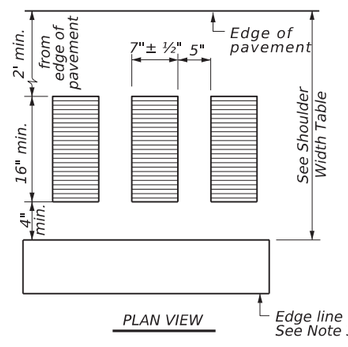


* This distance may vary based on width of shoulder

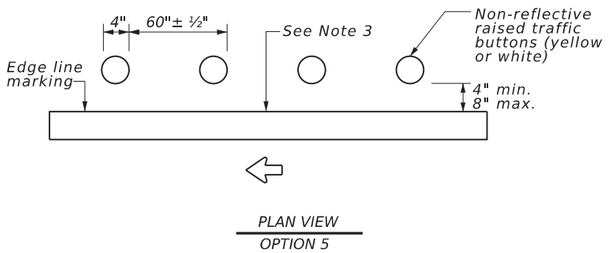
CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PROFILE VIEW
OPTION 4

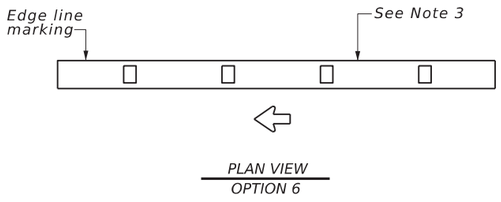


CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGE LINE
(Rumble Strips)



PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS
(Rumble Strips)

SHOULDER WIDTH TABLE

EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, or 6	Option 1, 2, 3, 5, or 6	Option 2, 4, 5, or 6

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use standard sheets PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edge line rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble stripe.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS RS(1)-23

FILE: rs(1)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
4-06 1-23	DIST	COUNTY		SHEET NO.
2-10	22	LA SALLE, Etc.		112
10-13				

DATE: 12/8/2023 12:43:22 PM
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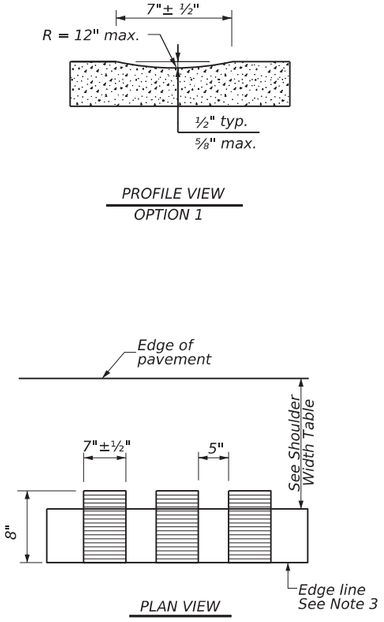
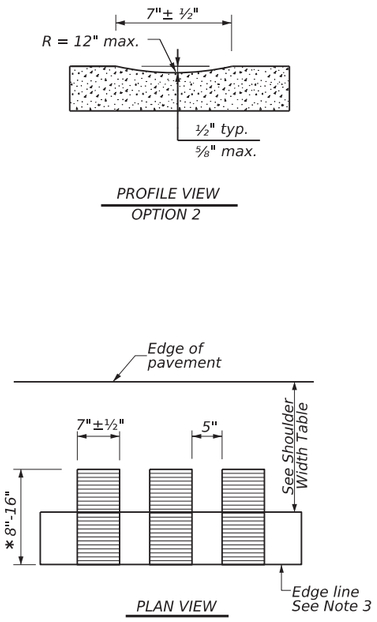


CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

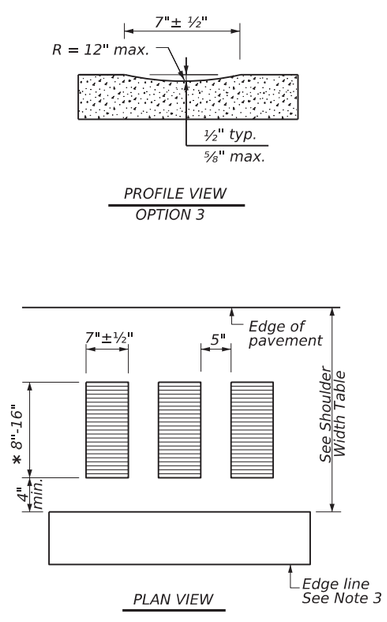
RAISED EDGE LINE (Rumble Strips)



∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

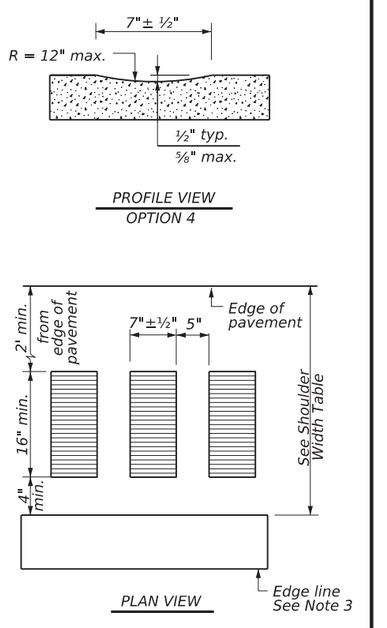
PROFILE EDGE LINE MARKINGS (Rumble Strips)



∗ This distance may vary based on width of shoulder

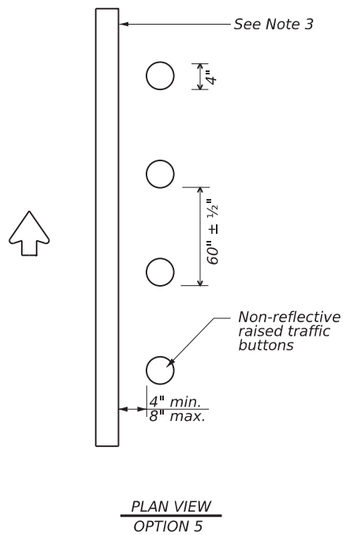
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

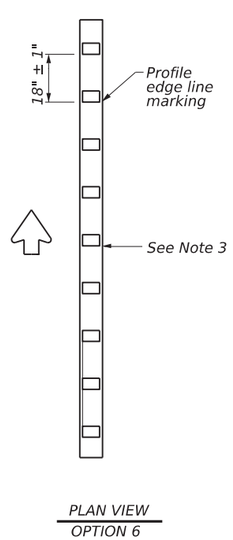
PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

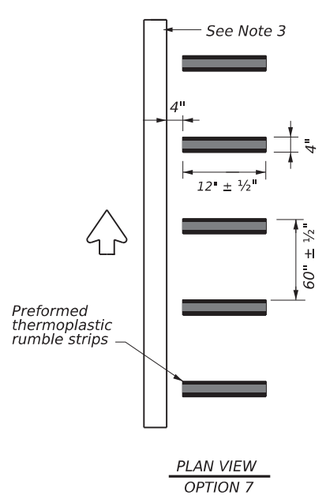


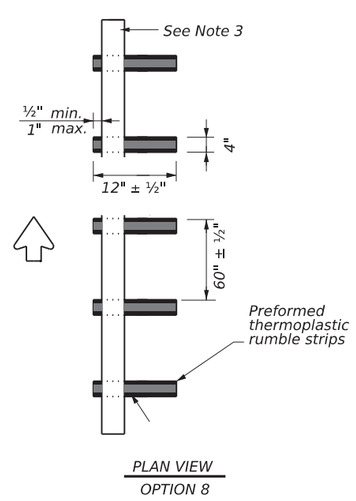
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)









SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, 6 or 8	Option 1, 2, 3 5, 6 or 7	Option 2, 4, 5 6 or 7

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edgeline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(2)-23

FILE: rs(2)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
10-13 1-23	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		113

DATE: 12/8/2023 12:43:31 PM
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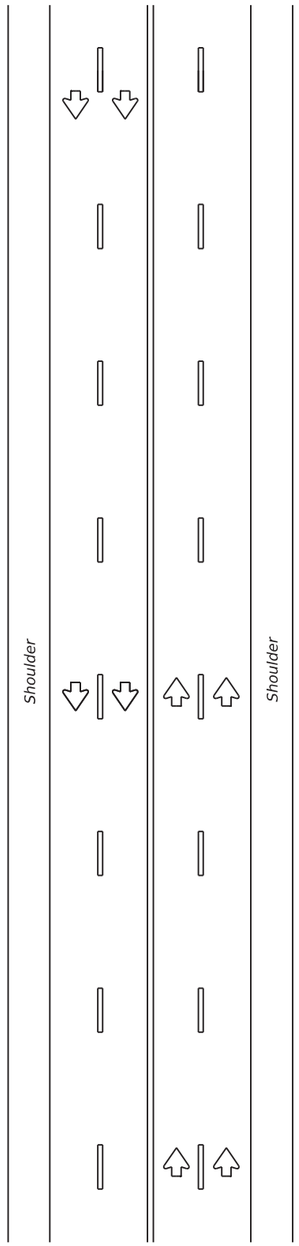
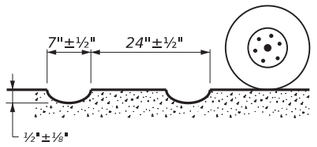
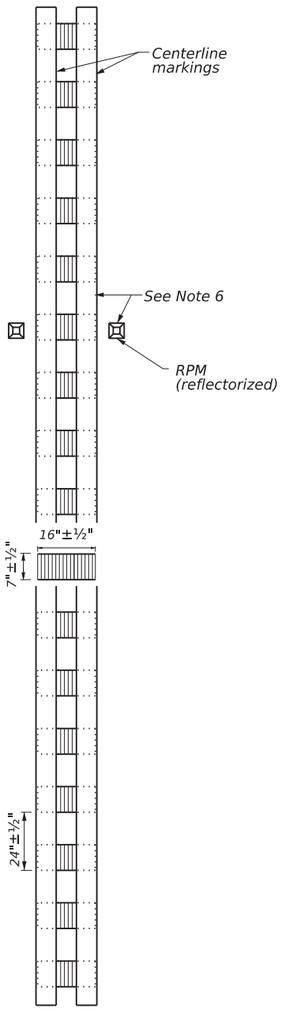
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

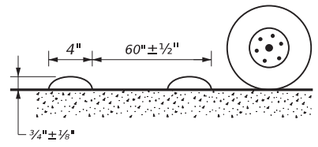


PROFILE VIEW

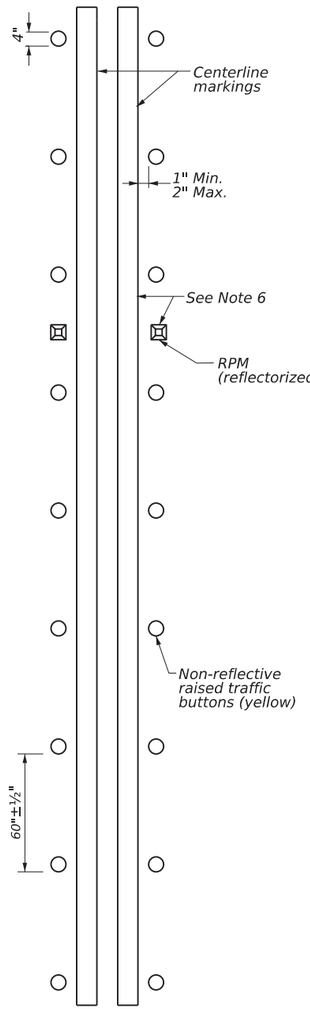


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

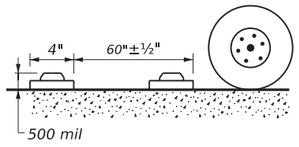


PROFILE VIEW

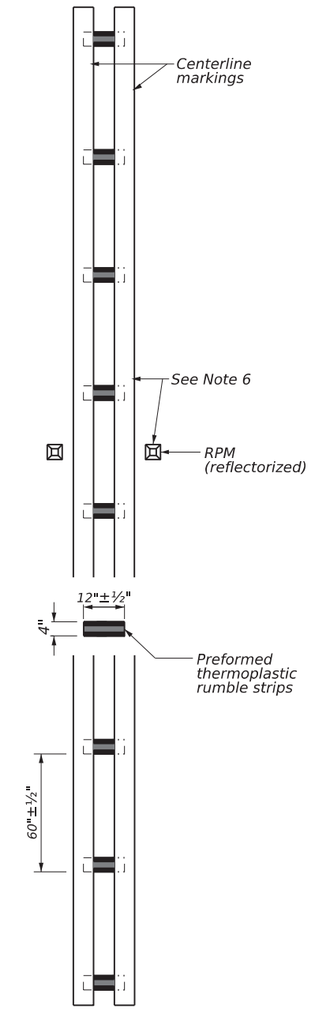


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

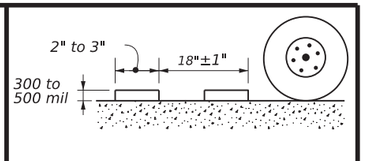


PROFILE VIEW

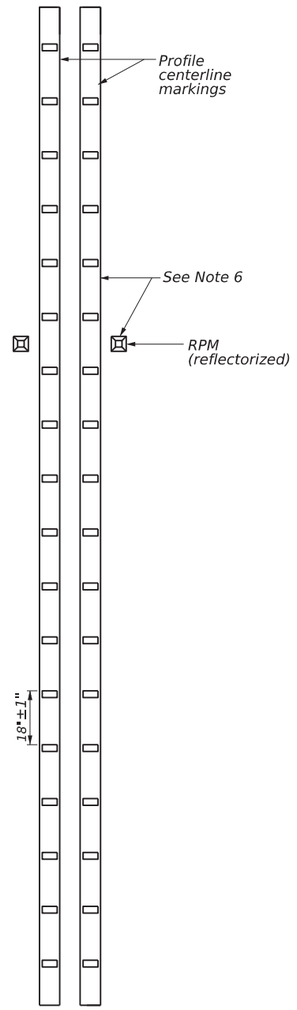


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. *This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.*
2. *Centerline and edge line rumble strips or profile markings shall not be placedon roadways with a posted speed limit of 45 MPH or less.*
3. *Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.*
4. *See dimensions for milled rumble strips. Other shapes and dimensions may beused if approved by the Traffic Safety Division.*
5. *Breaks in milled centerline rumble strips shall occur at least 50 feet and nomore than 150 feet in advance of bridges, railroad crossing, intersections ordriveways with high usage of large trucks.*
6. *Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.*
7. *Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.*
8. *Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.*

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. *Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.*
10. *When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.*
11. *Consideration shall be given to bicyclists. See RS(6).*

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. *See standard sheet RS(2).*

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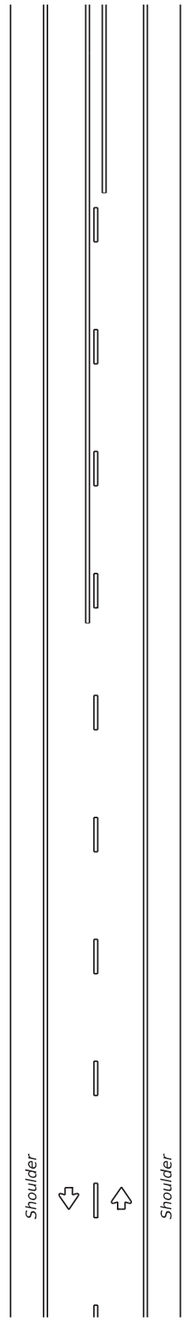
Texas Department of Transportation

Traffic Safety Division Standard

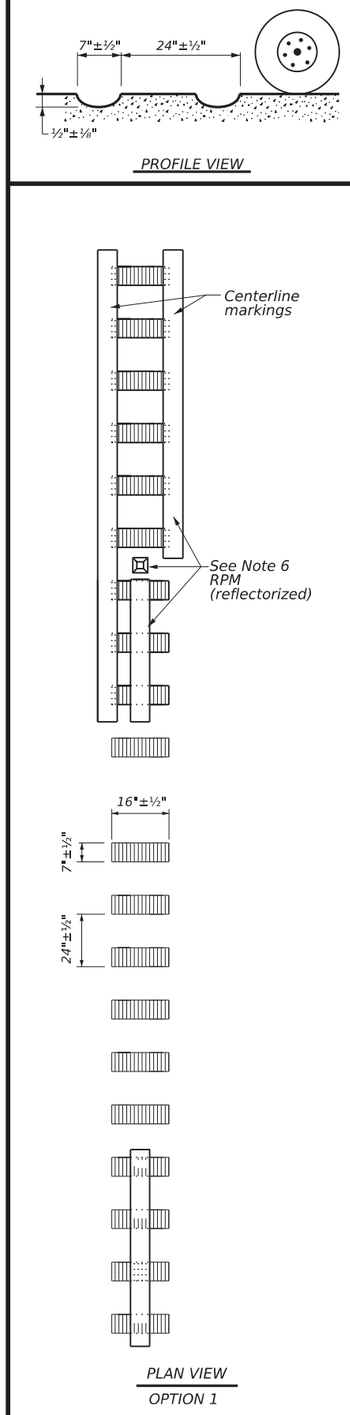
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

FILE: rs(3)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
10-13 1-23	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		114

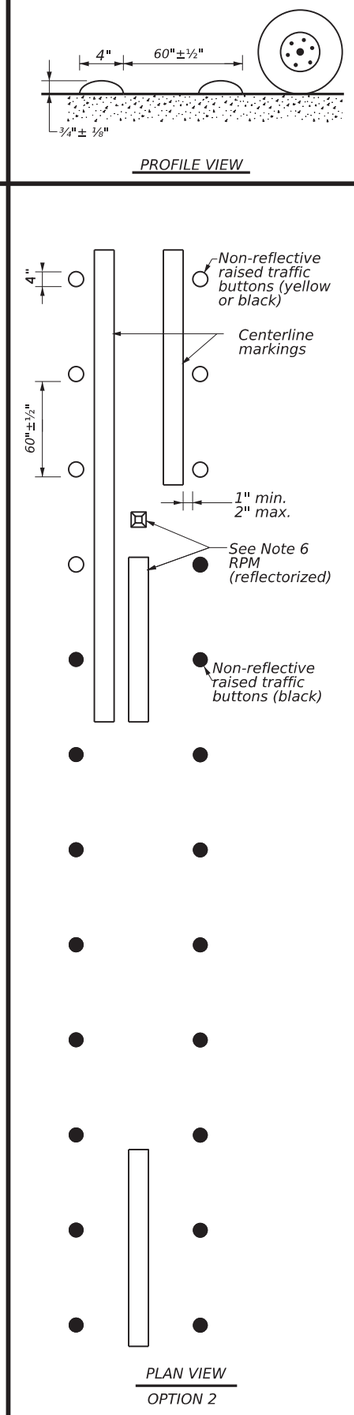
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS



MILLED CENTERLINE RUMBLE STRIPS



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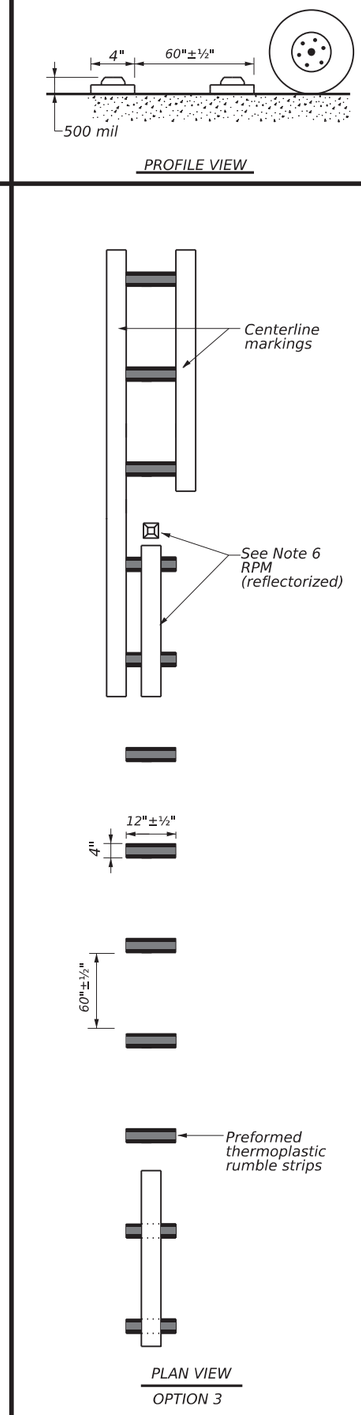
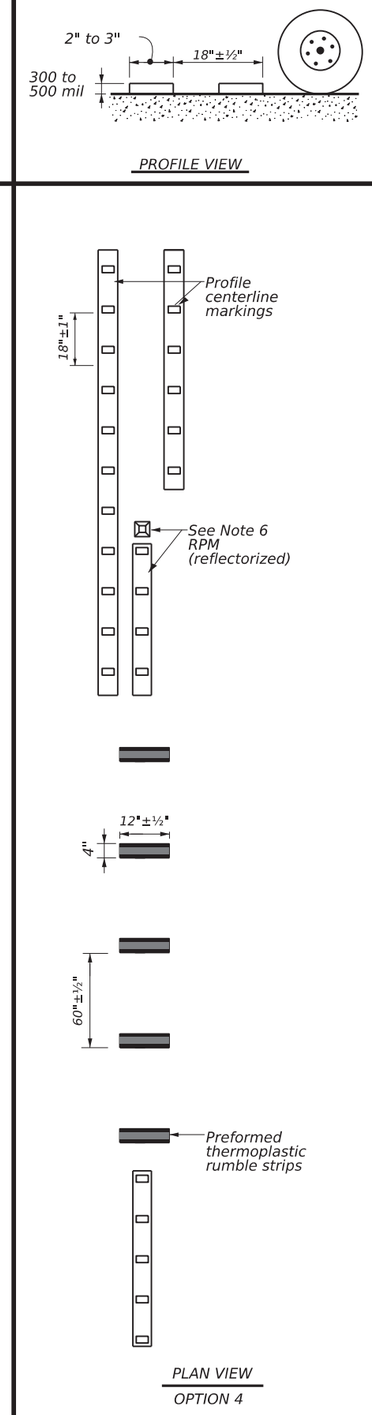


PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).

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Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
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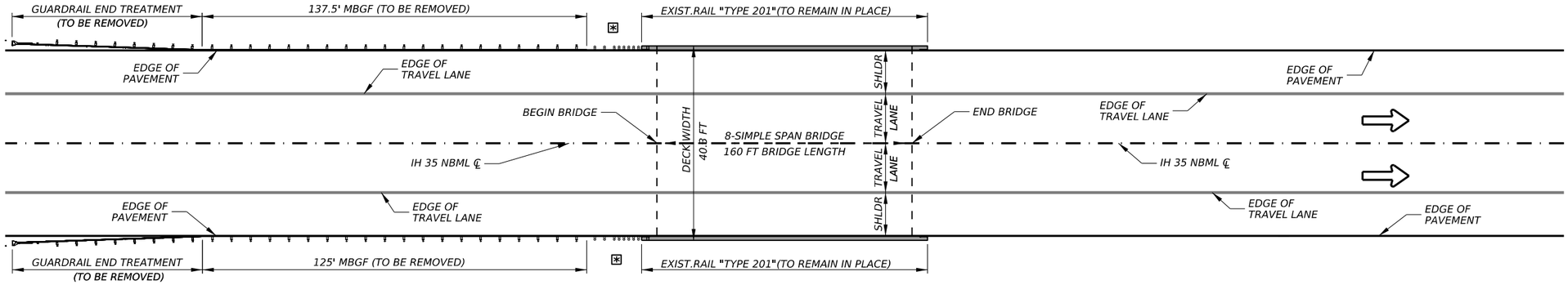
10-13	DIST	COUNTY		SHEET NO.
1-23	22	LA SALLE, Etc.		115



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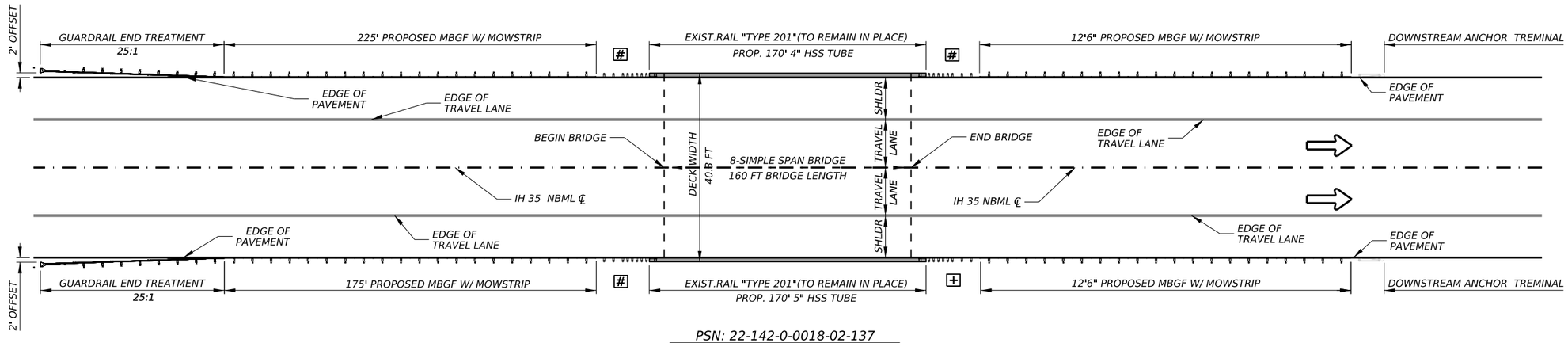
PSN: 22-142-0-0018-02-137
EXISTING MBGF, RAIL & TERMINAL



PSN: 22-142-0-0018-02-137
PROPOSED MBGF, RAIL & TERMINAL

STATE OF TEXAS
CYNTHIA GARCIA
149715
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PROFESSIONAL ENGINEER

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96CA7DFE12674F3...

12/27/2023

LEGEND:

⊛ EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED

PROPOSED MBGF THRIE-BEAM TRANSITION WITH MOWSTRIP

⊞ PROPOSED MBGF NON-SYMMETRICAL THRIE-BEAM TRANSITION

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL. ALSO INSTALLATION ON MOWSTRIP WILL BE PROPOSED FOR THE ENTIRE LENGTH ON BOTH SIDES.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.

LOCATION #1 - IH 35 NBML @ LA SALLE COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 1 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		116

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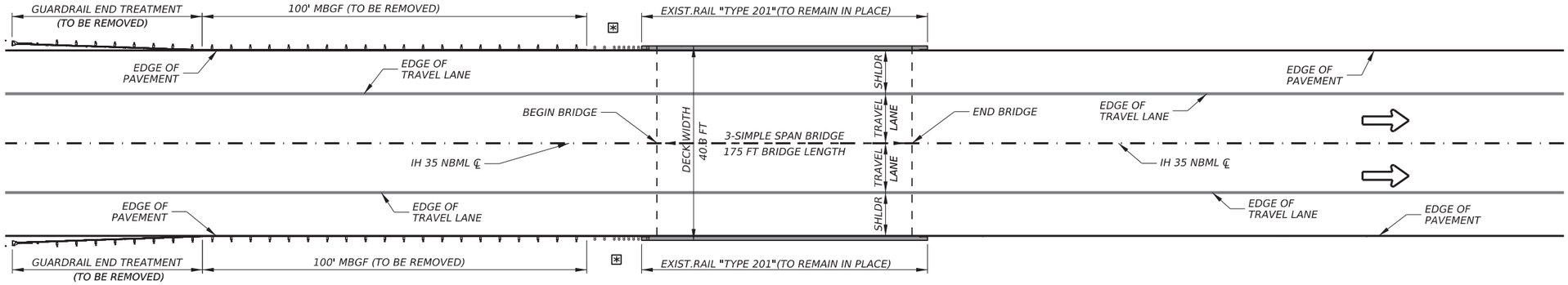

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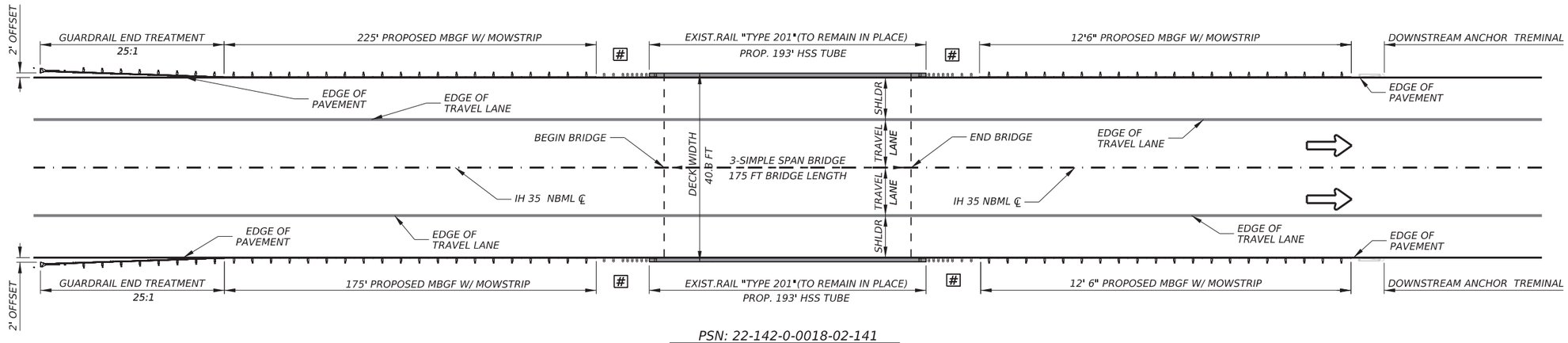

PSN: 22-142-0-0018-02-141
PROPOSED MBGF, RAIL & TERMINAL

STATE OF TEXAS
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LEGEND:

⊛ EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED

PROPOSED MBGF THRIE-BEAM TRANSITION WITH MOWSTRIP

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL. ALSO INSTALLATION ON MOWSTRIP WILL BE PROPOSED FOR THE ENTIRE LENGTH ON BOTH SIDES.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.

LOCATION #1 - IH 35 NBML @ LA SALLE COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 2 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		117

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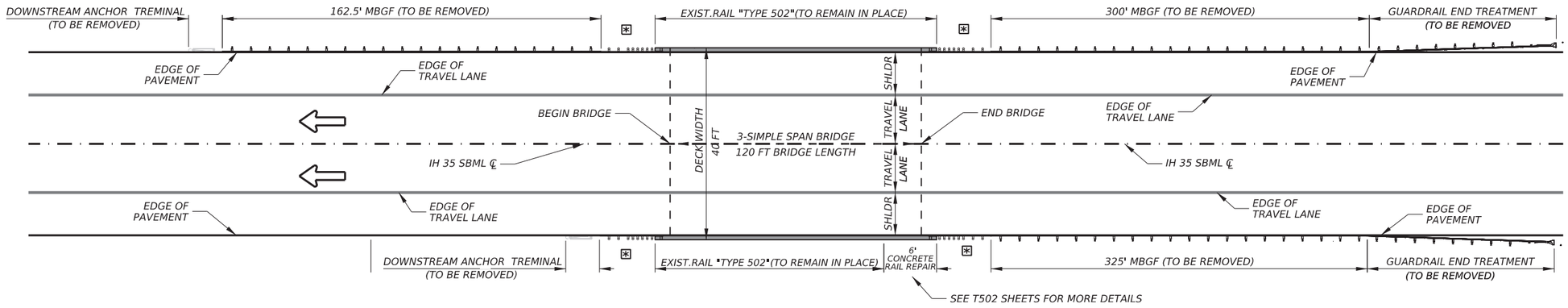

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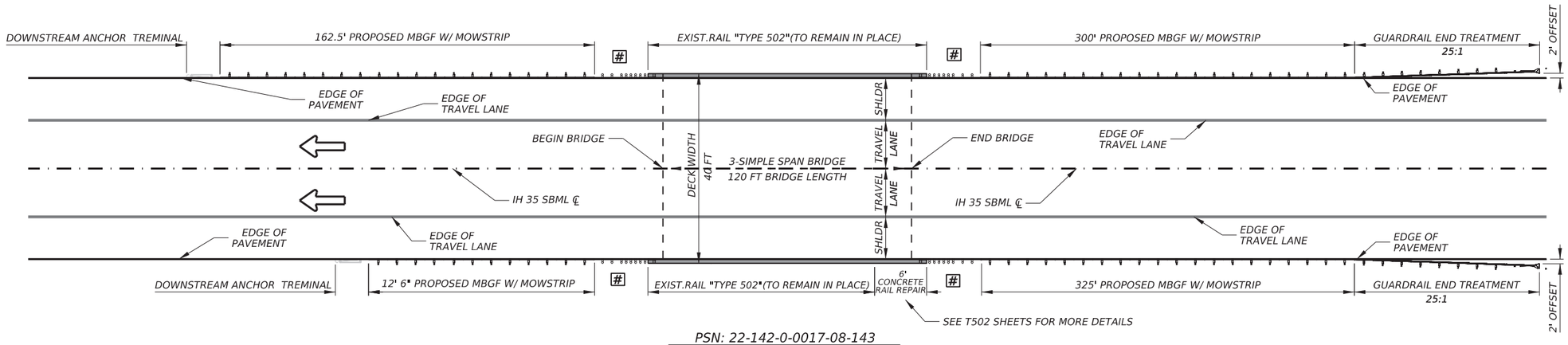

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PROPOSED MBGF, RAIL & TERMINAL

LEGEND:

⊛ EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED

PROPOSED MBGF THRIE-BEAM TRANSITION WITH MOWSTRIP

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL. ALSO INSTALLATION ON MOWSTRIP WILL BE PROPOSED FOR THE ENTIRE LENGTH ON BOTH SIDES.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.

NOT TO SCALE

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CYNTHIA GARCIA
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Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 3 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		118

LOCATION #2 - IH 35 SBML @ LA SALLE COUNTY

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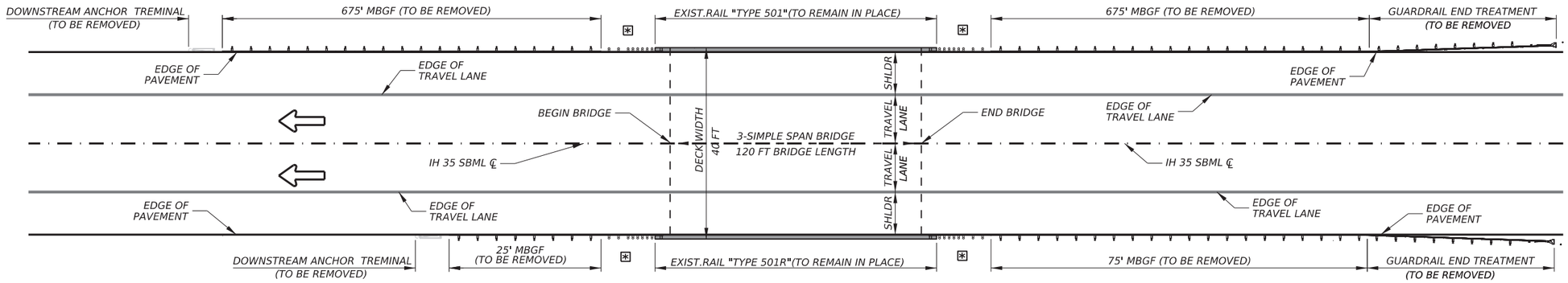

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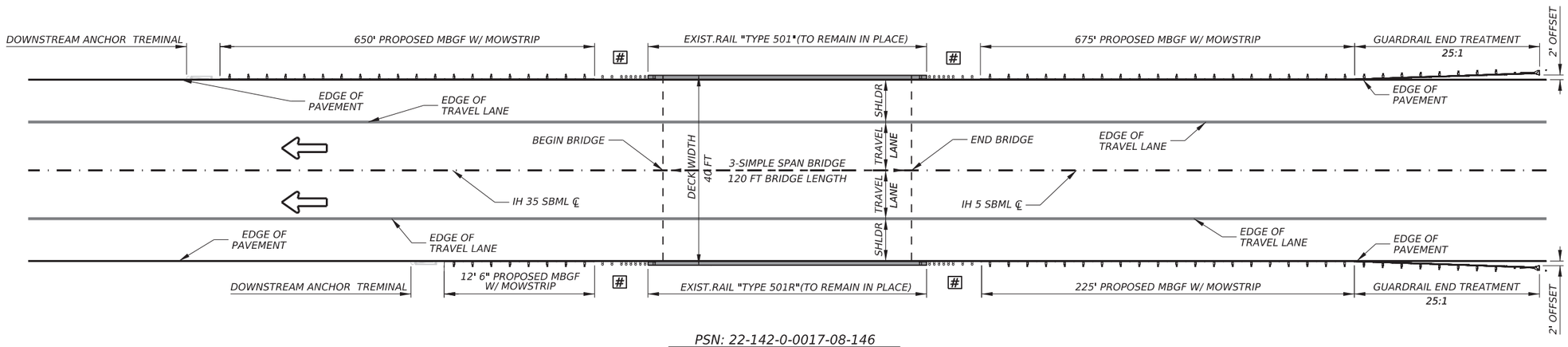

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PROPOSED MBGF, RAIL & TERMINAL

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LEGEND:

⊛ EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED

PROPOSED MBGF THRIE-BEAM TRANSITION WITH MOWSTRIP

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL. ALSO INSTALLATION ON MOWSTRIP WILL BE PROPOSED FOR THE ENTIRE LENGTH ON BOTH SIDES.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.

LOCATION #2 - IH 35 SBML @ LA SALLE COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 4 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		119

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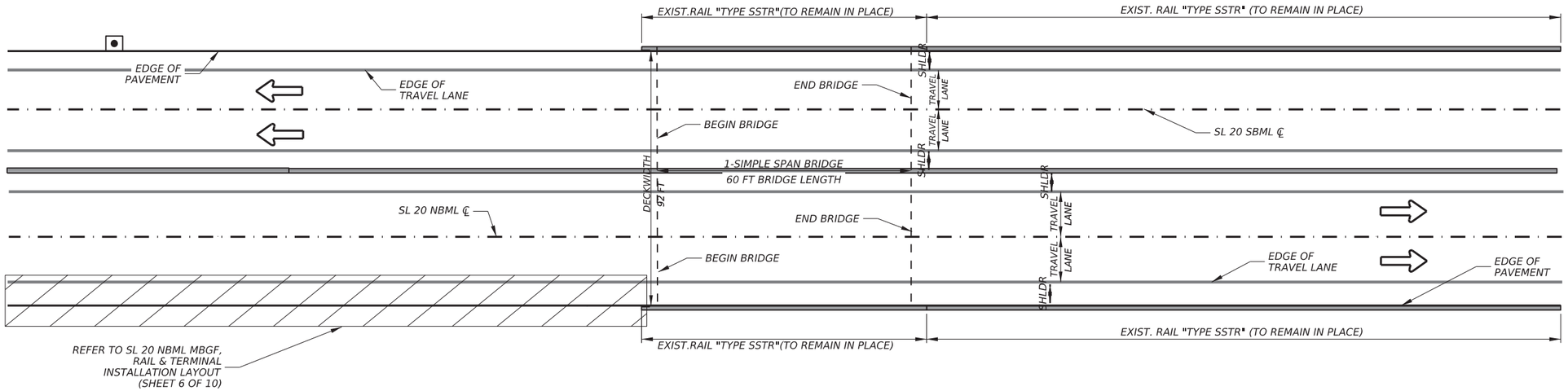

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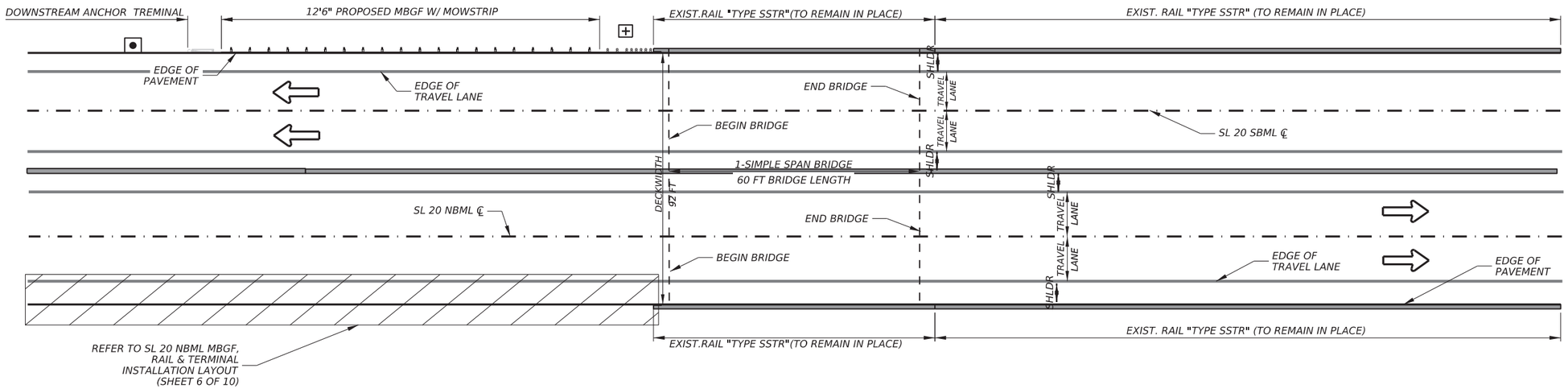

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PROPOSED MBGF, RAIL & TERMINAL

LEGEND:

⊞ PROPOSED MBGF NON-SYMMETRICAL THRIE-BEAM TRANSITION

◉ EXISTING INLET (TO REMAIN IN PLACE)

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL. ALSO INSTALLATION ON MOWSTRIP WILL BE PROPOSED FOR THE ENTIRE LENGTH ON BOTH SIDES.

2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.

LOCATION #10 - SL 20 NBML & SBML @ WEBB COUNTY

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MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

SHEET 5 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		120

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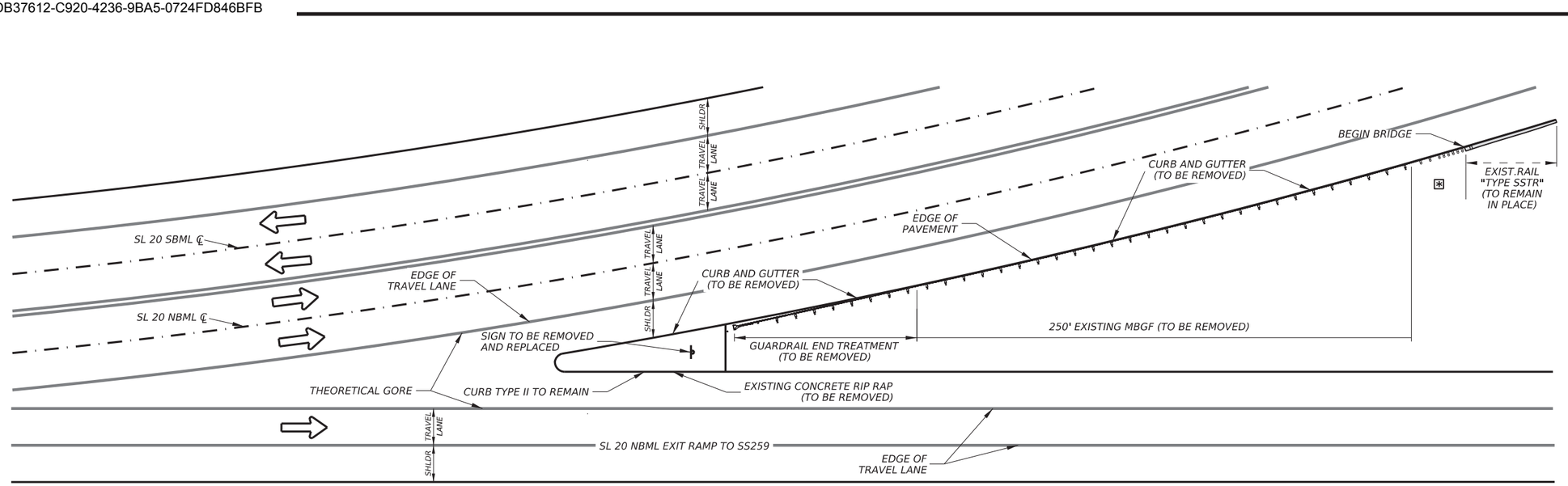

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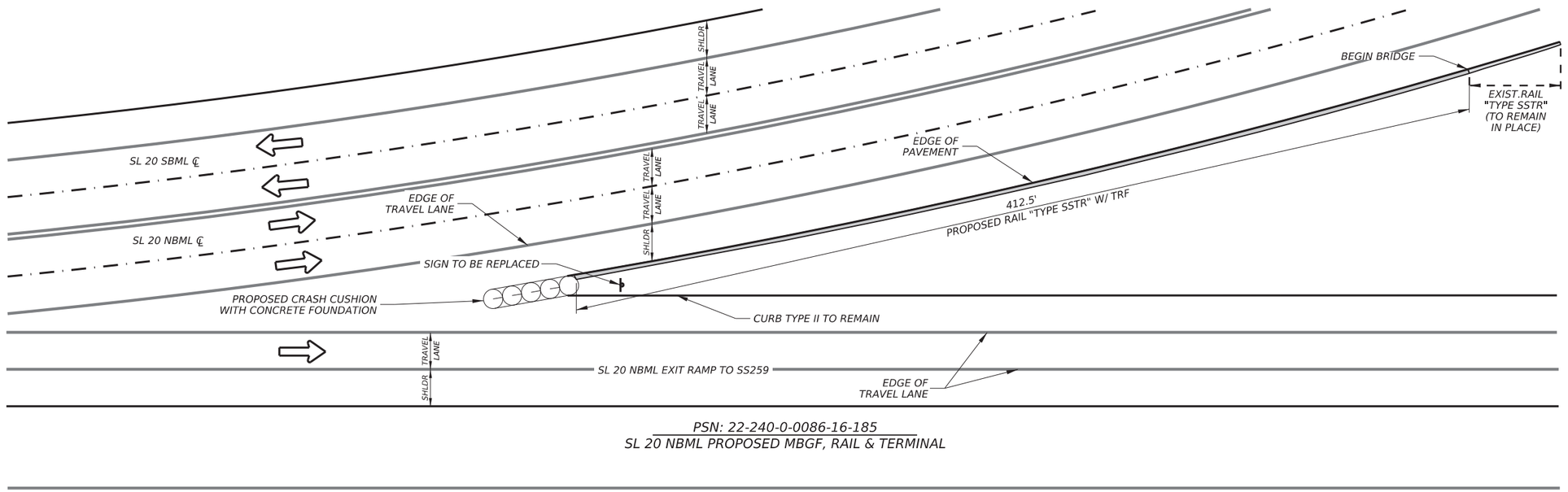

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SL 20 NBML PROPOSED MBGF, RAIL & TERMINAL

NOTES:

1. REFER TO TXDOT STANDARD TRAFFIC RAIL SINGLE SLOPE, TRAFFIC RAIL FOUNDATION AND "ROADWAY MISCELLANEOUS DETAILS CRASH CUSHION(S) FOR MORE INFORMATION.

LEGEND: ⊠ EXIST. MBGF THRIE-BEAM TRANSITION TO REMOVED

LOCATION #10 - SL 20 NBML @ WEBB COUNTY

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Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 6 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		121

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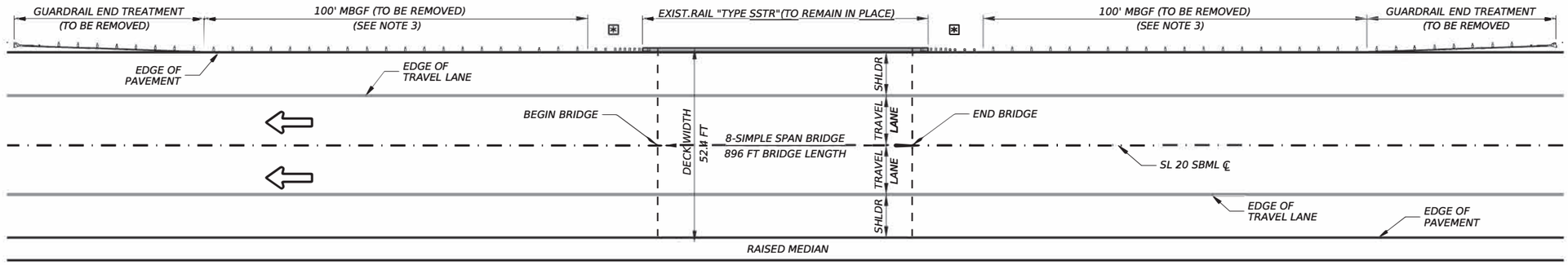

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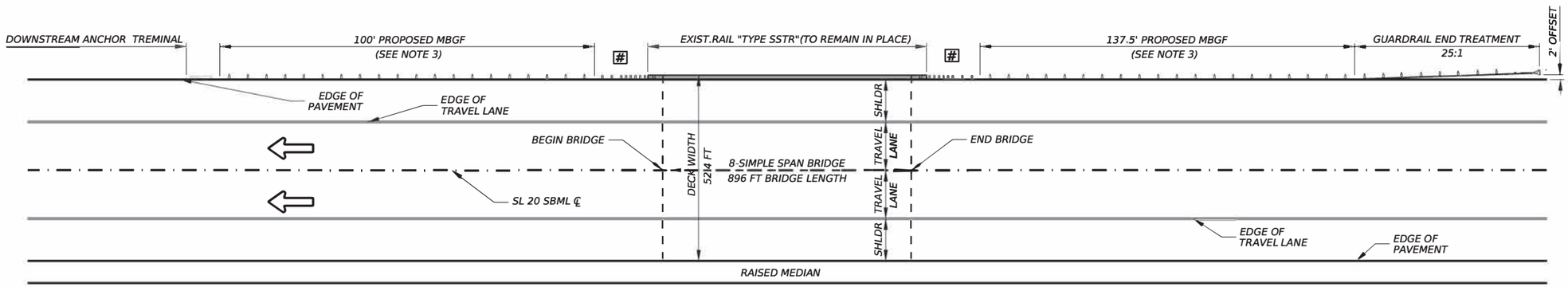

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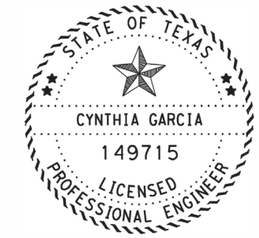
PROPOSED MBGF, RAIL & TERMINAL

NOT TO SCALE



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12/22/2023

LEGEND:

EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED

PROPOSED MBGF THRIE-BEAM TRANSITION

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.
3. APPROXIMATELY 4' OF CONCRETE SIDEWALK / PAVERS TO BE REMOVED. REMOVED SIDEWALK/ PAVERS TO BE REPLACED AFTER / DURING INSTALLATION OF NEW MBGF AND RELATED MATERIAL. WORK DONE WIL BE PAID UNDER ITEMS 104-6009 & 432-6002.

LOCATION #10 - SL 20 SBML @ WEBB COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 7 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		122

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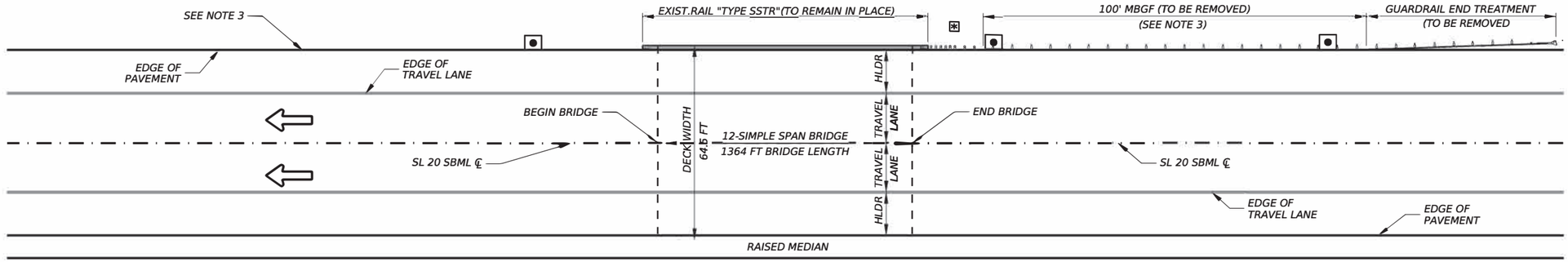
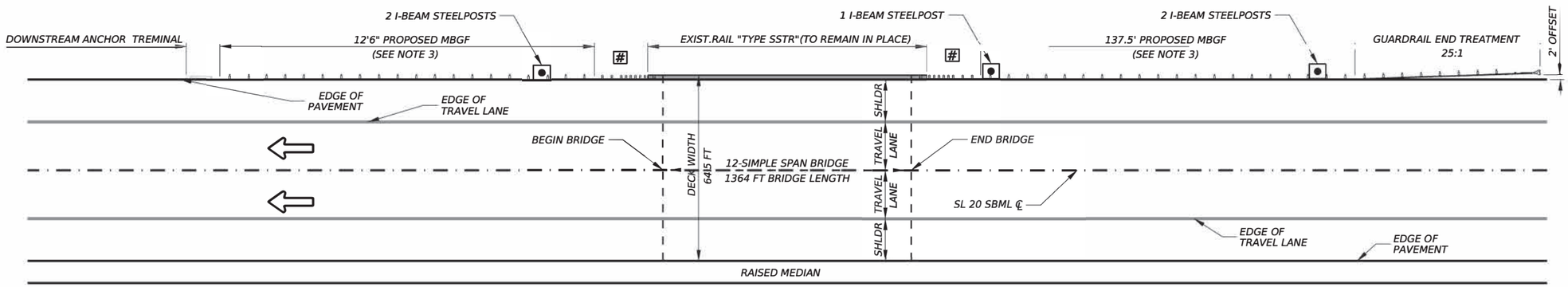


NOT TO SCALE

PSN: 22-240-0-0086-16-187
EXISTING MBGF, RAIL & TERMINAL



PSN: 22-240-0-0086-16-187
PROPOSED MBGF, RAIL & TERMINAL

STATE OF TEXAS
CYNTHIA GARCIA
149715
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LEGEND:

- EXISTING INLET (TO REMAIN IN PLACE)
- EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED
- PROPOSED MBGF THRIE-BEAM TRANSITION

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.
3. APPROXIMATELY 4' OF CONCRETE SIDEWALK / PAVERS TO BE REMOVED. REMOVED SIDEWALK/ PAVERS TO BE REPLACED AFTER / DURING INSTALLATION OF NEW MBGF AND RELATED MATERIAL. WORD DONE WILL BE PAID UNDER ITEMS 104-6009 & 432-6002.

LOCATION #10 - SL 20 SBML @ WEBB COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUTS

 SHEET 8 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		123

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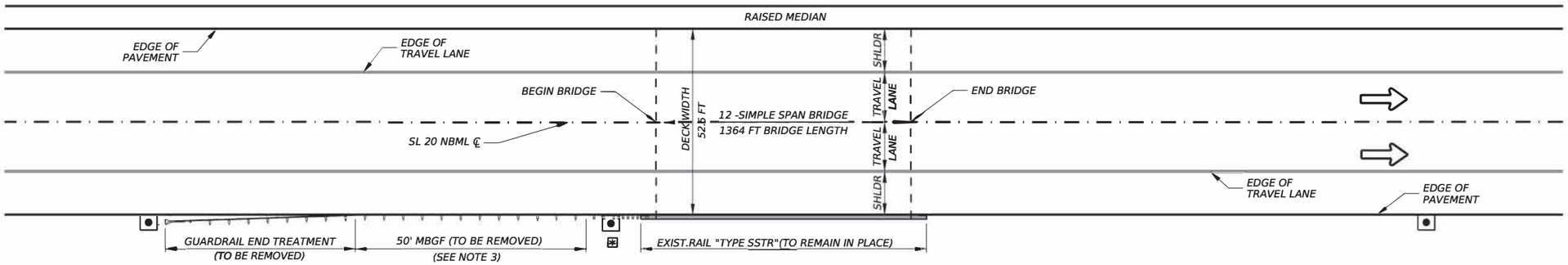

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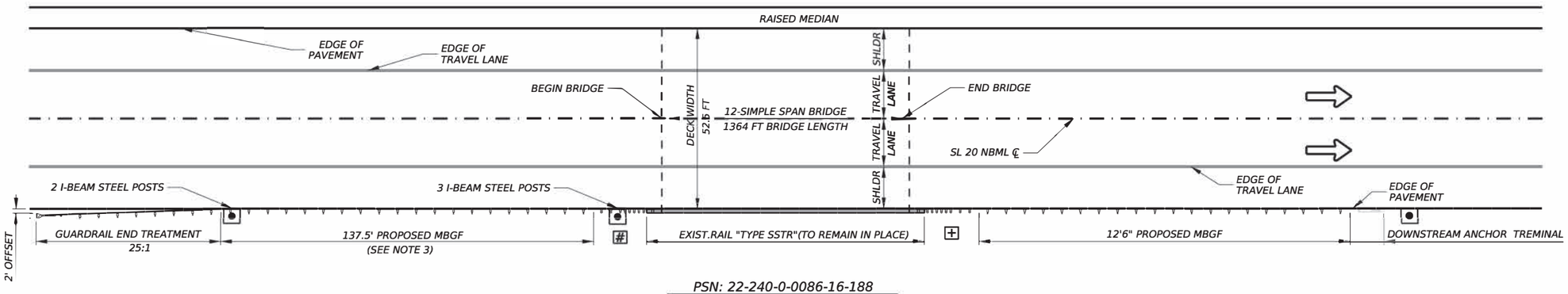

PSN: 22-240-0-0086-16-188
PROPOSED MBGF, RAIL & TERMINAL

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LEGEND:

- PROPOSED NON-SYMMETRICAL THRIE-BEAM TRANSITION
- EXISTING INLET (TO REMAIN IN PLACE)
- EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED
- PROPOSED MBGF THRIE-BEAM TRANSITION

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.
3. APPROXIMATELY 4' OF CONCRETE SIDEWALK / PAVERS TO BE REMOVED. REMOVED SIDEWALK/ PAVERS TO BE REPLACED AFTER / DURING INSTALLATION OF NEW MBGF AND RELATED MATERIAL. WORK DONE WILL BE PAID UNDER ITEMS 104-6009 & 432-6002.

LOCATION #10 - SL 20 NBML @ WEBB COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 9 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		124

DATE: 12/8/2023 12:45:26 PM
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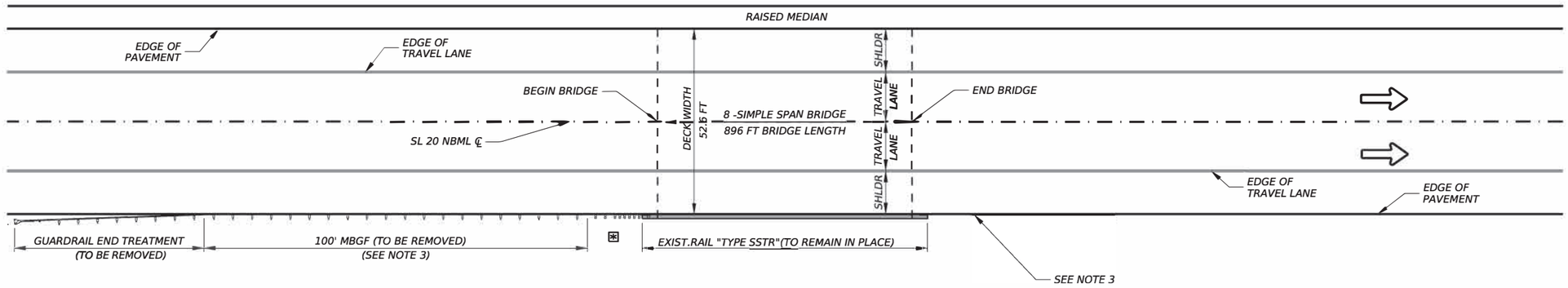
NOT TO SCALE



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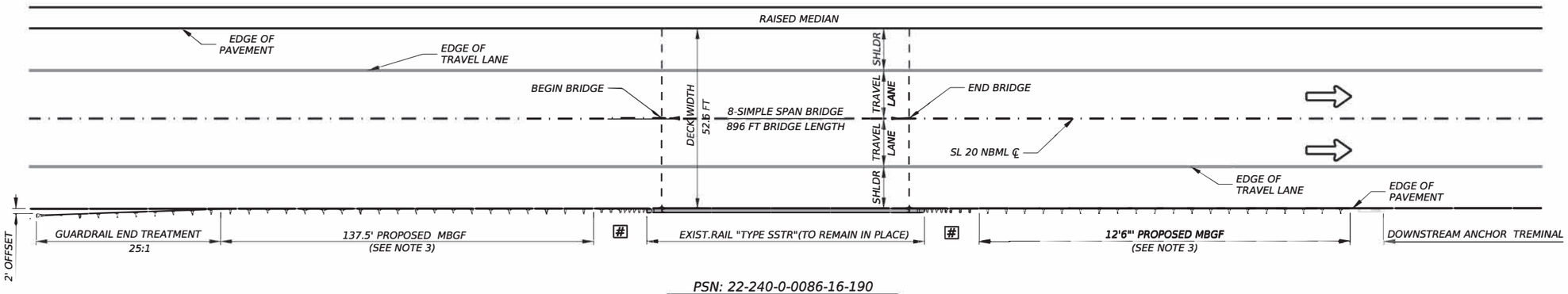
EXISTING MBGF, RAIL & TERMINAL



PSN: 22-240-0-0086-16-190
PROPOSED MBGF, RAIL & TERMINAL

LEGEND:

⊠ EXIST. MBGF THRIE-BEAM TRANSITION TO BE REMOVED

PROPOSED MBGF THRIE-BEAM TRANSITION

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.
3. APPROXIMATELY 4' OF CONCRETE SIDEWALK / PAVERS TO BE REMOVED. REMOVED SIDEWALK/ PAVERS TO BE REPLACED AFTER / DURING INSTALLATION OF NEW MBGF AND RELATED MATERIAL. WORK DONE WILL BE PAID UNDER ITEMS 104-6009 & 432-6002.

LOCATION #10 - SL 20 NBML @ WEBB COUNTY

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED PROFESSIONAL ENGINEER

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12/22/2023

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 10 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		125

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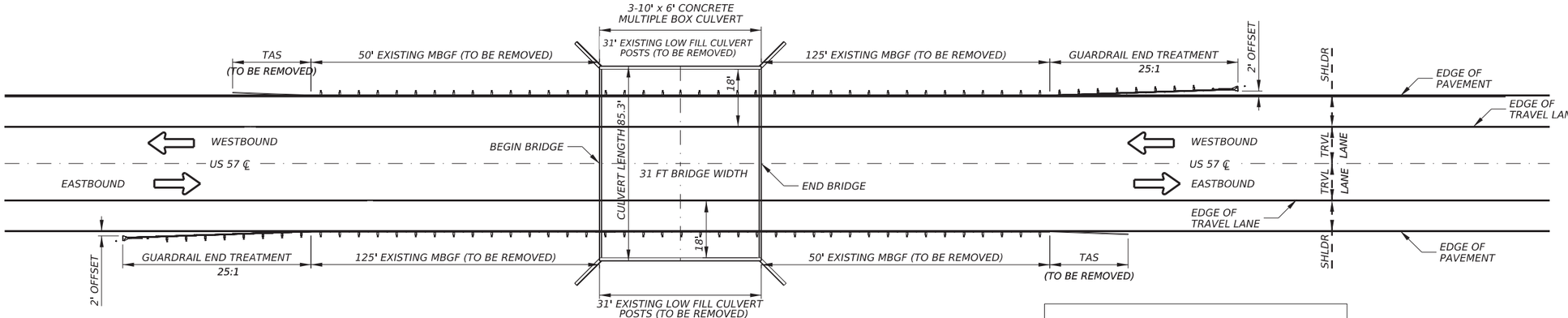
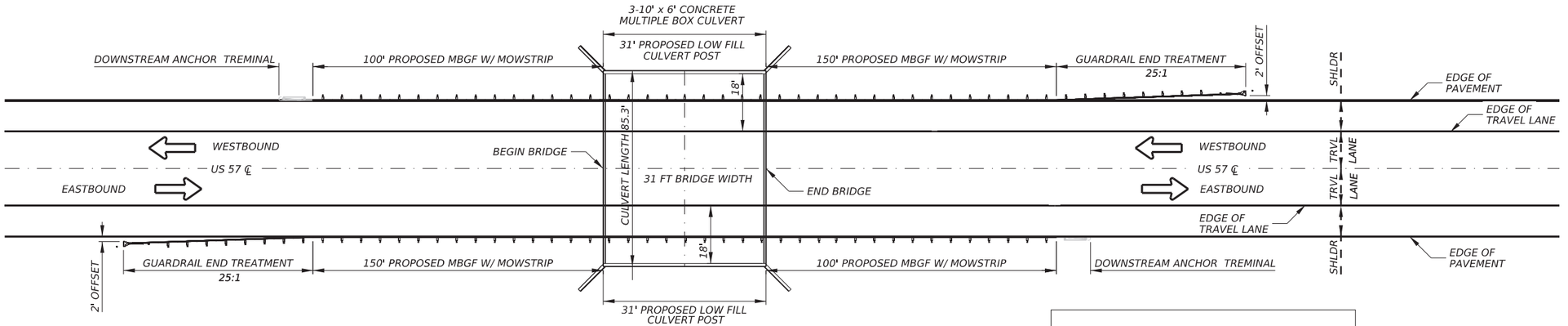


PSN: 22-159-0-0276-01-090
EXISTING MBGF, RAIL & TERMINAL



PSN: 22-159-0-0276-01-090
PROPOSED MBGF, RAIL & TERMINAL

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STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED PROFESSIONAL ENGINEER

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12/22/2023

NOTES:

1. THE PROPOSED WORK FOR THIS LOCATION CONSIST ON THE INSTALLATION OF MBGF, MBGF THRIE BEAMS AND DOWNSTREAM ANCHOR TERMINAL. ALSO INSTALLATION ON MOWSTRIP WILL BE PROPOSED FOR THE ENTIRE LENGTH ON BOTH SIDES.
2. REFER TO TXDOT STANDARD GF(31)MS-19 AND "ROADWAY MISCELLANEOUS DETAILS MOW STRIP" SHEET(S) FOR MORE INFORMATION.

LOCATION #6 - US 57 @ MAVERICK COUNTY

Texas Department of Transportation

IH 35, Etc.

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

 SHEET 11 OF 11

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		126

DATE: 12/8/2023 12:45:47 PM
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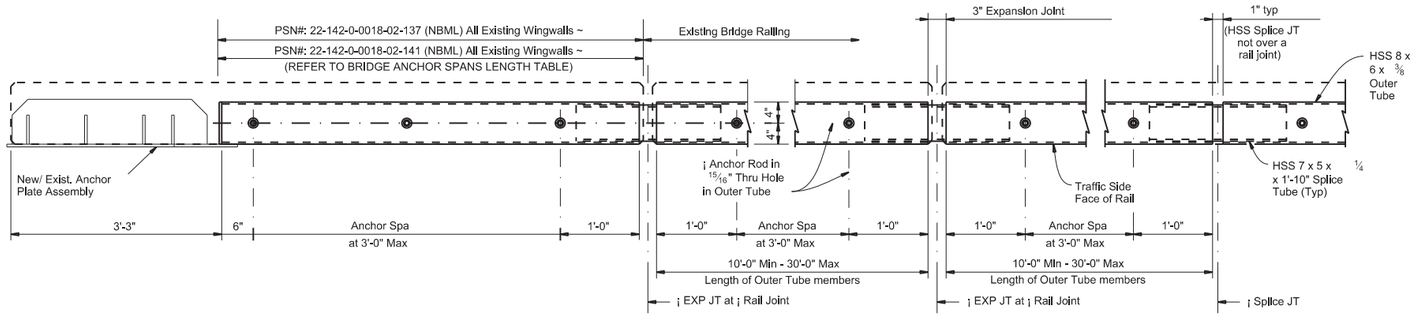
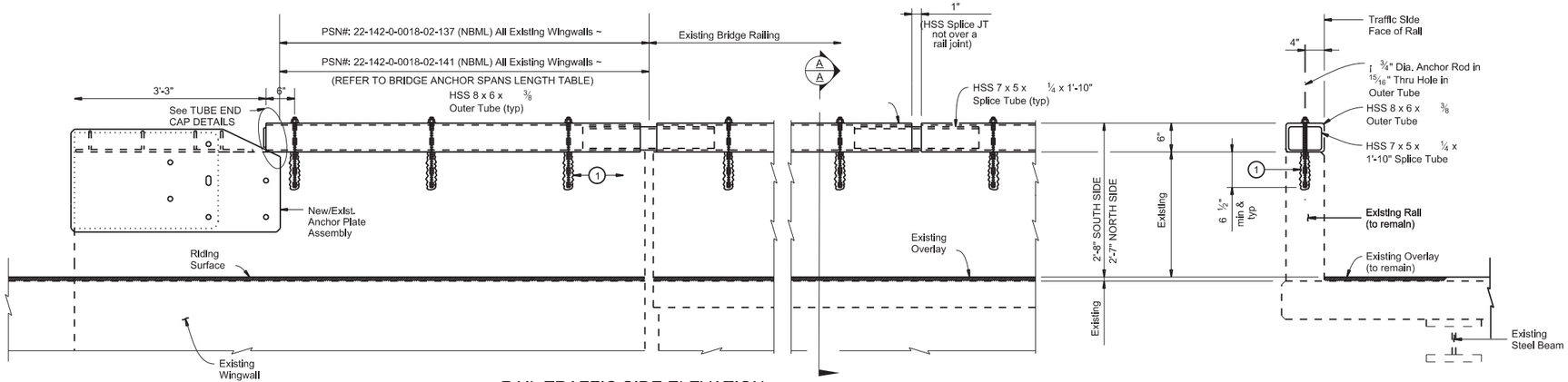
CK
DW
CK
DW

No additional overlay may be added to the existing bridge.
Mill down existing overlay prior to adding new overlay.
If future overlay is added, limit the depth of the new overlay such that the elevation of the existing riding surface is not exceeded.

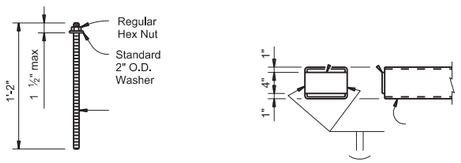


RAIL PLAN



RAIL TRAFFIC SIDE ELEVATION

SECTION A-A



ANCHOR RODS ①

TUBE END CAP DETAILS

① Anchor bolts must be 3/4" Dia. ASTM-A36 threaded rods with one regular hex nut and one standard 2" O.D. washer each. Embed threaded rods 6 1/2" Min into concrete rail using a Type III, Class C epoxy adhesive anchor system capable of obtaining an ultimate load of 20 kips in tension per threaded rod. Anchor installation, including hole size, drilling, and clean-out must be in accordance with the manufacturer's instructions.

GENERAL NOTES:

Remove MBGF (W-shape) fascia and attachment hardware from the existing rail, if present, prior to the installation of new HSS steel tube and must be subsidiary to the bid item. Dispose of the removed materials as directed by the Engineer. Plug newly exposed bolt holes that are in conflict with the structural tubing anchors with epoxy grout prior to the coring of new anchor holes. Existing bolt holes not in conflict do not need to be plugged.

Provide ASTM A1085 beam member structural steel and provide ASTM A36 end cap structural steel. Structural steel must conform to Item 441, "Steel Structures", and must be free from burrs, sharp edges, and weld splatter. Exposed edges and corners must be ground to 1/16" flat or radius.

All steel components must be galvanized in accordance with Item 445, "Galvanizing". Provide anchor bolts, rods, and nuts of Class 2A and 2B fit tolerances. Provide nuts that are tapped after galvanizing. Nuts must be installed to snug tight. Burr threads after installation to prevent back turn of the nut.

Verify all dimensions in the field prior to commencement of work. Shop drawings are required for this rail.

HSS Quantity = 12,620 LB. For Contractor's Information only.

Bridge Anchor Spans Length	NW	NE	SW	SE
PSN: 22-142-0-0018-02-137	25"	21"	22"	25"
PSN: 22-142-0-0018-02-141	69"	69"	69"	69"

STATE OF TEXAS
CYNTHIA GARCIA
149715
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PROFESSIONAL ENGINEER

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Texas Department of Transportation

IH 35, Etc.

BRIDGE RAIL RETROFIT
HSS TUBE DETAIL

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		127

DATE: 12/8/2023 2:20:06 PM
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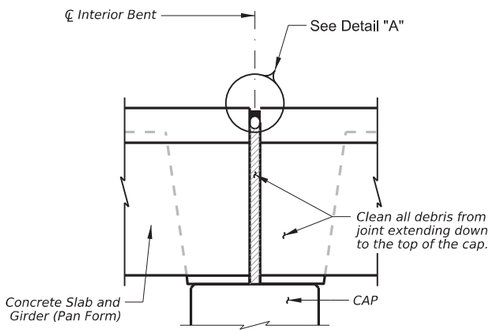
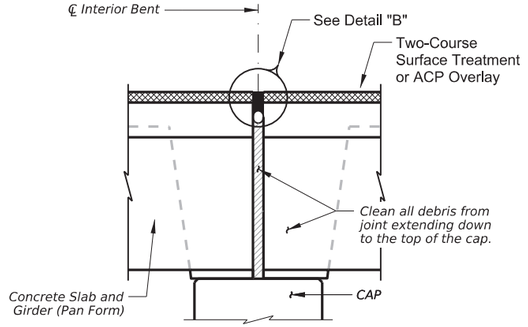


JOINT WITH SILICONE SEAL

(used without ACP Overlay)



JOINT WITH HOT POURED RUBBER SEAL

(used with ACP Overlay)

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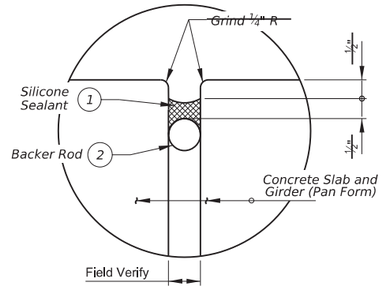
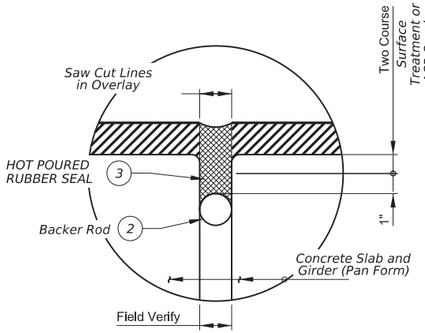
REF. LOC.# 2-PSN: 22-142-0-0017-08-146



DETAIL "A"



DETAIL "B"

EXISTING CONCRETE SLAB & GIRDER JOINT REPAIR

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE GIRDER JOINT WITH SILICONE SEAL:

1) Clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.

2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

3) Place backer rod into joint opening 1" below the top of concrete. The backer rod must be 25% larger than the joint opening. Fill void below backer rod with polystyrene foam.

4) Seal the joint opening with a Class 7 Silicone. Recess seal ½" below top of concrete in travel lanes and ⅛" below top of concrete in shoulders.

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE GIRDER JOINT WITH HOT POURED RUBBER SEAL:

1) Saw cut through the asphalt at the centerline of joint. Make multiple saw cuts to create a ½" minimum joint opening or match the existing joint opening. Clean joint opening of all old expansion materials/devices, bituminous materials, dirt, grease and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints."

2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

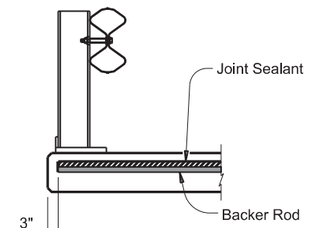
3) Place backer rod into joint opening 1" below the top of concrete. Backer rod must be compatible with the hot poured rubber sealant and rated for a minimum of 400°F. The backer rod must be 25% larger than the joint opening. Fill void below backer rod with extruded polystyrene foam.

4) Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.

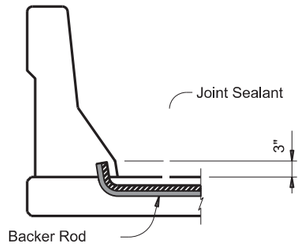
(1) Use Class 7 silicone sealant. Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."

(2) Backer rod must be 25% larger than joint opening and must be compatible with the sealant.

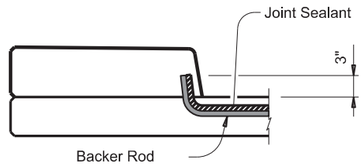
(3) Use Class 3 (Hot Poured Rubber Seal). Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."



Shown @ Steel Rail



Shown @ Concrete Barrier



Shown @ Curb

JOINT SEALANT TERMINATION DETAILS

GENERAL NOTES

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting joint opening, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the foot of "Cleaning and Sealing of Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

For Class 3 Hot Poured Rubber Seal, provide backer rod compatible with the hot poured rubber sealant and rated for a minimum of 400°F.

Provide Class 3 sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in asphalt overlay. Provide Class 7 silicone sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints inconcrete.

Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 Sealant cannot be effectively placed in the vertical position, a Class 4 Sealant compatible with the Class 7 sealant is allowed for the extension of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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12/22/2023

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Texas Department of Transportation

IH 35, Etc.

CLEANING AND SEALING EXISTING BRIDGE JOINTS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		128

DATE: 12/8/2023 2:20:16 PM
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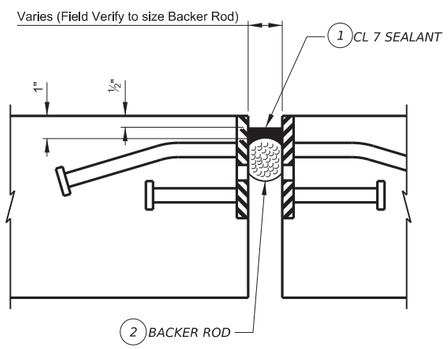

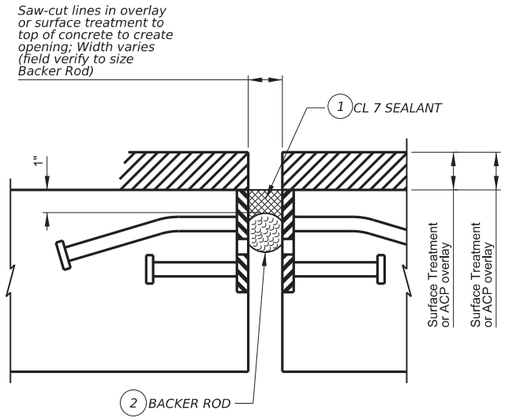

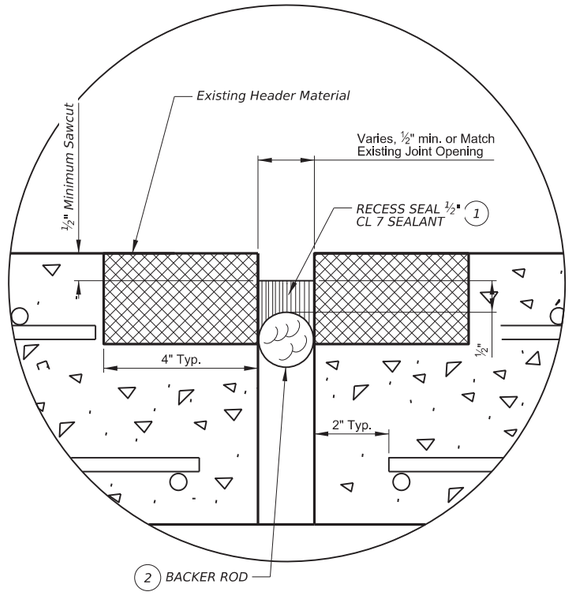

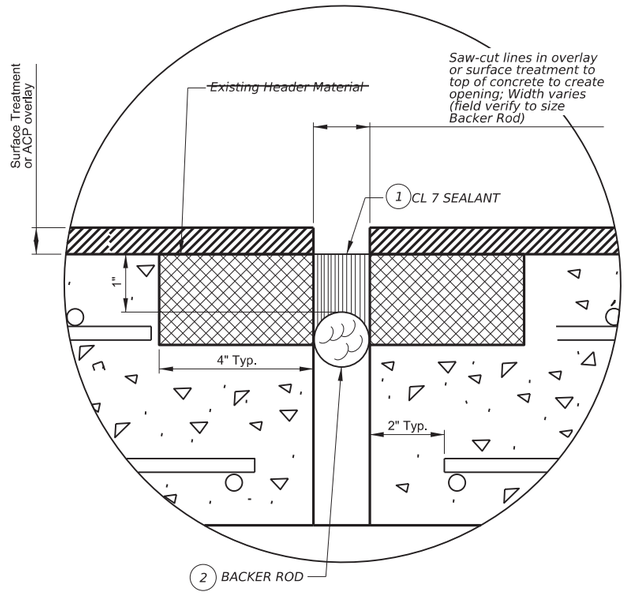

CLEANING AND SEALING EXISTING ARMOR JOINTS

PROCEDURE FOR CLEANING AND SEALING EXISTING ARMOR JOINTS

1a) FOR DECKS WITHOUT SURFACE TREATMENT:
Remove existing seal.

1b) FOR DECKS WITH SURFACE TREATMENT:
Sawcut through the asphalt at the cenerline of the joint. make multiple sawcuts to create a ½" minimum joint opening or match existing joint opening. Clean joint opening of all deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints".

2) Abrasive blast clean existing steel surface where seal is to be placed.

3) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

4) Condition of existing steel angle, plate, or rail shall be determined prior to sealing the exist joint. The entire length of existing joint shall be checked and any portion that is determined to be unsound by the Engineer shall be removed and replaced as directed by the Engineer. Compensation for any work beyond the scope of cleaning and sealing will be addressed with the Engineer.

5) Place backer rod into joint opening 1" below the top of concrete. The backer rod must be 25% larger than the joint opening.

6a) FOR DECKS WITH NO SURFACE TREATMENT:
Seal the joint opening with a Class 7 Sealant. Recess seal ½" below top of concrete in travel lanes and ⅛" below top of concrete in shoulders.

6b) FOR DECKS WITH SURFACE TREATMENTS:
Seal the joint opening with a Class 7 Sealant flush with top surface of deck, below the surface treatment.

PROCEDURE FOR CLEANING AND SEALING EXISTING HEADER JOINTS:

1a) FOR DECKS WITHOUT SURFACE TREATMENT:
Remove existing seal.

1b) FOR DECKS WITH SURFACE TREATMENT:
Sawcut through the asphalt at the cenerline of the joint. make multiple sawcuts to create a $^{59}/_{64}$" minimum joint opening or match existing joint opening. Clean joint opening of all deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints".

2) Abrasive blast clean existing concrete where seal is to be placed.

3) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

4) Condition of existing header material shall be determined prior to sealing the exist joint. The entire length of existsing joint shall be checked and any portion that is determined to be unsound by the Engineer shall be removed and replaced as directed by the Engineer. Compensation for any work beyond the scope of cleaning and sealing will be addressed with the Engineer.

5) Place backer rod into joint opening 1" below the top of concrete. The backer rod must be 25% larger than the joint opening.

6a) FOR DECKS WITH NO SURFACE TREATMENT:
Seal the joint opening with a Class 7 Sealant. Recess seal $^{59}/_{64}$" below top of concrete in travel lanes and ⅛" below top of concrete in shoulders.

6b) FOR DECKS WITH SURFACE TREATMENTS:
Seal the joint opening with a Class 7 Sealant, flush with top of header material, below the surface treatment.

CLEANING AND SEALING EXISTING HEADER JOINTS

(1) Use Class 7 sealant that conforms to DMS-6310. Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."

(2) Backer rod must be 25% larger than joint opening and must be compatible with the sealant.

GENERAL NOTES

Verify actual joint condition and bridge configuration prior to begining work and selecting appropriate detail to be used.

Cleaning existing joint opening (full depth) if all debris, providing and placing backer rod, saw-cutting joint opening, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the foot of "Cleaning and Sealing of Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

For Class 3 Hot Poured Rubber Seal, provide backer rod compatible with the hot poured rubber sealant and rated for a minimum of 400°F. Provide Class 3 sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in asphalt overlay.

Provide Class 7 silicone sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete.

Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 Sealant cannot be effectively placed in the vertical position, a Class 4 Sealant compatible with the Class 7 sealant is allowed for the extension of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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Texas Department of Transportation

IH-35, Etc.

CLEANING AND SEALING EXISTING BRIDGE JOINTS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		129

DATE: 12/8/2023 2:20:17 PM
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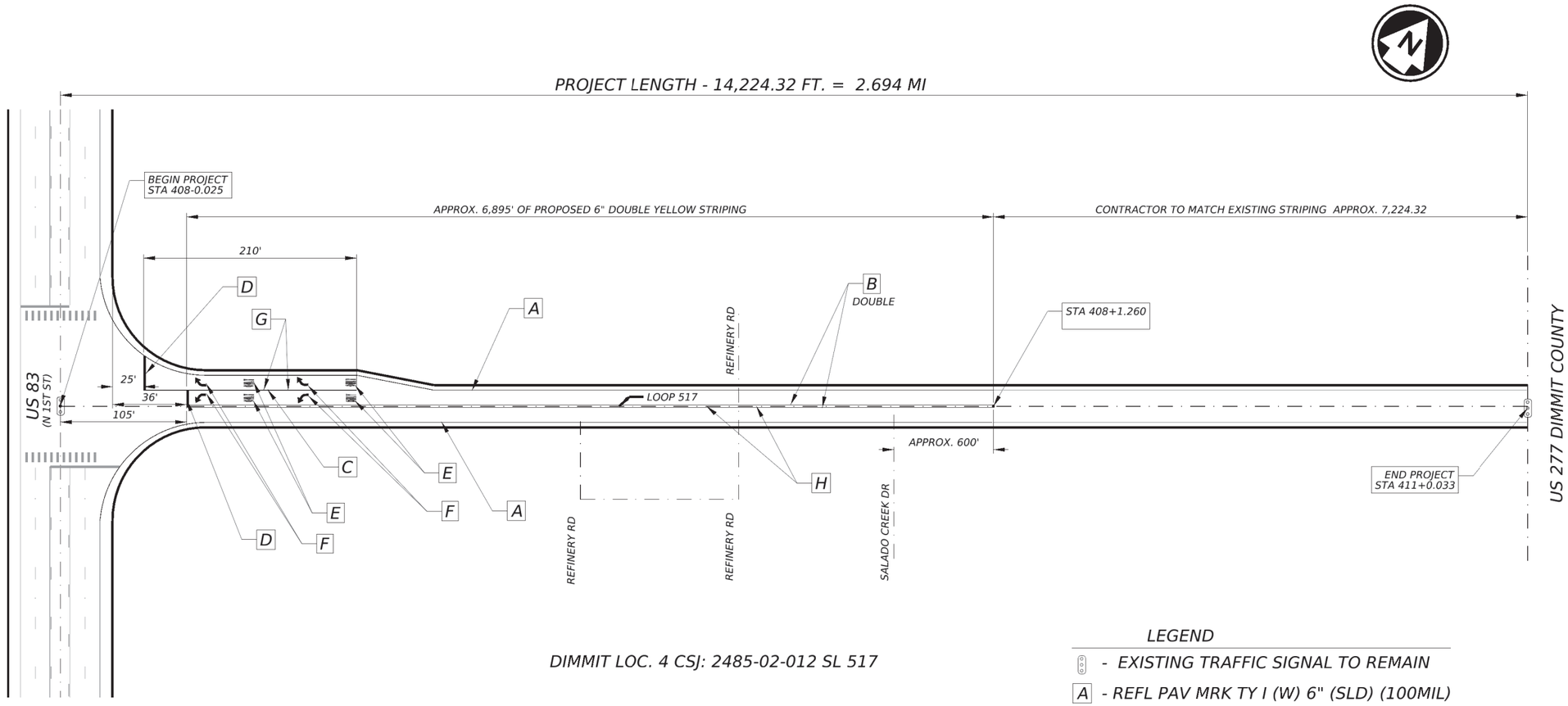

DIMMIT LOC. 4 CSJ: 2485-02-012 SL 517

NOTES:
1. THE PURPOSE OF THIS SHEET IS TO SHOW THE PROPOSED STRIPING ON AT SL 517 ALONG THE LENGTH SHOWN.
2. REFER TO PM STANDARD(S) SHEET(S) FOR MORE INFORMATION ON RPM'S. WORDS, ARROW AND STOP BARS..
3. REFER TO "SUMMARY OF QUANTITIES" SHEET FOR ALL APPLICABLE ITEMS.

LEGEND

- EXISTING TRAFFIC SIGNAL TO REMAIN
- A - REFL PAV MRK TY I (W) 6" (SLD) (100MIL)
- B - REFL PAV MRK TY I (Y) 6" (SLD) (100MIL)
- C - REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
- D - REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
- E - REFL PAV MRK TY I (W) (WORD) (100MIL)
- F - REFL PAV MRK TY I (W) (ARROW) (100MIL)
- G - REFL PAV MRKR TY I - C @ 20' C-C
- H - REFL PAV MRKR TY II - A - A @ 40' C-C

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CYNTHIA GARCIA
149715
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Cynthia Garcia
96CA7DFE12674F3...

12/22/2023

Texas Department of Transportation

IH 35, etc.

LOCATION # 4
SL 517
PAVEMENT MARKING
LAYOUT

 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		130

DATE: 12/8/2023 12:46:20 PM
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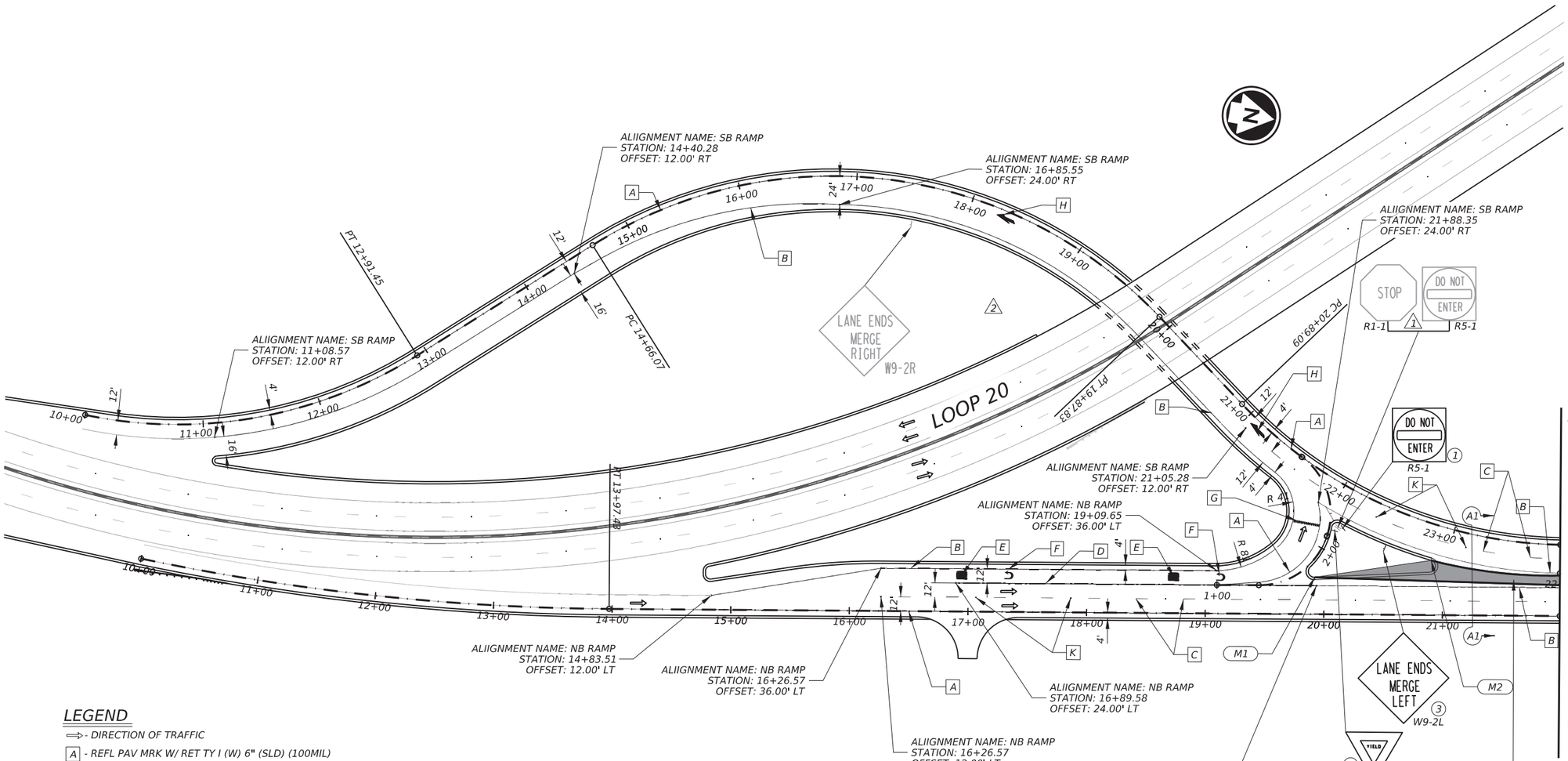
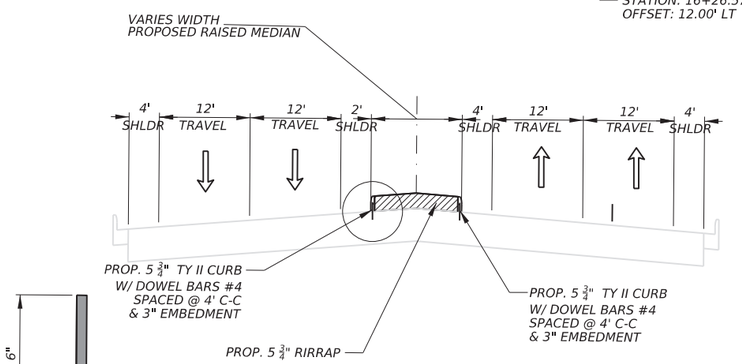


LEGEND

- ⟹ - DIRECTION OF TRAFFIC
- [A] - REFL PAV MRK W/ RET TY I (W) 6" (SLD) (100MIL)
- [B] - REFL PAV MRK W/ RET TY I (Y) 6" (SLD) (100MIL)
- [C] - REFL PAV MRK W/ RET TY I (W) 6" (BRK) (100MIL) / REFL PAV MRK TY I (BLACK) 6" (SHADOW) (100 MIL)
- [D] - REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
- [E] - REFL PAV MRK TY I (W)(WORD)(100MIL)
- [F] - REFL PAV MRK TY I(W)(UTURN ARW)(100MIL)
- [G] - REF PAV MRK TY I(W)18"(YLD TRI)(100MIL)
- [H] - REFL PAV MRK TY I(W)(LNDP ARW)(100MIL)
- [I] - REFL PAV MRK TY I (W)(ARROW)(100MIL)
- ⎯ - EXISTING SIGN TO BE REMOVED
- ⎓ - PROPOSED SIGN
- ▭ - PROPOSED RAISED CONCRETE MEDIAN

NOTES:
REFER TO STANDARD SHEET CCCG-22 FOR MORE INFORMATION ON TYPE II CURB.



SECTION A1

EMBED SMOOTH DOWLS TO A DEPTH OF 3" USING A TYPE III, CLASS C, D, E, OR F ANCHOR ADHESIVE.

∗PROPOSED MEDIAN

POINT #	STA	OFFSET FT	SIDE	ALIGNMENT NAME
M1	19+92.23	31.05	LT	NB RAMP
M2	20+90.23	45.98	LT	NB RAMP
M3	22+75.29	10.00	RT	NB_SB RAMP
M4	22+92.28	1.12	RT	NB_SB RAMP
M5	22+92.28	9.51	RT	NB_SB RAMP
M6	23+59.74	0.50	LT	NB_SB RAMP
M7	23+60.24	7.56	RT	NB_SB RAMP
M8	24+21.71	4.10	LT	NB_SB RAMP
M9	24+42.50	4.93	RT	NB_SB RAMP
M10	24+71.75	4.00	RT	NB_SB RAMP
M11	26+43.07	4.00	LT	NB_SB RAMP
M12	26+43.07	4.00	RT	NB_SB RAMP

∗FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED PROFESSIONAL ENGINEER

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12/22/2023

Texas Department of Transportation

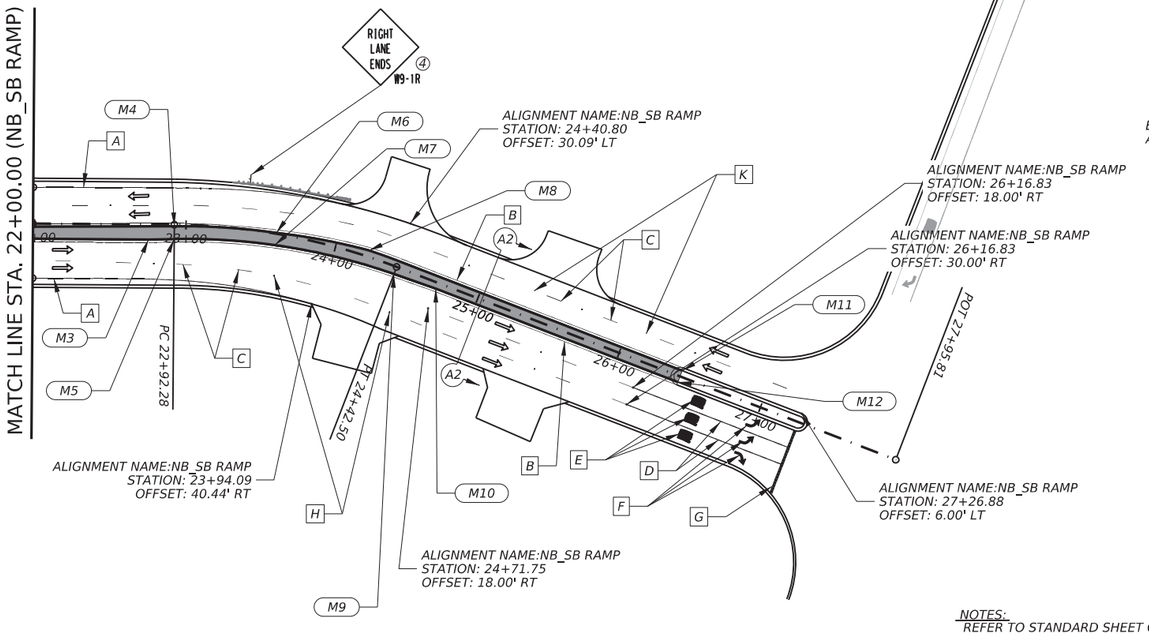
IH 35, etc.

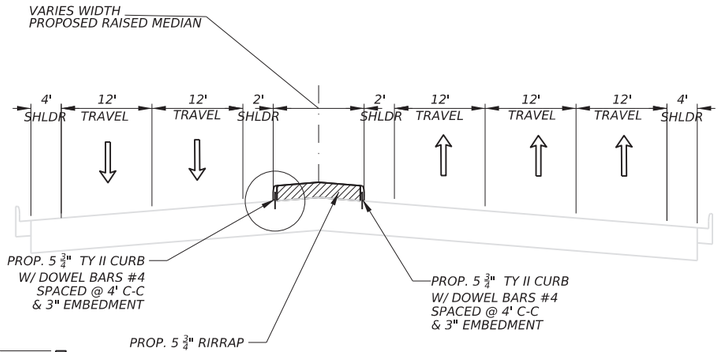
LOC. # 9 SS 259
PAVEMENT MARKING DETAIL

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		131

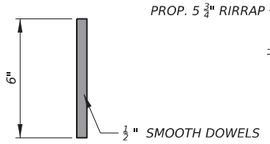
DATE: 12/8/2023 12:46:32 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garzald1010040\091 CV Sheet 1.dgn





SECTION A2

N.T.S.



BARS #4

EMBED SMOOTH DOWLS TO A DEPTH OF 3" USING A TYPE III, CLASS C, D, E, OR F ANCHOR ADHESIVE.

∗PROPOSED MEDIAN

POINT #	STA	OFFSET FT	SIDE	ALIGNMENT NAME
M1	19+92.23	31.05	LT	NB RAMP
M2	20+90.23	45.98	LT	NB RAMP
M3	22+75.29	10.00	RT	NB_SB RAMP
M4	22+92.28	1.12	RT	NB_SB RAMP
M5	22+92.28	9.51	RT	NB_SB RAMP
M6	23+59.74	0.50	LT	NB_SB RAMP
M7	23+60.24	7.56	RT	NB_SB RAMP
M8	24+21.71	4.10	LT	NB_SB RAMP
M9	24+42.50	4.93	RT	NB_SB RAMP
M10	24+71.75	4.00	RT	NB_SB RAMP
M11	26+43.07	4.00	LT	NB_SB RAMP
M12	26+43.07	4.00	RT	NB_SB RAMP

∗FOR CONTRACTOR'S INFORMATION ONLY.

NOTES:
REFER TO STANDARD SHEET CCCG-22 FOR MORE INFORMATION ON TYPE II CURB.

LEGEND

⇨ - DIRECTION OF TRAFFIC

A - REFL PAV MRK W/ RET TY I (W) 6" (SLD) (100MIL)

B - REFL PAV MRK W/ RET TY I (Y) 6" (SLD) (100MIL)

C - REFL PAV MRK W/ RET TY I (W) 6" (BRK) (100MIL)
REFL PAV MRK TY I (BLACK) 6" (SHADOW) (100 MIL)

D - REFL PAV MRK TY I (W) 8" (SLD) (100MIL)

E - REFL PAV MRK TY I (W)(WORD)(100MIL)

F - REFL PAV MRK TY I (W)(ARROW)(100MIL)

G - REFL PAV MRK TY I (W) 24" (SLD) (100MIL)

H - REFL PAV MRKR TY I-C

⎯ - EXISTING SIGN TO BE REMOVED

⎯ - PROPOSED SIGN

▭ - PROPOSED RAISED CONCRETE MEDIAN

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

IH 35, etc.

LOC. # 9 SS 259
PAVEMENT MARKING DETAIL

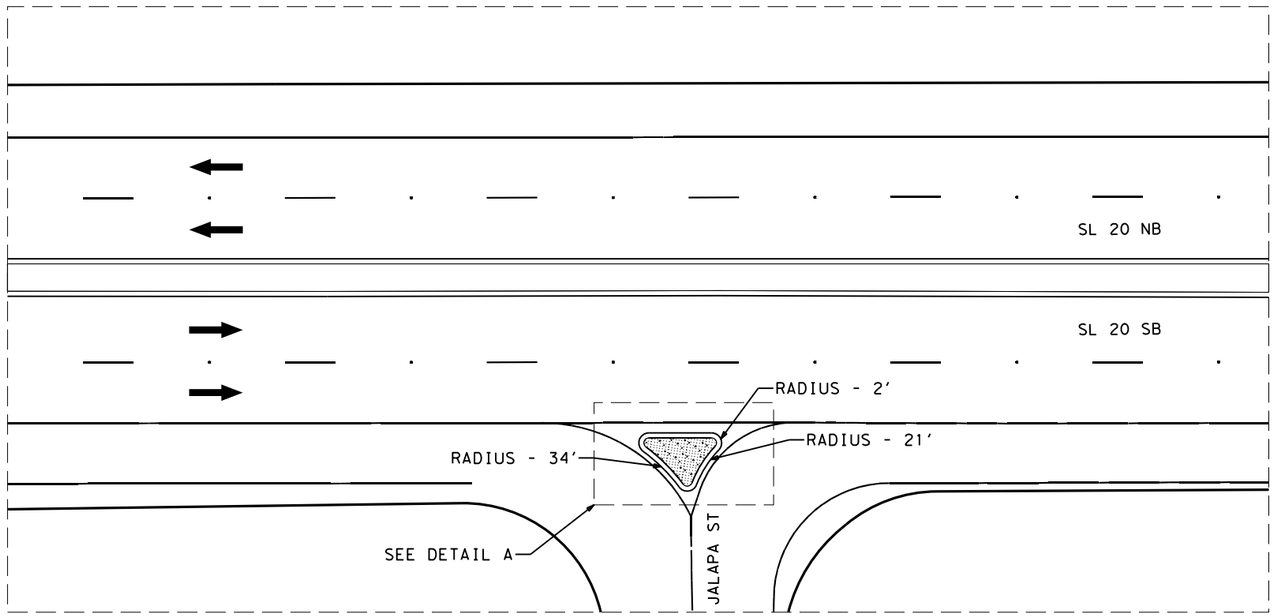
SHEET 2 OF 2

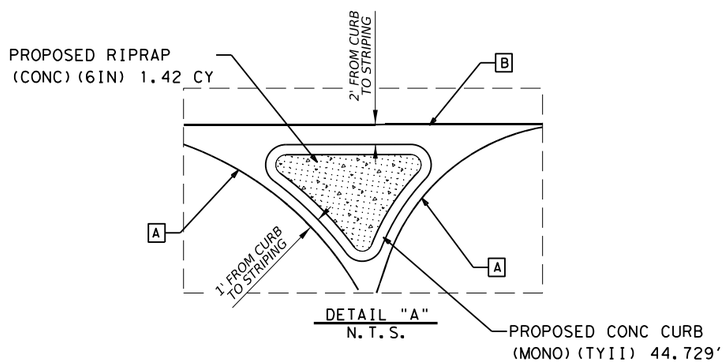
CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		132

DATE: 12/8/2023 12:46:41 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garza\d1010040\091_CV Sheet 2.dgn

LEGEND

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC
- A – RE PM W/RET REQ TY I (W)6" SLD)(100MIL)
- B – REFL PAV MRK TY I (W)8" SLD)(100MIL)





NOTES:

1. REFER TO RAISED MEDIAN DETAILS FOR MORE INFORMATION.
2. REFER TO STANDARDS FOR MORE INFORMATION.
3. ALL EXISTING DELINEATORS TO BE REMOVED AT ACCELERATION AND DECELERATION LANES.

SUMMARY OF QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	60.00

STATE OF TEXAS
RAFAEL GUZMAN
106025
LICENSED
PROFESSIONAL ENGINEER

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Texas Department of Transportation

IH 35,etc.

CUATRO VIENTOS LAYOUT

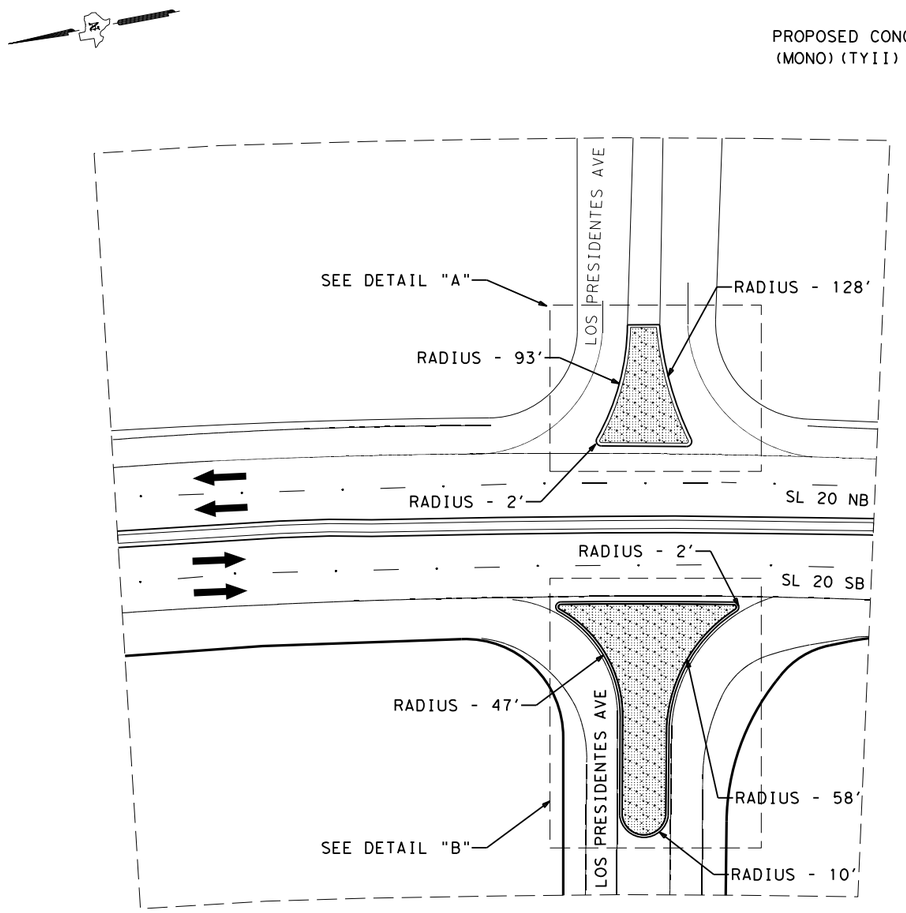
SHEET 1 OF 5

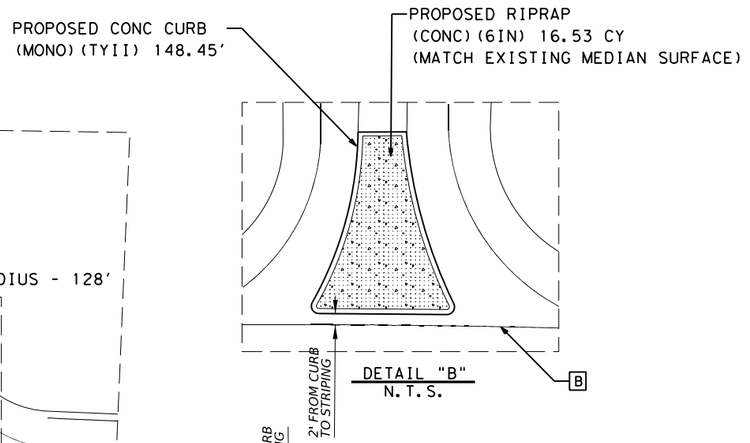
CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		133

DATE: 12/27/2023 2:32:21 PM
FILE: c:\txdotpw_online\txdot5\daniel.garzald\1010040\Cuatro Vientos & Median Details.dgn

LEGEND

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC
- [A] – RE PM W/RET REQ TY I (W)6" SLD) (100MIL)
- [B] – REFL PAV MRK TY I (W)8" SLD) (100MIL)





NOTES:

1. REFER TO RAISED MEDIAN DETAILS FOR MORE INFORMATION.
2. REFER TO STANDARDS FOR MORE INFORMATION.
3. ALL EXISTING DELINEATORS TO BE REMOVED AT ACCELERATION AND DECELERATION LANES.

SUMMARY OF QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	167.00

STATE OF TEXAS
RAFAEL GUZMAN
106025
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IH 35,etc.

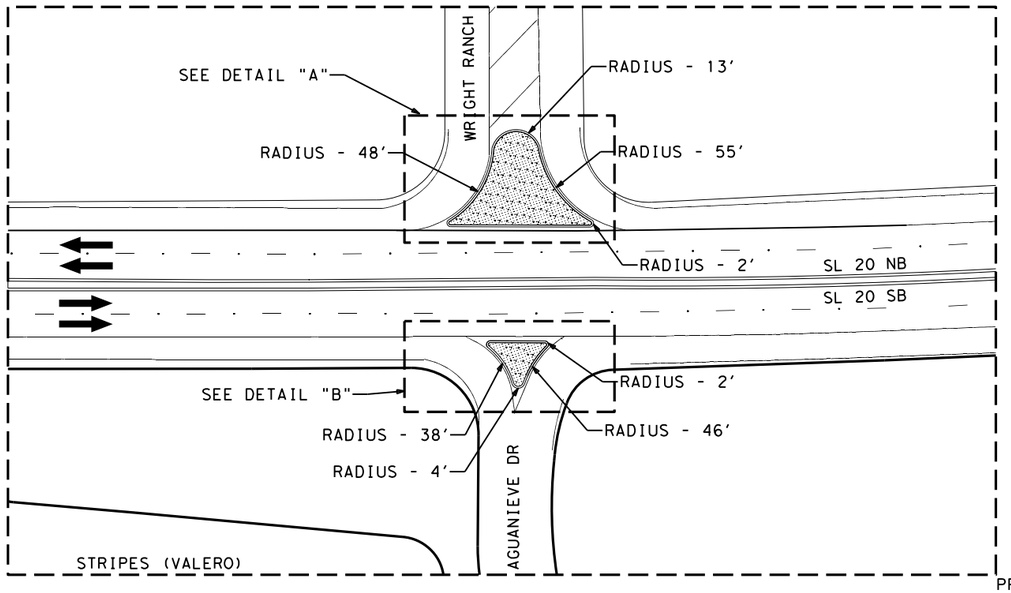
CUATRO VIENTOS LAYOUT

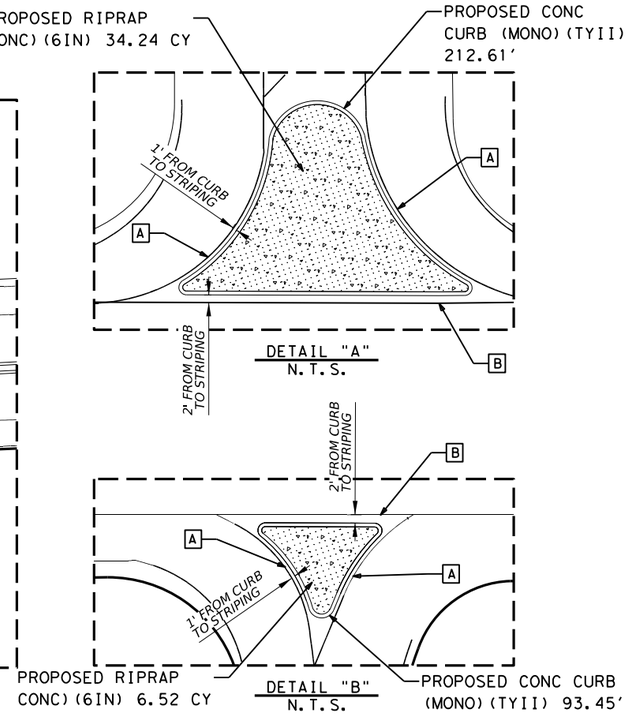
CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		134

DATE: 12/27/2023 2:32:21 PM
FILE: c:\txdot\pw online\txdot5\daniel.garzal\d1010040\Cuatro Vientos & Median Details.dgn

LEGEND

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC
- [A] – RE PM W/RET REQ TY I (W)6" SLD)(100MIL)
- [B] – REFL PAV MRK TY I (W)8" SLD)(100MIL)





NOTES:

1. REFER TO RAISED MEDIAN DETAILS FOR MORE INFORMATION.
2. REFER TO STANDARDS FOR MORE INFORMATION.
3. ALL EXISTING DELINEATORS TO BE REMOVED AT ACCELERATION AND DECELERATION LANES.

SUMMARY OF QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	228.00

STATE OF TEXAS
RAFAEL GUZMAN
106025
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IH 35,etc.

CUATRO VIENTOS LAYOUT

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		135

DATE: 12/27/2023 2:32:22 PM
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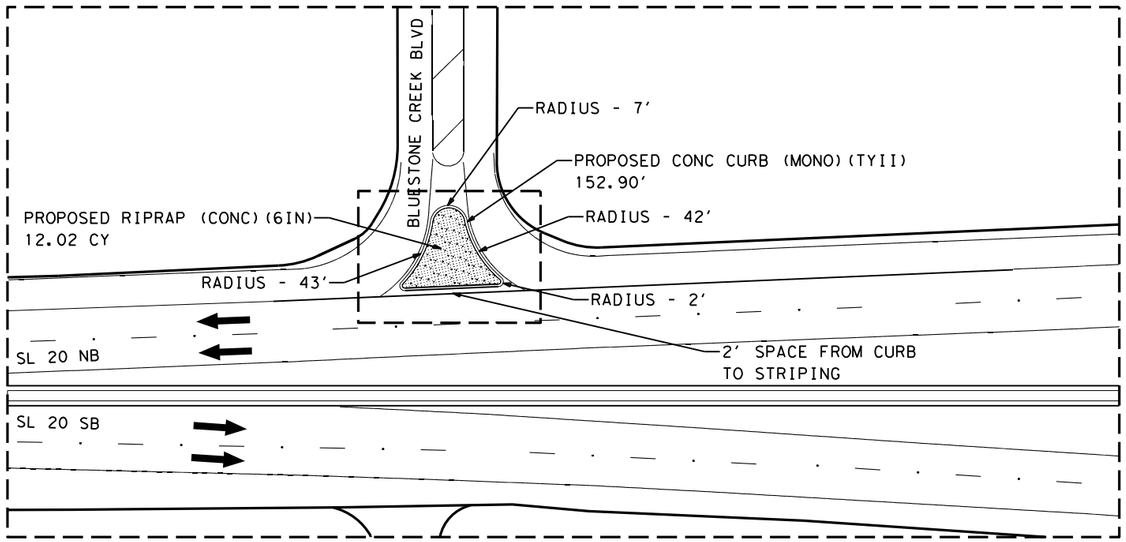
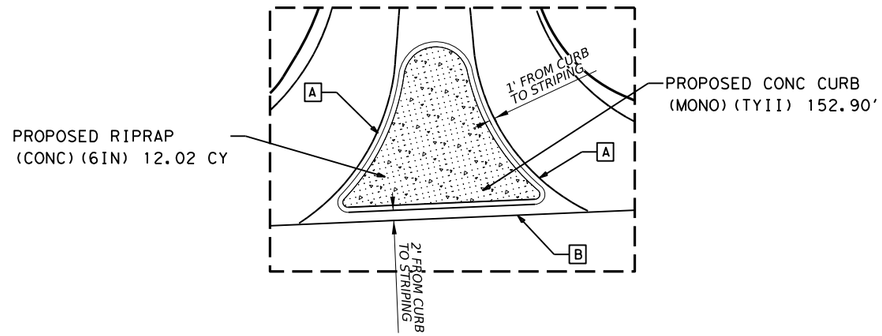
LEGEND

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC
- A – RE PM W/RET REQ TY I (W)6" SLD)(100MIL)
- B – REFL PAV MRK TY I (W)8" SLD)(100MIL)



DETAIL "A"
N.T.S.



NOTES:

1. REFER TO RAISED MEDIAN DETAILS FOR MORE INFORMATION.
2. REFER TO STANDARDS FOR MORE INFORMATION.
3. ALL EXISTING DELINEATORS TO BE REMOVED AT ACCELERATION AND DECELERATION LANES.

SUMMARY OF QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	44.00

STATE OF TEXAS
RAFAEL GUZMAN
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CUATRO VIENTOS LAYOUT

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		136

DATE: 12/27/2023 2:32:22 PM
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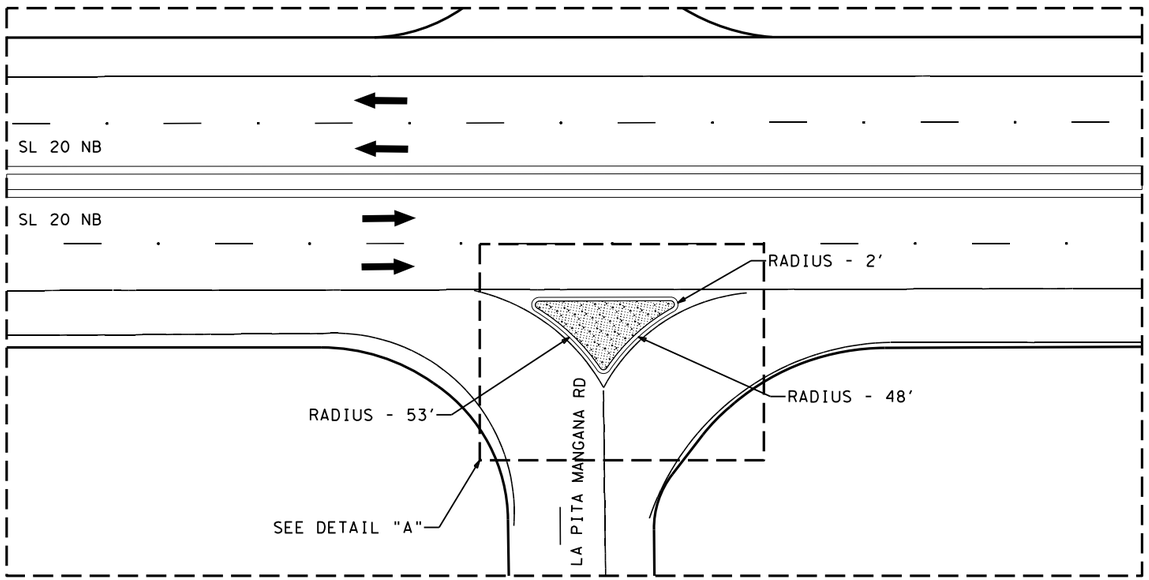
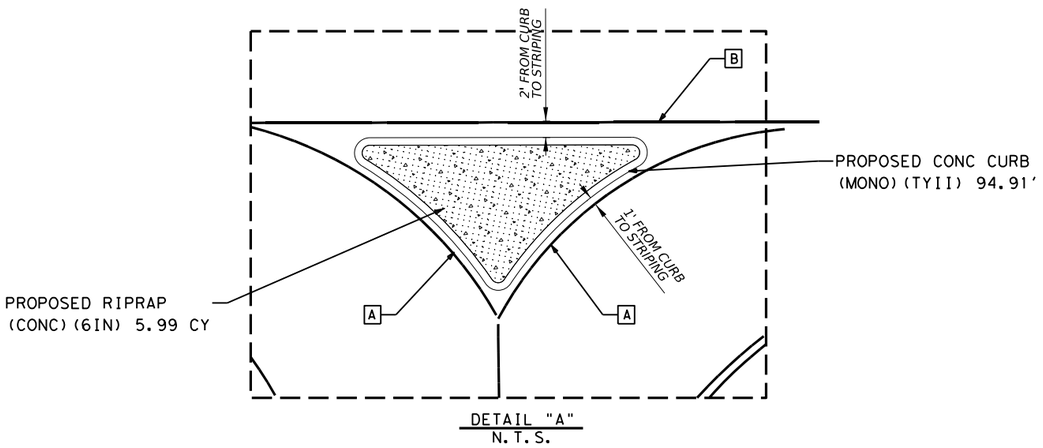
LEGEND

- PROPOSED RAISED MEDIAN
- DIRECTION OF TRAFFIC
- [A] – RE PM W/RET REQ TY I (W)6" SLD)(100MIL)
- [B] – REFL PAV MRK TY I (W)8" SLD)(100MIL)





DETAIL "A"
N.T.S.

NOTES:

1. REFER TO RAISED MEDIAN DETAILS FOR MORE INFORMATION.
2. REFER TO STANDARDS FOR MORE INFORMATION.
3. ALL EXISTING DELINEATORS TO BE REMOVED AT ACCELERATION AND DECELERATION LANES.

SUMMARY OF QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	74.00

STATE OF TEXAS
RAFAEL GUZMAN
106025
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IH 35,etc.

CUATRO VIENTOS LAYOUT

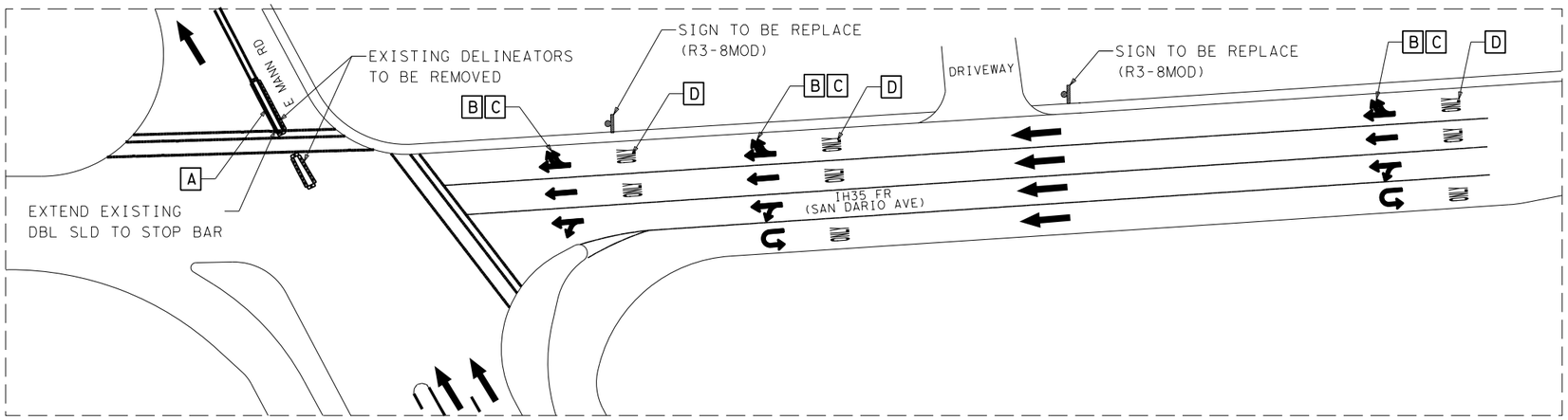
SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		137

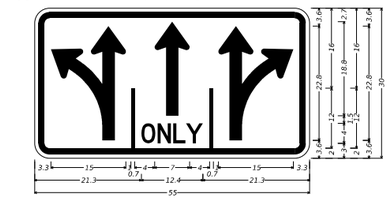
DATE: 12/27/2023 2:32:22 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garzald\1010040\Cuatro Vientos & Median Details.dgn

LEGEND

- EXISTING DELINEATORS TO BE REMOVED
- DIRECTION OF TRAFFIC
- A – RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)
- B – REFL PAV MRK TY I (W)(DBLARROW) (100MIL)
- C – ELIM EXT PAV MRK & MRKS (ARROW)
- D – ELIM EXT PAV MRK & MRKS (WORD)
- EXISTING SIGN TO BE REPLACED



6 SIGN DETAILS R3-8MOD



R3-8-MOD_55x30:
3.0" Radius, 1.3" Border, 0.8" Indent, Black on White;
BL l/r=13.25, s=2.5; C h=18.875, s=2.5; "ONLY", D 47% spacing;
BR l/r=13.25, s=2.5;

NOTES:

1. REFER TO STANDARDS FOR MORE INFORMATION.
2. EXISTING DELINEATORS TO BE REMOVED.

SUMMARY OF QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QTY
658	6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	30.00

STATE OF TEXAS
RAFAEL GUZMAN
106025
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Rafael Guzman
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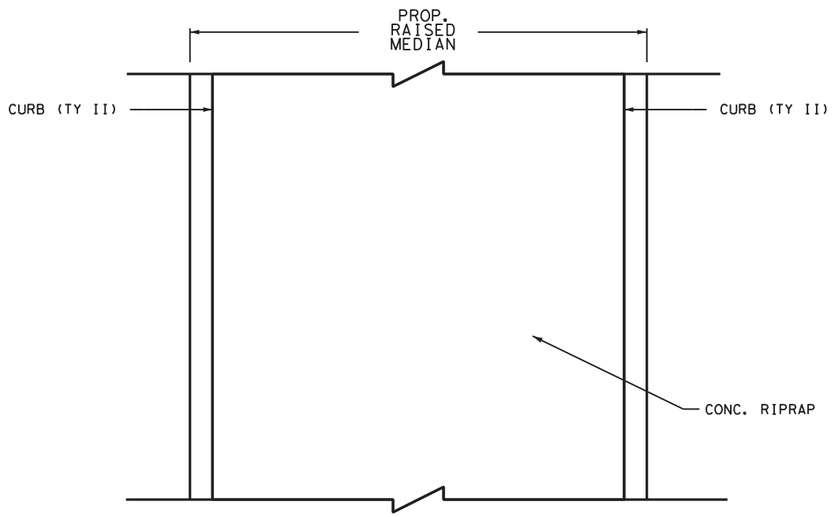
IH 35,etc.

SAN DARIO AVE LAYOUT

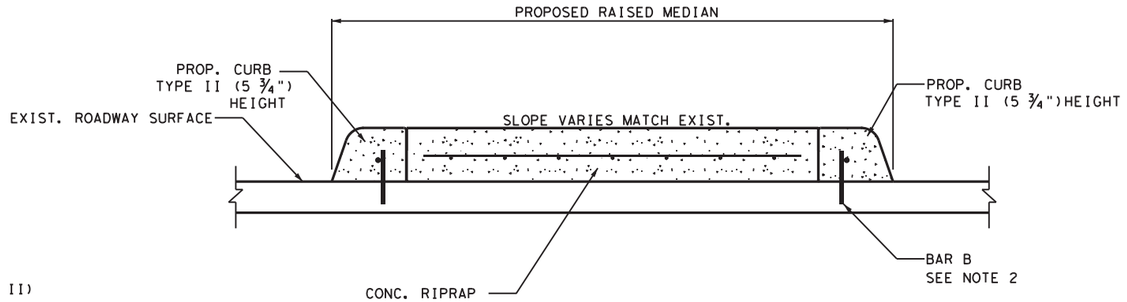
 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		138

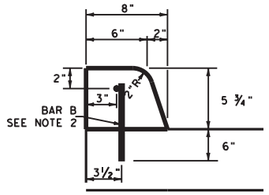
DATE: 12/27/2023 2:32:31 PM
FILE: c:\txdot\pw_online\txdots\daniel.garzald1010040\San Dario Ave & Mann Rd Layout.dgn



PROP. RAISED MEDIAN DETAIL
PLAN



PROP. RAISED MEDIAN DETAIL
SECTION



TYPE II CURB (MONOLITHIC)
5 ¾" HEIGHT

NOTES:

1. SEE CCCG-12 FOR MORE DETAILS ON CONCRETE CURB.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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Cynthia Garcia
96CA7DFE12674F3...

12/22/2023

Texas Department of Transportation

IH 35, Etc.

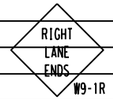
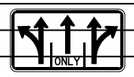
RAISED MEDIAN DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		139

DATE: 12/8/2023 12:47:12 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garzal\d1010040\Median_Details.dgn

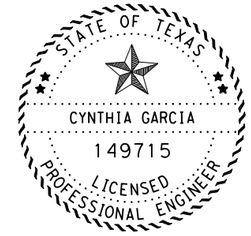
SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type (FRP = Fiberglass, TWT = Thin-wall 10BWG = 10 BWG, S80 = Sched 80)	Posts (1 or 2)	Anchor Type (UA = Univer-Conc, UB = Univer-Bolt, SA = Slip-Conc, SB = Slip-Bolt, WS = Wedge Steel, WP = Wedge Plstic)	Mounting Designation (P = Prefb."Plain", T = Prefab. "T", U = Prefab. "U")	Mounting Designation (1EXT or 2EXT = # of Ext. BM = Extruded Beam, WC = 1.12 #/ft Wing Chan., EXAL = Extruded Alum. Signs)	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) (TY N = Type N, TY S = Type S)
	1	R5-1	DO NOT ENTER	36 x 36			10BWG	1	SA	P		
			 R5-1									
	2	R1-2	YIELD	48 x 48 x 48			10BWG	1	SA	P		
			 R1-2									
	3	W9-2L	LANE ENDS MERGE LEFT	36 x 36			10BWG	1	SA	P		
			 W9-2L									
	4	W9-1R	RIGHT LANE ENDS	36 x 36			10BWG	1	SA	P		
			 W9-1R									
	5	E5-1a	EXT (ARROW RIGHT)	72 x 60			10BWG	2	SA	P		
			 E5-1a									
	6		R3-8MOD	55 x 30			10BWG	1	SA	P		
												

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 Sign Support Descriptive Codes, see Sign Mountaing Details Small Roadside Signs General Notes & Details SMD(GEN).

ALUMINUM SIGN BLANKS THICNESS	
Square Feet	Minimum Thicness
Less Than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"



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DocuSigned by: Cynthia Garcia 96CA7DFE12674F3...

12/27/2023

Texas Department of Transportation

IH 35,etc.

SUMMARY OF SMALL SIGNS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		140

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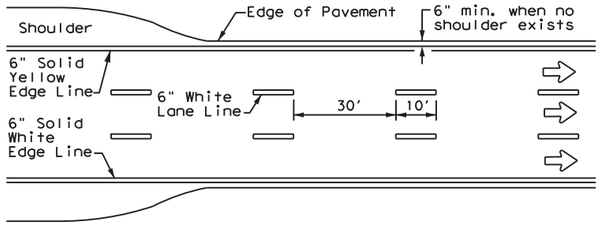
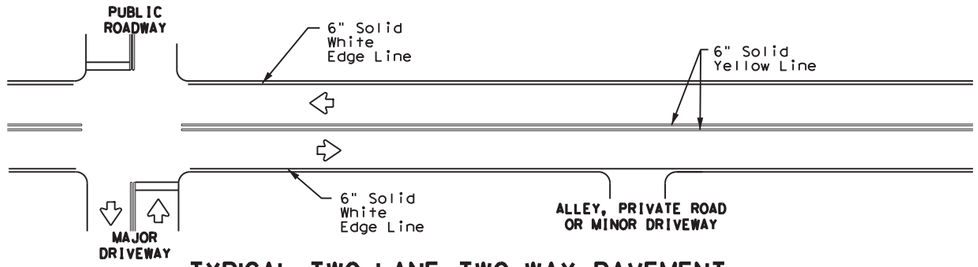
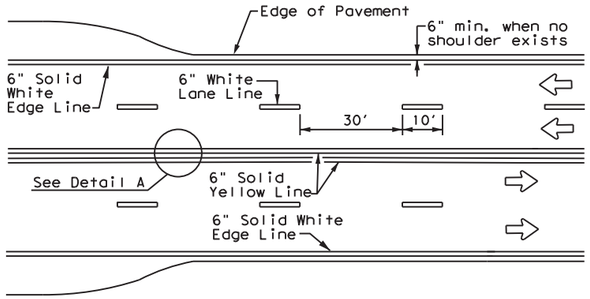
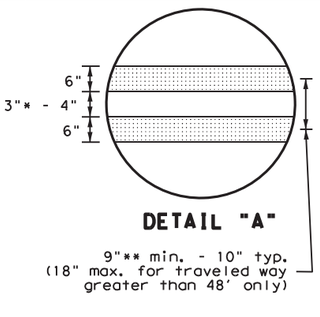


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

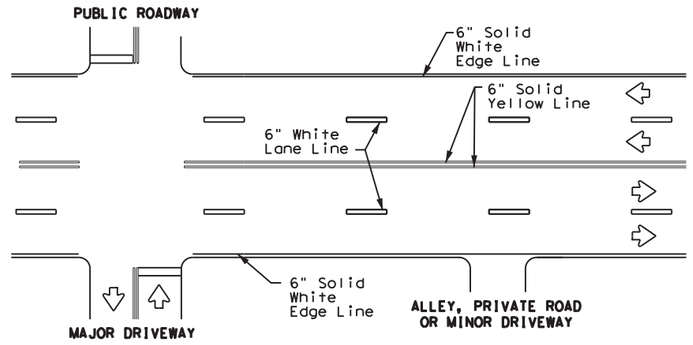




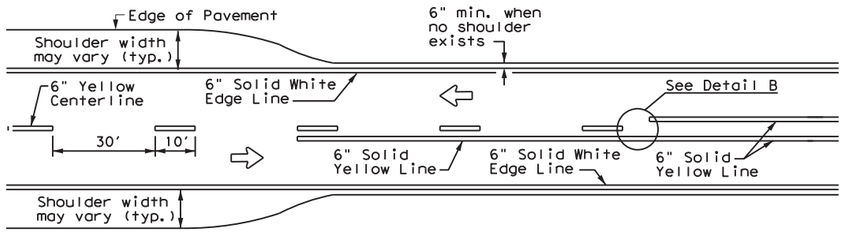
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

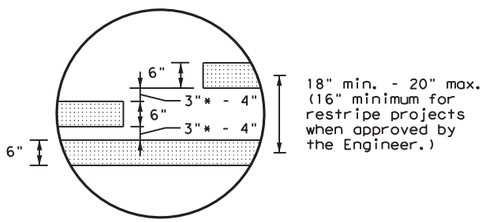
** 8" minimum for restripe projects when approved by the Engineer.



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

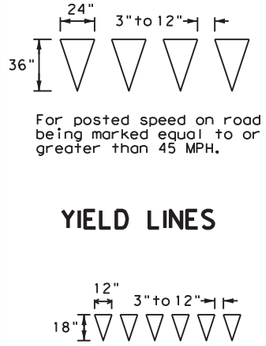


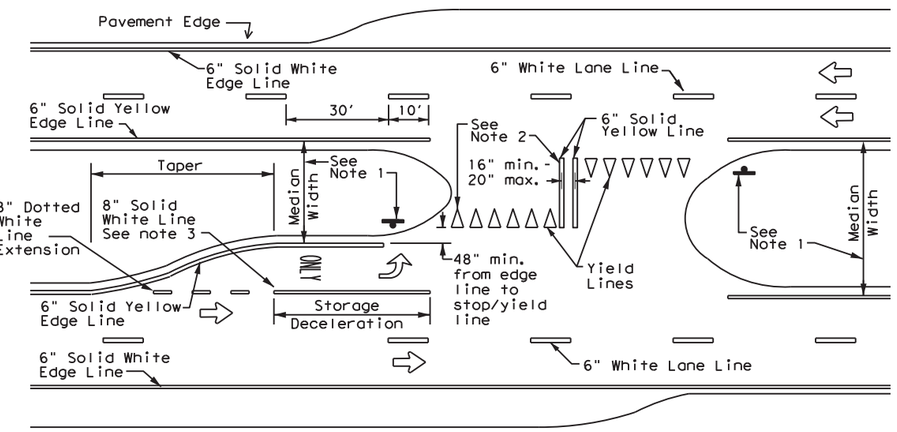
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

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





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

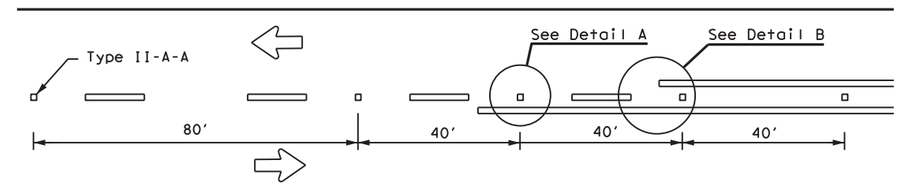
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

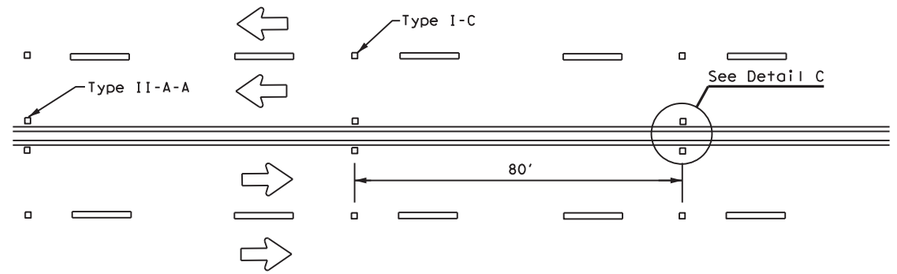
FILE: pm1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 / 8-95 3-03 12-22 / 5-00 2-12	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		141

22A

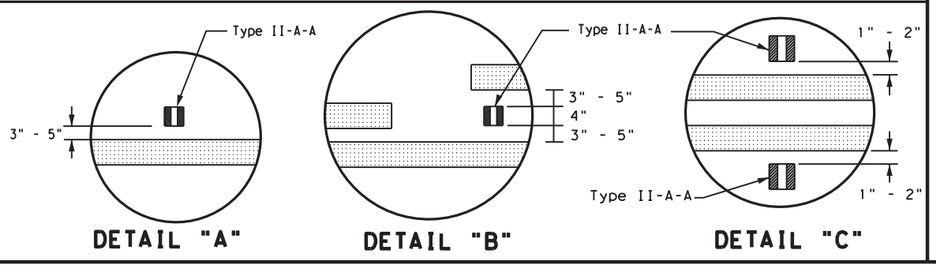
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



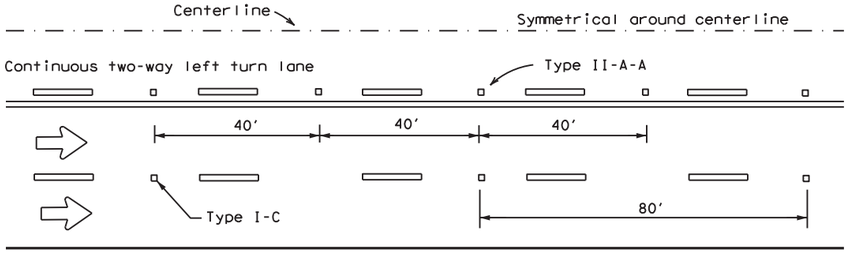
CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



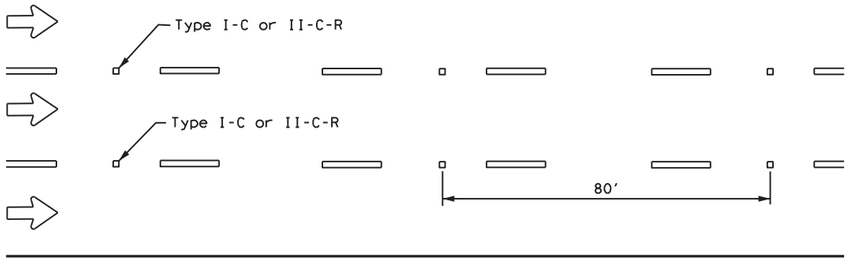
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



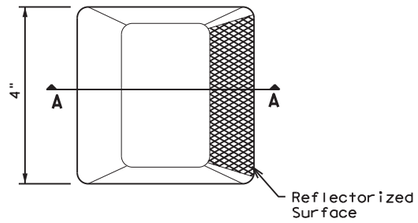
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

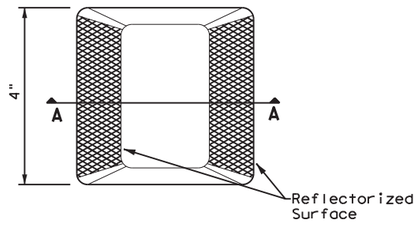
See Note 3.

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

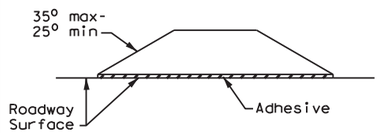
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

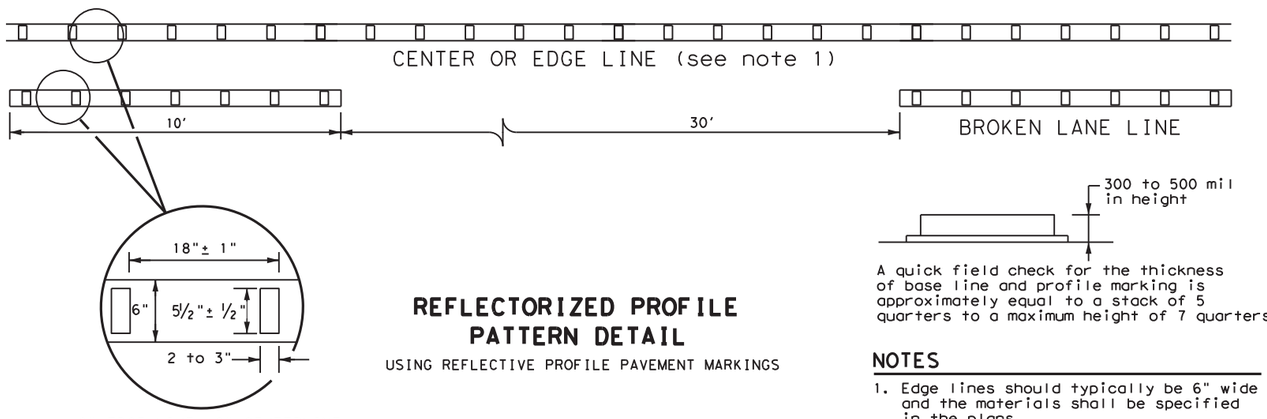


Type II (Top View)



SECTION A

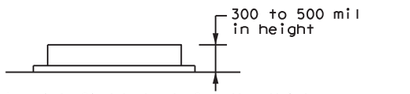
RAISED PAVEMENT MARKERS



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 RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		142

22B

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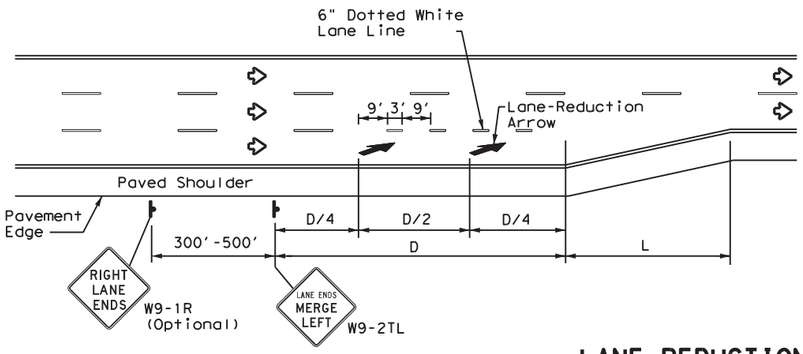
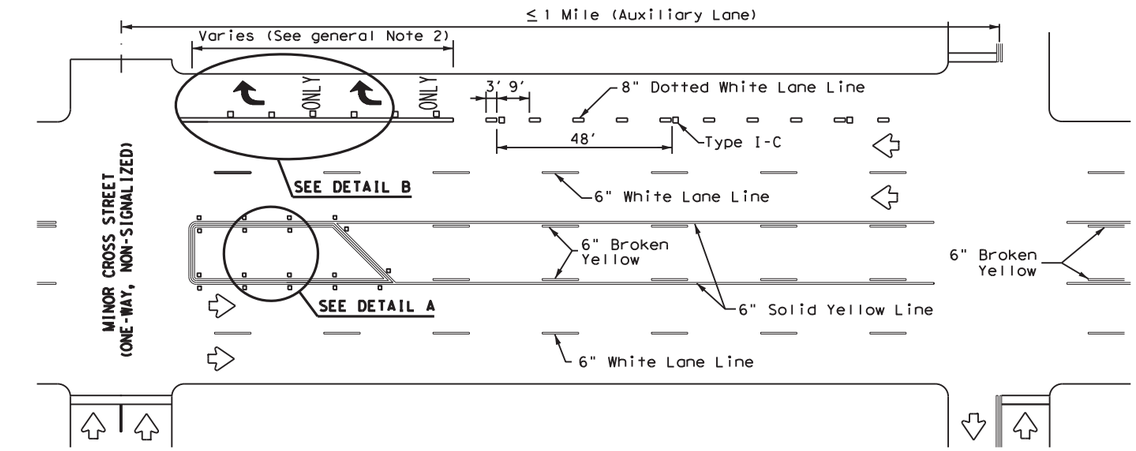


LANE REDUCTION

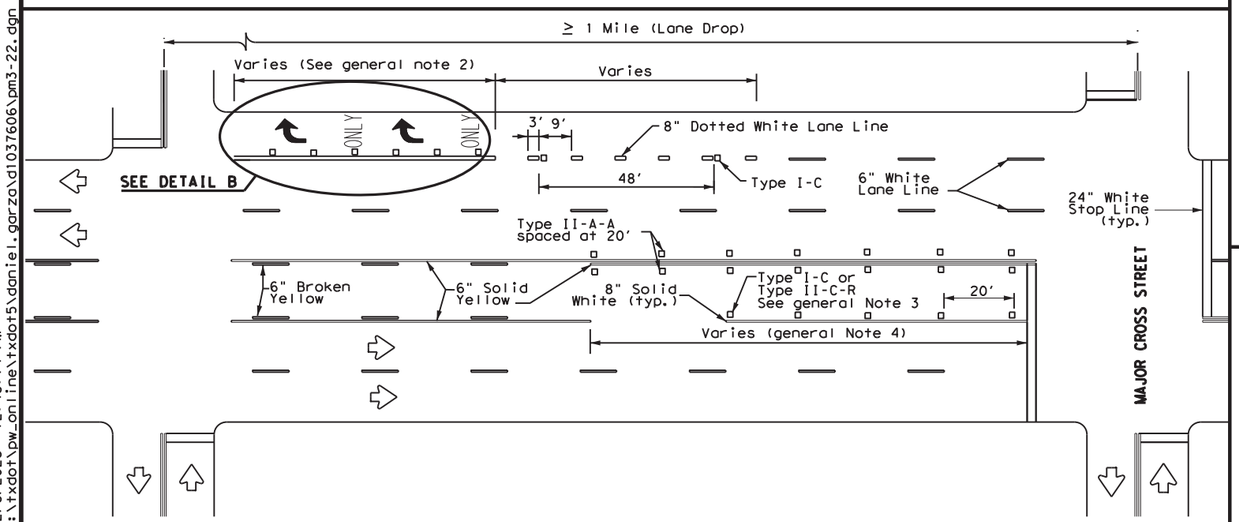
NOTES

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.

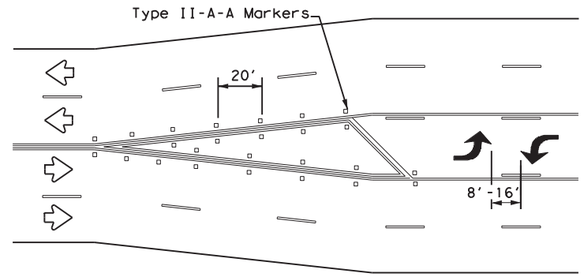
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



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

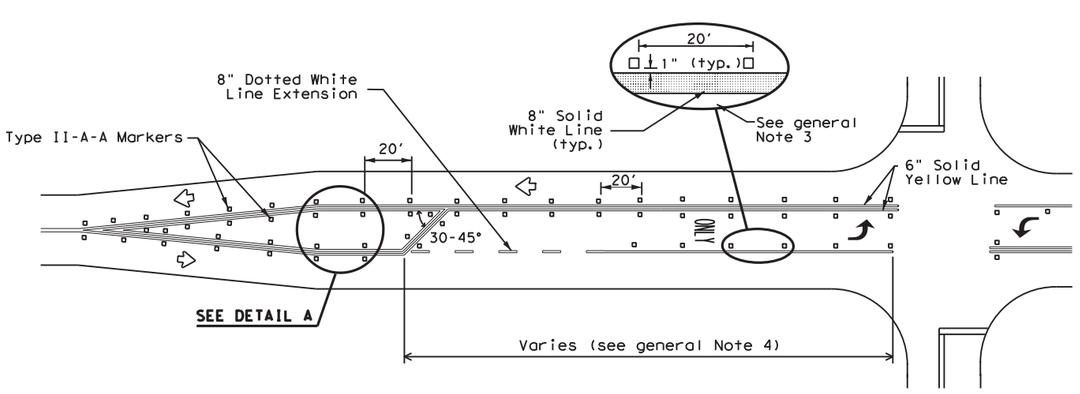


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

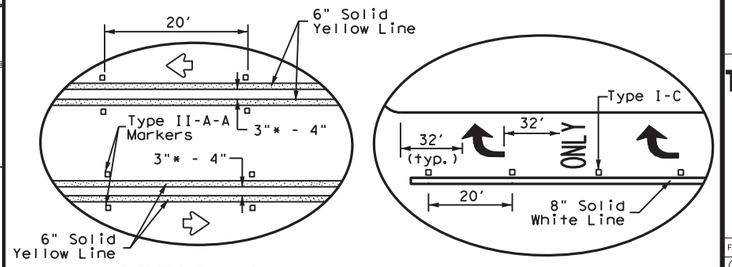


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

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.

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.

Texas Department of Transportation

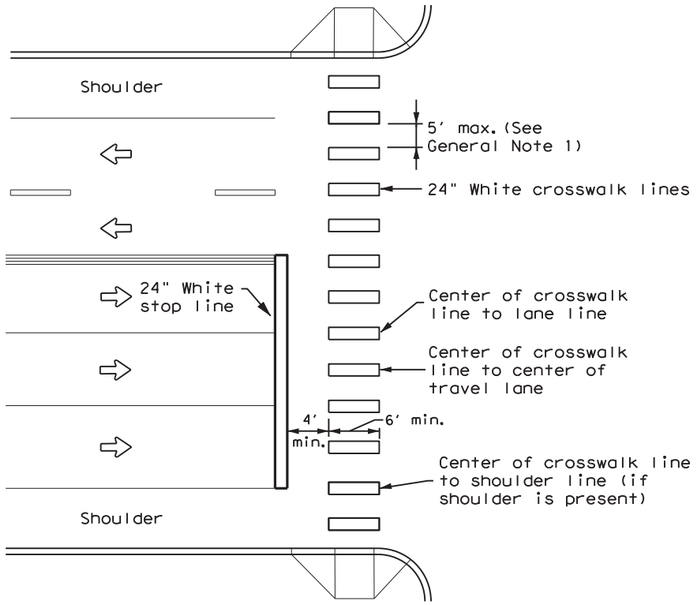
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20	0018	02	091,etc.	IH 35,etc.
5-00 2-10 12-22	DIST	COUNTY		SHEET NO.
8-00 2-12	22	LA SALLE, Etc.		143

22C



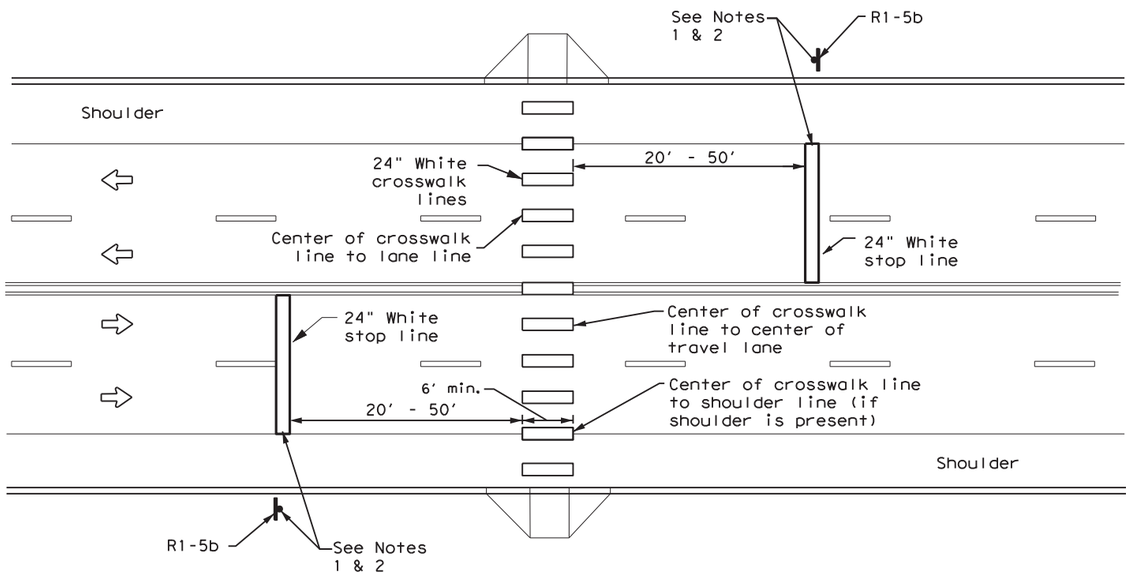
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

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.

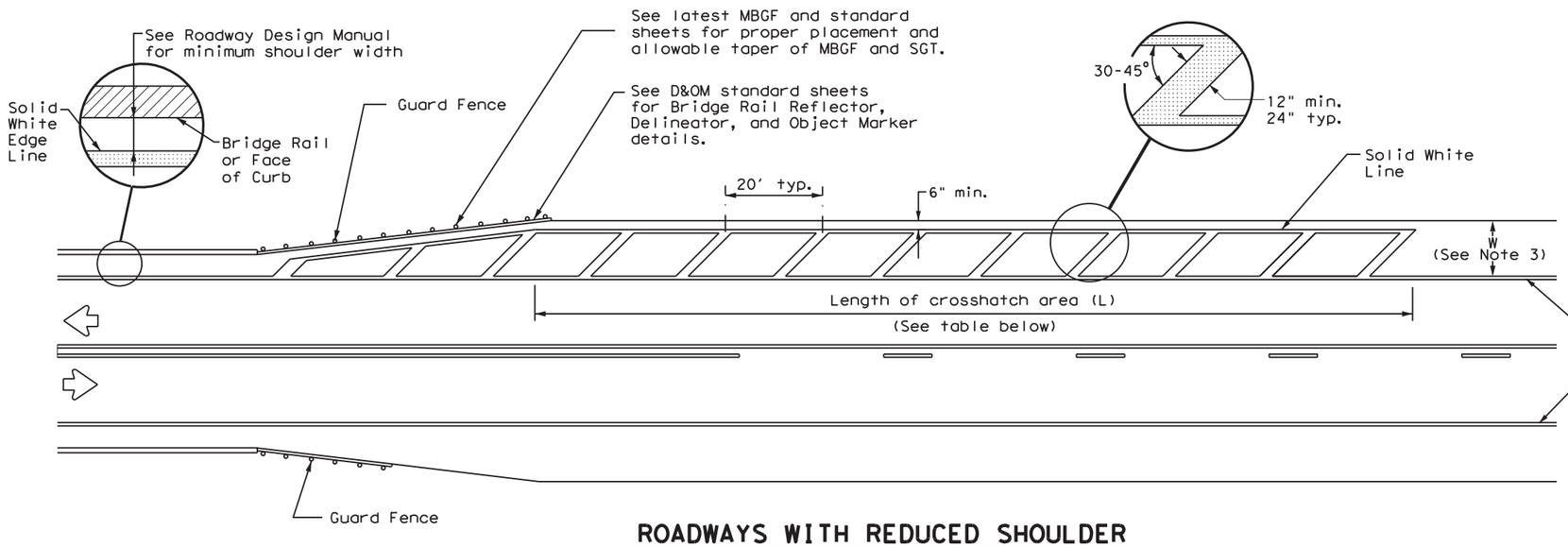
Texas Department of Transportation | Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
6-20	DIST	COUNTY		SHEET NO.
6-22	22	LA SALLE, Etc.		144
12-22				

22D



ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

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 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

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.

Texas Department of Transportation

Traffic Safety Division Standard

PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

PM(5)-22

FILE: pm5-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		145

22E

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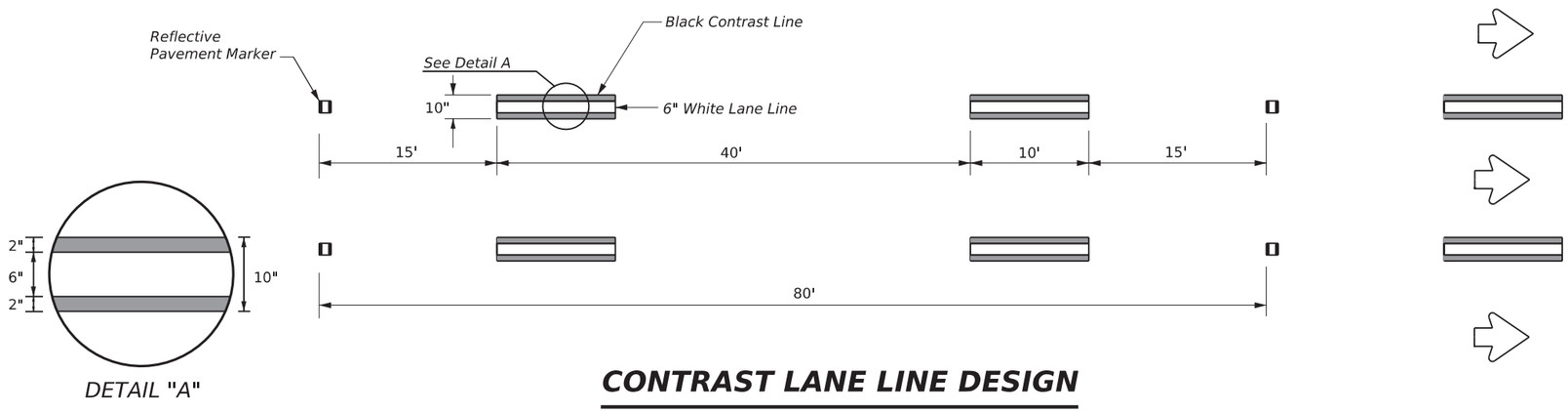
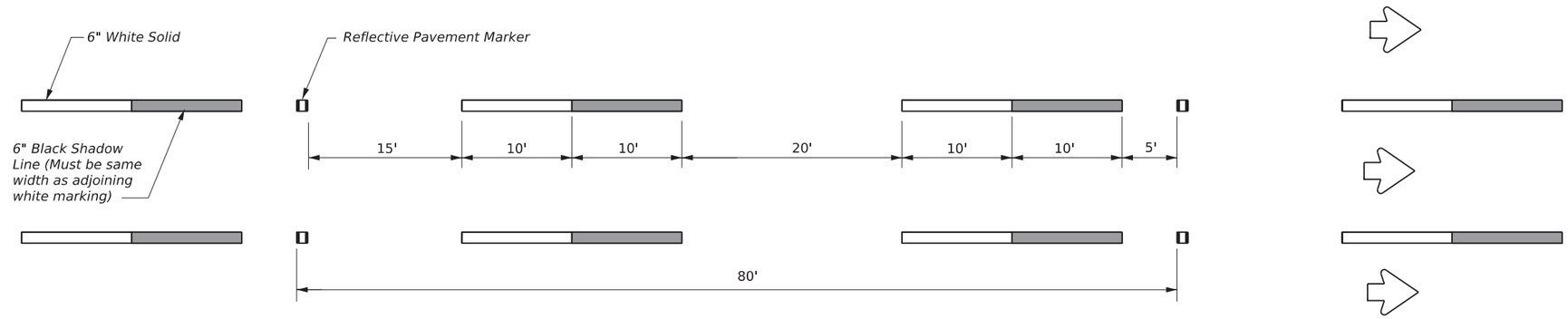
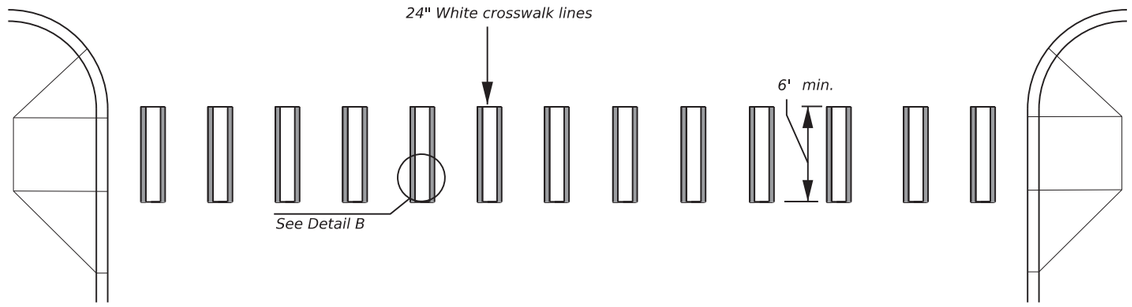


DETAIL "A"

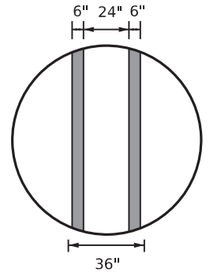
CONTRAST LANE LINE DESIGN



SHADOW LANE LINE DESIGN



CONTRAST CROSSWALK DESIGN



DETAIL "B"

(See PM(4) for crosswalk line placement details)

GENERAL NOTES

1. Contrast and Shadow markings may only be used on concrete pavements.
2. Contrast and Shadow markings shall not be used on edge lines.
3. Contrast lane lines shall be permanent prefabricated pavement markings meeting DMS 8240.
4. Shadow lane line designs shall be a liquid markings system approved by TxDOT.
5. All raised reflective pavement markers placed in broken lines shall be placed in line with and midway between the white stripes.
6. See PM(2) for raised reflective pavement markings installation details.

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.

Texas Department of Transportation

Traffic Safety Division Standard

CONTRAST AND SHADOW PAVEMENT MARKINGS

CPM(1)-23

FILE: CPM(1)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-14 2-23	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		146

22N

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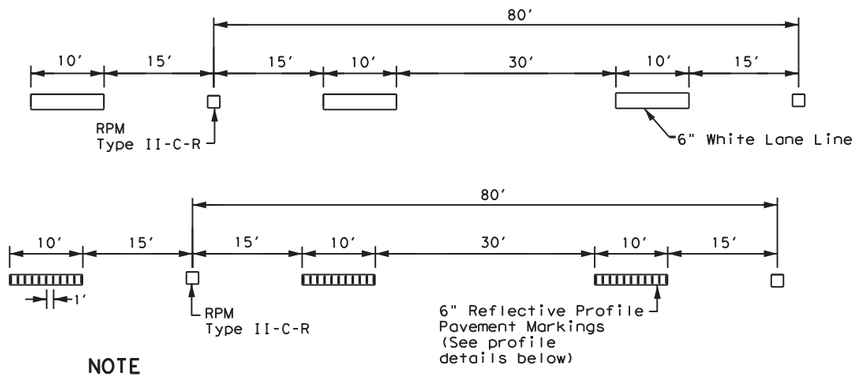
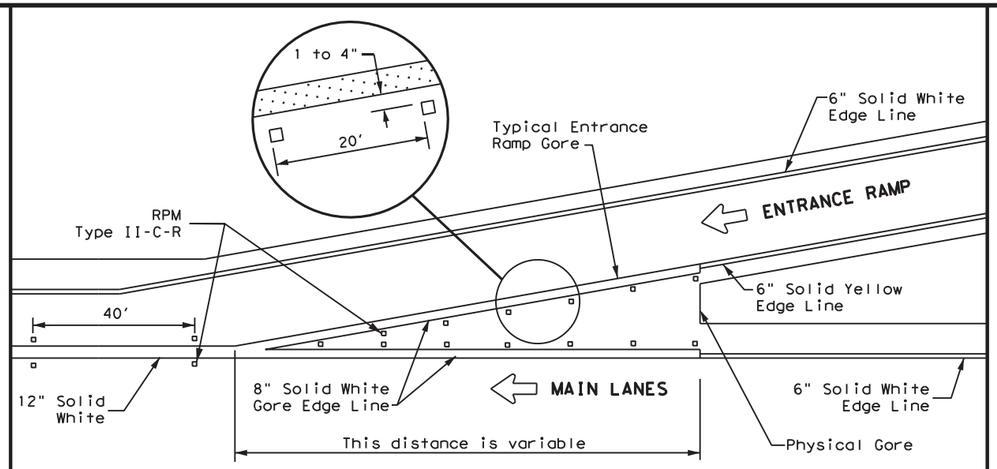


NOTE

Reflectorized raised pavement markers Type II-C-R shall be spaced on 80' centers with the clear face toward normal traffic and the red face toward wrong way traffic. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.

TRAFFIC LANE LINES PAVEMENT MARKING

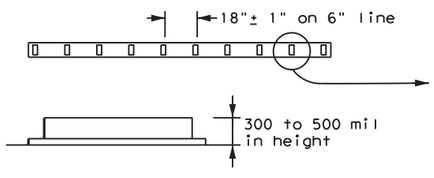


TYPICAL ENTRANCE RAMP GORE MARKING

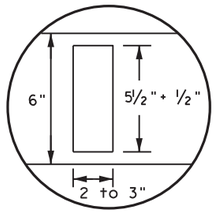
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Reflective Profile Pavement Markings

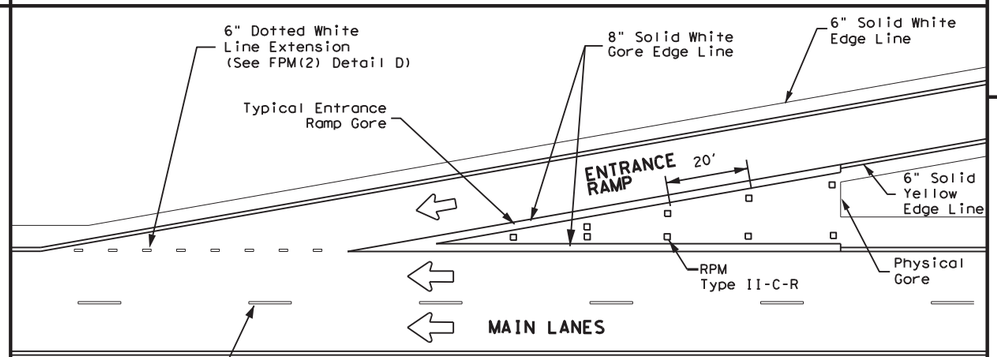


Standard 6" Profile Detail

NOTE

Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

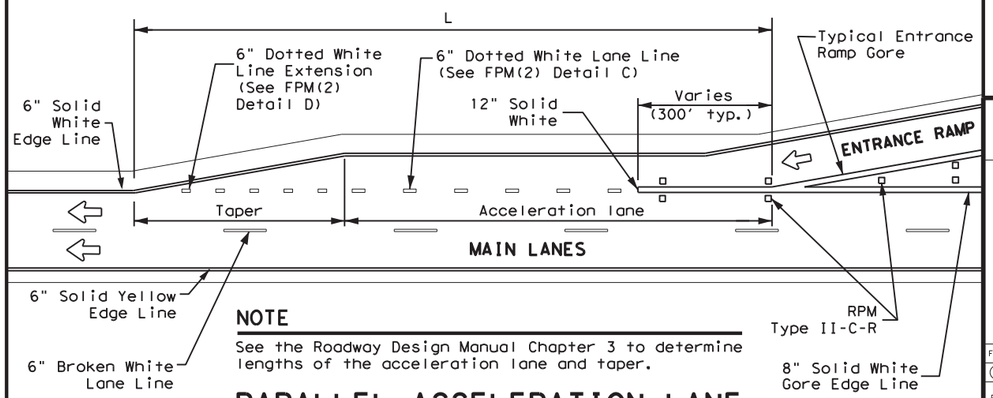
EDGE LINE PAVEMENT MARKINGS



NOTE

See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

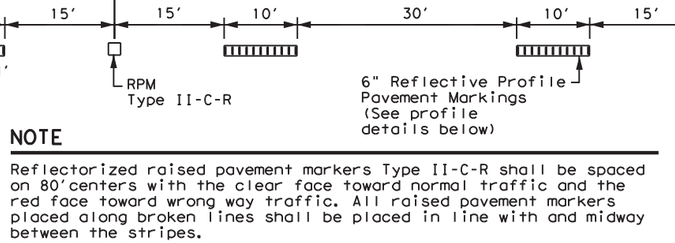
TAPERED ACCELERATION LANE



NOTE

See the Roadway Design Manual Chapter 3 to determine lengths of the acceleration lane and taper.

PARALLEL ACCELERATION LANE



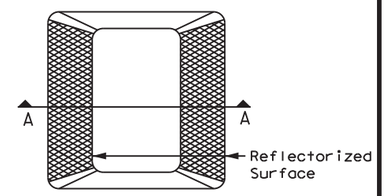
NOTES

1. Reflectorized raised pavement markers Type-II-C-R in the wrong way arrow shall have the clear face toward normal traffic and the red face toward the wrong way traffic.
2. Red reflectorized wrong way arrows, not to exceed two, may be placed on exit ramps. Locations of the arrows shall be as shown in the plans or as directed by the engineer.

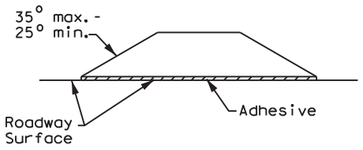
WRONG WAY ARROW

GENERAL NOTE

On concrete pavements the raised pavement markers shall be placed to one side of the longitudinal joints.



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

FILE: fpm(1)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
4-92 2-08 10-22	22	LA SALLE, Etc.		147
5-00 2-10				

23A

DATE: 12/8/2023 12:48:52 PM
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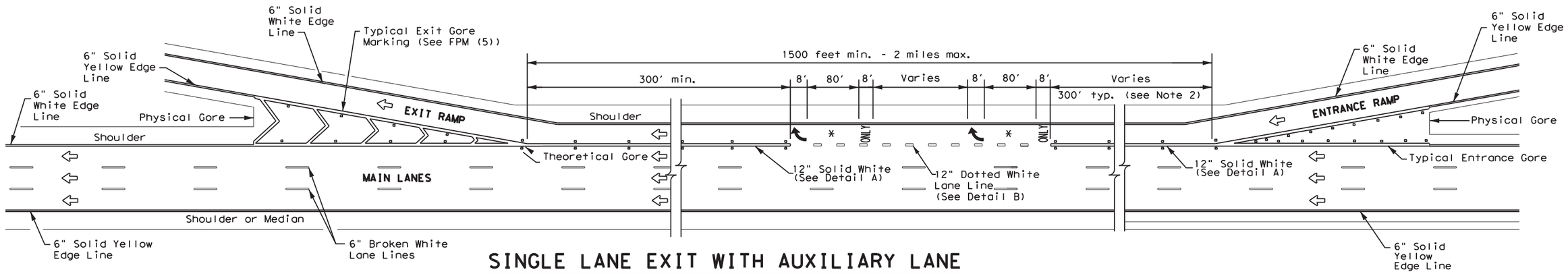
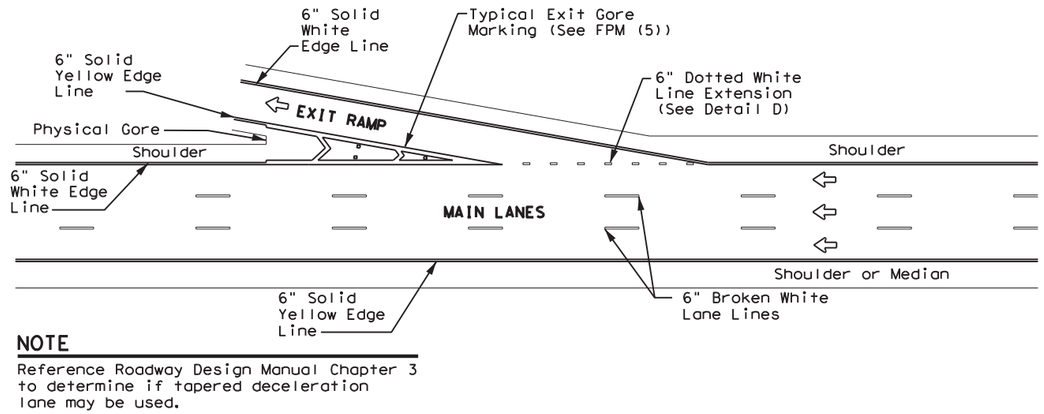


SINGLE LANE EXIT WITH AUXILIARY LANE

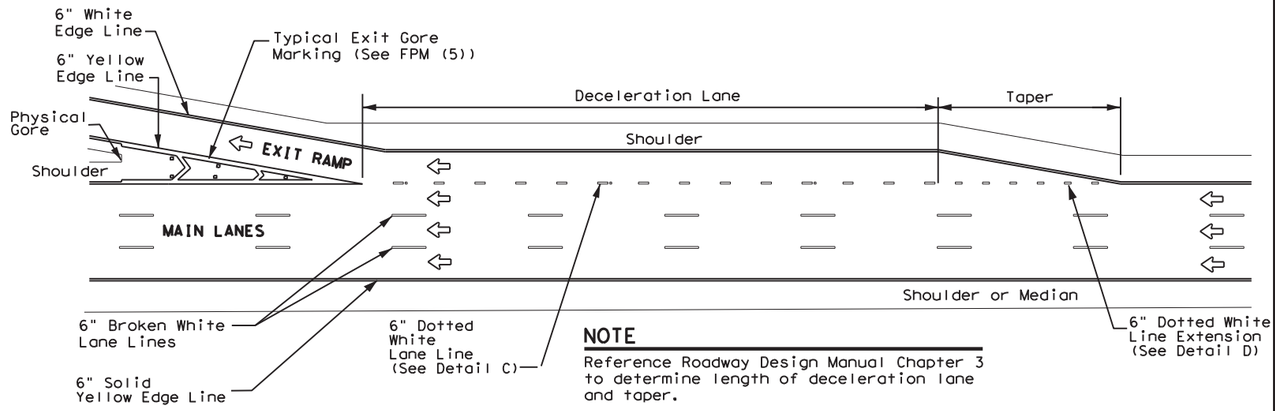
(See Note 2)



NOTE

Reference Roadway Design Manual Chapter 3 to determine if tapered deceleration lane may be used.

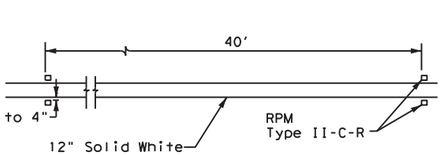
TAPERED DECELERATION LANE



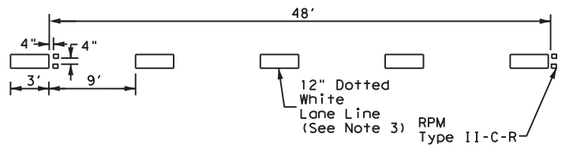
NOTE

Reference Roadway Design Manual Chapter 3 to determine length of deceleration lane and taper.

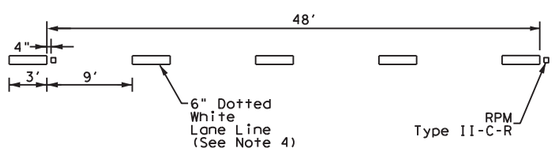
PARALLEL DECELERATION LANE



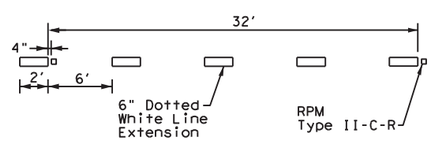
DETAIL A



DETAIL B



DETAIL C



DETAIL D

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Normal (6") dotted lane line (see Detail C) is used at parallel acceleration and deceleration lanes.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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.

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-22

FILE: fpm(2)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-77 5-00 2-12 4-92 8-00 10-22 8-95 2-10	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		148

23B

DATE: 12/8/2023 12:49:04 PM
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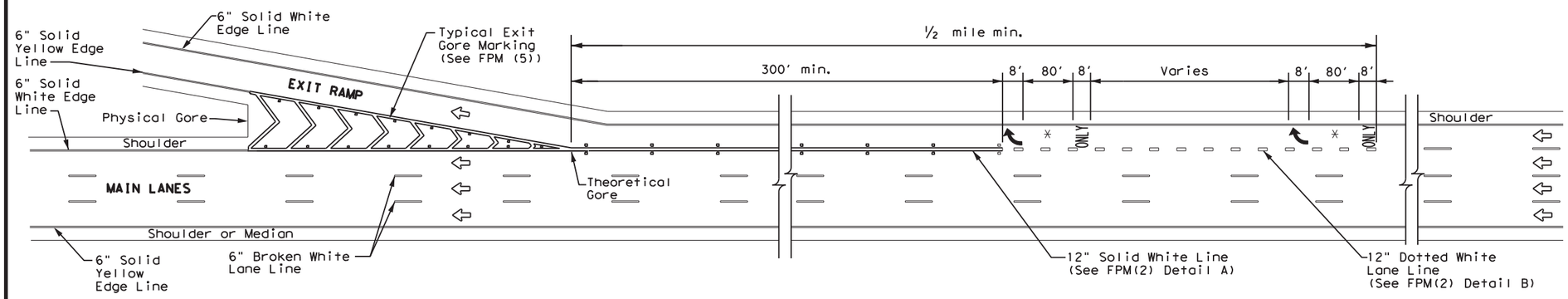
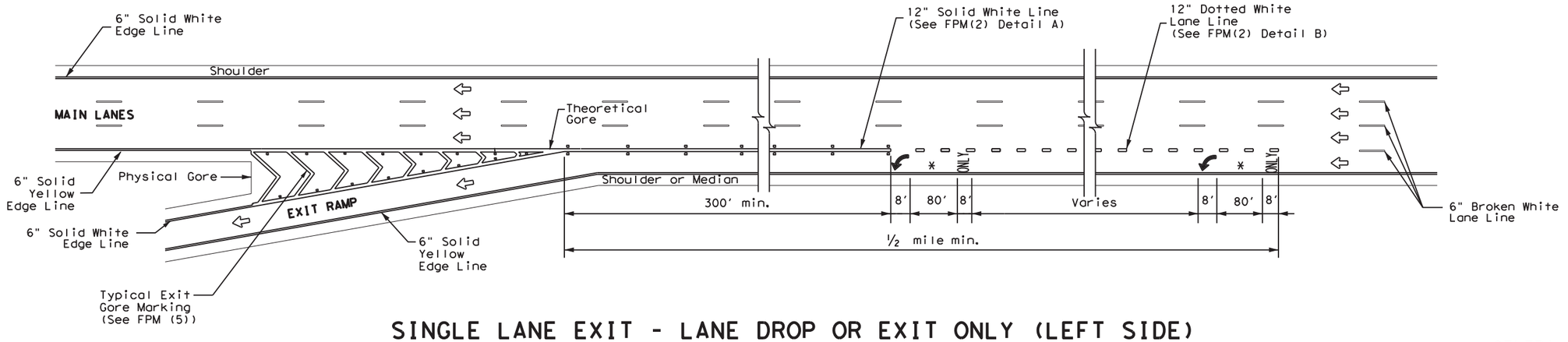


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

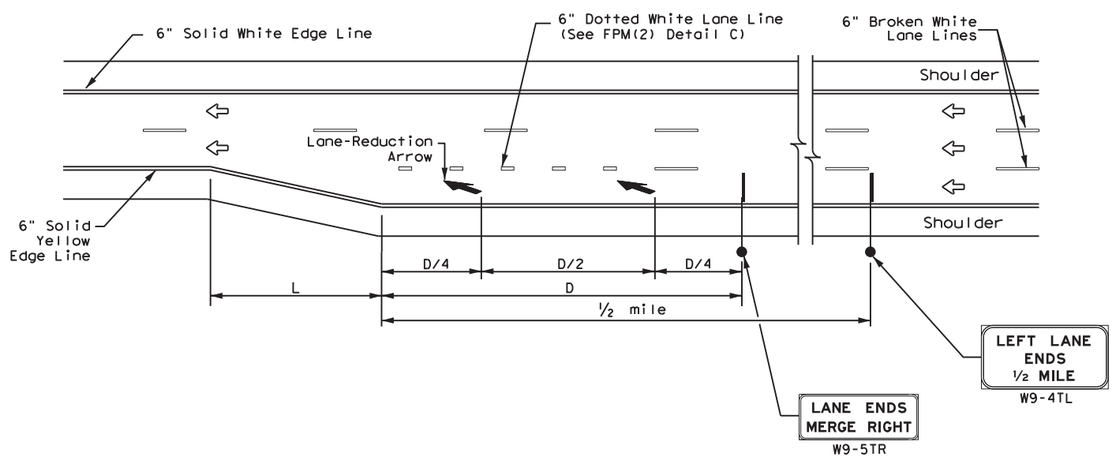
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
✳	Arrow markings are optional, however "ONLY" is required if arrow is used



SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFT SIDE)



FREEWAY LANE REDUCTION

NOTES

1. Large Guide signs shall conform to the TxDOT Freeway Signing Handbook.
2. 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.
3. Arrows and sign details can be found in the Standard Highway Sign Designs for Texas (SHSD) at http://www.txdot.gov.
4. These guidelines may also be applied to the design of a right side lane reduction. Use LANE ENDS MERGE LEFT (W9-5TL) and RIGHT LANE ENDS 1/2 MILE (W9-4TR) signs in lieu of what is shown on drawing.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
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	
80 MPH	1,500	
85 MPH	1,625	

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS SINGLE LANE DROP (EXIT ONLY) AND LANE REDUCTION DETAILS

FPM(3)-22

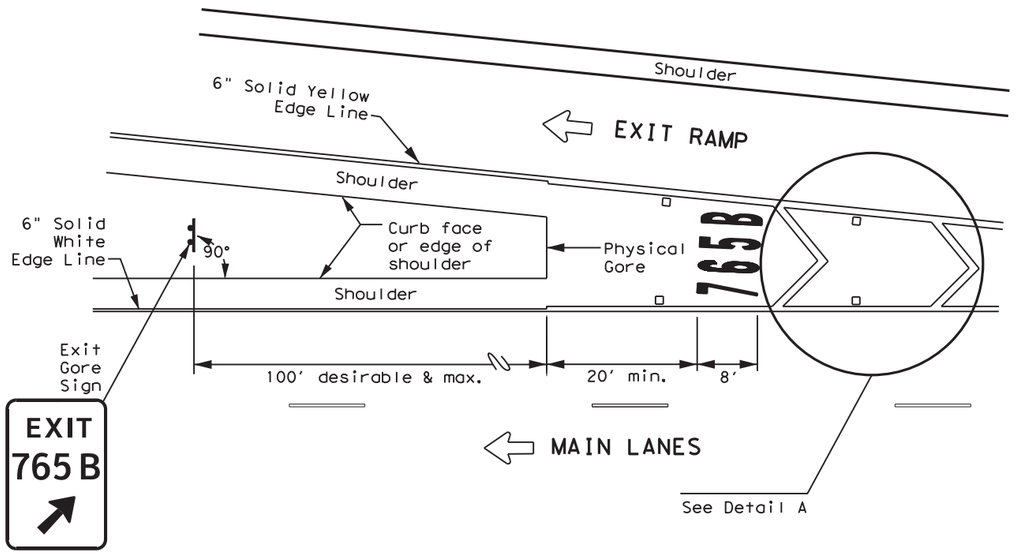
FILE: fpm(3)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
4-92 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	22	LA SALLE, Etc.		149
8-00 10-22				

23C

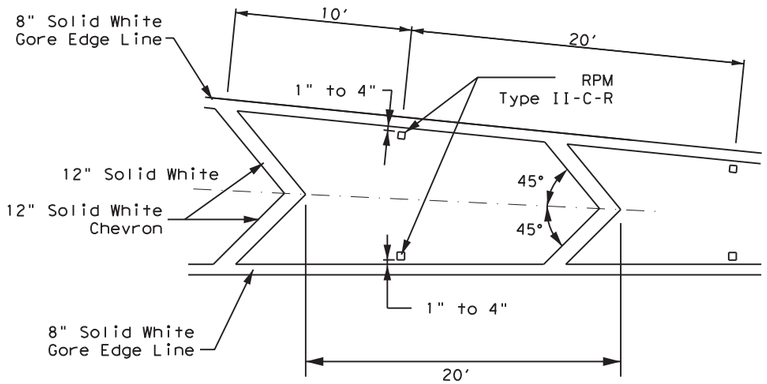
DATE: 12/8/2023 12:49:13 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garza\d1037606\fpm(3)-22.dgn

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white exit number pavement markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Section 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

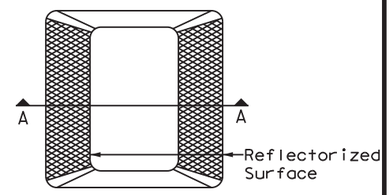
1. Raised pavement markers shall be centered between each chevron or neutral area line.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

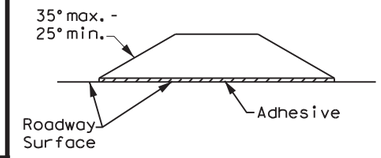
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

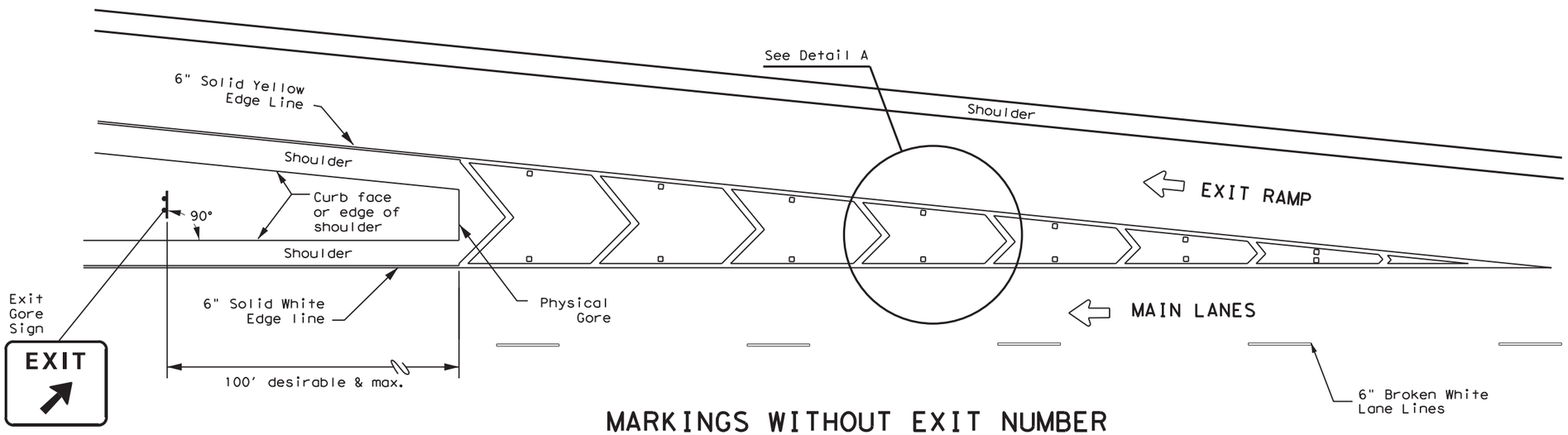
LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A



MARKINGS WITHOUT EXIT NUMBER

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

EXIT GORE PAVEMENT MARKINGS

FPM(5)-22

FILE: fpm(5)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-19 10-22	0018	02	091,etc.	IH 35,etc.
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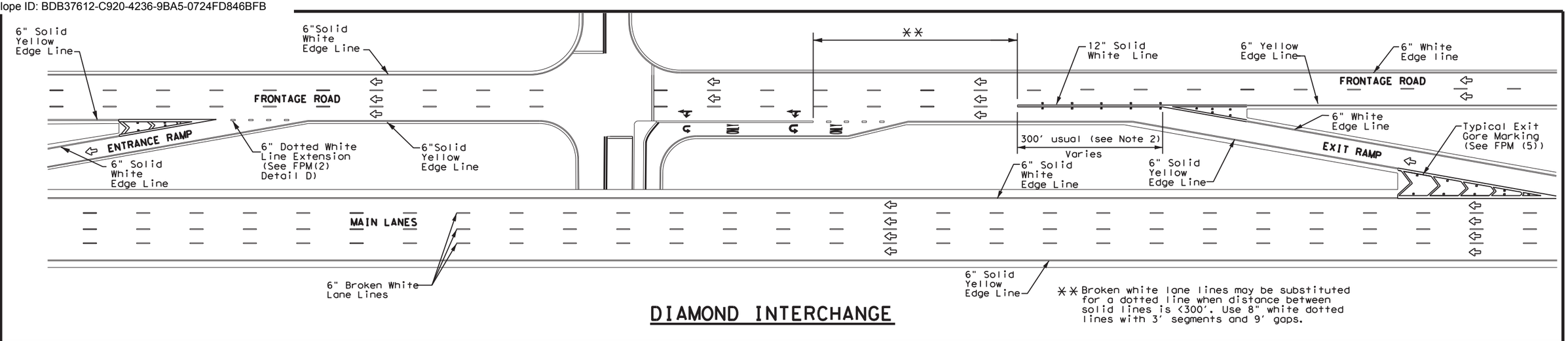
	22	LA SALLE, Etc.		150

23E



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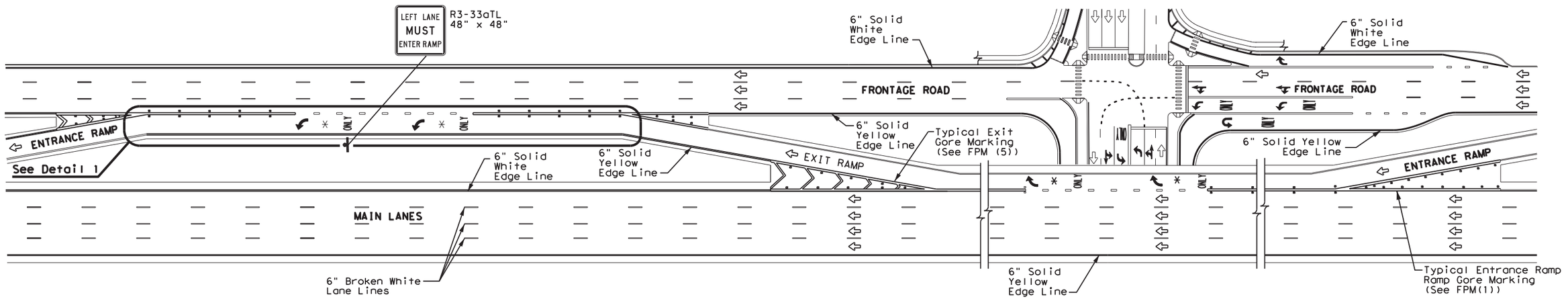
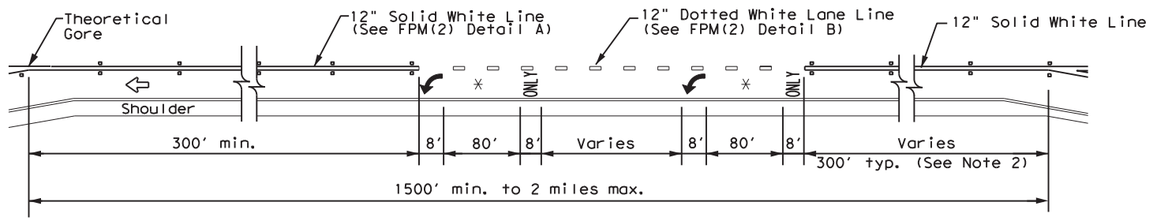


URBAN X-RAMP WITH FRONTAGE ROAD AUXILIARY LANE



DETAIL 1

(Frontage Road Auxiliary Lane for X-Ramps)

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.

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
⁎	Arrow markings are optional, however "ONLY" is required if arrow is used

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY AND FRONTAGE ROAD PAVEMENT MARKINGS

FPM(6)-22

FILE: fpm(6)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-22	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		151

23F

DATE: 12/8/2023 12:49:33 PM
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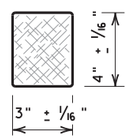
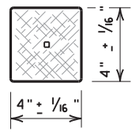
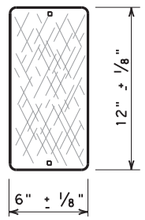
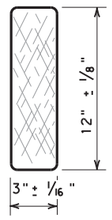
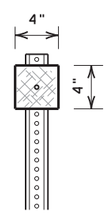
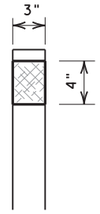
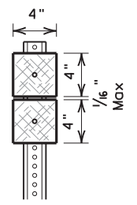
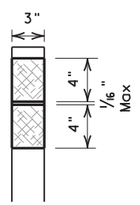
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

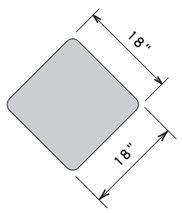
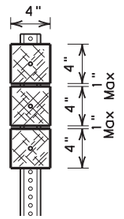
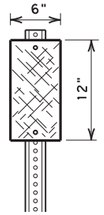
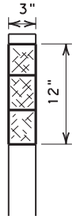
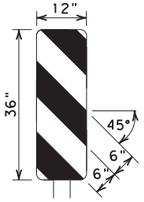
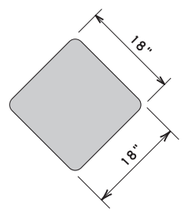
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

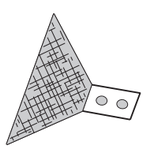
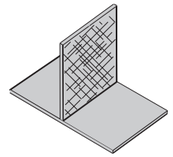
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

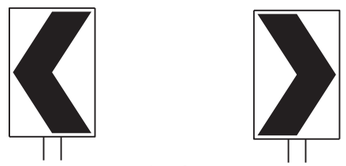
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE

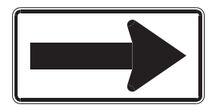


SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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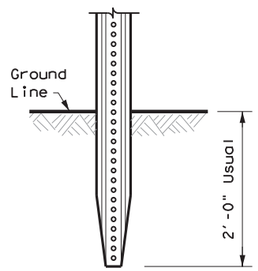
REVISIONS	0018	02	091,etc.	IH 35,etc.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	22	LA SALLE, Etc.		152

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

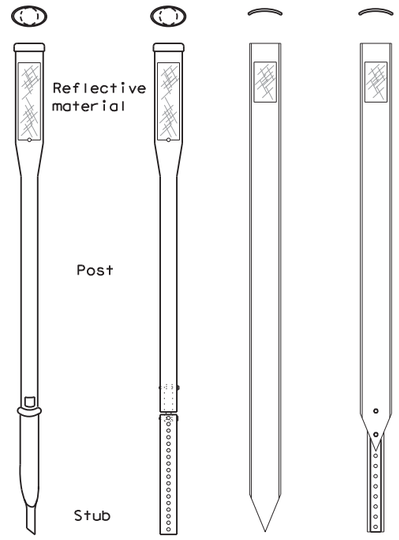


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

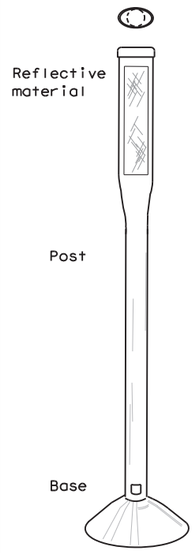
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



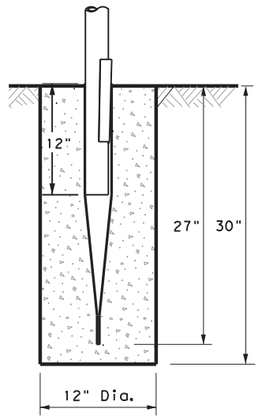
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

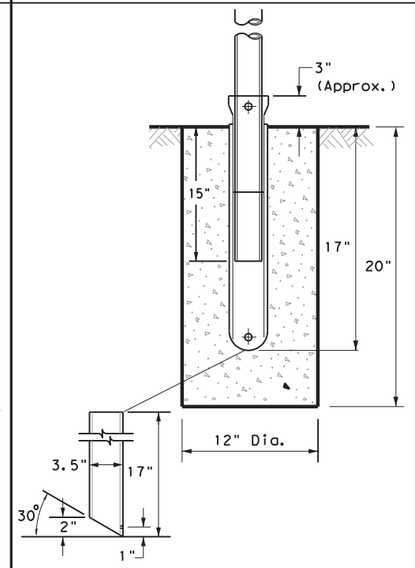
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

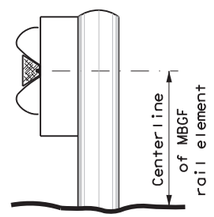
NOTE

1. Install per manufacturer's recommendations.

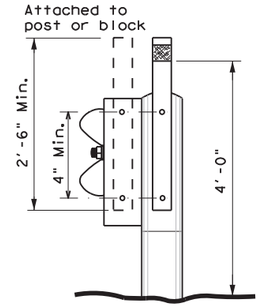
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

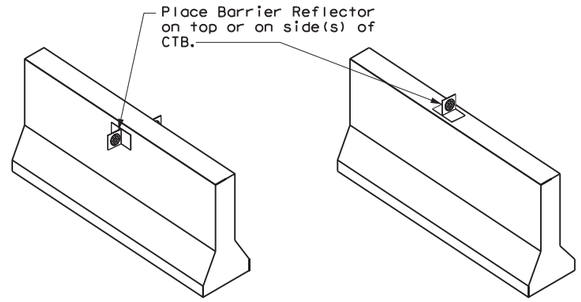
GF1



GF2



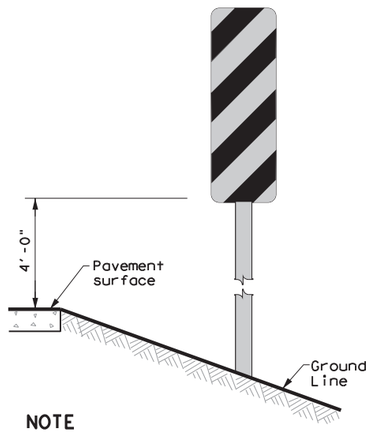
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

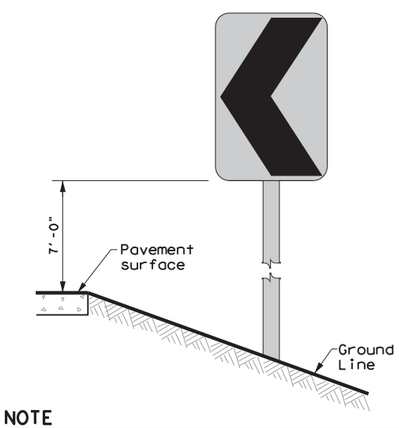
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

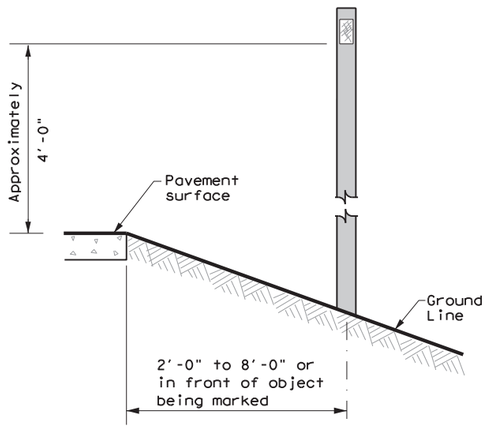
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	0018	02	091,etc.	IH 35,etc.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	22	LA SALLE, Etc.		153

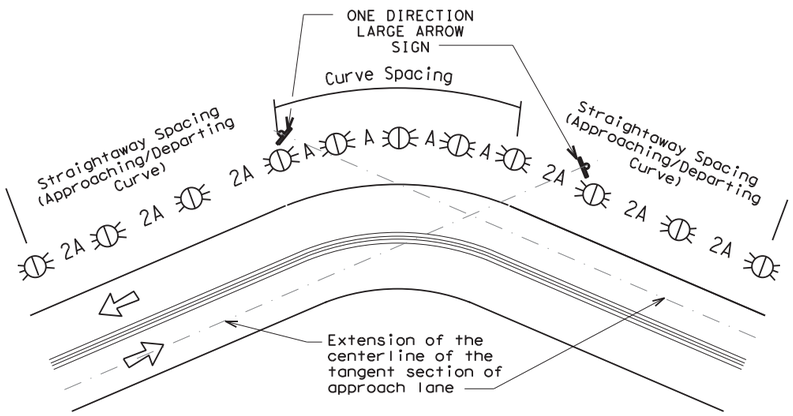
20B

DATE: 12/8/2023 12:49:53 PM
FILE: c:\txdot\pw_online\txdot5\daniel.garza\d1037606\dom2-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

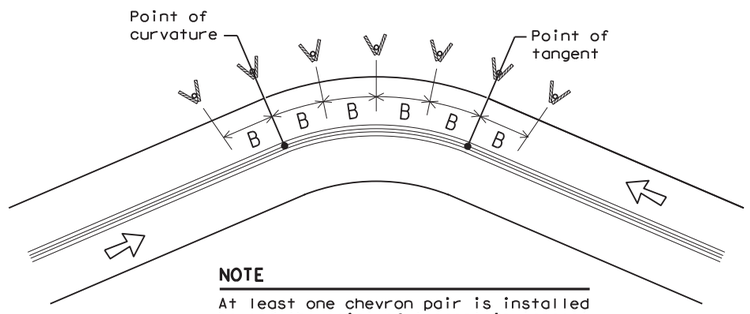
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	——
2	2865	160	320	——
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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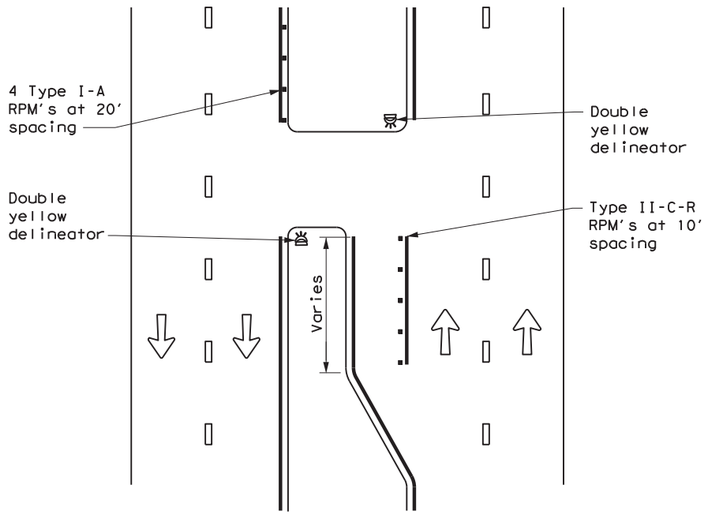
REVISIONS	0018	02	091,etc.	IH 35,etc.
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	22	LA SALLE, Etc.		154

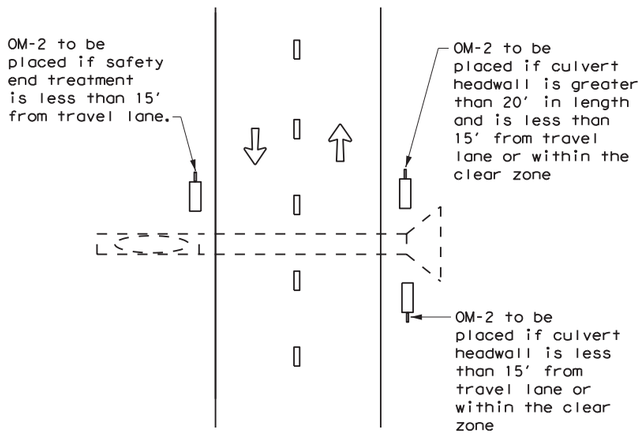
20C

CROSSOVERS



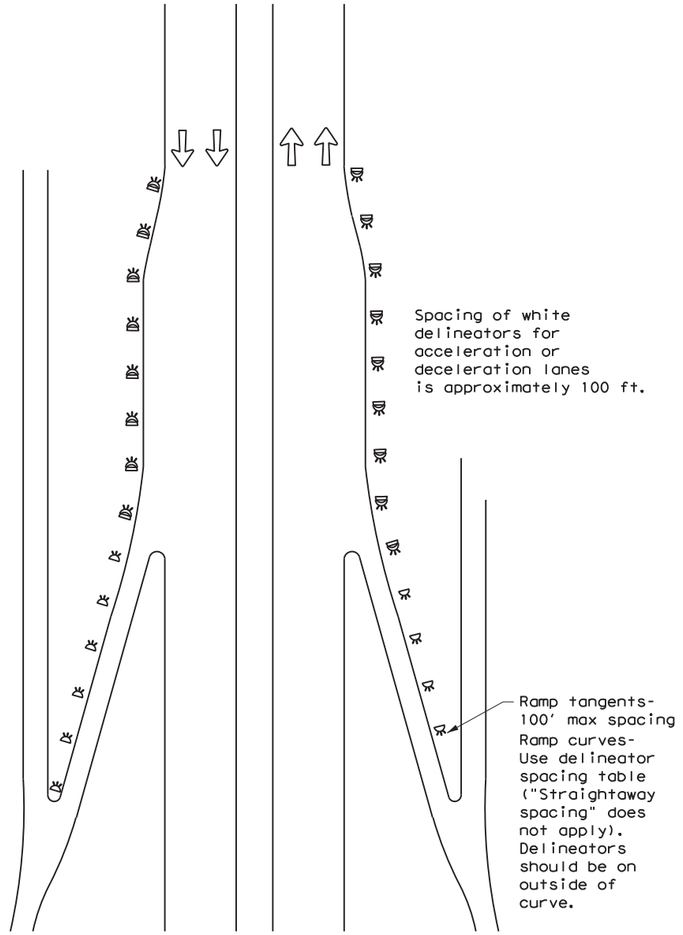
DETAIL 1

FOR CULVERTS WITHOUT MBGF



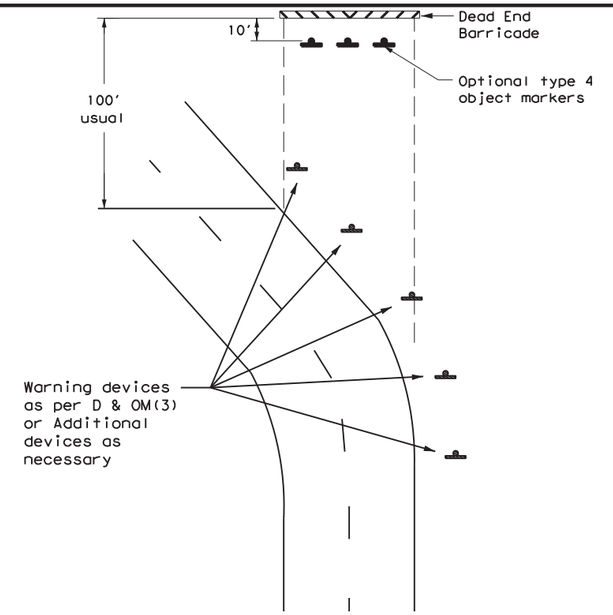
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



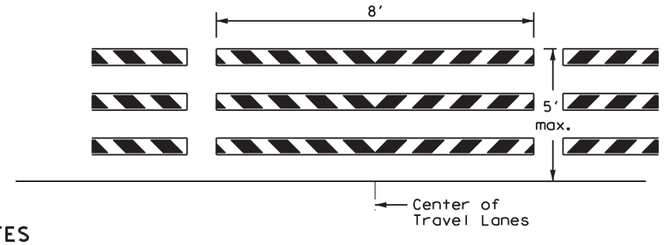
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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3-15 7-20	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		155

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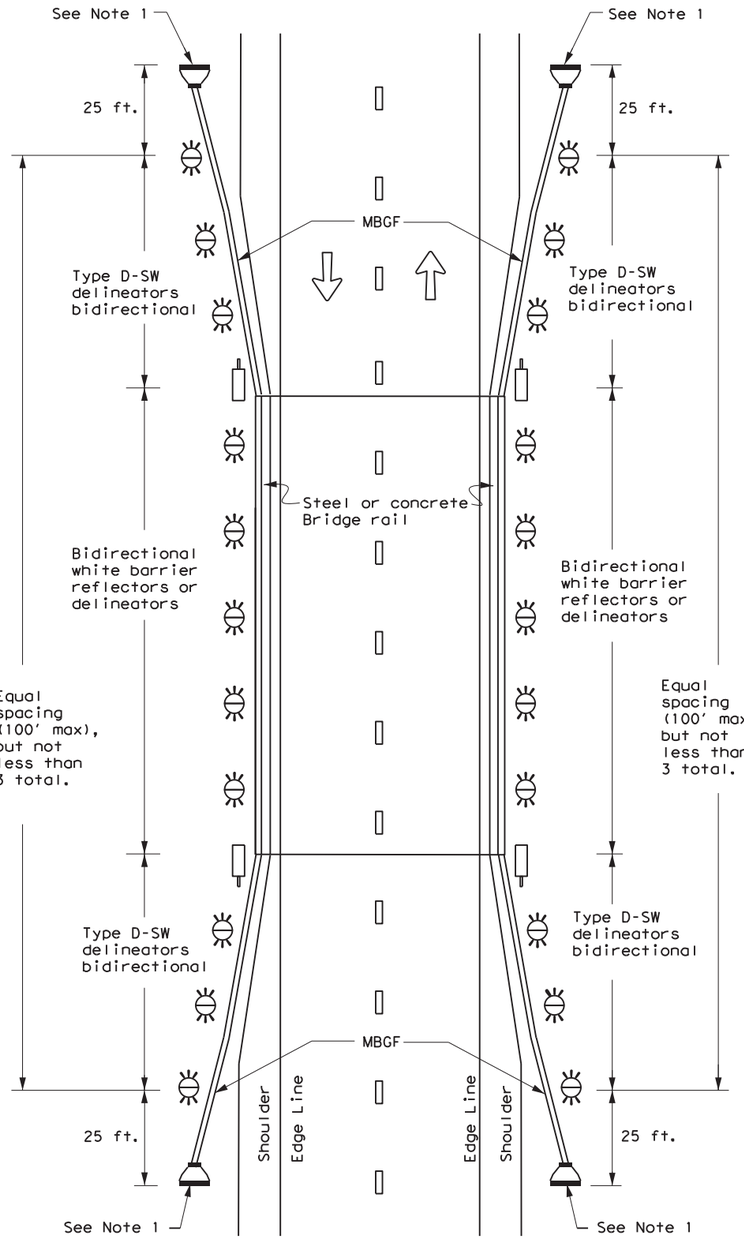
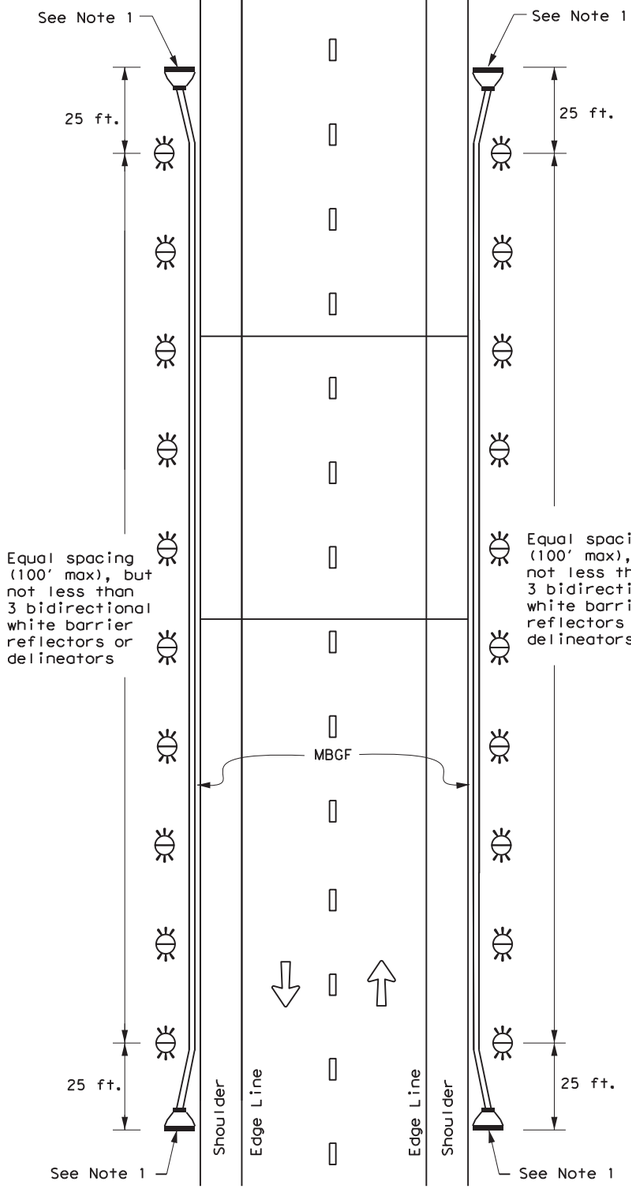
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

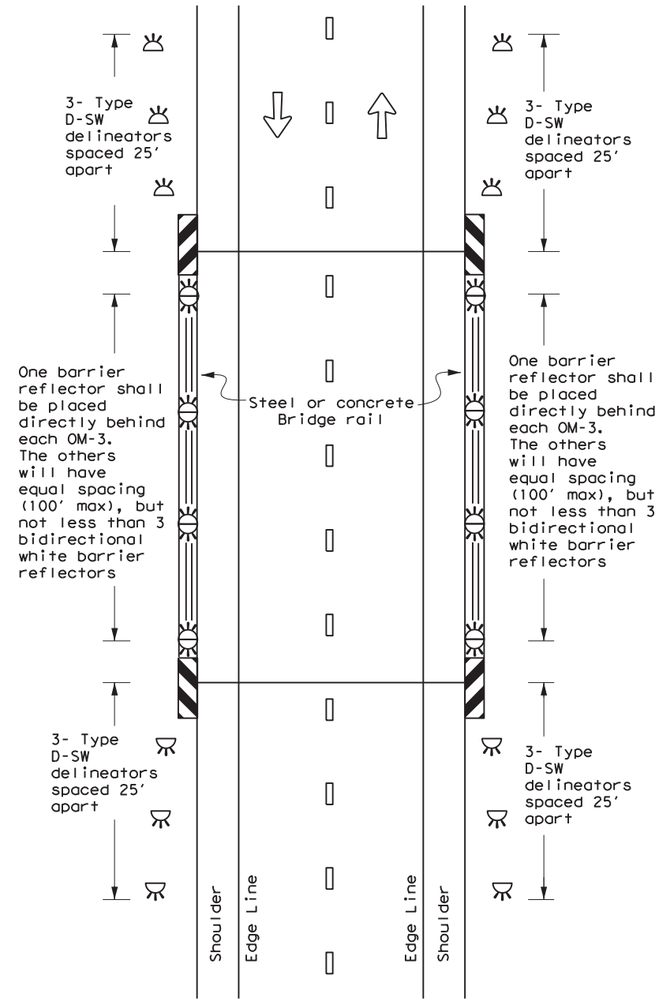
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

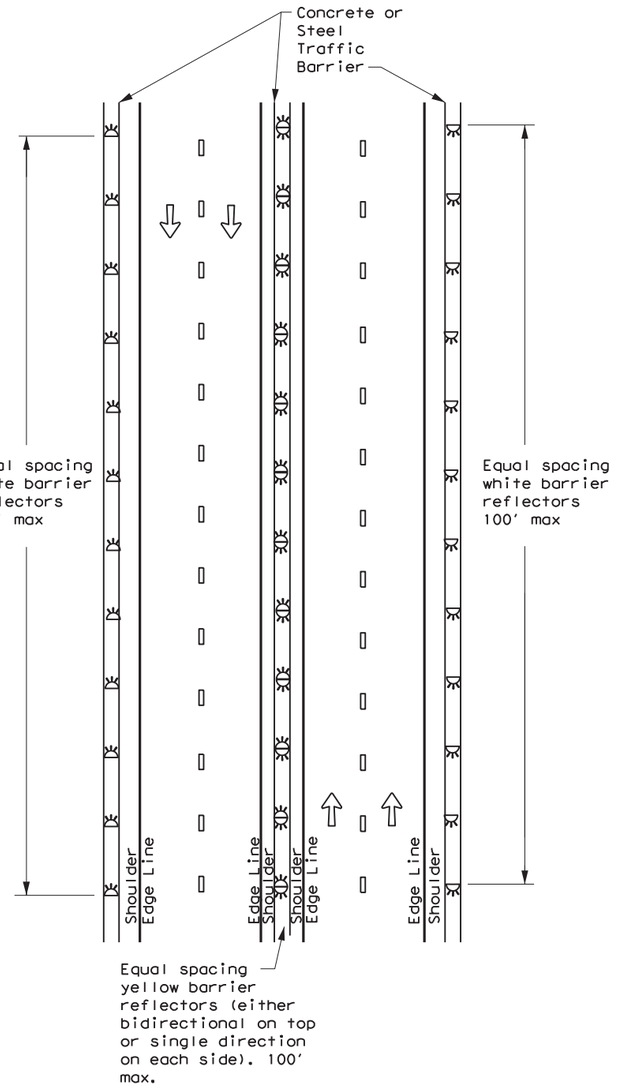
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

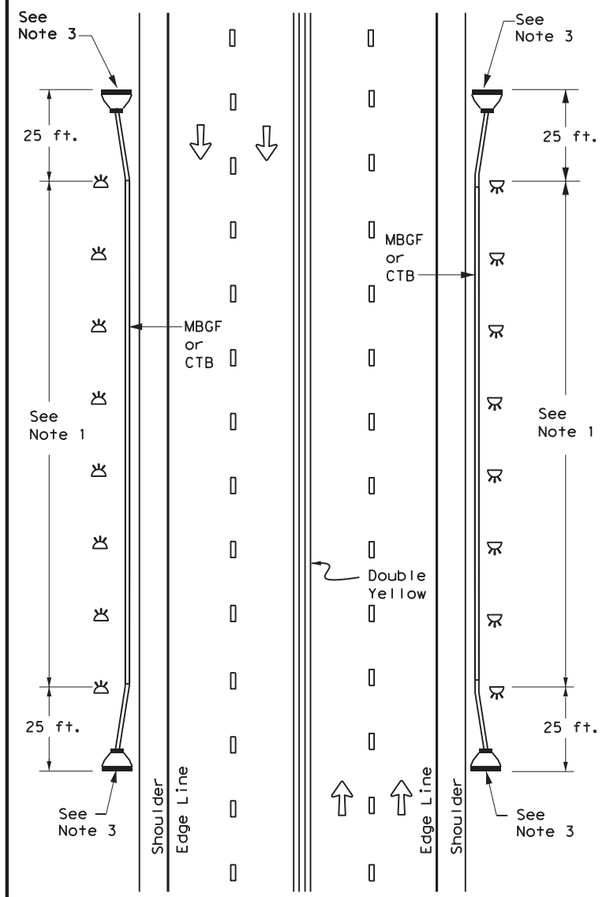
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091, etc.	IH 35, etc.
7-20	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		156

20E

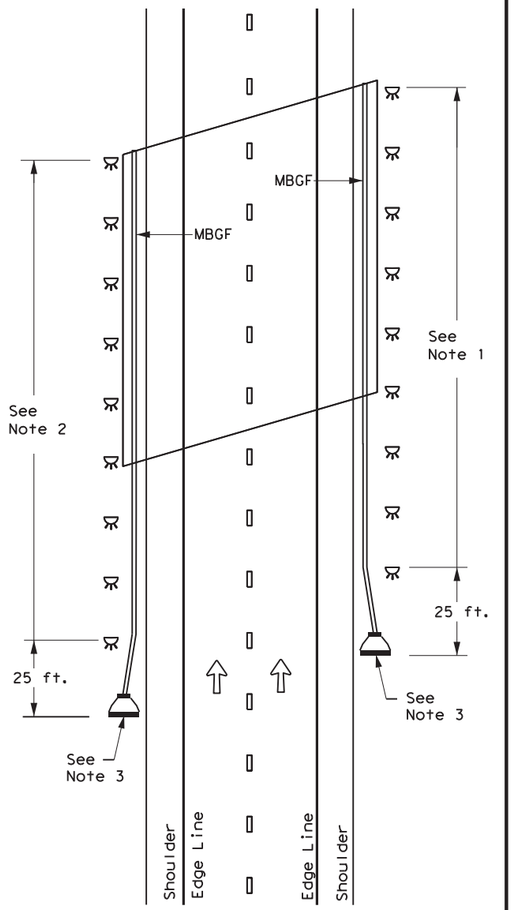
CONTINUOUS CONCRETE OR STEEL BARRIER



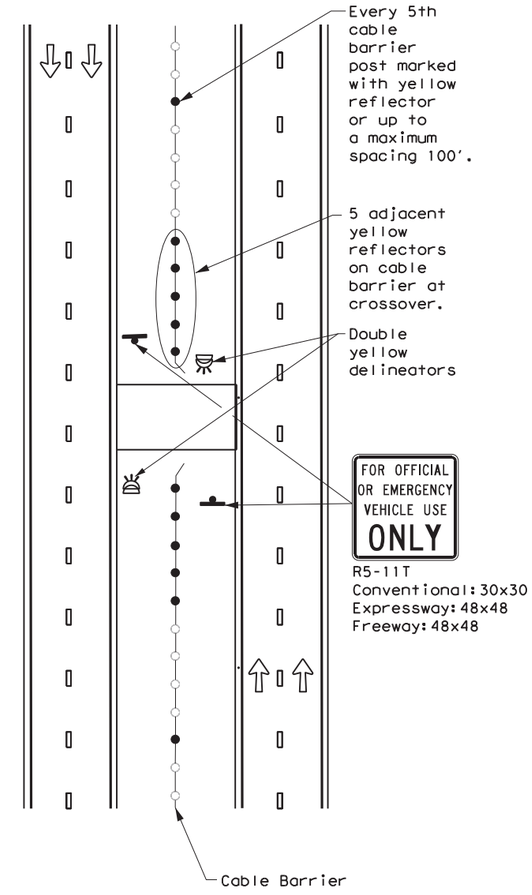
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100′ max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100′ max.)
2. Equal spacing (100′ max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3)in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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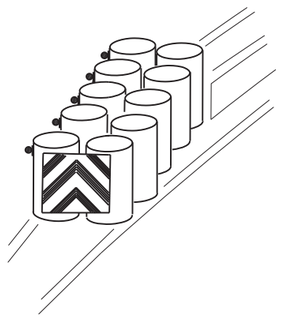
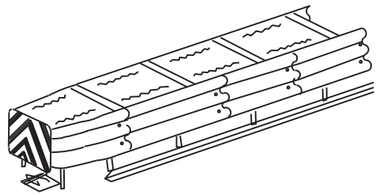
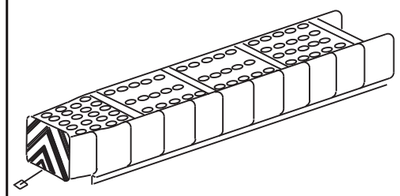
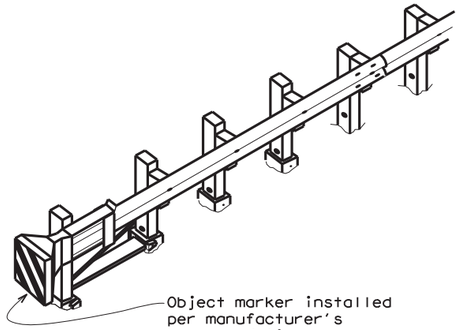
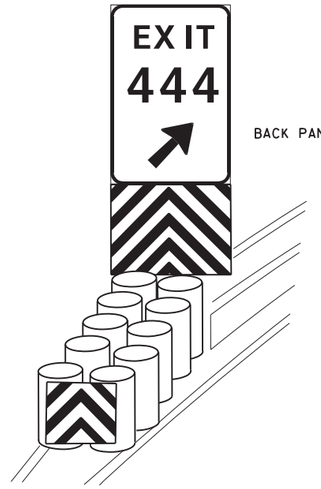
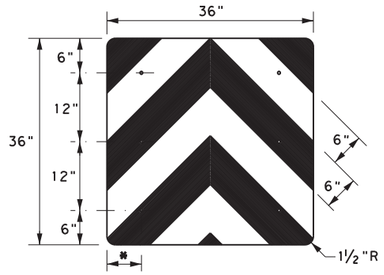


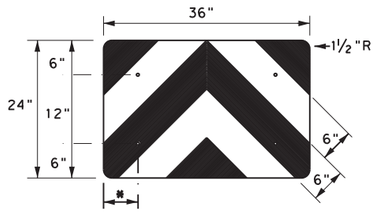




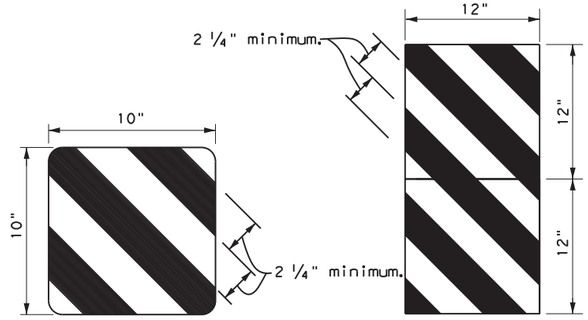




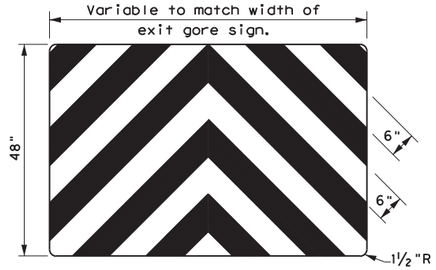


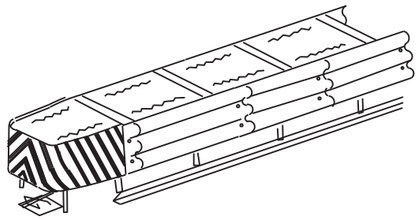


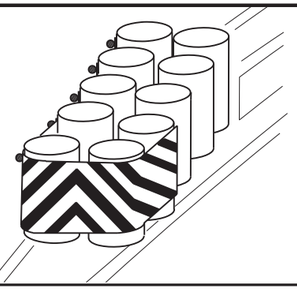
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

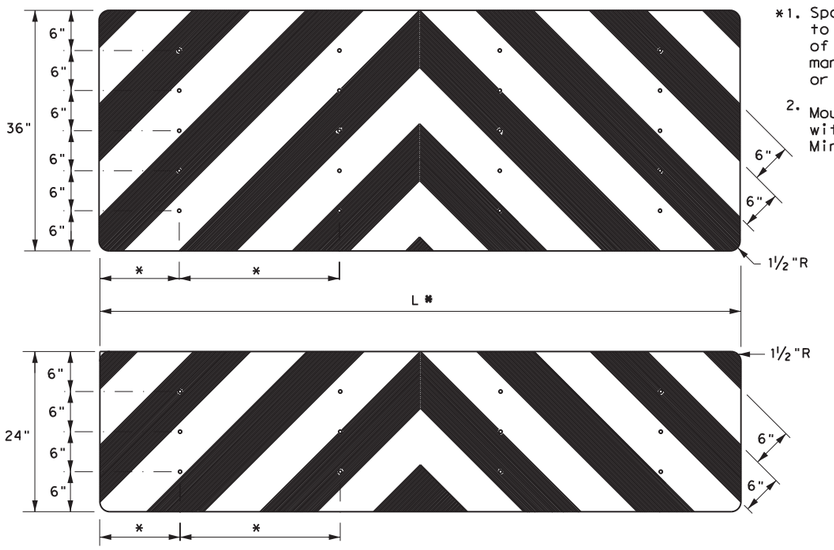


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: __domvia20.dgn__	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
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4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	22	LA SALLE, Etc.		158
4-98 7-20				

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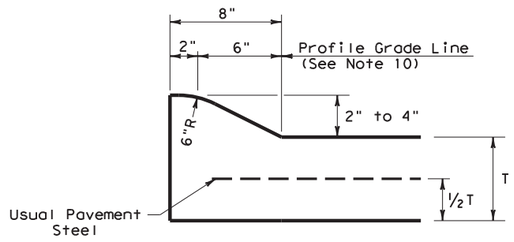
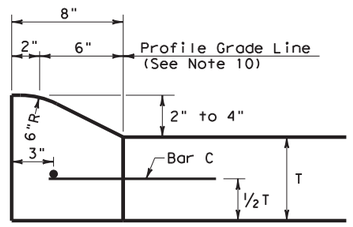


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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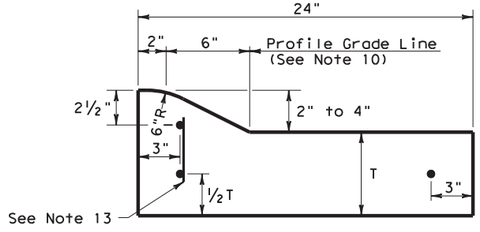
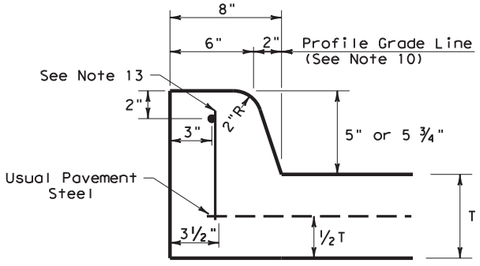
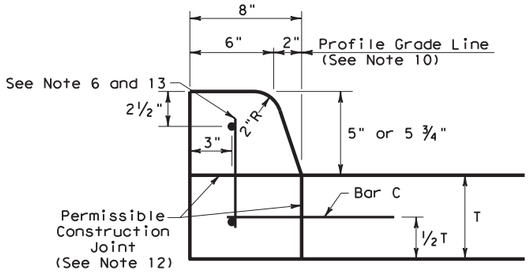
2" - 4" HEIGHT



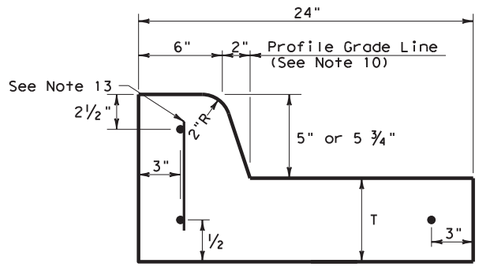
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



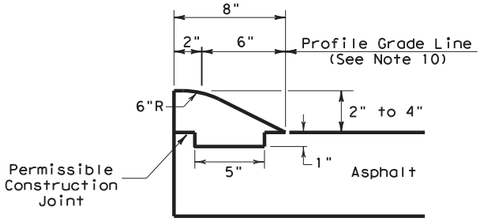
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



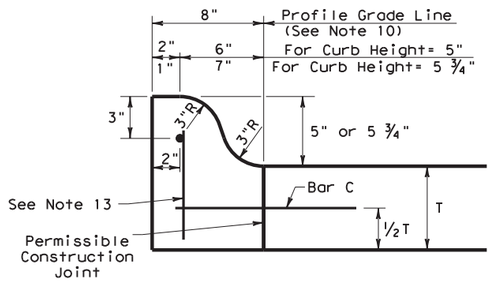
TYPE II CURB
5" - 5 ¾" HEIGHT



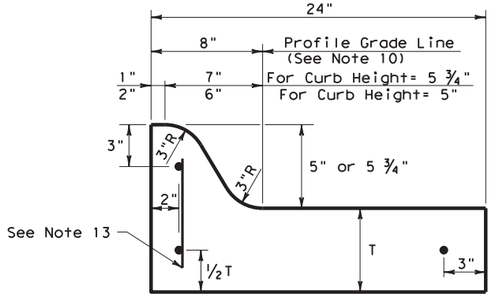
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



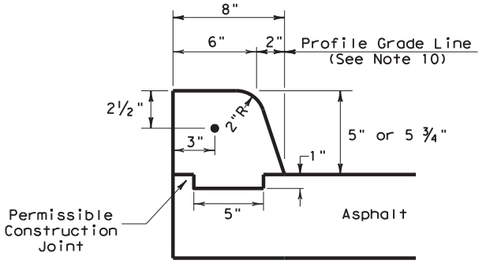
TYPE III CURB (KEYED)
2" - 4" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT



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



TYPE IV CURB (KEYED)
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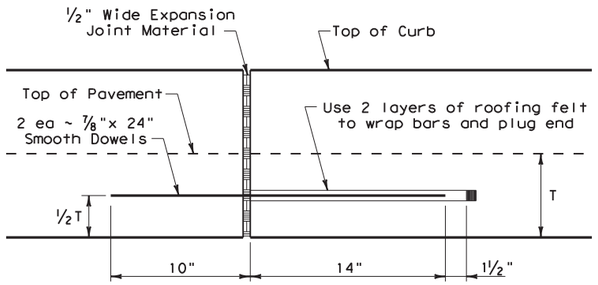
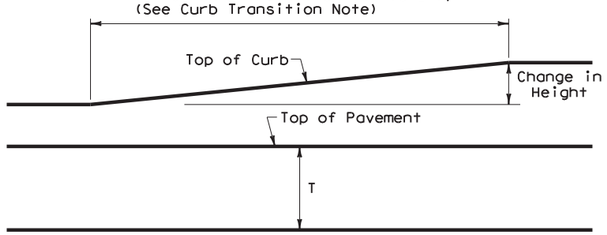


EXPANSION JOINT DETAIL

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.

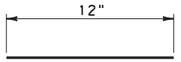


CURB TRANSITION
Note: To be paid for as Highest Curb

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
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	DIST	COUNTY		SHEET NO.
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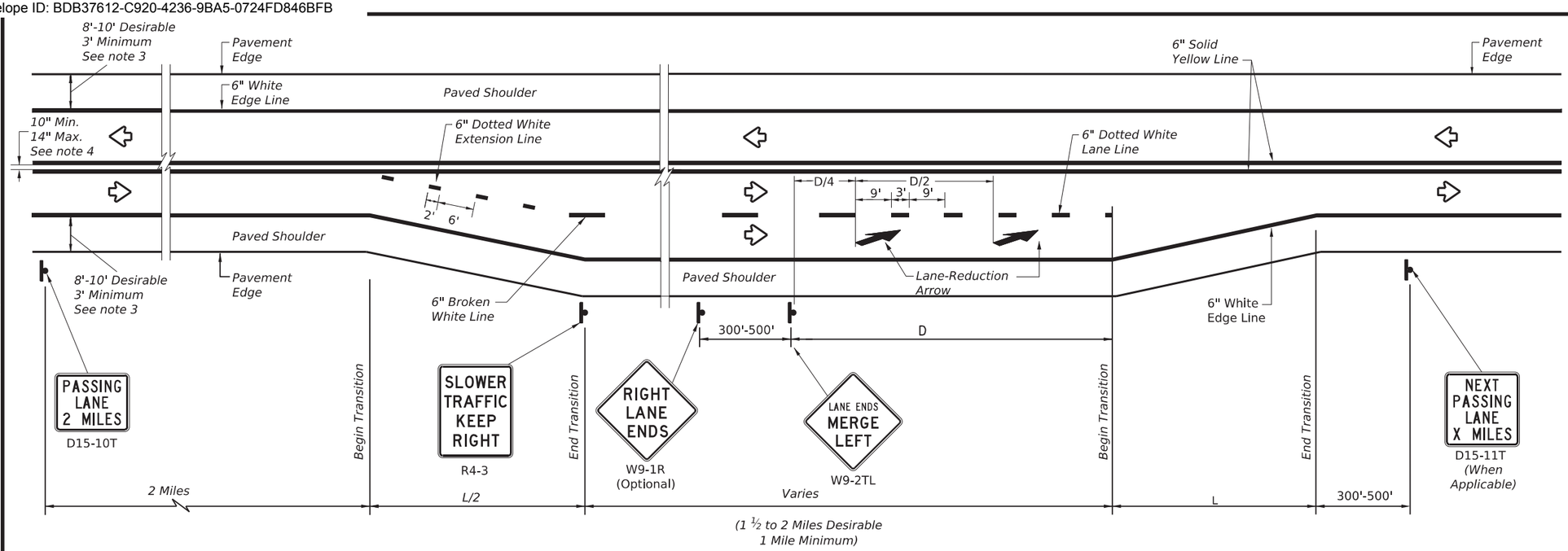

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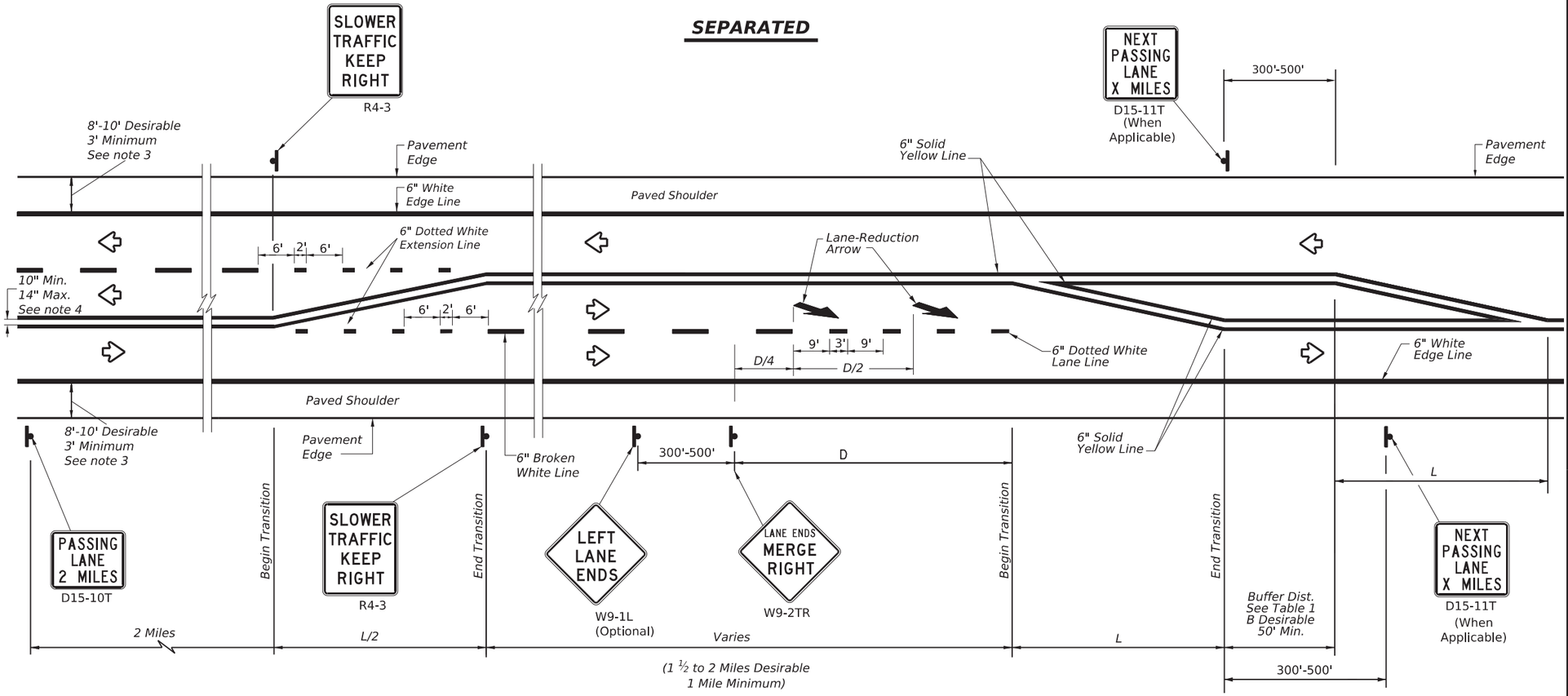


ALTERNATING

LEGEND

	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)

Formula *	L = WS

* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

1. For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
2. For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.
3. For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).
4. For pavement marking details, see Pavement Marking Standard sheet PM(1).

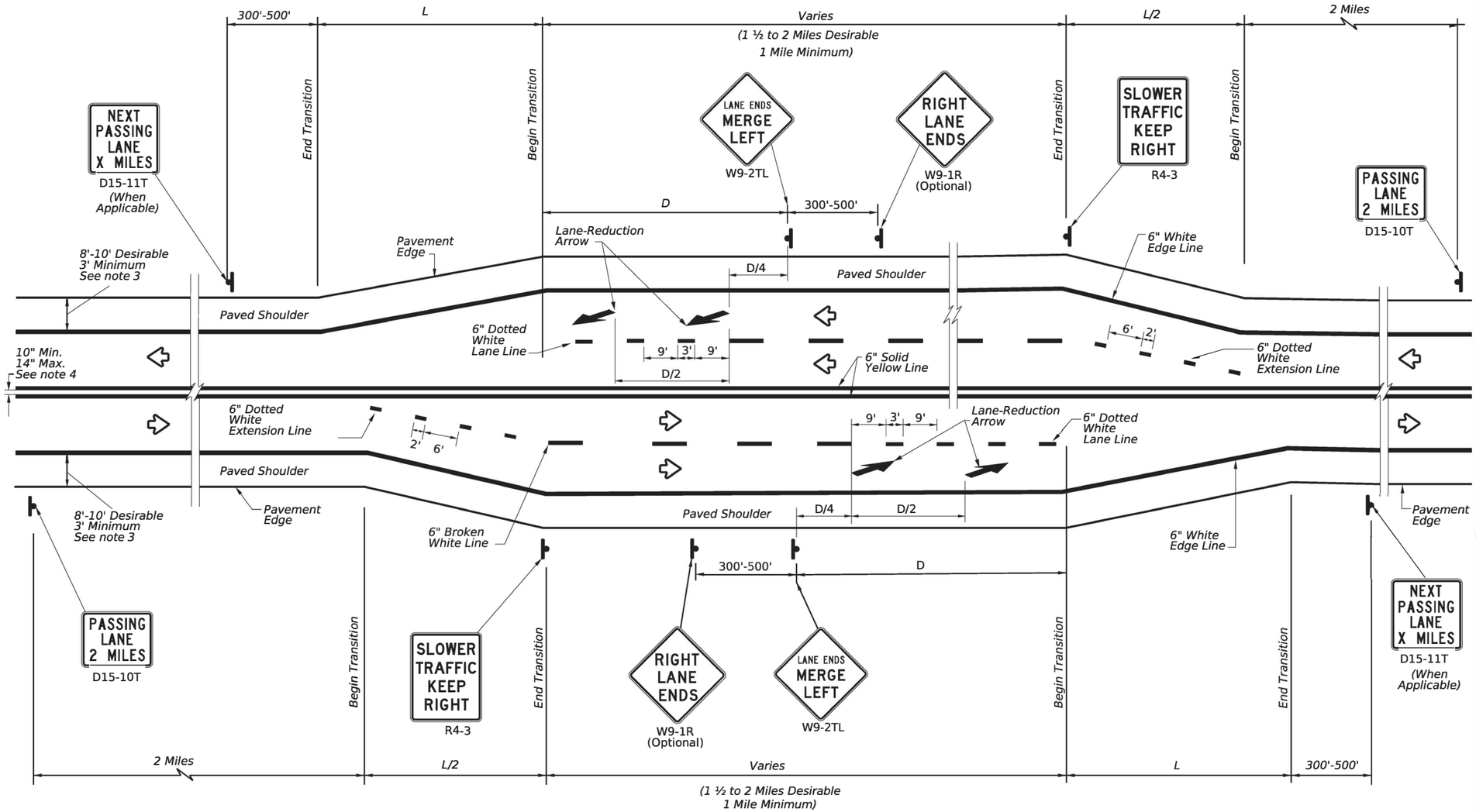
Texas Department of Transportation

Traffic Safety Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-1)-23

FILE: ts2-1-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
5-10 3-18 2-12 2-23 3-12	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		160



SIDE BY SIDE PASSING LANES

LEGEND

	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)

Formula *	L = WS

* *Transition length should be rounded up to nearest 5 foot increment.*

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1 ADVANCE WARNING SIGN DISTANCE (D)

Posted Speed	D (FT)
40	670
45	775
50	885
55	990
60	1100
65	1200
70	1250
75	1350

GENERAL NOTES

1. *For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.*
2. *For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.*
3. *For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).*
4. *For pavement marking details, see Pavement Marking Standard sheet PM(1).*

Texas Department of Transportation

Traffic Safety Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-2)-23

FILE: ts2-2-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
5-10 3-18 2-12 2-23 3-12	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		161

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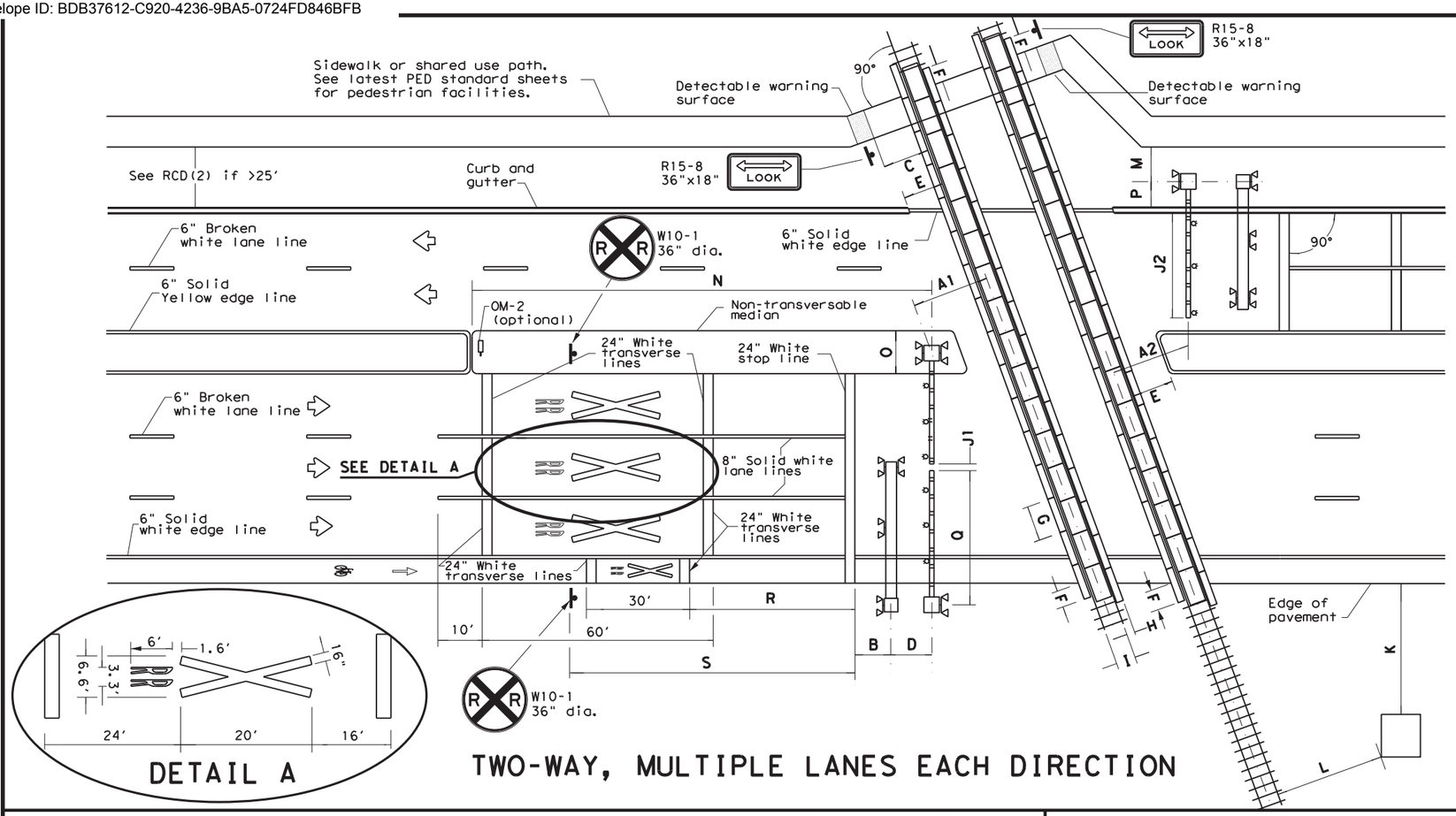


TWO-WAY, MULTIPLE LANES EACH DIRECTION

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.

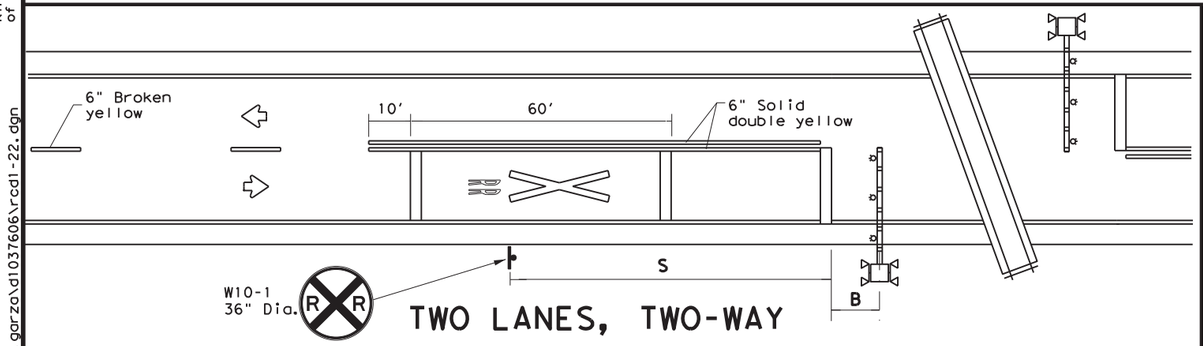
O: Width of median for RR gate assembly: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

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.



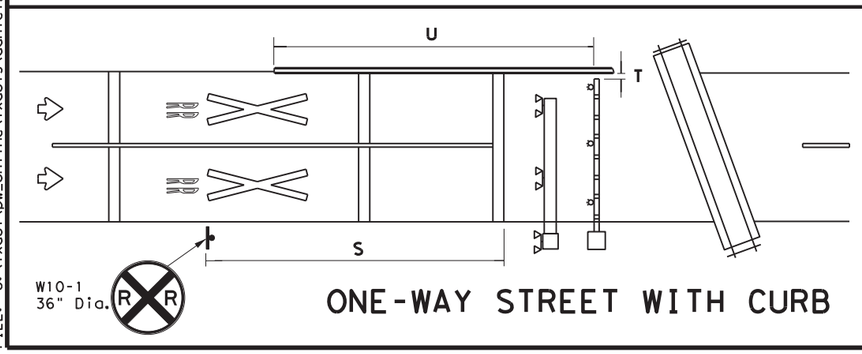
TWO LANES, TWO-WAY

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.

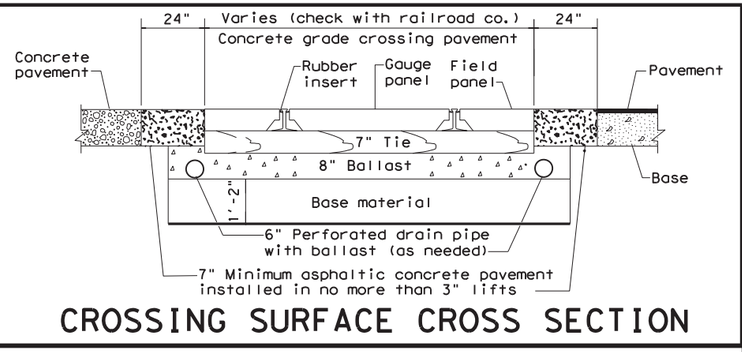


ONE-WAY STREET WITH CURB

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	0018	02	091,etc.	IH 35,etc.
2-16	DIST	COUNTY		SHEET NO.
11-22	22	LA SALLE, Etc.		162

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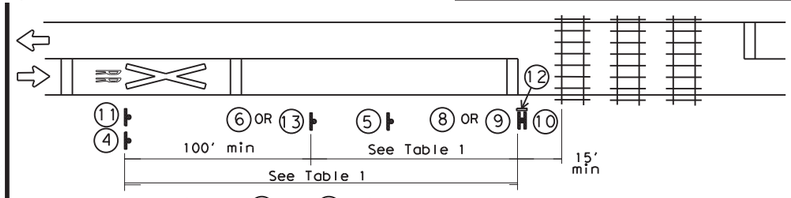
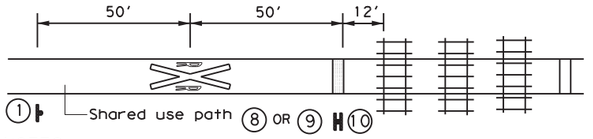


(if no (6) or (13) sign used)

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

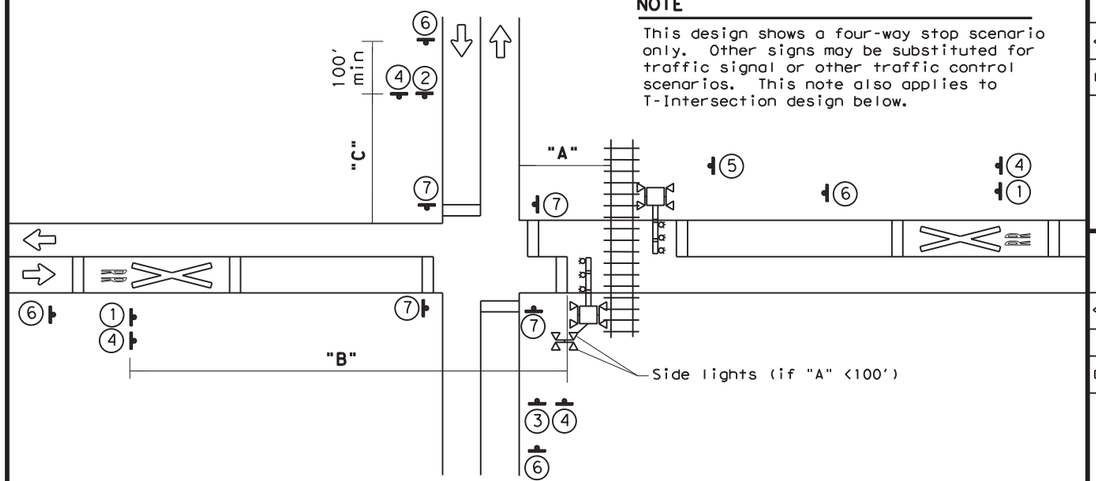
1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

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.

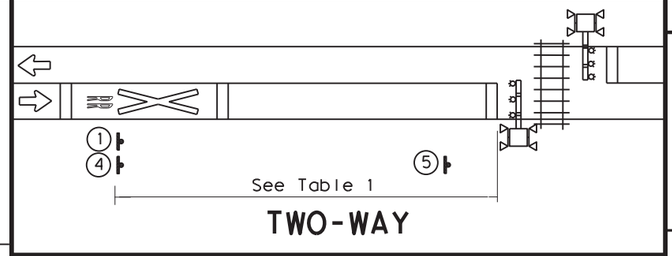


NOTE

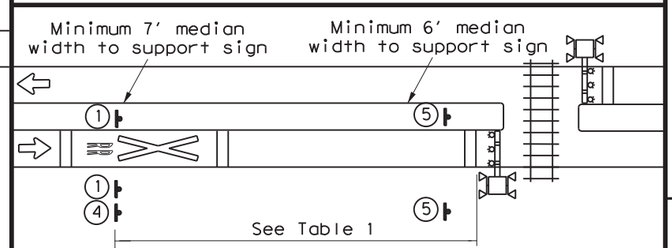
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"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.

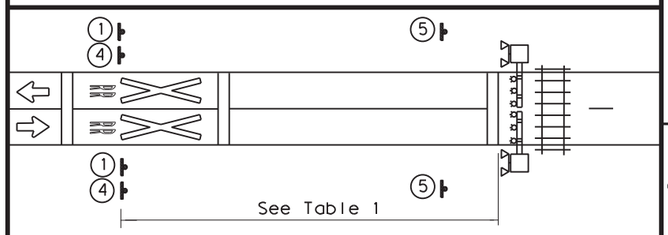
GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY

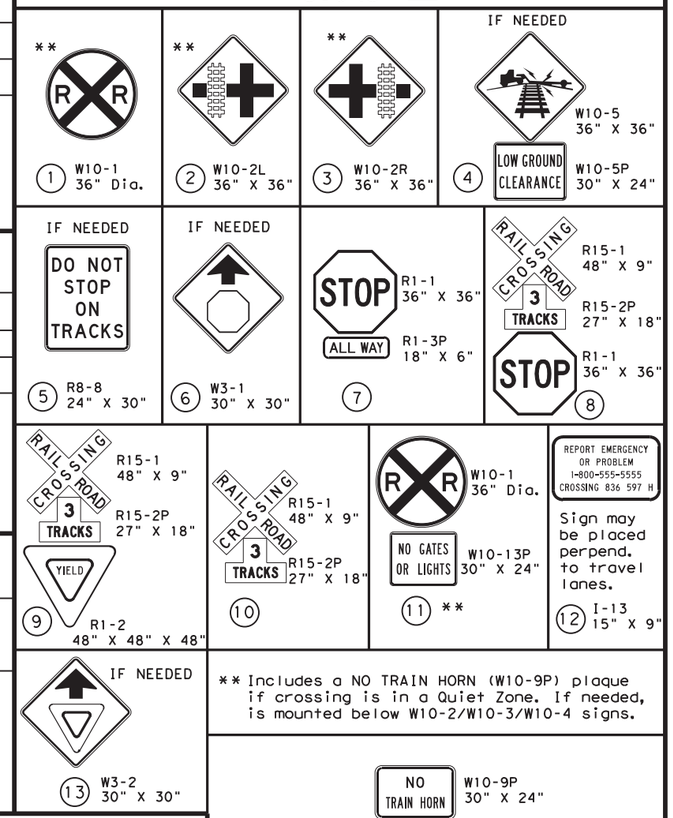


TWO-WAY WITH MEDIAN



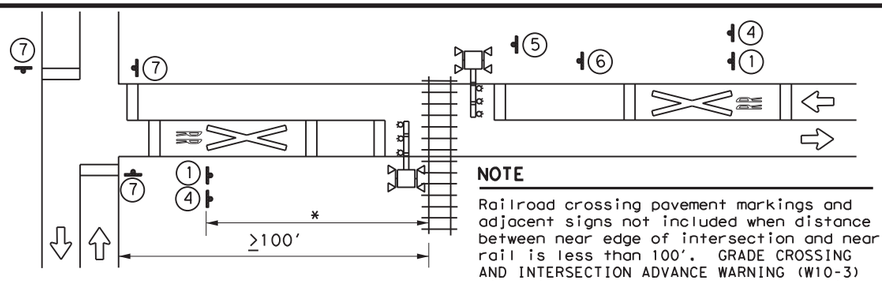
ONE-WAY

SIGNS



** 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"

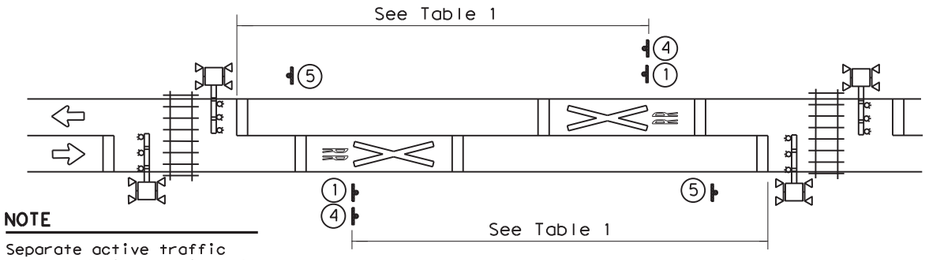


*Use Table 1 if sufficient space exists.

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	0018	02	091,etc.	IH 35,etc.
2-16 11-22	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		163

DATE: 12/8/2023 12:51:34 PM
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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.: 447865S
Crossing Type: Private
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 407.480 - 331.020
RR Subdivision: Laredo
City: Encinal
County: La Salle
CSJ at this Crossing: 0018-02-091
Latitude: 28.0723821
Longitude: -99.3456813

Scope of Work, including any TCP, to be performed by State Contractor:

State contractor will be performing a 3" mill-inlay operation, pavement structure spot base repairs and pavement markings on IH 35 NB Main Lanes. The proposed scope of work and TCP will not interfere with the crossing location.

Scope of Work to be performed by Railroad Company:

N/A

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 0

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☑ Not Required

☐ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000

☐ Other: _____

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☑ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
https://bnsf.railpermitting.com
- ☐ CPKCR
https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

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

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

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

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: 1-800-848-8715
Location: DOT 447865S
RR Milepost: 371.440
Subdivision: Laredo

RRD Review Only
Initials: _____
Date: 10/24/2023

Texas Department of Transportation — *Rail Division*

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS	6/2023	0018	02	091, etc		IH 35, etc.	
		DIST	COUNTY			SHEET NO.	
		22	La Salle, etc.			164	

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.: 764108U
Crossing Type: At-Grade
RR Company Operating Track at Crossing: Union Pacific and BNSF
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 33.713
RR Subdivision: Eagle Pass
City: Eagle Pass
County: Maverick
CSJ at this Crossing: 0018-02-091
Latitude: 28.7085987
Longitude: -100.4982840

Scope of Work, including any TCP, to be performed by State Contractor:

For railroad crossing state contractor will be performing a 2" mill-inlay operation with pavement structure spot base repairs as well as applying pavement markings. Equipment will be going over the railroad crossings.
Any contraflow must be approved in writing by the railroad.

Scope of Work to be performed by Railroad Company:

For railroad crossing Railroad Company will be flagging as support for proposed Overlay Project.

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 2 days

On this project, night or weekend flagging is:

☑ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

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

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad Company
Railroad Emergency Line at: (800)-848-8715
Location: DOT 764108U
RR Milepost: 33.713
Subdivision: Eagle Pass Sub

RRD Review Only
Initials: _____
Date: 09/26/2023

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		0299	13	034		BU277	
6/2023		DIST	COUNTY			SHEET NO.	
		LRD	Maverick			165	

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad 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 written 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 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 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 within 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 course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

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)(UPRR)and 14'-0" (KCS) 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 — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		166

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 1/4 inch 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's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

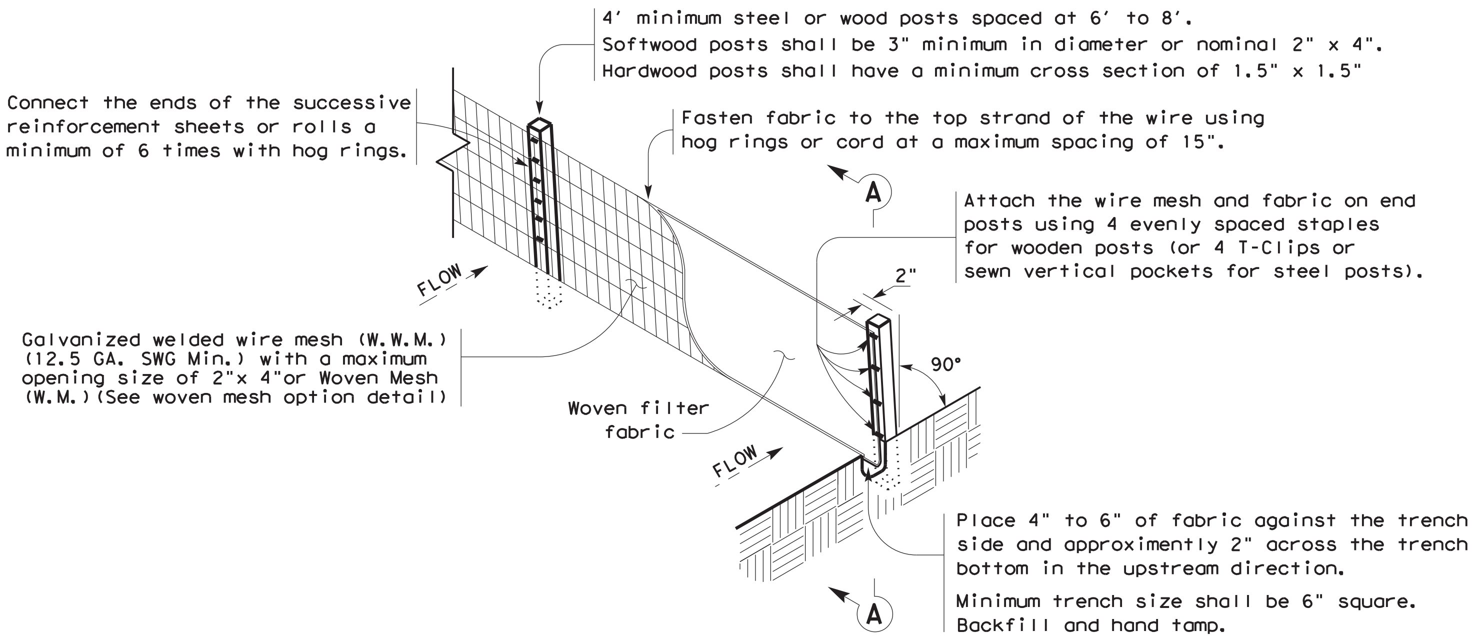
3.16 CLEANING OF RIGHT-OF-WAY

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.

Texas Department of Transportation — Rail Division

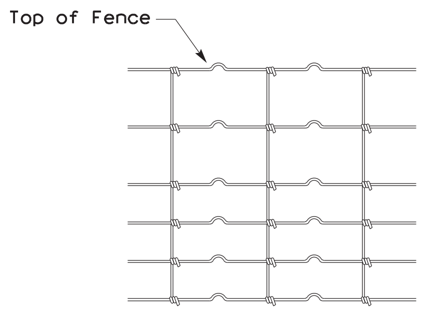
RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		167



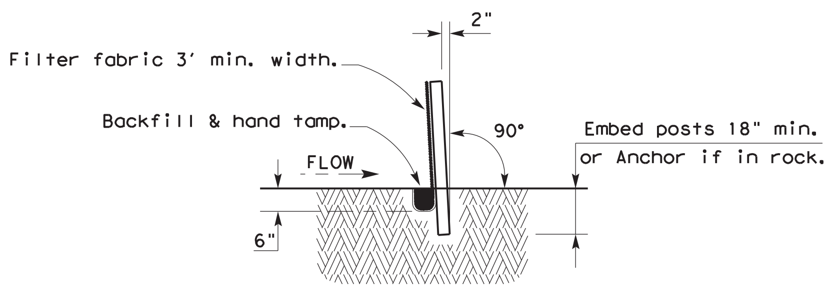
TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.



SECTION A-A

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

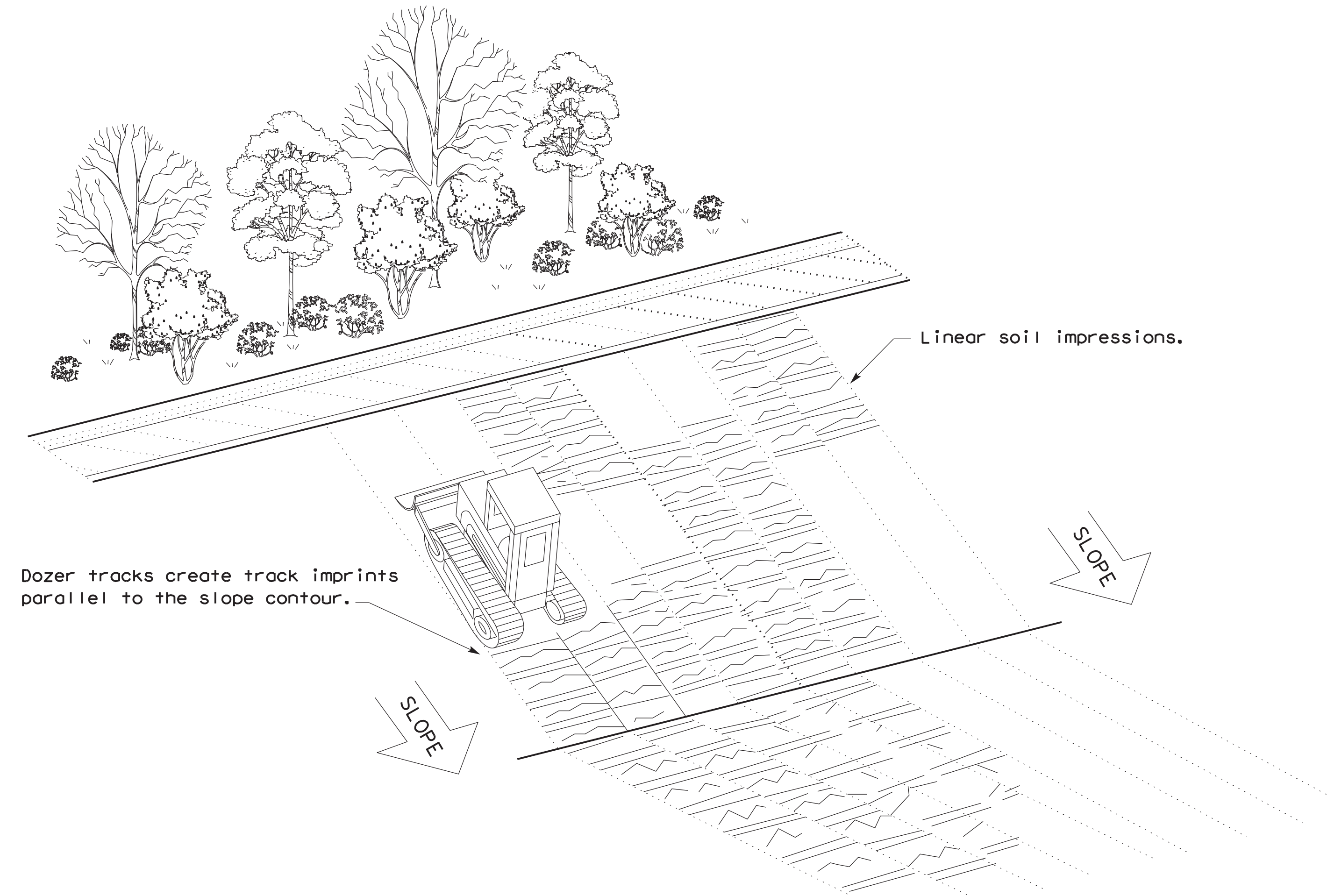
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT / SECT: 0018 02	JOB: 091,etc.		HIGHWAY: IH 35,etc.
REVISIONS	DIST: 22	COUNTY: LA SALLE, Etc.		SHEET NO. 168

12/8/2023
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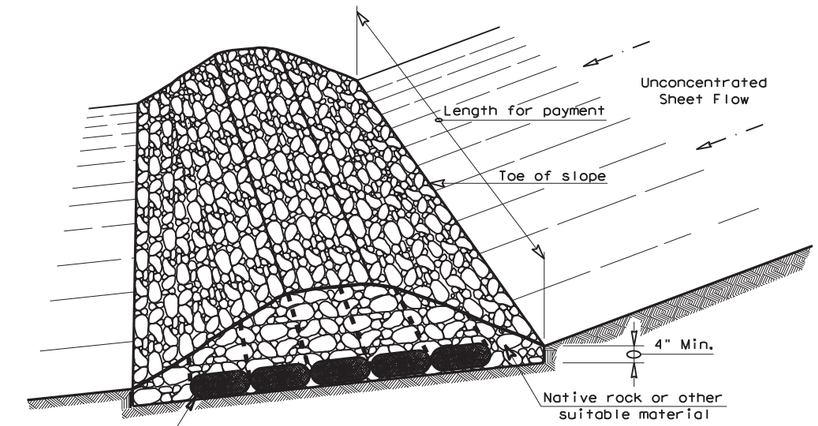
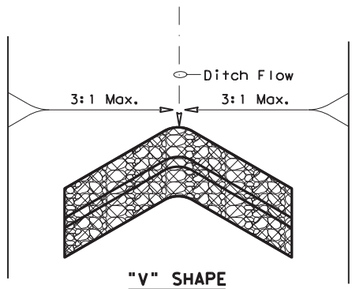
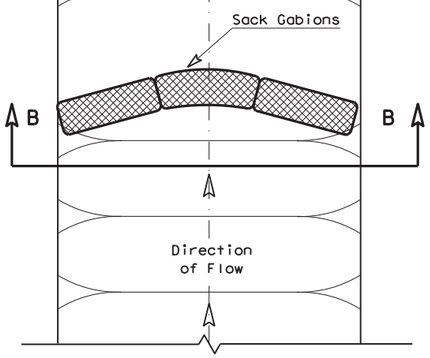


FILTER DAM AT TOE OF SLOPE

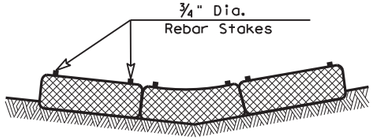
RFD1



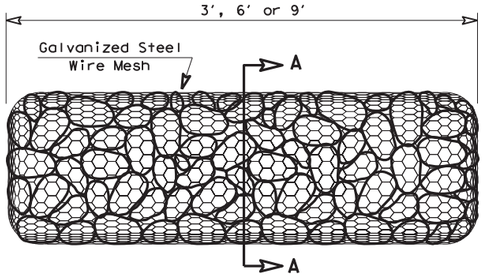
"V" SHAPE
PLAN VIEW



PLAN VIEW

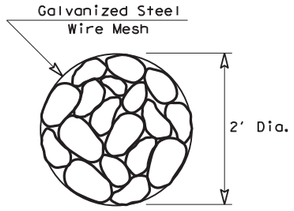


SECTION B-B

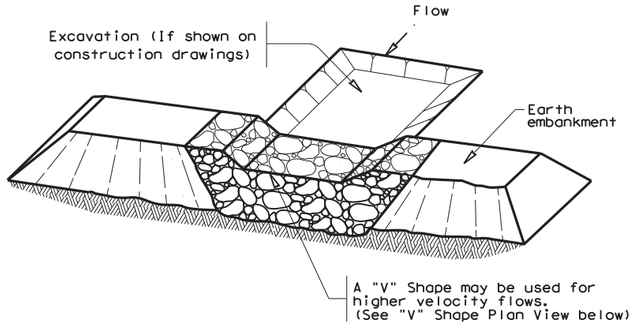


TYPE 4 (SACK GABIONS)

RFD4

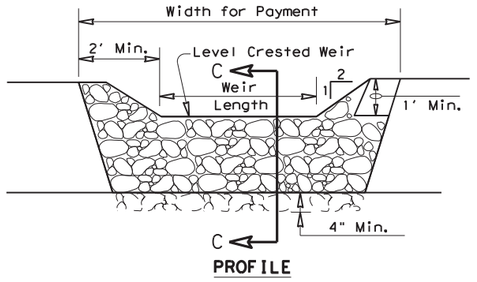


SECTION A-A

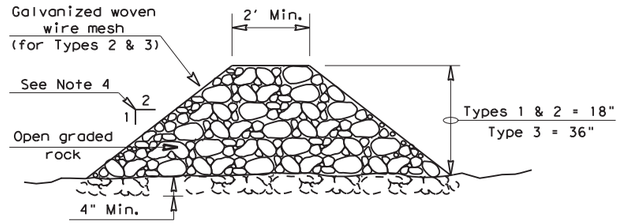


FILTER DAM AT SEDIMENT TRAP

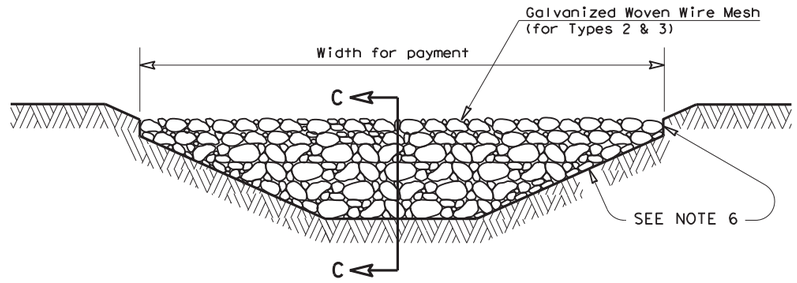
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

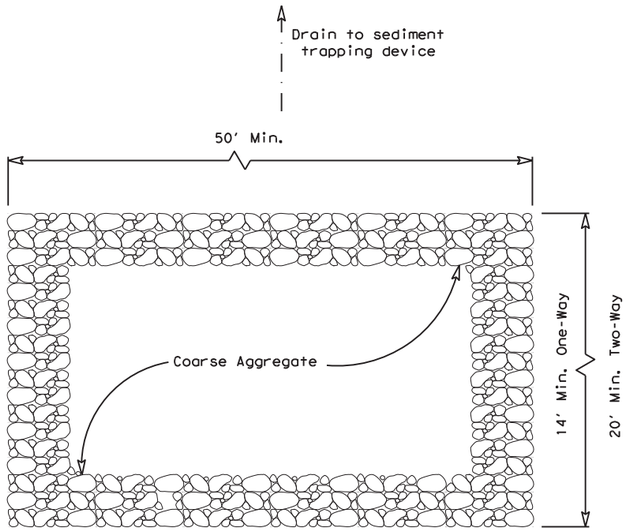
Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

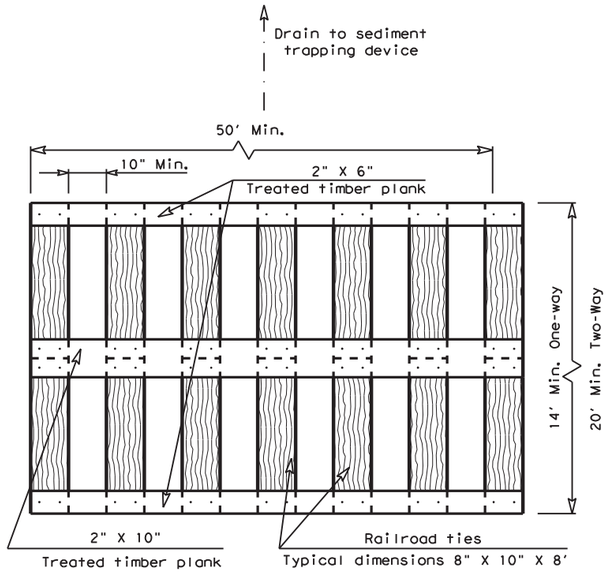
ROCK FILTER DAMS

EC(2)-16

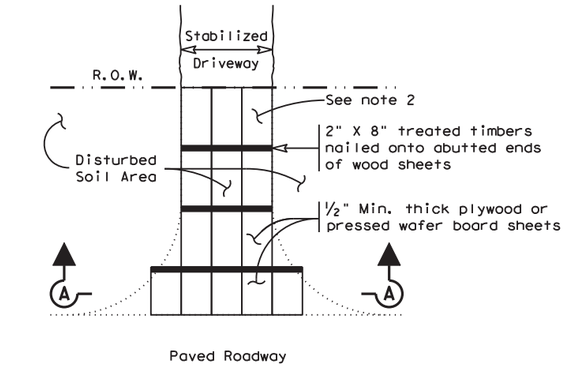
FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		169



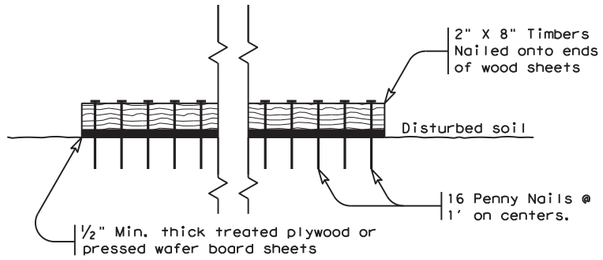
PLAN VIEW



PLAN VIEW



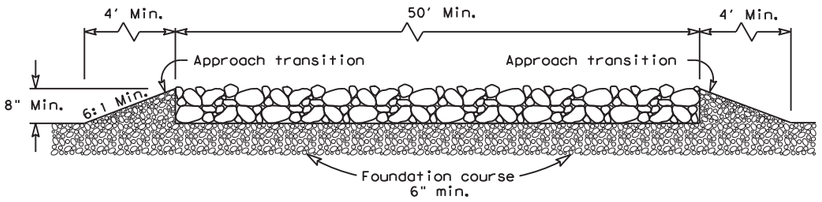
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

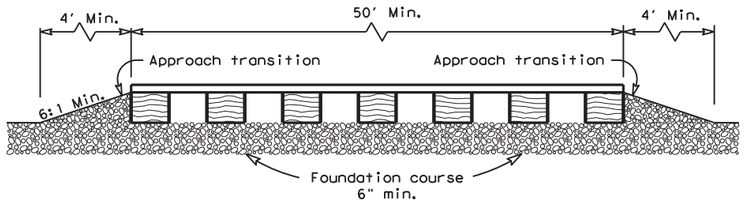
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	02	091,etc.	IH 35,etc.
	DIST	COUNTY		SHEET NO.
	22	LA SALLE, Etc.		170

DATE: 12/8/2023
FILE: c:\txdot\dw_online\txdot5\daniel.garza\d1037603\ec316.dgn

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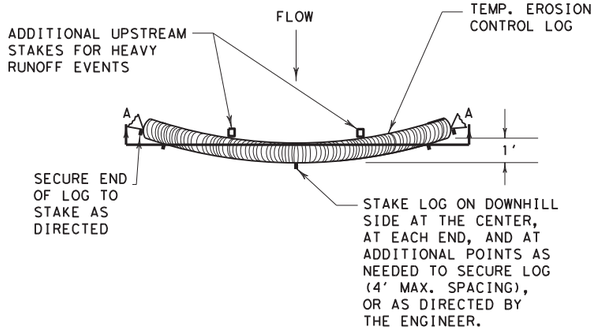
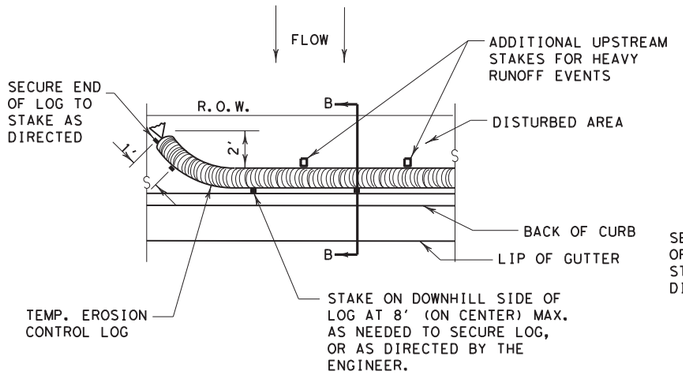
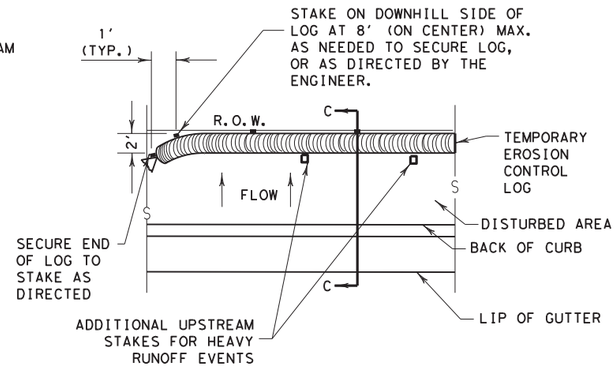


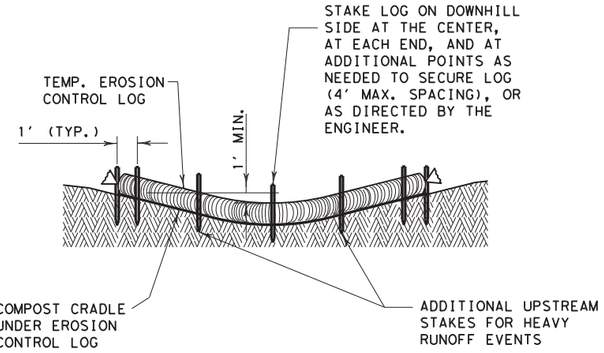
PLAN VIEW



PLAN VIEW



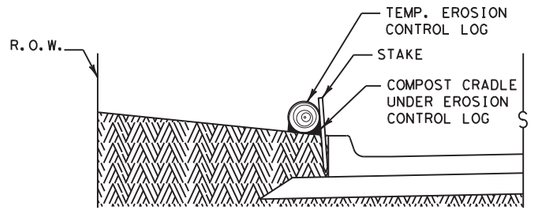
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

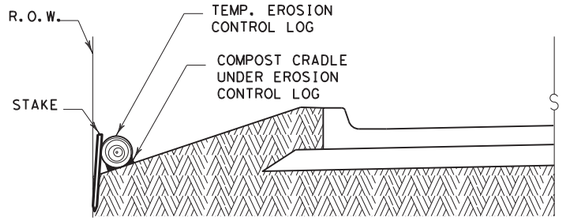
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



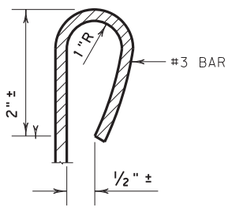
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

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



REBAR STAKE DETAIL

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.

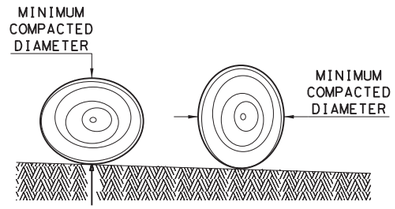
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0018	02	091,etc.		IH 35,etc.		
	DIST	COUNTY			SHEET NO.		
	22	LA SALLE, Etc.			171		

DATE: 12/8/2023
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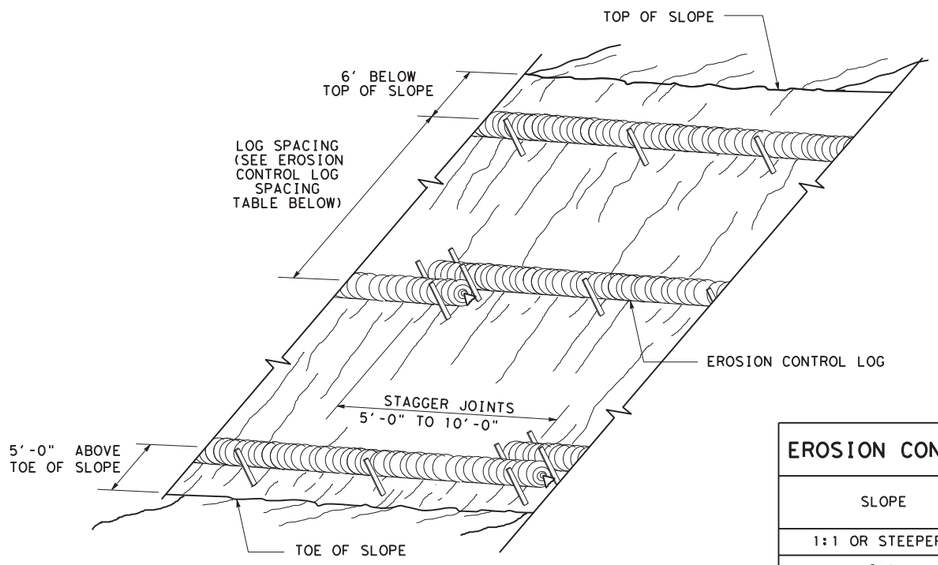
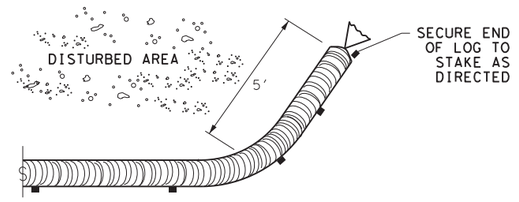


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

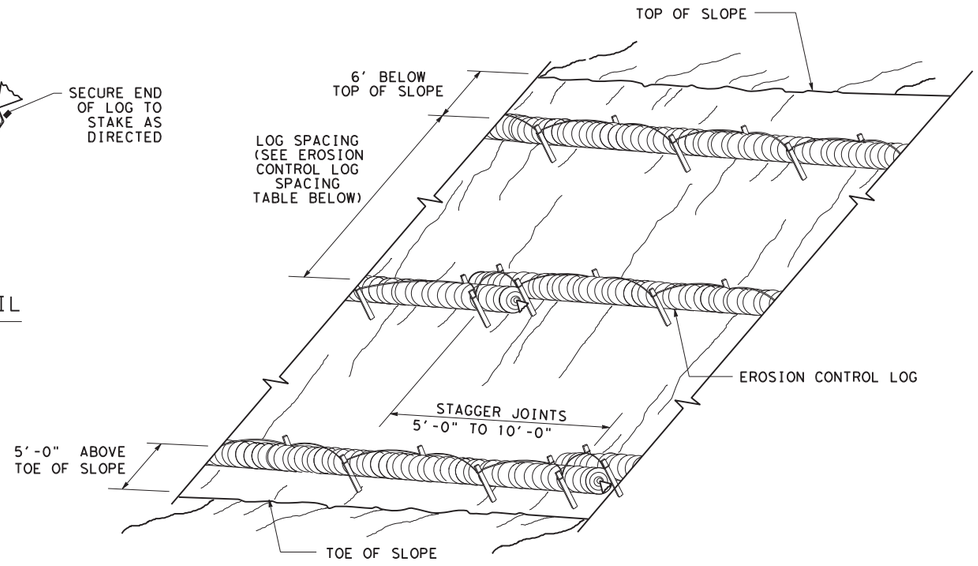
CL-SST



END SECTION RAP DETAIL

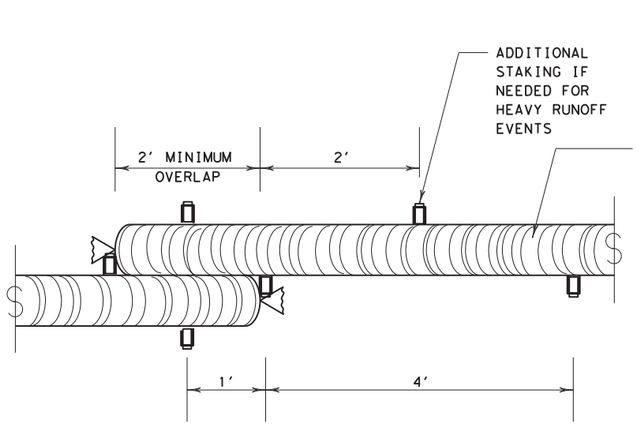
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

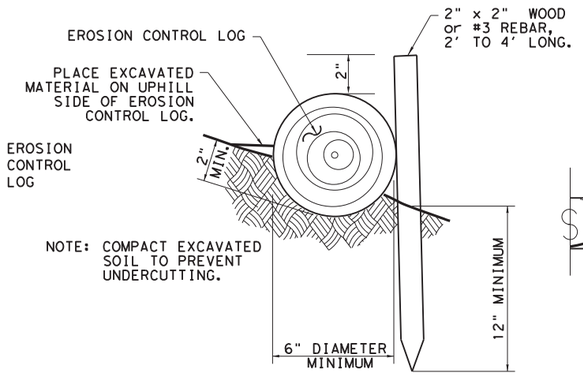
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

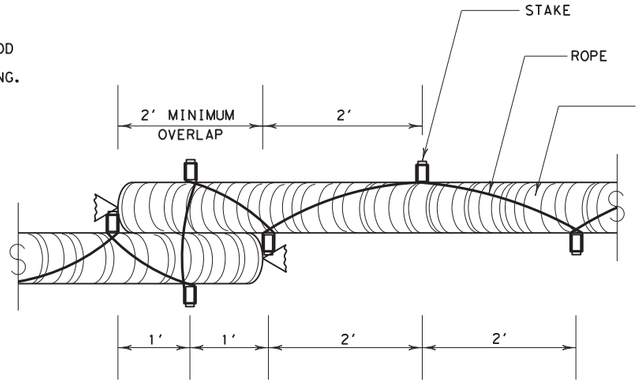


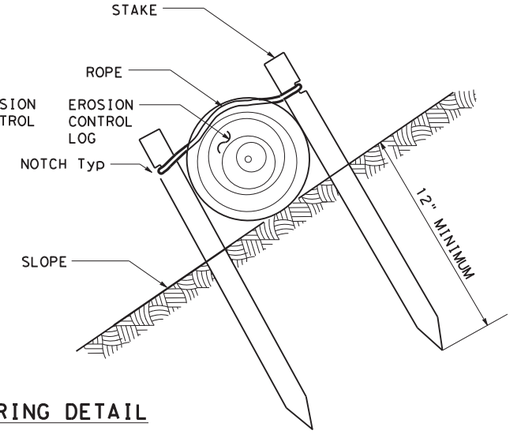


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

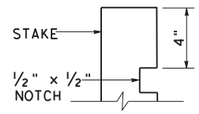
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





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

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0018	02	091,etc.		IH 35,etc.	
	DIST	COUNTY			SHEET NO.	
	22	LA SALLE, Etc.			172	

DATE: 12/8/2023
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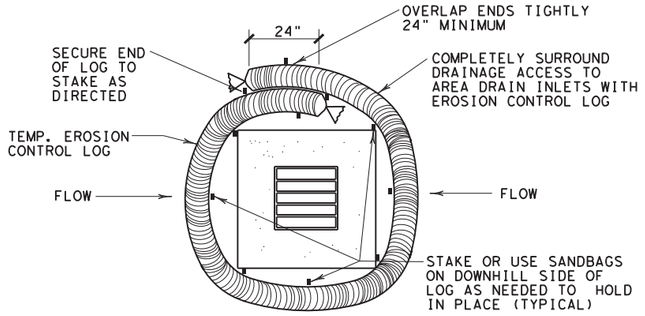
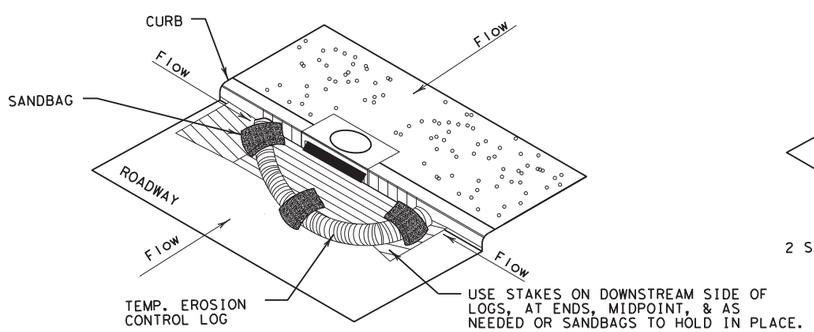


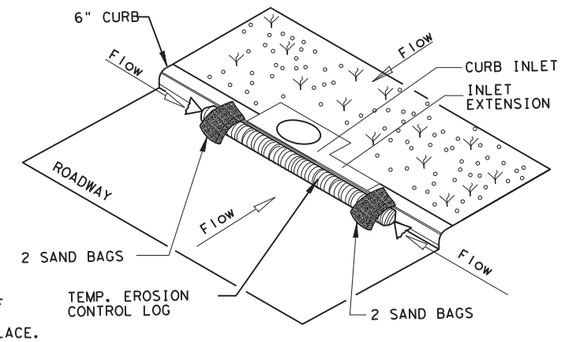
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

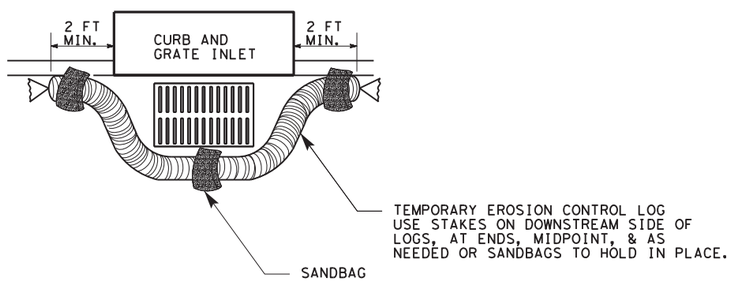
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

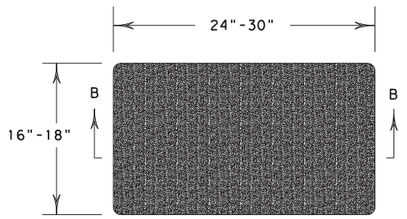
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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

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© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0018	02	091,etc.		IH 35,etc.	
	DIST	COUNTY				SHEET NO.
	22	LA SALLE, Etc.				173

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☒ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. Texas Horned Lizard - The Contractor will avoid harvester ant mound in the selection of PSLs where feasible
2. Texas Tortoise -The Contractor should cover utility trenches overnight, and should visually inspect all trenches before filling.
3. Reticulated Collared Lizard - This lizard may potentially occur in the project area. The Contractor shall avoid harming or handeling this species.
4. Texas Indigo Snake - This snake may potentially occur in the project area. The Contractor shall avoid harming or handeling this species.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

STATE OF TEXAS
CYNTHIA GARCIA
149715
LICENSED
PROFESSIONAL ENGINEER

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12/22/2023

Texas Department of Transportation

IH 35, etc.

ENVIROMENTAL PERMITS ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	02	091,etc.	IH 35,etc.
DIST	COUNTY		SHEET NO.
22	LA SALLE, Etc.		174

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