SEE SHEET 2 FOR INDEX OF SHEETS

CCSJ:0319-01-069
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 40 MPH
A.D.T. (2022) = 5,248
A.D.T. (2042) = 7,347

CSJ:0341-01-030
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 60 MPH
A.D.T. (2022) = 3,317
A.D.T. (2042) = 4,644

CSJ:0336-03-073
FUNCTIONAL CLASS.: PRINCIPAL ARTERIAL
DESIGN SPEED = 75 MPH
A.D.T. (2022) = 3,818
A.D.T. (2042) = 5,498

CSJ:0336-03-074
FUNCTIONAL CLASS.: PRINCIPAL ARTERIAL
DESIGN SPEED = 75 MPH
A.D.T. (2022) = 3,971
A.D.T. (2042) = 5,559

CSJ: 0390-02-051
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 70 MPH
A.D.T. (2022) = 1,706
A.D.T. (2042) = 2,388

CSJ:0175-02-092
FUNCTIONAL CLASS.: PRINCIPAL ARTERIAL
DESIGN SPEED = 80 MPH
A.D.T. (2022) = 7,755
A.D.T. (2042) = 10,857

CSJ:3315-01-025
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 60 MPH
A.D.T. (2022) = 5,524
A.D.T. (2042) = 7,734

CSJ:3315-01-026
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 50 MPH
A.D.T. (2022) = 5,223
A.D.T. (2042) = 7,312

CSJ:3315-01-027
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 65 MPH
A.D.T. (2022) = 3,168
A.D.T. (2042) = 4,435

CSJ:3315-01-028
FUNCTIONAL CLASS.: MINOR ARTERIAL
DESIGN SPEED = 65 MPH
A.D.T. (2022) = 3,683
A.D.T. (2042) = 5,156

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. F 2024(469), ETC.

US 287, ETC.
TRINITY COUNTY, ETC.

CSJ	NET LENGTH OF ROADWAY	
	FT	MI
0319-01-069	12,839.00	2.432
0341-01-030	48,593.30	9.203
0336-03-073	1,712.77	0.324
0336-03-074	46,990.10	8.900
0390-02-051	39,256.85	7.435
0175-02-092	4,830.90	0.915
3315-01-025	19,184.30	3.633
3315-01-026	6,062.00	1.148
3315-01-027	3,266.00	0.619
3315-01-028	12,532.00	2.373
NET LENGTH OF PROJECT	195,267.22	36.982

LIMITS:
(CCSJ: 0319-01-069) US 287 FROM SH 94 TO FM 355
(CSJ: 0341-01-030) US 287 FROM VICKERY ST. TO POLK COUNTY LINE
(CSJ: 0336-03-073) SH 7 FROM HOUSTON COUNTY LINE TO SH 103
(CSJ: 0336-03-074) SH 103 FROM SH 7 TO FM 706 SOUTH
(CSJ: 0390-02-051) SH 147 FROM SH 103 TO FM 83
(CSJ: 0175-02-092) US 59 FROM US 84 TO 0.211 MILES SOUTH OF FM 2141
(CSJ: 3315-01-025) SL 500 FROM SH 87 SOUTH TO SH 7 WEST
(CSJ: 3315-01-026) SL 500 FROM SH 7 EAST TO SH 87 SOUTH
(CSJ: 3315-01-027) SL 500 FROM US 96 NORTH TO BEGIN OF BNSF RR OVERPASS
(CSJ: 3315-01-028) SL 500 FROM END OF BNSF RR OVERPASS TO SH 7 EAST

FOR THE CONSTRUCTION OF OVERLAY
CONSISTING OF RESURFACE WITH THIN OVERLAY MIX

SEE PROJECT LOCATION MAPS
FOR INDIVIDUAL LOCATIONS

NO EXCEPTIONS

EQUATIONS:
(CSJ: 0341-01-030) STA 59+12.3 BK = STA 59+49.0 FWD = -36.7'
(CSJ: 0336-03-073) STA 1593+63.17 BK = STA 1595+42.40 FWD = -179.23'
(CSJ: 0336-03-074) STA 2020+92.40 BK = STA 2021+08.30 FWD = -15.90'
(CSJ: 0390-02-051) STA 771+78.20 BK = STA 350+00 FWD = 42,178.20'
(CSJ: 0390-02-051) STA 694+85.62 BK = STA 649+32.97 FWD = 4,552.65'
(CSJ: 0175-02-092) STA 777+51.90 BK = STA -7-79 FWD = 78,530.90'
(CSJ: 3315-01-025) STA 84+69.06 BK = STA 87+22.76 FWD = -253.70'

RAILROAD CROSSINGS:
(CSJ: 0175-02-092) STA 765+65
(CSJ: 3315-01-025) STA 133+55
(CSJ: 3315-01-028) STA 544+58.39

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023)

PROJECT NO.			
F 2024(469),ETC.			
CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		1

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED: _____

DATE WORK WAS ACCEPTED: _____

FINAL CONTRACT COST: $_____

CONTRACTOR : _____

CONSTRUCTION WORK ON THIS PROJECT WAS PERFORMED IN ACCORDANCE WITH THE PLANS, CONTRACT AND APPROVED CHANGE ORDERS.

_____ DATE _____

BARRICADES AND WARNING SIGNS

PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.

Texas Department of Transportation

RECOMMENDED FOR LETTING: _____

DocuSigned by:
Jennifer H. Adams
CE1DDBE07C00426...
10/2/2023

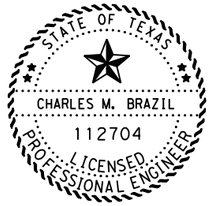
DISTRICT ADVANCE TRANSPORTATION PLANNING DIRECTOR

APPROVED FOR LETTING: _____

DocuSigned by:
Kelly D. Morris, P.E.
F044211639424B4...
10/2/2023

DISTRICT ENGINEER

DATE: 9/29/2023 10:37:20 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design/Plan Set/1. General/Title_Sheet_Border (US 287, etc).dgn



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

DocuSigned by:
AF852E728AEC4C0...
CHARLES M. BRAZIL, P.E.

9/27/2023
DATE

DocuSigned by:
AF852E728AEC4C0...
9/27/2023

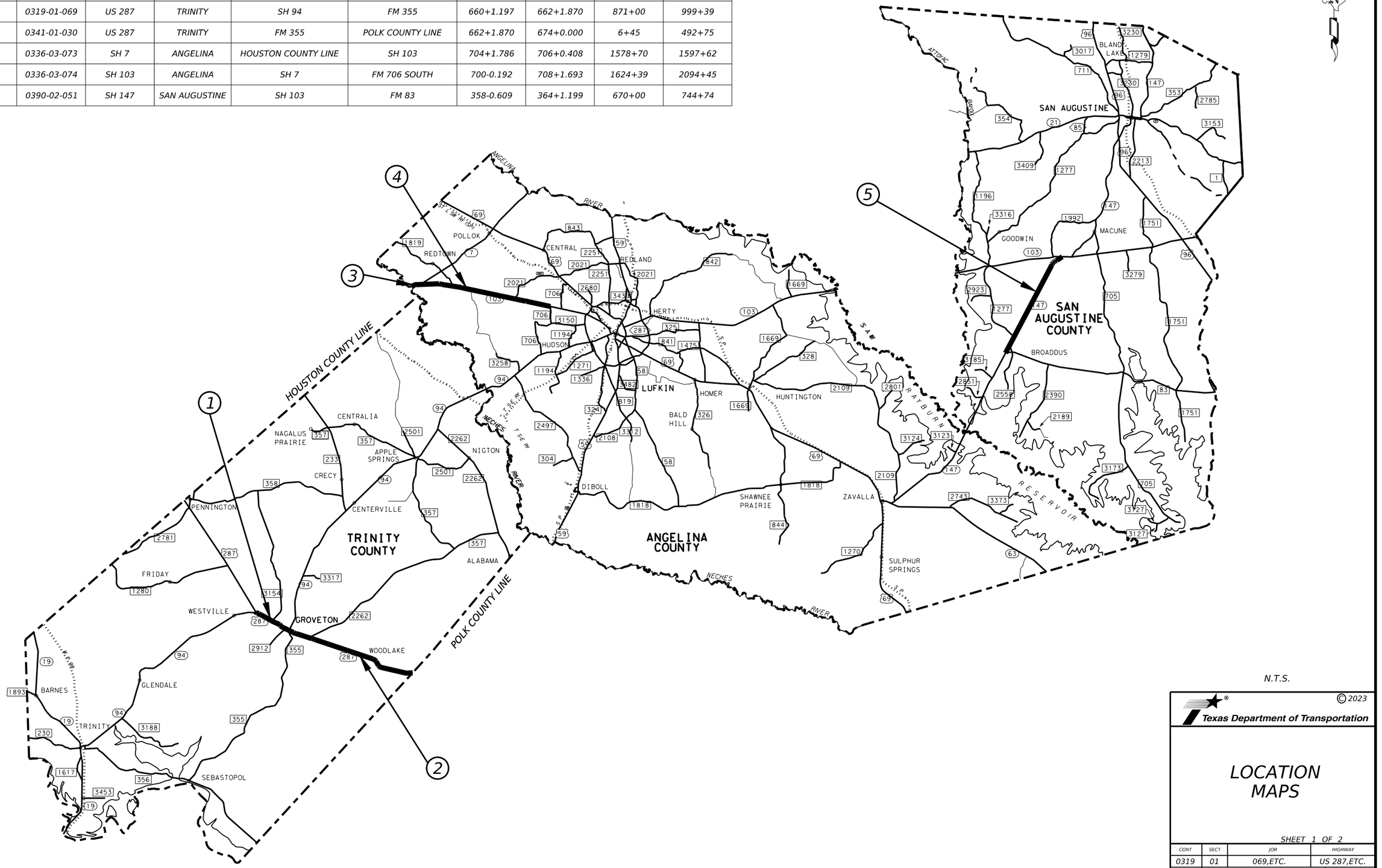
SHEET NO.		*DESCRIPTION*
		GENERAL
	1	*TITLE SHEET*
	2	*INDEX OF SHEETS*
	3-4	*LOCATION MAPS*
	5-18	*TYPICAL SECTIONS*
	19, 19A-19D	*GENERAL NOTES*
	20, 20A-20C	*ESTIMATE & QUANTITY SHEET*
	21-25	*QUANTITY SUMMARIES*
	26	*SUMMARY OF SMALL SIGNS*
	27-32	*INTERSECTION LAYOUTS*
		TRAFFIC CONTROL PLAN
#	*33-44*	*BC(1)-21 THRU BC(12)-21*
#	*45*	*TCP(2-1)-18*
#	*46*	*TCP(2-2)-18*
#	*47*	*TCP(2-3)-23*
#	*48*	*TCP(2-4)-18*
#	*49*	*TCP(3-1)-13*
#	*50*	*TCP(3-3)-14*
#	*51*	*TCP(3-4)-13*
#	*52*	*TCP(6-2)-12*
#	*53*	*TCP(6-4)-12*
#	*54*	*TCP(S-1)-08A*
#	*55*	*TCP(S-2)-08A*
#	*56*	*TCP(S-2c)-10*
#	*57*	*WZ(BRK)-13*
#	*58*	*WZ(RS)-22*
#	*59*	*WZ(STPM)-23*
		TRAFFIC ITEMS
#	*60-62*	*PM(1)-22 THRU PM(3)-22*
		RAILROAD
	63-65	*RAILROAD SCOPE OF WORK*
	66-67	*RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS*
		ENVIRONMENTAL ISSUES
	68	*EPIC*

Texas Department of Transportation

INDEX OF SHEETS

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		2

LOCATION REFERENCE	CSJ	HIGHWAY	COUNTY	LIMITS		REFERENCE MARKER		STATIONS	
				FROM	TO	FROM	TO	FROM	TO
1	0319-01-069	US 287	TRINITY	SH 94	FM 355	660+1.197	662+1.870	871+00	999+39
2	0341-01-030	US 287	TRINITY	FM 355	POLK COUNTY LINE	662+1.870	674+0.000	6+45	492+75
3	0336-03-073	SH 7	ANGELINA	HOUSTON COUNTY LINE	SH 103	704+1.786	706+0.408	1578+70	1597+62
4	0336-03-074	SH 103	ANGELINA	SH 7	FM 706 SOUTH	700-0.192	708+1.693	1624+39	2094+45
5	0390-02-051	SH 147	SAN AUGUSTINE	SH 103	FM 83	358-0.609	364+1.199	670+00	744+74



N.T.S.

Texas Department of Transportation

LOCATION MAPS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		3

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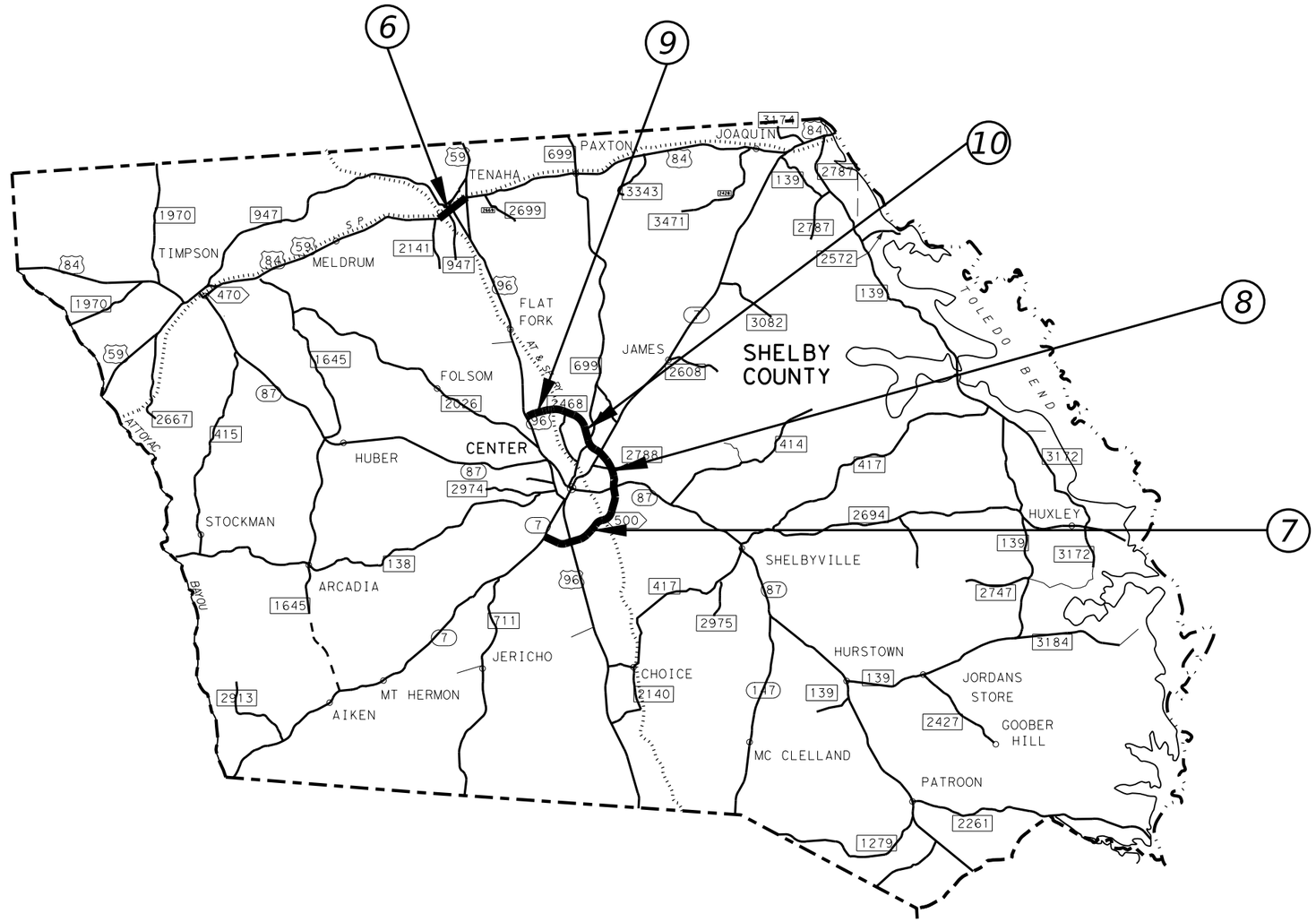
LOCATION REFERENCE	CSJ	HIGHWAY	COUNTY	LIMITS		REFERENCE MARKER		STATIONS	
				FROM	TO	FROM	TO	FROM	TO
6	0175-02-092	US 59	SHELBY	US 84	0.211 MILES NORTH OF FM 2141	328+1.081	328+2.062	(#) 33+00	760+00
7	3315-01-025	SL 500	SHELBY	SH 87 SOUTH	SH 7 WEST	326+1.272	330+0.979	197+30	0+32
8	3315-01-026	SL 500	SHELBY	SH 7 EAST	SH 87 SOUTH	324+1.985	326+1.272	203+00	263+62
9	3315-01-027	SL 500	SHELBY	US 96 NORTH	BEGIN OF BNSF RR OVERPASS	324-1.347	324-0.736	500+42	533+08
10	3315-01-028	SL 500	SHELBY	END OF BNSF RR OVERPASS	SH 7 EAST	324-0.483	324+1.985	546+08	671+40

NOTE: (#) INCIDENTAL CONSTRUCTION APPROXIMATELY 570'
(FROM STA 33+00 TO STA 27+30)



N.T.S.

Texas Department of Transportation

LOCATION MAPS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		4

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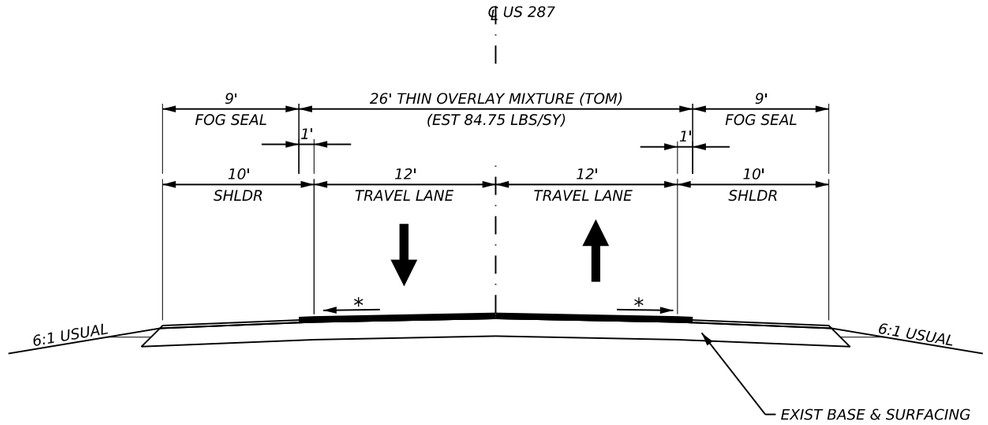
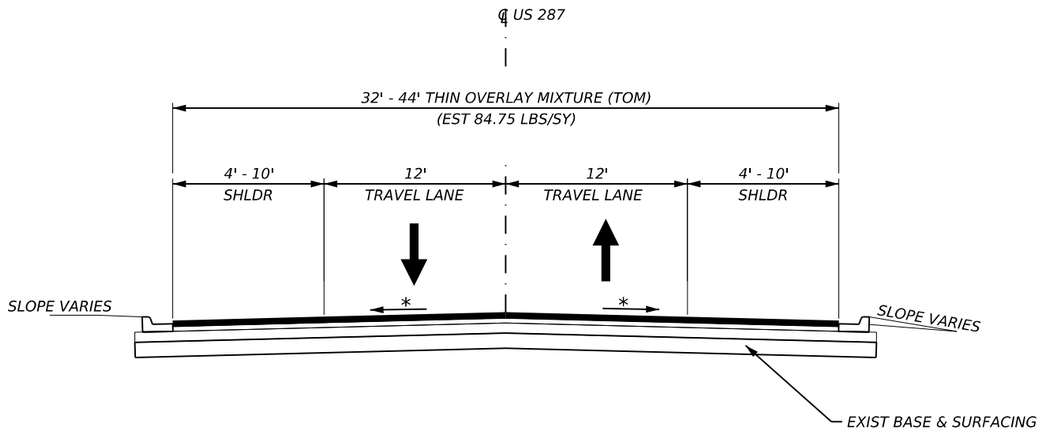
* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT



REF 1 - US 287 TYPICAL SECTION
(CSJ:0319-01-069)

STA 871+00 TO STA 963+30



REF 1 - US 287 TYPICAL SECTION
(CSJ:0319-01-069)

STA 963+30 TO STA 966+00 (44' PAVEMENT)
STA 966+00 TO STA 966+30 (44' PAVEMENT)
STA 968+78 TO STA 992+87 (32' PAVEMENT)

TRANSITIONS:
STA 966+30 TO STA 968+78 (44' TO 32' PAVEMENT)
STA 992+87 TO STA 999+39 (32' TO 38' PAVEMENT)

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
P.E.

9/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

SHEET 1 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		5

DATE: 9/25/2023 10:37:17 AM
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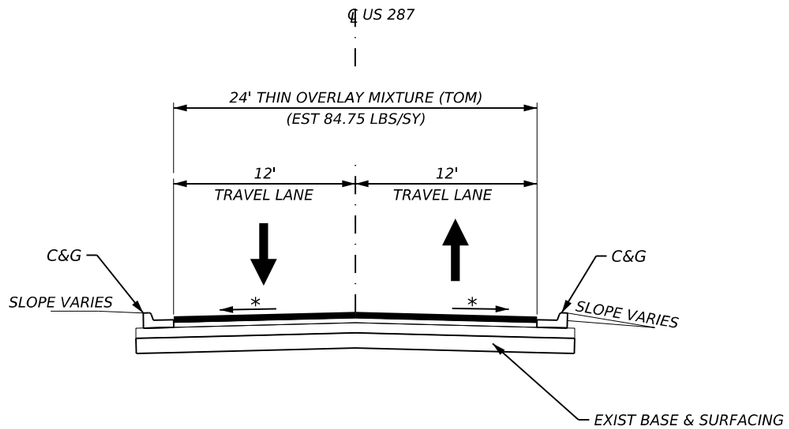
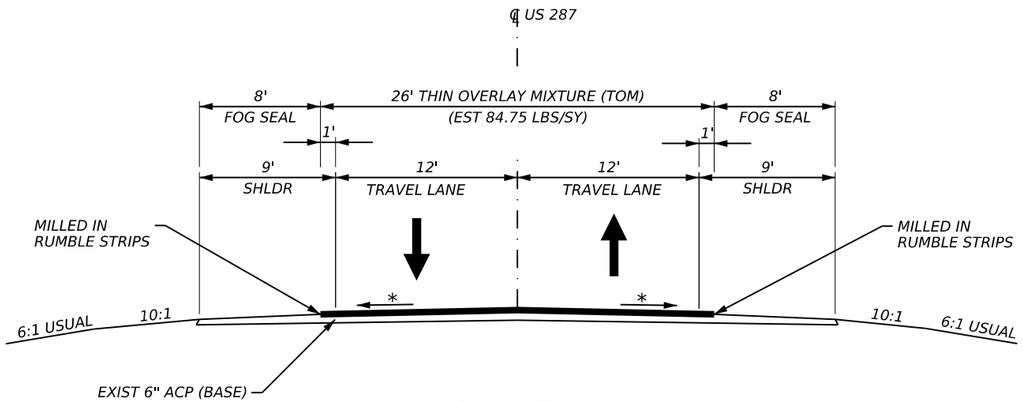


REF 2 - US 287 TYPICAL SECTION
(CSJ:0341-01-030)

STA 6+45 TO STA 21+69



REF 2 - US 287 TYPICAL SECTION
(CSJ:0341-01-030)

STA 21+69 TO STA 492+75

EQUATION: STA 59+12.3 BK = 59+49.0 FWD = -36.7'

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
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9/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

SHEET 2 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		6

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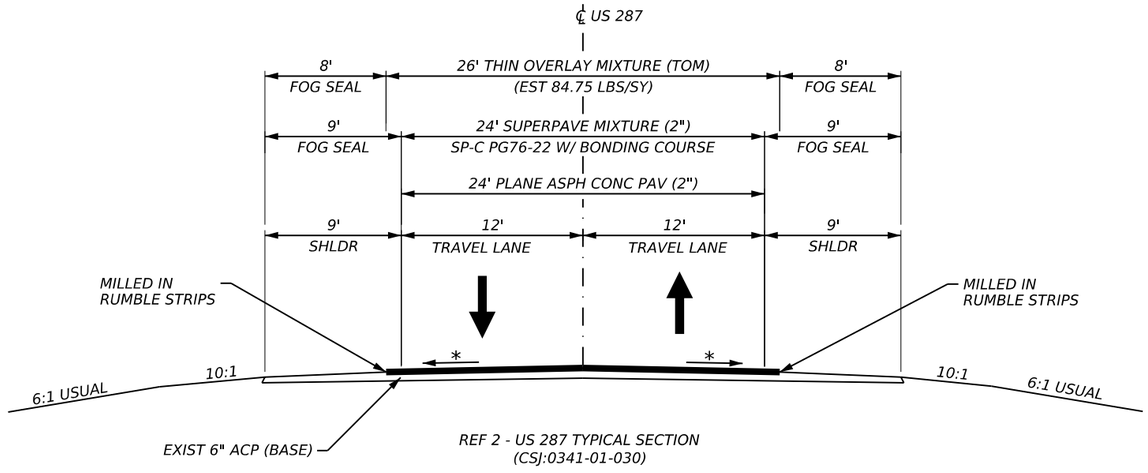
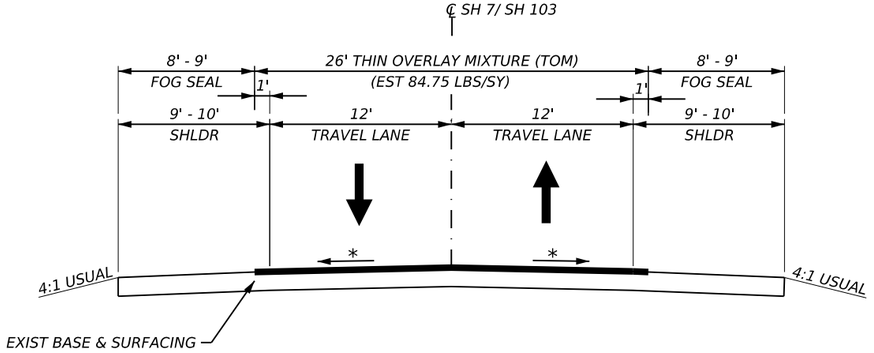


REF 2 - US 287 TYPICAL SECTION
(CSJ:0341-01-030)

STA 152+00 TO STA 215+00

NOTE: 24' PLANE ASPH CONC PAV (2") AND
INLAY 24' SP-C PG 70-22
SPENCER ROAD TO TRUSCOTT ROAD



REF 3/4 - SH 7 TYPICAL SECTION
(CSJ:0336-03-073, 074)

CSJ 0336-03-073:
STA 1578+70 TO STA 1580+72 (42' PAVEMENT)
STA 1580+72 TO STA 1593+18 (44' PAVEMENT)
STA 1593+18 TO STA 1597+62 (42' PAVEMENT)

CSJ 0336-03-074:
STA 1624+39 TO STA 1682+33 (44' PAVEMENT)
STA 1698+33 TO STA 1758+34 (42' PAVEMENT)
STA 1779+34 TO STA 1831+84 (42' PAVEMENT)
STA 1851+34 TO STA 1935+12 (42' PAVEMENT)
STA 1957+56 TO STA 1999+13 (42' PAVEMENT)
STA 2023+32 TO STA 2084+00 (42' PAVEMENT)

TRANSITIONS:
STA 1682+33 TO STA 1687+58 (44' TO 46' PAVEMENT)
STA 1758+34 TO STA 1763+59 (42' TO 46' PAVEMENT)
STA 1831+84 TO STA 1837+08 (42' TO 46' PAVEMENT)
STA 1935+12 TO STA 1940+60 (42' TO 44' PAVEMENT)
STA 1940+60 TO STA 1957+56 (44' TO 42' PAVEMENT)
STA 1999+13 TO STA 2004+60 (42' TO 52' PAVEMENT)
STA 2084+00 TO STA 2094+45 (42' TO 64' PAVEMENT)

EQUATIONS: STA 1593+63.17 BK = 1595+42.40 FWD = -179.23'
STA 2020+92.40 BK = STA 2021+08.30 FWD = -15.90'

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
9/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

SHEET 3 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		7

DATE: 9/26/2023 12:46:25 PM
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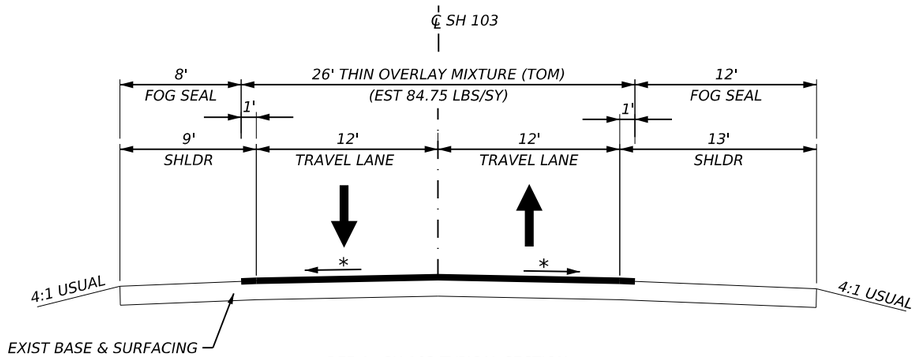


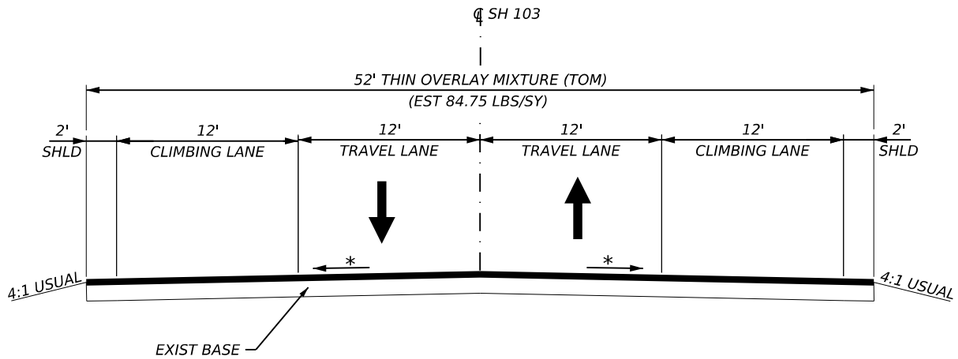
REF 4 - SH 103 TYPICAL SECTION
(CSJ:0336-03-074)

STA 1687+58 TO STA 1693+08 (46' PAVEMENT)
STA 1763+59 TO STA 1774+08 (46' PAVEMENT)
STA 1837+08 TO STA 1846+09 (46' PAVEMENT)

TRANSITIONS:
STA 1693+08 TO STA 1698+33 (46' TO 42' PAVEMENT)
STA 1774+08 TO STA 1779+34 (46' TO 42' PAVEMENT)
STA 1846+09 TO STA 1851+34 (46' TO 42' PAVEMENT)

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT



REF 4 - SH 103 TYPICAL SECTION
(CSJ:0336-03-074)

CLIMBING LANE
STA 2004+60 TO STA 2018+10

TRANSITION:
STA 2018+10 TO STA 2023+32 (52' TO 42' PAVEMENT)

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

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AF852E728AEC4C0...

9/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

SHEET 4 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		8

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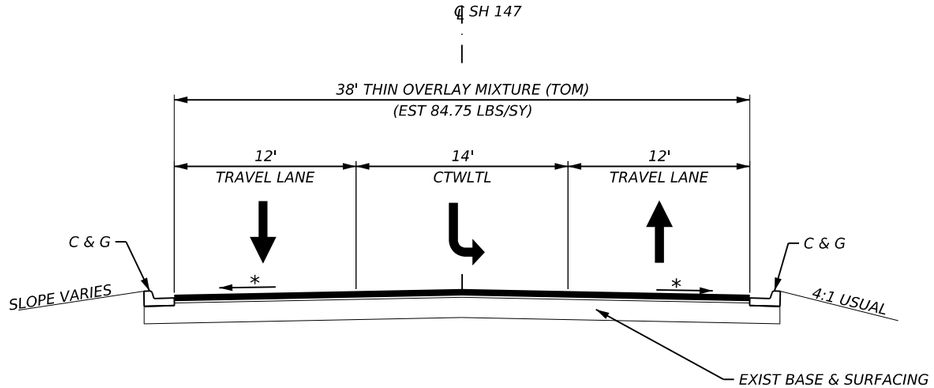

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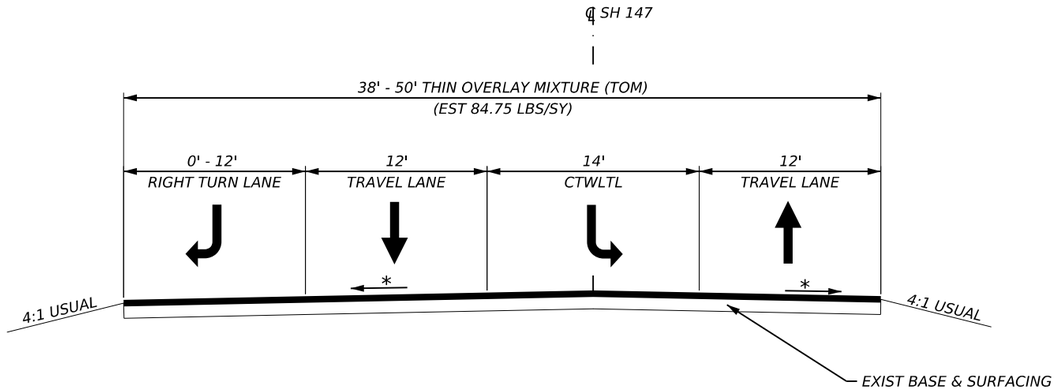
(CSJ:0390-02-051)

STA 744+74 TO STA 359+00



REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

STA 359+00 TO STA 390+96.20 (38' PAVEMENT)
STA 390+96.2 TO STA 392+96.20 (50' PAVEMENT)

EQUATION: STA 771+78.20 BK = STA 350+00 FWD = +42,178.20'

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...
9/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

SHEET 5 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		9

DATE: 9/25/2023 10:37:31 AM
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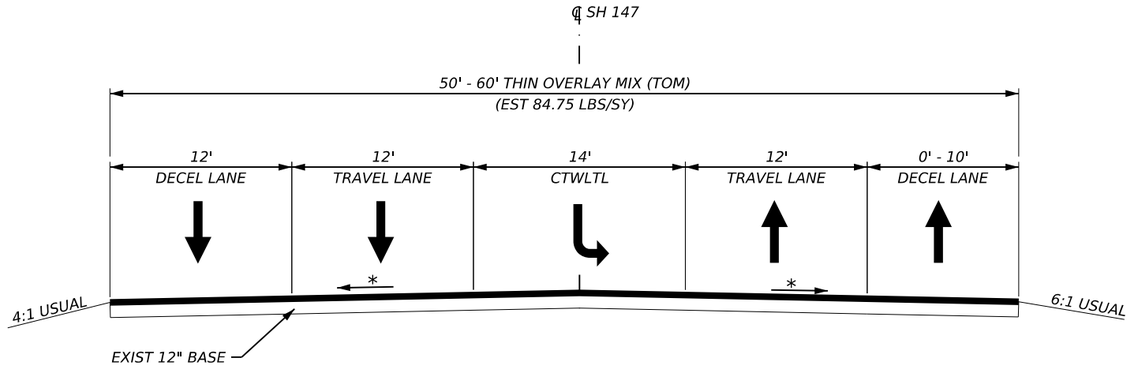
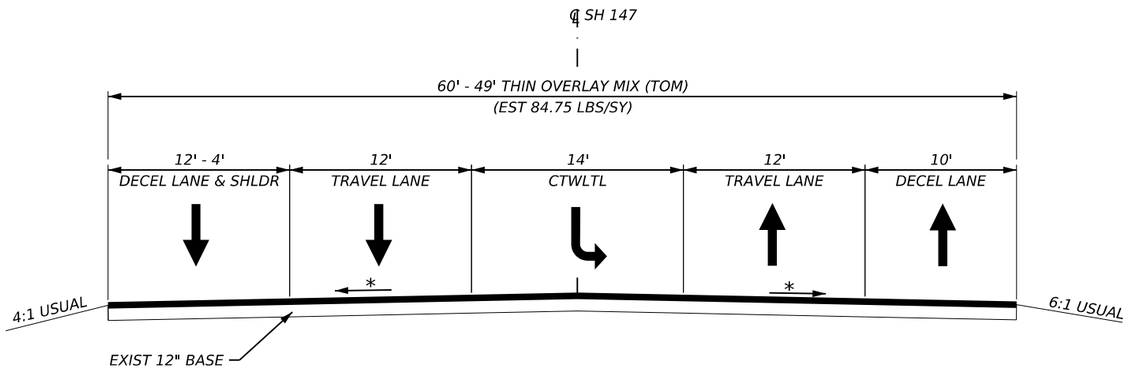


REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

TRANSITION:
STA 392+96.20 TO STA 395+00 (50' TO 60' PAVEMENT)



REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

TRANSITION:
STA 395+00 TO STA 396+00 (60' TO 49' PAVEMENT)

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

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P.E.

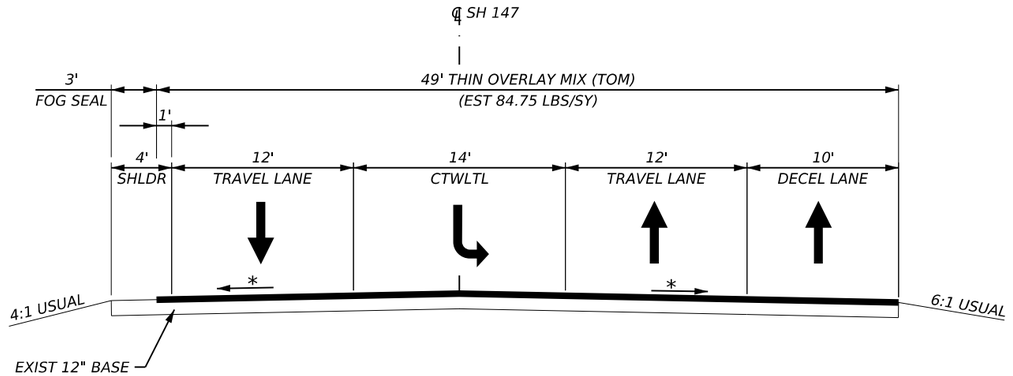
9/27/2023

Texas Department of Transportation

TYPICAL SECTIONS

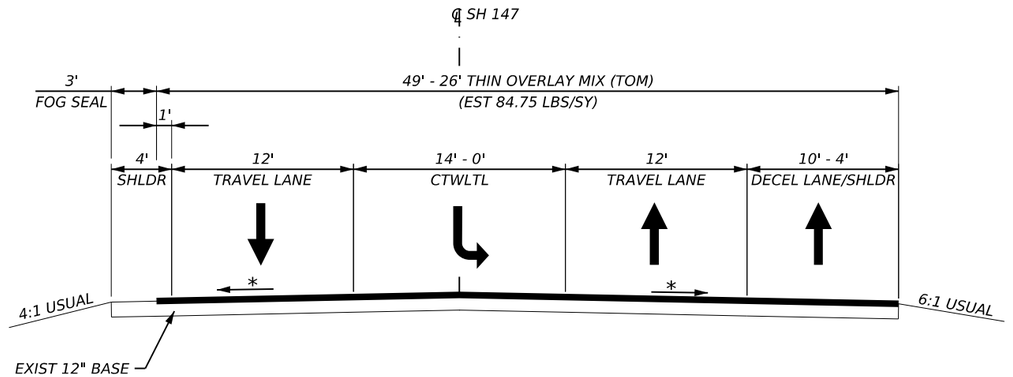
SHEET 6 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		10



REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

STA 396+00 TO STA 403+12.89



REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

STA 403+12.89 TO STA 407+62.89

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

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TYPICAL SECTIONS

SHEET 7 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		11

DATE: 9/25/2023 10:37:31 AM
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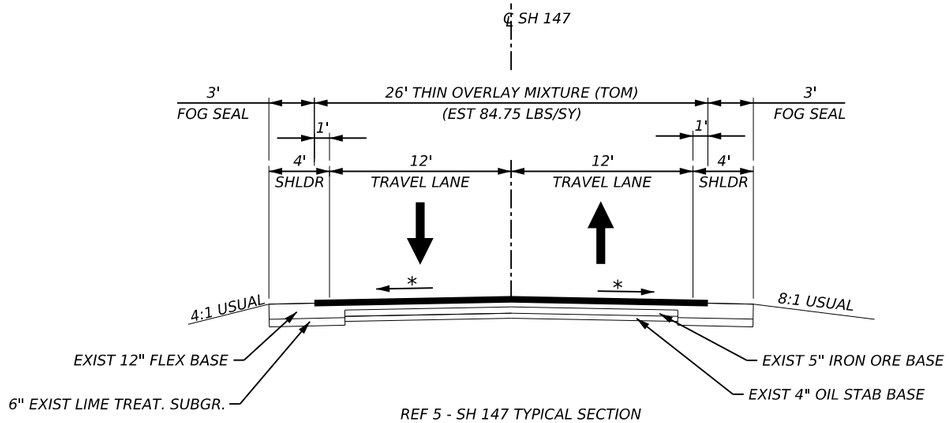
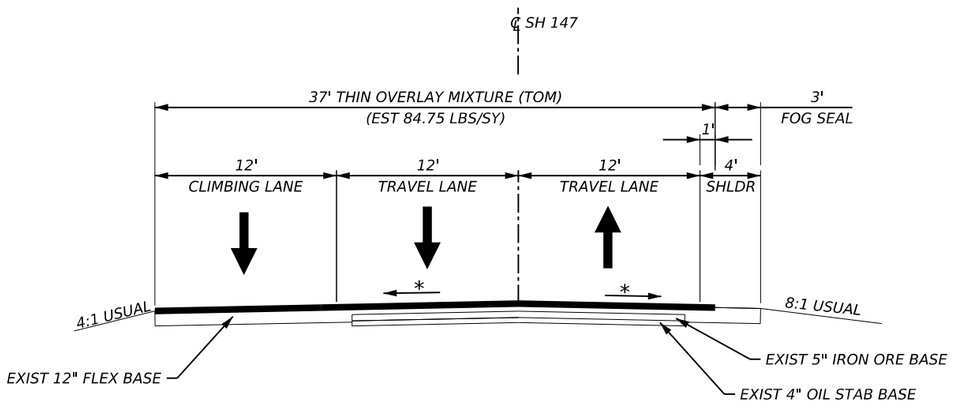


REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

STA 407+62.89 TO STA 654+00
STA 680+00 TO STA 694+85.62
STA 649+32.97 TO STA 670+00

NOTE: STA 649+32.97 TO STA 670+00 OCCURS AFTER EQUATION AT STA 694+85.62



REF 5 - SH 147 TYPICAL SECTION
(CSJ:0390-02-051)

CLIMBING LANE**
STA 654+00 TO STA 680+00

EQUATION: STA 694+85.62 BK = STA 649+32.97 FWD = +4,552.65'

**CLIMBING LANE OCCURS BEFORE THE EQUATION ABOVE

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

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9/27/2023

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TYPICAL SECTIONS

SHEET 8 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		12

DATE: 9/25/2023 10:37:31 AM
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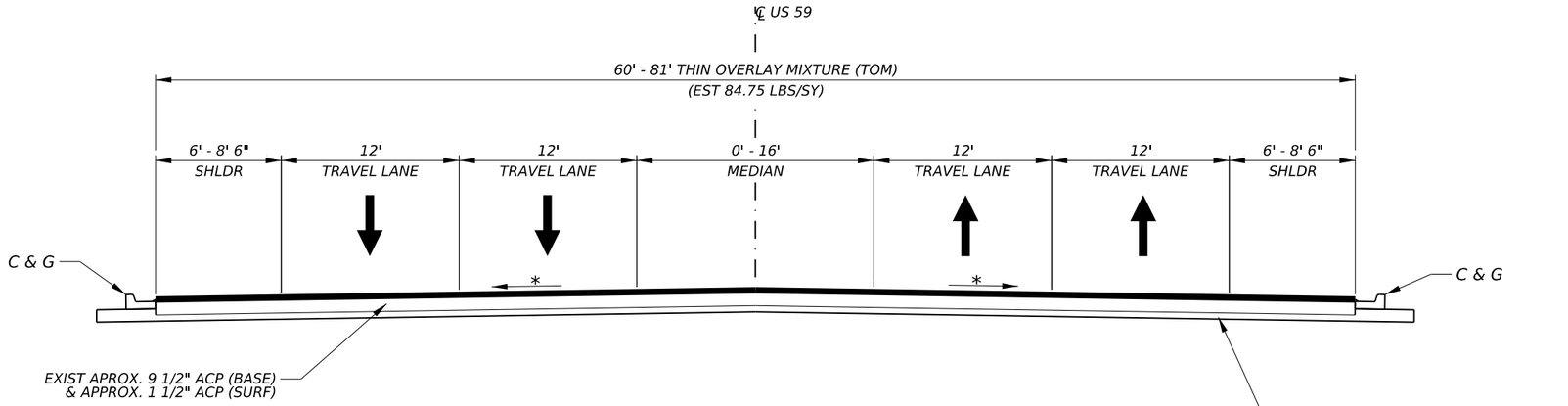
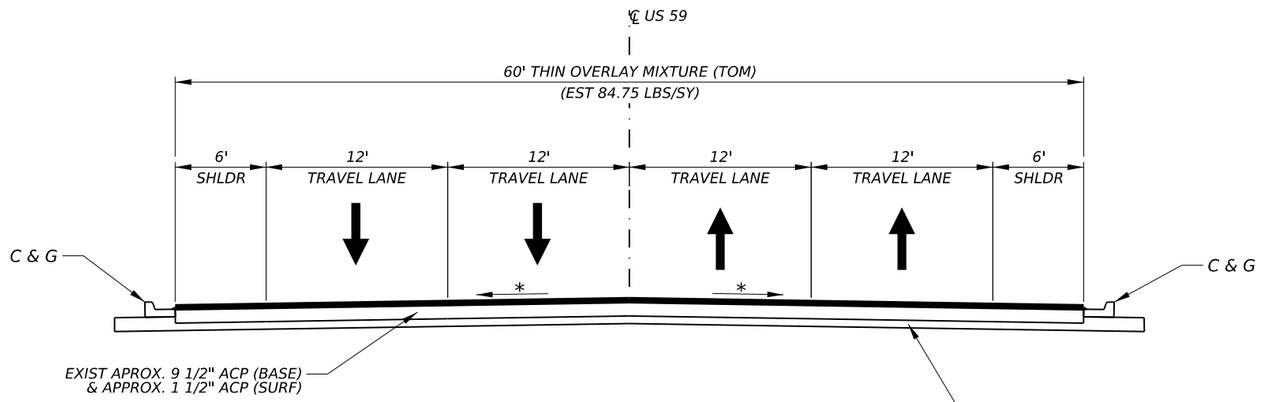
CK
DW
CK
DW



REF 6 - US 59 TYPICAL SECTION
(CSJ:0175-02-092)

STA 770+00 TO STA 772+00 (81' PAVEMENT)

TRANSITION:
STA 772+00 TO STA 774+00 (81' TO 60' PAVEMENT)



REF 6 - US 59 TYPICAL SECTION
(CSJ:0175-02-092)

STA 774+00 TO STA 777+51.90
STA 777+51.90 TO STA -7+79
STA -7+79 TO STA 7+68

EQUATION: STA 777+51.90 BK = STA -7+79 FWD = -78,530.90'

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

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TYPICAL SECTIONS

SHEET 9 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		13

DATE: 9/25/2023 10:37:36 AM
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DATE: 9/25/2023 10:37:36 AM
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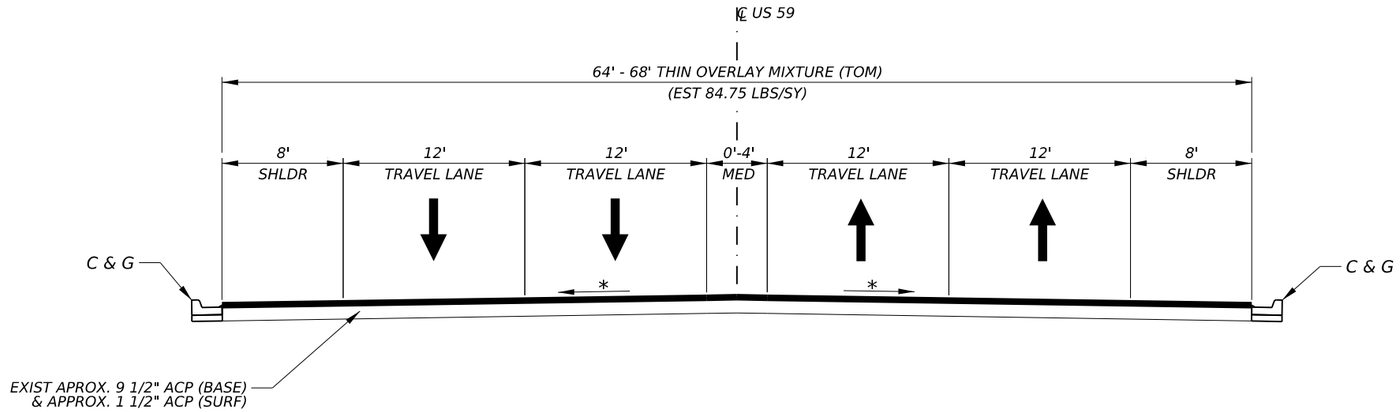
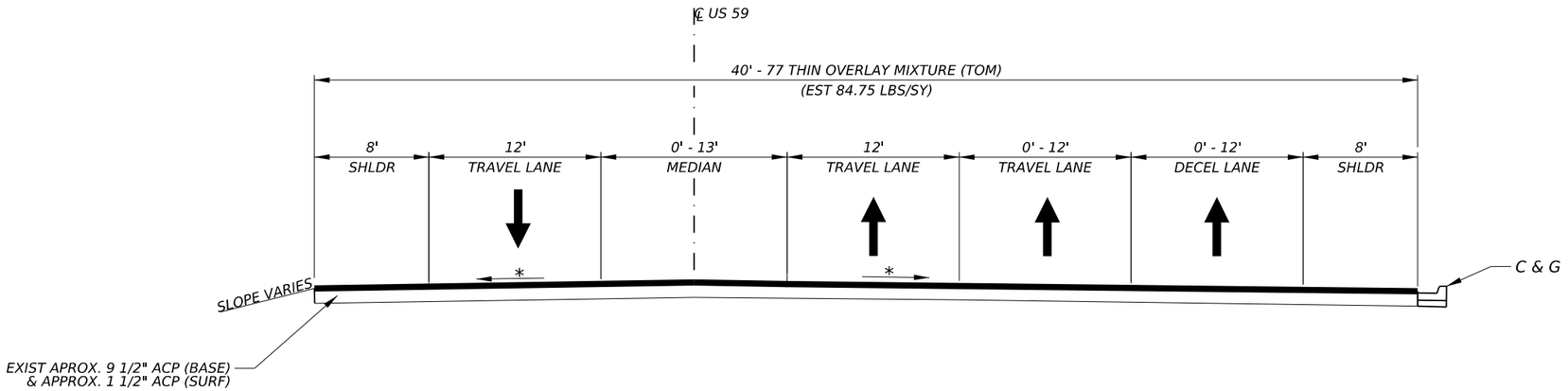


REF 6 - US 59 TYPICAL SECTION
(CSJ:0175-02-092)

STA 9+00 TO STA 16+95.30 (68' PAVEMENT)

TRANSITION:
STA 7+68 TO STA 9+00 (64' TO 68' PAVEMENT)



REF 6 - US 59 TYPICAL SECTION
(CSJ:0175-02-092)

TRANSITIONS:
STA 16+95.30 TO STA 20+25 (68' TO 77' PAVEMENT)
STA 20+25 TO STA 28+84.17 (77' TO 65' PAVEMENT)
STA 28+84.17 TO STA 30+00 (65' TO 49' PAVEMENT)
STA 30+00 TO STA 33+00 (49' TO 40' PAVEMENT)

* MATCH EXIST CROSS SLOPE

EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT

SCALE 1" = 10'

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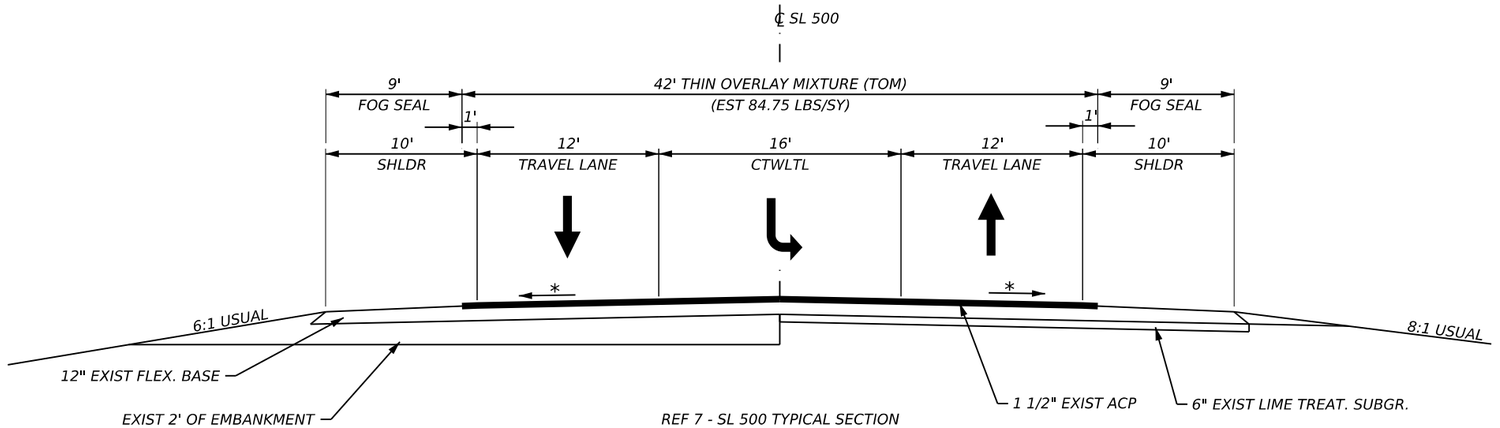
TYPICAL SECTIONS

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		14

* MATCH EXIST CROSS SLOPE

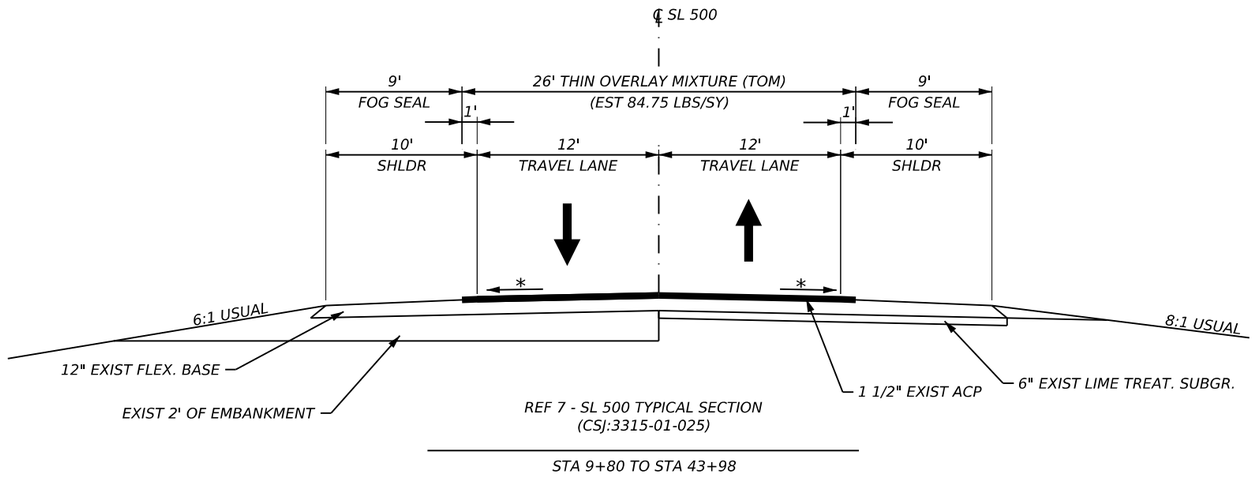
EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT



REF 7 - SL 500 TYPICAL SECTION
(CSJ:3315-01-025)

STA 0+32 TO STA 5+80
STA 47+98 TO STA 53+58

TRANSITIONS:
STA 5+80 TO STA 9+80 (60' TO 44' PAVEMENT)
STA 43+98 TO STA 47+98 (44' TO 60' PAVEMENT)



REF 7 - SL 500 TYPICAL SECTION
(CSJ:3315-01-025)

STA 9+80 TO STA 43+98

SCALE 1" = 10'

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TYPICAL SECTIONS

SHEET 11 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		15

DATE: 9/25/2023 10:37:40 AM
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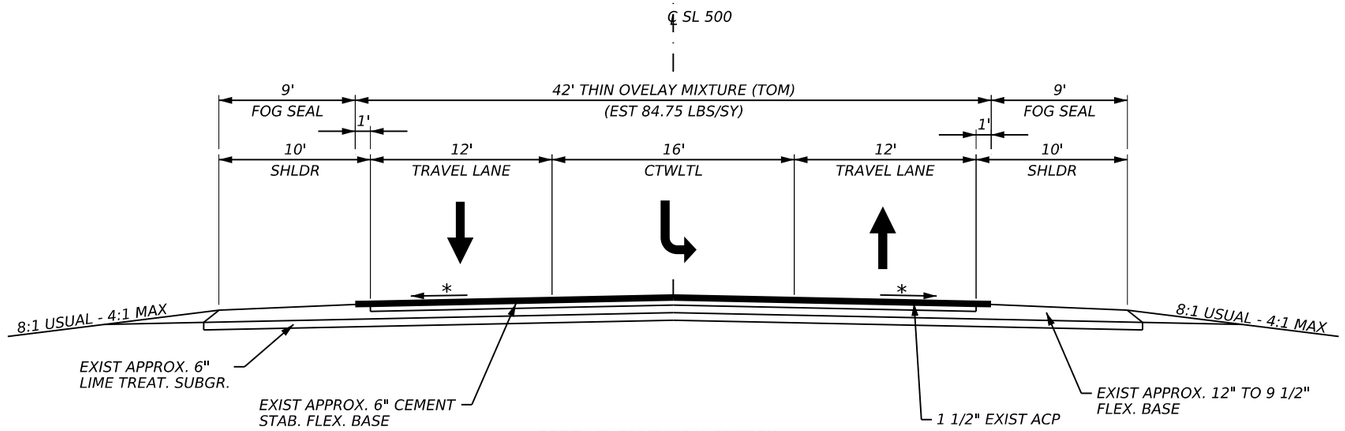
* MATCH EXIST CROSS SLOPE

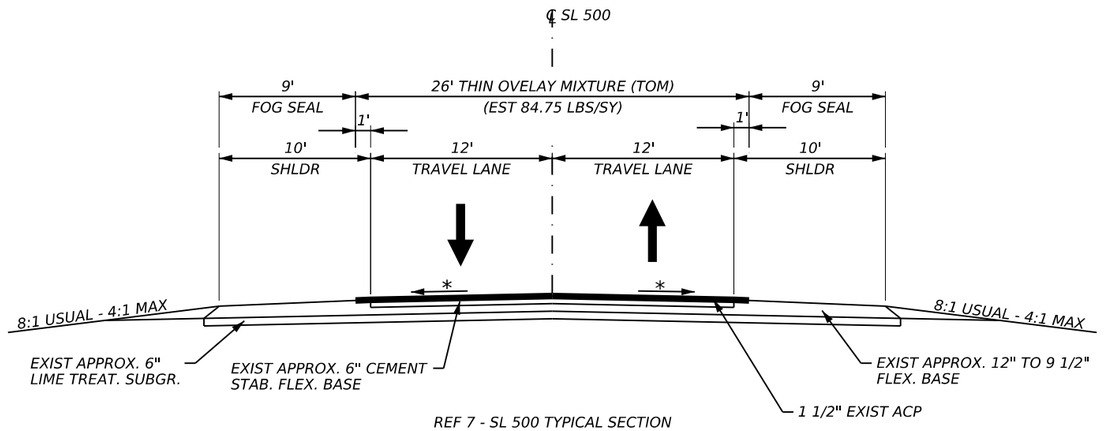
EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT



REF 7 - SL 500 TYPICAL SECTION
(CSJ:3315-01-025)

STA 53+58 TO STA 59+00
STA 194+97 TO STA 197+30

TRANSITIONS:
STA 59+00 TO STA 64+00 (60' TO 44' PAVEMENT)
STA 181+71 TO STA 194+97 (44' TO 60' PAVEMENT)



REF 7 - SL 500 TYPICAL SECTION
(CSJ:3315-01-025)

STA 64+00 TO STA 134+63
STA 137+23 TO STA 181+71

BRIDGE:
STA 134+63 TO STA 137+23

EQUATION: STA 84+69.06 BK = STA 87+22.76 FWD = -253.70'

SCALE 1" = 10'

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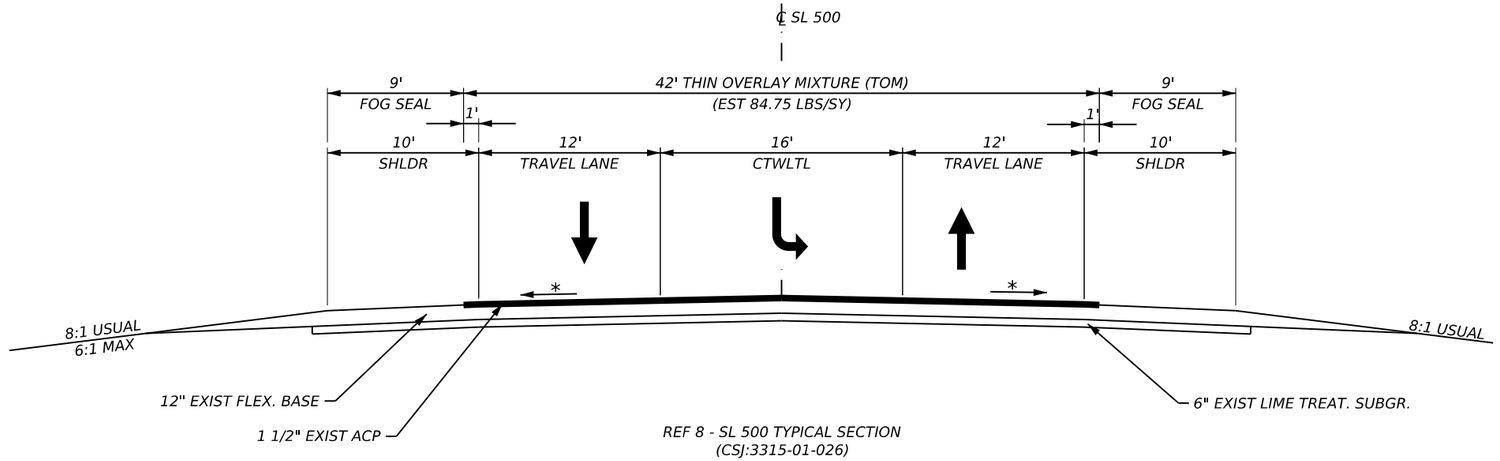
TYPICAL SECTIONS

SHEET 12 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		16

* MATCH EXIST CROSS SLOPE

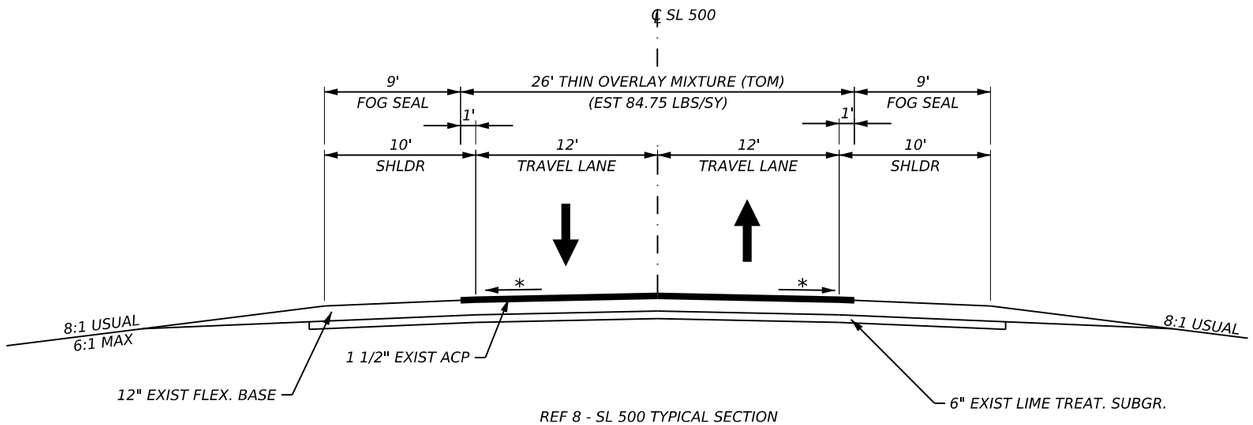
EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT



REF 8 - SL 500 TYPICAL SECTION
(CSJ:3315-01-026)

STA 203+00 TO STA 208+50

TRANSITIONS:
STA 208+50 TO STA 212+50 (60' TO 44' PAVEMENT)
STA 261+75 TO STA 263+62 (44' TO 60' PAVEMENT)



REF 8 - SL 500 TYPICAL SECTION
(CSJ:3315-01-026)

STA 212+50 TO STA 261+75

SCALE 1" = 10'

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TYPICAL SECTIONS

SHEET 13 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		17

DATE: 9/25/2023 10:37:45 AM
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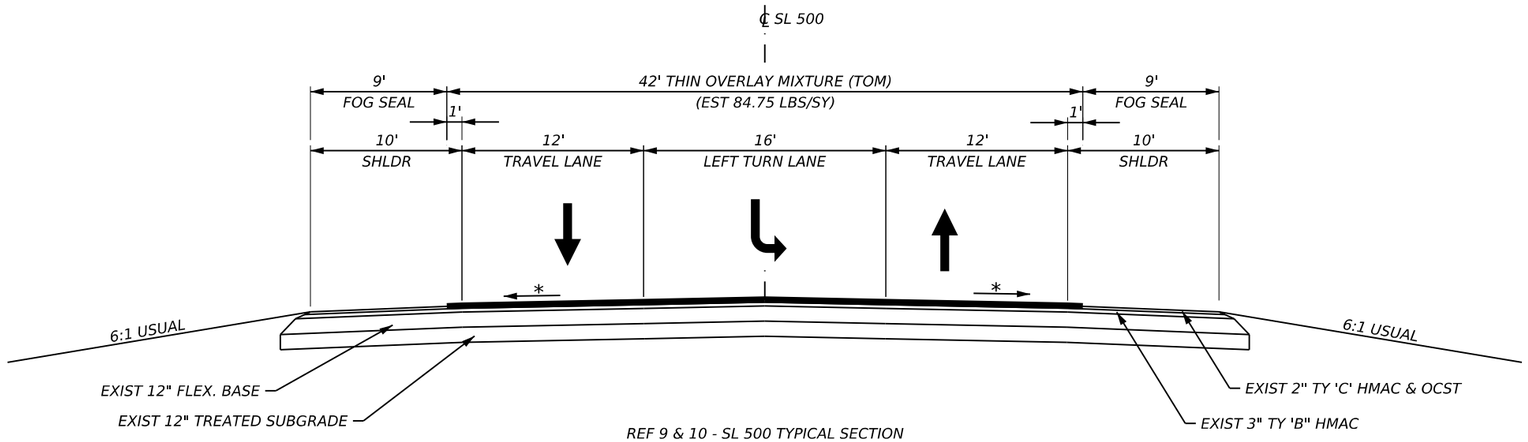
* MATCH EXIST CROSS SLOPE

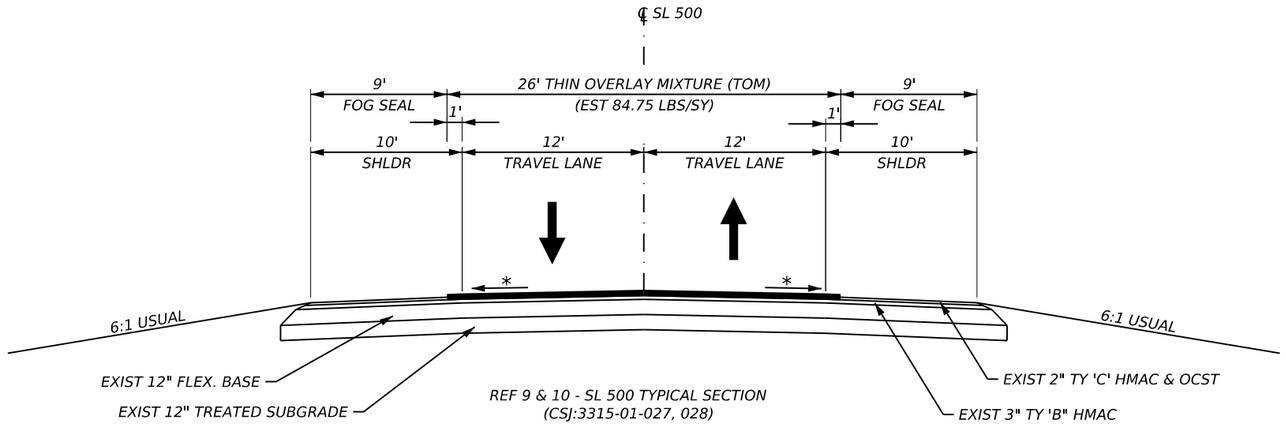
EXISTING EDGELINE MILLED RUMBLE STRIPS NOT TO BE COVERED BY TOM IF PRESENT



REF 9 & 10 - SL 500 TYPICAL SECTION
(CSJ:3315-01-027, 028)

CSJ 3315-01-027:
STA 500+42 TO STA 508+53
TRANSITION:
STA 508+53 TO STA 513+73 (60' TO 44' PAVEMENT)

CSJ 3315-01-028
STA 565+85 TO STA 581+30
STA 641+50 TO STA 657+50
STA 667+90 TO STA 671+40
TRANSITIONS:
STA 581+30 TO STA 586+50 (60' TO 44' PAVEMENT)
STA 657+50 TO STA 662+70 (60' TO 44' PAVEMENT)



REF 9 & 10 - SL 500 TYPICAL SECTION
(CSJ:3315-01-027, 028)

CSJ 3315-01-027:
STA 513+73 TO STA 533+08

CSJ 3315-01-028:
STA 546+08 TO STA 560+65
STA 586+50 TO STA 636+30
TRANSITIONS:
STA 560+65 TO STA 565+85 (44' TO 60' PAVEMENT)
STA 636+30 TO STA 641+50 (44' TO 60' PAVEMENT)
STA 662+70 TO STA 667+90 (44' TO 60' PAVEMENT)

SCALE 1" = 10'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED PROFESSIONAL ENGINEER

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TYPICAL SECTIONS

SHEET 14 OF 14

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		18

DATE: 9/25/2023 10:37:49 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design/Plan Set/1. General/3315-01-027, 028 Typical Section.dgn

GENERAL NOTES:

Existing regulatory, warning and guide signs within project limits are to remain visible to the traveling public at all times. If a sign must be repositioned during construction operations, move and install the sign to an approved location. Use care when working near existing signs and repair or replace signs damaged by work operations. All work involved repositioning existing signs will be subsidiary to various bid items.

Furnish materials and make repairs to the existing roadway at any location damaged by construction operations. This work shall be done in an approved manner and will be subsidiary to various bid items.

Maintain adequate surface drainage throughout the project limits during all phases of construction.

Roadway cross slopes shall conform approximately to the existing surface, unless otherwise directed.

Provide suitable access at all times to adjacent businesses, private property and side roads.

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

The contractor's attention is directed to the EPIC sheet(s) included in this plan set for additional information regarding environmental permits, issues, and commitments.

Project Mowing

Mow at locations where contract work, equipment or stockpiles conflict with TxDOT's mowing operations. Mowing will not be measured or paid for directly, but will be subsidiary to various bid items.

Litter Pickup

In addition to the requirements in Item 5, Section 11, Final Cleanup; remove litter from the right of way at locations where the Contractor may be required to mow. Litter pickup will not be measured or paid for directly, but will be subsidiary to various bid items.

For removal of large dead animals, contact nearest TxDOT maintenance section for disposal instructions. Do not bury animal carcasses on State property.

Item 6: Control of Materials

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

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

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

Item 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

The proposed work of this project is for the construction of overlay consisting of overlay with a thin overlay mix. This activity maintains the original line and grade, hydraulic capacity and original purpose of the site. Therefore, this project meets the definition of a routine maintenance activity as defined in the TPDES General Permit No. TXR150000 issued March 5, 2018 and 2023 TCEQ's TPDES CGP does not apply.

Dispose of all vegetative matter and any other materials removed from State Right of Way in accordance with applicable environmental laws, rules, regulations and requirements.

Burning locations must be approved by the Engineer prior to beginning. Burning activities must be conducted in compliance with Texas Commission on Environmental Quality (TCEQ) regulations. Notify the Engineer when burning activities will take place.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15

to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

Red-cockaded Woodpecker (federally listed endangered species) habitat is present adjacent to the ROW along SH 147 (CSJ: 0390-02-051) in San Augustine County. Conservation measures have been agreed upon by the United States Fish and Wildlife Service and TxDOT to ensure that the proposed action will not adversely affect the red-cockaded woodpecker. The conservation measures below must be followed in order to be in compliance with the Endangered Species Act:

1. WORK shall begin one hour after sunrise and cease one hour before sunset.
2. NO STOCKPILES or EQUIPMENT STORAGE shall be allowed along or within the ROW along SH 147 within the Angelina National Forest from SH 103 to 3.5 miles south of FM 2928 to 3.8 miles south of SH 103.

Engineer shall notify United States Forest Service prior to starting work on the roadways listed below. NO stockpiling or equipment storage is allowed along the roadway limits listed below.

1. Angelina National Forest: SH 147 (CSJ: 0390-02-051) from SH 103 to 1.10 miles south of SH 103 and from 2.0 miles south of SH 103 to 7.35 miles south of SH 103.
2. Davy Crockett National Forest: US 287 (CSJ: 0319-01-069) from SH 94 to 1.3 miles east of SH 94 and from FM 2262 to 2.2 miles east of FM 2262.

Item 8: Prosecution and Progress

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.4, “Standard Workweek”.

A 90-day delay has been included to allow extra time for mobilization and material processing.

No lane closures will be allowed after Noon on Fridays or on days preceding National Holidays unless otherwise approved.

Submit monthly progress schedules no later than the 20th calendar day of the month. Failure to comply with this deadline may result in the Engineer withholding progress (monthly) payments.

Item 354: Planing and Texturing Pavement

Complete planing operations in adjacent lanes and shoulders to the same point at the end of each day.

Stockpile salvaged material at Trinity County Maintenance Facility, 710 Sunset (US 287 West), Groveton, TX 75845. Notify the Engineer prior to dropping off salvaged material to confirm location.

RAP produced from this project may be used in the HMA mixtures. All RAP not utilized in the HMA shall be delivered to the TxDOT maintenance facility located at Trinity County Maintenance Facility, 710 Sunset (US 287 West), Groveton, TX 75845.

Blade the existing paved shoulders prior to planing operations to remove existing overgrowth. This work will be subsidiary to Item 354.

Cut the existing shoulder pavement to drain water away from planed travel lanes. This work will be subsidiary to various bid items.

Use an approved ski device to control longitudinal grade.

Where the underlying flexible base is exposed during the planing operation, prime exposed area with asphalt at the rate directed and patch with an approved HMA material at the end of the day’s operation in which it occurs. These items of work will not be paid for directly but will be subsidiary to Item 354.

Item 502: Barricades, Signs, and Traffic Handling

Traffic Control Plan (TCP):

Ensure the Contractor’s Responsible Person (CRP) or their alternate for Barricades, Signs and Traffic Handling is available at all times and able to receive instructions from the Engineer or authorized Department representative. The CRP shall be a person that is usually at the project site during normal working hours.

For protection of the traveling public, direct traffic through the work area using signs, flaggers and other devices. Required signs are shown in the plans on the Barricade and Construction Standards and Traffic Control Plan Sheets. The latest edition of the "Texas Manual on Uniform Traffic Control Devices" shall also be used as a guide for handling traffic on this project.

Use "Do Not Pass" (R4-1) signs to mark the beginnings of roadway sections where passing is prohibited and use "Pass With Care" (R4-2) signs to mark the beginnings of roadway sections where passing is permitted. Install signs at the time signing for project limits are erected. Sign placement shall be verified and approved.

This project requires speed reduction signs during construction. Fabricate, provide and maintain speed limit signs (XX mph) as shown on the applicable BC standards. Remove or cover

regulatory (black and white) speed limit signs, when not applicable. These signs are required for both lanes of travel on divided highways regardless of the location of work.

Furnishing, erecting, relocating and removing temporary speed zone signs is subsidiary to Item 502.

When pavement work begins, use flashing arrow panels and flaggers 24 hr. per day during inclement weather or as directed.

Install "No Center Line" (CW8-12) signs at 2-mile intervals. Install "Loose Gravel" (CW8-7) and "Next XX Miles" (CW7-3aP) signs as directed prior to the start of surface treatment operations.

Restrict construction work to single lane widths with only minor disruptions in traffic flow. Lane closures shall conform to the Traffic Control Plan for lane closures as shown in the plans. No overnight closures will be permitted.

Limit lane closures for multilane roads (4 or more lanes) to 2 mi. in length, unless otherwise approved.

Limit lane closures for 2 lane roads to 1 mi. in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

Plan the sequence of work to minimize the time lane closures are in place. Install lane closures only where construction operations are anticipated to start within 1 hr. and limited to the amount of lane that can be reached by the construction activity within 2 hr. unless otherwise approved.

Provide channelizing devices to restrict traffic from traveling on the shoulders.

Provide flashing arrow panels to supplement required signs and devices for lane closures.

Provide temporary rumble strips as shown on work zone rumble strip standards.

Provide a pilot car to lead traffic through the work area. The pilot car will not be paid for directly, but will be subsidiary to various bid items.

Provide adequate flaggers to protect the traveling public when working on or near a roadway carrying traffic. All flaggers shall wear hardhats and reflective vests.

Install “Be Prepared to Stop” (CW3-4) and “Flagger Ahead” (CW20-7aD) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained.

Use a flashing arrow board in addition to the required signs to warn motorists of flaggers.

Use additional flaggers at roadway intersections to direct traffic entering the work area, when deemed necessary by the Engineer.

Open all traffic lanes to traffic at the close of work each day.

Provide one high-intensity yellow, rotating dome-light on all equipment such as distributors, spreader boxes, lay-down machines, dump trucks, rollers, backhoes, road graders, loaders, etc. within the work zone. Mount lights high enough to be visible from all directions and operating when the equipment is in the work zone. On all other equipment such as automobiles, trailers, etc. use emergency flashers while within the work zone.

Notify the Engineer prior to placing any materials or equipment on the right of way. Locate equipment, stockpiles or other materials not in use as far as possible from the driving lanes and in no case closer than 30 ft. unless otherwise authorized. Any equipment, stockpiles, or materials placed within 30 ft. of the driving lane must have adequate signs, barricades or other warning devices as approved. As a minimum place an 8 ft. wide TY III Barricade or barrels on the approach side of each site that is within 30 ft. of the driving lane. Use TY III Barricade or barrels for the site similarly on the departure side if the location is within 30 ft. of the opposing traffic lane.

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.

Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public’s attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while travelling from one work location to another or while parked on the right of way away from the pavement or a work zone.

Provide an illuminated flagger station when nighttime work is performed.

Install "Stay Alert" (G20-10T) and "OBEY" (R20-3T) signs at the beginning of the construction zone at “T” intersections as directed.

Duplicate signs will be required in locations with a median able to duplicate sign placement.

All workers on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night.

Item 504: Field Office and Laboratory

Provide a Type D Structure. Provide internet connectivity and a wire line (land line) telephone. Asphalt content will be determined by the ignition method.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

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

Item 585: Ride Quality for Pavement Surfaces

Use Surface Test Type B pay adjustment schedule 3.

Item 662: Work Zone Pavement Markings

Install short term pavement markings (removable) on the finish course of the overlay immediately following final rolling, offset from lane lines so there will be no conflict with permanent stripes.

After placement of permanent striping on the finish course, remove all short-term pavement markings.

Item 666: Reflectorized Pavement Markings

Remove loose aggregate immediately prior to placing pavement markings.

Place reflectorized pavement markings no sooner than 3 days nor later than 14 days after placement of the surface treatment.

Before construction operations begin, observe and mark existing passing/no passing zones. Passing/no passing zones shall be verified prior to placement of permanent pavement markings.

Item 3077: Superpave Mixtures

No Department-owned RAP is available.

Add hydrated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP and/or RAS shall be designed at a minimum rate of 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, "Lime and Lime Slurry". The hydrated lime shall be added in accordance with the construction method in Item 301, "Asphalt Antistripping Agents". This lime will be subsidiary to this item.

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.

Cover each load of mixture with waterproof tarpaulins.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

On Table 1 under 3077.2.1.3, the Sand equivalent, %, Min is void and not replaced. The minimum percent for the sand equivalent shall be 45 for the combined aggregate.

Item 3081: Thin Overlay Mixtures (TOM)

Use aggregate that meets the SAC requirements of class A materials, no blending is allowed.

A calibrated Texas Gyratory Compactor (TGC) will be required to design mixture in accordance with Tex-204 part 1. Superpave Gyratory Compactor (SGC) will not be allowed for this project.

When placing mix under ambient temperature 80 degrees F, use 2 rollers in tandem to ensure proper compaction.

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.

Provide a tack that meets the requirements of Item 3084, Table 3A or Table 10A, unless otherwise approved by the engineer.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

A material transfer vehicle (MTV) will be required. An MTV is defined as a self-propelled, wheel-mounted vehicle capable of receiving HMA from the haul trucks separate from the paver. The MTV shall have a minimum storage capacity of approximately 25 tons and shall be equipped with a pivoting discharge conveyor and a means of completely remixing the HMA prior to placement.

Add hydrated lime to all performance-designed mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP. Mixtures that contain RAP shall be designed at a minimum rate of 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, "Lime and Lime Slurry". The hydrated lime shall be added in accordance with the construction method in Item 301, "Asphalt Antistripping Agents". This lime will be subsidiary to this item.

Cover each load of mixture with waterproof tarpaulins.

Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

Item 6185: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

Two (2) TMAs (stationary) will be required for this project. The contractor will be responsible for determining if multiple operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Three (3) TMAs will be required on all divided highways for mobile operations and two (2) TMAs will be required on all other roadways for each mobile operation. Quantities were estimated based on one mobile working operation, as per the number of working days. If multiple crews are utilized, additional TMAs will be required.

The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0319-01-069 **DISTRICT** Lufkin **COUNTY** Angelina, San Augustine, Shelby, Trinity
HIGHWAY SH 103, SH 147, SH 7, SL 500, US 287, US 59

				0175-02-092		0319-01-069		0336-03-073		0336-03-074		0341-01-030		0390-02-051	
		CONTROL SECTION JOB													
		PROJECT ID		A00063443		A00133027		A00067086		A00067087		A00067080		A00196067	
		COUNTY		Shelby		Trinity		Angelina		Angelina		Trinity		San Augustine	
		HIGHWAY		US 59		US 287		SH 7		SH 103		US 287		SH 147	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	315-6008	FOG SEAL (CMS-1P)	GAL			3,029.000		466.000		12,765.000		11,814.000		2,974.000	
	351-6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	SY	200.000		200.000		200.000		200.000		200.000		200.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY									16,800.000			
	500-6001	MOBILIZATION	LS	0.100		0.100		0.100		0.100		0.100		0.100	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			12.000									
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA												
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA												
	644-6076	REMOVE SM RD SN SUP&AM	EA												
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1,340.000						1,900.000				250.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	4,061.000		5,393.000		913.000		18,577.000		12,879.000		16,286.000	
	666-6017	REFL PAV MRK TY I (W)6"(DOT)(090MIL)	LF							189.000				426.000	
	666-6029	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	138.000		75.000				294.000				114.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	656.000						842.000				1,085.000	
	666-6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	1,340.000						1,900.000				250.000	
	666-6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	10,079.000		34,675.000		4,320.000		99,443.000		95,728.000		80,343.000	
	666-6317	RE PM W/RET REQ TY I (Y)6"(BRK)(090MIL)	LF			1,890.000		80.000		5,570.000		9,560.000		7,070.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	18,050.000		23,024.000		4,019.000		79,777.000		47,334.000		68,848.000	
	668-6075	PREFAB PAV MRK TY C (W) (18") (SLD)	LF											158.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	216.000		303.000						120.000			
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	4.000		1.000				1.000				6.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA							4.000				2.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	6.000		1.000				1.000				6.000	
	668-6108	PREFAB PAV MRK TY C (Y) (24") (SLD)	LF							95.000				359.000	
	672-6007	REFL PAV MRKR TY I-C	EA	102.000						53.000				70.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	299.000		810.000		57.000		1,836.000		1,075.000		1,633.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF												
	677-6006	ELIM EXT PAV MRK & MRKS (18")	LF											158.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	49.000		303.000						120.000			
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	4.000		1.000				1.000				6.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	6.000		1.000				1.000				6.000	
	3077-6021	SP MIXES SP-C PG70-22	TON									1,848.000			
	3077-6052	SP MIXES SP-D SAC-A PG70-22	TON			7.000				26.000					
	3081-6007	TOM-C PG76-22 SAC-A	TON	1,468.000		2,376.000		210.000		6,550.000		5,934.000		5,737.000	
	3084-6001	BONDING COURSE	GAL	1,732.000		2,813.000		247.000		7,764.000		7,842.000		7,403.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA			2.000									
	6185-6002	TMA (STATIONARY)	DAY			208.000									
	6185-6005	TMA (MOBILE OPERATION)	DAY			312.000									

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0319-01-069 **DISTRICT** Lufkin **COUNTY** Angelina, San Augustine, Shelby, Trinity
HIGHWAY SH 103, SH 147, SH 7, SL 500, US 287, US 59

		CONTROL SECTION JOB		**0175-02-092**		**0319-01-069**		**0336-03-073**		**0336-03-074**		**0341-01-030**		**0390-02-051**	
		PROJECT ID		**A00063443**		**A00133027**		**A00067086**		**A00067087**		**A00067080**		**A00196067**	
		COUNTY		**Shelby**		**Trinity**		**Angelina**		**Angelina**		**Trinity**		**San Augustine**	
		HIGHWAY		**US 59**		**US 287**		**SH 7**		**SH 103**		**US 287**		**SH 147**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000									
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000									
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000									

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0319-01-069 **DISTRICT** Lufkin **COUNTY** Angelina, San Augustine, Shelby, Trinity
HIGHWAY SH 103, SH 147, SH 7, SL 500, US 287, US 59

													TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**3315-01-025**		**3315-01-026**		**3315-01-027**		**3315-01-028**				
		PROJECT ID		**A00133021**		**A00138769**		**A00194865**		**A00194867**				
		COUNTY		**Shelby**		**Shelby**		**Shelby**		**Shelby**				
		HIGHWAY		**SL 500**		**SL 500**		**SL 500**		**SL 500**				
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL			
	315-6008	FOG SEAL (CMS-1P)	GAL	5,374.000		1,698.000		916.000		3,512.000			42,548.000	
	351-6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	SY	200.000		200.000		200.000		200.000			2,000.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY										16,800.000	
	500-6001	MOBILIZATION	LS	0.100		0.100		0.100		0.100			1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO										12.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3.000									3.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	1.000									1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	4.000									4.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF										3,490.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	8,763.000		3,529.000		2,030.000		6,915.000			79,346.000	
	666-6017	REFL PAV MRK TY I (W)6"(DOT)(090MIL)	LF										615.000	
	666-6029	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	272.000		198.000		90.000		516.000			1,697.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	2,090.000		372.000		222.000		1,472.000			7,744.000	
	666-6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	150.000									3,640.000	
	666-6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	38,312.000		13,313.000		8,925.000		27,073.000			412,211.000	
	666-6317	RE PM W/RET REQ TY I (Y)6"(BRK)(090MIL)	LF	1,810.000				460.000		520.000			26,960.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	38,040.000		15,686.000		8,791.000		30,471.000			334,040.000	
	668-6075	PREFAB PAV MRK TY C (W) (18") (SLD)	LF										158.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	304.000		161.000		42.000					1,146.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	8.000		9.000		4.000		8.000			41.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA										6.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	8.000		9.000		4.000		8.000			43.000	
	668-6108	PREFAB PAV MRK TY C (Y) (24") (SLD)	LF										454.000	
	672-6007	REFL PAV MRKR TY I-C	EA	116.000		20.000		13.000		75.000			449.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,122.000		385.000		63.000		957.000			8,237.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF					5,344.000					5,344.000	
	677-6006	ELIM EXT PAV MRK & MRKS (18")	LF										158.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	304.000		161.000		42.000					979.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	8.000		9.000		4.000		8.000			41.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	8.000		9.000		4.000		8.000			43.000	
	3077-6021	SP MIXES SP-C PG70-22	TON										1,848.000	
	3077-6052	SP MIXES SP-D SAC-A PG70-22	TON	179.000		79.000							291.000	
	3081-6007	TOM-C PG76-22 SAC-A	TON	2,818.000		1,117.000		480.000		1,894.000			28,584.000	
	3084-6001	BONDING COURSE	GAL	3,543.000		1,413.000		567.000		2,235.000			34,926.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA										2.000	
	6185-6002	TMA (STATIONARY)	DAY										208.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY										312.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0319-01-069 **DISTRICT** Lufkin **COUNTY** Angelina, San Augustine, Shelby, Trinity
HIGHWAY SH 103, SH 147, SH 7, SL 500, US 287, US 59

													TOTAL EST.	TOTAL FINAL
CONTROL SECTION JOB				**3315-01-025**		**3315-01-026**		**3315-01-027**		**3315-01-028**				
PROJECT ID				**A00133021**		**A00138769**		**A00194865**		**A00194867**				
COUNTY				**Shelby**		**Shelby**		**Shelby**		**Shelby**				
HIGHWAY				**SL 500**		**SL 500**		**SL 500**		**SL 500**				
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL			
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS										1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS										1.000	
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS										1.000	

ROADWAY SUMMARY

PROJ. REF. NO.		STATION TO STATION			LENGTH	WIDTH (FOG SEAL)			SURFACE AREA (FOG SEAL)	ITEM 315 6008 FOG SEAL (CMS-1P) 0.14 GAL/SY	ITEM 354 6045 PLANE ASPH CONC PAV (2")	ITEM 3077 6021 SP MIXESSP-C PG70-22 220 LBS/SY	WIDTH (TOM & BONDING COURSE)			SURFACE AREA (TOM & BONDING COURSE)	ITEM 3081 6007 TOM-C PG76-22 SAC A 84.75 LBS/SY	ITEM 3084 6001 BONDING COURSE .05 GAL/SY *	SURFACE AREA (SP-D)	ITEM 3077 6052 SP MIXES SP-D SAC-A PG70-22 82.5 LBS/SY	ITEM 3084 6001 BONDING COURSE .05 GAL/SY **
					FT	FT			SY	GAL	SY	TON	FT			SY	TON	GAL	SY	TON	GAL
		CSJ: 0319-01-069 (TRINITY COUNTY) (US 287)																			
1		871+00.00	TO	963+30.00	9,230.00		18		18,460	2,585				26		26,664	1,130	1,333			
		963+30.00	TO	966+00.00	270.00									44		1,320	56	66			
		966+00.00	TO	966+30.00	30.00									44		147	6	7			
		966+30.00	TO	968+78.00	248.00								44	TO	32	1,047	44	52			
		968+78.00	TO	992+87.00	2,409.00									32		8,565	363	428			
		992+87.00	TO	999+39.00	652.00								32	TO	38	2,536	107	127			
		INTERSECTION (1)			VAR				3,167	444			VAR	TO	VAR	15,821	670	791	175	7	9
		CSJ: 0319-01-069 TOTALS							**21,627**	**3,029**	**0**	**0**				**56,100**	**2,376**	**2,804**	**175**	**7**	**9**
2		CSJ: 0341-01-030 (TRINITY COUNTY) (US 287)																			
		6+45.00	TO	21+69.00	1,524.00									24		4,064	172	203			
	(a)	21+69.00	TO	152+00.00	12,994.30		16		23,101	3,235				26		37,539	1,591	1,877			
		152+00.00	TO	215+00.00	6,300.00	16	TO	18	11,900	1,666	16,800	1,848		26		18,200	771	910			840
		215+00.00	TO	492+75.00	27,775.00		16		49,378	6,913				26		80,239	3,400	4,012			
		CSJ: 0341-01-030 TOTALS							**84,379**	**11,814**	**16,800**	**1,848**				**140,042**	**5,934**	**7,002**	**0**	**0**	**840**
3		CSJ: 0336-03-073 (ANGELINA COUNTY) (SH 7)																			
		1578+70.00	TO	1580+72.00	202.00		16		359	51				26		584	25	29			
		1580+72.00	TO	1593+18.00	1,246.00		18		2,492	349				26		3,600	153	180			
	(b)	1593+18.00	TO	1597+62.00	264.77		16		471	66				26		765	32	38			
		CSJ: 0336-03-073 TOTALS							**3,322**	**466**	**0**	**0**				**4,949**	**210**	**247**	**0**	**0**	**0**
4		CSJ: 0336-03-074 (ANGELINA COUNTY) (SH 103)																			
		1624+39.00	TO	1682+33.00	5,794.00		18		11,588	1,623				26		16,738	709	837			
		1682+33.00	TO	1687+58.00	525.00		18		1,050	147				26		1,517	64	76			
		1687+58.00	TO	1693+08.00	550.00		20		1,222	172				26		1,589	67	79			
		1693+08.00	TO	1698+33.00	525.00		20		1,167	164				26		1,517	64	76			
		1698+33.00	TO	1758+34.00	6,001.00		16		10,668	1,494				26		17,336	735	867			
		1758+34.00	TO	1763+59.00	525.00		16		933	131				26		1,517	64	76			
		1763+59.00	TO	1774+08.00	1,049.00		20		2,331	327				26		3,030	128	152			
		1774+08.00	TO	1779+34.00	526.00		20		1,169	164				26		1,520	64	76			
		1779+34.00	TO	1831+84.00	5,250.00		16		9,333	1,307				26		15,167	643	758			
		1831+84.00	TO	1837+08.00	524.00		16		932	131				26		1,514	64	76			
		1837+08.00	TO	1846+09.00	901.00		20		2,002	281				26		2,603	110	130			
		1846+09.00	TO	1851+34.00	525.00		20		1,167	164				26		1,517	64	76			
		1851+34.00	TO	1935+12.00	8,378.00		16		14,894	2,086				26		24,203	1,026	1,210			
		1935+12.00	TO	1940+60.00	548.00		16		974	137				26		1,583	67	79			
		1940+60.00	TO	1957+56.00	1,696.00		18		3,392	475				26		4,900	208	245			
		1957+56.00	TO	1999+13.00	4,157.00		16		7,390	1,035				26		12,009	509	600			
		1999+13.00	TO	2004+60.00	547.00		16		972	137			26	TO	52	2,370	100	119			
		2004+60.00	TO	2018+10.00	1,350.00									52		7,800	331	390			
	(c)	2018+10.00	TO	2023+32.00	506.10								52	TO	26	2,193	93	110			
		2023+32.00	TO	2084+00.00	6,068.00		16		10,788	1,511				26		17,530	743	877			
		2084+00.00	TO	2094+45.00	1,045.00		16		1,858	261				26		3,019	128	151			
		INTERSECTION (2)			VAR				7,265	1,018			VAR	TO	VAR	13,433	569	672	631	26	32
		CSJ: 0336-03-074 TOTALS							**91,095**	**12,765**	**0**	**0**				**154,605**	**6,550**	**7,732**	**631**	**26**	**32**

NOTES: (1) REFER TO INTERSECTION LAYOUTS (US 287 & SH 94) FOR MORE DETAILS

(2) REFER TO INTERSECTION LAYOUTS (SH 7 & SH 103) FOR MORE DETAILS

* BONDING COURSE FOR TOM APPLICATION
** BONDING COURSE FOR SP APPLICATION

(a) EQUATION: STA 59+12.3 BK = STA 59+49 FWD = -36.7'

(b) EQUATION: STA 1593+63.17 BK = STA 1595+42.40 FWD = -179.23'

(c) EQUATION: STA 2020+92.40 BK = STA 2021+08.30 FWD = -15.90'

QUANTITY SUMMARIES

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		21

ROADWAY SUMMARY (CONT.)

PROJ. REF. NO.		STATION TO STATION			LENGTH	WIDTH (FOG SEAL)		SURFACE AREA (FOG SEAL)	ITEM 315 6008 FOG SEAL (CMS-1P) 0.14 GAL/SY	ITEM 354 6045 PLANE ASPH CONC PAV (2")	ITEM 3077 6021 SP MIXESSP-C PG70-22 220 LBS/SY	WIDTH (TOM & BONDING COURSE)			SURFACE AREA (TOM & BONDING COURSE)	ITEM 3081 6007 TOM-C PG76-22 SAC A 84.75 LBS/SY	ITEM 3084 6001 BONDING COURSE .05 GAL/SY *	SURFACE AREA (SP-D)	ITEM 3077 6052 SP MIXES SP-D SAC-A PG70-22 82.5 LBS/SY	ITEM 3084 6001 BONDING COURSE .05 GAL/SY **
					FT	FT		SY	GAL	SY	TON	FT			SY	TON	GAL	SY	TON	GAL
		CSJ: 0390-02-051 (SAN AUGUSTINE COUNTY) (SH147)																		
	(d)	744+74.00	TO	359+00.00	3,604.20								38		15,218	645	761			
		359+00.00	TO	390+96.20	3,196.20								38		13,495	572	675			
		390+96.20	TO	392+96.20	200.00								50		1,111	47	56			
		392+96.20	TO	395+00.00	203.80							50	TO	60	1,245	53	62			
		395+00.00	TO	396+00.00	100.00							60	TO	49	606	26	30			
5		396+00.00	TO	403+12.89	712.89		3		238	34			49		3,881	164	194			
		403+12.89	TO	407+62.89	450.00		3		150	21		49	TO	26	1,875	79	94			
		407+62.89	TO	654+00.00	24,637.11		6		16,425	2,300			26		71,174	3,016	3,559			
		654+00.00	TO	680+00.00	2,600.00		3		867	122			37		10,689	453	534			
		680+00.00	TO	694+85.62	1,485.62		6		990	139			26		4,292	182	215			
		649+32.97	TO	670+00.00	2,067.03		6		1,378	193			26		5,971	253	299			
		INTERSECTION (3)			VAR				1,175	165			VAR	TO	VAR	5,819	247	291			
		CSJ: 0390-02-051 TOTALS							**21,223**	**2,974**	**0**	**0**				**135,376**	**5,737**	**6,770**	**0**	**0**	**0**
		CSJ: 0175-02-092 (SHELBY COUNTY) (US 59)																		
		770+00.00	TO	772+00.00	200.00								81		1,800	76	90			
		772+00.00	TO	774+00.00	200.00							81	TO	60	1,567	66	78			
		774+00.00	TO	777+51.90	351.90								60		2,346	99	117			
		-7+79.00	TO	7+68.00	1,547.00								60		10,313	437	516			
		7+68.00	TO	9+00.00	132.00							64	TO	68	968	41	48			
6		9+00.00	TO	16+95.30	795.30								68		6,009	255	300			
		16+95.30	TO	20+25.00	329.70							68	TO	77	2,656	113	133			
		20+25.00	TO	28+84.17	859.17							77	TO	65	6,778	287	339			
	#	28+84.17	TO	30+00.00	115.83							65	TO	49	734	31	37			
	#	30+00.00	TO	33+00.00	300.00							49	TO	40	1,483	63	74			
		CSJ: 0175-02-092 TOTALS							**0**	**0**	**0**	**0**				**34,654**	**1,468**	**1,732**	**0**	**0**	**0**

NOTES: (3) REFER TO INTERSECTION LAYOUTS (SH 147 & SH103) FOR MORE DETAILS

* BONDING COURSE FOR TOM APPLICATION
** BONDING COURSE FOR SP APPLICATION

(d) EQUATION: STA 771+78.20 BK = STA 350+00 FWD = +42,178.20'

INCIDENTAL CONSTRUCTION APROXIMATELY 570' (FROM STA 33+00 TO STA 27+30)

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		22

ROADWAY SUMMARY (CONT.)

PROJ. REF. NO.	STATION TO STATION			LENGTH	WIDTH (FOG SEAL)			SURFACE AREA (FOG SEAL)	ITEM 315 6008 FOG SEAL (CMS-1P) 0.14 GAL/SY	ITEM 354 6045 PLANE ASPH CONC PAV (2")	ITEM 3077 6021 SP MIXESSP-C PG70-22 220 LBS/SY	WIDTH (TOM & BONDING COURSE)			SURFACE AREA (TOM & BONDING COURSE)	ITEM 3081 6007 TOM-C PG76-22 SAC A 84.75 LBS/SY	ITEM 3084 6001 BONDING COURSE .05 GAL/SY *	SURFACE AREA (SP-D)	ITEM 3077 6052 SP MIXES SP-D SAC-A PG70-22 82.5 LBS/SY	ITEM 3084 6001 BONDING COURSE .05 GAL/SY **
				FT	FT			SY	GAL	SY	TON	FT			SY	93	110	SY	TON	GAL
7 (e)	CSJ: 3315-01-025 (SHELBY COUNTY) (SL 500)																			
	0+32.00	TO	5+80.00	548.00		18		1,096	154				42		2,557	108	128			
	5+80.00	TO	9+80.00	400.00		18		800	112			42	TO	26	1,511	64	76			
	9+80.00	TO	43+98.00	3,418.00		18		6,836	958				26		9,874	418	494			
	43+98.00	TO	47+98.00	400.00		18		800	112			26	TO	42	1,511	64	76			
	47+98.00	TO	52+33.00	435.00		18		870	122				42		2,030	86	102			
	55+03.00	TO	59+00.00	397.00		18		794	112				42		1,853	79	93			
	59+00.00	TO	64+00.00	500.00		18		1,000	140			42	TO	26	1,889	80	94			
	64+00.00	TO	134+63.00	6,809.30		18		13,619	1,907				26		19,671	834	984			
	134+63.00	TO	137+23.00	260.00		18		520	73				26		751	32	38			
	137+23.00	TO	181+71.00	4,448.00		18		8,896	1,246				26		12,850	545	643			
	181+71.00	TO	194+97.00	1,326.00		18		2,652	372			26	TO	42	5,009	212	250			
	194+97.00	TO	197+30.00	233.00		18		466	66				42		1,087	46	54			
	INTERSECTION (4)			VAR								VAR	TO	VAR	1,867	79	93	2,053	85	103
	INTERSECTION (5)			VAR								VAR	TO	VAR	4,024	171	201	2,284	94	114
	CSJ: 3315-01-025 TOTALS							**38,349**	**5,374**	**0**	**0**				**66,484**	**2,818**	**3,326**	**4,337**	**179**	**217**
8	CSJ: 3315-01-026 (SHELBY COUNTY) (SL 500)																			
	203+00.00	TO	208+50.00	550.00		18		1,100	154				42		2,567	109	128			
	208+50.00	TO	212+50.00	400.00		18		800	112			42	TO	26	1,511	64	76			
	212+50.00	TO	261+75.00	4,925.00		18		9,850	1,379				26		14,228	603	711			
	261+75.00	TO	263+62.00	187.00		18		374	53			26	TO	42	706	30	35			
	INTERSECTION (6)			VAR								VAR	TO	VAR	7,350	311	368	1,908	79	95
	CSJ: 3315-01-026 TOTALS							**12,124**	**1,698**	**0**	**0**				**26,362**	**1,117**	**1,318**	**1,908**	**79**	**95**
9	CSJ: 3315-01-027 (SHELBY COUNTY) (SL 500)																			
	500+42.00	TO	508+53.00	811.00		18		1,622	228				42		3,785	160	189			
	508+53.00	TO	513+73.00	520.00		18		1,040	146			42	TO	26	1,964	83	98			
	513+73.00	TO	533+08.00	1,935.00		18		3,870	542				26		5,590	237	280			
	CSJ: 3315-01-027 TOTALS							**6,532**	**916**	**0**	**0**				**11,339**	**480**	**567**	**0**	**0**	**0**
10	CSJ: 3315-01-028 (SHELBY COUNTY) (SL 500)																			
	546+08.00	TO	560+65.00	1,457.00		18		2,914	408				26		4,209	178	210			
	560+65.00	TO	565+85.00	520.00		18		1,040	146			26	TO	42	1,964	83	98			
	565+85.00	TO	581+30.00	1,545.00		18		3,090	433				42		7,210	306	361			
	581+30.00	TO	586+50.00	520.00		18		1,040	146			42	TO	26	1,964	83	98			
	586+50.00	TO	636+30.00	4,980.00		18		9,960	1,395				26		14,387	610	719			
	636+30.00	TO	641+50.00	520.00		18		1,040	146			26	TO	42	1,964	83	98			
	641+50.00	TO	657+50.00	1,600.00		18		3,200	448				42		7,467	316	373			
	657+50.00	TO	662+70.00	520.00		18		1,040	146			42	TO	26	1,964	83	98			
	662+70.00	TO	667+90.00	520.00		18		1,040	146			26	TO	42	1,964	83	98			
	667+90.00	TO	671+40.00	350.00		18		700	98				42		1,633	69	82			
	CSJ: 3315-01-028 TOTALS							**25,064**	**3,512**	**0**	**0**				**44,726**	**1,894**	**2,235**	**0**	**0**	**0**
	PROJECT TOTALS							**303,715**	**42,548**	**16,800**	**1,848**				**674,637**	**28,584**	**33,733**	**7,051**	**291**	**1,193**

NOTES: (4) REFER TO INTERSECTION LAYOUTS (SL 500 & US 96) FOR MORE DETAILS

(5) REFER TO INTERSECTION LAYOUTS (SL 500 & SH 87) FOR MORE DETAILS

(6) REFER TO INTERSECTION LAYOUTS (SL 500 & SH 7) FOR MORE DETAILS

* BONDING COURSE FOR TOM APPLICATION
** BONDING COURSE FOR SP APPLICATION

(e) EQUATION: STA 694+85.62 BK = STA 649+32.97 FWD = +4,552.65'

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		23

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DATE: 9/29/2023 9:04:17 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design/Plan Set/1. General/QUANTITY SUMMARIES

SUMMARY OF PAVEMENT MARKINGS AND MARKERS																
PROJ. REF. NO.	COUNTY	HIGHWAY NUMBER	CSJ NO.	LENGTH	ITEM 351	ITEM 666							ITEM 677				
					6008	6305	6308	6317	6320	6017	6029	6035	6001	6006	6007	6008	6012
					FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	RE PM W/RET REQ TY I (W) 6" (BRK) (090MIL)	RE PM W/RET REQ TY I (W) 6" (SLD) (090MIL)	RE PM W/RET REQ TY I (Y) 6" (BRK) (090MIL)	RE PM W/RET REQ TY I (Y) 6" (SLD) (090MIL)	REFL PAV MRK TY I (W) 6"(DOT) (090MIL)	REFL PAV MRK TY I (W) 8"(DOT) (090MIL)	REFL PAV MRK TY I (W) 8" (SLD) (090MIL)	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (18")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (ARROW)	ELIM EXT PAV MRK & MRKS (WORD)
				FT	SY	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA
1	TRINITY	US 287	0319-01-069	12,839	200		34,675	1,890	23,024		75	1005			303	1	1
2	TRINITY	US 287	0341-01-030	48,593	200		95,728	9,560	47,334						120		
3	ANGELINA	SH 7	0336-03-073	1,713	200		4,320	80	4,019								
4	ANGELINA	SH 103	0336-03-074	46,990	200	1,900	99,443	5,570	79,777	189	294	842				1	1
5	SAN AUGUSTINE	SH 147	0390-02-051	39,257	200	250	80,343	7,070	68,848	426	114	1,085		158		6	6
6	SHELBY	US 59	0175-02-092	4,831	200	1,340	10,079		18,050		138	656			49	4	6
7	SHELBY	SL 500	3315-01-025	19,184	200	150	38,312	1,810	38,040		272	2,090			304	8	8
8	SHELBY	SL 500	3315-01-026	6,062	200		13,313		15,686		198	372			161	9	9
9	SHELBY	SL 500	3315-01-027	3,266	200		8,925	460	8,791		90	222	5,344 *		42	4	4
10	SHELBY	SL 500	3315-01-028	12,532	200		27,073	520	30,471		516	1,472				8	8
PROJECT TOTALS				**195,267**	**2,000**	**3,640**	**412,211**	**26,960**	**334,040**	**615**	**1,697**	**7,744**	**5,344**	**158**	**979**	**41**	**43**

* NOTE: PERTAINING TO CONCRETE BRIDGE DECK

SUMMARY OF TRUCK MOUNTED ATTENUATORS		
CSJ NO.	ITEM 6185	
	6002	6005
	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	DAY	DAY
0319-01-069, ETC.	208	312
PROJECT TOTALS	**208**	**312**

SUMMARY OF TRAFFIC CONTROL ITEMS	
CSJ NO.	ITEM 6001
	6002
	PORTABLE CHANGEABLE MESSAGE SIGN
	EA
0319-01-069, ETC.	2
PROJECT TOTALS	**2**

NOTE:

MESSAGE BOARDS TO BE USED DAILY AND SHALL BE UTILIZED ON ALL LOCATIONS AS DIRECTED BY THE ENGINEER

SUMMARY OF SMALL SIGNS			
CSJ NO.	ITEM 644		
	6060	6001	6076
	IN SM RD SN SUP&AM TYTWT(1)WS(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	REMOVE SM RD SN SUP&AM
	EA	EA	EA
3315-01-025	1	3	4
PROJECT TOTALS	**1**	**3**	**4**

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		24

DATE: 9/29/2023 9:04:17 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design/Plan Set/1. General/QUANTITY SUMMARIES

SUMMARY OF PREFAB & RAISED PAV MRK												
PROJ. REF. NO.	COUNTY	HIGHWAY NUMBER	CSJ NO.	LENGTH	ITEM 668						ITEM 672	
					6075	6076	6077	6083	6085	6108	6007	6009
					PREFAB PAV MRK TY C (W) (18") (SLD)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (Y) (24") (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
				FT	LF	LF	EA	EA	EA	LF	EA	EA
1	TRINITY	US 287	0319-01-069	12,839		303	1		1			810
2	TRINITY	US 287	0341-01-030	48,593		120						1,075
3	ANGELINA	SH 7	0336-03-073	1,713								57
4	ANGELINA	SH 103	0336-03-074	46,990			1	4	1	95	53	1,836
5	SAN AUGUSTINE	SH 147	0390-02-051	39,257	158		6	2	6	359	70	1,633
6	SHELBY	US 59	0175-02-092	4,831		216	4		6		102	299
7	SHELBY	SL 500	3315-01-025	19,184		304	8		8		116	1,122
8	SHELBY	SL 500	3315-01-026	6,062		161	9		9		20	385
9	SHELBY	SL 500	3315-01-027	3,266		42	4		4		13	63
10	SHELBY	SL 500	3315-01-028	12,532			8		8		75	957
			PROJECT TOTALS	**195,267**	**158**	**1,146**	**41**	**6**	**43**	**454**	**449**	**8,237**

SUMMARY OF WORK ZONE PAV MRK *						
PROJ. REF. NO.	COUNTY	HIGHWAY	CSJ NO.	LENGTH	ITEM 662	
					6064	6098
					WK ZN PAV MRK REMOV (W)6"(BRK)	WK ZN PAV MRK REMOV (Y)6"(SLD)
				FT	LF	LF
1	TRINITY	US 287	0319-01-069	12,839		5,393
2	TRINITY	US 287	0341-01-030	48,593		12,879
3	ANGELINA	SH 7	0336-03-073	1,713		913
4	ANGELINA	SH 103	0336-03-074	46,990	1,900	18,577
5	SAN AUGUSTINE	SH 147	0390-02-051	39,257	250	16,286
6	SHELBY	US 59	0175-02-092	4,831	1,340	4,061
7	SHELBY	SL 500	3315-01-025	19,184		8,763
8	SHELBY	SL 500	3315-01-026	6,062		3,529
9	SHELBY	SL 500	3315-01-027	3,266		2,030
10	SHELBY	SL 500	3315-01-028	12,532		6,915
			PROJECT TOTALS	**195,267**	**3,490**	**79,346**

* NOTE: PREFABRICATED MARKINGS (STICK DOWN TAPE)

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		25

DATE: 9/29/2023 9:04:17 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010069/4 - Design/Plan Set/1. General/QUANTITY SUMMARIES

CK DW CK DW

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
	S1	R1-1	STOP	36 x 36	X		TWT	1	WS	P		
	S2	R1-1	STOP	36 x 36	X		TWT	1	SA	P		
	S3	R1-1	STOP	36 x 36	X		TWT	1	SA	P		
	S4	R1-1	STOP	36 x 36	X		TWT	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0319	01	069,ETC.	US 287,ETC.
4-16		DIST	COUNTY		SHEET NO.
8-16		LFK	TRINITY,ETC.		26

TB

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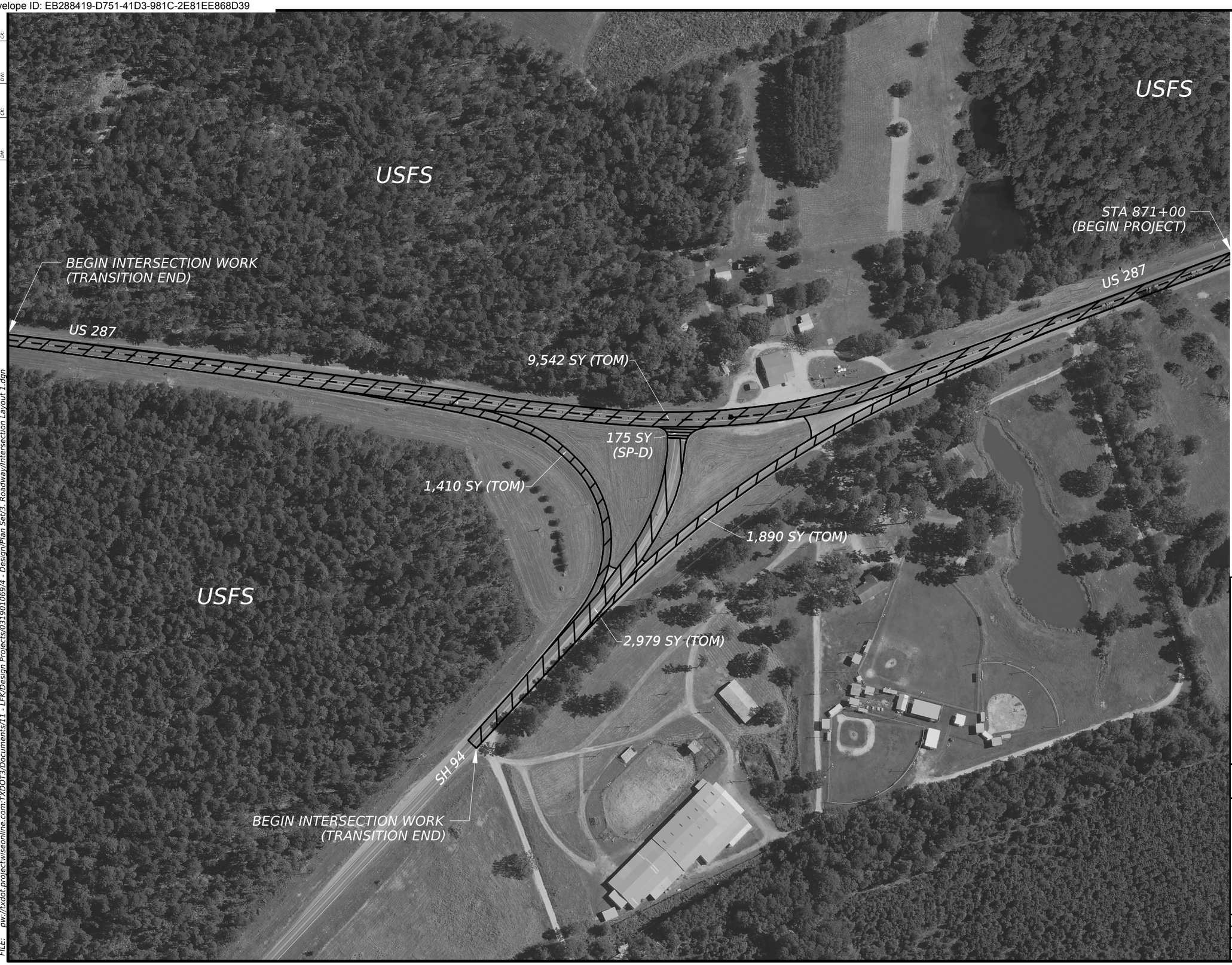

LEGEND

SP-D MIX

THIN OVERLAY MIX

LOCATION REF. 1
TRINITY COUNTY
CCSJ 0319-01-069
US 287 & SH 94

SCALE 1" = 200'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
cmb, P.E.
AF852E728AEC4C0...

9/27/2023

Texas Department of Transportation

INTERSECTION LAYOUTS

(US 287 & SH 94)

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		27

DATE: 9/25/2023 10:37:59 AM
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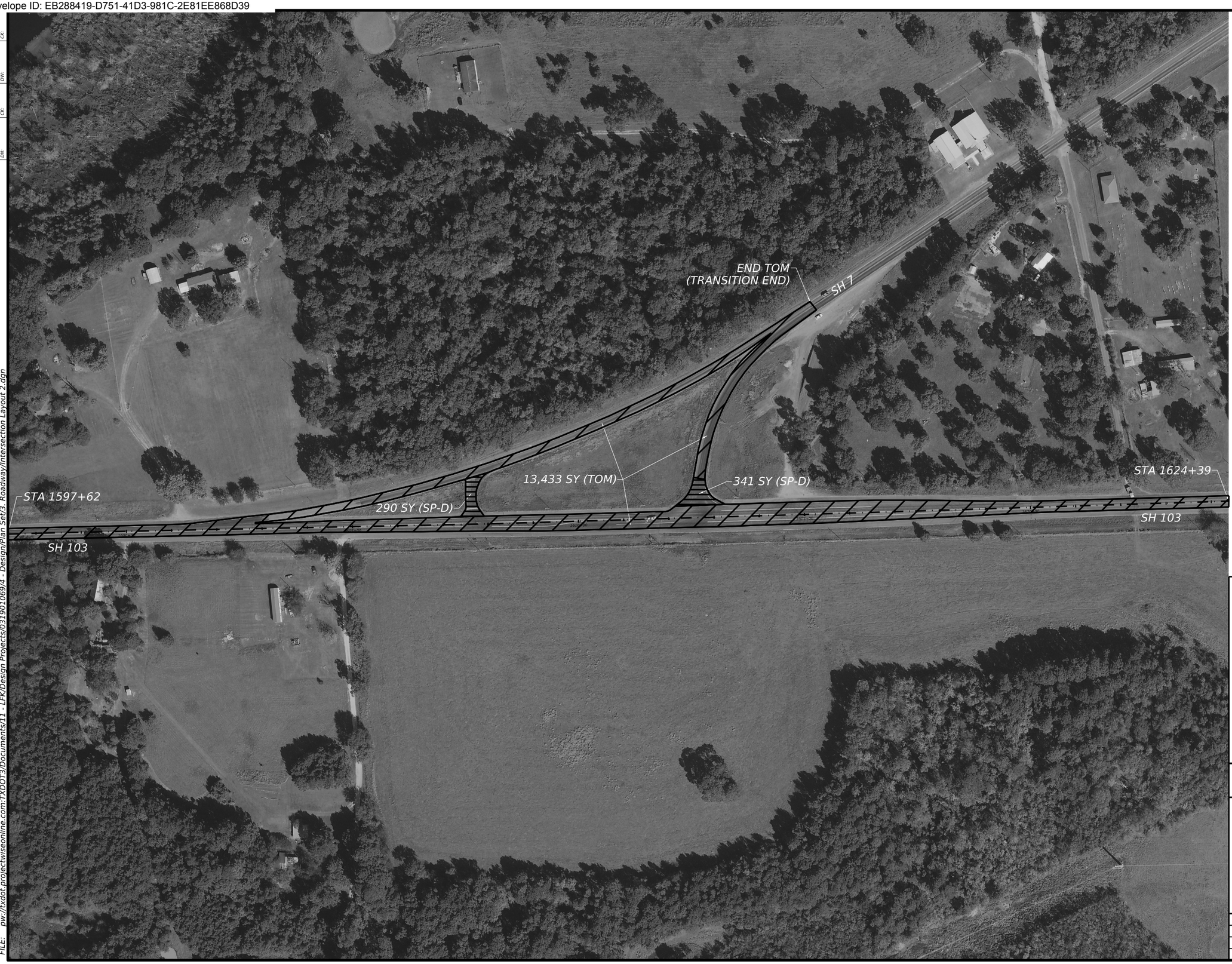

LEGEND

SP-D MIX

THIN OVERLAY MIX

LOCATION REF. 3 & 4
ANGELINA COUNTY
CSJ 0336-03-073 & 074
SH 7 & SH 103

SCALE 1" = 200'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...

9/27/2023

Texas Department of Transportation

INTERSECTION LAYOUTS

(SH 103 & SH 7)

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		28

DATE: 9/25/2023 10:44:28 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010069/4 - Design/Plan Set/3. Roadway/Intersection Layout 2.dgn

LEGEND

THIN OVERLAY MIX

LOCATION REF. 5
SAN AUGUSTINE COUNTY
CSJ: 0390-02-051
SH 147 & SH 103

SCALE 1" = 110'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

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9/27/2023

Texas Department of Transportation

INTERSECTION LAYOUTS

(SH 147 & SH 103)

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		29

DATE: 9/25/2023 11:19:14 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design/Plan Set/3. Roadway/Intersection Layout 3.dgn

LEGEND

SP-D MIX

THIN OVERLAY MIX

LOCATION REF. 7
SHELBY COUNTY
CSJ 3315-01-025
SL 500 & US 96

SCALE 1" = 60'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
AF852E728AEC4C0...

9/27/2023

Texas Department of Transportation

INTERSECTION LAYOUTS
(SL 500 & US 96)

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		30

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FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010069/4 - Design/Plan Set/3. Roadway/Intersection Layout 4.dgn

LEGEND

- SP-D MIX
- THIN OVERLAY MIX
- SIGN TO BE REMOVED AND REPLACED

LOCATION REF. 7
SHELBY COUNTY
CSJ 3315-01-025
SL 500 & SH 87

SCALE 1" = 60'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
cmb P.E.
AF852E728AEC4C0...

9/27/2023

Texas Department of Transportation

INTERSECTION LAYOUTS

(SL 500 & SH 87)

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		31

DATE: 9/25/2023 11:25:26 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010069/4 - Design/Plan Set/3. Roadway/Intersection Layout 5.dgn

LEGEND

SP-D MIX

THIN OVERLAY MIX

LOCATION REF. 8
SHELBY COUNTY
CSJ: 3315-01-026
SL 500 & SH 7

SCALE 1" = 100'

STATE OF TEXAS
CHARLES M. BRAZIL
112704
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PROFESSIONAL ENGINEER

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AF852E728AEC4C0...

9/27/2023

Texas Department of Transportation

INTERSECTION LAYOUTS

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		32

DATE: 9/25/2023 11:27:47 AM
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DATE: 9/5/2023 9:46:44 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design/Plan Set/2. TCP/bc-21.dgn

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

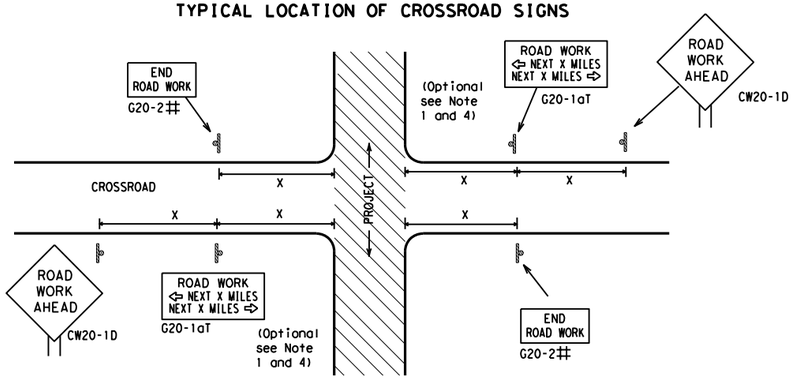
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0319	01	069,ETC.	US 287,ETC.
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	LFK	TRINITY,ETC.		33
5-10 5-21				

DATE: 9/5/2023 9:46:44 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/0319010694 - Design Plan Set/2. TCP/bc-21.dgn

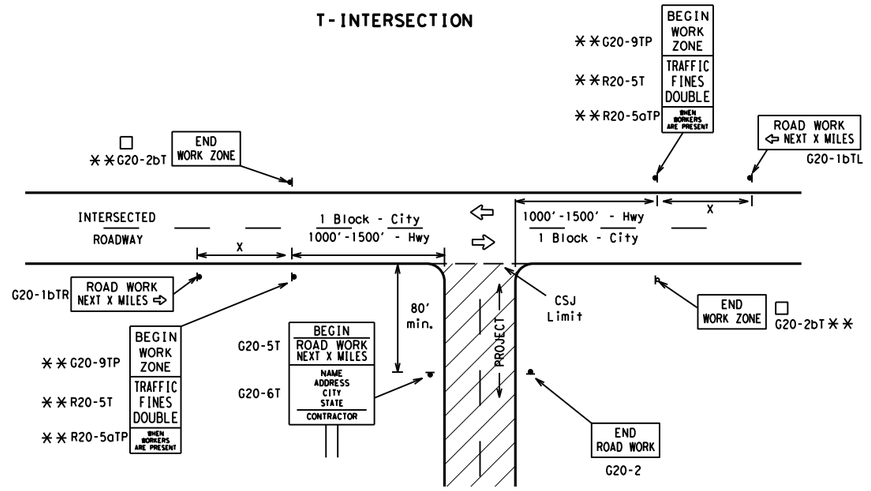
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

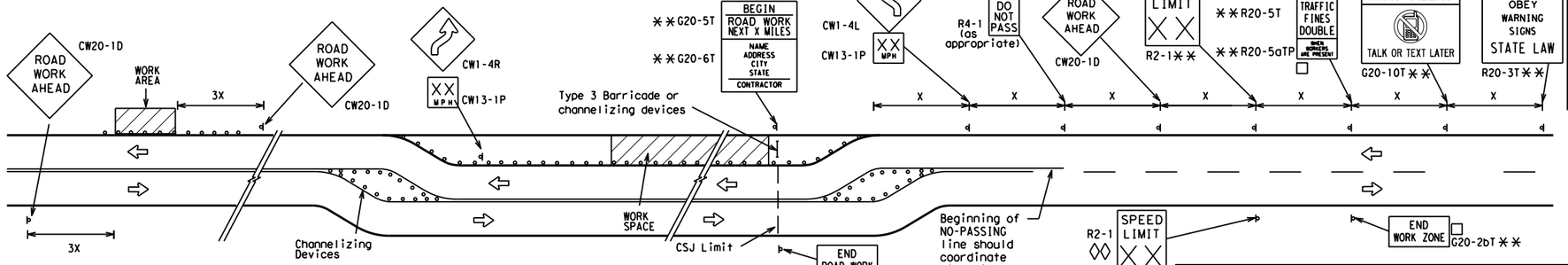
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

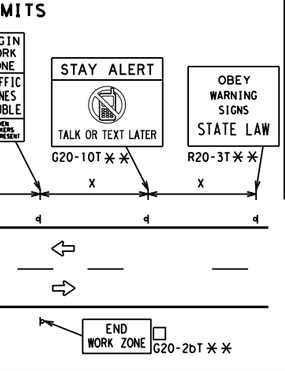
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

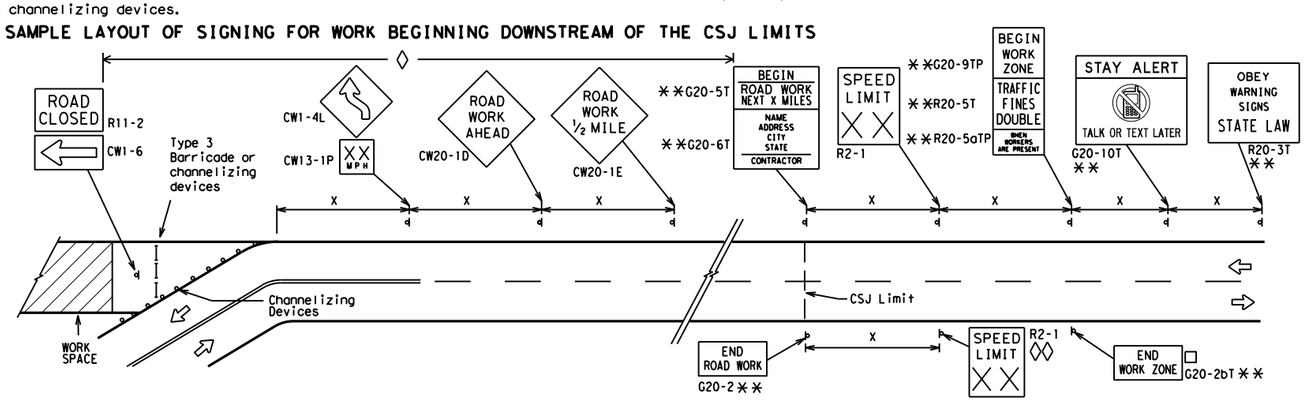


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

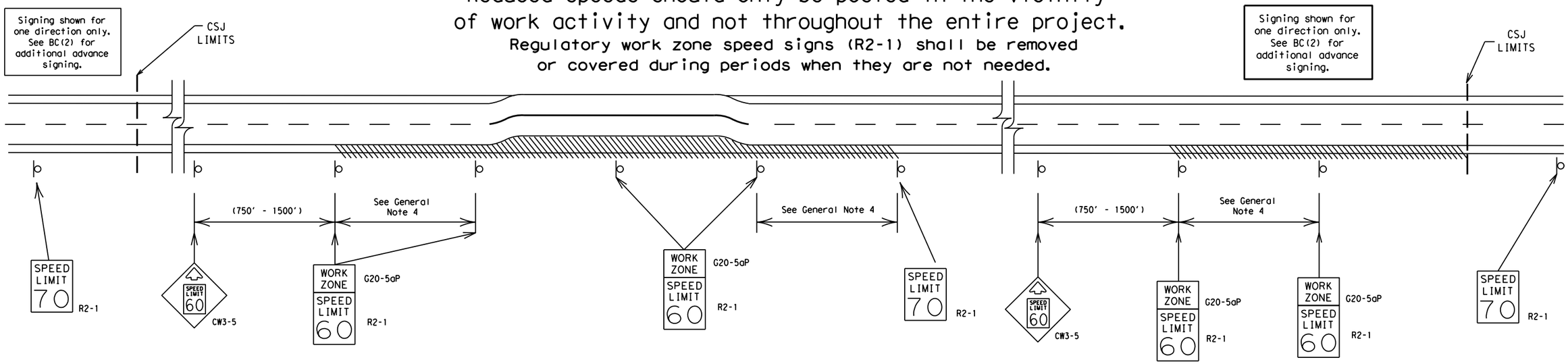
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0319	01	069,ETC.	US 287,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	TRINITY,ETC.		34

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.

DATE: 9/5/2023 9:46:45 AM
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SHEET 3 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

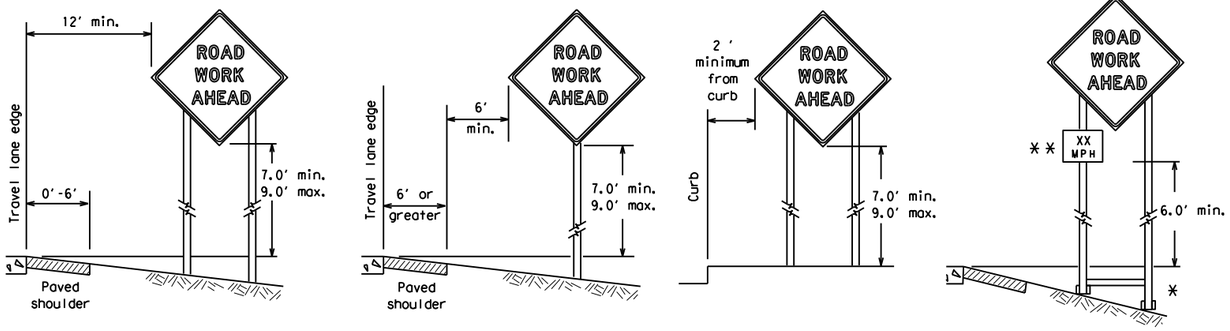
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

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	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		35

DATE: 9/5/2023 9:46:45 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/031906l0694 - Design/Plan Set/2. TCP/bc-21.dgn

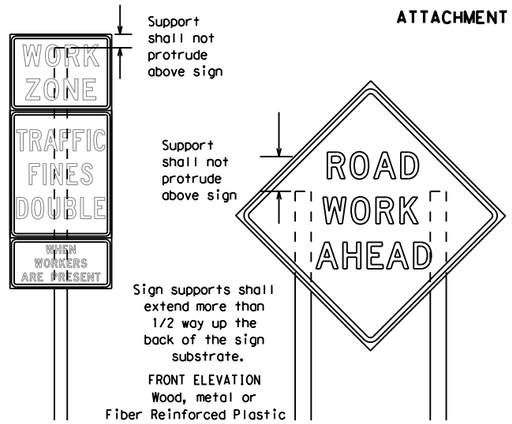
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

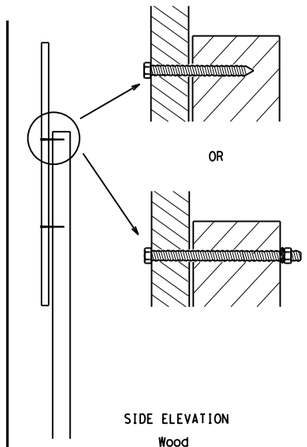


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





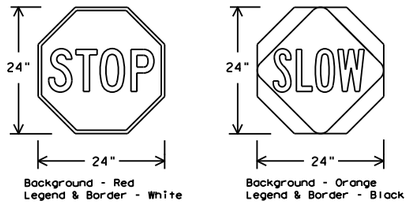
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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	0319	01	069,ETC.	US 287,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	TRINITY,ETC.		36

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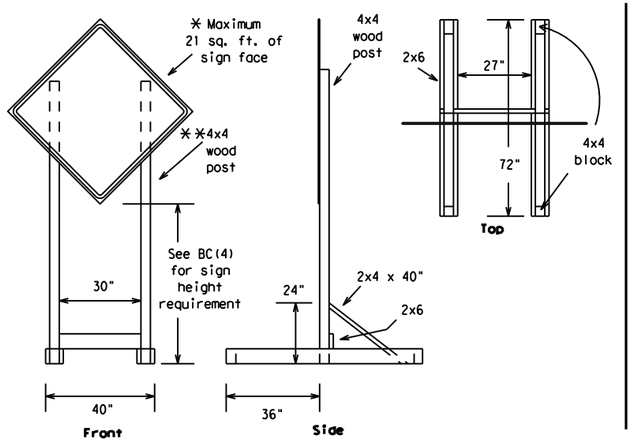
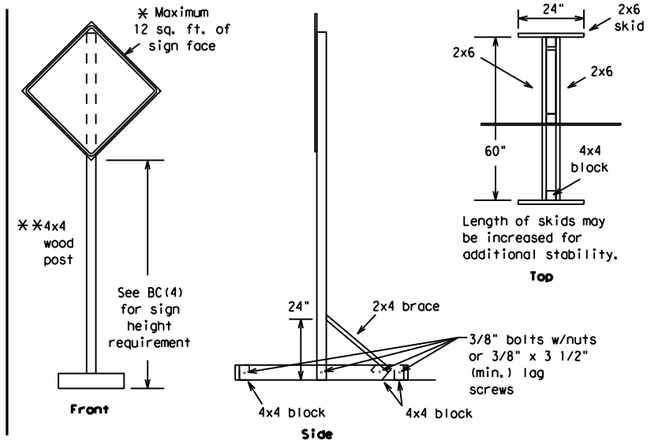
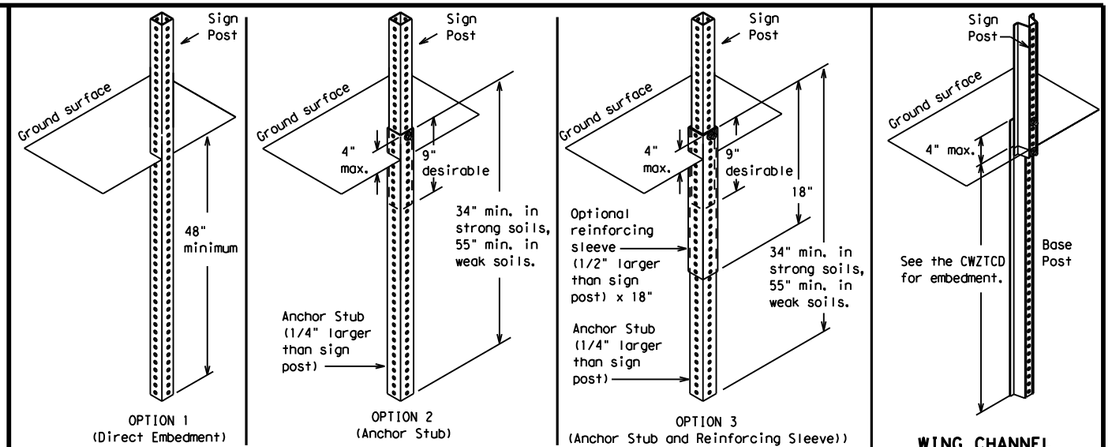




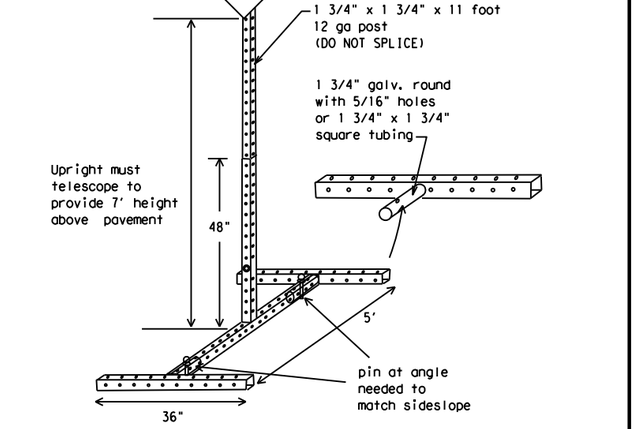
SKID MOUNTED WOOD SIGN SUPPORTS

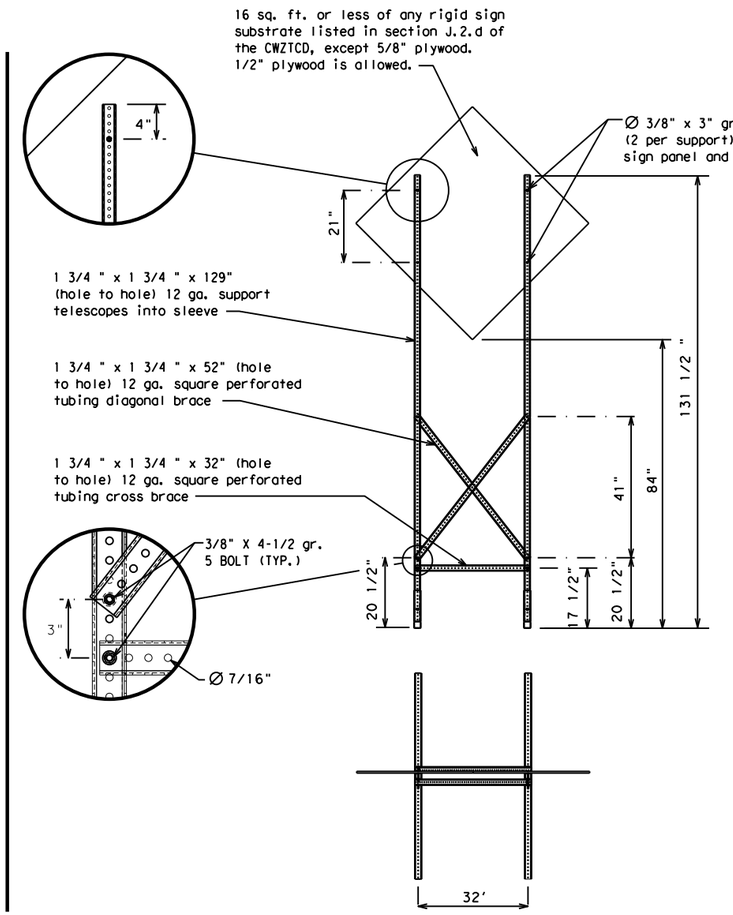
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

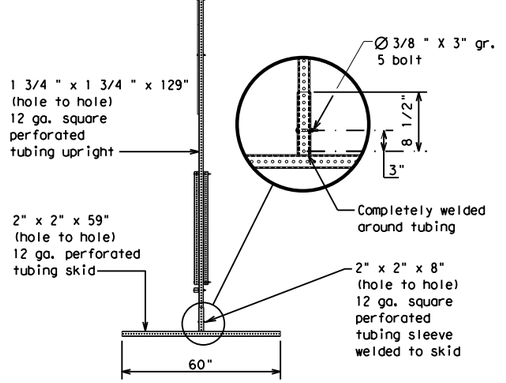


GROUND MOUNTED SIGN SUPPORTS

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

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	TRINITY,ETC.		37

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT
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
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9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		LFK	TRINITY,ETC.		38

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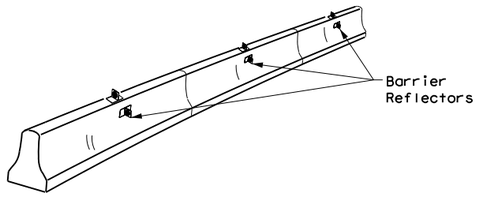
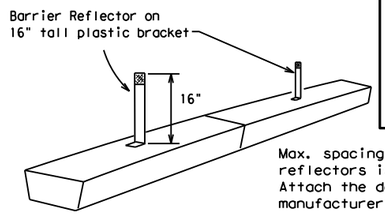
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

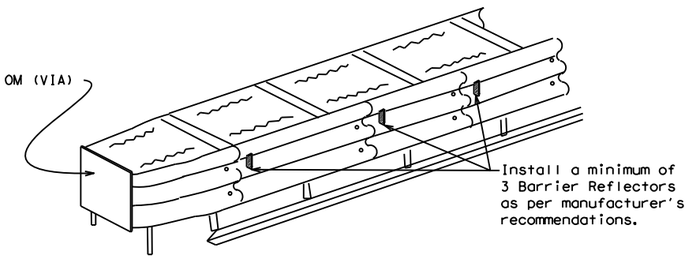


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

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)

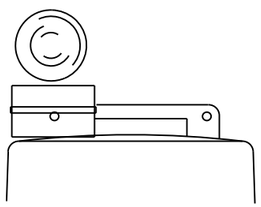


DELINEATION OF END TREATMENTS

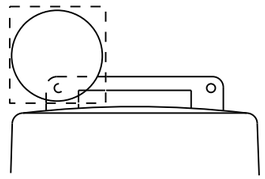
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

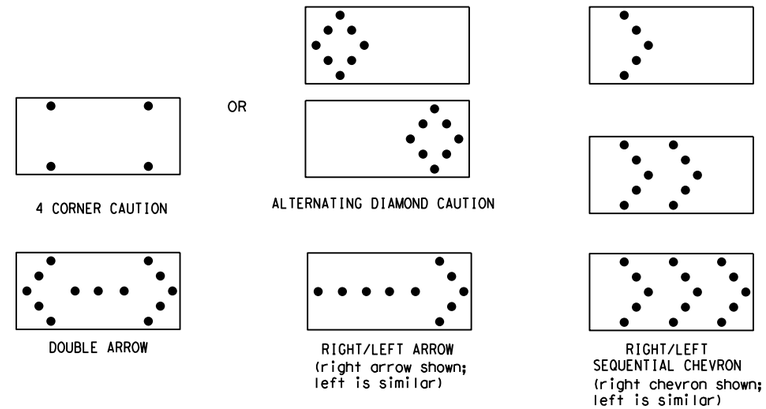
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0319	01	069,ETC.	US 287,ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	TRINITY,ETC.		39

TOT

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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:

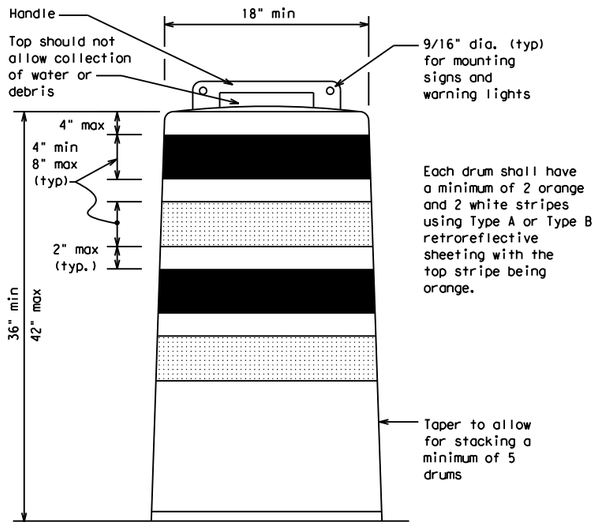
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

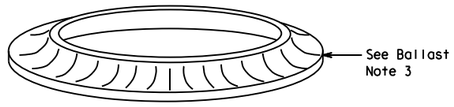
RETROREFLECTIVE SHEETING

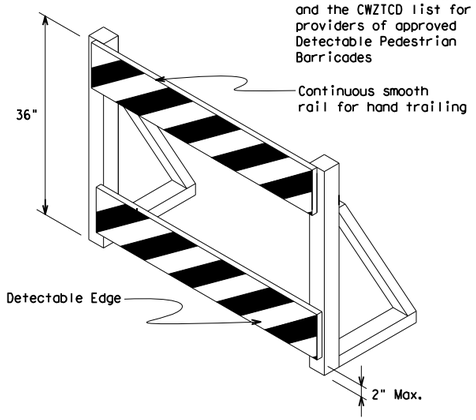
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

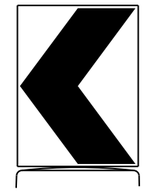




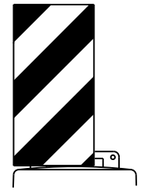


DETECTABLE PEDESTRIAN BARRICADES

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0319	01	069,ETC.	US 287,ETC.
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	LFK	TRINITY,ETC.		40
7-13				

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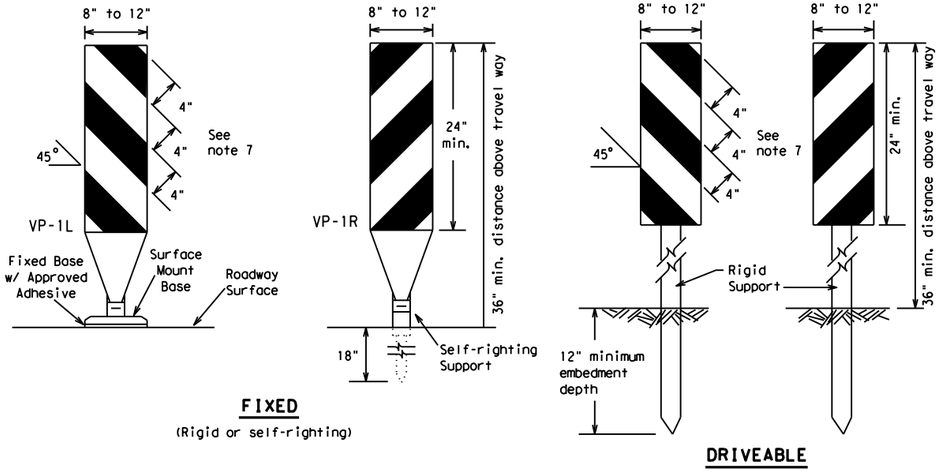
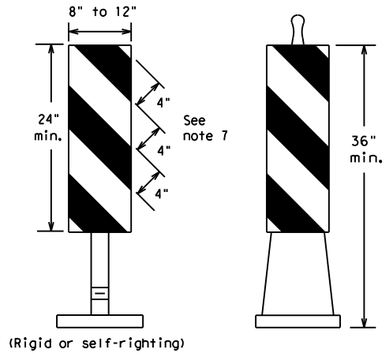


FIXED
(Rigid or self-righting)

DRIVEABLE

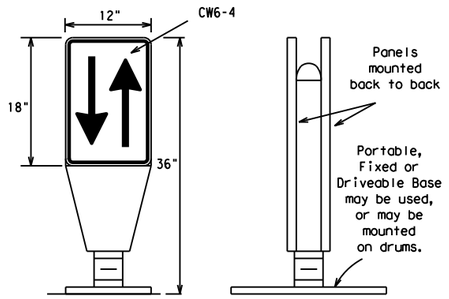


(Rigid or self-righting)

PORTABLE

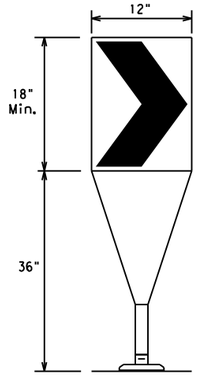
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



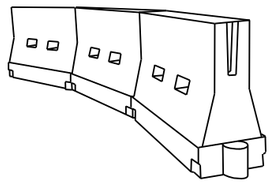
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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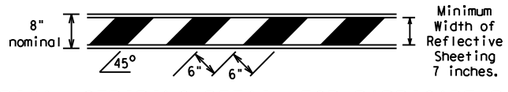
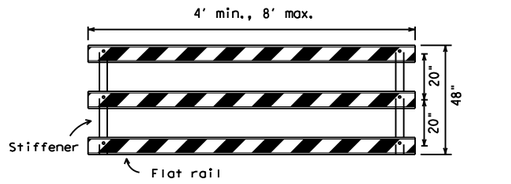
TYPE 3 BARRICADES

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.



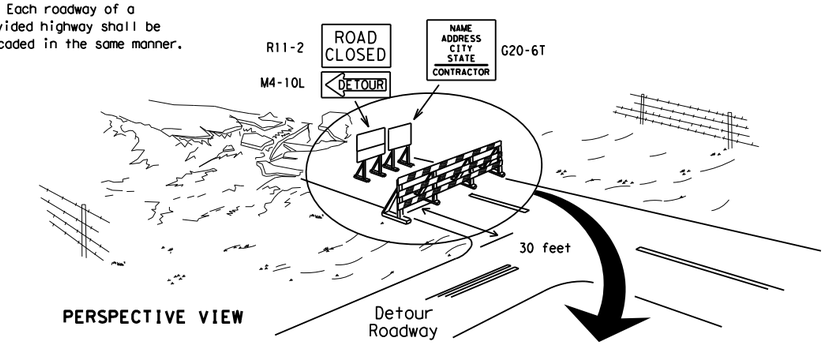
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

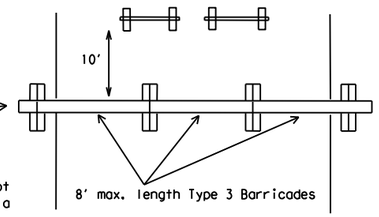
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

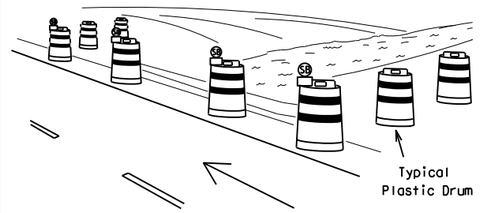
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

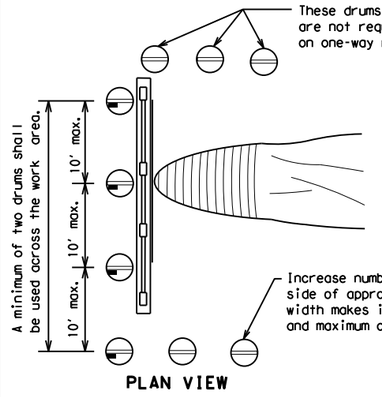
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

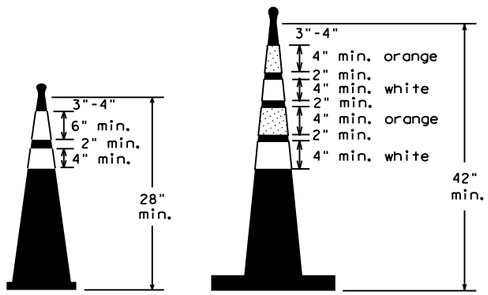
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

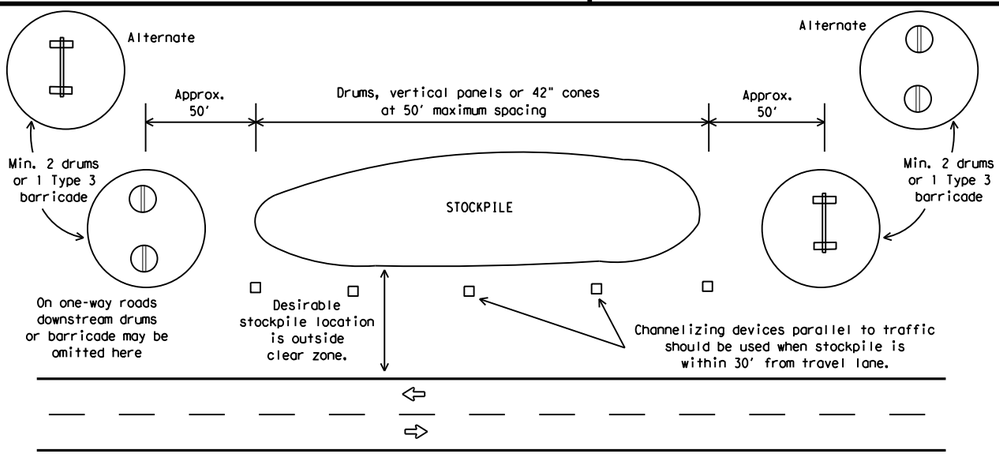
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

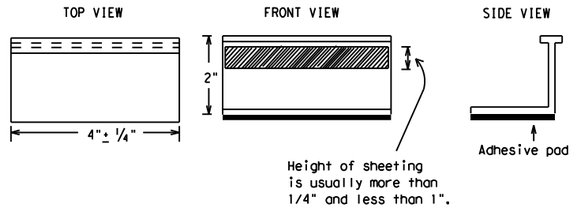
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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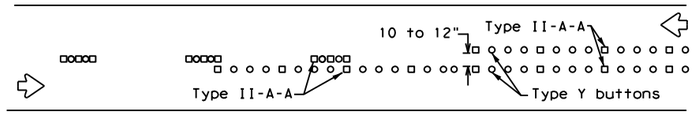
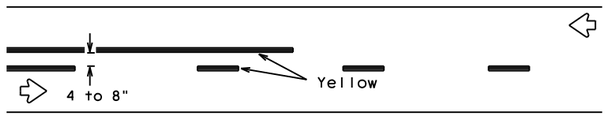
PAVEMENT MARKING PATTERNS

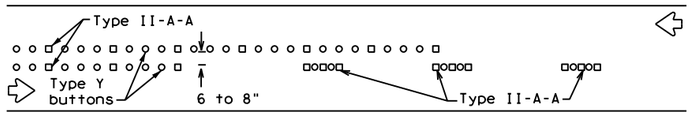
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



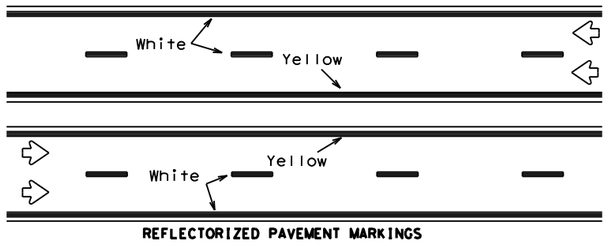
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



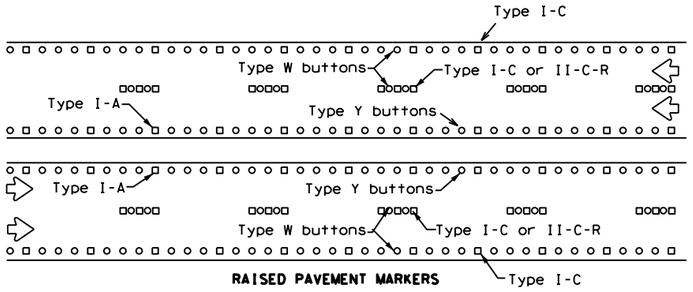
RAISED PAVEMENT MARKERS - PATTERN B

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



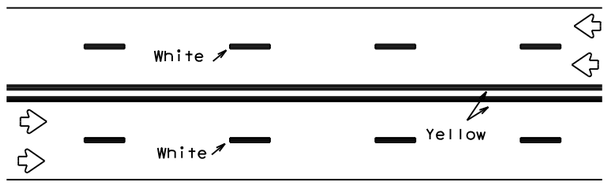
REFLECTORIZED PAVEMENT MARKINGS



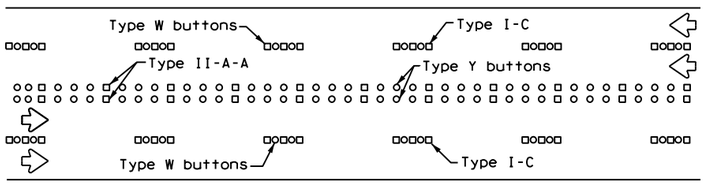
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



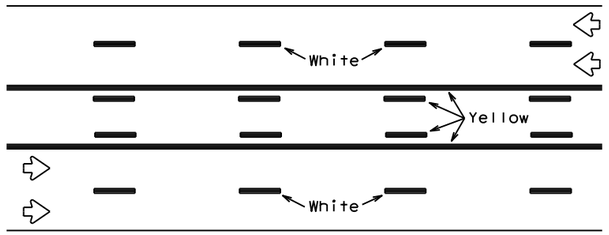
REFLECTORIZED PAVEMENT MARKINGS



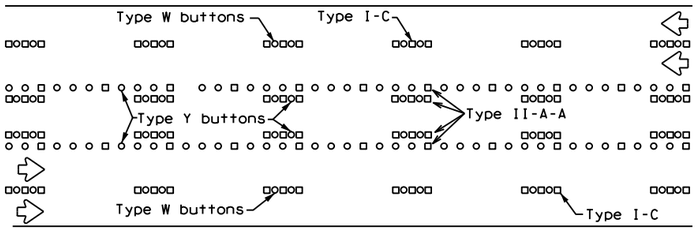
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

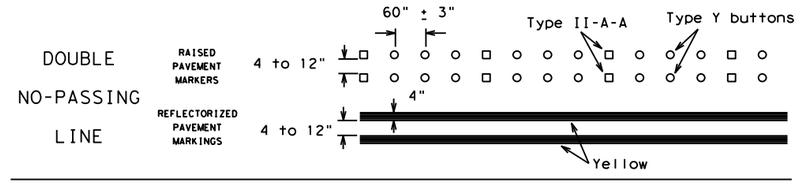
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

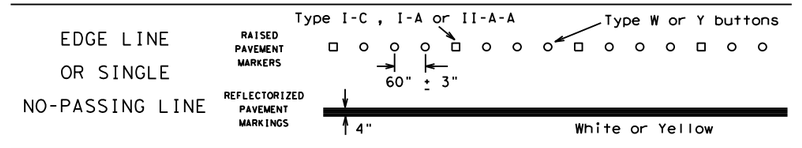
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

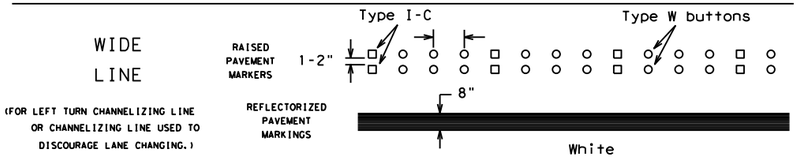


EDGE LINE OR SINGLE NO-PASSING LINE



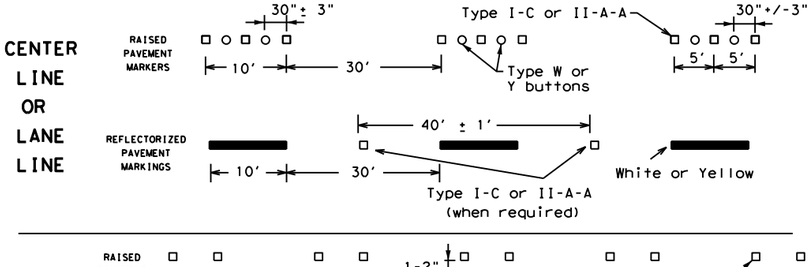
WIDE LINE

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

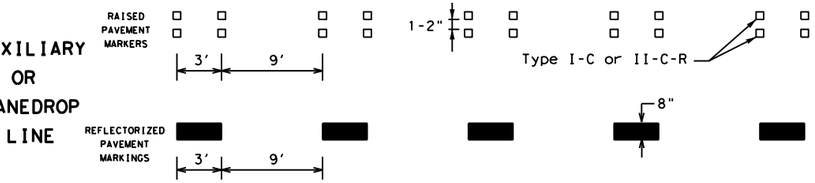


BROKEN LINES

CENTER LINE OR LANE LINE

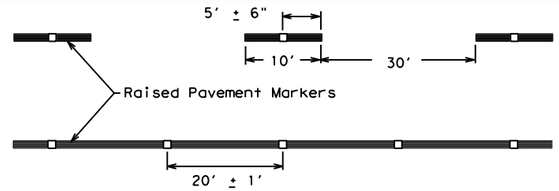


AUXILIARY OR LANEDROP LINE



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

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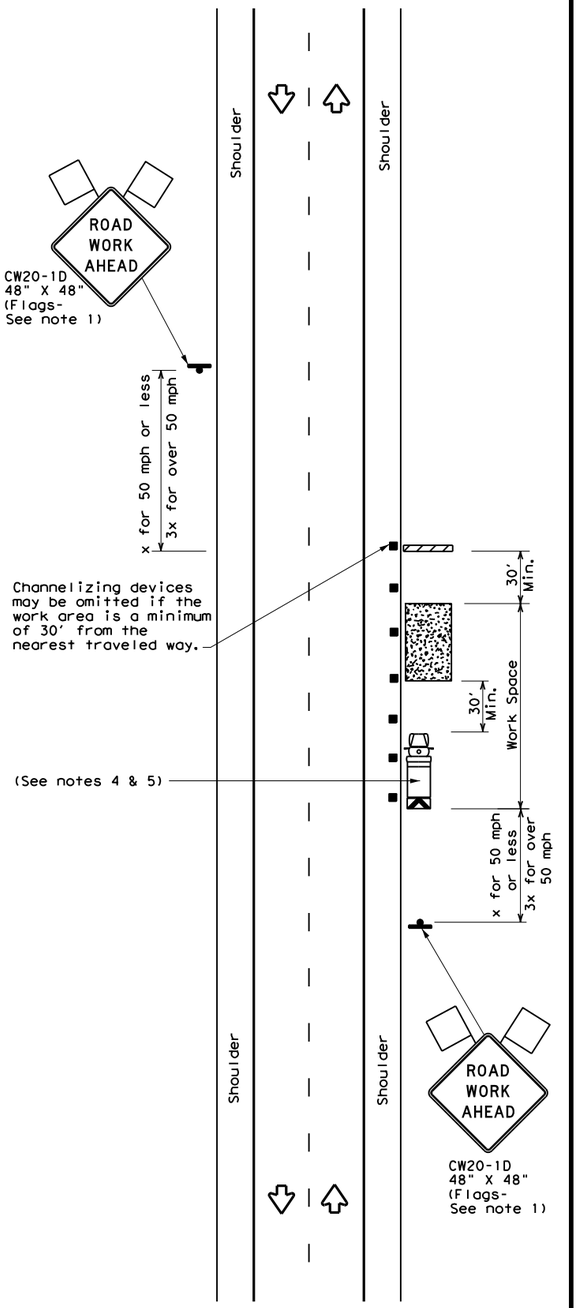
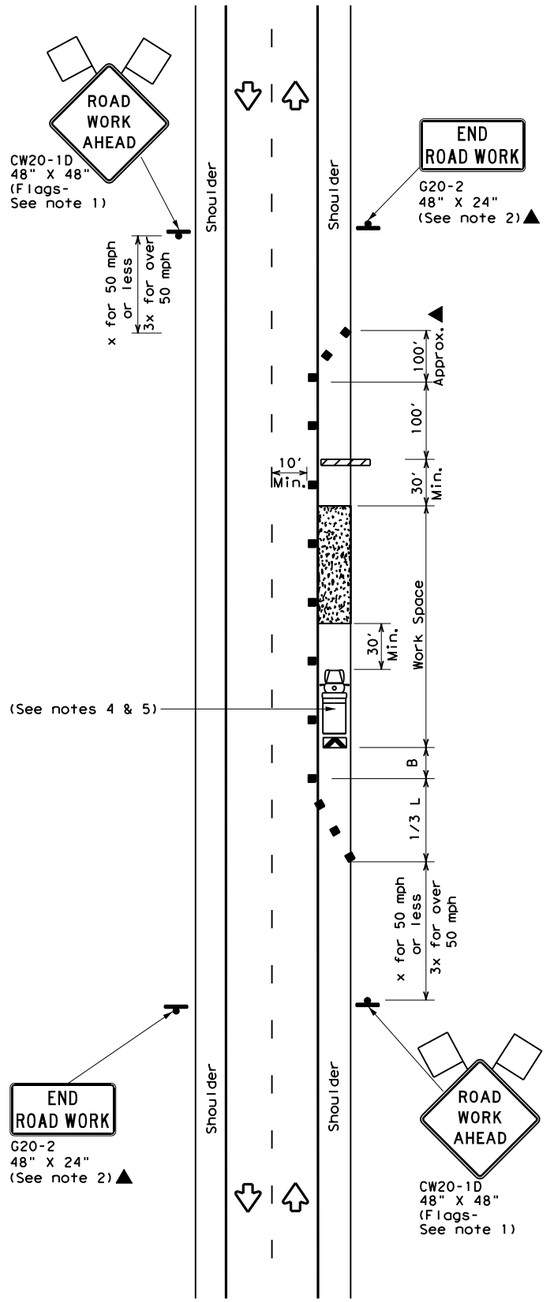


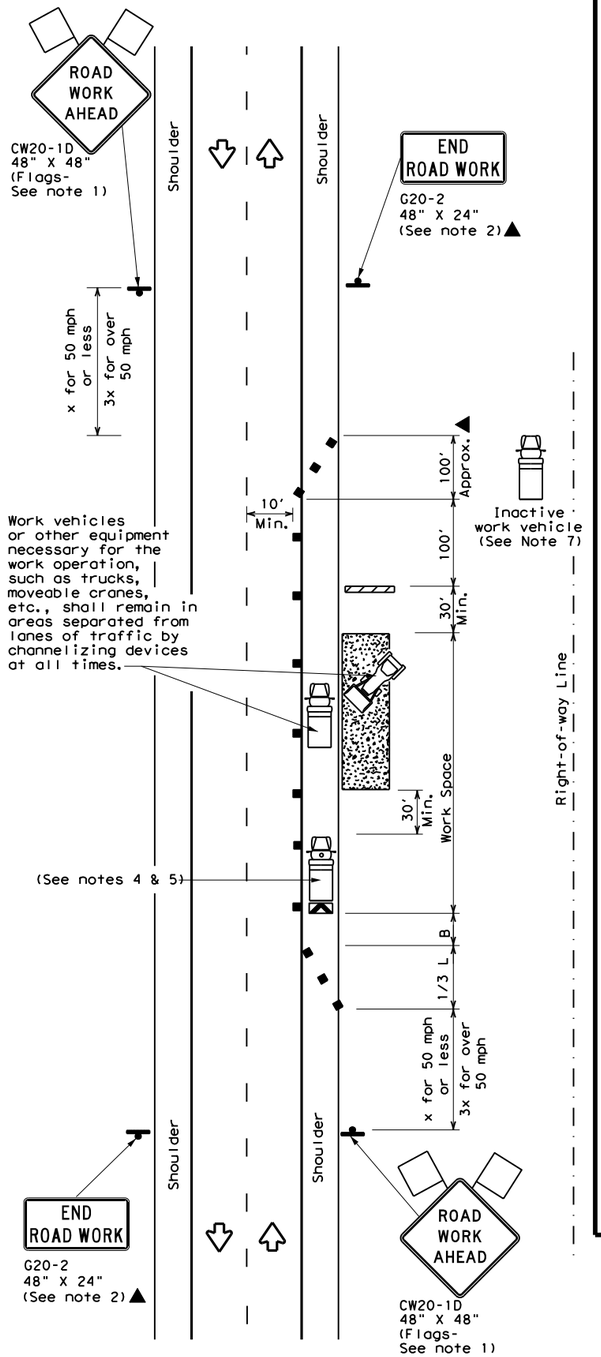
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	LFK	TRINITY,ETC.		45
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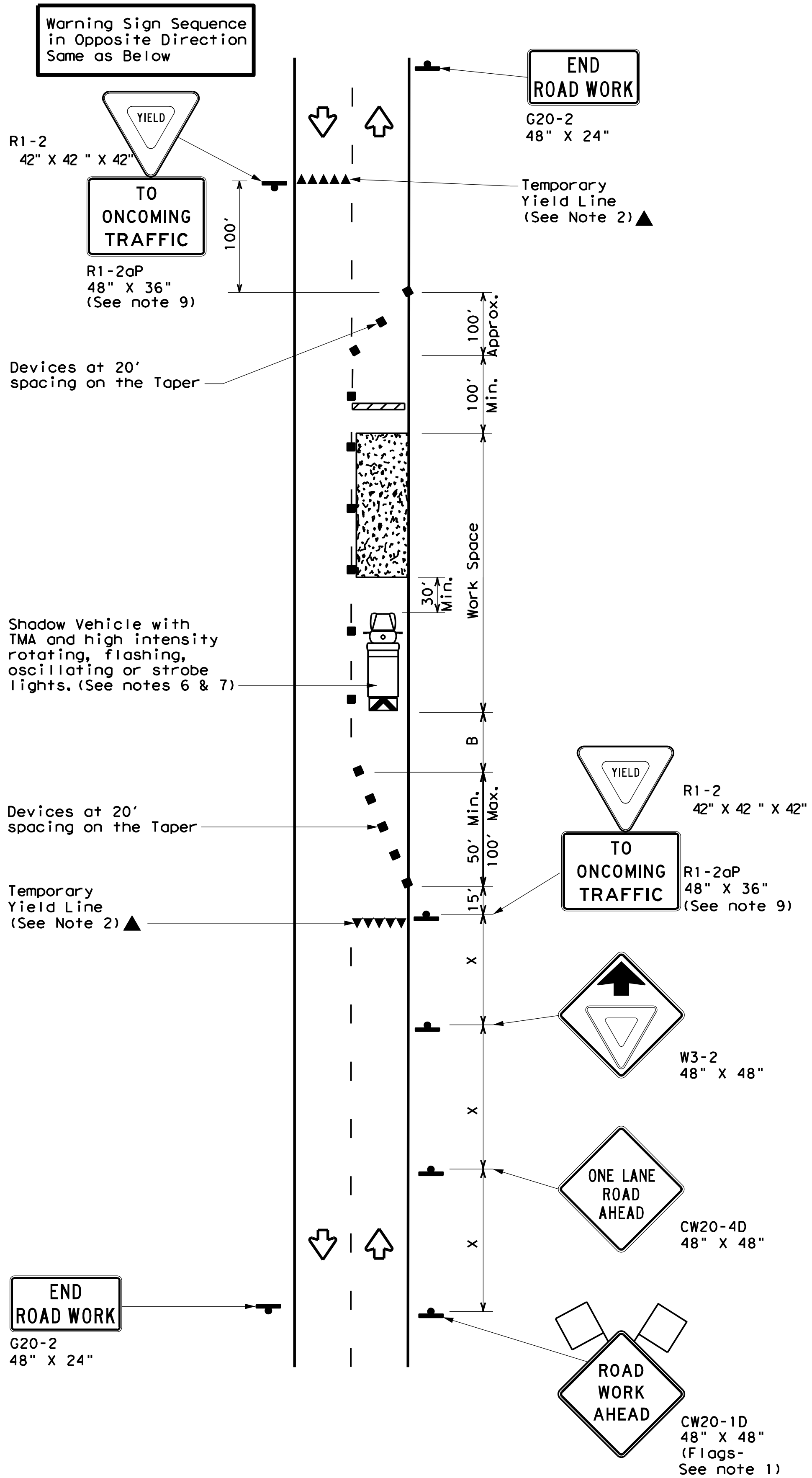
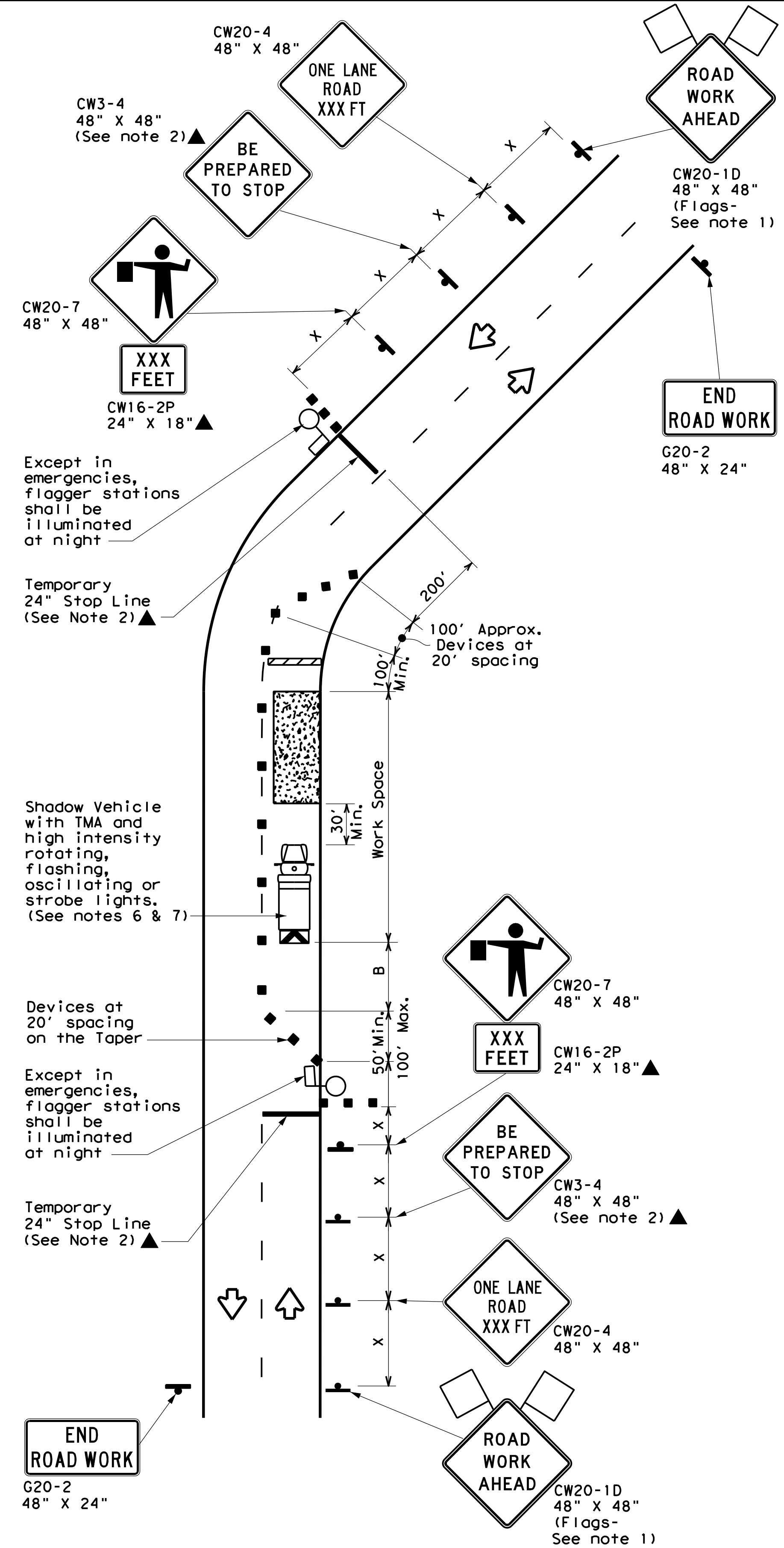


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
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

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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	LFK		TRINITY,ETC.	46

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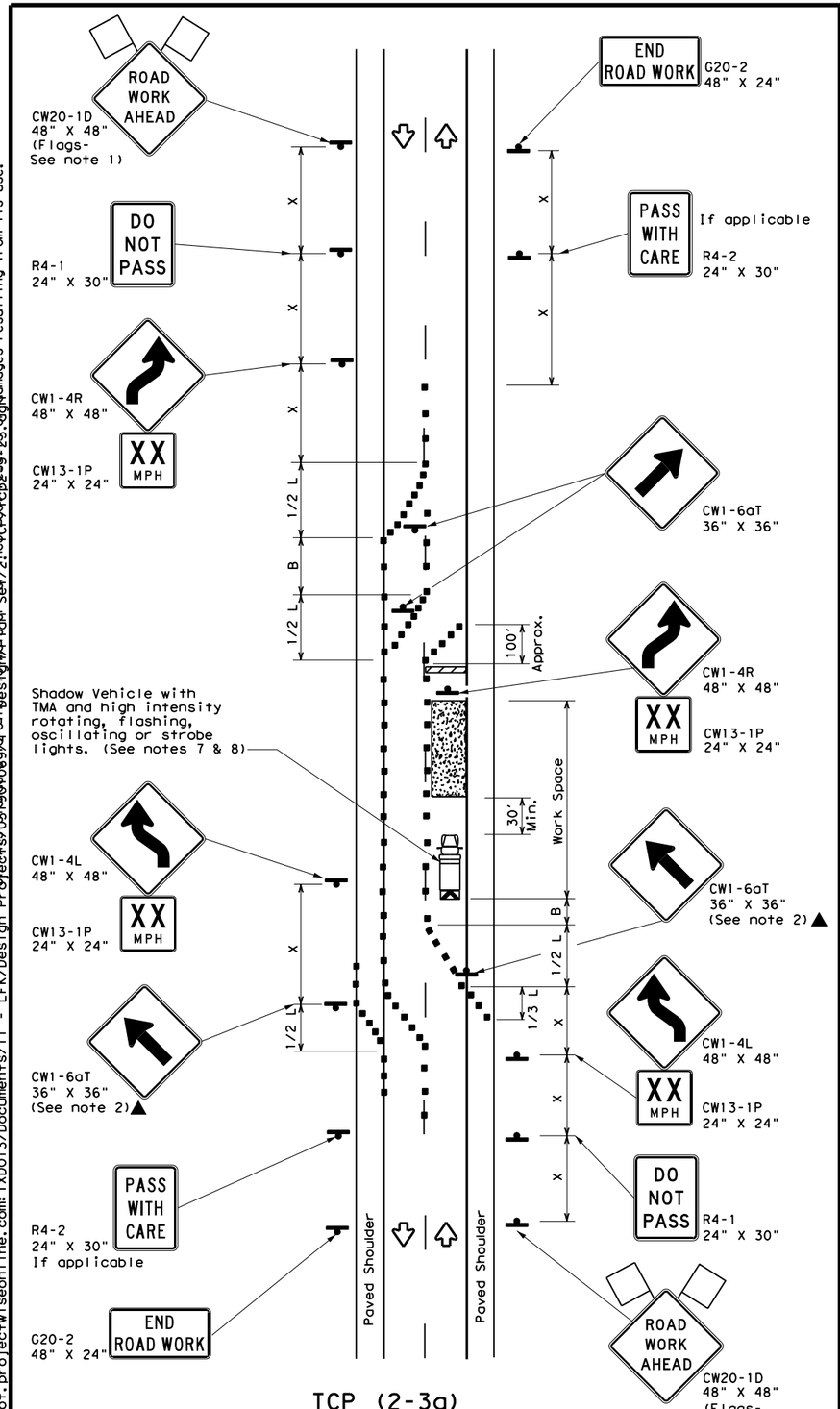
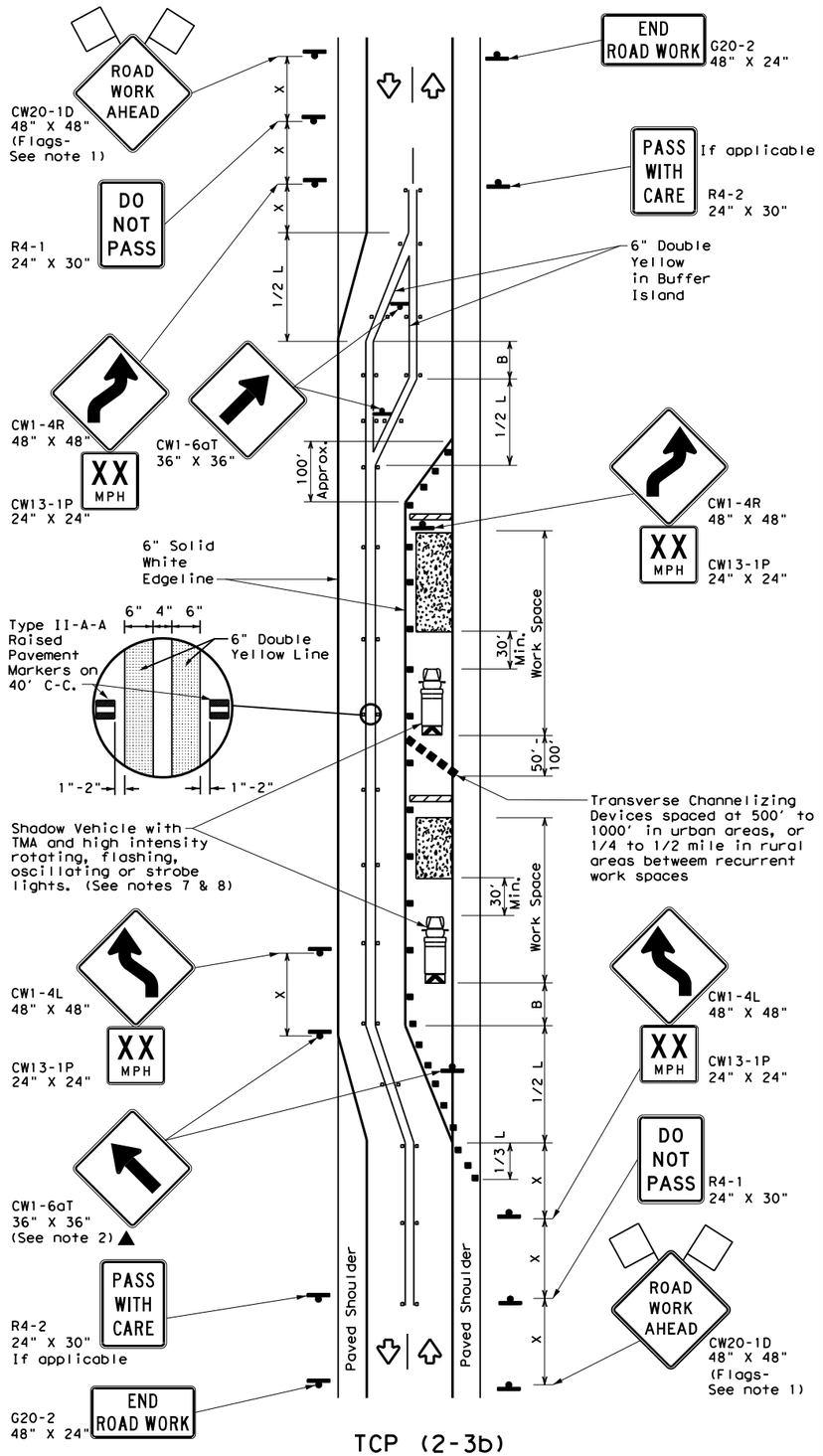


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	• • • •	Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

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

Texas Department of Transportation — *Traffic Operations Division Standard*

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

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© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
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8-95 3-03 4-23	DIST	COUNTY		SHEET NO.
1-97 2-12	LFK	TRINITY,ETC.		47

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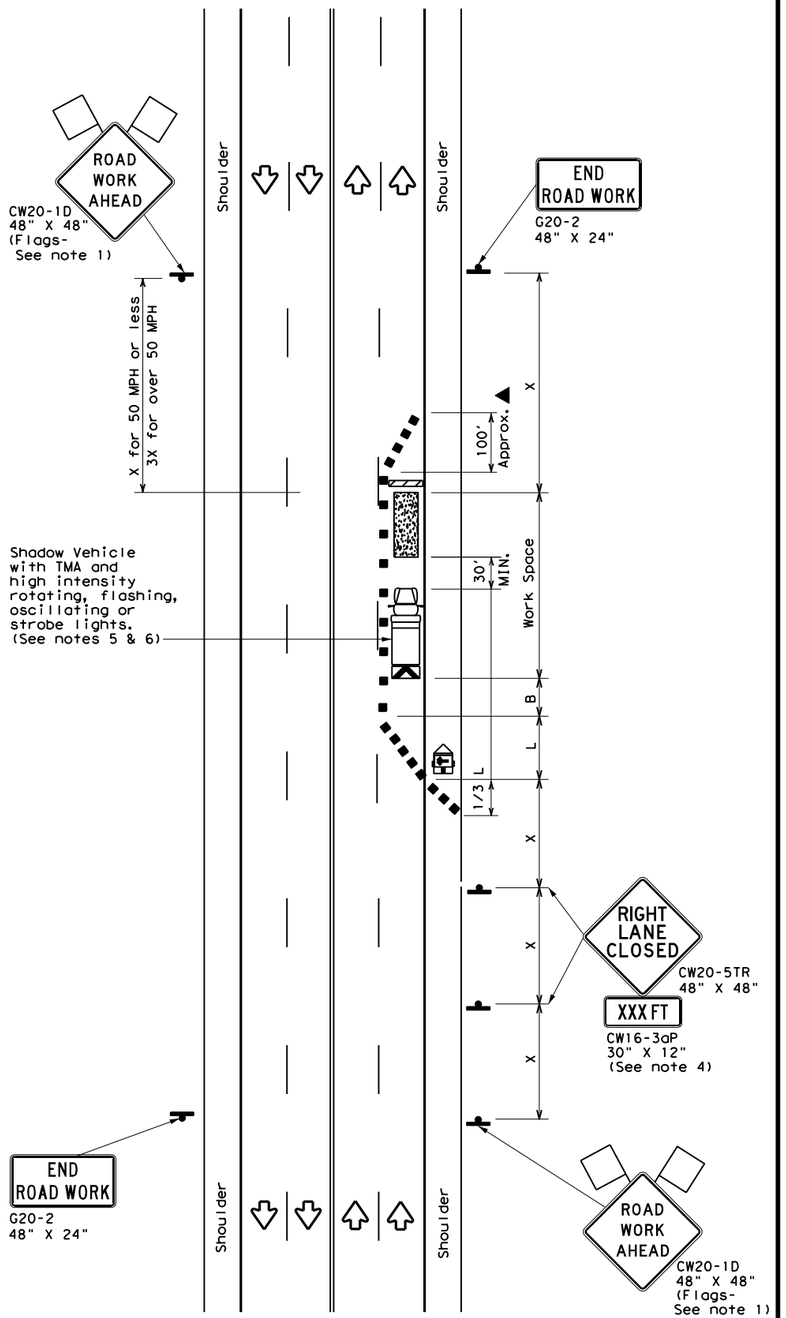
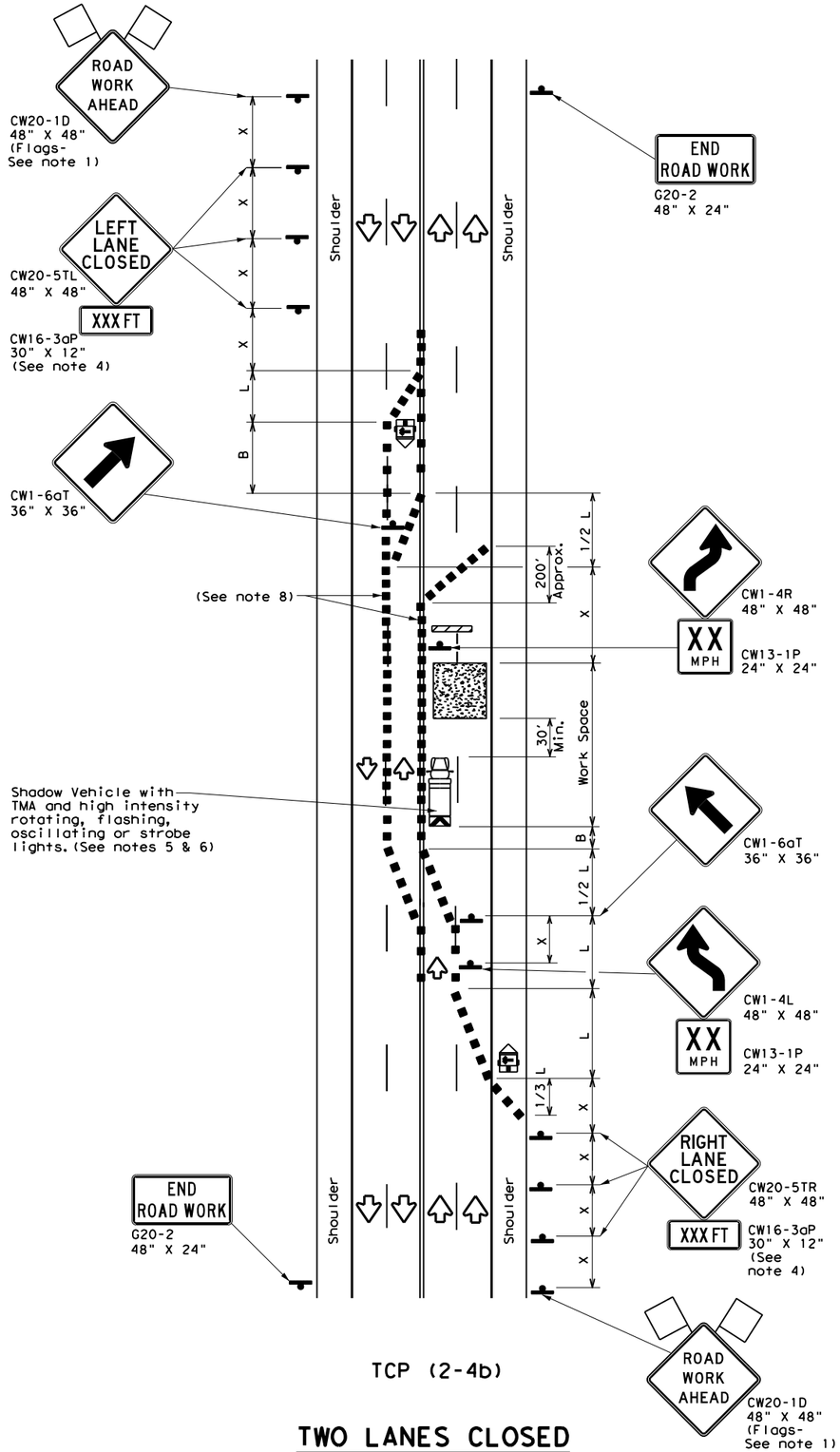


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	LFK	TRINITY,ETC.		48

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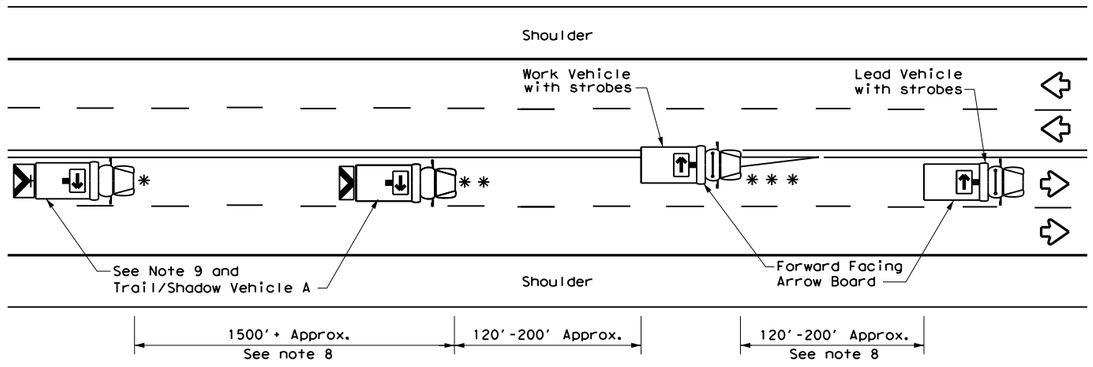
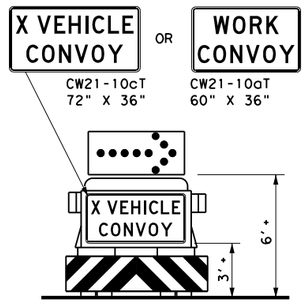


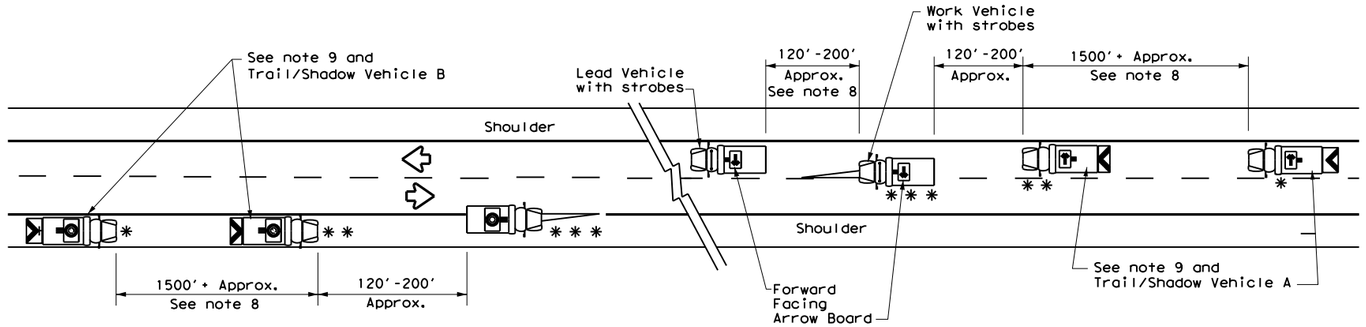
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

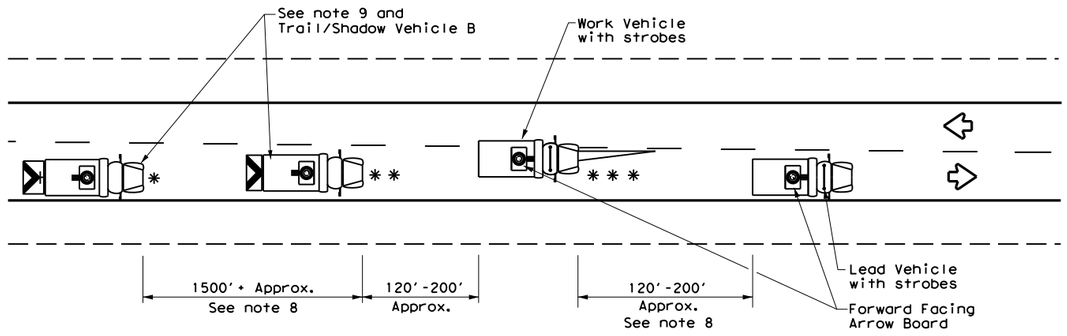


WORK ON SHOULDER

WORK ON TRAVEL LANE

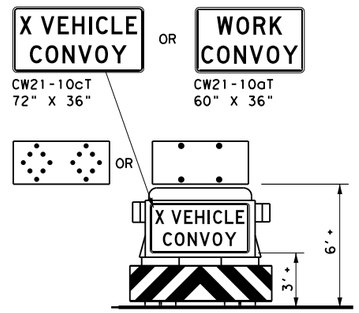
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

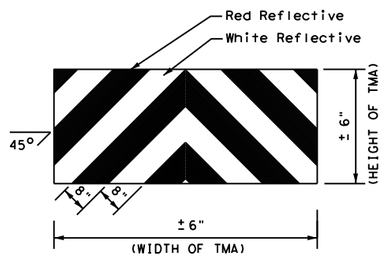
with Flashing Arrow Board in CAUTION display

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.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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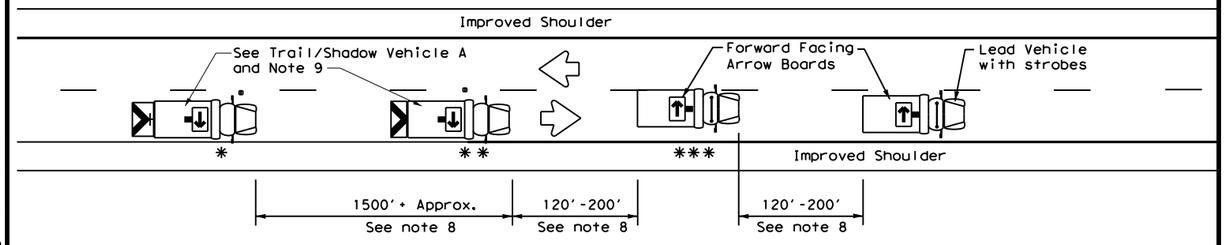
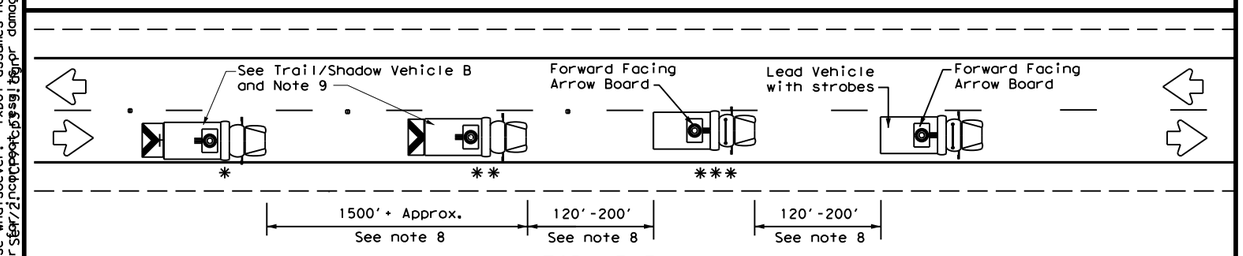


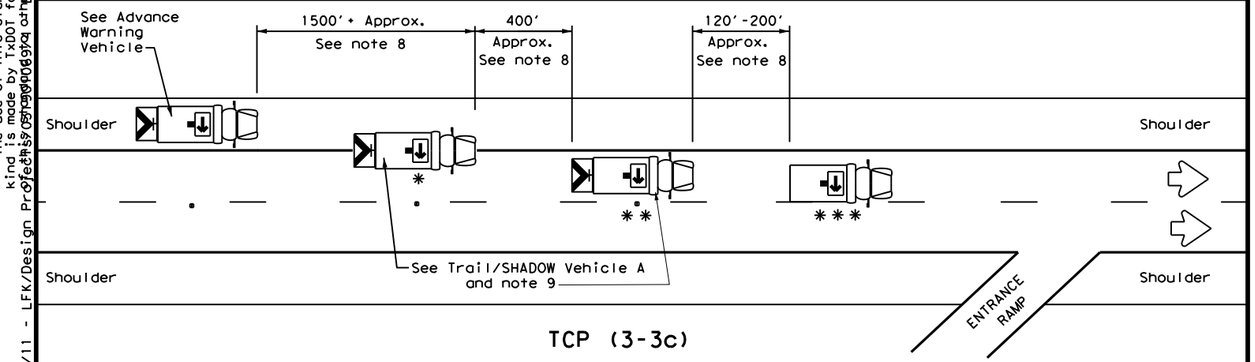
TCP (3-3a)

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



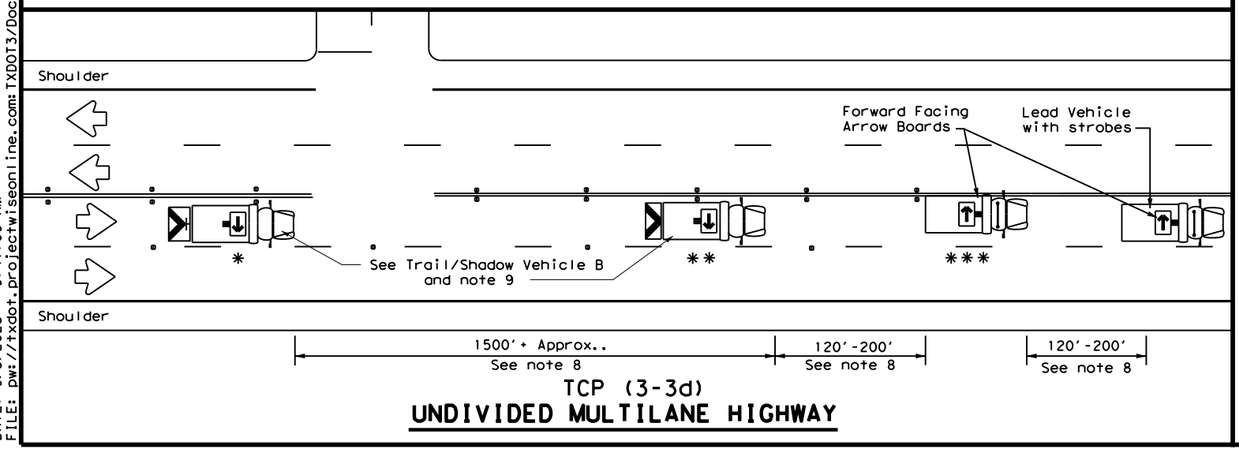
TCP (3-3b)

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



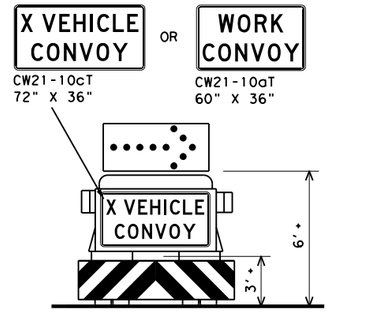
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



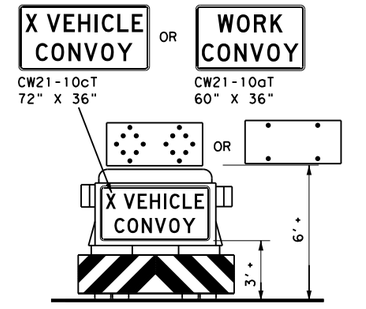
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



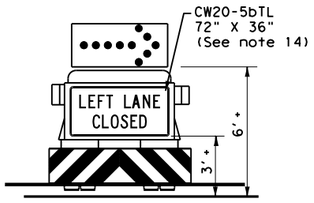
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

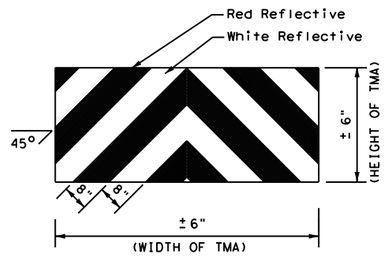


TRAIL/SHADOW VEHICLE B

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0319	01	069,ETC.	US 287,ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13				
1-97 7-14	LFK	TRINITY,ETC.		50

DATE: 9/5/2023 9:47:13 AM
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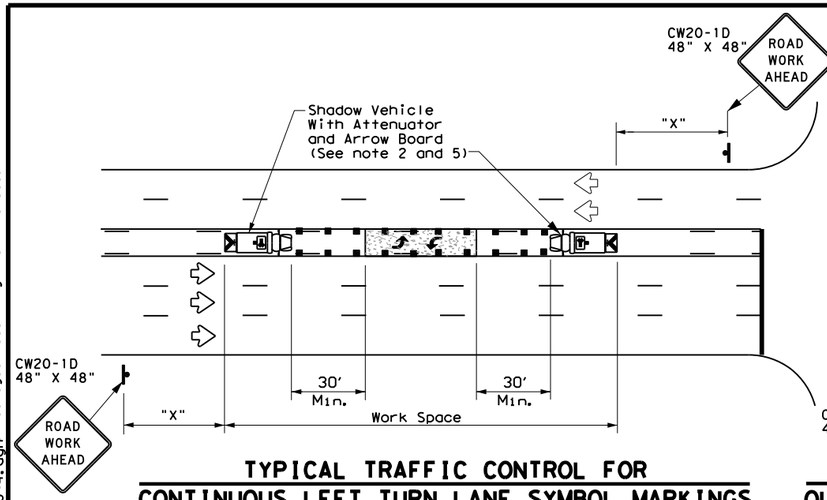
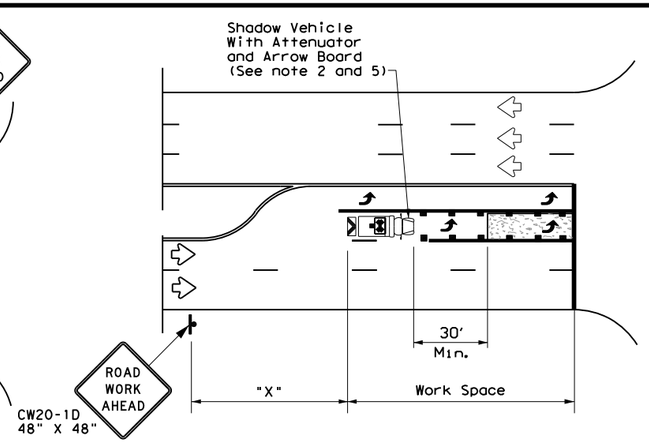
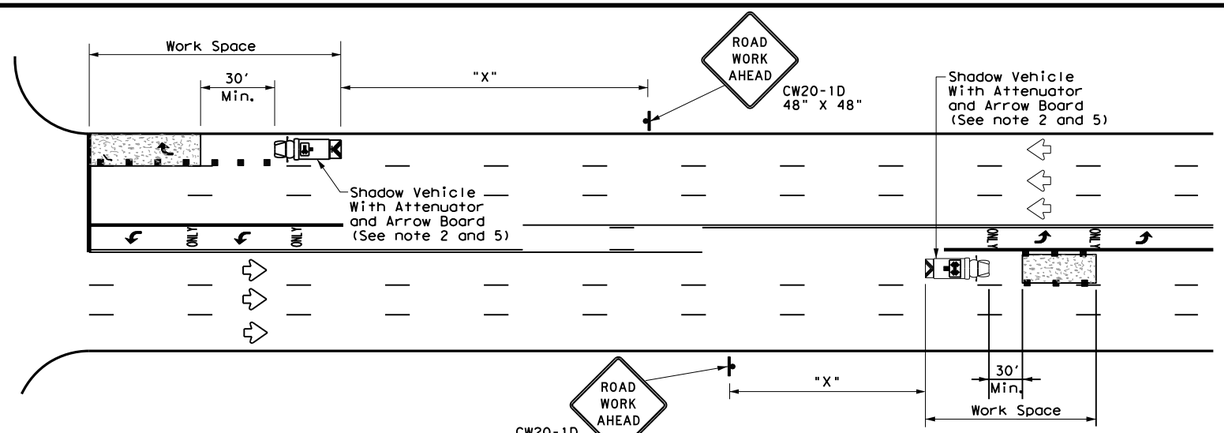


TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

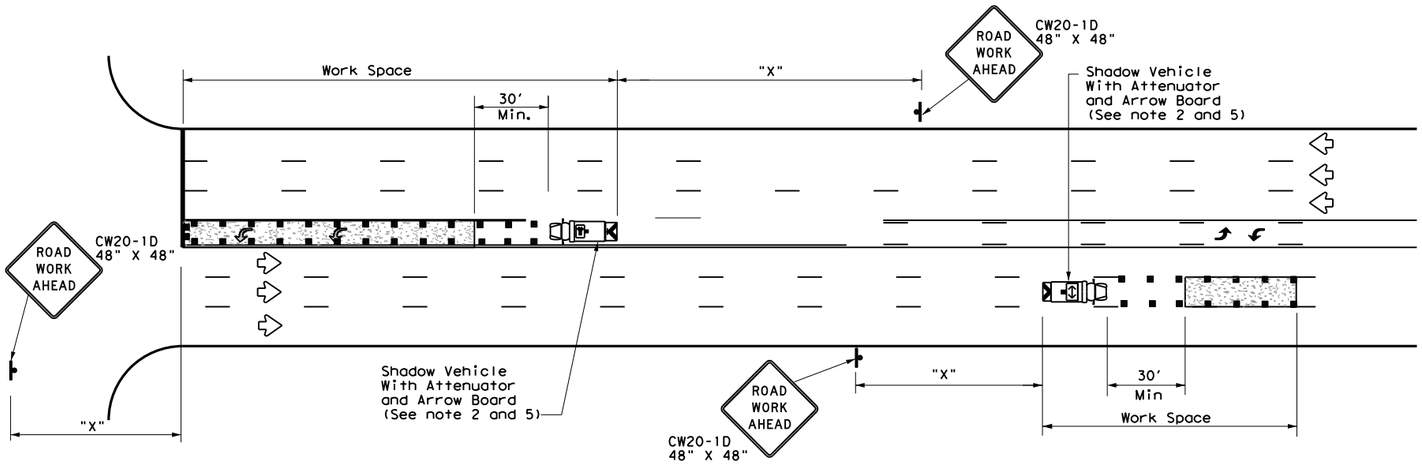


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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

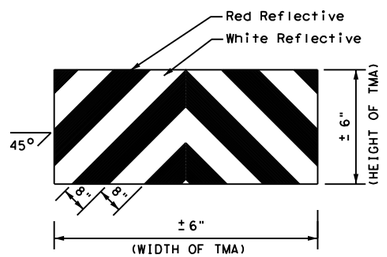
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take 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
REVISIONS	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		51

DATE: 9/5/2023 9:47:17 AM
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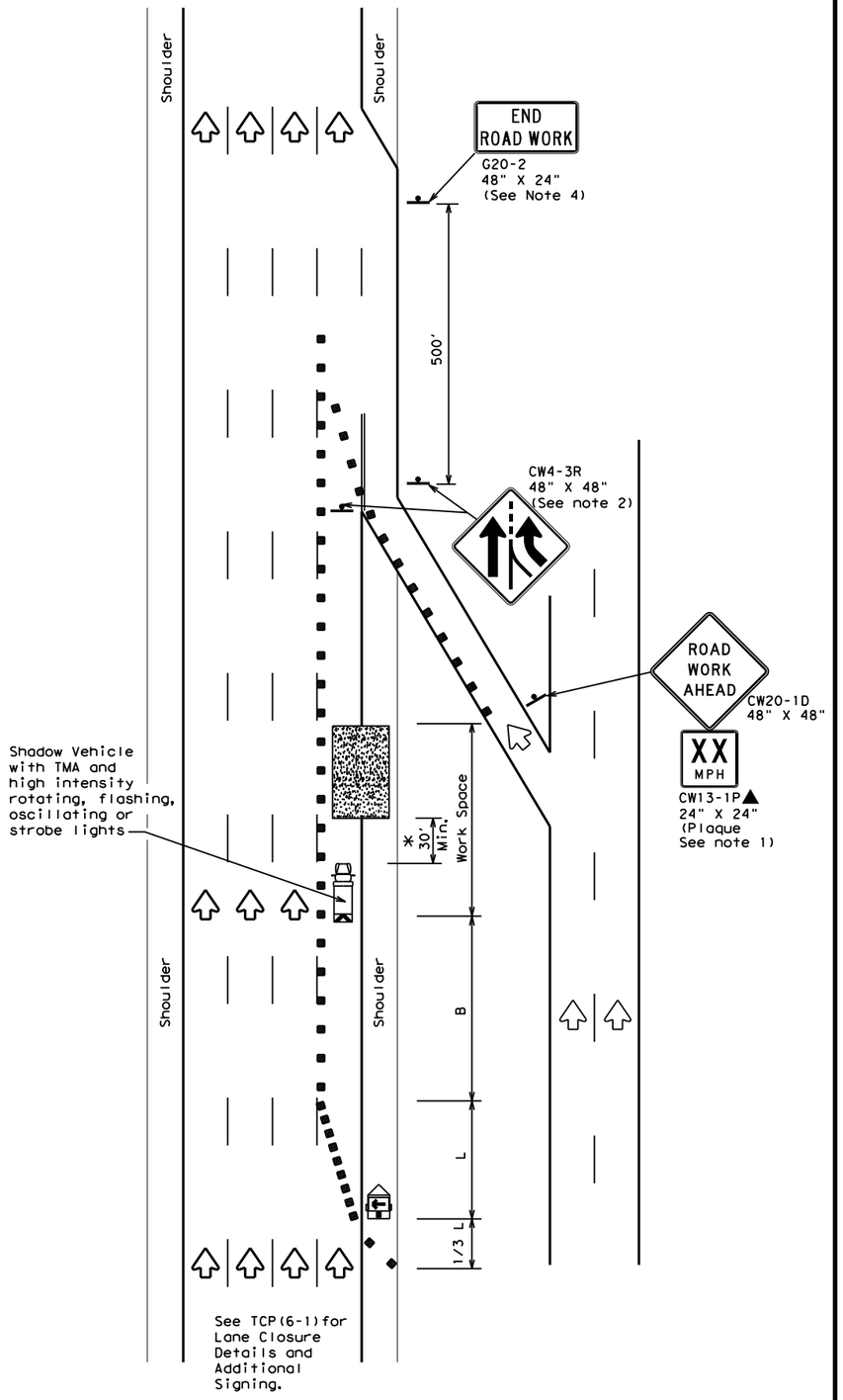
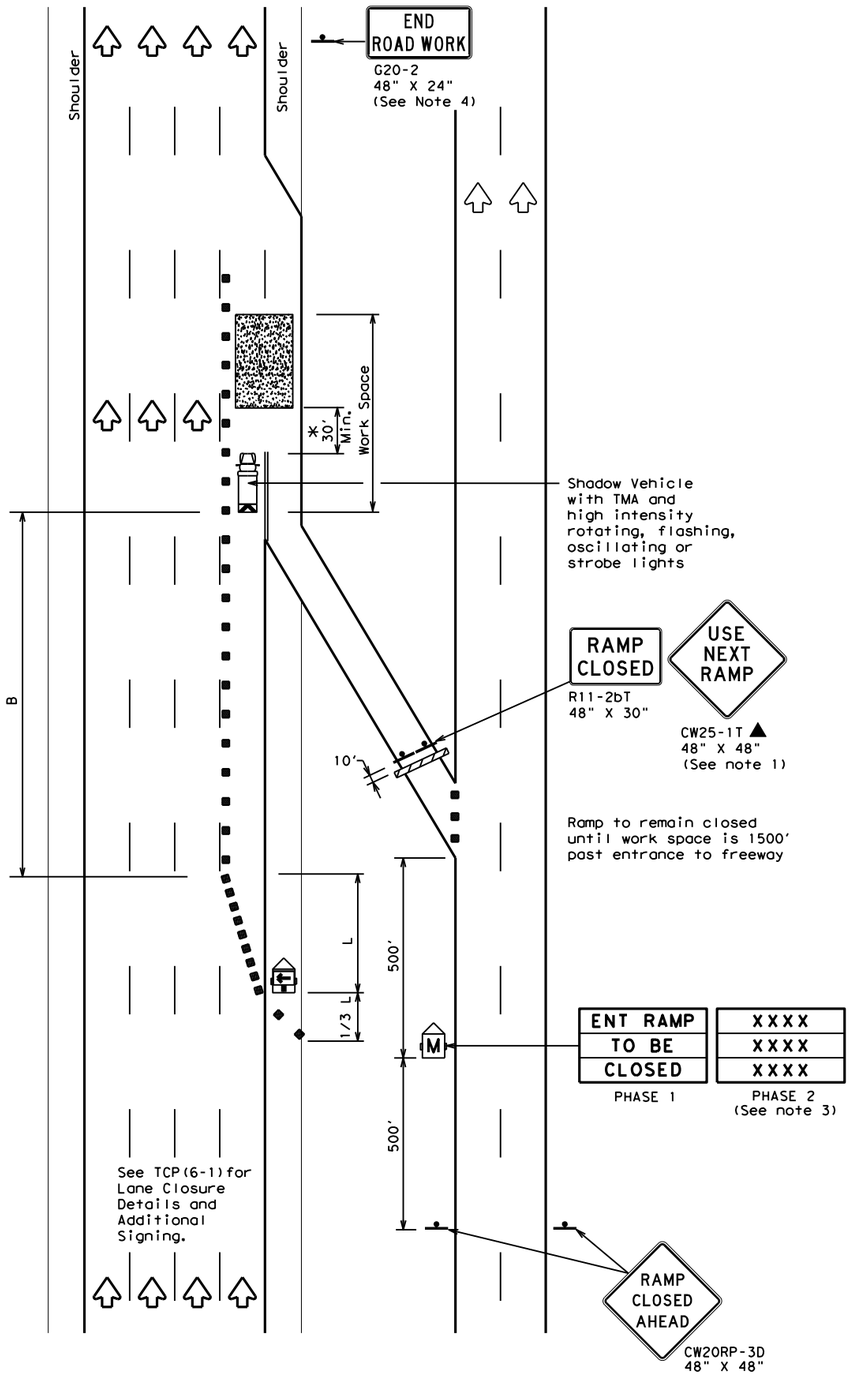


TCP (6-2a)

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" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
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

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©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0319	01	069,ETC.	US 287,ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	LFK	TRINITY,ETC.		52

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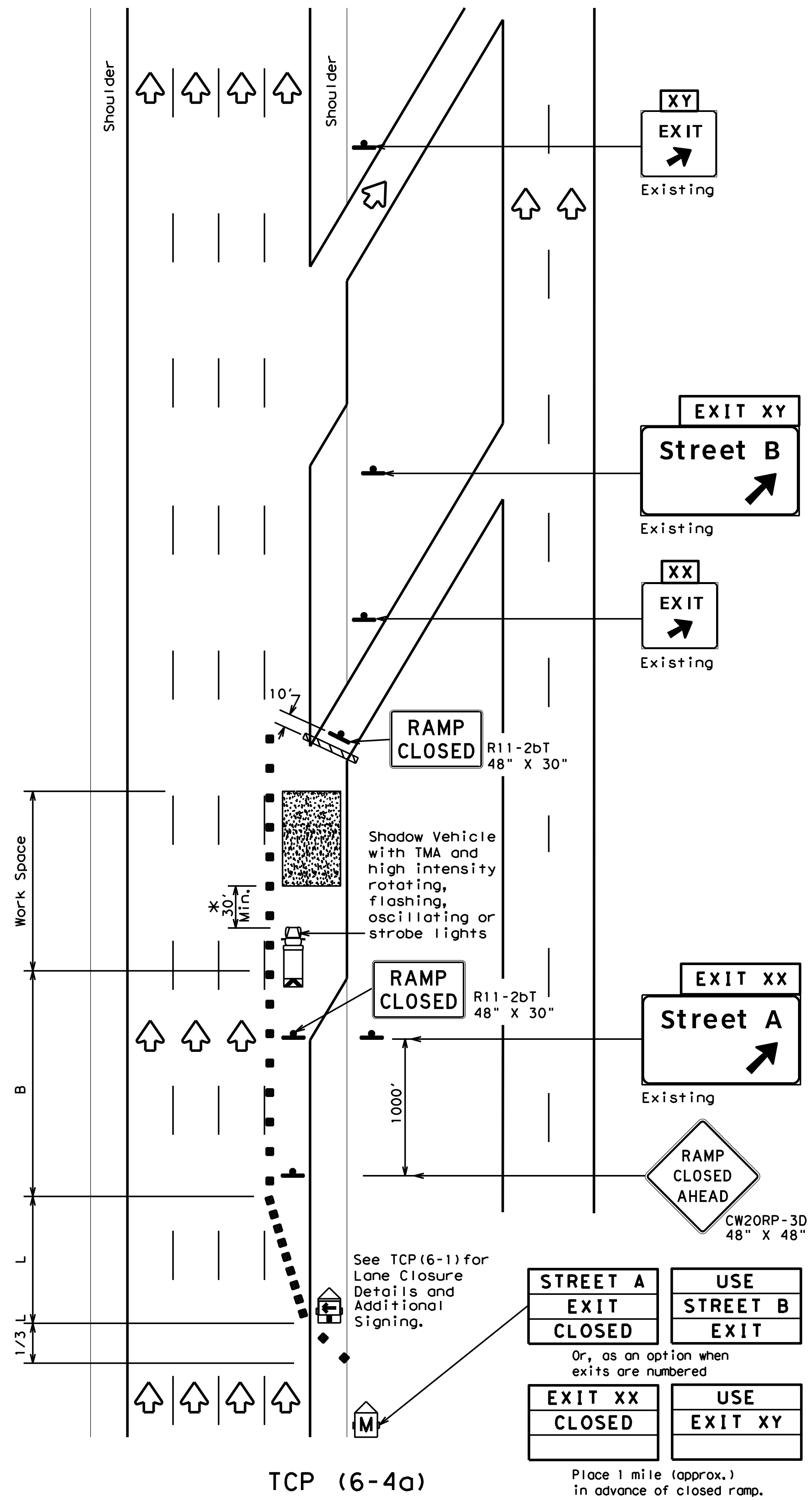
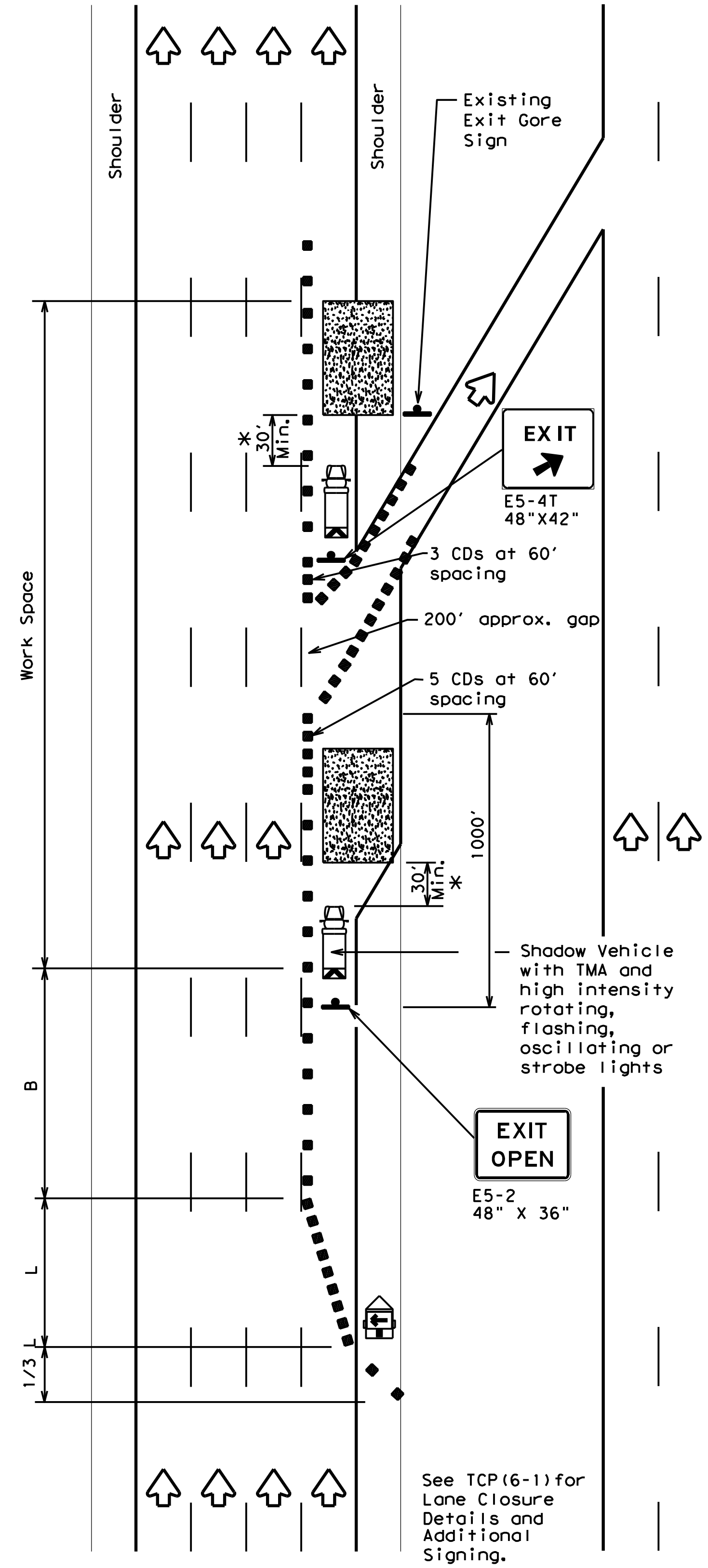


TCP (6-4a)

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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
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

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT 0319	SECT 01	JOB 069,ETC.	HIGHWAY US 287,ETC.
REVISIONS 1-97 8-98 4-98 8-12	DIST LFK	COUNTY TRINITY,ETC.		SHEET NO. 53

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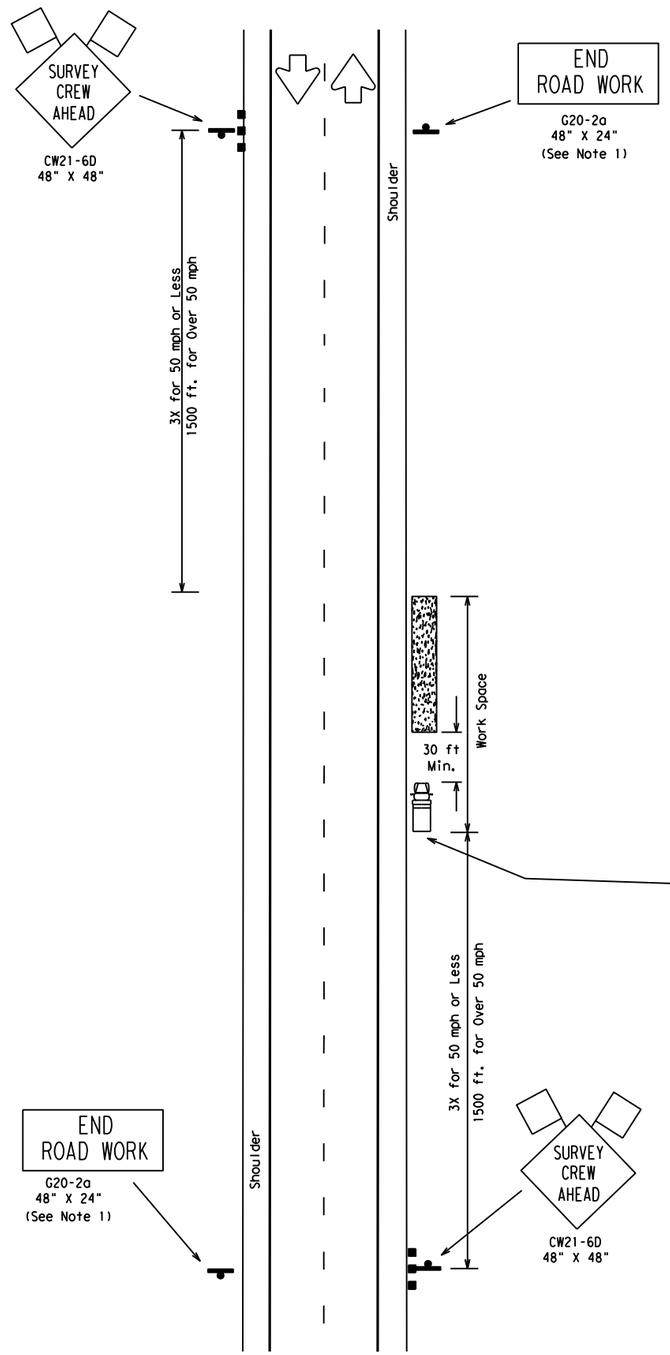

TCP (S-1a)
WORK OFF SHOULDER OR PAVED SURFACE

TCP (S-1b)
WORK ON SHOULDER

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Channelizing devices on the shoulder taper and tangent section may be omitted for short duration (less than 1 hour) work.
3. If line-of-sight requirements for surveying operations will preclude the placement of the Work Vehicle to protect workers, the channelizing devices mentioned in Note 2 are required.
4. ⚠1 A Shadow Vehicle with a Truck Mounted Attenuator and flashing warning lights/arrow panel in caution mode may be used in lieu of the Work Vehicle to protect the work space.
5. The CW20-1D "ROAD WORK AHEAD" sign may be substituted for the CW21-6D "SURVEY CREW AHEAD" sign.
6. This plan may also be used for shoulder work or off shoulder work for multilane undivided roadways.
7. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-1a)

8. Cones may be placed at edge of pavement adjacent to the work space to enhance safety.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
⚠1 Corrected misspelling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-1)-08A

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

REVISIONS
8-08

CONT	SECT	JOB	HIGHWAY
0319	01	069,ETC.	US 287,ETC.
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		54

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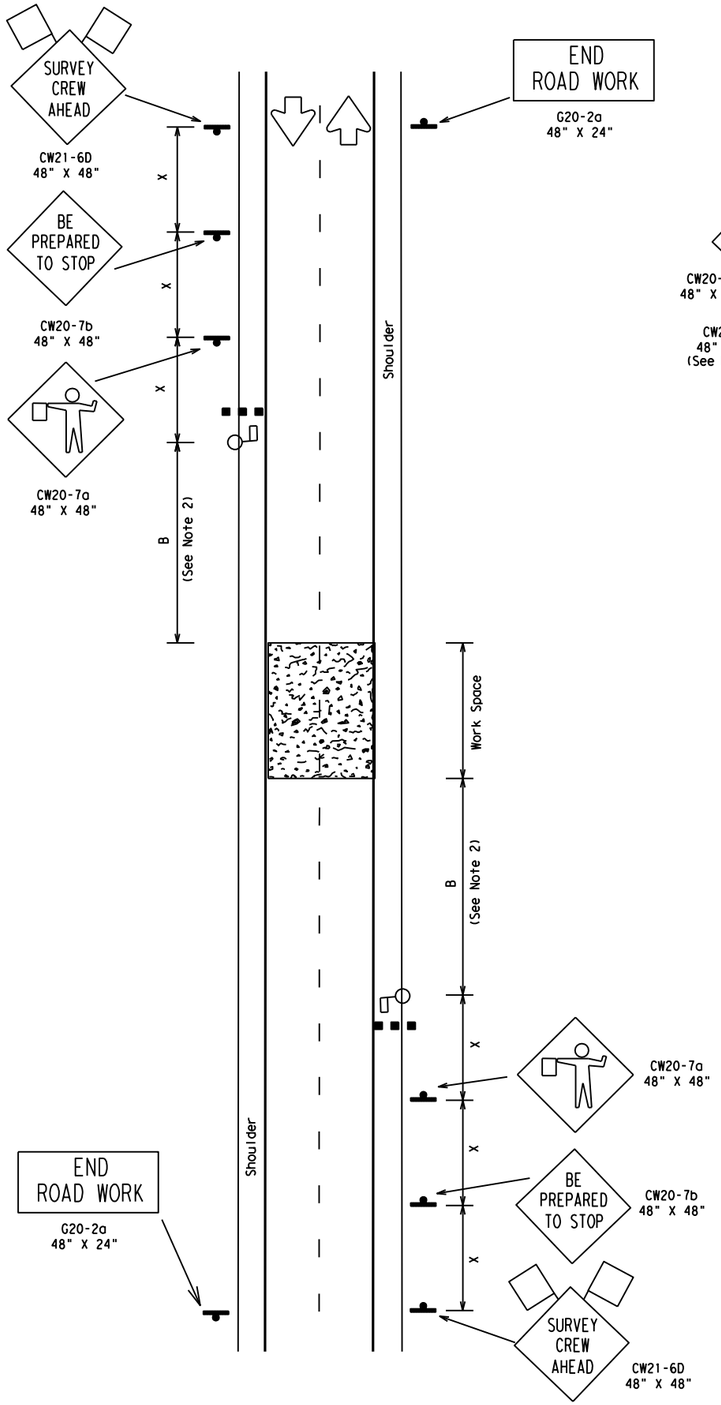
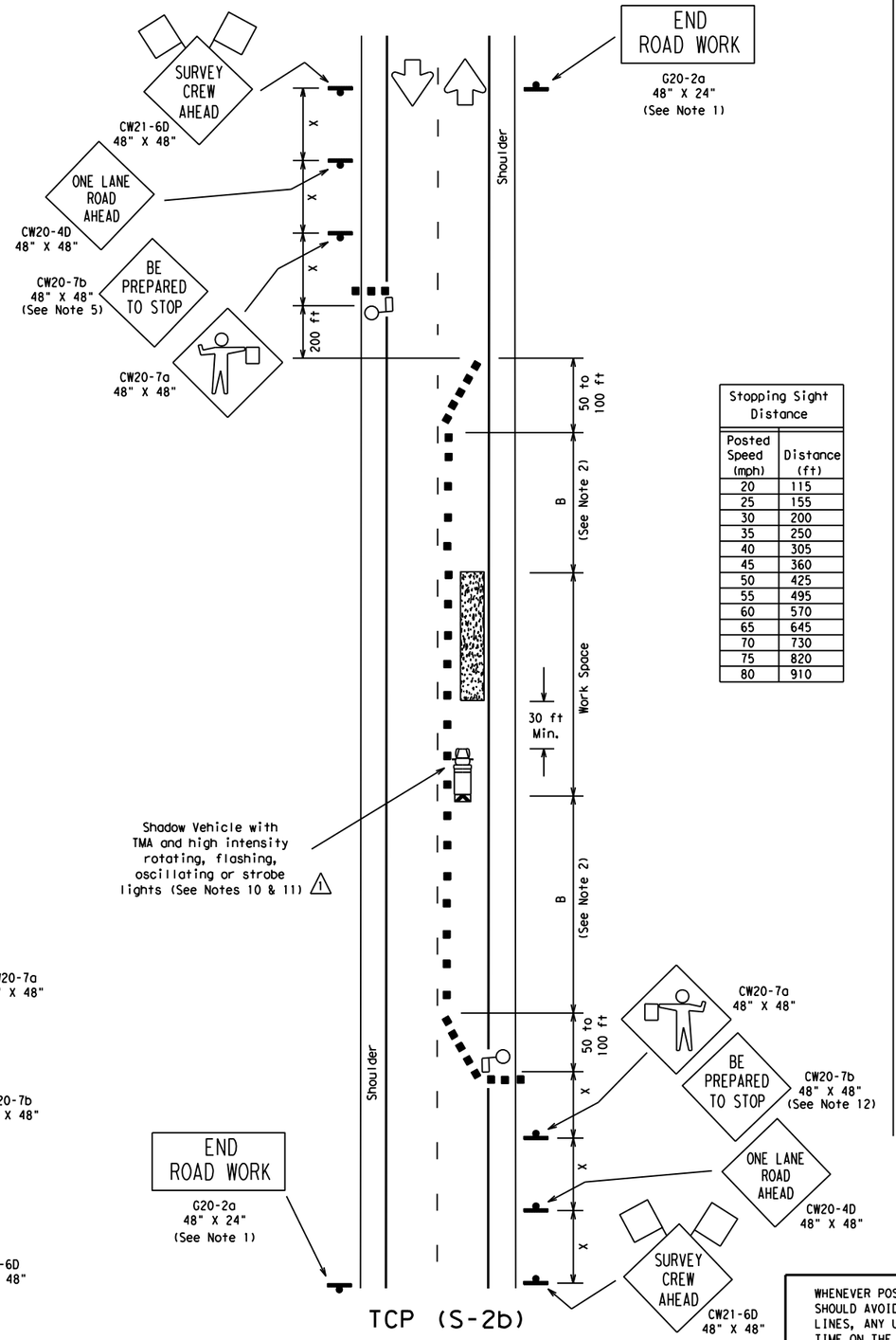


TCP (S-2a)
ROAD CLOSED FOR LESS THAN 20 MINUTES -
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS



TCP (S-2b)
WORK IN ROADWAY
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Adequate Stopping Sight Distance (see Stopping Sight Distance table) should be maintained from approaching traffic to the flagger or a queue of stopped vehicles. The Buffer Space "B" should be extended around curves or other obstacles, when necessary, to have adequate Stopping Sight Distance to the flagger station.
3. Flaggers should use two-way radios or other means of communication while flagging.
4. The length of the work space should be based on the ability of the flaggers to communicate.
5. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
6. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-2a)

7. Road closures shall be less than 20 minutes. Closures less than 5 minutes are desirable.
8. Sign spacing should be increased if traffic repeatedly queues past the CW20-7b "BE PREPARED TO STOP" sign.
9. The surveying instrument should not be located on the paved surface.

TCP (S-2B)

10. For short duration work the Shadow Vehicle with a TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
11. Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
12. The CW20-7b "BE PREPARED TO STOP" sign is optional. When used, it should be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
1 Corrected referrence to notes.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2)-08A

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
8-08	CONT	SECT	JOB	HIGHWAY
	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		55

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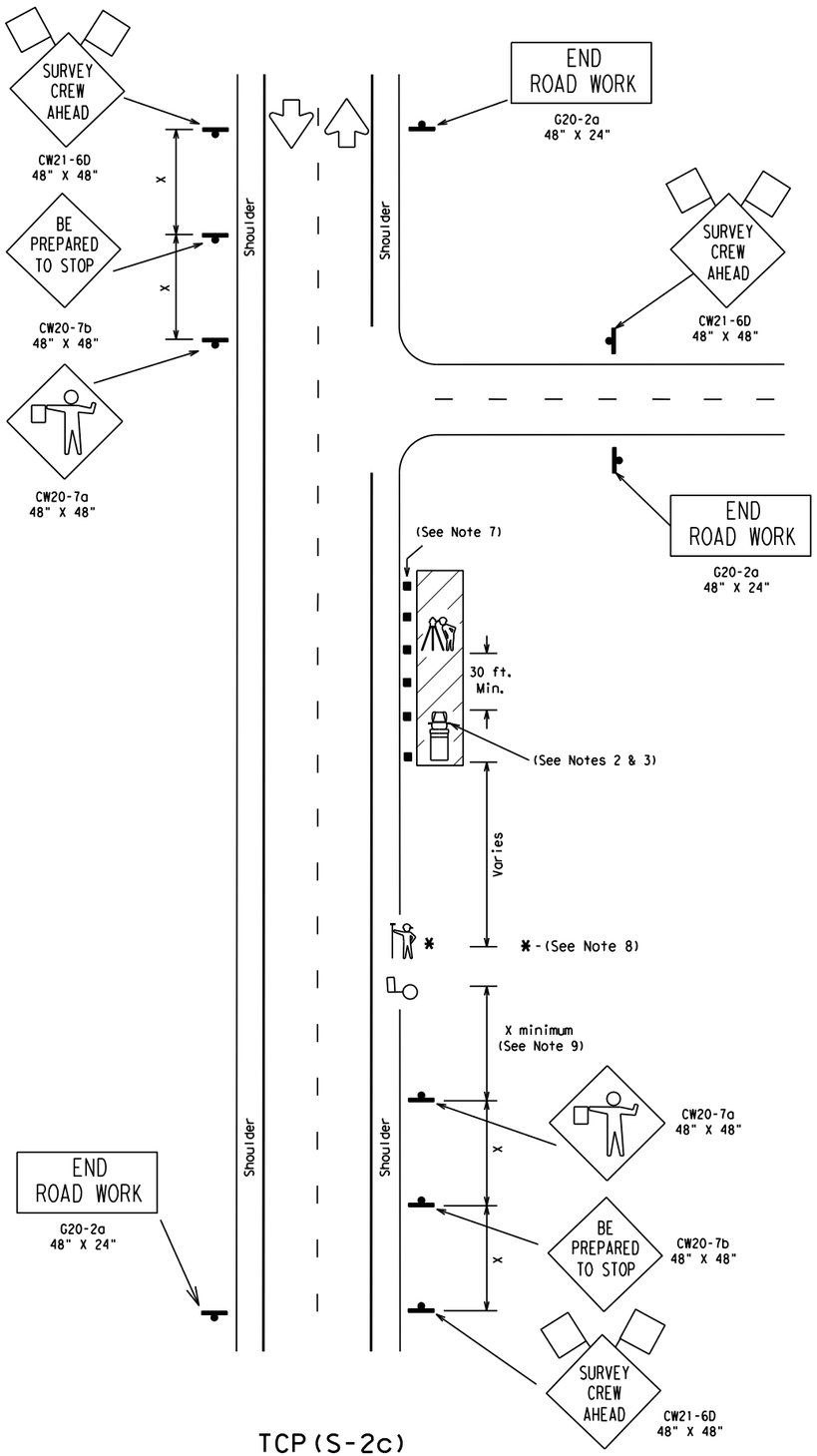

TCP(S-2c)

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

Posted Speed ✱	Formula	Minimum Desirable Taper Lengths ✱✱ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:

MOBILE - work that moves continously or intermittently (stopping up to approximately 15 minutes).

SHORT DURATION - work that occupies a location up to 1 hour.

SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Work Vehicle with high intensity rotating, flashing, oscillating or strobe lights should be used to protect work space.
3. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Heavy Work Vehicle.
4. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" SIGNS.
5. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads may be omitted when approved by the Engineer.
6. The Surveying Instrument shall not be located on the paved surface.
7. Cones at edge of pavement adjacent to instrument person may be omitted when approved by the Engineer.
8. Rodman may only enter roadway when accompanied by flagger and as traffic allows.
9. The distance between the advance warning signs and the work should not exceed a two mile maximum.
10. Flaggers and Survey Crew should use two-way radios or other means of communication.
11. Survey Crew and Flaggers shall wear high-visibility apparel meeting the ANSI 107-2007 standard performance for Class 2 or Class 3 risk exposure.
12. Additional traffic control devices may be required to address local site conditions.
13. Stopping Sight Distance shall be maintained from approaching traffic to the flagger. See "Stopping Sight Distance" table.

SURVEY PARTIES SHOULD AVOID ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

This TCP is to cover two lane rural type roadways as determined by the Engineer. All other type roadways will be covered by other established Survey TCP'S.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2c)-10

REVISIONS

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

CONT	SECT	JOB	HIGHWAY
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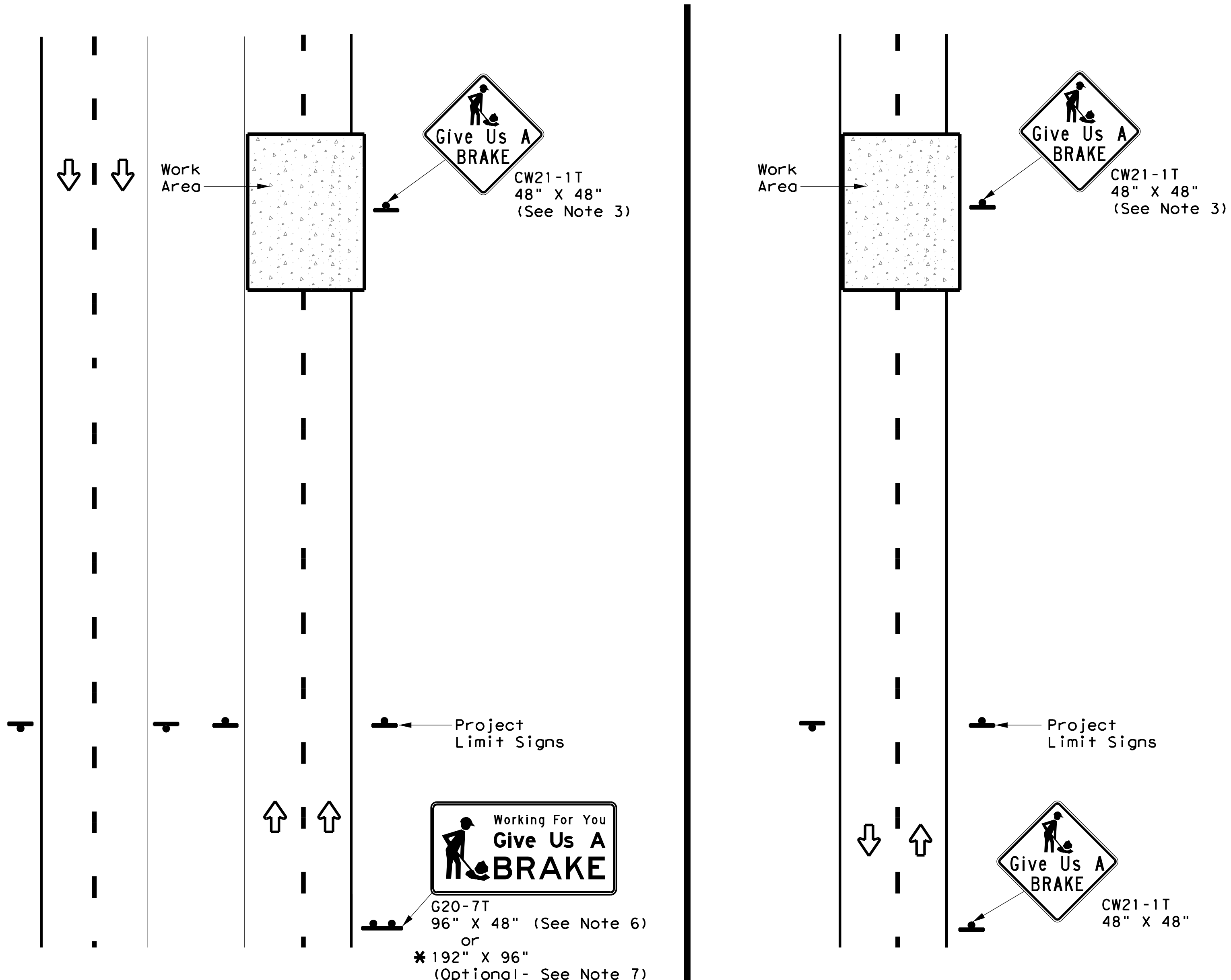
DIST	COUNTY		SHEET NO.
LFK	TRINITY,ETC.		56

212A



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

Symbol	Meaning
(sign symbol)	Sign
(large sign symbol)	Large Sign
(arrow)	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	0319	01	069,ETC.	US 287,ETC.
6-96 5-98 7-13	DIST		COUNTY	SHEET NO.
8-96 3-03	LFK		TRINITY,ETC.	57

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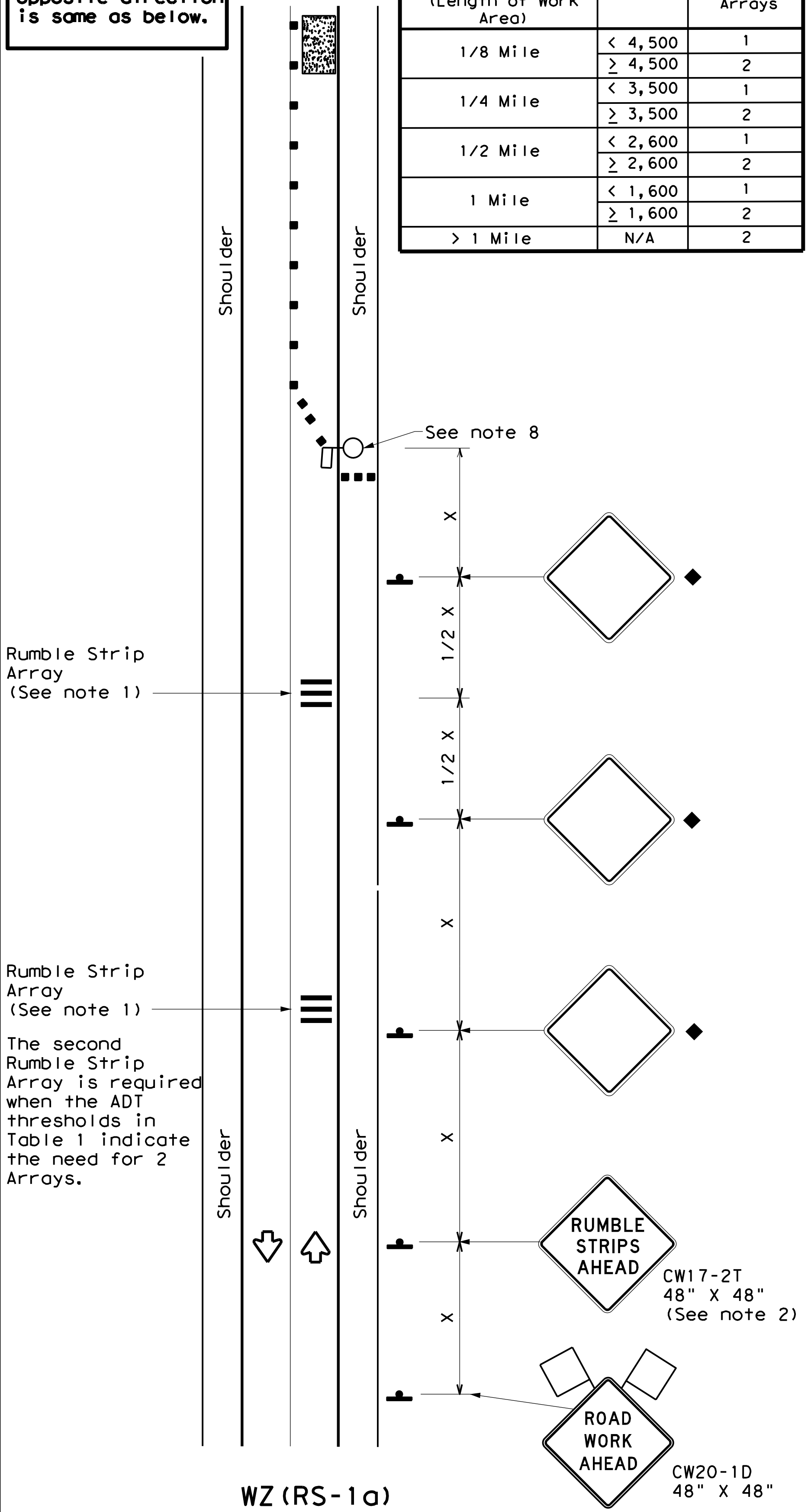
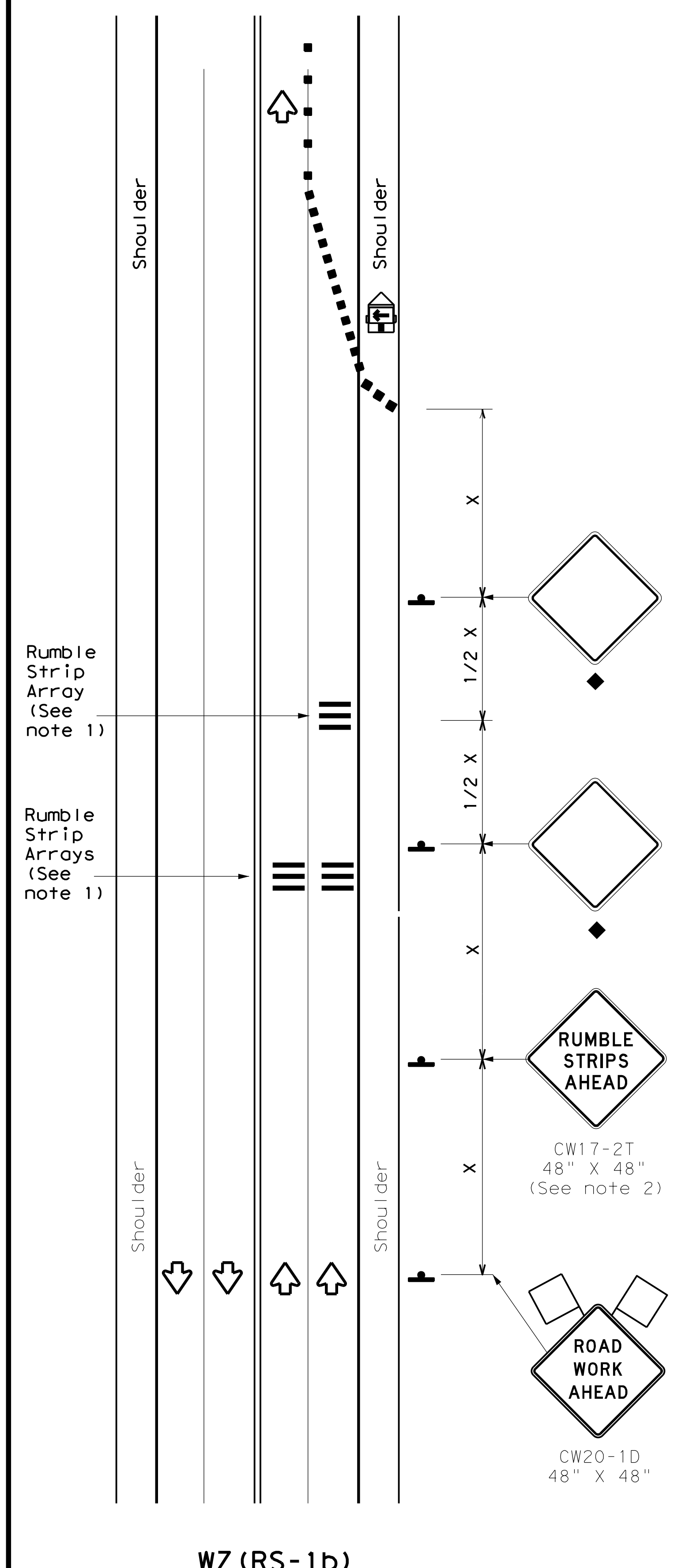
Warning sign and rumble strip sequence in opposite direction is same as below.

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



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



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.

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

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10′ Offset	11′ Offset	12′ Offset	On a Taper	On a Tangent		
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.**

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

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© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0319	01	069,ETC.	US 287,ETC.
	DIST		COUNTY	SHEET NO.
	LFK		TRINITY,ETC.	58

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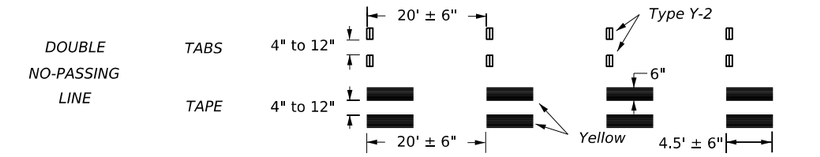
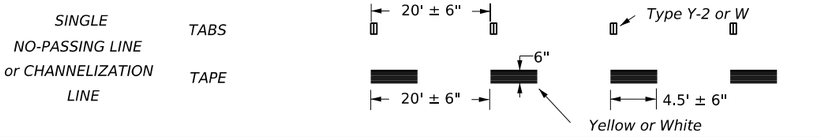
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

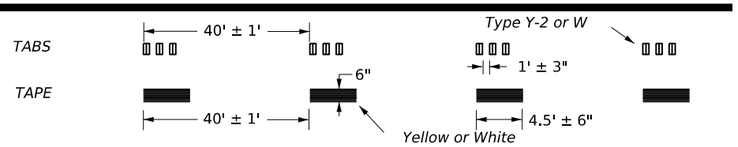


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



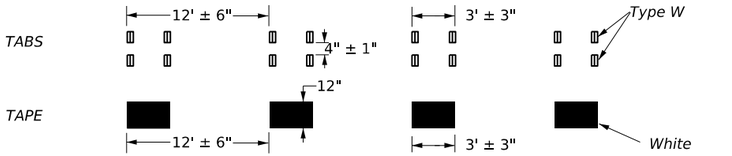
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

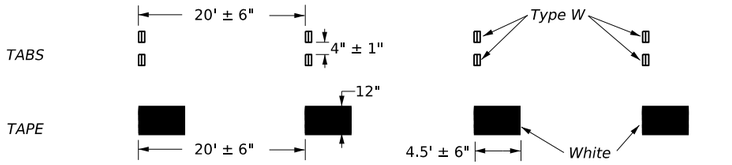


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



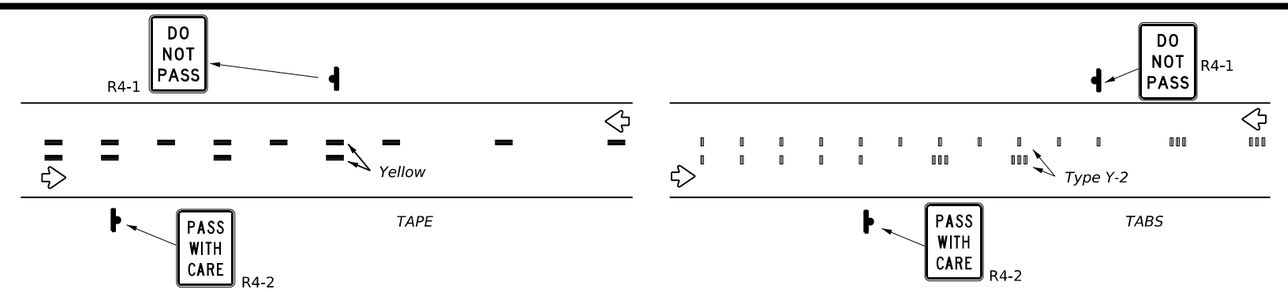
NOTES:

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

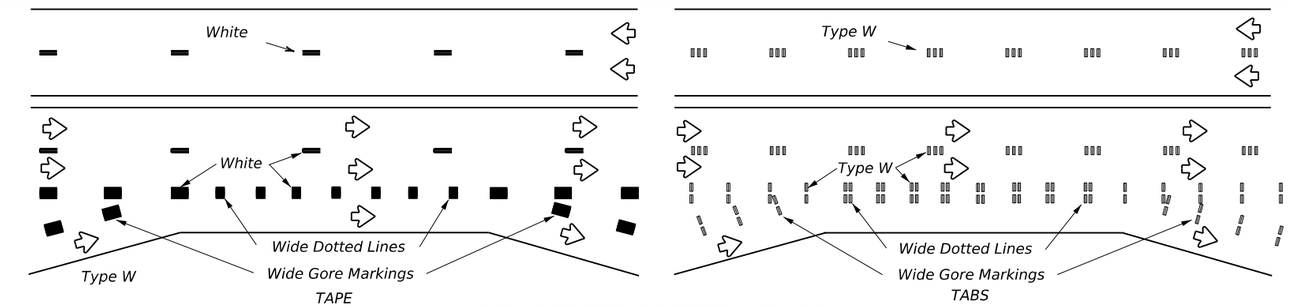
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

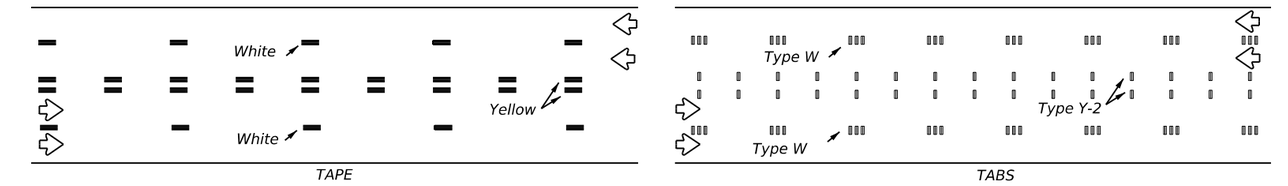
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



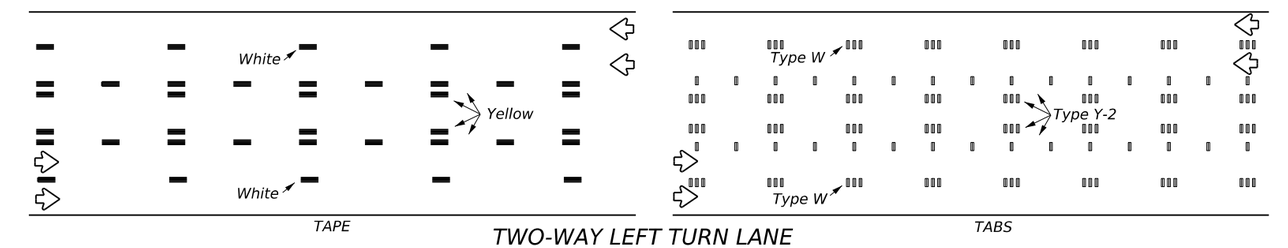
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



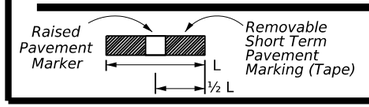
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

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©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
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4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		59

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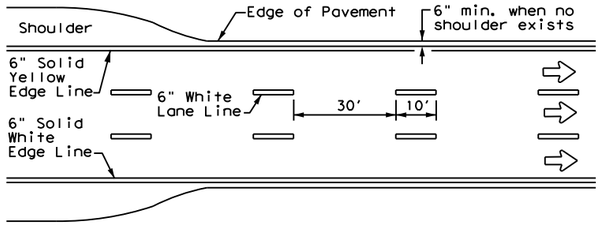
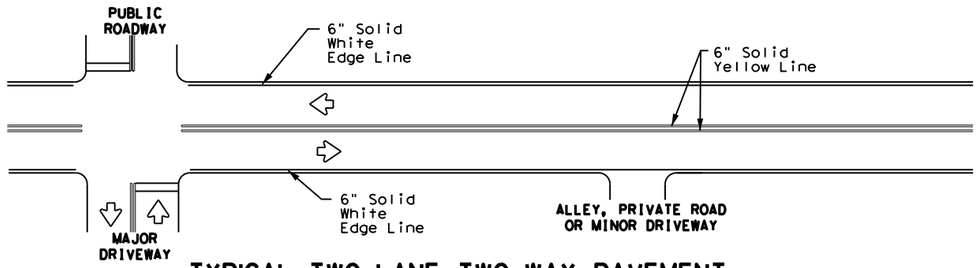
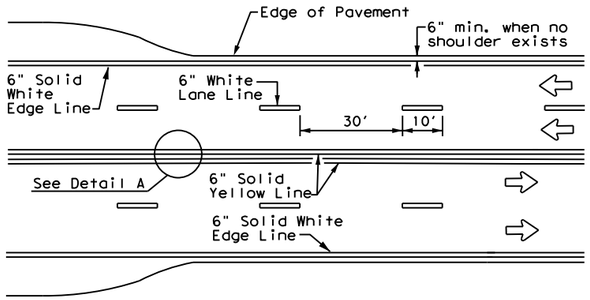
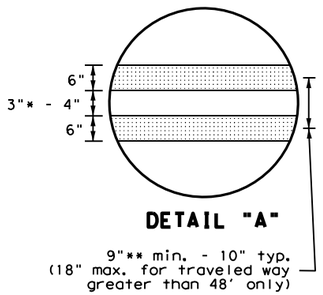


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





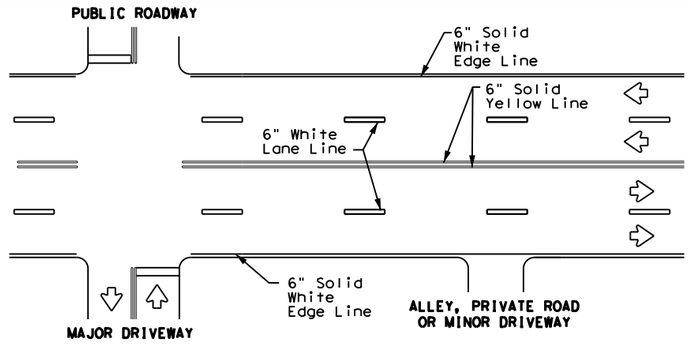
DETAIL "A"

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

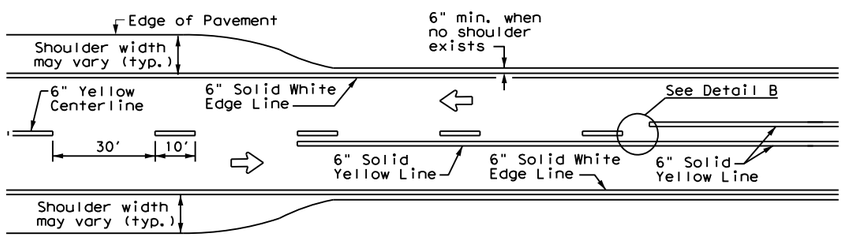
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

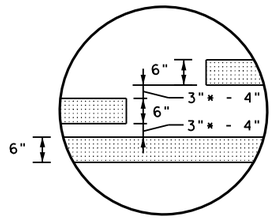
** 8" minimum for restripe projects when approved by the Engineer.



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



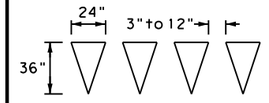
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

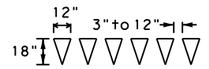
DETAIL "B"

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

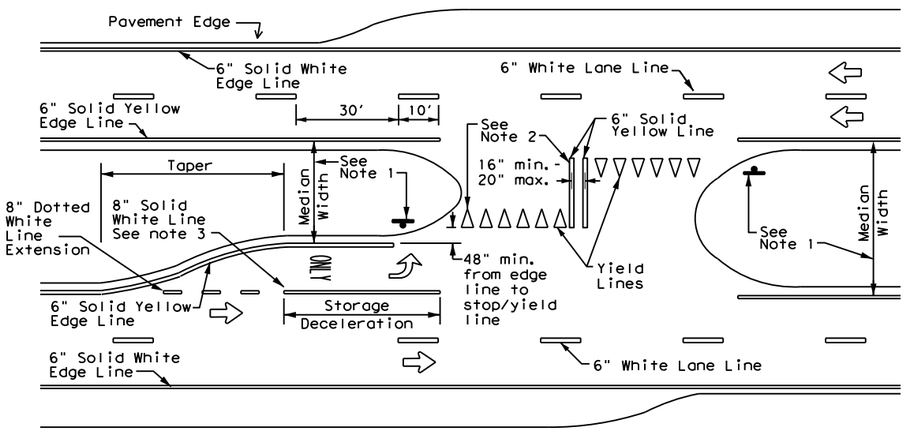


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

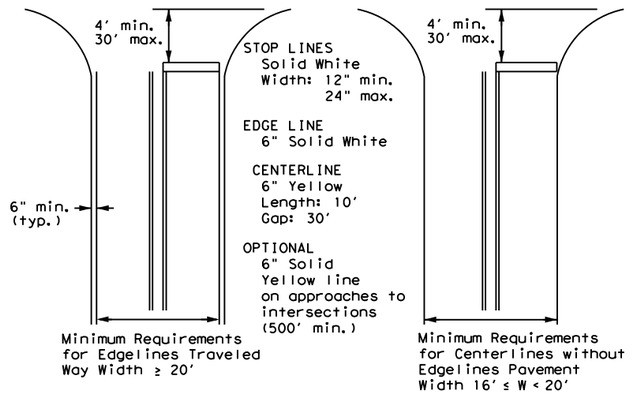
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

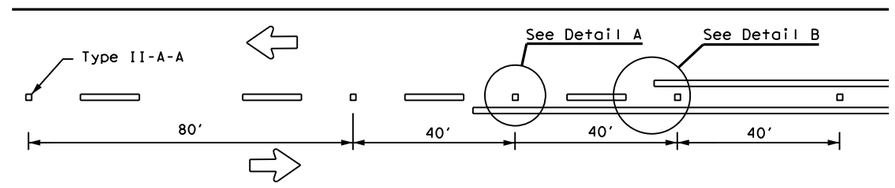
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

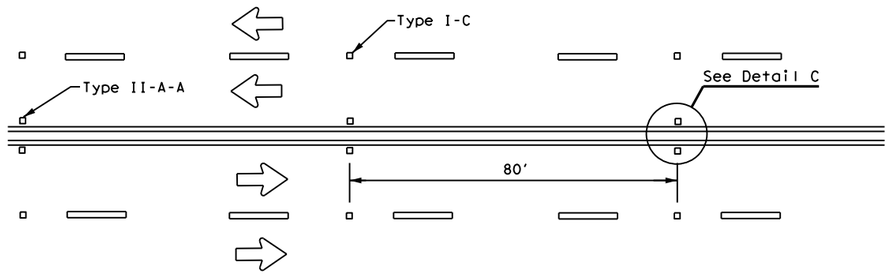
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		60

22A

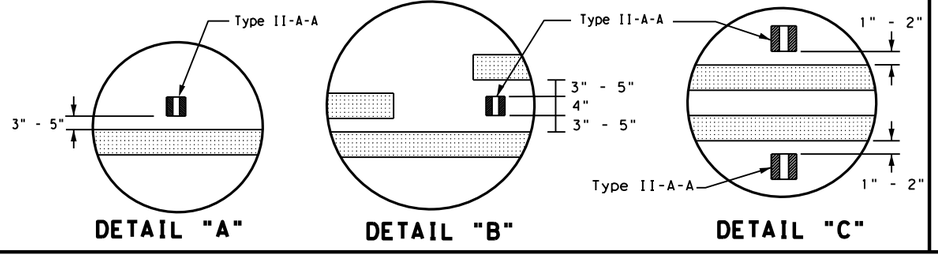
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

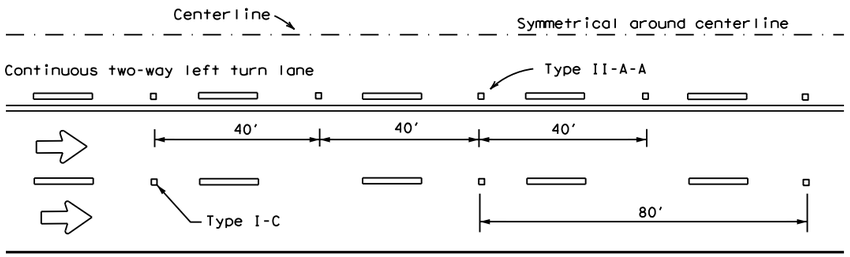


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

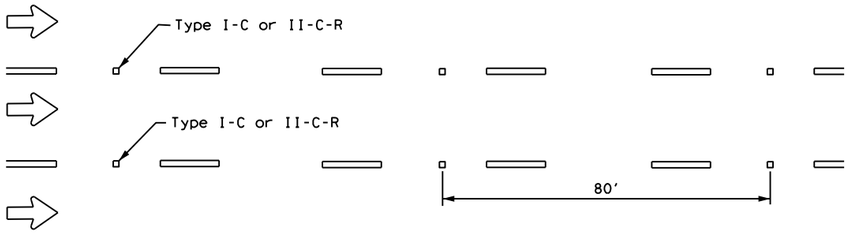


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



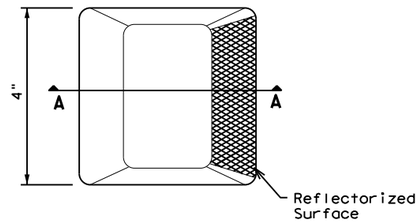
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

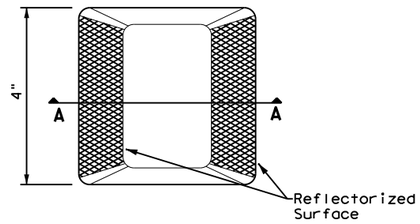
See Note 3.

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

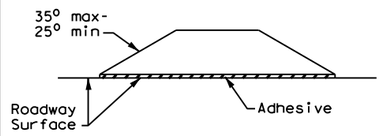
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

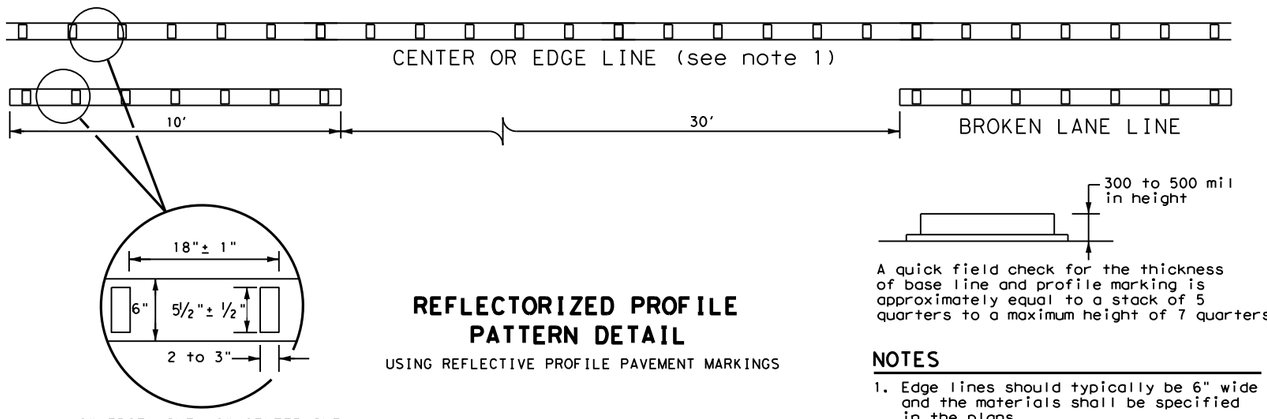


Type II (Top View)



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

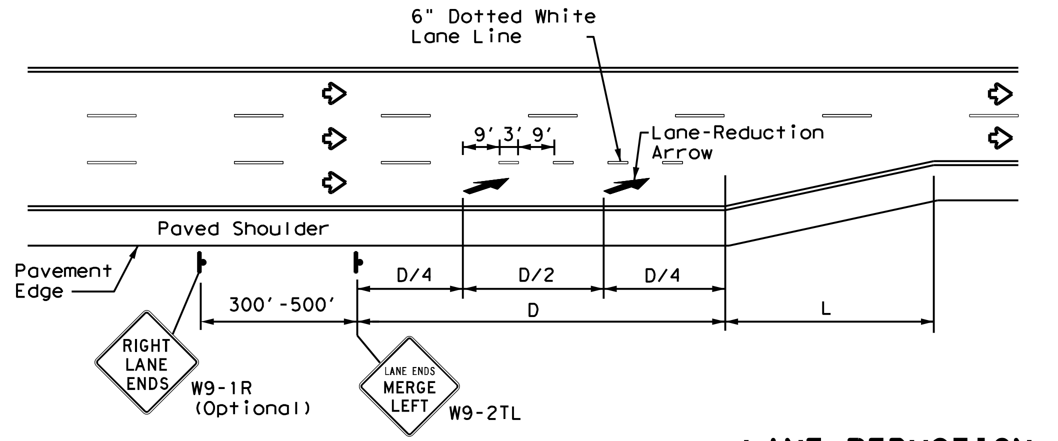
Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		61

22B

DATE: 9/5/2023 9:47:51 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/pm2-22.dgn



LANE REDUCTION

NOTES

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

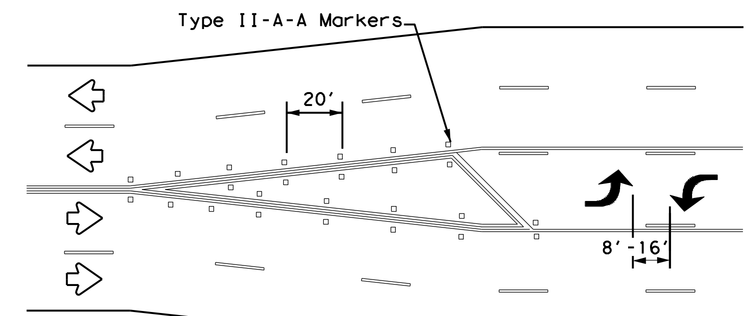
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

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

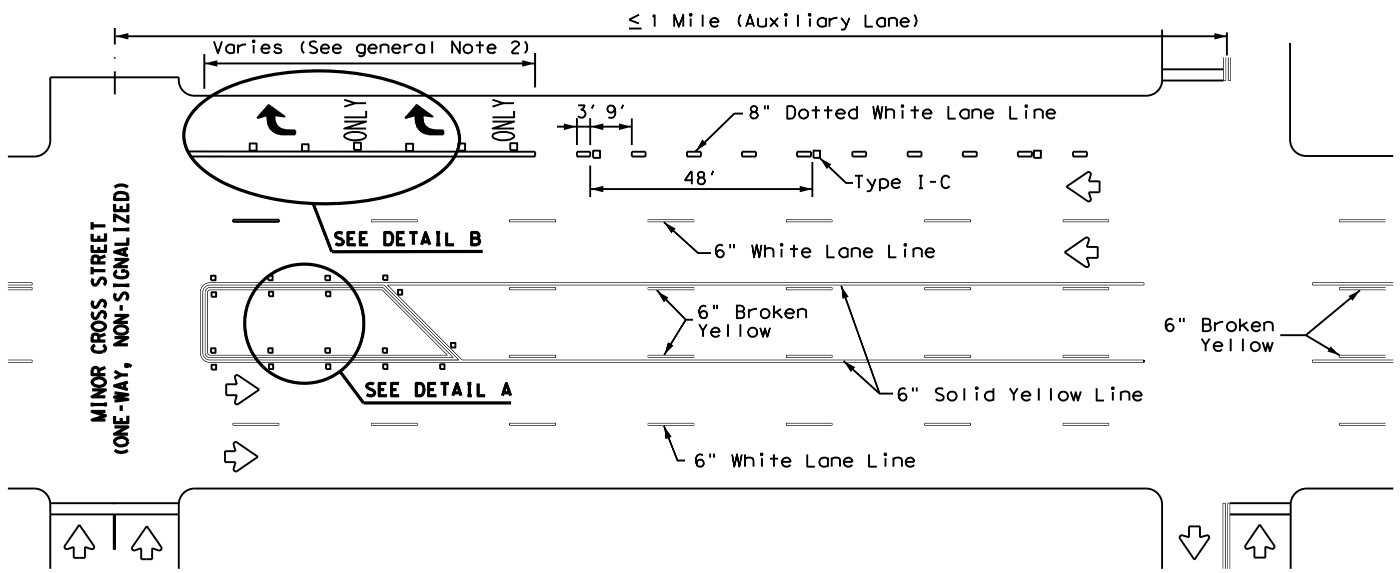
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

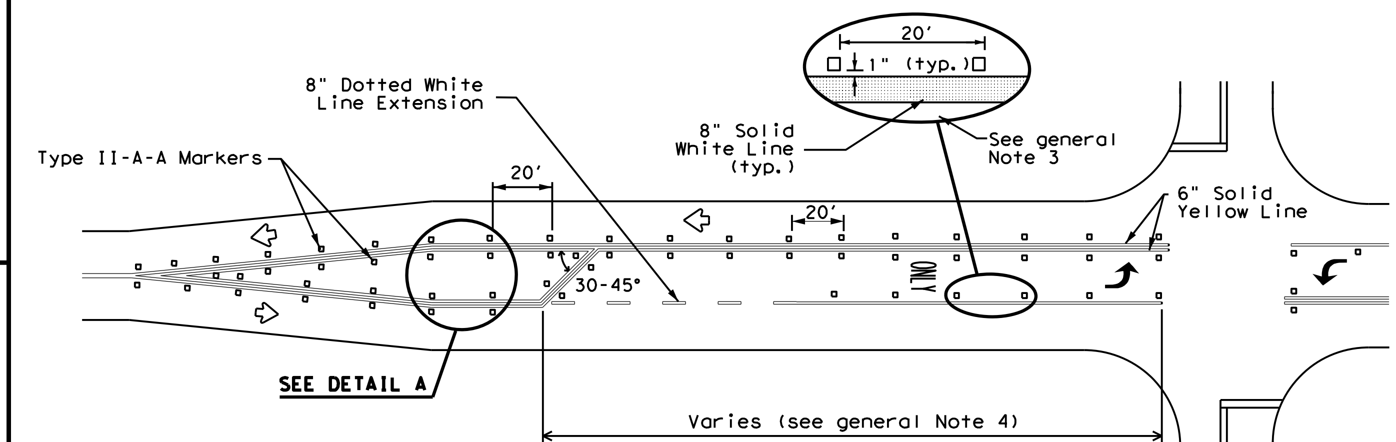


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

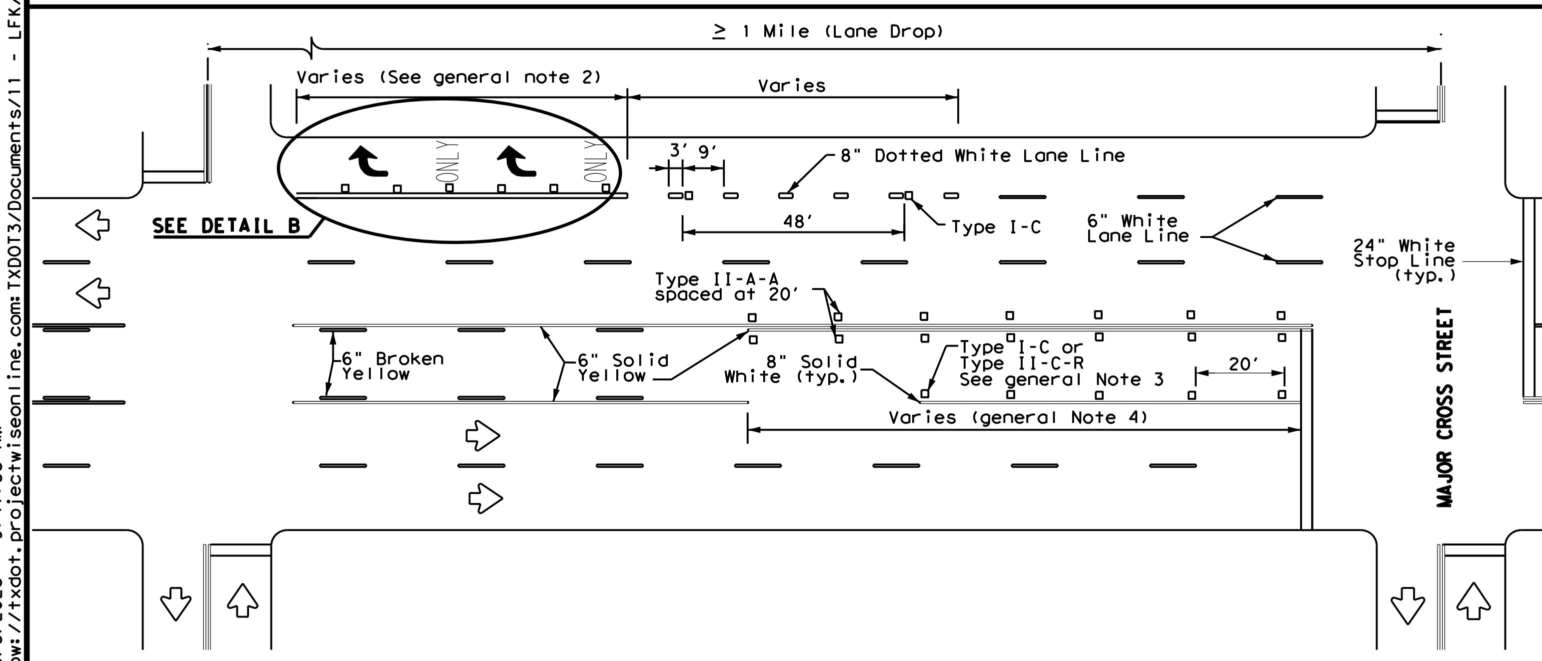
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



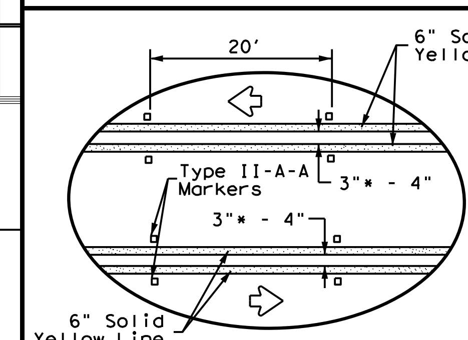
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



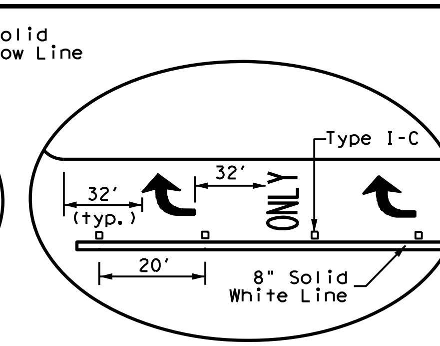
TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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



DETAIL A



DETAIL B

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

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0319	01	069,ETC.	US 287,ETC.
	DIST		COUNTY	SHEET NO.
	LFK		TRINITY,ETC.	62

22C

DATE: 9/5/2023 9:47:55 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/...

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.: 938795L

Crossing Type: HIGHWAY OVERPASS

RR Company Operating Track at Crossing: BNSF RAILWAY COMPANY

RR Company Owning Track at Crossing: BNSF RAILWAY COMPANY

RR MP: 143.930

RR Subdivision: LONGVIEW

City: CENTER

County: SHELBY

CSJ at this Crossing: 3315-01-028

Scope of Work, including any TCP, to be performed by State Contractor:

THIS CONSTRUCTION PROJECT IS TO PLACE BRIDGE STRIPING ON TO THE EXISTING BRIDGE SURFACE ON LOOP 500 OVER THE RAILROAD RIGHT OF WAY.

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: TxDOT will pay flagging invoices. Flagging Agreement with Railroad will be needed

☐ 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 877-984-677

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **KCS** 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 Construction Inspection into anticipated construction schedule.

☑ Not Required

☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required. Railroad Point of Contact: _____

☑ Not Required

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
- ☐ KCS
  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, KCS/TEXMEX 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: BNSF RAILWAY COMPANY

Railroad Emergency Line at: 866-386-9321

Location: DOT 938795L

RR Milepost: 143.930

Subdivision: LONGIVEW

RRD Review Only

Initials: KLS

Date: 9/29/23

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	0319	01	069	US 287		
3/2023	DIST	COUNTY			SHEET NO.	
	LFK	TRINITY			63	

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.: 024083J

Crossing Type: HIGHWAY OVERPASS

RR Company Operating Track at Crossing: BNSF RAILWAY COMPANY

RR Company Owning Track at Crossing: BNSF RAILWAY COMPANY

RR MP: 138.460

RR Subdivision: LONGVIEW

City: CENTER

County: SHELBY

CSJ at this Crossing: 3115-01-025

Scope of Work, including any TCP, to be performed by State Contractor:

THIS CONSTRUCTION PROJECT IS TO PLAVE A THIN OVERLAY MIX (TOM) ASPHALT PAVEMENT MIXTURE ON TO THE EXISTING BRIDGE SURFACE ON LOOP 500 OVER THE RAILROAD RIGHT OF WAY.

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: TxDOT will pay flagging invoices. Flagging Agreement with Railroad will be needed

☐ 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 877-984-677

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **KCS** 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 Construction Inspection into anticipated construction schedule.

☑ Not Required

☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required. Railroad Point of Contact: _____

☑ Not Required

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
- ☐ KCS
  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, KCS/TEXMEX 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: BNSF RAILWAY COMPANY

Railroad Emergency Line at: 866-386-9321

Location: DOT 024083J

RR Milepost: 138.460

Subdivision: LONGVIEW

RRD Review Only

Initials: KRD

Date: 9/29/23

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	0319	01	069	US 287		
3/2023	DIST	COUNTY			SHEET NO.	
	LFK	TRINITY			64	

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.: 023957G
Crossing Type: HIGHWAY OVERPASS
RR Company Operating Track at Crossing: BNSF RAILWAY COMPANY
RR Company Owning Track at Crossing: BNSF RAILWAY COMPANY
RR MP: 151.530
RR Subdivision: LONGVIEW
City: TENAHA
County: SHELBY
CSJ at this Crossing: 0175-02-092

Scope of Work, including any TCP, to be performed by State Contractor:

THIS CONSTRUCTION PROJECT IS TO PLACE A THINK OVERLAY MIX (TOM) ASPHALT PAVEMENT MIXTURE ON TO THE EXISTING PAVEMENT SURFACE ON US 84/59 BELOW THE RAILROAD RIGHT OF WAY.

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: TxDOT will pay flagging invoices. Flagging Agreement with Railroad will be needed
☐ 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.

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☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
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Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

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☐ Required. Railroad Point of Contact: _____
☑ Not Required

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Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
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Railroad Protective Liability Limits

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☐ 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
  ☐ KCS
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
  ☐ Other Railroads: _____

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Railroad Emergency Line at: 866-386-9321
Location: DOT 023957G
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Subdivision: LONGVIEW

RRD Review Only
Initials: KD
Date: 9/29/23

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	0319	01	069	US 287		
3/2023	DIST	COUNTY		SHEET NO.		
	LFK	TRINITY		65		

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	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		66

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 $\frac{1}{4}$ 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

REVISIONS
March 2020

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
	0319	01	069,ETC.	US 287,ETC.
	DIST	COUNTY		SHEET NO.
	LFK	TRINITY,ETC.		67

DATE: 9/5/2023 9:48:14 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT3/Documents/11 - LFK/Design Projects/[illegible] EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. N/A

☐ No Action Required ☒ Required Action

Action No.

1. The proposed work of this project is to resurface the existing roadway with overlay. This activity maintains the original line and grade, hydraulic capacity and original purpose of the site. Therefore, this project meets the definition of a routine maintenance activity as defined in the TPDES General Permit No. TXR150000 issued March 5, 2023 and TCEQ's TPDES CGP does not apply. However, the contractor shall place BMP's as directed by 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. N/A

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. Historical markers are present at the following Stations. No stockpiling, parking or storage of equipment is allowed at these locations.

Station 246+06 on US 287
Station 789+82 on US 59

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. N/A

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

If federally listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1. N/A

TPWD Commitments:

1. N/A

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SWP3:	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. N/A

VII. OTHER ENVIRONMENTAL ISSUES

(Include regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☒ Required Action

Action No.

1. US 287 is within the boundaries of the Davy Crockett National Forest. Area Enginner is to contact the Davy Crockett National Forest prior to the commencement of work.

Texas Department of Transportation

Design Standard

EPIC

(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0319	01	069, ETC.	US 287, ETC.
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	LFK	TRINITY, ETC.		68