FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			SHEET NO.
6	TEXAS	F 2B23 (137)			1
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
FTW	TARRANT	0312	05	031, ETC.	FM 730

INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

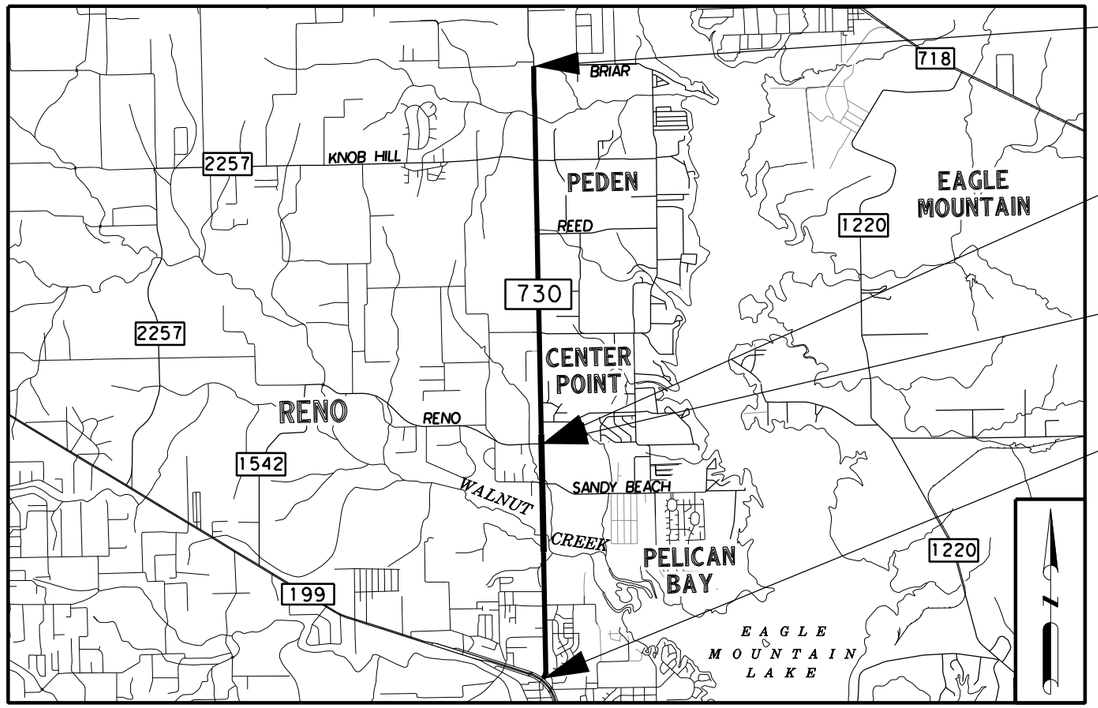
PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT# F 2B23 (137)

FM 730
TARRANT COUNTY

CSJ	HWY	LIMITS	ROADWAY LENGTH		BRIDGE LENGTH		PROJECT LENGTH	
			FEET	MILES	FEET	MILES	FEET	MILES
0312-05-031	FM 730	SH 199 TO FM 1542	11,800.88	2.235	1,316.00	0.249	13,116.88	2.484
0312-05-032	FM 730	FM 1542 TO WISE COUNTY LINE	21,040.98	3.986	93.50	0.017	21,134.48	4.003
PROJECT TOTAL			32,841.86	6.221	1,409.50	0.266	34,251.36	6.487

FOR THE CONSTRUCTION OF OVERLAY WORK
CONSISTING OF REPAIR BASE FAILURES, RETROFIT RAIL, MILL, HMAC OVERLAY AND PAVEMENT MARKINGS



LOCATION MAP
SCALE:NTS

BEGIN PROJECT
CSJ 0312-05-032
FM 730
STA 13+56.97
REF MARKER: 258+0.003
BEGIN MP: 0.003

END PROJECT
CSJ 0312-05-032
FM 730
STA 224+91.45
REF MARKER: 262+0.006
END MP: 4.006

BEGIN PROJECT
CSJ 0312-05-031
FM 730
STA 224+91.45
REF MARKER: 262+0.006
BEGIN MP: 4.006

END PROJECT
CSJ 0312-05-031
FM 730
STA 356+08.33
REF MARKER: 264+0.490
END MP: 6.490

HIGHWAY: FM 730
FUNCTIONAL CLASSIFICATION: MINOR ARTERIAL
DESIGN SPEED: 40 MPH
POSTED SPEED: 55 MPH MAX
ADT (2021): 26,353
ADT (2041): 36,894

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

consor
F-12040

LETTING DATE:
CONTRACTOR:
WORK BEGIN:
WORK COMPLETED:
WORK ACCEPTED:
CHANGE ORDERS:

Texas Department of Transportation

SUBMITTED FOR LETTING: 5-25-23
AREA ENGINEER

RECOMMENDED FOR LETTING: 5/25/2023
DocuSigned by:
DIRECTOR OF PLANNING AND DEVELOPMENT
7879B0B92E5D403...

APPROVED FOR LETTING: 5/26/2023
DocuSigned by:
David M Salazar, P.E.
DISTRICT ENGINEER
B741E64FAD82411...

TDLR NOT REQUIRED FOR THIS PROJECT

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER , 2014, AND SPECIFICATIONS ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA-1273, JULY 5, 2022)

RAILROAD CROSSINGS: NONE
EQUATIONS: NONE
EXCEPTIONS: NB STA 269+06.00 TO STA 282+18.00 = 1,312 FT
SB STA 268+93.00 TO STA 282+10.00 = 1,317 FT

COUNTY TARRANT
HWY. NO. FM 730
DATE ACCEPTED
PROJ. NO. STP ( )
LETTING DATE

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5/23/2023
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SHT NO.		SHEET TITLE
		GENERAL
1		TITLE SHEET
2		INDEX OF SHEETS
3-18		PROJECT LAYOUT
19-24		EXISTING TYPICAL SECTIONS
25-30		PROPOSED TYPICAL SECTIONS
31,31A-31F		GENERAL NOTES
32,32A		ESTIMATE & QUANTITY SHEETS
33-34		QUANTITY SUMMARY
35-37		SUMMARY OF SMALL SIGNS
		TRAFFIC CONTROL PLAN
38		TRAFFIC CONTROL SEQUENCE OF WORK
		TRAFFIC CONTROL PLAN STANDARDS
39-50	#	BC (1)-21 THRU BC (12)-21
51	#	TCP (1-3)-18
52	#	TCP (1-4)-18
53	#	TCP (2-1)-18
54	#	TCP (2-2)-18
55	#	TCP (2-4)-18
56	#	TCP (2-5)-18
57	#	TCP (3-1)-13
58	#	TCP (3-4)-13
59	#	TREATMENT FOR VARIOUS EDGE CONDITIONS
60	#	WZ (STPM)-23
61	#	WZ (UL)-13
62	#	WZ (RS)-22
		ROADWAY DETAILS
63		HORIZONTAL DATA SHEET
64-65		MISCELLANEOUS ROADWAY DETAILS
66		MBGF DETAIL
		ROADWAY DETAILS STANDARDS
67	#	BED-14
68	#	GF(31)-19
69	#	GF(31)DAT-19
70-71	#	GF(31)TR TL3-20
72	#	GF(31)MS-19
73	#	SGT(10S)31-16
74	#	SGT(11S)31-18
75	#	SGT(12S)31-18
76		T5/T501/T502TR (MOD)
77	#	TE(HMAC)-11

SHT NO.		SHEET TITLE
		BRIDGE
78		BRIDGE RAIL RETROFIT & OVERLAY DETAILS
79		BRIDGE RAIL RETROFIT SECTION
80		BRIDGE REPAIR DETAILS
81		JOINT SEAL AT EXPANSION JOINTS
		STRUCTURE STANDARDS
82-85		TYPE T131RC (MOD)
		TRAFFIC ITEMS
86-101		SIGNING AND PAVEMENT MARKING LAYOUT
102-103		GUIDE SIGN DETAILS
		TRAFFIC STANDARDS
104-109	#	D & OM(1)-20 - D & OM (6)-20
110-114	#	PM(1)-22 - PM(5)-22
115-116	#	RS(3)-23 - RS(4)-23
117	#	SMD(GEN)-08
118-120	#	SMD(SLIP-1)-08 thru SMD(SLIP-3)-08
121	#	TSR(3)-13
		ENVIRONMENTAL ISSUES
122-123		STORM WATER POLLUTION PREVENTION PLAN - SW3P
124		ENVIRONMENT PERMITS, ISSUES AND COMMITMENTS - EPIC
		ENVIRONMENTAL ISSUES STANDARDS
125-127	#	EC(9)-16

TXDOT STANDARDS

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A NUMBER SIGN PLUS SHEETS 75, 81, 82, 83, AND 84 HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

LAURA C. FULLER P.E. — 6/1/2023 DATE

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER

6/1/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

FM 730

INDEX OF SHEETS

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		2
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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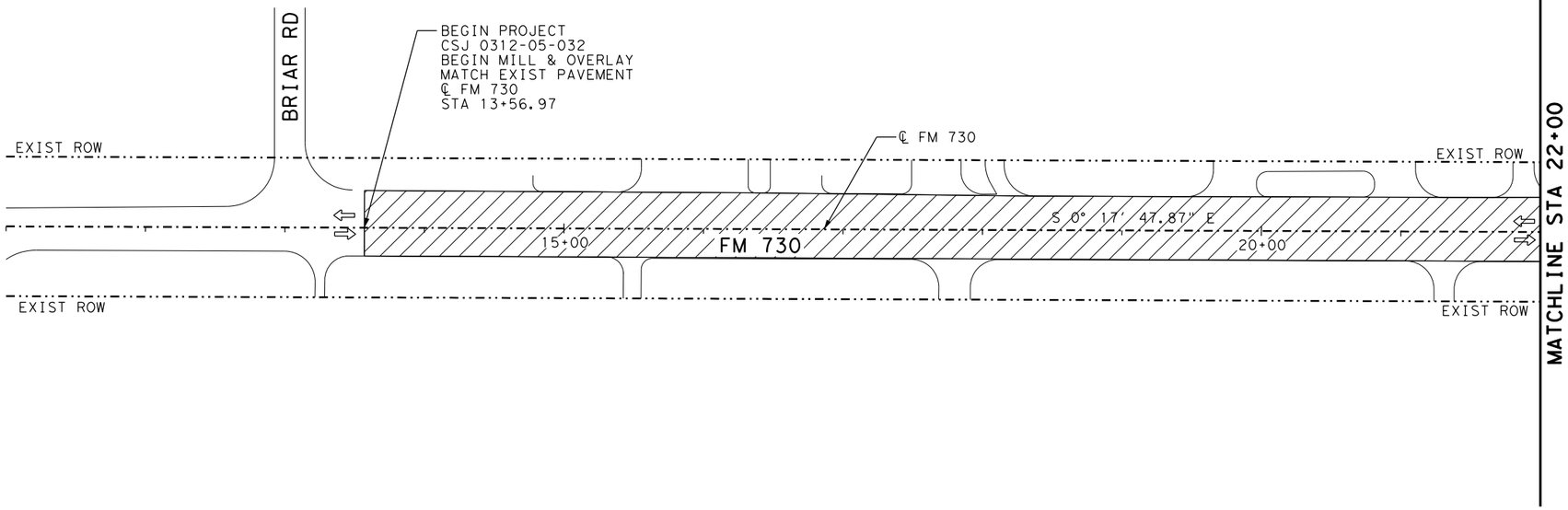

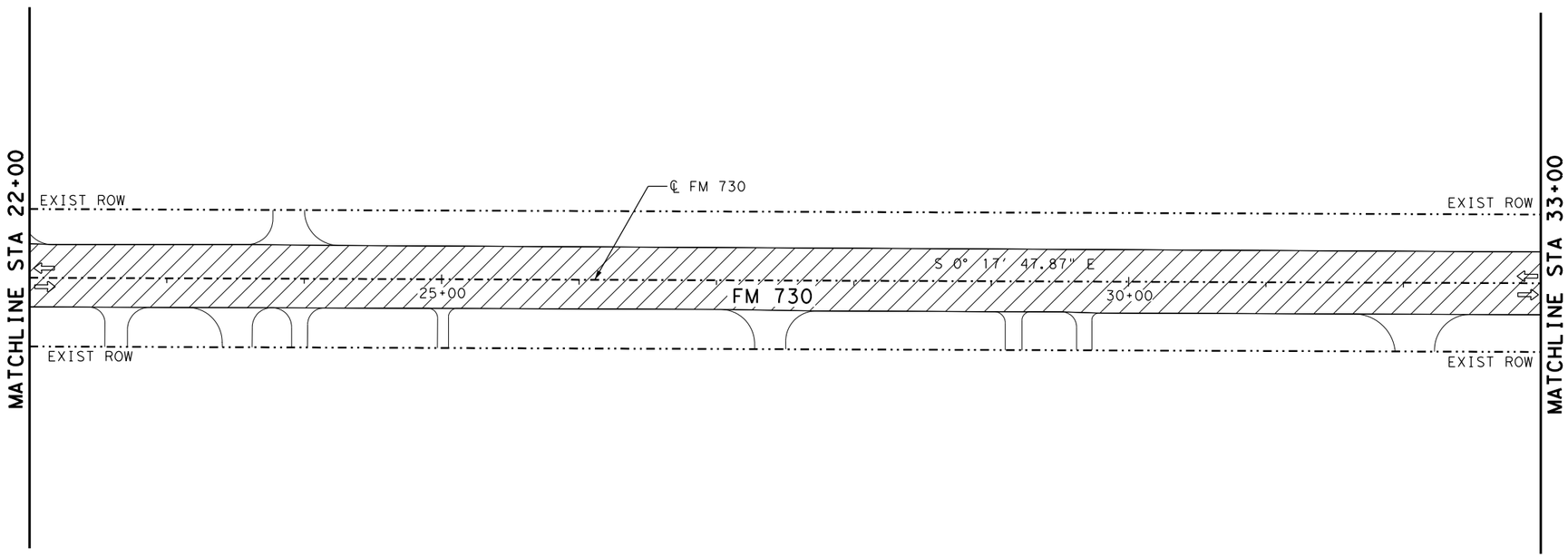

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.

0 50′ 100′

SCALE: 1" = 100′

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

FM 730

PROJECT LAYOUT

(BEGIN PROJECT TO STA 33+00)

SHEET 1 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		3
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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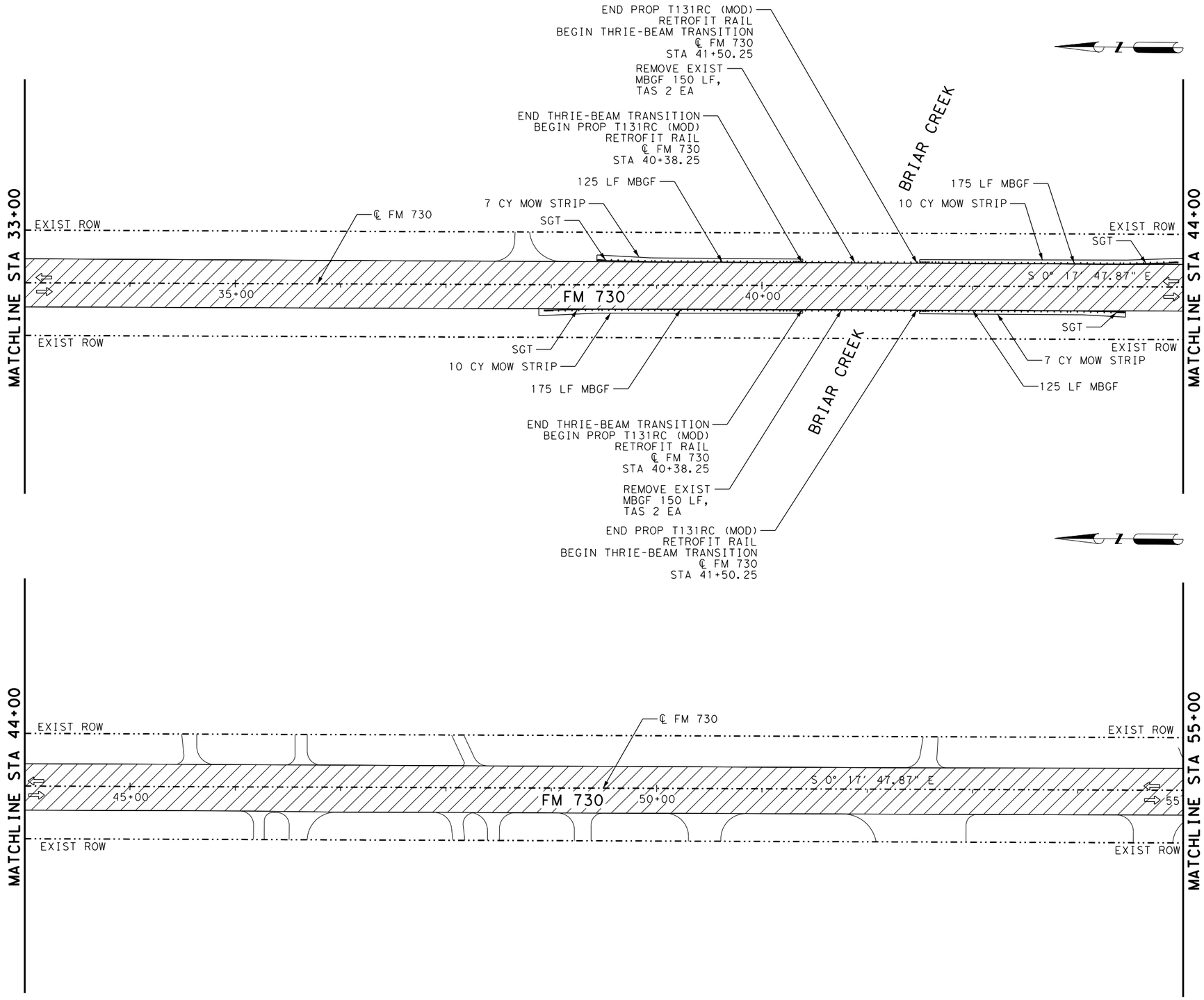

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

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2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. BEGIN & END BRIDGE RETROFIT RAIL STATIONS ARE APPROXIMATE BASED ON AS BUILTS. SEE "BRIDGE RAIL RETROFIT & OVERLAY DETAILS" FOR MORE INFORMATION.

0 50′ 100′

SCALE: 1" = 100′

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

consor
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Texas Department of Transportation

FM 730

PROJECT LAYOUT

(STA 33+00 TO STA 55+00)

SHEET 2 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		4
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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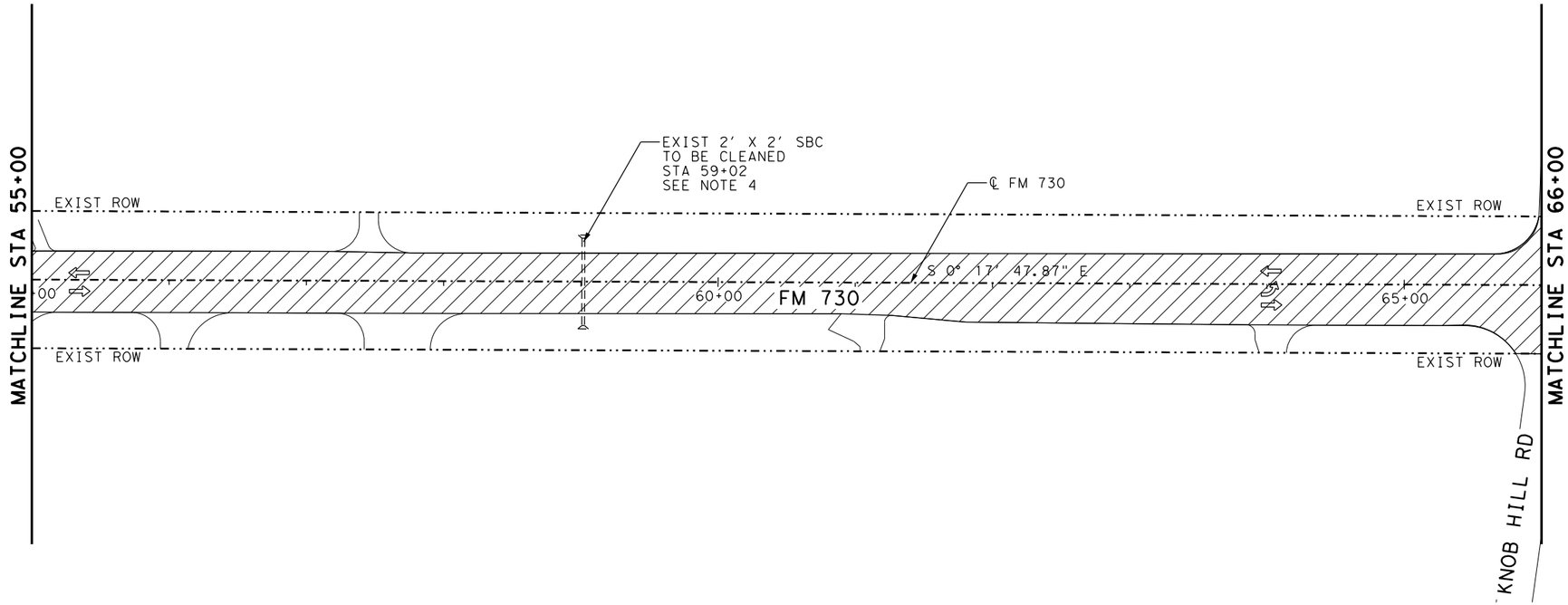

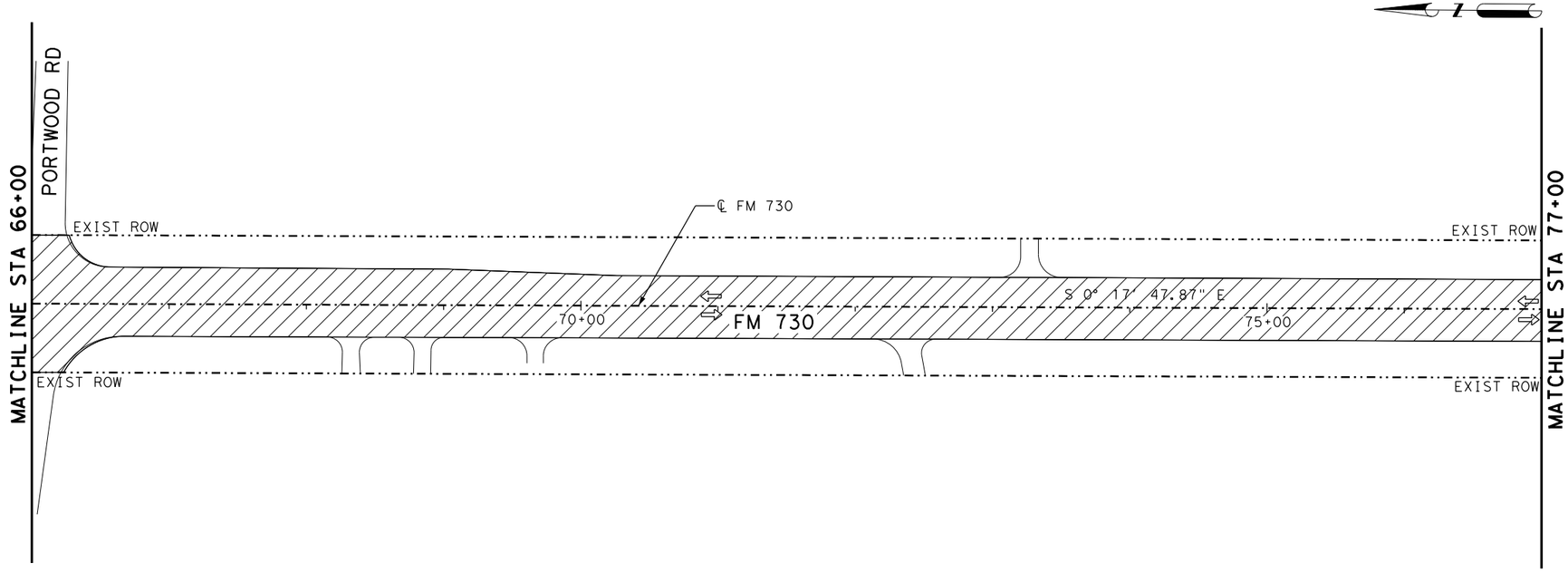

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
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3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. CULVERT LOCATION IS APPROXIMATE BASED ON AS BUILTS.

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

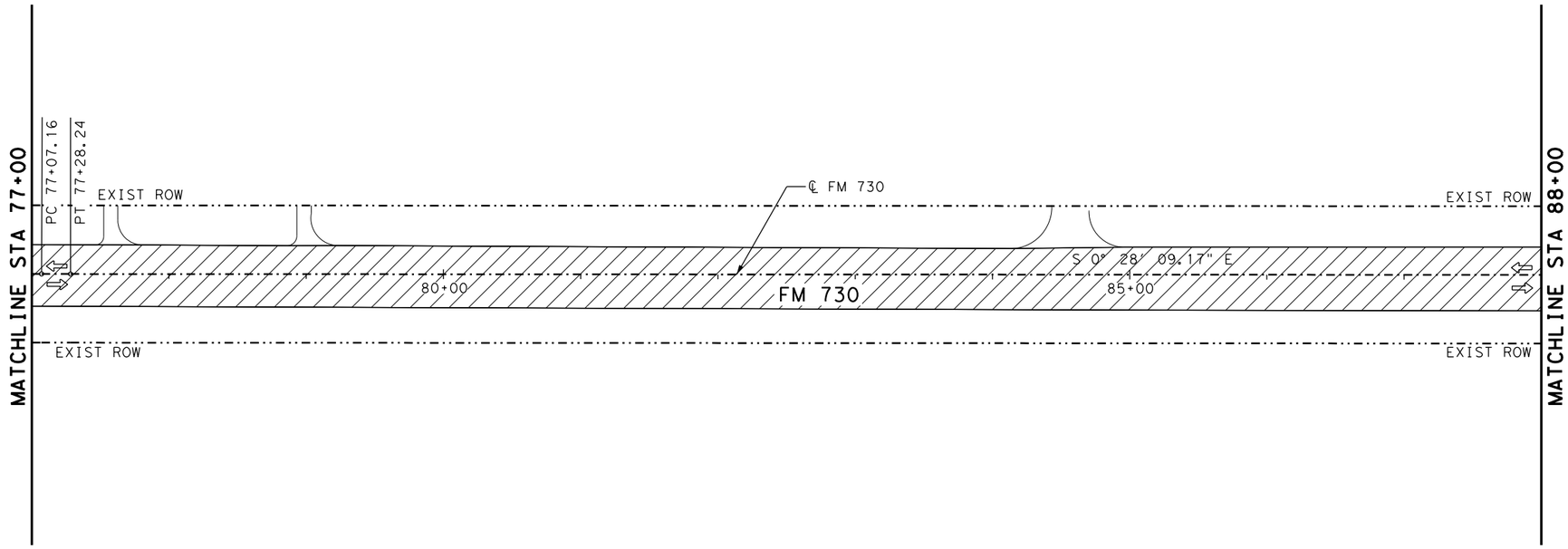
FM 730

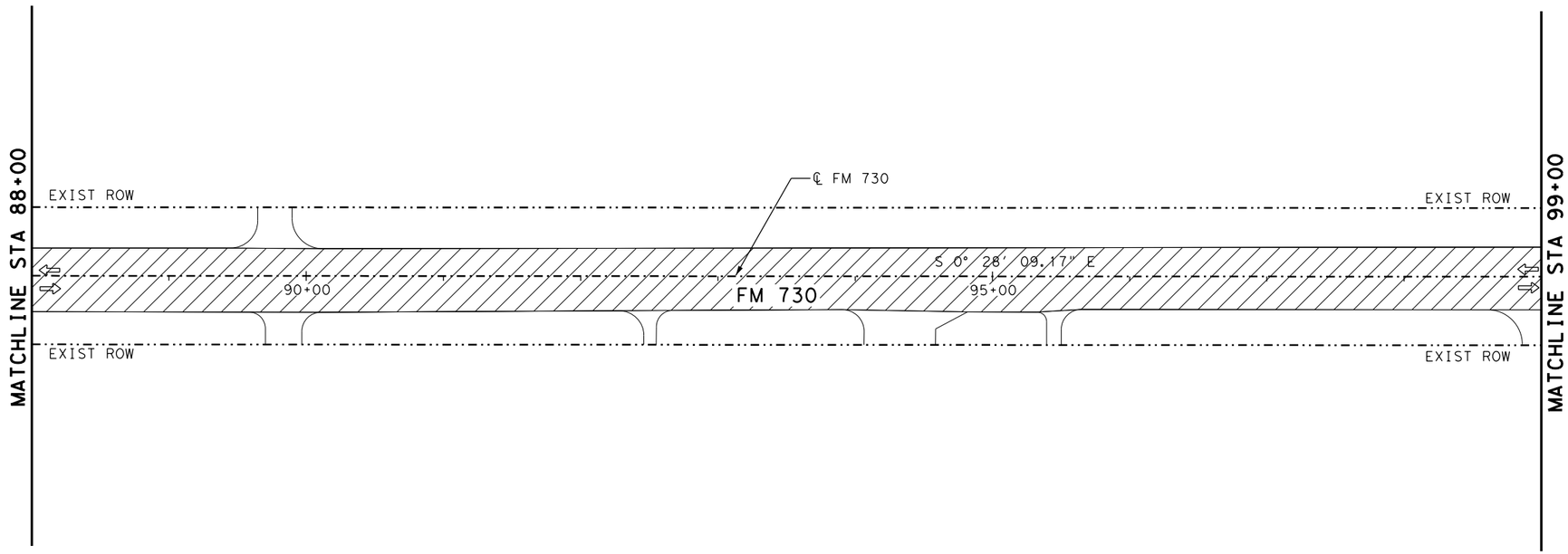
PROJECT LAYOUT

(STA 55+00 TO STA 77+00)

SHEET 3 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		5
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

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0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

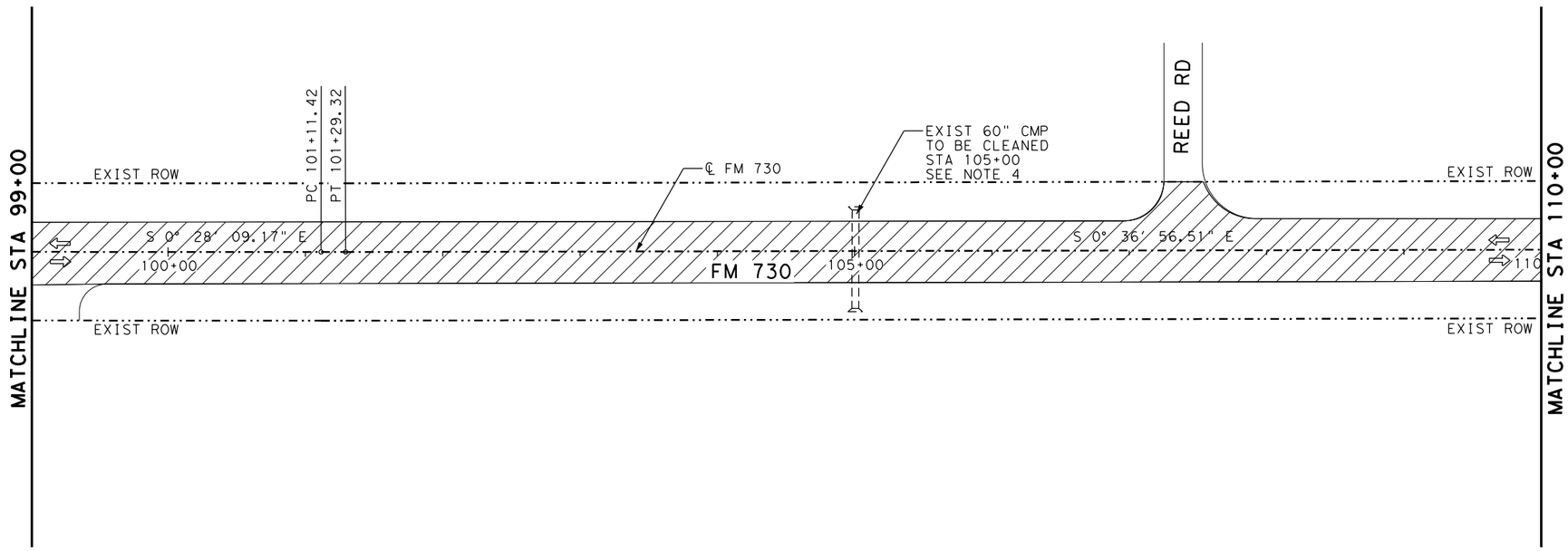
FM 730

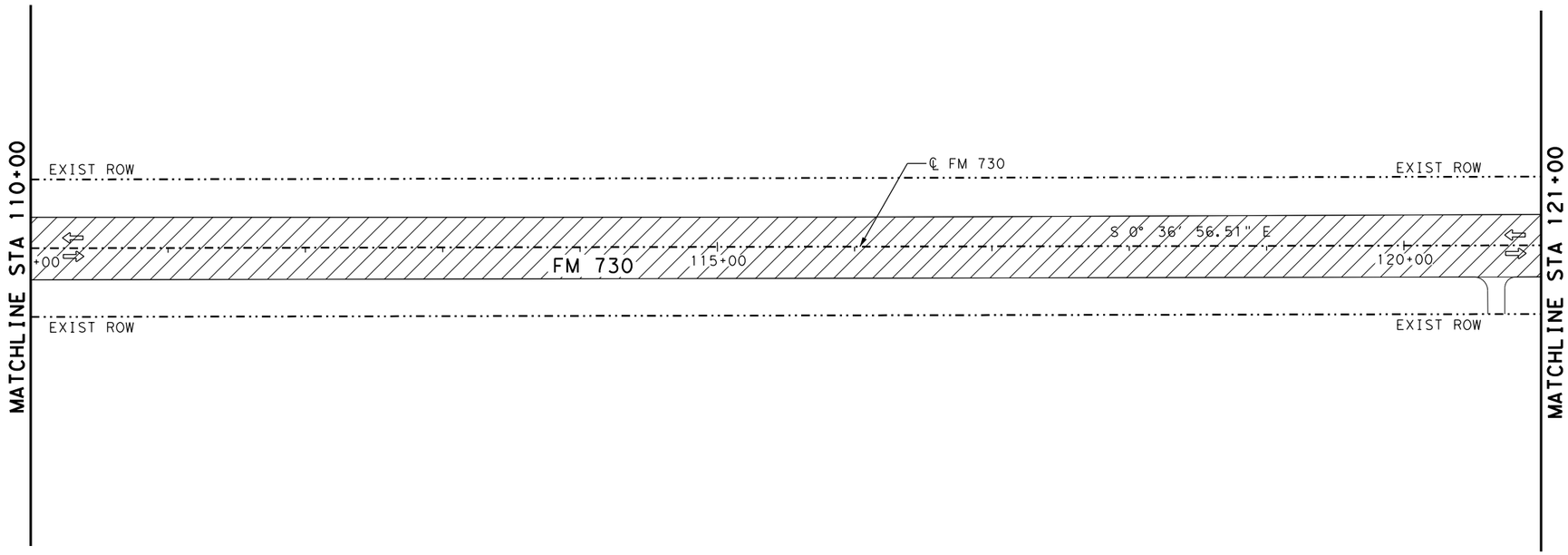
PROJECT LAYOUT

(STA 77+00 TO STA 99+00)

SHEET 4 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		6
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031, ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

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4. CULVERT LOCATION IS APPROXIMATE BASED ON AS BUILTS.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

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PROJECT LAYOUT

(STA 99+00 TO STA 121+00)

SHEET 5 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		7
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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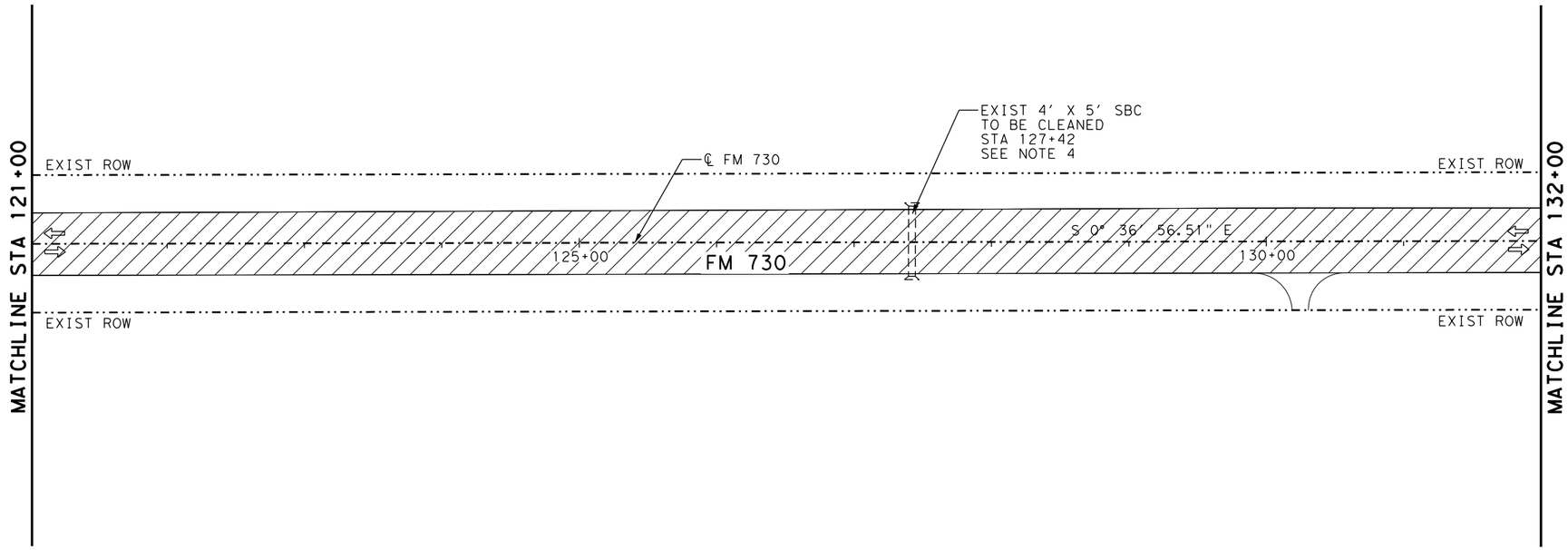

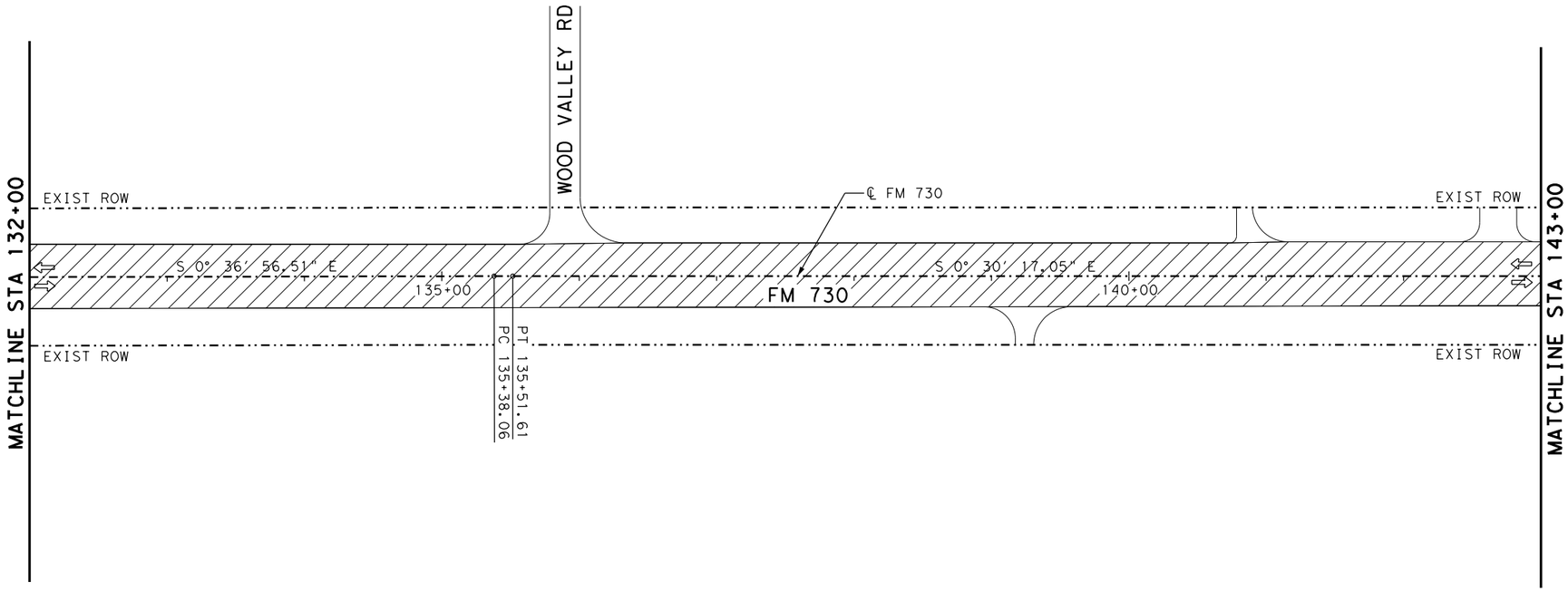

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

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0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
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NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

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PROJECT LAYOUT

(STA 121+00 TO STA 143+00)

SHEET 6 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		8
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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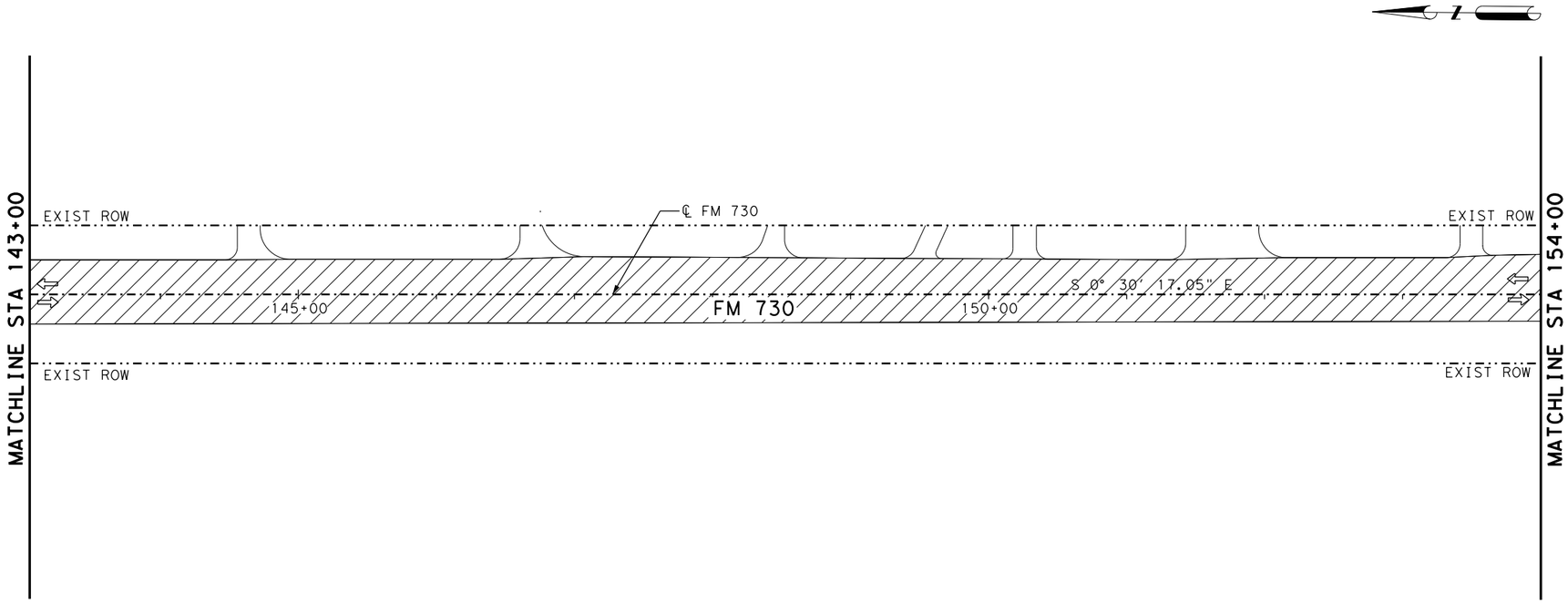

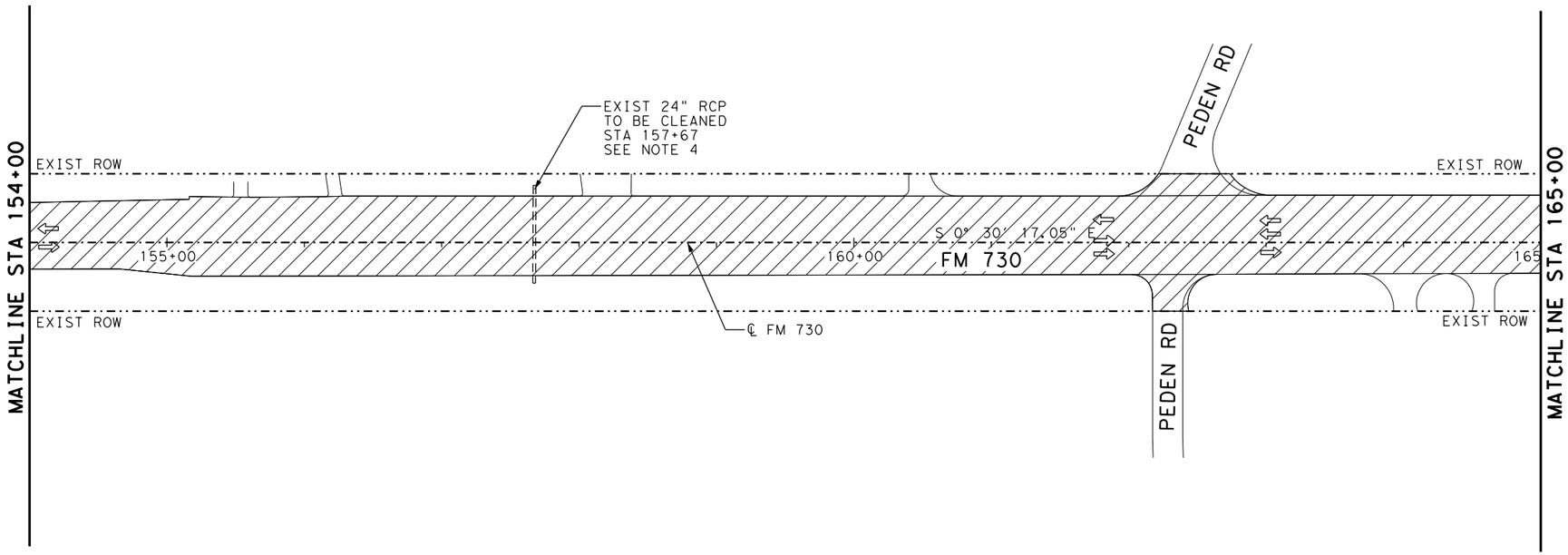

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

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4. CULVERT LOCATION IS APPROXIMATE BASED ON AS BUILTS.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

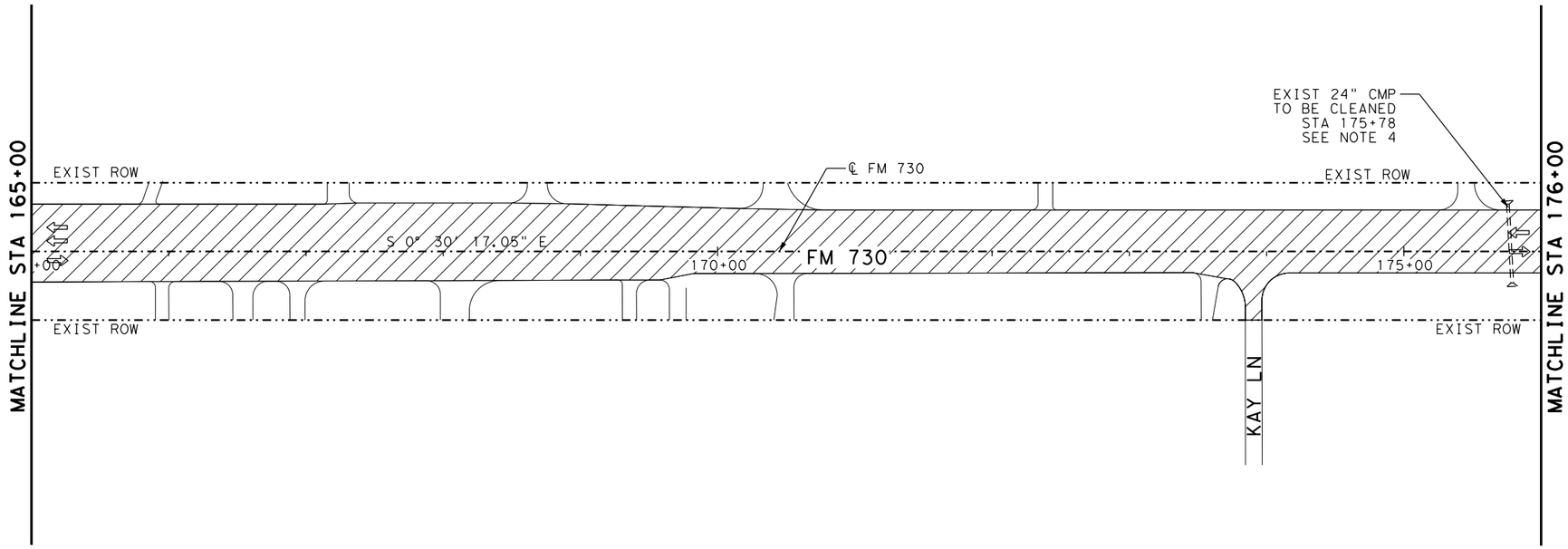
FM 730

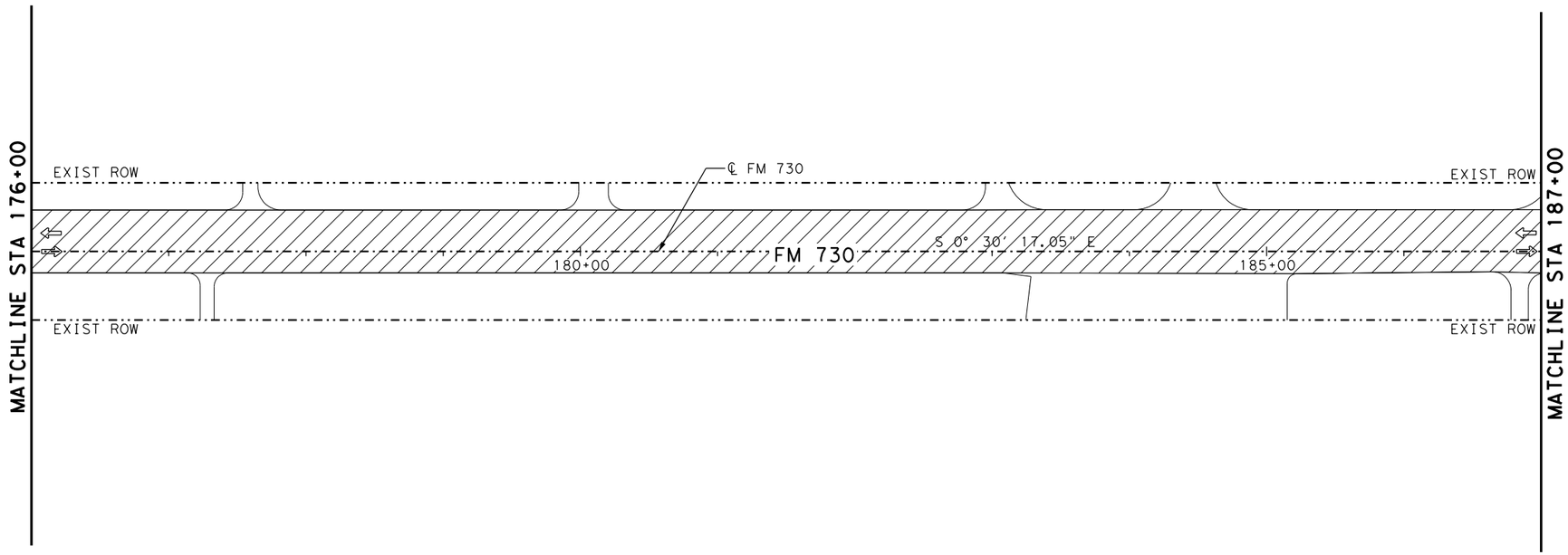
PROJECT LAYOUT

(STA 143+00 TO STA 165+00)

SHEET 7 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		9
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
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- CL-CI — EROSION CONTROL LOG

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0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

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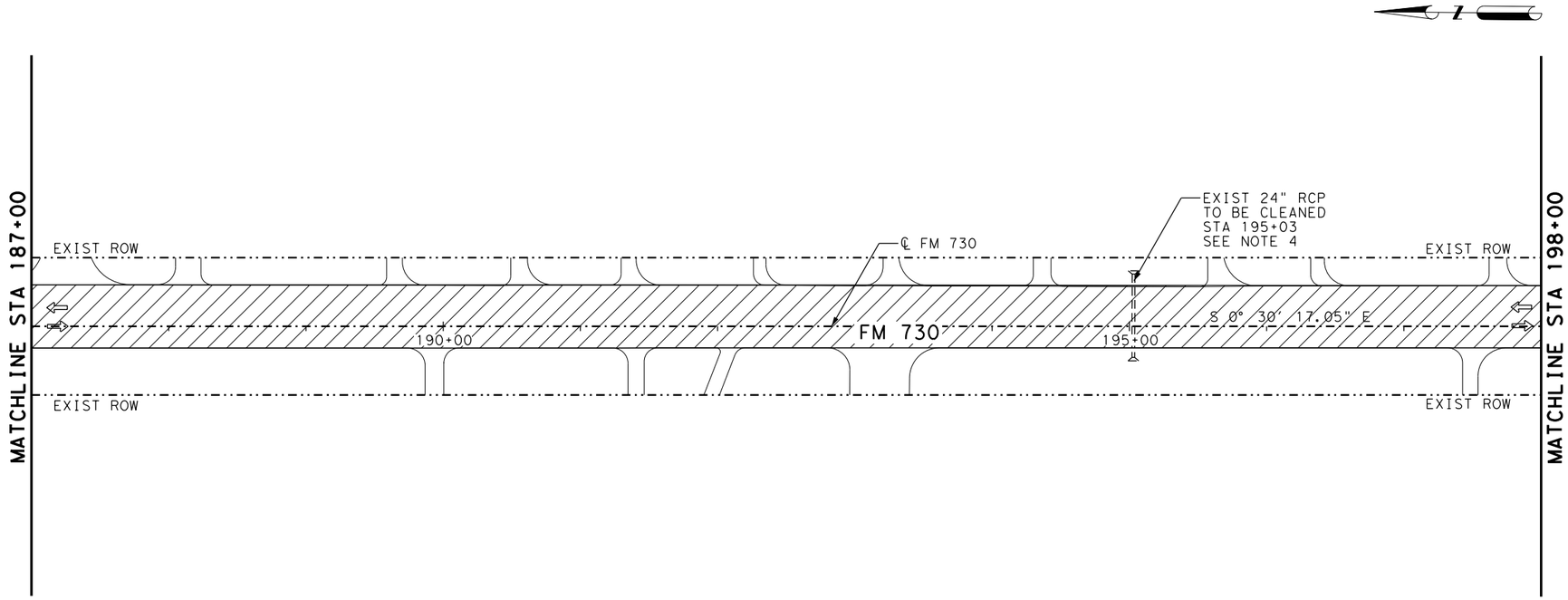
FM 730

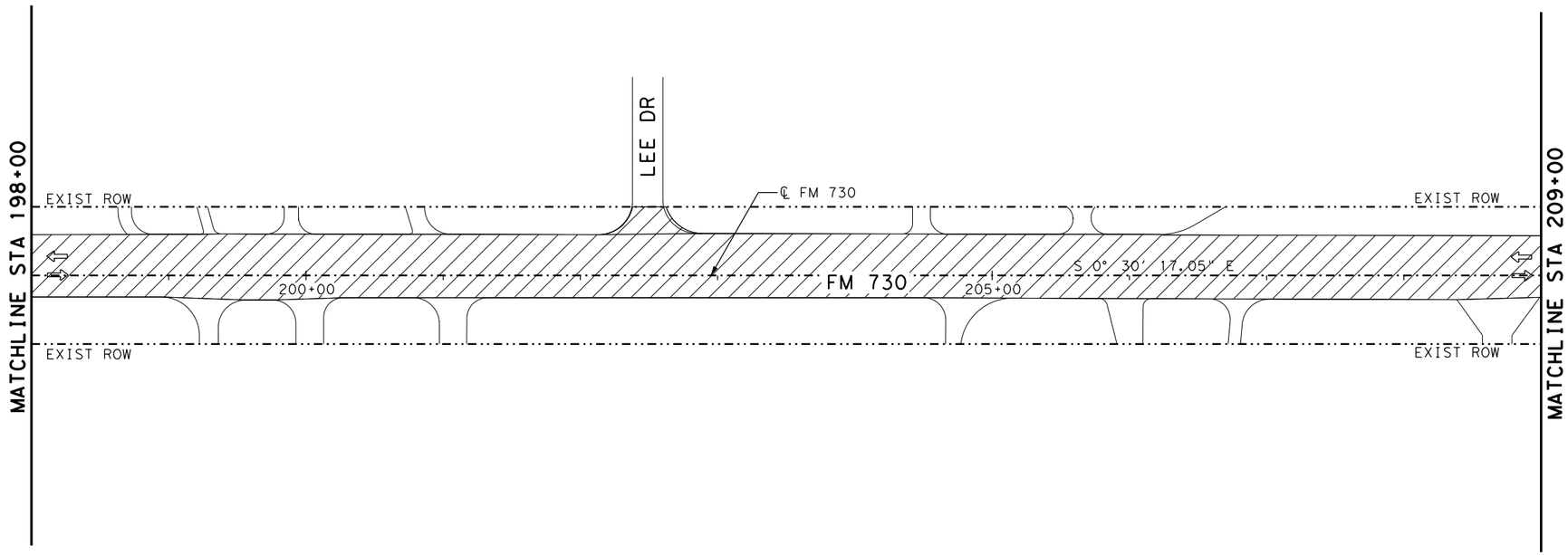
PROJECT LAYOUT

(STA 165+00 TO STA 187+00)

SHEET 8 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		10
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. CULVERT LOCATION IS APPROXIMATE BASED ON AS BUILTS.

0 50' 100'
SCALE: 1" = 100'

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92927
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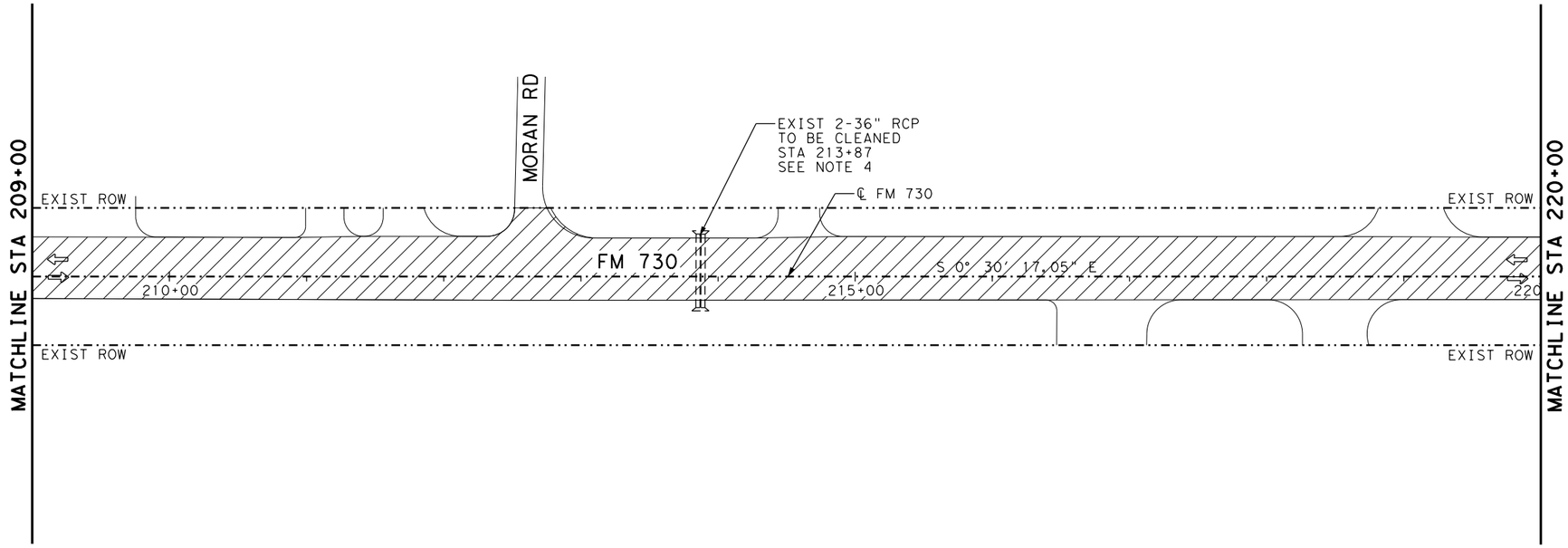
FM 730

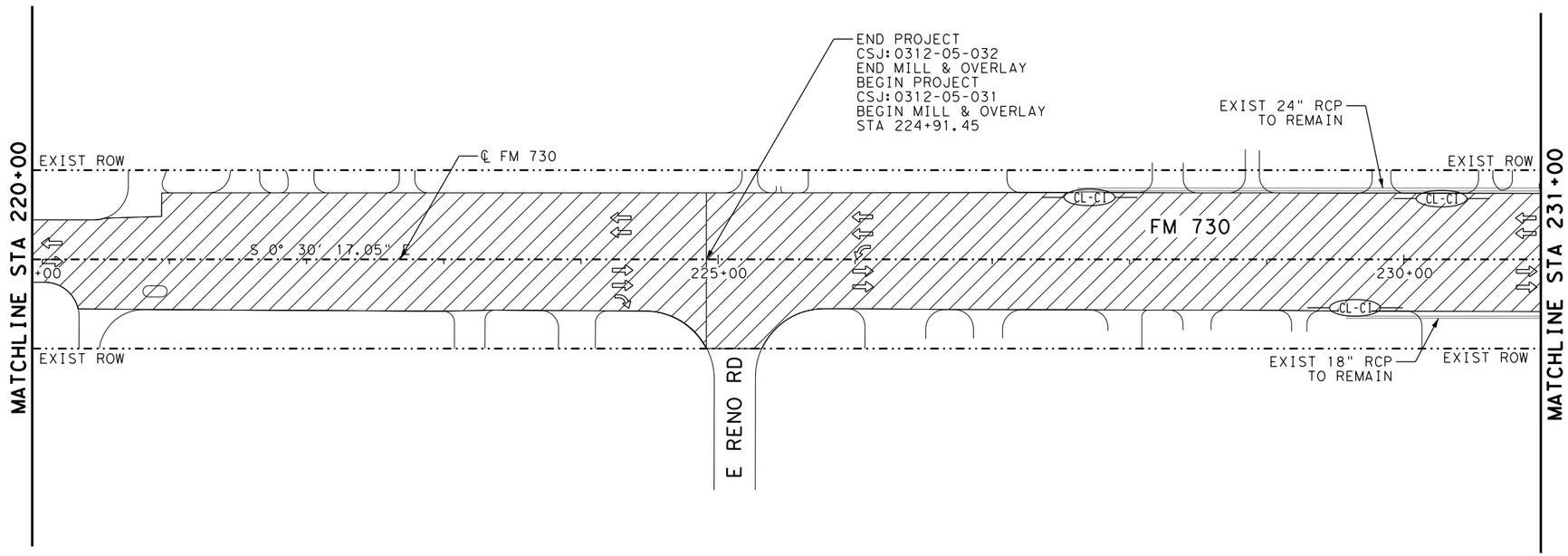
PROJECT LAYOUT

(STA 187+00 TO STA 209+00)

SHEET 9 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		11
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. CULVERT LOCATION IS APPROXIMATE BASED ON AS BUILTS.

0 50' 100'
SCALE: 1" = 100'

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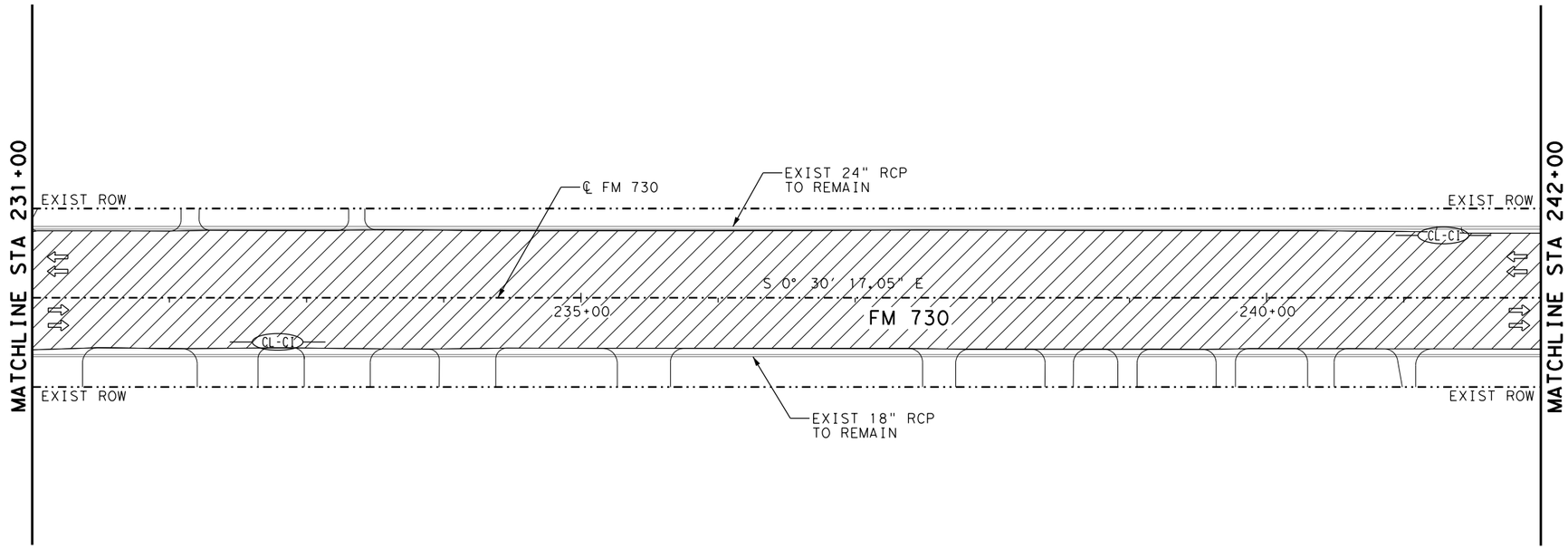
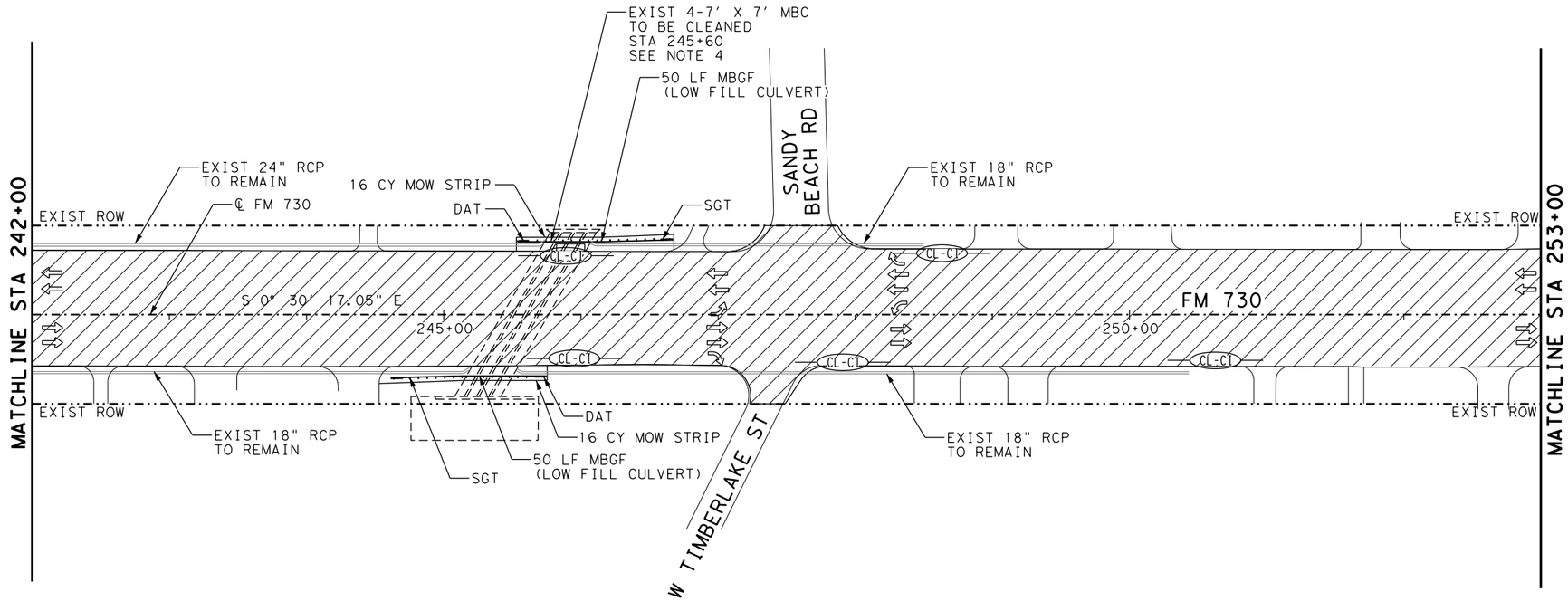
PROJECT LAYOUT

(STA 209+00 TO STA 231+00)

SHEET 10 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		12
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031, ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. CULVERT LOCATION IS APPROXIMATE BASED ON AS BUILTS.
5. REFER TO "MBGF DETAIL" FOR ADDITIONAL INFORMATION.

0 50' 100'
SCALE: 1" = 100'

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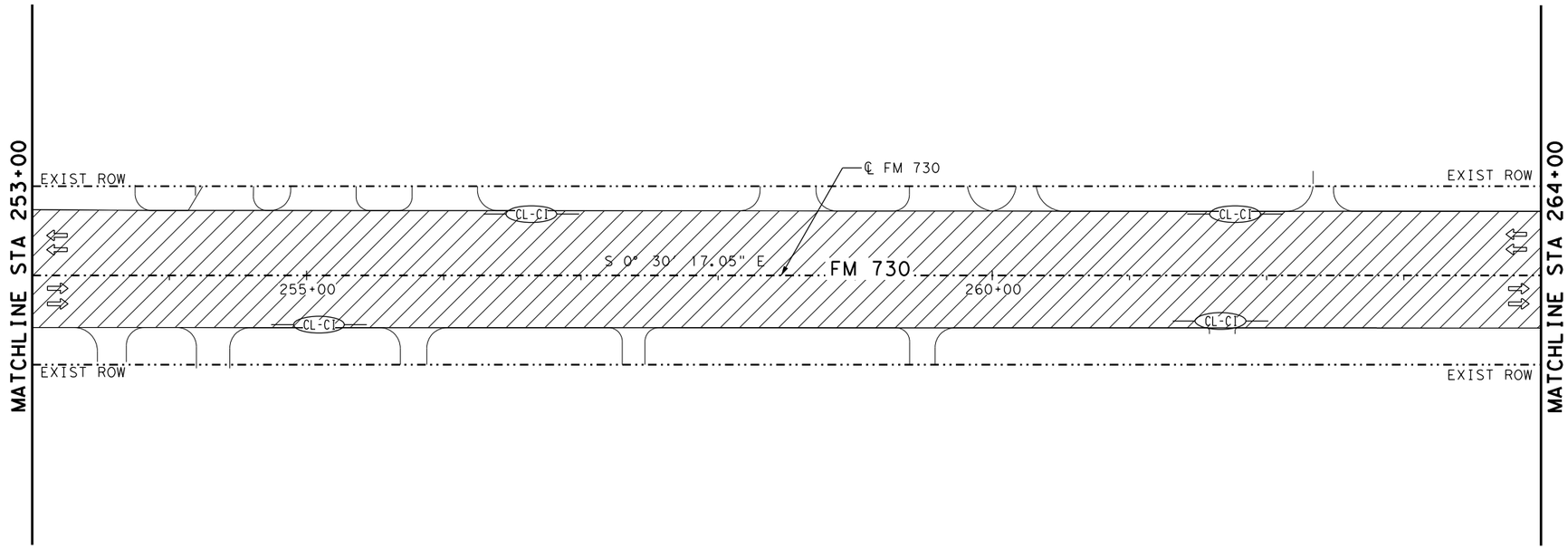
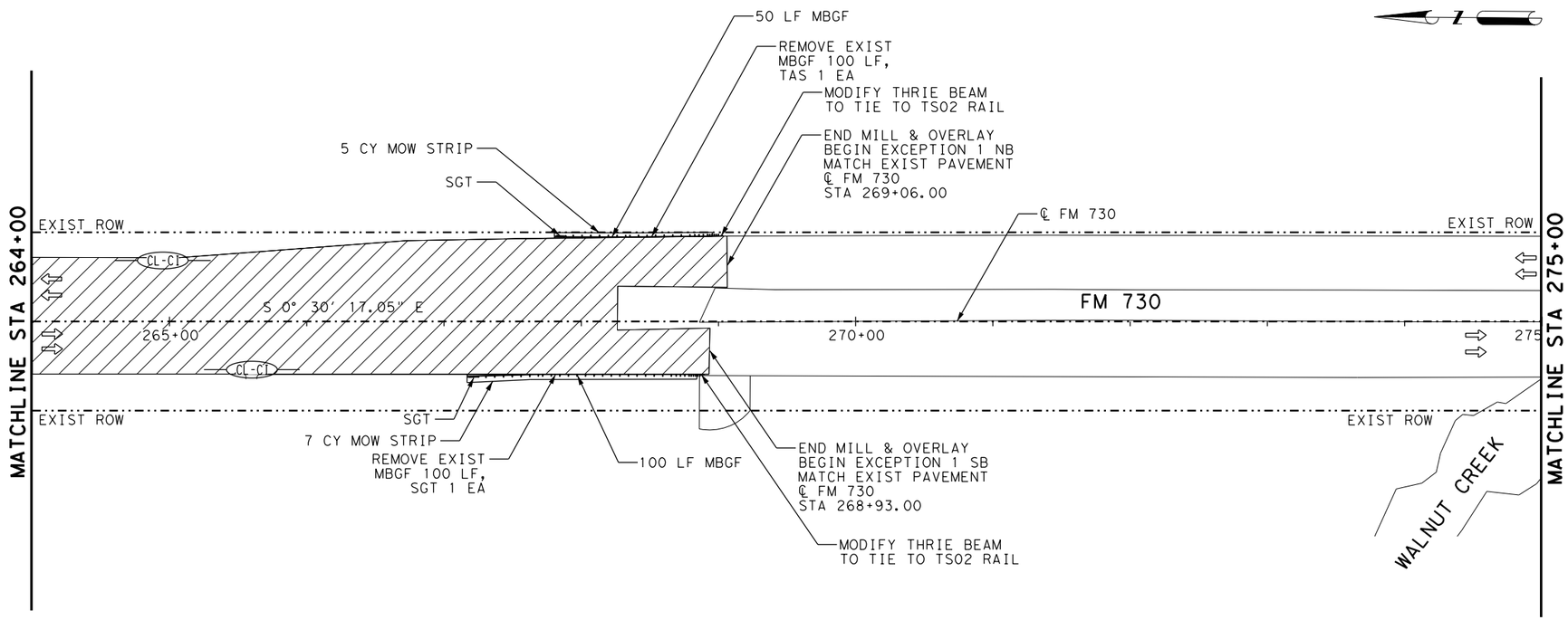
PROJECT LAYOUT

(STA 231+00 TO STA 253+00)

SHEET 11 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		13
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730





LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. BEGIN & END BRIDGE RETROFIT RAIL STATIONS ARE APPROXIMATE BASED ON AS BUILTS.

0 50′ 100′
SCALE: 1" = 100′

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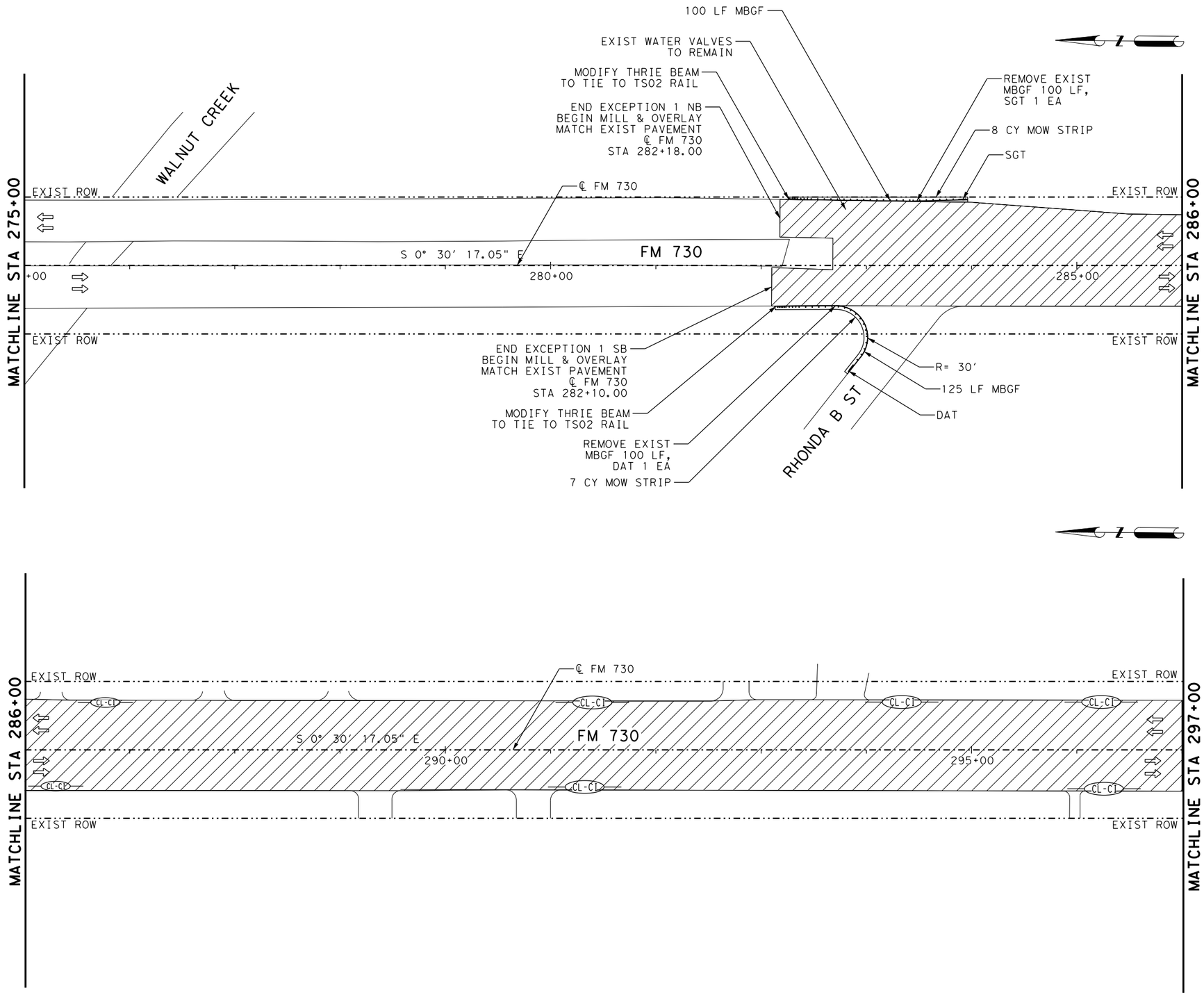
PROJECT LAYOUT

(STA 253+00 TO STA 275+00)

SHEET 12 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		14
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.
4. BEGIN & END BRIDGE RETROFIT RAIL STATIONS ARE APPROXIMATE BASED ON AS BUILTS.

0 50' 100'

SCALE: 1" = 100'

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PROJECT LAYOUT

(STA 275+00 TO STA 297+00)

SHEET 13 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		15
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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5/23/2023
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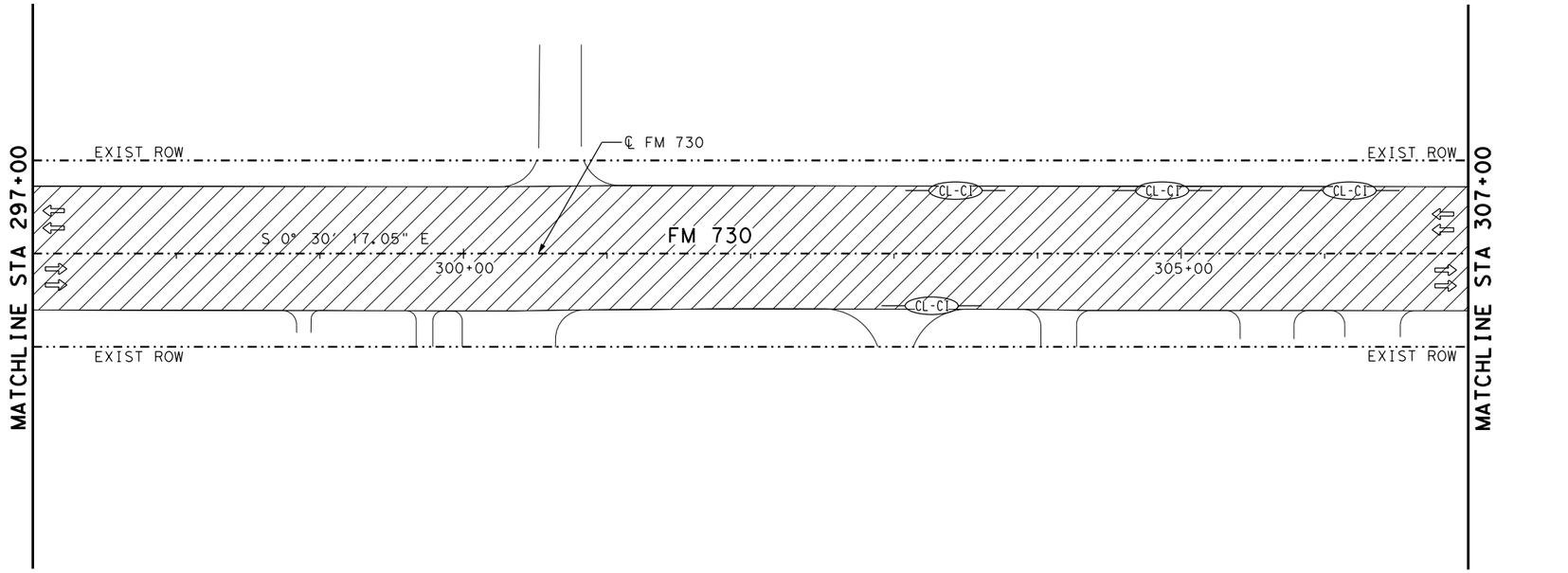

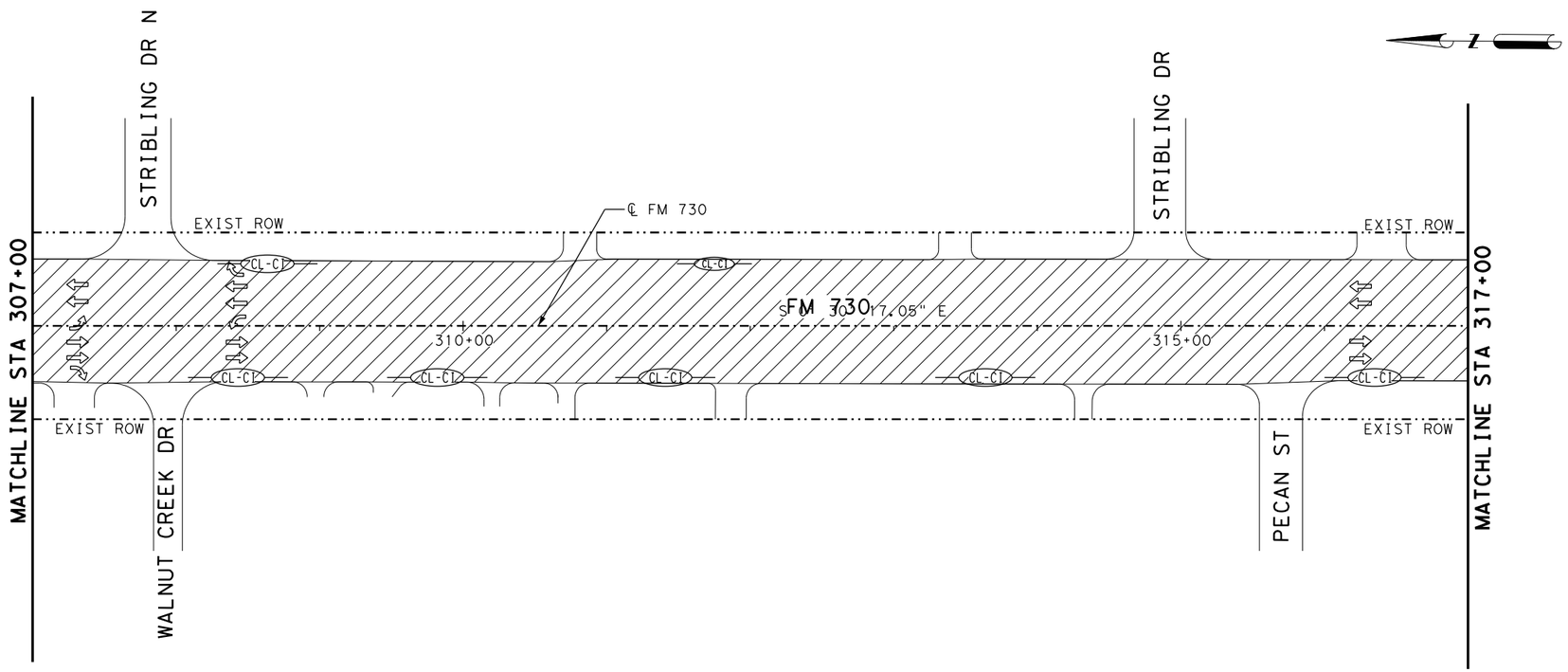

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.

0 50' 100'
SCALE: 1" = 100'

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PROJECT LAYOUT

(STA 297+00 TO STA 317+00)

SHEET 14 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		16
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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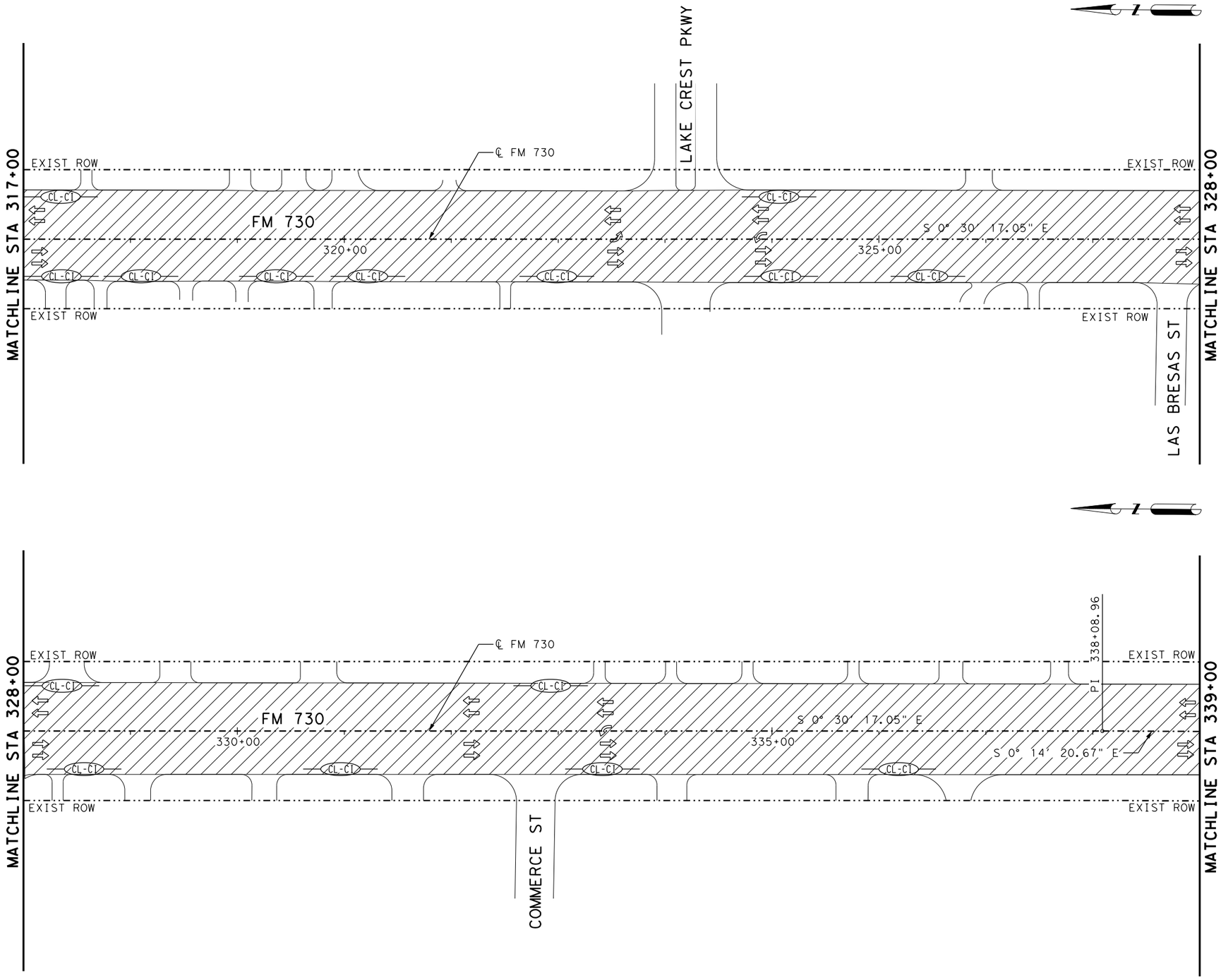

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG

NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.

0 50′ 100′
SCALE: 1" = 100′

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PROJECT LAYOUT

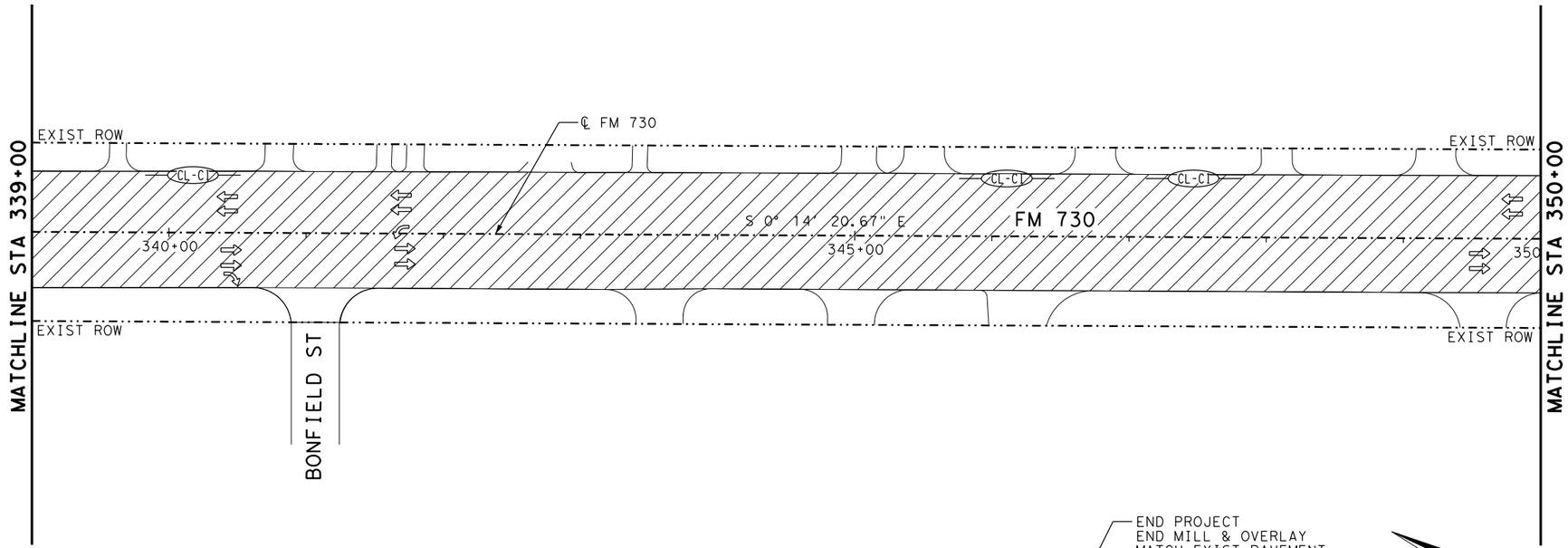
(STA 317+00 TO STA 339+00)

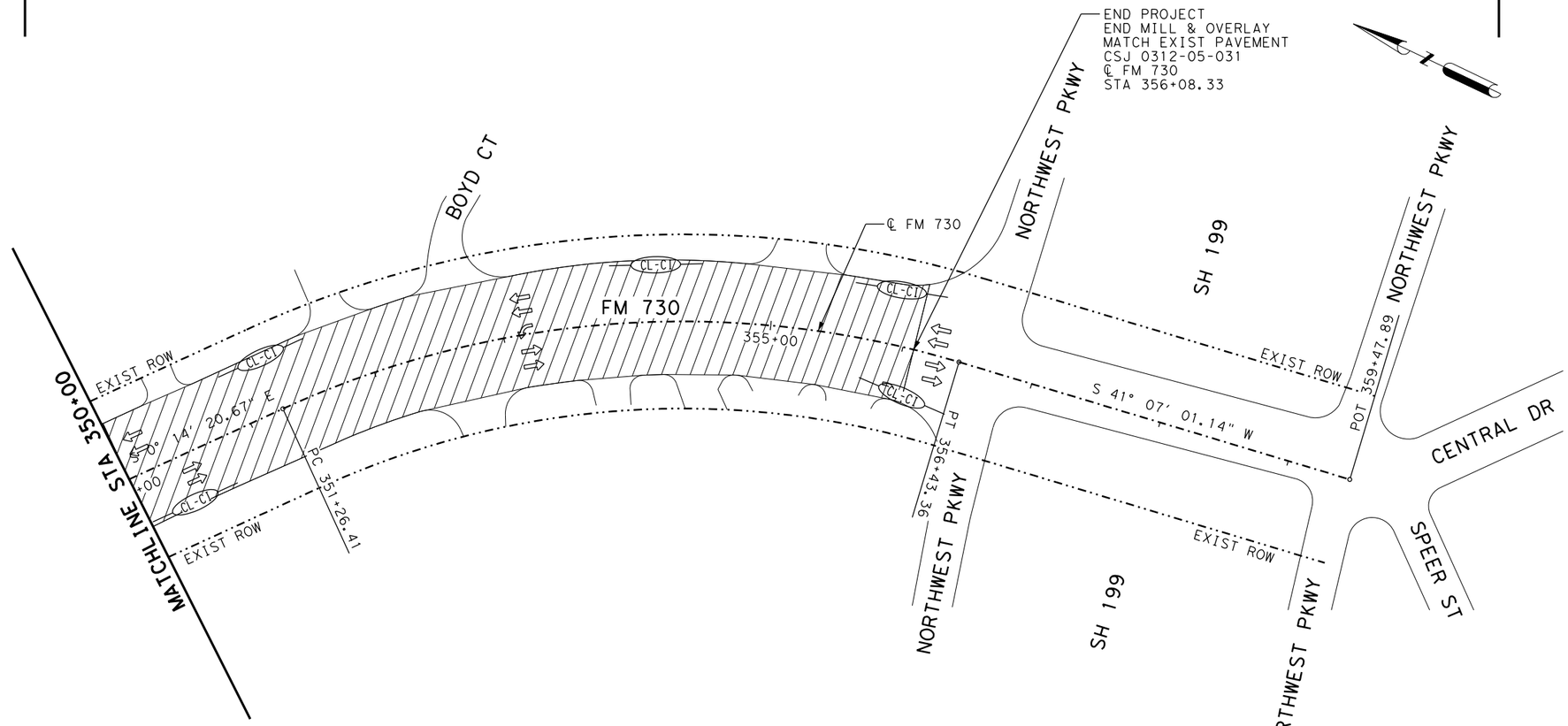
SHEET 15 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		17
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

LEGEND

- MILL & OVERLAY LIMITS
- DIRECTION OF TRAFFIC
- EXIST ROW
- CL-CI — EROSION CONTROL LOG





NOTES:

1. REFER TO "SIGNING AND PAVEMENT MARKING" SHEET FOR SIGNING AND STRIPING INFORMATION.
2. REFER TO "HORIZONTAL DATA" FOR ADDITIONAL INFORMATION.
3. REFER TO "MISCELLANEOUS ROADWAY DETAILS" FOR ADDITIONAL INFORMATION.

0 50' 100'
SCALE: 1" = 100'

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PROJECT LAYOUT

(STA 339+00 TO END PROJECT)

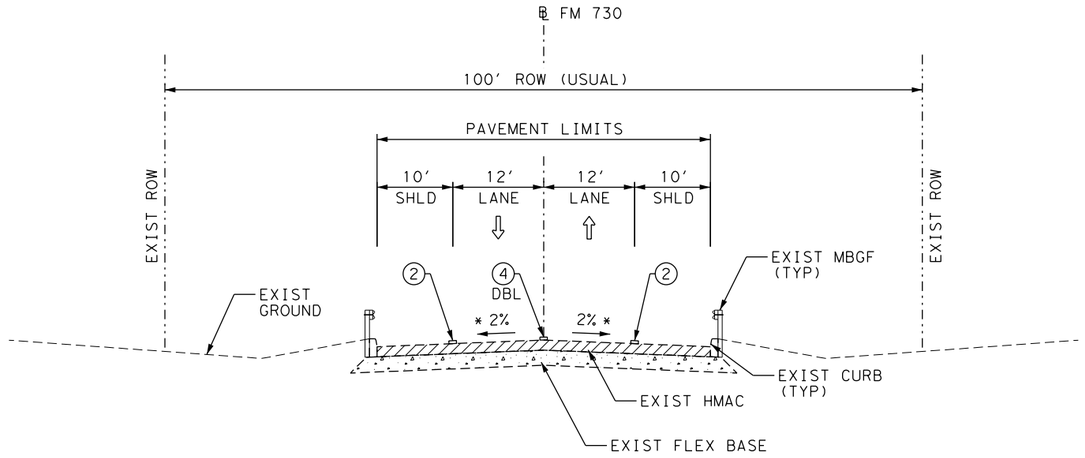
SHEET 16 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		18
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031, ETC.	FM 730

LEGEND

1. EXISTING WHITE 4" BRK PAVEMENT MARKINGS
2. EXISTING WHITE 4" SLD PAVEMENT MARKINGS
3. EXISTING YELLOW 4" BRK PAVEMENT MARKINGS
4. EXISTING YELLOW 4" SLD PAVEMENT MARKINGS
5. EXISTING WHITE 8" SLD PAVEMENT MARKINGS

⇦ EXISTING DIRECTION OF TRAFFIC

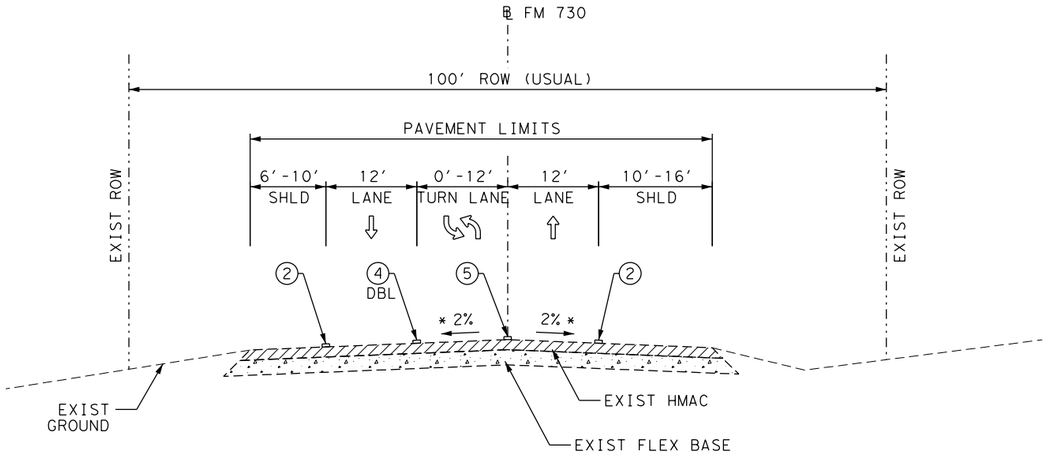


MBGF LIMITS
STA 39+00 TO STA 42+50 (LT)

MBGF LIMITS
STA 39+50 TO STA 43+50 (RT)

EXISTING FM 730 TYPICAL SECTION

STA 13+56.97 TO STA 40+47.50
BRIAR CREEK BRIDGE STA 40+47.50 TO STA 41+41.00
STA 41+41 TO STA 61+80
STA 69+75 TO STA 155+00
STA 169+70 TO STA 220+60



EXISTING FM 730 TYPICAL SECTION

STA 61+80 TO STA 66+00
STA 155+00 TO STA 169+70

* 2% USUAL

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EXISTING TYPICAL SECTIONS

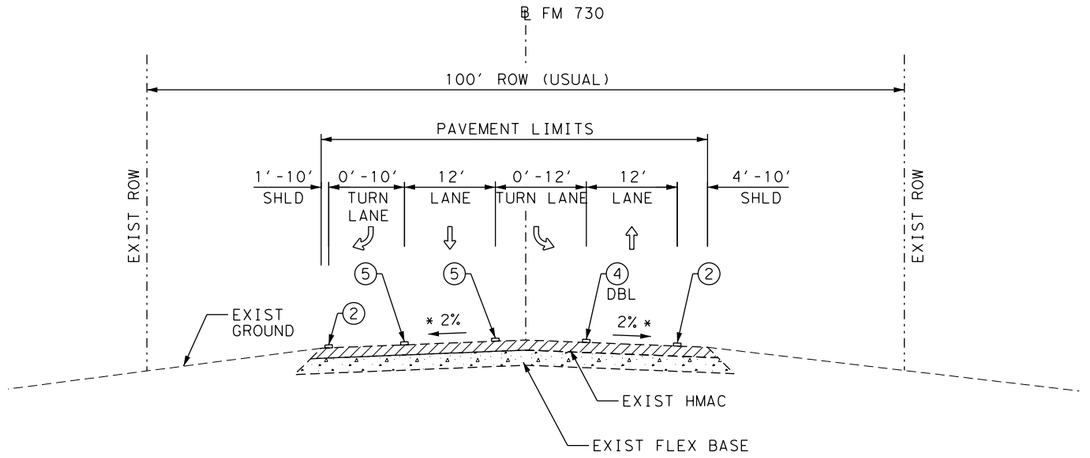
SHEET 1 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		19
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

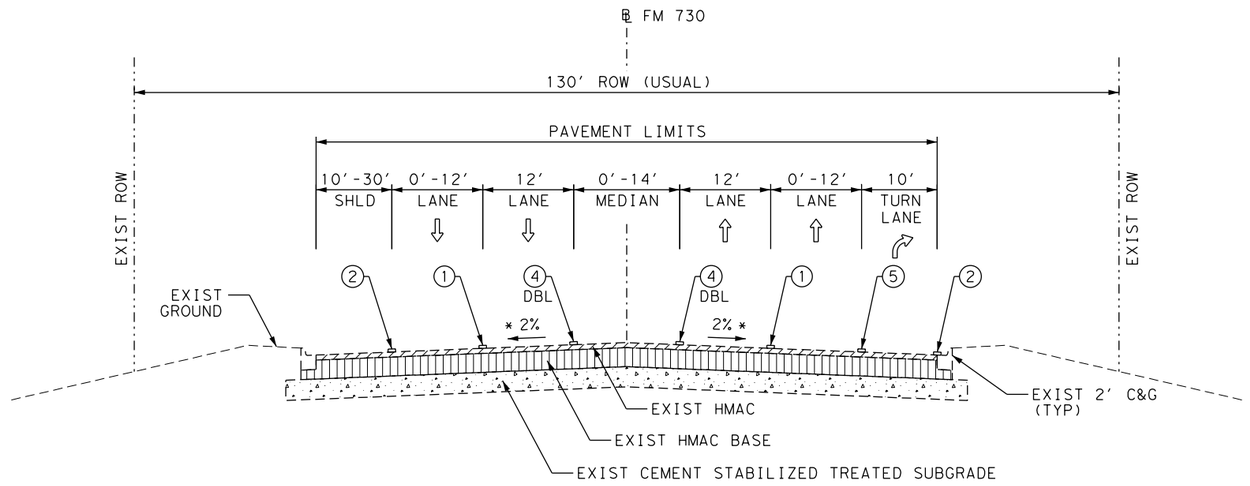
LEGEND

1. EXISTING WHITE 4" BRK PAVEMENT MARKINGS
2. EXISTING WHITE 4" SLD PAVEMENT MARKINGS
3. EXISTING YELLOW 4" BRK PAVEMENT MARKINGS
4. EXISTING YELLOW 4" SLD PAVEMENT MARKINGS
5. EXISTING WHITE 8" SLD PAVEMENT MARKINGS

⇦ EXISTING DIRECTION OF TRAFFIC



EXISTING FM 730 TYPICAL SECTION
STA 66+00 TO STA 69+75



EXISTING FM 730 TYPICAL SECTION
STA 220+60 TO STA 225+00

* 2% USUAL

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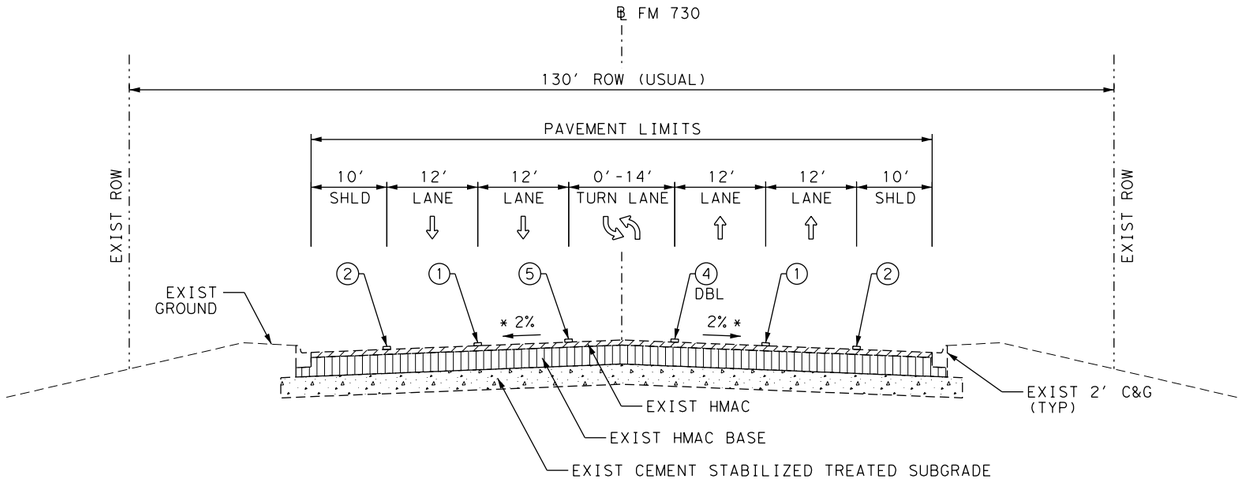
EXISTING TYPICAL SECTIONS

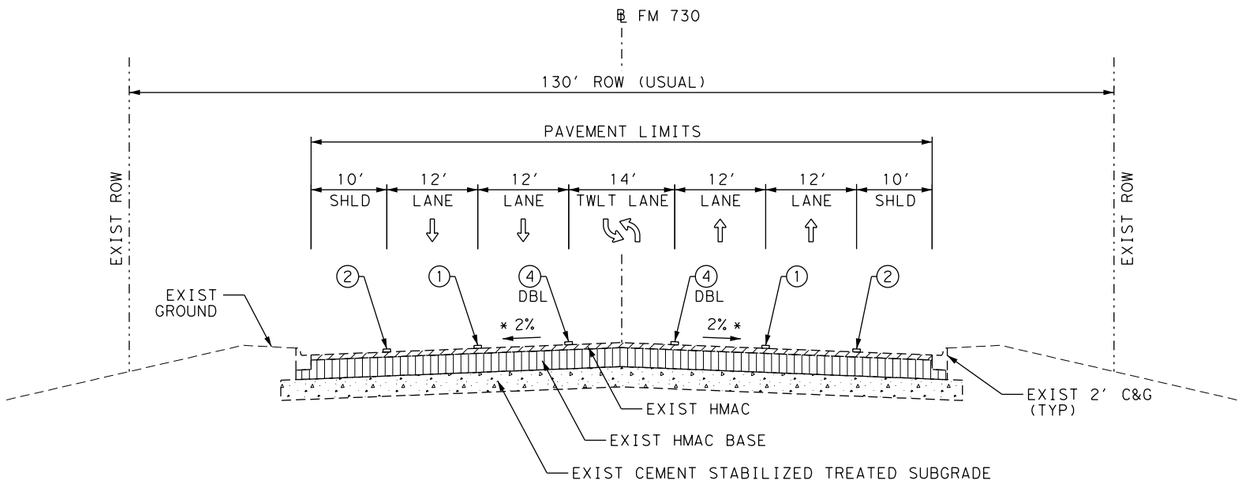
SHEET 2 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		20
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



EXISTING FM 730 TYPICAL SECTION

STA 225+00 TO STA 227+46
STA 311+65 TO STA 318+80
STA 319+77 TO STA 325+60
STA 332+75 TO STA 336+70
STA 341+10 TO STA 344+00



EXISTING FM 730 TYPICAL SECTION

STA 227+46 TO STA 245+16
STA 251+07 TO STA 264+50
STA 286+00 TO STA 303+85
STA 325+60 TO STA 330+87
STA 344+00 TO STA 352+50

* 2% USUAL

LEGEND

1. EXISTING WHITE 4" BRK PAVEMENT MARKINGS
2. EXISTING WHITE 4" SLD PAVEMENT MARKINGS
3. EXISTING YELLOW 4" BRK PAVEMENT MARKINGS
4. EXISTING YELLOW 4" SLD PAVEMENT MARKINGS
5. EXISTING WHITE 8" SLD PAVEMENT MARKINGS

⇦ EXISTING DIRECTION OF TRAFFIC

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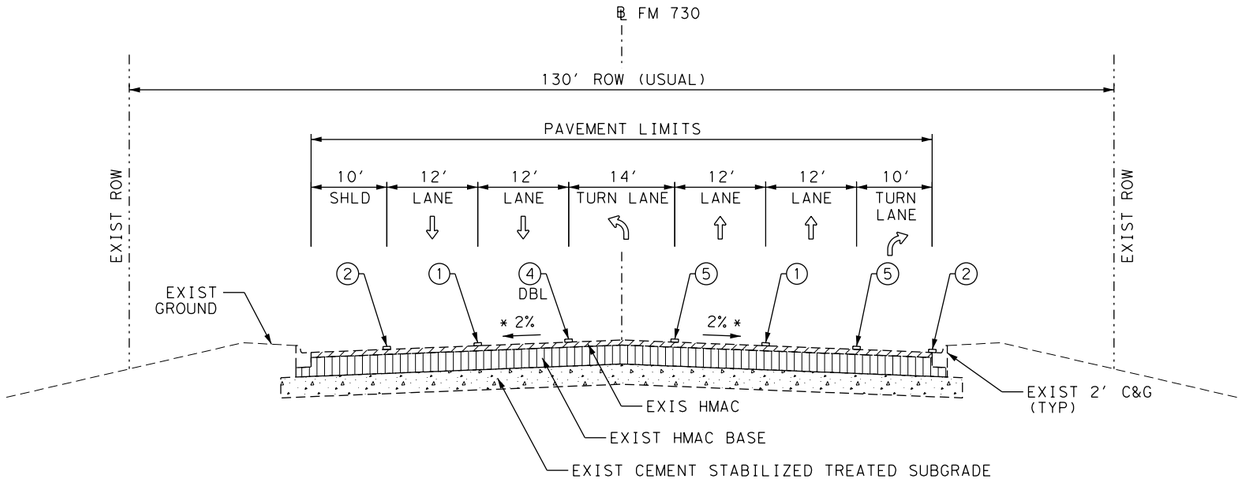
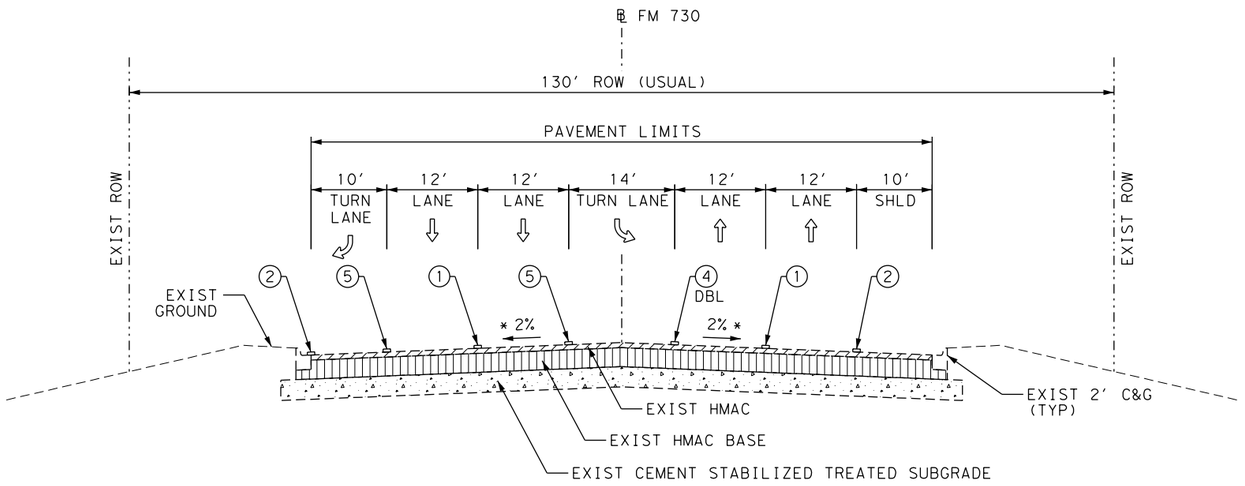
EXISTING TYPICAL SECTIONS

SHEET 3 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		21
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



EXISTING FM 730 TYPICAL SECTION
STA 245+16 TO STA 247+60
STA 303+85 TO STA 307+80



EXISTING FM 730 TYPICAL SECTION
STA 247+60 TO STA 251+07
STA 307+80 TO STA 310+80

* 2% USUAL

LEGEND

1. EXISTING WHITE 4" BRK PAVEMENT MARKINGS
2. EXISTING WHITE 4" SLD PAVEMENT MARKINGS
3. EXISTING YELLOW 4" BRK PAVEMENT MARKINGS
4. EXISTING YELLOW 4" SLD PAVEMENT MARKINGS
5. EXISTING WHITE 8" SLD PAVEMENT MARKINGS

⇦ EXISTING DIRECTION OF TRAFFIC

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EXISTING TYPICAL SECTIONS

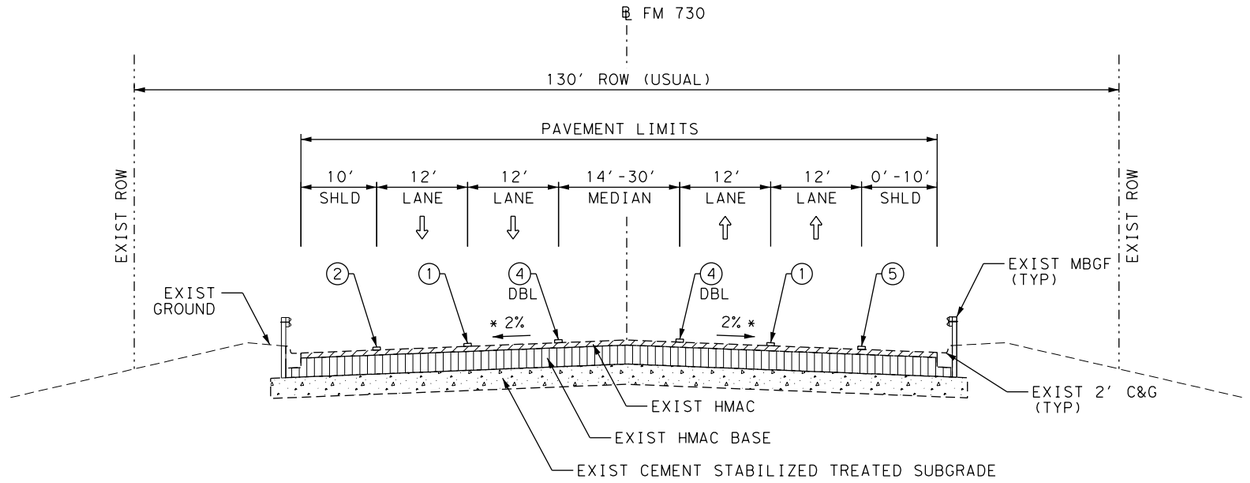
SHEET 4 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		22
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

LEGEND

1. EXISTING WHITE 4" BRK PAVEMENT MARKINGS
2. EXISTING WHITE 4" SLD PAVEMENT MARKINGS
3. EXISTING YELLOW 4" BRK PAVEMENT MARKINGS
4. EXISTING YELLOW 4" SLD PAVEMENT MARKINGS
5. EXISTING WHITE 8" SLD PAVEMENT MARKINGS

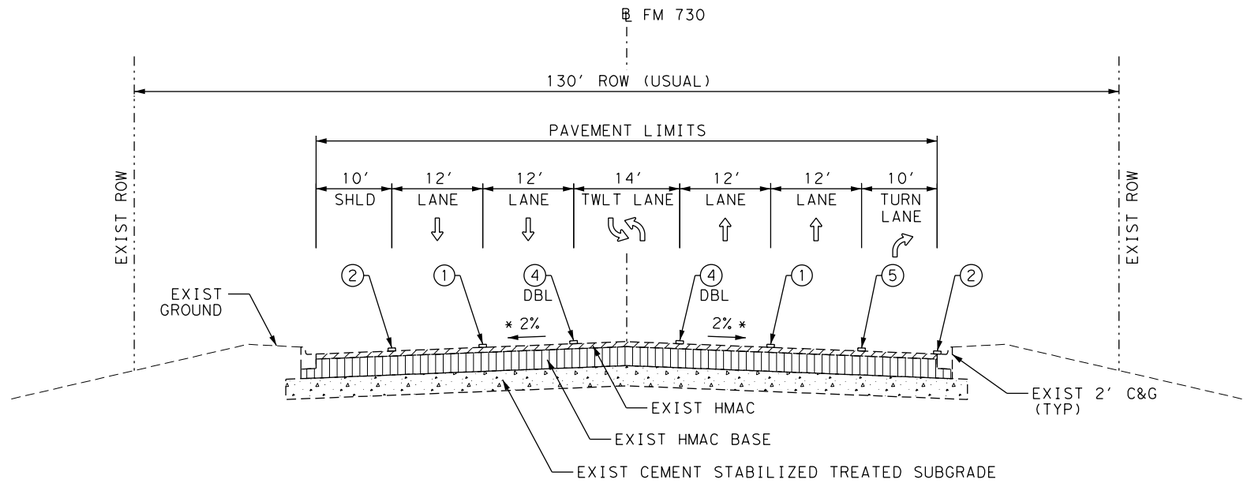
⇦ EXISTING DIRECTION OF TRAFFIC



MBGF LIMITS
STA 267+80 TO STA 269+00 (LT)
STA 282+20 TO STA 283+80 (LT)

EXISTING FM 730 TYPICAL SECTION
STA 264+50 TO STA 268+26
WALNUT CREEK BRIDGE STA 268+26 TO STA 282+68
STA 282+68 TO STA 286+00
STA 310+80 TO STA 311+65
STA 318+80 TO STA 319+77
STA 330+87 TO STA 332+75
STA 336+70 TO STA 338+60

MBGF LIMITS
STA 267+20 TO STA 268+90 (RT)
STA 282+10 TO STA 283+00 (RT)



EXISTING FM 730 TYPICAL SECTION
STA 338+60 TO STA 341+10

* 2% USUAL

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FM 730

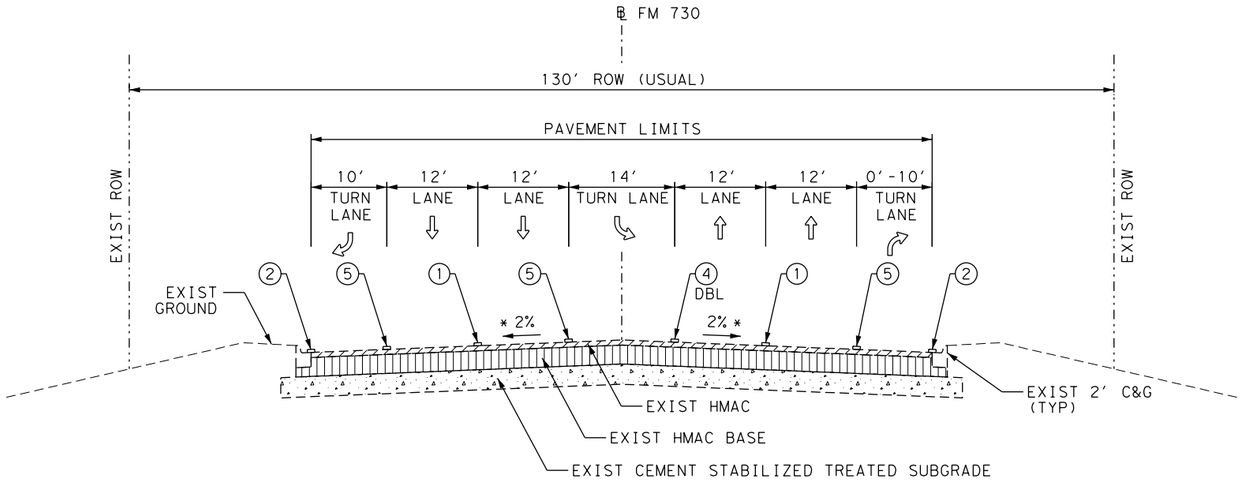
EXISTING TYPICAL SECTIONS

SHEET 5 OF 6

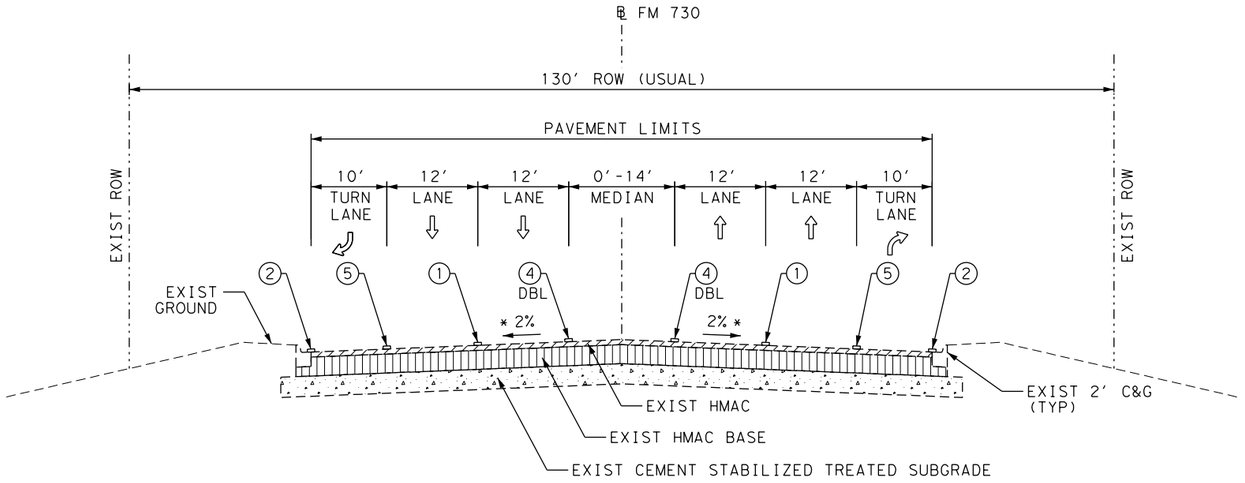
FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		23
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

LEGEND

1. EXISTING WHITE 4" BRK PAVEMENT MARKINGS
2. EXISTING WHITE 4" SLD PAVEMENT MARKINGS
3. EXISTING YELLOW 4" BRK PAVEMENT MARKINGS
4. EXISTING YELLOW 4" SLD PAVEMENT MARKINGS
5. EXISTING WHITE 8" SLD PAVEMENT MARKINGS
6. EXISTING DIRECTION OF TRAFFIC



EXISTING FM 730 TYPICAL SECTION
STA 352+50 TO STA 354+50



EXISTING FM 730 TYPICAL SECTION
STA 354+50 TO STA 356+50

* 2% USUAL

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92927
LICENSED PROFESSIONAL ENGINEER

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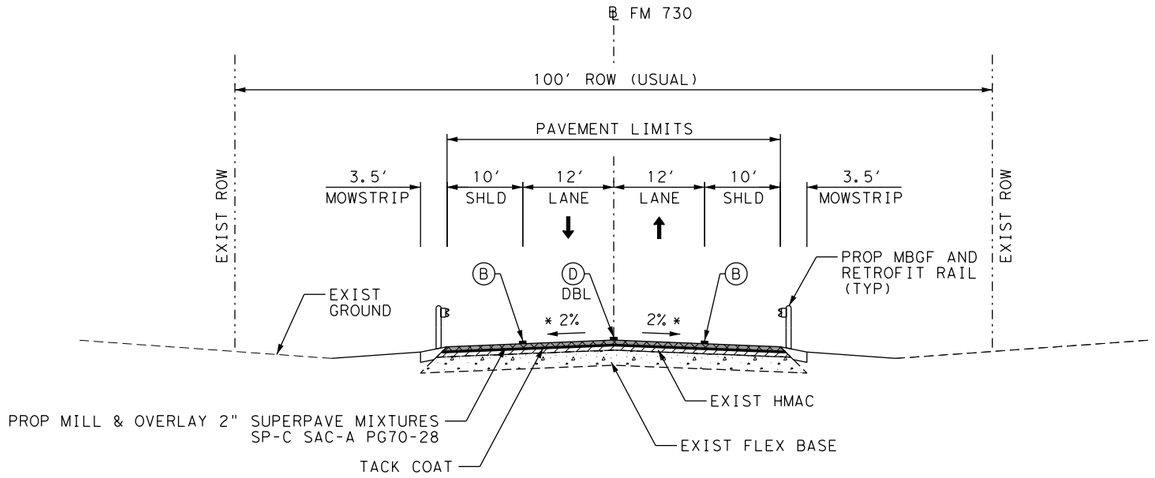
FM 730

EXISTING TYPICAL SECTIONS

SHEET 6 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		24
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

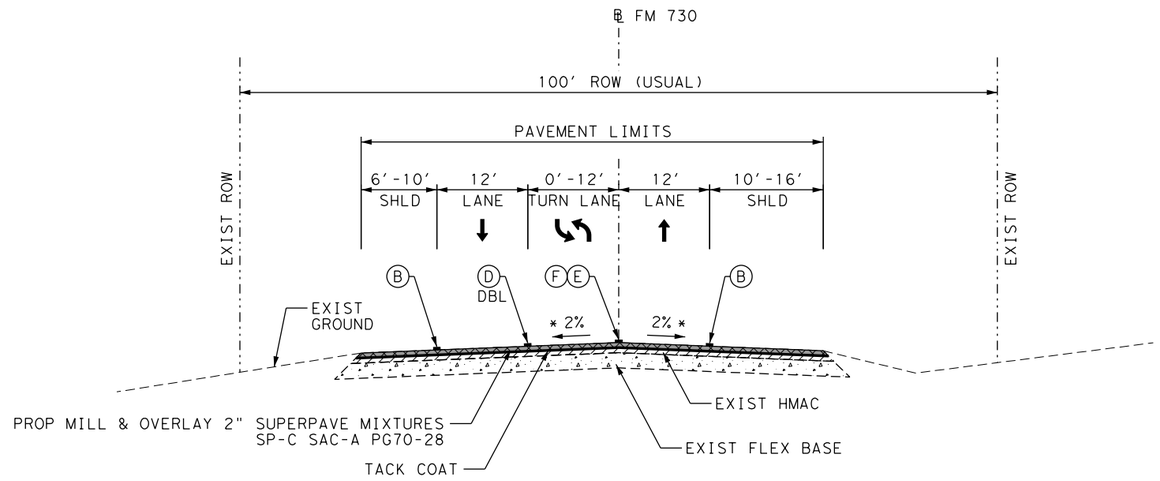


MBGF LIMITS
STA 38+44.50 TO STA 40+38.25 (LT)
STA 41+50.25 TO STA 43+83.00 (LT)

MBGF LIMITS
STA 37+94.50 TO STA 40+38.25 (RT)
STA 41+50.25 TO STA 43+45.00 (RT)

PROPOSED FM 730 TYPICAL SECTION

STA 13+56.97 TO STA 40+38.25
BRIAR CREEK BRIDGE FROM STA 40+38.25 TO STA 41+50.25
STA 41+50.25 TO STA 61+80
STA 69+75 TO STA 155+00
STA 169+70 TO STA 220+60



PROPOSED FM 730 TYPICAL SECTION

STA 61+80 TO STA 66+00
STA 155+00 TO STA 169+70

* MATCH EXISTING GRADE, 2% USUAL

LEGEND

- (A) REFL PAV MRK TY I (W) 4" (BRK)
- (B) REFL PAV MRK TY I (W) 4" (SLD)
- (C) REFL PAV MRK TY I (Y) 4" (BRK)
- (D) REFL PAV MRK TY I (Y) 4" (SLD)
- (E) REFL PAV MRK TY I (W) 8" (SLD)
- (F) REFL PAV MRKR TY II-C-R
- ← PROPOSED DIRECTION OF TRAFFIC

NOTES:

1. LEAVE A UNIFORM SURFACE OF PLANED PAVEMENT FREE OF LOOSE ASPHALT MATERIAL.
2. REPAIR PAVEMENT FAILURES IN ACCORDANCE WITH FLEXIBLE PAVEMENT REPAIR DETAIL AND/OR AS DIRECTED BY THE ENGINEER.
3. REFERENCE ALL EXISTING PAVEMENT MARKINGS PRIOR TO PLANING OPERATIONS.
4. CONTRACTOR TO ENSURE THAT EXISTING DRAINAGE FEATURES SUCH AS DROP INLETS, CURB INLETS, CURBS, GUTTER PANS, ETC ARE NOT IMPACTED DURING CONSTRUCTION AND PLANING OPERATIONS. DAMAGED PORTIONS, AS A RESULT OF CONSTRUCTION, ARE TO BE REPAIRED AT CONTRACTOR'S EXPENSE.
5. MBGF STATIONING PROVIDED IS APPROXIMATE. CONTRACTOR TO ADJUST LOCATIONS OF MBGF BASED ON DETAIL OR AS DIRECTED BY ENGINEER.

N.T.S

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PROPOSED TYPICAL SECTIONS

SHEET 1 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		25
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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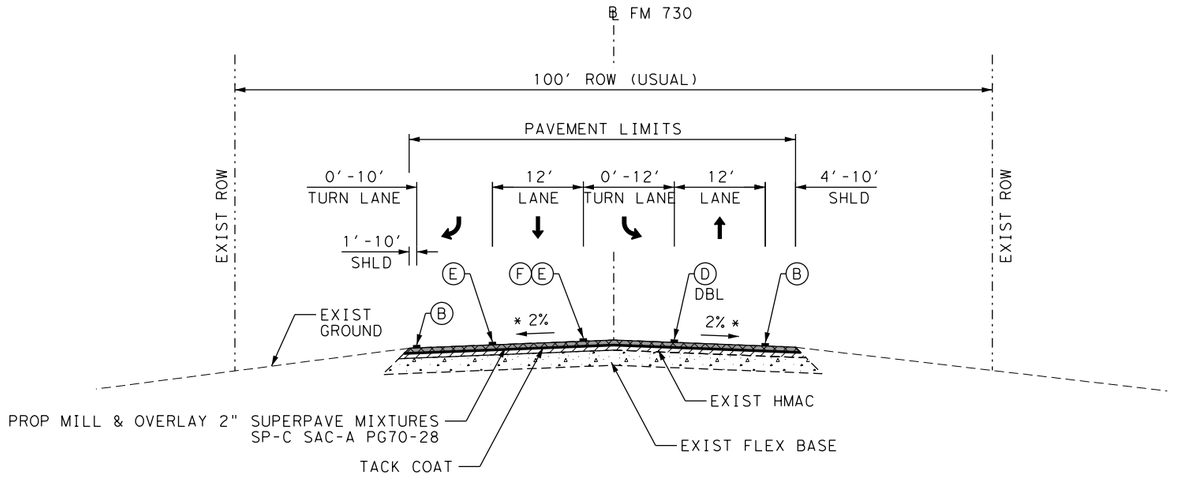
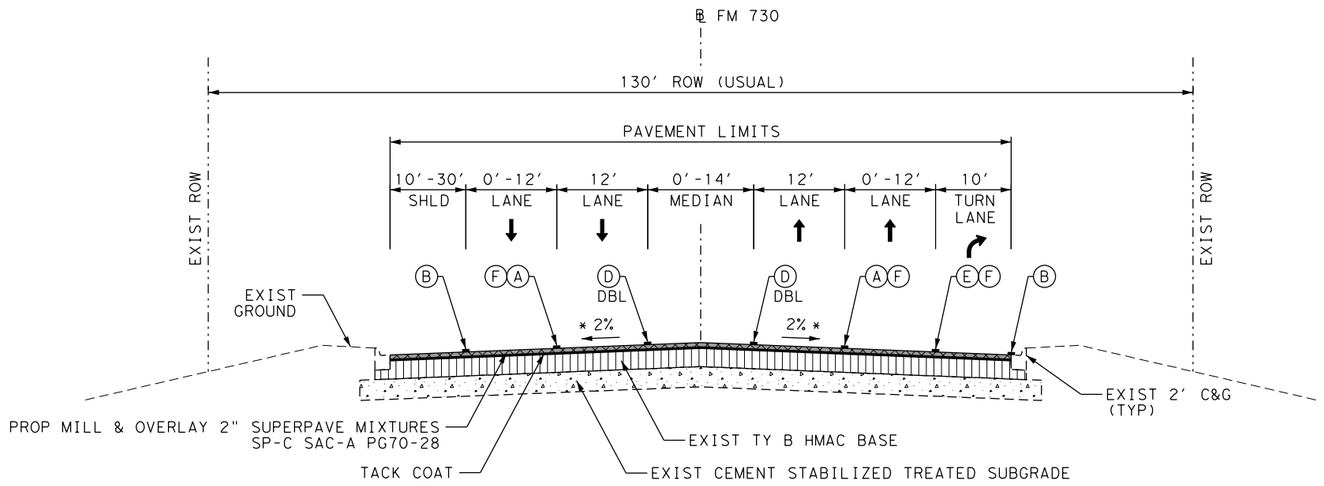


PROPOSED FM 730 TYPICAL SECTION
STA 66+00 TO STA 69+75



PROPOSED FM 730 TYPICAL SECTION
STA 220+60 TO STA 225+00

* MATCH EXISTING GRADE, 2% USUAL

LEGEND

- (A) REFL PAV MRK TY I (W) 4" (BRK)
- (B) REFL PAV MRK TY I (W) 4" (SLD)
- (C) REFL PAV MRK TY I (Y) 4" (BRK)
- (D) REFL PAV MRK TY I (Y) 4" (SLD)
- (E) REFL PAV MRK TY I (W) 8" (SLD)
- (F) REFL PAV MRKR TY II-C-R
- ← PROPOSED DIRECTION OF TRAFFIC

NOTES:

1. LEAVE A UNIFORM SURFACE OF PLANED PAVEMENT FREE OF LOOSE ASPHALT MATERIAL.
2. REPAIR PAVEMENT FAILURES IN ACCORDANCE WITH FLEXIBLE PAVEMENT REPAIR DETAIL AND/OR AS DIRECTED BY THE ENGINEER.
3. REFERENCE ALL EXISTING PAVEMENT MARKINGS PRIOR TO PLANING OPERATIONS.
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N.T.S

STATE OF TEXAS
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92927
LICENSED PROFESSIONAL ENGINEER

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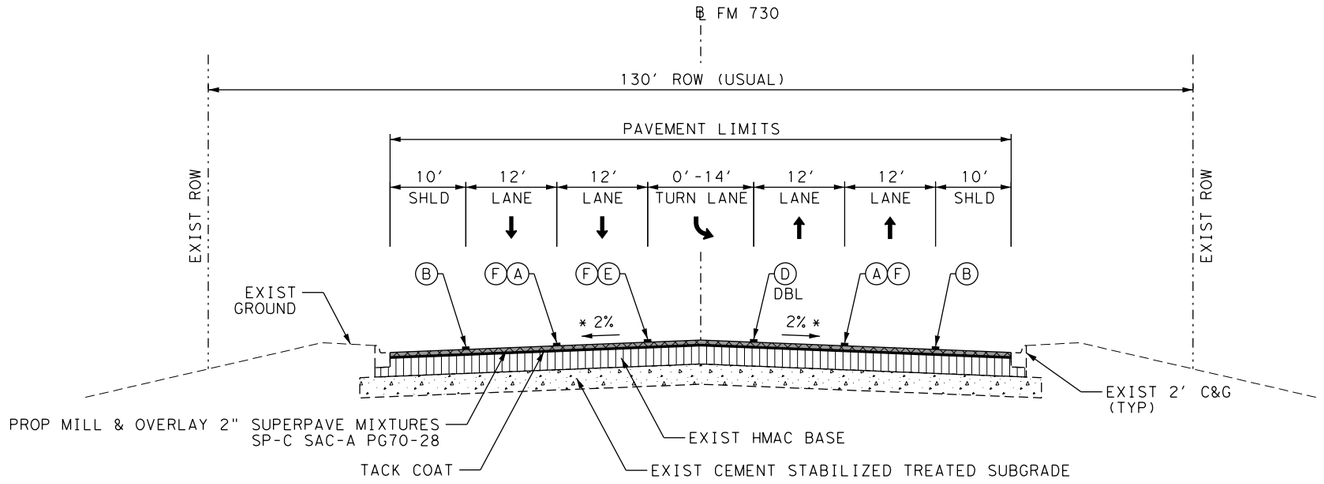
PROPOSED TYPICAL SECTIONS

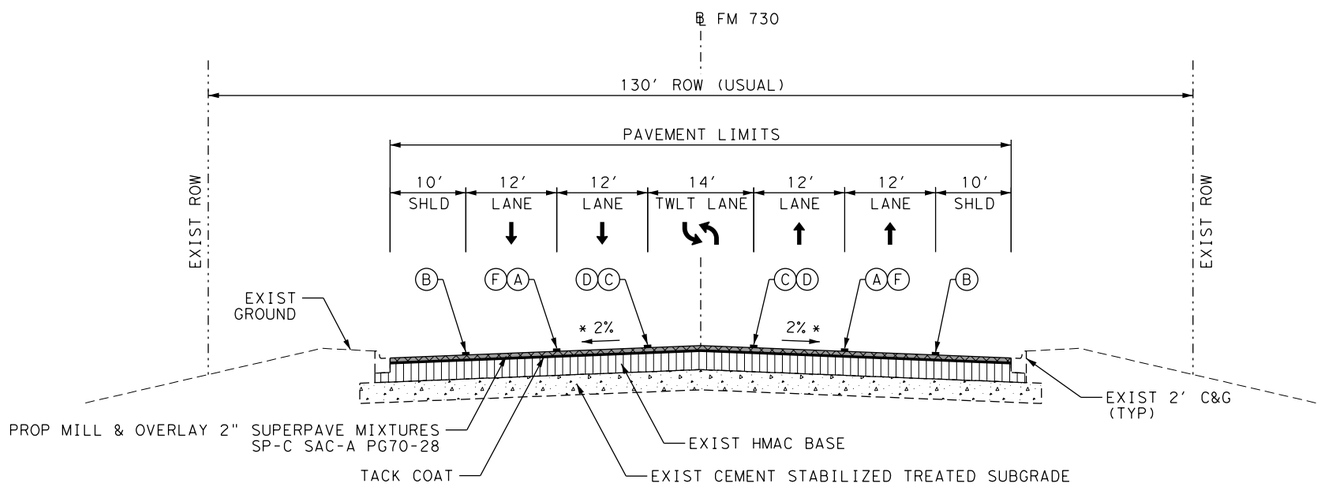
SHEET 2 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		26
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



PROPOSED FM 730 TYPICAL SECTION

STA 225+00 TO STA 227+46
STA 311+65 TO STA 318+80
STA 319+77 TO STA 325+60
STA 332+75 TO STA 336+70
STA 341+10 TO STA 344+00



PROPOSED FM 730 TYPICAL SECTION

STA 227+46 TO STA 245+16
STA 251+07 TO STA 264+50
STA 286+00 TO STA 303+85
STA 325+60 TO STA 330+87
STA 344+00 TO STA 352+50

* MATCH EXISTING GRADE, 2% USUAL

LEGEND

- Ⓐ REFL PAV MRK TY I (W) 4" (BRK)
- Ⓑ REFL PAV MRK TY I (W) 4" (SLD)
- Ⓒ REFL PAV MRK TY I (Y) 4" (BRK)
- Ⓓ REFL PAV MRK TY I (Y) 4" (SLD)
- Ⓔ REFL PAV MRK TY I (W) 8" (SLD)
- Ⓕ REFL PAV MRKR TY II-C-R
- ← PROPOSED DIRECTION OF TRAFFIC

NOTES:

1. LEAVE A UNIFORM SURFACE OF PLANED PAVEMENT FREE OF LOOSE ASPHALT MATERIAL.
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N.T.S

STATE OF TEXAS
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FM 730

PROPOSED TYPICAL SECTIONS

SHEET 3 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		27
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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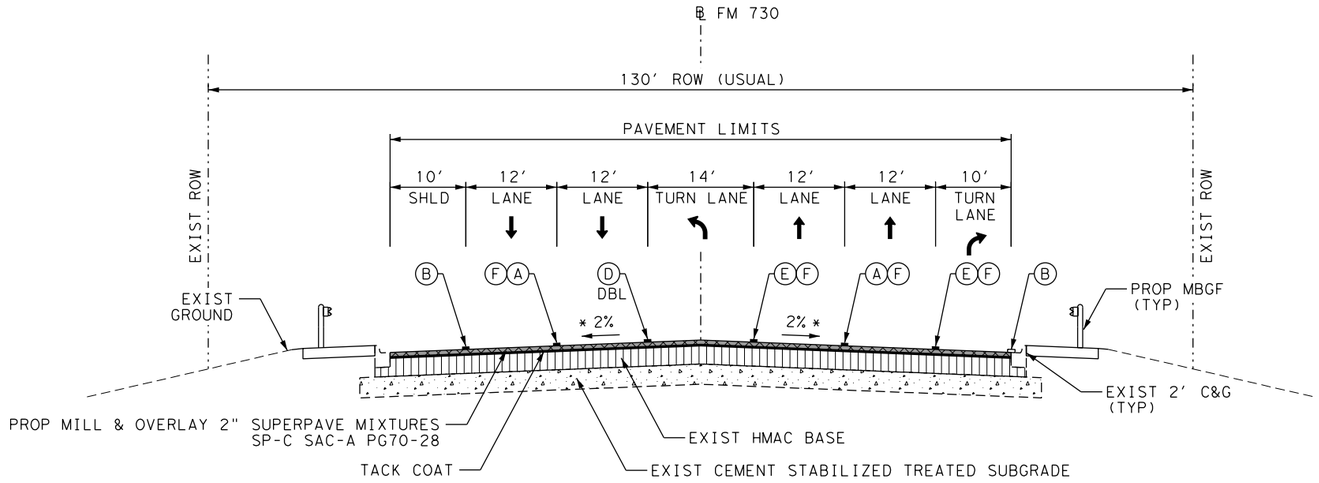
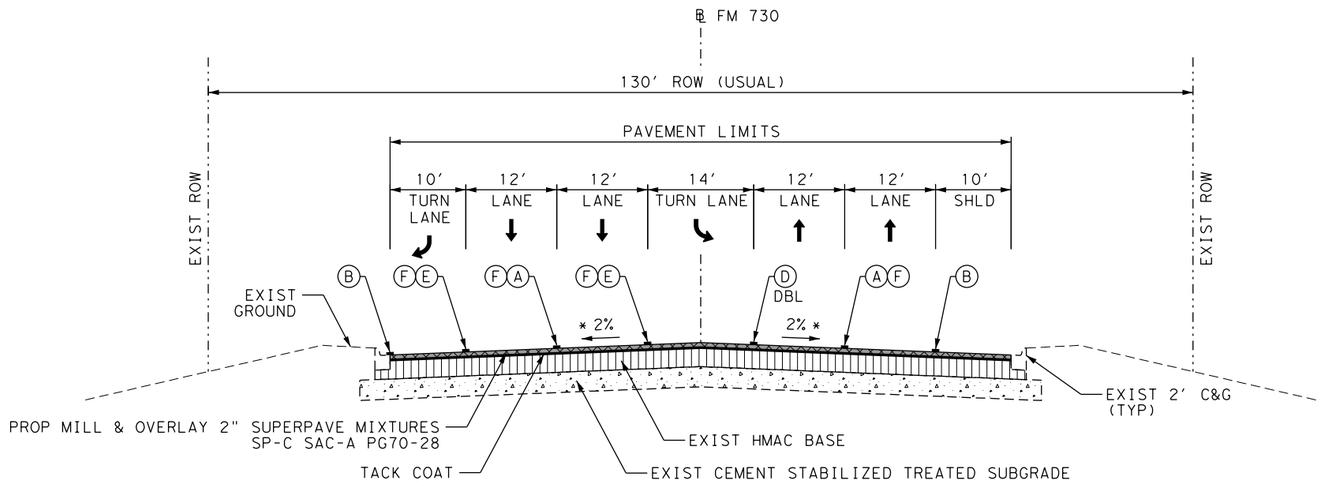


MBGF LIMITS
STA 245+65 TO STA 246+15 (LT)

PROPOSED FM 730 TYPICAL SECTION
STA 245+16 TO STA 247+60
STA 303+85 TO STA 307+80

MBGF LIMITS
STA 244+14 TO STA 245+64 (RT)



PROPOSED FM 730 TYPICAL SECTION
STA 247+60 TO STA 251+07
STA 307+80 TO STA 310+80

* MATCH EXISTING GRADE, 2% USUAL

LEGEND

- (A) REFL PAV MRK TY I (W) 4" (BRK)
- (B) REFL PAV MRK TY I (W) 4" (SLD)
- (C) REFL PAV MRK TY I (Y) 4" (BRK)
- (D) REFL PAV MRK TY I (Y) 4" (SLD)
- (E) REFL PAV MRK TY I (W) 8" (SLD)
- (F) REFL PAV MRKR TY II-C-R
- ← PROPOSED DIRECTION OF TRAFFIC

NOTES:

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FM 730

PROPOSED TYPICAL SECTIONS

SHEET 4 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		28
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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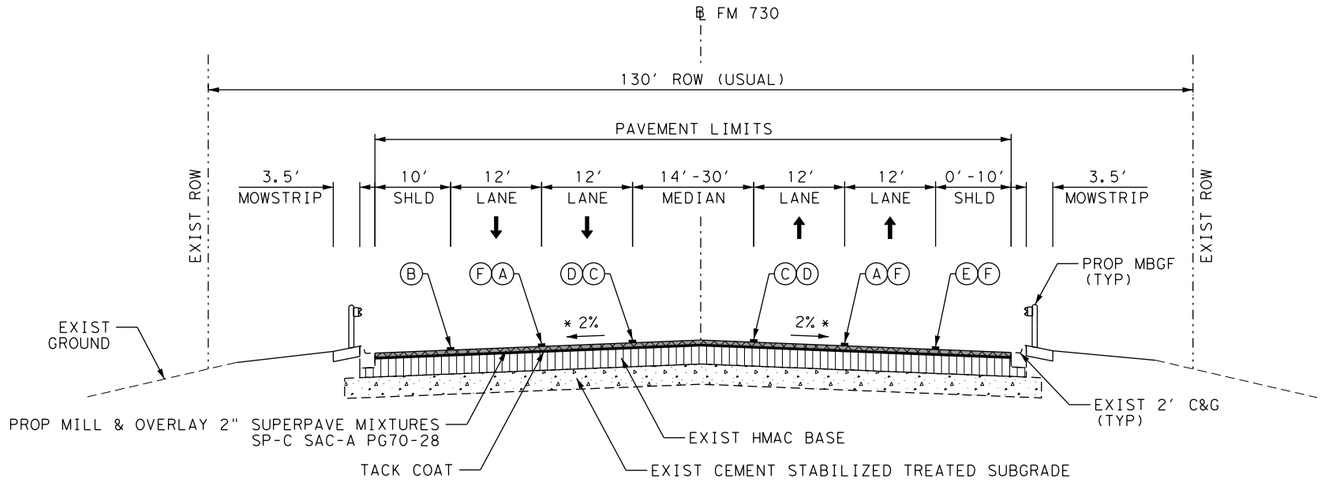
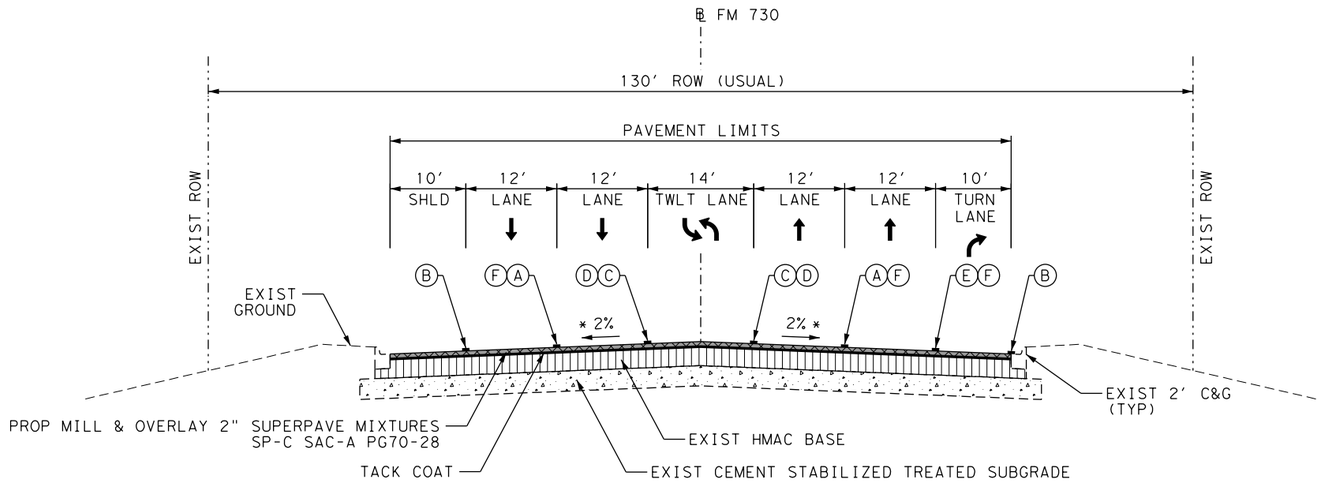


MBGF LIMITS
STA 267+69.00 TO STA 269+06.00 (LT)
STA 282+18.00 TO STA 284+27.00 (LT)

MBGF LIMITS
STA 266+92.00 TO STA 268+93.00 (RT)
STA 282+10.00 TO STA 283+01.00 (RT)

PROPOSED FM 730 TYPICAL SECTION

STA 264+50 TO STA 268+26
WALNUT CREEK BRIDGE STA 268+26 TO STA 282+68
STA 282+68 TO STA 286+00
STA 310+80 TO STA 311+65
STA 318+80 TO STA 319+77
STA 330+87 TO STA 332+75
STA 336+70 TO STA 338+60



PROPOSED FM 730 TYPICAL SECTION
STA 338+60 TO STA 341+10

* MATCH EXISTING GRADE, 2% USUAL

LEGEND

- (A) REFL PAV MRK TY I (W) 4" (BRK)
- (B) REFL PAV MRK TY I (W) 4" (SLD)
- (C) REFL PAV MRK TY I (Y) 4" (BRK)
- (D) REFL PAV MRK TY I (Y) 4" (SLD)
- (E) REFL PAV MRK TY I (W) 8" (SLD)
- (F) REFL PAV MRKR TY II-C-R
- ← PROPOSED DIRECTION OF TRAFFIC

NOTES:

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FM 730

PROPOSED TYPICAL SECTIONS

SHEET 5 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		29
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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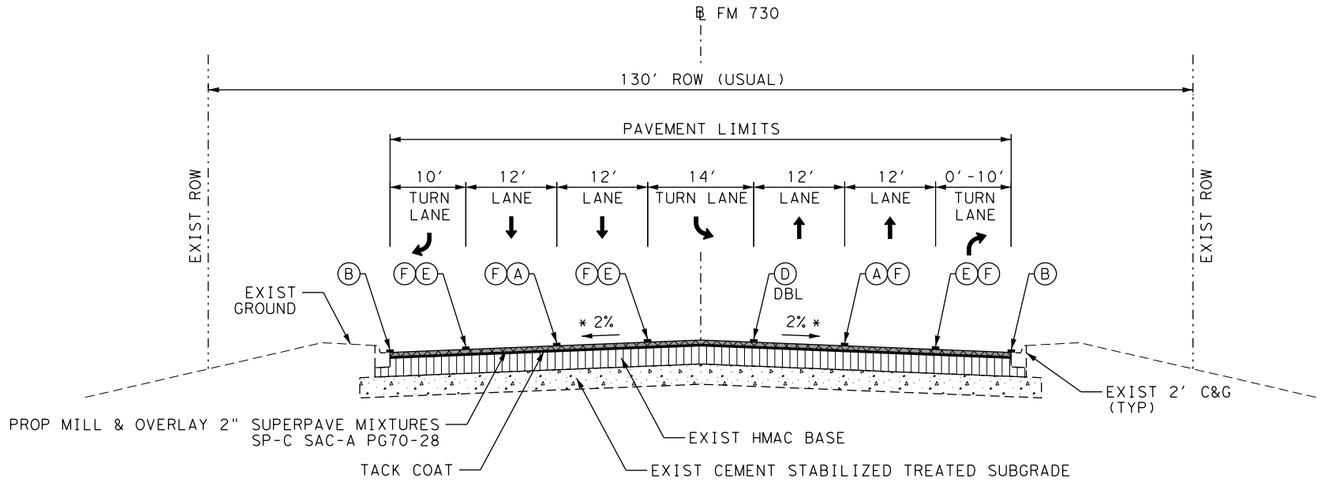
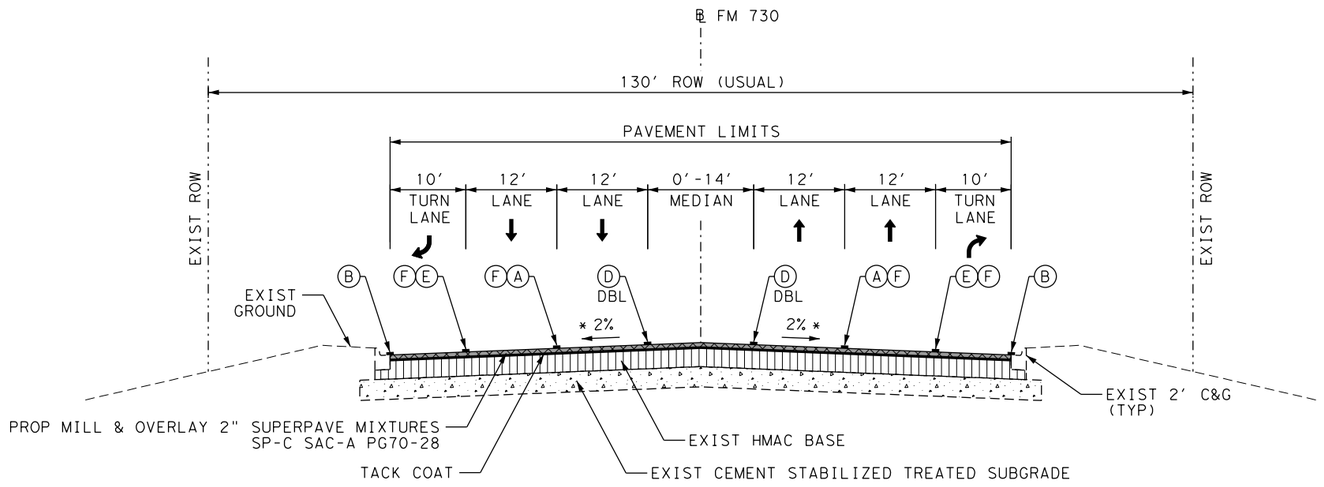


PROPOSED FM 730 TYPICAL SECTION
STA 352+50 TO STA 354+50



PROPOSED FM 730 TYPICAL SECTION
STA 354+50 TO STA 356+50

* MATCH EXISTING GRADE, 2% USUAL

LEGEND

- (A) REFL PAV MRK TY I (W) 4" (BRK)
- (B) REFL PAV MRK TY I (W) 4" (SLD)
- (C) REFL PAV MRK TY I (Y) 4" (BRK)
- (D) REFL PAV MRK TY I (Y) 4" (SLD)
- (E) REFL PAV MRK TY I (W) 8" (SLD)
- (F) REFL PAV MRKR TY II-C-R
- ← PROPOSED DIRECTION OF TRAFFIC

NOTES:

1. LEAVE A UNIFORM SURFACE OF PLANED PAVEMENT FREE OF LOOSE ASPHALT MATERIAL.
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STATE OF TEXAS
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PROPOSED TYPICAL SECTIONS

SHEET 6 OF 6

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		30
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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Specification Data

Basis of Estimate

Item	Description	Rate	Unit
3077	SP MIXES SP-C	115 lb./sq. yd.-in.	ton
3077	Tack Coat - CSS-1P	0.20 gal./sq. yd.	gal.

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site: http://www.txdot.gov/business/letting-bids/plans-online.html

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

Area Engineer's Email: Minh.Tran@txdot.gov
Assistant Area Engineer's Email: Daniel.Poole@txdot.gov
Design Manager's Email: Sam.Yacoub@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

For Q&A's on Proposals navigate to https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors. Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard

Control: 0312-05-031, etc.

County: TARRANT

Highway: FM 730

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.

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

Mail box manipulation made necessary because of construction will be in accordance with Item 560 "Mailbox Assemblies," except that this work will not be paid for directly but will subsidiary to the pertinent bid items.

Provide all-weather surface for temporary ingress and egress to adjacent property, as directed. Materials, labor, equipment and incidentals necessary to provide temporary ingress and egress will not be paid for directly, but will be subsidiary to the various bid items.

Where necessary, the governing slopes indicated herein may be varied from the limits shown, to the extent approved.

On superelevated curves the shoulders will have the same cross-slope as the pavement, unless otherwise indicated.

On superelevated curves where the grade line is in a sag or on a flat grade, overlay the shoulders to the extent necessary to prevent trapping of water on the high side.

All driveway openings will be determined by the Engineer and will conform with Texas Department of Transportation "Regulations for Access Driveways to State Highways" adopted September 1953, and revised June 2004.

Do not discolor or damage existing curb and curb and gutter during construction operations. In the event of discoloration or damage, clean or repair as directed.

Remove the grass from the crown of shoulders or pavement edges by blading or other approved methods. Payment for this work will not be made directly, but will be subsidiary to the various items of the contract.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the Contractor's expense.

The following standard detail sheets have been modified:

T5/T501/T502
TYPE T131RC

Item 2. Instructions to Bidders

Proposals with a bid of more than 149 working days for the substantial completion of the project will be considered non-responsive.

Item 4 – Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

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Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

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

Do not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area that has not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to haul roads, equipment staging areas, borrow and disposal sites. "Associated" as defined here means materials are delivered to or from the PSL. The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may

be required for such work. The contractor will be responsible for all consultations with the USACE regarding activities, including project specific locations (PSLs) that have not been previously evaluated by the USACE. Provide the Department with a copy of all consultations or approvals from the USACE prior to initiating activities.

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

Document and coordinate with the USACE, if required, prior to any excavation hauled from or embankment hauled into a USACE permit area by either (1) or (2) below.

(1) Restricted Use of Materials for Previously Evaluated Permit Areas. Document both the project specific location (PSL) and its authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or temporary fill (Item 132, Embankment) within a USACE permit area;
b. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area; and,
c. Unsuitable excavation or excess excavation ["Waste"] (Item 110) that is disposed of at a location approved by the Engineer within a USACE evaluated area.

(2) Contractor Materials from Areas Other than Previously Evaluated Areas. Provide the Department with a copy of all USACE coordination or approvals prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to haul roads, equipment staging areas, borrow and disposal sites:

a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area; and,
b. Unsuitable excavation or excess excavation ["Waste"] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is 0.17 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ

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for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean and repair all of these features if they weren't properly protected at contractor's expense. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, avoid nests containing migratory birds and perform no work in the nesting areas until the young birds have fledged.

Structures

Do not begin bridge and culvert construction operations until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event lane closure restriction requirements apply to this project:

No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.'

Only nighttime work will be allowed, unless written permission from the Engineer is provided for the following locations: Phase 1 for the installation of the Retro fit Rail and MBGF installation.

Before starting night work on a construction project, prepare and submit a work zone light system design in accordance with NCHRP Report 476, Section 3 for approval by the Engineer. The Engineer will review the work zone light system design and notify the contractor of its acceptability. Do not start work until the work zone light system design is accepted.

The road-user cost liquidated damages is $7,369 per day.

Progress schedule Bar Chart will be required for this project.

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Item 301. Asphalt Antistripping Agent

Furnish a liquid antistripping agent unless otherwise directed.

Item 351. Flexible Pavement Structure Repair

Provide a PG 64-22 asphalt for the base course.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

In Table 1, the Micro-Deval abrasion test is not required.

RAP aggregate must meet the requirements of Table 1.

Use the Boil Test, Test Procedure Tex-530-C, and provide only mixes that produce zero percent (0%) stripping for design verification and during production.

Include the approved mix design number on each delivery ticket.

Item 354. Planing and Texturing Pavement

Milled material will become the property of the Contractor.

Intent is to remove all HMAC from existing concrete in one pass. Repair damaged concrete paving caused by Contractor's operations at the expense of the Contractor as directed by the Engineer.

Take precaution to avoid damage to existing bridge decks and bridge joints including but not limited to armor joints, header joints, relieve joints, etc.. Repair any damage to the bridge decks and/or joints as approved. This work will not be paid directly, but will be performed at the Contractor's expense.

Item 432. Riprap

Provide weep holes as directed.

The quantities for riprap at the location indicated may be varied to the extent necessary to ensure proper functioning for the purpose intended.

All concrete riprap will be 4" (.33') in thickness, unless otherwise shown on the plans, and must be reinforced.

Item 454. Bridge Expansion Joints

For header-type expansion joints refer to the following TxDOT website for the approved systems:

http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html

Item 502. Barricades, Signs, and Traffic Handling

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 typically 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.

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas".

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 504. Field Office and Laboratory

Furnish the following structures for this project:

Type	No.
Field Lab (Ty. A)	1
Field Lab (Ty. D)	1

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Field office will require at least a 3' by 3' landing on the outside of each exit door and a concrete landing at the bottom of exit stairs. The concrete landing will be the width of the stairs and extend at least 4' in front of the bottom step.

Furnish the following for the Field Office structure:

Item	No.
Desktop Computer	1
Laptop Computer	1
Printer	1
Internet Service	1

Provide Laptop computers with an Intel i5 (2.8 GHz) processor, or greater.

Integrated printer/copier/scanner/fax units will be permitted.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 540. Metal Beam Guard Fence

The locations and lengths of guard fence shown on the plans are approximate. Actual lengths and locations are to be determined in the field.

The tops of timber posts will be domed. Beveled tops will not be permitted for timber or steel posts.

When holes for timber posts are drilled below bottom of proposed grade, backfill the excessive depth with an acceptable sand. The furnishing and installation of the sand backfill will not be paid for directly but will be subsidiary to this Item.

When guardrail posts are placed in a finished surface, backfill the top 4 inches with an asphaltic material, domed to carry water away from the posts or as shown on the plans. The furnishing and installation of the asphaltic material backfill will not be paid for directly but will be subsidiary to this Item.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding ½" from the edge of the hole.

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Item 542. Removing Metal Beam Guard Fence

Remove existing metal beam guard fence only when authorized.

Item 585. Ride Quality for Pavement Surfaces

Use Surface Test Type A to evaluate ride quality of travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

Collection of retroreflectivity readings using a mobile retroreflectometer is the preferred method. If retroreflectivity readings are collected using a portable or handheld unit, then measurement is defined as a collective average of at least 20 readings taken along a 200-foot test section. A minimum of three measurements will be required per mile of roadway. Measurements collected on a centerline stripe will be averaged separately for stripe in each direction of travel. A TxDOT inspector must witness the calibration and collection of all retro-reflectivity data.

Item 3077. Superpave Mixtures

RAP aggregate must meet the requirements of Table 1.

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the travel lanes and shoulders.

No blending, of the material retained on the No. 4 sieve, to meet SAC A will be allowed for surface mixes.

Natural (field) sands are not allowed.

Provide a PG 64-22 asphalt for the base course.

Provide a PG 70-28 asphalt for the surface course and levelup course, if applicable.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

RAP and RAS are not permitted in any surface and levelup mixes on this project.

Grade substitution per Table 5 is not allowed.

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Provide a mix design with the gradation curve below the restricted zone.

Use the Boil Test, Test Procedure Tex-530-C, and provide only mixes that produce zero percent (0%) stripping for design verification and during production.

Include the approved mix design number on each delivery ticket.

Use a Material Transfer Device (MTD) unless otherwise directed.

Stop production after Lot 1. Review all test data and confirm any changes with the Engineer. Do not start production and placement on subsequent Lots until approved by the Engineer.

Shoulders, crossovers, and other areas listed on the Plan sheets or as directed are not subject to in-place air void determination for this project.

Temporary detours are subject to in-place air void determination for this project.

Use Surface Test Type B for this project.

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

(2) electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay

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12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles

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

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 1 additional shadow vehicle(s) with TMA for TCP (1-3)-18, (1-4)- 18, and (3-1)-13, as detailed on General Note of this standard sheet.

Therefore, 2 total shadow vehicles with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0312-05-031 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY FM 730

				CONTROL SECTION JOB	0312-05-031		0312-05-032		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00129783		A00129785			
				COUNTY	Tarrant		Tarrant			
				HIGHWAY	FM 730		FM 730			
ALT	BID CODE	DESCRIPTION	UNIT		EST.	FINAL	EST.	FINAL		
	134-6001	BACKFILL (TY A)	STA				42.000		42.000	
	351-6028	FLEX PAVE STRUCTURE REPAIR (8"-10")	SY		2,476.000		2,497.000		4,973.000	
	354-6002	PLAN & TEXT ASPH CONC PAV(0" TO 2")	SY		108,331.000		108,827.000		217,158.000	
	354-6013	PLAN & TEXT CONC PAV(0" TO 1/2")	SY				447.000		447.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY		59.000		34.000		93.000	
	438-6002	CLEANING AND SEALING EXIST JOINTS(CL3)	LF				89.000		89.000	
	438-6010	RESIZING AND SEALING JOINTS	LF		76.000				76.000	
	451-6004	RETROFIT RAIL (TY T131RC)	LF				224.000		224.000	
	454-6008	HEADER TYPE EXPANSION JOINT	CF		22.000				22.000	
	480-6001	CLEAN EXIST CULVERTS	EA		4.000		8.000		12.000	
	500-6001	MOBILIZATION	LS		0.500		0.500		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO		3.000		4.000		7.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF		1,140.000				1,140.000	
	506-6045	BIODEG EROSN CONT LOGS (INSTL) (6")	LF		1,140.000				1,140.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF				36,392.000		36,392.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF				18,198.000		18,198.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF		375.000		600.000		975.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA		4.000		4.000		8.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA		3.000				3.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF		100.000				100.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF		400.000		300.000		700.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA		2.000		4.000		6.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA		5.000		4.000		9.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA		2.000				2.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF		210.000		99.000		309.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA				1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA				1.000		1.000	
	644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA		14.000		7.000		21.000	
	658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA		32.000				32.000	
	658-6026	INSTL DEL ASSM (D-SY)SZ (BRF)CTB	EA		32.000				32.000	
	658-6048	INSTL OM ASSM (OM-2Z)(FLX)GND	EA				14.000		14.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA		14.000				14.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA				10.000		10.000	
	662-6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF		5,640.000		80.000		5,720.000	
	662-6006	WK ZN PAV MRK NON-REMOV (W)6"(DOT)	LF		133.000				133.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF		3,726.000		871.000		4,597.000	
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF		2,078.000				2,078.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0312-05-031 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY FM 730

			CONTROL SECTION JOB		**0312-05-031**		**0312-05-032**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00129783**		**A00129785**			
			COUNTY		**Tarrant**		**Tarrant**			
			HIGHWAY		**FM 730**		**FM 730**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	662-6015	WK ZN PAV MRK NON-REMOV (W)18"(SLD)		LF	173.000				173.000	
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)		LF	723.000		152.000		875.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)		EA	46.000		8.000		54.000	
	662-6029	WK ZN PAV MRK NON-REMOV(W)(WORD)		EA	28.000		8.000		36.000	
	662-6035	WK ZN PAV MRK NON-REMOV (Y)6"(BRK)		LF	3,312.000				3,312.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)		LF	28,972.000		45,036.000		74,008.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W		EA	2,018.000		75.000		2,093.000	
	662-6110	WK ZN PAV MRK SHT TERM (TAB)TY Y		EA	2,442.000		2,252.000		4,694.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)		LF	133.000				133.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)		LF	3,726.000		871.000		4,597.000	
	666-6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)		LF	173.000				173.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)		LF	2,105.000		152.000		2,257.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)		EA	46.000		8.000		54.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)		EA	28.000		8.000		36.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)		LF	688.000		155.000		843.000	
	666-6225	PAVEMENT SEALER 6"		LF	5,916.000				5,916.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)		LF	5,640.000		80.000		5,720.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)		LF	25,070.000		41,372.000		66,442.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)		LF	3,312.000				3,312.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)		LF	28,972.000		45,036.000		74,008.000	
	672-6007	REFL PAV MRKR TY I-C		EA	477.000		45.000		522.000	
	672-6009	REFL PAV MRKR TY II-A-A		EA	929.000		2,123.000		3,052.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")		LF	5,916.000				5,916.000	
	678-6002	PAV SURF PREP FOR MRK (6")		LF	5,916.000				5,916.000	
	3077-6027	SP MIXESSP-CSAC-A PG70-28		TON	12,459.000		12,515.000		24,974.000	
	3077-6075	TACK COAT		GAL	21,666.000		21,765.000		43,431.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	1.000		1.000		2.000	
	6185-6002	TMA (STATIONARY)		DAY	80.000		100.000		180.000	
	6185-6005	TMA (MOBILE OPERATION)		DAY	13.000		17.000		30.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)		LS	1.000				1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)		LS	1.000				1.000	

SUMMARY OF ROADWAY QUANTITIES

PLAN SHEET	STREET NAME	FROM	TO	134 6001 BACKFILL (TY A) STA	351 6028 FLEX PAVE STRUCTURE REPAIR (8"-10") SY	354 6002 PLAN & TEXT ASPH CONC PAV(0" TO 2") SY	354 6013 PLAN & TEXT CONC PAV(0" TO 1/2") SY	432 6045 RIPRAP (MOW STRIP) (4 IN) CY	480 6001 CLEAN EXIST CULVERTS EA	506 6043 BIODEG EROSN CONT LOGS (REMOVE) LF	506 6045 BIODEG EROSN CONT LOGS (INSTL) (6") LF	540 6001 MTL W-BEAM GD FEN (TIM POST) LF	540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM) EA	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION EA	540 6020 MTL W - BEAM GD FEN (LOW FILL CULVERT) LF	542 6001 REMOVE METAL BEAM GUARD FENCE LF	542 6002 REMOVE TERMINAL ANCHOR SECTION EA	544 6001 GUARDRAIL END TREATMENT (INSTALL) EA	544 6003 GUARDRAIL END TREATMENT (REMOVE) EA	3077 6027 SUPERPAVE MIXTURES SP-C SAC-A PG70-28 TON	3077 6075 TACK COAT (0.2 GAL/SY) GAL
CSJ: 0312-05-032																					
1 OF 16	FM 730	BEGIN	33+00.00			9,500														1,093	1,900
2 OF 16	FM 730	33+00.00	55+00.00			10,756	447	34				600	4			300	4	4		1,237	2,151
3 OF 16	FM 730	55+00.00	77+00.00			11,681			1											1,343	2,336
4 OF 16	FM 730	77+00.00	99+00.00			10,756														1,237	2,151
5 OF 16	FM 730	99+00.00	121+00.00			10,896			1											1,253	2,179
6 OF 16	FM 730	121+00.00	143+00.00			10,756			1											1,237	2,151
7 OF 16	FM 730	143+00.00	165+00.00			12,540			1											1,442	2,508
8 OF 16	FM 730	165+00.00	187+00.00			11,458			1											1,318	2,292
9 OF 16	FM 730	187+00.00	209+00.00			10,839			1											1,246	2,168
10 OF 16	FM 730	209+00.00	224+91.45			9,645			2											1,109	1,929
CSJ:0312-05-032 TOTAL				**42 #**	**2,497 #**	**108,827**	**447**	**34**	**8**	**0**	**0**	**600**	**4**	**0**	**0**	**300**	**4**	**4**	**0**	**12,515**	**21,765**
CSJ: 0312-05-031																					
10 OF 16	FM 730	224+91.45	231+00.00			5,712				60	60									657	1,142
11 OF 16	FM 730	231+00.00	253+00.00			20,302		32	4	140	140			2	100			2		2,335	4,060
12 OF 16	FM 730	253+00.00	268+93.00			14,814		12		120	120	150	2			200	1	2	1	1,704	2,963
FM 730 EXCEPTION 1 NB		269+06.00	282+18.00																		
FM 730 EXCEPTION 1 SB		268+93.00	282+10.00																		
13 OF 16	FM 730	282+10.00	297+00.00			13,773		15		140	140	225	2	1		200	1	1	1	1,584	2,755
14 OF 16	FM 730	297+00.00	317+00.00			18,223				220	220									2,096	3,645
15 OF 16	FM 730	317+00.00	339+00.00			20,045				300	300									2,305	4,009
16 OF 16	FM 730	339+00.00	END			15,462				160	160									1,778	3,092
CSJ:0312-05-031 TOTAL				**0**	**2,476 #**	**108,331**	**0**	**59**	**4**	**1,140**	**1,140**	**375**	**4**	**3**	**100**	**400**	**2**	**5**	**2**	**12,459**	**21,666**
PROJECT TOTAL				**42 #**	**4,973 #**	**217,158**	**447**	**93**	**12**	**1,140**	**1,140**	**975**	**8**	**3**	**100**	**700**	**6**	**9**	**2**	**24,974**	**43,431**

APPROXIMATE QUANTITY. EXACT LOCATION AND QUANTITY TO BE DETERMINED IN THE FIELD

SUMMARY OF TCP ITEMS

FM 730	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO	662 6005 WK ZN PAV MRK NON-REMOV (W)6"(BRK) LF	662 6006 WK ZN PAV MRK NON-REMOV (W)6"(DOT) LF	662 6012 WK ZN PAV MRK NON-REMOV (W)8"(SLD) LF	662 6014 WK ZN PAV MRK NON-REMOV (W)12"(SLD) LF	662 6015 WK ZN PAV MRK NON-REMOV (W)18"(SLD) LF	662 6016 WK ZN PAV MRK NON-REMOV (W)24"(SLD) LF	662 6017 WK ZN PAV MRK NON-REMOV (W)(ARROW) EA	662 6029 WK ZN PAV MRK NON-REMOV (W)(WORD) EA	662 6035 WK ZN PAV MRK NON-REMOV (Y)6"(BRK) LF	662 6037 WK ZN PAV MRK NON-REMOV (Y)6"(SLD) LF	662 6109 WK ZN PAV MRK SHT TERM (TAB)TY W EA	662 6110 WK ZN PAV MRK SHT TERM (TAB)TY Y EA	6001 6002 PORTABLE CHANGEABLE MESSAGE SIGN EA	6185 6002 TMA (STATIONARY) DAY	6185 6005 TMA (MOBILE OPERATION) DAY
CSJ: 0312-05-032 TOTAL	**4**	**80**	**0**	**871**	**0**	**0**	**152**	**8**	**8**	**0**	**45,036**	**75**	**2,252**	**1**	**100**	**17**
CSJ: 0312-05-031 TOTAL	**3**	**5,640**	**133**	**3,726**	**2,078**	**173**	**723**	**46**	**28**	**3,312**	**28,972**	**2,018**	**2,442**	**1**	**80**	**13**
NOTES																
PROJECT TOTAL	**7**	**5,720**	**133**	**4,597**	**2,078**	**173**	**875**	**54**	**36**	**3,312**	**74,008**	**2,093**	**4,694**	**2**	**180**	**30**

* TMA MOBILE = 3 TMA x 10 DAYS

*TMA STATIONARY=2TMA x 90 DAYS

SUMMARY OF BRIDGE ITEMS

CSJ	BRIDGE NBI EXISTING	BRIDGE NBI PROPOSED	DESIGN EXISTING	DESIGN PROPOSED	BRIDGE LOCATION	STATION BEGIN	STATION END	LENGTH FT	CLEAR RDWY WIDTH FT	LOADING	438 6002 CLEANING AND SEALING EXIST JOINTS(CL3) LF	438 6010 RESIZING AND SEALING JOINTS LF	451 6004 RETROFIT RAIL (TY T131RC) LF	454 6008 HEADER TYPE EXPANSION JOINT CF
0312-05-032	02-220-0-0312-05-039	N/A	CONCRETE (3 SPANS)	N/A	BRIAR BRANCH	40+47.50	41+41.00	93.5	43	NOT AVAILABLE	89	0	224.0	0
										CSJ 0312-05-032 TOTAL	89	0	224.0	0
0312-05-031	02-220-0-0312-05-015	N/A	BRIDGE CLASS CULVERT	N/A	TRIBUTARY WALNUT CREEK	245+42.66	245+78.66	36	86	NOT AVAILABLE	NO WORK TO BE DONE			
0312-05-031	02-220-0-0312-05-050	N/A	CONCRETE (19 SPANS)	N/A	WALNUT CREEK SB	268+93.00	282+08.00	1,315	37	NOT AVAILABLE	0	38	0	11
0312-05-031	02-220-0-0312-05-051	N/A	CONCRETE (18 SPANS)	N/A	WALNUT CREEK NB	269+06.00	282+18.00	1,312	37	NOT AVAILABLE	0	38	0	11
										CSJ 0312-05-031 TOTAL	0	76	0	22
										PROJECT TOTAL	89	76	224.0	22

NOTES:

1. REMOVAL OF TRANSITIONS ARE QUANTIFIED AS MBGF REMOVAL.
2. REMOVAL OF TY 6 METAL BEAM RAIL AT BRIAR CREEK IS PAID UNDER REMOVING MBGF.

NO.	DATE	REVISION	APPROV.

consor F-12040

Texas Department of Transportation

FM 730

QUANTITY SUMMARY

SHEET 1 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		33
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\01. General\C_FM730_S_GSQ01.dgn

SUMMARY OF SIGNING & PAVEMENT MARKING ITEMS

PLAN SHEET	STREET NAME	FROM	TO	533 6001 RUMBLE STRIPS (SHOULDER) LF	533 6002 RUMBLE STRIPS (CENTERLINE) LF	636 6007 REPLACE EXISTING ALUMINUM SIGNS(TY A) SF	644 6030 IN SM RD SN SUP&AM TYS80(1) SA(T) EA	644 6076 REMOVE SM RD SN SUP&AM EA	644 6078 REMOVE SM RD SN SUP&AM (SIGN ONLY) EA	658 6013 INSTL DEL ASSM (D-SW)SZ (BRF)CTB EA	658 6026 INSTL DEL ASSM (D-SY)SZ (BRF)CTB EA	658 6048 INSTL OM ASSM (OM-2Z) (FLX)GND EA	658 6061 INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2 EA	658 6062 INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2(BI) EA	666 6018 REFL PAV MRK TY I (W)6"(DOT)(100MIL) LF	666 6036 REFL PAV MRK TY I (W) 8"(SLD) (100MIL) LF	666 6045 REFL PAV MRK TY I (W) 18"(SLD) (100MIL) LF	666 6048 REFL PAV MRK TY I (W) 24"(SLD) (100MIL) LF
CSJ: 0312-05-032																		
1 OF 16	FM 730	BEGIN	33+00.00	3,887	1,944													
2 OF 16	FM 730	33+00.00	55+00.00	2,286	1,143									10				
3 OF 16	FM 730	55+00.00	77+00.00	3,624	1,812	23			1			2				397		18
4 OF 16	FM 730	77+00.00	99+00.00	4,400	2,200	16			1									
5 OF 16	FM 730	99+00.00	121+00.00	3,919	1,960	10			1			2						12
6 OF 16	FM 730	121+00.00	143+00.00	4,000	2,000							2						12
7 OF 16	FM 730	143+00.00	165+00.00	3,815	1,908	32	1	1	2			2				374		61
8 OF 16	FM 730	165+00.00	187+00.00	3,961	1,981	9			1			2						
9 OF 16	FM 730	187+00.00	209+00.00	4,400	2,200							2						
10 OF 16	FM 730	209+00.00	224+91.45	2,100	1,050	9			1			2				100		49
CSJ: 0312-05-032 TOTAL				**36,392**	**18,198**	**99**	**1**	**1**	**7**	**0**	**0**	**14**	**0**	**10**	**0**	**871**	**0**	**152**
CSJ: 0312-05-031																		
10 OF 16	FM 730	224+91.45	231+00.00													130		173
11 OF 16	FM 730	231+00.00	253+00.00			137			7				6			496		208
12 OF 16	FM 730	253+00.00	275+00.00			9			1	14	14		4					
13 OF 16	FM 730	275+00.00	297+00.00			21			2	18	18		4					16
14 OF 16	FM 730	297+00.00	317+00.00													1,147	86	739
15 OF 16	FM 730	317+00.00	339+00.00			43			4							745	87	502
16 OF 16	FM 730	339+00.00	363+00.00												133	1,208		315
CSJ: 0013-10-084 TOTAL				**0**	**0**	**210**	**0**	**0**	**14**	**32**	**32**	**0**	**14**	**0**	**133**	**3,726**	**173**	**1,953**
PROJECT TOTAL				**36,392**	**18,198**	**309**	**1**	**1**	**21**	**32**	**32**	**14**	**14**	**10**	**133**	**4,597**	**173**	**2,105**

SUMMARY OF SIGNING & PAVEMENT MARKING ITEMS

PLAN SHEET	STREET NAME	FROM	TO	666 6054 REFL PAV MRK TY I (W) (ARROW) (100MIL) EA	666 6078 REFL PAV MRK TY I (W) (WORD) (100MIL) EA	666 6147 REFL PAV MRK TY I (Y) 24"(SLD) (100MIL) LF	666 6225 PAVEMENT SEALER 6" LF	666 6306 RE PM W/RET REQ TY I (W)6"(BRK) (100MIL) LF	666 6309 RE PM W/RET REQ TY I (W)6"(SLD) (100MIL) LF	666 6318 RE PM W/RET REQ TY I (Y)6"(BRK) (100MIL) LF	666 6321 RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL) LF	672 6007 REFL PAV MRKR TY I-C EA	672 6009 REFL PAV MRKR TY II-A-A EA	677 6001 ELIM EXT PAV MRK & MRKS (4") LF	678 6002 PAV SURF PREP FOR MRK (6") LF
CSJ: 0312-05-032															
1 OF 16	FM 730	BEGIN	33+00.00						3,944		3,934		198		
2 OF 16	FM 730	33+00.00	55+00.00						4,400		4,400		220		
3 OF 16	FM 730	55+00.00	77+00.00	3	3				4,179		4,868	19	244		
4 OF 16	FM 730	77+00.00	99+00.00						4,400		4,400		220		
5 OF 16	FM 730	99+00.00	121+00.00						4,400		4,334		216		
6 OF 16	FM 730	121+00.00	143+00.00						4,332		4,412		220		
7 OF 16	FM 730	143+00.00	165+00.00	4	4				4,300		5,176	17	129		
8 OF 16	FM 730	165+00.00	187+00.00						4,400		5,324		266		
9 OF 16	FM 730	187+00.00	209+00.00						4,400		4,400		220		
10 OF 16	FM 730	209+00.00	224+91.45	1	1	155		80	2,617		3,788	9	190		
CSJ: 0312-05-032 TOTAL				**8**	**8**	**155**	**0**	**80**	**41,372**	**0**	**45,036**	**45**	**2,123**	**0**	**0**
CSJ: 0312-05-031															
10 OF 16	FM 730	224+91.45	231+00.00	1	1			270	1,121	160	1,216	19	38		
11 OF 16	FM 730	231+00.00	253+00.00	9	5			990	4,180	800	4,578	74	151		
12 OF 16	FM 730	253+00.00	275+00.00	2		252	2,676	1,100	4,400	562	5,192	54	98	2,676	2,676
13 OF 16	FM 730	275+00.00	297+00.00	4		81	3,240	550	4,250	680	4,564	55	86	3,240	3,240
14 OF 16	FM 730	297+00.00	317+00.00	12	10	101		880	3,842	340	4,220	100	176		
15 OF 16	FM 730	317+00.00	339+00.00	8	6	194		1,000	3,925	250	5,436	77	240		
16 OF 16	FM 730	339+00.00	363+00.00	10	6	60		850	3,352	520	3,766	98	140		
CSJ: 0013-10-084 TOTAL				**46**	**28**	**688**	**5,916**	**5,640**	**25,070**	**3,312**	**28,972**	**477**	**929**	**5,916**	**5,916**
PROJECT TOTAL				**54**	**36**	**843**	**5,916**	**5,720**	**66,442**	**3,312**	**74,008**	**522**	**3,052**	**5,916**	**5,916**

NOTES:

1. APPLY A PAVEMENT SEALER AND SURFACE PREP TO THE WALNUT CREEK BRIDGE CONCRETE SURFACE BEFORE PLACING THE PAVEMENT MARKINGS.
2. FOR MILLED CENTERLINE RUMBLE STRIPS ON TWO -WAY HIGHWAY SECTIONS, REFER TO OPTION 1 IN STANDARD RS(3)-13.
3. FOR MILLED EDGELINE RUMBLE STRIPS ON TWO -WAY HIGHWAY SECTIONS, REFER TO OPTION 2 OR OPTION 4 IN STANDARD RS(4)-13.

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

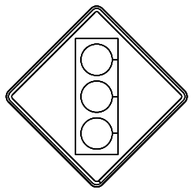
FM 730

QUANTITY SUMMARY

SHEET 2 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		34
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 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
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
3												
OF	1	D1-2	← Portwood Rd Knob Hill Rd →	108"x 30"	*							
16												
4												
OF	2	W3-4	BE PREPARED TO STOP	48"X48"	*							
16												
5												
OF	3	D1-1R	Reed Rd →	78"x 18"	*							
16												
7												
OF	4	D3-1	Peden Road	78"x 18"	*							
16												
7												
OF	5	D1-1R	Lyle Lodge →	96"x 18"	*							
16												
7												
OF	6	D3-1	Peden Road	78"x 18"	*		S80	1	SA	T		
16												
8												
OF	7	W3-3		36"x 36"	*							
16												

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 SHEET 1 OF 3

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0312	05	031,ETC.	FM 730
4-16		DIST	COUNTY		SHEET NO.
8-16		FTW	TARRANT		35

18

DATE: 5/23/2023 8:08:24 AM
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\01. General\C_FM730_FS190_SUMS16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		TY = TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		
10												
OF	8	W8-5aT	SLOW DOWN ON WET ROAD	36"x 36"	*							
16												
11												
OF	9	D3-1	Center Point	84"x 18"	*							
16												
11												
OF	10	D3-1	Center Point	84"x 18"	*							
16												
11												
OF	11	D1-1L	← Sandy Beach Rd	120"x 18"	*							
16												
11												
OF	12	D1-3	← Boys Club Camp ← T.G.C. Camp ← Timberlake	126"x 42"	*							
16												
11												
OF	13	D1-1L	← Pelican Bay	96"x 18"	*							
16												
11												
OF	14	D1-1R	Sandy Beach Rd →	120"x 18"	*							
16												
11												
OF	15	D1-3	Boys Club Camp → T.G.C. Camp → Timberlake →	126"x 42"	*							
16												

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

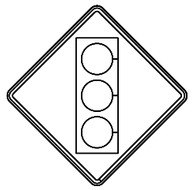
SOSS SHEET 2 OF 3

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
4-16	DIST	COUNTY		SHEET NO.
8-16	FTW	TARRANT		36

T8

DATE: 5/23/2023 8:08:25 AM
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02. Plan Set\01. General\C_FM730SS01.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		TY = TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		
12												
OF	16	W3-3		36"x 36"	*							
16												
13												
OF	17	D1-1R	Rhonda B →	84"x 18"	*							
16												
13												
OF	18	D1-1L	← Rhonda B	84"x 18"	*							
16												
15												
OF	19	D1-1L	← Lake Crest Pkwy	96"x 12"	*							
16												
15												
OF	20	D1-1R	Lake Crest Pkwy →	96"x 12"	*							
16												
15												
OF	21	D1-1R	Commerce St →	108"x 18"	*							
16												
15												
OF	22	D1-1L	← Commerce St	108"x 18"	*							
16												

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 SHEET 3 OF 3

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
4-16	DIST	COUNTY		SHEET NO.
8-16	FTW	TARRANT		37

TB

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DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC", OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

1. GENERAL

1. THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATIONS BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER WITH THE STATE OF TEXAS FOR INCLUSION IN THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.
2. CONTRACTOR SHALL USE FIVE DAY WORK WEEK WITH RESTRICTED WORK HOURS TO BE OFF PEAK ONLY. REFER TO GENERAL NOTES FOR RESTRICTIONS.
3. TRAFFIC SHALL NOT BE PERMITTED ON FAILED SUBGRADE.
4. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC. DO NOT STORE EQUIPMENT OUTSIDE DESIGNATED RIGHT-OF-WAY WITHOUT PERMISSION GRANTED FIRST BY THE PROPERTY OWNER.
5. CONTRACTOR IS TO MAINTAIN POSITIVE DRAINAGE AT ALL TIMES.
6. ALL SEQUENCE OF WORK ON THIS PROJECT SHALL BE COORDINATED TO COINCIDE WITH ANY PROJECTS WITHIN OR ADJACENT TO THIS PROJECT.
7. COORDINATE WITH TXDOT FOR SIGNAL TIMING REVISIONS, AS NECESSARY.

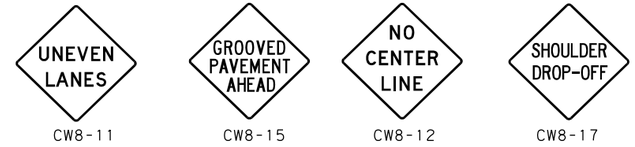
2. LANE CLOSURES

1. IN ADDITION TO THE PREVIOUSLY MENTIONED REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

   a. ALL TRAFFIC SIGNAL WORK, DETOURS, HORIZONTAL TRAFFIC MOVEMENTS, LANE CLOSURES, ETC. ARE DIRECTLY RELATED TO THE SEQUENCE OF WORK.
   b. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF IMPEDING / UPCOMING LANE CLOSURES AT LEAST FIVE WORKING DAYS IN ADVANCE OF CLOSURES.

3. TRAFFIC CONTROL NOTES

1. FOLLOW STANDARD TCP SHEETS FOR LANE CLOSURES.
2. PLACE WORK ZONE PAVEMENT MARKINGS IN ACCORDANCE WITH WZ(STPM)-23.
3. SIGN AND TREATMENT FOR VARIOUS EDGE CONDITIONS IN ACCORDANCE WITH WZ(UL)-13.
4. PLACE REMOVABLE WORK ZONE PAVEMENT MARKINGS IN ACCORDANCE WITH BC(11)-21 & BC(12)-21 ON FINAL SURFACES.



CW8-11 CW8-15 CW8-12 CW8-17

PLACE IN ACCORDANCE WITH SHEET "TREATMENT FOR VARIOUS EDGE CONDITIONS", WZ (UL)-13, BC 'S, AND/OR AS DIRECTED.
UNLESS OTHERWISE SHOWN ALL CW SIGNS SHALL BE 48" X 48"

4. SEQUENCE OF WORK

TCP PHASE I
1. PLACE PROJECT ADVANCED WARNING SIGNS.
2. PERFORM BASE FAILURE REPAIRS FROM BEGINNING TO END OF PROJECT.
3. REPLACE RAIL RETROFIT, METAL BEAM GUARD FENCE, SGT, DAT AND CONSTRUCT MOW STRIP.

TCP PHASE II-STAGE I (SB & NB FM 730)
FROM: BRIAR RD. STA. 13+33.57 (BEGIN PROJECT)
TO: KNOB HILL/PORTWOOD RD. APPROX. STA.66+00
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE II-STAGE III (SB & NB FM 730)
FROM: REED RD. APPROX. STA 107+70
TO: PEDEN RD. APPROX STA 162+30
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE III-STAGE I (NB FM 730)
FROM: E RENO RD. APPROX STA 224+91.45 (BEGIN CSJ: 0312-05-031)
TO: WALNUT CREEK BRIDGE STA 269+06.00
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE IV-STAGE I (NB FM 730)
FROM: WALNUT CREEK BRIDGE STA 282+18.00
TO: LAKE CREST PKWY APPROX. STA 323+18
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE IV-STAGE III (NB FM 730)
FROM: LAKE CREST PKWY APPROX. STA 323+18
TO: STA. 356+51.79(END PROJECT)
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE II-STAGE II (SB & NB FM 730)
FROM: KNOB HILL/PORTWOOD RD. APPROX. STA.66+00
TO: REED RD. APPROX. STA 107+70
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE II STAGE IV (SB & NB FM 730)
FROM: PEDEN RD. APPROX STA 162+30
TO: E RENO RD. APPROX STA 224+91.45 (END CSJ: 0312-05-032)
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE III-STAGE II (SB FM 730)
FROM: E RENO RD. APPROX STA 224+91.45 (BEGIN CSJ: 0312-05-031)
TO: WALNUT CREEK BRIDGE STA 268+93.00
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE IV-STAGE II (SB FM 730)
FROM: WALNUT CREEK BRIDGE STA 282+10.00
TO: LAKE CREST PKWY APPROX. STA 323+18
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

TCP PHASE IV-STAGE IV (SB FM 730)
FROM: LAKE CREST PKWY APPROX. STA 323+18
TO: STA. 356+51.79(END PROJECT)
1. FOLLOW APPLICABLE TCP STANDARD SHEETS FOR LANE CLOSURES.
2. REFERENCE EXISTING PAVEMENT MARKINGS.
3. PLACE NECESSARY EROSION CONTROL DEVICES, IF NEEDED.
4. MILL, OVERLAY & PLACE PAVEMENT MARKINGS.

5. CONSTRUCTION NOTES

*THE CONTRACTOR WILL NOT BE ALLOWED TO ADVANCE TO THE NEXT PHASE OR STAGE OF WORK UNTIL COMPLETING WORK FOR THE CURRENT PHASE & STAGE.
*THE CONTRACTOR SHALL MEASURE AND RECORD ALL PAVEMENT MARKINGS PRIOR TO CONSTRUCTION.
*THE CONTRACTOR SHALL MEASURE AND RECORD EXISTING CROSS SLOPES.
*THE CONTRACTOR SHALL MAINTAIN EXISTING GRADES AND SLOPES EXCEPT AS SHOWN OR AS DIRECTED AND PERFORM WORK IN A WAY TO ELIMINATE THE TRAPPING OF WATER AND ALLOW PROPER DRAINAGE.
*THE CONTRACTOR SHALL CREATE TAPERED FEATHERED BUTT JOINTS TO PROVIDE A SMOOTH TRANSITION GRADE CHANGE AT THE END OF WORK SHIFTS AND PRIOR TO OPENING UP THE ROADWAY TO TRAFFIC.
*TEMPORARY STRIPING OPERATIONS TO BE COMPLETED DAILY.
*PLACE PAVEMENT MARKINGS AND MARKERS IN THE SAME MANNER SO AS TO MATCH PRE-CONSTRUCTION CONDITIONS. EXISTING STRIPING PATTERNS ARE PROVIDED ON "SIGNING AND PAVING MARKING LAYOUTS 1-15" FOR REFERENCE.
*REMOVE TRAFFIC CONTROL DEVICES, CONSTRUCTION DEBRIS AND EROSION CONTROL DEVICES WHEN DIRECTED BY THE ENGINEER.

5/23/2023

NO.	DATE	REVISION	APPROV.

consor F-12040

Texas Department of Transportation

FM 730

TRAFFIC CONTROL SEQUENCE OF WORK

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		38
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		39

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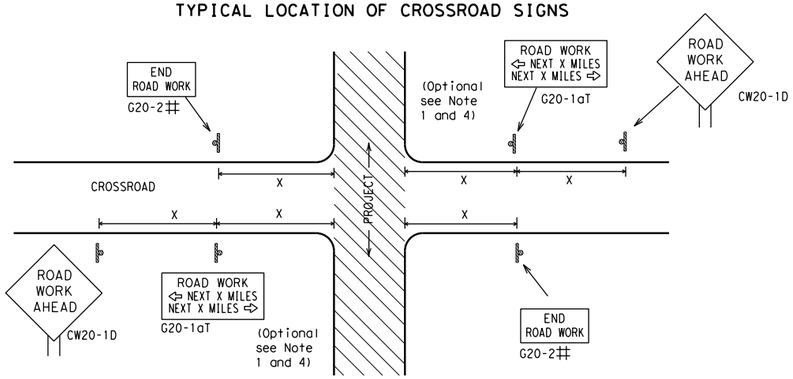
DATE: 5/23/2023 8:08:33 AM
FILE: \\consor.local\legacy\AIA - H-drive\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\02. TCP\Standards\bc-21(2).dgn

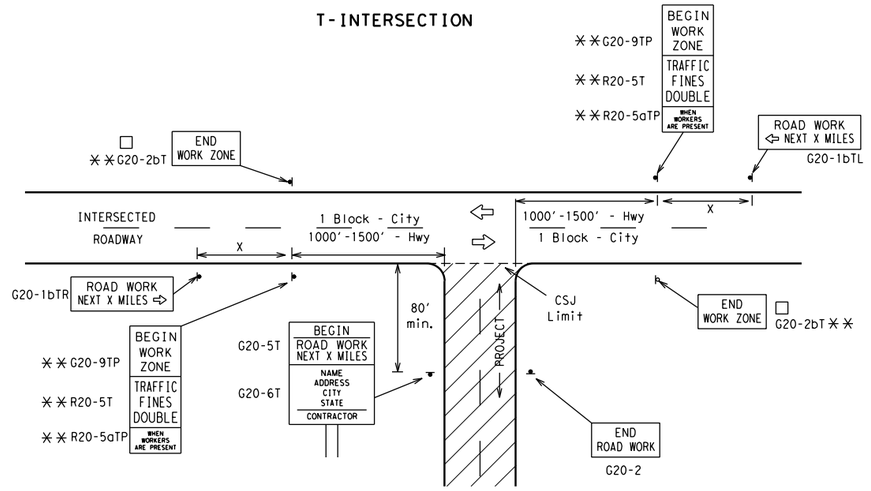
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

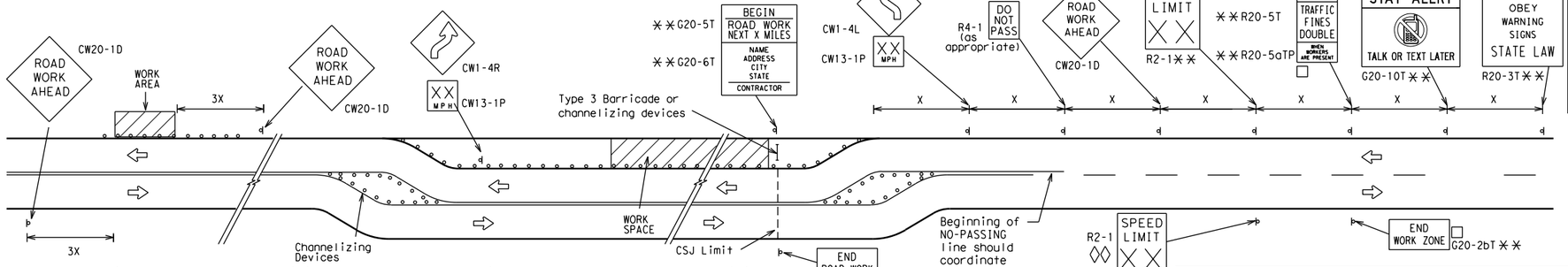
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

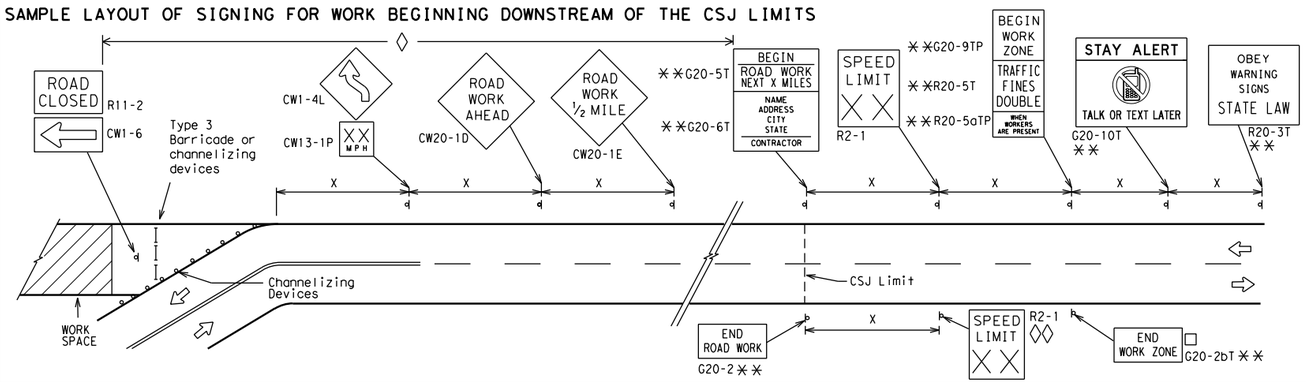
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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	0312	05	031,ETC.	FM 730
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		40

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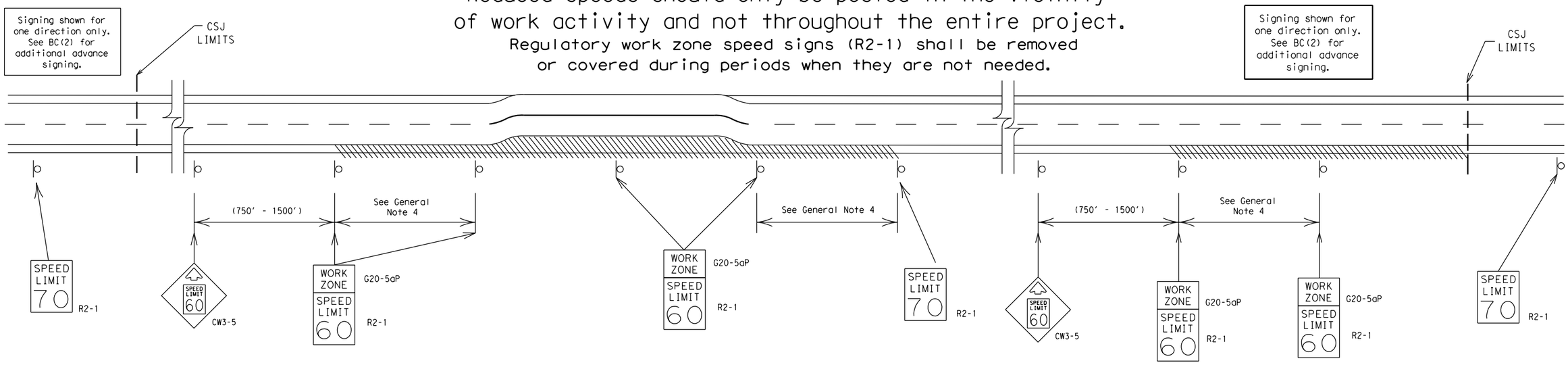
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

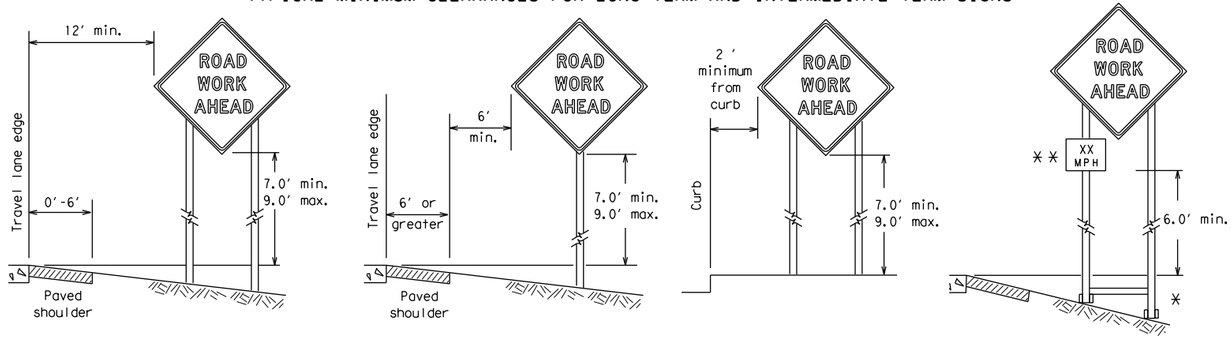
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		41

DW: /
DATE: 5/23/2023 8:08:35 AM
FILE: \\consor.local\legacy\AIA - H-drive\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\02. TCP\Standards\bc-21(4).dgn

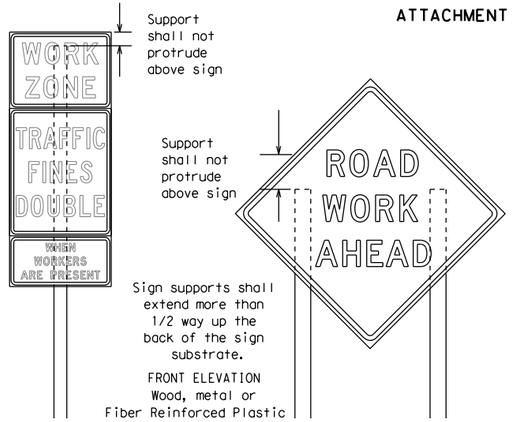
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

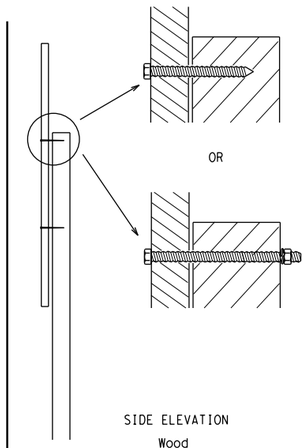


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





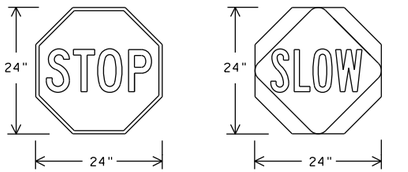
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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
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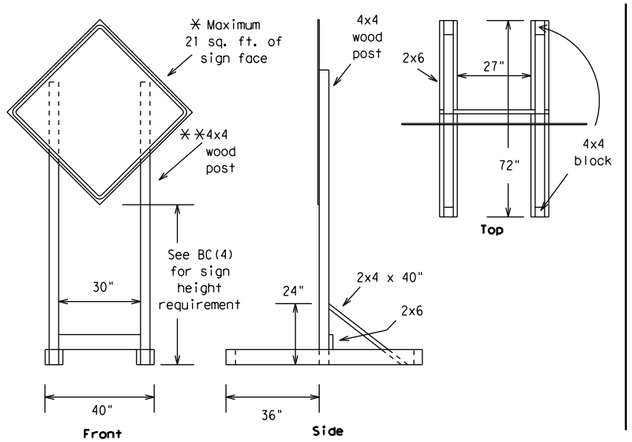
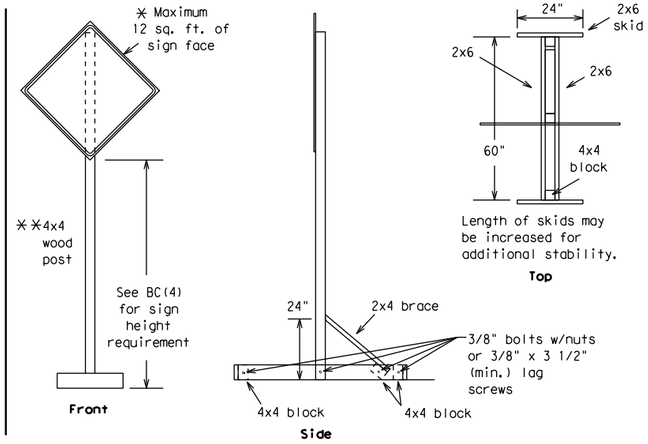
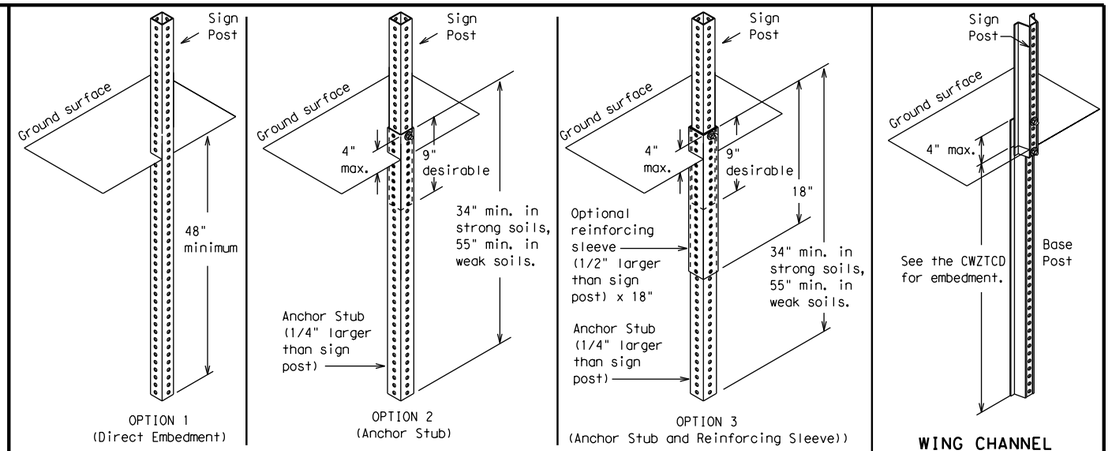
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		42





SKID MOUNTED WOOD SIGN SUPPORTS

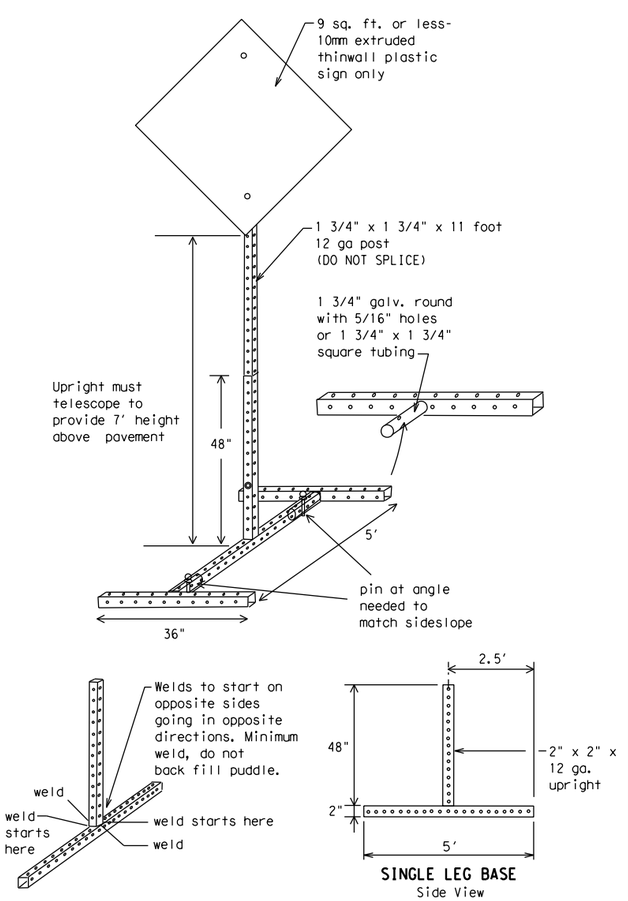
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

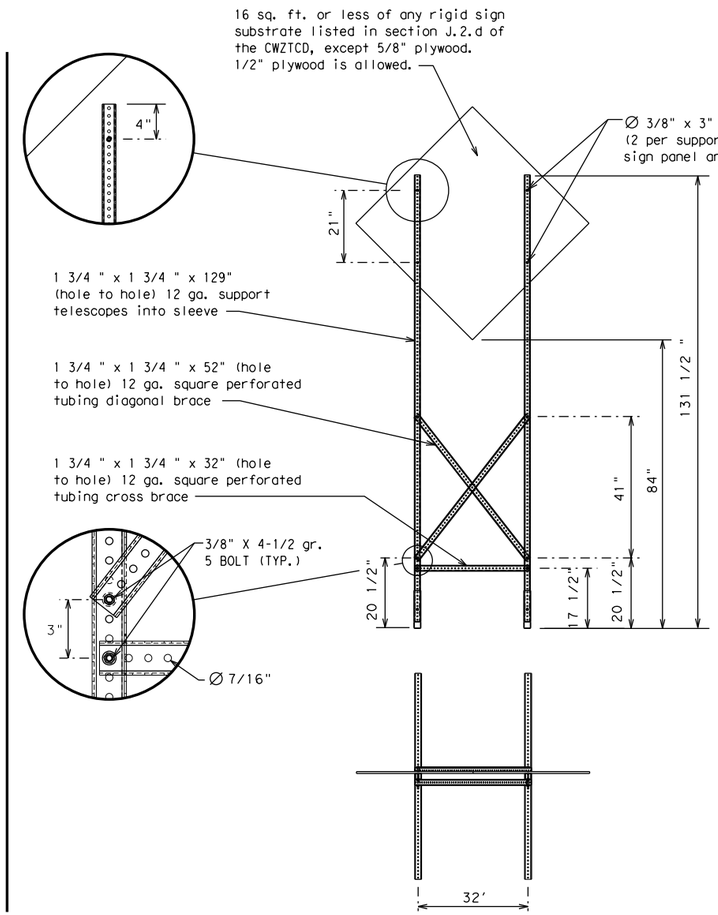


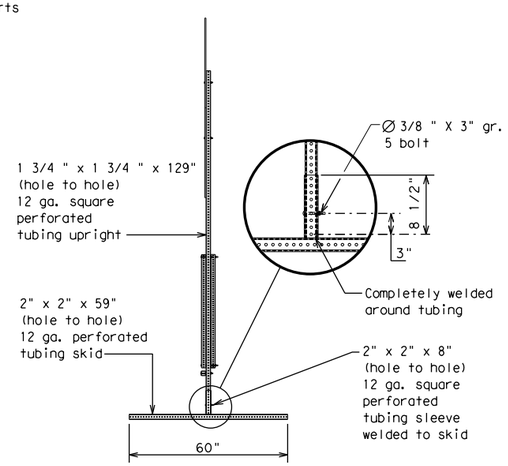
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		43

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

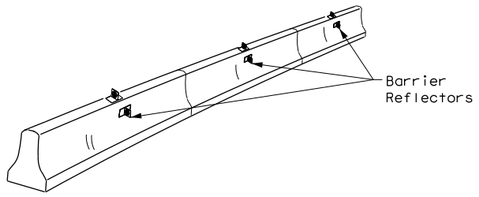
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		44

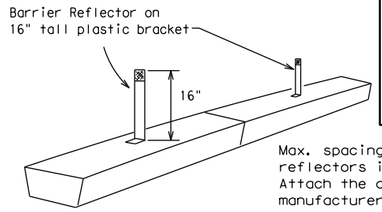
DW: /
DATE: 5/23/2023 8:08:38 AM
FILE: \\consor.local\legacy\AIA - H-drive\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\02. TCP\Standards\bc-21(7).dgn

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



CONCRETE TRAFFIC BARRIER (CTB)

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

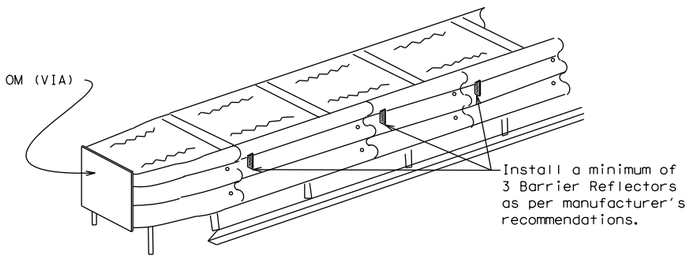


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

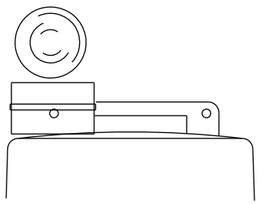


DELINEATION OF END TREATMENTS

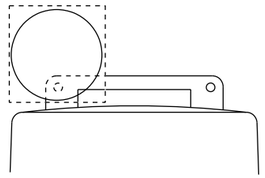
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

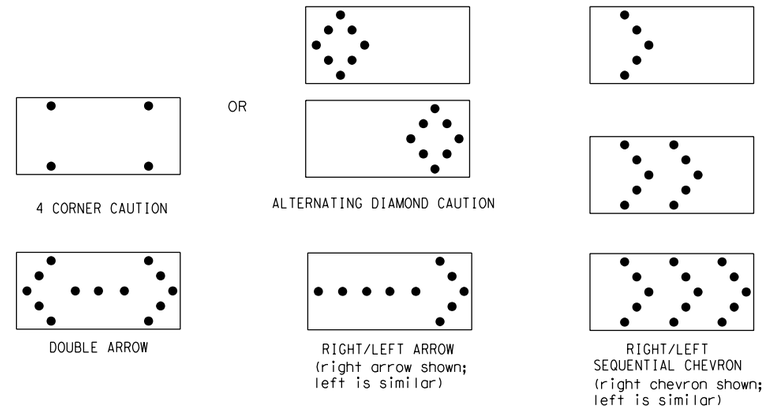
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

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

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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		45

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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:

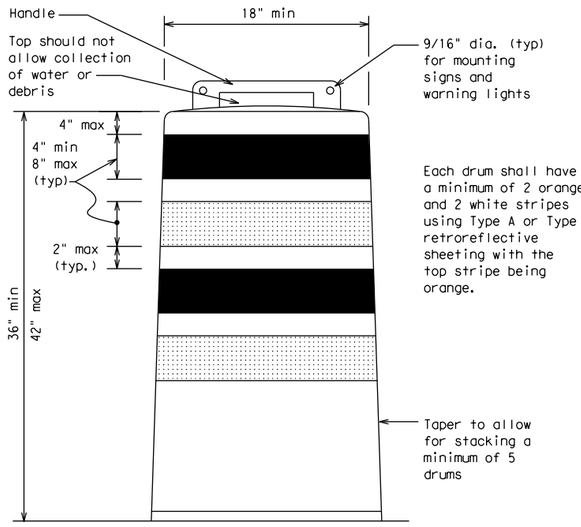
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

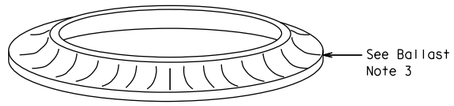
RETROREFLECTIVE SHEETING

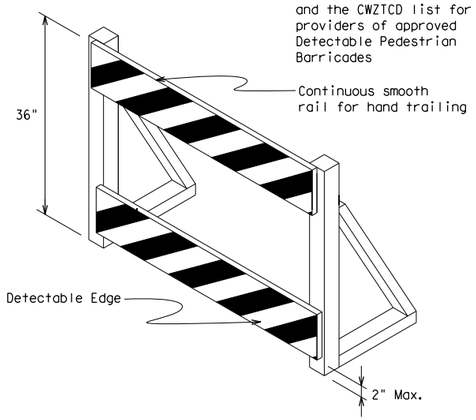
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

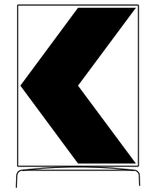




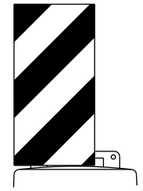


DETECTABLE PEDESTRIAN BARRICADES

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	0312	05	031,ETC.	FM 730
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	FTW	TARRANT		46
7-13				

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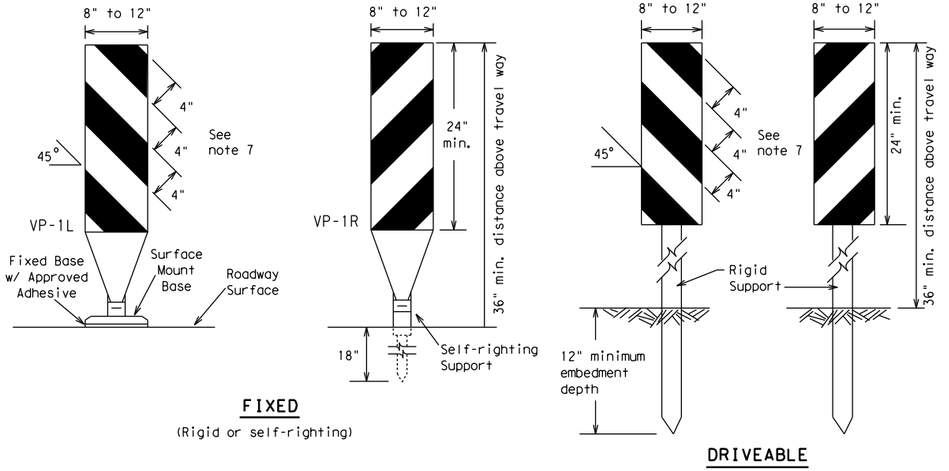
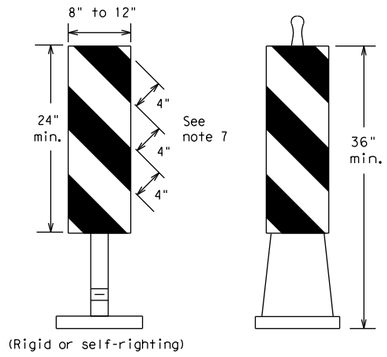


FIXED

(Rigid or self-righting)

DRIVEABLE

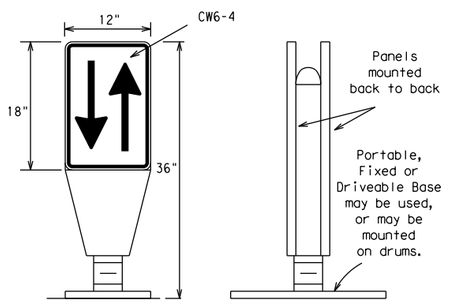


(Rigid or self-righting)

PORTABLE

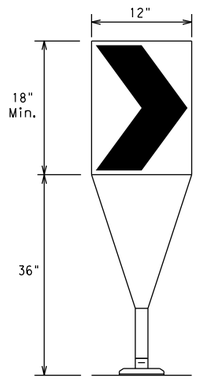
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



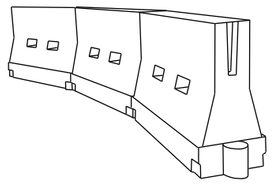
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0312	05	031,ETC.	FM 730
9-07 8-14	DIST	COUNTY		SHEET NO.
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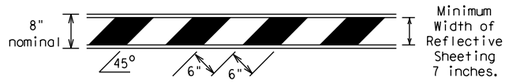
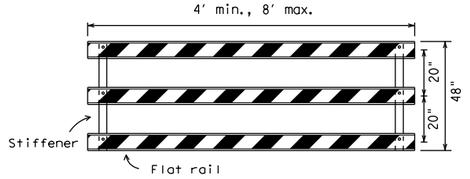
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



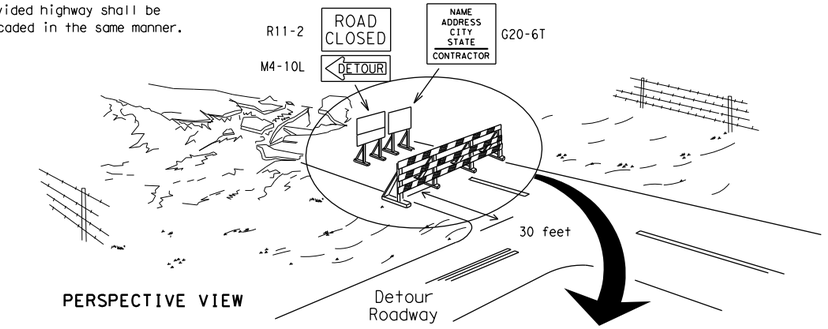
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

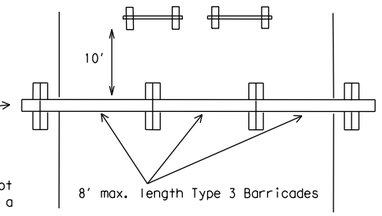
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

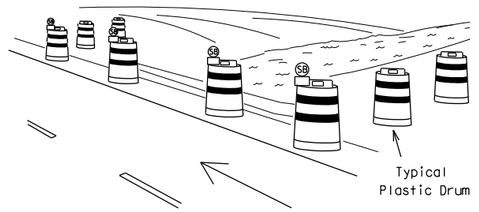
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

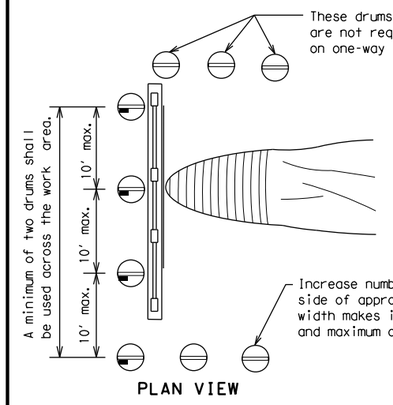
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

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



PLAN VIEW

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

Two-Piece cones

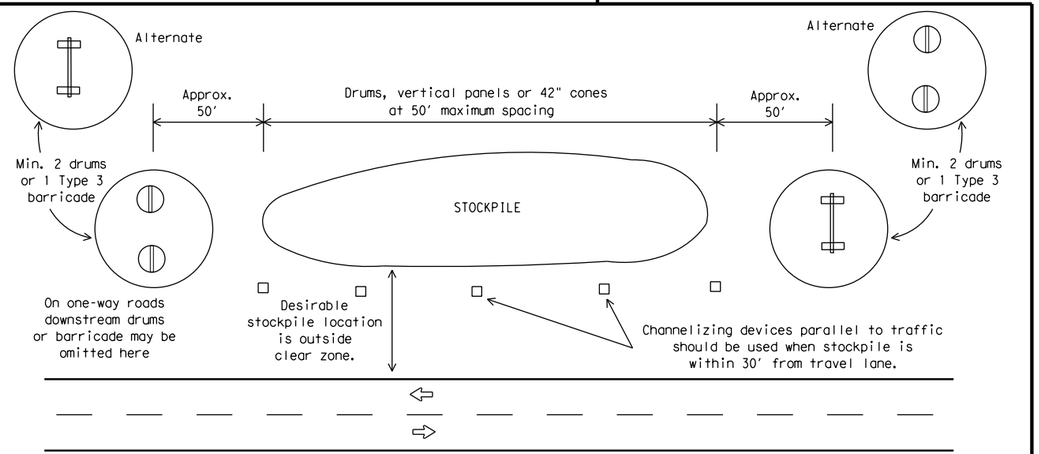
One-Piece cones

Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

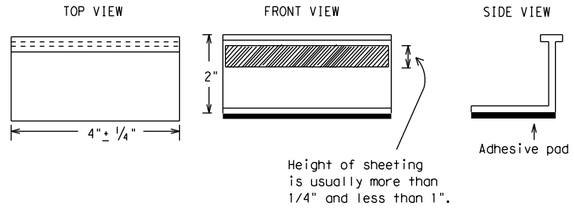
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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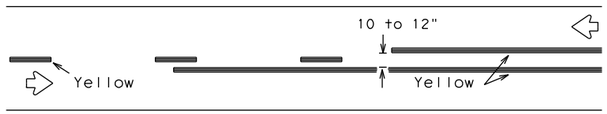
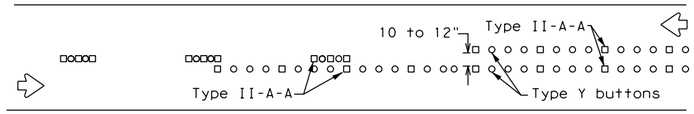
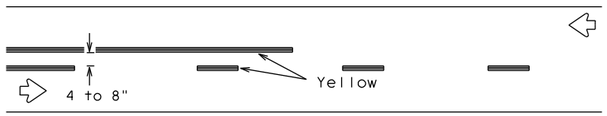
PAVEMENT MARKING PATTERNS



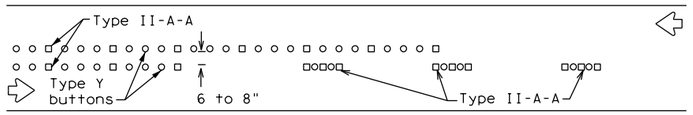
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



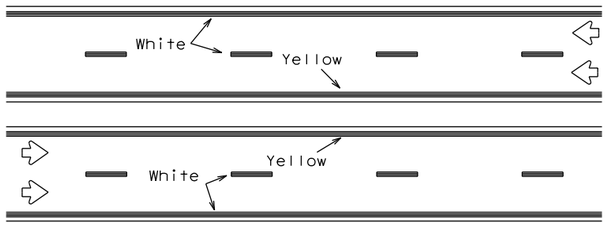
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



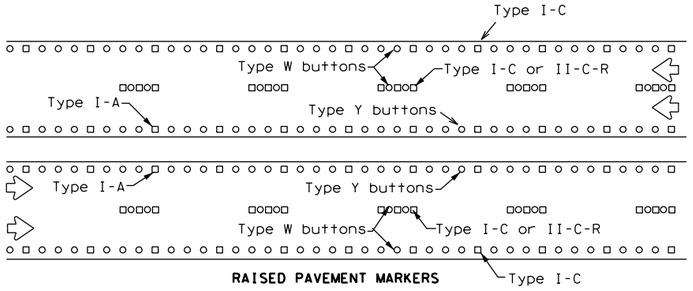
RAISED PAVEMENT MARKERS - PATTERN B

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

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



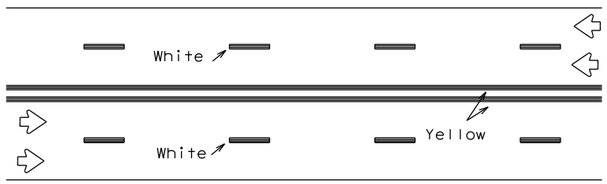
REFLECTORIZED PAVEMENT MARKINGS



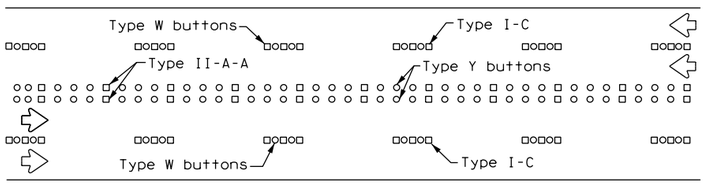
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



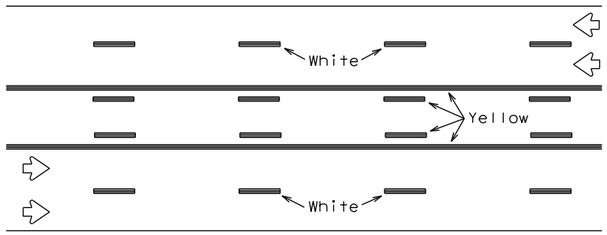
REFLECTORIZED PAVEMENT MARKINGS



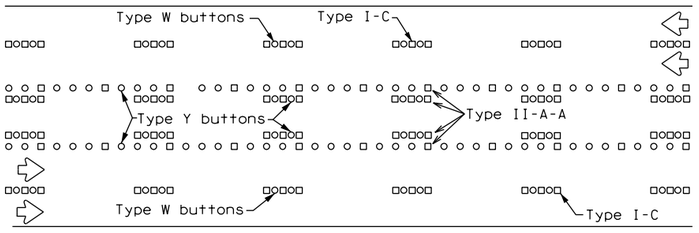
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

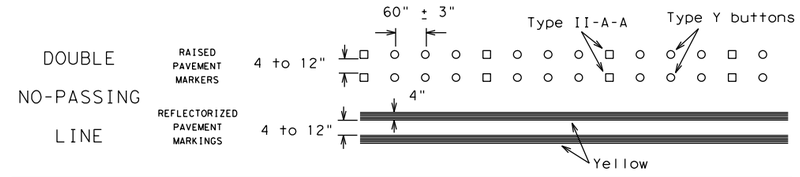
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

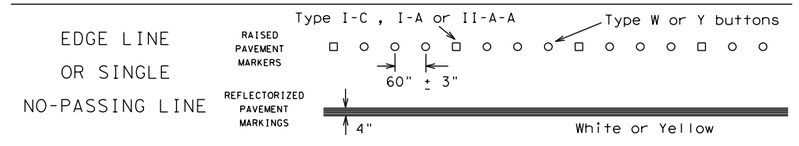
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

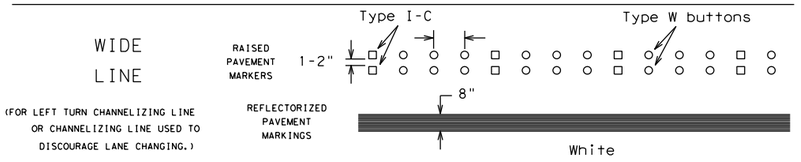


EDGE LINE OR SINGLE NO-PASSING LINE



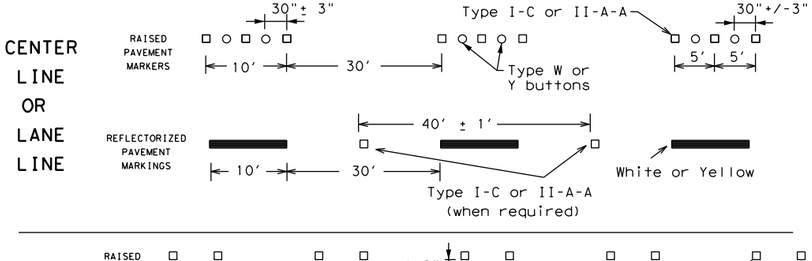
WIDE LINE

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

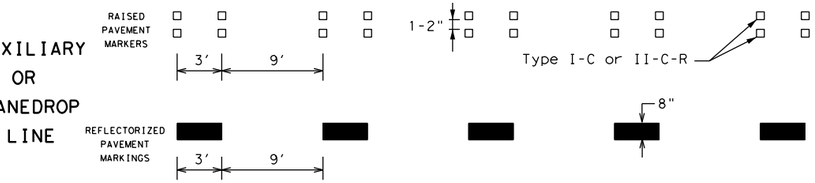


BROKEN LINES

CENTER LINE OR LANE LINE

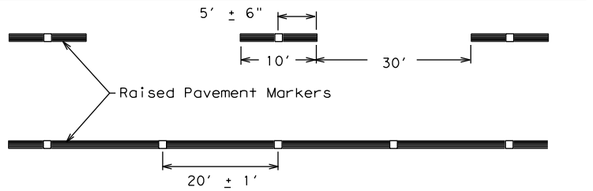


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		50

DATE: 5/23/2023 8:08:43 AM
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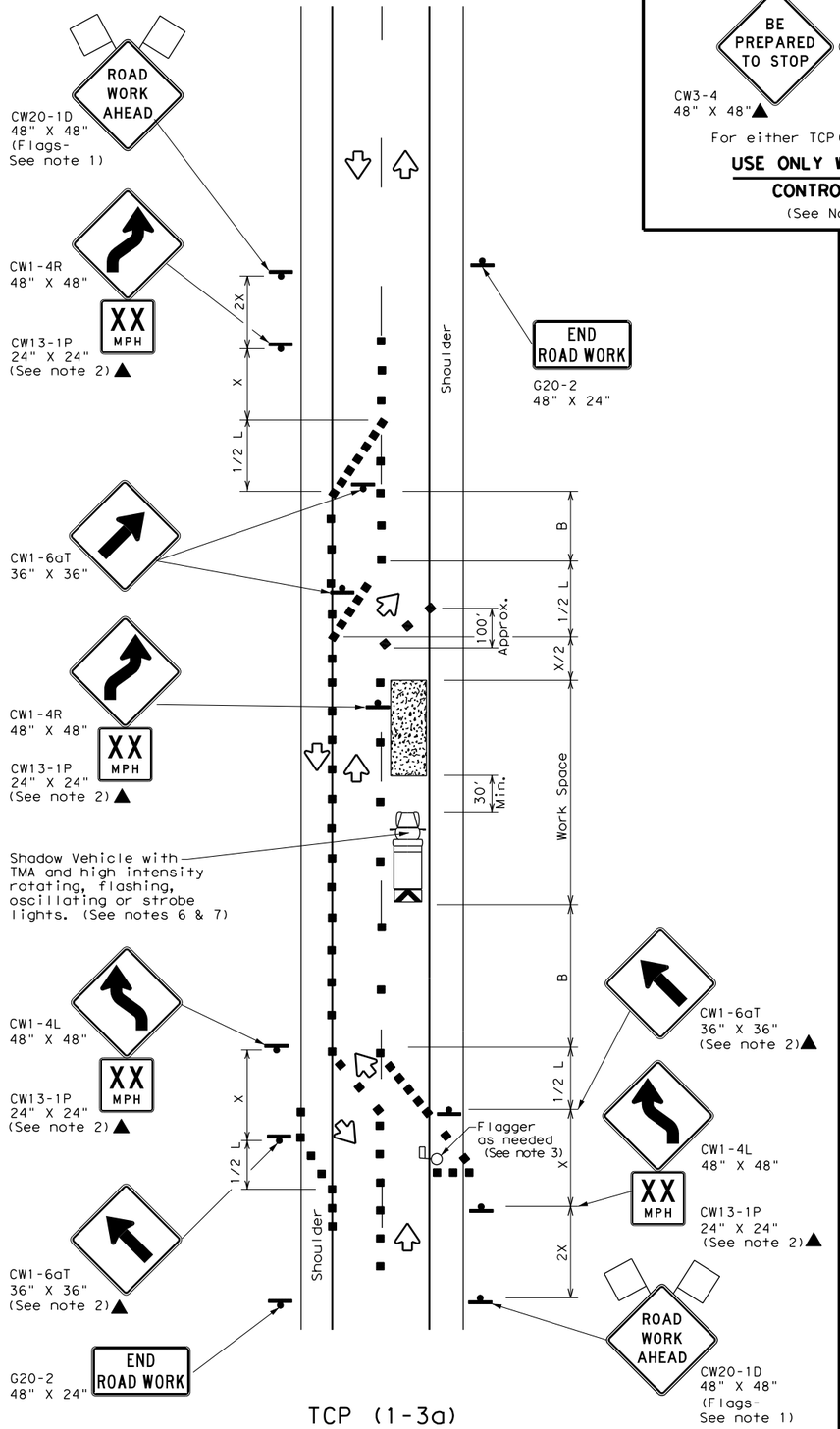
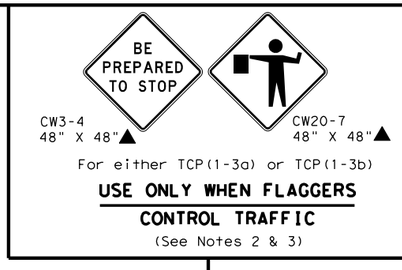
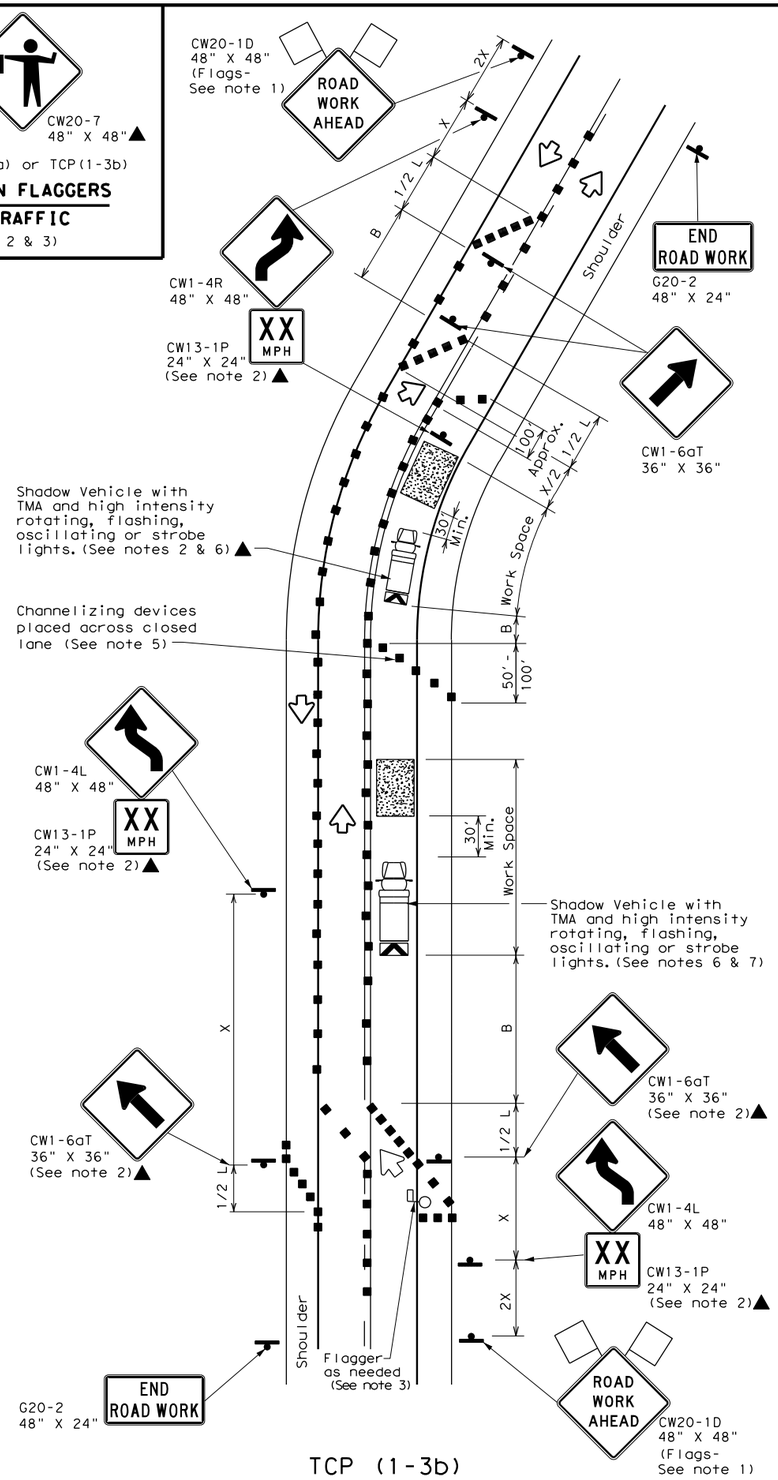


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW





TCP (1-3b)
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	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. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
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 wider work spaces.
8. 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 speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

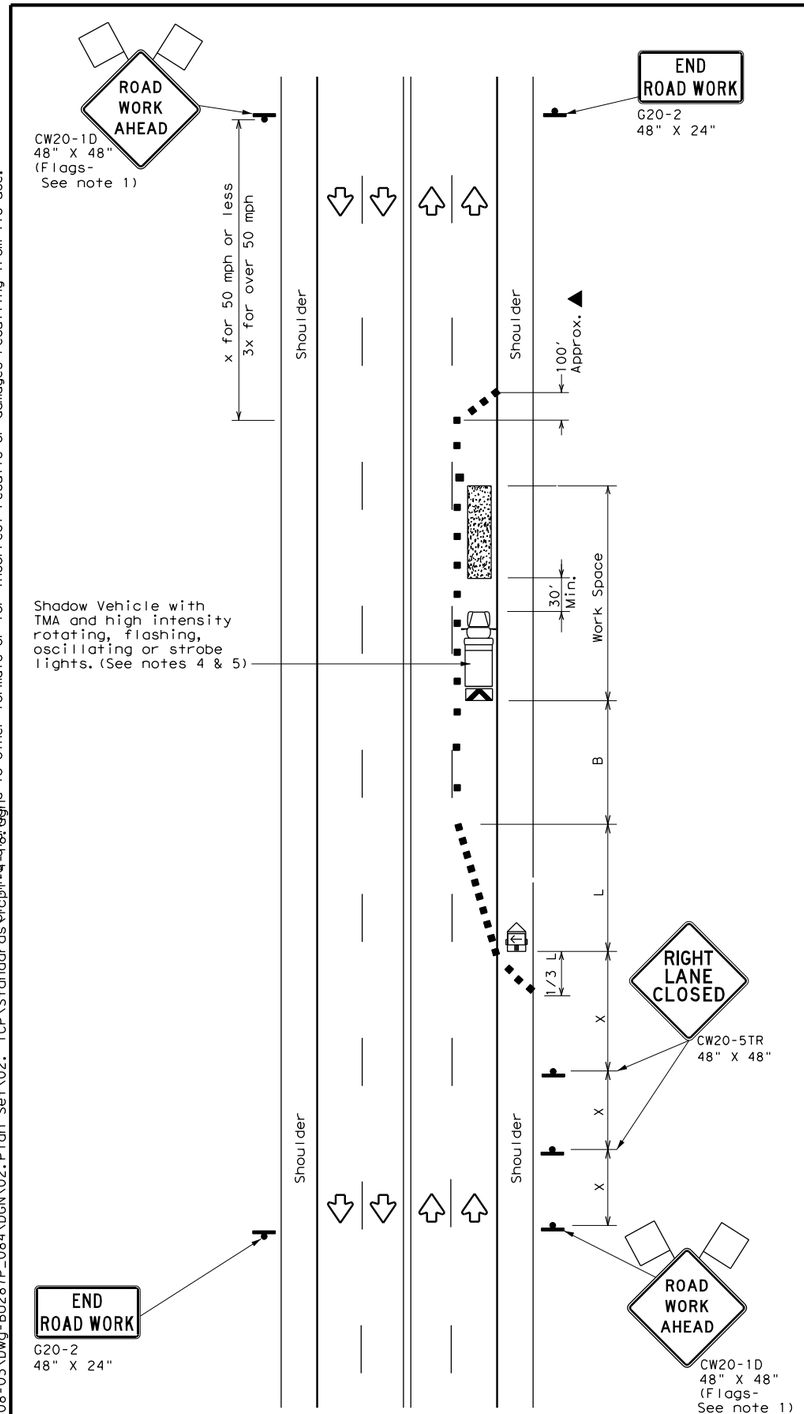
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

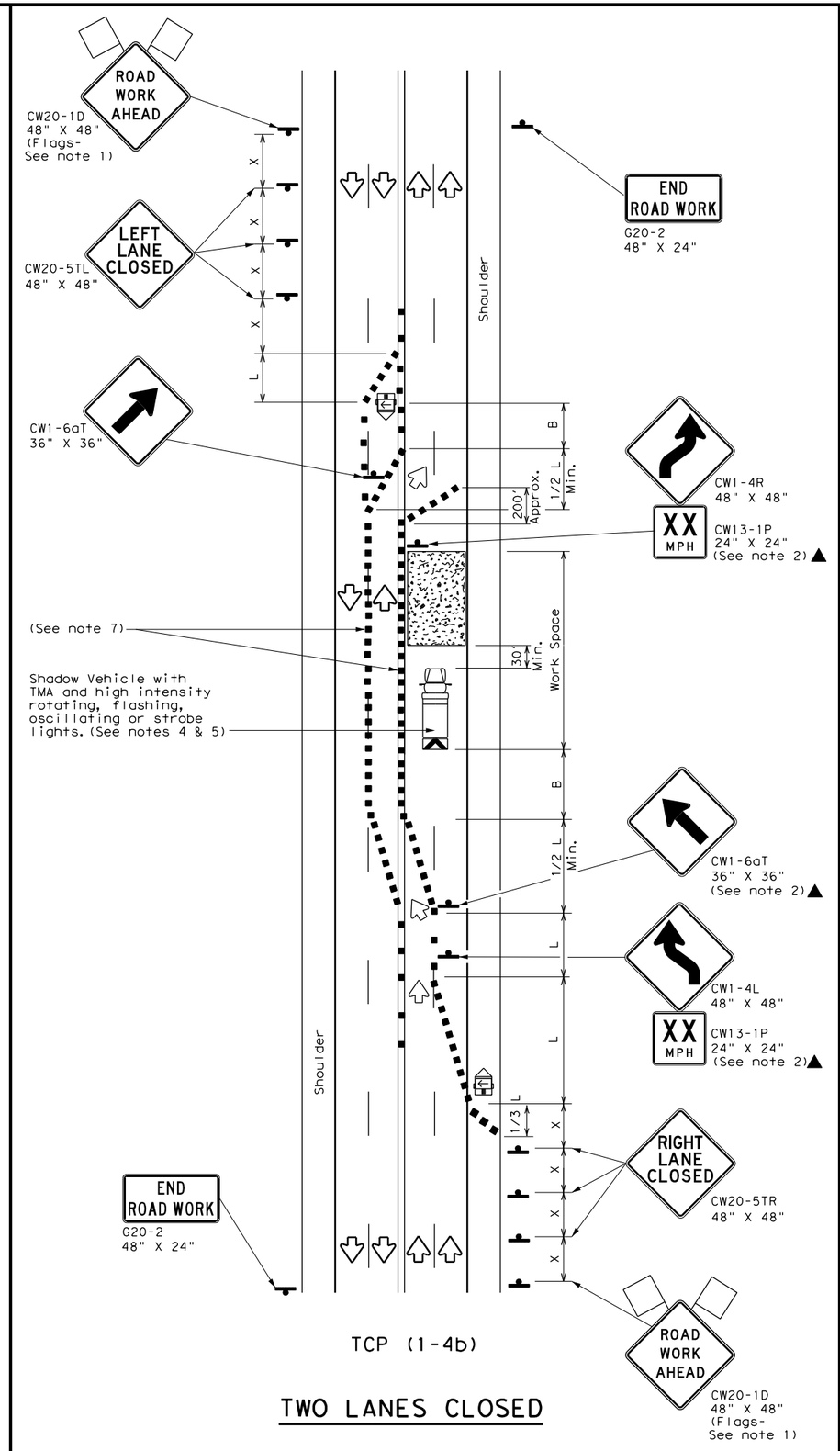
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	TARRANT		51
1-97 2-18				

DATE: 5/23/2023 8:08:44 AM
FILE: H:\TXPROJ\TX2608-03\Dwg-BU287P_084\DGN\02.Plan Set\02. TCP\Standards\tcp1-4-18.dgn



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

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 CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. 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 wider work spaces.

TCP (1-4a)

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

TCP (1-4b)

7. 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas 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(1-4)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	TARRANT		52
1-97 2-18				

DATE: 5/23/2023 8:08:45 AM
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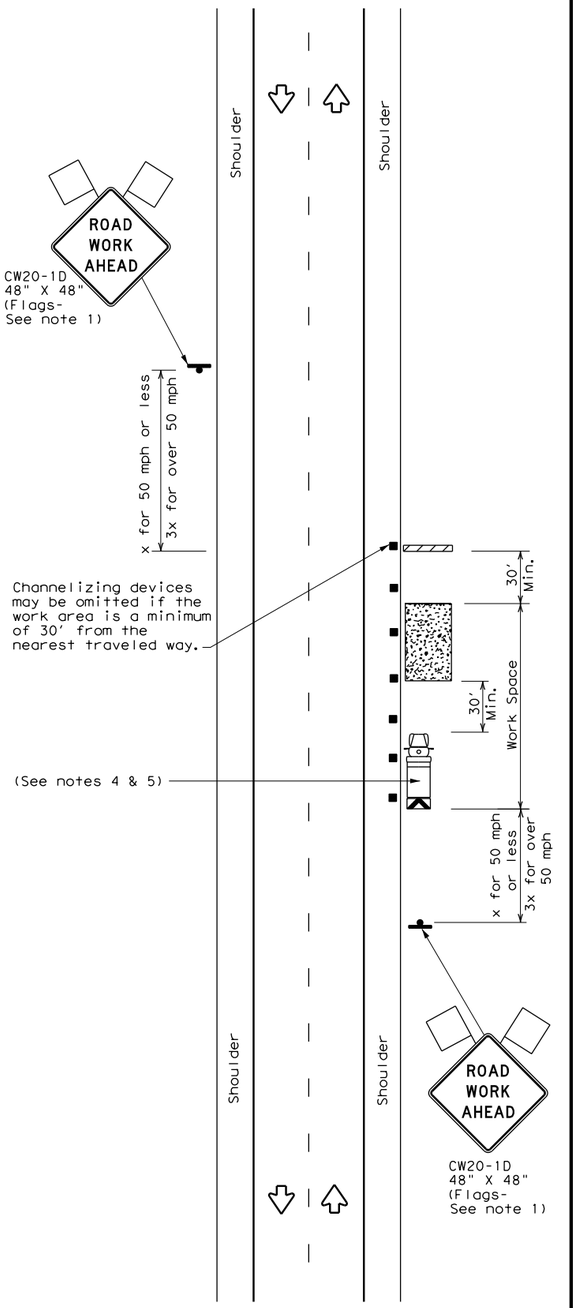
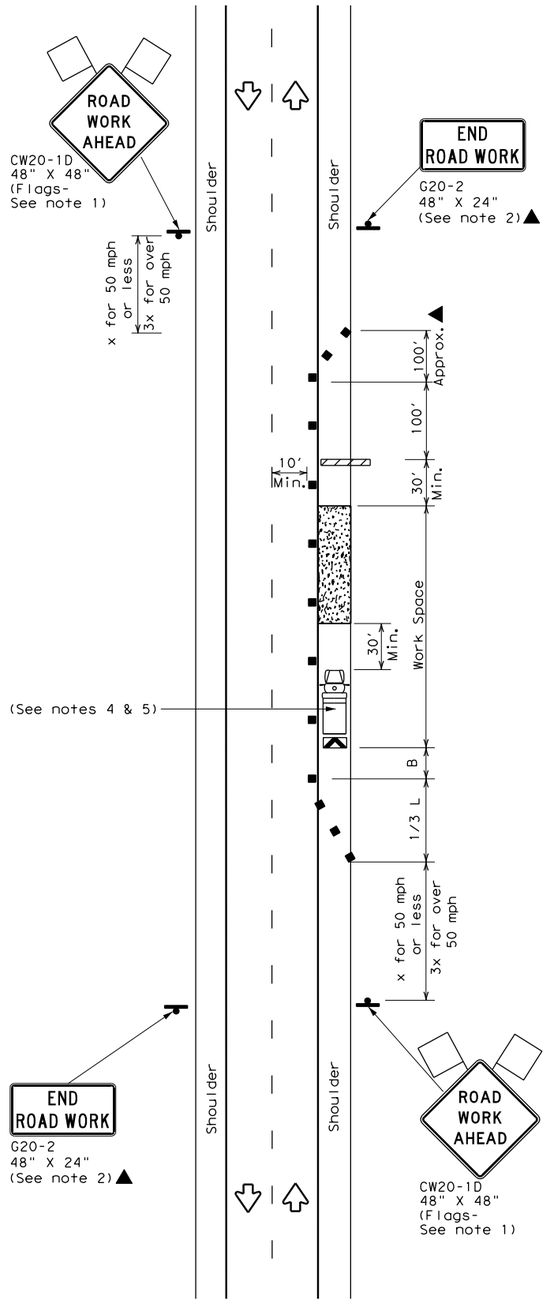


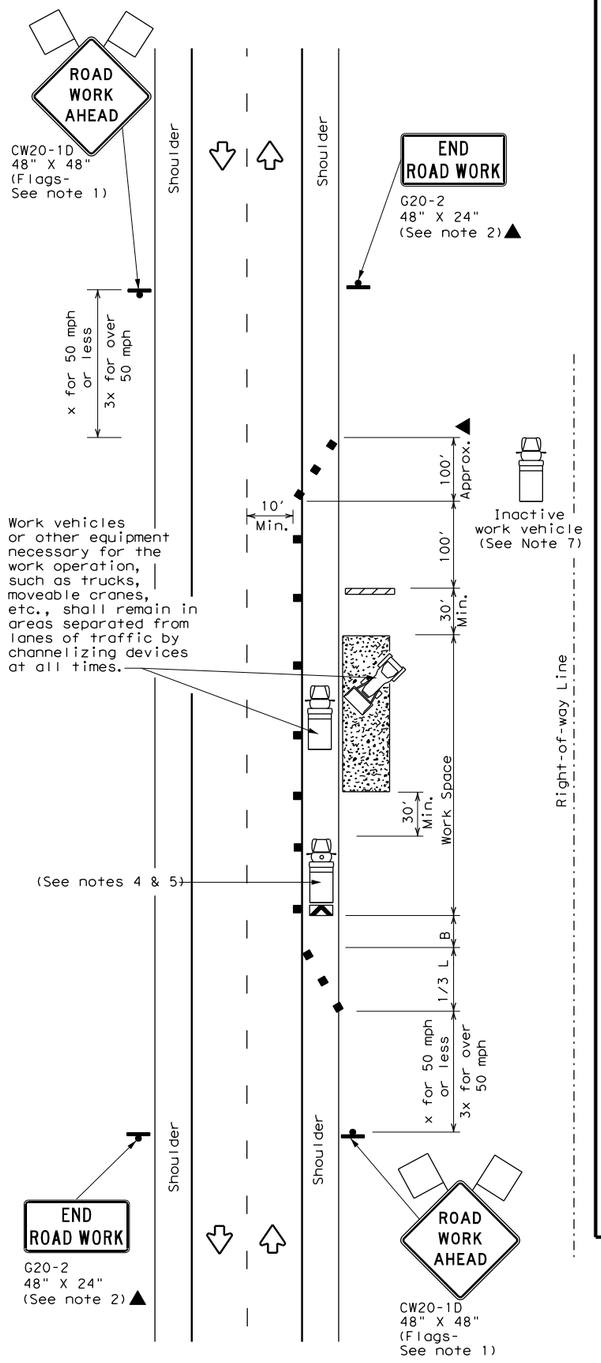
TCP (2-1a)

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 CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	TARRANT		53
1-97 2-18				

161

DATE: 5/23/2023 8:08:46 AM
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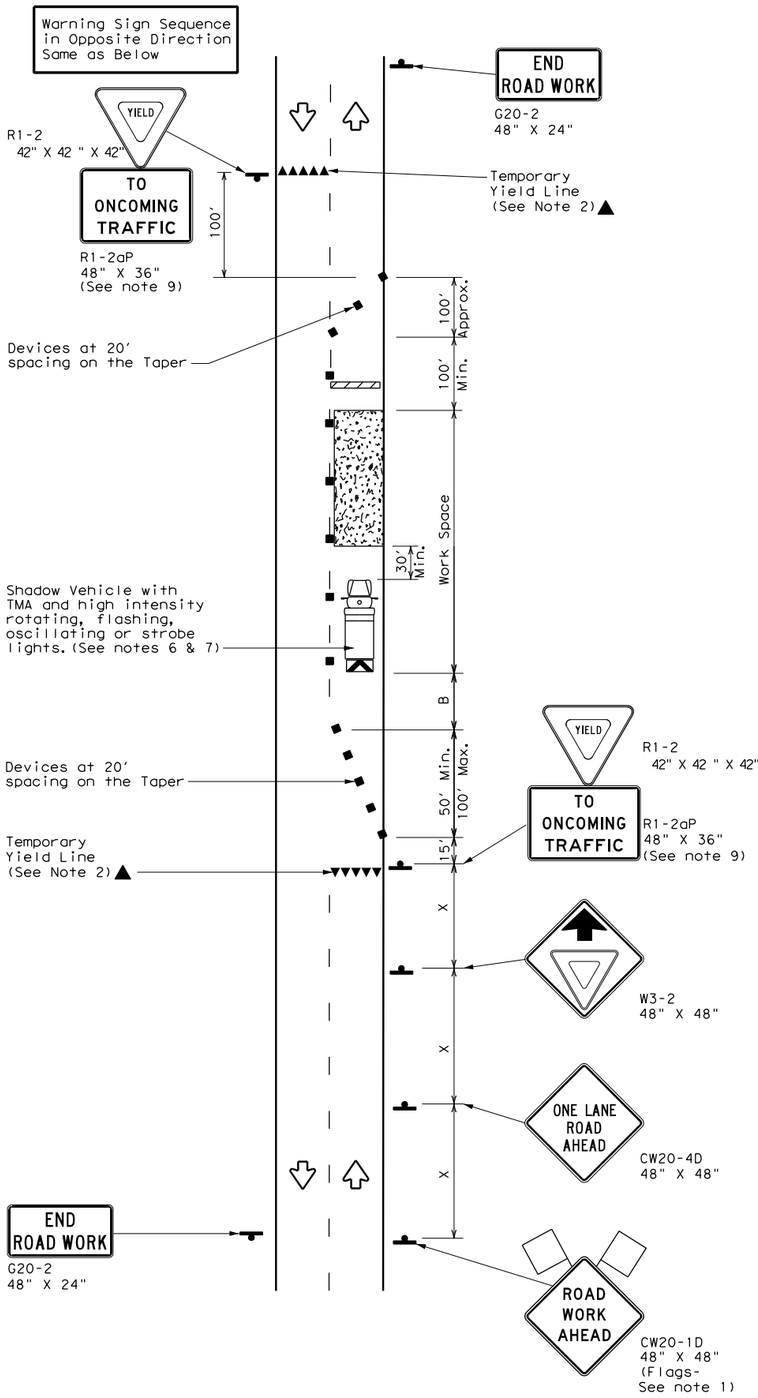
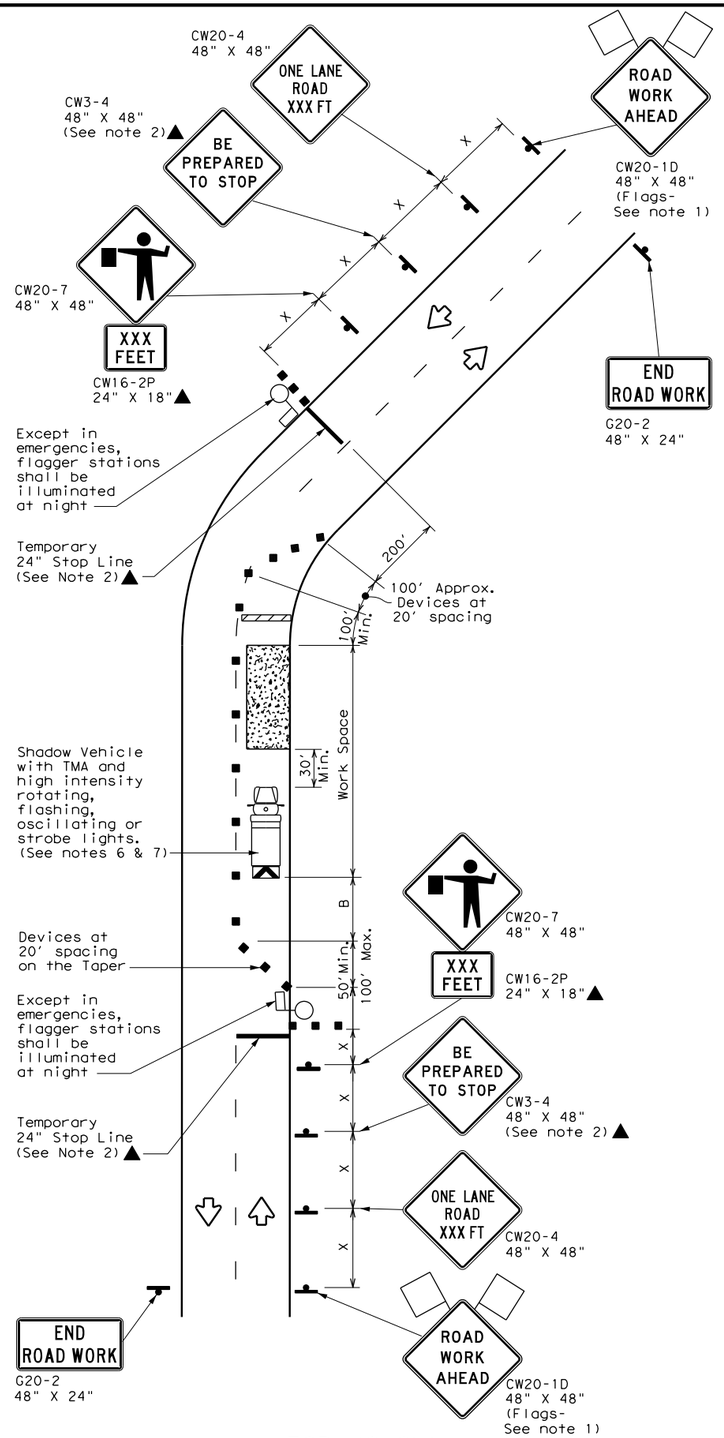


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		54

DATE: 5/23/2023 8:08:48 AM
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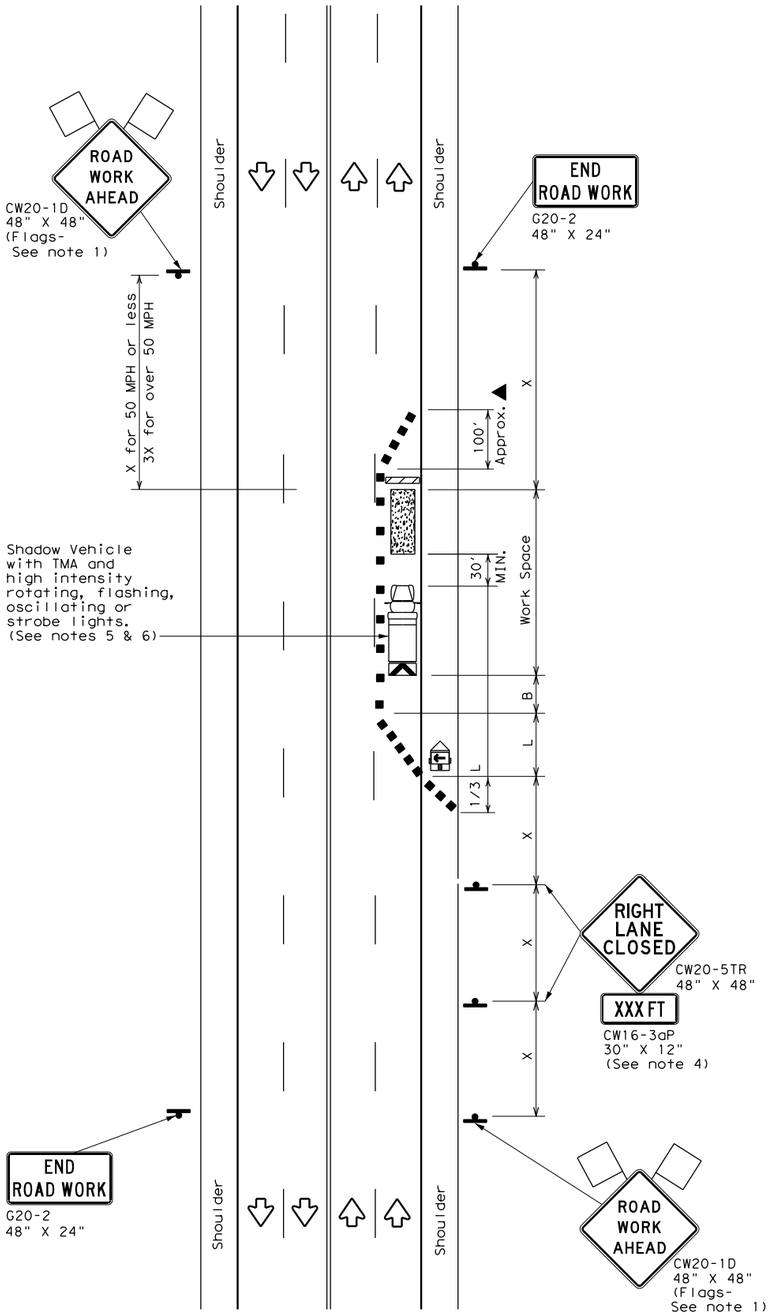
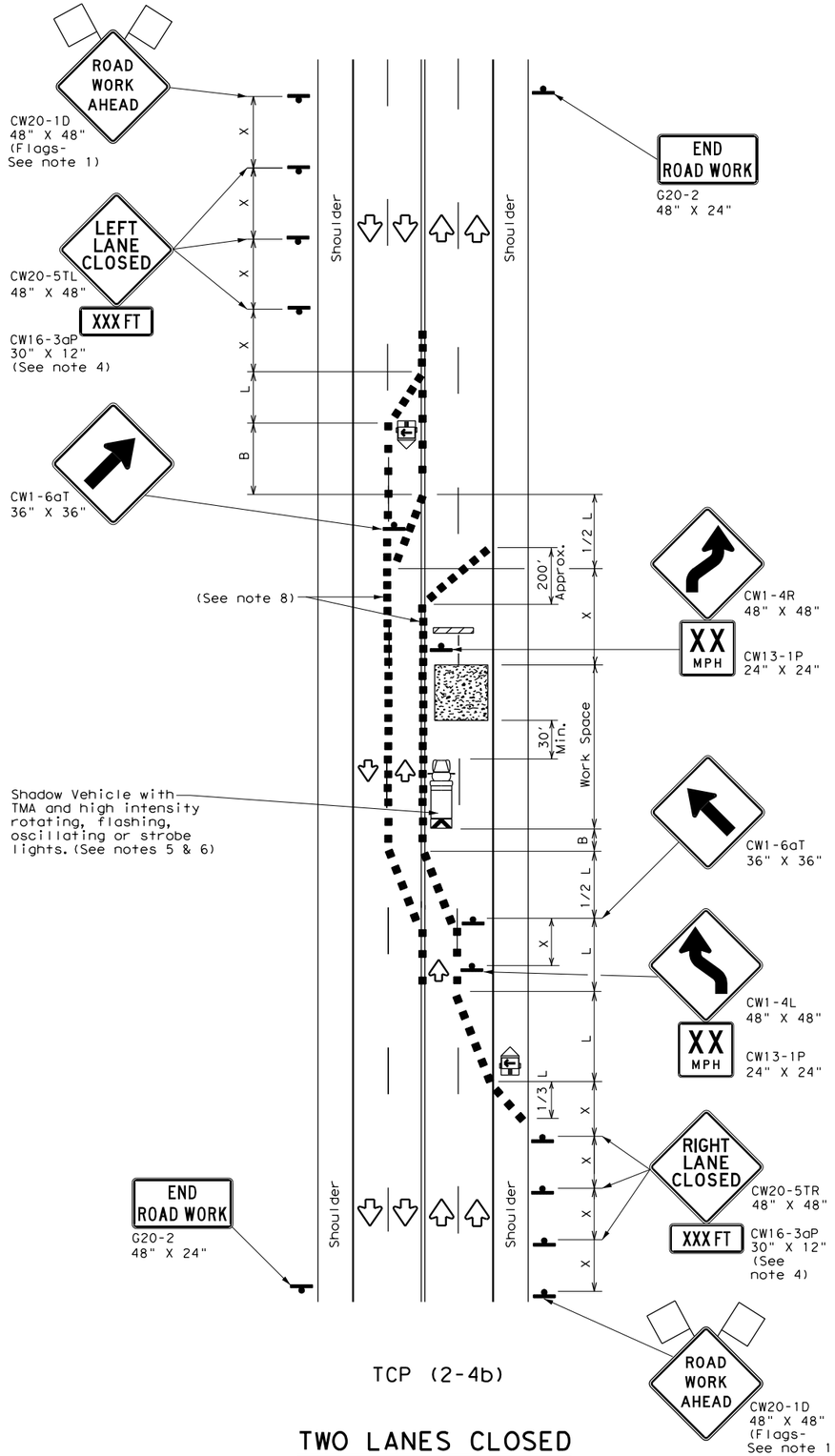


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0312	05	031,ETC.	FM 730
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	FTW	TARRANT		55

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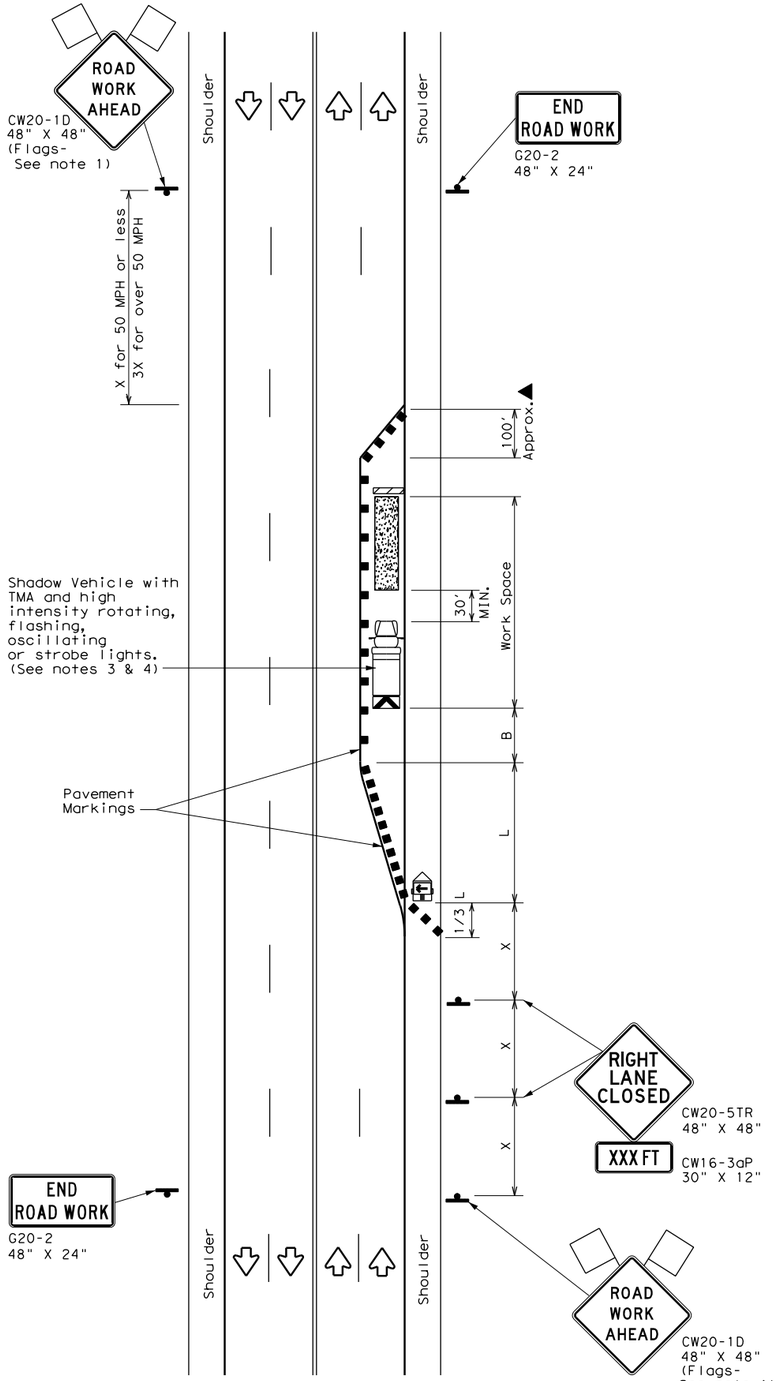
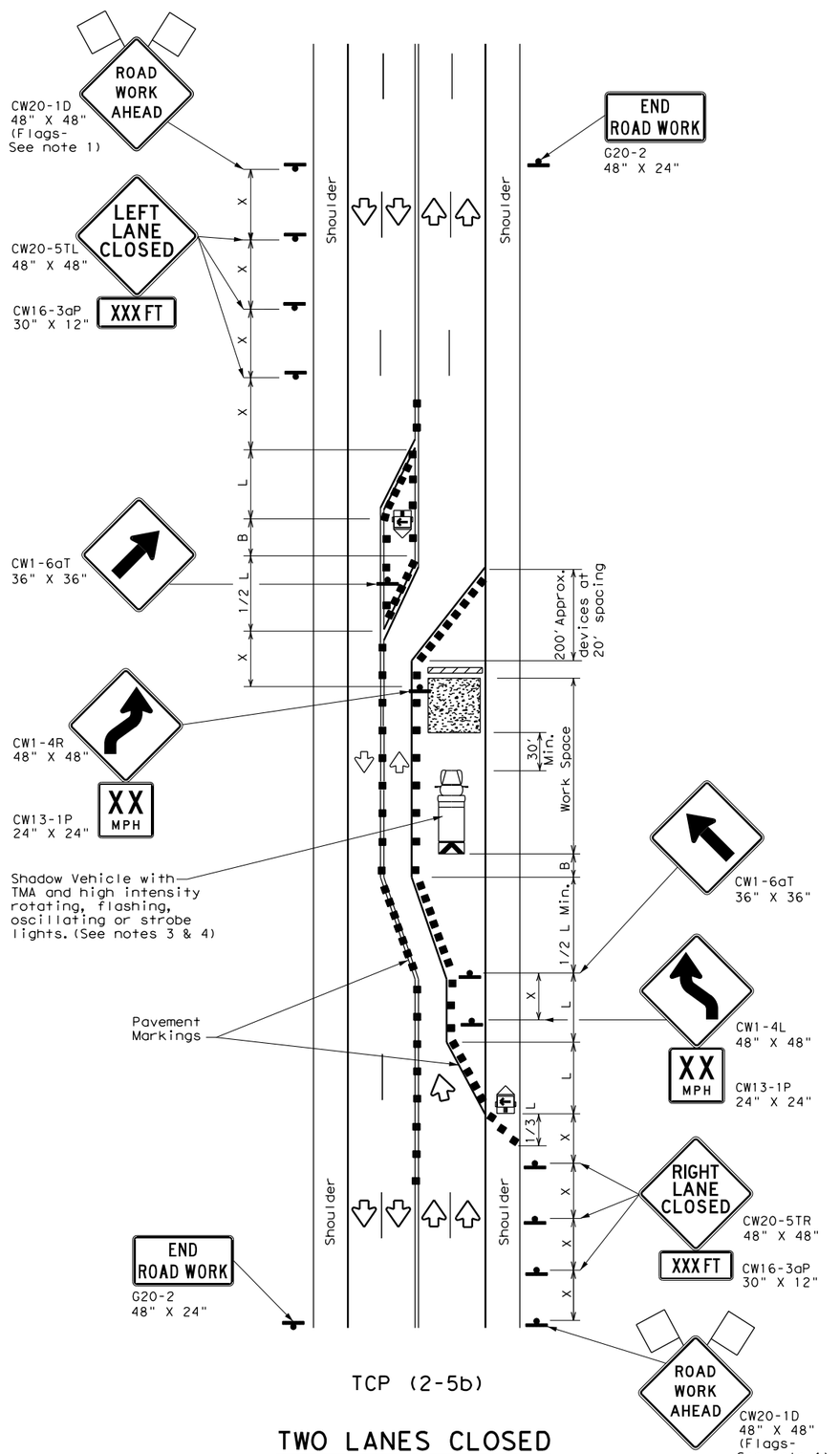


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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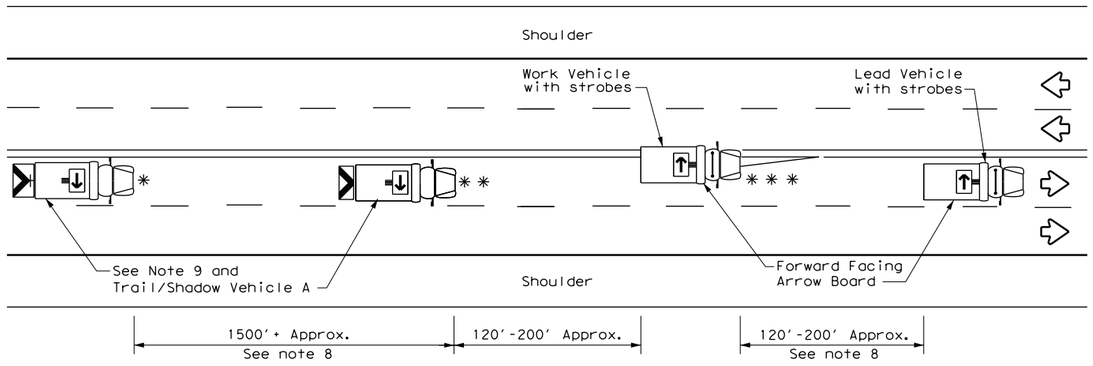
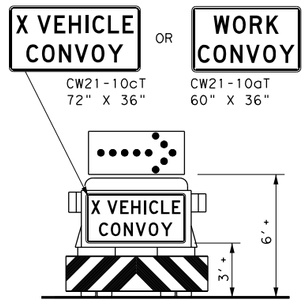


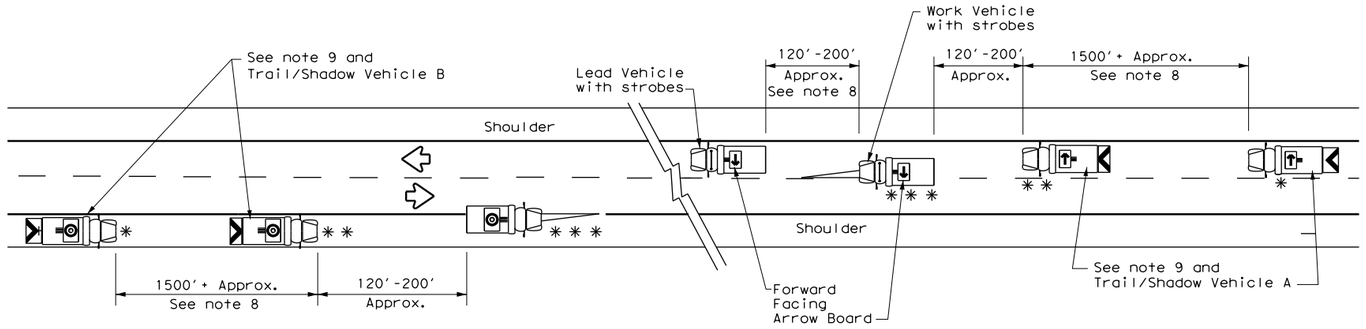
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

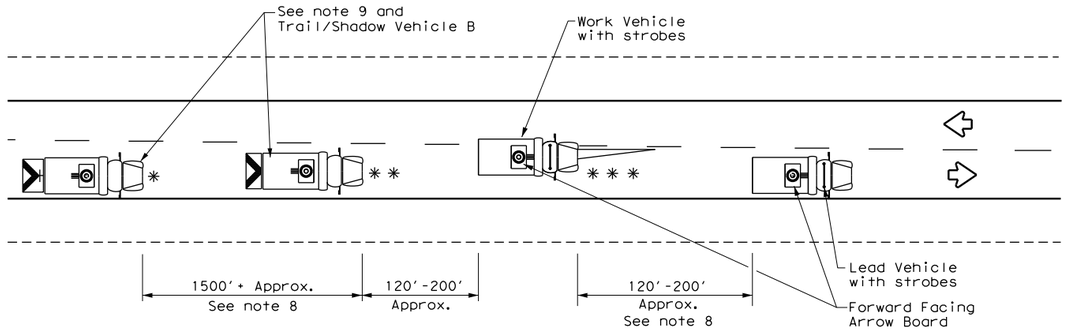


WORK ON SHOULDER

WORK ON TRAVEL LANE

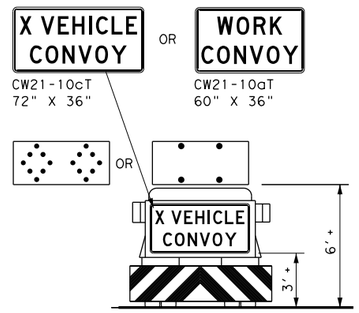
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

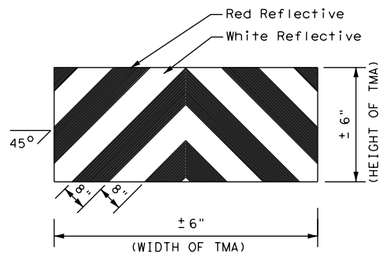
with Flashing Arrow Board in CAUTION display

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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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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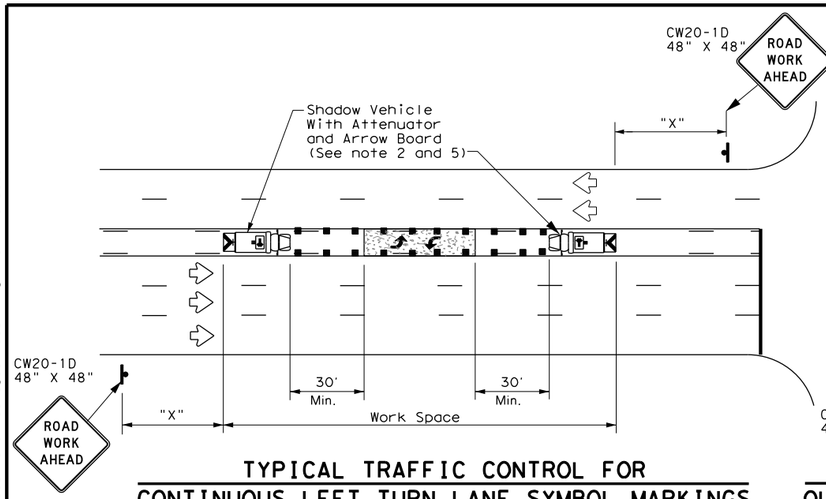
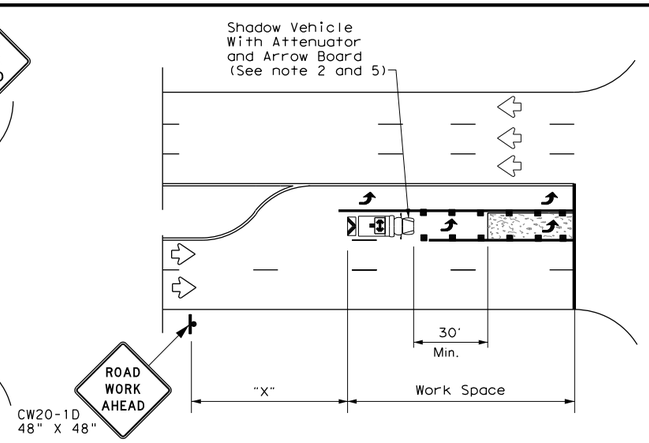
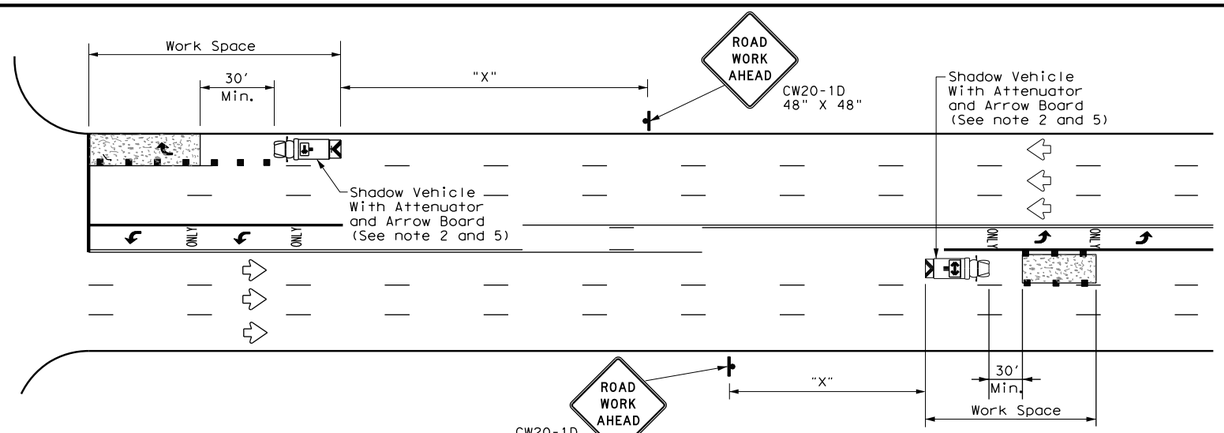
	FTW	TARRANT		57



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

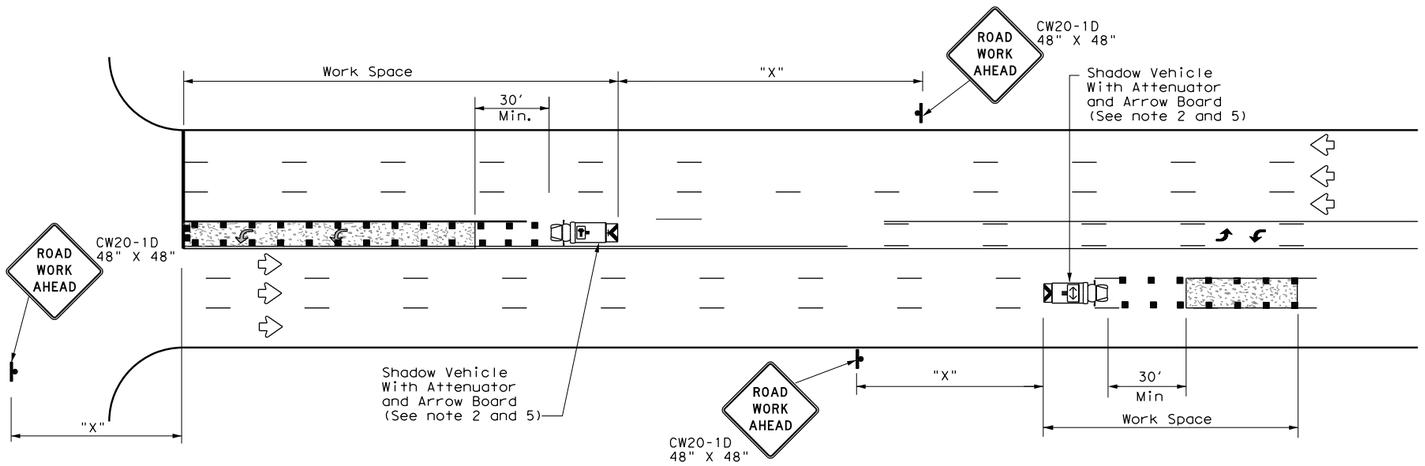


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

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

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

✳ Conventional Roads Only

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

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

GENERAL NOTES

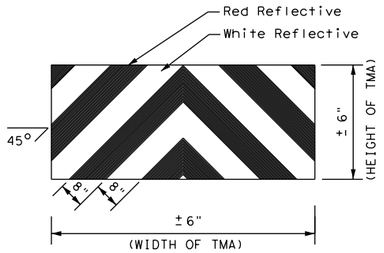
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.

2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.

3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.

4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.

5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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178

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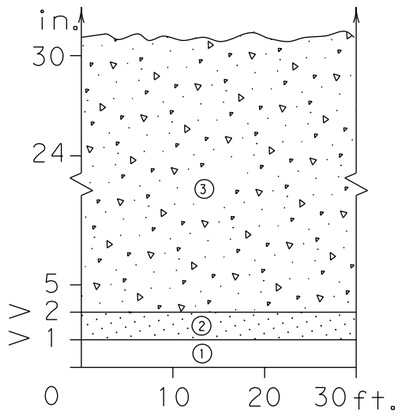
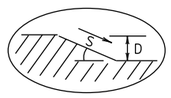
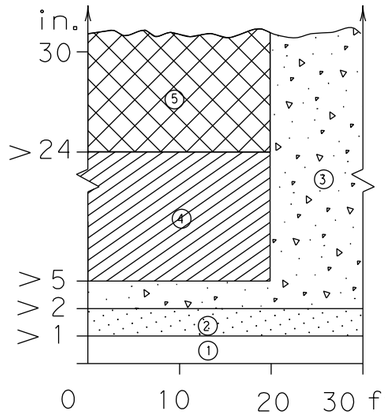
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

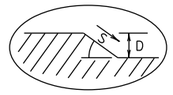


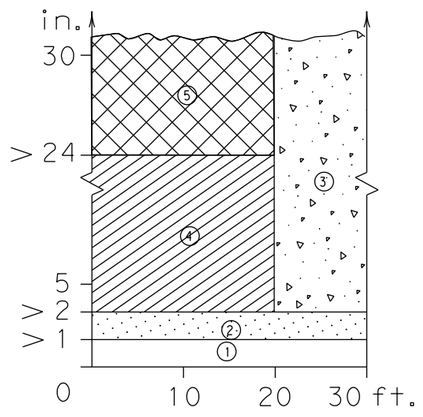
Edge Condition I
S = (3:1) (or flatter)



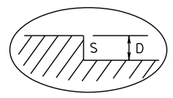


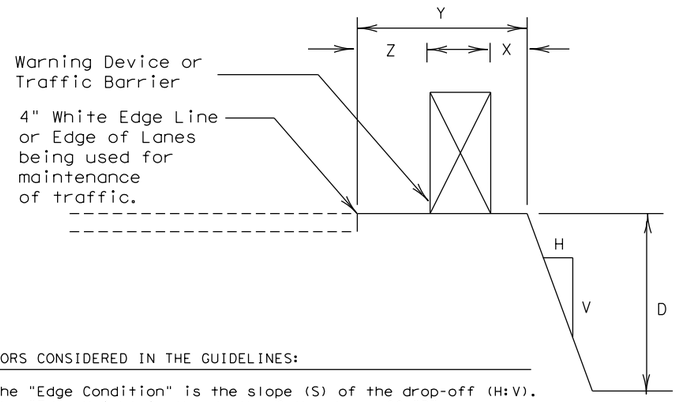
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment.
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone- 4 may be used after consideration of other applicable factors.

Edge Condition Notes:

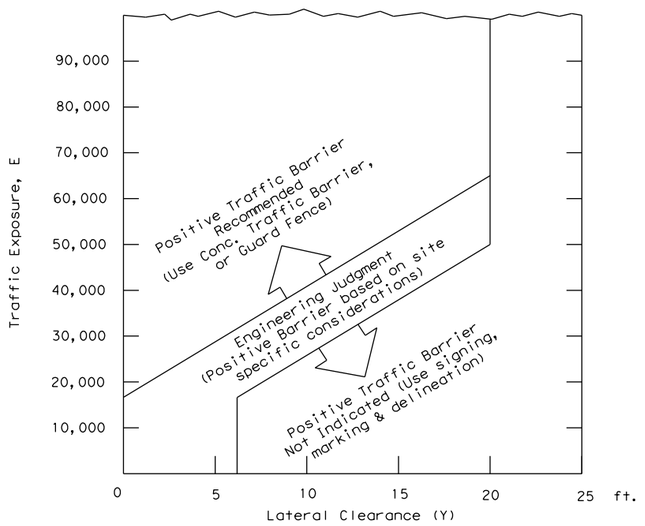
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



1 E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2 Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3 An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

Date 5/23/2023

Texas Department of Transportation
Traffic Operations Division

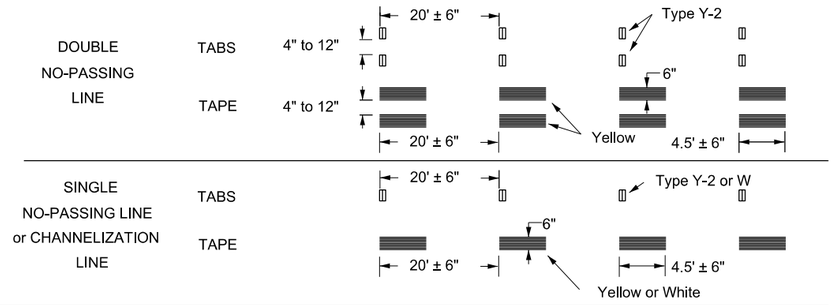
TREATMENT FOR VARIOUS EDGE CONDITIONS

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
03-01	0312	05	031, ETC.	FM 730
08-01 correct typos	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		59

DATE: 5/23/2023 8:08:54 AM
FILE: \\consor.local\legacy\AIA - H-drive\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\02. TCP\Standards\wz(stpm)-23.dgn

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



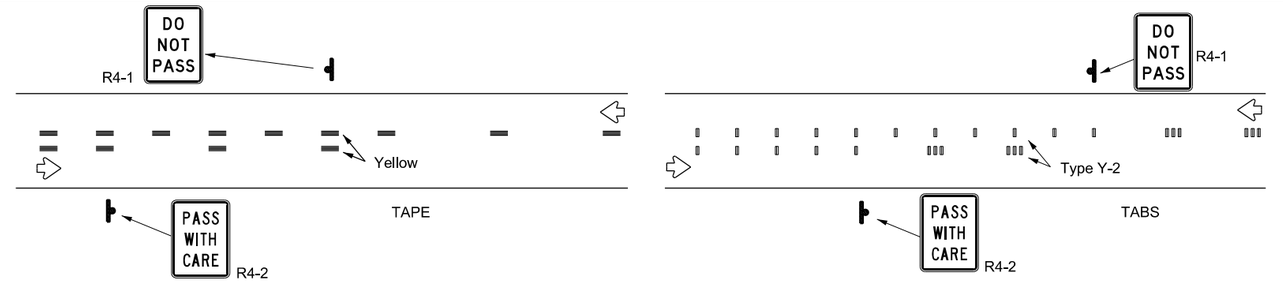
NOTES:

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

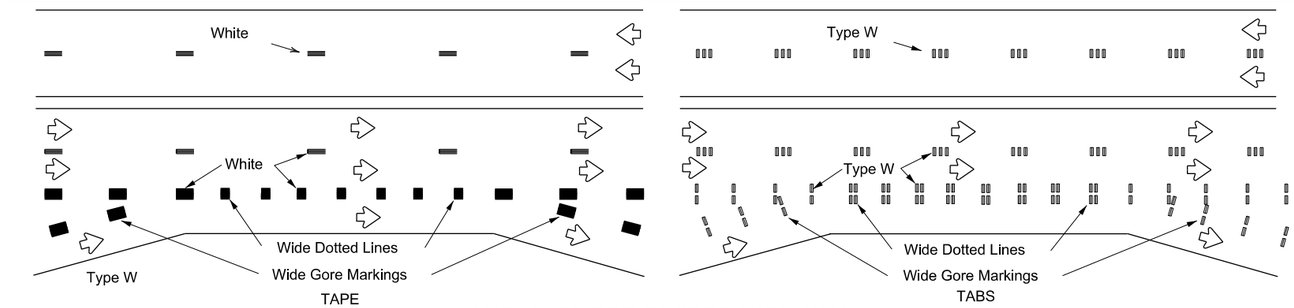
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

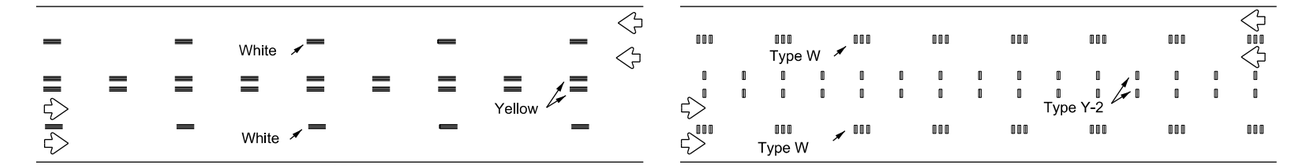
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



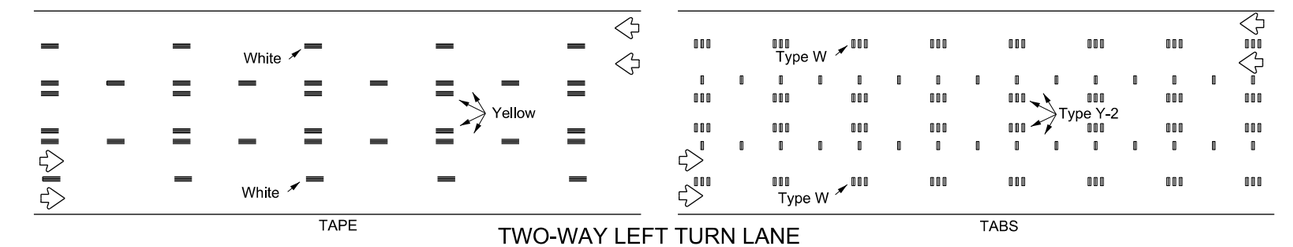
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



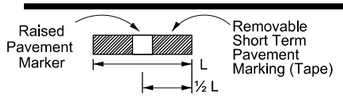
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 7-13 1-97 2-23 3-03	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		60

DATE: 5/23/2023 8:08:55 AM
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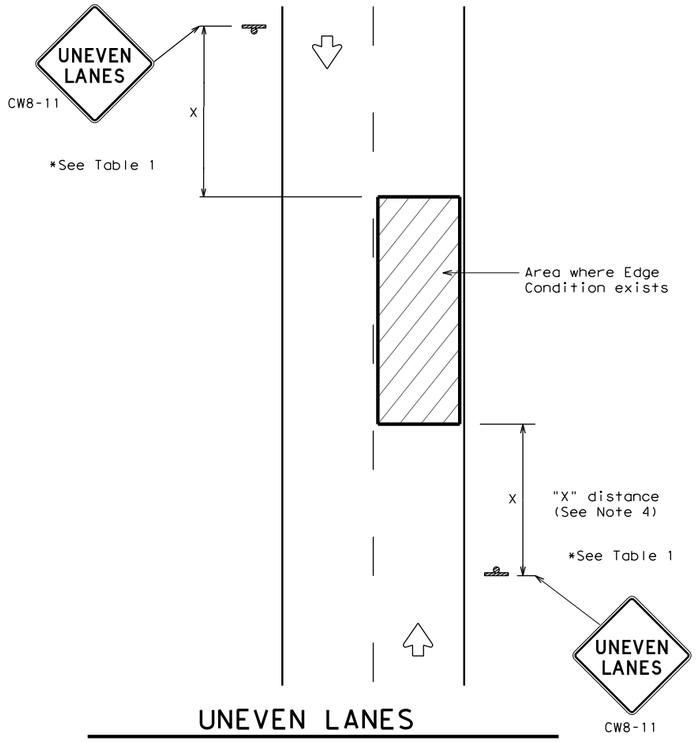
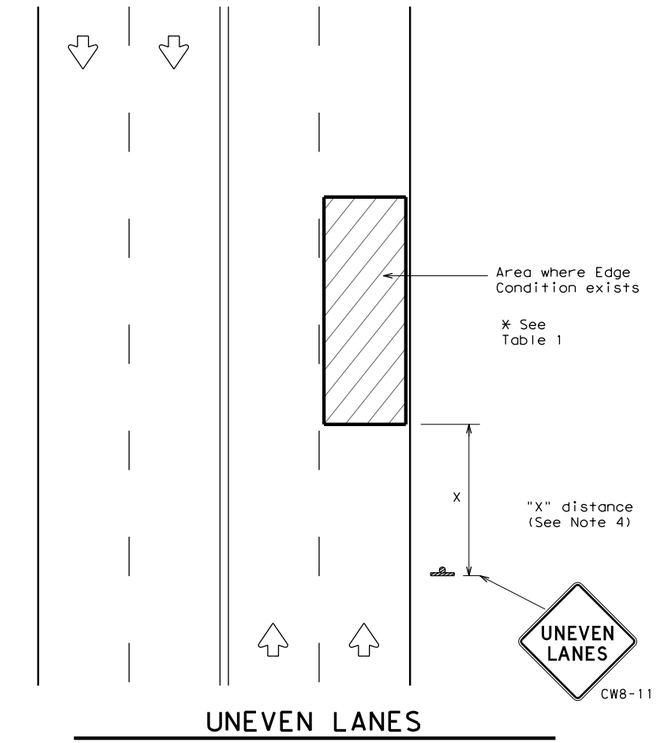
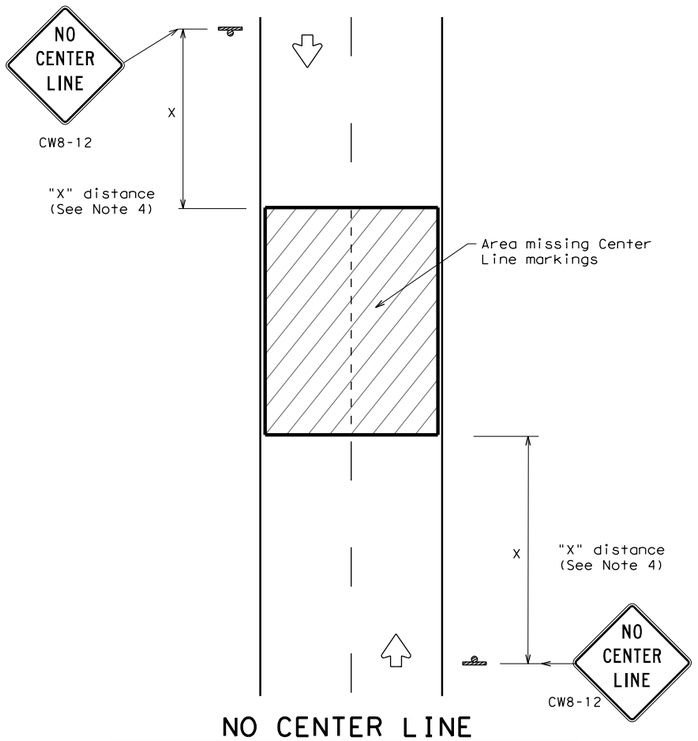


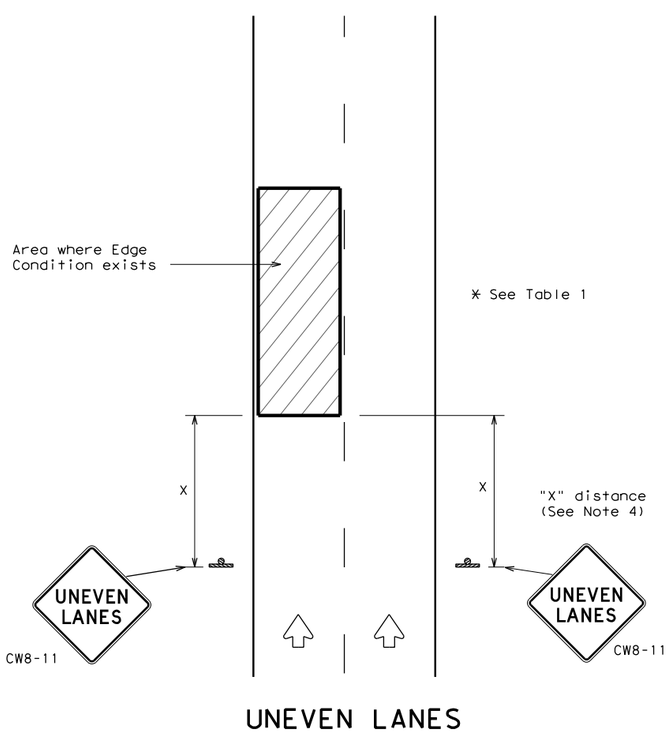
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

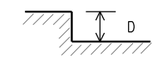
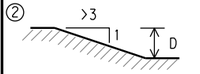
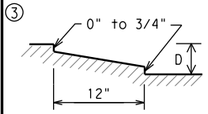
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

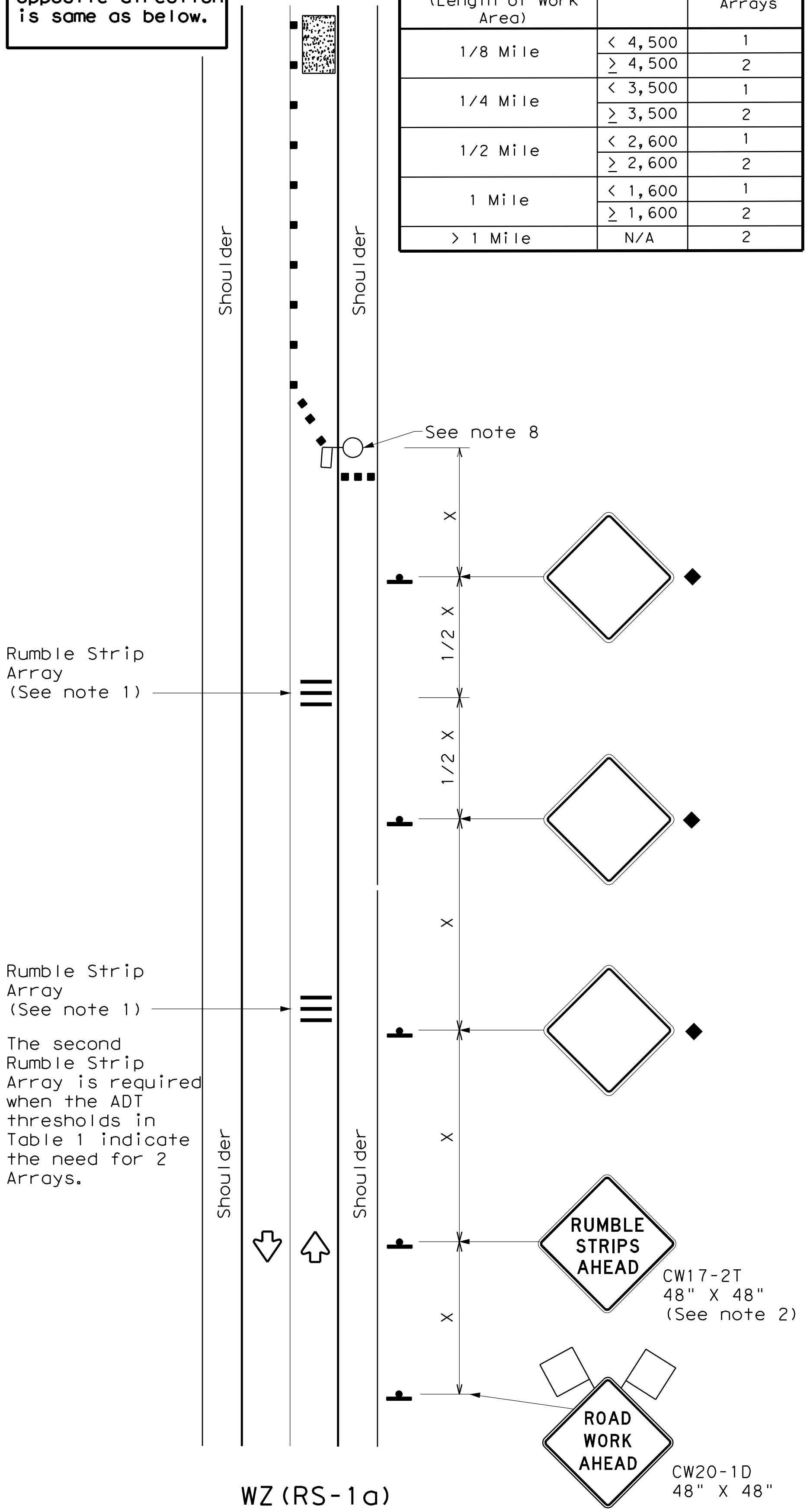
WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	FTW	TARRANT		61

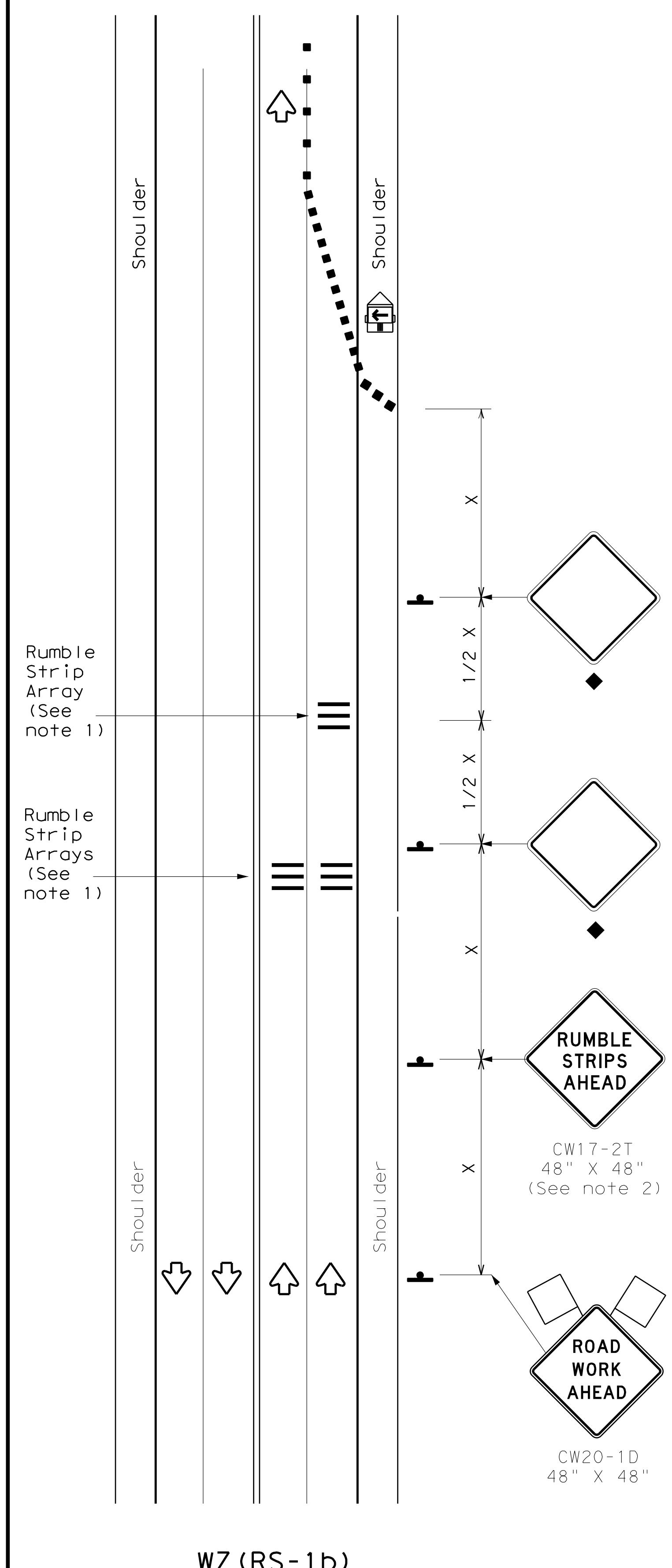
Warning sign and rumble strip sequence in opposite direction is same as below.

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

∗ Conventional Roads Only

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

TYPICAL USAGE

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

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

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

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Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT 0312	SECT 05	JOB 031,ETC.	HIGHWAY FM 730
REVISIONS 2-14 1-22 4-16	DIST FTW		COUNTY TARRANT	SHEET NO. 62

117

FM 730 BASELINE

Chain FM730 contains:
1000 CUR FM7301 CUR FM7302 CUR FM7303 1001 CUR FM7304 1002

Beginning chain FM730 description

Point 1000 N 7,046,210.2418 E 2,261,758.5343 Sta 10+00.00

Course from 1000 to PC FM7301 S 0° 17′ 47.87" E Dist 6,707.1573

Curve Data						
Curve FM7301						
P.I. Station		77+17.70	N	7,039,492.6318	E	2,261,793.3128
Delta	=	0° 10′ 21.31"	(LT)			
Degree	=	0° 49′ 06.64"				
Tangent	=	10.5426				
Length	=	21.0852				
Radius	=	7,000.0000				
External	=	0.0079				
Long Chord	=	21.0852				
Mid. Ord.	=	0.0079				
P.C. Station		77+07.16	N	7,039,503.1743	E	2,261,793.2582
P.T. Station		77+28.24	N	7,039,482.0896	E	2,261,793.3992
C.C.			N	7,039,539.4144	E	2,268,793.1644
Back	= S	0° 17′ 47.87" E				
Ahead	= S	0° 28′ 09.17" E				
Chord Bear	= S	0° 22′ 58.52" E				

Course from PT FM7301 to PC FM7302 S 0° 28′ 09.17" E Dist 2,383.1771

Curve Data						
Curve FM7302						
P.I. Station		101+20.37	N	7,037,090.0446	E	2,261,812.9889
Delta	=	0° 08′ 47.34"	(LT)			
Degree	=	0° 49′ 06.64"				
Tangent	=	8.9481				
Length	=	17.8962				
Radius	=	7,000.0000				
External	=	0.0057				
Long Chord	=	17.8962				
Mid. Ord.	=	0.0057				
P.C. Station		101+11.42	N	7,037,098.9924	E	2,261,812.9156
P.T. Station		101+29.32	N	7,037,081.0971	E	2,261,813.0850
C.C.			N	7,037,156.3172	E	2,268,812.6809
Back	= S	0° 28′ 09.17" E				
Ahead	= S	0° 36′ 56.51" E				
Chord Bear	= S	0° 32′ 32.84" E				

Course from PT FM7302 to PC FM7303 S 0° 36′ 56.51" E Dist 3,408.7420

Curve Data						
Curve FM7303						
P.I. Station		135+44.84	N	7,033,665.7740	E	2,261,849.7873
Delta	=	0° 06′ 39.46"	(RT)			
Degree	=	0° 49′ 06.64"				
Tangent	=	6.7782				
Length	=	13.5564				
Radius	=	7,000.0000				
External	=	0.0033				
Long Chord	=	13.5564				
Mid. Ord.	=	0.0033				
P.C. Station		135+38.06	N	7,033,672.5518	E	2,261,849.7145
P.T. Station		135+51.61	N	7,033,658.9961	E	2,261,849.8470
C.C.			N	7,033,597.3317	E	2,254,850.1186
Back	= S	0° 36′ 56.51" E				
Ahead	= S	0° 30′ 17.05" E				
Chord Bear	= S	0° 33′ 36.78" E				

Course from PT FM7303 to 1001 S 0° 30′ 17.05" E Dist 20,257.3501

Point 1001 N 7,013,402.4321 E 2,262,028.2981 Sta 338+08.96

Course from 1001 to PC FM7304 S 0° 14′ 20.67" E Dist 1,317.4411

Curve Data						
Curve FM7304						
P.I. Station		353+96.72	N	7,011,814.6892	E	2,262,034.9233
Delta	=	41° 21′ 21.81"	(RT)			
Degree	=	7° 59′ 59.89"				
Tangent	=	270.3156				
Length	=	516.9527				
Radius	=	716.2000				
External	=	49.3148				
Long Chord	=	505.8035				
Mid. Ord.	=	46.1380				
P.C. Station		351+26.41	N	7,012,085.0024	E	2,262,033.7953
P.T. Station		356+43.36	N	7,011,611.0419	E	2,261,857.1641
C.C.			N	7,012,082.0140	E	2,261,317.6016
Back	= S	0° 14′ 20.67" E				
Ahead	= S	41° 07′ 01.14" W				
Chord Bear	= S	20° 26′ 20.23" W				

Course from PT FM7304 to 1002 S 41° 07′ 01.14" W Dist 304.5344

Point 1002 N 7,011,381.6153 E 2,261,656.9027 Sta 359+47.89

Ending chain FM730 description

NOTES:

1. HORIZONTAL ALIGNMENT DATA SUPPLIED IS A BEST FIT ALIGNMENT TO THE EXISTING ROADWAY DRAWN FROM AERIAL ONLY.
2. HORIZONTAL ALIGNMENT PROVIDED TO DETAIL LIMITS OF CONSTRUCTION ONLY. MODIFICATION TO EXISTING ALIGNMENT MAY ONLY BE MADE WITH ENGINEERS APPROVAL.

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

FM 730

HORIZONTAL DATA

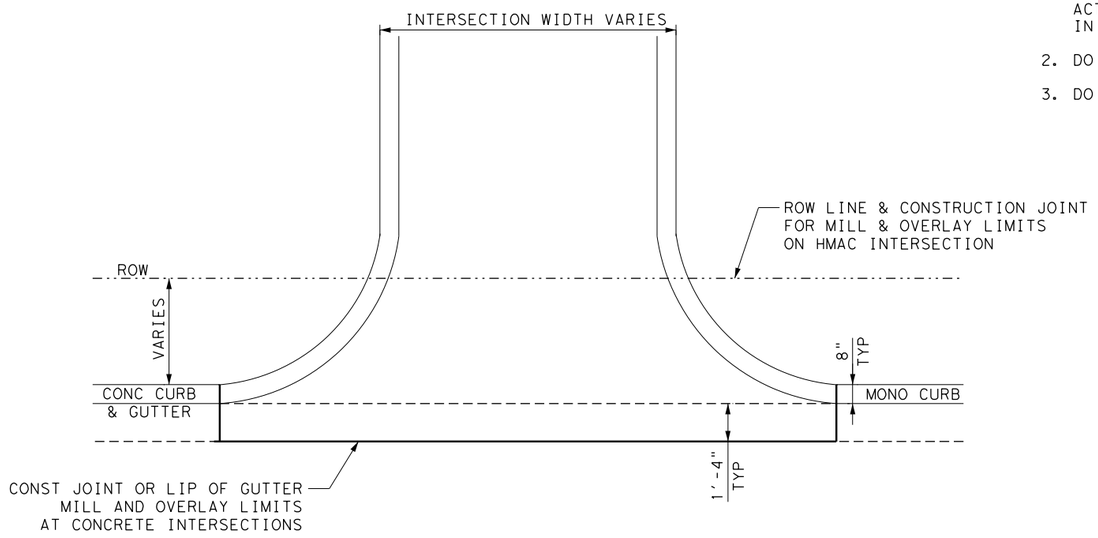
SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		63
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

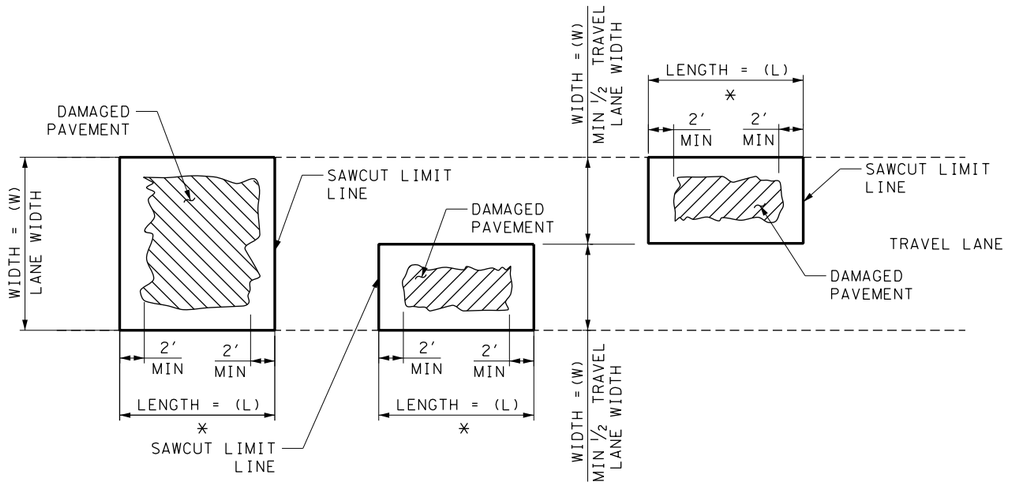
H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\03. Roadway\C_FM730_S_RHD01.dgn

NOTES:

1. REFER TO PROJECT LAYOUTS AND SIGNING AND PAVEMENT MARKING LAYOUTS FOR APPROXIMATE MILL AND OVERLAY LIMITS AT INTERSECTIONS. ACTUAL LIMITS TO BE DETERMINED & COORDINATED WITH THE ENGINEER IN THE FIELD.
2. DO NOT MILL AND OVERLAY CONCRETE INTERSECTIONS.
3. DO NOT MILL AND OVERLAY DRIVEWAYS.

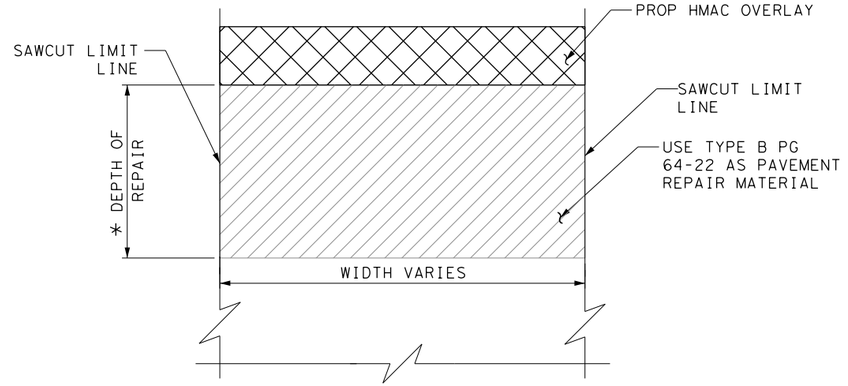


HMAC INTERSECTION DETAIL



FLEXIBLE PAVEMENT REPAIR DETAIL

* ACTUAL DIMENSIONS AND LOCATIONS TO BE INITIALLY DETERMINED BY THE CONTRACTOR AND COORDINATED WITH THE ENGINEER IN THE FIELD.



FLEXIBLE PAVEMENT REPAIR DETAIL PROFILE VIEW

N.T.S

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

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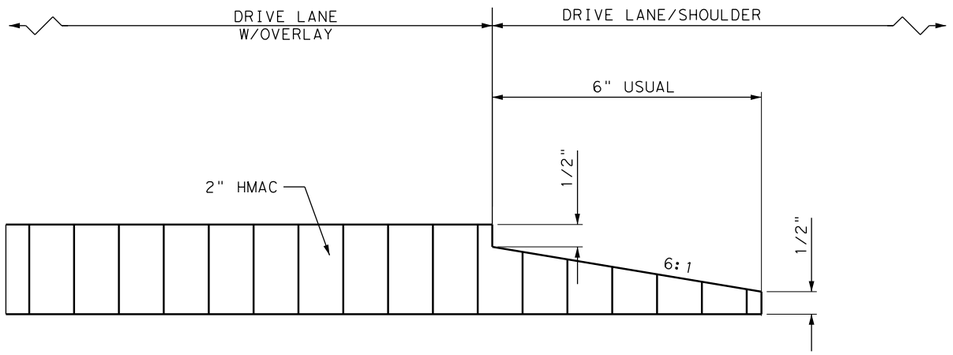
FM 730

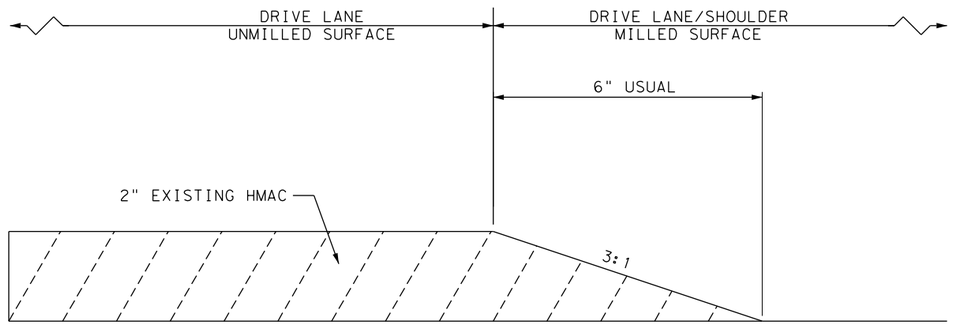
MISCELLANEOUS ROADWAY DETAILS

SHEET 1 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		64
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



EXTRUDED TAPERED LONGITUDINAL HOT MIX JOINT DETAIL



PLANED TAPERED LONGITUDINAL JOINT DETAIL

NOTES:

1. COMPACT TAPER WITH SMALL STATIC STEEL-WHEEL ROLLER OR PNEUMATIC ROLLER.
2. APPLY A UNIFORM AMOUNT OF TACK COAT TO ALL VERTICAL SURFACES PRIOR TO PAVING ADJACENT AREA.
3. APPLY TACK COAT TO WEDGE (TAPERED PORTION) WHEN CONSTRUCTED PAVEMENT HAS BEEN OPEN TO TRAFFIC FOR A SIGNIFICANT AMOUNT OF TIME.

N.T.S

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

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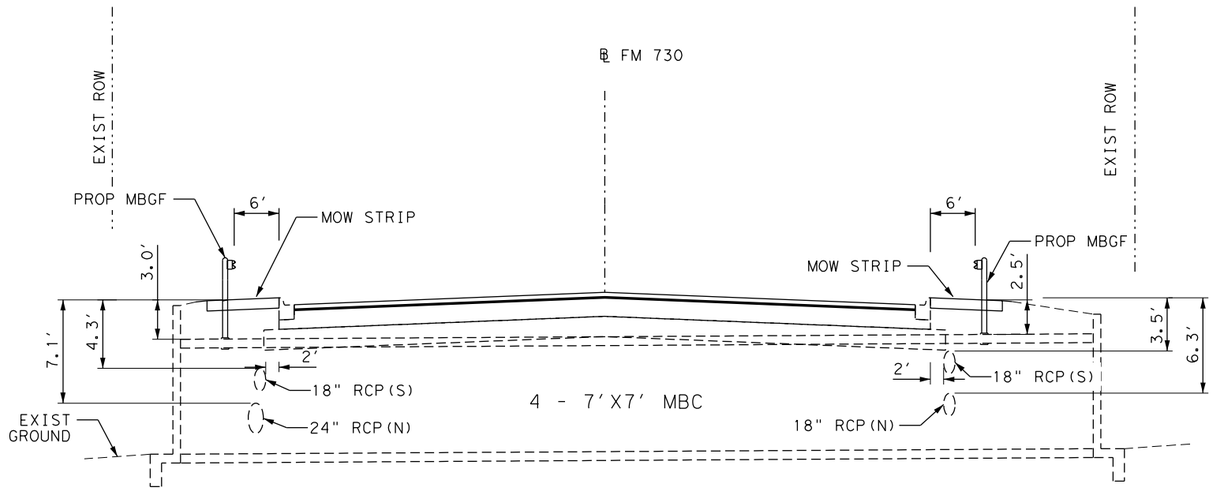
Texas Department of Transportation

FM 730

MISCELLANEOUS ROADWAY DETAILS

SHEET 2 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		65
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



MBGF AT BRIDGE CLASS CULVERT

NOTES:

1. DIMENSIONS SHOWN ARE MEASURED FROM THE BACK OF CURB.
2. CULVERT AND STORM DEPTHS AND LOCATIONS ARE APPROXIMATE AND BASED ONLY ON AS BUILTS.
3. MBGF OFFSET FROM CURB TO ENSURE NO CONFLICT WITH EXISTING STORM SEWER. IF CONTRACTOR FINDS CONFLICT, THEN PROVIDE DETAILS TO ENGINEER AT ONCE IN ORDER TO DETERMINE IF SHIFT IS REQUIRED.

N.T.S

STATE OF TEXAS
LAURA C. FULLER
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5/23/2023

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MBGF DETAIL

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		66
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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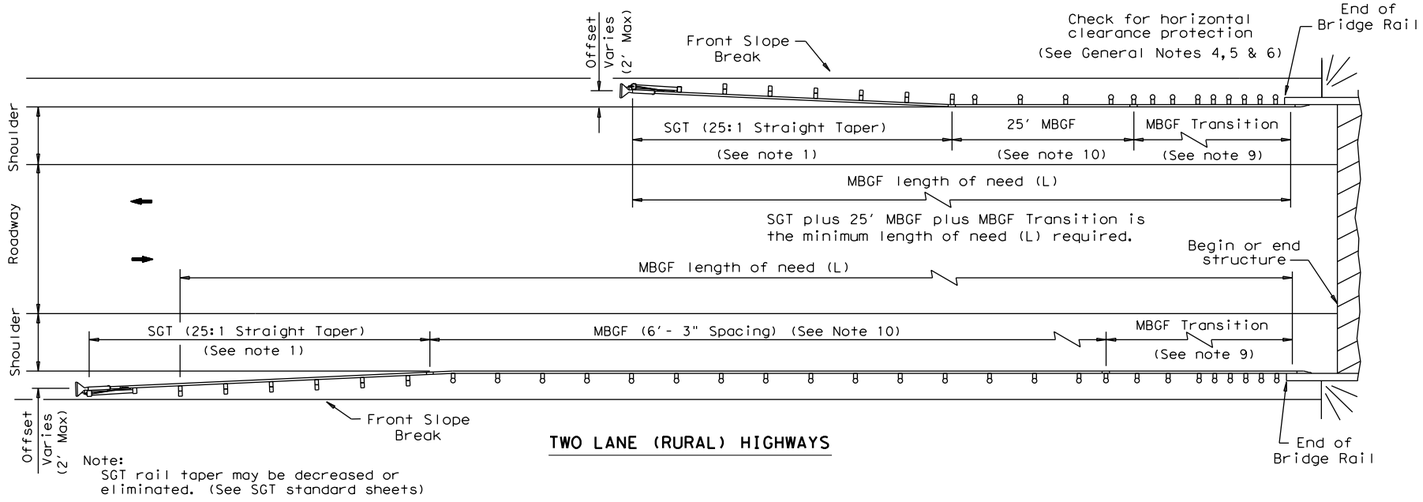
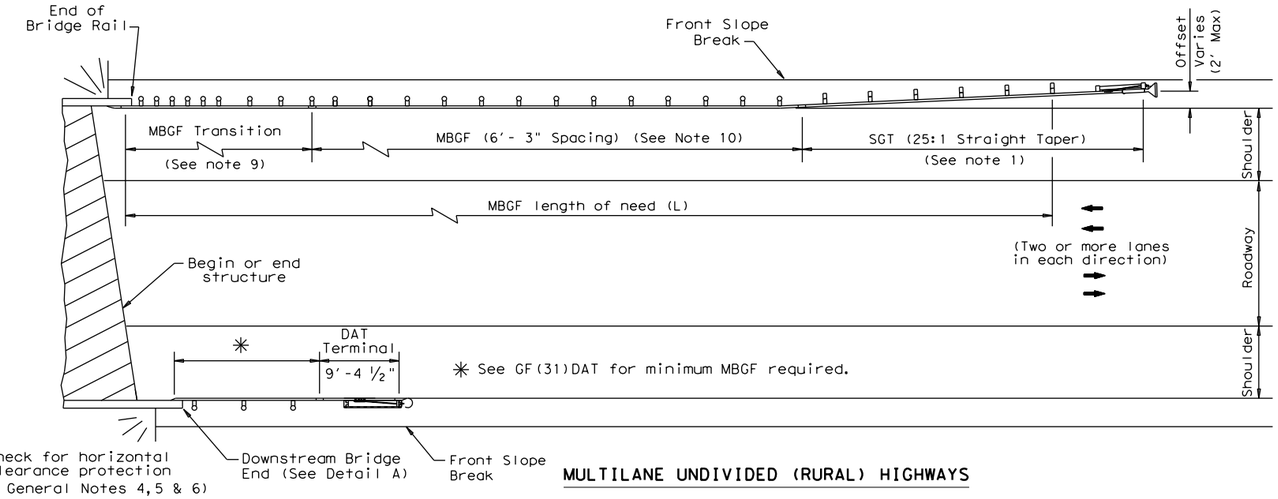
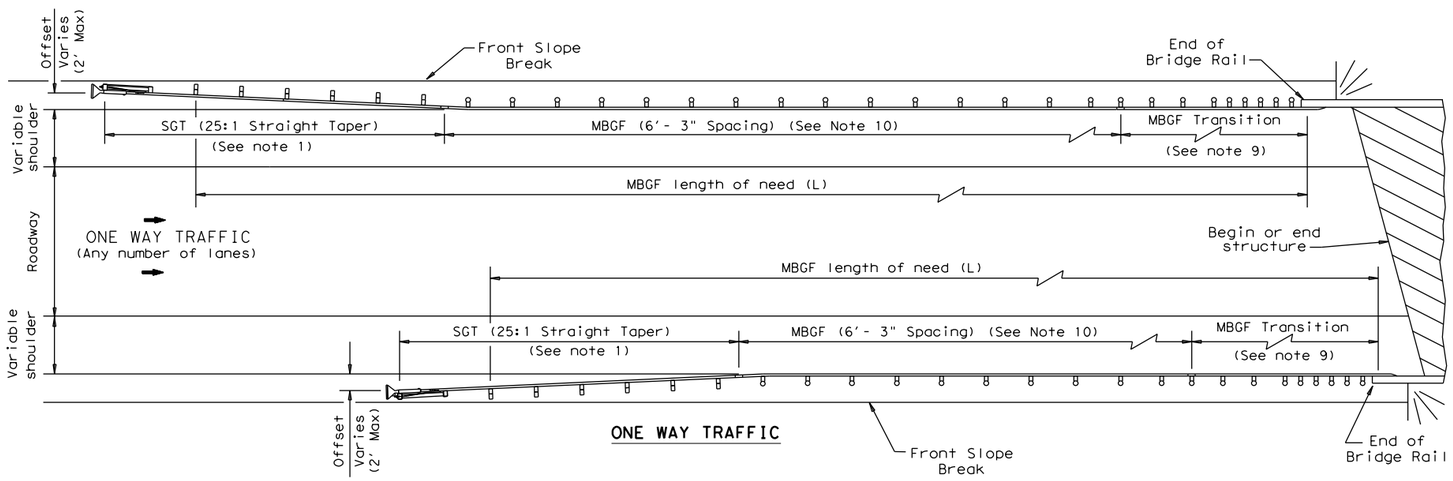


TWO LANE (RURAL) HIGHWAYS

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



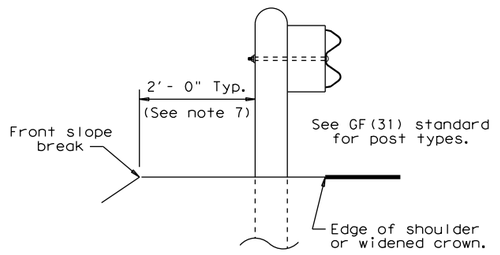
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



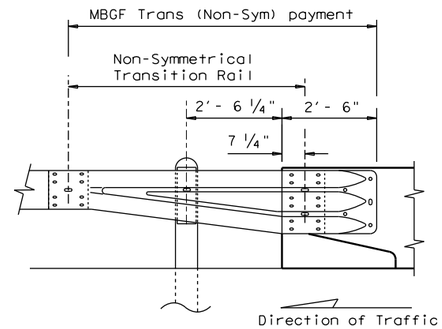
ONE WAY TRAFFIC

GENERAL NOTES

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



TYPICAL CROSS SECTION AT MBGF



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

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation

Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		67

DATE: 5/23/2023
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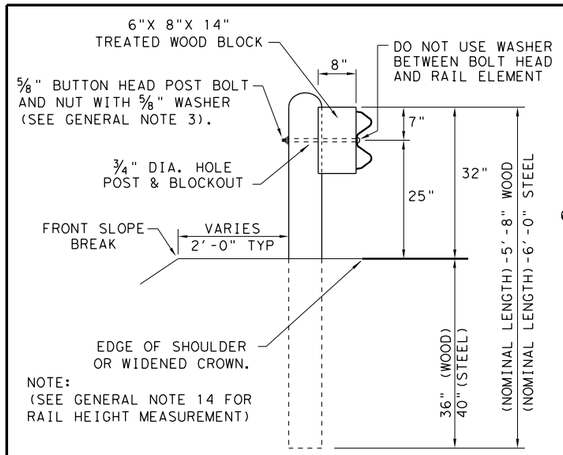
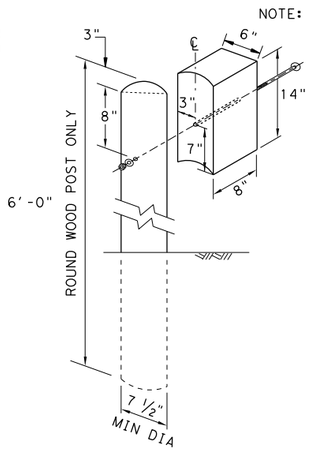
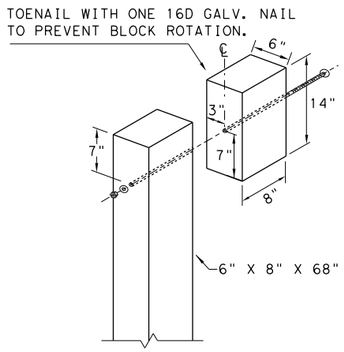


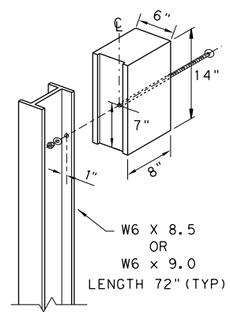
TYPICAL POST PLACEMENT



WOOD BLOCK TO
ROUND WOOD POST

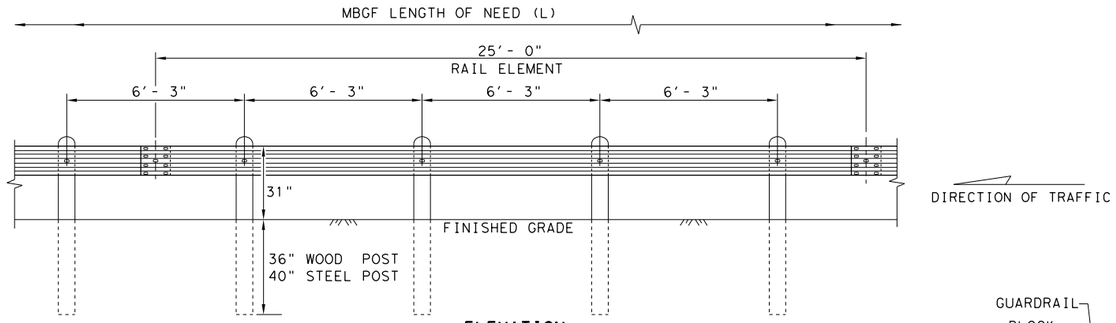


WOOD BLOCK TO
RECTANGULAR WOOD POST



ROUTED WOOD BLOCK
TO I-BEAM STEEL POST

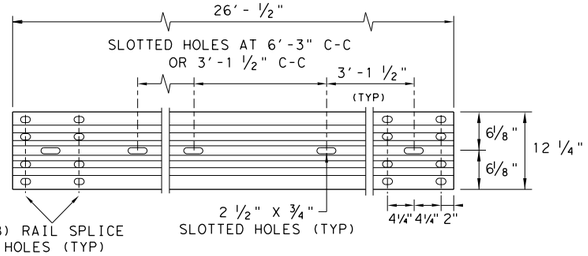
NOTE: ✻✻ "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



DIRECTION OF TRAFFIC

ELEVATION
MID-SPAN RAIL SPLICE

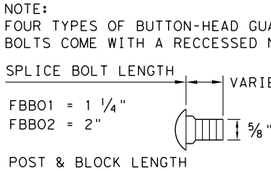
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

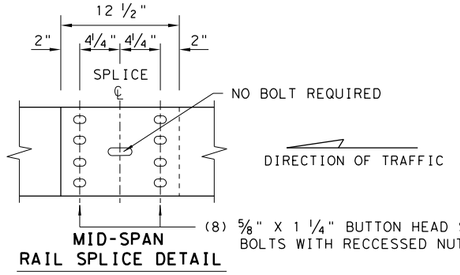
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

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



BUTTON HEAD BOLT

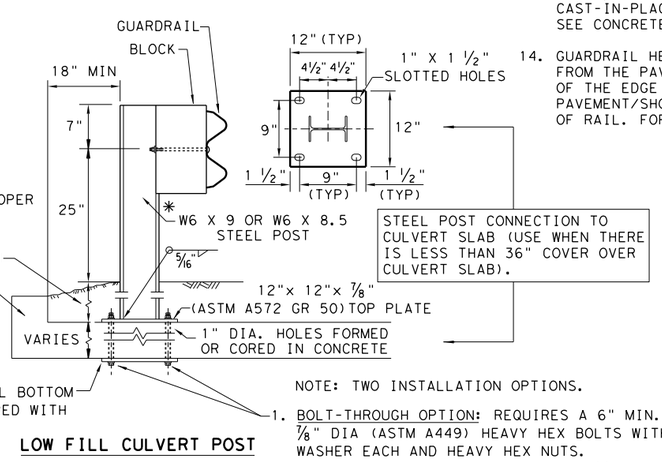
NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



DIRECTION OF TRAFFIC

MID-SPAN
RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
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REVISIONS	0312	05	031,ETC.	FM 730	
	DIST	COUNTY		SHEET NO.	
	FTW	TARRANT		68	

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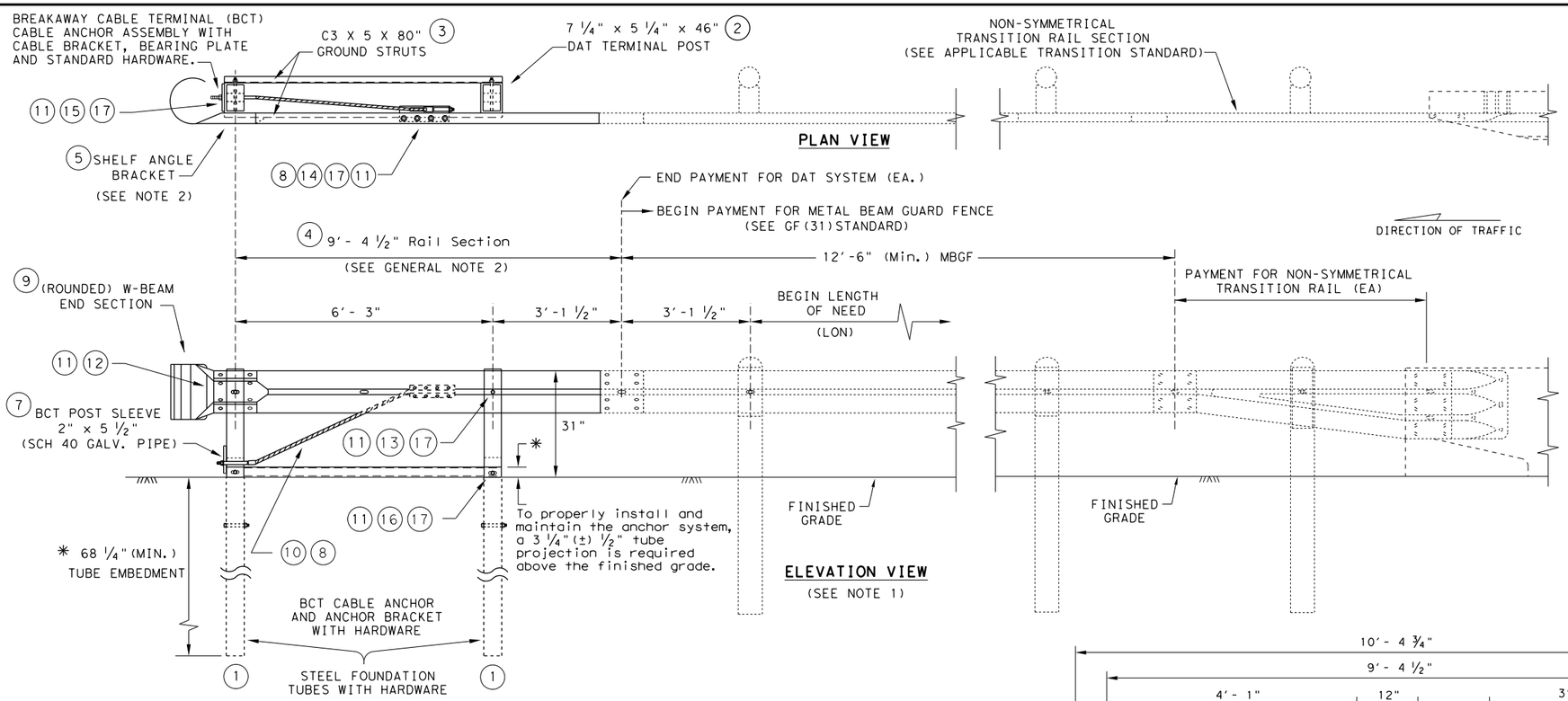


DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

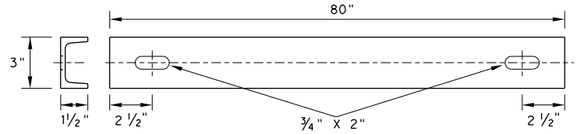
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN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

MOW STRIP INSTALLATION

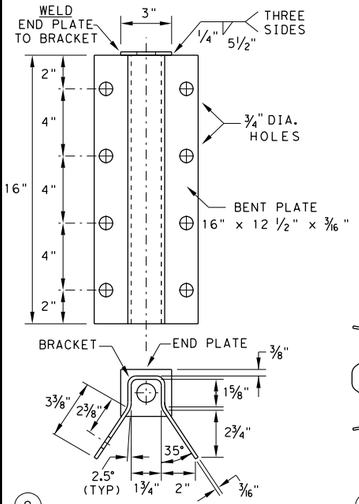
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

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

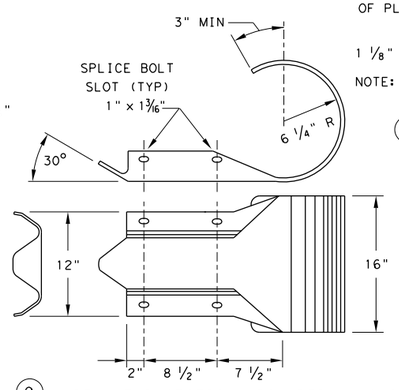
(4) TERMINAL RAIL ELEMENT FOR DAT



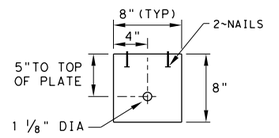
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

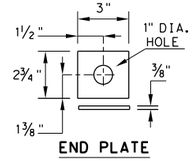


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

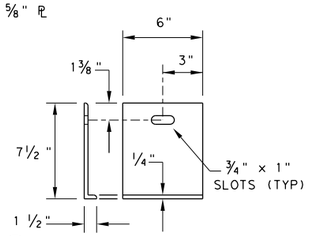


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

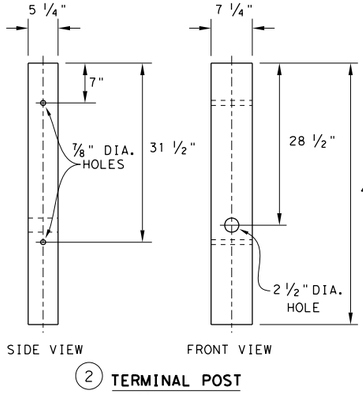
(6) BEARING PLATE
8"x 8"x 5/8" PL



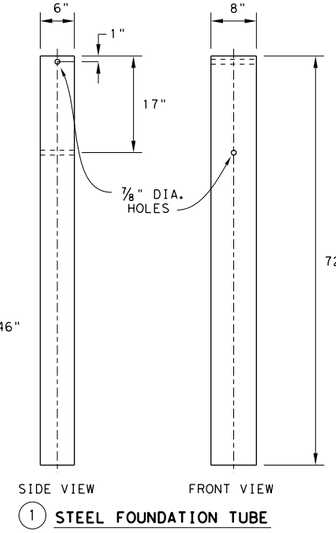
END PLATE



(5) SHELF ANGLE BRACKET



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



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

Texas Department of Transportation

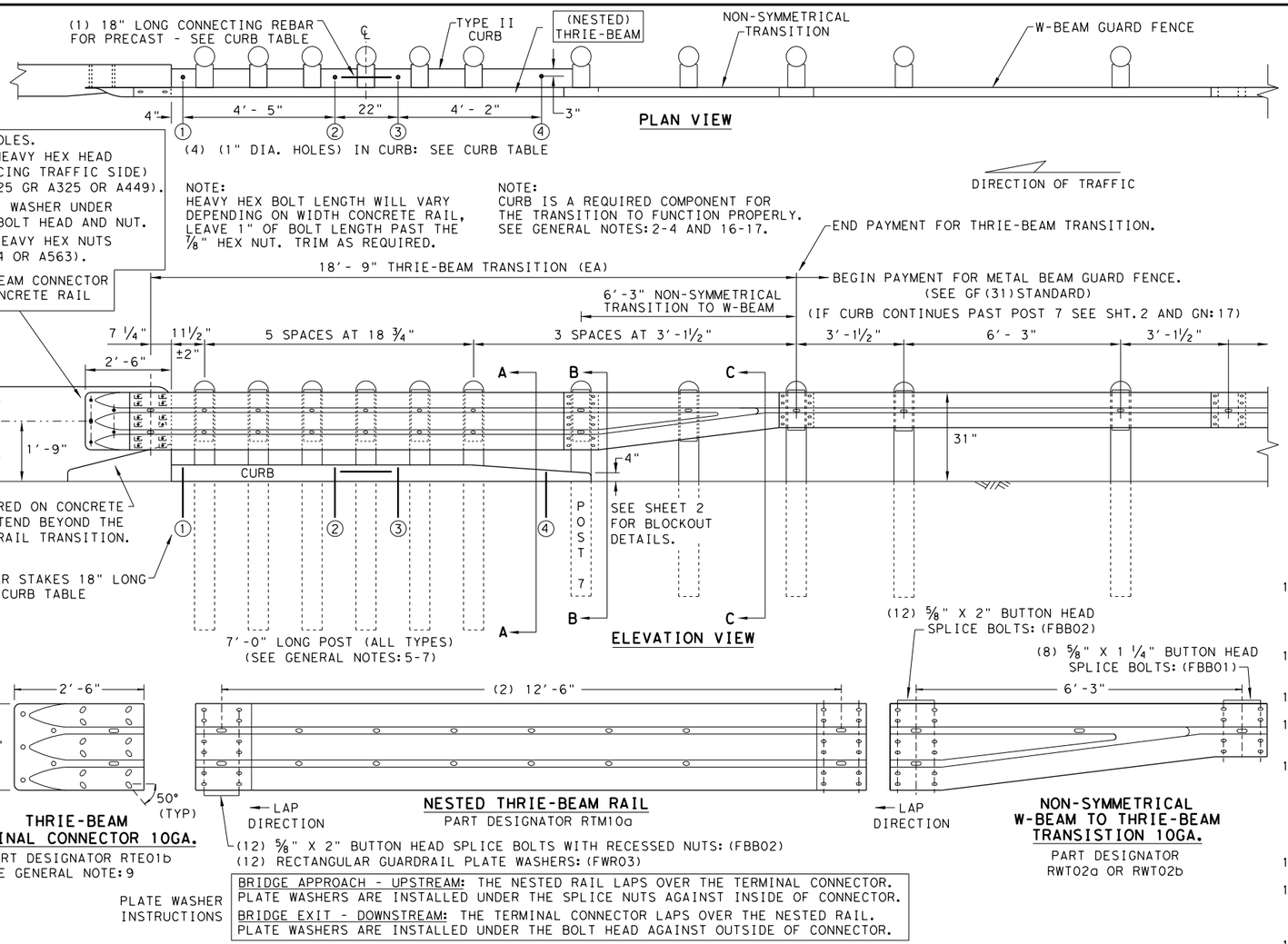
Design Division Standard

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

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		69

DATE: 5/23/2023
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\03. Roadway\Standards\gf31tr1320(1).dgn



GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

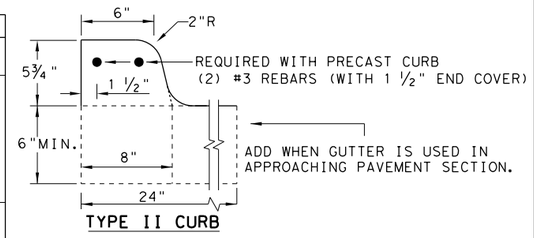
THRIE-BEAM TERMINAL - CURB TABLE

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

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

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

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

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

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

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
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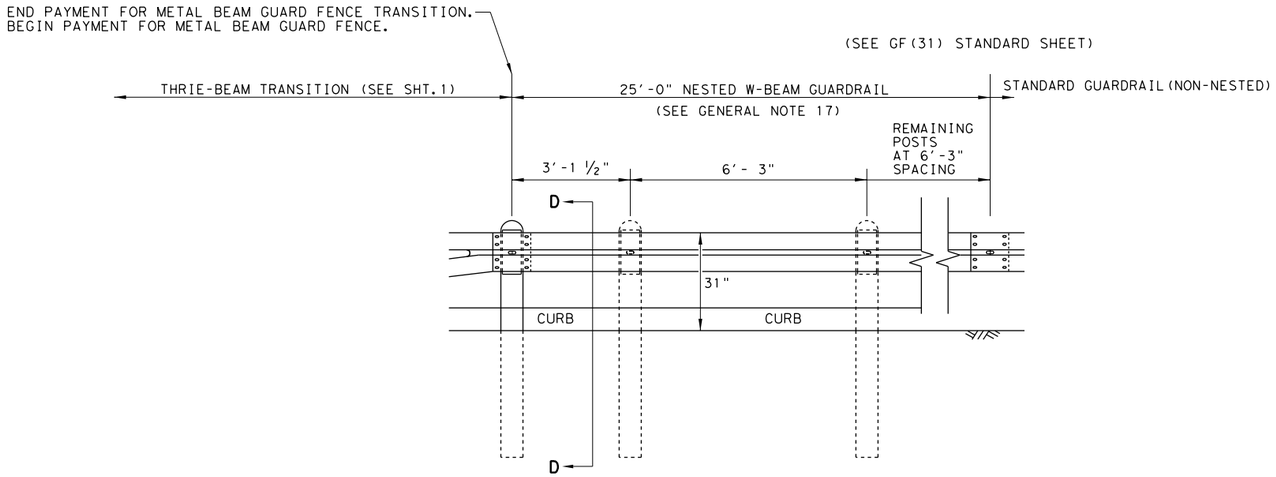
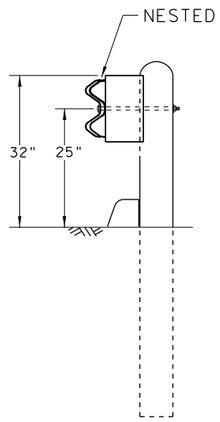
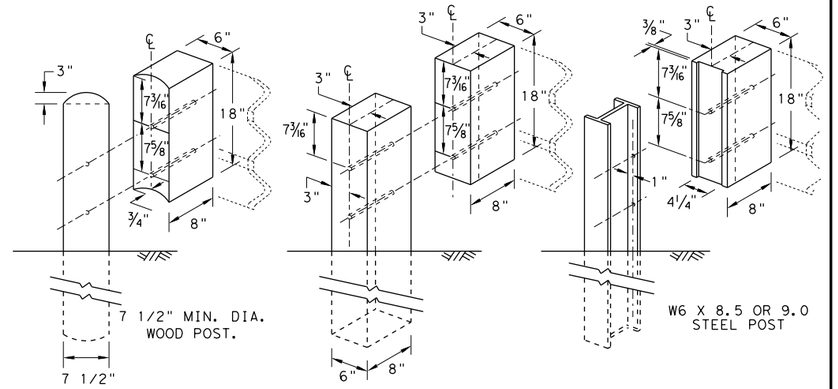
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0312	05	031,ETC.	FM 730	
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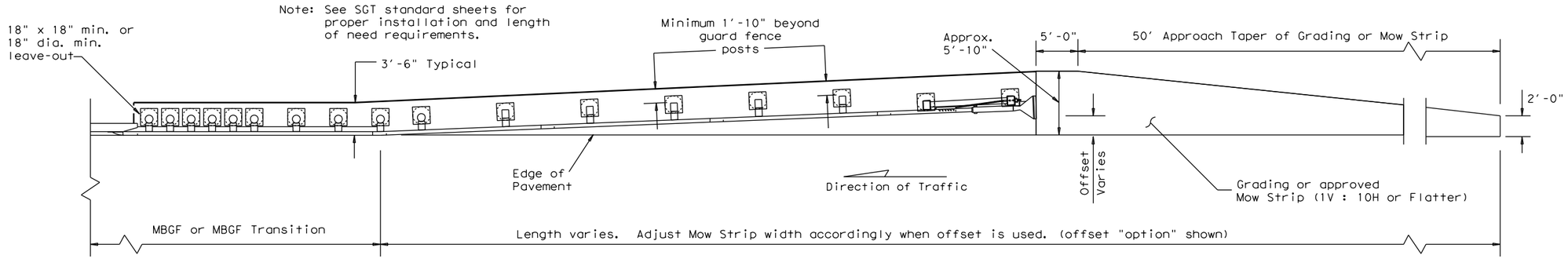
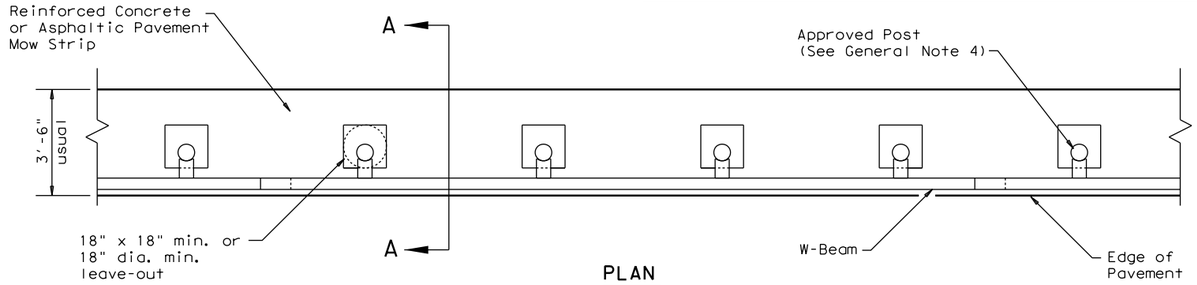


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

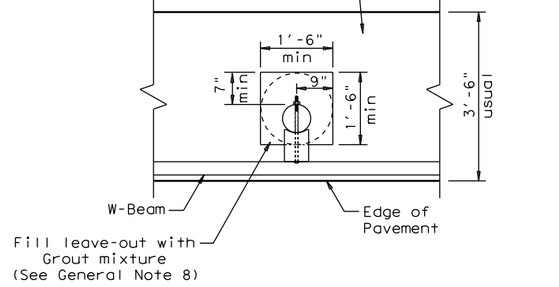


PLAN

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

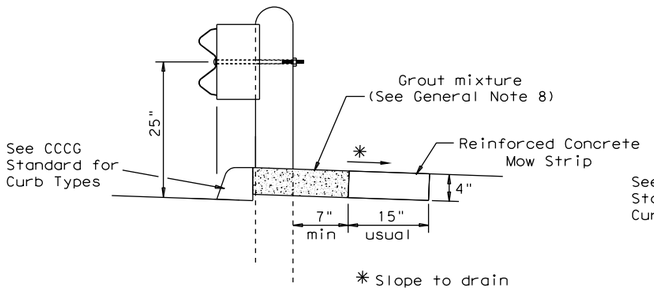
SECTION A-A

Typical



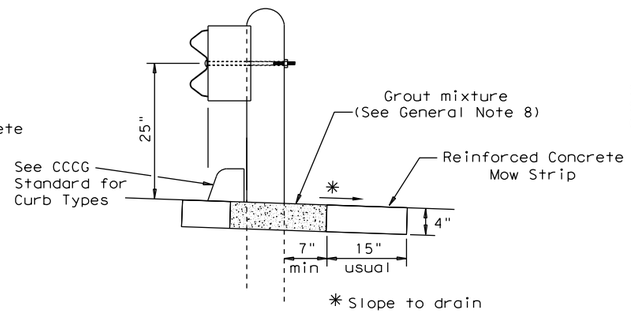
MOW STRIP DETAIL

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



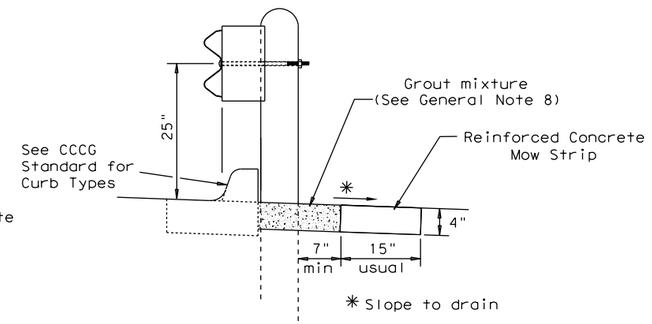
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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REVISIONS	0312	05	031,ETC.	FM 730
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	FTW	TARRANT		72

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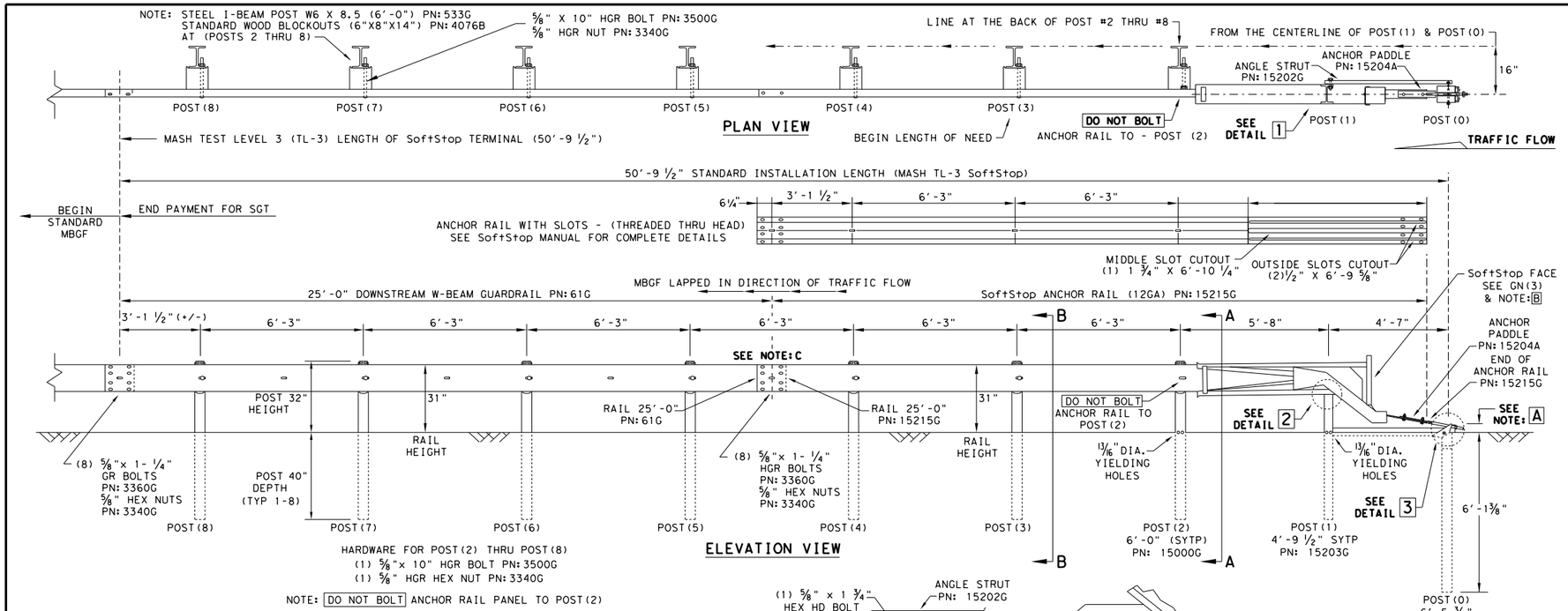

GENERAL NOTES

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

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

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

Texas Department of Transportation

Design Division Standard

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

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		73

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(SEE GN NOTE 15)
STANDARD 31" MBGF

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

FIELD-SIDE
(RAIL 3)

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

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

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

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

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

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

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

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

PLAN VIEW

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

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

INSTALLATION LENGTH 55'- ½"

49'-8 9/16"

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

RAIL
HEIGHT
31"

ARROWS

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

DETAIL (D)

CABLES

FINISHED
GRADE

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

32-¼"

68-⅛"

ITEM (10)
CABLE
ASSEMBLY

ITEM (2)
GROUNDSTRUT

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

ITEM (4)
I-BEAM
W6 X 9

NO BLOCKOUT
AT (POST 1)

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

ELEVATION VIEW

**SOIL
ANCHOR POST**
ITEM (1)

A

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

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

TSS PANEL AND RSS PLATE

DETAIL (D)

HEAD
HEIGHT
32-¼"

TOP OF POST

31-⅞"

FINISHED
GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

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

**SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9**

SECTION VIEW A-A

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

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

ITEM (24)

ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

✳ ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

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

7 5/16"

2 1/8"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

GENERAL NOTES

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

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

✳ TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

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

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

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

2'-0" MAX.
RAIL OFFSET

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

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

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

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

Texas Department of Transportation

Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		74

DATE: 5/23/2023
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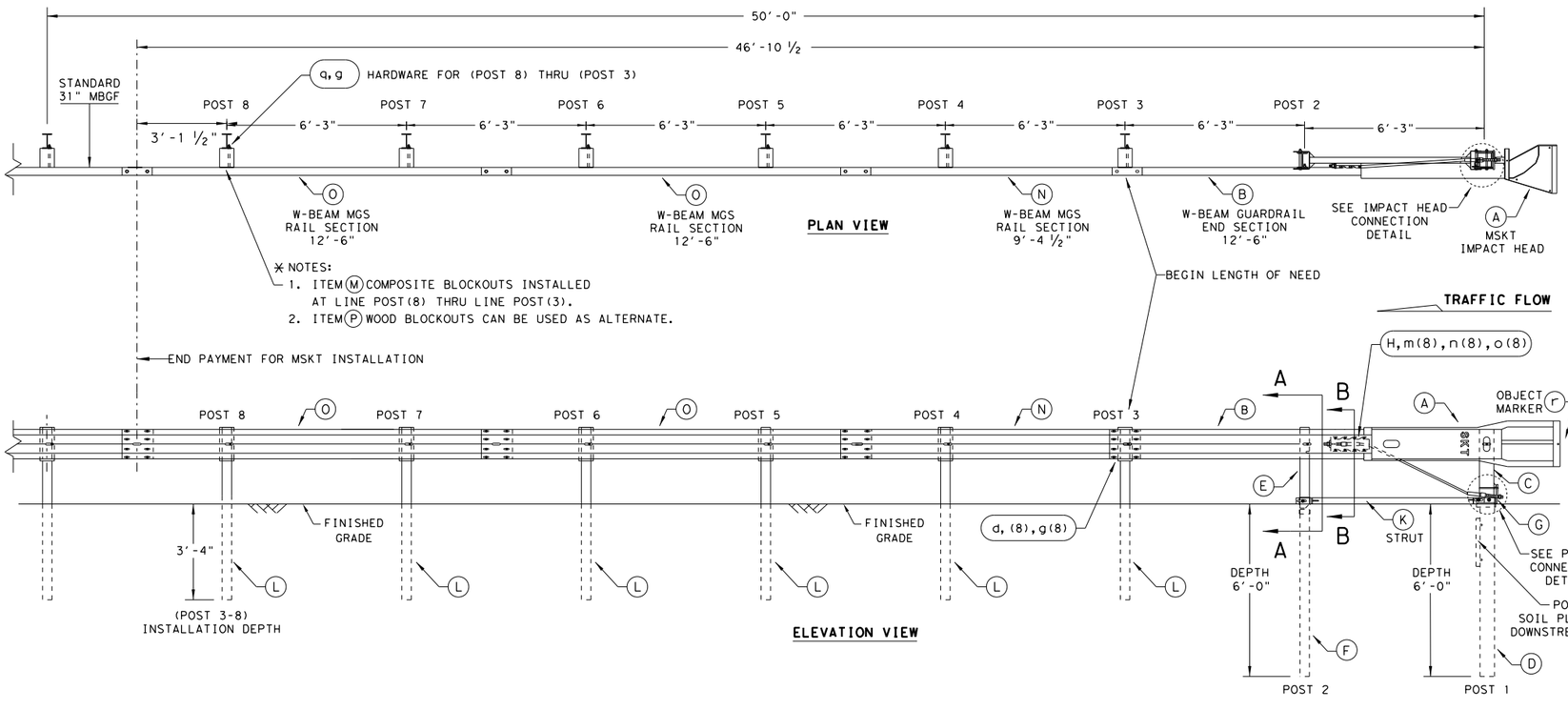


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

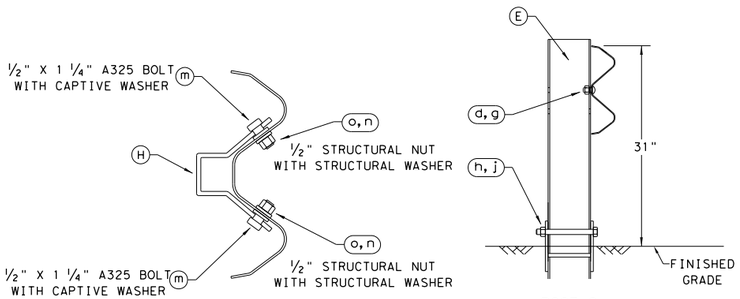
GENERAL NOTES

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

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

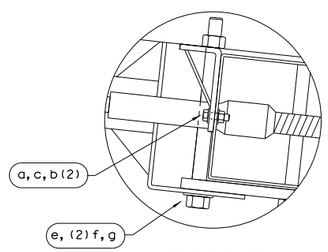
SEE NOTES: ✳

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

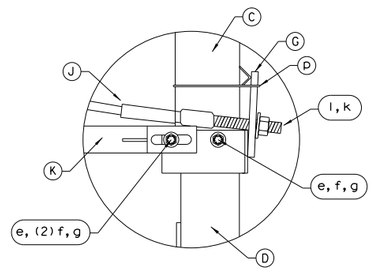


SECTION B-B
ANCHOR BRACKET

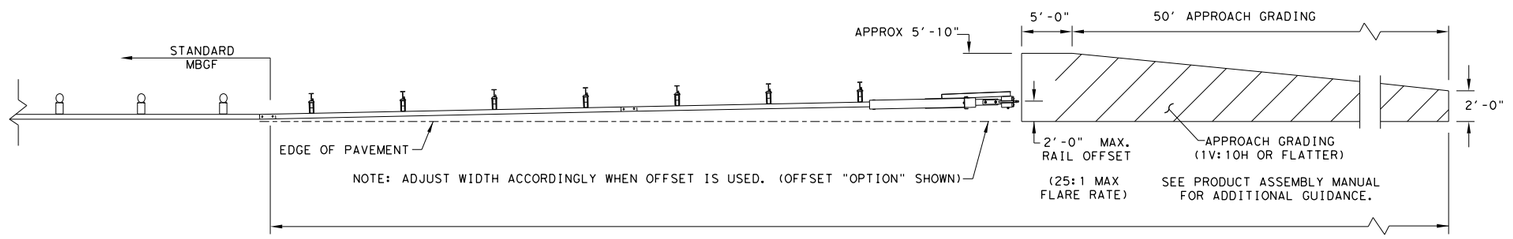
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

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

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

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT(12S)31-18

FILE: sgt12s3118.dgn	DN:TxDOT	CK:KM	DW:VP	CK:CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
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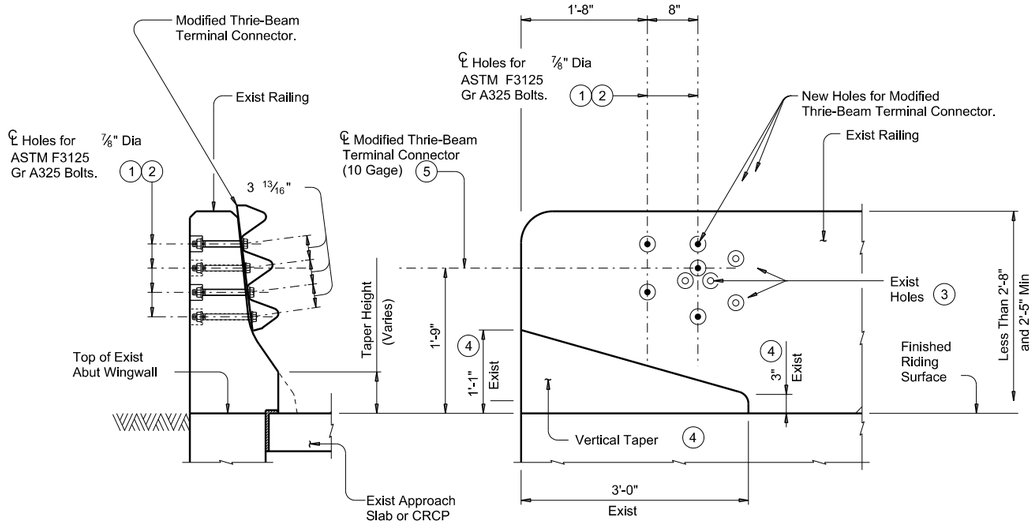


SECTION ELEVATION

TERMINAL CONNECTION ON EXISTING RAIL

(1) ℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Holes and recesses must be core drilled. Percussion drilling is not permitted. Concrete spalls in rail exceeding ½" from edge of holes will be patched in accordance with Item 429, "Concrete Structure Repair" at the contractor's expense. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail.

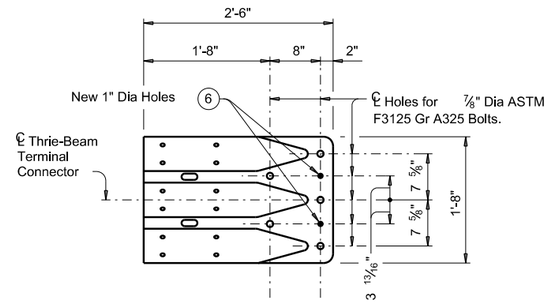
(2) ℄ 5 ~ ⅞" Dia F3125 Gr A325 Bolts with two 1 ¾" O.D. washers. Place washer under each head and nut. The 5 Terminal Connection Bolts must be tightened in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Bolts must be cut off after installation so as to extend no more than ¾" beyond nut. End of cut-off bolt must be painted with two coats of zinc-rich paint conforming to the Item "Galvanizing".

(3) Existing anchor bolt holes in rail that can not be utilized and are within 3" of a new bolt hole must be filled with an epoxy grout prior to coring new holes.

(4) If vertical taper is not present, then a vertical taper must be field cut to limits shown when the existing rail measurement is 2'-8". Rail measurement should be taken from behind rail as to not include overlay if present. If existing rail measurement is 2'-10" and existing rail does not have vertical taper, then add 2" to vertical dimensions and field cut vertical taper. Any exposed reinforcing steel from field cut taper must be ground flush and painted with two coats of zinc-rich paint conforming to the Item "Galvanizing".

(5) 10 Gage Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Metal Beam Guard Fence Transitions must be attached to the bridge rail and extended along the embankment unless otherwise shown in the plans.

(6) Terminal Connector must be modified for the Terminal Connection on Existing Rail with Overlay with two new 1" Dia holes as shown. Top new 1" Dia hole is used in lieu of existing top hole in terminal connector. All other existing holes in terminal connector must be used. Additional hole on bottom of terminal connector is used for other side for opposite hand. Damage to galvanization caused by this modification must be painted with two coats of zinc-rich paint conforming to the Item "Galvanizing".



MODIFIED

THRIE-BEAM TERMINAL CONNECTORS (5)

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

Remove any MBGF (W-beam) and attachment hardware, from the face of rail if present, prior to installation of new MBGF Transition. Dispose of these materials as directed by the Engineer. Plugging of exposed existing bolt holes is not necessary except as stated herein or otherwise indicated on the plans. This work is considered subsidiary to the pertinent bid items.

If vertical taper is not present, then a vertical taper must be field cut to limits shown and debris removed.

Attach the MBGF Transition to the existing rail and extend along the embankment using the Thrie-Beam Terminal Connection unless shown otherwise on the plans. Splice the Approach Guard Rail and the Terminal Connection with the normal 12 connection bolts. Refer to Metal Beam Guard Fence detail sheets for additional details and information not shown herein.

MATERIAL NOTES:

Galvanize all steel components unless otherwise noted.

GENERAL NOTES:

These details are shown for retrofitting MBGF transitions to existing rails only and not used for new construction.

Shop drawings are not required for this installation.

Materials, fabrication and installation of this assembly are to be included in the price bid for "Metal Beam Guard Fence."

STATE OF TEXAS
DAVID C. REID
127517
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

Texas Department of Transportation

Bridge Division Standard

T5/T501/T502 TRANSITION RETROFIT GUIDE

(MOD)

T5/T501/T502TR (MOD)

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©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
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	FTW	TARRANT		76

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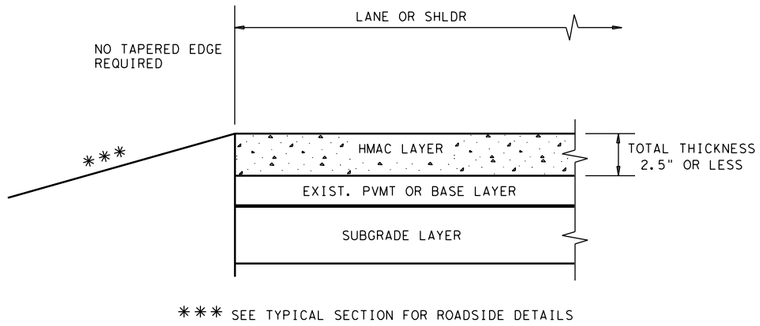
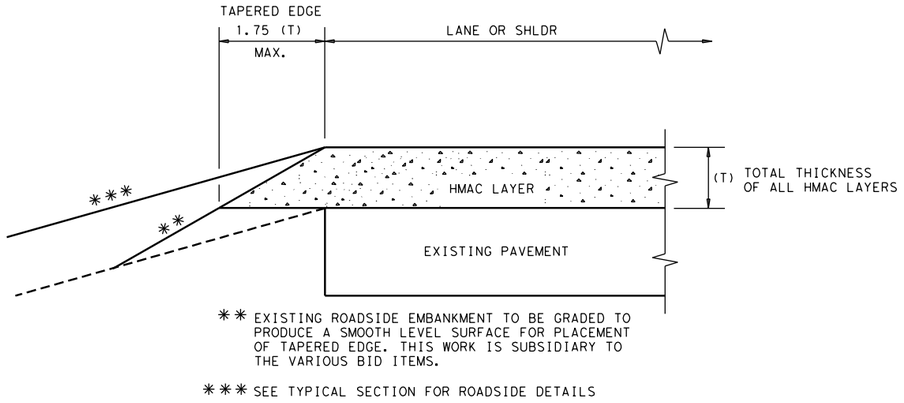


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

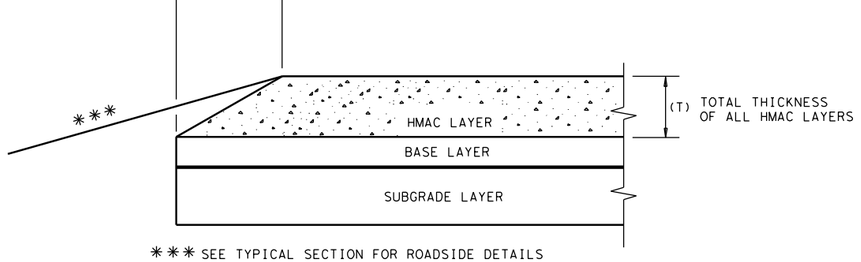
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

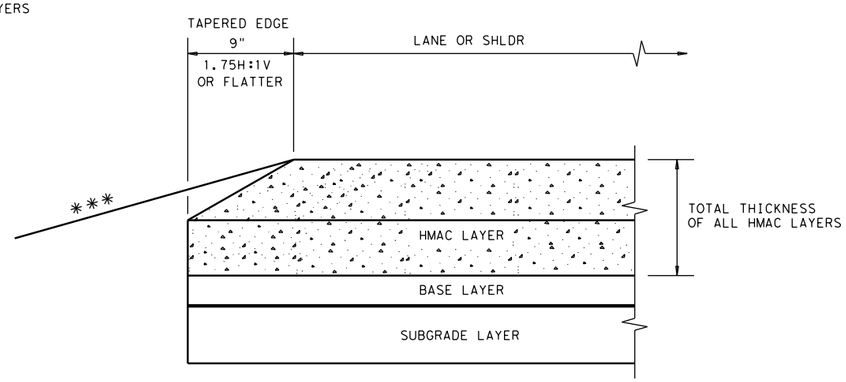
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

Texas Department of Transportation | Design Division Standard

TAPERED EDGE DETAILS
HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
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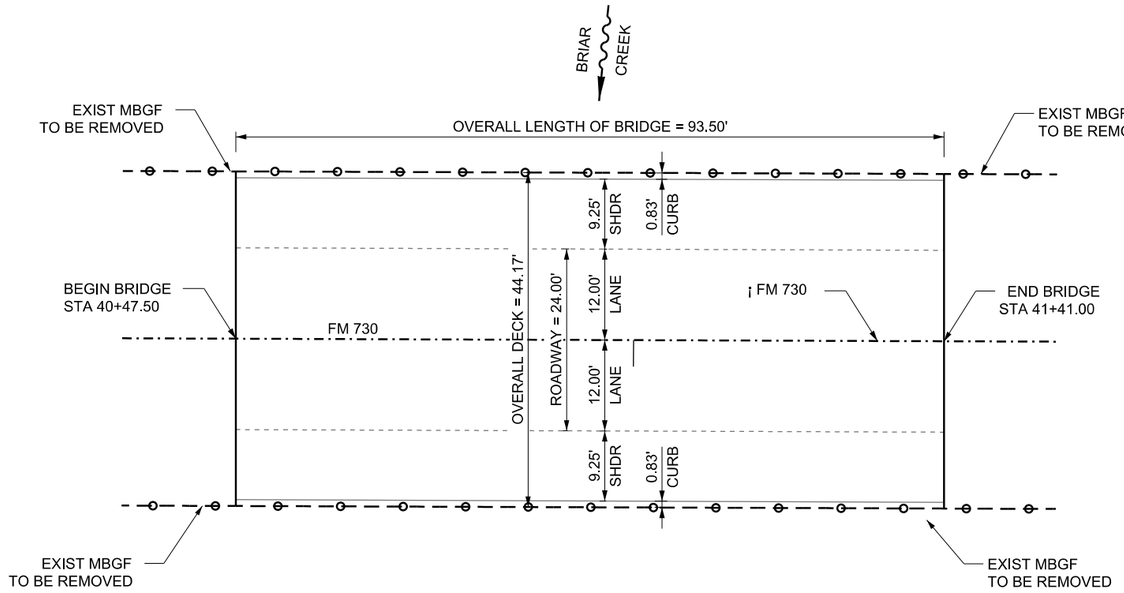
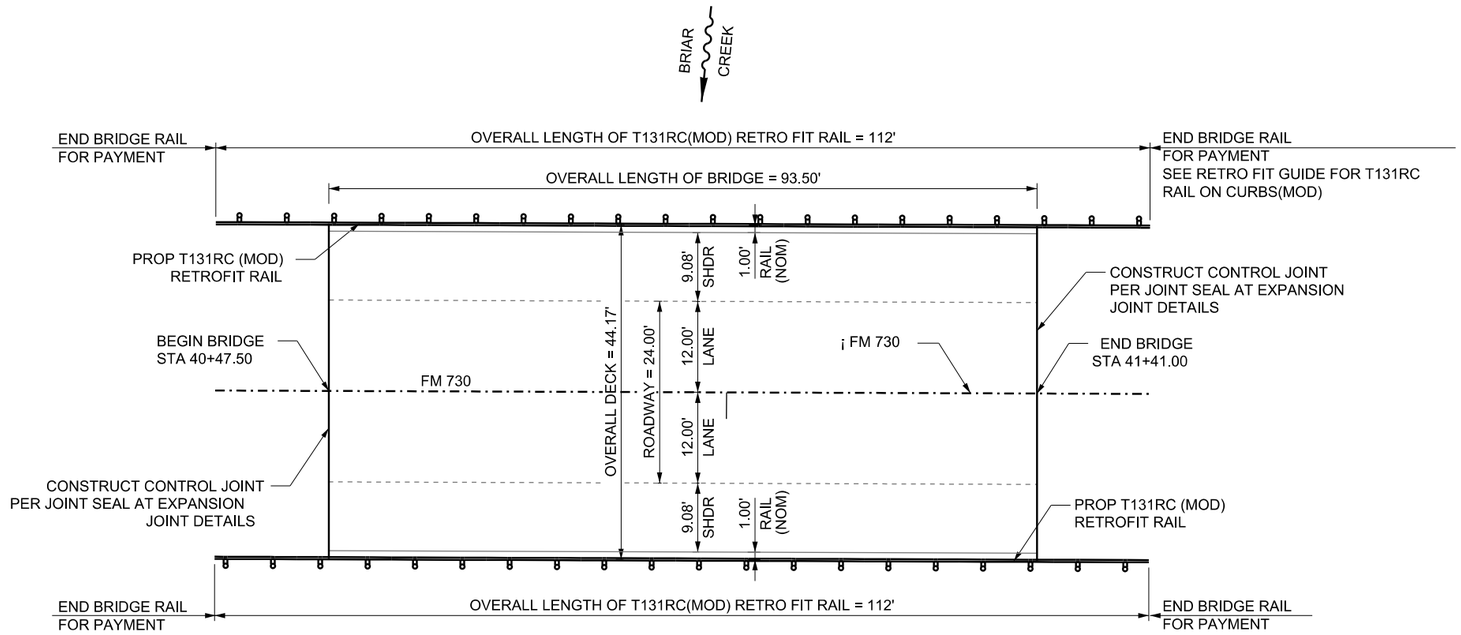
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		77



EXISTING PLAN

NOTES:

1. REFER TO ROADWAY SHEETS FOR RAIL LIMITS, MILL AND OVERLAY INFORMATION.
2. BRIDGE START AND END STATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY LIMITS PRIOR TO COMMENCING CONSTRUCTION.
3. FOR RAIL RETROFIT INFORMATION SEE "RETROFIT GUIDE FOR T131RC RAIL ON CURBS (MOD)".
4. SEE PLAN SET FOR OTHER INFORMATION AS NEEDED FOR CONSTRUCTION COMPLETION.
5. PRIOR TO BEGINNING MILLING OPERATIONS IN THE VICINITY OF THE BRIDGE, CONTRACTOR WILL DETERMINE EXISTING OVERLAY THICKNESS ON BRIDGE. LABOR AND EQUIPMENT REQUIRED TO DETERMINE THICKNESS WILL NOT BE PAID DIRECTLY, BUT BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS. IF EXISTING OVERLAY IS LESS THAN 2" THICK, THE THICKNESS OF THE APPLIED OVERLAY ON THE EXISTING BRIDGE DECK WILL BE ADJUSTED TO MATCH THE EXISTING OVERLAY THICKNESS. THE LAST 1/2" OF EXISTING ASPHALT MILLED WILL BE PAID UNDER ITEM 354 3013.
6. PER ITEM 354-3.2, TAKE PRECAUTION TO AVOID DAMAGE TO EXISTING BRIDGE DECK AND EXPANSION JOINTS. REPAIR ANY DAMAGE AS APPROVED. THIS WORK WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE PERFORMED AT THE CONTRACTOR'S EXPENSE PRIOR TO STARTING OVERLAY OPERATIONS.
7. AFTER COMPLETING OVERLAY OPERATIONS, CONSTRUCT CONTROL JOINT SEAL AT BRIDGE ENDS PER THE JOINT SEAL AT EXPANSION JOINT DETAILS.



PROPOSED PLAN

0 10' 20'

SCALE: 1" = 20'

STATE OF TEXAS
DAVID C. REID
127517
LICENSED PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

consor F-12040

Texas Department of Transportation

FM 730

BRIDGE RAIL RETROFIT & OVERLAY DETAILS

BRIAR CREEK
02-220-0312-05-039

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			FM 730
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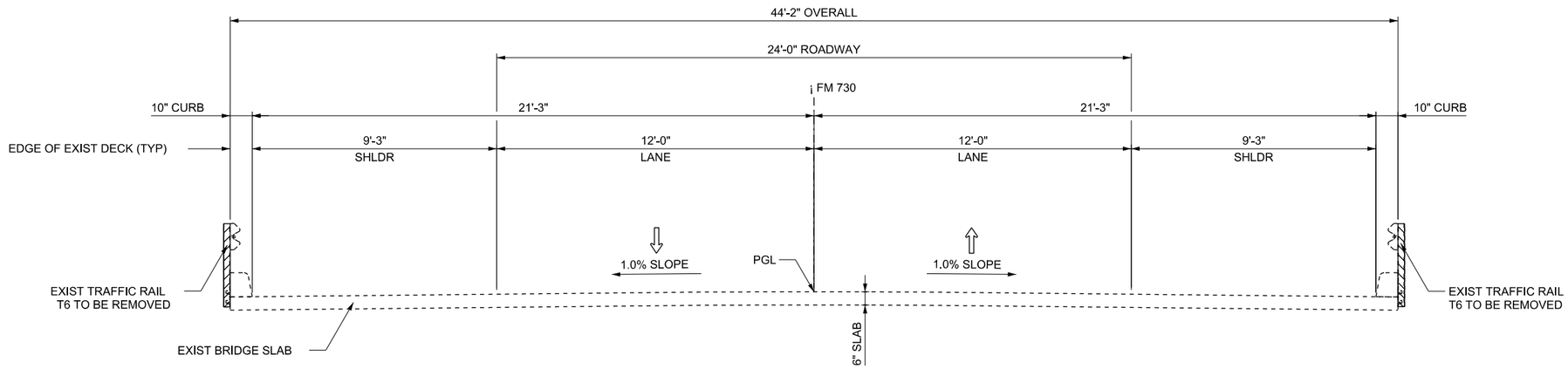
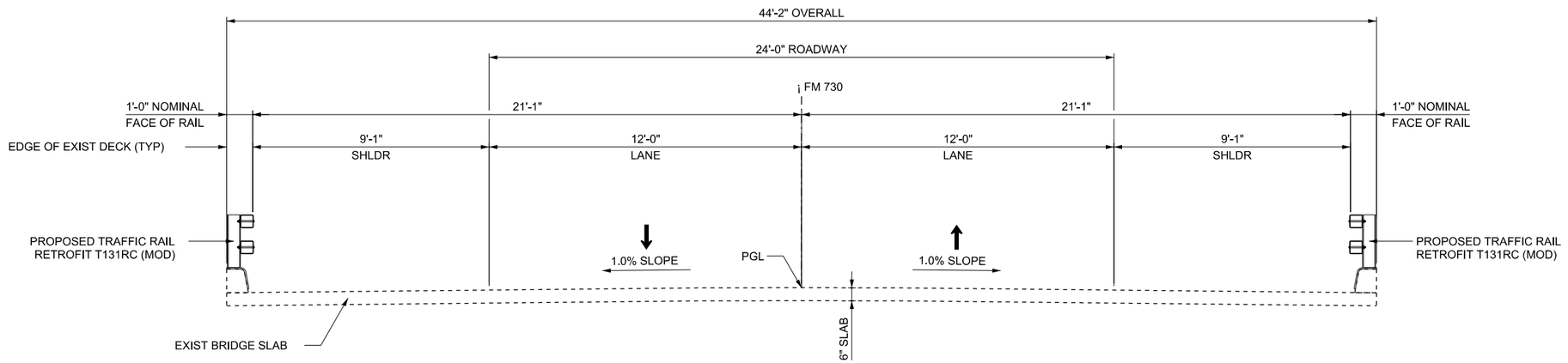
FTW	TARRANT	0312	05	031, ETC.	78



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

0 2.5' 5'

SCALE: 1" = 5'

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Texas Department of Transportation

FM 730

BRIDGE RAIL RETROFIT SECTION

BRIAR CREEK
02-220-0312-05-039

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			FM 730
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0312	05	031, ETC.	79

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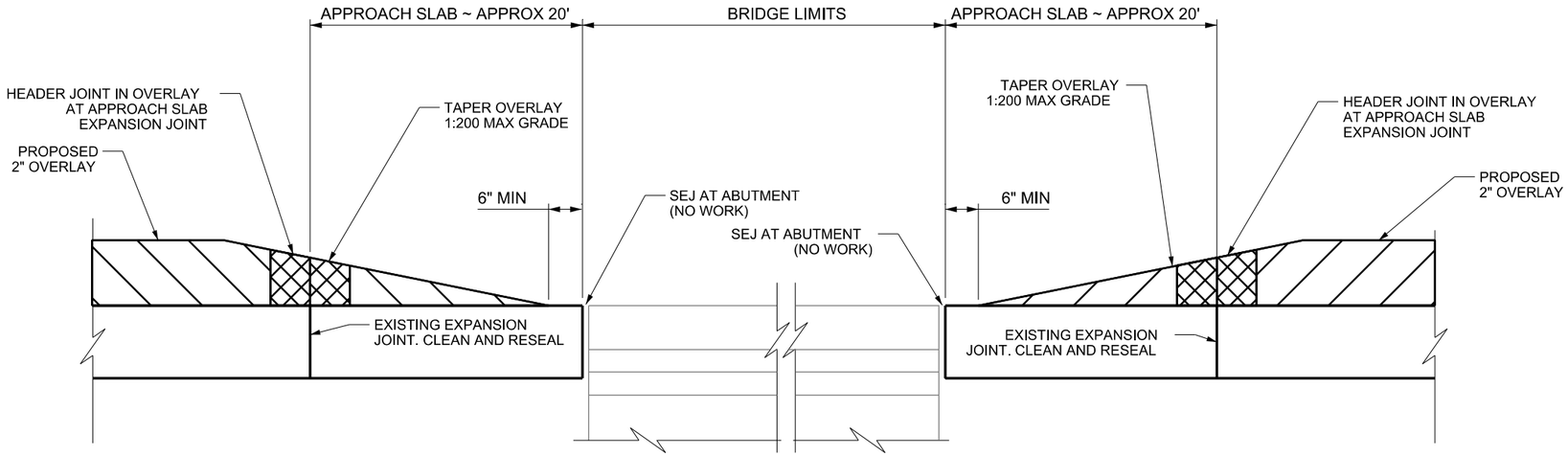
5/23/2023

5/23/2023 8:09:18 AM H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\07. Bridge\C_FM730_S_BBT01.dgn

NOTES:

1. ITEM 354-3.2: TAKE PRECAUTION TO AVOID DAMAGE TO EXIST BRIDGE DECKS AND EXPANSION JOINTS. REPAIR ANY DAMAGE TO THE BRIDGE DECKS AS APPROVED. THIS WORK WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE PERFORMED AT THE CONTRACTOR'S EXPENSE.

2. REPAIR AND REPLACE ALL EXPANSION JOINTS AT ENDS OF APPROACH SLABS IN ACCORDANCE WITH "JOINT SEAL AT EXPANSION JOINTS" SHEET.

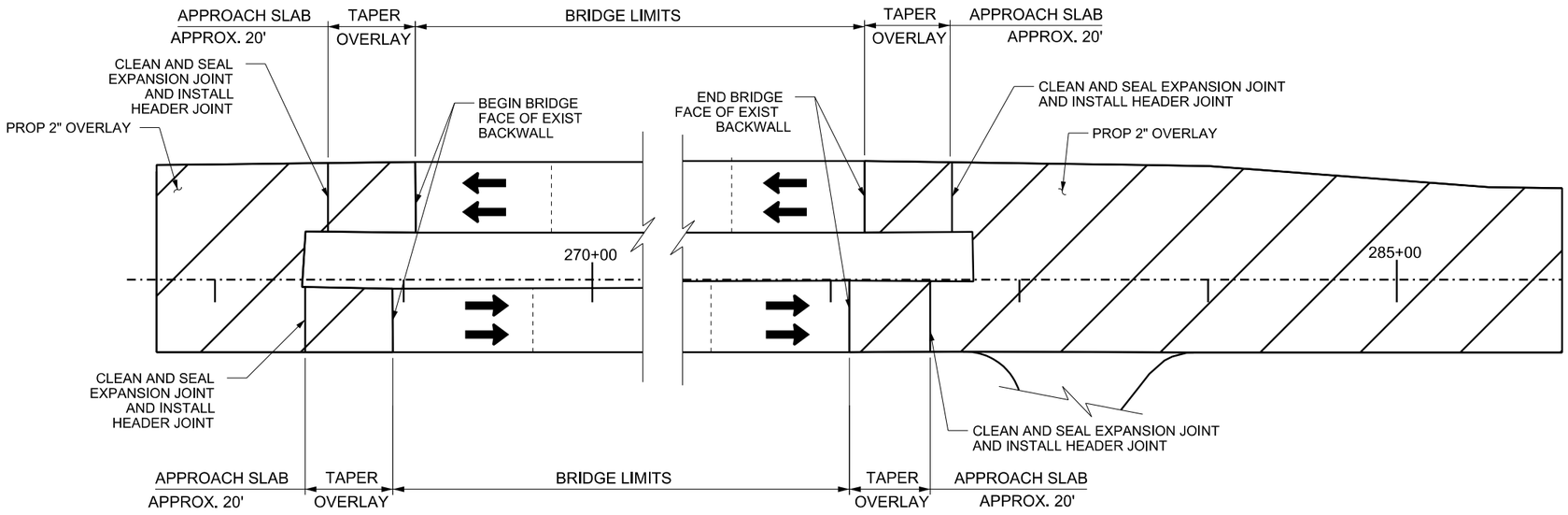


OVERLAY AND JOINT REPAIR AT APPROACH SLABS

LEGEND

OVERLAY (2")

HEADER JOINT MATERIAL



WALNUT CREEK BRIDGE

SCALE: N.T.S.

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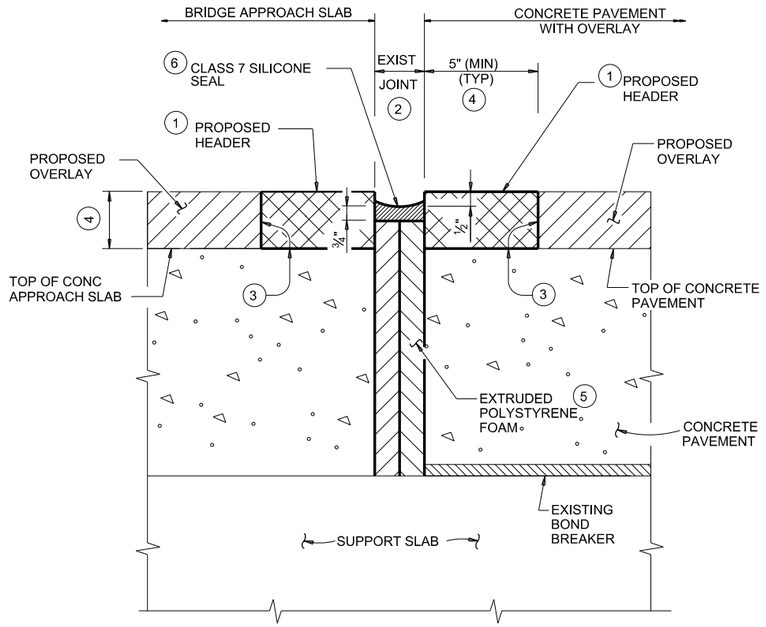
BRIDGE REPAIR DETAILS

WALNUT CREEK
02-220-0312-05-050
02-220-0312-05-051

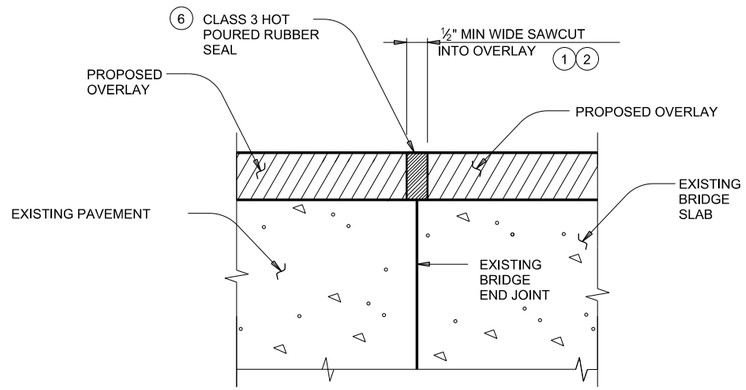
SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			FM 730
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0312	05	031, ETC.	80



HEADER TYPE EXPANSION JOINT AT APPROACH SLABS

CLEANING OF EXISTING JOINT PAID FOR AS ITEM 438-6010
HEADER AND JOINT SEAL PAID FOR AS ITEMS 454-6008
(NTS)



EXPANSION JOINTS AT BRIAR CREEK

SAWCUT AND POUR SEAL AFTER COMPLETION OF OVERLAY
PAID FOR AS ITEM 438-6002

NOTES - AFTER EXISTING OVERLAY IS REMOVED:

1. CLEAN JOINT OF ALL BITUMINOUS MATERIALS, DIRT, GREASE, AND ALL OTHER DELETERIOUS MATERIALS. JOINT OPENINGS WILL BE CLEANED OF ALL OLD EXPANSION MATERIALS AND DEVICES IN ACCORDANCE WITH ITEM 438.
2. REPAIR ANY SIGNIFICANT SPALLED OR CRACKED AREAS, AS DETERMINED BY THE ENGINEER, WITH AN APPROVED CONCRETE REPAIR MATERIAL. ANY CONCRETE REPAIR WILL BE IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT BRIDGE DIVISION "CONCRETE REPAIR MANUAL". NO ADDITIONAL PAYMENT.

NOTES - AFTER EXISTING OVERLAY IS REMOVED:

1. ASSUMED JOINT TYPE IS BASED OFF AS-BUILTS AND AVAILABLE INFORMATION. CONTRACTOR WILL INSPECT JOINT AFTER REMOVAL OF EXISTING OVERLAY. IF JOINT CONSTRUCTION DIFFERS FROM WHAT IS SHOWN IN THE PLANS, NOTIFY ENGINEER FOR ALTERNATIVE JOINT SEALING.
2. REPAIR ANY SIGNIFICANT SPALLED OR CRACKED AREAS, AS DETERMINED BY THE ENGINEER, WITH AN APPROVED CONCRETE REPAIR MATERIAL. ANY CONCRETE REPAIR WILL BE IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT BRIDGE DIVISION "CONCRETE REPAIR MANUAL". NO ADDITIONAL PAYMENT.

NOTES - AFTER PROPOSED OVERLAY IS PLACED:

1. REMOVE MATERIAL TO EXPOSE EXISTING JOINT.
2. THE ENTIRE LENGTH OF EXISTING JOINT MUST BE CHECKED AND ANY PORTION THAT IS DETERMINED UNSOUND BY THE ENGINEER MUST BE REMOVED AS DIRECTED BY THE ENGINEER. THE EXISTING SEAL MUST BE REMOVED AND DISPOSED OF.
3. SURFACES WHERE HEADER MATERIAL IS TO BE PLACED MUST BE CLEAN AND DRY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
4. HEADER JOINT MATERIAL THICKNESS WILL MATCH THE THICKNESS OF THE OVERLAY. HEADER THICKNESS SHOULD NOT BE LESS THAN 1". THERE WILL BE NO ADDITIONAL COMPENSATION FOR THICKNESS GREATER THAN 2". IF THE THICKNESS OF THE OVERLAY IS GREATER THAN 2", THE WIDTH OF THE HEADER MATERIAL NEEDS TO BE 2 TIMES GREATER THAN THE THICKNESS OF EXISTING OVERLAY OR 6", WHICHEVER IS GREATER.
5. AFTER HEADER MATERIAL HAS HARDENED, INSTALL FOAM JOINT FILLER. SEE DETAIL FOR SIZE AND LOCATION.
6. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

SCALE: N.T.S.

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JOINT SEAL AT EXPANSION JOINTS

WALNUT CREEK
02-220-0312-05-050
02-220-0312-05-051

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			FM 730
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0312	05	031, ETC.	81

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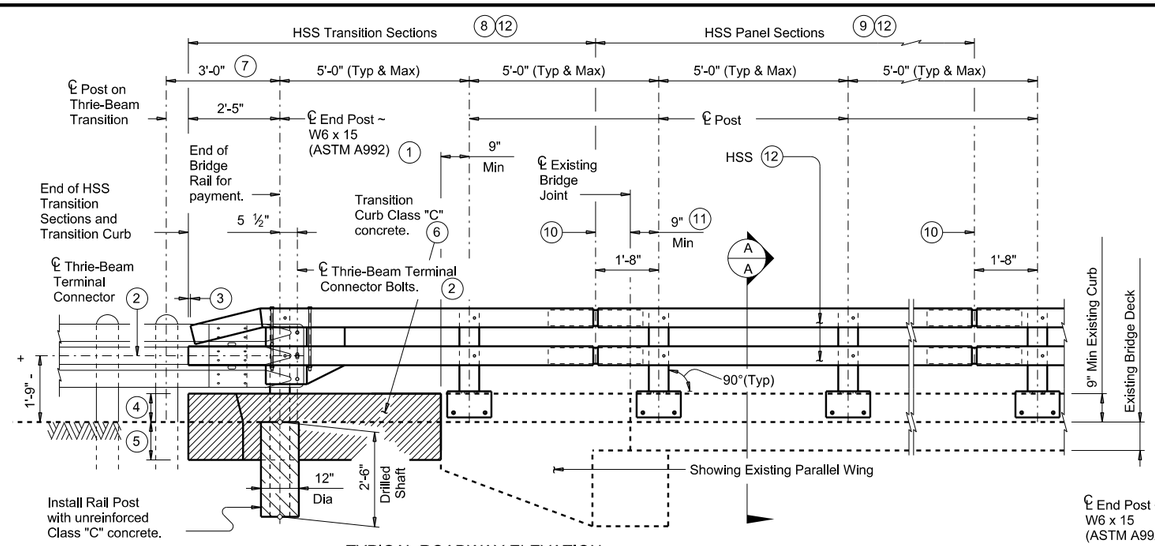
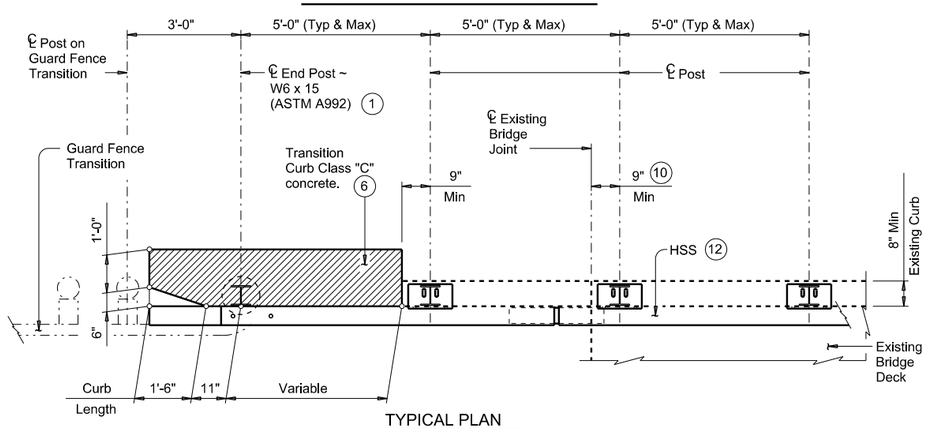


TYPICAL ROADWAY ELEVATION

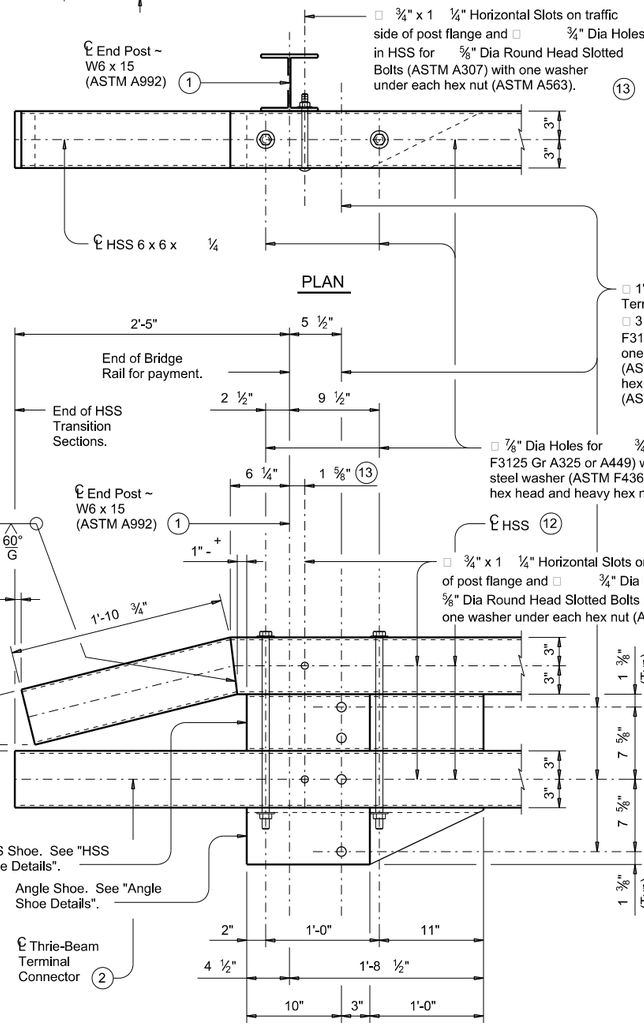


TYPICAL PLAN

EXAMPLE "A" RETROFIT WITH PARALLEL WING

(Showing 9" high and 8" wide curbs, higher and wider curbs similar)

1. Post length = Top of rail elevation minus bottom of drilled shaft elevation.
2. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach the appropriate Metal Beam Guard Fence Transitions or Downstream Anchor Terminal to the bridge rail using 3 bolts as shown, and extend along the embankment.
3. Top HSS can be shorter than bottom HSS ⅝" plus or minus.
4. Match existing bridge curb height.
5. Cast transition curb 1'-0" into soil or top of concrete approach slab. Remove any asphaltic concrete or mow strip if present.
6. Match existing bridge curb face on traffic side of transition curb. Transition curb 6" x 1'-6" taper will remain vertical.
7. Showing first post for a TL-3 rated guard fence transition. First post for a TL-2 rated guard fence transition or a guard fence downstream anchor terminal is 4'-4 ¾".
8. HSS Transition Sections must have one soil mounted end post embedded in an unreinforced, Class "C" concrete drilled shaft as shown, and a minimum of one curb mounted post per transition section.
9. HSS Panel Sections must have a minimum of three posts and a maximum of eight posts per panel section.
10. ℄ HSS Expansion Joint or L HSS Splice Joint as required.
11. Use 9" minimum for both expansion joints and construction/controlled joints.
12. HSS 6 x 6 x ¼ (ASTM A1085 or A500 Gr C).
13. May be placed on either side of W6 x 15 web.



ROADWAY ELEVATION

HSS TRANSITION SECTION END DETAILS

Thrie-Beam Terminal Connector not shown for clarity.

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

Provide Type VIII epoxy mortar under post base plates if gaps larger than ⅛" exist.

One shop splice per rail member section is permitted with minimum 85 percent penetration.

The weld may be square groove or single vee groove.

Round or chamfer exposed edges of HSS rail, rail post and plate to approximately ⅛" by grinding.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Submit erection drawings showing panel lengths, splice locations, post placement, anchor bolt locations and adhesive anchor test data to demonstrate pullout strength to the Engineer for approval. Shop drawings are not required.

MATERIAL NOTES:

Galvanize all metal components of steel rail system.

Provide Grade 60 reinforcing steel.

Provide Class "C" concrete. As an alternate, provide Class "K" concrete, or a Type A-2 or Type C concrete repair material per DMS-4655 "Concrete Repair Materials". Do not use Type "B" (Ultra-Rapid) concrete repair materials.

Anchor bolts must be ¾" Dia ASTM A193 Gr B7 or ASTM A449 fully threaded rods with one heavy hex nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into concrete curb using a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 6 ¾". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 30 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

GENERAL NOTES:

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

Rail anchorage details shown on this guide may require modification for select structure types.

See "Section A-A" for limits on existing overlay/seal coats thickness based on existing curb height.

This rail is to be paid for as "Retrofit Rail (Ty T131RC)" under Item 451 "Retrofit Railing".

Average weight with no overlay: 55 plf (9", 11" & 12" Curbs)
53 plf (18" Curbs)

Cover dimensions are clear dimensions, unless noted otherwise.

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SHEET 1 OF 4

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Bridge Division Standard

RETROFIT GUIDE FOR T131RC RAIL ON CURBS (MOD)

TYPE T131RC (MOD)

FILE: rlstd034-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: MAS
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		82

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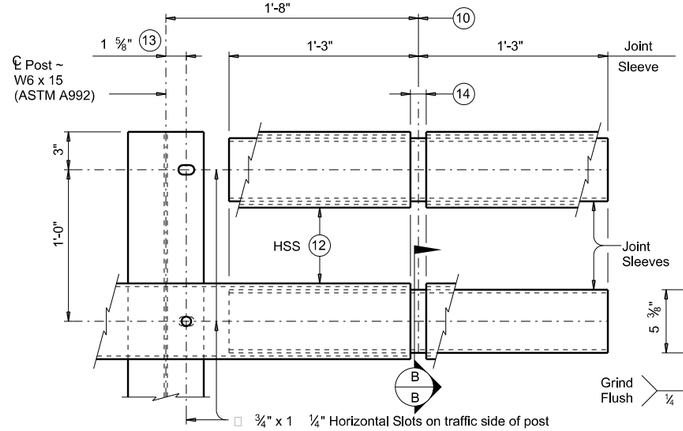
6 Match existing bridge curb face on traffic side of transition curb. Transition curb 6" x 1'-6" taper will remain vertical.

10 ℄ HSS Expansion Joint or L HSS Splice Joint as required.

12 HSS 6 x 6 x ¼ (ASTM A1085 or A500 Gr C).

13 May be placed on either side of W6 x 15 web.

14 Place HSS Expansion Joints in rail at every slab Expansion Joint. For Expansion and Splice Joints openings, use the greater of 1" or (slab opening plus ½").



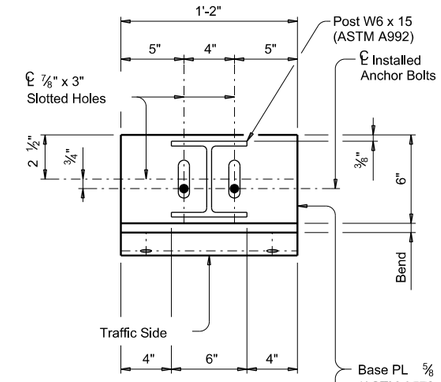
□ ¾" x 1 ¼" Horizontal Slots on traffic side of post flange and □ ¾" Dia Holes in HSS for ⅝" Dia Round Head Slotted Bolts (ASTM A307) with one washer under each hex nut. Nuts must conform to ASTM A563 requirements. 13

TYPICAL POST CONNECTION AND SPLICE DETAIL FOR HSS

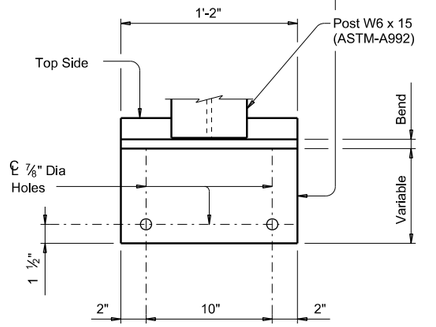
Showing post with HSS and HSS splice.

SECTION B-B

Showing typical joint sleeve.



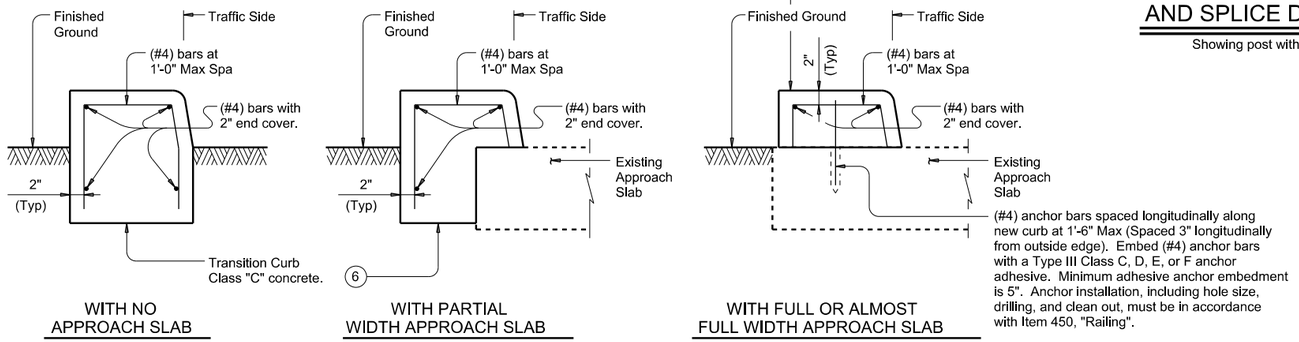
TOP VIEW



FRONT VIEW

BASE PLATE DETAILS

5/23/2023



WITH NO APPROACH SLAB

WITH PARTIAL WIDTH APPROACH SLAB

WITH FULL OR ALMOST FULL WIDTH APPROACH SLAB

(#4) anchor bars spaced longitudinally along new curb at 1'-6" Max (Spaced 3" longitudinally from outside edge). Embed (#4) anchor bars with a Type III Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment is 5". Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

EXAMPLES OF TRANSITION CURB SECTIONS

SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

RETROFIT GUIDE FOR T131RC RAIL ON CURBS (MOD)

TYPE T131RC (MOD)

FILE: rlstd034-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: MAS
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REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		83

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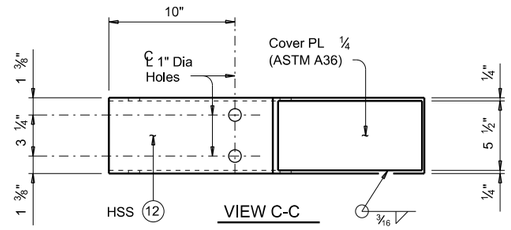
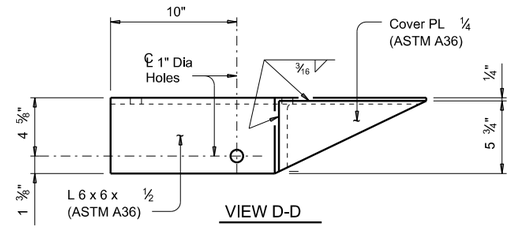
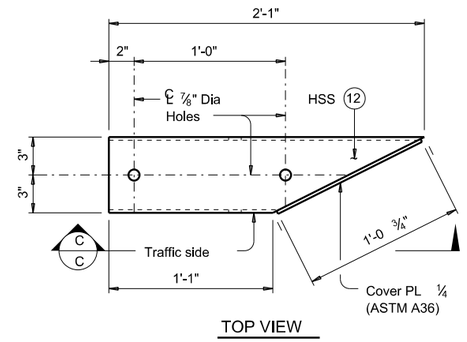
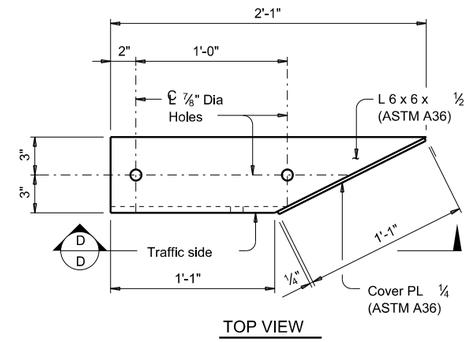






HSS SHOE DETAILS



ANGLE SHOE DETAILS

Angle Shoe shown is detailed for one side only, other side similar. For other side shoe must be built for opposite hand.

(12) HSS 6 x 6 x ¼ (ASTM A1085 or A500 Gr C).

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Bridge Division Standard

RETROFIT GUIDE FOR T131RC RAIL ON CURBS

(MOD)

TYPE T131RC (MOD)

FILE: rlstd034-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: MAS
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REVISIONS	0312	05	031,ETC.	FM 730
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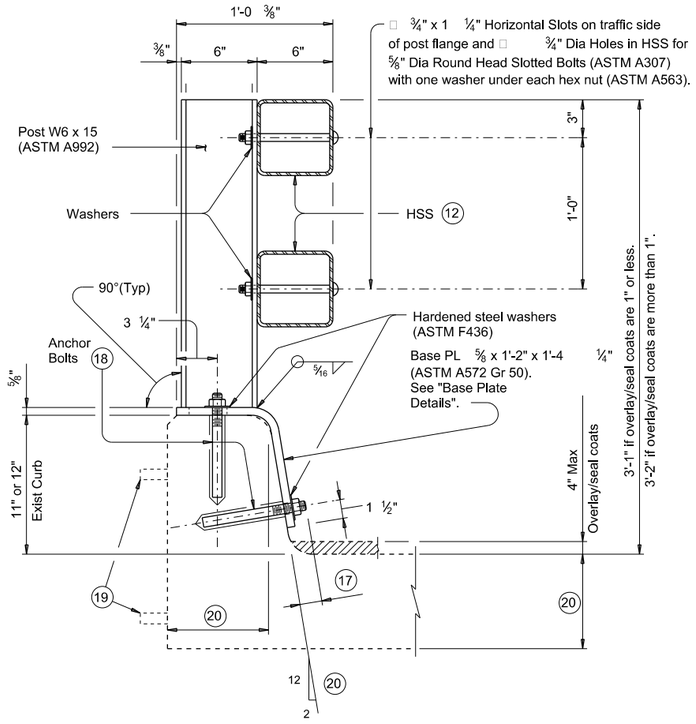
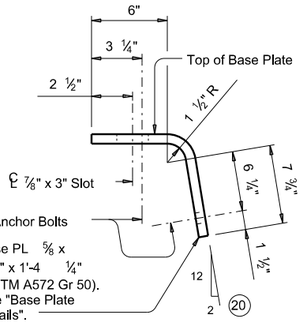


SECTION A-A OF 11" & 12" HIGH CURBS

(Showing example of 8" Min width curb, wider curbs similar)



11" & 12" HIGH CURB BASE PLATE DETAIL

(12) HSS 6 x 6 x 1/4 (ASTM A1085 or A500 Gr C).

(17) 1 3/4" Bolt Projection (Typ).

(18) See "Material Notes" for anchor Bolt information.

(19) Remove existing railing (including posts), cut and grind anchor bolts flush and paint ends with two coats of zinc-rich paint conforming to the Item "Galvanizing".

(20) See elsewhere in plans for dimensions (curb width and height, slab and overlay thickness). Slope of curb may differ from what is shown. Adjust base plate as necessary to conform to curb face geometry.

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RETROFIT GUIDE FOR T131RC RAIL ON CURBS (MOD)

TYPE T131RC (MOD)

FILE: rlstd034-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: MAS
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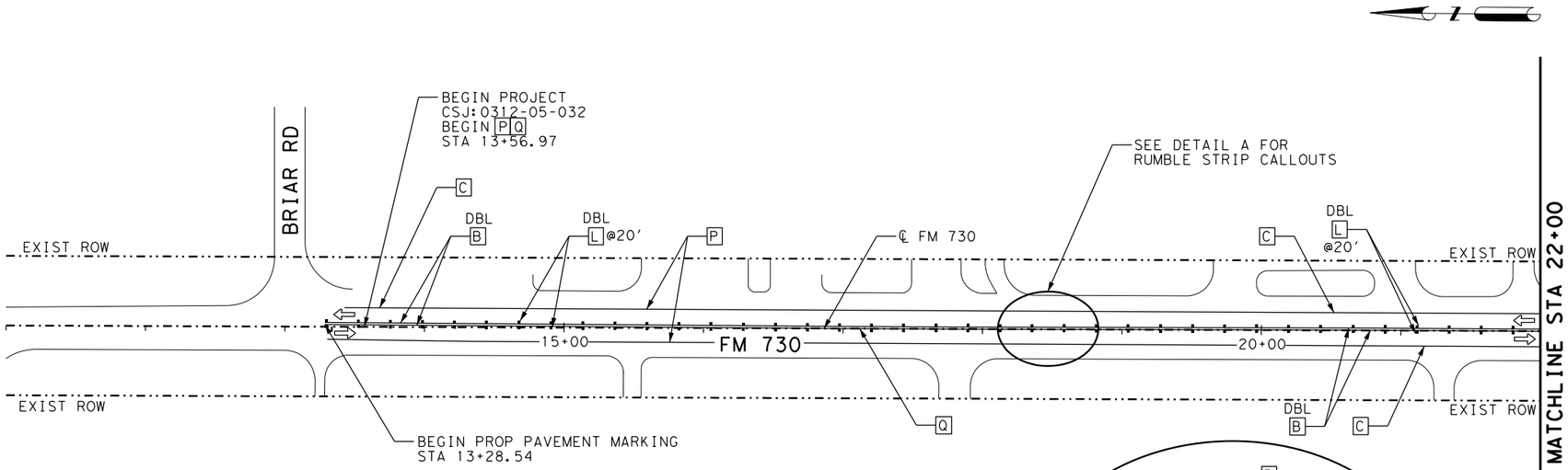
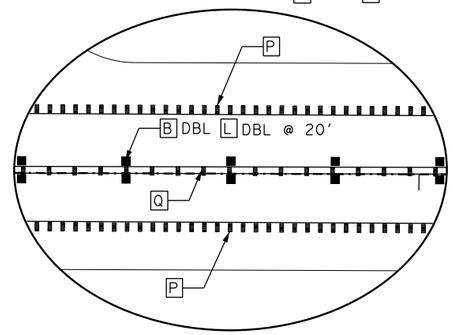
REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		85

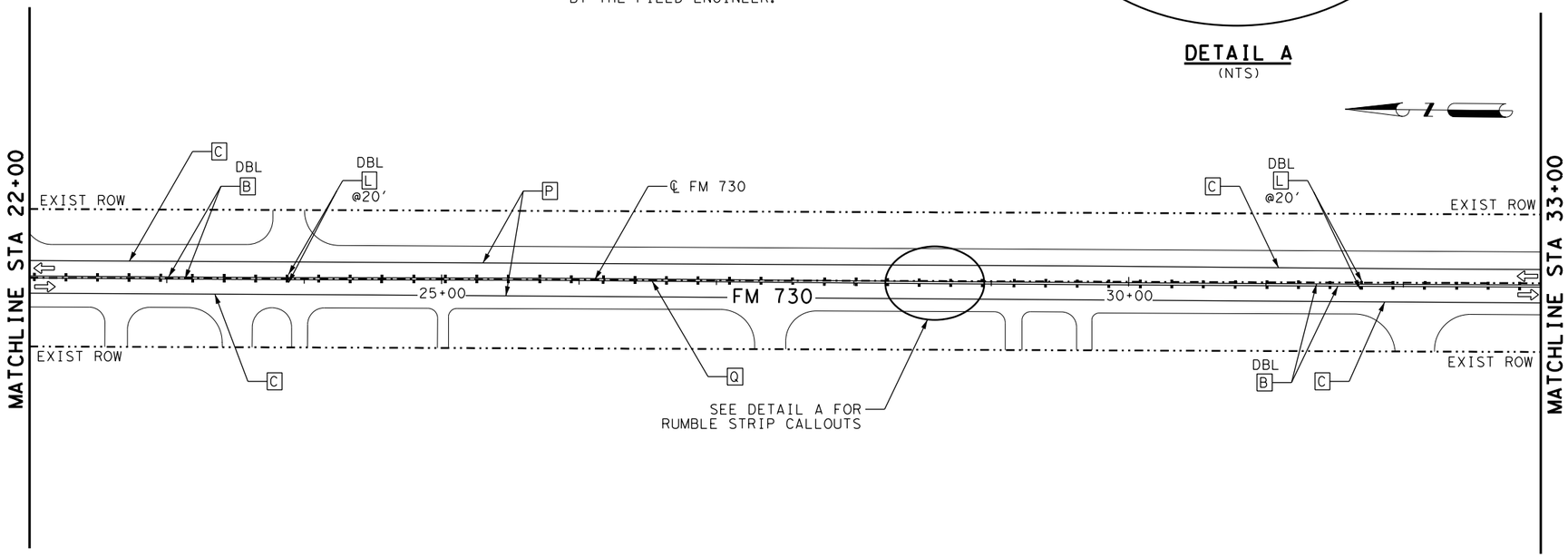


NOTES:

1. ALL STATIONING IS TO ℄ OF FM 730 UNLESS OTHERWISE NOTED.
2. ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED.
3. SEE "SUMMARY OF SMALL SIGNS" FOR MORE INFORMATION ON PROPOSED SIGNS.
4. SMALL SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY FIELD ENGINEER.
5. REMOVE EXISTING OBJECT MARKERS AS NEEDED. PROPOSED OBJECT MARKER LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY THE FIELD ENGINEER.



DETAIL A
(NTS)



LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
- O REFL PAV MARK TY I (W)6"(DOT)
- P RUMBLE STRIPS (SHOULDER)
- Q RUMBLE STRIPS (CENTERLINE)
- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

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F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(BEGIN PROJECT TO STA 33+00)

SHEET 1 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		86
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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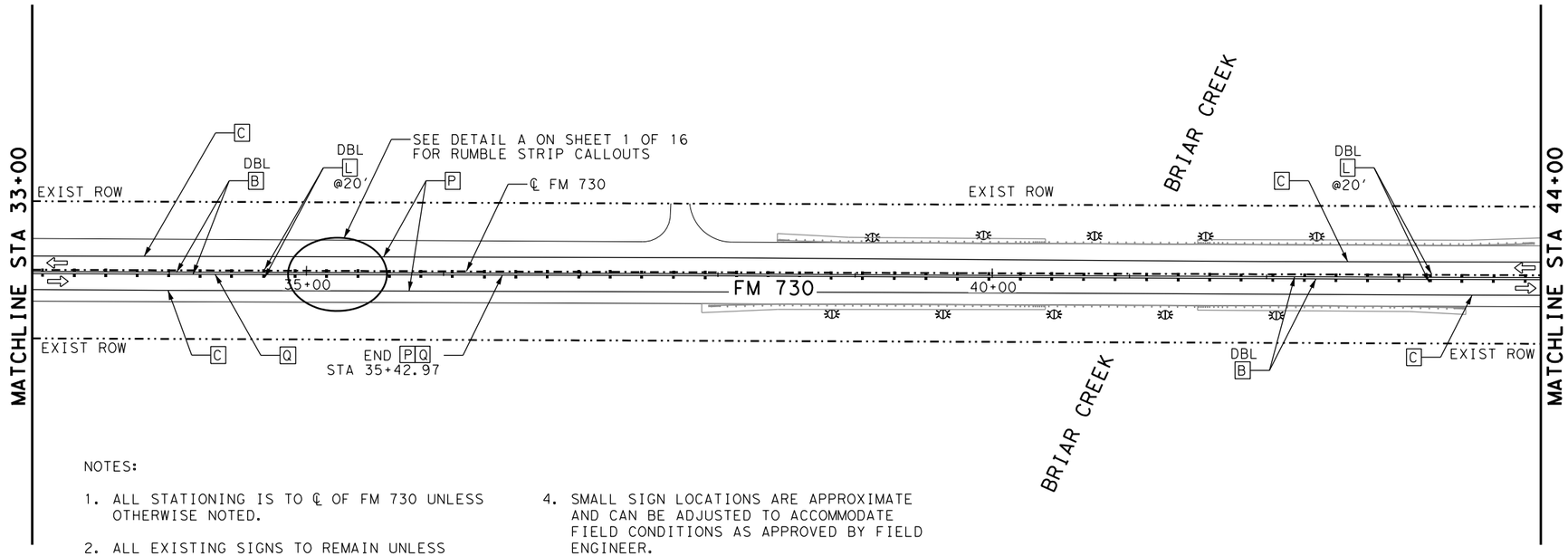
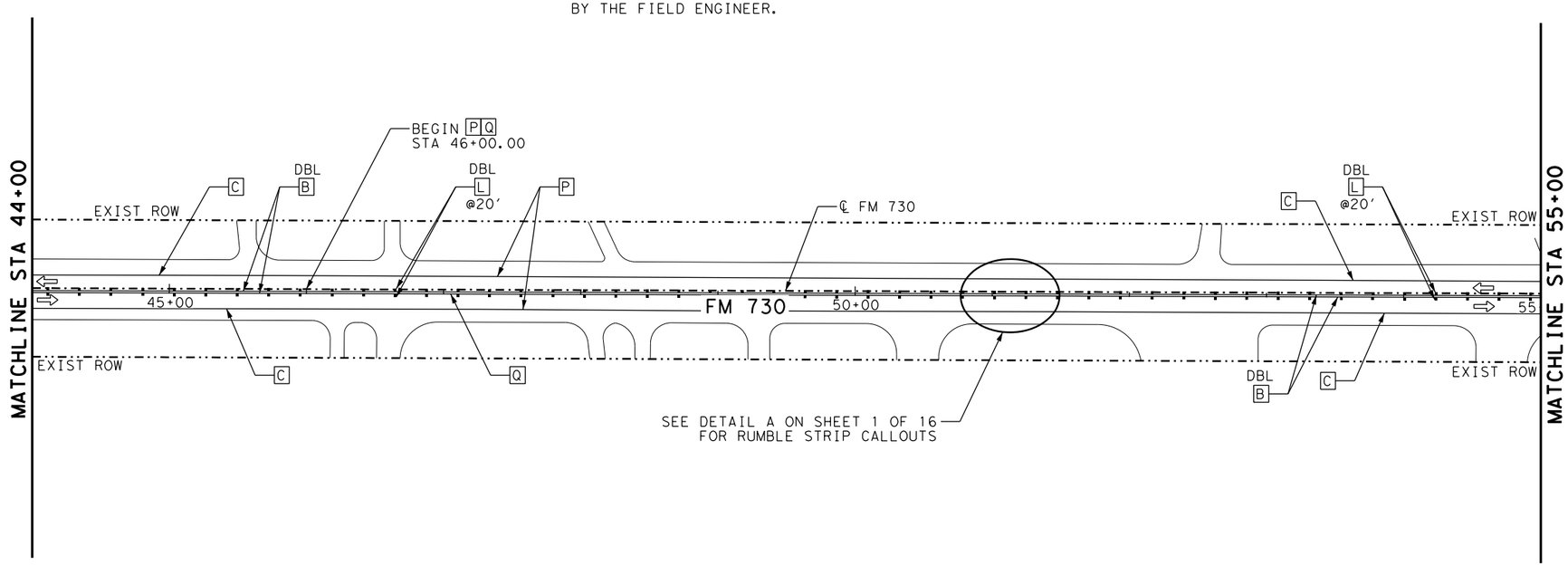


NOTES:

1. ALL STATIONING IS TO ℄ OF FM 730 UNLESS OTHERWISE NOTED.
2. ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED.
3. SEE "SUMMARY OF SMALL SIGNS" FOR MORE INFORMATION ON PROPOSED SIGNS.
4. SMALL SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY FIELD ENGINEER.
5. REMOVE EXISTING OBJECT MARKERS AS NEEDED. PROPOSED OBJECT MARKER LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY THE FIELD ENGINEER.



LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
- O REFL PAV MARK TY I (W)6"(DOT)
- P RUMBLE STRIPS (SHOULDER)
- Q RUMBLE STRIPS (CENTERLINE)
- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 33+00 TO STA 55+00)

SHEET 2 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		87
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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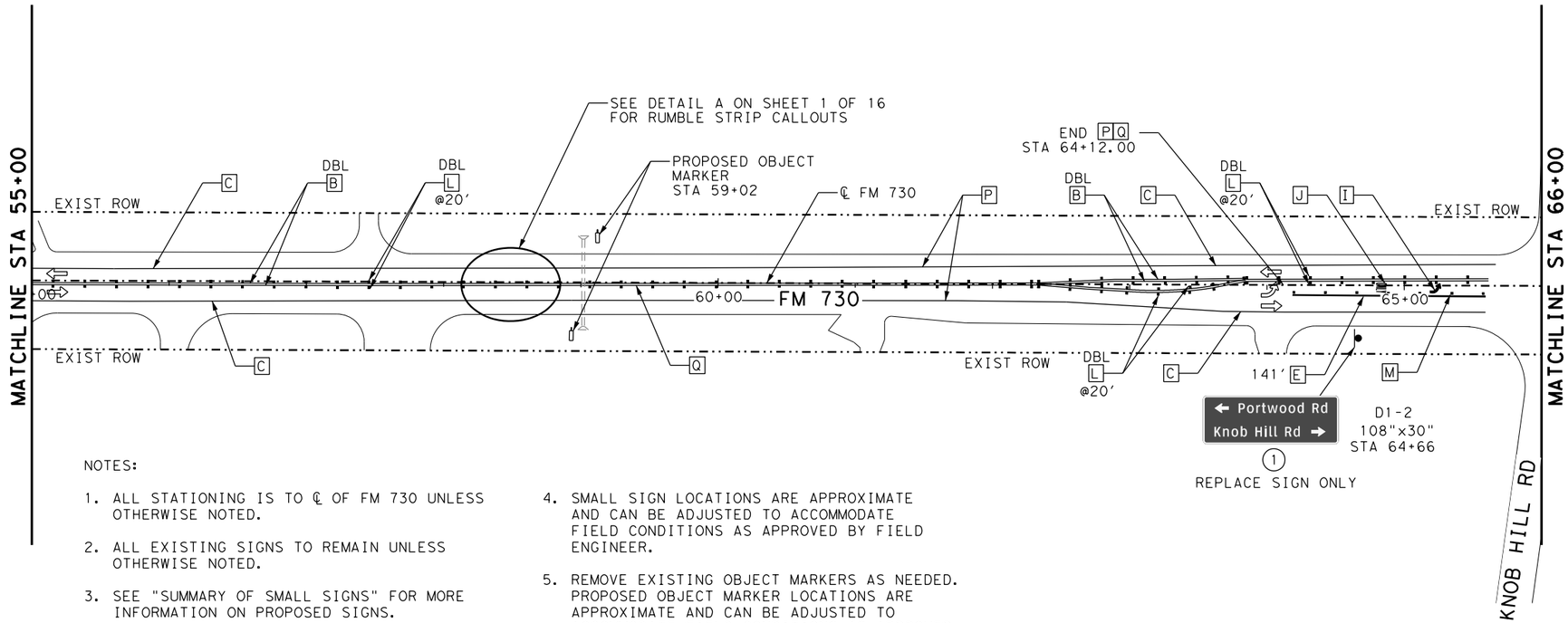

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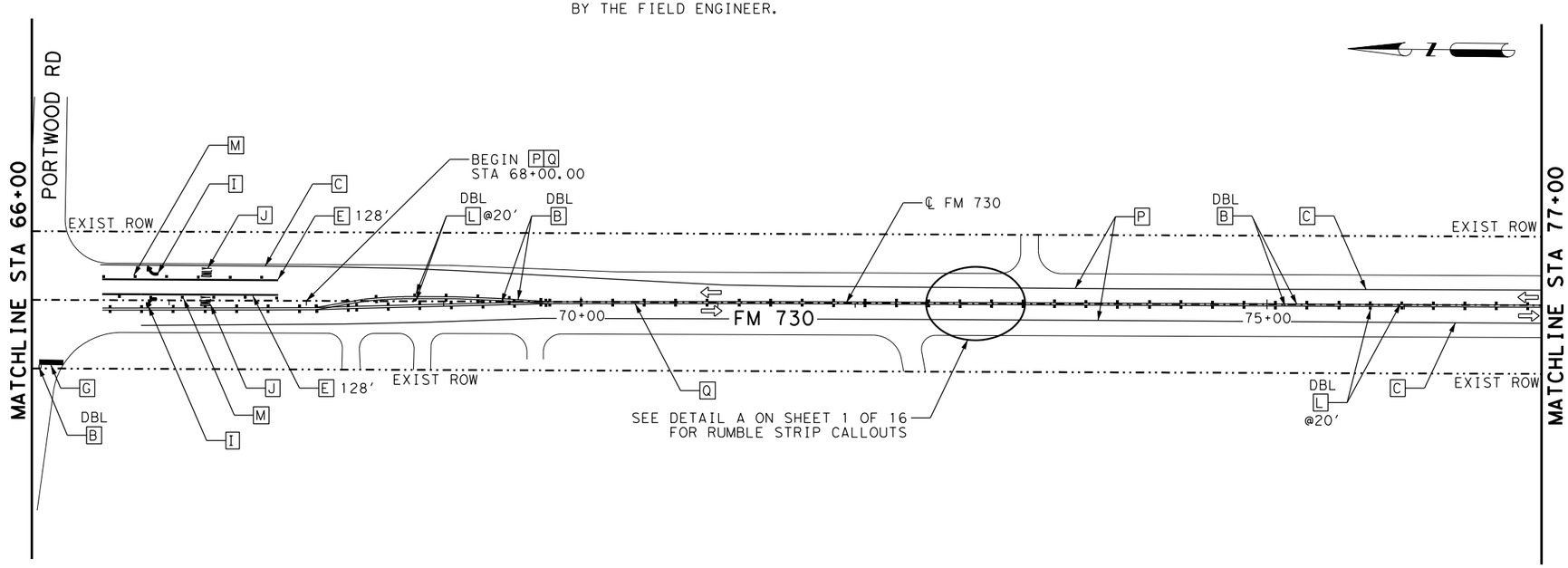

LEGEND

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- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
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- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
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- J REFL PAV MARK TY I (W) (WORD)
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- N REFL PAV MRK TY I (W)18"(SLD)
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- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

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Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 55+00 TO STA 77+00)

SHEET 3 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		88
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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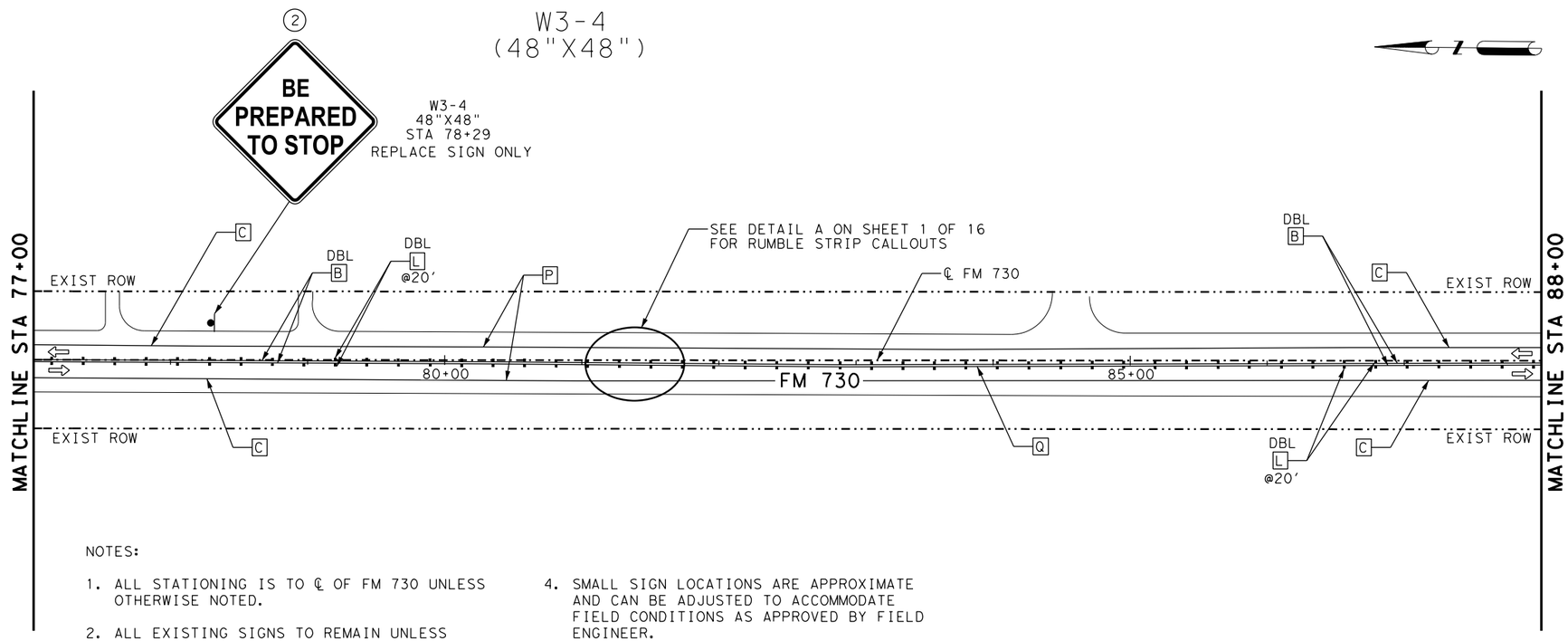

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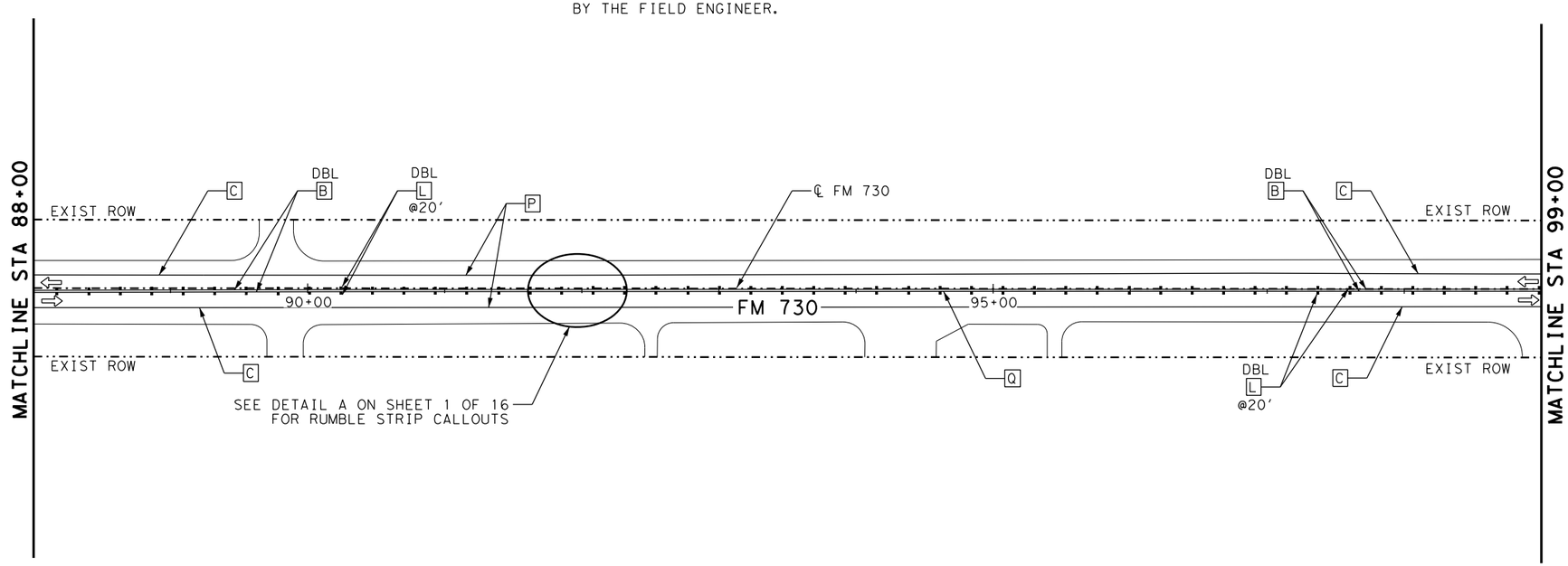

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
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- J REFL PAV MARK TY I (W) (WORD)
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- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
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- P RUMBLE STRIPS (SHOULDER)
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- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
5/23/2023

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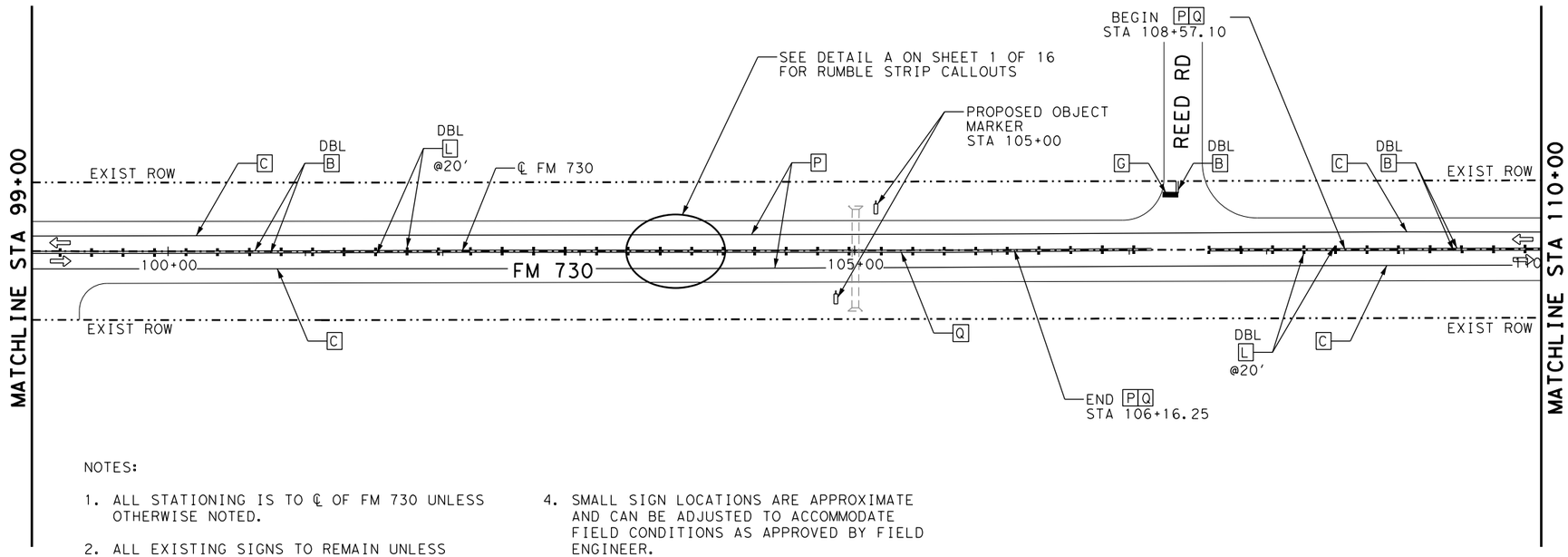
Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 77+00 TO STA 99+00)

SHEET 4 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		89
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



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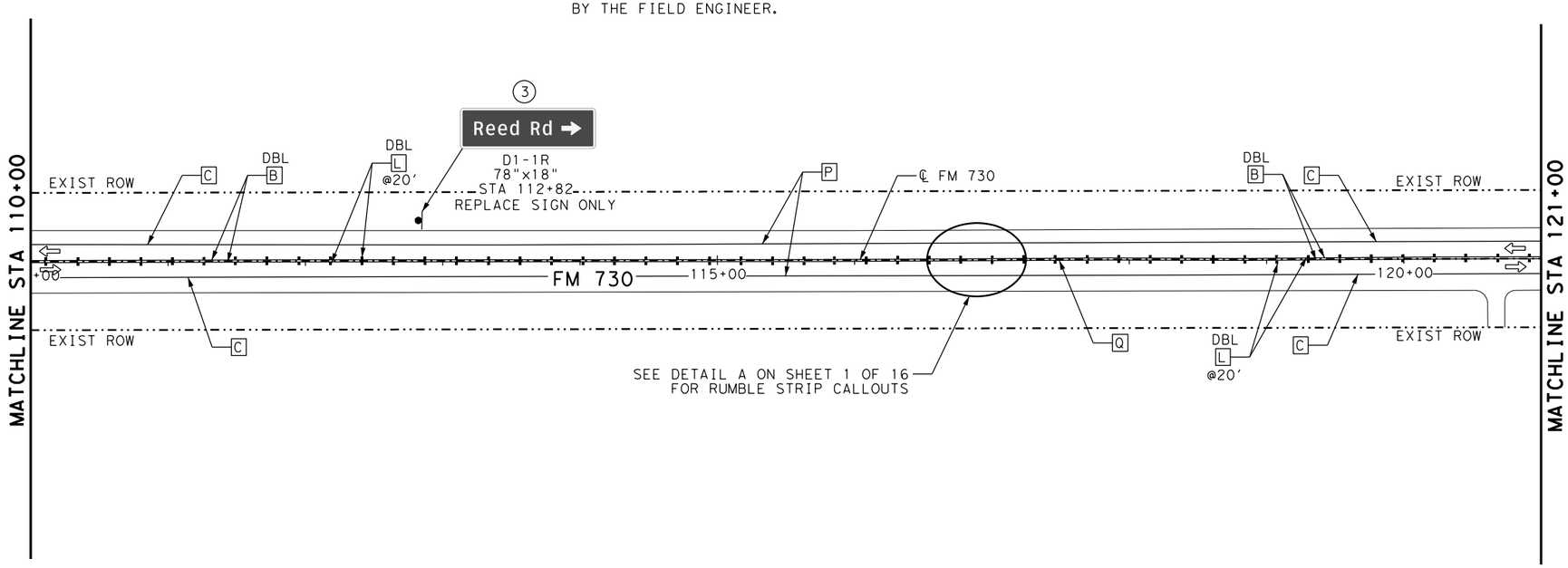

LEGEND

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- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
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- DEL ASSM(D-SW)SZ(BFR)CTB
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0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

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consor F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 99+00 TO STA 121+00)

SHEET 5 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		90
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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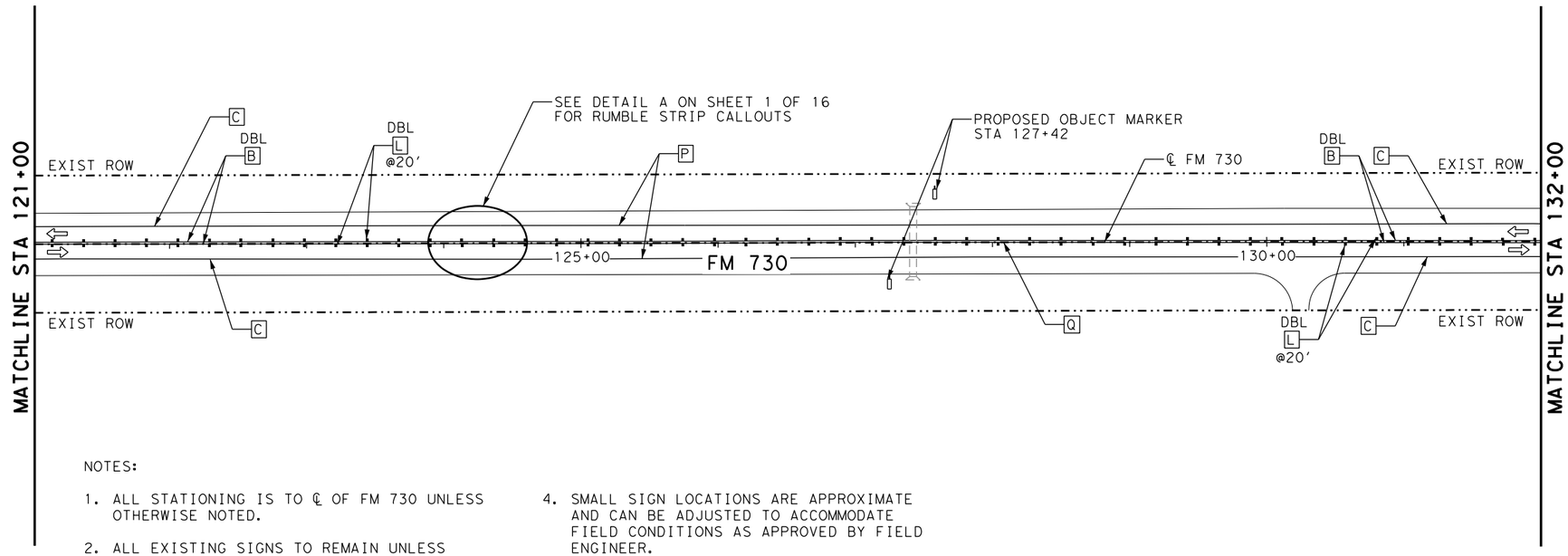

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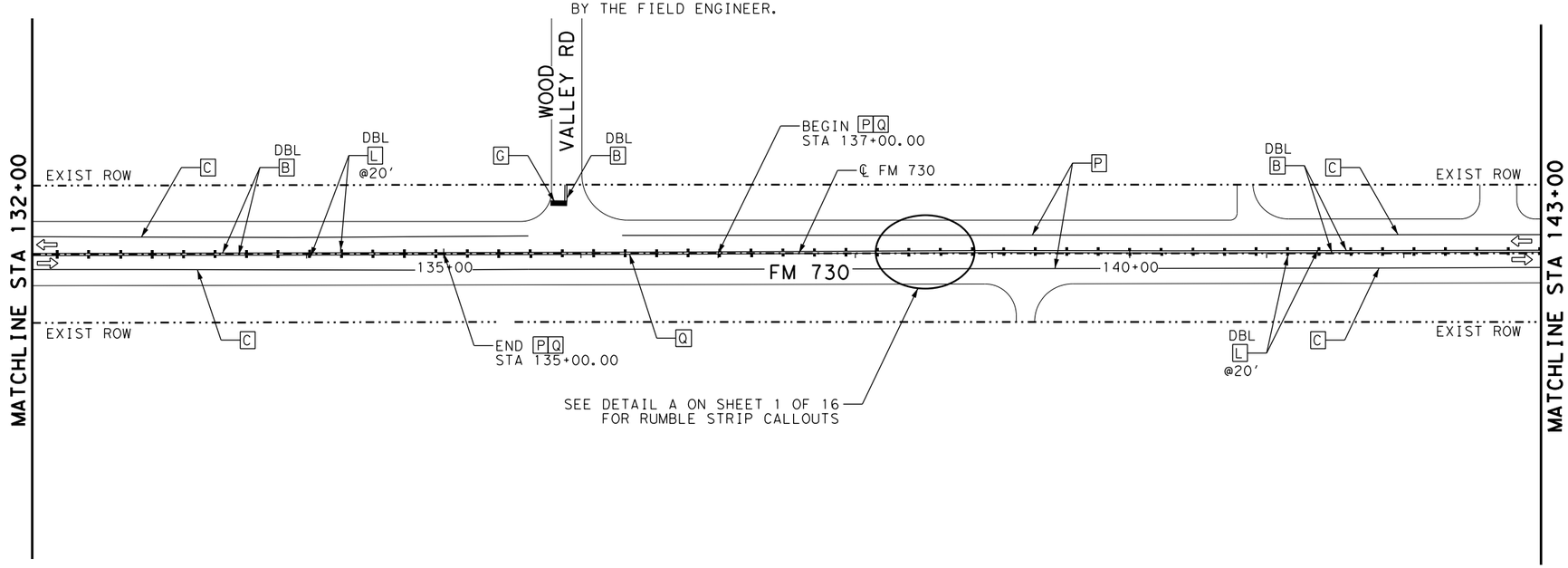

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
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- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
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- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
- O REFL PAV MARK TY I (W)6"(DOT)
- P RUMBLE STRIPS (SHOULDER)
- Q RUMBLE STRIPS (CENTERLINE)

(#) EXISTING SMALL SIGN TO BE REPLACED

PROPOSED OBJECT MARKER TYPE OM-2Z

PROPOSED OBJECT MARKER TYPE OM-3L

DIRECTION OF TRAFFIC

DEL ASSM(D-SW)SZ 1(BFR)GF2
DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
DEL ASSM(D-SW)SZ(BFR)CTB
DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

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Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 121+00 TO STA 143+00)

SHEET 6 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		91
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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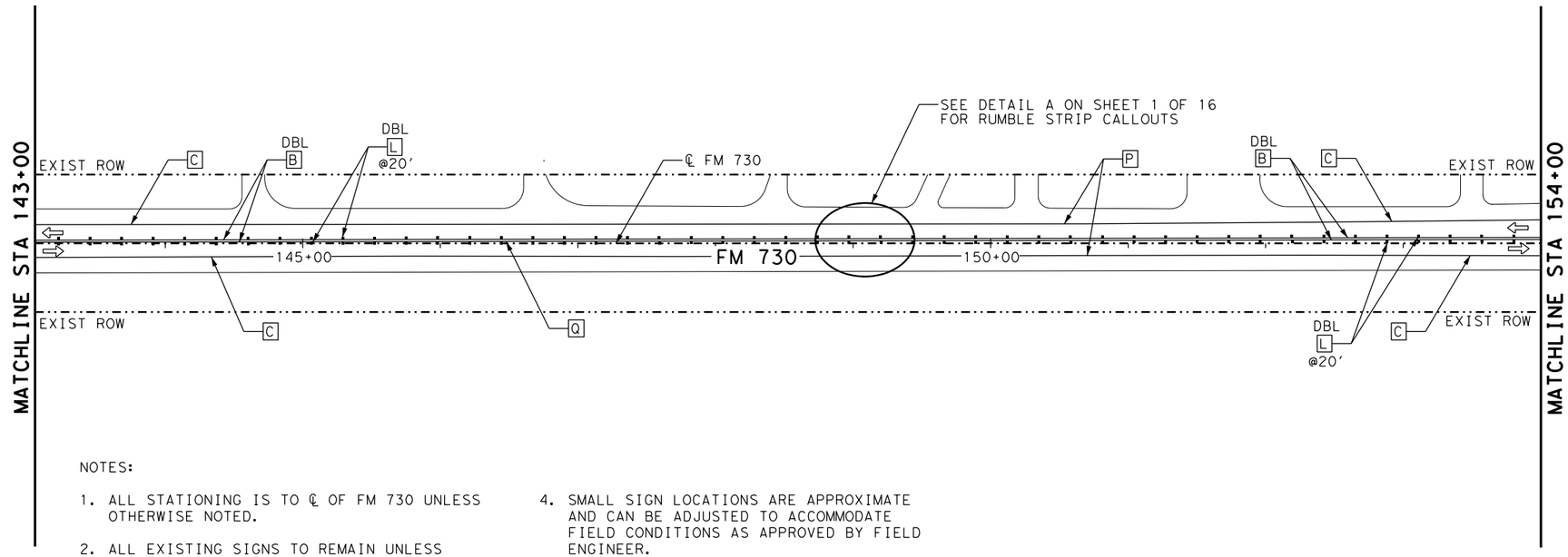

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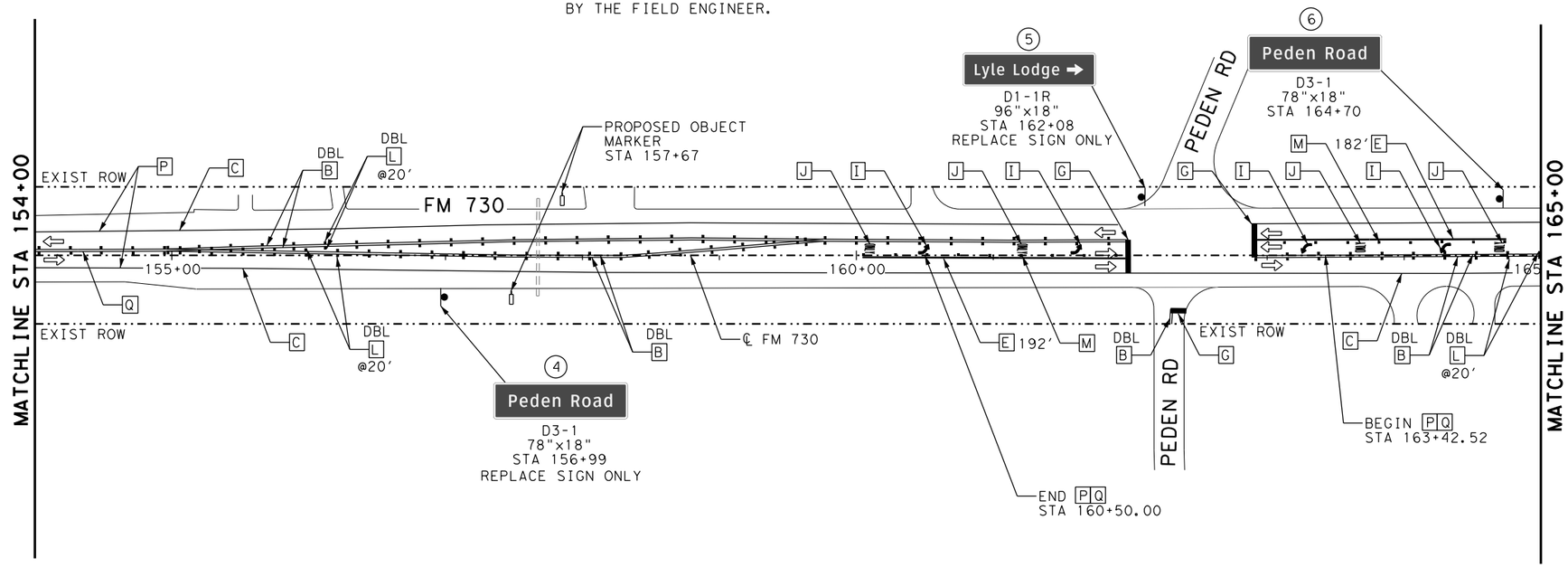

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- L REFL PAV MRKR TY II-A-A
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0 50' 100'

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STATE OF TEXAS
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PROFESSIONAL ENGINEER

5/23/2023

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Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT

(STA 143+00 TO STA 165+00)

SHEET 7 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		92
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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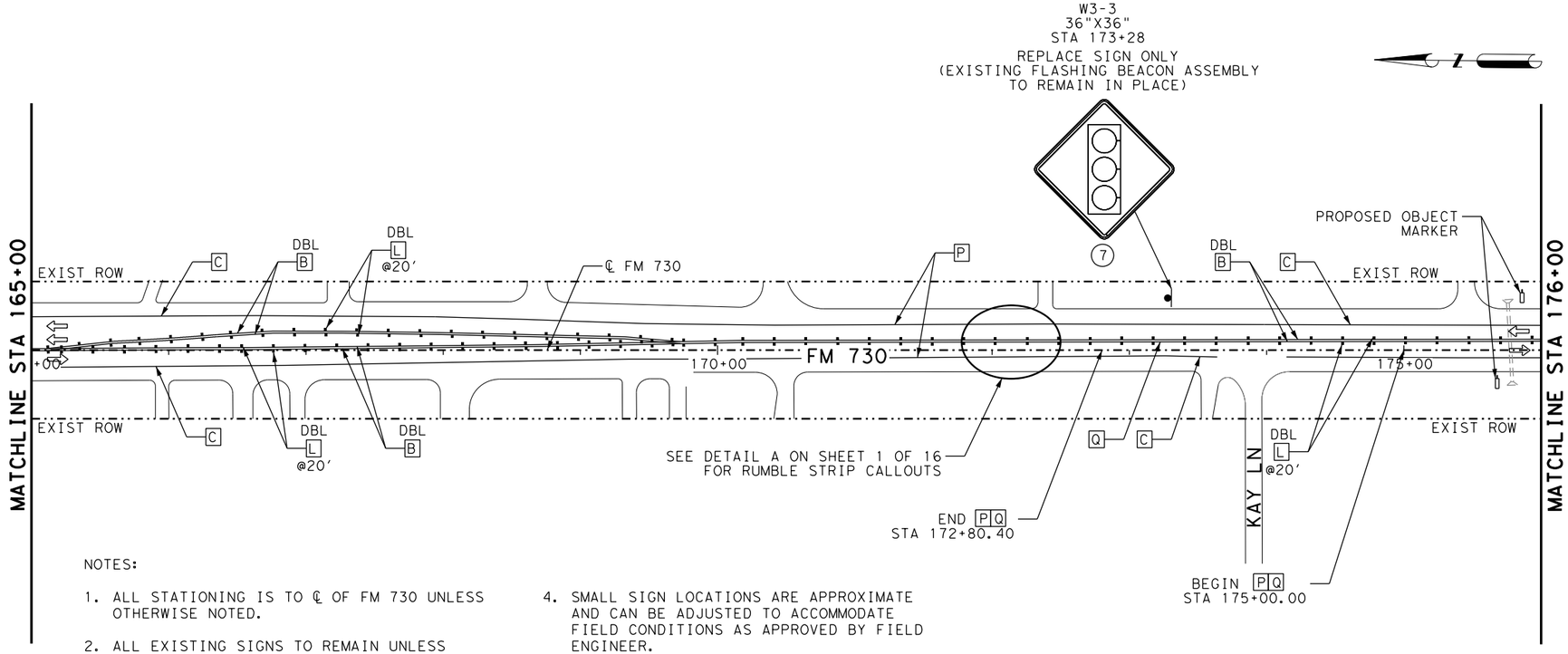

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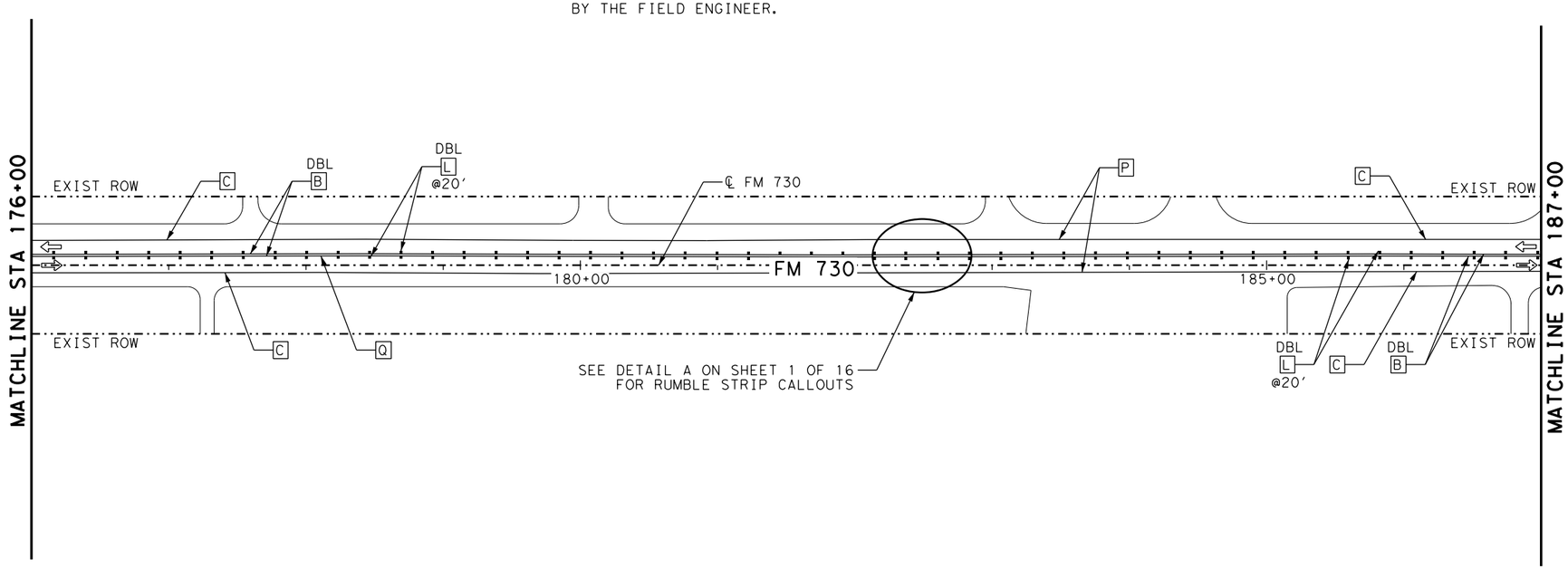

LEGEND

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- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
- O REFL PAV MARK TY I (W)6"(DOT)
- P RUMBLE STRIPS (SHOULDER)
- Q RUMBLE STRIPS (CENTERLINE)
- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 165+00 TO STA 187+00)

SHEET 8 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		93
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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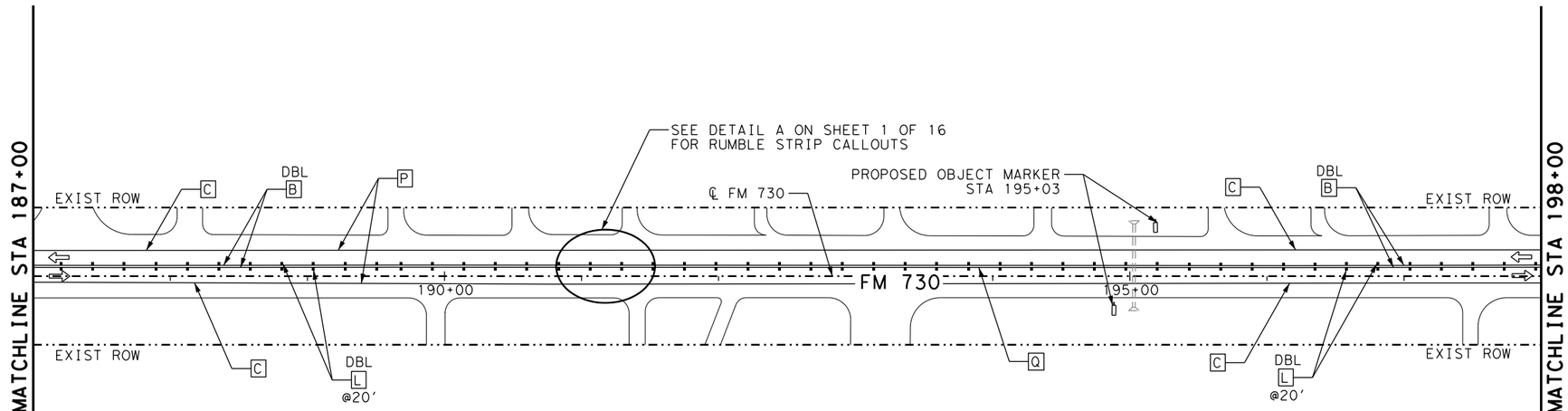

NOTES:

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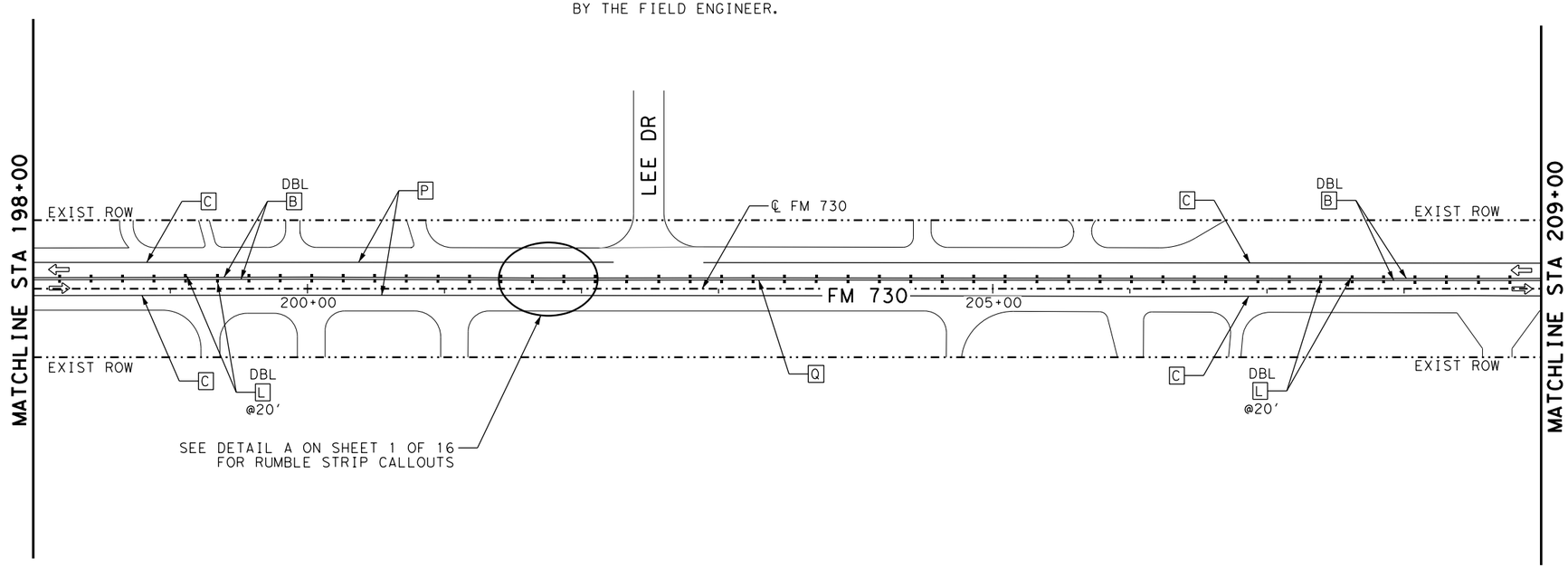
2. ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED.
3. SEE "SUMMARY OF SMALL SIGNS" FOR MORE INFORMATION ON PROPOSED SIGNS.
4. SMALL SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY FIELD ENGINEER.
5. REMOVE EXISTING OBJECT MARKERS AS NEEDED. PROPOSED OBJECT MARKER LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY THE FIELD ENGINEER.



LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
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- M REFL PAV MRKR TY I-C
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- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
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- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50′ 100′

SCALE: 1" = 100′

LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

5/23/2023

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F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT

(STA 187+00 TO STA 209+00)

SHEET 9 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		94
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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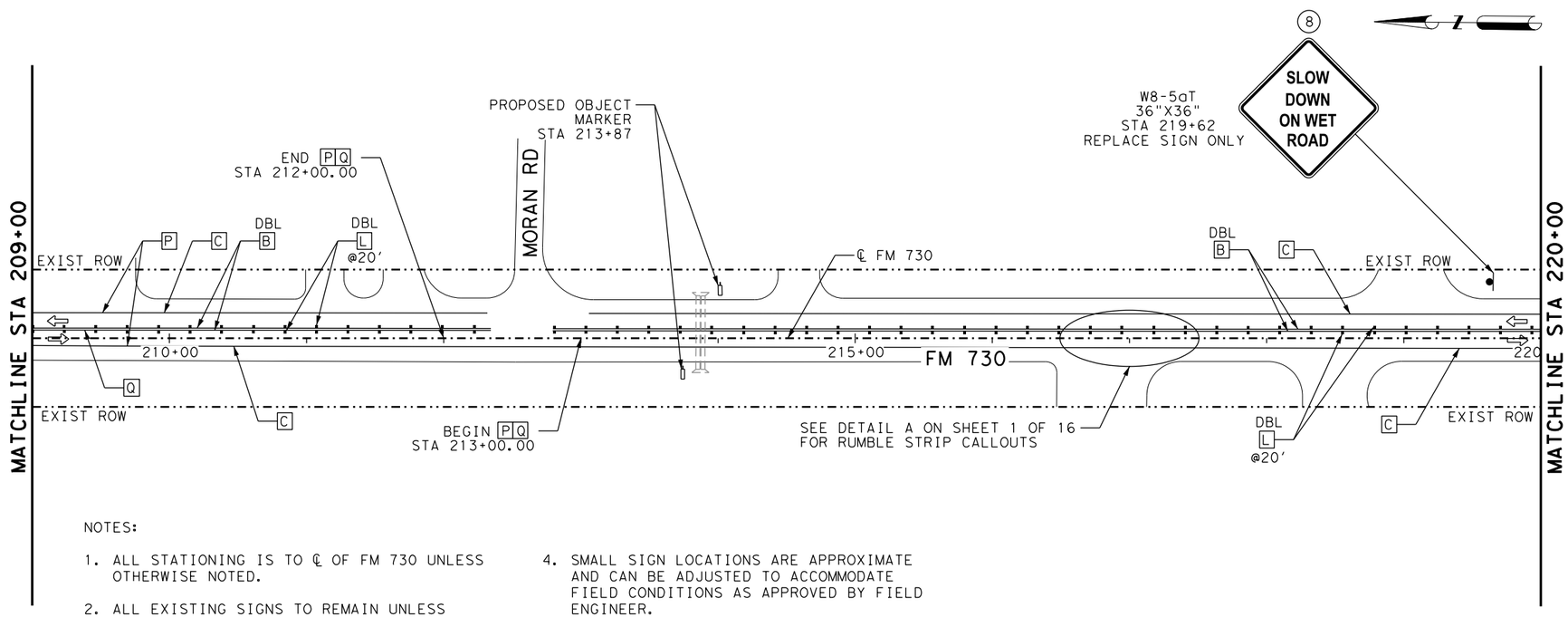

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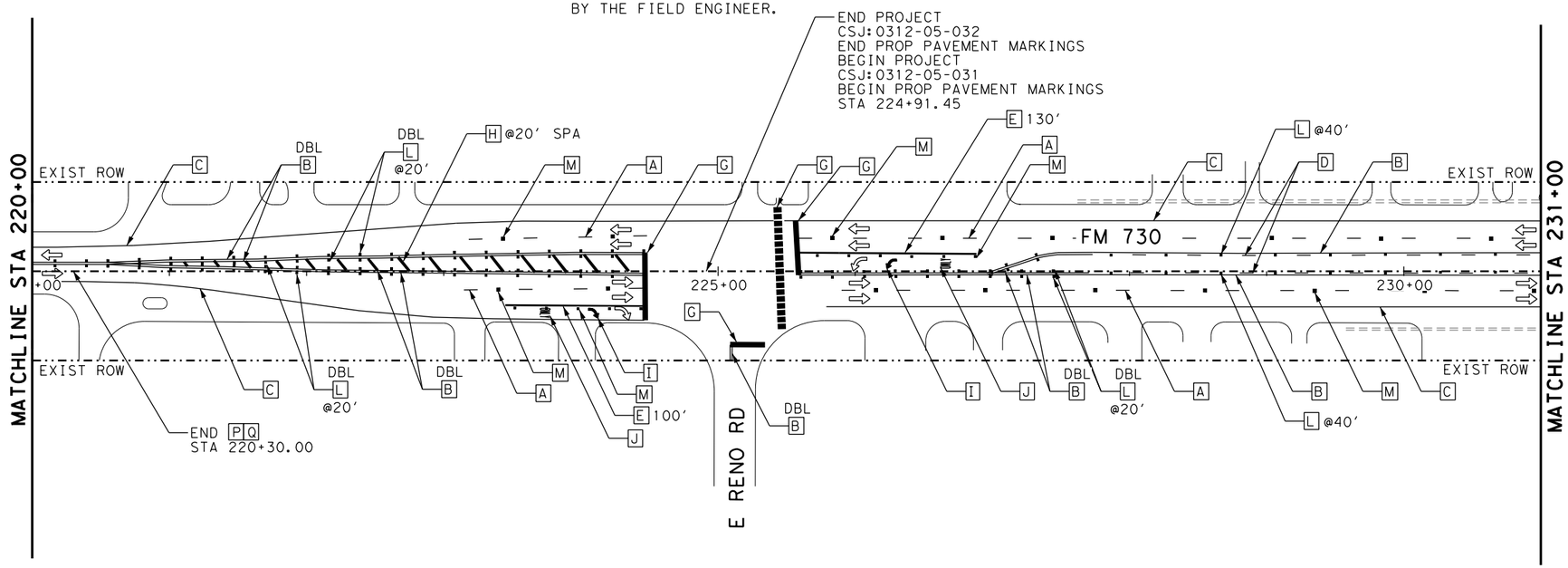

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
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- (#) EXISTING SMALL SIGN TO BE REPLACED
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- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 209+00 TO STA 231+00)

SHEET 10 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		95
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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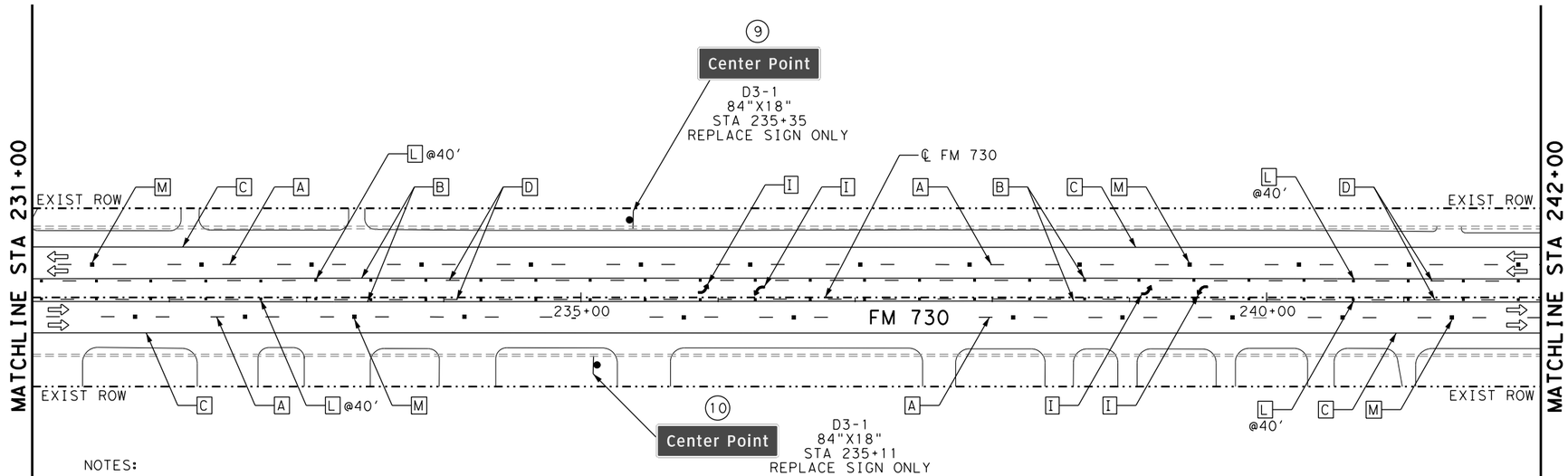

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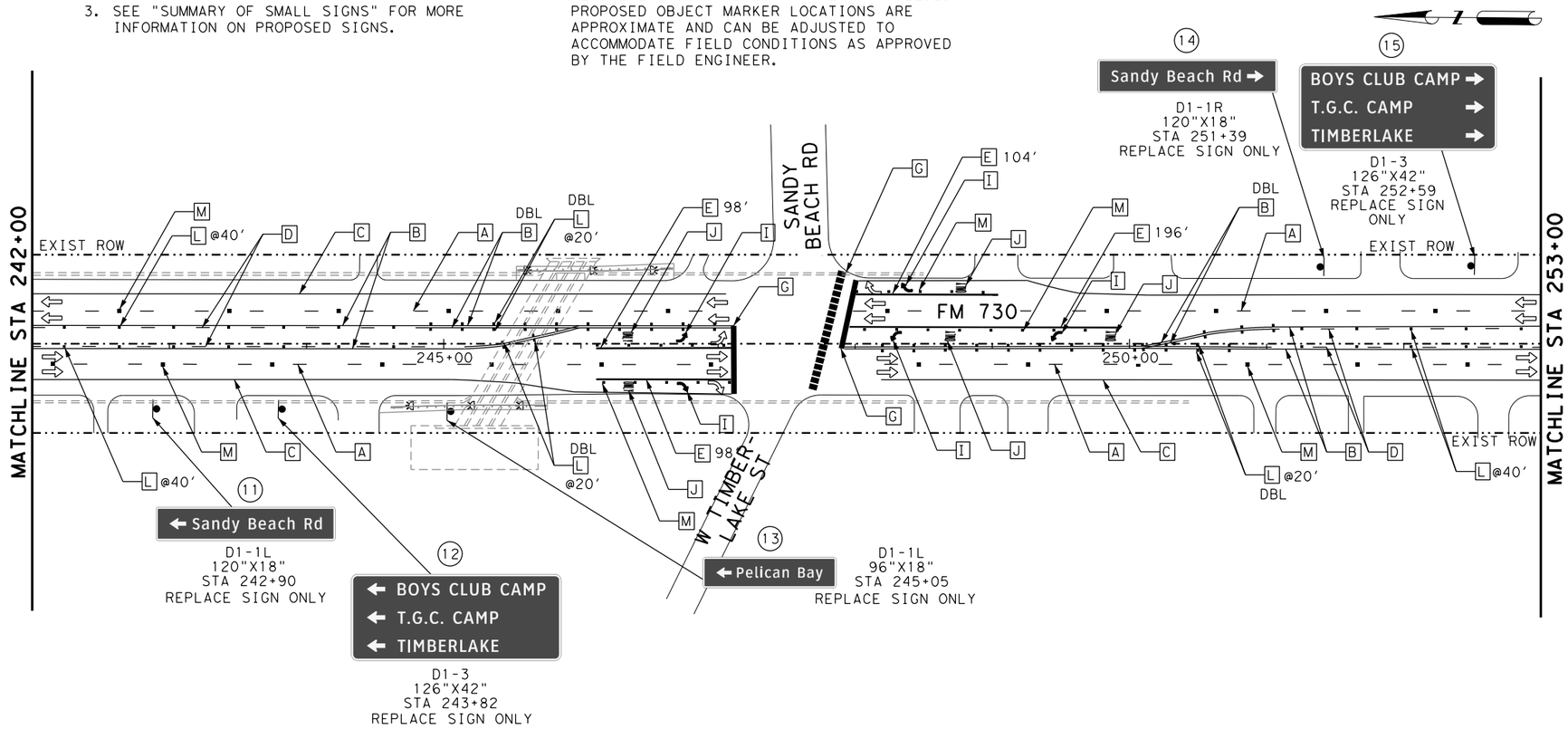

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
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- PROPOSED OBJECT MARKER TYPE OM-2Z
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- DIRECTION OF TRAFFIC
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- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

consor F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 231+00 TO STA 253+00)

SHEET 11 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		96
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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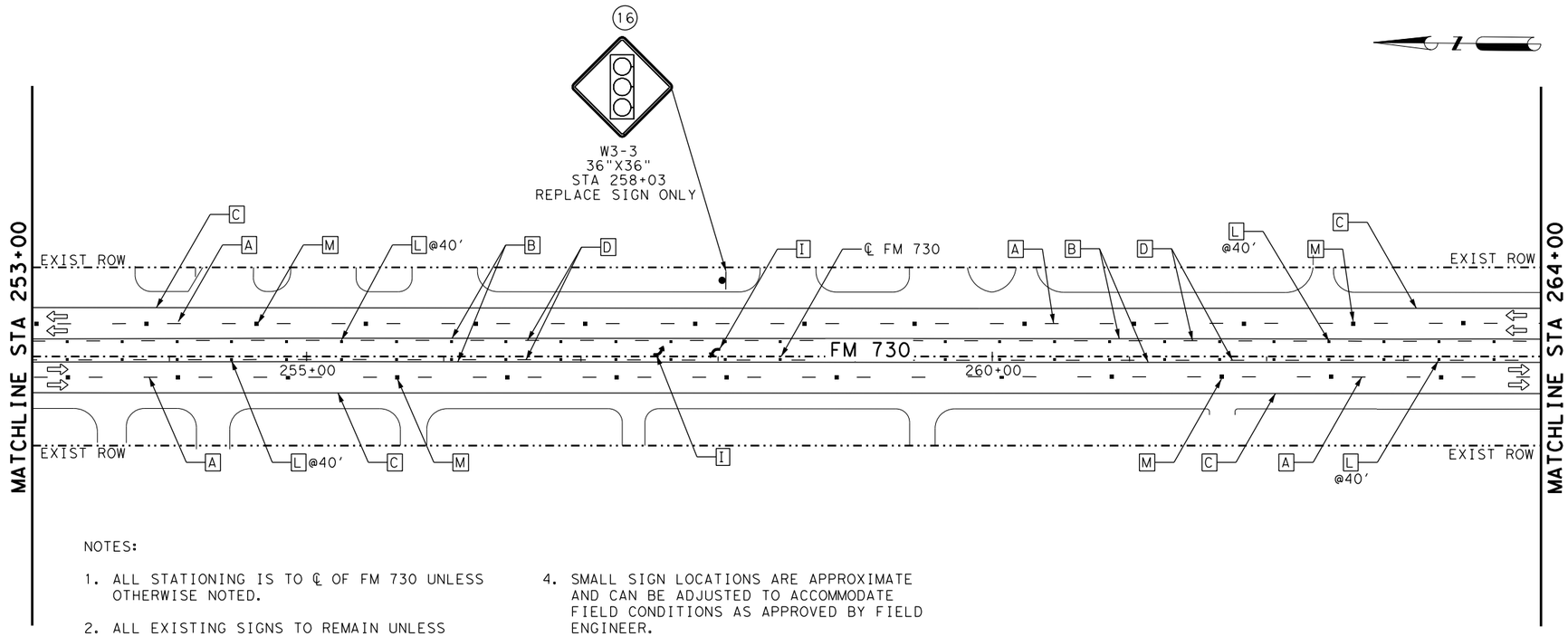

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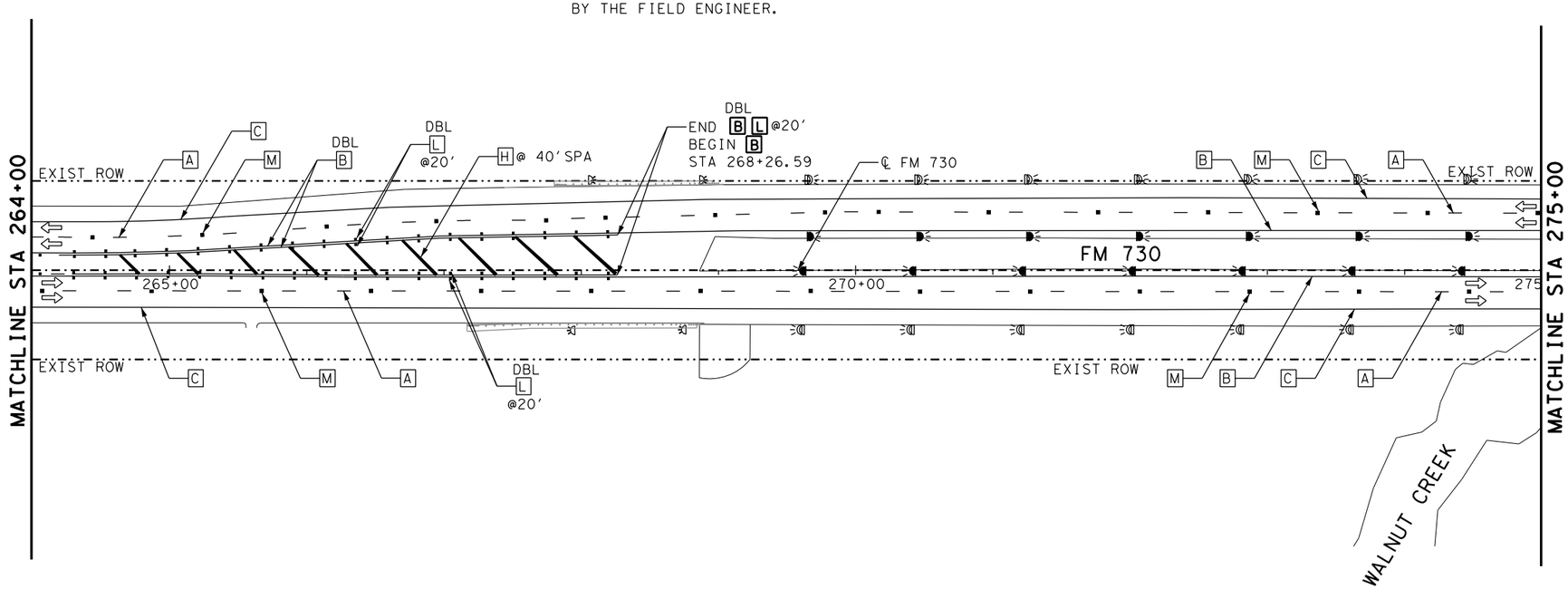

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
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- N REFL PAV MRK TY I (W)18"(SLD)
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- Q RUMBLE STRIPS (CENTERLINE)
- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
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- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'

SCALE: 1" = 100'

LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

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Texas Department of Transportation

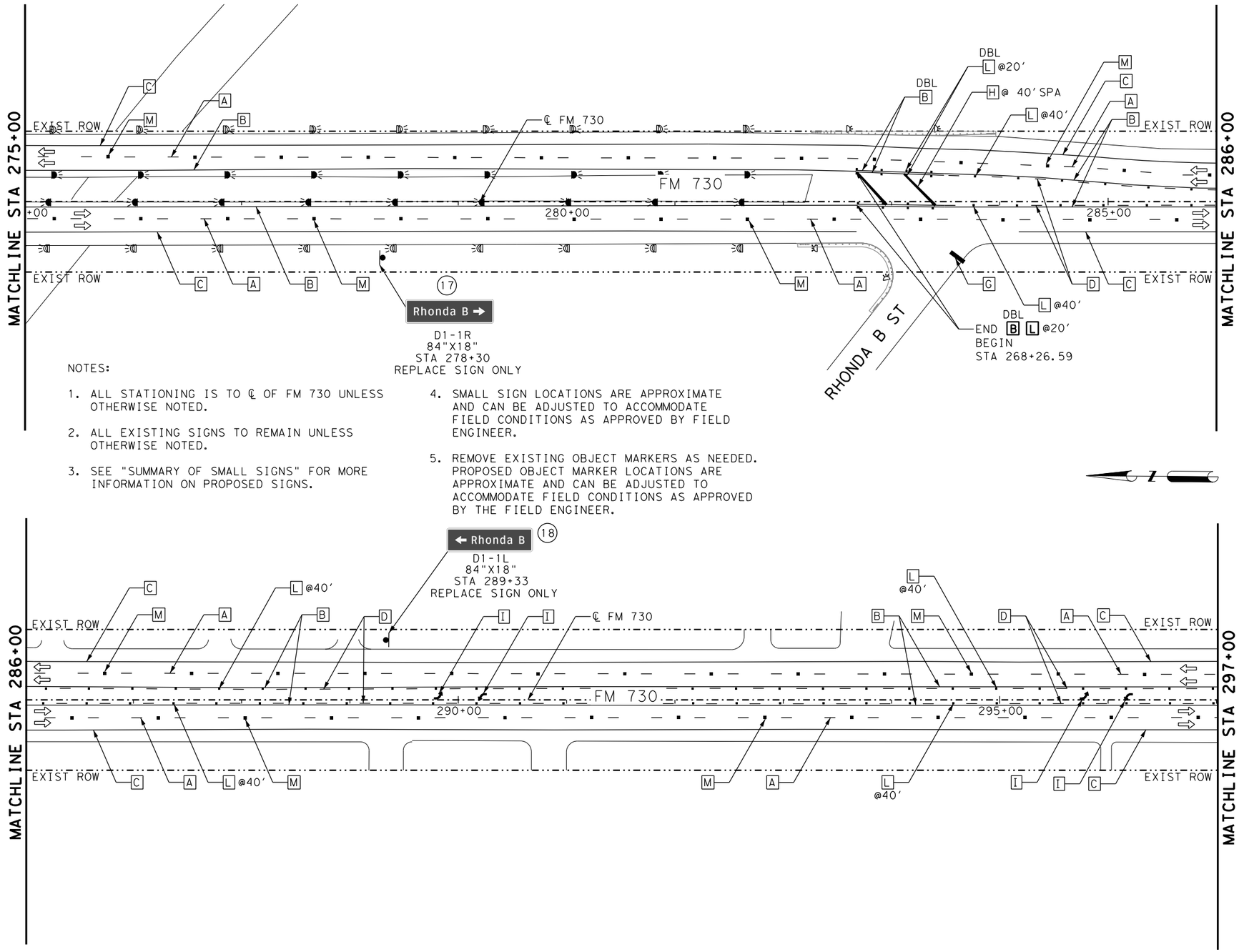
FM 730

SIGNING AND PAVEMENT MARKING LAYOUT

(STA 253+00 TO STA 275+00)

SHEET 12 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		97
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730



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LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
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- I REFL PAV MARK TY I (W) (ARROW)
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- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
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- PROPOSED OBJECT MARKER TYPE OM-2Z
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- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50' 100'
SCALE: 1" = 100'

LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

consor
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Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 275+00 TO STA 297+00)

SHEET 13 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		98
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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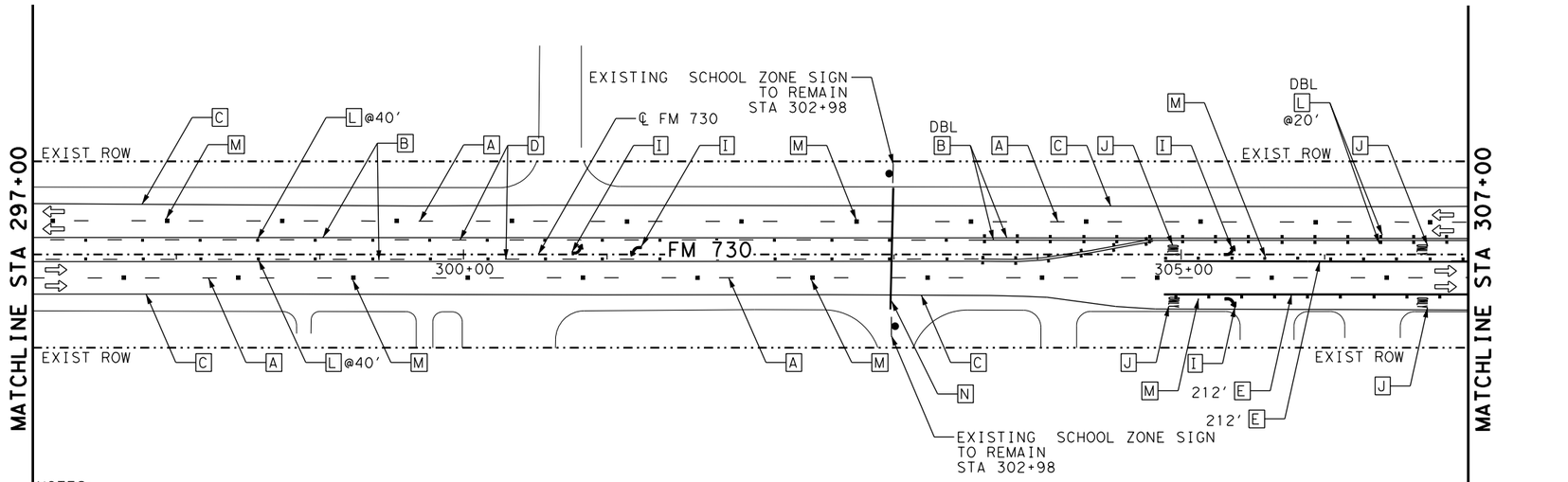

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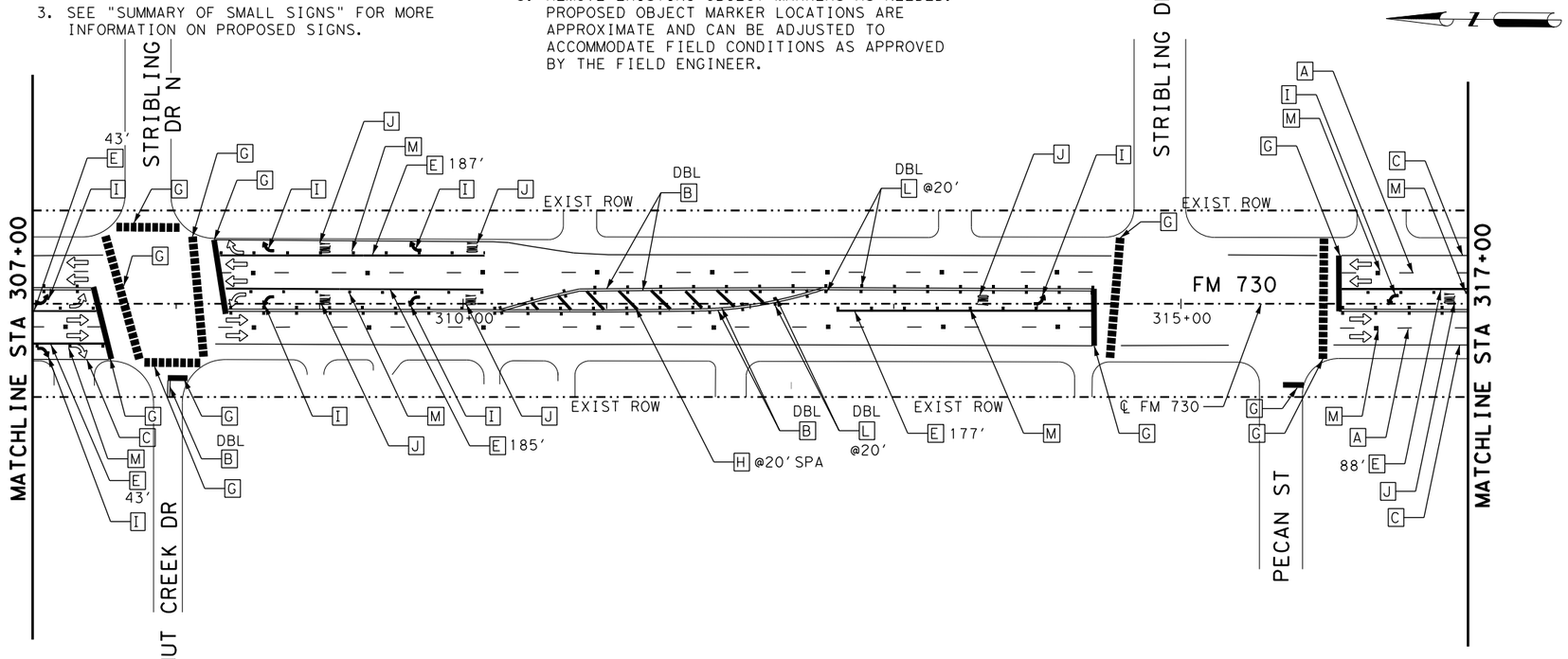

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
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(#) EXISTING SMALL SIGN TO BE REPLACED

PROPOSED OBJECT MARKER TYPE OM-2Z

PROPOSED OBJECT MARKER TYPE OM-3L

DIRECTION OF TRAFFIC

DEL ASSM(D-SW)SZ 1(BFR)GF2
DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
DEL ASSM(D-SW)SZ(BFR)CTB
DEL ASSM(D-SY)SZ(BFR)CTB

0 50′ 100′
SCALE: 1" = 100′

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

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Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 297+00 TO STA 317+00)

SHEET 14 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		99
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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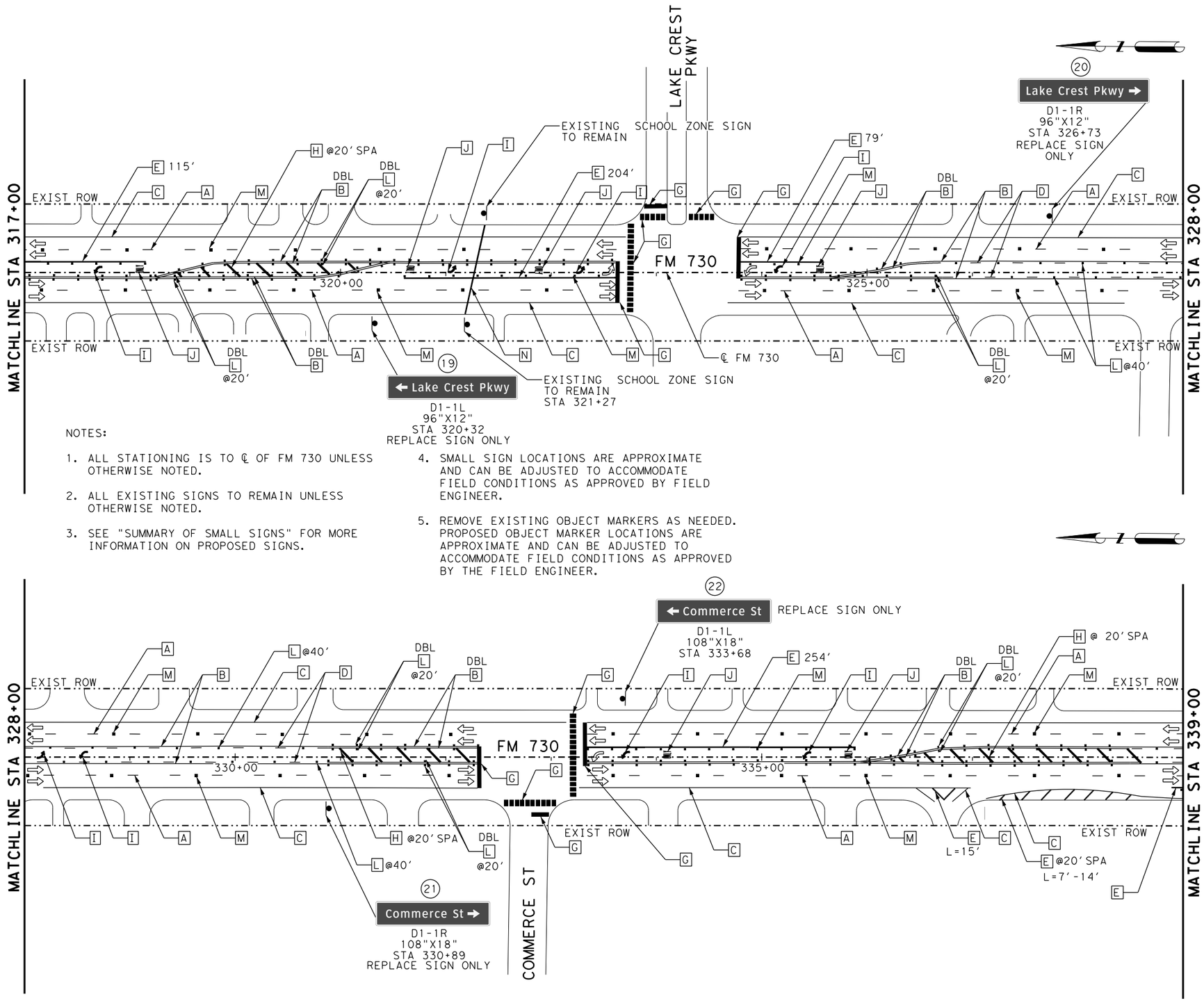

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- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
- O REFL PAV MARK TY I (W)6"(DOT)
- P RUMBLE STRIPS (SHOULDER)
- Q RUMBLE STRIPS (CENTERLINE)
- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50′ 100′
SCALE: 1" = 100′

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER
5/23/2023

NO.	DATE	REVISION	APPROV.

consor F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT
(STA 317+00 TO STA 339+00)

SHEET 15 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		100
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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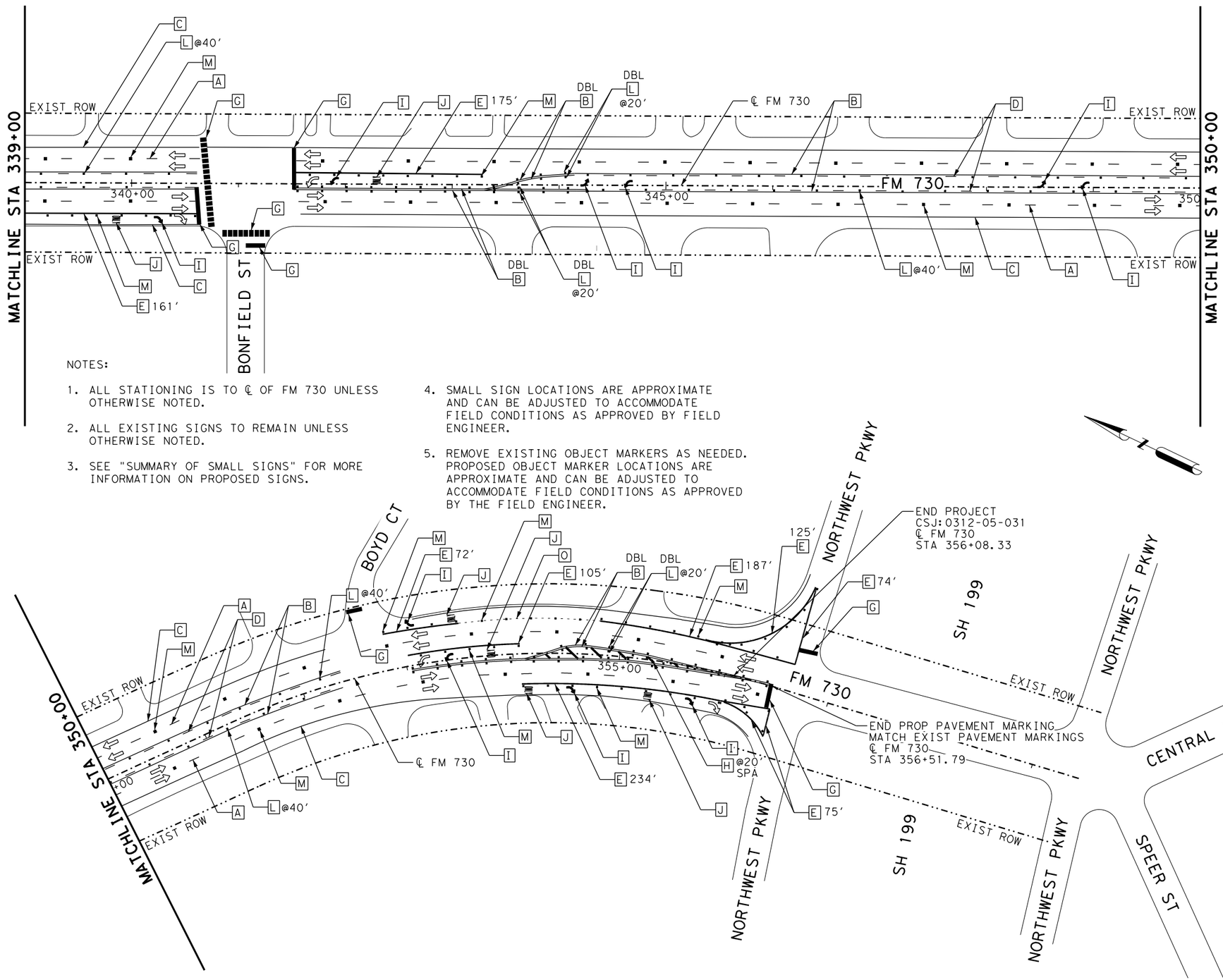

NOTES:

1. ALL STATIONING IS TO ℄ OF FM 730 UNLESS OTHERWISE NOTED.
2. ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED.
3. SEE "SUMMARY OF SMALL SIGNS" FOR MORE INFORMATION ON PROPOSED SIGNS.
4. SMALL SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY FIELD ENGINEER.
5. REMOVE EXISTING OBJECT MARKERS AS NEEDED. PROPOSED OBJECT MARKER LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS AS APPROVED BY THE FIELD ENGINEER.

LEGEND

- A REFL PAV MARK TY I (W)6"(BRK)
- B REFL PAV MARK TY I (Y)6"(SLD)
- C REFL PAV MARK TY I (W)6"(SLD)
- D REFL PAV MARK TY I (Y)6"(BRK)
- E REFL PAV MRK TY I (W)8"(SLD)
- F REFL PAV MRK TY I (W)12"(SLD)
- G REFL PAV MRK TY I (W)24"(SLD)
- H REFL PAV MARK TY I (Y)24"(SLD)
- I REFL PAV MARK TY I (W) (ARROW)
- J REFL PAV MARK TY I (W) (WORD)
- L REFL PAV MRKR TY II-A-A
- M REFL PAV MRKR TY I-C
- N REFL PAV MRK TY I (W)18"(SLD)
- O REFL PAV MARK TY I (W)6"(DOT)
- P RUMBLE STRIPS (SHOULDER)
- Q RUMBLE STRIPS (CENTERLINE)
- (#) EXISTING SMALL SIGN TO BE REPLACED
- PROPOSED OBJECT MARKER TYPE OM-2Z
- PROPOSED OBJECT MARKER TYPE OM-3L
- DIRECTION OF TRAFFIC
- DEL ASSM(D-SW)SZ 1(BFR)GF2
- DEL ASSM(D-SW)SZ 1(BFR)GF2(BI)
- DEL ASSM(D-SW)SZ(BFR)CTB
- DEL ASSM(D-SY)SZ(BFR)CTB

0 50′ 100′

SCALE: 1" = 100′

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

NO.	DATE	REVISION	APPROV.

consor F-12040

Texas Department of Transportation

FM 730

SIGNING AND PAVEMENT MARKING LAYOUT

(STA 339+00 TO END PROJECT)

SHEET 16 OF 16

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		101
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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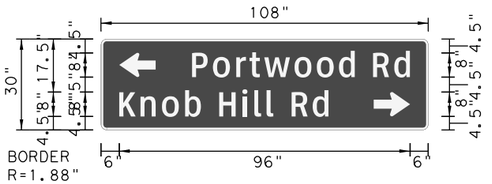

BORDER
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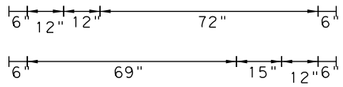
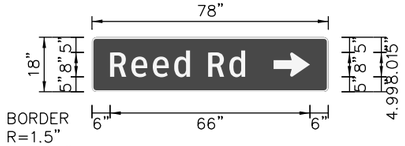
TH=0.75"

Panel Style: Standard Highway 30 8FNT.ssi
M.U.T.C.D.: 2009 Edition



SIGN NO.01: STA 64+66.00, ℄ FM 730
SHEET 3 OF 16



BORDER
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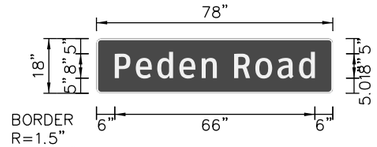
TH=0.5"

Panel Style: Standard Highway 8FNT 1.5 BDR.ssi
M.U.T.C.D.: 2009 Edition

SIGN NO.03: STA 112+82.00, ℄ FM 730
SHEET 5 OF 16



BORDER
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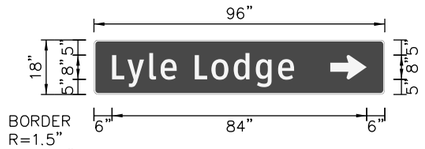
TH=0.5"

Panel Style: standard highway no arrow.ssi
M.U.T.C.D.: 2009 Edition

SIGN NO.04: STA 156+99.00, ℄ FM 730
SHEET 7 OF 16

SIGN NO.06: STA 164+70.00, ℄ FM 730
SHEET 7 OF 16



BORDER
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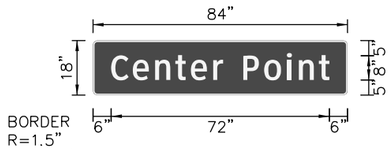
TH=0.5"

Panel Style: Standard Highway 8FNT 1.5 BDR.ssi
M.U.T.C.D.: 2009 Edition

SIGN NO.05: STA 162+08.00, ℄ FM 730
SHEET 7 OF 16



BORDER
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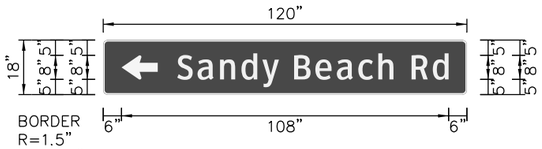
TH=0.5"

Panel Style: standard highway no arrow.ssi
M.U.T.C.D.: 2009 Edition



BORDER
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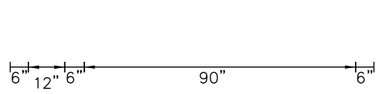
M.U.T.C.D.: 2009 Edition



SIGN NO.11: STA 242+90.00, ℄ FM 730
SHEET 11 OF 16

BORDER
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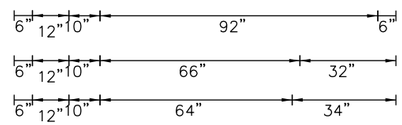
Panel Style: D1-3 Standard 42IN 2.25 BDR.ssi
M.U.T.C.D.: 2009 Edition



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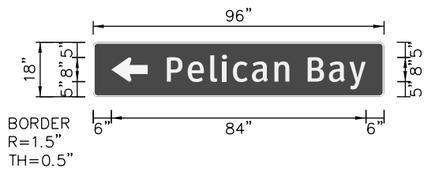
SHEET 11 OF 16



BORDER
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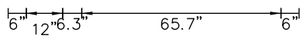
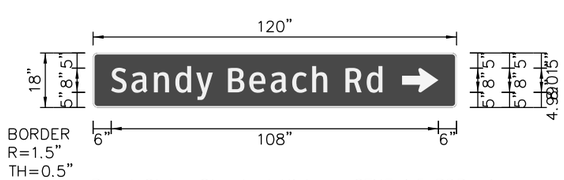
Panel Style: Standard Highway 8FNT 1.5 BDR.ssi
M.U.T.C.D.: 2009 Edition



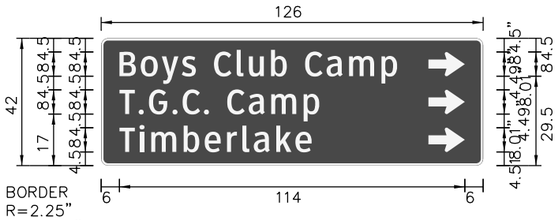
SIGN NO.13: STA 245+05.00, ℄ FM 730
SHEET 11 OF 16



BORDER
R=1.5"
TH=0.5"

Panel Style: Standard Highway 8FNT 1.5 BDR.ssi
M.U.T.C.D.: 2009 Edition

SIGN NO.14: STA 251+39.00, ℄ FM 730
SHEET 11 OF 16



BORDER
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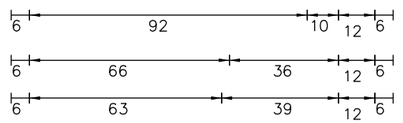
Panel Style: D1-3 Standard 42IN 2.25 BDR.ssi
M.U.T.C.D.: 2009 Edition



SIGN NO.15: STA 252+59.00, ℄ FM 730
SHEET 11 OF 16

5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

FM 730

GUIDE SIGN DETAILS

SHEET 1 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		102
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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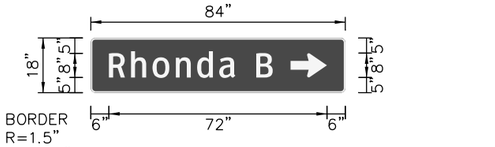

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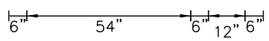
M.U.T.C.D.: 2009 Edition



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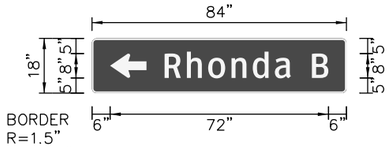
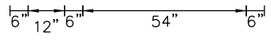
SHEET 13 OF 16



Panel Style: Standard Highway.ssi
M.U.T.C.D.: 2009 Edition



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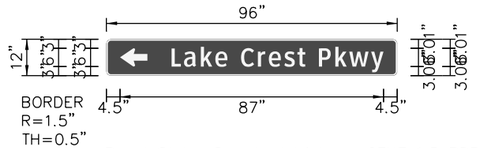
SHEET 13 OF 16



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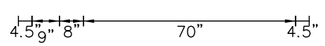
M.U.T.C.D.: 2009 Edition



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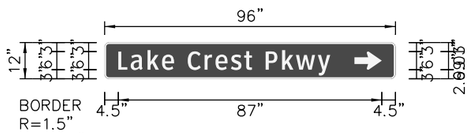
SHEET 15 OF 16



Panel Style: Standard Highway 6FNT 1.5 BDR.ssi
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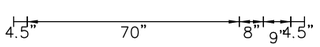

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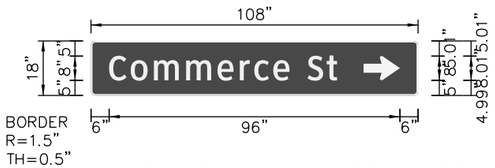
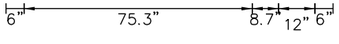
SHEET 15 OF 16



Panel Style: Standard Highway 8FNT 1.5 BDR.ssi
M.U.T.C.D.: 2009 Edition



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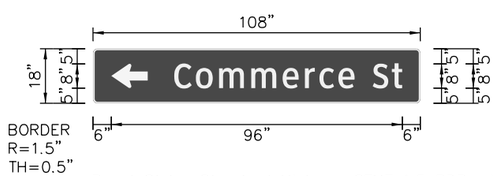
SHEET 15 OF 16



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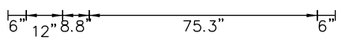
M.U.T.C.D.: 2009 Edition



SIGN NO.22: STA 333+68.00, ℄ FM 730
SHEET 15 OF 16

5/23/2023

NO.	DATE	REVISION	APPROV.

consor
F-12040

Texas Department of Transportation

FM 730

GUIDE SIGN DETAILS

SHEET 2 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		103
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

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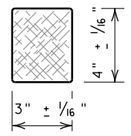
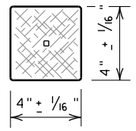
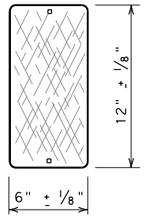
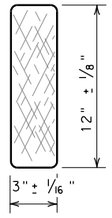
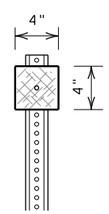
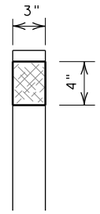
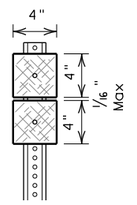
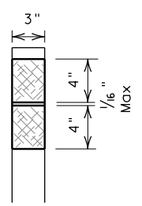
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE	 1-Size 2 reflector unit	 1-Size 1 reflector unit	 2-Size 2 reflector units	 2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

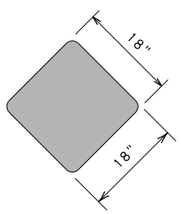
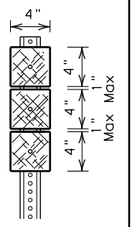
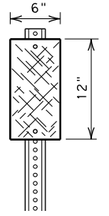
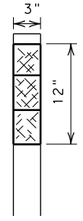
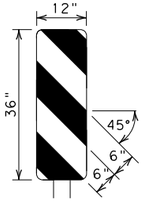
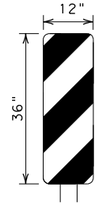
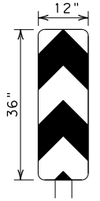
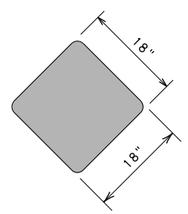
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

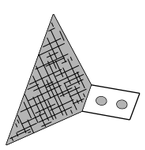
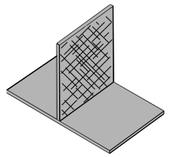
TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

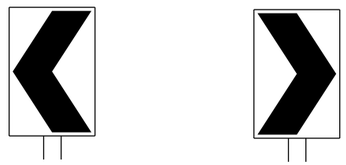
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		 3-Size 2 reflector units	 1-Size 3 reflector unit	 3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

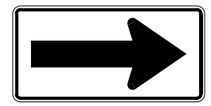
CHEVRONS

DEVICE:  W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	TARRANT		104

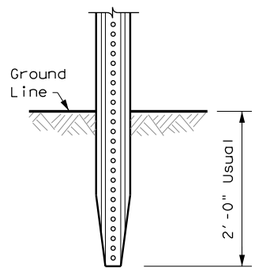
20A

DATE: 5/23/2023 8:10:02 AM
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\08. Traffic\Standards\dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

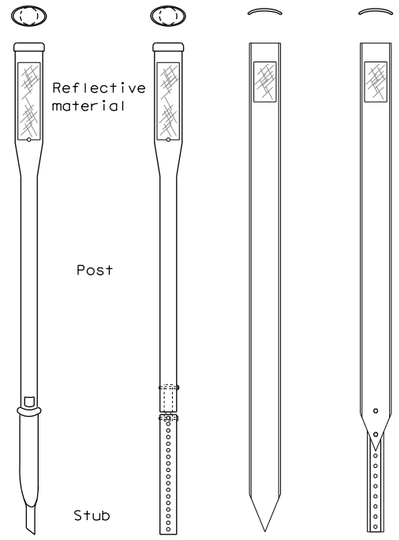


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

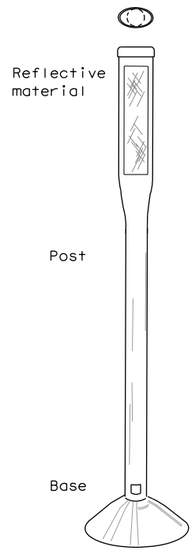
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



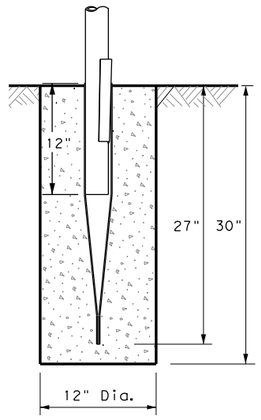
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

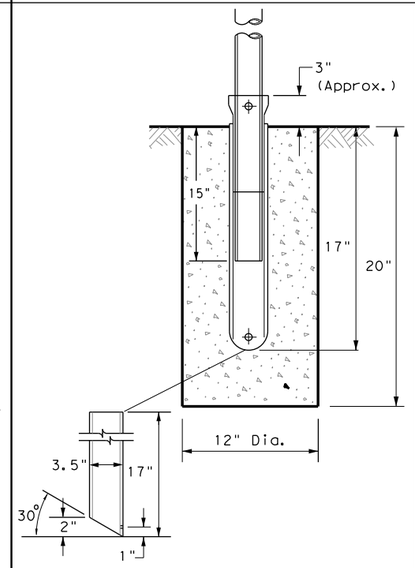
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

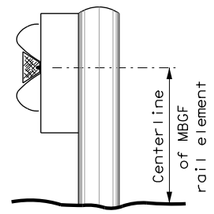
NOTE

1. Install per manufacturer's recommendations.

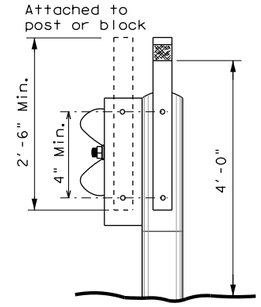
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

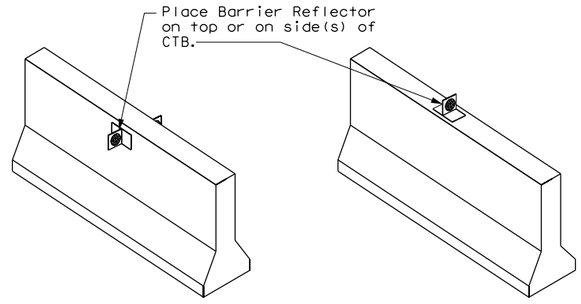
GF1



GF2



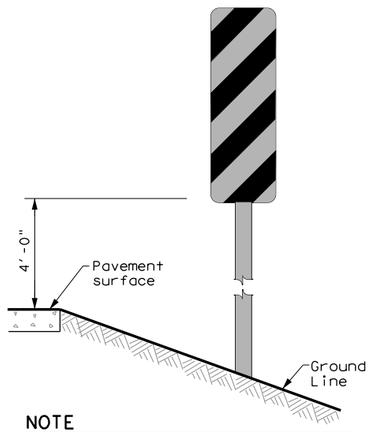
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

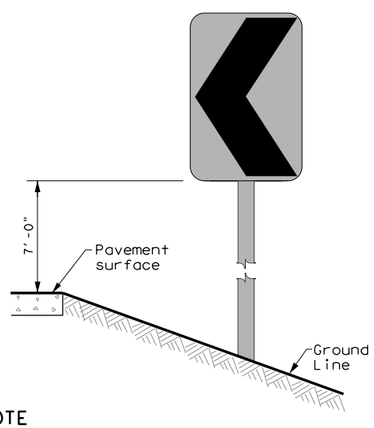
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

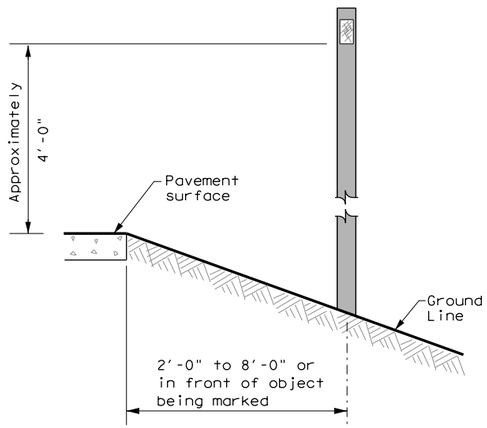
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

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© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	TARRANT		105

20B

DATE: 5/23/2023 8:10:03 AM
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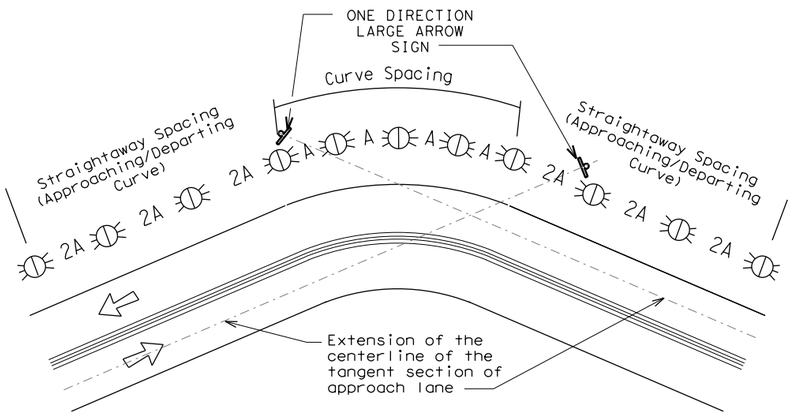
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

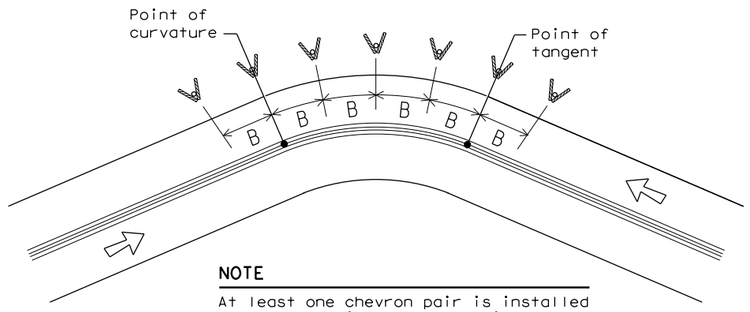
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	——
2	2865	160	320	——
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

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3-15 8-15 8-15 7-20	DIST	COUNTY		SHEET NO.
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20C

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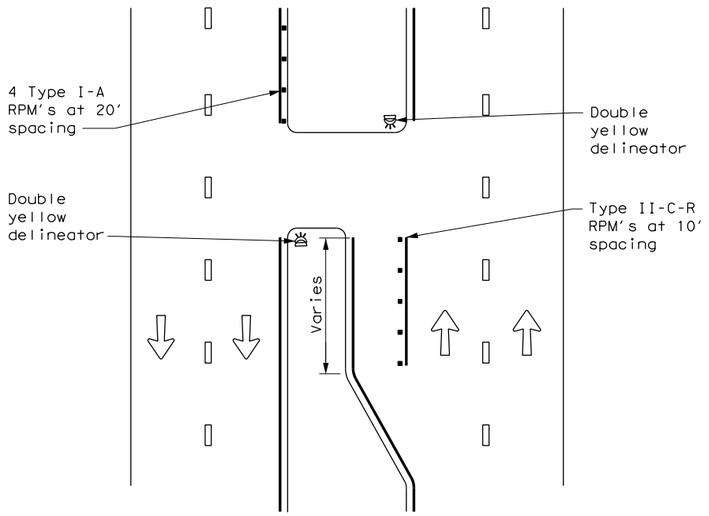
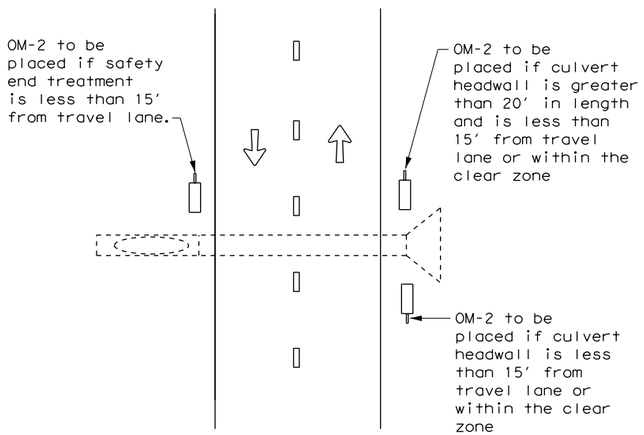
CROSSOVERS



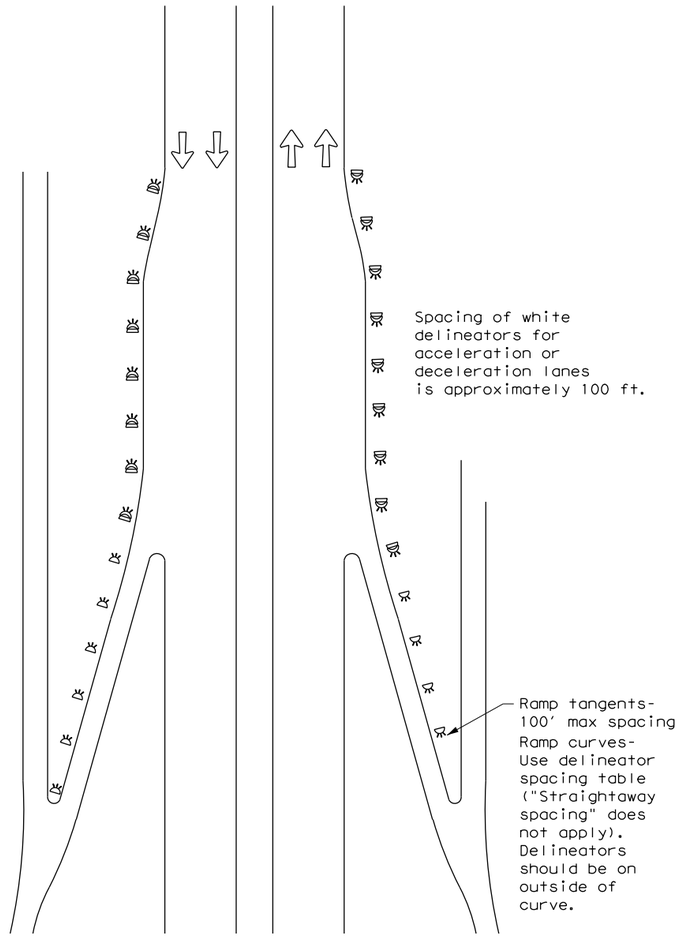
DETAIL 1

FOR CULVERTS WITH MBGF



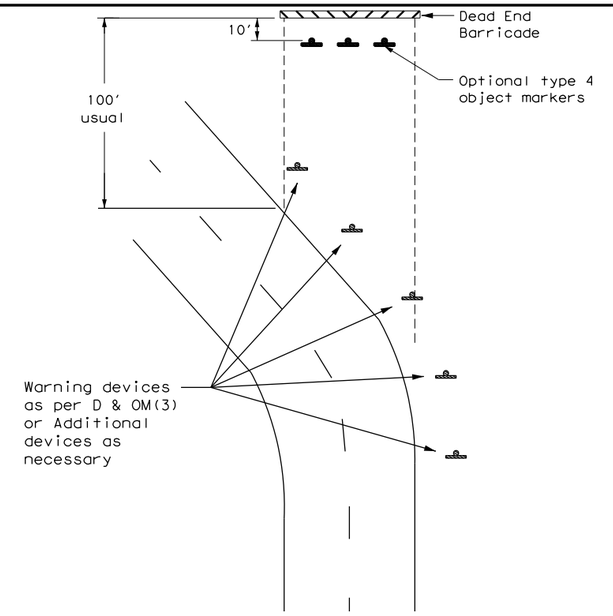
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



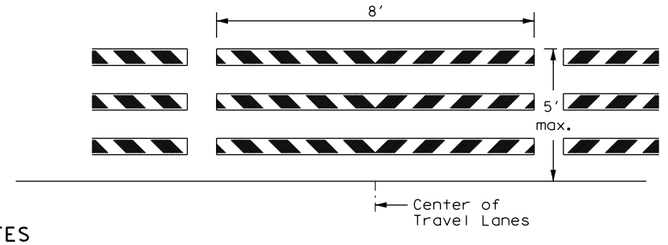
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

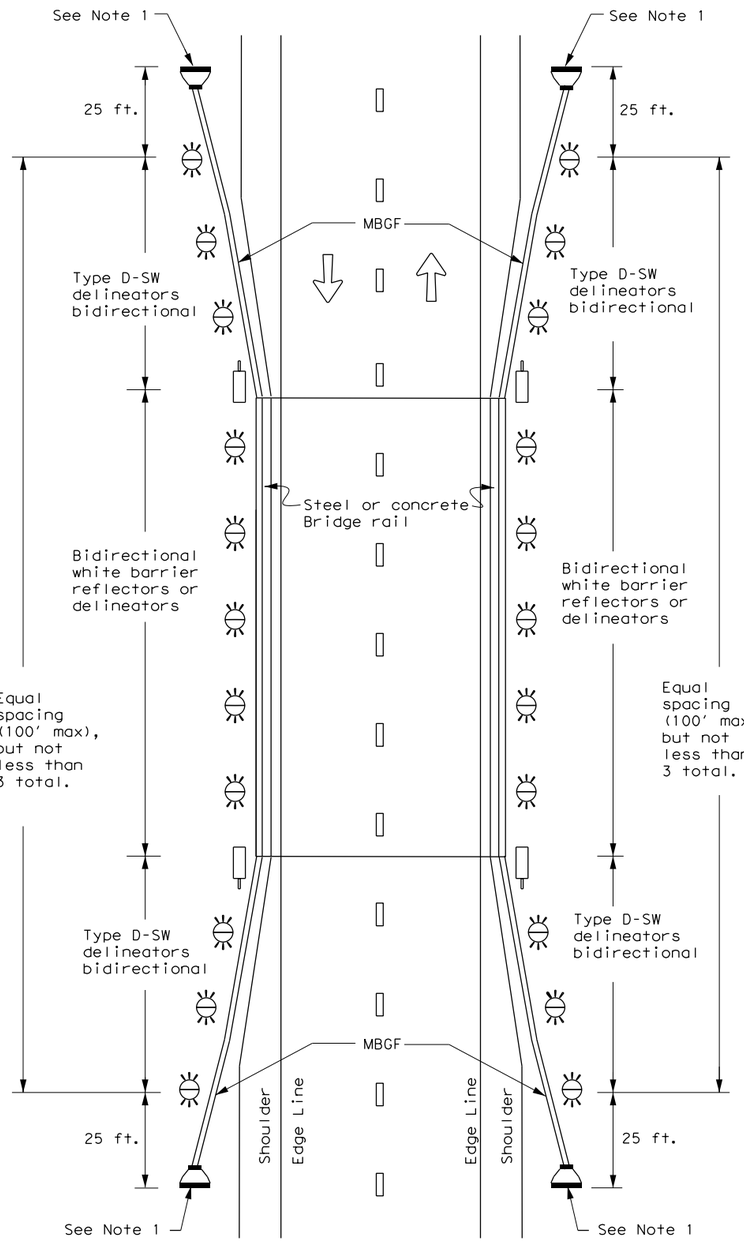
D & OM(4)-20

FILE: dom4-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
3-15	DIST	COUNTY		SHEET NO.
7-20	FTW	TARRANT		107

20D

DATE: 5/23/2023 8:10:05 AM
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\08. Traffic\Standards\dom5-20.dgn

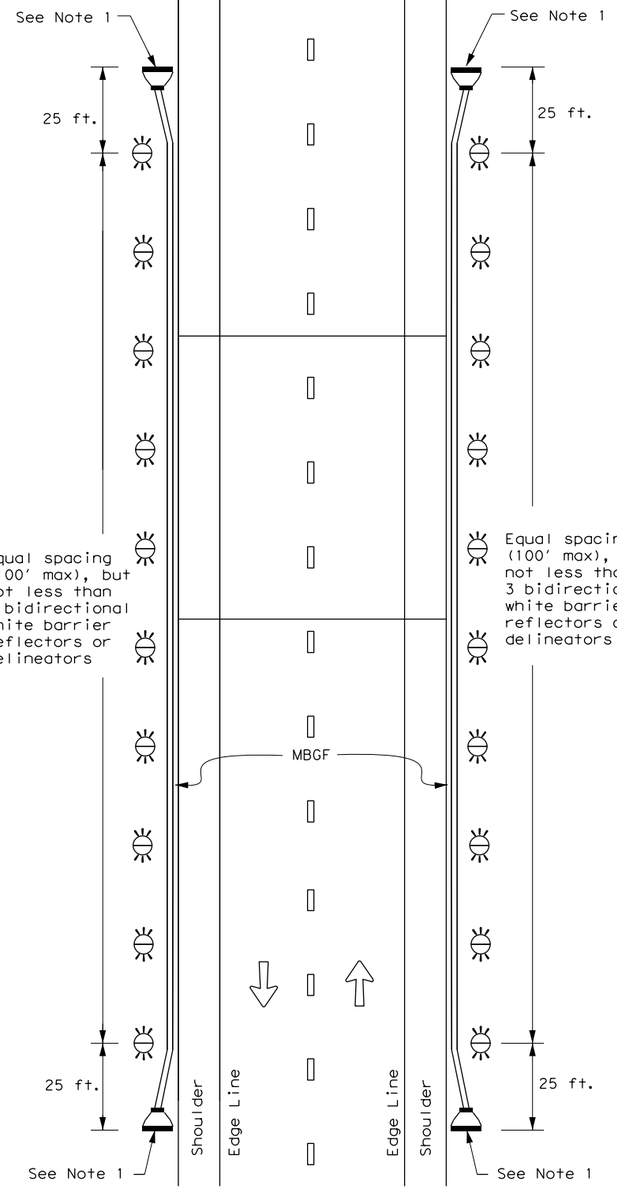
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

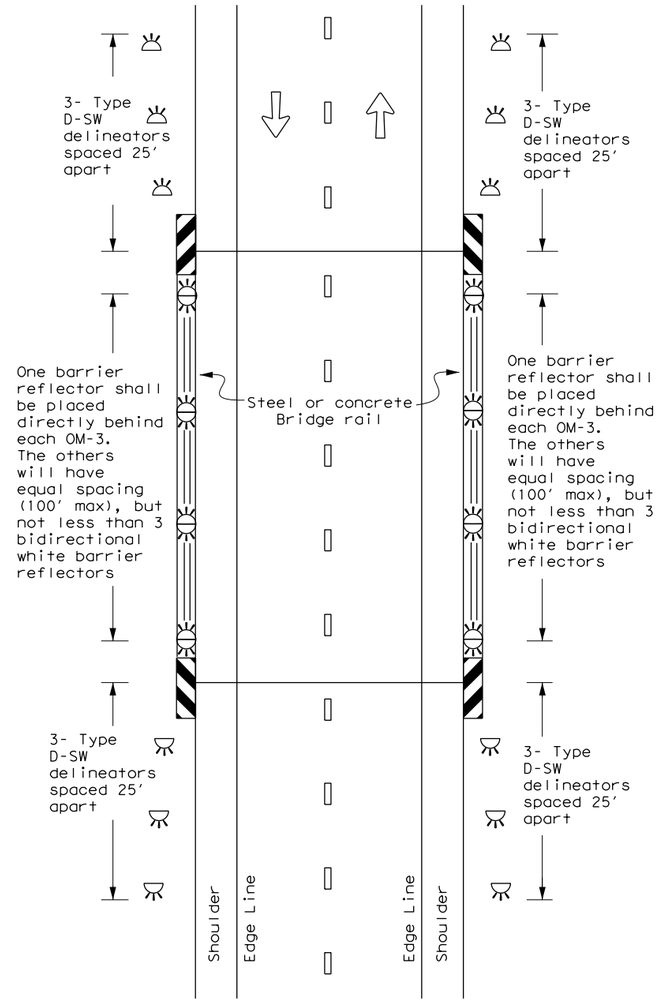
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
7-20	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		108

20E

DATE: 5/23/2023 8:10:06 AM
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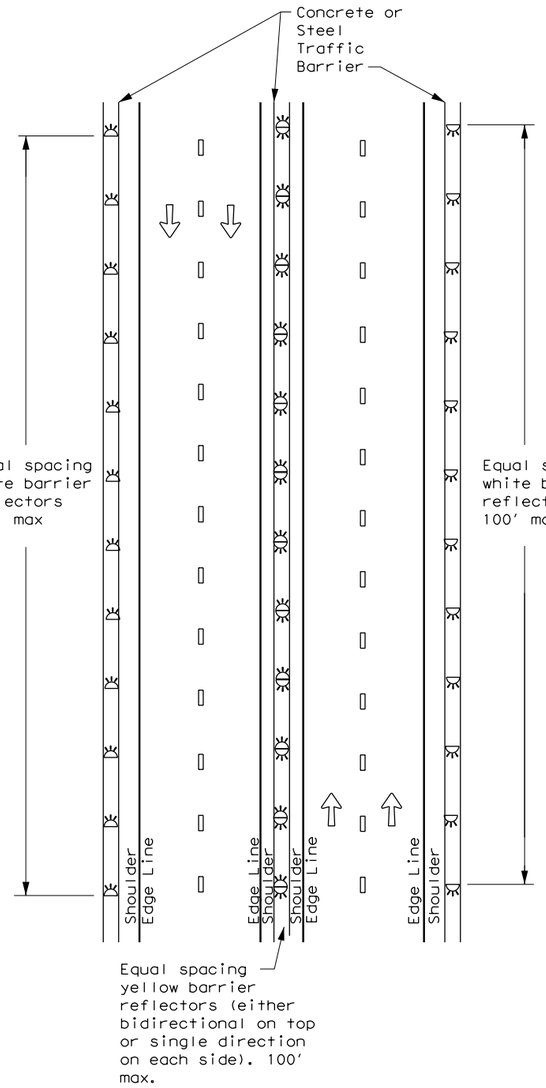
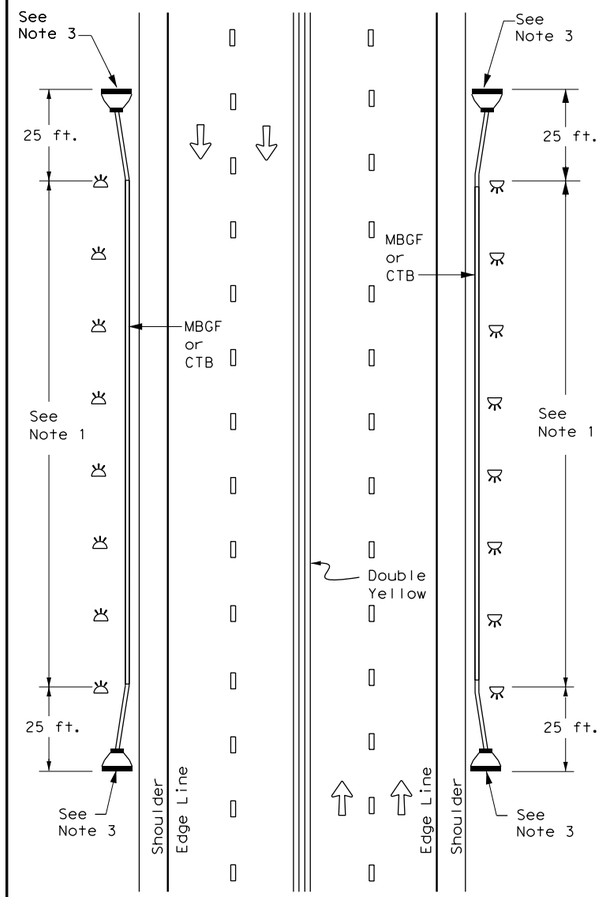
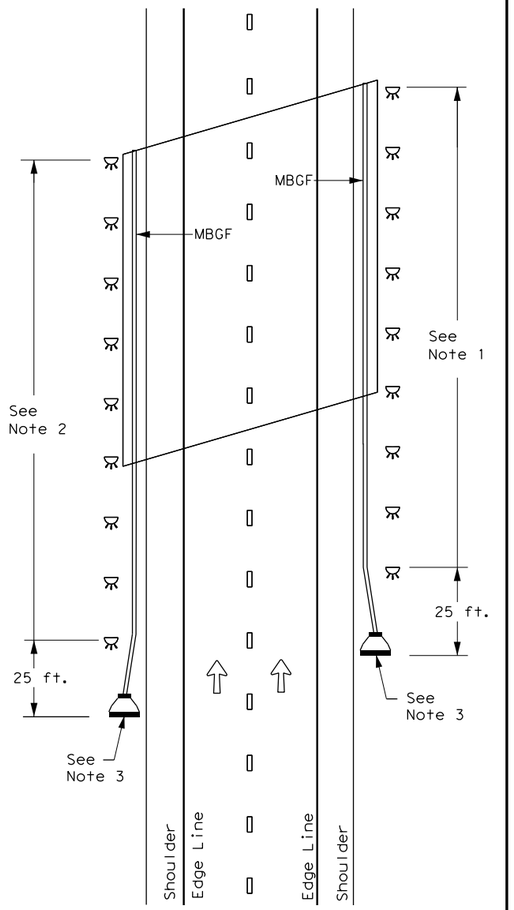
CONTINUOUS CONCRETE OR STEEL BARRIER



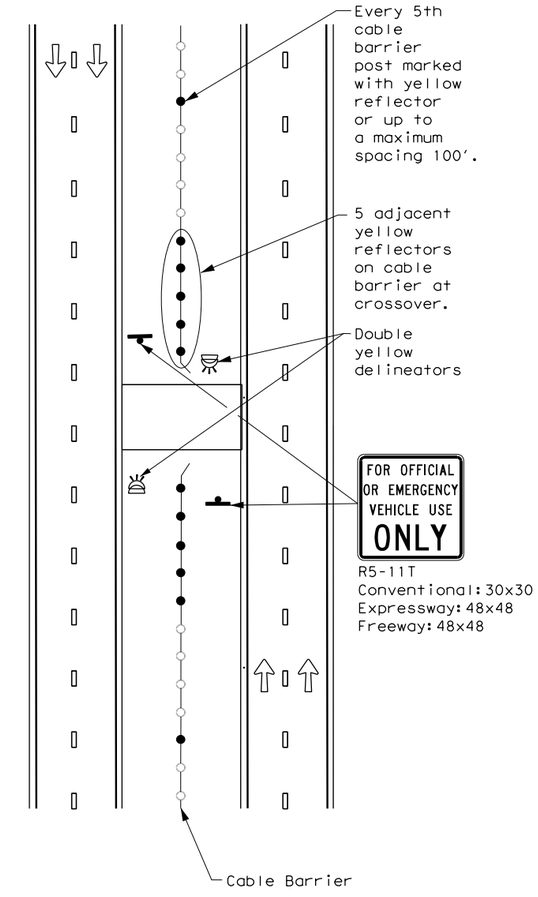
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100′ max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100′ max.)
2. Equal spacing (100′ max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3)in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
7-20	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		109

DATE: 5/23/2023 8:10:06 AM
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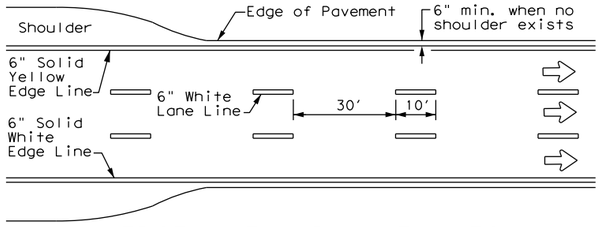
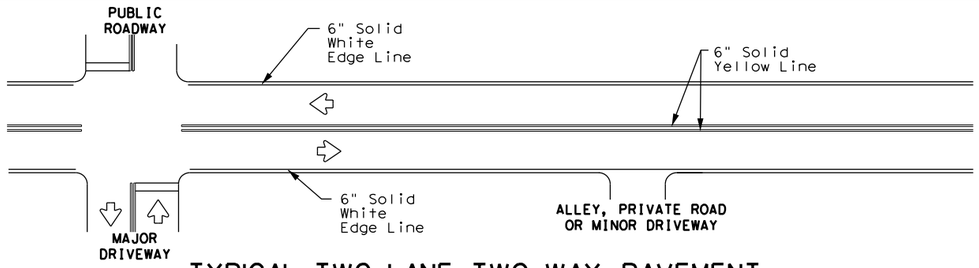
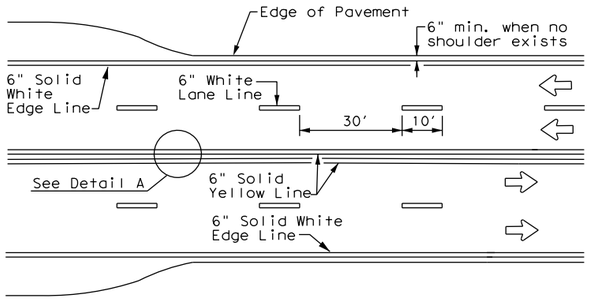
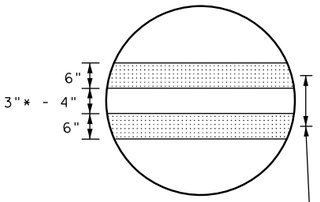


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





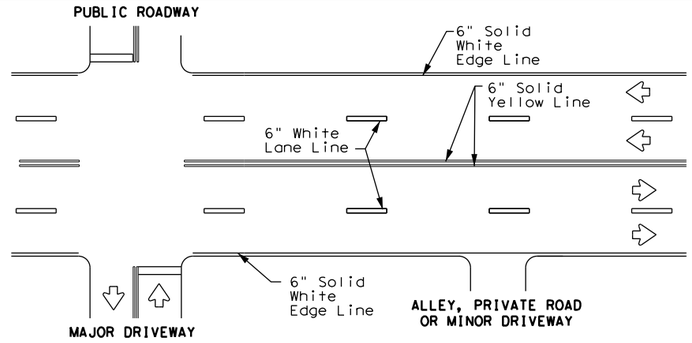
DETAIL "A"

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

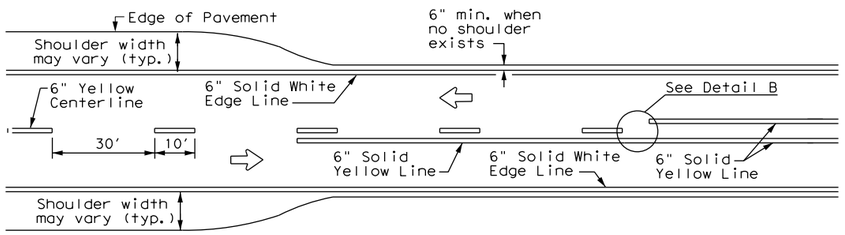
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

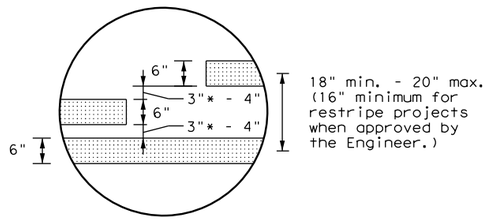
** 8" minimum for restripe projects when approved by the Engineer.



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

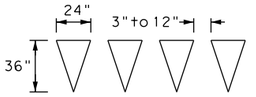


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



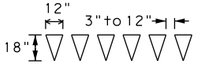
DETAIL "B"

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

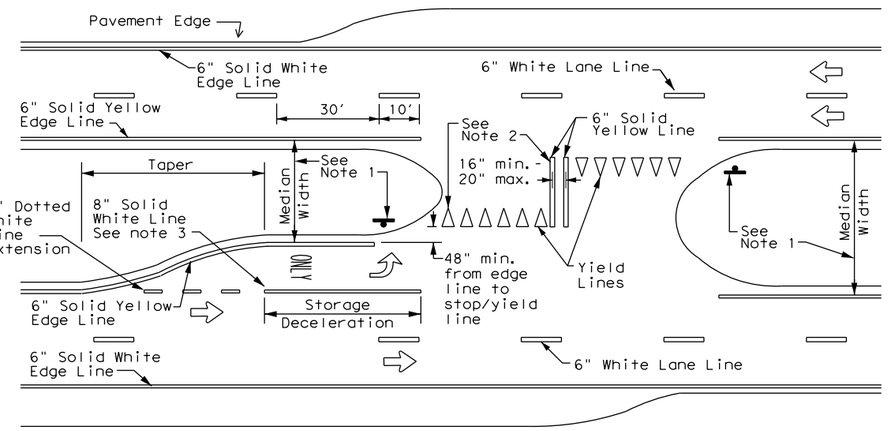


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

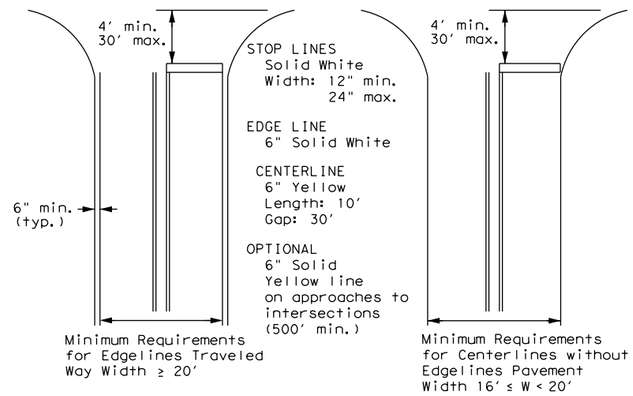
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

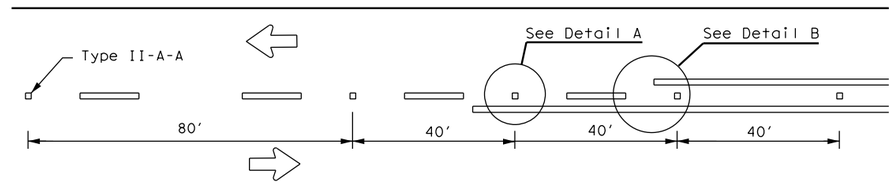
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

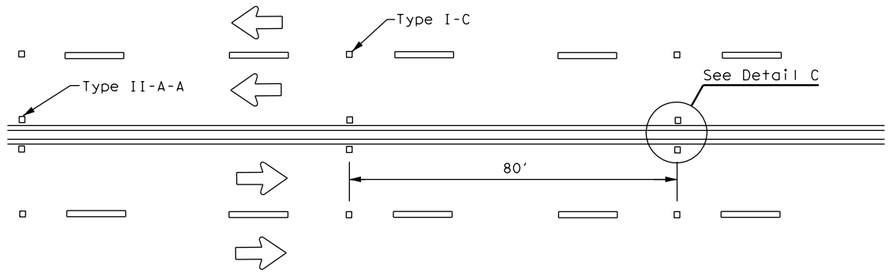
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		110

22A

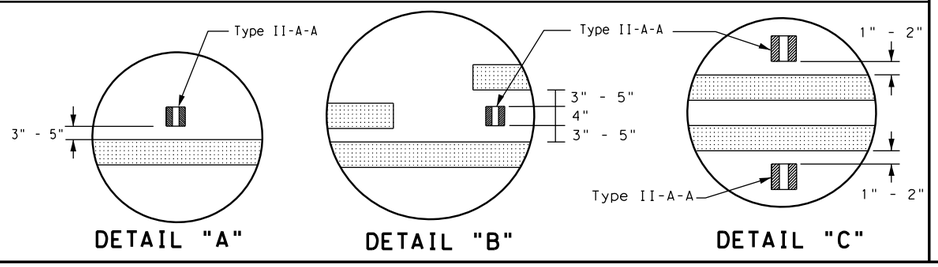
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

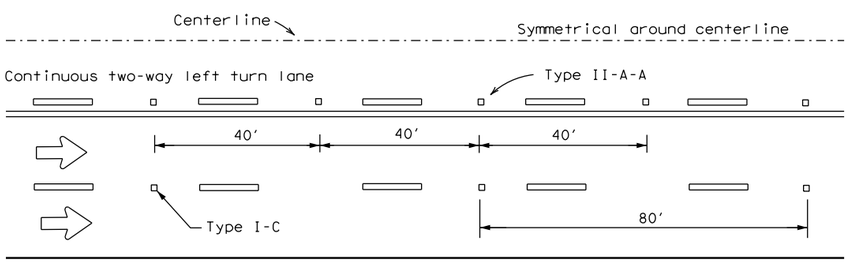


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

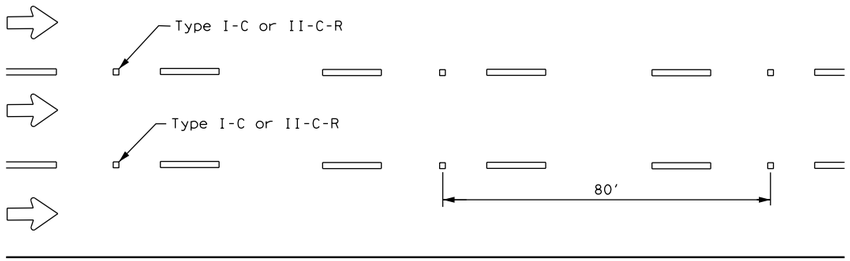


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





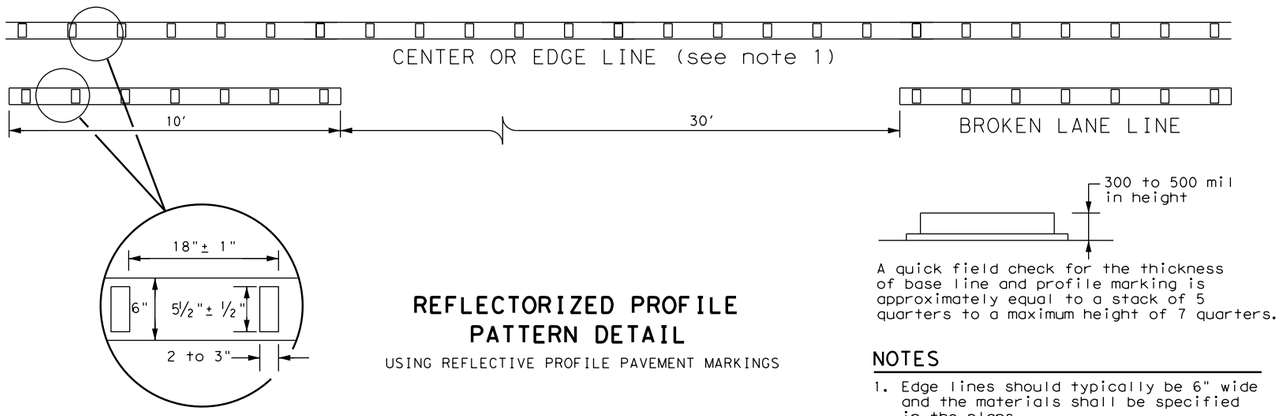
CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

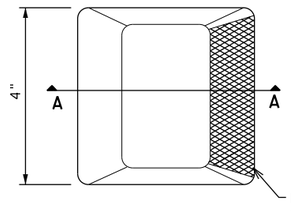
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

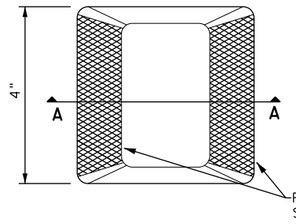
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians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

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

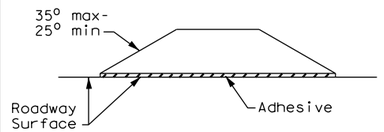
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

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	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		111

22B

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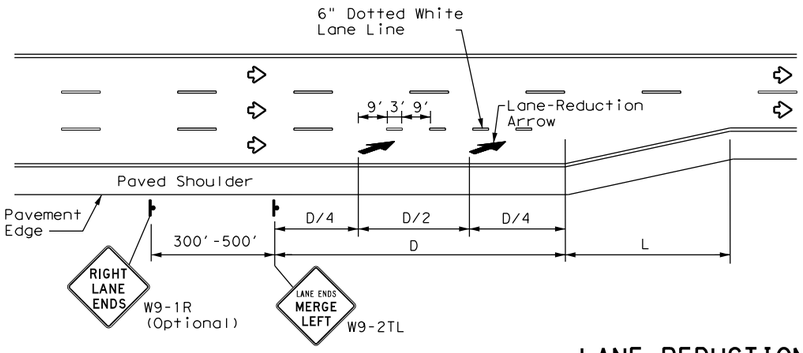
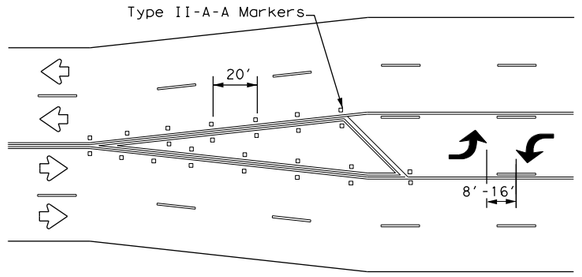


LANE REDUCTION

NOTES

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

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



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.

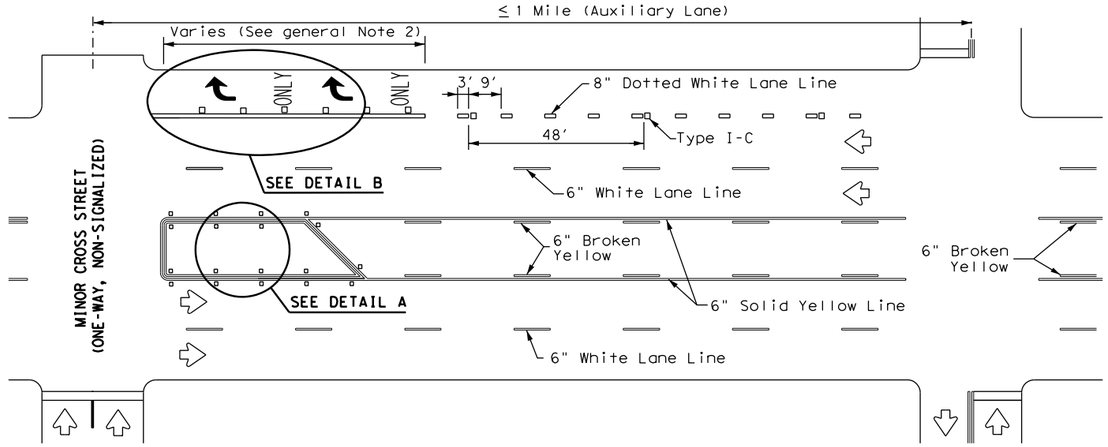
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

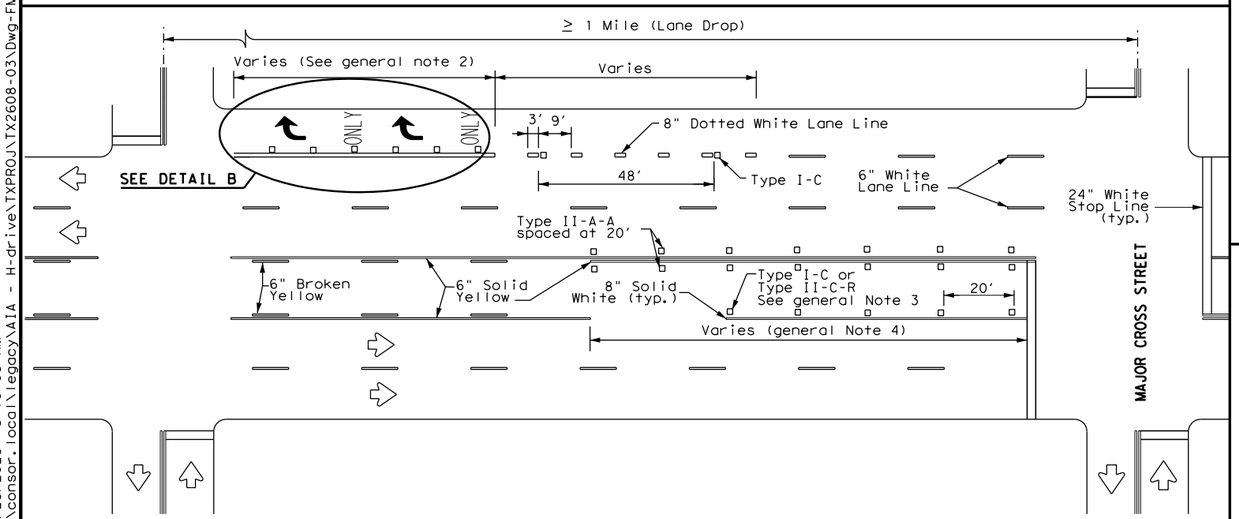
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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

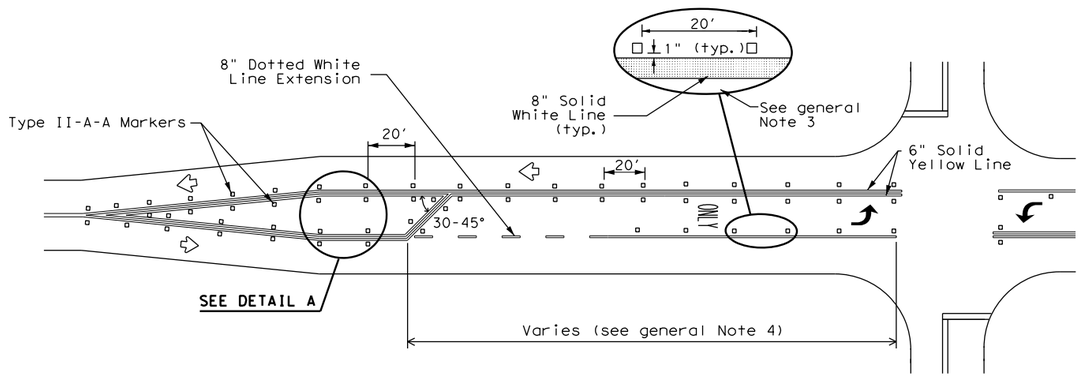
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



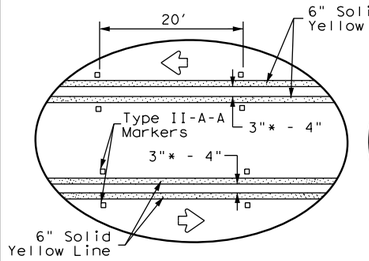
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



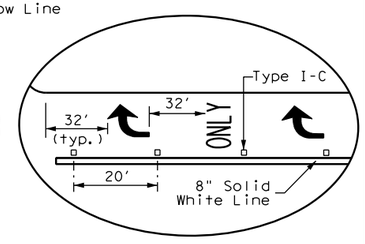
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		112

22C

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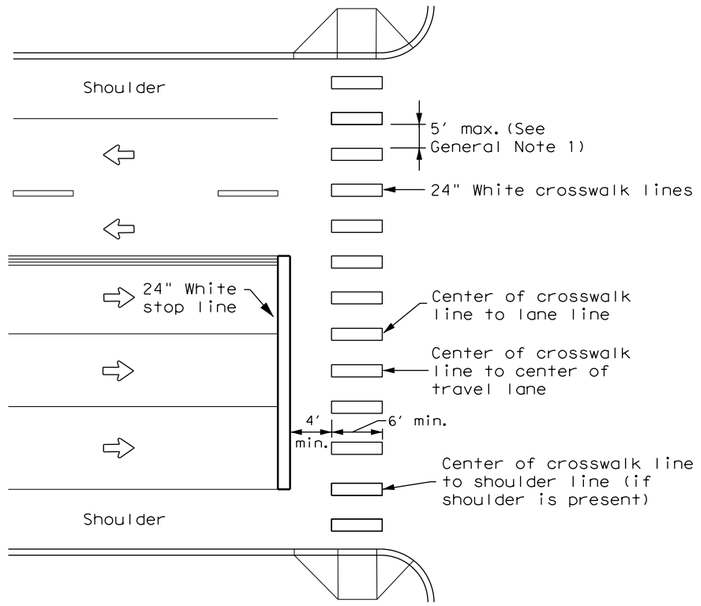


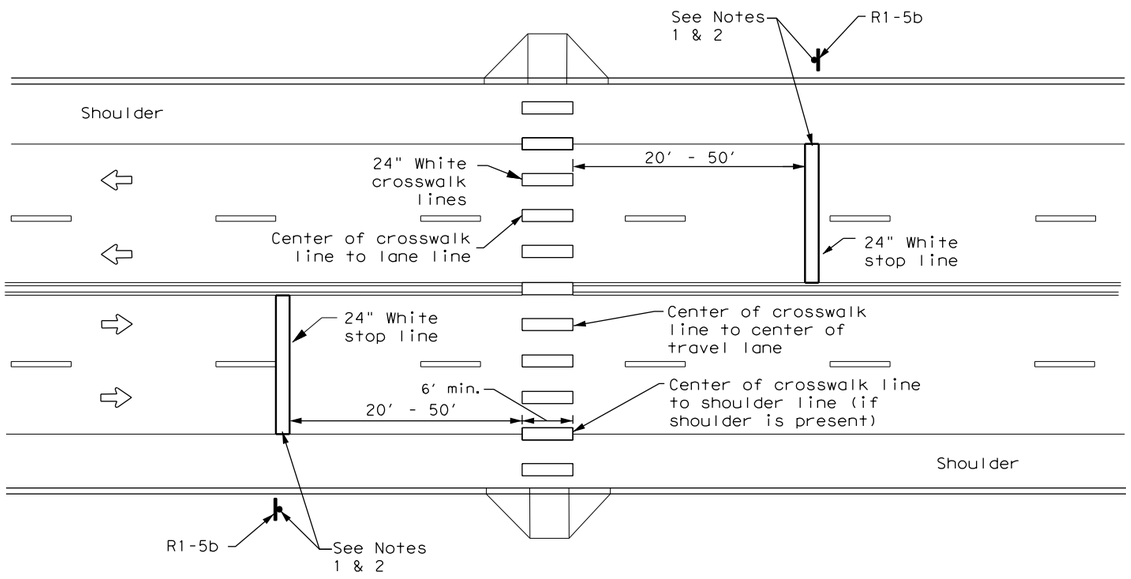
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6′ wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
6-20	DIST	COUNTY		SHEET NO.
6-22	FTW	TARRANT		113
12-22				
22D				

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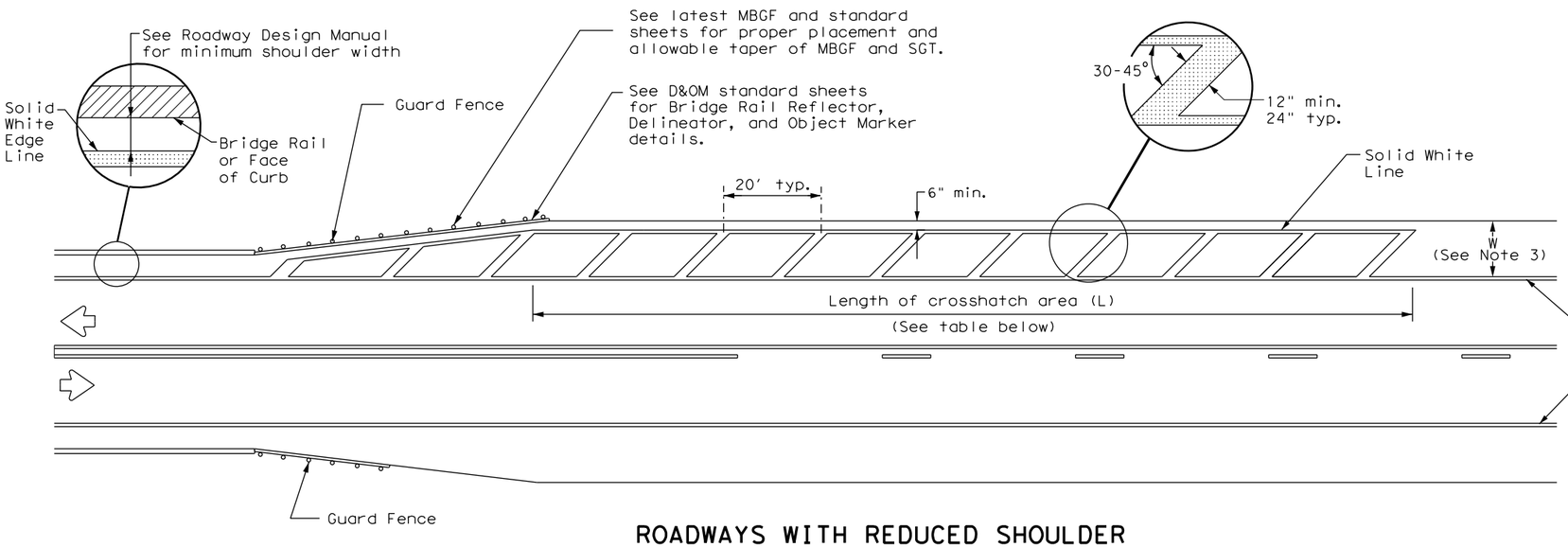

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

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

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

Texas Department of Transportation

Traffic Safety Division Standard

PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

PM(5)-22

FILE: pm5-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		114

22E

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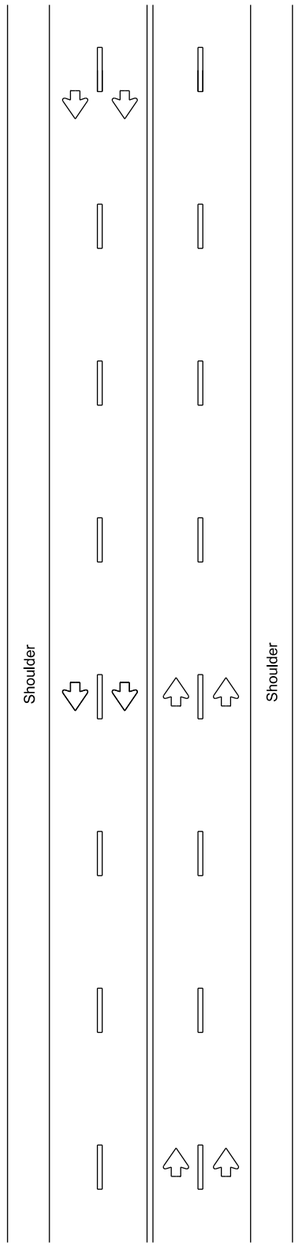
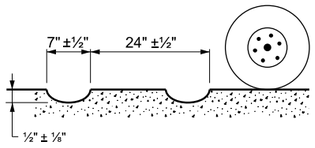
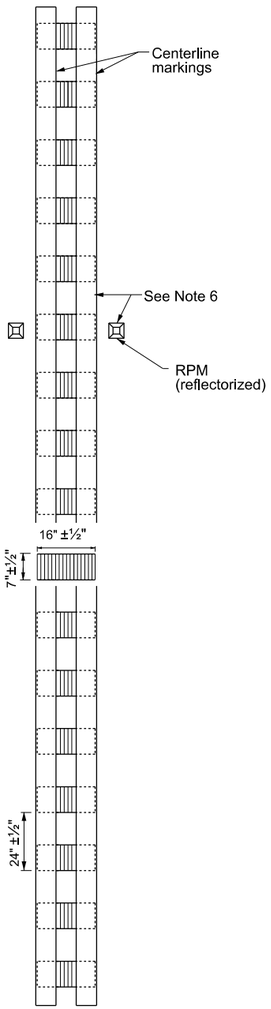
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

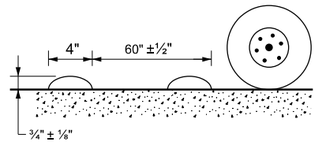


PROFILE VIEW

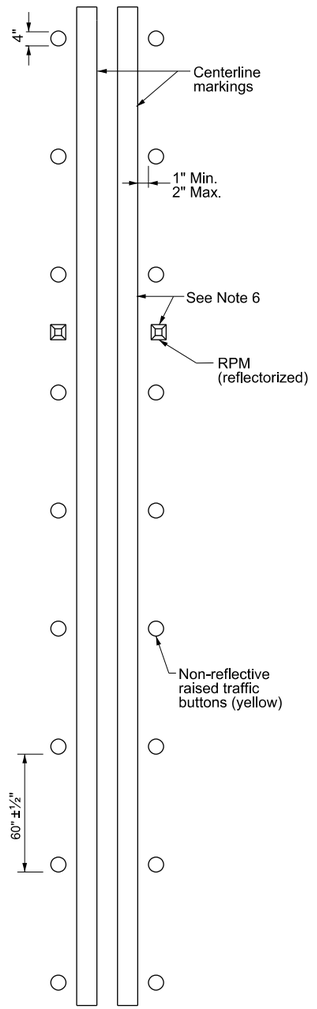


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

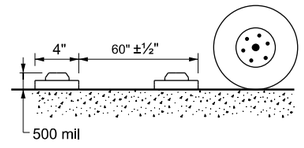


PROFILE VIEW

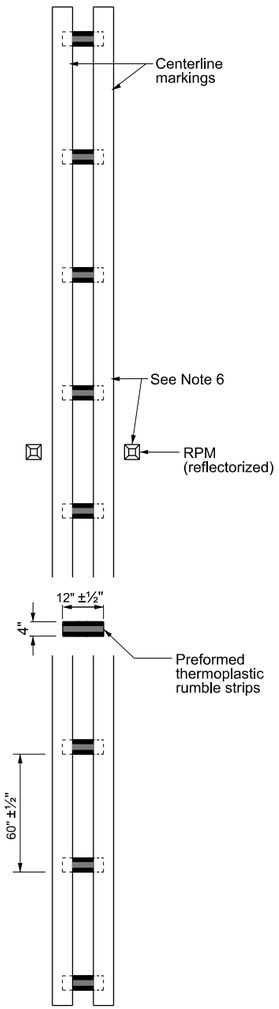


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

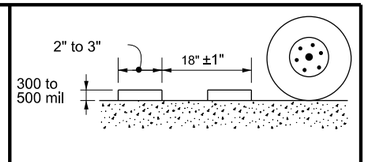


PROFILE VIEW

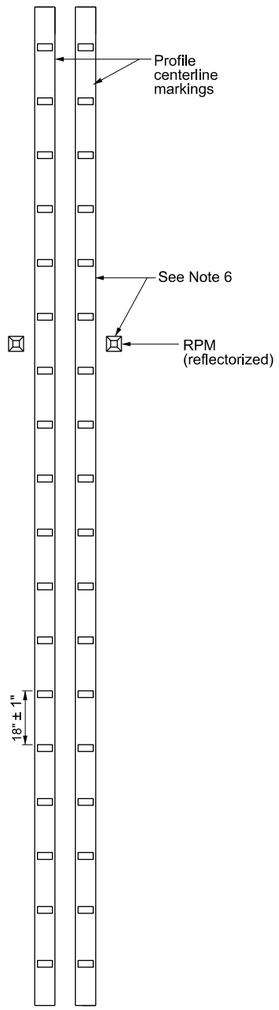


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edge line rumble strips or profile markings shall not be placedon roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may beused if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and nomore than 150 feet in advance of bridges, railroad crossing, intersections ordriveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

FILE: rs(3)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0312	05	031,ETC.	FM 730
10-13 1-23	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		115

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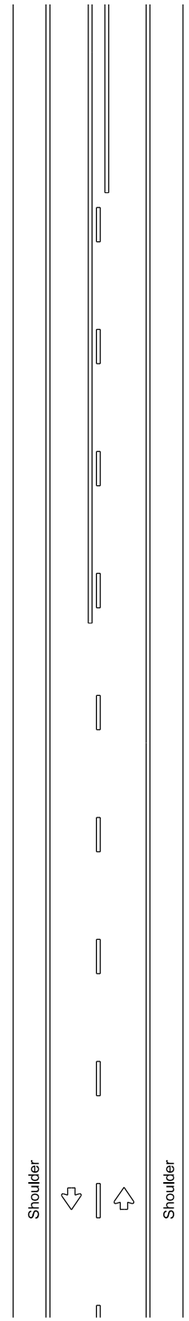
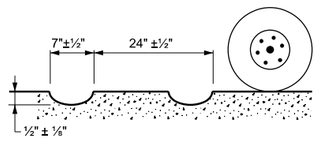
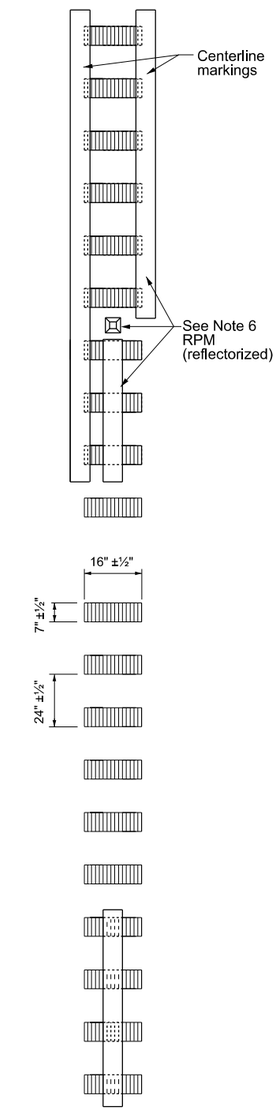
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

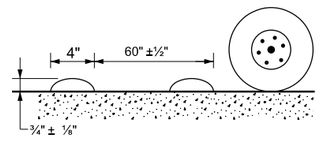


PROFILE VIEW

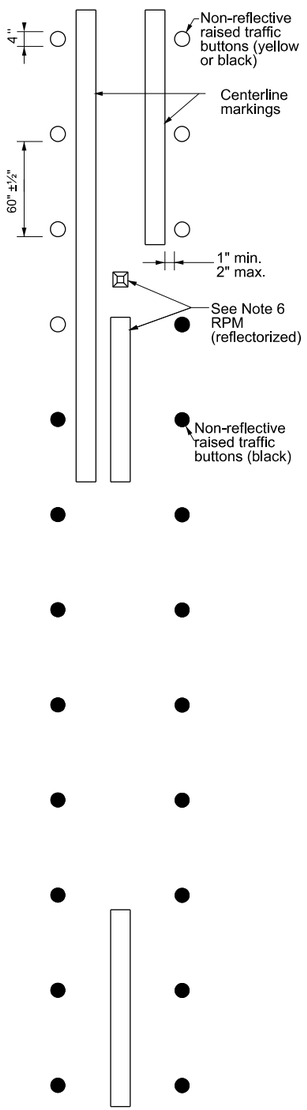


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

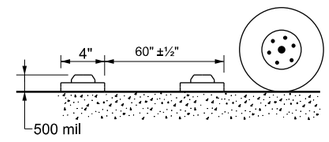


PROFILE VIEW

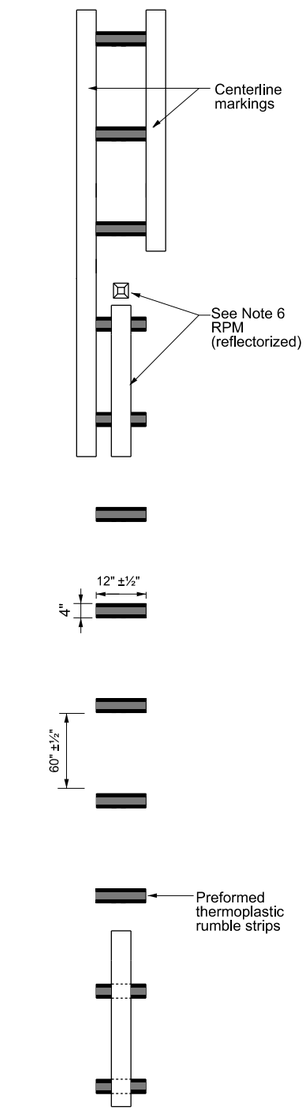


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

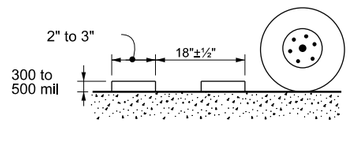


PROFILE VIEW

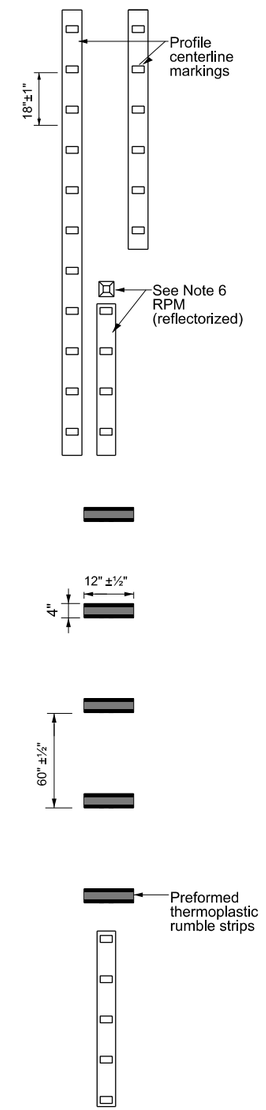


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0312	05	031,ETC.	FM 730
10-13	DIST	COUNTY		SHEET NO.
1-23	FTW	TARRANT		116

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

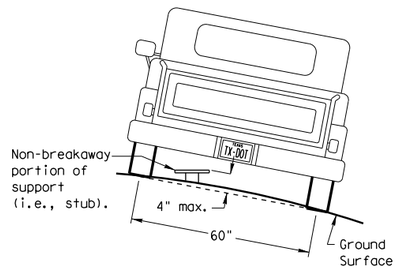
Anchor Type

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

Sign Mounting Designation

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

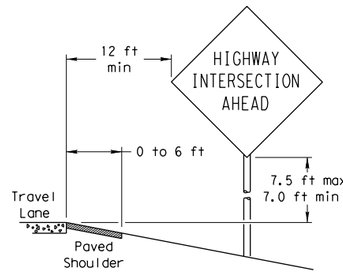
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

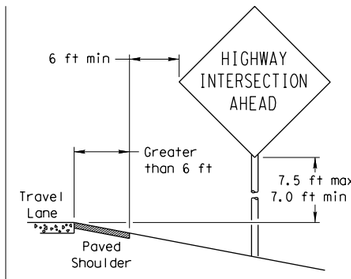
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

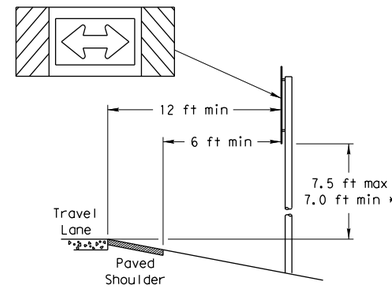
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



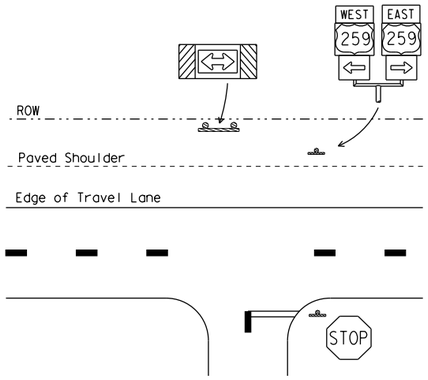
GREATER THAN 6 FT. WIDE

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

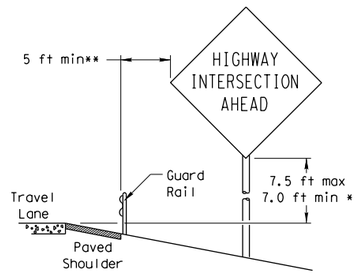
T-INTERSECTION



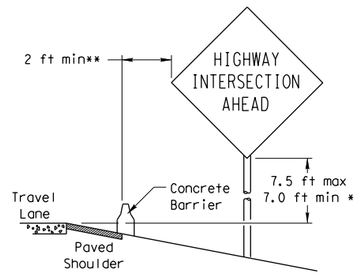
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

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

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

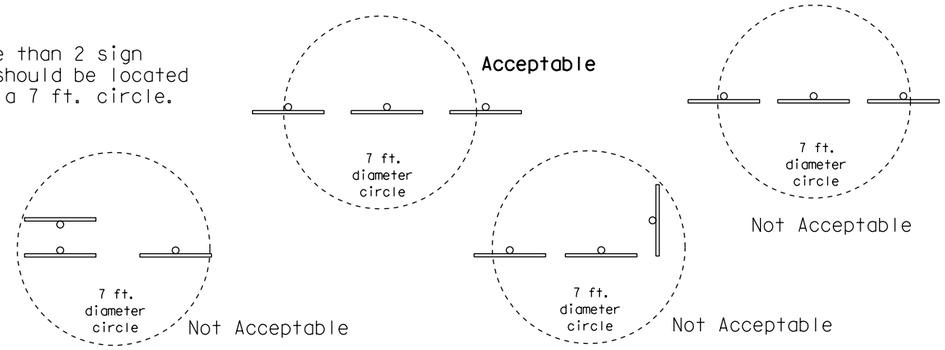
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

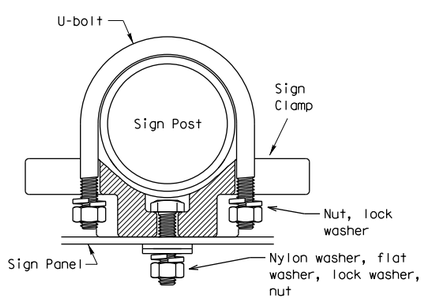
The website address is:
http://www.txdot.gov/publications/traffic.htm

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

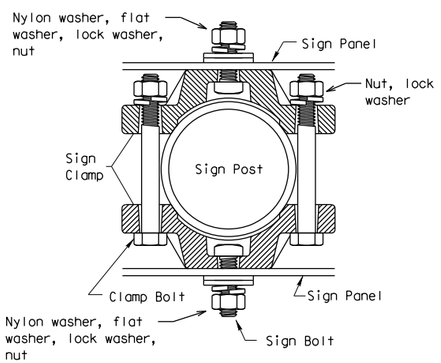


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

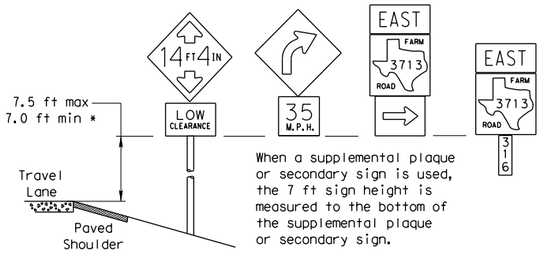
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



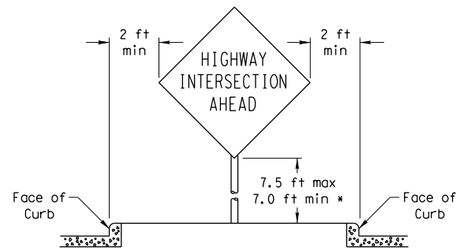
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



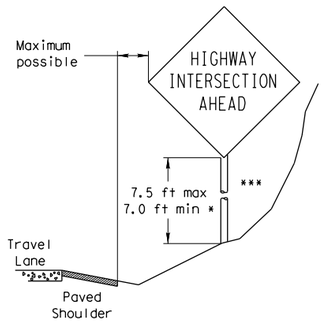
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

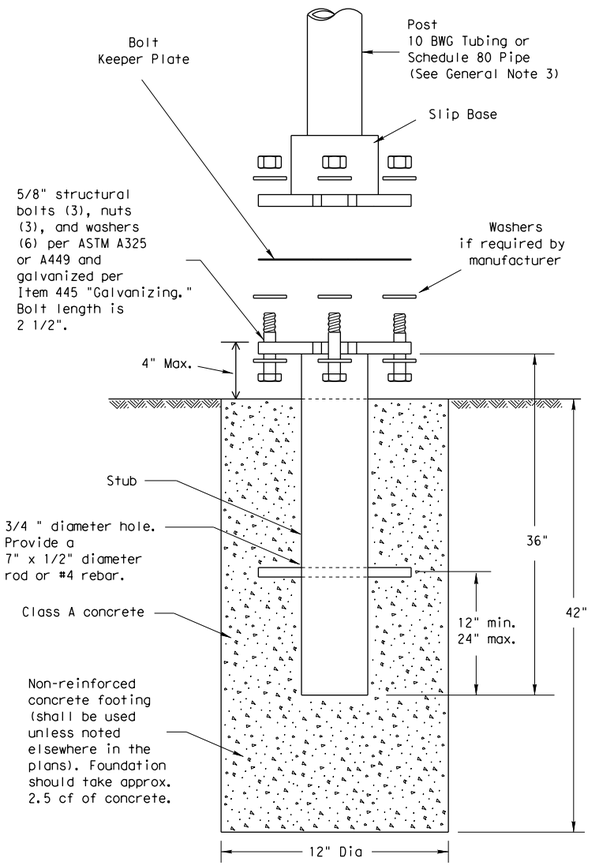
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

© TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		117

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

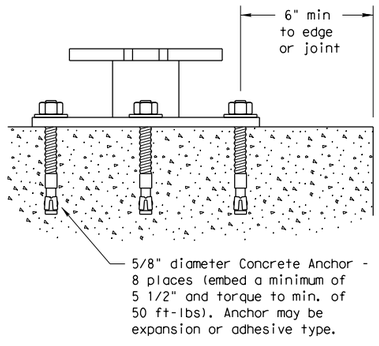
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

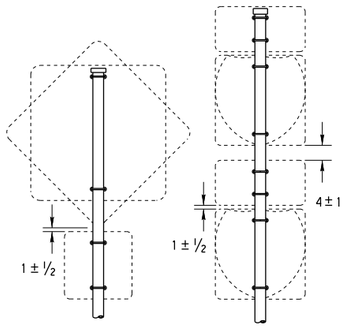
SMD(SLIP-1)-08

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

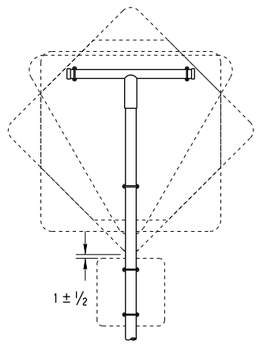
REVISIONS 9-08

CONT	SECT	JOB	HIGHWAY
0312	05	031,ETC.	FM 730

DIST	COUNTY	SHEET NO.
FTW	TARRANT	118



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



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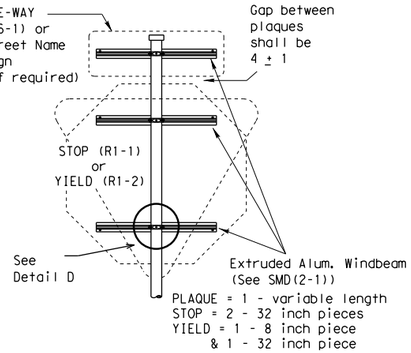
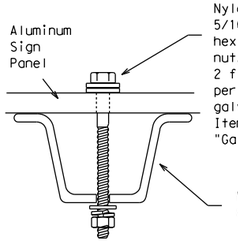
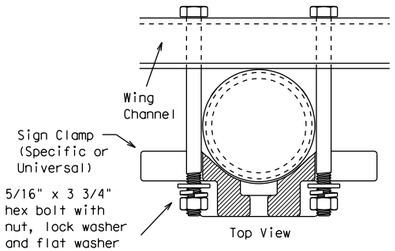


SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



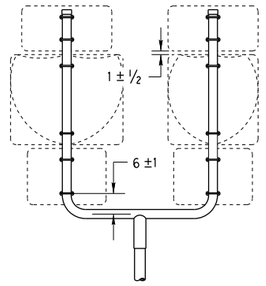
Top View

Detail A

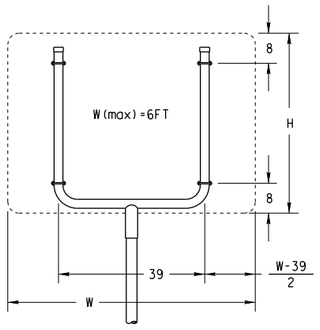


Top View

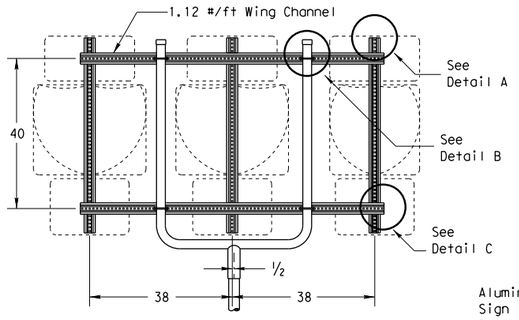
Detail B



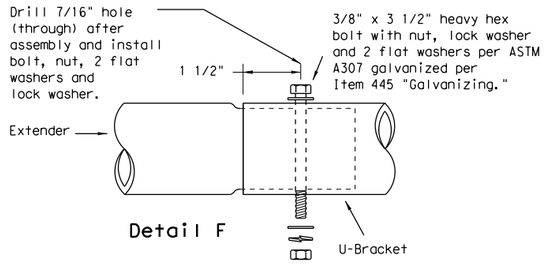
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

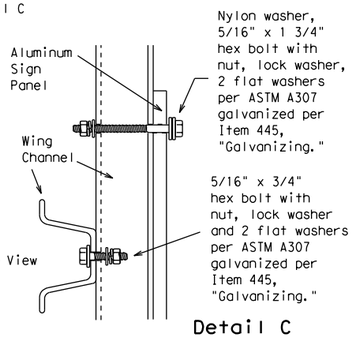


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

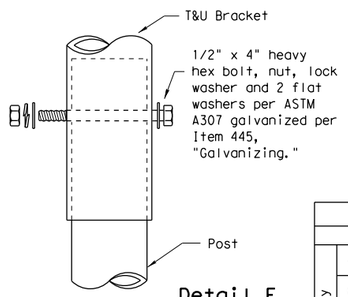


Detail F

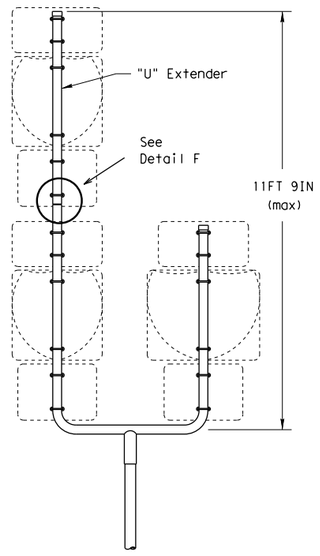
Splices shall only be allowed behind the sign substrate.



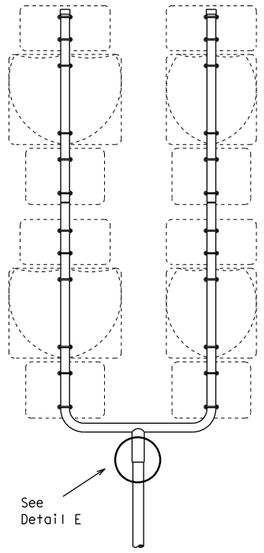
Detail C



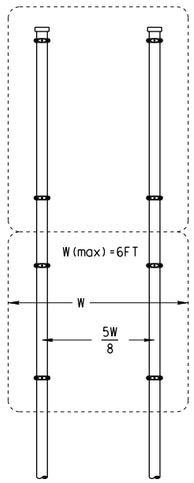
Detail E



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

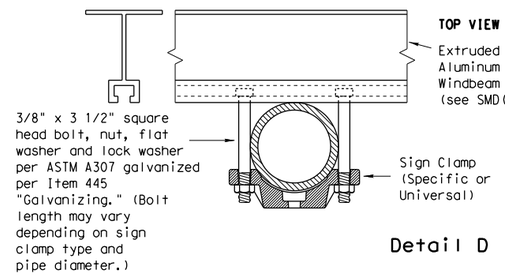


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

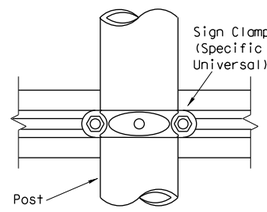


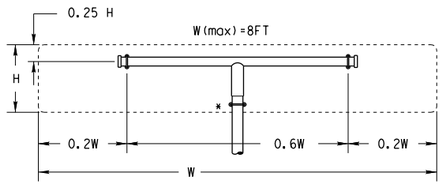
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

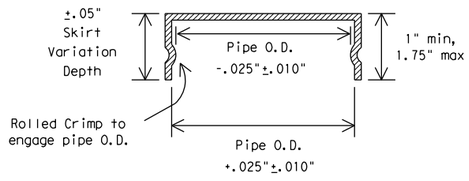




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



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

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

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

GENERAL NOTES:

1.

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

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

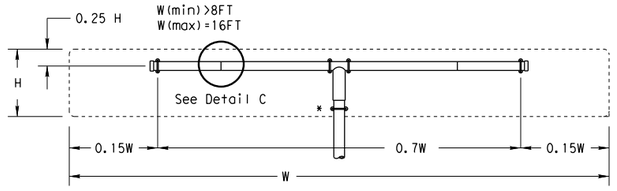
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

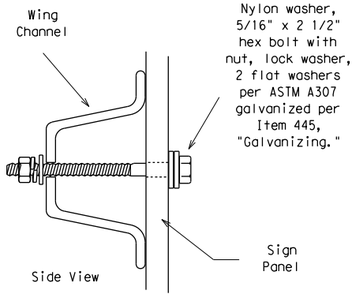
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0312	05	031,ETC.	FM 730

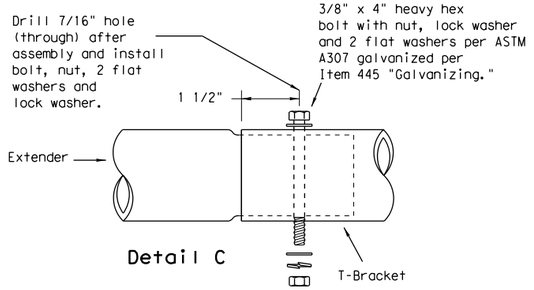
DIST	COUNTY	SHEET NO.
FTW	TARRANT	119



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



Detail B



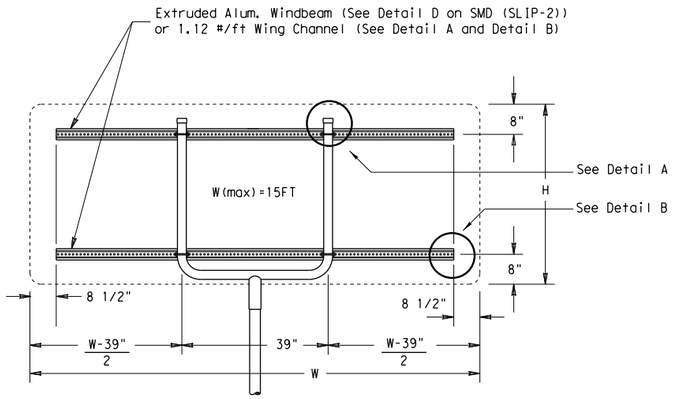
Detail C

Splices shall only be allowed behind the sign substrate.

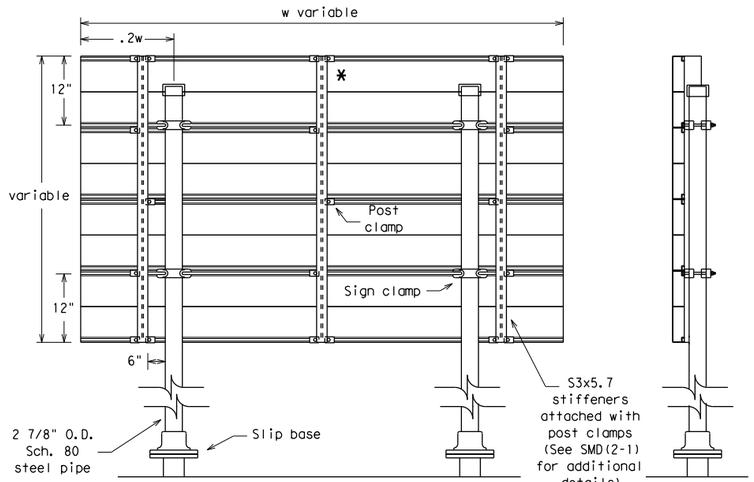
GENERAL NOTES:

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

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



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

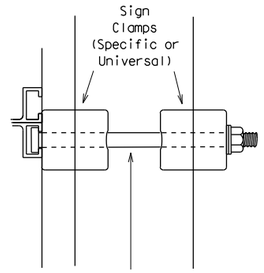


Typical Sign Mount

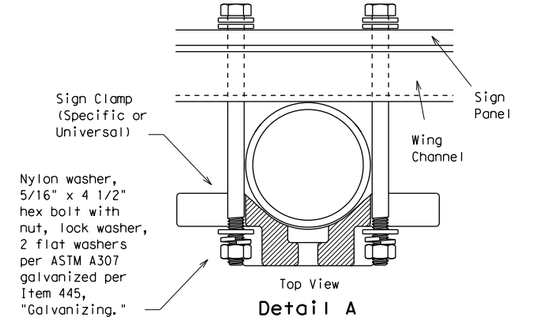
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

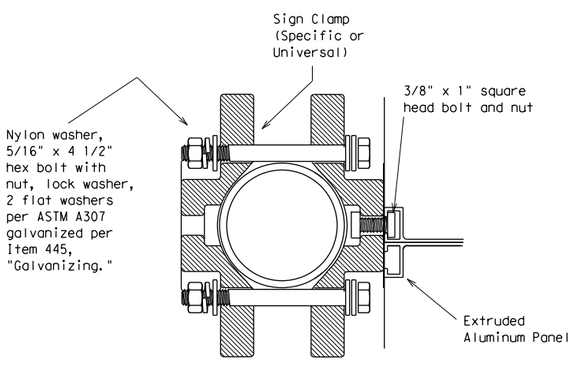
See Detail E
for clamp installation



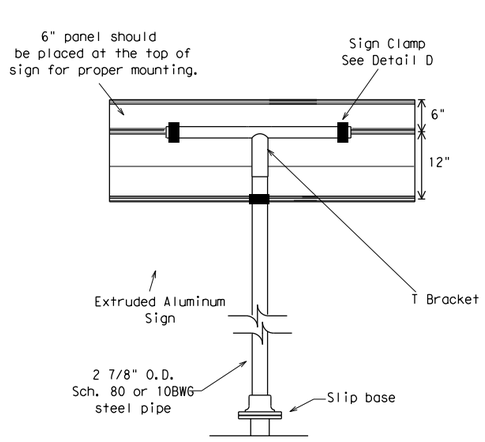
Detail E



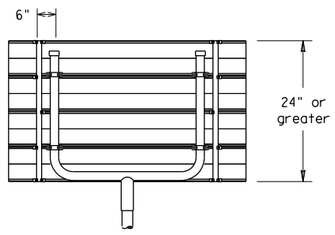
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

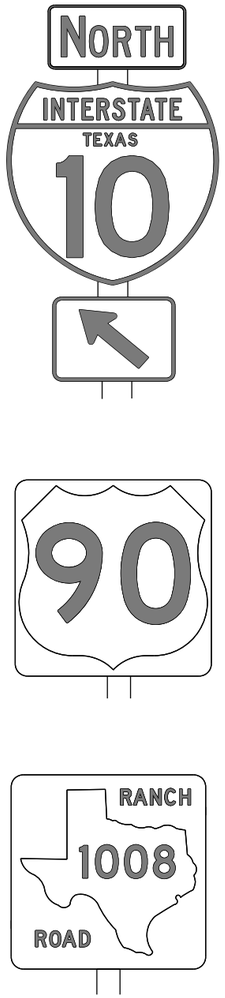
SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		120

DATE: 5/23/2023 8:10:17 AM
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\08. Traffic\Standards\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

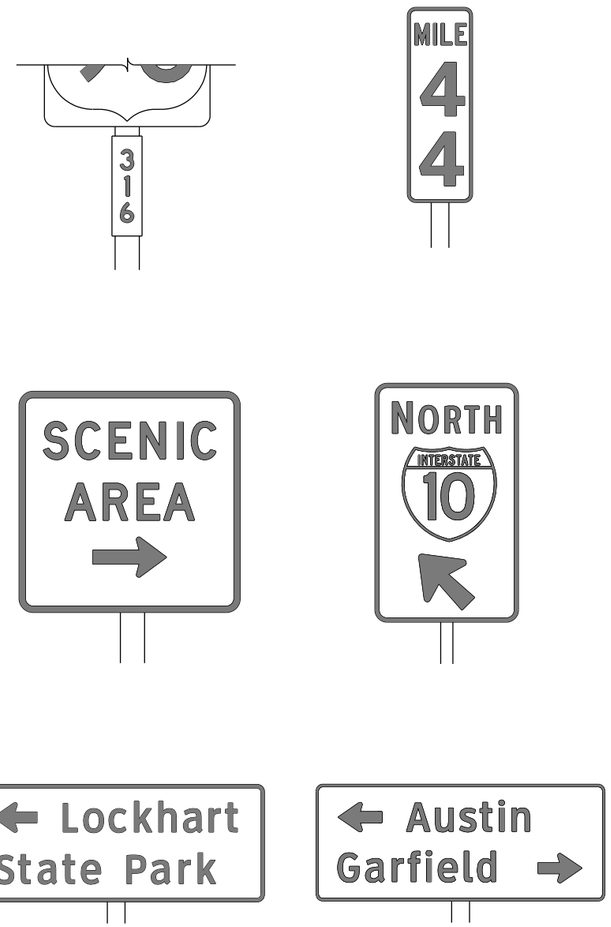
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	FTW	TARRANT		121

3

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0312-05-031, ETC

1.2 PROJECT LIMITS:
From: SH 199

To: WISE COUNTY LINE

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 32.9356833 ,(Long) -97.5435313

END: (Lat) 32.8997186 ,(Long) -97.5441999

1.4 TOTAL PROJECT AREA (Acres): 78.80

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.17

1.6 NATURE OF CONSTRUCTION ACTIVITY:
MILL, HMAC OVERLAY, MBGF, PAVEMENT MARKINGS

1.7 MAJOR SOIL TYPES:

Soil Type	Description
N/A	

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☒ Mobilization
☐ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☐ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☒ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☒ Install mow strip, MBGF, bridge rail
☐ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
☐ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☐ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☐ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☐ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
EAGLE MOUNTAIN RESERVOIR - 0809	CLASSIFIED
WALNUT CREEK - 0809A	UNCLASSIFIED
ASH CREEK (*) - 0809B	UNCLASSIFIED

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____
☐ Other: _____

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER

6/28/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			122
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0312	05	031,ETC.	FM 730

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STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- X ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- ☐ ☐ Permanent Planting, Sodding or Seeding
- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- X ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
N/A		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☐ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☐ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☐ Concrete and Materials Waste Management
- ☐ Debris and Trash Management
- ☐ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
N/A		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- X Fire hydrant flushings
- X Irrigation drainage
- X Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- X Potable water sources
- X Springs
- X Uncontaminated groundwater
- X Water used to wash vehicles or control dust
- X Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED PROFESSIONAL ENGINEER

6/28/2023

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			123
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0312	05	031,ETC.	FM 730

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DATE: 5/23/2023
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

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

During construction, efforts would be taken to avaid and minimize disturbance of vegetation and soils. Areas within the existing ROW, but outside the limits of construction, would not be disturbed. Every effort would be made to preserve trees where they would neither compromise safety nor substantially interfere wiht the proposed projects.

No landscaping would be a part of the proposed project activities. Re-vegetation of disturbed area would be in compliance with the Executive Memorandum on Beneficial Landscaping (26Apr94) and the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants would be used to the extent practicable in landscaping and re-vegetation.

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

☐ No Action Required ☒ Required Action

No disturbing, destroying, or removing active nests of Bald Eagles, including ground nesting birds, during the nesting season. Avoid the removal of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. No collecting, capturing, relocating or transporting birds, eggs, young or active nests without a permit. The Eagle Protection Act prohibits the taking or possesion of and commerce in eagles, parts, feathers, nests or eggs with limited exceptions. The definition of take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issued prior to the taking.

Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structure that would be affected by the proposed project, and complete any bridge work/demolition and/or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.

The contractor and/or TxDOT personnel would be advised of the potential for Whooping Cranes to occur within the project limits. Construction personnel would be advised to avoid adverse impacts to this species and to report any sightings to TxDOT District Environmental staff. Drainage modifications would be limited to the extent practical to accommodate the additional paved surface needed to bring the roadway up to current TxDOT safety standards. The construction personnel would report all sightings to TxDOT Fort Worth District Environmental staff. Reports should include the time, date and location and any available photos.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

STATE OF TEXAS
LAURA C. FULLER
92927
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

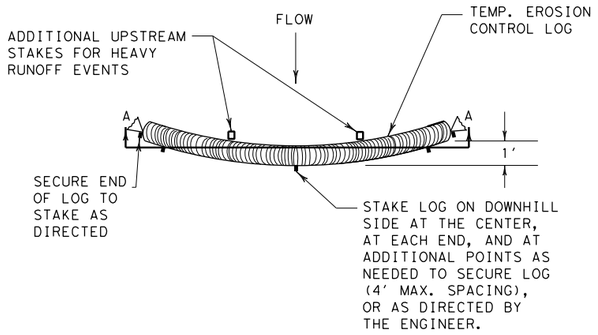
Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

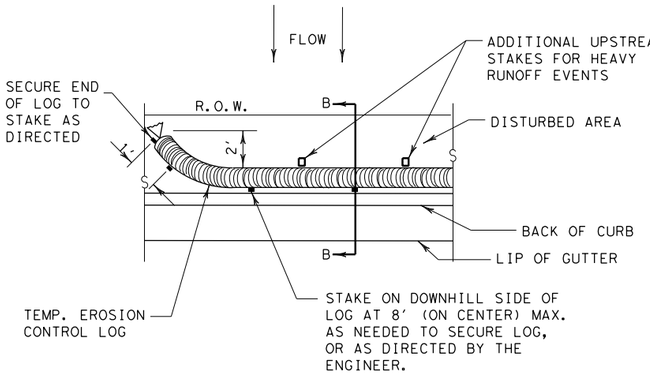
EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0312	05	031,ETC.	FM 730
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.	FTW	TARRANT		124

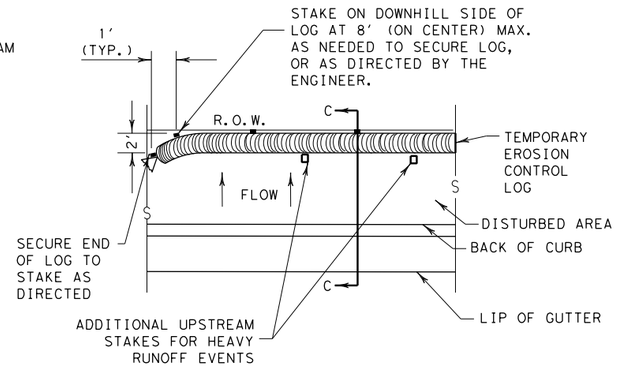
DATE: 5/23/2023
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\09. Environmental\Standards\ec916(1).dgn



PLAN VIEW



PLAN VIEW



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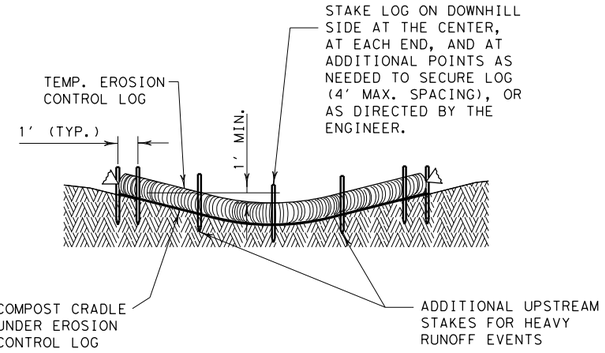
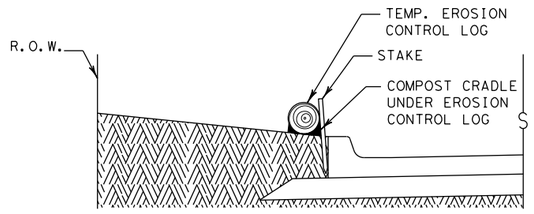


SECTION A-A

EROSION CONTROL LOG DAM

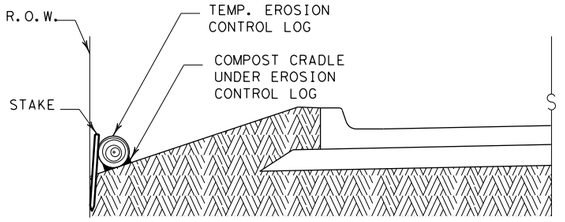
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

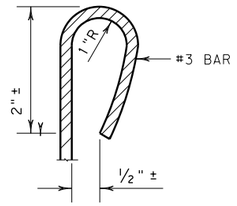
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



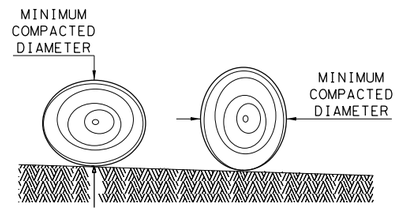
REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

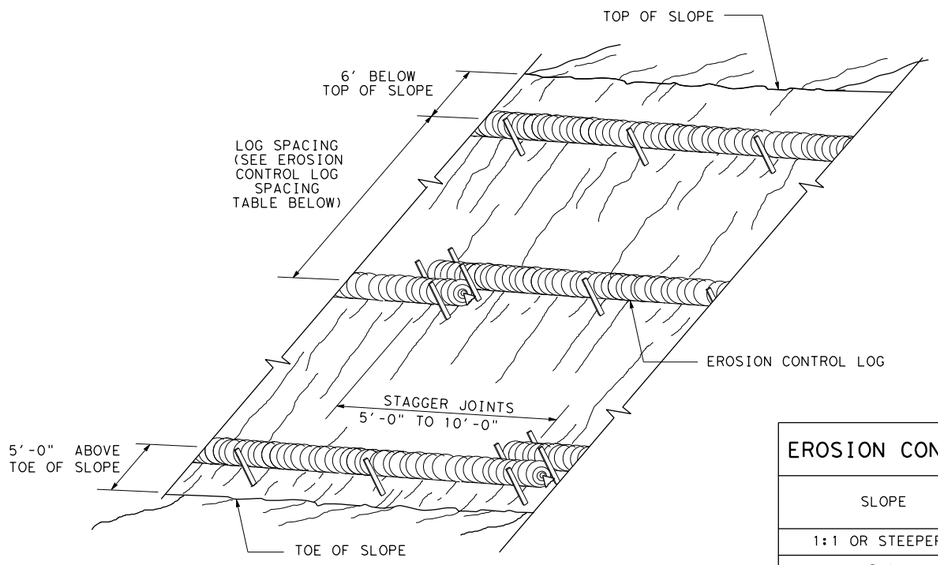
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

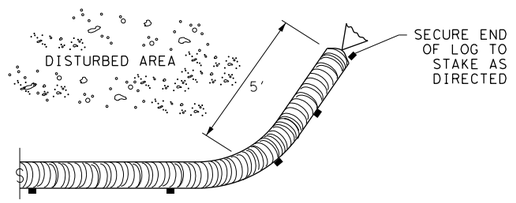
EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0312	05	031,ETC.		FM 730		
	DIST	COUNTY			SHEET NO.		
	FTW	TARRANT			125		



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

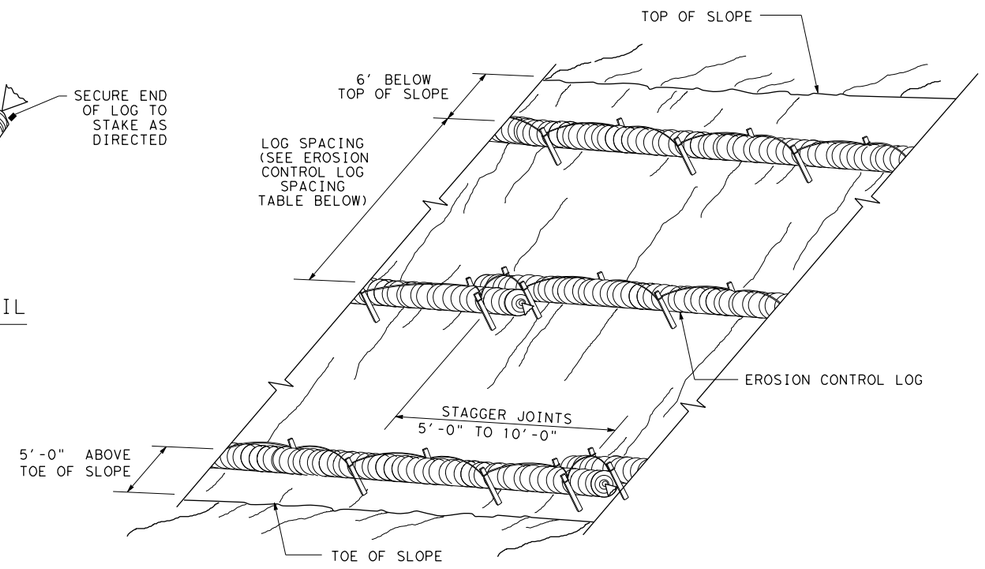
CL-SST



END SECTION RAP DETAIL

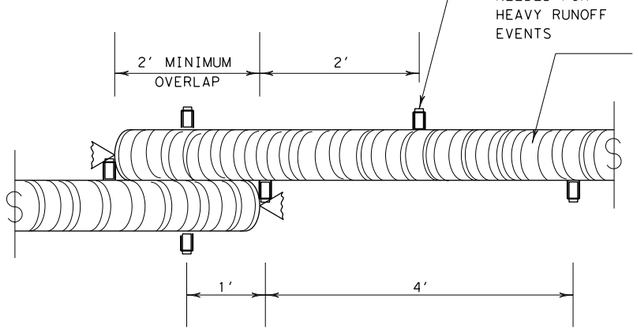
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

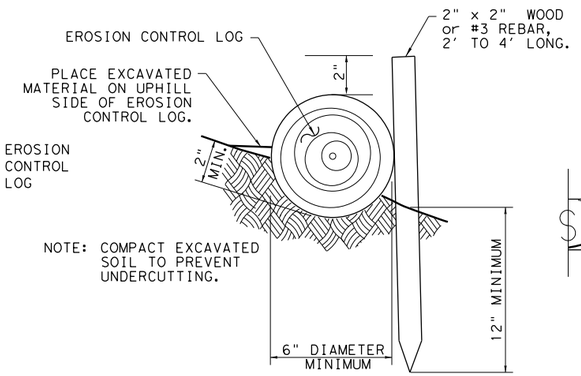
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

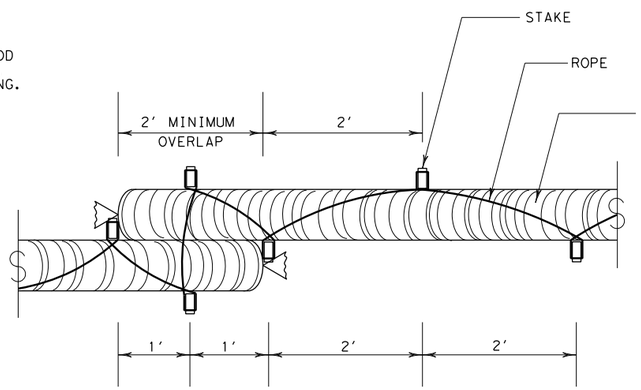


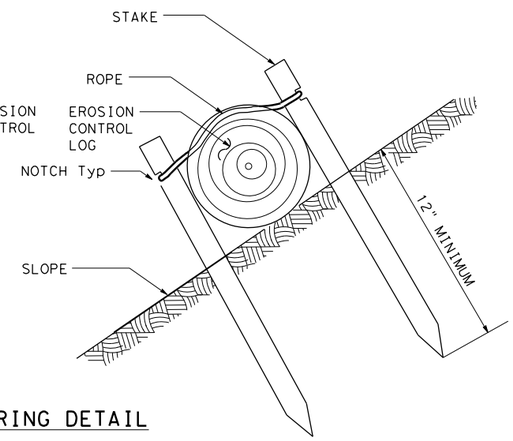


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

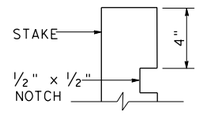
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0312	05	031,ETC.		FM 730	
	DIST		COUNTY			SHEET NO.
	FTW		TARRANT			126

DATE: 5/23/2023
FILE: H:\TXPROJ\TX2608-03\Dwg-FM730_031\DGN\02.Plan Set\09. Environmental\Standards\ec916(2).dgn

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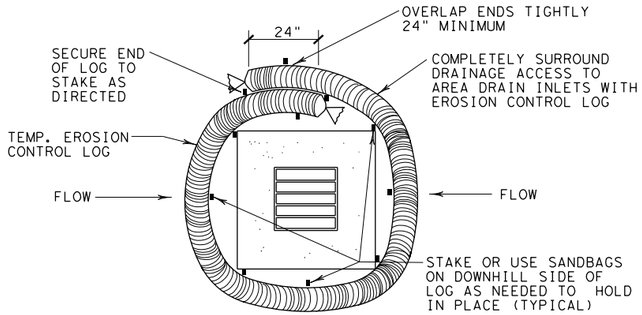
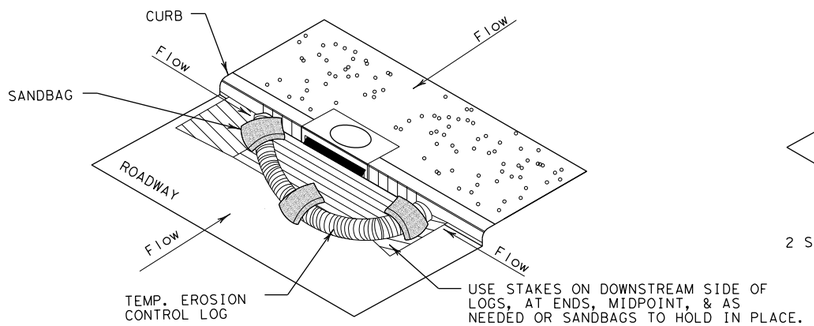


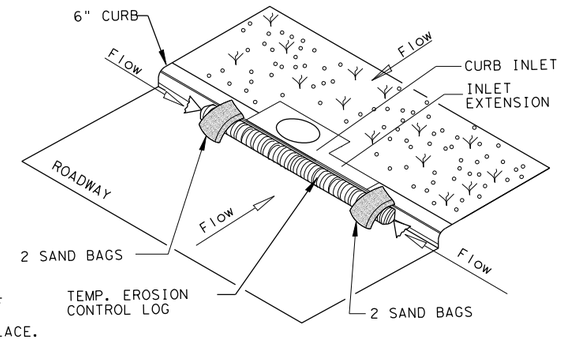
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

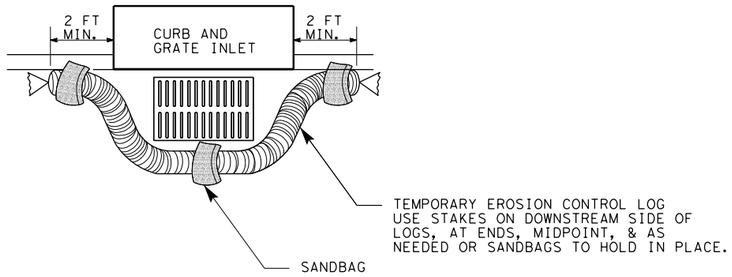
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

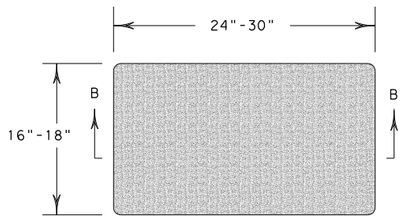
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0312	05	031,ETC.	FM 730
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		127